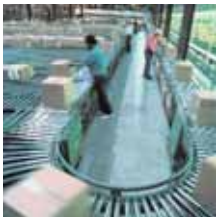
ACTUATORS

A vast array of actuators – from full-size to compact cylinders, grippers, slide tables, rodless cylinders, rotary actuators, switches and more – are available from this catalogue. For more information on a specific actuator or actuator series, simply go to the web address printed under the online icons at the bottom of the following actuator product pages.




Roundline cylinders

(including cylinders conforming to Standard ISO 6432)

RM/28000/M
ISO 6432
Ø 10 ... 25 mm

Page 1-008

RT/57100/M
Ø 8 ... 40 mm

Page 1-018

RM/55401/M
Ø 32 ... 100 mm

Page 1-028

RM/8000/M
ISO 6432
Ø 10 ... 25 mm

Page 1-012

RT/57200/M
Ø 8 ... 63 mm

Page 1-022

VSM/55600/N2
Hollow piston rod cylinders
Ø 25 & 40 mm

Page 1-032

Compact cylinders

(including cylinders conforming to Standards ISO 21287)

RM/91000/M
Ø 20 ... 63 mm

Page 1-037

RA/191000/MX, ../M
RA/193000/MX, ../M
ISO 21287
Ø 20 ... 63 mm

Page 1-046

M/50100
Ø 8 ... 63 mm

Page 1-034

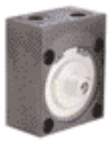
RM/92000
Ø 12 ... 100 mm

Page 1-040

RA/192000/MX, ../M
ISO 21287
Ø 20 ... 125 mm

Page 1-050

M/50200
Ø 8 ... 63 mm



Page 1-034

Single Acting

Double Acting

ACTUATORS

Profile cylinders Tie-rod cylinders

(all conforming to Standards
ISO 15552
ISO 6431
VDMA 24562
NFE 49 003-1)

PRA/181000/M
ISO, VDMA, NFE
Ø 32 ... 100 mm

Page 1-058

RA/28000/M
ISO, VDMA, NFE
Ø 32 ... 100 mm

Page 1-081

PRA/282000/M
Cylinder with integrated valve and position sensor
Ø 32 ... 100 mm

Page 1-076

PRA/182000, ../M
PRA/182000/L2, ../L4
ISO, VDMA, NFE
Ø 32 ... 125 mm

Page 1-062 & 1-067

RA/8000,../M
RA/8000/L2, ../L4
ISO, VDMA, NFE
Ø 32 ... 320 mm

Page 1-084 & 1-090

PSA/182000/F1
Cylinder with position sensor
Ø 40 ... 125 mm

Page 1-069

LINTRA® PLUS

Pneumatic rodless cylinders

M/146000, ../M
Internal guided
Ø 16 ... 80 mm

Page 1-100

M/146100, ../M
External guided
Ø 16 ... 80 mm

Page 1-100

M/146200, ../M
Precision roller guided
Ø 25 ... 63 mm

Page 1-100

Single Acting

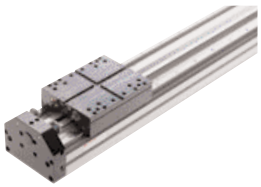
Double Acting

LINTRA®
Pneumatic rodless cylinders

M/44000/M ■
Compact cylinders
Ø 25 ... 40 mm

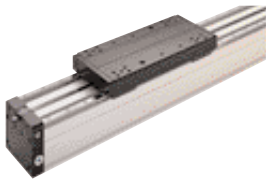
Page 1-118

M/46800/M, ../HM ■
Heavy duty cylinders
Ø 20 ... 40 mm



Page 1-122

M/46800/PM ■
Heavy duty pneumatic cylinders
Ø 16 ... 63 mm



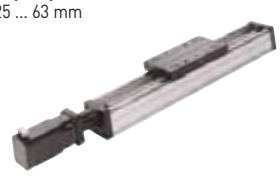
Page 1-126

LAP4, LAP8
Linear cylinders
Sizes 4 and 8

Page 1-132

LINTRA®
Spindle and toothed belt actuators

M/49800/P, /BS & /LS
Spindle
Heavy duty version
Ø 25 ... 63 mm



Page 1-158

M/48200/H
Toothed belt
Roller guided
Ø 25 ... 63 mm

Page 1-138

M/48800/P
Toothed belt
Heavy duty version
Ø 25 ... 63 mm

Page 1-144

LAE4, LAE8
Toothed belt
Sizes 4 and 8

Page 1-164

M/49000, M/49100, M/49200
Spindle
Internal guided, external guided and precision roller guided
Ø 25 ... 63 mm

Page 1-150

■ Double Acting

ACTUATORS

Cylinders with guiding and silde tables

M/60100/M
Slide units
Ø 10 ... 40 mm

Page 1-168

M/61000/M,../MR
Guiding and stopper cylinders
Ø 32 ... 100 mm

Page 1-172

M/61200/M,../MR
Slide tables
Ø 16 ... 32 mm

Page 1-178

Grippers

M/160300/M/11
M/160300/M/12
Angular grippers
Ø 8 ... 25 mm

Page 1-183

M/160340/M/11
M/160340/M/12
Parallel grippers
Ø 10 ... 25 mm

Page 1-188

M/160330/M/12
180° angular grippers
Ø 16 ... 20 mm

Page 1-186

M/160350/M/11
M/160350/M/12
Parallel grippers - precision
Ø 8 ... 50 mm

Page 1-191

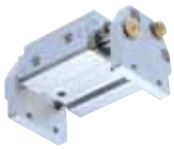
M/160360/M/12
Parallel grippers - low profile
Ø 8 & 12 mm

Page 1-196

M/160380/M/12
Parallel grippers - three jaw
Ø 16 & 20 mm

Page 1-198

M/160390/M/12
Parallel grippers - long stroke
Ø 12 ... 25 mm



Page 1-200

Single Acting

Double Acting

Rotary actuators

(including actuators conforming to Standards ISO 15552 – end cover dimensions)

M/60210/M
Miniature rotary actuators
0,23 ... 1,0 Nm/6 bar

Page 1-204

M/60270/M
Compact rotary actuators
1,5 ... 7,4 Nm/6 bar

Page 1-206

M/60280
Rotary vane actuator
0,2 ... 242 Nm/6 bar

Page 1-208

M/162000/MI
Rack & pinion type,
ISO 15552
7,2 ... 306 Nm/6 bar

Page 1-216

Corrision - resistant and stainless steel cylinders

Materials:
AISI 303
AISI 304
AISI 316

KM/8000/M
Stainless steel roundline cylinders,
ISO 6432
Ø 12 ... 25 mm

Page 1-260

KM/55001/M
Stainless steel roundline cylinders,
ISO 1552
Ø 32 ... 125 mm

Page 1-266

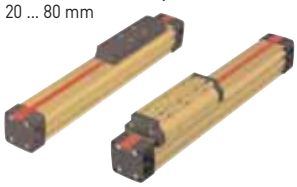
KA/8000, ../M
Stainless Steel,
ISO 15552, ISO 6431, VDMA 24562
and NFE 49-003-1
Ø 32 ... 200 mm

Page 1-272

PVA/182000, ../M
Corrision resistant
Smooth line cylinders
ISO 15552, ISO 6431, VDMA 24562
and NFE 49-003-1
Ø 32 ... 100 mm

Page 1-072

VM/146000, ../M,
VM/146100, ../M
Corrision resistant
LINTRA®PLUS rodless cylinders
Ø 20 ... 80 mm



Page 1-278

KM/31000
Stainless Steel,
Serviceable air bellows
Ø 8... 14 inch

Page 1-286

■ Single Acting
■ Double Acting

ACTUATORS

Special products

M/3000
Impact cylinder
Ø 2 ... 6 inch

Page 1-223

RM/900/.., ../M
Imperial cylinder
Ø 1 1/4 ... 14 inch

Page 1-226

M/1000
Heavy duty cylinder
Ø 2 ... 12 inch

Page 1-236

M/1525, M/1540
In line positioner
Ø 2 1/2 and 4 inch

Page 1-220

PM/31000
Compact air bellows
Ø 2 3/4... 12 inch

Page 1-246

M/31000
Serviceable air bellows
Ø 6 ... 26 inch

Page 1-254

M/55900
Air oil converter

Page 1-244

Single Acting

Double Acting

Switches
(Reed and solid state)

M/50 (Reed)
M/50/EA.. (Solid state)

Page 1-290

QM/32 (Reed)
QM/132 (Solid state)
TQM/31 (Reed)

Page 1-291

M/345 (Solid state)
M/346 (Reed & Solid state)
M/344 (Solid state)

Page 1-292

Inductive proximity switches

Page 1-293

RM/28000/M Roundline cylinders (ISO)

Single acting, ISO 6432 - Ø 10 ... 25 mm

- **Magnetic piston as standard**
- **Generally conforms to ISO 6432**
- **High strength, double crimped end cap design**
- **Corrosion resistant**
- **Nose mounting nut and piston rod locknut supplied as standard**

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Single acting (sprung in), magnetic piston, buffer cushioning

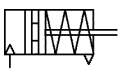
Operating pressure:
2 ... 10 bar

Operating temperature:
-10°C ... +80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Barrel: stainless steel (austenitic)
End covers: clear anodised aluminium alloy
Piston rod: stainless steel (austenitic)
Buffer: polyurethane
Seals: nitrile ruber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS	ACCESSORIES Reed switch with integral 5m cable	Switch mounting >15 mm stroke	Switch mounting <15 mm stroke	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
									
	10	4	M5	**RM/28010/M/***	M/50/LSU/5V	QM/33/010/22	QM/33/010/23	C0225**04**05	C0247**04**05
	12	6	M5	**RM/28012/M/***	M/50/LSU/5V	QM/33/012/22	QM/33/016/23	C0225**04**05	C0247**04**05
	16	6	M5	**RM/28016/M/***	M/50/LSU/5V	QM/33/016/22	QM/33/016/23	C0225**04**05	C0247**04**05
	20	8	G1/8	**RM/28020/M/***	M/50/LSU/5V	QM/33/020/22	QM/33/020/23	C0225**06**18	C0247**06**18
	25	10	G1/8	**RM/28025/M/***	M/50/LSU/5V	QM/33/025/22	QM/33/025/23	C0225**06**18	C0247**06**18

* Insert stroke length in mm.
Service kits are not available for these cylinders.

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	10	25	50
10	•	•	•
12	•	•	•
16	•	•	•
20	•	•	•
25	•	•	•

Theoretical forces

Cylinder Ø	Theoretical forces (N) at 6 bar Outstroke	F1
10	40,7	3,7
12	57,7	4,8
16	102	10,5
20	165	16,1
25	260	21,6

F1 = Return force of spring

For further information

www.norgren.com/info/en1-008

OPTIONS SELECTOR

RM/28★★★/★★/★★

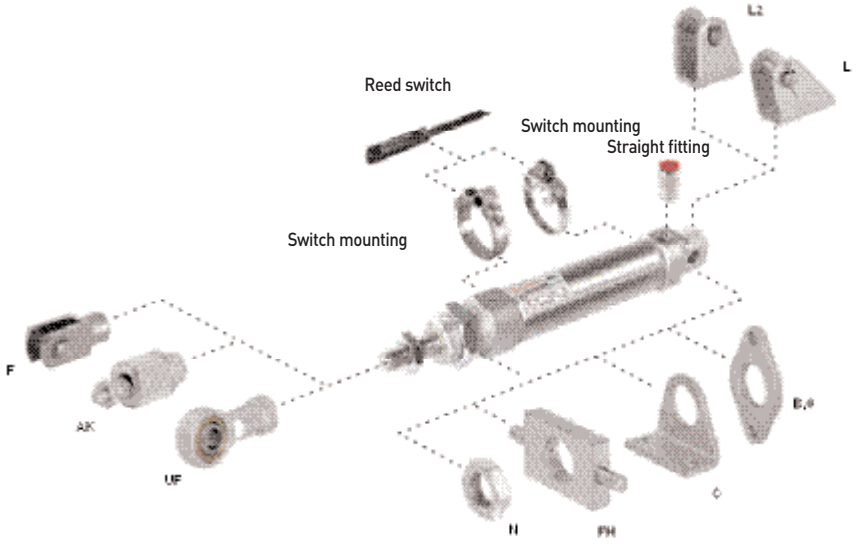
Cylinder Ø (mm)	Substitute
10	010
12	012
16	016
20	020
25	025

Stroke (mm)
max. 50

Variants (magnetic piston)	Substitute
Standard with integral eye mounting	M
Central rear port	MC
Flat rear cover	MF

Note: If option is not required, disregard option position within part number eg. RM/28025/M/50.
This options selector explains only the cylinder variants. Additional variants/options are not possible.
Information about variants see data sheet.

MOUNTINGS



Ø	AK	B, G	C	F	FH	L	L2	N	UF
10	QM/8010/38	M/P19407	M/P19369	QM/8010/25	–	QM/947	QM/8010/44	M/P1501/90	QM/8010/32
12	QM/8012/38	M/P19408	M/P19389	QM/8012/25	QM/8012/34	QM/8012/24	QM/8012/44	M/P13834	QM/8012/32
16	QM/8012/38	M/P19408	M/P19389	QM/8012/25	QM/8012/34	QM/8012/24	QM/8012/44	M/P13834	QM/8012/32
20	QM/8020/38	M/P19409	M/P19406	QM/8020/25	QM/8020/34	QM/8020/24	QM/8020/44	M/P13615	QM/8020/32
25	QM/8025/38	M/P19409	M/P19406	QM/8025/25	QM/8020/34	QM/8020/24	QM/8020/44	M/P13615	QM/8025/32

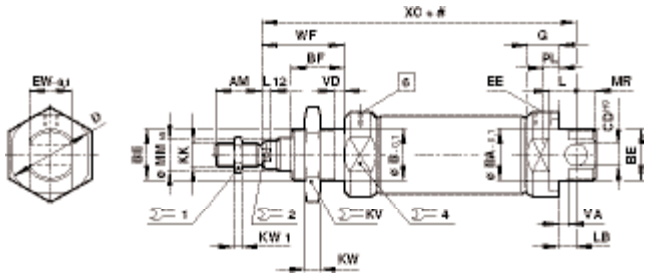
Dimensions of mountings see page 15

RM/28000/M Roundline cylinders (ISO)

Single acting, ISO 6432 - Ø 10 ... 25 mm

BASIC DIMENSIONS

RM/28000/M – Standard



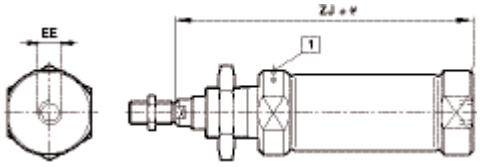
#	Stroke
1	Exhaust position, do not obstruct

MODELS	Ø	AM	Ø B/BA-0,1	BE	BF	Ø CD H9	Ø D	EE	EW-0,1	G	KK	Σ= KV	Σ= 1	KW	KW1
RM/28010/M/.	10	12	12	M12x1,25	12	4	16,5	M5	7,9	9	M4	19	7	6	2
RM/28012/M/.	12	16	16	M16x1,5	17	6	21	M5	11,9	9,5	M6	22	10	5	3
RM/28016/M/.	16	16	16	M16x1,5	17	6	21	M5	11,9	9,5	M6	22	10	5	3
RM/28020/M/.	20	20	22	M22x1,5	20	8	30	G1/8	15,9	15	M8	27	13	8	4
RM/28025/M/.	25	22	22	M22x1,5	22	8	30	G1/8	15,9	15	M10x1,25	27	17	8	5

MODELS	Ø	L	L12	LB	Ø MM h9	MR	PL	Σ= 2	Σ= 4	WF	VA/VD	XC	at 0 mm	per 25 mm
RM/28010/M/.	10	6	–	2	4	8	5,5	–	14	16	1,5	64	0,034 kg	0,007 kg
RM/28012/M/.	12	9	3	3	6	8	5,5	5	19	22	2	75	0,058 kg	0,011 kg
RM/28016/M/.	16	9	3	4	6	7	5,5	5	19	22	2	82	0,070 kg	0,012 kg
RM/28020/M/.	20	12	3	3	8	11	8	7	27	24	2	95	0,145 kg	0,018 kg
RM/28025/M/.	25	12	4	7	10	9	8	9	27	28	2	104	0,200 kg	0,028 kg

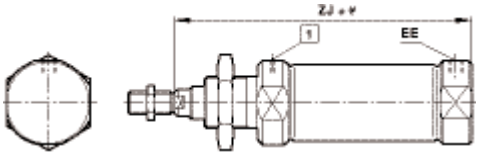
CYLINDER VARIANTS

RM/28000/MC – Cylinders with central rear port



MODELS	Ø	EE	ZJ	at 0 mm	per 25 mm
RM/28010/M.	10	M5	62	0,031 kg	0,007 kg
RM/28012/M.	12	M5	72	0,052 kg	0,011 kg
RM/28016/M.	16	M5	78	0,064 kg	0,012 kg
RM/28020/M.	20	G1/8	92	0,130 kg	0,018 kg
RM/28025/M.	25	G1/8	97	0,185 kg	0,028 kg

RM/28000/MF – Cylinders with flat rear cover



#	Stroke
1	Exhaust position, do not obstruct

“If you need to optimise cost, reduce your time to market or improve your system performance we can help”

Customers drive our business relationships

A powerful and strong brand needs foundations as strong as possible. And that’s why we’ve established clear values at the heart of our brand.

Our starting point is the needs and expectations of our customers. As pioneers we innovate continuously and explore new options with creativity. We strive to excel in all we do, aiming for the highest quality, particularly in activities with the greatest value potential. We encourage everyone to contribute, because every employee counts. And we act with integrity, testing every proposed action to see whether it is proper and reflects standards we can be proud of.

>>THE BOTTOM LINE since 1927

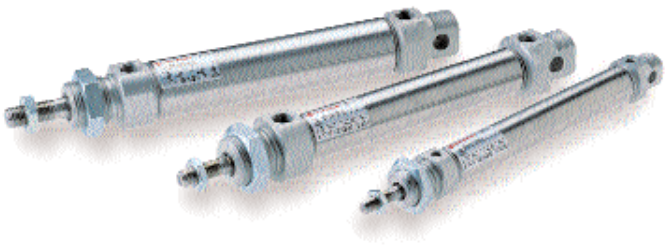
‘Customer needs and expectations’

We don’t focus on any solution at any cost; we focus on the right solution at the right cost. Thousands of customers with long standing relationships value the partnership they have with Norgren. They value our technical expertise, our heritage, our reputation and our commitment. No-compromise manufacturing techniques, ensures the customer receives a reliable product or solution produced to the highest quality standards.

Our diverse range of solutions for a wide variety of customers, support thousands of projects world wide - visit norgren.com

RM/8000/M Roundline cylinders (ISO)

Double acting, ISO 6432 - Ø 10 ... 25 mm



- Magnetic piston as standard
- Conforms to ISO 6432
- High strength, double crimped end cap design
- Corrosion resistant
- Buffer or adjustable cushioning
- Nose mounting nut and piston rod locknut supplied as standard

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting, magnetic piston with buffer or adjustable cushioning

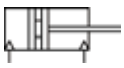
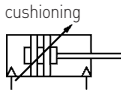
Operating pressure:
1 ... 10 bar

Operating temperature:
-10°C ... +80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Barrel: stainless steel (austenitic)
End covers: clear anodised aluminium alloy
Piston rod: stainless steel (austenitic)
Buffer: polyurethane
Wiper: polyurethane
Seals: nitrile ruber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Buffer cushioning	MODELS Adjustable cushioning	ACCESSORIES Reed switch with integral 5m cable	Switch mounting >15 mm stroke	Switch mounting <15 mm stroke	Banjo flow control (Tube diameter in bold)	Straight fitting	Elbow fitting
 Buffer cushioning	10	4	M5	**RM/8010/M/***		M/50/LSU/5V	QM/33/010/22	QM/33/010/23	C0K51**0**405	C0225**0**405	C0247**0**405
 Adjustable cushioning	12	6	M5	**RM/8012/M/***		M/50/LSU/5V	QM/33/012/22	QM/33/016/23	C0K51**0**405	C0225**0**405	C0247**0**405
	16	6	M5	**RM/8016/M/***	**RM/8017/M/***	M/50/LSU/5V	QM/33/016/22	QM/33/016/23	C0K51**0**405	C0225**0**405	C0247**0**405
	20	8	G1/8	**RM/8020/M/***	**RM/8021/M/***	M/50/LSU/5V	QM/33/020/22	QM/33/020/23	C0K51**0**618	C0225**0**618	C0247**0**618
	25	10	G1/8	**RM/8025/M/***	**RM/8026/M/***	M/50/LSU/5V	QM/33/025/22	QM/33/025/23	C0K51**0**618	C0225**0**618	C0247**0**618








*Insert stroke length in mm.
Service kits are not available for these cylinders.

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

(buffer cushioning) RM/8010, 12, 16, 20, 25

Ø	10	25	40	50	80	100	125	160	200	250
10	•	•	•	•	•	•				
12	•	•	•	•	•	•	•	•	•	
16	•	•	•	•	•	•	•	•	•	
20	•	•	•	•	•	•	•	•	•	•
25	•	•	•	•	•	•	•	•	•	•

Other strokes available

Standard strokes

(adjustable cushioning) RM/8017, 21, 26

Ø	25	50	80	100	125	160	200	250
16	•	•	•	•	•	•	•	
20	•	•	•	•	•	•	•	•
25	•	•	•	•	•	•	•	•

Other strokes available

For further information

www.norgren.com/info/en1-012

OPTIONS SELECTOR

★RM/8★★★/★★/★★★

Special variants	Substitute
High temperature version: 150°C max..	T

Cylinder Ø (mm) ith buffer	Substitute
10	010
12	012
16	016
20	020
25	025

Cylinder Ø (mm) with adjustable cushioning	Substitute
16	017
20	021
25	026

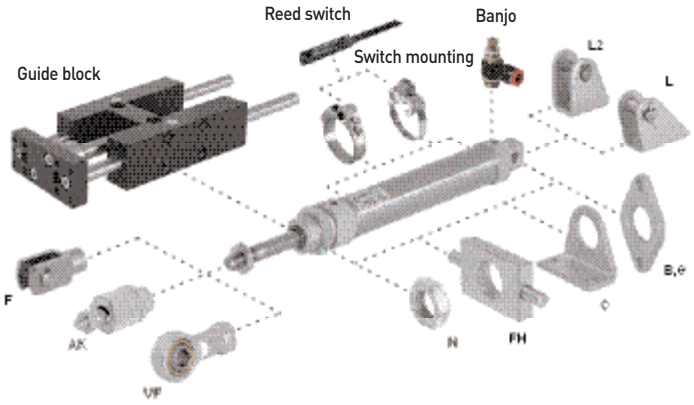
Stroke (mm)
max. 500

Variants (non-magnetic piston)	Substitute
Extended piston rod	IU
RM/8***/IU*/***/***	
→ Extension (mm)	

Variants (magnetic piston)	Substitute
Standard with integral eye mounting	M
Central rear port	MC
Flat rear cover	MF
Non-rotating piston rod	N2
Double ended piston rod	JM
Locking unit	L4
Extended piston rod	MU
RM/8***/MU/***/***	
→ Extension (mm)	

Note: If option is not required, disregard option position within part number eg. RM/8025/M/50. For combinations of cylinder variants consult our Technical Service. Please note that heat resistant seals are not available for all variants. This options selector explains only the cylinder variants. Additional variants/options are not possible. Information about variants see data sheet.

MOUNTINGS



Ø	AK	B, G	C	F	FH	L	L2
10	QM/8010/38	M/P19407	M/P19369	QM/8010/25	–	QM/947	QM/8010/44
12	QM/8012/38	M/P19408	M/P19389	QM/8012/25	QM/8012/34	QM/8012/24	QM/8012/44
16	QM/8012/38	M/P19408	M/P19389	QM/8012/25	QM/8012/34	QM/8012/24	QM/8012/44
20	QM/8020/38	M/P19409	M/P19406	QM/8020/25	QM/8020/34	QM/8020/24	QM/8020/44
25	QM/8025/38	M/P19409	M/P19406	QM/8025/25	QM/8020/34	QM/8020/24	QM/8020/44

Ø	N	UF	Guide block
10	M/P1501/90	QM/8010/32	–
12	M/P13834	QM/8012/32	QM/8012/61/*
16	M/P13834	QM/8012/32	QM/8012/61/*
20	M/P13615	QM/8020/32	QM/8020/61/*
25	M/P13615	QM/8025/32	QM/8025/61/*

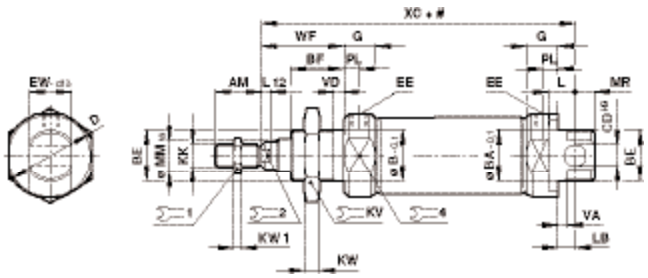
* Insert standard stroke length: Ø 12 mm: 50, 100, 160, 200 and 250 mm; Ø 16 ... 25 mm: 50, 100, 160, 200, 250, 320, 400 and 500 mm.
Other stroke lengths are not available, use nearest standard stroke.

RM/8000/M Roundline cylinders (ISO)

Double acting, ISO 6432 - Ø 10 ... 25 mm

BASIC DIMENSIONS

RM/8000/M – Standard



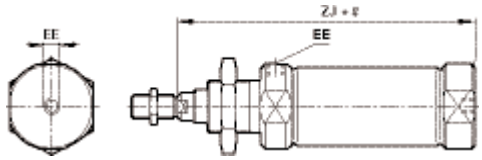
\# Stroke

MODELS	Ø	AM	Ø B/BA-0,1	BE	BF	Ø CD H9	Ø D	EE	EW-0,1	G	KK	KV	1	KW	KW1
RM/8010/M/.	10	12	12	M12x1,25	12	4	16,5	M5	7,9	9	M4	19	7	6	2
RM/8012/M/.	12	16	16	M16x1,5	17	6	21	M5	11,9	9,5	M6	22	10	5	3
RM/8016/M/.	16	16	16	M16x1,5	17	6	21	M5	11,9	9,5	M6	22	10	5	3
RM/8020/M/.	20	20	22	M22x1,5	20	8	30	G1/8	15,9	15	M8	27	13	8	4
RM/8025/M/.	25	22	22	M22x1,5	22	8	30	G1/8	15,9	15	M10x1,25	27	17	8	5

MODELS	Ø	L	L12	LB	Ø MM h9	MR	PL	2	4	WF	VA/VD	XC	at 0 mm	per 25 mm
RM/8010/M/.	10	6	–	2	4	8	5,5	–	14	16	1,5	64	0,034 kg	0,007 kg
RM/8012/M/.	12	9	3	3	6	8	5,5	5	19	22	2	75	0,058 kg	0,011 kg
RM/8016/M/.	16	9	3	4	6	7	5,5	5	19	22	2	82	0,070 kg	0,012 kg
RM/8020/M/.	20	12	3	3	8	11	8	7	27	24	2	95	0,145 kg	0,018 kg
RM/8025/M/.	25	12	4	7	10	9	8	9	27	28	2	104	0,200 kg	0,028 kg

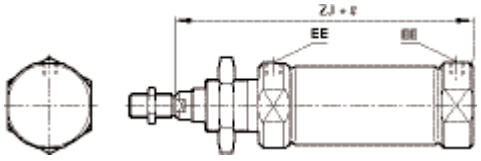
CYLINDER VARIANTS

RM/8000/MC – Cylinder with central rear port



MODELS	Ø	EE	ZJ	at 0 mm	per 25 mm
RM/8010/M/.	10	M5	62	0,031 kg	0,007 kg
RM/8012/M/.	12	M5	72	0,052 kg	0,011 kg
RM/8016/M/.	16	M5	78	0,064 kg	0,012 kg
RM/8020/M/.	20	G1/8	92	0,130 kg	0,018 kg
RM/8025/M/.	25	G1/8	97	0,185 kg	0,028 kg

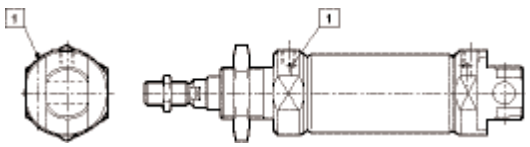
RM/8000/MF – Cylinder with flat rear cover



\# Stroke

RM/8017/M, RM/8021/M, RM/8026/M – Cylinder with adjustable cushioning

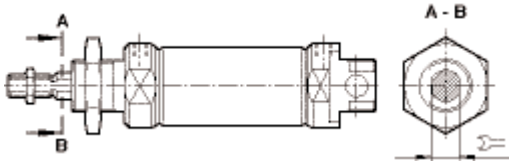
MODELS	Ø	at 0 mm	per 25 mm
RM/8017/M/.	16	0,070 kg	0,012 kg
RM/8021/M/.	20	0,145 kg	0,018 kg
RM/8026/M/.	25	0,195 kg	0,028 kg



1 Cushion screw

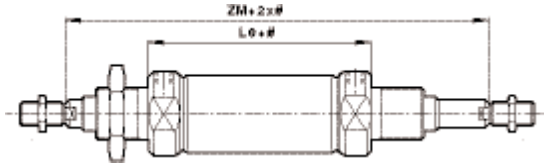
RM/8000/N2 – Cylinder with non-rotating piston rod

MODELS	Ø		Torque max.	at 0 mm	per 25 mm
RM/8012/N2/.	12	5	0,04 Nm	0,058 kg	0,011 kg
RM/8016/N2/.	16	5	0,04 Nm	0,070 kg	0,012 kg
RM/8020/N2/.	20	6	0,15 Nm	0,145 kg	0,018 kg
RM/8025/N2/.	25	8	0,25 Nm	0,200 kg	0,028 kg



RM/8000/JM – Cylinder with double ended piston rod

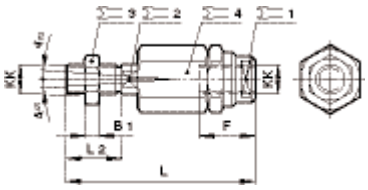
MODELS	Ø	L8	ZM	at 0 mm	per 25 mm
RM/8016/JM/.	16	56	100	0,080 kg	0,017 kg
RM/8020/JM/.	20	68	116	0,165kg	0,028 kg
RM/8025/JM/.	25	69	125	0,250 kg	0,043 kg



\# Stroke

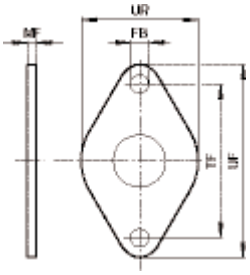
MOUNTINGS - For RM/28000/M & RM/8000/M

Piston rod swivel - AK, ISO 8139



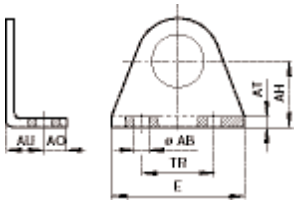
MODELS	Ø	KK	B1	F	L	L2	Σ 1	Σ 2	Σ 3	Σ 4	kg
QM/8010/38	10	M 4	2	12,5	33	8	11	3,2	7	11	0,01
QM/8012/38	12/16	M 6	3	14	39	12	7	5	10	13	0,02
QM/8020/38	20	M 8	4	18	55	16	10	7	13	17	0,05
QM/8025/38	25	M 10x1,25	5	26	73	20	19	12	17	30	0,20

Front or rear flange - B & G



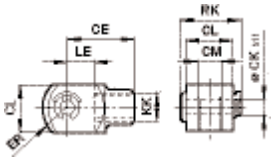
MODELS	Ø	Ø FB	MF	TF	UF	UR	kg
M/P19407	10	4,5	3	30	40	22	0,02
M/P19408	12/16	5,5	4	40	51	28	0,03
M/P19409	20/25	6,6	5	50	63	38	0,05

Foot - C, ISO 6432



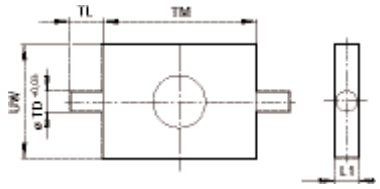
MODELS	Ø	Ø AB	AH	AO	AT	AU	E	TR	kg
M/P19369	10	4,5	16	6	2	10	35	25	0,02
M/P19389	12/16	5,5	20	6	3	13	43	32	0,03
M/P19406	20/25	6,6	25	7,5	4	16	53	40	0,06

Piston rod clevis - F, ISO 8140



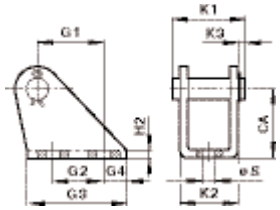
MODELS	Ø	KK	CE	Ø CK$_{h11}$	CL	CM	ER	LE	RK	kg
QM/8010/25	10	M4	16	4	8	4	6,5	8	11,5	0,01
QM/8012/25	12/16	M6	24	6	12	6	9,5	12	17,5	0,02
QM/8020/25	20	M8	32	8	16	8	13	16	22	0,06
QM/8025/25	25	M10 x1,25	40	10	20	10	16	20	28	0,10

Front or rear detachable trunnion - FH



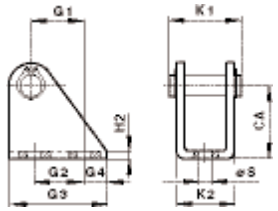
MODELS	Ø	L1	Ø TD$^{+0,03}$	TL	TM	UW	kg
QM/8012/34	12/16	8	6	10	38	25	0,05
QM/8020/34	20/25	8	6	10	46	30	0,07

Rear hinge - L



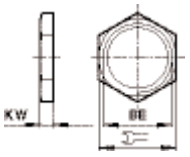
MODELS	Ø	CA	G1	G2	G3	G4	H2	K1	K2	K3	Ø S	kg
QM/947	10	12	6,5	–	15	6	1	13,5	10,5	2	4,8	0,01
QM/8012/24	12/16	20	18,5	15	30	8	1,5	20	15	3	5,5	0,02
QM/8020/24	20/25	25	20	15	35	10	2	25	20,5	3	6,6	0,04

Rear hinge - L2



MODELS	Ø	CA	G1	G2	G3	G4	H2	K1	K2	Ø S	kg
QM/8010/44	10	24	11	12,5	20	4	2,5	17,5	13	4,5	0,018
QM/8012/44	12/16	27	13	15	25	5	3	23	18	5,5	0,035
QM/8020/44	20/25	30	16	20	32	6	4	29,5	24	6,6	0,077

Nose nut - N

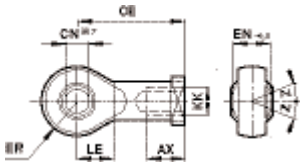


MODELS	Ø	BE	Σ	KW	kg
M/P1501/90	10	M12x1,25	19	6	0,01
M/P13834	12/16	M16x1,5	22	5	0,01
M/P13615	20/25	M22x1,5	27	8	0,02

RM/8000/M Roundline cylinders (ISO)

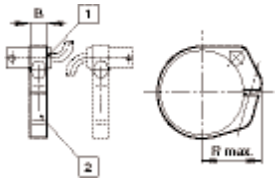
Double acting, ISO 6432 - Ø 10 ... 25 mm

Universal piston rod eye - UF



MODELS	Ø	KK	AX	CE	Ø CN H7	EN -0,1	ER	LE	Z	kg
QM/8010/32	10	M4	14	27	5	8	8	10	5°	0,02
QM/8012/32	12/16	M6	14	30	6	9	9	11	5°	0,02
QM/8020/32	20	M8	16	36	8	12	11	13	5°	0,05
QM/8025/32	25	M10x1,25	25	42	10	14	14	15	5°	0,08

Brackets > 15 mm stroke

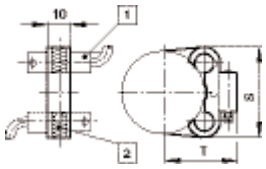


1 Magnetically operated switch

2 Switch mounting bracket

MODELS	Ø	B	R max.	kg
QM/33/010/22	10	8	16	0,01
QM/33/012/22	12	8	18	0,01
QM/33/016/22	16	10	20	0,01
QM/33/020/22	20	10	22	0,01
QM/33/025/22	25	10	24	0,01

Brackets < 15 mm stroke

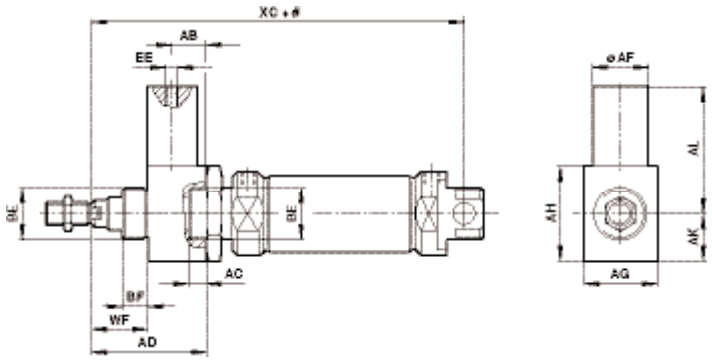


1 Magnetically operated switch

2 Switch mounting bracket

MODELS	Ø	S	T	kg
QM/33/010/23	10	27,5	19,5	0,01
QM/33/016/23	12	28,5	21,5	0,01
QM/33/016/23	16	29,5	23,5	0,01
QM/33/020/23	20	29,5	26	0,01
QM/33/025/23	25	31,5	28,5	0,01

RM/8000/L4 – Cylinder with locking unit

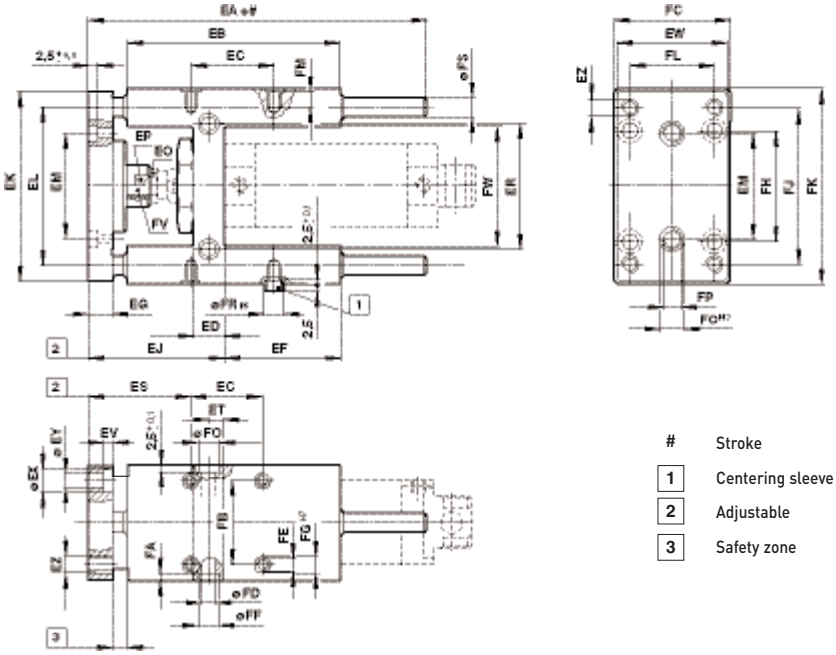


\# Stroke

MODELS	Ø	AB	AC	AD	Ø AF	AG	AH	AL	AK
RM/8012/L4/.	12	21	13	48,5	20	20	20	43,5	10
RM/8016/L4/.	16	21	13	48,5	20	20	20	43,5	10
RM/8020/L4/.	20	24	14	66	22	27	33	45,5	16,5
RM/8025/L4/.	25	24	14	65	22	27	33	45,5	16,5

MODELS	Ø	BE	BF	EE	WF	XC	Locking forces	at 0 mm	per 25 mm
RM/8012/L4/.	12	M16x1,5	12	M5	18,5	109	200 N	0,130 kg	0,011 kg
RM/8016/L4/.	16	M16x1,5	12	M5	18,5	116	200 N	0,140 kg	0,012 kg
RM/8020/L4/.	20	M22x1,5	23	M5	31	145	350 N	0,300 kg	0,018 kg
RM/8025/L4/.	25	M22x1,5	23	M5	30	151,5	400 N	0,360 kg	0,028 kg

BASIC DIMENSIONS
QM/8000/61/*



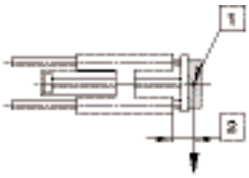
MODELS	Ø	EA	EB	EC	ED	EF	EG	EJ	EK	EL	EM	EO	EP	ER	ES	ET	EV	EW	Ø EX	Ø EY	EZ
QM/8012/61	12/16	132	75	32,5	16,5	37	10	76	63	46	24	10	8	24	65	6,5	4,6	27	8	4,5	M4
QM/8020/61	20	160	108	32,5	19	58	12	90	76	58	38	13	13	38	75	8,5	5,7	32	10	5,5	M5
QM/8025/61	25	160	108	32,5	19	58	12	90	76	58	38	17	13	38	75	8,5	5,7	32	10	5,5	M5

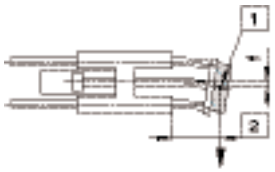
MODELS	FA	FB	FC	Ø FD	FE	FF	Ø FG H7	FH	FJ	FK	FL	FM	Ø FO H7	FP	Ø FR f6	ØFS	FV	FW	kg at 0 mm	kg per 100 mm
QM/8012/61	6	22	30	5,5	M 4	9	6	32	54	65	15	10	9	M 5	6	8	M 6	27	0,40	0,04
QM/8020/61	7	23	34	6,6	M 6	11	9	40	68	79	20	14	9	M 6	9	10	M 8	37	0,65	0,06
QM/8025/61	7	23	34	6,6	M 6	11	9	40	68	79	20	14	9	M 6	9	10	M 10 x 1,25	37	0,65	0,06

Note: supplied complete with cylinder mounting screws and two centering sleeves

Maximum load

In the case of shock load applications, the figures given in the diagrams above must be reduced by a factor of 2.





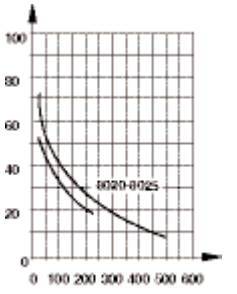
1 Centre of gravity
2 Outstroke

Maximum load capacity is dependent on the outstroke of a horizontally installed guide unit. In the case of short stroke operation, the load capacity figures taken from the diagram must be multiplied by the correction factor (diagram 2). In the load capacity graph (diagram 1), the short stroke corrections have already been taken into account for an outstroke → 60 mm

The total deflection of guide rods will be determined by the addition of that due to own weight (diagram 3) and that due to load capacity (diagram 4).

Maximum load capacity depending on outstroke(diagram 1)

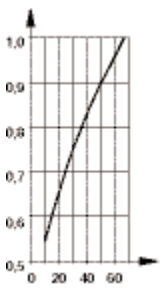
Load capicity (N)



Outstroke (mm)

(diagram 2)

Correction factor

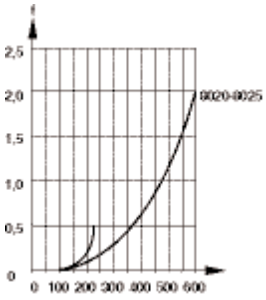


Stroke (mm)

Reduction of load capacity for short stroke operation

Deflection caused by own weight (diagram 3)

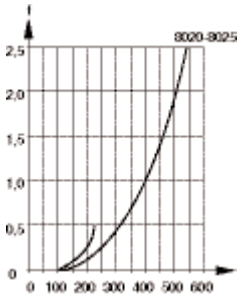
Deflection (mm)



Outstroke (mm)

Deflection caused by a load of 10 N (diagram 4)

Deflection (mm)



Outstroke (mm)

RT/57100/M Roundline cylinders

Single acting - Ø 8 ... 40 mm

One fifth shorter than the basic length of a corresponding ISO/VDMA cylinder

Low friction, long life seals

High strength, double crimped end cap design

Standard magnetic piston for full control system versatility

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Single acting, sprung in

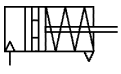
Operating pressure:
2 ... 10 bar

Operating temperature:
+80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Piston rod: stainless steel (cylinder Ø 8 ... 16 mm martensitic, cylinder Ø 20 ... 40 mm austenitic)
Barrel: stainless steel (austenitic)
End covers: aluminium
Wiper: polyurethane
Seals and 'O'-rings: nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS	ACCESSORIES Reed switch with integral 5m cable	Switch mounting	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
								
	8	3	M3	**RT/57108/M/***	-	-	M0225**03**03	M0247**03**03
	10	4	M5	**RT/57110/M/***	M/50/LSU/5V	QM/33/010/22	C0225**04**05	C0247**04**05
	16	6	M5	**RT/57116/M/***	M/50/LSU/5V	QM/33/016/22	C0225**04**05	C0247**04**05
	20	8	Rc 1/8	**RT/57120/M/***	M/50/LSU/5V	QM/33/020/22	C0125**06**18	C0147**06**18
	25	10	Rc 1/8	**RT/57125/M/***	M/50/LSU/5V	QM/33/025/22	C0125**06**18	C0147**06**18
	32	12	Rc 1/8	**RT/57132/M/***	M/50/LSU/5V	QM/33/032/22	C0125**06**18	C0147**06**18
	40	14	Rc 1/8	**RT/57140/M/***	M/50/LSU/5V	QM/33/040/22	C0125**06**18	C0147**06**18

*Insert stroke length in mm.
Service kits are not available for these cylinders.

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	10	25	50
8	•	•	•
10	•	•	•
16	•	•	•
20	•	•	•
25	•	•	•
32		•	•
40		•	•

Theoretical forces

MODELS Cylinder Ø	Theoretical forces (N) at 6 bar instroke	F 1
8	22,7	3,6
10	38,2	4,6
12	56,2	6,1
16	101	10,5
20	161	14,5
25	264	20
32	432	32
40	687	44

F1 = Return force of spring

For further information

www.norgren.com/info/en1-018

OPTIONS SELECTOR

R★/57★★★/★★/★★

Cylinder Ø (mm)	Ports	Substitute
8	M3	T
10	M5	T
12	M5	T
16	M5	T
20	Rc1/8	T
20	M6	M
25	Rc1/8	T
25	M6	M
32	Rc1/8	T
32	G1/8	M
40	Rc1/8	T
40	G1/8	M

Spring postion	Substitute
Sprung in	1
Sprung out	3

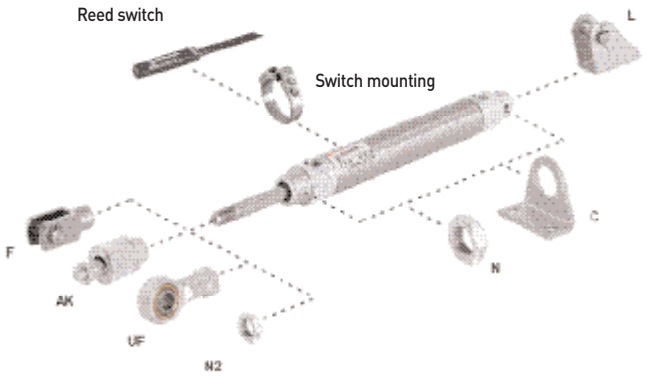
Stroke (mm)
50 max.

Cylinder variants	Substitute
Magnetic piston	M
Magnetic piston and central rear port	MC

Cylinder Ø (mm)	Substitute
8	08
10	10
12	12
16	16
20	20
25	25
32	32
40	40

Note: If option is not required, disregard option position within part number eg. RT/57025/M/50. For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants.
Additional variants/options are not possible.
Information about variants see data sheet.

MOUNTINGS



Ø	AK	C	F	L	N	N2	UF
8	-	M/P71273/1	QM/57008/25	QM/57008/24	M/P71364	M/P1500/111	-
10	QM/8010/38	M/P71273/2	QM/8010/25	QM/947	M/P71364	M/P1501/80	QM/8010/32
12	QM/8010/38	M/P71273/2	QM/8010/25	QM/947	M/P71364	M/P1501/80	QM/8010/32
16	QM/8012/38	M/P19369	QM/57016/25	QM/946	M/P1501/90	M/P1501/79	QM/8012/32
20	QM/8020/38	M/P19389	QM/57020/25	QM/8012/24	M/P13834	M/P1501/60	QM/8020/32
25	QM/8025/38	M/P40381	QM/57025/25	QM/57025/24	M/P13607	M/P1501/89	QM/8025/32
32	QM/8025/38	M/P19406	QM/57032/25	QM/8020/24	M/P13615	M/P1501/89	QM/8025/32
40	QM/8040/38	M/P71273/3	QM/57040/25	QM/57040/24	M/P29254	M/P1501/90	QM/8040/32

Dimensions of mountings see page 26

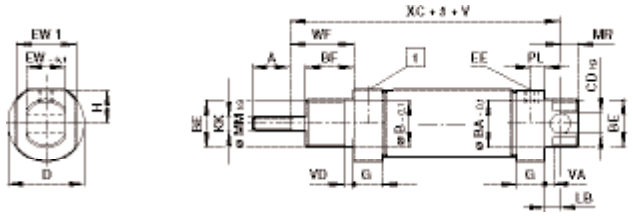
RT/57100/M Roundline cylinders

Single acting - Ø 8 ... 40 mm

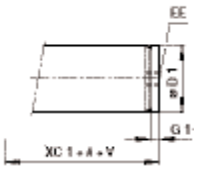
BASIC DIMENSIONS

Ø 8 ... 12 mm

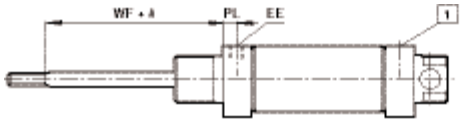
R./571../M



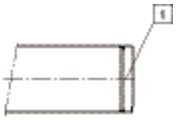
R./571../MC



R./573../M

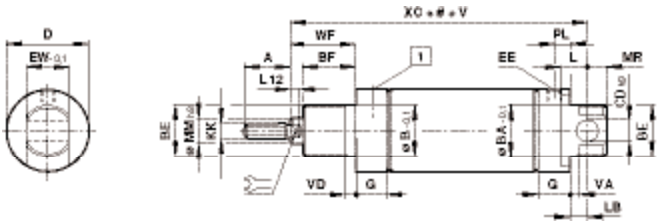


R./573../MC

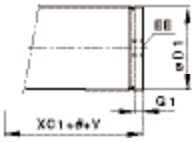


Ø 16 ...40 mm

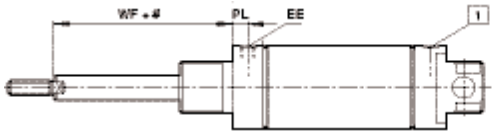
R./571../M



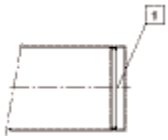
R./571../MC



R./573../M



R./573../MC



\# Stroke

[1] Filtered exhaust position, do not obstruct

MODELS	Ø	A	Ø B-0,1/ Ø BA-0,1	BE	BF	Ø CDh9	Ø D	Ø D1	EE RT/57...	EE RM/57...	EW-0,1	EW1	G	G1	H	KK
RT/57.08/M	8	8	10	M10 x 1	7,5	3	12	9,5	M3	–	6	10	7,5	3	5	M3
RT/57.10/M	10	9	10	M10 x 1	8	4	15	11,5	M5	–	8	12,5	9,5	4,5	6,5	M4
RT/57.12/M	12	9	10	M10 x 1	8	4	15	13	M5	–	8	–	9,5	4,5	6,5	M4
RT/57.16/M	16	12	12	M12 x 1,25	10	5	17,5	17,5	M5	–	10	–	11,5	4	–	M6
R./57.20/M	20	14	16	M16 x 1,5	12	6	22	21,5	Rc 1/8	M6	12	–	15,5	8	–	M8
R./57.25/M	25	16	18	M18 x 1,5	12	8	26,5	26,5	Rc 1/8	M6	14	–	15,5	8	–	M10 x 1,25
R./57.32/M	32	22	22	M22 x 1,5	15	8	33,5	33,5	Rc 1/8	G 1/8	16	–	17,5	5,5	–	M10 x 1,25
R./57.40/M	40	23	30	M30 x 1,5	15	10	41,5	41,5	Rc 1/8	G 1/8	20	–	18	5,5	–	M12 x 1,25

MODELS	L	LB	L12	Ø MMh9	MR	PL	Σ=	V*	V**	VA/VD	WF	XC	XC1	57100 < 25 mm	57300 < 25 mm	per extra 25 mm
RT/57.08/M	–	4,5	–	3	3	4	–	17	34	1,5	8,5	48	39	0,017 kg	0,02 kg	0,01 kg
RT/57.10/M	–	5	–	4	4	5,5	–	14	28	1,5	10	54	44	0,025 kg	0,02 kg	0,01 kg
RT/57.12/M	–	5	–	4	4	5,5	–	14	28	1,5	10	54	44	0,027 kg	0,03 kg	0,01 kg
RT/57.16/M	–	7	5	6	5	5,5	5	15	30	2	13,5	64,5	50	0,053 kg	0,05 kg	0,01 kg
R./57.20/M	–	7	5	8	6	9	7	17	34	3	15,5	75,5	61	0,095 kg	0,09 kg	0,02 kg
R./57.25/M	–	9	5	10	8	9	9	18	36	3	16,5	78,5	62	0,15 kg	0,14 kg	0,03 kg
R./57.32/M	12	7	5	12	8	9	10	19	38	3	23	93	74	0,26 kg	0,25 kg	0,04 kg
R./57.40/M	14	5	6	14	10	10	12	20	40	3	24	96	78,5	0,5 kg	0,38 kg	0,05 kg

* For 10 and 25 mm stroke

** For 50 mm stroke

“High performance, absolute reliability and versatility in a space saving design”

Lintra® Plus

Lintra® Plus combines all the features of Norgren’s acclaimed Lintra® series with lower static and dynamic friction levels, a labyrinth seal that increases dust protection and an improved piston design for higher load capacity.

New weight-saving aluminium profile can be directly integrated into your machine • Polyurethane piston seals and precision extruded aluminium profile offers long life • New wiper seal and cover strip design on all guide system options prevent dirt ingress • Lintra® Plus is fully interchangeable with the long established Norgren Lintra® enabling you to replace existing Lintra® cylinders without the need for any machine modifications.

LINTRA® PLUS

ISO - VDMA CYLINDERS

LINTRA® PLUS

>>VERSATILITY PLUS Lintra® Plus

‘Integral pneumatic cushioning’

The LINTRA® Plus offers a standardised series, capable of carrying medium to heavy loads or simply transmitting motion to a machine function for maximum design versatility.

The series has four variants:

» M/146000 - Internal guiding
» M/146100 - External guiding
» M/146200 - Precision roller guiding
» M/146200/P - Precision caged ball linear motion guiding

For details and specifications, download the Norgren Actuators & Accessories pdf from norgren.com/ads/en/lintra

RT/57200/M Roundline cylinders

Double acting - Ø 8 ... 63 mm

One fifth shorter than the basic length of a corresponding ISO/VDMA cylinder

Low friction, long life seals

High strength, double crimped end cap design

Standard magnetic piston for full control system versatility

TECHNICAL DATA

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

Double acting, buffer cushioning
RT/57200/M
Side port, integral eye mounting (Ø 8 ... 40 mm), fixing holes in the end cover (Ø 50 and 63 mm)
RT/57200/MC
Central rear port (Ø 16 ... 25 mm)
RT/57200/MF
Flat rear cover (Ø 8 ... 32 mm)

Operating pressure:

1 ... 10 bar

Operating temperature:

+80°C

Consult our Technical Service for use below +2°C

MATERIALS

Piston rod: stainless steel (8 ... 16 mm bore austenitic, 20 ... 63 mm bore martensitic)
End covers: aluminium
Barrel: stainless steel (austenitic) (Ø 8 ... 16 mm martensitic, Ø 20 ... 63 mm austenitic)
Wiper: polyurethane
Seals and 'O'-rings: nitrile rubber

STANDARD MODELS

				MODELS			ACCESSORIES				
	Ø	Piston rod Ø	Port size	Side port, integral eye mounting	Central rear port, flat end	Side port, flat end	Reed switch with integral 5m cable	Switch mounting	Banjo flow control Tube diameter in bold	Straight fitting	Elbow fitting
											
	8	3	M3	**RT/57208/M/***	–	**RT/57208/MF/***	–	–	–	M022**50**303	M022**50**303
	10	4	M5	**RT/57210/M/***	–	**RT/57210/MF/***	M/50/LSU/5V	QM/33/010/22	C0K51**0**405	C0225**0**405	C0247**0**405
	12	4	M5	**RT/57212/M/***	–	**RT/57212/MF/***	M/50/LSU/5V	QM/33/012/22	C0K51**0**405	C0225**0**405	C0247**0**405
	16	6	M5	**RT/57216/M/***	**RT/57216/MC/***	**RT/57216/MF/***	M/50/LSU/5V	QM/33/016/22	C0K51**0**405	C0225**0**405	C0247**0**405
	20	8	Rc 1/8	**RT/57220/M/***	**RT/57220/MC/***	**RT/57220/MF/***	M/50/LSU/5V	QM/33/020/22	C0TA0**0**618	C0125**0**618	C0147**0**618
	25	10	Rc 1/8	**RT/57225/M/***	**RT/57225/MC/***	**RT/57225/MF/***	M/50/LSU/5V	QM/33/025/22	C0TA0**0**618	C0125**0**618	C0147**0**618
	32	12	Rc 1/8	**RT/57232/M/***	**RT/57232/MC/***	**RT/57232/MF/***	M/50/LSU/5V	QM/33/032/22	C0TA0**0**618	C0125**0**618	C0147**0**618
	40	14	Rc 1/8	**RT/57240/M/***	**RT/57240/MC/***	**RT/57240/MF/***	M/50/LSU/5V	QM/33/040/22	C0TA0**0**618	C0125**0**618	C0147**0**618
	50	16	Rc 1/4	**RT/57250/M/***	–	–	M/50/LSU/5V	QM/33/050/22	C0TA0**0**828	C0125**0**828	C0147**0**828
	63	20	Rc 1/4	**RT/57263/M/***	–	–	M/50/LSU/5V	QM/33/063/22	C0TA0**0**828	C0125**0**828	C0147**0**828

*Insert stroke length in mm.
Service kits are not available for these cylinders.

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	10	25	40	50	80	100	125	160	200	250	320
8	•	•	•	•	•	•					
10	•	•	•	•	•	•					
12	•	•	•	•	•	•					
16	•	•	•	•	•	•					
20	•	•	•	•	•	•	•	•	•	•	•
25	•	•	•	•	•	•	•	•	•	•	•
32	•	•	•	•	•	•	•	•	•	•	•
40		•	•	•	•	•	•	•	•	•	•
50		•	•	•	•	•	•	•	•	•	•
63		•	•	•	•	•	•	•	•	•	•

Other strokes available

For further information

www.norgren.com/info/en1-022

OPTIONS SELECTOR

R★/572★★/★★/★★

Cylinder Ø (mm)	Ports	Substitute
8	M3	T
10	M5	T
12	M5	T
16	M5	T
20	Rc1/8	T
20	M6	M
25	Rc1/8	T
25	M6	M
32	Rc1/8	T
32	G1/8	M
40	Rc1/8	T
40	G1/8	M
50	Rc1/4	T
50	G1/4^	M
63	Rc1/4	T
63	G1/4	M

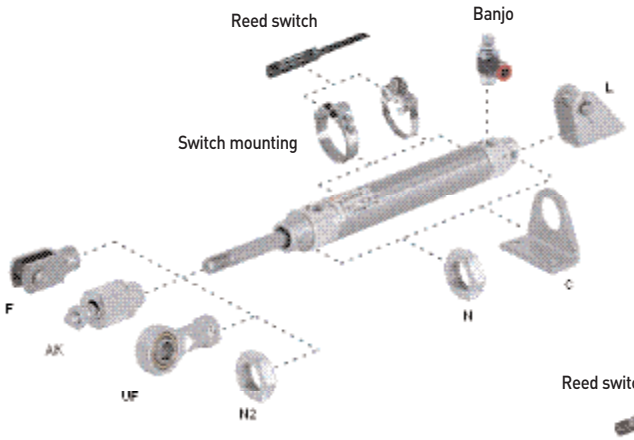
Stroke (mm)
500 max.

Cylinder variants	Substitute
Magnetic piston	M
Magnetic piston, central rear port, flat end	MC
Magnetic piston, side port, flat end	MF
Magnetic piston, double ended piston rod	JM

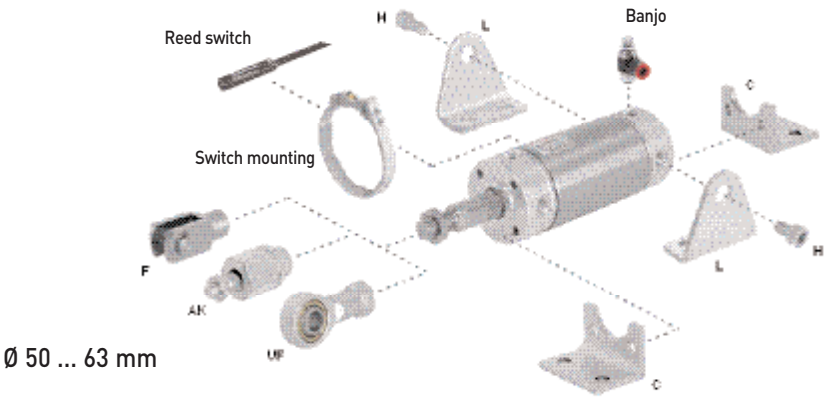
Cylinder Ø (mm)	Substitute
8	08
10	10
12	12
16	16
20	20
25	25
32	32
40	40
50	50
63	63

Note: If option is not required, disregard option position within part number eg. RT/57225/M/50.
This options selector explains only the cylinder variants. Additional variants/options are not possible.
Information about variants see data sheet.

MOUNTINGS



Ø 8 ... 40 mm



Ø 50 ... 63 mm

Ø	AK	C	F	H	L	N	N2	UF
8	–	M/P71273/1	QM/57008/25	–	QM/57008/24	M/P71364	M/P1500/111	–
10	QM/8010/38	M/P71273/2	QM/8010/25	–	QM/947	M/P71364	M/P1501/80	QM/8010/32
12	QM/8010/38	M/P71273/2	QM/8010/25	–	QM/947	M/P71364	M/P1501/80	QM/8010/32
16	QM/8012/38	M/P19369	QM/57016/25	–	QM/946	M/P1501/90	M/P1501/79	QM/8012/32
20	QM/8020/38	M/P19389	QM/57020/25	–	QM/8012/24	M/P13834	M/P1501/60	QM/8020/32
25	QM/8025/38	M/P40381	QM/57025/25	–	QM/57025/25	M/P13607	M/P1501/89	QM/8025/32
32	QM/8025/38	M/P19406	QM/57032/25	–	QM/8020/24	M/P13615	M/P1501/89	QM/8025/32
40	QM/8040/38	M/P71273/3	QM/57040/25	–	QM/57040/24	M/P29254	M/P1501/90	QM/8040/32
50	QM/8040/38	QM/57050/21	QM/57040/25	QM/55240/28	QM/57050/24	–	M/P1501/90	QM/8040/32
63	QM/8050/38	QM/57063/21	QM/57063/25	QM/55250/28	QM/57063/24	–	M/P1501/91	QM/8050/32

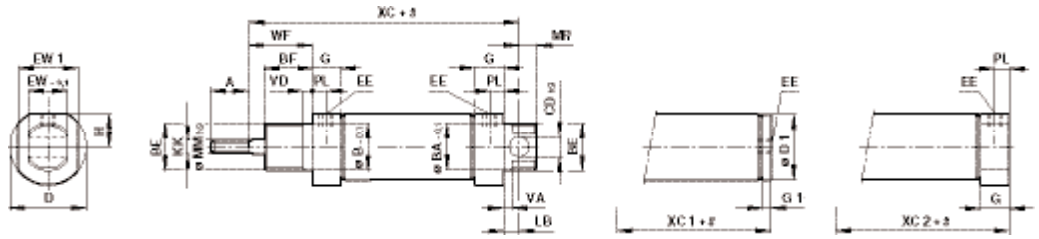
RT/57200/M Roundline cylinders

Double acting - Ø 8 ... 63 mm

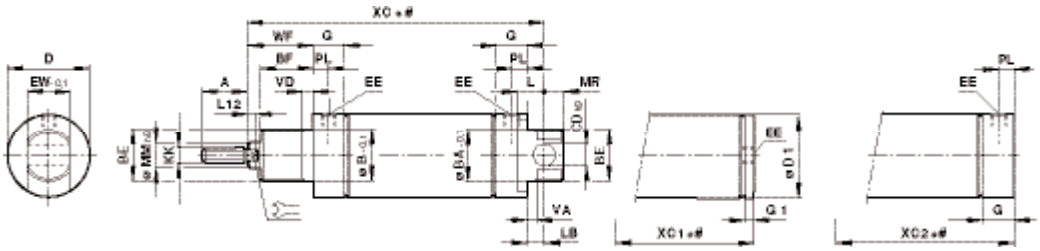
BASIC DIMENSIONS

RT/57200/M – Standard

Ø 8 ... 12 mm
RT/57200/M **RT/57200/MC** **RT/57200/MF**



Ø 16 ... 40 mm
R./57200/M **R./57200/MC** **R./57200/MF**

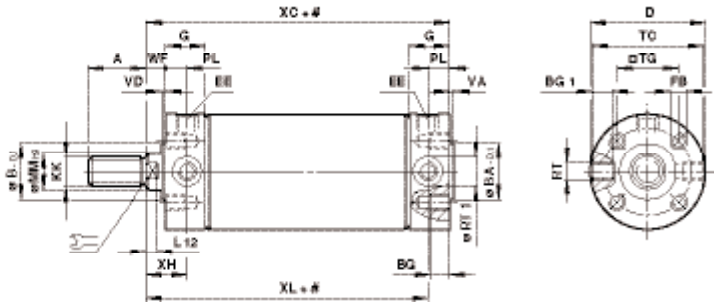


\# Stroke

MODELS	Ø	A	Ø B-0,1/ Ø BA-0,1	BE	BF	Ø CDh9	Ø D	Ø D1	EE RT/57...	EE RM/57...	EW-0,1	EW1	G	G1	H	KK
RT/57208/M.	8	8	10	M10 x 1	7,5	3	12	9,5	M3	M3	6	10	7,5	3	5	M3
RT/57210/M.	10	9	10	M10 x 1	8	4	15	11,5	M5	M5	8	12,5	9,5	4,5	6,5	M4
RT/57212/M.	12	9	10	M10 x 1	8	4	15	13	M5	M5	8	–	9,5	4,5	6,5	M4
RT/57216/M.	16	12	12	M12 x 1,25	10	5	17,5	17,5	M5	M5	10	–	11,5	4	–	M6
R./57220/M.	20	14	16	M16 x 1,5	12	6	22	21,5	Rc 1/8	M6	12	–	15,5	8	–	M8
R./57225/M.	25	16	18	M18 x 1,5	12	8	26,5	26,5	Rc 1/8	M6	14	–	15,5	8	–	M10 x 1,25
R./57232/M.	32	22	22	M22 x 1,5	15	8	33,5	33,5	Rc 1/8	G 1/8	16	–	17,5	5,5	–	M10 x 1,25
R./57240/M.	40	23	30	M30 x 1,5	15	10	41,5	41,5	Rc 1/8	G 1/8	20	–	18	5,5	–	M12 x 1,25

MODELS	L	LB	L12	Ø MMh9	MR	PL	⌧	VA/VD	WF	XC	XC1	XC2	at 0 mm	per 25 mm
RT/57208/M.	–	4,5	–	3	3	4	–	1,5	8,5	48	39	43,5	0,02 kg	0,02 kg
RT/57210/M.	–	5	–	4	4	5,5	–	1,5	10	54	44	49	0,02 kg	0,03 kg
RT/57212/M.	–	5	–	4	4	5,5	–	1,5	10	54	44	49	0,02 kg	0,03 kg
RT/57216/M.	–	7	5	6	5	5,5	5	2	13,5	64,5	50	57,5	0,04 kg	0,05 kg
R./57220/M.	–	7	5	8	6	9	7	3	15,5	75,5	61	68,5	0,08 kg	0,07 kg
R./57225/M.	–	9	5	10	8	9	9	3	16,5	78,5	62	69,5	0,12 kg	0,11 kg
R./57232/M.	12	7	5	12	8	9	10	3	23	93	74	86	0,21 kg	0,16 kg
R./57240/M.	14	5	6	14	10	10	12	3	24	96	78,5	91	0,33 kg	0,20 kg

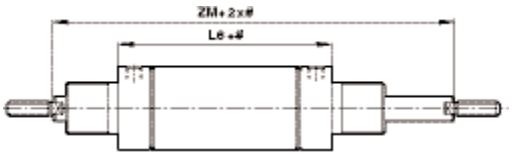
Ø 50 and 63 mm
R./57200/M

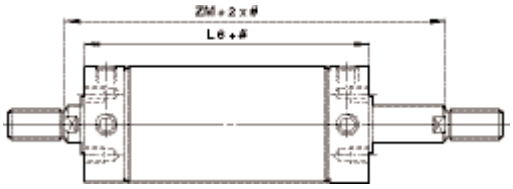


MODELS	Ø	A	Ø B/BA-0,1	BG	BG 1	Ø D	EE RT/57...	EE RM/57...	FB	G	KK	Ø MM h9	PL
R./57250/M	50	23	28	12	8	52,5	Rc 1/4	G 1/4	M 6	22	M 12 x 1,25	16	13
R./57263/M	63	30	35	12	9,5	65,5	Rc 1/4	G 1/4	M 8	22	M 16 x 1,5	20	13

MODELS	Ø	RT	RT 1	⌲	□TG	TC	VA/VD	WF	XH	XL	at 0 mm	per 100 mm
R./57250/M	50	M 10 x 1	13	13	28,5	49	2	13	26	84	0,39 kg	0,31 kg
R./57263/M	63	M 12 x 1,5	15	17	35,5	62	2	13	26	86	0,89 kg	0,44 kg

CYLINDER VARIANTS
R./57200/JM - Double ended piston rod





MODELS	Ø	L8	ZM
R./57216/JM	16	44	71
R./57220/JM	20	53	84
R./57225/JM	25	53	86
R./57232/JM	32	63	109
R./57240/JM	40	67	115
R./57250/JM	50	84	110
R./57263/JM	63	86	112

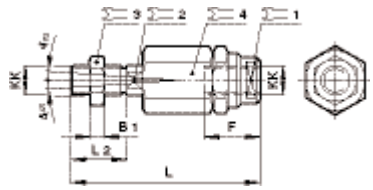
Stroke

RT/57200/M Roundline cylinders

Double acting - Ø 8 ... 63 mm

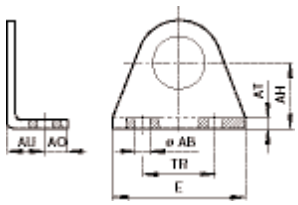
MOUNTINGS - For RT/57100/M & RT/57200/M

Piston rod swivel mounting - AK, ISO 8139



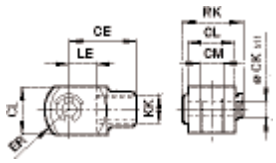
MODELS	Ø	KK	B1	F	L	L2	Σ= 1	Σ= 2	Σ= 3	Σ= 4	kg
QM/8010/38	10/12	M 4	2	12,5	33	8	11	3,2	7	11	0,01
QM/8012/38	16	M 6	3	14	39	12	7	5	10	13	0,02
QM/8020/38	20	M 8	4	18	55	16	10	7	13	17	0,05
QM/8025/38	25/32	M 10x1,25	5	26	73	20	19	12	17	30	0,20
QM/8040/38	40/50	M 12x1,25	6	26	77	24	19	12	19	30	0,20
QM/8050/38	63	M 16x1,5	8	34	106	32	30	19	24	42	0,65

Foot mounting - C, ISO 6431



MODELS	Ø	Ø AB	AH	AO	AT	AU	E	TR	kg
M/P71273/1	8	3,8	10	3,5	1,5	7,5	25	18	0,01
M/P71273/2	10/12	5	12	4,5	1,5	7,5	30	20	0,01
M/P19369	16	4,5	16	6	2	10	35	25	0,02
M/P19389	20	5,5	20	6	3	13	43	32	0,03
M/P40381	25	6,6	22	8	3	12,5	49	38	0,04
M/P19406	32	6,6	25	7,5	4	16	53	40	0,06
M/P71273	40	7	28	7	4	16	66	52	0,08
QM/57050/21	150	9	40	10	4	17	52	36	0,18
QM/57063/21	163	9	47	10	5	19	61	45	0,28

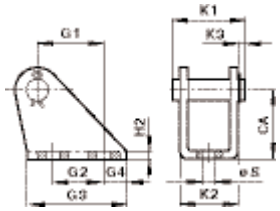
Piston rod clevis mounting - F, ISO 8140



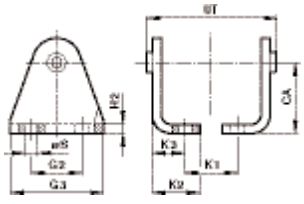
MODELS	Ø	KK	CE	Ø CK h11	CL	CM	ER	LE	RK	kg
QM/57008/25	8	M3	11	3	6	3	4,5	5	10,5	0,01
QM/8010/25	10/12	M4	16	4	8	4	6,5	8	11,5	0,01
QM/57016/25	16	M6	20	5	10	5	8	10	14,5	0,01
QM/57020/25	20	M8	24	6	12	6	9,5	12	17,5	0,02
QM/57025/25	25	M10x1,25	26	8	14	7	11,5	12	20,5	0,04
QM/57032/25	32	M10x1,25	32	8	16	8	13	16	22,5	0,05
QM/57040/25	40	M12x1,25	40	10	20	10	16	20	29	0,09
QM/57040/25	50	M 12x1,25	48	12	24	12	19	24	33	
QM/57063/25	63	M 16x1,5	56	14	27	14	21	28	36,5	

Rear hinge mounting - L

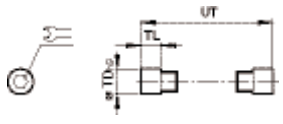
for Ø 8 ... 40 mm



for Ø 50 and 63 mm



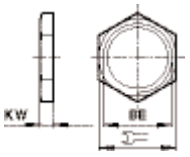
Central trunnion - H



MODELS	Ø	Ø TD h9	TL	UT	Σ=	kg
QM/55240/28	50	12	9,5	63	6	0,03
QM/55250/28	63	14	11	76	6	0,05

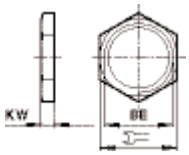
MODELS	Ø	CA	G1	G2	G3	G4	H2	K1	K2	K3	Ø S	UT	kg
QM/57008/24	8	10	9	7	14	3,5	1	–	8	–	3,5	–	0,01
QM/947	10/12	12	6,5	–	15	6	1	13,5	10,5	2	4,8	–	0,01
QM/946	16	16	13	10	22	6	1,5	–	12,5	–	4,8	–	0,02
QM/8012/24	20	20	18,5	15	30	8	1,5	20	15	3	5,5	–	0,02
QM/57025/25	25	22	20	15	33	9	2	–	18	–	6,6	–	0,04
QM/8020/24	32	25	20	15	35	10	2	25	20,5	3	6,6	–	0,04
QM/57040/25	40	28	25	20	42	11	3	–	26	–	7	–	0,09
QM/57050/24	50	40	–	30	54	–	4	30,5	24	15	9	68	0,20
QM/57063/24	63	47	–	40	64	–	5	40,5	26,5	17,5	9	84	0,32

Nut - N



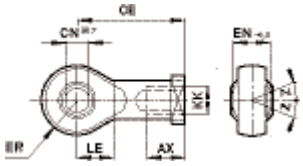
MODELS	Ø	BE	⌀	KW	kg
M/P71364	8...12	M10x1	14	4	0,01
M/P1501/90	16	M12x1,25	19	6	0,01
M/P13834	20	M16x1,5	22	5	0,01
M/P13607	25	M18x1,5	24	5	0,01
M/P13615	32	M22x1,5	27	8	0,02
M/P29254	40	M30x1,5	36	8	0,03

Nut - N2



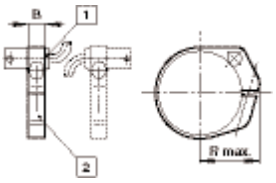
MODELS	Ø	BE	⌀	KW	kg
M/P1500/111	8	M3	6	2	0,01
M/P1501/80	10/12	M4	7	2	0,01
M/P1501/79	16	M6	10	3	0,01
M/P1501/60	20	M8	13	4	0,01
M/P1501/89	25/32	M10x1,25	17	5	0,01
M/P1501/90	40/50	M12x1,25	19	6	0,01
M/P1501/91	63	M16x1,5	24	8	0,02

Universal piston rod eye - UF



MODELS	Ø	KK	AX	CE	Ø CN^{H7}	EN$_{-0,1}$	ER	LE	Z	kg
QM/8010/32	10/12	M4	14	27	5	8	8	10	5°	0,02
QM/8012/32	16	M6	14	30	6	9	9	11	5°	0,02
QM/8020/32	20	M8	16	36	8	12	11	13	5°	0,05
QM/8025/32	25/32	M10x1,25	25	42	10	14	14	15	5°	0,08
QM/8040/32	40	M12x1,25	22	50	12	16	16	17	5°	0,12
QM/8040/32	50	M12x1,25	22	50	12	16	19	17	13°	0,13
QM/8050/32	63	M16x1,5	28	64	16	21	21	22	15°	0,33

Bracket mounting for > 15 mm stroke



1 Switch
2 Bracket mounting

MODELS	Ø	B	R max.	kg
QM/33/010/22	10	8	16	0,01
QM/33/012/22	12	8	18	0,01
QM/33/016/22	16	10	20	0,01
QM/33/020/22	20	10	22	0,01
QM/33/025/22	25	10	24	0,01
QM/33/032/22	32	10	29	0,01
QM/33/040/22	40	10	32	0,01
QM/33/050/22	50	10	38	0,01
QM/33/063/22	63	10	46	0,01

RM/55401/M Roundline cylinders

Double acting - Ø 32 ... 100 mm

- Clean line design
- Low friction, long life seals
- Standard magnetic piston for full control system versatility
- Non-lube operation

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting, magnetic piston, adjustable cushioning

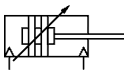
Operating pressure:
1 ... 10 bar

Operating temperature:
-20°C ... +80°C
Consult our Technical Service for use below +2°C

MATERIALS

Barrel: anodised aluminium
End covers: anodised aluminium
Piston rods: stainless steel (martensitic)
Piston rod seals: polyurethane
Piston seals: polyurethane
'O'-rings: nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS	ACCESSORIES Reed switch with integral 5m cable	Switch mounting	Banjo Flow control (Tube diameter in bold)	Straight fitting	Elbow fitting
									
	32	12	G1/8	**RM/55433/M/***	M/50/LSU/5V	QM/33/432/22	C0K51**06**18	C0225**06**18	C0247**06**18
	40	16	G1/4	**RM/55441/M/***	M/50/LSU/5V	QM/33/440/22	C0K51**06**28	C0225**06**28	C0247**06**28
	50	20	G1/4	**RM/55451/M/***	M/50/LSU/5V	QM/33/450/22	C0K51**08**28	C0225**08**28	C0247**08**28
	63	20	G3/8	**RM/55464/M/***	M/50/LSU/5V	QM/33/463/22	C0K51**08**38	C0225**08**38	C0247**08**38
	80	25	G3/8	**RM/55481/M/***	M/50/LSU/5V	QM/33/480/22	C0K51**10**38	C0225**10**38	C0247**10**38
	100	25	G1/2	**RM/55411/M/***	M/50/LSU/5V	QM/33/410/22	C0K51**12**48	C0225**12**48	C0247**12**48

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	25	50	80	100	125	160	200	250	300
32	•	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•	•
80	•	•	•	•	•	•	•	•	•
100	•	•	•	•	•	•	•	•	•

Other strokes available

For further information

www.norgren.com/info/en1-028

OPTIONS SELECTOR

★M/554★★/★★/★★★★

Piston rod material	Substitute
Stainless steel (martensitic)	R
Hard chromium plated	C
Stainless steel (austenitic)	S

Cylinder diameter (mm)	Substitute
Ø 32	33
Ø 40	41
Ø 50	51
Ø 63	64
Ø 80	81
Ø 100	11

Strokes (mm)
3000 max.

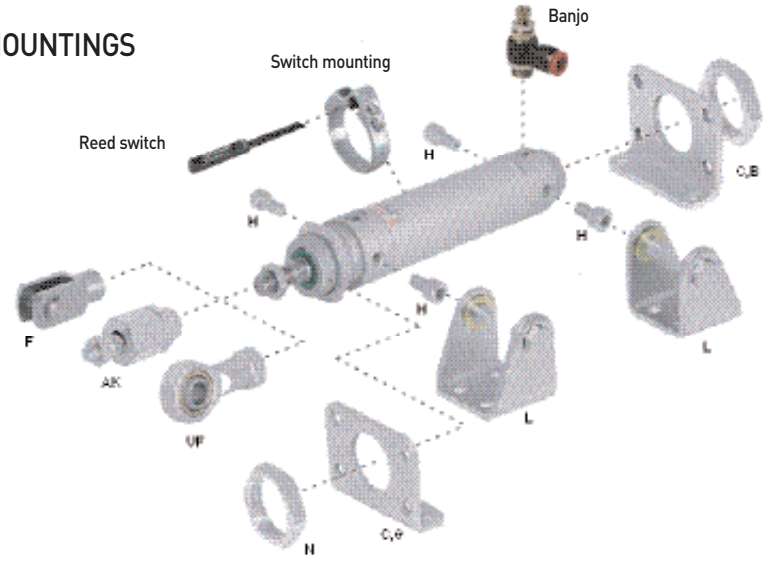
Variants (magnetic piston)	Substitute
Standard	M
Special wiper/seal	W2
Double ended piston rod	JM
Double ended piston rod, special wiper/seal	W4
Extended piston rod	MU
Extended piston rod, special wiper/seal	W6

*M/554**/MU/***/***

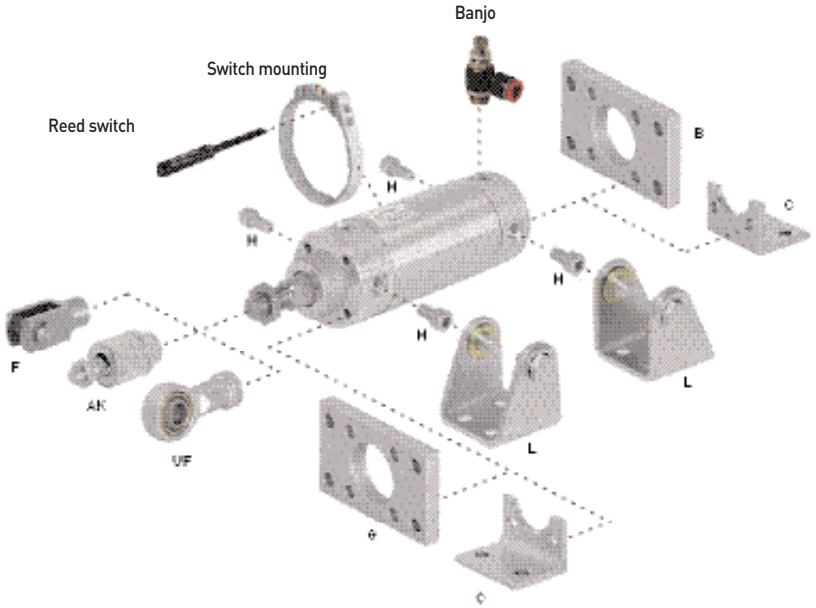
*M/554**/W6/***/*** → Extension (mm)

Note: please fill in only the numbers of digits required e.g. RM/55433/M/25. For combinations of cylinder variants consult our Technical Service. This options selector explains only the cylinder variants.
Additional variants/options can not be derived from. Information about variants see data sheet.

MOUNTINGS



Ø 32 ... 63 mm



Ø 80 ... 100 mm

Ø	AK	B, G	C	F	H	L	N	UF
32	QM/8025/38	QM/55232/22	QM/55232/21	QM/8025/25	QM/55232/28	QM/55232/24	M/P29254	QM/8025/32
40	QM/8040/38	QM/55240/22	QM/55240/21	QM/8040/25	QM/55240/28	QM/55240/24	M/P29255	QM/8040/32
50	QM/8050/38	QM/55250/22	QM/55250/21	QM/8050/25	QM/55250/28	QM/55250/24	M/P29256	QM/8050/32
63	QM/8050/38	QM/55263/22	QM/55263/21	QM/8050/25	QM/55263/28	QM/55263/24	M/P29256	QM/8050/32
80	QM/8080/38	QM/55480/22	QM/55480/21	QM/8080/25	QM/55480/28	QM/55480/24	M/P34806	QM/8080/32
100	QM/8080/38	QM/55410/22	QM/55410/21	QM/8080/25	QM/55410/28	QM/55410/24	M/P34806	QM/8080/32

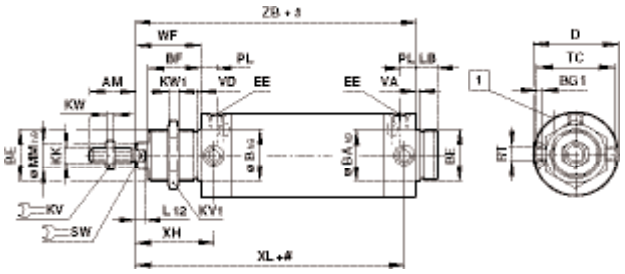
RM/55401/M Roundline cylinders

Double acting - Ø 32 ... 100 mm

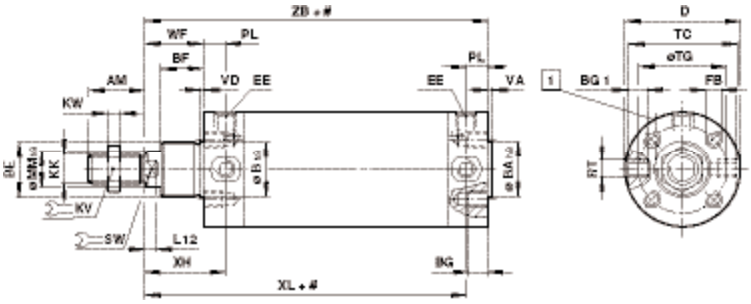
BASIC DIMENSIONS

RM/55401/M – Standard cylinder

Ø 32 ... 63 mm



Ø 80 and 100 mm



\# Stroke

1 Cushion screw

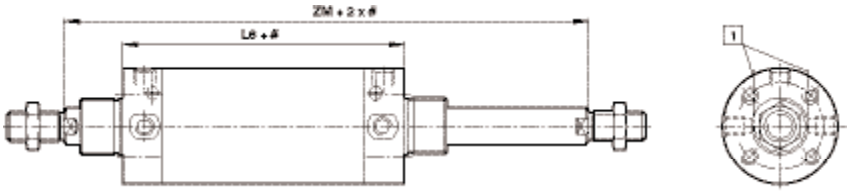
MODELS	Ø	AM	Ø B/BA h9	BE	BF	BG	BG1	D	EE	FB	KK	KV Σ=	KV1 Σ=	KW	KW1	LB
RM/55433	32	22	30	M 30 x 1,5	30	–	6	36,5	G 1/8	–	M 10 x 1,25	17	36	5	8	14
RM/55441	40	24	38	M 38 x 1,5	35	–	8	45,5	G 1/4	–	M 12 x 1,25	19	46	6	10	16
RM/55451	50	32	45	M 45 x 1,5	38	–	9,5	55,5	G 1/4	–	M 16 x 1,5	24	55	8	10	18
RM/55464	63	32	45	M 45 x 1,5	38	–	10	69,5	G 3/8	–	M 16 x 1,5	24	55	8	10	18
RM/55481	80	40	55	M 55 x 1,5	45	14	17,5	87,5	G 3/8	M8	M 20 x 1,5	30	–	10	–	–
RM/55411	100	40	55	M 55 x 1,5	45	14	21,5	107,5	G 1/2	M10	M 20 x 1,5	30	–	10	–	–

MODELS	Ø	L12	Ø MM h9	PL	RT	SW Σ=	Ø TC	TG	VA/VD	WF	XH	XL	ZB	kg at 0 mm	kg per 100 mm
RM/55433	32	5,5	12	9	M 8 x 1	10	35	–	3	38	47	123	132	0,40	0,14
RM/55441	40	7,5	16	12	M 10 x 1	13	44	–	3	45	57	142	154	0,83	0,27
RM/55451	50	8,5	20	12	M 12 x 1,5	17	54	–	3	50	62	152	164	1,30	0,32
RM/55464	63	8,5	20	13	M 14 x 1,5	17	67	–	3	51	64	159	172	1,60	0,38
RM/55481	80	11,5	25	15	M 16 x 1,5	22	85,5	70	5	61	76	196	211	3,10	0,59
RM/55411	100	11,5	25	18,5	M 20 x 1,5	22	105,5	80	5	61	79,5	200,5	219	4,60	0,68

CYLINDER VARIANTS

RM/55401/JM - Double ended piston rod

MODELS	Ø	L8	ZM
RM/55433/5M/.	32	94	170
RM/55441/5M/.	40	109	199
RM/55451/5M/.	50	114	214
RM/55461/5M/.	63	121	223
RM/55481/5M/.	80	150	272
RM/55411/5M/.	100	158	280

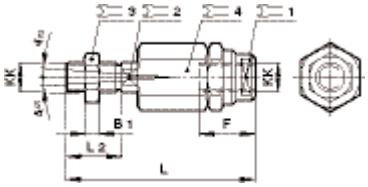


\# Stroke

1 Cushion screw

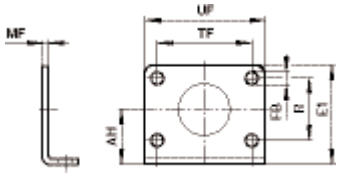
MOUNTINGS

Piston rod swivel - AK



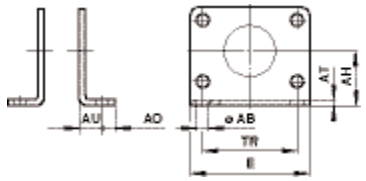
MODELS	Ø	KK	B1	F	L	L2	Σ= 1	Σ= 2	Σ= 3	Σ= 4	kg
QM/8025/38	32	M10x1,25	5	26	73	20	19	12	17	30	0,20
QM/8040/38	40	M12x1,25	6	26	77	24	19	12	19	30	0,20
QM/8050/38	50/63	M16x1,5	8	34	106	32	30	19	24	42	0,65
QM/8080/38	80/100	M20x1,5	10	42	122	40	30	19	30	42	0,72

Rear flange - B, front flange - G



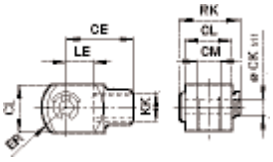
MODELS	Ø	AH	E1	Ø FB	MF	R	TF	UF	kg
QM/55232/22	32	28	49	7	4	28	52	66	0,11
QM/55240/22	40	33	58	9	5	30	60	80	0,19
QM/55250/22	50	40	70	9	5	40	70	90	0,25
QM/55263/22	63	45	80	9	5	50	76	96	0,33
QM/55480/22	80	56	100	12	8	–	120	150	0,81
QM/55410/22	100	66	120	14	8	–	130	170	1,10

Foot - C



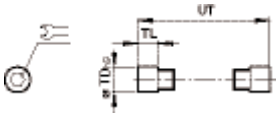
MODELS	Ø	Ø AB	AH	AO	AT	AU	E	TR	kg
QM/55232/21	32	7	28	7	4	14	66	52	0,25
QM/55240/21	40	9	33	10	5	20	80	60	0,44
QM/55250/21	50	9	40	10	5	20	90	70	0,59
QM/55263/21	63	9	45	10	5	20	96	76	0,73
QM/55480/21	80	12	56	15	5	45	90	63	0,67
QM/55410/21	100	14	66	20	5	45	113	75	1,00

Piston rod clevis - F
Corresponds to DIN ISO 8140



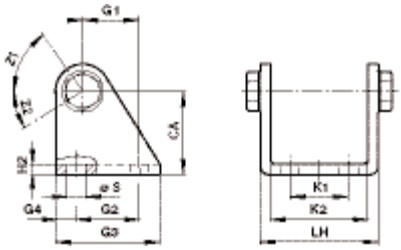
MODELS	Ø	KK	CE	Ø CK$_{h11}$	CL	CM	ER	LE	RK	kg
QM/8025/25	32	M10x1,25	40	10	20	10	16	20	28	0,09
QM/8040/25	40	M12x1,25	48	12	24	12	19	24	32	0,13
QM/8050/25	50/63	M16x1,5	64	16	32	16	25	32	41,5	0,33
QM/8080/25	80/100	M20x1,5	80	20	40	20	32	40	50	0,67

End cover trunnion - H



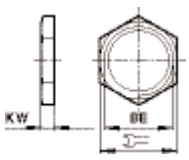
MODELS	Ø	Ø TD$_{h9}$	TL	UT	Σ	kg
QM/55232/28	32	10	8	51	5	0,02
QM/55240/28	40	12	9,5	63	6	0,03
QM/55250/28	50	14	11	76	6	0,05
QM/55263/28	63	16	13	93	8	0,07
QM/55480/28	80	18	13	111,5	8	0,09
QM/55410/28	100	20	13	131,5	10	0,25

Rear hinge - L



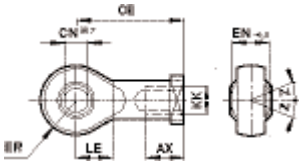
MODELS	Ø	CA	G1	G2	G3	G4	Ø S	H2	K1	K2	LH	Z1	Z2
QM/55232/24	32	35	20	24	40	8	7	4	20	46,5	59,5	65°	36°
QM/55240/24	40	40	27	30	50	10	9	5	28	56,5	71	55°	32°
QM/55250/24	50	45	30	34	54	10	9	5	36	68,5	83	60°	30°
QM/55263/24	63	50	34	35	65	15	9	5	42	82,5	99	189°	25°
QM/55480/24	80	65	47,5	55	80	12,5	11	6	55	102,5	125,5	193°	27°
QM/55410/24	100	77	63	70	100	15	11	6	70	122,5	145,5	191°	25°

Nut - N



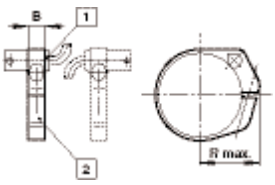
MODELS	Ø	BE	Σ	KW	kg
M/P29254	32	M30 x 1,5	36	8	0,03
M/P29255	40	M38 x 1,5	46	10	0,06
M/P29256	50/63	M45 x 1,5	55	10	0,08
M/P34806	80/100	M55 x 1,5	60	13	0,25

Universal piston rod eye - UF
Corresponds to DIN ISO 8139



S	Ø	Thread KK	AX	CE	Ø CN^{H7}	EN$_{-0,1}$	ER	LE	Z	kg
QM/8025/32	32	M10x1,25	20	43	10	14	14	15	13°	0,09
QM/8040/32	40	M12x1,25	22	50	12	16	16	17	13°	0,13
QM/8050/32	50/63	M16x1,5	28	64	16	21	21	22	15°	0,33
QM/8080/32	80/100	M20x1,5	33	77	20	25	25	26	15°	0,67

QM/33/XXX/22 – BRACKETS FOR SWITCHES



1 Magnetically operated switch

2 Switch mounting bracket

For switches M/50

MODELS	Ø	B	R max.
QM/33/432/22	32	10	29
QM/33/440/22	40	10	32
QM/33/450/22	50	10	38
QM/33/463/22	63	10	46
QM/33/480/22	80	12	54
QM/33/410/22	100	10	59

VSM/55600/N2 Hollow piston rod cylinders

Double acting - Ø 25 and 40 mm

Ideally suited for vacuum and selected liquid transfer applications through the piston rod

Non-rotating and telescopic piston rod provides accurate, repeatable component orientation

Non-corrosive specification

Magnetic piston as standard

Buffer cushioning

Direct attachment of vacuum pumps and suction cups

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated and non-lubricated

Operation:
Double acting with buffer cushioning

Operating pressure:
1 ... 10 bar

Operating temperature:
+80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Barrel: Ø 25: stainless steel (austenitic)
Ø 40: anodised aluminium
End covers: anodised aluminium
Piston rod: stainless steel (austenitic)
Buffer: polyurethane
Wiper: polyurethane
Piston seals: Ø 25: nitrile rubber
Ø 40: polyurethane
'O'-rings: nitrile rubber

STANDARD MODELS

Ø	Piston rod Ø	Port size	MODELS	ACCESSORIES Reed switch with integral 5m cable	Switch mounting	Banjo Flow control (Tube diameter in bold)	Straight fitting	Elbow fitting
								
25	12	G1/8	**VSM/55625/N2/***	M/50/LSU/5V	QM/33/025/22	C0K51**06**18	C0225**06**18	C0247**06**18
40	16	G1/4	**VSM/55640/N2/***	M/50/LSU/5V	QM/33/440/22	C0K51**06**28	C0225**06**28	C0247**06**28

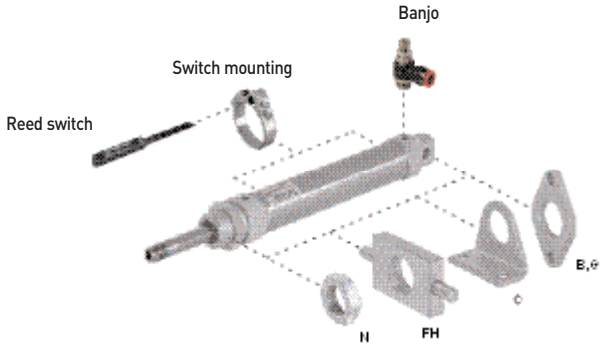
* Insert stroke length in mm.
Non standard stroke up to 500 mm maximum available.

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

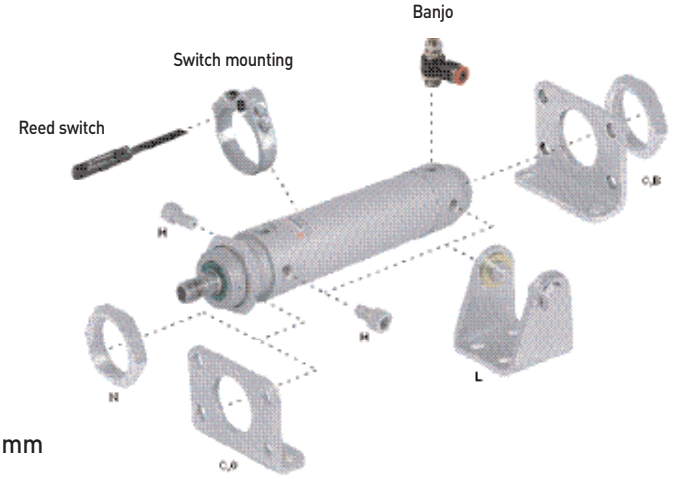
For further information

www.norgren.com/info/en1-032

MOUNTINGS



Ø 25 mm



Ø 40 mm

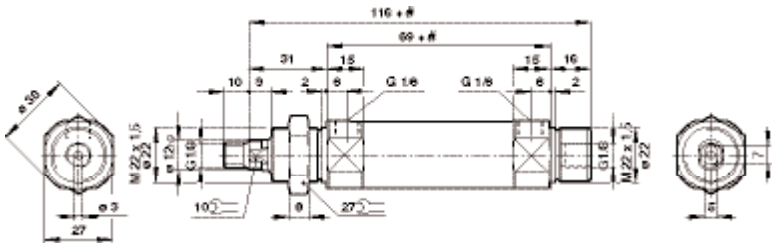
Ø	B, G	C	FH	N	
25	M/P19409	M/P19406	QM/8020/34	M/P13615	

Ø	B, G	C	H	N	L
40	QM/55240/22	QM/55240/21	QM/55240/28	M/P29255	QM/55240/24

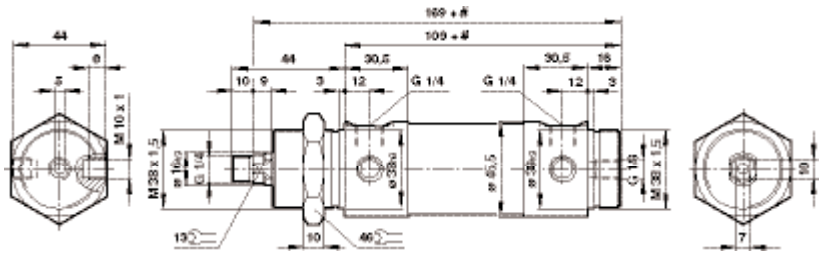
Dimensions of mountings see page 17 for Ø 25 mm and 32 for Ø 40 mm

BASIC DIMENSIONS

VSM/55625/N2
Ø 25 mm



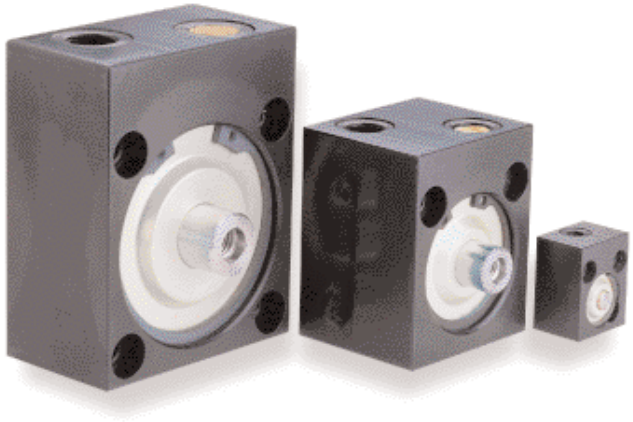
VSM/55640/N2
Ø 40 mm



\# Stroke

M/50100, M/50200 Clamping cylinders

Single and double acting - Ø 8 ... 63 mm



Enable high thrusts to be achieved in restricted space

Neat, clean appearance

One-piece body construction

TECHNICAL DATA

Medium:
Compressed air, filtered and lubricated

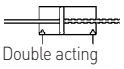
Operating pressure:
2 ... 10 bar (single acting)
1,5 ... 10 bar (double acting)

Operating temperature:
-10°C ... +70°C
Consult our Technical Service for use below +2°C

MATERIALS

Piston rod: stainless steel (austenitic)
Body: anodised aluminium
Seals: nitrile rubber

STANDARD MODELS

	Ø	Port size	MODELS Piston rod Ø	Single acting	MODELS Piston rod Ø	Double acting	ACCESSORIES Straight fitting (Tube diameter in bold)	Elbow fitting
								
 Single acting	8	M5	4	**M/50108/***	4	**M/50208/***	CO225**04**05	CO247**04**05
	12	M5	6	**M/50112/***	5	**M/50212/***	CO225**04**05	CO247**04**05
	20	M5	10	**M/50120/***	10	**M/50220/***	CO225**04**05	CO247**04**05
 Double acting	32	G1/8	16	**M/50132/***	12	**M/50232/***	CO225**06**18	CO247**06**28
	50	G1/4	20	**M/50150/***	16	**M/50250/***	CO225**06**28	CO247**06**28
	63	G1/4	20	**M/50163/***	16	**M/50263/***	CO225**06**28	CO247**06**28

* Insert stroke length in mm

Other fittings are available, please see section 7

Standard strokes

Ø	4	5	10	25
8	•			
12	•		•	
20	•		•	
32		•	•	•
50			•	•
63			•	•

Other stroke lengths are not available

Theoretical forces

MODELS	Theoretical forces (N) at 6 bar Outstroke	F 1	MODELS	Theoretical forces (N) at 6 bar Outstroke	F 1
M/50108/4	25	3,4	**M/50132/10**	445	22,3
M/50112/4	55	5,6	**M/50132/25**	445	13,7
M/50112/10	55	5,4	**M/50150/10**	1100	36,3
M/50120/4	165	13,2	**M/50150/25**	1100	25,5
M/50120/10	165	9,6	**M/50163/10**	1760	52,5
M/50132/5	445	25,2	**M/50163/25**	1760	41,1

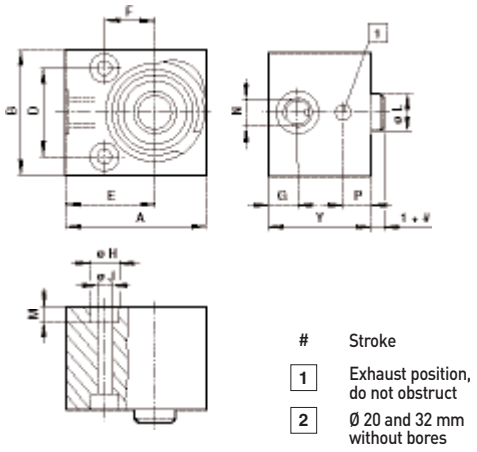
F1 = Return force of spring

For further information

www.norgren.com/info/en1-034

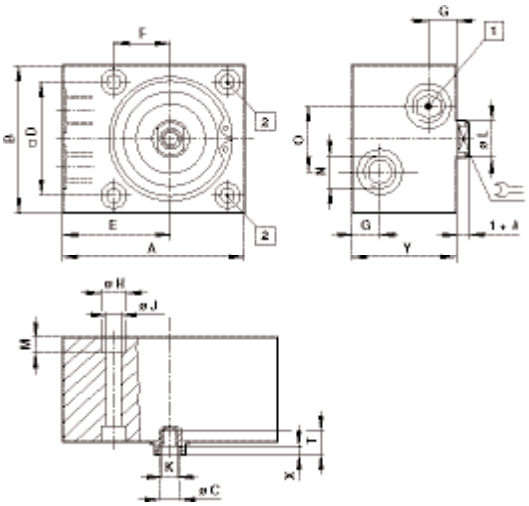
BASIC DIMENSIONS

M/50108 ... M/50112



#	Stroke
1	Exhaust position, do not obstruct
2	Ø 20 and 32 mm without bores

M/50120 ... M/50163



MODELS	Ø	A	B	Ø C	□ D	E	F	G	Ø H	Ø J	K	Ø L	M	N	O	P	Σ=	T	X
M/50108/.	8	20	18	–	11	13,5	8	5	6	3,4	–	4	3,2	M 5	–	5	–	–	–
M/50112/.	12	25	20	–	13	16	9	5	6	3,4	–	5	3,4	M 5	–	4,5	–	–	–
M/50120/.	20	40	32	5,3	20	24	15	5	10	5,5	M 5	10	5,5	M 5	–	4,5	8	8	2
M/50132/.	32	55	45	6,4	32	32	18	10	10	5,5	M 6	12	5,5	G 1/8	20	–	10	14,5	2,5
M/50150/.	50	80	65	8,4	50	47,5	25	12	11	6,6	M 8	16	6,8	G 1/4	30	–	13	15	3
M/50163/.	63	90	80	8,4	62	50	31	12	15	9	M 8	16	9	G 1/4	30	–	13	15	3

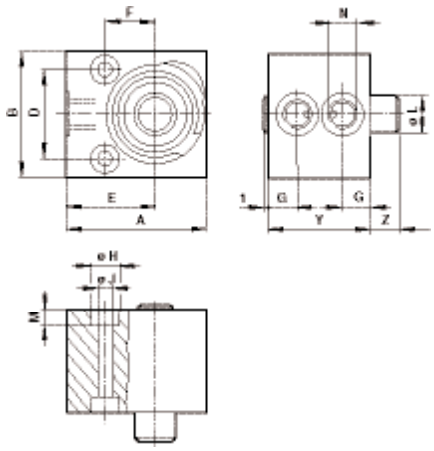
MODELS	Ø	Standard strokes	Y	kg
M/50108/4	8	4	15	0,02
M/50112/4	12	4	15	0,03
M/50112/10	12	10	23	0,04
M/50120/4	20	4	20	0,10
M/50120/10	20	10	26	0,10
M/50132/5	32	5	26	0,22
M/50132/10	32	10	31	0,25
M/50132/25	32	25	46	0,31
M/50150/10	50	10	30	0,50
M/50150/25	50	25	45	0,60
M/50163/10	63	10	35	0,80
M/50163/25	63	25	50	1,05

M/50100, M/50200 Clamping cylinders

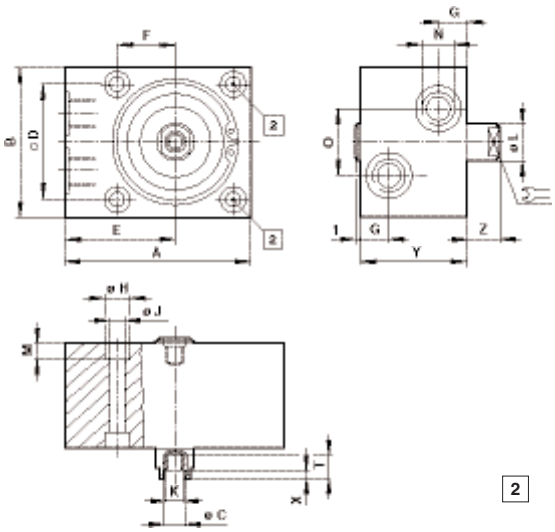
Single and double acting - Ø 8 ... 63 mm

BASIC DIMENSIONS

M/50208 ... M/50212



M/50220 ... M/50263



2 Ø 20 and 32 mm without bores

MODELS	Ø	A	B	Ø C	□ D	E	F	G	Ø H	Ø J	K	Ø L	M	N	O	⌀	T	X
M/50208/.	8	20	18	–	11	13,5	8	5	6	3,4	–	4	3,2	M 5	–	–	–	–
M/50212/.	12	25	20	–	13	16	9	5	6	3,4	–	5	3,4	M 5	–	–	–	–
M/50220/.	20	40	32	5,3	20	24	15	5	10	5,5	M 5	10	5,5	M 5	–	8	8	2
M/50232/.	32	55	45	6,4	32	32	18	10	10	5,5	M 6	12	5,5	G 1/8	20	10	14,5	2,5
M/50250/.	50	80	65	8,4	50	47,5	–	12	11	6,6	M 8	16	6,8	G 1/4	30	13	15	3
M/50263/.	63	90	80	8,4	62	50	–	12	15	9	M 8	16	9	G 1/4	30	13	15	3

MODELS	Ø	Standard strokes	Y	Z	kg
M/50208/4	8	4	22	5	0,03
M/50208/10	8	10	28	11	0,03
M/50212/4	12	4	24	5	0,04
M/50212/10	12	10	30	11	0,05
M/50220/4	20	4	25	8	0,10
M/50220/10	20	10	31	14	0,11
M/50232/5	32	5	33,5	10	0,25
M/50232/10	32	10	38,5	15	0,30
M/50232/25	32	25	53,5	30	0,42
M/50250/10	50	10	36,5	15	0,60
M/50250/25	50	25	51,5	30	0,68
M/50263/10	63	10	41,5	15	0,90
M/50263/25	63	25	56,5	30	1,16

RM/91000/M Short stroke cylinders

Single acting - Ø 20 ... 63 mm

- One third the basic length of a corresponding ISO/VDMA model
- Low friction, long life seal design
- Non-corrosive specification - gives consistency with other ranges
- Standard magnetic piston

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Single acting, non-cushioned, magnetic piston sprung in

Operating pressure:
2 ... 10 bar

Operating temperature:
+80°C
Consult our Technical Service for use below +2°C

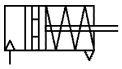
MATERIALS

Barrel and end caps: anodised aluminium alloy

Piston rod: stainless steel (Ø12 ... 40 mm Austenitic, Ø 50 and 63 mm Martensitic)

Seals: polyurethane and/or nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Female thread sprung in	ACCESSORIES Reed switch with integral 5 m cable	Switch mounting	Straight fitting Tube diameter in bold	Elbow fitting	Service kit
									
	20	10	M5	**RM/91020/M/***	M/50/LSU/5V	M/P72487	C022504**05**	C024704**05**	–
	25	12	M5	**RM/91025/M/***	M/50/LSU/5V	M/P72487	C022504**05**	C024704**05**	–
	32	16	G1/8	**RM/91032/M/***	M/50/LSU/5V	M/P72487	C022506**18**	C024706**18**	–
	40	16	G1/8	**RM/91040/M/***	M/50/LSU/5V	M/P72487	C022506**18**	C024706**18**	–
	50	20	G1/8	**RM/91050/M/***	M/50/LSU/5V	M/P72487	C022506**18**	C024706**18**	QM/92050/00
	63	20	G1/4	**RM/91063/M/***	M/50/LSU/5V	M/P72487	C022506**28**	C024706**28**	QM/92063/00

*Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	10	25
20	•	
25	•	
32	•	•
40	•	•
50	•	•
63	•	•

Theoretical forces

Cylinder Ø	Theoretical forces (N) at 6 bar outstroke	F1
12	57	7
16	103	12,5
20	161	14,5
25	264	20
32	432	32
40	687	44
50	1094	56,5
63	1770	74,5

F1 = Return force of spring (N)

For further information

www.norgren.com/info/en1-037

RM/91000/M Short stroke cylinders

Single acting - Ø 20 ... 63 mm

OPTIONS SELECTOR

RM/9★★★★/★★/★★

Special variants	Substitute
Sprung in	1
Sprung out	3

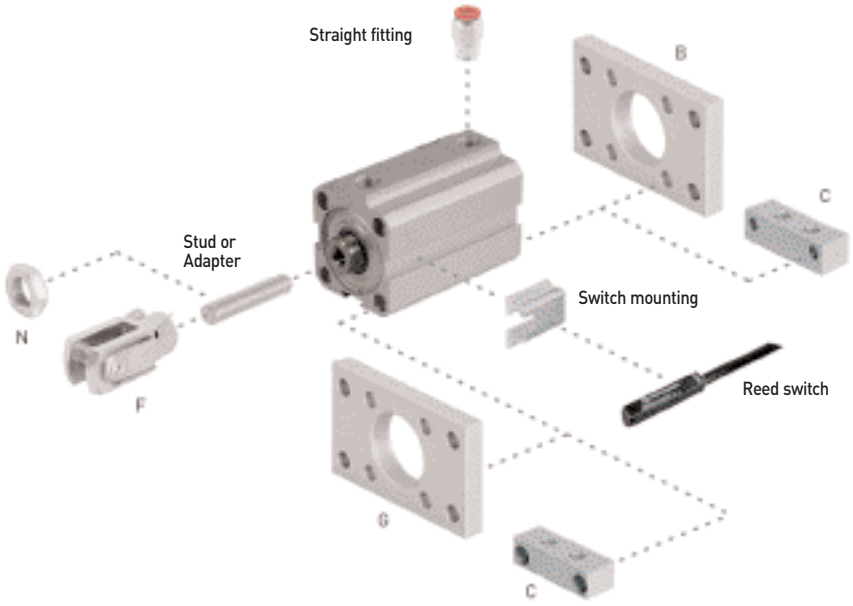
Cylinder diameters (mm)	Substitute
012	**012**
016	**016**
020	**020**
025	**025**
032	**032**
040	**045**
050	**050**
063	**063**

Strokes (mm)
50max.

Variants (magnetic piston)	Substitute
Standard	**M**
Non-rotating piston rod	**N2**

Note: If option is not required, disregard option position within part number eg. RM/91025/M/25. For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants. Additional variants/options are not possible.
Information about variants see data sheet.

MOUNTINGS

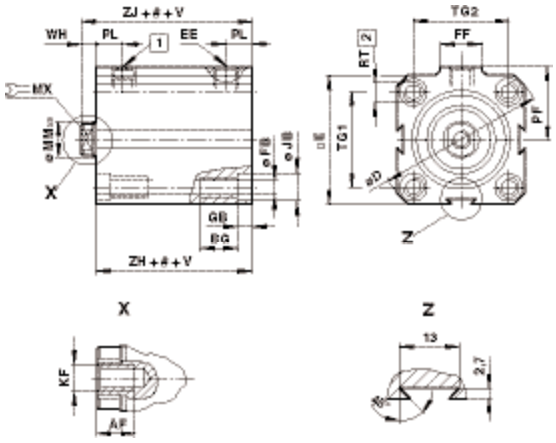


Ø	B,G	C	F	N	Stud or Adapter*
20	QM/90020/22	QM/90020/21	QM/92020/25	M/P1501/109	M/P1710/20
25	QM/90025/22	QM/90025/21	QM/57016/25	M/P1501/79	M/P1710/21
32	QM/90032/22	QM/90032/21	QM/57020/25	M/P1501/60	M/P1710/22
40	QM/90040/22	QM/90040/21	QM/57020/25	M/P1501/60	M/P1710/22
50	QM/90050/22	QM/90050/21	QM/57025/25	-	M/P71470/1
63	QM/90063/22	QM/90063/21	QM/57040/25	-	M/P71470/2

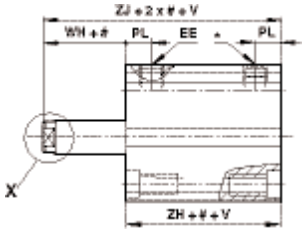
* For attaching F mounting to female piston rod thread.
For details of mountings see page 45.

BASIC DIMENSIONS

RM/91000/M (sprung in)



RM/93000/M (sprung out)

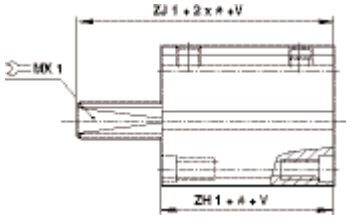


#	Stroke
1	Port thread with inserted filter, do not obstruct
2	Only the 4 front holes are tapped on stroke lengths of less than: Ø 25 and 32 mm: 5 mm, Ø 40 and 63 mm: 15 mm Ø 50 mm: 10 mm Note: Ø 12 ... 20 mm feature only two side dovetails.

CYLINDER VARIANTS

RM/91000/N2 – Cylinders with non-rotating piston rod – sprung in

RM/93000/N2 – Cylinders with non-rotating piston rod – sprung out



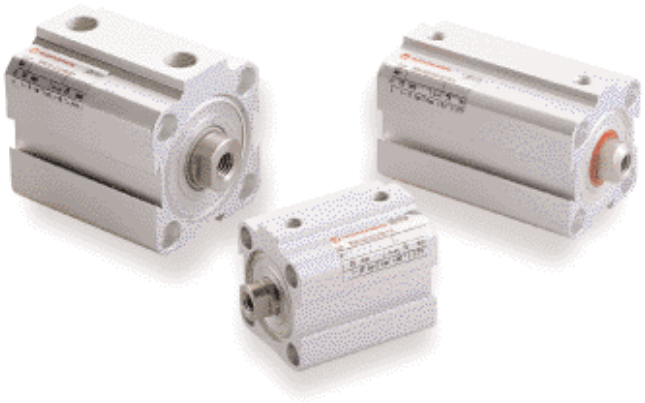
Ø	AF	BG	Ø D	❑ E	EE	Ø FB	FF	GB	Ø JB	KF	Ø MM h9	Σ= MX	Σ= MX1	PF
12	6	9	32,5	25	M 5	3,3	10	3,5	6	M 3	6	5	–	15
16	7	9	36,5	28	M 5	3,3	10	3,5	6	M 4	8	6	6	17
20	8	9	41,5	32	M 5	3,3	10	3,5	6	M 5	10	8	8	19,5
25	9	12	48	37	M 5	4,2	10	4,5	7,5	M 6	12	10	10	22
32	12	12	58	45	G 1/8	4,2	18	4,5	7,5	M 8	16	13	13	27,5
40	12	16	71,5	55	G 1/8	6,8	18	6,5	10,5	M 8	16	13	13	31,5
50	14	16	81	63	G 1/8	6,8	18	6,5	10,5	M 10	20	17	16	37
63	16	20	104	80	G 1/4	8,5	22	8,5	13,5	M 12	20	17	16	48

Ø	PL	RT	TG 1	TG 2	V* 0 ... 25 mm	V* 26 ... 50 mm	WH	ZH	ZH 1	ZJ	ZJ 1	at 0 mm	per 5 mm
12	7	M 4	17	13	14	–	4,5	24	–	28,5	–	0,07 kg	0,02 kg
16	7,5	M 4	20	20	15	–	5,5	24,5	34,5	30	40	0,09 kg	0,02 kg
20	7,5	M 4	23	23	17	34	6	26	36	32	42	0,12 kg	0,02 kg
25	8	M 5	27	27	18	36	6,5	28,5	38,5	35	45	0,17 kg	0,03 kg
32	9	M 5	33	33	19	38	6,5	29	39	35,5	45,5	0,28 kg	0,05 kg
40	10	M 8	41	41	20	40	6,5	31,5	41,5	38	48	0,44 kg	0,06 kg
50	10,5	M 8	48	48	30	60	8	35	45	43	53	0,50 kg	0,08 kg
63	13	M 10	61	61	30	60	8	42,5	52,5	50,5	60,5	0,90 kg	0,11 kg

* Stroke length (mm)

RM/92000/M Short stroke cylinders

Double acting - Ø 12 ... 100 mm



One third the basic length of a corresponding ISO/VDMA model

Low friction, long life seal design

Fully non-corrosive specification - gives consistency with other ranges

Standard magnetic piston for full control system versatility

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting, magnetic piston non-cushioned

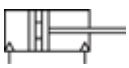
Operating pressure:
1 ... 10 bar

Operating temperature:
+80°C
Consult our Technical Service for use below +2°C

MATERIALS

Barrel & end caps: anodised aluminium alloy
Piston rod: stainless steel
(Ø 12 ... 40 mm Austenitic,
Ø 50 ... 100 mm Martensitic)
Seals: polyurethane and/or nitrile rubber

STANDARD MODELS

				MODELS		ACCESORIES					
	Ø	Piston rod Ø	Port size	Magnetic	Guided	Reed switch with integral 5m cable	Switch mounting	Banjo flow control Tube diameter in bold	Straight fitting	Elbow fitting	Service kit
											
	12	6	M5	**RM/92012/M/***		M/50/LSU/5V	M/P72487	C0K510**04**05	C0225**04**05	C0247**04**05	–
	16	8	M5	**RM/92016/M/***	**RM/92016/N4/***	M/50/LSU/5V	M/P72487	C0K510**04**05	C0225**04**05	C0247**04**05	–
	20	10	M5	**RM/92020/M/***	**RM/92020/N4/***	M/50/LSU/5V	M/P72487	C0K510**04**05	C0225**04**05	C0247**04**05	–
	25	12	M5	**RM/92025/M/***	**RM/92025/N4/***	M/50/LSU/5V	M/P72487	C0K510**04**05	C0225**04**05	C0247**04**05	–
	32	16	G1/8	**RM/92032/M/***	**RM/92032/N4/***	M/50/LSU/5V	M/P72487	C0K510**06**18	C0225**06**18	C0247**06**18	–
	40	16	G1/8	**RM/92040/M/***	**RM/92040/N4/***	M/50/LSU/5V	M/P72487	C0K510**06**18	C0225**06**18	C0247**06**18	–
	50	20	G1/8	**RM/92050/M/***	**RM/92050/N4/***	M/50/LSU/5V	M/P72487	C0K510**06**18	C0225**06**18	C0247**06**18	QM/92050/00
	63	20	G1/4	**RM/92063/M/***	**RM/92063/N4/***	M/50/LSU/5V	M/P72487	C0K510**06**28	C0225**06**28	C0247**06**28	QM/92063/00
	80	25	G1/4	**RM/92080/M/***	**RM/92080/N4/***	M/50/LSU/5V	M/P72487	C0K510**06**28	C0225**06**28	C0247**06**28	QM/92080/00
	100	25	G1/4	**RM/92100/M/***	**RM/92100/N4/***	M/50/LSU/5V	M/P72487	C0K510**06**28	C0225**06**28	C0247**06**28	QM/92100/00

*Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	5	10	15	20	25	30	40	50	60	80	100
12	•	•	•	•	•	•					
16	•	•	•	•	•	•					
20	•	•	•	•	•	•	•	•			
25	•	•	•	•	•	•	•	•			
32	•	•	•	•	•	•	•	•	•	•	
40	•	•	•	•	•	•	•	•	•	•	
50		•	•	•	•	•	•	•	•	•	•
63		•	•	•	•	•	•	•	•	•	•
80			•	•	•	•	•	•	•	•	•
100			•	•	•	•	•	•	•	•	•

Other strokes available

For further information

www.norgren.com/info/en1-040

OPTIONS SELECTOR

★RM/92★★★/★★/★★★

Special variants	Substitute
Heat resistant seals, 150°C max.	T

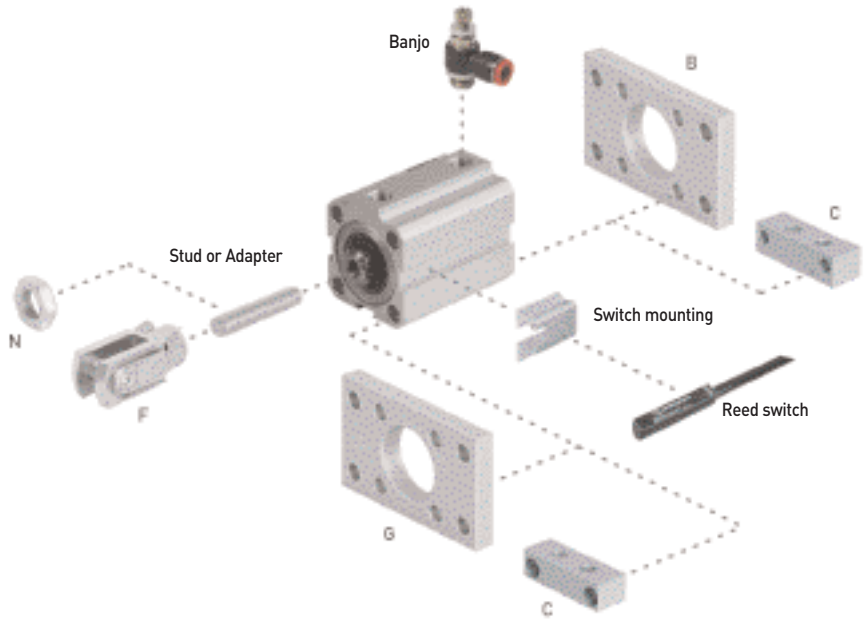
Cylinder diameters (mm)	Substitute
012	012
016	016
020	020
025	025
032	032
040	045
050	050
063	063
080	080
100	100

Strokes (mm)	
Ø 16 ... 25	max. 200
Ø 32 ... 40	max. 250
Ø 50 ... 100	max. 300

Variants (magnetic piston)	Substitute
Standard	M
Non-rotating piston rod	N2
Guided piston rod	N4
Double ended piston rod	JM
Extended piston rod	MU
RM92***/MU/***/*** → Extension (mm)	

Note: If option is not required, disregard option position within part number eg. RM/92100/M/100. For combinations of cylinder variants consult our technical service.
Please note that heat resistant seals are not available for all variants.
This options selector explains only the cylinder variants. Additional variants/options can not be derived from. Information about variants see data sheet.

MOUNTINGS



Ø	B,G	C	F	N	Stud or Adapter*
12	QM/90012/22	QM/90012/21	QM/57008/25	M/P1500/111	M/P1710/18
16	QM/90016/22	QM/90016/21	QM/8010/25	M/P1501/80	M/P1710/1
20	QM/90020/22	QM/90020/21	QM/92020/25	M/P1501/109	M/P1710/20
25	QM/90025/22	QM/90025/21	QM/57016/25	M/P1501/79	M/P1710/21
32	QM/90032/22	QM/90032/21	QM/57020/25	M/P1501/60	M/P1710/22
40	QM/90040/22	QM/90040/21	QM/57020/25	M/P1501/60	M/P1710/22
50	QM/90050/22	QM/90050/21	QM/57025/25	–	M/P71470/1
63	QM/90063/22	QM/90063/21	QM/57040/25	–	M/P71470/2
80	QM/90080/22	QM/90080/21	QM/57063/25	–	M/P71470/3
100	QM/90100/22	QM/90100/21	QM/57063/25	–	M/P71470/3

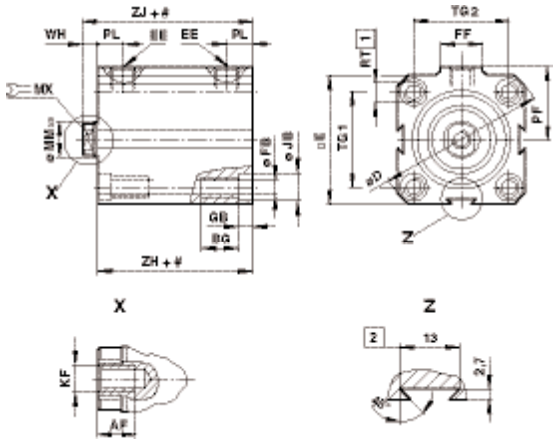
*For attaching F mounting to female piston rod thread

RM/92000/M Short stroke cylinders

Double acting - Ø 12 ... 100 mm

BASIC DIMENSIONS

RM/92000/M – Standard



#	Stroke
1	Only the 4 front holes are tapped on stroke lengths of less than: Ø 25 and 32 mm: 5 mm, Ø 40 and 63 mm: 15 mm (.../N2: 5 mm), Ø 50 and 80 mm: 10 mm, Ø 100 mm: 25 mm (.../N2: 15 mm)
2	Note: Ø 12 ... 20 mm feature only two side dovetails

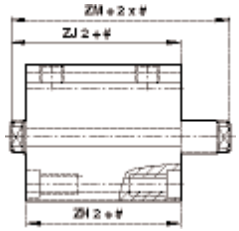
MODELS	Ø	AF	BG	Ø D	❑ E	EE	Ø FB	FF	GB	Ø JB	KF	Ø MM h9	Σ= MX
RM/92012/.	12	6	9	32,5	25	M 5	3,3	10	3,5	6	M 3	6	5
RM/92016/.	16	7	9	36,5	28	M 5	3,3	10	3,5	6	M 4	8	6
RM/92020/.	20	8	9	41,5	32	M 5	3,3	10	3,5	6	M 5	10	8
RM/92025/.	25	9	12	48	37	M 5	4,2	10	4,5	7,5	M 6	12	10
RM/92032/.	32	12	12	58	45	G 1/8	4,2	18	4,5	7,5	M 8	16	13
RM/92040/.	40	12	16	71,5	55	G 1/8	6,8	18	6,5	10,5	M 8	16	13
RM/92050/.	50	14	16	81	63	G 1/8	6,8	18	6,5	10,5	M 10	20	17
RM/92063/.	63	16	20	104	80	G 1/4	8,5	22	8,5	13,5	M 12	20	17
RM/92080/.	80	22	20	120	94	G 1/4	8,5	22	8,5	13,5	M 16	25	22
RM/92100/.	100	22	25	148,5	116,5	G 1/4	10,2	22	10,5	16,5	M 16	25	22

MODELS	Ø	PF	PL	RT	TG1	TG2	WH	ZH	ZH*	ZJ	ZJ *	at 0 mm	per 5 mm
RM/92012/.	12	15	7	M 4	17	13	4,5	24	34	28,5	38,5	0,06 kg	0,04 kg
RM/92016/.	16	17	7,5	M 4	20	20	5,5	24,5	34,5	30	40	0,08 kg	0,04 kg
RM/92020/.	20	19,5	7,5	M 4	23	23	6	26	36	32	42	0,10 kg	0,06 kg
RM/92025/.	25	22	8	M 5	27	27	6,5	28,5	38,5	35	45	0,15 kg	0,07 kg
RM/92032/.	32	27,5	9	M 5	33	33	6,5	29	39	35,5	45,5	0,25 kg	0,12 kg
RM/92040/.	40	31,5	10	M 8	41	41	6,5	31,5	41,5	38	48	0,38 kg	0,15 kg
RM/92050/.	50	37	10,5	M 8	48	48	8	35	45	43	53	0,45 kg	0,18 kg
RM/92063/.	63	48	13	M 10	61	61	8	42,5	52,5	50,5	60,5	0,82 kg	0,26 kg
RM/92080/.	80	57	14,5	M 10	73	73	9	47	57	56	66	1,20 kg	0,33 kg
RM/92100/.	100	67	16	M 12	90,5	90,5	10	48,5	58,5	58,5	68,5	1,83 kg	0,42 kg

* for stroke > 50 mm

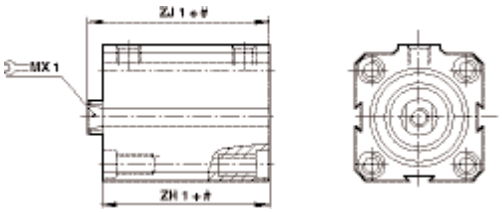
CYLINDER VARIANTS

RM/92000/JM – Cylinders with double ended piston rod



MODELS	Ø	ZH2	ZJ2	ZM
RM/92016/JM	16	29,5	35	41
RM/92020/JM	20	31,5	37,5	44
RM/92025/JM	25	34,5	41	48
RM/92032/JM	32	36,5	43	50
RM/92040/JM	40	39,5	46	53
RM/92050/JM	50	42	50	59
RM/92063/JM	63	52	60	69
RM/92080/JM	80	56	65	74
RM/92100/JM	100	58	68	78

RM/92000/N2 – Cylinders with non-rotating piston rod



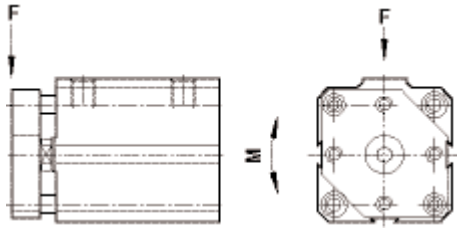
\# Stroke

MODELS	Ø	MX1	ZH1	ZJ1	Torque max.
RM/92016/N2	16	6	34,5	40	0,15 Nm
RM/92020/N2	20	8	36	42	0,25 Nm
RM/92025/N2	25	10	38	45	0,40 Nm
RM/92032/N2	32	13	39	45,5	0,75 Nm
RM/92040/N2	40	13	41,5	48	0,75 Nm
RM/92050/N2	50	16	45	53	1,50 Nm
RM/92063/N2	63	16	52,5	60,5	1,50 Nm
RM/92080/N2	80	21	57	66	2,50 Nm
RM/92100/N2	100	21	58,5	68,5	2,50 Nm

RM/92000/M Short stroke cylinders

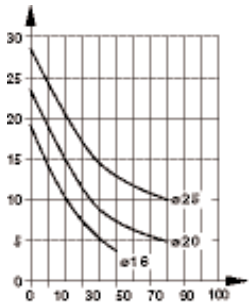
Double acting - Ø 12 ... 100 mm

RM/92000/N4 – Cylinder with guide piston rod
Side load

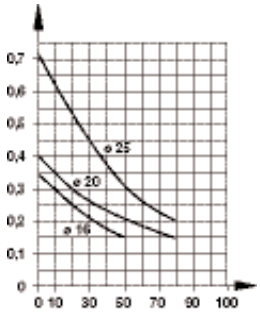


Permissible load and torque

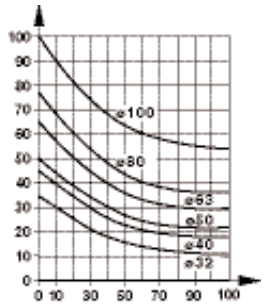
F – Side load (N)



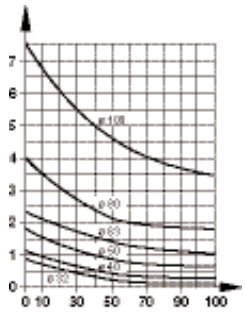
M – Torque (Nm)



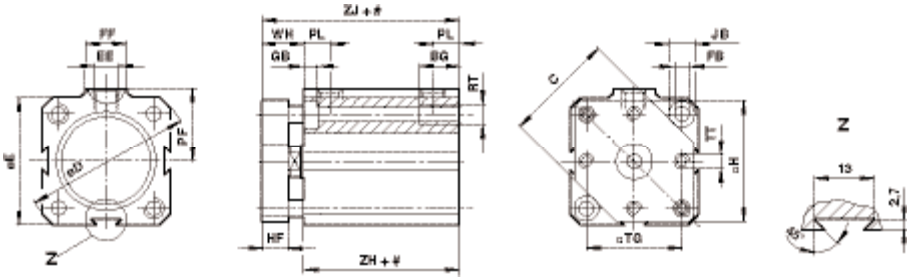
F – Side load (N)



F – Side load (N)



RM/92000/N4 – Cylinder with guide piston rod



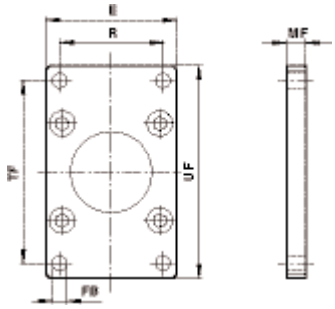
MODELS	Ø	BG	C	Ø D	❑ E	EE	Ø FB	FF	GB	❑ H	HF	Ø JB
RM/92016/N4	16	9	21	36,5	28	M 5	3,3	10	3,5	26,5	6	6
RM/92020/N4	20	9	25	41,5	32	M 5	3,3	10	3,5	30	8	6
RM/92025/N4	25	12	29,5	48	37	M 5	4,2	10	4,5	35	8	7,5
RM/92032/N4	32	12	38	58	45	G 1/8	4,2	18	4,5	43	10	7,5
RM/92040/N4	40	16	46,5	71,5	55	G 1/8	6,8	18	6,5	52	10	10,5
RM/92050/N4	50	16	56,5	81	63	G 1/8	6,8	18	6,5	60	12	10,5
RM/92063/N4	63	20	71	104	80	G 1/4	8,5	22	8,5	76	12	13,5
RM/92080/N4	80	20	89	120	94	G 1/4	8,5	22	8,5	90	16	13,5
RM/92100/N4	100	25	110	148,5	116,5	G 1/4	10,2	22	10,5	113	20	16,5

MODELS	PF	PL	RT	❑ TG	TT	WH	ZH	ZH*	ZJ	ZJ *	at 0 mm	per 25 mm
RM/92016/N4	17	7,5	M 4	20	M 3	11,5	24,5	24,5	36	36	0,110 kg	0,050 kg
RM/92020/N4	19,5	7,5	M 4	23	M 3	14	26	36	40	50	0,130 kg	0,070 kg
RM/92025/N4	22	8	M 5	27	M 4	14,5	28,5	38,5	43	53	0,170 kg	0,100 kg
RM/92032/N4	27,5	9	M 5	33	M 4	16,5	29	39	45,5	55,5	0,280 kg	0,130 kg
RM/92040/N4	31,5	10	M 8	41	M 5	16,5	31,5	41,5	48	58	0,440 kg	0,150 kg
RM/92050/N4	37	10,5	M 8	48	M 6	20	35	45	55	65	0,500 kg	0,200 kg
RM/92063/N4	48	13	M 10	61	M 8	20	42,5	52,5	62,5	72,5	0,900 kg	0,300 kg
RM/92080/N4	57	14,5	M 10	73	M 10	25	47	57	72	82	1,350 kg	0,350 kg
RM/92100/N4	67	16	M 12	90,5	M 12	30	48,5	58,5	78,5	88,5	2,200 kg	0,600 kg

* for stroke > 50 mm

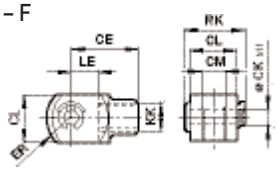
MOUNTINGS - For RM/91000/M & RM/92000/M

Front flange – G
Rear flange – B



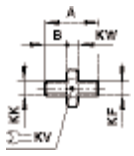
MODELS	Ø	E	R	Ø FB	MF	TF	UF	kg
QM/90012/22	12	26	18	3,5	5	38	46	0,02
QM/90016/22	16	30	22	3,5	5	42	50	0,02
QM/90020/22	20	33	25	3,5	5	48	56	0,02
QM/90025/22	25	38	28	4,5	6,5	54	64	0,04
QM/90032/22	32	46	36	4,5	6,5	66	76	0,06
QM/90040/22	40	57	43	6,5	9,5	78	92	0,15
QM/90050/22	50	64	50	6,5	9,5	90	104	0,17
QM/90063/22	63	81	63	9,5	12,5	110	128	0,33
QM/90080/22	80	95	77	8,5	12,5	128	146	0,41
QM/90100/22	100	118	98	11	12,5	156	176	0,72

Piston rod clevis – F



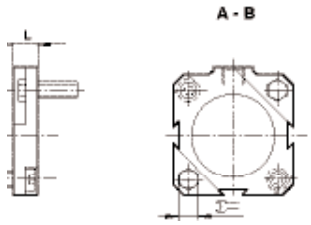
MODELS	Ø	KK	CE	Ø CK$_{h11}$	CL	CM	ER	LE	RK	kg
QM/57008/25	12	M3	11	3 h9	6	3	4,5	5	10	0,01
QM/8010/25	16	M4	16	4	8	4	6,5	8	11,5	0,01
QM/92020/25	20	M5	20	5	10	5	8	10	14,5	0,01
QM/57016/25	25	M6	20	5	10	5	8	10	14,5	0,01
QM/57020/25	32 & 40	M8	24	6	12	6	9,5	12	17,5	0,02
QM/57025/25	50	M10x1,25	26	8	14	7	11,5	12	20,5	0,04
QM/57040/25	63	M12x1,25	40	10	20	11	16	20	29	0,09
QM/57063/25	80 &100	M16x1,5	56	14	27	14	21	28	36,5	0,22

Adaptor



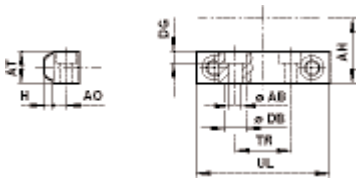
MODELS	Ø	A	B	KF	KK	KV	KW	kg
M/P71470/1	50	29	12	M10	M10x1,25	12	5	0,02
M/P71470/1	63	35	15	M12	M12x1,25	13	5	0,04
M/P71470/1	80 & 100	45	20	M16	M16x1,5	17	5	0,08

Assembly kit



MODELS	Ø	L	Σ
QM/90012/55	12	10	7
QM/90016/55	16	10	7
QM/90020/55	20	10	7
QM/90025/55	25	10	8
QM/90032/55	32	10	8
QM/90040/55	40	15	13
QM/90050/55	50	15	13
QM/90063/55	63	20	17
QM/90080/55	80	20	17
QM/90100/55	100	25	19

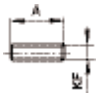
Foot – C



MODELS	Ø	Ø AB	AH	AO	AT	H
QM/90012/21	12	3,4	13,5	4	9,5	2
QM/90016/21	16	3,4	15	4	9,5	2
QM/90020/21	20	3,4	16,5	4	9,5	2
QM/90025/21	25	4,3	20	5	12,5	3
QM/90032/21	32	4,3	23	5	12,5	3
QM/90040/21	40	6,4	28,5	6,5	16	4,5
QM/90050/21	50	6,4	32	6,5	16	4,5
QM/90063/21	63	8,4	41,5	8	22	5,5
QM/90080/21	80	8,4	49	8	25,5	5,5
QM/90100/21	100	10,5	59,5	9,	28,5	6,5

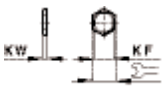
MODELS	Ø	Ø DB	DG	TR	UL	kg
QM/90012/21	12	6	3,5	25	33	0,02
QM/90016/21	16	6	3,5	32	40	0,02
QM/90020/21	20	6	3,5	35	43	0,02
QM/90025/21	25	7,5	4,5	41	51	0,04
QM/90032/21	32	7,5	4,5	19	46	0,04
QM/90040/21	40	10,5	6,5	21	56	0,10
QM/90050/21	50	10,5	6,5	27	64	0,11
QM/90063/21	63	13,5	8,5	34	81	0,13
QM/90080/21	80	13,5	8,5	44	95	0,18
QM/90100/21	100	16,5	10,5	56	118	0,48

Stud



MODELS	Ø	A	KF	kg
M/P1710/18	12	12	M3	0,01
M/P1710/19	16	16	M4	0,01
M/P1710/20	20	20	M5	0,01
M/P1710/21	25	25	M6	0,01
M/P1710/22	32 & 40	25	M8	0,01

Nut - N



MODELS	Ø	KF	KW	Σ	kg
M/P1500/111	12	M3	2	6	0,01
M/P1501/80	16	M4	2	7	0,01
M/P1501/109	20	M5	2,5	8	0,01
M/P1501/79	25	M6	3	10	0,01
M/P1501/60	32 & 40	M8	4	13	0,01

RA/191000/MX,.../M; RA/193000/MX,.../M Compact cylinders

Single acting, ISO 21287- Ø 20 ... 63 mm

- Conforms to ISO21287
- Magnetic piston as standard
- Low friction, long life seals
- Switches can be mounted flush with the profile

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

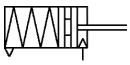
Operating pressure:
2 ... 10 bar

Operating temperature:
-5°C ... +80°C
Consult our Technical Service for use below +2°C

MATERIALS

Profile barrel: Anodised aluminium
End covers: Pressure diecast aluminium
Piston rod: Stainless steel
Piston rod seals: Polyurethane
Piston seals: Nitrile rubber
O-rings: Nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Female thread Sprung in	Sprung out	MODELS Male thread Sprung in	Sprung out	ACCESSORIES Reed switch with integral 5m cable	Straight fitting	Elbow fitting
									Tube diameter in bold	
										
 Sprung In	20	10	M5	RA/191020/MX/*	RA/193020/MX/*	RA/191020/M/*	RA/193020/M/*	M/50/LSU/5V	C022504**05**	C024704**05**
	25	10	M5	RA/191025/MX/*	RA/193025/MX/*	RA/191025/M/*	RA/193025/M/*	M/50/LSU/5V	C022504**05**	C024704**05**
	32	12	G1/8	RA/191032/MX/*	RA/193032/MX/*	RA/191032/M/*	RA/193032/M/*	M/50/LSU/5V	C022506**18**	C024706**18**
	40	16	G1/8	RA/191040/MX/*	RA/193040/MX/*	RA/191040/M/*	RA/193040/M/*	M/50/LSU/5V	C022506**18**	C024706**18**
	50	20	G1/8	RA/191050/MX/*	RA/193050/MX/*	RA/191050/M/*	RA/193050/M/*	M/50/LSU/5V	C022506**18**	C024706**18**
Sprung Out	63	20	G1/8	RA/191063/MX/*	RA/193063/MX/*	RA/191063/M/*	RA/193063/M/*	M/50/LSU/5V	C022506**18**	C024706**18**

*Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	5	10	25
20	•	•	
25	•	•	
32		•	•
40		•	•
50		•	•
63		•	•

Theoretical forces

Ø	RA/191000/M Theoretical forces (N) at 6 bar Outstroke	F1	RA/193000/M Theoretical forces (N) at 6 bar Instroke	F1	Energy (J) max.
20	161	14,5	119	14,5	0,20
25	264	20	197	20	0,30
32	432	32	311	32	0,45
40	687	44	566	44	0,75
50	1043	56,5	906	56,5	1,10
63	1770	74,5	1582	74,5	1,30

F1 = Return force of spring

For further information

www.norgren.com/info/en1-046

OPTIONS SELECTOR

★A/19★★★★/★★★/★★

Piston rod materials	Substitute
Stainless steel martensitic (1.4021)	R
Stainless steel austenitic (1.4305)	S

Operation	Substitute
Sprung in	1
Sprung out	3

Cylinder diameters (mm)	Substitute
20	020
25	025
32	032
40	040
50	050
63	063

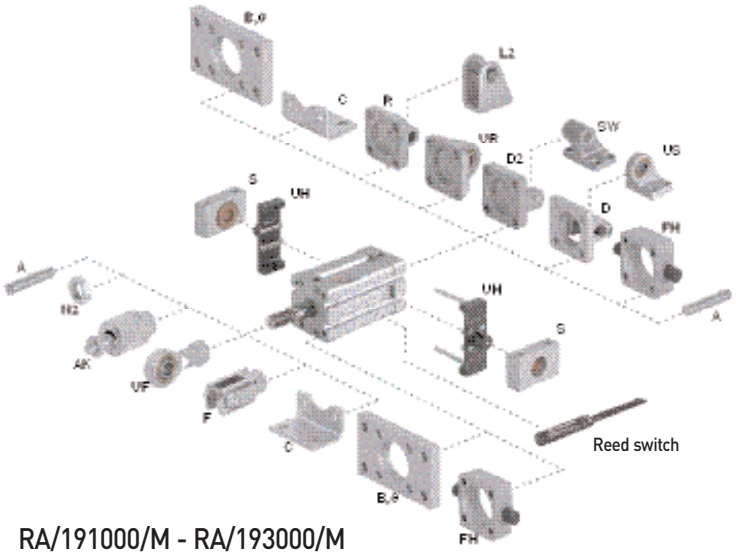
Strokes (mm)
50 max.

Piston rod thread	Substitute
Female	X
Male	None

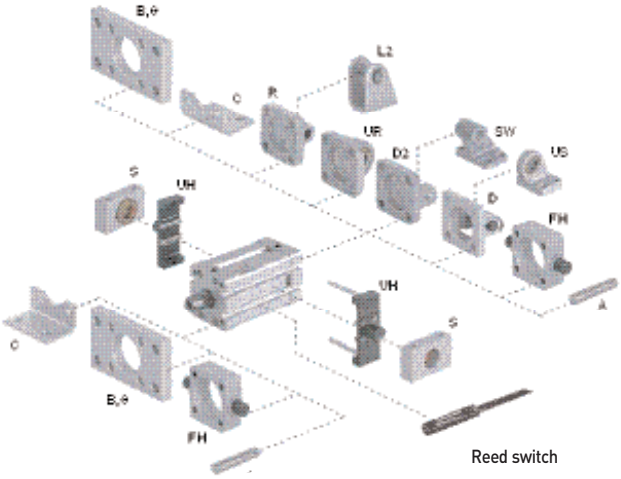
Variants (magnetic piston)	Substitute
Standard	M
Non-rotating piston rod	N2
Extended piston rod	MU
RA/19****/MU*/**/*** → Extension (mm)	

Note: If option is not required, disregard option position within part number eg. RA/191032/M/25. For combinations of cylinder variants consult our technical service.
This options selector explains only the cylinder variants. Additional variants/options can not be derived from. Information about variants see data sheet.

MOUNTINGS



RA/191000/M - RA/193000/M



RA/191000/MX - RA/193000/MX

For cylinders with male and female piston rod thread

Ø	A	B, G	C	D	D2	FH	L2
20	–	QA/192020/22	QM/192020/21	–	–	–	QM/8020/44
25	–	QA/192025/22	QM/192025/21	–	–	–	QM/8020/44
32	QM/8032/35	QA/8032/22	QA/192032/21	QA/8032/23	QA/8032/42	QA/8032/34	–
40	QM/8032/35	QA/8040/22	QA/192040/21	QA/8040/23	QA/8040/42	QA/8040/34	–
50	QM/8050/35	QA/8050/22	QA/192050/21	QA/8050/23	QA/8050/42	QA/8050/34	–
63	QM/8050/35	QA/8063/22	QA/192063/21	QA/8063/23	QA/8063/42	QA/8063/34	–

Ø	R	S	SW	UH	UR	US
20	QM/192020/27	–	–	–	–	–
25	QM/192025/27	–	–	–	–	–
32	QA/8032/27	QA/8032/41	M/P19493	PQA/182032/40	QA/8032/33	M/P40310
40	QA/8040/27	QA/8040/41	M/P19494	PQA/182040/40	QA/8040/33	M/P40311
50	QA/8050/27	QA/8040/41	M/P19495	PQA/182050/40	QA/8050/33	M/P40312
63	QA/8063/27	QA/8063/41	M/P19496	PQA/182063/40	QA/8063/33	M/P40313

For cylinders with male piston rod thread

	Ø	AK	F	N2	UF
20	QM/8020/38	QM/8020/25	M/P1501/60	QM/8020/32	
25	QM/8020/38	QM/8020/25	M/P1501/60	QM/8020/32	
32	QM/8025/38	QM/8025/25	M/P1501/89	QM/8025/32	
40	QM/8025/38	QM/8025/25	M/P1501/89	QM/8025/32	
50	QM/8040/38	QM/8040/25	M/P1501/90	QM/8040/32	
63	QM/8040/38	QM/8040/25	M/P1501/90	QM/8040/32	

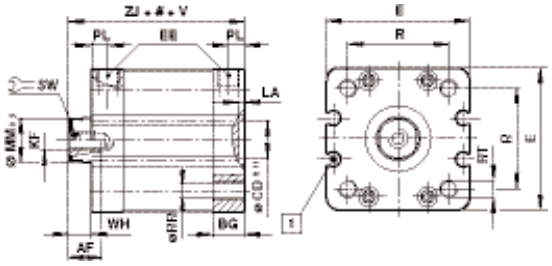
For details of mountings see page 92

RA/191000/MX,.../M; RA/193000/MX,.../M Compact cylinders

Single acting, ISO 21287- Ø 20 ... 63 mm

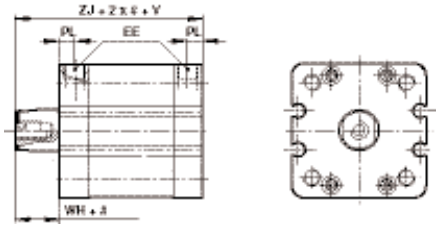
BASIC DIMENSIONS

RA/191000/MX
Sprung in with female piston rod thread



RA/191000/M
Sprung in with male piston rod thread

RA/193000/MX
Sprung out with female piston rod thread



RA/193000/M
Sprung out with male piston rod thread

\# Stroke

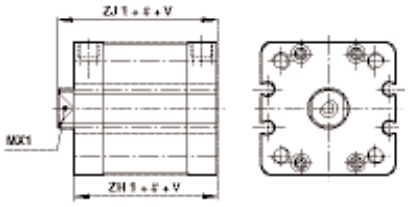
1 M/50 – Switches can be mounted flush with the profile

MODELS	Ø	AF	AM	BG	Ø CD H11	❑ E	EE	KF	KK	LA	Ø MM h9	PL	❑ R
RA/19.020/M.	20	10	16	12	10	37	M 5	M6	M8x1,25	2,5	10	7	22
RA/19.025/M.	25	10	16	13	10	41	M 5	M6	M8x1,25	2,5	10	7	26
RA/19.032/M.	32	12	19	14,5	14	48	G 1/8	M8	M10x1,25	2,5	12	7,5	32,5
RA/19.040/M.	40	12	19	14,5	14	54,5	G 1/8	M8	M10x1,25	2,5	16	7,5	38
RA/19.050/M.	50	16	22	14	18	66	G 1/8	M10	M12x1,25	2,5	20	7,5	46,5
RA/19.063/M.	63	16	22	14	18	76	G 1/8	M10	M12x1,25	2,5	20	7,5	56,5

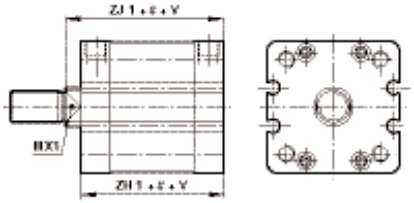
MODELS	Ø	Ø RR	RT	⊃= SW	V mm stroke 0 ... 25	V mm stroke 26 ... 50	WH	ZJ	RA/19.000/M. at 0 mm	RA/19.000/M. per 5 mm
RA/19.020/M.	20	4,3	M5	8	17	34	6	43	0,17 kg	0,01 kg
RA/19.025/M.	25	4,3	M5	8	18	36	6	45	0,20 kg	0,01 kg
RA/19.032/M.	32	5,3	M6	10	19	38	7	51	0,30 kg	0,02 kg
RA/19.040/M.	40	5,3	M6	13	20	40	7	52	0,40 kg	0,02 kg
RA/19.050/M.	50	6,8	M8	17	30	60	8	53	0,65 kg	0,03 kg
RA/19.063/M.	63	6,8	M8	17	30	60	8	57	0,90 kg	0,03 kg

CYLINDER VARIANTS

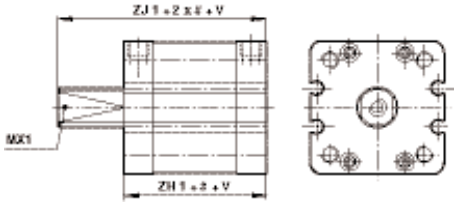
RA/191000/N2X – Cylinder with non-rotating piston rod
Sprung in with female piston rod thread



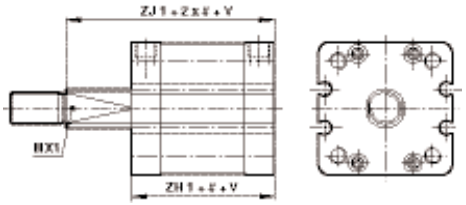
RA/191000/N2 – Cylinder with non-rotating piston rod
Sprung in with male piston rod thread



RA/193000/N2X – Cylinder with non-rotating piston rod
Sprung out with female piston rod thread



RA/193000/N2 – Cylinder with non-rotating piston rod
Sprung out with male piston rod thread



\# Stroke

MODELS	Ø	MX1	V*		ZH1	ZJ1	RA/19.000/N2.	
			0 ... 25	26 ... 50			at 0 mm	per 5 mm
RA/19.020/N2.	20	8	17	34	47	53	0,17 kg	0,01 kg
RA/19.025/N2.	25	8	18	36	49	55	0,20 kg	0,01 kg
RA/19.032/N2.	32	10	19	38	54	61	0,30 kg	0,02 kg
RA/19.040/N2.	40	13	20	40	55	62	0,40 kg	0,02 kg
RA/19.050/N2.	50	16	30	60	55	63	0,65 kg	0,03 kg
RA/19.063/N2.	63	16	30	60	59	67	0,90 kg	0,03 kg

* stroke length (mm)

Torque for cylinders RA/19.000/N2.

MODELS	Ø	Torque max. (Nm)
RA/19.020/N2.	20	0,15
RA/19.025/N2.	25	0,25
RA/19.032/N2.	32	0,40
RA/19.040/N2.	40	0,75
RA/19.050/N2.	50	1,50
RA/19.063/N2.	63	1,50

RA/192000/MX, .../M Compact cylinders

Double acting - Ø 20 ... 125 mm

- Conforms to ISO 21287
- Magnetic piston as standard
- Low friction, long life seals
- Switches can be mounted flush with the profile

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
RA/192000/M
Double acting, magnetic piston, male piston rod thread, buffer cushioning
RA/192000/MX
Double acting, magnetic piston, female piston rod thread, buffer cushioning

Operating pressure:
1 ... 10 bar

Operating temperature:
-5°C ... +80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Profile barrel: Anodised aluminium
End covers: Pressure diecast aluminium
Piston rod: Stainless steel
Piston rod seals: Polyurethane
Piston seals: Nitrile rubber
O-rings: Nitrile rubber

STANDARD MODELS

				MODELS		ACCESSORIES				
	Ø	Piston rod Ø	Port size	Female thread	Male thread	Reed switch with integral 5m cable	Banjo flow control Tube diameter in bold	Straight fitting	Elbow fitting	Service kit
										
	20	10	M5	**RA/192020/MX/***	**RA/192020/M/***	M/50/LSU/5V	C0K51**04**05	C022**504**05	C024**704**05	QM/192020/00
	25	10	M5	**RA/192025/MX/***	**RA/192025/M/***	M/50/LSU/5V	C0K51**04**05	C022**504**05	C024**704**05	QM/192025/00
	32	12	G1/8	**RA/192032/MX/***	**RA/192032/M/***	M/50/LSU/5V	C0K51**06**18	C022**506**18	C024**706**18	QM/192032/00
	40	16	G1/8	**RA/192040/MX/***	**RA/192040/M/***	M/50/LSU/5V	C0K51**06**18	C022**506**18	C024**706**18	QM/192040/00
	50	20	G1/8	**RA/192050/MX/***	**RA/192050/M/***	M/50/LSU/5V	C0K51**06**18	C022**506**18	C024**706**18	QM/192050/00
	63	20	G1/8	**RA/192063/MX/***	**RA/192063/M/***	M/50/LSU/5V	C0K51**06**18	C022**506**18	C024**706**18	QM/192063/00
	80	25	G1/8	**RA/192080/MX/***	**RA/192080/M/***	M/50/LSU/5V	C0K51**08**18	C022**508**18	C024**708**18	QM/192080/00
	100	25	G1/8	**RA/192100/MX/***	**RA/192100/M/***	M/50/LSU/5V	C0K51**08**18	C022**508**18	C024**708**18	QM/192100/00
	125	32	G1/4	**RA/192125/MX/***	**RA/192125/M/***	M/50/LSU/5V	C0K51**08**28	C022**508**28	C024**708**28	QM/192125/00

*Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	5	10	15	20	25	30	40	50	60	80	100
20	•	•	•	•	•	•	•	•			
25	•	•	•	•	•	•	•	•			
32	•	•	•	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•	•	•	•
50		•	•	•	•	•	•	•	•	•	•
63		•	•	•	•	•	•	•	•	•	•
80			•	•	•	•	•	•	•	•	•
100			•	•	•	•	•	•	•	•	•
125			•	•	•	•	•	•	•	•	•

For further information

www.norgren.com/info/en1-050

OPTIONS SELECTOR

★P★A/182★★★/★★★/★★★★

Non-standard variants	Substitute
High temperature version: 150°C max.	T
Hydraulic (Ø 32 ... 100 mm)	H

Piston rod material	Substitute
Stainless steel martensitic	R
Hard chromium plated	C
Stainless steel austenitic	S

Cylinder Ø	Substitute
32	032
40	040
50	050
63	063
80	080
100	100
125	125

Variants (magnetic piston)	Substitute
Standard	M
Special wiper/seal	W2
low friction	X2
Piston rod bellow	MG
Without cushion	MW
Without cushion, low friction	X4
Double ended piston rod	JM
Double ended piston rod and special wiper/seal	W4
Four-positon cylinder	MT
Non-rotating piston rod (internal)	N2
Locking unit (passive)	L4
Barrel turned at 90° (for use with guideblocks QA/8000/51 and .../61)	MIL
Extended piston rod	MU

P*A/182***/MU/****/***
/W6/ → Extension (mm)

Strokes (mm)
3000 max.

Variants (non-magnetic piston)	Substitute
Standard	None
Special wiper/seal	W1
Low friction	X1
Piston rod bellow	G
Without cushion	W
Without cushion, low friction	X3
Double ended piston rod	J
Double ended piston rod special wiper/seal	W3
Four-positon cylinder	IT
Non-rotating piston rod (internal)	N1
Locking unit (passive)	L2
Barrel turned at 90° (for use with guideblocks QA/8000/51 and .../61)	IIL
Extended piston rod	IU

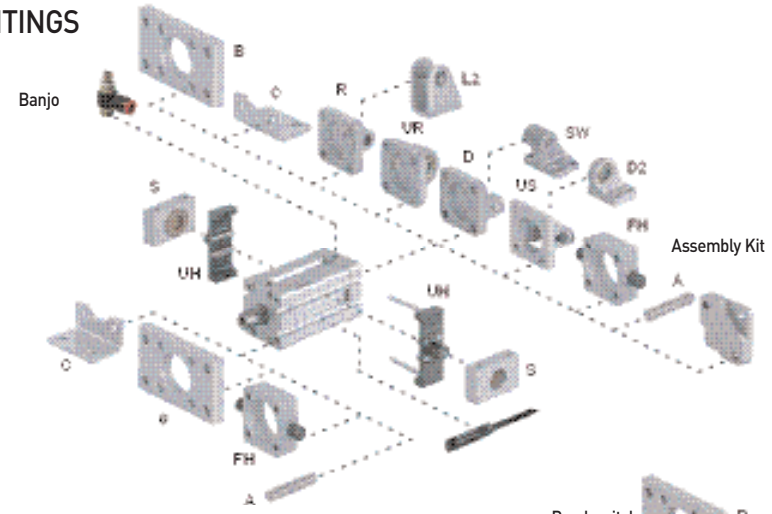
P*A/182***/IU/****/***
/W5/ → Extension (mm)

Note: If option is not required, disregard option position within part number eg. RA/182100/M/100.
For combinations of cylinder variants consult our technical service. Please note that heat resistant seals are not available for all variants.
This options selector explains only the cylinder variants. Additional variants/options are not possible.

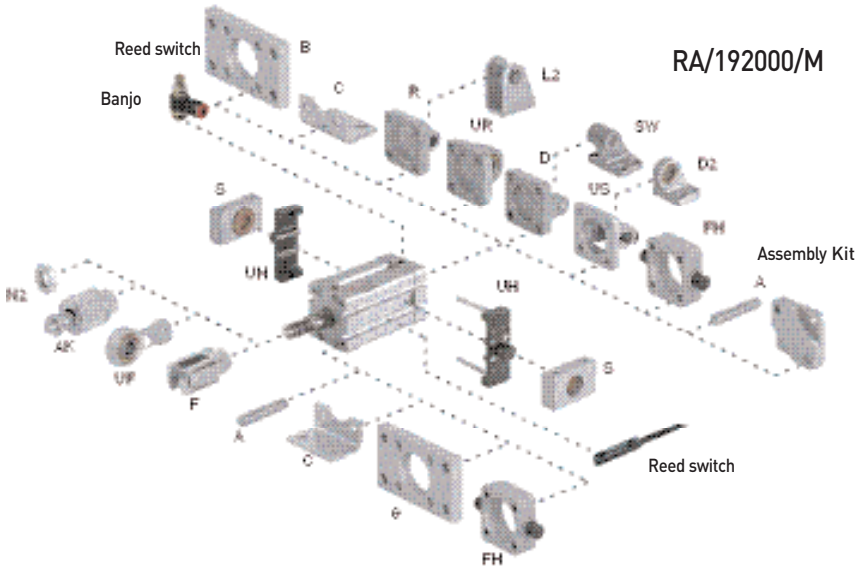
RA/192000/MX, .../M Compact cylinders

Double acting - Ø 20 ... 125 mm

MOUNTINGS



RA/192000/MX



RA/192000/M

For cylinders with male and female piston rod thread

Ø	A	B, G	C	D	D2	FH	L2
20	–	QA/192020/22	QM/192020/21	–	–	–	QM/8020/44
25	–	QA/192025/22	QM/192025/21	–	–	–	QM/8020/44
32	QM/8032/35	QA/8032/22	QA/192032/21	QA/8032/23	QA/8032/42	QA/8032/34	–
40	QM/8032/35	QA/8040/22	QA/192040/21	QA/8040/23	QA/8040/42	QA/8040/34	–
50	QM/8050/35	QA/8050/22	QA/192050/21	QA/8050/23	QA/8050/42	QA/8050/34	–
63	QM/8050/35	QA/8063/22	QA/192063/21	QA/8063/23	QA/8063/42	QA/8063/34	–
80	QM/8080/35	QA/8080/22	QA/192080/21	QA/8080/23	QA/8080/42	QA/8080/34	–
100	QM/8080/35	QA/8100/22	QA/192100/21	QA/8100/23	QA/8100/42	QA/8100/34	–
125	QM/8125/35	QM/8125/22	QM/8125/21	QM/8125/23	QA/8125/42	QA/8125/34	–

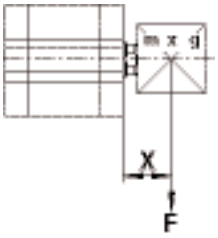
Ø	R	S	SW	UH	UR	US	Assembly Kit
20	QM/192020/27	–	–	–	–	–	QA/192020/55
25	QM/192025/27	–	–	–	–	–	QA/192025/55
32	QA/8032/27	QA/8032/41	M/P19493	PQA/182032/40	QA/8032/33	M/P40310	QA/192032/55
40	QA/8040/27	QA/8040/41	M/P19494	PQA/182040/40	QA/8040/33	M/P40311	QA/192040/55
50	QA/8050/27	QA/8040/41	M/P19495	PQA/182050/40	QA/8050/33	M/P40312	QA/192050/55
63	QA/8063/27	QA/8063/41	M/P19496	PQA/182063/40	QA/8063/33	M/P40313	QA/192063/55
80	QA/8080/27	QA/8063/41	M/P19497	PQA/182080/40	QA/8080/33	M/P40314	QA/192080/55
100	QA/8100/27	QA/8100/41	M/P19498	PQA/182100/40	QA/8100/33	M/P40315	QA/192100/55
125	QM/8125/27	QA/8100/41	M/P19499	PQA/182125/40	QM/8125/33	M/P71355	QA/192125/55

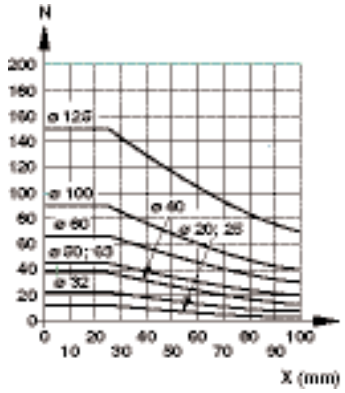
For cylinders with male piston rod thread

Ø	AK	F	N2	UF
20	QM/8020/38	QM/8020/25	M/P1501/60	QM/8020/32
25	QM/8020/38	QM/8020/25	M/P1501/60	QM/8020/32
32	QM/8025/38	QM/8025/25	M/P1501/89	QM/8025/32
40	QM/8025/38	QM/8025/25	M/P1501/89	QM/8025/32
50	QM/8040/38	QM/8040/25	M/P1501/90	QM/8040/32
63	QM/8040/38	QM/8040/25	M/P1501/90	QM/8040/32
80	QM/8050/38	QM/8050/25	M/P1501/91	QM/8050/32
100	QM/8050/38	QM/8050/25	M/P1501/91	QM/8050/32
125	QM/8125/38	QM/8125/25	M/P1501/105	QM/8125/32

For details of mountings see page 92

RA/192000/M.
RA/192000/N2. – Cylinder with non-rotating piston rod
Side load





For RA/192000/M.

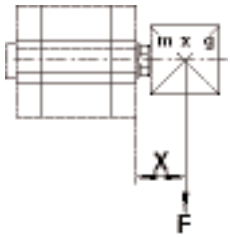
Ø	Energy (J) max.
20	0,2
25	0,3
32	0,45
40	0,75
50	1,1
63	1,3
80	1,9
100	2,3
125	3,0

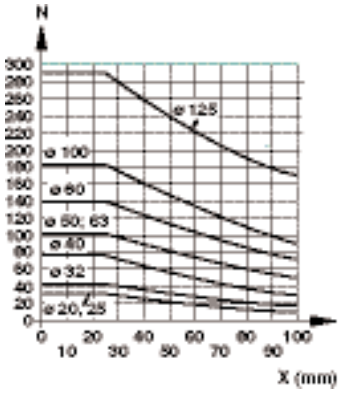
For RA/192000/N2

MODELS	Ø	Torque max. (Nm)
RA/192020/N2	20	0,15
RA/192025/N2	25	0,25
RA/192032/N2	32	0,40
RA/192040/N2	40	0,75
RA/192050/N2	50	1,5
RA/192063/N2	63	1,5
RA/192080/N2	80	2,5
RA/192100/N2	100	2,5

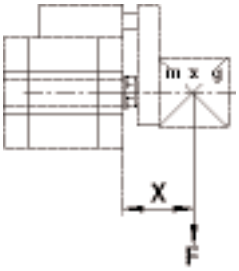
Special variant
TRA/192000: F x 0,5

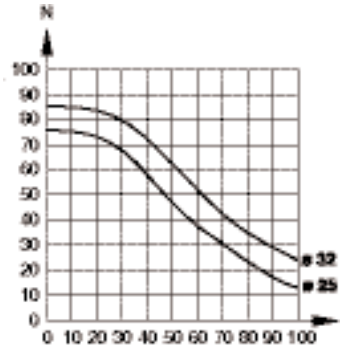
RA/192000/JM – Cylinder with double ended piston rod
Side load



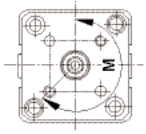


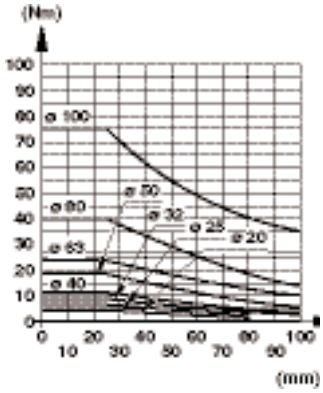
RA/192000/N6 – Cylinder with external guiding
Side load



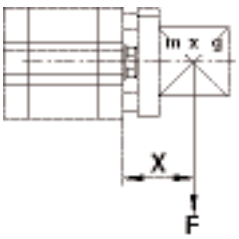


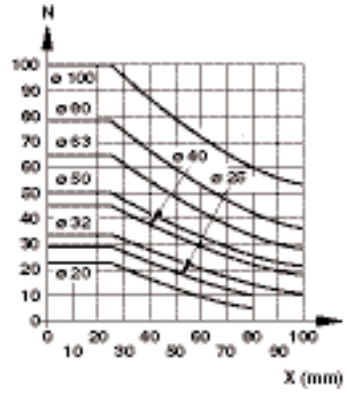
RA/192000/N4 – Cylinder with guiding
Side load





Side load





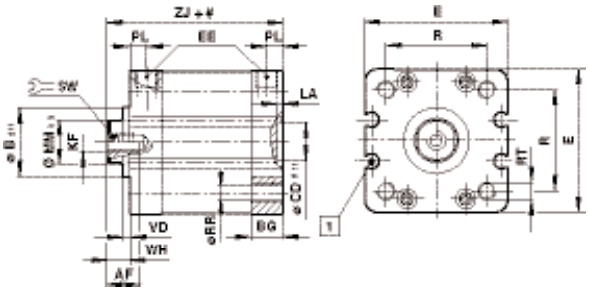
RA/192000/MX, .../M Compact cylinders

Double acting - Ø 20 ... 125 mm

BASIC DIMENSIONS

RA/192000/MX

With female piston rod thread



RA/192000/M

With male piston rod thread

1 M/50 switches can be mounted flush with the profile

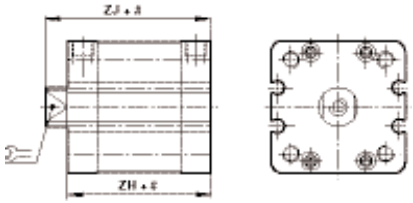
\# Stroke

MODELS	Ø	AF	AM	Ø B_{d11}	BG	Ø CD^{H11}	□ E	EE	KF	KK	LA	Ø MM_{h9}
RA/192020/.	20	10	16	–	12	10	37	M 5	M6	M8x1,25	2,5	10
RA/192025/.	25	10	16	–	13	10	41	M 5	M6	M8x1,25	2,5	10
RA/192032/.	32	12	19	–	14,5	14	48	G 1/8	M8	M10x1,25	2,5	12
RA/192040/.	40	12	19	–	14,5	14	54,5	G 1/8	M8	M10x1,25	2,5	16
RA/192050/.	50	16	22	–	14	18	66	G 1/8	M10	M12x1,25	2,5	20
RA/192063/.	63	16	22	–	14	18	76	G 1/8	M10	M12x1,25	2,5	20
RA/192080/.	80	20	28	–	15,5	23	96	G 1/8	M12	M16x1,5	3	25
RA/192100/.	100	20	28	–	21,5	26	116	G 1/8	M12	M16x1,5	3	25
RA/192125/.	125	30	54	60	20,5	28	142	G 1/4	M20	M27x2	3	32

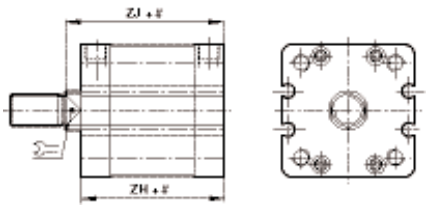
MODELS	Ø	PL	□ R	Ø RR	RT	⌀ SW	VD	WH	ZJ	at 0 mm	per 5 mm
RA/192020/.	20	7	22	4,3	M5	8	–	6	43	0,12 kg	0,01 kg
RA/192025/.	25	7	26	4,3	M5	8	–	6	45	0,15 kg	0,01 kg
RA/192032/.	32	7,5	32,5	5,3	M6	10	–	7	51	0,23 kg	0,02 kg
RA/192040/.	40	7,5	38	5,3	M6	13	–	7	52	0,30 kg	0,02 kg
RA/192050/.	50	7,5	46,5	6,8	M8	17	–	8	53	0,46 kg	0,03 kg
RA/192063/.	63	7,5	56,5	6,8	M8	17	–	8	57	0,70 kg	0,03 kg
RA/192080/.	80	7,5	72	8,6	M10	22	–	10	64	1,23 kg	0,04 kg
RA/192100/.	100	10,5	89	8,6	M10	22	–	10	77	2,20 kg	0,05 kg
RA/192125/.	125	10,5	110	10,6	M12	27	4	18	89	3,60 kg	0,07 kg

CYLINDER VARIANTS

RA/192000/N2X – Cylinder with non-rotating piston rod



RA/192000/N2 – Cylinder with non-rotating piston rod

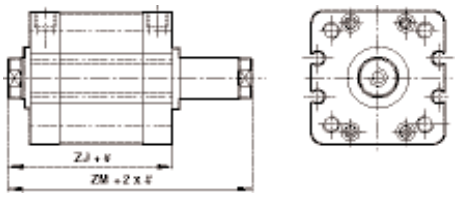


MODELS	Ø	⌀	ZH	ZJ	at 0 mm	per 5 mm
RA/192020/N2.	20	8	47	53	0,12 kg	0,01 kg
RA/192025/N2.	25	8	49	55	0,15 kg	0,01 kg
RA/192032/N2.	32	10	54	61	0,23 kg	0,02 kg
RA/192040/N2.	40	13	55	62	0,30 kg	0,02 kg
RA/192050/N2.	50	16	55	63	0,46 kg	0,03 kg
RA/192063/N2.	63	16	59	67	0,70 kg	0,03 kg
RA/192080/N2.	80	21	64	74	1,23 kg	0,04 kg
RA/192100/N2.	100	21	77	87	2,20 kg	0,05 kg

Note: The basic length of the RA/192000/N2 version is slightly longer than the standard

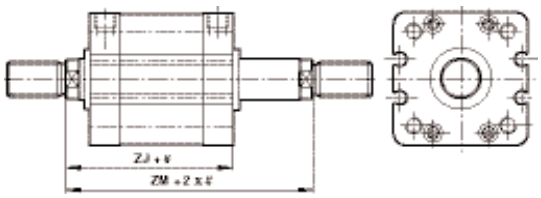
\# Stroke

RA/192000/JMX – Cylinder with double ended piston rod



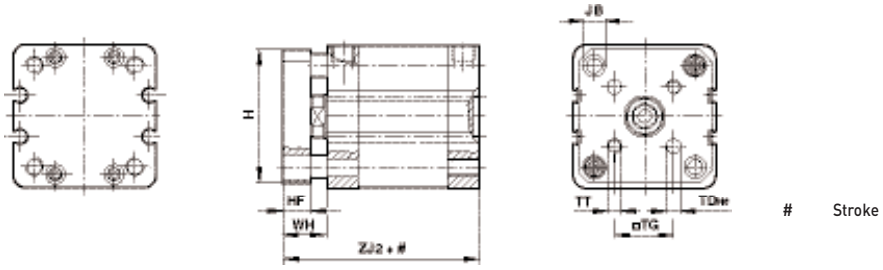
MODELS	Ø	ZJ	ZM	at 0 mm	per 5 mm
RA/192020/JM.	20	43	49	0,15 kg	0,01 kg
RA/192025/JM.	25	45	51	0,18 kg	0,01 kg
RA/192032/JM.	32	51	58	0,28 kg	0,02 kg
RA/192040/JM.	40	52	59	0,35 kg	0,02 kg
RA/192050/JM.	50	53	61	0,52 kg	0,03 kg
RA/192063/JM.	63	57	65	0,76 kg	0,03 kg
RA/192080/JM.	80	64	74	1,30 kg	0,04 kg
RA/192100/JM.	100	77	87	2,30 kg	0,05 kg
RA/192125/JM.	125	89	107	3,75 kg	0,07 kg

RA/192000/JM – Cylinder with double ended piston rod



Stroke

RA/192000/N4 – Cylinder with guiding



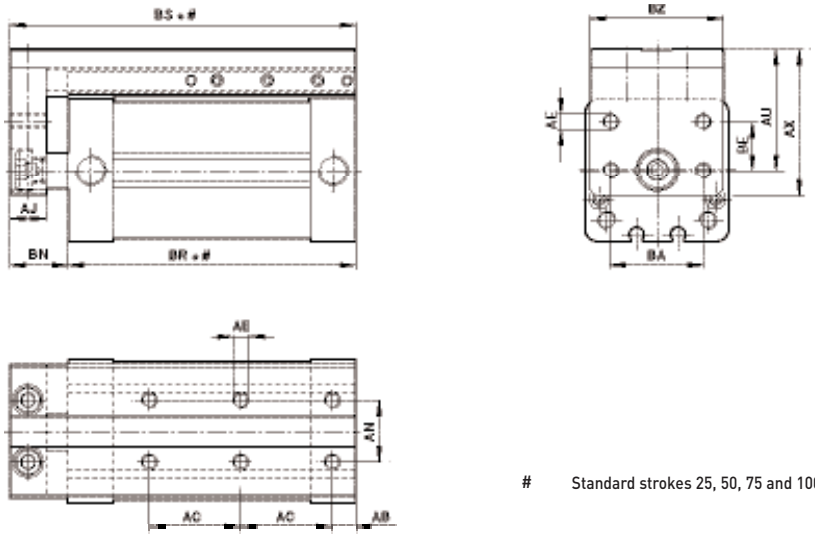
Stroke

MODELS	Ø	H	HF	Ø JB	Ø TDH8	□ TG	TT	WH	ZJ2	at 0 mm	per 5 mm
RA/192020/N4	20	34	8	7,5	4	12	M4	14	51	0,17 kg	0,01 kg
RA/192025/N4	25	38	8	7,5	5	15,6	M5	14	53	0,23 kg	0,01 kg
RA/192032/N4	32	45	10	9	5	19,8	M5	17	61	0,33 kg	0,02 kg
RA/192040/N4	40	51	10	9	5	23,3	M5	17	62	0,45 kg	0,02 kg
RA/192050/N4	50	62,5	12	11	6	29,7	M6	20	65	0,65 kg	0,03 kg
RA/192063/N4	63	72	12	11	6	35,4	M6	20	69	0,95 kg	0,03 kg
RA/192080/N4	80	92	15	15	8	46	M8	25	79	1,70 kg	0,04 kg
RA/192100/N4	100	112	15	15	10	56,5	M10	25	92	3,10 kg	0,05 kg

RA/192000/MX, .../M Compact cylinders

Double acting - Ø 20 ... 125 mm

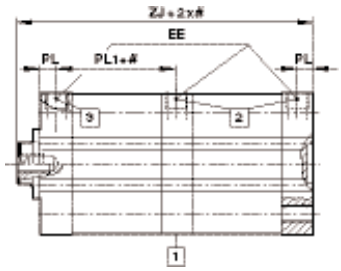
RA/192000/N6 – Cylinder with external guiding



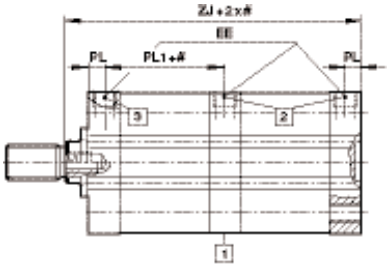
Standard strokes 25, 50, 75 and 100 mm only

MODELS	Ø	AB	AC	AE	AJ	AN	AU	AX	BA	BE	BN	BR	BS	BZ	at 0 mm	per 5 mm
RA/192025/N6	25	7,5	30	M5	12	20	37,5	44	30	16	18	39	57	43,5	0,31 kg	0,09 kg
RA/192032/N6	32	7,5	30	M5	12	20	40,5	48,5	30	16	19	44	63	43,5	0,44 kg	0,12 kg

RA/192000/TMX – Tandem cylinder
with female piston rod thread



RA/192000/TM – Tandem cylinder
with male piston rod thread



MODELS	Ø	EE	PL	PL1	ZJ	at 0 mm	per 5 mm
RA/192020/TM.	20	M5	7	25,5	68	0,21 kg	0,01 kg
RA/192025/TM.	25	M5	7	26,5	71	0,26 kg	0,01 kg
RA/192032/TM.	32	G 1/8	7,5	30	81	0,39 kg	0,02 kg
RA/192040/TM.	40	G 1/8	7,5	31	83	0,51 kg	0,02 kg
RA/192050/TM.	50	G 1/8	7,5	31	85	0,78 kg	0,03 kg
RA/192063/TM.	63	G 1/8	7,5	36	94	1,21 kg	0,03 kg
RA/192080/TM.	80	G 1/8	7,5	40	104	2,11 kg	0,04 kg
RA/192100/TM.	100	G 1/8	10,5	45,5	122	3,68 kg	0,05 kg

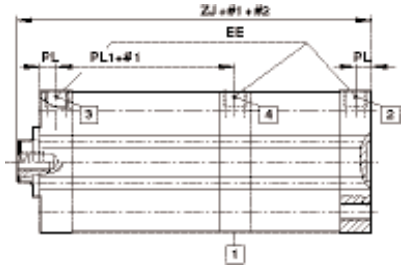
1 Exhaust port Note: Do not cover this area!

Stroke

2 Pressure »outstroke«

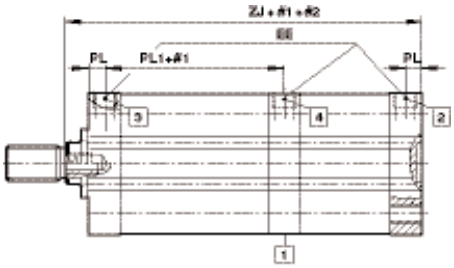
3 Pressure »instroke«

RA/192000/SMX – Multi position cylinder
with female piston rod thread



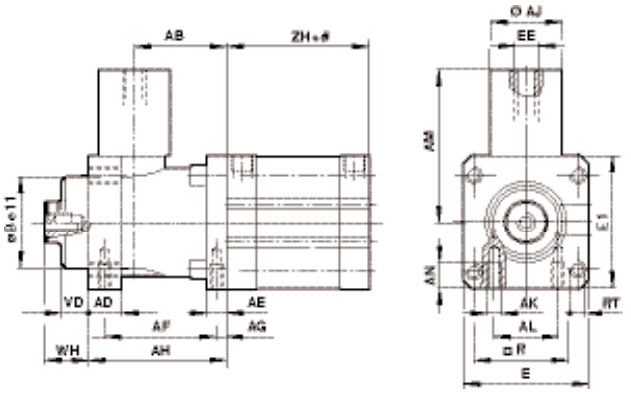
MODELS	Ø	EE	PL	PL1	ZJ	at 0 mm	per 5 mm
RA/192020/SM.	20	M5	7	25,5	68	0,21 kg	0,01 kg
RA/192025/SM.	25	M5	7	26,5	71	0,26 kg	0,01 kg
RA/192032/SM.	32	G 1/8	7,5	30	81	0,39 kg	0,02 kg
RA/192040/SM.	40	G 1/8	7,5	31	83	0,51 kg	0,02 kg
RA/192050/SM.	50	G 1/8	7,5	31	85	0,78 kg	0,03 kg
RA/192063/SM.	63	G 1/8	7,5	36	94	1,21 kg	0,03 kg
RA/192080/SM.	80	G 1/8	7,5	40	104	2,11 kg	0,04 kg
RA/192100/SM.	100	G 1/8	10,5	45,5	122	3,68 kg	0,05 kg

RA/192000/SM – Multi position cylinder
with male piston rod thread

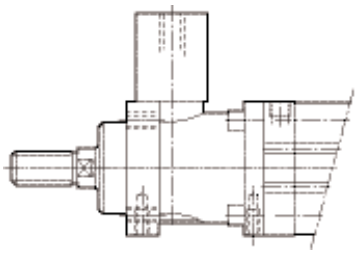


1	Exhaust port Note: Do not cover this area!
2	Pressure »outstroke« rear cylinder
3	Pressure »instroke«
4	Pressure »outstroke« front cylinder
#1	Stroke front cylinder
#2	Stroke rear cylinder
	Note: Stroke (#1) → stroke (#2)

RA/192000/L4X – Cylinder with locking unit
female piston rod thread



RA/192000/L4 – Cylinder with locking unit
male piston rod thread



Stroke

MODELS	Ø	AB	AD	AE	AF	AG	AH	Ø AJ	AK	AL	AM	AN	B e11
RA/192032/L4X	32	32	12	8	40	4,2	48	25	M 5	16	49	8	30
RA/192040/L4X	40	35,5	12	10	46	4,5	55	24	M 5	21	61,5	10	35
RA/192050/L4X	50	49	16	15	54	11,5	70	30	M 6	24	75	12	40
RA/192063/L4X	63	49	15	15	55	7,5	70	38	M 8	32	86	12	45
RA/192080/L4X	80	62	16	16	70	10	90	53	M 8	44	119	16	45
RA/192100/L4X	100	65	18	16	70	10	92	48	M 8	60	119	16	55
RA/192125/L4X	125	85	27	25	95	11	122	65	M 10	75	140	20	60

MODELS	Ø	E	E 1	EE	R	RT	VD	WH	ZH	Locking forces	at 0 mm	per 5 mm
RA/192032/L4X	32	48	50	M 5	32,5	M 6	10	16	44	600 N	0,53 kg	0,02 kg
RA/192040/L4X	40	56	58	G 1/8	38	M 6	10	18	45	1000 N	0,70 kg	0,02 kg
RA/192050/L4X	50	68	70	G 1/8	46,5	M 8	12	22	45	1500 N	1,26 kg	0,03 kg
RA/192063/L4X	63	82	85	G 1/8	56,5	M 8	12	20	49	2200 N	1,90 kg	0,03 kg
RA/192080/L4X	80	100	105	G 1/8	72	M 10	20	33	54	5000 N	3,80 kg	0,04 kg
RA/192100/L4X	100	120	130	G 1/8	89	M 10	23	38	67	5000 N	5,90 kg	0,05 kg
RA/192125/L4X	125	140	150	G 1/8	110	M 12	32	65	71	7000 N	10,10 kg	0,07 kg

PRA/181000, PRA/183000 ISO/VDMA Profile cylinders

Single acting - Ø 32 ... 100 mm

Conforms to ISO 15552, ISO 6431, VDMA 24562 and NFE 49-003-1

Profile barrel with concealed tie rods

Polyurethane seals ensure efficient low friction operation and long life

Switches can be mounted flush with the profile barrel

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
magnetic piston, adjustable cushioning

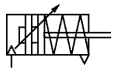
Operating pressure:
2 ... 10 bar

Operating temperature:
-20°C ... +80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Profile barrel: anodised aluminium
End covers: pressure diecast aluminium
Piston rod: stainless steel (martensitic)
Piston seals and piston rod seals: polyurethane
O-rings: nitrile rubber

STANDARD MODELS

	Ø	Piston prod Ø	Port size	MODELS Sprung in	ACCESSORIES Reed switch with integral 5m cable	Straight fitting	Elbow fitting	Service kit
						Tube diameter in bold		
								
	32	12	G1/8	**PRA/181032/M/***	M/50/LSU/5V	C0225**06**18	C0247**06**18	QA/8032/00
	40	16	G1/4	**PRA/181040/M/***	M/50/LSU/5V	C0225**06**28	C0247**06**28	QA/8040/00
	50	20	G1/4	**PRA/181050/M/***	M/50/LSU/5V	C0225**08**28	C0247**08**28	QA/8050/00
	63	20	G3/8	**PRA/181063/M/***	M/50/LSU/5V	C0225**08**38	C0247**08**38	QA/8063/00
	80	25	G3/8	**PRA/181080/M/***	M/50/LSU/5V	C0225**10**38	C0247**10**38	QA/8080/00
	100	25	G1/2	**PRA/181100/M/***	M/50/LSU/5V	C0225**12**48	C0247**12**48	QA/8100/00

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	25	50	80	100
32	•	•	•	•
40	•	•	•	•
50	•	•	•	•
63	•	•	•	•
80	•	•	•	•
100	•	•	•	•

Theoretical forces, cushioning

MODELS	Ø	PRA/181000,../M Theoretical forces (N) at 6 bar outstroke	F1	Initial cushion length (mm)	cushion volume (cm^3)
PRA/181032/.	32	392	50	19	12,3
PRA/181040/.	40	648	60	22	20,7
PRA/181050/.	50	1043	75	24	36
PRA/181063/.	63	1735	75	24	64
PRA/181080/.	80	2795	130	27	116
PRA/181100/.	100	4492	130	34	242

F1 = Return force of spring

For further information

www.norgren.com/info/en1-058

OPTIONS SELECTOR

P★A/18★★★★/★★/★★★

Piston rod material	Substitute
Stainless steel martensitic	R
Hard chromium plated	C
Stainless steel austenitic	S

Operation	Substitute
Sprung in	1
Sprung out	3

Cylinder Ø	Substitute
32	032
40	040
50	050
63	063
80	080
100	100

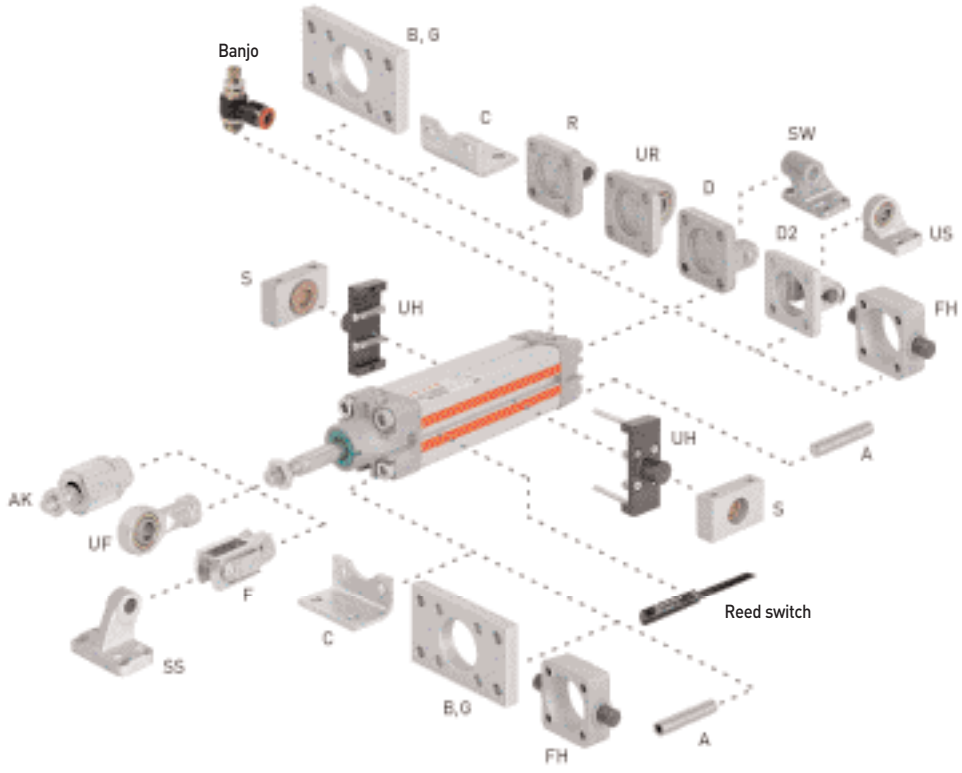
Stroke (mm)
250 max.

Variants (magnetic piston)	Substitute
Standard	M
Non-rotating oiston rod	N2
Special wiper/seal	W2

Variants (non-magnetic piston)	Substitute
Standard	None
Non-rotating oiston rod	N1
Special wiper/seal	W1

Note: If option is not required, disregard option position within part number eg. PRA/181100/M/50. For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants. Additional variants/options are not possible.

MOUNTINGS



Ø	A	AK	B, G	C	D	D2	F	FH
32	QM/8032/35	QM/8025/38	QA/8032/22	QA/8032/21	QA/8032/23	QA/8032/42	QM/8025/25	QA/8032/34
40	QM/8032/35	QM/8040/38	QA/8040/22	QA/8040/21	QA/8040/23	QA/8040/42	QM/8040/25	QA/8040/34
50	QM/8050/35	QM/8050/38	QA/8050/22	QA/8050/21	QA/8050/23	QA/8050/42	QM/8050/25	QA/8050/34
63	QM/8050/35	QM/8050/38	QA/8063/22	QA/8063/21	QA/8063/23	QA/8063/42	QM/8050/25	QA/8063/34
80	QM/8080/35	QM/8080/38	QA/8080/22	QA/8080/21	QA/8080/23	QA/8080/42	QM/8080/25	QA/8080/34
100	QM/8080/35	QM/8080/38	QA/8100/22	QA/8100/21	QA/8100/23	QA/8100/42	QM/8080/25	QA/8100/34

Ø	R	S	SS	SW	UF	UH	UR	US
32	QA/8032/27	QA/8032/41	M/P19931	M/P19493	QM/8025/32	PQA/182032/40	QA/8032/33	M/P40310
40	QA/8040/27	QA/8040/41	M/P19932	M/P19494	QM/8040/32	PQA/182040/40	QA/8040/33	M/P40311
50	QA/8050/27	QA/8040/41	M/P19933	M/P19495	QM/8050/32	PQA/182050/40	QA/8050/33	M/P40312
63	QA/8063/27	QA/8063/41	M/P19934	M/P19496	QM/8050/32	PQA/182063/40	QA/8063/33	M/P40313
80	QA/8080/27	QA/8063/41	M/P19935	M/P19497	QM/8080/32	PQA/182080/40	QA/8080/33	M/P40314
100	QA/8100/27	QA/8100/41	M/P19936	M/P19498	QM/8080/32	PQA/182100/40	QA/8100/33	M/P40315

For details of mountings see page 92

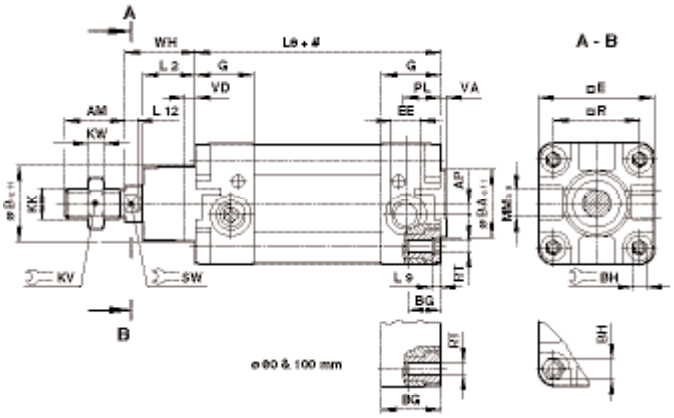
PRA/181000/M ISO/VDMA Profile cylinders

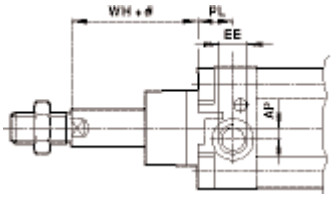
Single acting - Ø 32 ... 100 mm

BASIC DIMENSIONS

PRA/181000
Sprung in

PRA/183000
Sprung out





\# Stroke

MODELS	Ø	AM	AP	Ø B_{e11}	Ø BA_{e11}	BG	⌧ BH	□ E	EE	G	KK	⌧ KV	KW	L2
PRA/18.032/.	32	22	3,5	30	30	16	6	47	G 1/8	27,5	M10x1,25	17	5	20
PRA/18.040/.	40	24	4,5	35	35	16	6	53	G 1/4	32	M12x1,25	19	6	22
PRA/18.050/.	50	32	6	40	40	16	8	65	G 1/4	31	M16x1,5	24	8	27
PRA/18.063/.	63	32	10	45	45	16	8	75	G 3/8	33	M16x1,5	24	8	29
PRA/18.080/.	80	40	8,5	45	45	17	19	95	G 3/8	33	M20x1,5	30	10	33
PRA/18.100/.	100	40	9	55	55	17	19	115	G 1/2	37	M20x1,5	30	10	36

MODELS	Ø	L8	L9	L12	Ø MMh9	PL	□ R	RT	⌧ SW	VA	VD	WH	at 0 mm	per 25 mm
PRA/18.032/.	32	94	4	6	12	13	32,5	M 6	10	3	6	26	0,51 kg	0,06 kg
PRA/18.040/.	40	105	4	6,5	16	15	38	M 6	13	3,5	6	30	0,80 kg	0,08 kg
PRA/18.050/.	50	106	5	8	20	18,5	46,5	M 8	17	3,5	6	37	1,33 kg	0,12 kg
PRA/18.063/.	63	121	5	8	20	19	56,5	M 8	17	4	6	37	1,80 kg	0,13 kg
PRA/18.080/.	80	128	–	10	25	19	72	M 10	22	4	6	46	3,25 kg	0,20 kg
PRA/18.100/.	100	138	–	10	25	18	89	M 10	22	4	6	51	4,81 kg	0,23 kg

MODELS	181032	183032	181040	183040	181050	183050	181063	183063	181080	183080	181100	183100
Standard strokes	25, 50	80, 100	25, 50	80, 100	25, 50	80, 100	25, 50	80, 100	25, 50	80, 100	25, 50	80, 100
L8	119	147	130	158	131	159	146	174	153	181	163	191
L8	119 + (N * x 28)		130 + (N * x 28)		131 + (N * x 28)		146 + (N * x 28)		153 + (N * x 28)		163 + (N * x 28)	
non-standard strokes							250 mm max.					

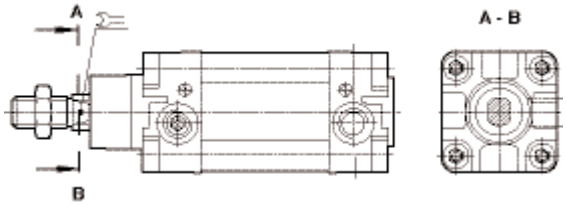
* Stroke ⩽ 50 mm 1/2 N = 0

Stroke > 50 mm 1/2 N = $\frac{\text{Stroke}}{50}$ -1 (round up to integer)

CYLINDER VARIANTS

PRA/18.000/N1, PRA/18.000/N2 – Cylinder with non-rotating piston rod

MODELS	Ø	Σ=	Max. Torque
PRA/18.032/N.	32	10	0,5 Nm
PRA/18.040/N.	40	13	1,0 Nm
PRA/18.050/N.	50	16	1,5 Nm
PRA/18.063/N.	63	16	1,5 Nm
PRA/18.080/N.	80	16	2,5 Nm
PRA/18.100/N.	100	21	2,5 Nm



PRA/182000, PRA/182000/M ISO/VDMA Profile cylinders

Double acting - Ø 32 ... 125 mm

Conforms to ISO 15552, ISO 6431, VDMA 24562 and NFE 49-003-1

Profile barrel with concealed tie rods

High performance, stability and reliability

Polyurethane seals ensure efficient low friction operation and long life

Switches can be mounted flush with the profile barrel

TECHNICAL DATA

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

PRA/182000: Adjustable cushioning

PRA/182000/M: Magnetic piston, adjustable cushioning

Operating pressure:

1 ... 16 bar

Operating temperature:

-20°C ... +80°C max.

Consult our Technical Service for use below +2°C

MATERIALS

Profile barrel: anodised aluminium

End covers: pressure diecast aluminium

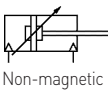
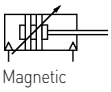
Piston rod: stainless steel (Martensitic)

Piston rod seals: polyurethane

Piston seals: polyurethane

O-rings: nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Non-magnetic	Magnetic	Magnetic non-rotating	ACCESSORIES Reed switch with integral 5m cable	Banjo flow control (Tube diameter in bold)	Straight fitting	Elbow fitting	Service kit
											
 Non-magnetic	32	12	G1/8	**PRA/182032/***	**PRA/182032/M/***	**PRA/182032/N2/***	M/50/LSU/5V	C0K51**06**18	C0225**06**18	C0247**06**18	QA/8032/00
	40	16	G1/4	**PRA/182040/***	**PRA/182040/M/***	**PRA/182040/N2/***	M/50/LSU/5V	C0K51**06**28	C0225**06**28	C0247**06**28	QA/8040/00
	50	20	G1/4	**PRA/182050/***	**PRA/182050/M/***	**PRA/182050/N2/***	M/50/LSU/5V	C0K51**08**28	C0225**08**28	C0247**08**28	QA/8050/00
 Magnetic	63	20	G3/8	**PRA/182063/***	**PRA/182063/M/***	**PRA/182063/N2/***	M/50/LSU/5V	C0K51**08**38	C0225**08**38	C0247**08**38	QA/8063/00
	80	25	G3/8	**PRA/182080/***	**PRA/182080/M/***	**PRA/182080/N2/***	M/50/LSU/5V	C0K51**10**38	C0225**10**38	C0247**10**38	QA/8080/00
	100	25	G1/2	**PRA/182100/***	**PRA/182100/M/***	**PRA/182100/N2/***	M/50/LSU/5V	C0K51**12**48	C0225**12**48	C0247**12**48	QA/8100/00
	125	32	G1/2	**PRA/182125/***	**PRA/182125/M/***	–	M/50/LSU/5V	C0K51**12**48	C0225**12**48	C0247**12**48	QA/8125/00

* Insert stroke length in mm

For information on additional magnetic switches see page 290

Other fittings are available, please see section 7

Standard strokes

Ø	25	50	80	100	125	160	200	250	320	400	500
32	•	•	•	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•	•	•	•
80	•	•	•	•	•	•	•	•	•	•	•
100	•	•	•	•	•	•	•	•	•	•	•
125	•	•	•	•	•	•	•	•	•	•	•

Other strokes available

For further information

www.norgren.com/info/en1-062

OPTIONS SELECTOR

★★A/192★★★/★★★/★★★

Special variants	Substitute
High temperature version: 150°C max.	T

Piston rod materials	Substitute
Stainless steel martensitic (1.4021)	R
Stainless steel austenitic (1.4305)	S

Cylinder diameters (mm)	Substitute
20	020
25	025
32	032
40	040
50	050
63	063
80	080
100	100
125	125

Note: If option is not required, disregard option position within part number eg. RA/192100/M/100. For combinations of cylinder variants consult our technical service.
Please note that heat resistant seals are not available for all variants.
This options selector explains only the cylinder variants. Additional variants/options can not be derived from.
Information about variants see data sheet.

Strokes (mm)		
Ø 20 and 25	min. 5	max. 200
Ø 32 and 40	min. 5	max. 300
Ø 50 and 63	min. 10	max. 400
Ø 80 ... 125	min. 15	max. 500

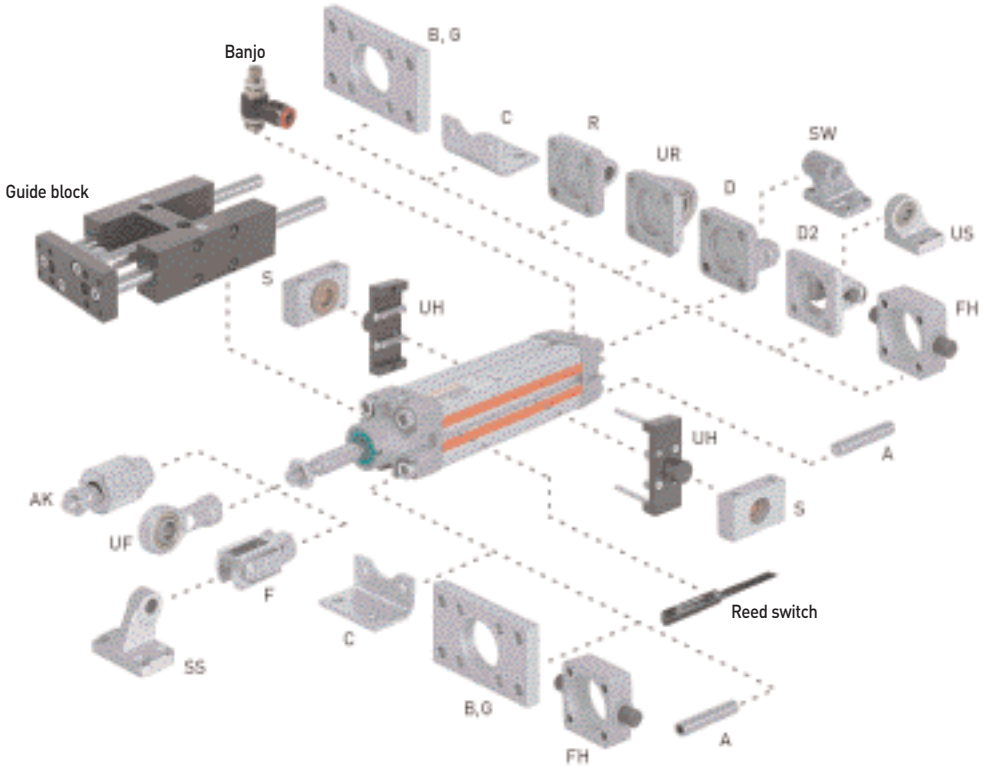
Piston rod thread	Substitute
Female	X
Male	None

Variants (magnetic piston)	Substitute
Standard	M
Double ended piston rod	JM
Non-rotating piston rod (internal)	N2
Guiding	N4
Special wiper/seal	W2
Locking unit	L4
External guiding	N6
Extended piston rod	MU
RA/192***/MU*/***/*** → Extension (mm)	
low friction	X4
Tandem cylinder	TM
Multi-positon cylinder	SM
RA/192***/SM*/***/*** → Rear cylinder stroke	
→ Front cylinder stroke	

PRA/182000, PRA/182000/M ISO/VDMA Profile cylinders

Double acting - Ø 32 ... 125 mm

MOUNTINGS



Ø	A	AK	B, G	C	D	D2	F	FH
32	QM/8032/35	QM/8025/38	QA/8032/22	QA/8032/21	QA/8032/23	QA/8032/42	QM/8025/25	QA/8032/34
40	QM/8032/35	QM/8040/38	QA/8040/22	QA/8040/21	QA/8040/23	QA/8040/42	QM/8040/25	QA/8040/34
50	QM/8050/35	QM/8050/38	QA/8050/22	QA/8050/21	QA/8050/23	QA/8050/42	QM/8050/25	QA/8050/34
63	QM/8050/35	QM/8050/38	QA/8063/22	QA/8063/21	QA/8063/23	QA/8063/42	QM/8050/25	QA/8063/34
80	QM/8080/35	QM/8080/38	QA/8080/22	QA/8080/21	QA/8080/23	QA/8080/42	QM/8080/25	QA/8080/34
100	QM/8080/35	QM/8080/38	QA/8100/22	QA/8100/21	QA/8100/23	QA/8100/42	QM/8080/25	QA/8100/34
125	QM/8125/35	QM/8125/38	QM/8125/22	QM/8125/21	QM/8125/23	QA/8125/42	QM/8125/25	QA/8125/34

Ø	R	S	SS	SW	UF	UH	UR	US
32	QA/8032/27	QA/8032/41	M/P19931	M/P19493	QM/8025/32	PQA/182032/40	QA/8032/33	M/P40310
40	QA/8040/27	QA/8040/41	M/P19932	M/P19494	QM/8040/32	PQA/182040/40	QA/8040/33	M/P40311
50	QA/8050/27	QA/8040/41	M/P19933	M/P19495	QM/8050/32	PQA/182050/40	QA/8050/33	M/P40312
63	QA/8063/27	QA/8063/41	M/P19934	M/P19496	QM/8050/32	PQA/182063/40	QA/8063/33	M/P40313
80	QA/8080/27	QA/8063/41	M/P19935	M/P19497	QM/8080/32	PQA/182080/40	QA/8080/33	M/P40314
100	QA/8100/27	QA/8100/41	M/P19936	M/P19498	QM/8080/32	PQA/182100/40	QA/8100/33	M/P40315
125	QM/8125/27	QA/8100/41	M/P19937	M/P19499	QM/8125/32	PQA/182125/40	QM/8125/33	M/P71355

For details of mountings see page 92

Guide blocks

Ø	MODELS	MODELS
32	**QA/8032/51/***	**QA/8032/61/***
40	**QA/8040/51/***	**QA/8040/61/***
50	**QA/8050/51/***	**QA/8050/61/***
63	**QA/8063/51/***	**QA/8063/61/***
80	**QA/8080/51/***	**QA/8080/61/***
100	**QA/8100/51/***	**QA/8100/61/***

* Insert stroke length in mm from table on the right.

For details of guide blocks see page 97.

Note: QA/8_ _ _/51* = Plain bearing.
QA/8_ _ _/61* = Ball bearing.

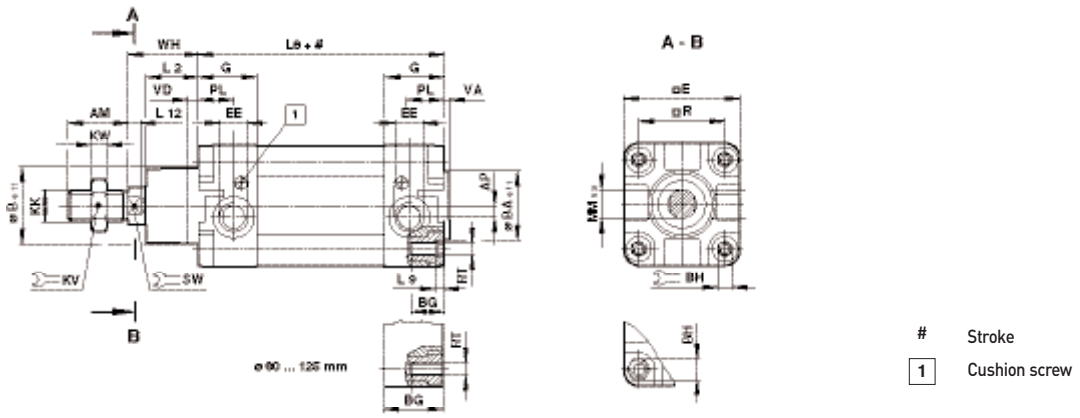
Standard strokes for guide block

Ø	50	100	160	200	250	320	400	500
32	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•
80	•	•	•	•	•	•	•	•
100	•	•	•	•	•	•	•	•

Other stroke lengths are not available, use nearest standard stroke.
Maximum stroke 500 mm.

BASIC DIMENSIONS

PRA/182000



\# Stroke

1 Cushion screw

MODELS	Ø	AM	AP	Ø B_{e11}	Ø BA_{e11}	BG	⌧ BH	□ E	EE	G	KK	⌧ KV	KW	L2
PRA/182032/.	32	22	3,5	30	30	16	6	47	G 1/8	27,5	M10x1,25	17	5	20
PRA/182040/.	40	24	4,5	35	35	16	6	53	G 1/4	32	M12x1,25	19	6	22
PRA/182050/.	50	32	6	40	40	16	8	65	G 1/4	31	M16x1,5	24	8	27
PRA/182063/.	63	32	10	45	45	16	8	75	G 3/8	33	M16x1,5	24	8	29
PRA/182080/.	80	40	8,5	45	45	17	19	95	G 3/8	33	M20x1,5	30	10	33
PRA/182100/.	100	40	9	55	55	17	19	115	G 1/2	37	M20x1,5	30	10	36
PRA/182125/.	125	54	10	60	60	20	24	140	G 1/2	46	M27x2	41	13,5	45

MODELS	Ø	L8	L9	L12	Ø MM_{h9}	PL	□ R	RT	⌧ SW	VA	VD	WH	at 0 mm	per 25 mm
PRA/182032/.	32	94	4	6	12	13	32,5	M 6	10	3	6	26	0,51 kg	0,06 kg
PRA/182040/.	40	105	4	6,5	16	15	38	M 6	13	3,5	6	30	0,80 kg	0,08 kg
PRA/182050/.	50	106	5	8	20	18,5	46,5	M 8	17	3,5	6	37	1,33 kg	0,12 kg
PRA/182063/.	63	121	5	8	20	19	56,5	M 8	17	4	6	37	1,80 kg	0,13 kg
PRA/182080/.	80	128	–	10	25	19	72	M 10	22	4	6	46	3,25 kg	0,20 kg
PRA/182100/.	100	138	–	10	25	18	89	M 10	22	4	6	51	4,81 kg	0,23 kg
PRA/182125/.	125	160	–	13	32	20	110	M 12	27	6	15,5	65	8,00 kg	0,33 kg

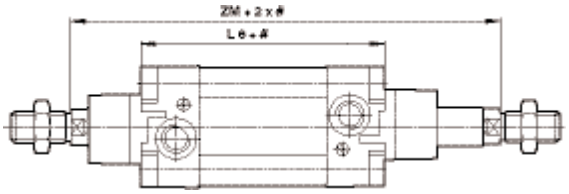
PRA/182000, PRA/182000/M ISO/VDMA Profile cylinders

Double acting - Ø 32 ... 125 mm

CYLINDER VARIANTS

PRA/182000/J, PRA/182000/JM – Cylinder with double ended piston rod

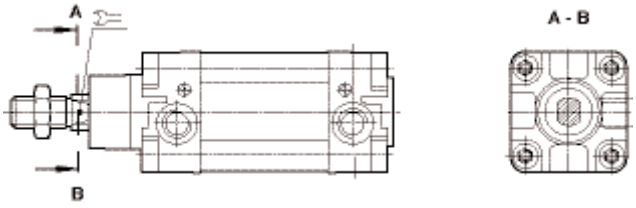
MODELS	Ø	ZM	L8
PRA/182032/J.	32	146	94
PRA/182040/J.	40	165	105
PRA/182050/J.	50	180	106
PRA/182063/J.	63	195	121
PRA/182080/J.	80	220	128
PRA/182100/J.	100	240	138
PRA/182125/J.	125	290	160



Stroke

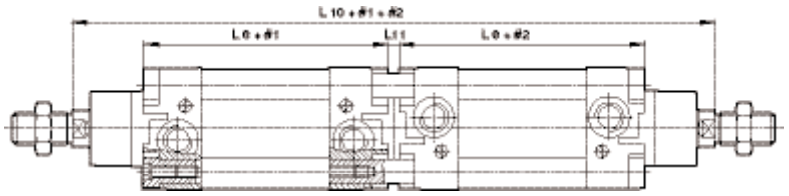
PRA/182000/N1, PRA/182000/N2 – Cylinder with non-rotating piston rod

MODELS	Ø	Σ=	Max. torque
PRA/182032/N.	32	10	0,5 Nm
PRA/182040/N.	40	13	1,0 Nm
PRA/182050/N.	50	16	1,5 Nm
PRA/182063/N.	63	16	1,5 Nm
PRA/182080/N.	80	16	2,5 Nm
PRA/182100/N.	100	21	2,5 Nm



PRA/182000/IT, PRA/182000/MT – Four-position cylinder

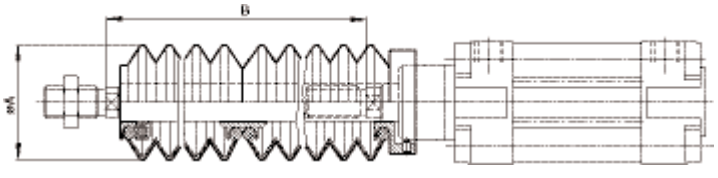
MODELS	Ø	L 8	L 10	L 11
PRA/182032/.T	32	94	247	7
PRA/182040/.T	40	105	278	8
PRA/182050/.T	50	106	294	8
PRA/182063/.T	63	121	325	9
PRA/182080/.T	80	128	357	9
PRA/182100/.T	100	138	387	9
PRA/182125/.T	125	160	462	12



Stroke

PRA/182000/G, PRA/182000/MG – Piston rod bellow

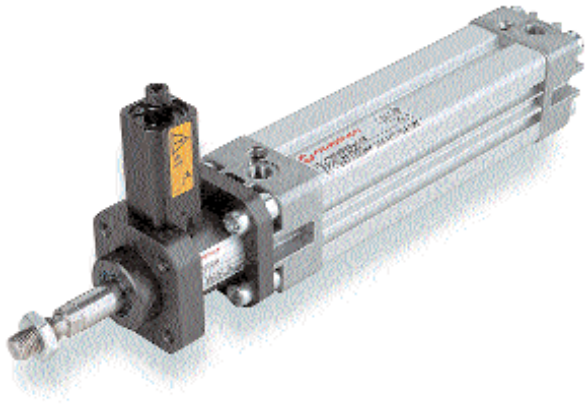
MODELS	Ø	Ø A	Max. stroke per bellow	Piston rod extension B for first bellow	for further bellow
PRA/182032/.G	32	40	60	30	25
PRA/182040/.G	40	63	145	50	32
PRA/182050/.G	50	63	145	40	32
PRA/182063/.G	63	63	145	40	32
PRA/182080/.G	80	80	250	50	45
PRA/182100/.G	100	80	250	50	45
PRA/182125/.G	125	80	250	50	45



PRA/182000/L2, PRA/182000/L4

(ISO/VDMA/NFE) Cylinders with piston rod locking units

Double acting - Ø 32 ... 125 mm



Magnetic and non-magnetic piston conforms to ISO 15552, ISO 6431, VDMA 24562 and NFE 49-003-1

Secure locking of piston rod in any position

Locks when air is removed

Compact, maintenance-free design

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Passive model – pressure applied to release

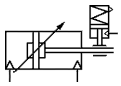
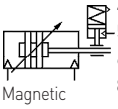
Operating pressure:
4,5 ... 10 bar

Operating temperature:
+80°C
Consult our Technical Service for use below +2°C

MATERIALS

Profile barrel: anodised aluminium
End covers: pressure diecast aluminium
Piston rod: stainless steel (Martensitic)
Piston rod seals: polyurethane
Piston seals: polyurethane
O-rings: nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Non-magnetic	MODELS Magnetic	ACCESSORIES Reed switch with integral 5m cable	Banjo flow control (Tube diameter in bold)	Straight fitting	Elbow fitting	Service kit
 Non-magnetic Passive	32	12	G1/8	**PRA/182032/L2/***	**PRA/182032/L4/***	M/50/LSU/5V	C0K51**06**18	C0225**06**18	C0247**06**18	QA/8032/00
	40	16	G1/4	**PRA/182040/L2/***	**PRA/182040/L4/***	M/50/LSU/5V	C0K51**06**28	C0225**06**28	C0247**06**28	QA/8040/00
 Magnetic Passive	50	20	G1/4	**PRA/182050/L2/***	**PRA/182050/L4/***	M/50/LSU/5V	C0K51**08**28	C0225**08**28	C0247**08**28	QA/8050/00
	63	20	G3/8	**PRA/182063/L2/***	**PRA/182063/L4/***	M/50/LSU/5V	C0K51**08**38	C0225**08**38	C0247**08**38	QA/8063/00
	80	25	G3/8	**PRA/182080/L2/***	**PRA/182080/L4/***	M/50/LSU/5V	C0K51**10**38	C0225**10**38	C0247**10**38	QA/8080/00
	100	25	G1/2	**PRA/182100/L2/***	**PRA/182100/L4/***	M/50/LSU/5V	C0K51**12**48	C0225**12**48	C0247**12**48	QA/8100/00
	125	32	G1/2	**PRA/182125/L2/***	**PRA/182125/L4/***	M/50/LSU/5V	C0K51**12**48	C0225**12**48	C0247**12**48	QA/8125/00

*Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Locking unit

Ø	MODELS Locking unit	Locking cartige
32	**QA/8032/59**	**QA/8032/63**
40	**QA/8040/59**	**QA/8040/63**
50	**QA/8050/59**	**QA/8050/63**
63	**QA/8063/59**	**QA/8063/63**
80	**QA/8080/59**	**QA/8100/63**
100	**QA/8100/59**	**QA/8100/63**
125	**QA/8125/59**	–

Locking unit includes cartridge.
For all applications please consult our Technical Service.

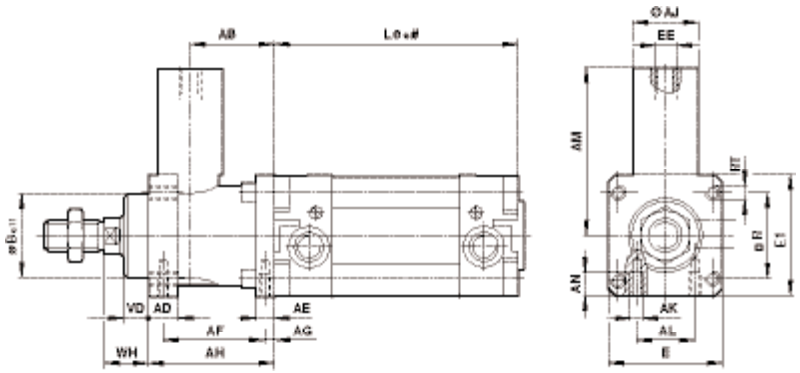
For further information

www.norgren.com/info/en1-067

PRA/182000, PRA/182000/M ISO/VDMA Profile cylinders

Double acting - Ø 32 ... 125 mm

PRA/182000/L2, PRA/182000/L4 – Cylinder with locking unit (passive)



\# Stroke

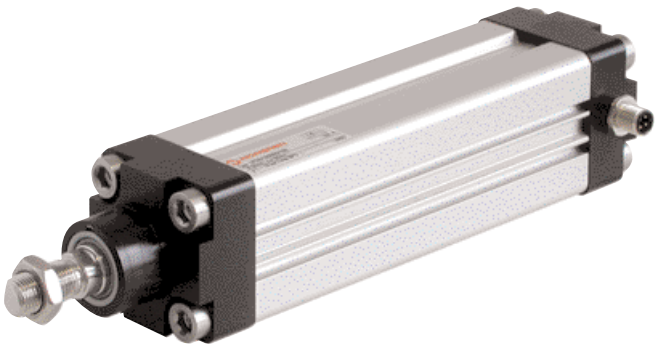
MODELS	Ø	AB	AD	AE	AF	AG	AH	Ø AJ	AK	AL	AM	AN
PRA/182032/L./.	32	32	12	8	40	4,2	48	25	M 5	16	59	8
PRA/182040/L./.	40	35,5	12	10	46	4,5	55	24	M 5	21	61,5	10
PRA/182050/L./.	50	49	16	15	54	11,5	70	30	M 6	24	75	12
PRA/182063/L./.	63	49	15	15	55	7,5	70	38	M 8	32	86	12
PRA/182080/L./.	80	62	16	16	70	10	90	53	M 8	44	119	16
PRA/182100/L./.	100	65	18	16	70	10	92	48	M 8	60	119	16
PRA/182125/L./.	125	85	27	25	95	11	122	65	M 10	75	140	20

MODELS	Ø	Ø Be11	E	E 1	EE	L 8	□ R	RT	VD	WH	Locking force
PRA/182032/L./.	32	30	48	50	M 5	94	32,5	M 6	10	16	600 N
PRA/182040/L./.	40	35	56	58	G 1/8	105	38	M 6	10	18	1000 N
PRA/182050/L./.	50	40	68	70	G 1/8	106	46,5	M 8	12	22	1500 N
PRA/182063/L./.	63	45	82	85	G 1/8	121	56,5	M 8	12	20	2200 N
PRA/182080/L./.	80	45	100	105	G 1/8	128	72	M 10	20	33	5000 N
PRA/182100/L./.	100	55	120	130	G 1/8	138	89	M 10	23	38	5000 N
PRA/182125/L./.	125	60	140	150	G 1/8	160	110	M 12	32	65	7000 N

For details of mountings see page 92

PSA/182000/F1 ISO/VDMA Cylinder with position sensor

Double acting - Ø 40 ... 125 mm



Conforms to ISO 15552, ISO 6431, VDMA 24562 and NFE 49-003-1

Position sensor provides an analogue output voltage proportional to the stroke length of the cylinder

Accurate read-out of piston positioning

Standard cylinders with a wide range of mountings offer a variety of installation options

MATERIALS

Piston rod: stainless steel (austenitic)

Barrel: anodised aluminium

End covers: anodisiert aluminium

'O'-rings: nitrile rubber

Piston and piston rod seals: polyurethane

Position sensor: conductive plastic strip potentiometer, plastic body

TECHNICAL DATA

Medium:
Compressed air, filtered (to 5 µm) and non-lubricated

Operation:
Double acting, non-cushioned
A linear potentiometer located inside the piston rod gives an analogue direct voltage proportional to the stroke of the cylinder. The output socket is located in the rear end cover

Operating pressure:
1 ... 16 bar

Operating temperature:
-20°C ... +80°C max.
Consult our Technical Service for use below +2°C

Maximum input voltage:
40 V d.c.

Recommended input impedance:
100 x sensor resistance

Maximum wiper current Is:
100 µA

Sensor resistance:
8 KΩ/100 mm electrical stroke ±20%, see table on page 2

Insulation resistance:
min. 50 MΩ a 250 V d.c.

Power rating:
1 W/100 mm of electrical travel
Repeatibility of potentiometer: min. 0,013 mm

Protection:
IP67 electrical plug

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS	ACCESSORIES Cable with socket PVC 5m	Cable with socket polyurethane 5m	Banjo flow control (Tube diameter in bold)	Straight fitting	Elbow fitting
									
	40	16	G1/4	**PSA/182040/F1/***	M/P34592/5	M/P34594/5	C0K51**06**28	C0225**06**28	C0247**06**28
	50	20	G1/4	**PSA/182050/F1/***	M/P34592/5	M/P34594/5	C0K51**08**28	C0225**08**28	C0247**08**28
	63	20	G3/8	**PSA/182063/F1/**	M/P34592/5	M/P34594/5	C0K51**08**38	C0225**08**38	C0247**08**38
	80	25	G3/8	**PSA/182080/F1/***	M/P34592/5	M/P34594/5	C0K51**10**38	C0225**10**38	C0247**10**38
	100	25	G1/2	**PSA/182100/F1/***	M/P34592/5	M/P34594/5	C0K51**12**48	C0225**12**48	C0247**12**48
	125	32	G1/2	**PSA/182125/F1/***	M/P34592/5	M/P34594/5	C0K51**12**48	C0225**12**48	C0247**12**48

* Insert stroke length in mm

Other fittings are available, please see section 7

Standard strokes

Ø	50	80	100	125	160	200	250	320	400	500
40	•	•	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•	•	•
80	•	•	•	•	•	•	•	•	•	•
100	•	•	•	•	•	•	•	•	•	•
125	•	•	•	•	•	•	•	•	•	•

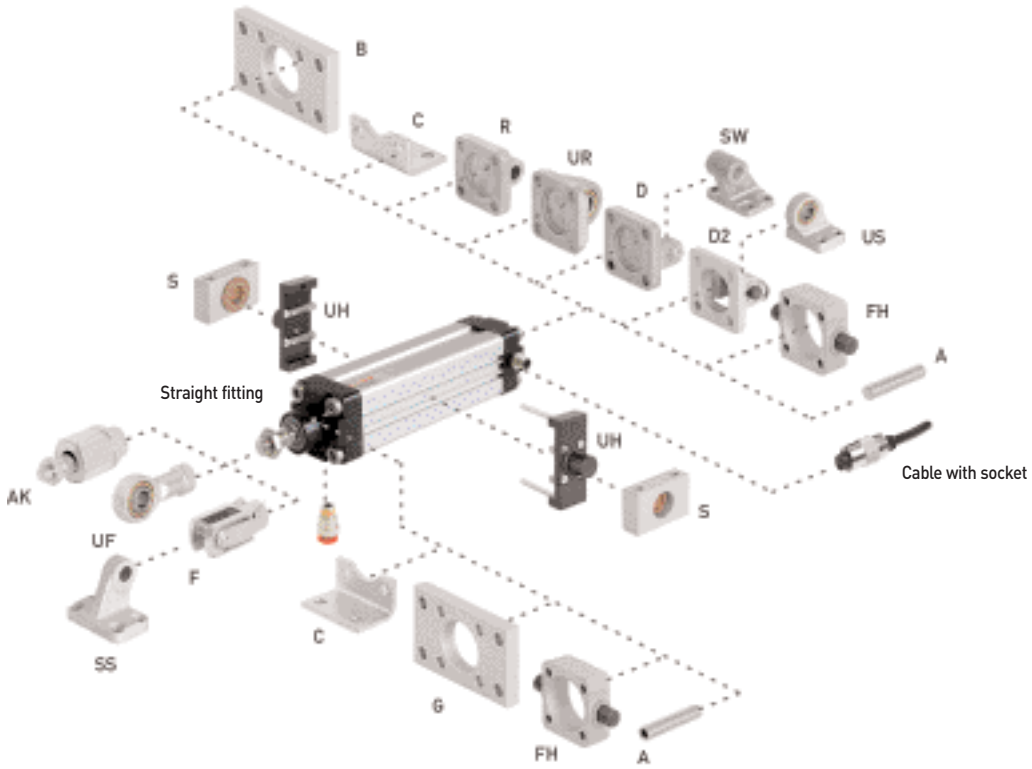
For further information

www.norgren.com/info/en1-069

PSA/182000/F1 ISO/VDMA Cylinder with position sensor

Double acting - Ø 40 ... 125 mm

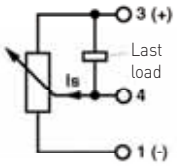
MOUNTINGS



Ø	A	AK	B, G	C	D	D2	F	FH
40	QM/8032/35	QM/8040/38	QA/8040/22	QA/8040/21	QA/8040/23	QA/8040/42	QM/8040/25	QA/8040/34
50	QM/8050/35	QM/8050/38	QA/8050/22	QA/8050/21	QA/8050/23	QA/8050/42	QM/8050/25	QA/8050/34
63	QM/8050/35	QM/8050/38	QA/8063/22	QA/8063/21	QA/8063/23	QA/8063/42	QM/8050/25	QA/8063/34
80	QM/8080/35	QM/8080/38	QA/8080/22	QA/8080/21	QA/8080/23	QA/8080/42	QM/8080/25	QA/8080/34
100	QM/8080/35	QM/8080/38	QA/8100/22	QA/8100/21	QA/8100/23	QA/8100/42	QM/8080/25	QA/8100/34
125	QM/8125/35	QM/8125/38	QM/8125/22	QM/8125/21	QM/8125/23	QA/8125/42	QM/8125/25	QA/8125/34
Ø	**R**	**S**	**SS**	**SW**	**UF**	**UH**	**UR**	**US**
40	QA/8040/27	QA/8040/41	M/P19932	M/P19494	QM/8040/32	PQA/182040/40	QA/8040/33	M/P40311
50	QA/8050/27	QA/8040/41	M/P19933	M/P19495	QM/8050/32	PQA/182050/40	QA/8050/33	M/P40312
63	QA/8063/27	QA/8063/41	M/P19934	M/P19496	QM/8050/32	PQA/182063/40	QA/8063/33	M/P40313
80	QA/8080/27	QA/8063/41	M/P19935	M/P19497	QM/8080/32	PQA/182080/40	QA/8080/33	M/P40314
100	QA/8100/27	QA/8100/41	M/P19936	M/P19498	QM/8080/32	PQA/182100/40	QA/8100/33	M/P40315
125	QM/8125/27	QA/8100/41	M/P19937	M/P19499	QM/8125/32	PQA/182125/40	QM/8125/33	M/P71355

For details of mountings see page 92

Connection



1	resistance-begin
2	not used
3	resistance-end
4	slider ring

output socket

Attention

To reach the electrical values given in this catalogue sheet it is necessary to measure the take-off voltage load-free.

In order to get proper values there must not be any load in the take-offcircuit of the resistive strip potentiometer.

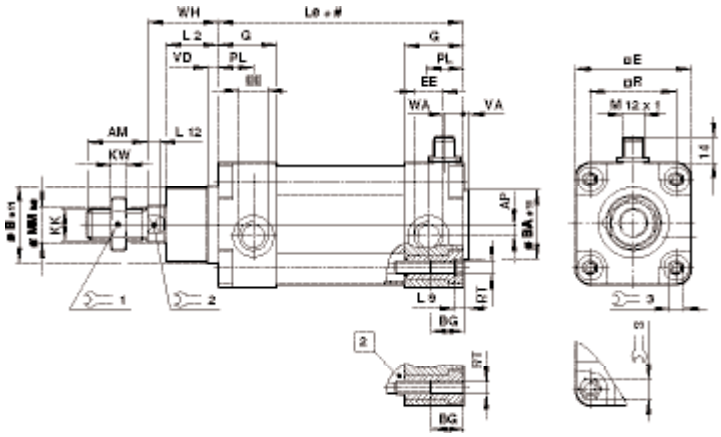
The full range of the potentiometer cannot be used at the non-standard strokes.

Zero Voltage adjustment at the instroke and max. voltage adjustment (or resistance adjustment) at full stroke has to be performed.

Sensor resistance

Cylinder stroke (mm)	Sensor-resistance KΩ
0 ... 50	4
51 ... 100	8
101 ... 150	12
151 ... 200	16
201 ... 250	20
251 ... 300	24
301 ... 350	28
351 ... 400	32
401 ... 450	36
451 ... 500	40
501 ... 550	44
551 ... 600	48

BASIC DIMENSIONS
PSA/182000/F1



\# Stroke

2 For Ø 80 ... 125 mm

MODELS	Ø	AM	AP	Ø B_{e11}	Ø BA_{e11}	BG	❑ E	EE	G	KK	KW	L2	L8	L9	L12
PSA/182040/F1	40	24	4,5	35	35	15	53	G 1/4	32	M12x1,25	6	22	105	4	6,5
PSA/182050/F1	50	32	6	40	40	18,5	65	G 1/4	31	M16x1,5	8	27	106	5	8
PSA/182063/F1	63	32	10	45	45	19	75	G 3/8	33	M16x1,5	8	29	121	5	8
PSA/182080/F1	80	40	8,5	45	45	19	95	G 3/8	33	M20x1,5	10	33	128	–	10
PSA/182100/F1	100	40	9	55	55	18	115	G 1/2	37	M20x1,5	10	36	138	–	10
PSA/182125/F1	125	54	10	60	60	25,5	140	G 1/2	46	M27x2	13,5	45	160	–	13

MODELS	Ø	Ø MM_{h9}	PL	❑ R	RT	VA	VD	WA	WH	⌧ 1	⌧ 2	⌧ 3	at 0 mm	per 25 mm
PSA/182040/F1	40	16	15	38	M 6	3,5	6	10	30	19	13	6	0,85 kg	0,07 kg
PSA/182050/F1	50	20	18,5	46,5	M 8	3,5	6	10,5	37	24	17	8	1,40 kg	0,11 kg
PSA/182063/F1	63	20	19	56,5	M 8	4	6	16	37	24	17	8	1,90 kg	0,12 kg
PSA/182080/F1	80	25	19	72	M 10	4	6	16	46	30	22	19	3,50 kg	0,19 kg
PSA/182100/F1	100	25	18	89	M 10	4	6	18,5	51	30	22	19	5,40 kg	0,22 kg
PSA/182125/F1	125	32	25,5	110	M 12	6	15,5	23	65	41	27	24	7,90 kg	0,29 kg

PVA/182000, PVA/182000/M ISO/VDMA cylinders

Double acting - Ø 32 ... 100 mm

Conforms to ISO 15552, ISO 6431, VDMA 24562 and NFE 49-003-1

Smooth and spherical profile design with concealed tie rods

Special polyurethane wiper seal

Body sealing conforms to EN 1672-2

Corrision resistant design, accepted in the food industry

Electrical connection with M12-conector

Adjustable integrated end position sensing option

Integrated rear eye mounting option

MATERIALS

Profile barrel / end covers: clear anodised aluminium

Piston rod and nuts: X10 Cr Ni S 18 9 (AISI 303, 1.4305)

Cover screws: X10 Cr Ni S 18 9 (AISI 303, 1.4305)

Cover screw seals: PTFE

Barrel seals: X10 Cr Ni S 18 9 (AISI 303, 1.4305) and nitrile rubber

Piston and position rod seals: polyurethane

O-rings: nitrile rubber

M12-plug housing: X10 Cr Ni S 18 9 (AISI 303, 1.4305)

TECHNICAL DATA

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

PRA/182000: Adjustable cushioning

PRA/182000/M: Magnetic piston, adjustable cushioning

Operating pressure:

1 ... 16 bar

Operating temperature:

-20°C ... +80°C max.

Consult our Technical Service for use below +2°C

MATERIALS

Profile barrel: anodised aluminium

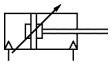
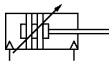
End covers: pressure diecast aluminium

Piston rod: stainless steel (Martensitic)

Piston rod seals: polyurethane

Piston seals: polyurethane

O-rings: nitrile rubber

	Ø	Piston rod Ø	Port size	MODELS Non-magnetic	MODELS Magnetic	ACCESSORIES Connector cable lenght 2 m	Banjo flow control (Tube diameter in bold)	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)	Service kit
										
 Non-magnetic	32	12	G1/8	**PVA/182032/***	**PVA/182032/M./***	M/P73525/2	C0K51**06**18	C0225**06**18	C0247**06**18	PVQA/182032/00
	40	16	G1/4	**PVA/182040/***	**PVA/182040/M./***	M/P73525/2	C0K51**06**28	C0225**06**28	C0247**06**28	PVQA/182040/00
	50	20	G1/4	**PVA/182050/***	**PVA/182050/M./***	M/P73525/2	C0K51**08**28	C0225**08**28	C0247**08**28	PVQA/182050/00
	63	20	G3/8	**PVA/182063/***	**PVA/182063/M./***	M/P73525/2	C0K51**08**38	C0225**08**38	C0247**08**38	PVQA/182063/00
	80	25	G3/8	**PVA/182080/***	**PVA/182080/M./***	M/P73525/2	C0K51**10**38	C0225**10**38	C0247**10**38	PVQA/182080/00
Magnetic	100	25	G1/2	**PVA/182100/***	**PVA/182100/M./***	M/P73525/2	C0K51**12**48	C0225**12**48	C0247**12**48	PVQA/182100/00

*Insert stroke length in mm

Other fittings e.g. plastic or stainless steel are available, please see section 7

Standard strokes

Ø	25	50	80	100	125	160	200	250	320	400	500
32	•	•	•	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•	•	•	•
80	•	•	•	•	•	•	•	•	•	•	•
100	•	•	•	•	•	•	•	•	•	•	•

For further information

www.norgren.com/info/en1-072

OPTIONS SELECTOR

P★A/182★★★/★★★/★/★★★★

Corrosion protection	Substitute
Standard	V
With special corrosions resistand surface	L
Hard chromium plated stainless steel piston rod	E

Cylinder diameters	Substitute
32	032
40	040
50	050
63	063
80	080
100	100

Variants (with switches)	Substitute
Standard	MI
Extended piston rod	MU
P*A/182***/MU/****/*** → Extension (mm)	

Variants (without switches)	Substitute
Standard	None
Extended piston rod	IU
Double ended piston rod	J
P*A/182***/IU/****/*** → Extension (mm)	

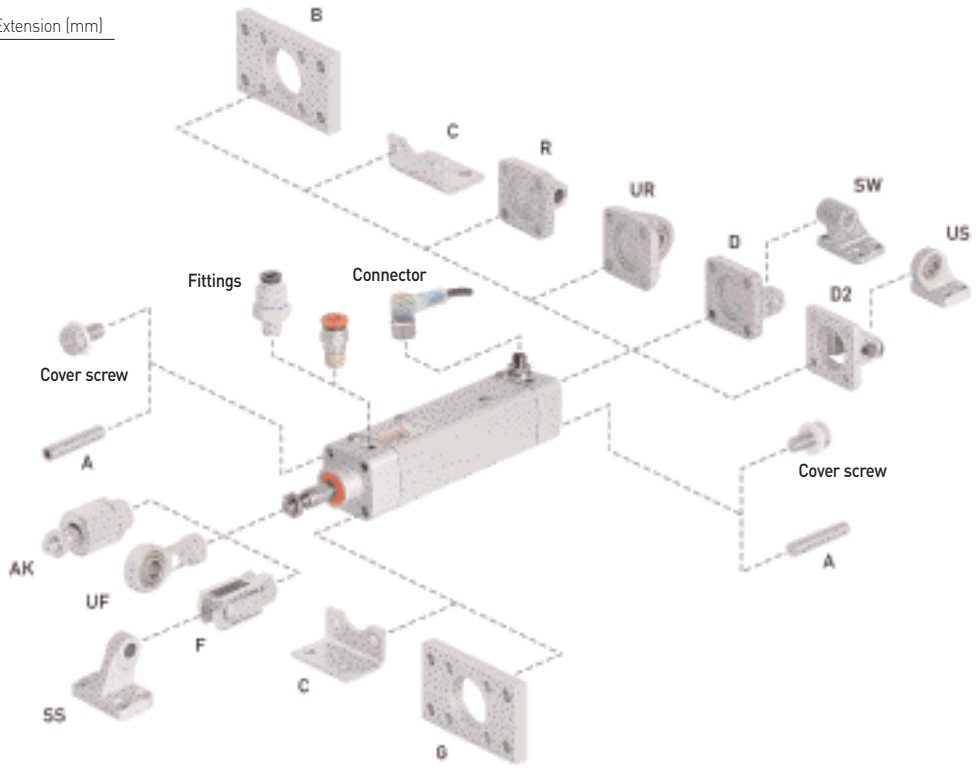
Stroke
10 ... 3000, non-magnetic piston
25 ... 3000 magnetic piston

Mounting variants	Substitute
Standard	None
Integrated rear eye	R

Variants (with switches)	Substitute
Fixed end position, Reed, M/50/LSU	..1
Fixed end position, Solid state, M/50/EAP	..2
Adjustable end position, Reed, M/50/LSU	..3
Adjustable end position, Solid state, M/50/EAP	..4

Note: If option is not required, disregard option position within part number eg. PVA/182100/M/100.
For combinations of cylinder variants consult our technical service. Please note that heat resistant seals are not available for all variants.
This options selector explains only the cylinder variants. Additional variants/options are not possible.

MOUNTINGS



STANDARD

Ø	A	AK	B, G	C	D	D2	F	R
32	QM/8032/35	QM/8025/38	QA/8032/22	QA/8032/21	QA/8032/23	QA/8032/42	QM/8025/25	QA/8032/27
40	QM/8032/35	QM/8040/38	QA/8040/22	QA/8040/21	QA/8040/23	QA/8040/42	QM/8040/25	QA/8040/27
50	QM/8050/35	QM/8050/38	QA/8050/22	QA/8050/21	QA/8050/23	QA/8050/42	QM/8050/25	QA/8050/27
63	QM/8050/35	QM/8050/38	QA/8063/22	QA/8063/21	QA/8063/23	QA/8063/42	QM/8050/25	QA/8063/27
80	QM/8080/35	QM/8080/38	QA/8080/22	QA/8080/21	QA/8080/23	QA/8080/42	QM/8080/25	QA/8080/27
100	QM/8080/35	QM/8080/38	QA/8100/22	QA/8100/21	QA/8100/23	QA/8100/42	QM/8080/25	QA/8100/27

Ø	SS	SW	UF	UR	US
32	M/P19931	M/P19493	QM/8025/32	QA/8032/33	M/P40310
40	M/P19932	M/P19494	QM/8040/32	QA/8040/33	M/P40311
50	M/P19933	M/P19495	QM/8050/32	QA/8050/33	M/P40312
63	M/P19934	M/P19496	QM/8050/32	QA/8063/33	M/P40313
80	M/P19935	M/P19497	QM/8080/32	QA/8080/33	M/P40314
100	M/P19936	M/P19498	QM/8080/32	QA/8100/33	M/P40315

WITH SURFACE TREATMENT

Ø	B, G	D	F	R	SW	UF	UR	Cover screws
32	PVQA/8032/22	PVQA/8032/23	PVQM/8025/25	PVQA/8032/27	M/P40459	PVQM/8025/32	PVQA/8032/33	PVQA/182032/88
40	PVQA/8040/22	PVQA/8040/23	PVQM/8040/25	PVQA/8040/27	M/P40460	PVQM/8040/32	PVQA/8040/33	PVQA/182032/88
50	PVQA/8050/22	PVQA/8050/23	PVQM/8050/25	PVQA/8040/27	M/P40460	PVQM/8040/32	PVQA/8040/33	PVQA/182050/88
63	PVQA/8063/22	PVQA/8063/23	PVQM/8050/25	PVQA/8063/27	M/P40462	PVQM/8050/32	PVQA/8063/33	PVQA/182050/88
80	PVQA/8080/22	PVQA/8080/23	PVQM/8080/25	PVQA/8080/27	M/P40463	PVQM/8080/32	PVQA/8080/33	PVQA/182080/88
100	PVQA/8100/22	PVQA/8100/23	PVQM/8080/25	PVQA/8100/27	M/P40464	PVQM/8080/32	PVQA/8100/33	PVQA/182080/88

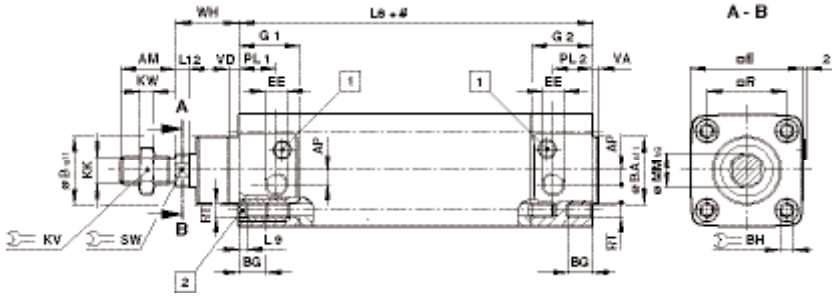
For details of mountings see page 92

PVA/182000, PVA/182000/M ISO/VDMA cylinders

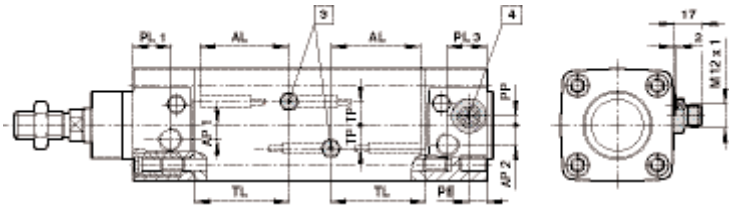
Double acting - Ø 32 ... 100 mm

BASIC DIMENSIONS

PVA/182000/...



PVA/182000/M../..



#	Stroke
1	Cushion screw
2	Torques for mounting screws Ø 32 + 40mm 4,5 – 5 Nm Ø 50 + 63mm 12 – 15 Nm Ø 80 + 100mm 23 – 26 Nm
3	Adjustable lenght AL for PVA/182000/M.3, M.4 only
4	4 x 90° rotatable

Stroke	AL	TL
< 80	30	35
>= 80	50	55

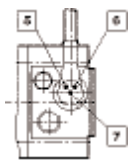
MODELS	Ø	AM	AP1	AP2	Ø B e11	Ø BA e11	BG	⌧ BH	□E	EE	G1	G2
PVA/182032	32	22	6	7,5	30	30	16	6	48	G1/8"	27	33
PVA/182040	40	24	6,5	8,5	35	35	16	6	55	G1/4"	35,5	35,5
PVA/182050	50	32	8,5	11,5	40	40	16	8	66	G1/4"	36	36
PVA/182063	63	32	11	14,5	45	45	16	8	77	G3/8"	40,5	40,5
PVA/182080	80	40	15,5	19,5	45	45	16	10	96,5	G3/8"	41	41
PVA/182100	100	40	15,5	22	55	55	16	10	117	G1/2"	46	46

MODELS	Ø	KK	⌧ KV	KW	L2	L8	L9	L12	Ø MMh9	PE	PL1	PL2
PVA/182032	32	M10 x 1,25	17	5	18	94	4	6	12	10,5	16	22
PVA/182040	40	M12 x 1,25	19	6	20	105	4	6,5	16	10,5	21,5	21,5
PVA/182050	50	M16 x 1,5	24	8	24,5	106	5	8	20	10,5	22	22
PVA/182063	63	M16 x 1,5	24	8	24,5	121	5	8	20	11	24,5	24,5
PVA/182080	80	M20 x 1,5	30	10	32,5	128	5,5	10	25	11	25	25
PVA/182100	100	M20 x 1,5	30	10	35,5	138	5,5	10	25	11	27	27

MODELS	Ø	PL3	PP	□R	RT	⌧ SW	TP	VA	VD	WH	at 0 mm	per 25 mm
PVA/182032	32	24,5	2,3	32,5	M6	10	10,5	3	6	26	0,64 kg	0,07 kg
PVA/182040	40	23,5	6,6	38	M6	13	13	3,5	6	30	0,95 kg	0,09 kg
PVA/182050	50	23	5,5	46,5	M8	17	14	3,5	6	37	1,51 kg	0,13 kg
PVA/182063	63	24,5	4,5	56,5	M8	17	18	4	6	37	2,10 kg	0,15 kg
PVA/182080	80	25	0	72	M10	22	18,5	4	6	46	3,75 kg	0,23 kg
PVA/182100	100	27	0	89	M10	22	19,5	4	6	51	5,61 kg	0,26 kg

Wiring diagram

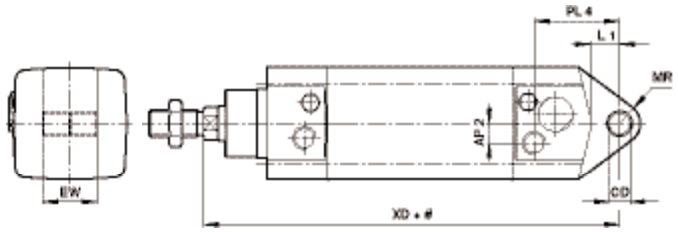
Pin 1	+10V ... +30V d.c.
Pin 2	Signal outstroke
Pin 3	not used on PVA/182000/M.1, .../M.4 0V on PVA/182000/M.2, .../M.4
Pin 4	Signal instroke



5	Power supply (green)
6	Sensor signal rear end (yellow)
7	Sensor signal front end (yellow)

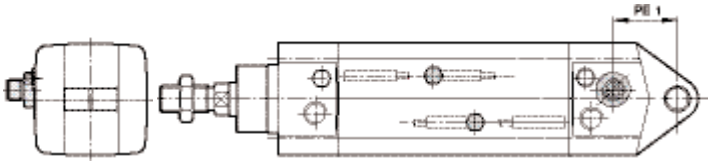
CYLINDER VARIANTS

PVA/182000/.../R – Cylinder with integrated
rear eye monting and without magnetic sensoring



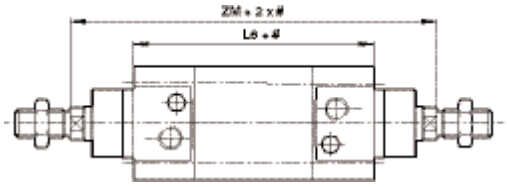
Stroke

PVA/182000/M../R.. – Cylinder with integrated
rear eye monting and with magnetic sensoring



MODELS	Ø	AP2	Ø CD	EW-0,4	L1	MR	PE 1	PL 4	XD	at 0 mm	at 25 mm
PVA/182032/.../R	32	7,5	10	25,8	12,5	10	32,5	46,5	142	0,70	0,07
PVA/182040/.../R	40	8,5	12	27,8	15,5	12	35,5	48,5	160	1,04	0,09
PVA/182050/.../R	50	11,5	12	31,8	17	12	37,5	50	170	1,65	0,13
PVA/182063/.../R	63	14,5	16	39,8	22	15	43	56,5	190	2,33	0,15
PVA/182080/.../R	80	19,5	16	49,8	21	15	47	61	210	3,96	0,23
PVA/182100/.../R	100	22	20	59,8	27	20	52	68	230	5,93	0,26

PVA/182000/J – Cylinder with double ended piston rod



Stroke

MODELS	Ø	L8	ZM	at 0 mm	at 25 mm
PVA/182032/J	32	88 1)	146	0,67	0,09
PVA/182040/J	40	105	165	1,09	0,13
PVA/182050/J	50	106	180	1,77	0,19
PVA/182063/J	63	121	195	2,39	0,21
PVA/182080/J	80	128	220	3,96	0,33
PVA/182100/J	100	138	240	5,82	0,36

PRA/282000/M ISO/VDMA SMART-Cylinder

Double acting - Ø 32 ... 100 mm

- Conforms to ISO 15551, ISO 6431 VDMA 24562 and NFE 49-003-1
- Complete functional unit with LED display
- Integrated AS-i Bus or multipole connector
- Integrated 5/2 or 5/3 valve with different functions
- Flow regulator for speed control as standard
- Integrated reed or solid state switch
- Profile with concealed tie rods
- Comprehensive range of standard VDMA mountings

TECHNICAL DATA

Medium:
Compressed air, filtered,lubricated or non-lubricated

Operation:
Double acting, adjustable cushioning,
magnetic piston and flow regulators

Operating pressure:
2 ... 8 bar

Operating temperature:
-5°C ... + 50°C
Consult our Technical Service for use below +2°C

Strokes:
Up to 1000 mm max.

Speed:
Ø 32 ... 80 mm: max 1,5 m/s
Ø 100 mm: max 1,0 m/s

Protection rating:
IP 65, IP 67 on request

MATERIALS

Profile barrel: anodised aluminium
End covers: anodised aluminium
Piston rod: stainless steel (Martensitic)
Piston rod seals: polyurethane
Piston seals and O-rings: nitrile rubber
Spool and sleeve: anodised aluminium with special coating

STANDARD MODELS

Ø	Piston rod Ø	Port size	MODELS	ACCESSORIES Connector with socket PVC 5 m	Straight fitting (Tube diameter in bold)	Elbow fitting	Service kit (pneumatic)
							
32	12	G1/8	**PRA/282032/M/***	M/P73200/5	C02250**6**18	C02470**6**18	QA/282032/00
40	16	G1/4	**PRA/282040/M/***	M/P73200/5	C02250**6**28	C02470**6**28	QA/282040/00
50	20	G1/4	**PRA/282050/M/***	M/P73200/5	C02250**8**28	C02470**8**28	QA/282050/00
63	20	G3/8	**PRA/282063/M/***	M/P73200/5	C02250**8**38	C02470**8**38	QA/282063/00
80	25	G3/8	**PRA/282080/M/***	M/P73200/5	C02251**0**38	C02471**0**38	QA/282080/00
100	25	G1/2	**PRA/282100/M/***	M/P73200/5	C02251**2**48	C02471**2**48	QA/282100/00

* Insert stroke length in mm

Other fittings are available, please see section 7

For further information

www.norgren.com/info/en1-076

OPTIONS SELECTOR

P★A/282★★★/★★★/★★/★★★★

Piston rod material	Substitute
Stainless steel (Martensitic)	R
Hard chromium plated	C
Stainless steel (Austenitic)	S

Cylinder diameters (mm)	Substitute
32	032
40	040
50	050
63	063
80	080
100	100

Pneumatic variants	Substitute
Standard	MI
Piston rod bellow	MG
Locking unit	L4
Extended piston rod	MU

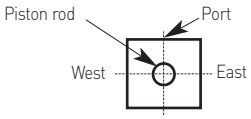
P*A/282***/***/MU*/****/***

→ Extension (mm)

Valve variants		Substitute
5/2 Sol/spring (cylinder instroke)		R
5/2 Sol/spring (cylinder outstroke)		E
5/2 Sol/sol (Bistable)		B
5/3 Sol/sol (APB)		A
5/3 Sol/sol (COE)		C

Strokes (mm)
1000 max.

Electric variants	Substitute
AS-i Bus, Reed switch M/50/LSU (east)	A1
AS-i Bus, Solid state M/50/EAP (east)	A2
AS-i Bus, Reed switch M/50/LSU (west)	A3
AS-i Bus, Solid state M/50/EAP (west)	A4
AS-i Bus, external power, reed switch M/50/LSU (east)	B1
AS-i Bus, external power, solid state M/50/EAP (east)	B2
AS-i Bus, external power, reed switch M/50/LSU (west)	B3
AS-i Bus, external power, solid state M/50/EAP (west)	B4
Multipole connector, reed switch M/50/LSU (east)	M1
Multipole connector, solid state M/50/EAP (east)	M2
Multipole connector, reed switch M/50/LSU (west)	M3
Multipole connector, solid state M/50/EAP (west)	M4

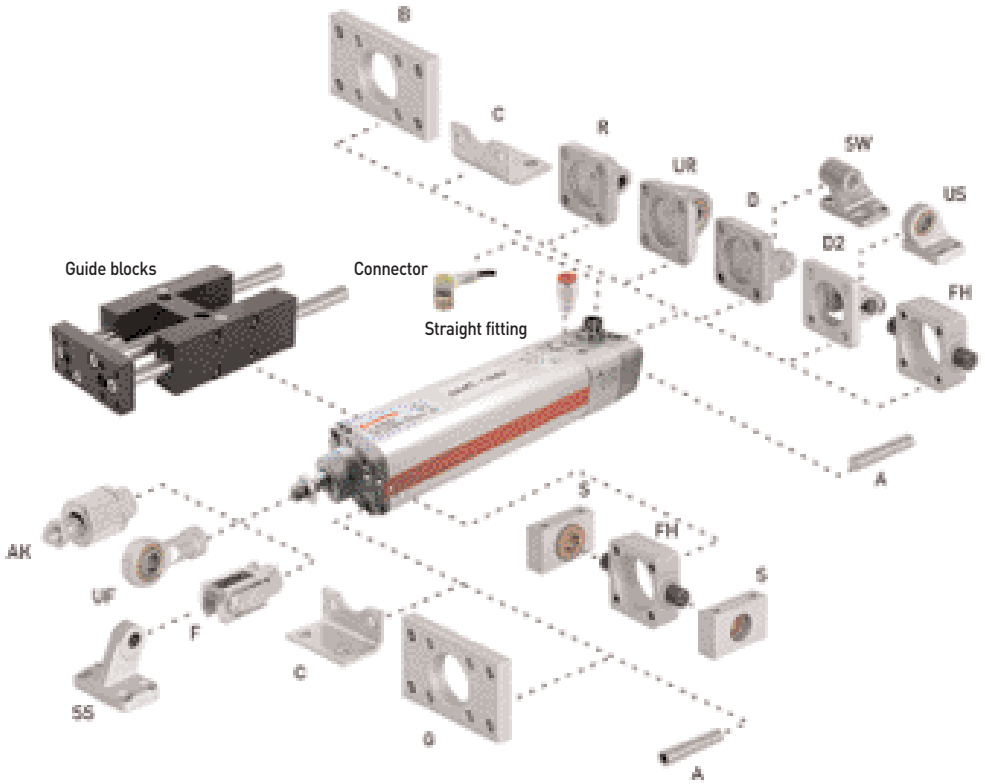


Note: If option is not required, disregard option position within part number eg. PRA/282100/M/100.
For combinations of cylinder variants consult our technical service. Please note that heat resistant seals are not available for all variants.
This options selector explains only the cylinder variants. Additional variants/options are not possible.

PRA/282000/M ISO/VDMA SMART-Cylinder

Double acting - Ø 32 ... 100 mm

MOUNTINGS



Ø	A	AK	B, G	C	D	D2	F	FH	H
32	QM/8032/35	QM/8025/38	QA/8032/22	QA/8032/21	QA/8032/23	QA/8032/42	QM/8025/25	QA/8032/34	QA/8032/28
40	QM/8032/35	QM/8040/38	QA/8040/22	QA/8040/21	QA/8040/23	QA/8040/42	QM/8040/25	QA/8040/34	QA/8040/28
50	QM/8050/35	QM/8050/38	QA/8050/22	QA/8050/21	QA/8050/23	QA/8050/42	QM/8050/25	QA/8050/34	QA/8050/28
63	QM/8050/35	QM/8050/38	QA/8063/22	QA/8063/21	QA/8063/23	QA/8063/42	QM/8050/25	QA/8063/34	QA/8063/28
80	QM/8080/35	QM/8080/38	QA/8080/22	QA/8080/21	QA/8080/23	QA/8080/42	QM/8080/25	QA/8080/34	QA/8080/28
100	QM/8080/35	QM/8080/38	QA/8100/22	QA/8100/21	QA/8100/23	QA/8100/42	QM/8080/25	QA/8100/34	QA/8100/28

Ø	R	S	SS	SW	UF	UR	US
32	QA/8032/27	QA/8032/41	M/P19931	M/P19493	QM/8025/32	QA/8032/33	M/P40310
40	QA/8040/27	QA/8040/41	M/P19932	M/P19494	QM/8040/32	QA/8040/33	M/P40311
50	QA/8050/27	QA/8040/41	M/P19933	M/P19495	QM/8050/32	QA/8050/33	M/P40312
63	QA/8063/27	QA/8063/41	M/P19934	M/P19496	QM/8050/32	QA/8063/33	M/P40313
80	QA/8080/27	QA/8063/41	M/P19935	M/P19497	QM/8080/32	QA/8080/33	M/P40314
100	QA/8100/27	QA/8100/41	M/P19936	M/P19498	QM/8080/32	QA/8100/33	M/P40315

Ø	Guide blocks	
32	QA/8032/51/*	QA/8032/61/*
40	QA/8040/51/*	QA/8040/61/*
50	QA/8050/51/*	QA/8050/61/*
63	QA/8063/51/*	QA/8063/61/*
80	QA/8080/51/*	QA/8080/61/*
100	QA/8100/51/*	QA/8100/61/*

* Insert stroke length in mm from table below. For details of mountings see page 92.
Note: QA/8_ _ _/51* = Plain bearing.
QA/8_ _ _/61* = Roller bearing.

Standard strokes for guide blocks

Ø	50	100	160	200	250	320	400	500
32	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•
80	•	•	•	•	•	•	•	•
100	•	•	•	•	•	•	•	•

Other stroke lengths are not available, use nearest standard stroke.
Maximum stroke 500 mm.
For details of guide bolcks see page 97.

Example: PRA/282000/MIR/A.
AS-Interface-Bus System

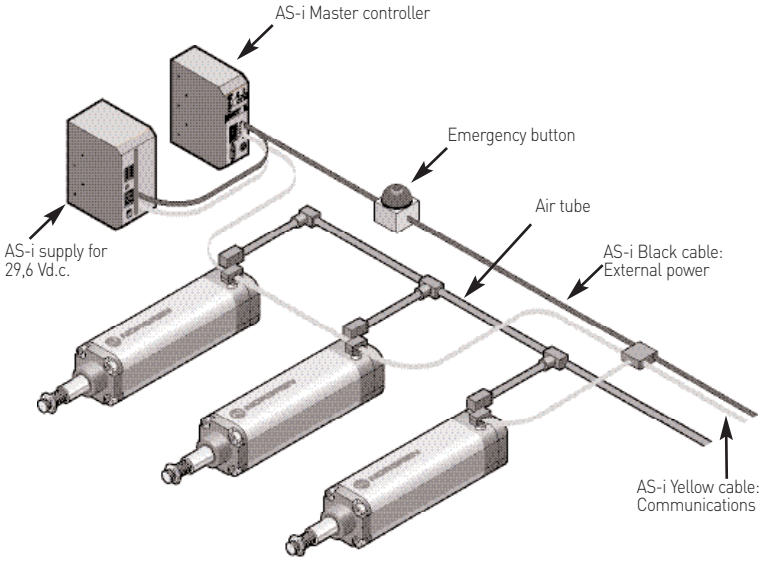
Complete functional unit with LED display and integrated AS-i Bus

Conforms to ISO 15551, ISO 6431 VDMA 24562 and NFE 49-003-1

Flexible open system

Hand held function available

Easy installation: Only 1 pneumatic and 1 electric connection



TECHNICAL DATA

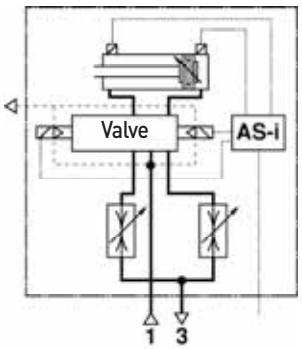
Supply voltage:
24 V d.c.

AS-i connection:
M12 male 4 pin

ID-Code AS-Interface:
F

IO-Code AS-Interface:
3

Cable:
AS-i
Yellow: Communications
Black: External power (optional)



Example: PRA/282000/MIR/M.
Multipole connection

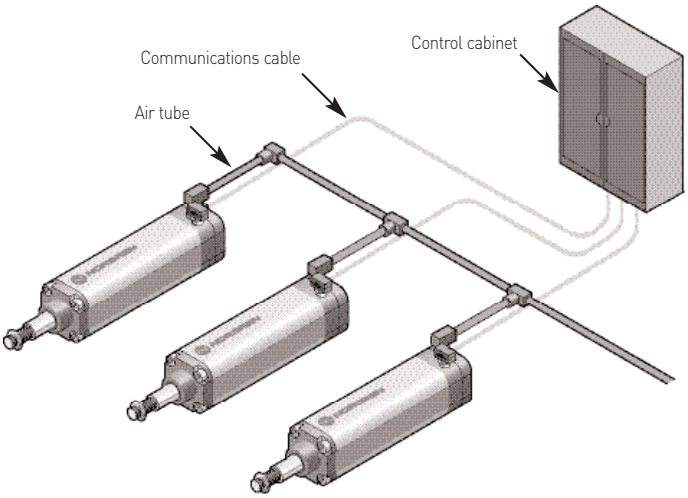
Complete functional unit with LED display and multipole connection

Conforms to ISO 15551, ISO 6431 VDMA 24562 and NFE 49-003-1

Fieldbus compatible 24 V d.c.

Hand held function available

Quick and easy installation



TECHNICAL DATA

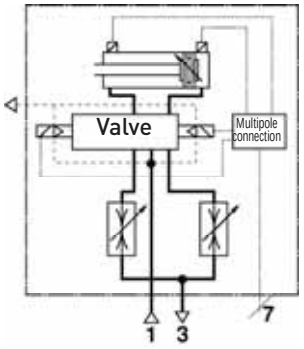
Supply voltage:
24 V d.c.

Multipole connection:
M12 male 8 pin

Max. power consumption:
1 W per coil

Rating:
100 % E.D.

Electrical protection:
Fly-wheel diode

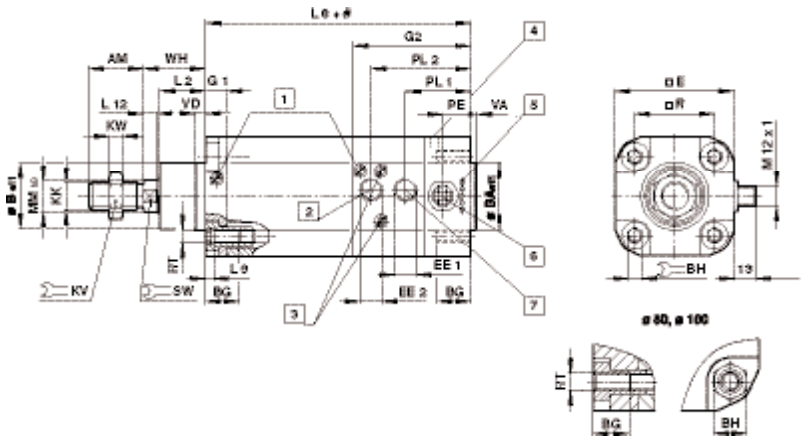


PRA/282000/M ISO/VDMA SMART-Cylinder

Double acting - Ø 32 ... 100 mm

BASIC DIMENSIONS

PRA/282000/M – Standard



#	Stroke
1	Cushion screws
2	Exhaust
3	Speed control
4	Valve exhaust Ø 32 & 40 mm: M3, Ø 50 ... 100 mm: M5
5	Display
6	Electric plug
7	Air supply

MODELS	Ø	AM	Ø B_{e11}	Ø BA_{e11}	BG min.	⌧ BH	□E	EE 1	EE 2	G 1	G 2	KK	⌧ KV	KW	L2	L8
PRA/282032/M	32	22	30	30	16	6	50	G 1/8	G 1/8	10,5	61	M10x1,25	17	5	20	94
PRA/282040/M	40	24	35	35	16	6	58	G 1/4	G 1/8	12	67	M12x1,25	19	6	22	105
PRA/282050/M	50	32	40	40	16	8	70	G 1/4	G 1/4	13	69	M16x1,5	24	8	28	106
PRA/282063/M	63	32	45	45	16	8	85	G 3/8	G 3/8	13,5	76,5	M16x1,5	24	8	28	121
PRA/282080/M	80	40	45	45	16	19	105	G 3/8	G 3/8	15	82	M20x1,5	30	10	33	128
PRA/282100/M	100	40	55	55	16	19	130	G 1/2	G 3/8	19	88	M20x1,5	30	10	36	138

MODELS	Ø	L9	L12	Ø MM_{h9}	PE	PL1	PL2	□R	RT	⌧ SW	VA	VD	WH	at 0 mm	per 100 mm
PRA/282032/M	32	4	5	12	16,5	36,5	53,5	32,5	M 6	10	3	6	26	0,66 kg	0,07 kg
PRA/282040/M	40	4	5	16	16,5	36,5	53,5	38	M 6	13	3,5	6	30	1,03 kg	0,11 kg
PRA/282050/M	50	5	6,5	20	16,5	38,5	59	46,5	M 8	17	3,5	6	37	1,58 kg	0,18 kg
PRA/282063/M	63	5	6,5	20	16,5	39,5	64,5	56,5	M 8	17	4	6	37	2,42 kg	0,19 kg
PRA/282080/M	80	-	10	25	16,5	39	67	72	M 10	22	4	6	46	4,12 kg	0,29 kg
PRA/282100/M	100	-	10	25	16,5	43,5	73,5	89	M 10	22	4	6	51	6,34 kg	0,35 kg

Wiring diagram for electric plug AS-Interface

Pin 1	AS-Interface	+
Pin 2	External power	-
Pin 3	AS-Interface	-
Pin 4	External power	+

Multipole

Plug Valves

Pin 1	Not used
Pin 2	Solenoid 2 (instroke)
Pin 3	0 V
Pin 4	Solenoid 1 (outstroke)

Wiring diagram for connector cable M/P73200/.

white
brown
green
yellow

Plug Switches

Pin 5	+ 24 V dc
Pin 6	Switch 2 (rear end)
Pin 7	0 V
Pin 8	Switch 1 (front end)

Wiring diagram for connector cable M/P73200/.

grey
pink
blue
red

RA/28000/M ISO/VDMA cylinders

Single acting - Ø 32 ... 100 mm

Conforms to ISO 15552, ISO 6431, VDMA 24562 and NFE 49-003-1

Polyurethane seals ensure efficient low friction operation and long life

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
magnetic piston, adjustable cushioning

Operating pressure:
2 ... 10 bar

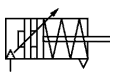
Operating temperature:
-20°C ... +80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Profile barrel: anodised aluminium
End covers: pressure diecast aluminium
Piston rod: stainless steel (martensitic)
Piston seals and piston rod seals: polyurethane
O-rings: nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Sprung in	ACCESSORIES Reed switch with integral 5 m cable	Switch mounting	Straight fitting	Elbow fitting	Service kit
							Tube diameter in bold		
									
	32	12	G1/8	**RA/28032/M/***	M/50/LSU/5V	QM/27/2/1	C0225**06**18	C0247**06**18	QA/8032/00
	40	16	G1/4	**RA/28040/M/***	M/50/LSU/5V	QM/27/2/1	C0225**06**28	C0247**06**28	QA/8040/00
	50	20	G1/4	**RA/28050/M/***	M/50/LSU/5V	QM/27/2/1	C0225**08**28	C0247**08**28	QA/8050/00
	63	20	G3/8	**RA/28063/M/***	M/50/LSU/5V	QM/27/2/1	C0225**08**38	C0247**08**38	QA/8063/00
	80	25	G3/8	**RA/28080/M/***	M/50/LSU/5V	QM/27/2/1	C0225**10**38	C0247**10**38	QA/8080/00
	100	25	G1/2	**RA/28100/M/***	M/50/LSU/5V	QM/27/2/1	C0225**12**48	C0247**12**48	QA/8100/00



* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	25	50	80	100
32	•	•	•	•
40	•	•	•	•
50	•	•	•	•
63	•	•	•	•
80	•	•	•	•
100	•	•	•	•

Theoretical forces, cushioning

MODELS	Ø	Theoretical forces (N) at 6 bar outstroke	F1	Cushion length (mm)	Cushion volume (cm3)
RA/28032/.	32	392	50	19	12,3
RA/28040/.	40	648	60	22	20,7
RA/28050/.	50	1043	75	24	36
RA/28063/.	63	1735	75	24	64
RA/28080/.	80	2795	130	27	116
RA/28100/.	100	4492	130	34	242

F1 = Return force of spring

For further information

www.norgren.com/info/en1-081

RA/28000/M ISO/VDMA cylinders

Single acting - Ø 32 ... 100 mm

OPTIONS SELECTOR

★A/28★★★★/★★/★★★

Piston rod material	Substitute
Stainless steel martensitic	R
Hard chromium plated	C
Stainless steel austenitic	S

Operation	Substitute
Sprung in	0
Sprung out	3

Cylinder Ø	Substitute
32	032
40	040
50	050
63	063
80	080
100	100

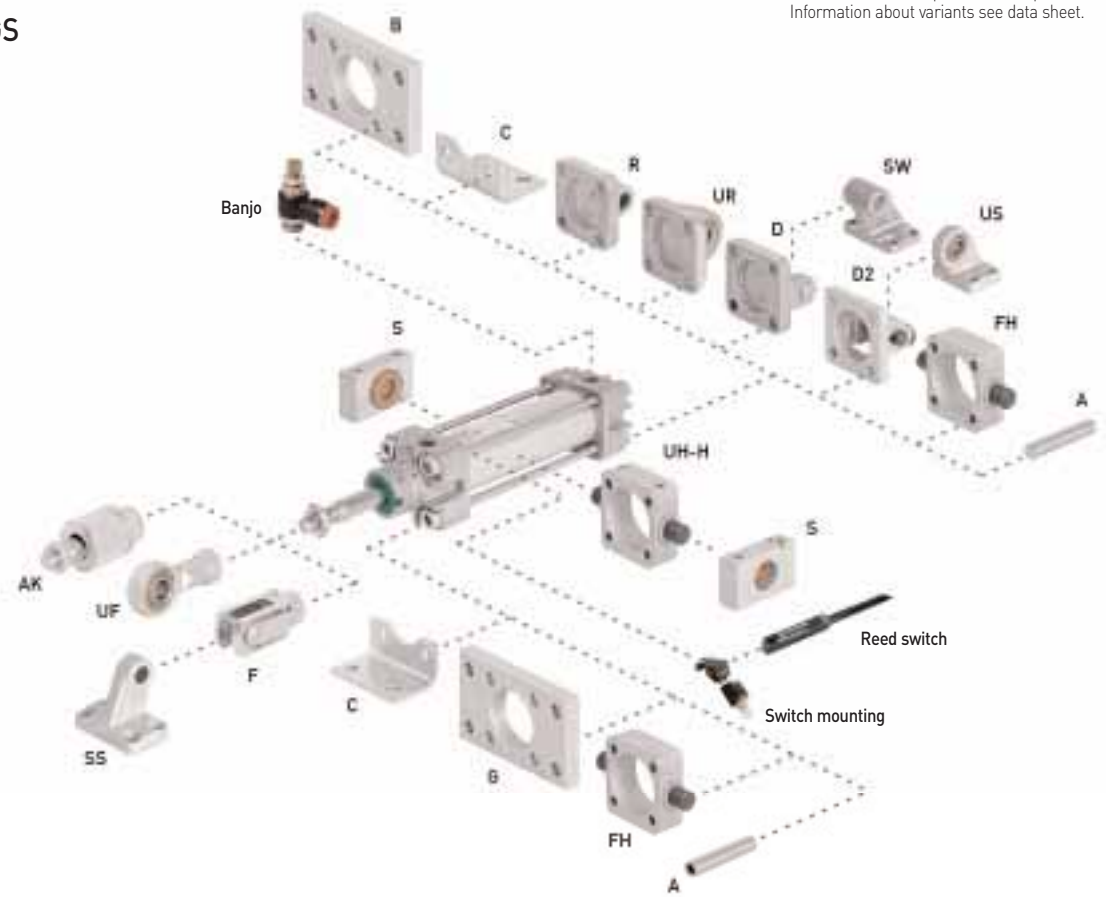
Stroke (mm)
250 max.

Variants (magnetic piston)	Substitute
Standard	M
Non-rotating oiston rod	N2
Special wiper/seal	W2

Variants (non-magnetic piston)	Substitute
Standard	None
Non-rotating oiston rod	N1
Special wiper/seal	W1

Note: If option is not required, disregard option position within part number eg. PRA/181100/M/50. For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants.
Additional variants/options are not possible.
Information about variants see data sheet.

MOUNTINGS

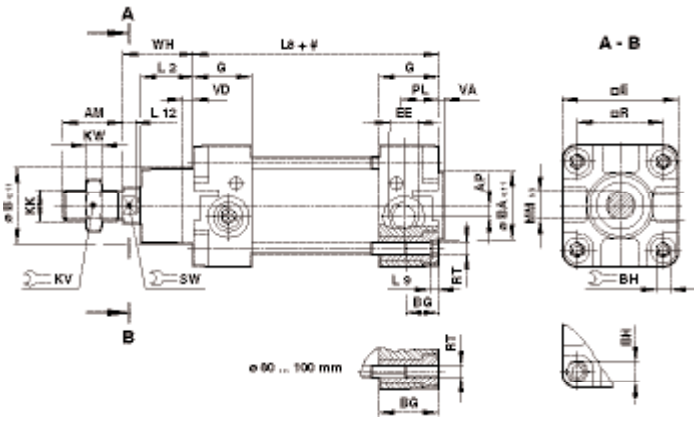


Ø	A	AK	B, G	C	D	D2	F	FH	H
32	QM/8032/35	QM/8025/38	QA/8032/22	QA/8032/21	QA/8032/23	QA/8032/42	QM/8025/25	QA/8032/34	QA/8032/28
40	QM/8032/35	QM/8040/38	QA/8040/22	QA/8040/21	QA/8040/23	QA/8040/42	QM/8040/25	QA/8040/34	QA/8040/28
50	QM/8050/35	QM/8050/38	QA/8050/22	QA/8050/21	QA/8050/23	QA/8050/42	QM/8050/25	QA/8050/34	QA/8050/28
63	QM/8050/35	QM/8050/38	QA/8063/22	QA/8063/21	QA/8063/23	QA/8063/42	QM/8050/25	QA/8063/34	QA/8063/28
80	QM/8080/35	QM/8080/38	QA/8080/22	QA/8080/21	QA/8080/23	QA/8080/42	QM/8080/25	QA/8080/34	QA/8080/28
100	QM/8080/35	QM/8080/38	QA/8100/22	QA/8100/21	QA/8100/23	QA/8100/42	QM/8080/25	QA/8100/34	QA/8100/28

Ø	R	S	SS	SW	UF	UH	UR	US	
32	QA/8032/27	QA/8032/41	M/P19931	M/P19493	QM/8025/32	QA/8032/40	QA/8032/33	M/P40310	
40	QA/8040/27	QA/8040/41	M/P19932	M/P19494	QM/8040/32	QA/8040/40	QA/8040/33	M/P40311	
50	QA/8050/27	QA/8040/41	M/P19933	M/P19495	QM/8050/32	QA/8050/40	QA/8050/33	M/P40312	
63	QA/8063/27	QA/8063/41	M/P19934	M/P19496	QM/8050/32	QA/8063/40	QA/8063/33	M/P40313	
80	QA/8080/27	QA/8063/41	M/P19935	M/P19497	QM/8080/32	QA/8080/40	QA/8080/33	M/P40314	
100	QA/8100/27	QA/8100/41	M/P19936	M/P19498	QM/8080/32	QA/8100/40	QA/8100/33	M/P40315	

For details of mountings see page 92

BASIC DIMENSIONS
RA/28000



\# Stroke

MODELS	Ø	AM	AP	Ø B_{e11}	Ø BA_{e11}	BG	⌧ BH	□E	EE	G	KK	⌧ KV	KW	L2
RA/28.32/.	32	22	3,5	30	30	18	6	47	G 1/8	27,5	M10x1,25	17	5	20
RA/28.40/.	40	24	4,5	35	35	18	6	53	G 1/4	32	M12x1,25	19	6	22
RA/28.50/.	50	32	6	40	40	18	8	65	G 1/4	31	M16x1,5	24	8	27
RA/28.63/.	63	32	10	45	45	17,5	8	75	G 3/8	33	M16x1,5	24	8	29
RA/28.80/.	80	40	8,5	45	45	21,5	19	95	G 3/8	33	M20x1,5	30	10	33
RA/28..0/.	100	40	9	55	55	21,5	19	115	G 1/2	37	M20x1,5	30	10	36

MODELS	Ø	L8	L9	L12	Ø MM_{h9}	PL	□R	RT	⌧ SW	VA	VD	WH	at 0 mm	per 25 mm
RA/28.32/.	32	94	4	6	12	13	32,5	M 6	10	3	6	26	0,51 kg	0,06 kg
RA/28.40/.	40	105	4	6,5	16	15	38	M 6	13	3,5	6	30	0,80 kg	0,08 kg
RA/28.50/.	50	106	5	8	20	18,5	46,5	M 8	17	3,5	6	37	1,33 kg	0,12 kg
RA/28.63/.	63	121	5	8	20	19	56,5	M 8	17	4	6	37	1,80 kg	0,13 kg
RA/28.80/.	80	128	–	10	25	19	72	M 10	22	4	6	46	3,25 kg	0,20 kg
RA/28..0/.	100	138	–	10	25	18	89	M 10	22	4	6	51	4,81 kg	0,23 kg

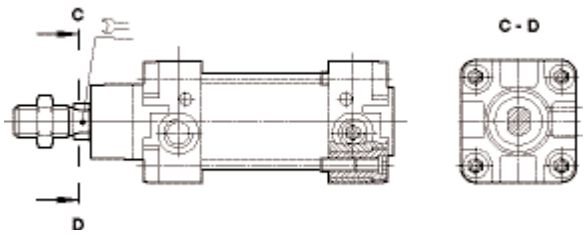
MODELS	28032	28332	28040	28340	28050	28350	28063	28363	28080	28380	28100	28310
Standard strokes	25, 50	80, 100	25, 50	80, 100	25, 50	80, 100	25, 50	80, 100	25, 50	80, 100	25, 50	80, 100
L8	119	147	130	158	131	159	146	174	153	181	163	191
L8	119 + (N * x 28)		130 + (N * x 28)		131 + (N * x 28)		146 + (N * x 28)		153 + (N * x 28)		163 + (N * x 28)	
non-standard strokes		250 mm max.										

* Stroke ≤ 50 mm ➞ N = 0

Stroke > 50 mm ➞ N = $\frac{\text{Stroke}}{50}$ -1 (round up to integer)

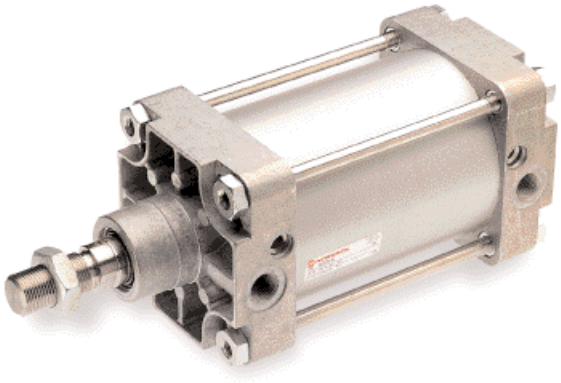
CYLINDER VARIANTS
RA/28.00/N1, RA/28.00/N2 – cylinder with non-rotating piston rod

MODELS	Ø	⌧	Max. Torque
RA/28.32/N.	32	10	0,5 Nm
RA/28.40/N.	40	13	1,0 Nm
RA/28.50/N.	50	16	1,5 Nm
RA/28.63/N.	63	16	1,5 Nm
RA/28.80/N.	80	16	2,5 Nm
RA/28..0/N.	100	21	2,5 Nm



RA/8000, RA/8000/M ISO/VDMA Cylinders

Double acting - Ø 32 ... 320 mm



Conforms to ISO 15552, ISO 6431, VDMA 24562 and NFE 49-003-1

High performance, ruggedness and reliability

Extensive range of mountings

MATERIALS

Barrel: Anodised aluminium

End covers: Pressure diecast aluminium
(Ø 200 ... 320 mm gravity cast aluminium)

Piston rod: Stainless steel (Martensitic)

Piston rod seals: Polyurethane
(Ø 125 ... 320 mm nitrile rubber)

Piston seals: Polyurethane
(Ø 125 ... 320 mm nitrile rubber)

'O'-rings: Nitrile rubber

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
RA/8000 double acting, adjustable cushioning
RA/8000/M double acting, magnetic piston, adjustable cushioning

Operating pressure:
1 ... 16 bar (1 ... 10 bar for Ø 250 and 320 mm)

Operating temperature:
-20°C ... +80°C max.
Consult our Technical Service for use below +2°C

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Non-magnetic	MODELS Magnetic	ACCESSORIES Reed switch integral with 5m cable	Switch mounting	Banjo Flow control	Straight fitting	Elbow fitting	Service kit
								Tube diameter in bold			
											
	32	12	G1/8	**RA/8032/***	**RA/8032/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**06**18	C0225**06**18	C0247**06**18	QA/8032/00
	40	16	G1/4	**RA/8040/***	**RA/8040/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**06**28	C0225**06**28	C0247**06**28	QA/8040/00
	50	20	G1/4	**RA/8050/***	**RA/8050/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**08**28	C0225**08**28	C0247**08**28	QA/8050/00
	63	20	G3/8	**RA/8063/***	**RA/8063/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**08**38	C0225**08**38	C0247**08**38	QA/8063/00
	80	25	G3/8	**RA/8080/***	**RA/8080/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**10**38	C0225**10**38	C0247**10**38	QA/8080/00
	100	25	G1/2	**RA/8100/***	**RA/8100/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**12**48	C0225**12**48	C0247**12**48	QA/8100/00
Non-magnetic	125	32	G1/2	**RA/8125/***	**RA/8125/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**12**48	C0225**12**48	C0247**12**48	QA/8125/00
	160	40	G3/4	**RA/8160/***	**RA/8160/M/***	M/50/LSU/5V	QM/27/2/1	–	–	–	QA/8160/00
	200	40	G3/4	**RA/8200/***	**RA/8200/M/***	M/50/LSU/5V	QM/27/2/1	–	–	–	QA/8200/00
Magnetic	250	50	G1	**RA/8250/***	**RA/8250/M/***	QM/32/5	QM/31/250/22	–	–	–	QA/8250/00
	320	63	G1	**RA/8320/***	**RA/8320/M/***	QM/32/5	QM/31/320/22	–	–	–	QA/8320/00

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Standard strokes

Ø	25	50	80	100	125	160	200	250	320	400	500
32	•	•	•	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•	•	•	•
80	•	•	•	•	•	•	•	•	•	•	•
100	•	•	•	•	•	•	•	•	•	•	•
125	•	•	•	•	•	•	•	•	•	•	•
160	•	•	•	•	•	•	•	•	•	•	•
200	•	•	•	•	•	•	•	•	•	•	•
250	•	•	•	•	•	•	•	•	•	•	•
320	•	•	•	•	•	•	•	•	•	•	•

Other strokes available

For further information

www.norgren.com/info/en1-084

OPTIONS SELECTOR

★★A/8★★★/★★/★★★★

Special variants	Substitute
High temperature version: 150°C max.	T

Piston rod material	Substitute
Stainless steel (martensitic)	R
Hard chromium plated	C
Stainless steel (austenitic)	S

Cylinder Ø (mm)	Substitute
32	032
40	040
50	050
63	063
80	080
100	100
125	125
160	160
200	200
250	250
320	320

Variants (magnetic piston)	Substitute
Standard	M
Special wiper/seal	W2
Low friction	X2
Piston rod bellow	MG
Without cushioning	MW
Without cushioning, low friction	X4
Double ended piston rod	JM
Double ended piston rod, special wiper/seal	W4
Four position	MT
Non-rotating piston rod	N2
Locking unit	L4
Extended piston rod	MU
Extended piston rod, special wiper/seal	W6

A/8*/MU/****/***
/W6/ → Extension (mm)

Strokes (mm)
3000 max.

Variants (non-magnetic piston)	Substitute
Standard	None
Special wiper/seal	W1
Low friction	X1
Piston rod bellow	G
Without cushioning	W
Without cushioning, low friction	X3
Double ended piston rod	J
Double ended piston rod, special wiper/seal	W3
Four position	IT
Non-rotating piston rod	N1
Locking unit	L2
Extended piston rod	IU
Extended piston rod, special wiper/seal	W5

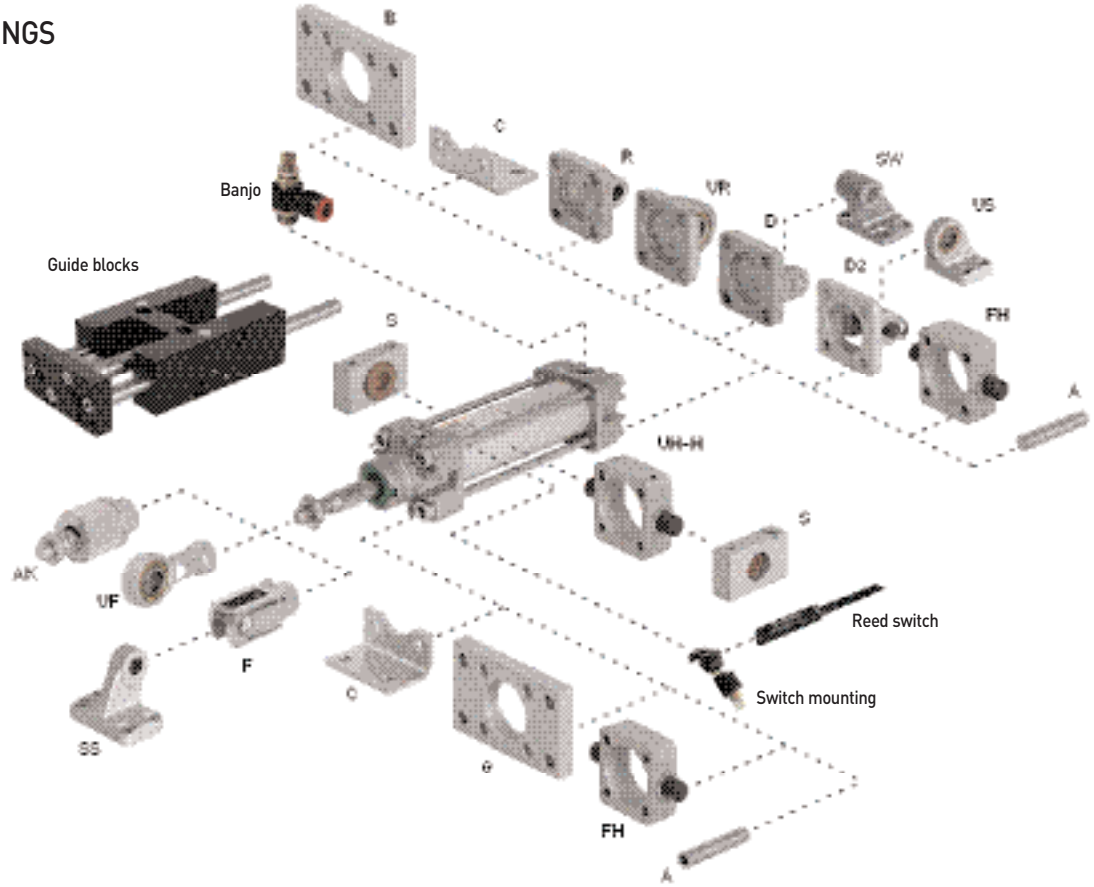
A/8*/IU/****/***
/W5/ → Extension (mm)

Note: If option is not required, disregard option position within part number, eg. RA/8100/100. For combinations of cylinder variants consult our Technical Service.
Please note that heat resistant seals are not available for all variants.
This options selector explains only the cylinder variants. Additional variants/options can not be derived from.

RA/8000, RA/8000/M ISO/VDMA Cylinders

Double acting - Ø 32 ... 320 mm

MOUNTINGS



Ø	A	AK	B, G	C	D	D2	F	FH	H
32	QM/8032/35	QM/8025/38	QA/8032/22	QA/8032/21	QA/8032/23	QA/8032/42	QM/8025/25	QA/8032/34	QA/8032/28
40	QM/8032/35	QM/8040/38	QA/8040/22	QA/8040/21	QA/8040/23	QA/8040/42	QM/8040/25	QA/8040/34	QA/8040/28
50	QM/8050/35	QM/8050/38	QA/8050/22	QA/8050/21	QA/8050/23	QA/8050/42	QM/8050/25	QA/8050/34	QA/8050/28
63	QM/8050/35	QM/8050/38	QA/8063/22	QA/8063/21	QA/8063/23	QA/8063/42	QM/8050/25	QA/8063/34	QA/8063/28
80	QM/8080/35	QM/8080/38	QA/8080/22	QA/8080/21	QA/8080/23	QA/8080/42	QM/8080/25	QA/8080/34	QA/8080/28
100	QM/8080/35	QM/8080/38	QA/8100/22	QA/8100/21	QA/8100/23	QA/8100/42	QM/8080/25	QA/8100/34	QA/8100/28
125	QM/8125/35	QM/8125/38	QM/8125/22	QM/8125/21	QM/8125/23	QA/8125/42	QM/8125/25	QA/8125/34	QM/8125/28
160	QM/8160/35	QM/8160/38	QM/8160/22	QM/8160/21	QM/8160/23	QA/8160/42	QM/8160/25	–	QM/8160/28
200	QM/8160/35	QM/8160/38	QM/8200/22	QM/8200/21	QM/8200/23	QA/8200/42	QM/8160/25	–	QM/8200/28
250	QM/8250/35	–	QM/8250/22	QM/8250/21	QM/8250/23	–	QM/8250/25	–	QM/8250/28
320	QM/8320/35	–	QM/8320/22	QM/8320/21	QM/8320/23	–	QM/8320/25	–	QM/8320/28

Ø	R	S	SS	SW	UF	UH	UR	US
32	QA/8032/27	QA/8032/41	M/P19931	M/P19493	QM/8025/32	QA/8032/40	QA/8032/33	M/P40310
40	QA/8040/27	QA/8040/41	M/P19932	M/P19494	QM/8040/32	QA/8040/40	QA/8040/33	M/P40311
50	QA/8050/27	QA/8040/41	M/P19933	M/P19495	QM/8050/32	QA/8050/40	QA/8050/33	M/P40312
63	QA/8063/27	QA/8063/41	M/P19934	M/P19496	QM/8050/32	QA/8063/40	QA/8063/33	M/P40313
80	QA/8080/27	QA/8063/41	M/P19935	M/P19497	QM/8080/32	QA/8080/40	QA/8080/33	M/P40314
100	QA/8100/27	QA/8100/41	M/P19936	M/P19498	QM/8080/32	QA/8100/40	QA/8100/33	M/P40315
125	QM/8125/27	QA/8100/41	M/P19937	M/P19499	QM/8125/32	QA/8125/40	QM/8125/33	M/P71355
160	QM/8160/27	QA/8160/41	M/P19938	M/P19679	QM/8160/32	QA/8160/40	QM/8160/33	M/P71356
200	QM/8200/27	QA/8160/41	M/P19939	M/P19683	QM/8160/32	QA/8200/40	QM/8200/33	M/P71357
250	–	–	–	M/P19446	QM/8250/32	–	QM/8250/33	–
320	–	–	–	M/P19447	QM/8320/32	–	QM/8320/33	–

Guide blocks

Ø	MODELS	MODELS
32	**QA/8032/51/***	**QA/8032/61/***
40	**QA/8040/51/***	**QA/8040/61/***
50	**QA/8050/51/***	**QA/8050/61/***
63	**QA/8063/51/***	**QA/8063/61/***
80	**QA/8080/51/***	**QA/8080/61/***
100	**QA/8100/51/***	**QA/8100/61/***

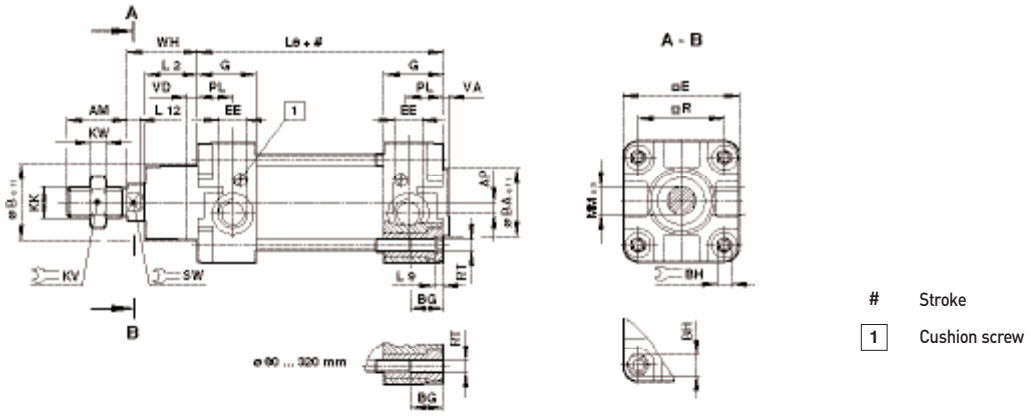
* Insert stroke length in mm from table on the right.
Note: QA/8_ _ _/51* = Plain bearing.
QA/8_ _ _/61* = Roller bearing.

Standard strokes for guide blocks

Ø	50	100	160	200	50	320	400	500
32	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•
80	•	•	•	•	•	•	•	•
100	•	•	•	•	•	•	•	•

Other stroke lengths are not available, use nearest standard stroke.
Maximum stroke 500 mm.

BASIC DIMENSIONS
RA/8000



MODELS	Ø	AM	AP	Ø B_{e11}	Ø BA_{e11}	BG	⌧ BH	□E	EE	G	KK	⌧ KV	KW	L2
RA/8032/.	32	22	3,5	30	30	18	6	47	G 1/8	27,5	M10x1,25	17	5	20
RA/8040/.	40	24	4,5	35	35	18	6	53	G 1/4	32	M12x1,25	19	6	22
RA/8050/.	50	32	6	40	40	18	8	65	G 1/4	31	M16x1,5	24	8	27
RA/8063/.	63	32	10	45	45	17,5	8	75	G 3/8	33	M16x1,5	24	8	29
RA/8080/.	80	40	8,5	45	45	21,5	19	95	G 3/8	33	M20x1,5	30	10	33
RA/8100/.	100	40	9	55	55	21,5	19	115	G 1/2	37	M20x1,5	30	10	36
RA/8125/.	125	54	10	60	60	30	24	140	G 1/2	46	M27x2	41	13,5	45
RA/8160/.	160	72	18	65	65	28,5	32	183,5	G 3/4	50	M36x2	55	18	58
RA/8200/.	200	72	18	75	75	28,5	32	224	G 3/4	50	M36x2	55	18	67
RA/8250/.	250	84	22,5	90	90	35	36	280	G 1	58	M42x2	65	21	80
RA/8320/.	320	96	22,5	110	110	30	46	350	G 1	60	M48x2	75	24	90

MODELS	Ø	L8	L9	L12	Ø MM_{h9}	PL	□R	RT	⌧ SW	VA	VD	WH	at 0 mm	per 25 mm
RA/8032/.	32	94	4	6	12	13	32,5	M 6	10	3	6	26	0,51 kg	0,06 kg
RA/8040/.	40	105	4	6,5	16	15	38	M 6	13	3,5	6	30	0,80 kg	0,08 kg
RA/8050/.	50	106	5	8	20	18,5	46,5	M 8	17	3,5	6	37	1,33 kg	0,12 kg
RA/8063/.	63	121	5	8	20	19	56,5	M 8	17	4	6	37	1,80 kg	0,13 kg
RA/8080/.	80	128	-	10	25	19	72	M 10	22	4	6	46	3,25 kg	0,20 kg
RA/8100/.	100	138	-	10	25	18	89	M 10	22	4	6	51	4,81 kg	0,23 kg
RA/8125/.	125	160	-	13	32	22,5	110	M 12	27	6	15,5	65	8,00 kg	0,33 kg
RA/8160/.	160	180	-	16	40	21	140	M 16	36	4	15	80	14,9 kg	0,55 kg
RA/8200/.	200	180	-	16	40	21	175	M 16	36	5	15	95	21,7 kg	0,60 kg
RA/8250/.	250	200	-	20	50	29	220	M 20	41	7	13	105	32,6 kg	0,92 kg
RA/8320/.	320	220	-	24	63	30	270	M 24	55	7	13	120	59,8 kg	1,46 kg

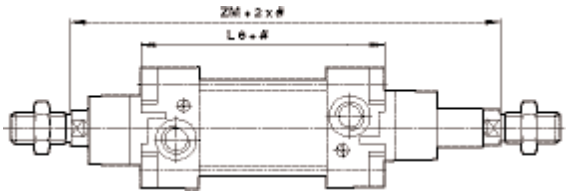
RA/8000, RA/8000/M ISO/VDMA Cylinders

Double acting - Ø 32 ... 320 mm

CYLINDER VARIANTS

RA/8000/J, RA/8000/JM – Cylinder with double ended piston rod

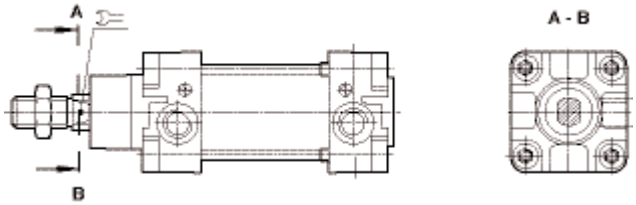
MODELS	Ø	ZM	L8
RA/8032/J./.	32	146	94
RA/8040/J./.	40	165	105
RA/8050/J./.	50	180	106
RA/8063/J./.	63	195	121
RA/8080/J./.	80	220	128
RA/8100/J./.	100	240	138
RA/8125/J./.	125	290	160
RA/8160/J./.	160	340	180
RA/8200/J./.	200	370	180
RA/8250/J./.	250	410	200
RA/8320/J./.	320	460	220



Stroke

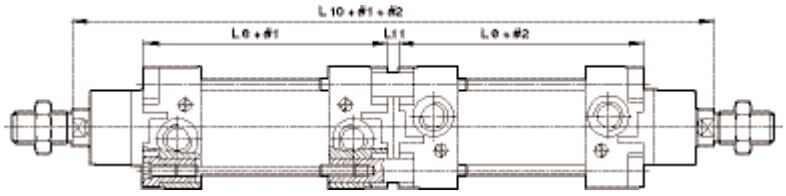
RA/8000/N1, RA/8000/N2 – Cylinder with non-rotating piston rod

MODELS	Ø	⊐	Torque max.
RA/8032/N./.	32	10	0,5 Nm
RA/8040/N./.	40	13	1,0 Nm
RA/8050/N./.	50	16	1,5 Nm
RA/8063/N./.	63	16	1,5 Nm
RA/8080/N./.	80	16	2,5 Nm
RA/8100/N./.	100	21	2,5 Nm



RA/8000/IT, RA/8000/MT – Four position cylinder

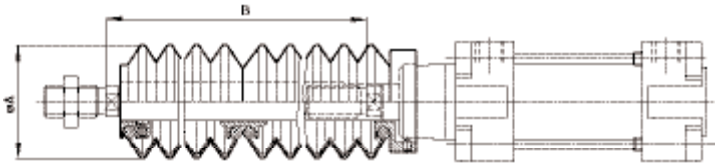
MODELS	Ø	L 8	L 10	L 11
RA/8032/.T/.	32	94	247	7
RA/8040/.T/.	40	105	278	8
RA/8050/.T/.	50	106	294	8
RA/8063/.T/.	63	121	325	9
RA/8080/.T/.	80	128	357	9
RA/8100/.T/.	100	138	387	9
RA/8125/.T/.	125	160	462	12
RA/8160/.T/.	160	180	532	12
RA/8200/.T/.	200	180	560	10



Stroke

RA/8000/G and RA/8000/MG – Cylinder with piston rod bellows

MODELS	Ø	Ø A	Max. stroke per bellow	Piston rod extension B for first bellow	Piston rod extension B for further bellow
RA/8032/.G/..	32	40	60	30	25
RA/8040/.G/..	40	63	145	50	32
RA/8050/.G/..	50	63	145	40	32
RA/8063/.G/..	63	63	145	40	32
RA/8080/.G/..	80	80	250	50	45
RA/8100/.G/..	100	80	250	50	45
RA/8125/.G/..	125	80	250	50	45
RA/8160/.G/..	160	116	350	70	60
RA/8200/.G/..	200	116	350	70	60
RA/8250/.G/..	250	116	350	70	60
RA/8320/.G/..	320	143	500	110	100



RA/8000/L2, RA/8000/L4

(ISO/VDMA/NFE) Cylinders with piston rod locking units

Double acting - Ø 32 ... 125 mm

Magnetic and non-magnetic piston conforms to ISO 15552, ISO 6431, VDMA 24562 and NFE 49-003-1

Secure locking of piston rod in any position

Locks when air is removed

Compact, maintenance-free design

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Passive model – pressure applied to release

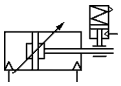
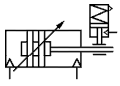
Operating pressure:
4,5 ... 10 bar

Operating temperature:
+80°C
Consult our Technical Service for use below +2°C

MATERIALS

Profile barrel: anodised aluminium
End covers: pressure diecast aluminium
Piston rod: stainless steel (Martensitic)
Piston rod seals: polyurethane
Piston seals: polyurethane
O-rings: nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Non-Magnetic	MODELS Magnetic	ACCESSORIES Reed switch with integral 5m cable	Banjo Flow Control (Tube diameter in bold)	Straight Fitting	Elbow Fitting	Service Kit
										
Non-magnetic Passive	32	12	G1/8	**RA/8032/L2/***	**RA/8032/L4/***	M/50/LSU/5V	C0K51**06**18	C0225**06**18	C0247**06**18	QA/8032/00
	40	16	G1/4	**RA/8040/L2/***	**RA/8040/L4/***	M/50/LSU/5V	C0K51**06**28	C0225**06**28	C0247**06**28	QA/8040/00
	50	20	G1/4	**RA/8050/L2/***	**RA/8050/L4/***	M/50/LSU/5V	C0K51**08**28	C0225**08**28	C0247**08**28	QA/8050/00
	63	20	G3/8	**RA/8063/L2/***	**RA/8063/L4/***	M/50/LSU/5V	C0K51**08**38	C0225**08**38	C0247**08**38	QA/8063/00
	80	25	G3/8	**RA/8080/L2/***	**RA/8080/L4/***	M/50/LSU/5V	C0K51**10**38	C0225**10**38	C0247**10**38	QA/8080/00
Magnetic Passive	100	25	G1/2	**RA/8100/L2/***	**RA/8100/L4/***	M/50/LSU/5V	C0K51**12**48	C0225**12**48	C0247**12**48	QA/8100/00
	125	32	G1/2	**RA/8125/L2/***	**RA/8125/L4/***	M/50/LSU/5V	C0K51**12**48	C0225**12**48	C0247**12**48	QA/8125/00

*Insert stroke length in mm

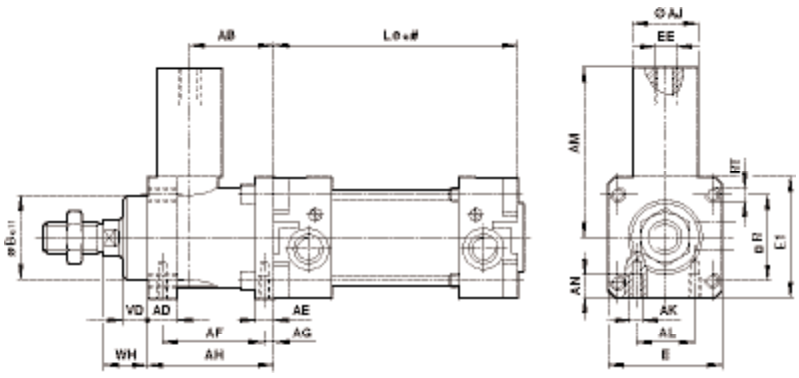
For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Locking unit

Ø	MODELS Locking unit	Locking cartige
32	**QA/8032/59**	**QA/8032/63**
40	**QA/8040/59**	**QA/8040/63**
50	**QA/8050/59**	**QA/8050/63**
63	**QA/8063/59**	**QA/8063/63**
80	**QA/8080/59**	**QA/8100/63**
100	**QA/8100/59**	**QA/8100/63**
125	**QA/8125/59**	–

Locking unit includes cartridge.
For all applications please consult our Technical Service.

RA/8000/L2, RA/8000/L4 – Cylinder with locking unit (passive)



\# Stroke

MODELS	Ø	AB	AD	AE	AF	AG	AH	Ø AJ	AK	AL	AM	AN
RA/8032/L.	32	32	12	8	40	4,2	48	25	M 5	16	59	8
RA/8040/L.	40	35,5	12	10	46	4,5	55	24	M 5	21	61,5	10
RA/8050/L.	50	49	16	15	54	11,5	70	30	M 6	24	75	12
RA/8063/L.	63	49	15	15	55	7,5	70	38	M 8	32	86	12
RA/8080/L.	80	62	16	16	70	10	90	53	M 8	44	119	16
RA/8100/L.	100	65	18	16	70	10	92	48	M 8	60	119	16
RA/8125/L.	125	85	27	25	95	11	122	65	M 10	75	140	20

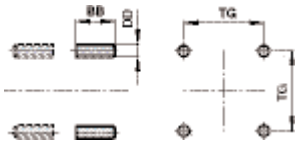
MODELS	Ø	Ø Be11	E	E 1	EE	L 8	□R	RT	VD	WH	Locking force
RA/8032/L.	32	30	48	50	M 5	94	32,5	M 6	10	16	600 N
RA/8040/L.	40	35	56	58	G 1/8	105	38	M 6	10	18	1000 N
RA/8050/L.	50	40	68	70	G 1/8	106	46,5	M 8	12	22	1500 N
RA/8063/L.	63	45	82	85	G 1/8	121	56,5	M 8	12	20	2200 N
RA/8080/L.	80	45	100	105	G 1/8	128	72	M 10	20	33	5000 N
RA/8100/L.	100	55	120	130	G 1/8	138	89	M 10	23	38	5000 N
RA/8125/L.	125	60	140	150	G 1/8	160	110	M 12	32	65	7000 N

RA/8000/L2, RA/8000/L4 (ISO/VDMA/NFE) Cylinders with piston rod locking units

Double acting - Ø 32 ... 125 mm

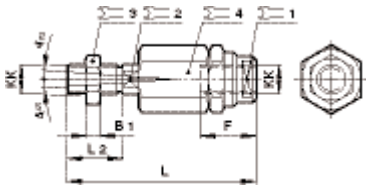
MOUNTINGS - For RA/191000, RA/193000, RA/192000, PRA/181000, PRA/183000, PRA/182000, PSA/182000/F1, PVA/182000, PRA/282000, RA/28000, M/162000

Front or rear stud mounting - A
Conforms to ISO 15552, type MX1



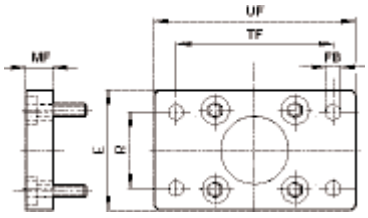
MODELS	Ø	BB	DD	TG	kg
QM/8032/35	32/40	17	M6	32,5/38	0,02
QM/8050/35	50/63	23	M8	46,5/56,5	0,05
QM/8080/35	80/100	28	M10	72/89	0,08
QM/8125/35	125	34	M12	110	0,14
QM/8160/35	160/200	42	M16	140/175	0,31
QM/8250/35	250	50	M20	220	0,92
QM/8320/35	320	60	M24	270	1,46

Piston rod swivel - AK



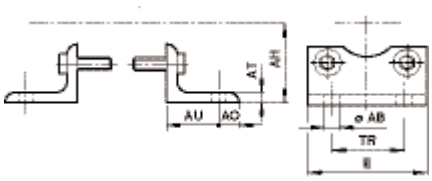
MODELS	Ø	KK	B1	F	L	L2	Σ 1	Σ 2	Σ 3	Σ 4	kg
QM/8025/38	32	M10x1,25	5	26	73	20	19	12	17	30	0,20
QM/8040/38	40	M12x1,25	6	26	77	24	19	12	19	30	0,20
QM/8050/38	50/63	M16x1,5	8	34	106	32	30	19	24	42	0,65
QM/8080/38	80/100	M20x1,5	10	42	122	40	30	19	30	42	0,72
QM/8125/38	125	M27x2	13,5	40	147	54	40	24	41	55	1,70
QM/8160/38	160/200	M36x2	18	78	251	72	50	36	55	75	5,40
For compact cylinder RA/191000/M., RA/192000/M. and RA/193000/M., only for cylinders with male piston rod thread, order nut type N2 separately											
QM/8020/38	20/25	M8x1,25	4	18	55	16	10	7	13	17	0,05
QM/8025/38	32/40	M10x1,25	5	26	73	20	19	12	17	30	0,20
QM/8040/38	50/63	M12x1,25	6	26	77	24	19	12	19	30	0,20
QM/8050/38	80/100	M16x1,5	8	34	106	32	30	19	24	42	0,65
QM/8125/38	125	M27x2	13,5	40	147	54	40	24	41	55	1,70

Front flange - B, G
Conforms to ISO 15552, type MF1 and MF2



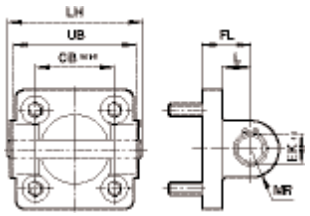
MODELS	Ø	E	Ø FB	MF	R	TF	UF	kg
QA/192020/22	20	36	6,6	8	–	55	70	0,16
QA/192025/22	25	40	6,6	8	–	60	76	0,20
QA/8032/22	32	50	7	10	32	64	80	0,25
QA/8040/22	40	55	9	10	36	72	90	0,35
QA/8050/22	50	65	9	12	45	90	110	0,70
QA/8063/22	63	75	9	12	50	100	125	0,80
QA/8080/22	80	100	12	16	63	126	154	1,35
QA/8100/22	100	120	14	16	75	150	186	2,20
QM/8125/22	125	140	16	20	90	180	224	2,70
QM/8160/22	160	180	18	20	115	230	280	3,10
QM/8200/22	200	220	22	25	135	270	320	4,60
QM/8250/22	250	280	26	25	165	330	395	7,40
QM/8320/22	320	350	33	30	200	400	475	13,6
Corrosion protected version for Smooth Line cylinders PVA/182000								
PVQA/8032/22	32	50	7	10	32	64	80	0,25
PVQA/8040/22	40	55	9	10	36	72	90	0,35
PVQA/8050/22	50	65	9	12	45	90	110	0,70
PVQA/8063/22	63	75	9	12	50	100	125	0,80
PVQA/8080/22	80	100	12	16	63	126	154	1,35
PVQA/8100/22	100	120	14	16	75	150	186	2,20

Foot mounting - C
Conforms to ISO 15552 or ISO 21287, type MS1



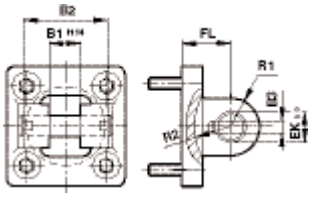
MODELS	Ø	Ø AB	AH	AO	AT	AU	E	TR	kg
QA/8032/21	32	7	32	8	4	24	48	32	0,15
QA/8040/21	40	9	386	9	4	28	53	36	0,18
QA/8050/21	50	9	45	10	5	32	64	45	0,30
QA/8063/21	63	9	50	12	5	32	74	50	0,39
QA/8080/21	80	12	63	19	5	41	98	63	0,80
QA/8100/21	100	14	71	19	5	41	115	75	0,95
QM/8125/21	125	16	90	20	9	45	140	90	2,40
QM/8160/21	160	18	115	20	8	60	180	115	3,50
QM/8200/21	200	22	135	30	9	70	220	135	5,25
QM/8250/21	250	26	165	35	10	75	280	165	9,50
QM/8320/21	320	33	200	45	16	85	350	200	22,0
For compact cylinder RA/191000/M., RA/192000/M. and RA/193000/M. only Conforms to ISO 21 287 (Ø 20 to 100 mm)									
QM/192020/21	20	7	27	6	4	16	36	22	0,03
QM/192025/21	25	7	30	6	4	16	40	26	0,04
QA/192032/21	32	7	33,5	7	4	16	50	32	0,15
QA/192040/21	40	10	38	9	4	18	58	36	0,18
QA/192050/21	50	10	45	9	5	21	70	45	0,30
QA/192063/21	63	10	50	9	5	21	80	50	0,39
QA/192080/21	80	12	63	11	6	26	96	63	0,80
QA/192100/21	100	14,5	74	13	6	27	116	75	0,95

Rear clevis - D
Conforms to ISO 15552, type MP2



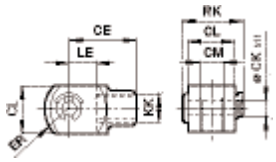
MODELS	Ø	CB H14	Ø EK f8	FL	L	LH	MR	UB	kg
QA/8032/23	32	26	10	22	13	52	9	45	0,11
QA/8040/23	40	28	12	25	16	60	12	52	0,16
QA/8050/23	50	32	12	27	17	68	12	60	0,22
QA/8063/23	63	40	16	32	22	79	15	70	0,34
QA/8080/23	80	50	16	36	22	99	15	90	0,54
QA/8100/23	100	60	20	41	27	119	20	110	0,90
QM/8125/23	125	70	25	50	31	139	25	130	2,70
QM/8160/23	160	90	30	55	35,5	181	30	170	4,30
QM/8200/23	200	90	30	60	36	181	30	170	6,10
QM/8250/23	250	110	40	70	45	218	40	200	19,0
QM/8320/23	320	120	45	80	50	238	45	220	30,5
Corrosion protected version for Smooth Line cylinders PVA/182000									
PVQA/8032/23	32	26	10	22	13	52	9	45	0,11
PVQA/8032/23	40	28	12	25	16	60	12	52	0,16
PVQA/8050/23	50	32	12	27	17	68	12	60	0,22
PVQA/8063/23	63	40	16	32	22	79	15	70	0,34
PVQA/8080/23	80	50	16	36	22	99	15	90	0,54
PVQA/8100/23	100	60	20	41	27	119	20	110	0,90

Rear clevis - D2
Conforms to ISO 15552, type AB6



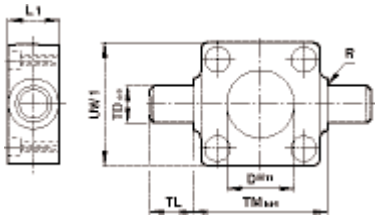
MODELS	Ø	B1 H14	B2	B3	Ø EK h9	FL	R1	R2	kg
QA/8032/42	32	14	34	3,3	10	22	11	17	0,20
QA/8040/42	40	16	40	4,3	12	25	12	20	0,23
QA/8050/42	50	21	45	4,3	16	27	14,5	22	0,36
QA/8063/42	63	21	51	4,3	16	32	18	25	0,55
QA/8080/42	80	25	65	4,3	20	36	22	30	0,90
QA/8100/42	100	25	75	4,3	20	41	22	32	1,45
QA/8125/42	125	37	97	6,3	30	50	30	42	2,70
QA/8160/42	160	43	122	6,3	35	55	36	46	4,30
QA/8200/42	200	43	122	6,3	35	60	38	49	6,10

Piston rod clevis - F
Conforms to DIN ISO 8140



MODELS	Ø	KK	CE	Ø CK h11	CL	CM	ER	LE	RK	kg
QM/8025/25	32	M10x1,25	40	10	20	10	16	20	28	0,09
QM/8040/25	40	M12x1,25	48	12	24	12	19	24	32	0,13
QM/8050/25	50/63	M16x1,5	64	16	32	16	25	32	41,5	0,33
QM/8080/25	80/100	M20x1,5	80	20	40	20	32	40	50	0,67
QM/8125/25	125	M27x2	110	30	55	30	45	54	62	1,35
QM/8160/25	160/200	M36x2	144	35	70	35	57	72	95	3,00
QM/8250/25	250	M42x2	168	40	85	40	68	84	106	6,40
QM/8320/25	320	M48x2	192	50	96	50	85	96	121	8,70
Corrosion protected version for smooth line cylinders PVA/182000										
PVQM/8032/25	32	M10x1,25	40	10	20	10	16	20	28	0,09
PVQM/8040/25	40	M12x1,25	48	12	24	12	19	24	32	0,13
PVQM/8050/25	50/63	M16x1,5	64	16	32	16	25	32	41,5	0,33
PVQM/8080/25	80/100	M20x1,5	80	20	40	20	32	40	50	0,67
For compact cylinder RA/191000/M., RA/192000/M. and RA/193000/M. only for cylinders with male piston rod thread order nut, type N2 separately										
QM/8020/25	20/25	M8x1,25	32	8	16	8	13	16	22	0,06
QM/8025/25	32/40	M10x1,25	40	10	20	10	16	20	28	0,09
QM/8040/25	50/63	M12x1,25	48	12	24	12	19	24	32	0,13
QM/8050/25	80/100	M16x1,5	64	16	32	16	25	32	41,5	0,33
QM/8125/25	125	M27x2	110	30	55	30	45	54	62	1,35

Front or rear detachable trunnion - FH
Conforms to ISO 15552 part 2, type MT 5/6

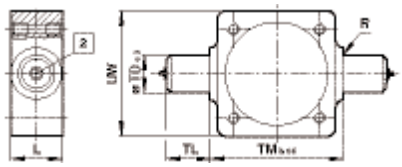


MODELS	Ø	Ø D h11	L1	R	Ø TD e9	TL	TM h14	UW1	kg
QA/8032/34	32	30	16	1	12	12	50	50	0,20
QA/8040/34	40	35	20	1,6	16	16	63	55	0,38
QA/8050/34	50	40	24	1,6	16	16	75	65	0,60
QA/8063/34	63	45	24	1,6	20	20	90	75	1,10
QA/8080/34	80	45	28	1,6	20	20	110	100	1,90
QA/8100/34	100	55	38	2	25	25	132	120	3,50
QA/8125/34	125	60	50	2	25	25	160	145	6,50

RA/8000/L2, RA/8000/L4 (ISO/VDMA/NFE) Cylinders with piston rod locking units

Double acting - Ø 32 ... 125 mm

Centre trunnion - H
Conforms to ISO 15552, type MT4

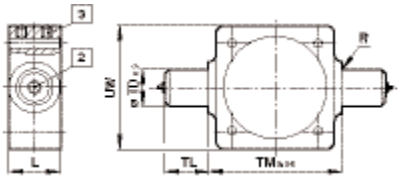


2 Grease nippel up to Ø 125 mm

MODELS	Ø	L	R	Ø TDe9	TL	TMh14	UW	XV min.	XV max.	kg
QA/8032/28	32	20	1	12	12	50	50	66	80	0,16
QA/8040/28	40	24	1,6	16	16	63	58	76	89	0,35
QA/8050/28	50	28	1,6	16	16	75	70	82	98	0,65
QA/8063/28	63	28	1,6	20	20	90	80	88	107	0,85
QA/8080/28	80	28	1,6	20	20	110	100	97	123	1,20
QA/8100/28	100	38	2	25	25	132	126	112	128	2,30
QM/8125/28	125	50	2	25	25	160	152	136	154	3,30
QM/8160/28	160	50	2,5	32	32	200	192	155	185	5,30
QM/8200/28	200	50	2,5	32	32	250	240	170	200	9,40
QM/8250/28	250	60	3,2	40	40	320	318	193	217	18,0
QM/8320/28	320	70	3,2	50	50	400	400	215	245	30,0

Note: Style 'H': These mountings are only supplied assembled complete with the cylinder. Unless otherwise specified, units will be supplied with dimension 'XV' plus half the stroke length. 'XV' = Distance from the piston rod shoulder to the centre of the mounting.

Adjustable intermediate trunnion mounting - UH
Conforms to ISO 15552, type MT4



2 Grease nippel up to Ø 125 mm

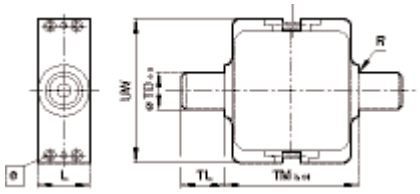
3 Locking screws
Torque max
Ø 32 & 40 mm = 6 Nm
Ø 50 & 63 mm = 10 Nm
Ø 80 & 100 mm = 15 Nm
Ø 125 mm = 25 Nm
Ø 160 & 200 mm = 40 Nm

MODELS	Ø	L	R	Ø TDe9	TL	TMh14	UW	XV min.	XV max.	kg
QA/8032/40	32	20	1	12	12	50	50	66	80	0,16
QA/8040/40	40	24	1,6	16	16	63	58	76	89	0,35
QA/8050/40	50	28	1,6	16	16	75	70	82	98	0,65
QA/8063/40	63	28	1,6	20	20	90	80	88	107	0,85
QA/8080/40	80	28	1,6	20	20	110	100	97	123	1,20
QA/8100/40	100	38	2	25	25	132	126	112	128	2,30
QM/8125/40	125	50	2	25	25	160	152	136	154	3,30
QM/8160/40	160	50	2,5	32	32	200	192	155	185	5,30
QM/8200/40	200	50	2,5	32	32	250	240	170	200	9,40

Style 'UH': It is most important that the locking screws which secure the mounting to the tie rod are tightened to the torque figures shown in the table below. For maximum energy input, consult our Technical Service.

Unless otherwise specified, units will be supplied with dimension 'XV' plus half the stroke length. 'XV' = Distance from the piston rod shoulder to the centre of the mounting.

Adjustable trunnion mounting - UH
Conforms to ISO 15552, type MT4
For profile cylinders only

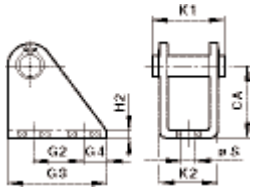


8 locking screw

MODELS	Ø	L	R	Ø TDe9	TL	TMh14	UW	Torque max. (Nm)	kg
PQA/182032/40	32	25	1	12	12	50	58	2,0	0,16
PQA/182040/40	40	28	1,6	16	16	63	65	3,5	0,35
PQA/182050/40	50	28	1,6	16	16	75	80	3,5	0,65
PQA/182063/40	63	36	1,6	20	20	90	96	5,0	0,85
PQA/182080/40	80	36	1,6	20	20	110	116	6,0	1,20
PQA/182100/40	100	48	2	25	25	132	140	6,0	2,30
PQA/182125/40	125	48	2	25	25	160	163	6,0	3,30

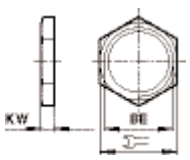
Note: style 'UH': It is most important that the locking screws which secure the mounting to the cylinder barrel are tightened to the torque figures shown in the table below. For maximum energy input, consult our Technical Service.

Bracket hinge - L2
For rear eye mounting R
Cylinder RA/191000/M., RA/192000/M. and RA/193000/M. only



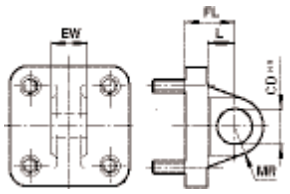
MODELS	Ø	CA	G1	G2	G3	G4	H2	K1	K2	ØS	kg
QM/8020/44	20/25	30	16	20	32	6	4	29,5	24	6,6	0,08

Nut - N2
For cylinder with male piston rod thread



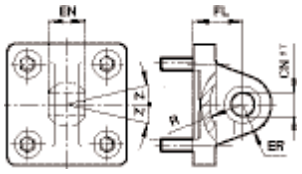
MODELS	Ø	BE	KW	⌀=	kg
M/P1501/60	20/25	M8x1,25	4	13	0,01
M/P1501/89	32/40	M10x1,25	5	17	0,01
M/P1501/90	50/63	M12x1,25	6	19	0,01
M/P1501/91	80/100	M16x1,5	8	24	0,02
M/P1501/105	125	M27x2	13,5	41	0,09

Rear eye - R
Conforms to ISO 15552, type MP4



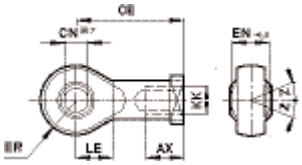
MODELS	Ø	Ø CD^{H9}	EW	FL	L	MR	kg
QM/192020/27	20	8	15,8	20	14	8	0,02
QM/192025/27	25	8	15,8	20	14	8	0,03
QA/8032/27	32	10	25,8	22	13	9	0,09
QA/8040/27	40	12	27,8	25	16	12	0,11
QA/8050/27	50	12	31,7	27	17	12	0,17
QA/8063/27	63	16	39,7	32	22	15	0,24
QA/8080/27	80	16	49,7	36	22	15	0,37
QA/8100/27	100	20	59,7	41	27	20	0,59
QM/8125/27	125	25	69,7	50	33	25	3,20
QM/8160/27	160	30	89,7	55	35,5	30	6,10
QM/8200/27	200	30	89,7	60	37	30	6,80
Corrosion protected version for Smooth Line cylinders PVA/182000							
PVQA/8032/27	32	10	25,8	22	13	9	0,09
PVQA/8040/27	40	12	27,8	25	16	12	0,11
PVQA/8050/27	50	12	31,7	27	17	12	0,17
PVQA/8063/27	63	16	39,7	32	22	15	0,24
PVQA/8080/27	80	16	49,7	36	22	15	0,37
PVQA/8100/27	100	20	59,7	41	27	20	**0,59**

Universal rear eye - UR
Conforms to ISO 15552, type MP6



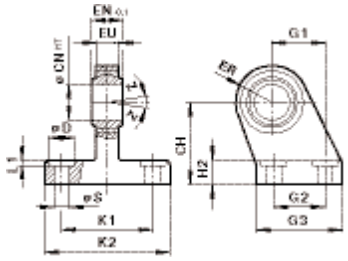
MODELS	Ø	Ø CN^{H7}	EN	ER	FL	R	Z	kg
QA/8032/33	32	10	14	16	22	14,5	13°	0,15
QA/8040/33	40	12	16	19	25	18	13°	0,25
QA/8050/33	50	16	21	21	27	19	13°	0,40
QA/8063/33	63	16	21	24	32	24	15°	0,55
QA/8080/33	80	20	25	28	36	24	15°	0,90
QA/8100/33	100	20	25	30	41	29	15°	1,50
QM/8125/33	125	30	37	40	50	36	15°	2,70
QM/8160/33	160	35	43	44	55	41	16°	4,6
QM/8200/33	200	35	43	48	60	42	16°	7,3
QM/8250/33	250	40	49	50	70	47	10°	16,5
QM/8320/33	320	50	60	58	80	52	8°	26,0
Corrosion protected version for Smooth Line cylinders PVA/182000								
PVQA/8032/33	32	10	14	16	22	14,5	13°	0,15
PVQA/8040/33	40	12	16	19	25	18	13°	0,25
PVQA/8050/33	50	16	21	21	27	19	13°	0,4
PVQA/8063/33	63	16	21	24	32	24	15°	0,55
PVQA/8080/33	80	20	25	28	36	24	15°	0,9
PVQA/8100/33	100	20	25	30	41	29	15°	1,5

Universal piston rod eye - UF
Conforms to DIN ISO 8139



MODELS	Ø	Thread KK	AX	CE	Ø CN^{H7}	EN$^{-0,1}$	ER	LE	Z	kg
QM/8025/32	32	M10x1,25	20	43	10	14	14	15	13°	0,09
QM/8040/32	40	M12x1,25	22	50	12	16	16	17	13°	0,13
QM/8050/32	50/63	M16x1,5	28	64	16	21	21	22	15°	0,33
QM/8080/32	80/100	M20x1,5	33	77	20	25	25	26	15°	0,67
QM/8125/32	125	M27x2	51	110	30	37	35	36	15°	1,35
QM/8160/32	160/200	M36x2	56	125	35	43	40	41	16°	3,00
QM/8250/32	250	M42x2	60	142	40	49	45	46	17°	6,40
QM/8320/32	320	M48x2	65	160	50	60	58	59	12°	8,70
Corrosion protected version for smooth line cylinders PVA/182000										
PVQM/8025/32	32	M10x1,25	20	43	10	14	14	15	13°	0,09
PVQM/8040/32	40	M12x1,25	22	50	12	16	16	17	13°	0,13
PVQM/8050/32	50/63	M16x1,5	28	64	16	21	21	22	15°	0,33
PVQM/8080/32	80/100	M27x2	51	110	30	37	35	36	15°	1,35
For compact cylinder RA/191000/M., RA/192000/M. and RA/193000/M. only for cylinders with male piston rod thread order nut, type N2 separately										
QM/8020/32	20/25	M8x1,25	16	36	8	12	11	13	5°	0,05
QM/8025/32	32/40	M10x1,25	20	43	10	14	14	15	13°	0,09
QM/8040/32	50/63	M12x1,25	22	50	12	16	16	17	13°	0,13
QM/8050/32	80/100	M16x1,5	28	64	16	21	21	22	15°	0,33
QM/8125/32	125	M27x2	51	110	30	37	35	36	15°	1,35

Swivel hinge - US
Conforms to VDMA 24562 part 2

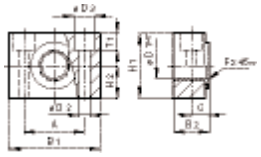


MODELS	Ø	CH	Ø CN^{H7}	ØD	EN$^{-0,1}$	ER	EU	G1	G2	G3	H2	K1	K2	L1	ØS	Z	kg
M/P40310	32	32	10	11	14	16	10,5	21	18	31	8	38	51	1,6	6,6	13°	0,19
M/P40311	40	36	12	11	16	19	12	24	22	35	10	41	54	1,6	6,6	13°	0,24
M/P40312	50	45	16	15	21	21	15	33	30	45	12	50	65	1,6	9	13°	0,46
M/P40313	63	50	16	15	21	24	15	37	35	50	12	52	67	1,6	9	15°	0,59
M/P40314	80	63	20	18	25	28	18	47	40	60	14	66	86	2,5	11	15°	1,03
M/P40315	100	71	20	18	25	30	18	55	50	70	15	76	96	2,5	11	15°	1,40
M/P71355	125	90	30	20	37	40	25	70	60	90	20	94	124	3,2	14	15°	3,10
M/P71356	160	115	35	20	43	44	28	97	88	126	25	118	159	4	14	15°	6,40
M/P71357	200	135	35	26	43	48	28	105	90	130	30	122	162	4	18	15°	9,10

RA/8000/L2, RA/8000/L4 (ISO/VDMA/NFE) Cylinders with piston rod locking units

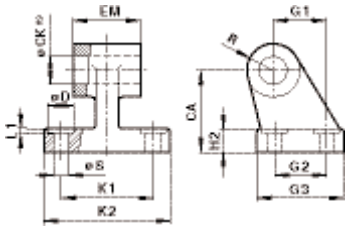
Double acting - Ø 32 ... 125 mm

Trunnion support - S
Conforms to ISO 15552, type AT4



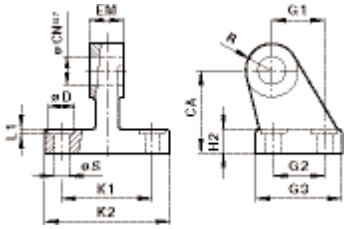
MODELS	Ø	A	B1	B2	C	Ø D1^{H7}	Ø D2	Ø D3	F x 45°	H1	H2	T1	kg
QA/8032/41	32	32	46	18	10,5	12	6,6	11	1	30	15	6,8	0,10
QA/8040/41	40/50	36	55	21	12	16	9	15	1,6	36	18	9	0,14
QA/8063/41	63/80	42	65	23	13	20	11	18	1,6	40	20	11	0,18
QA/8100/41	100/125	50	75	28,5	16	25	14	20	2	50	25	13	0,34
QA/8160/41	160/200	60	92	39	21,5	32	18	26	2,5	60	25	15,5	1,90

Wide hinge - SW
Conforms to ISO 15552, type AB7



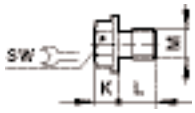
MODELS	Ø	CA	Ø CK^{H9}	ØD	H2	EM	G1	G2	G3	K1	K2	L1	R	ØS	kg
M/P19493	32	32	10	11	8	26,5	21	18	31	38	51	1,6	10	6,6	0,05
M/P19494	40	36	12	11	10	28,5	24	22	35	41	54	1,6	11	6,6	0,07
M/P19495	50	45	12	15	12	32,5	33	30	45	50	65	1,6	13	9	0,14
M/P19496	63	50	16	15	12	40,5	37	35	50	52	67	1,6	15	9	0,18
M/P19497	80	63	16	18	14	50,5	47	40	60	66	86	2,5	15	11	0,28
M/P19498	100	71	20	18	15	60,5	55	50	70	76	96	2,5	19	11	0,42
M/P19499	125	90	25	20	20	70,5	70	60	90	94	124	3,2	22	14	2,70
M/P19679	160	115	30	20	25	89,5	97	88	126	118	156	4	31	14	6,30
M/P19683	200	135	30	26	30	89,5	105	90	130	122	162	4	31	18	8,00
M/P19446	250	165	40	40	35	109,5	128	110	160	150	200	4	39	22	13,4
M/P19447	320	200	45	48	40	119,5	150	122	186	170	234	4	44	26	22,0
Corrosion protected version for Smooth Line cylinders PVA/182000															
M/P40459	32	32	10	11	8	26,5	21	18	31	38	51	1,6	10	6,6	0,05
M/P40460	40	36	12	11	10	28,5	24	22	35	41	54	1,6	11	6,6	0,07
M/P40461	50	45	12	15	12	32,5	33	30	45	50	65	1,6	13	9	0,14
M/P40462	63	50	16	15	12	40,5	37	35	50	52	67	1,6	15	9	0,18
M/P40463	80	63	16	18	14	50,5	47	40	60	66	86	2,5	15	11	0,28
M/P40464	100	71	20	18	15	60,5	55	50	70	76	96	2,5	19	11	0,42

Narrow hinge - SS



MODELS	Ø	CA	Ø CN^{G7}	ØD	H2	EM	G1	G2	G3	K1	K2	L1	R	ØS	kg
M/P19931	32	32	10	11	8	10	21	18	31	38	51	1,6	10	6,6	0,15
M/P19932	40	36	12	11	10	12	24	22	35	41	54	1,6	11	6,6	0,20
M/P19933	50	45	16	15	12	16	33	30	45	50	65	1,6	13	9	0,48
M/P19934	63	50	16	15	12	16	37	35	50	52	67	1,6	15	9	0,50
M/P19935	80	63	20	18	14	20	47	40	60	66	86	2,5	15	11	0,75
M/P19936	100	71	20	18	15	20	55	50	70	76	96	2,5	19	11	1,20
M/P19937	125	90	25	20	20	30	70	60	90	94	124	3,2	22	14	2,50
M/P19938	160	115	35	20	25	35	97	88	126	118	156	4	31	14	6,00
M/P19939	200	135	35	26	30	35	105	90	130	122	162	4	31	18	7,60

Cover screws, stainless steel
For Smooth Line cylinders PVA/182000

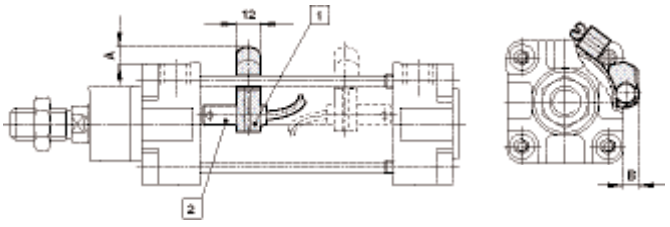


MODELS	Ø	M	⌀ SW	K	L	kg
PVA/182032/88	32/40	M6	10	5,5	10,5	0,018
PVA/182050/88	50/63	M8	13	6,8	10,5	0,041
PVA/182080/88	80/100	M10	17	8,4	10	0,072

BRACKETS

QM/27/2/1 – Bracket
Switches: M/50

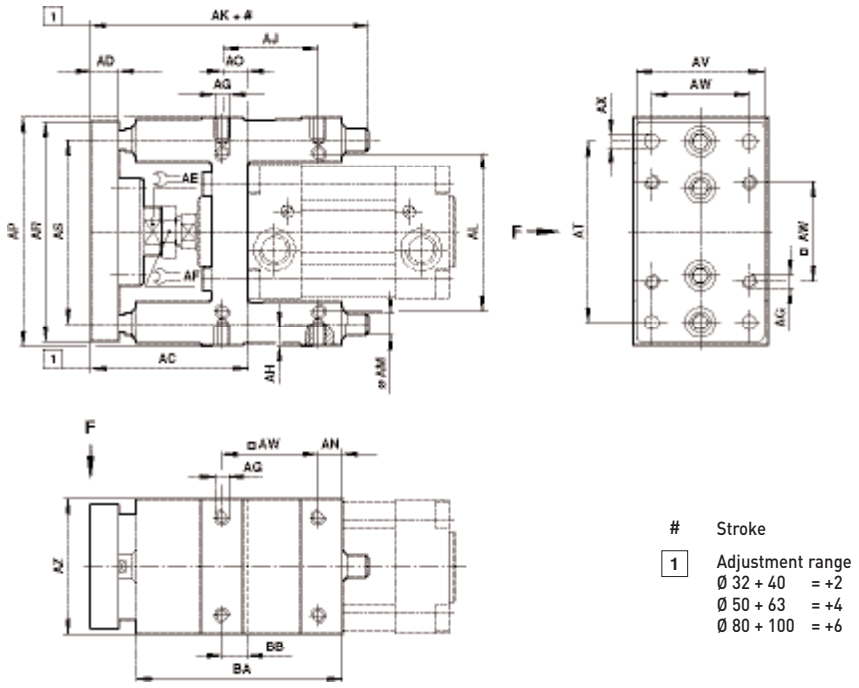
Cylinder Ø	A	B	Weight
32	9	7	0,010 kg
40	8	8	0,010 kg
50	7	5	0,010 kg
63	7	7	0,010 kg
80	7	4	0,010 kg
100	2	2	0,010 kg
125	- 4	- 3	0,010 kg
160	- 10	- 9	0,010 kg
200	- 17	- 14	0,010 kg



1 Bracket

2 Switch

QA/8000/51 – Guide blocks (plain bearings)



\# Stroke

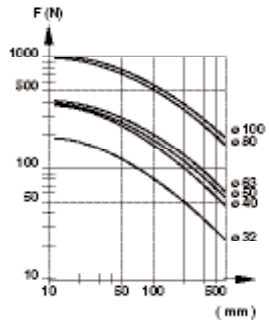
[1] Adjustment range
Ø 32 + 40 = +2
Ø 50 + 63 = +4
Ø 80 + 100 = +6

MODELS	Ø	AC	AD	AE ⊱	AF ⊱	AG	AH	AJ	AK	AL	Ø AM	AN	AO
QA/8032/51	32	69	12	15	17	M 6	10	32,5	110	58	10	6	9
QA/8040/51	40	74	12	15	19	M 6	10	38	122	64	12	6	11
QA/8050/51	50	91,5	15	22	24	M 8	12	46,5	135	80	12	6	19
QA/8063/51	63	92	15	22	24	M 8	12	56,5	153	95	12	7	15
QA/8080/51	80	106	15	27	30	M 10	15	50	180	130	16	9	14
QA/8100/51	100	111	15	27	30	M 10	17	70	199	150	16	9	19

MODELS	AP	AR	AS	AT	AV	□AW	Ø AX	AZ	BA	BB	kg at 0 mm	kg per 100 mm
QA/8032/51	100	90	74	78	45	32,5	6,6	48	76	9	1,00	0,06
QA/8040/51	106	100	80	84	50	38	6,6	56	85	11	1,20	0,09
QA/8050/51	125	120	96	100	60	46,5	9	66	99	19	1,80	0,09
QA/8063/51	132	125	104	105	70	56,5	9	76	114	15	2,20	0,09
QA/8080/51	165	155	130	130	90	72	11	98	134,5	25	4,10	0,16
QA/8100/51	185	175	150	150	110	89	11	118	153,5	28,5	5,80	0,16

Note: Supplied complete with mounting screws for cylinders

Maximum load

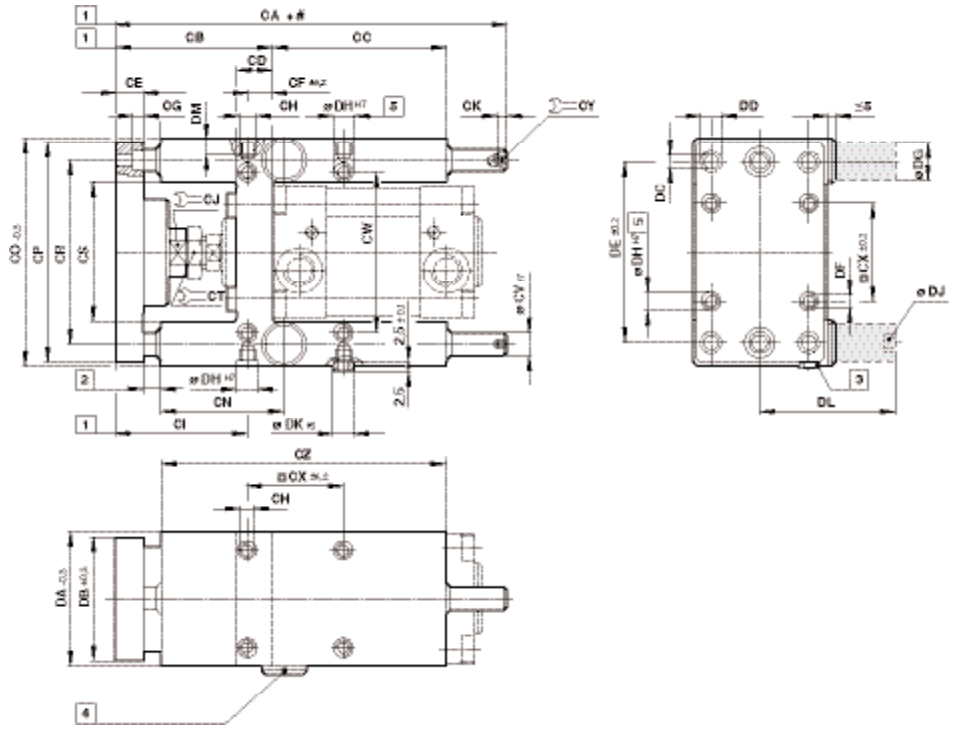


Outstroke (mm)

RA/8000/L2, RA/8000/L4 (ISO/VDMA/NFE) Cylinders with piston rod locking units

Double acting - Ø 32 ... 125 mm

QA/8000/61 – Guide blocks (roller bearings)



#	Stroke
1	Adjustment range Ø 32 + 40 = +5 Ø 50 ... 100 = +10
2	Safety zone 28 min
3	Centering sleeve
4	Blanking plug (remove when using locking catridge)
5	2,5 deep
6	Locking cartridge on request

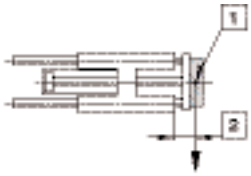
MODELS	Ø	CA	CB	CC	CD	CE	CF ±0,2	CG	CH	CI	CJ Σ=	CK	CN
QA/8032/61	32	177	100	65	28	12	15,3	6,5	M 6	84,5	13	5	61
QA/8040/61	40	192	111	69	33	12	23	6,5	M 6	88	15	6	67
QA/8050/61	50	237	128	65	40	15	33,8	9	M 8	94	22	6	75,5
QA/8063/61	63	237	128	97	40	15	29,3	9	M 8	98,5	22	6	80
QA/8080/61	80	280	151	112	50	20	37	11	M 10	114	27	7	92
QA/8100/61	100	280	156	112	55	20	40,5	11	M 10	115,5	27	7	93

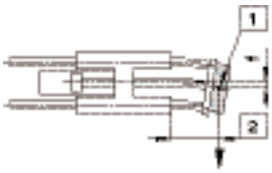
MODELS	CO -0,3	CP	CR	CS	CT Σ=	Ø CV f7	CW	□ CX ±0,2	CY Σ=	CZ	DA -0,3	DB ±0,3	DC
QA/8032/61	97	90	74	50,5	17	12	61	32,5	5	125	50	45	6,6
QA/8040/61	115	110	87	58,5	19	16	69	38	6	140	58	54	6,6
QA/8050/61	137	130	104	70,5	24	20	85	46,5	6	150	70	63	9
QA/8063/61	152	145	119	85,5	24	20	100	56,5	6	182	85	80	9
QA/8080/61	189	180	148	105,5	30	25	130	72	8	215	105	100	11
QA/8100/61	213	200	172	130,5	30	25	150	89	8	220	130	120	11

MODELS	Ø DD	DE ±0,2	DF	Ø DG	Ø DH H7	DJ	Ø DK f6	DL	DM	kg at 0 mm	kg per 100 mm
QA/8032/61	11	78	M 6	20	9	M 5	9	45	14	1,20	0,18
QA/8040/61	11	84	M 6	24	9	G 1/8	9	61,5	14	2,20	0,32
QA/8050/61	15	100	M 8	30	11	G 1/8	11	76,5	16	3,60	0,49
QA/8063/61	15	105	M 8	30	11	G 1/8	11	76,5	16	4,60	0,49
QA/8080/61	18	130	M 10	48	13	G 1/8	13	119	20	8,70	0,77
QA/8100/61	18	150	M 10	48	13	G 1/8	13	119	20	11,0	0,77

Note: Supplied complete with mounting screws for cylinders and two centering sleeves

Maximum load for QA/8000/61





1 Centre of gravity load capacity

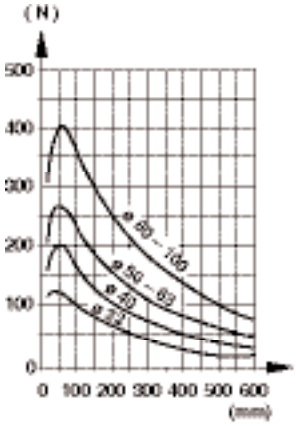
2 Outstroke

Maximum load capacity is dependent on the outstroke of a horizontally installed guide unit. In the case of short stroke operation, the load capacity figures taken from the diagram must be multiplied by the correction factor (diagram 2). In the curves of load capacity (diagram 1), the short stroke corrections have already been taken into account for an outstroke > 60 mm.

The total deflection of guide rods will be determined by the addition of that due to own weight (diagram 3) and that due to load capacity (diagram 4).

Max. load capacity depending on outroke (diagram 1)

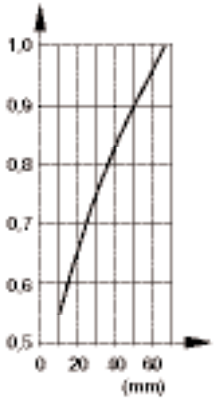
Load capacity



Outstroke

(diagram 2)

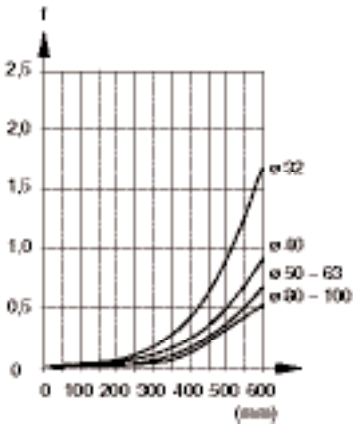
Correction factor



Stroke

Deflection caused by own weight (diagram 3)

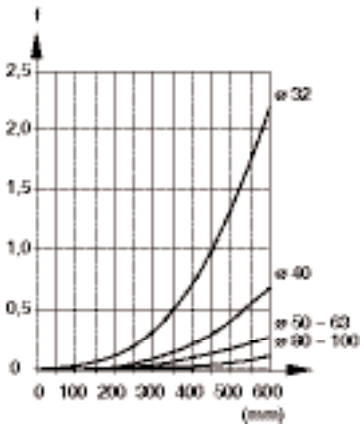
Deflection (mm)



Outstroke

Deflection caused by a load of 10 N (diagram 4)

Deflection (mm)



Outstroke

In the case of shock load applications, the figures given in the diagrams above must be reduced by factor of 2

M/146000, M/146100, M/146200 LINTRA®PLUS rodless cylinders

Double acting, magnetic and non-magnetic piston - Ø 16 ... 80 mm

New lightweight design extrusion with universal mounting grooves

Proven and patented sealing system

Dust protection as standard

Interchangeable with M/46000 series

MATERIALS

End covers: aluminium diecast, moulded plastic (Ø 16) and anodised aluminium (Ø 20 & 80)

Yoke: anodised aluminium, moulded plastic (Ø 16 & 20)

Carriage , closer & cover: aluminium diecast

Guiding bridge and profile barrel: anodised aluminium

Seal strip, wiper and piston seal: polyurethane

Cover strip: polyamide

Other seals: nitrile rubber

Mounting screws: A2E

Shim ring: stainless steel (A2)

TECHNICAL DATA

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

M/146000, M/146100, M/146200
Double acting, with adjustable cushioning

M/146000/M, M/146100/M, M/146200/M
Double acting with adjustable cushioning and magnetic piston

Operating pressure:

1 ... 8 bar

Operating temperature:

-30°C ... +80°C max.

Consult our Technical Service for use below +2°C

Max strokes:

Made to order
Ø 16 ... 40 mm 8500 mm
Ø 50 ... 63 mm 8000 mm
Ø 80 mm 5500 mm

STANDARD MODELS

	Cylinder Ø	Port size	MODELS Internal guide non-magnetic	External guide non-magnetic	Precision roller guide non-magnetic	ACCESSORIES Banjo Flow control (Tube diameter in bold)	Straight fitting	Elbow fitting
								
 Non-magnetic piston	16	M5	**M/146016/***	**M/146116/***	–	C0K51**06**05	C022**50**605	C024**70**605
	20	G1/8	**M/146020/***	**M/146120/***	–	C0K51**08**18	C022**50**818	C024**70**818
	25	G1/8	**M/146025/***	**M/146125/***	**M/146225/***	C0K51**08**18	C022**50**818	C024**70**818
	32	G1/4	**M/146032/***	**M/146132/***	**M/146232/***	C0K511028	C022**51**028	C024**71**028
	40	G1/4	**M/146040/***	**M/146140/***	**M/146240/***	C0K511028	C022**51**028	C024**71**028
	50	G3/8	**M/146050/***	**M/146150/***	**M/146250/***	C0K511238	C022**51**238	C024**71**238
	63	G1/2	**M/146063/***	**M/146163/***	**M/146263/***	C0K511248	C022**51**248	C024**71**248
	80	G1/2	**M/146080/***	**M/146180/***	–	C0K511248	C022**51**248	C024**71**248

* Insert stroke length in mm

Other fittings are available, please see section 7

	Cylinder Ø	Port size	MODELS Internal guide magnetic	External guide magnetic	Precision roller guide magnetic	ACCESSORIES Reed switch with integral 5m cable	Banjo Flow control (Tube diameter in bold)	Straight fitting	Elbow fitting
									
 magnetic piston	16	M5	**M/146016/M/***	**M/146116/M/***	–	M/50/LSU/5V	C0K51**06**05	C022**50**605	C024**70**605
	20	G1/8	**M/146020/M/***	**M/146120/M/***	–	M/50/LSU/5V	C0K51**08**18	C022**50**818	C024**70**818
	25	G1/4	**M/146025/M/***	**M/146125/M/***	**M/146225/M/***	M/50/LSU/5V	C0K51**08**18	C022**50**818	C024**70**818
	32	G1/4	**M/146032/M/***	**M/146132/M/***	**M/146232/M/***	M/50/LSU/5V	C0K51**06**28	C022**50**628	C024**70**628
	40	G1/4	**M/146040/M/***	**M/146140/M/***	**M/146240/M/***	M/50/LSU/5V	C0K51**06**28	C022**50**628	C024**70**628
	50	G3/8	**M/146050/M/***	**M/146150/M/***	**M/146250/M/***	M/50/LSU/5V	C0K51**08**38	C022**50**838	C024**70**838
	63	G1/2	**M/146063/M/***	**M/146163/M/***	**M/146263/M/***	M/50/LSU/5V	C0K511248	C022**51**248	C024**71**248
	80	G1/2	**M/146080/M/***	**M/146180/M/***	–	M/50/LSU/5V	C0K511248	C022**51**248	C024**71**248

* Insert stroke length in mm

For information on additional magnetic switches see page 290

Other fittings are available, please see section 7

For further information

www.norgren.com/info/en1-100

	Cylinder Ø	Port size	MODELS Added caged ball linear motion guide non-magnetic	Added caged ball linear motion guide magnetic	ACCESSORIES Reed switch with integral 5m cable	Banjo flow control Tube diameter in bold	Straight fitting	Elbow fitting
Non magnetic piston								
Magnetic piston	25	G1/8	**M/146225/P/***	**M/146225/PM/***	M/50/LSU/5V	C0K51**08**18	C022**50818**	C024**70818**
	32	G1/4	**M/146232/P/***	**M/146232/PM/***	M/50/LSU/5V	C0K51**06**28	C022**50628**	C024**70628**
	40	G1/4	**M/146240/P/***	**M/146240/PM/***	M/50/LSU/5V	C0K51**06**28	C022**50628**	C024**70628**
	50	G3/8	**M/146250/P/***	**M/146250/PM/***	M/50/LSU/5V	C0K51**08**38	C022**50838**	C024**70838**
	63	G1/2	**M/146263/P/***	**M/146263/PM/***	M/50/LSU/5V	C0K51**12**48	C022**51248**	C024**71248**

* Insert stroke length in mm

For information on additional magnetic switches see page 288
Other fittings are available, please see section 7

	Cylinder Ø	Port size	MODELS Active holding brake non-magnetic	Active holding brake magnetic	ACCESSORIES Reed switch with integral 5m cable	Banjo flow control Tube diameter in bold	Straight fitting	Elbow fitting
Non magnetic piston								
Magnetic piston	25	G1/8	**M/146025/L1/***	**M/146125/L3/***	M/50/LSU/5V	C0K51**08**18	C022**50818**	C024**70818**
	32	G1/4	**M/146032/L1/***	**M/146132/L3/***	M/50/LSU/5V	C0K51**06**28	C022**50628**	C024**70628**
	40	G1/4	**M/146040/L1/***	**M/146140/L3/***	M/50/LSU/5V	C0K51**06**28	C022**50628**	C024**70628**
	50	G3/8	**M/146050/L1/***	**M/146150/L3/***	M/50/LSU/5V	C0K51**08**38	C022**50838**	C024**70838**
	63	G1/2	**M/146063/L1/***	**M/146163/L3/***	M/50/LSU/5V	C0K51**12**48	C022**51248**	C024**71248**

* Insert stroke length in mm

For information on additional magnetic switches see page 288
Other fittings are available, please see section 7

	Cylinder Ø	Port size	MODELS Passive holding brake Non-magnetic	Passive holding brake Magnetic	ACCESSORIES Reed switch with integral 5m cable	Banjo flow control Tube diameter in bold	Straight fitting	Elbow fitting
Non magnetic piston								
Magnetic piston	25	G1/8	**M/146025/L2/***	**M/146125/L4/***	M/50/LSU/5V	C0K51**08**18	C022**50818**	C024**70818**
	32	G1/4	**M/146032/L2/***	**M/146132/L4/***	M/50/LSU/5V	C0K51**06**28	C022**50628**	C024**70628**
	40	G1/4	**M/146040/L2/***	**M/146140/L4/***	M/50/LSU/5V	C0K51**06**28	C022**50628**	C024**70628**
	50	G3/8	**M/146050/L2/***	**M/146150/L4/***	M/50/LSU/5V	C0K51**08**38	C022**50838**	C024**70838**
	63	G1/2	**M/146063/L2/***	**M/146163/L4/***	M/50/LSU/5V	C0K51**12**48	C022**51248**	C024**71248**

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

	Cylinder Ø	Port size	MODELS Linear position sensor internal guide Magnetic	Linear position sensor external guide Magnetic	Linear position sensor precision roller guide Magnetic	ACCESSORIES Banjo flow control Tube diameter in bold	Straight fitting	Elbow fitting
Magnetic piston								
	32	G1/8	**M/146032/F1/***	**M/146132/F1/***	**M/146232/F1/***	C0K51**06**28	C022**50628**	C024**70628**
	40	G1/4	**M/146040/F1/***	**M/146140/F1/***	**M/146232/F1/***	C0K51**06**28	C022**50628**	C024**70628**
	50	G3/8	**M/146050/F1/***	**M/146150/F1/***	**M/146250/F1/***	C0K51**08**38	C022**50838**	C024**70838**
	63	G1/2	**M/146063/F1/***	**M/146163/F1/***	**M/146263/F1/***	C0K51**12**48	C022**51248**	C024**71248**

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

M/146000, M/146100, M/146200 LINTRA®PLUS rodless cylinders locking units

Double acting, magnetic and non-magnetic piston - Ø 16 ... 80 mm

SERVICE KIT

Guiding systems	Ø 16 mm	Ø 20 mm	Ø 25 mm	Ø 32 mm	Ø 40 mm	Ø 50 mm	Ø 63 mm	Ø 80 mm	Service kit
Internal	M/146016, .../M	M/146020, .../M	M/146025, .../M	M/146032, .../M	M/146040, .../M	M/146050, .../M	M/146063, .../M	M/146080, .../M	QM/1460**/88/*
	-	-	-	M/146032/F1	M/146040/F1	M/146050/F1	M/146063/F1	-	
	-	-	M/146025/L1, .../L2	M/146032/L1, .../L2	M/146040/L1, .../L2	M/146050/L1, .../L2	M/146063/L1, .../L2	-	
External	M/146116, .../M	M/146120, .../M	M/146125, .../M	M/146132, .../M	M/146140, .../M	M/146150, .../M	M/146163, .../M	M/146180, .../M	QM/1461**/88/*
	-	-	-	M/146132/F1	M/146140/F1	M/146150/F1	M/146163/F1	-	
	-	-	M/146125/L3, .../L4	M/146132/L3, .../L4	M/146140/L3, .../L4	M/146150/L3, .../L4	M/146163/L3, .../L4	-	
Roller ball	-	-	M/146225/M	M/146232/M	M/146240/M	M/146250/M	M/146263/M	-	QM/1460**/88/*
	-	-	-	M/146232/F1	M/146240/F1	M/146250/F1	M/146263/F1	-	
	-	-	M/146225/P, .../PM	M/146232/P, .../PM	M/146240/P, .../PM	M/146250/P, .../PM	M/146263/P, .../PM	-	

* Insert stroke length in mm

** Insert cylinder diameters for the service kit.

OPTIONS SELECTOR

M/146★★★/★★/★★★★

Guiding system	Substitute
Internal	0
External	1
Roller	2

Cylinder Ø (mm)	Substitute
16	16
20	20
25	25
32	32
40	40
50	50
63	63
80	80

Note: Disregard option positions not used.
For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants.
Additional variants/options are not possible.

Strokes (mm)
On request

Variants (non-magnetic piston)	Substitute
Alternative ports	IC
Active brake	L1
Passive brake	L2
With added caged ball linear motion guide	P
Double carriages *1)	ID

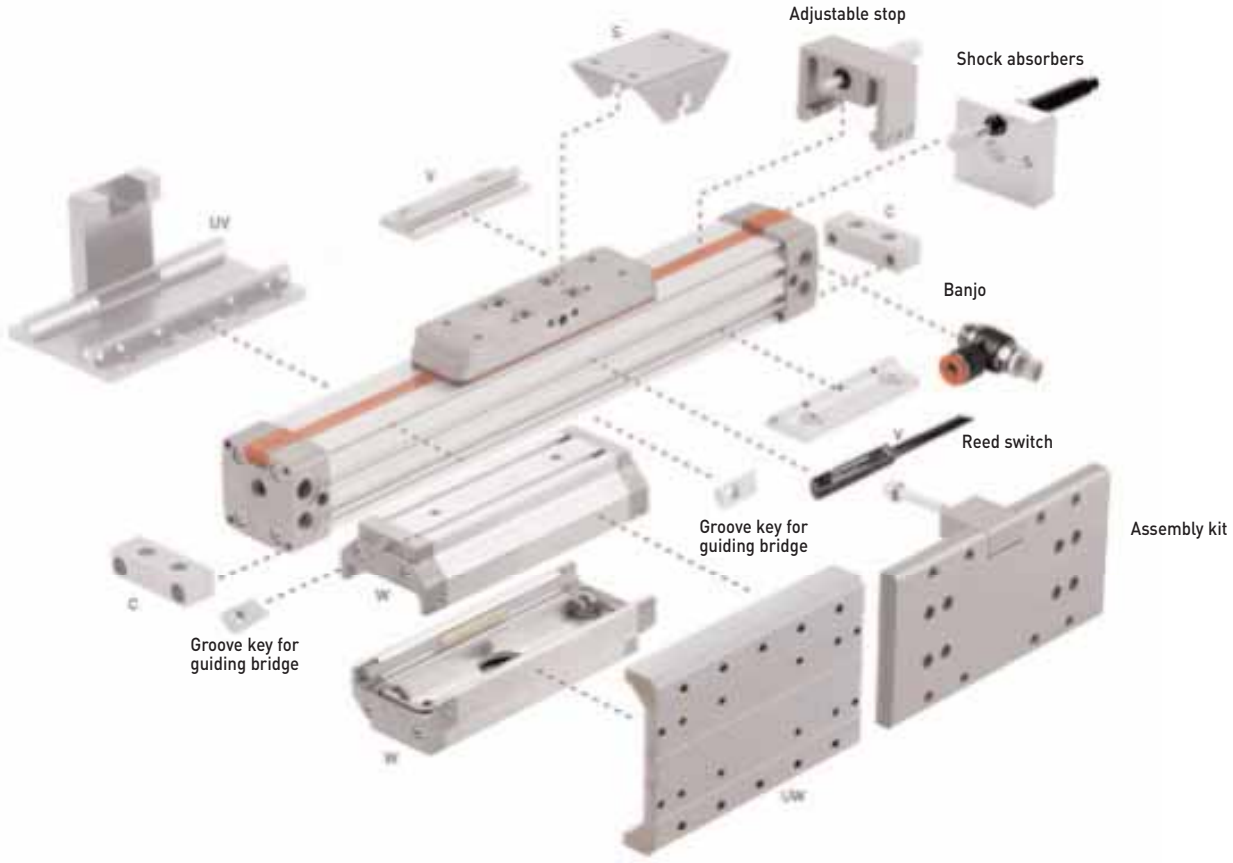
M/146***/ID/****/**** → Distance between carriage centres (mm)

Variants (magnetic piston)	Substitute
Alternative ports	MC
Active brake	L3
Passive brake	L4
With added caged ball linear motion guide	PM
With linear position sensor	F1
Double carriages *1)	MD

M/146***/MD/****/**** → Distance between carriage centres (mm)

*1) For M/146100 & M/146200 only

MOUNTINGS



Ø	C	S*	UV*	UW**	V	W**
16	QM/146016/21	QM/146016/37	QM/146016/34	-	QM/146016/32	QM/146116/35
20	QM/146020/21	QM/146020/37	QM/146020/34	QM/146120/36	QM/146020/32	QM/146120/35
25	QM/146025/21	QM/146025/37	QM/146025/34	QM/146125/36	QM/146025/32	QM/146125/35
32	QM/146032/21	QM/146032/37	QM/146032/34	QM/146132/36	QM/146032/32	QM/146132/35
40	QM/146040/21	QM/146032/37	QM/146040/34	QM/146140/36	QM/146040/32	QM/146140/35
50	QM/146050/21	QM/146050/37	QM/146050/34	QM/146150/36	QM/146050/32	QM/146150/35
63	QM/146063/21	QM/146050/37	QM/146063/34	QM/146163/36	QM/146063/32	QM/146163/35
80	QM/146080/21	QM/146080/37	QM/146080/34	-	QM/146080/32	QM/146180/35

Ø	Assembly kit for caged ball linear motion guide	Adjustable stop	Assembly kit for shockabsorbers	Groove key for guiding bridge	Groove key for profile barrel
16	-	-	-	-	-
20	-	QM/146120/75	-	-	-
25	QM/146225/P/70	QM/146125/75	QM/146125/67	M/P74065	M/P74065
32	QM/146232/P/70	QM/146132/75	QM/146132/67	M/P74065	M/P74065
40	QM/146240/P/70	QM/146140/75	QM/146140/67	M/P74066	M/P74065
50	QM/146250/P/70	-	QM/146150/67	M/P41858	M/P74065
63	QM/146263/P/70	-	QM/146163/67	M/P41858	M/P74065

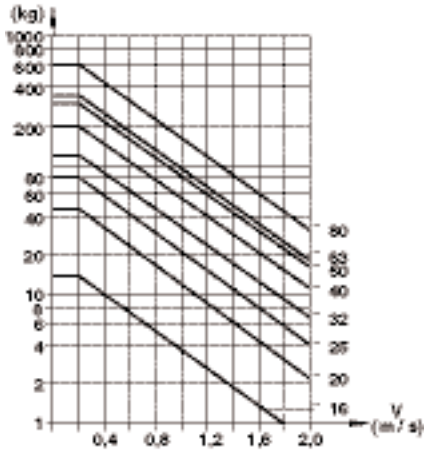
* Suitable for internally guided models only, ** Suitable for external guided models only

M/146000, M/146100, M/146200 LINTRA®PLUS rodless cylinders locking units

Double acting, magnetic and non-magnetic piston - Ø 16 ... 80 mm

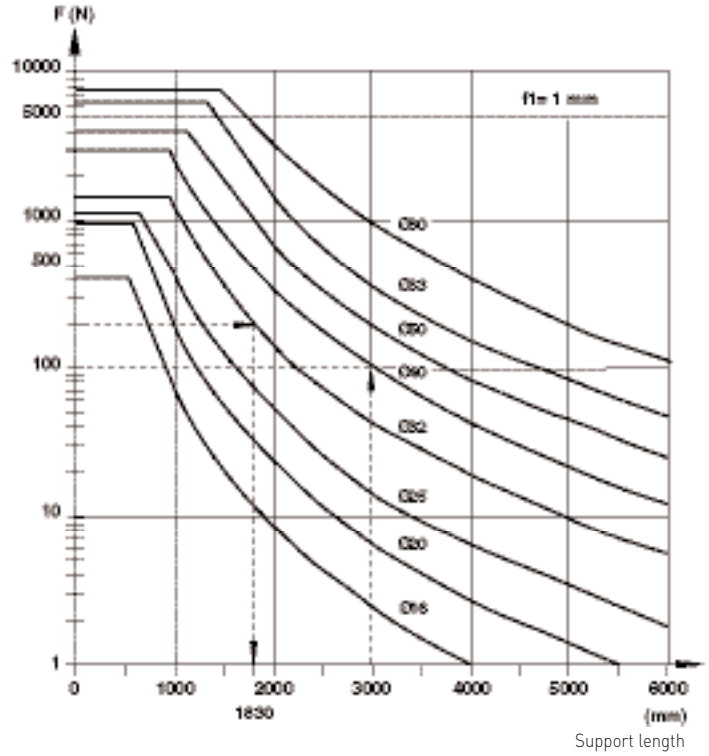
CUSHIONING PERFORMANCE

The dynamic energy of a LINTRA® cylinder is caused by direct or partial external loads which must be absorbed by pneumatic cushioning.
The cushioning ability depends to a large extent on the pneumatic circuit (e. g. counter pressure, pre-exhaust). The values given in the diagram were tested with an operation pressure of 6 bar using a 5/2 control valve. When installed horizontally, depending upon the speed, dynamic energy can be absorbed by the cylinder. Whenever the values given in the diagram are exceeded, the transported mass must be cushioned by additional shock absorbers. These have to be located at the center of gravity of the mass.



CYLINDER DEFLECTION

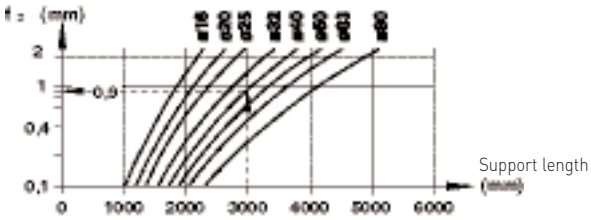
Deflection due to external forces



Support length

Example:
Cylinder Ø 32 mm, stroke length 3500 mm, external load 200 N and a deflection about 1 mm
Maximum distance between supports = 1830 mm (see diagrams).
Therefore an additional support is required.

Deflection due to cylinder weight



Example:
Cylinder Ø 40 mm, external force 180 N,
distance between supports 3000 mm
Required: total deflection

1. Deflection due to external force (f1) see Diagram 1 (1mm/100 N) · 180 N	1,8 mm
2. Deflection due to cylinder weight diagram 2	+ 0,9 mm
Total deflection:	2,7 mm

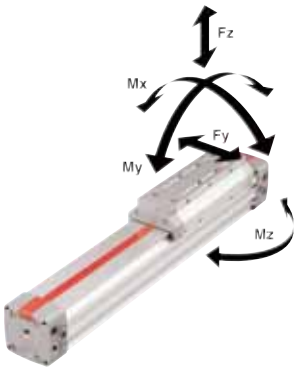
Max. permitted deflection (f1 + f2) < 1 mm / 1000 mm Stroke

A deflection of more than 3 mm is not permitted.

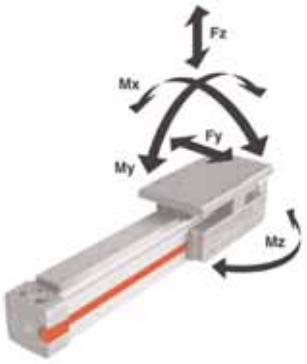
THEORETICAL FORCES, AIR CONSUMPTION, CUSHIONING LENGTH, HOLDING FORCES

Ø mm	Theoretical forces (N) at 6 bar	Air consumption (l/cm) of stroke at 6 bar	Cushioning length (mm)	Holding forces (N) of brake (on dry braking surface) active (L1 + L3) at 6 bar	passive (L2 + L4)
16	120	0,014	12	–	–
20	188	0,022	26	–	–
25	294	0,035	26	500	220
32	482	0,056	35	900	375
40	754	0,088	50	1500	630
50	1178	0,137	60	2500	1000
63	1870	0,218	70	4000	1650
80	3016	0,350	75	–	–

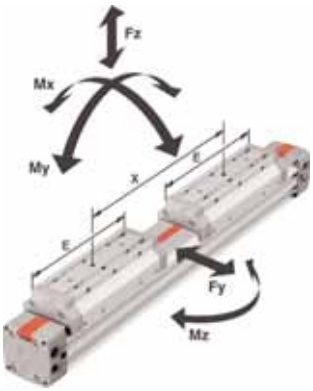
M/146000, M/146100, M/146200



M/146200/P



M/146100/ID, M/146200/ID



	Internal guide M/146000					External adjustable guide M/146100			Precision roller guide M/146200				Added caged ball linear motion guide M/146200/P		
Ø mm	Fy (N)	Fz (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Fy, Fz (N)	Mx (Nm)	My, Mz (Nm)	Fy (N)	Fz (N)	Mx (Nm)	My, Mz (Nm)	Fy, Fz (N)	Mx (Nm)	My,Mz (Nm)
16	40	120	0,3	3,8	1,1	200	2	5,5	–	–	–	–	–	–	–
20	90	280	0,9	12	3,6	470	6	18	–	–	–	–	–	–	–
25	125	385	1,5	19	5,6	590	9	28	590	1180	13	42	2000	15	100
32	165	500	3	33	10	780	17	43	780	1560	25	64	4000	64	250
40	330	990	6,5	84	24	1600	39	110	1500	3000	58	160	4000	64	400
50	440	1320	11	120	35	2000	65	160	2000	4000	97	240	8000	180	800
63	690	2000	20	240	70	3200	120	350	3200	6400	180	520	8000	180	1000
80	780	2300	27	360	100	3900	180	520	–	–	–	–	–	–	–

Loading values applicable to a speed of ⩽ 0,2 m/s. Maximum working life is normally reached below a speed of 1 m/s.
* The forces and moments refers to the centre of the guide. They must not be exceeded in dynamic applications.

M/146100/ID, M/146100/MD

	External adjustable guide, M/146100/ID and M/146100/MD											
Ø mm	Fy, Fz (N)	Mx (Nm)	My, Mz (Nm) x min.=E	x=100 mm	x=150 mm	x=200 mm	x=250 mm	x=300 mm	x=350 mm	x=400 mm	x=450 mm	x=500 mm
16	400	4	14	17	23	29	35	41	48	54	60	66
20	940	12	64	–	80	99	119	139	158	178	197	217
25	1180	18	96	–	106	131	155	180	205	230	255	279
32	1560	34	155	–	–	181	213	246	278	310	343	375
40	3000	78	393	–	–	–	435	496	557	618	679	740
50	4000	130	457	–	–	–	457	518	579	639	700	761
63	6400	240	1280	–	–	–	–	–	1360	1500	1630	1770
80	7800	360	1910	–	–	–	–	–	–	1940	2110	2270
	Precision roller guide M/146200/ID and M/146200/MD											
Ø mm	Fy, Fz (N)	Mx (Nm)	My, Mz (Nm) x min.=E	x=100 mm	x=150 mm	x=200 mm	x=250 mm	x=300 mm	x=350 mm	x=400 mm	x=450 mm	x=500 mm
25	1180	26	125	–	138	170	202	234	267	299	332	363
32	1560	50	202	–	–	235	277	320	361	403	446	488
40	3000	116	511	–	–	–	566	645	724	803	883	962
50	4000	194	594	–	–	–	594	673	753	831	910	989
63	6400	360	1664	–	–	–	–	–	1768	1850	2119	230

Loading values applicable to a speed of ⩽ 0,2 m/s. Maximum working life is normally reached below a speed of 1 m/s.
* The forces and moments refers to the centre of the guide. They must not be exceeded in dynamic applications.

LOADING VALUES FOR LINTRA® CYLINDERS WITH DOUBLE CARRIAGES

The values given in the table below show the single forces in the directions Fy and Fz and the maximum moments Mx, My and Mz.
All values are applicable only for speeds of max. 0,2 m/s.
A requirement for using these values is a smooth constant movement of the mass over the whole stroke length of the cylinder.
The reference point from which the moments for all cylinders should be calculated is the centre line of the pistons.

For speeds up to 2 m/s please use our calculation programme LINTRA® PNEUCALC. It is available upon request.
When a LINTRA® cylinder has to take several loads and moments, an additional calculation is necessary using this formula:

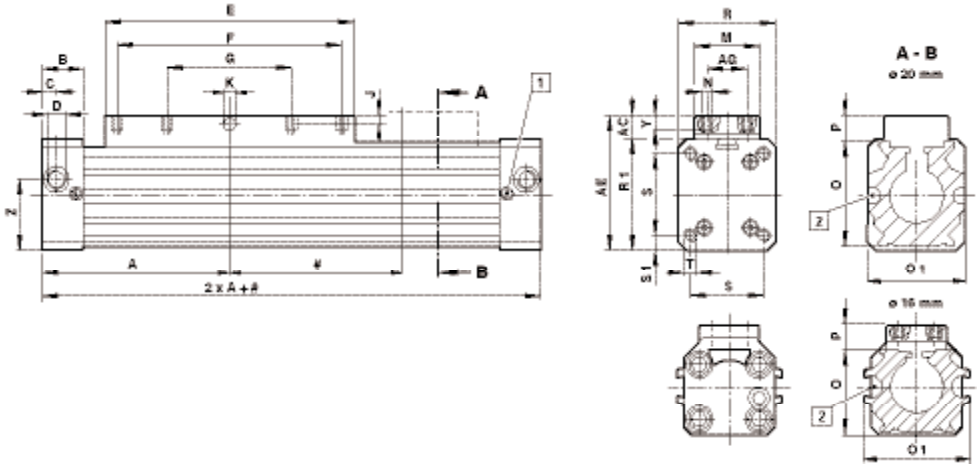
$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz}{Fz\ max} \leq 1$$

M/146000, M/146100, M/146200 LINTRA®PLUS rodless cylinders locking units

Double acting, magnetic and non-magnetic piston - Ø 16 ... 80 mm

BASIC DIMENSIONS

M/146000 – cylinder with internal guide, cylinder Ø 16 and 20 mm



\# Stroke

1 Cushion screw

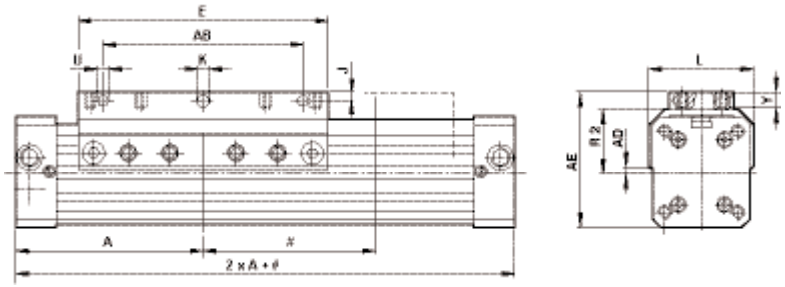
2 M/50 – switches and groove key can be mounted flush with the profile

MODELS	Ø	A	AC	AE	AG	B	C	D	E	F	G	J	Ø K D7
M/146016/...	16	62,5	24,5	38	8	17,5	8	M5	80	60	–	7	3
M/146020/...	20	85	34,5	54	18	23	8	G1/8	110	80	40	7	4,2

MODELS	Ø	M	N	O	O 1	P	R	R 1	S	S 1	T	Y	Z	Weight at 0 mm	Weight per 100 mm
M/146016/...	16	18	M3	25	32	12	27	31	16	5,5	M3-5*	4	16,5	0,16 kg	0,10 kg
M/146020/...	20	27	M5	32	38	18,5	40	40	32	4	M5-12*	12	20,5	0,50 kg	0,15 kg

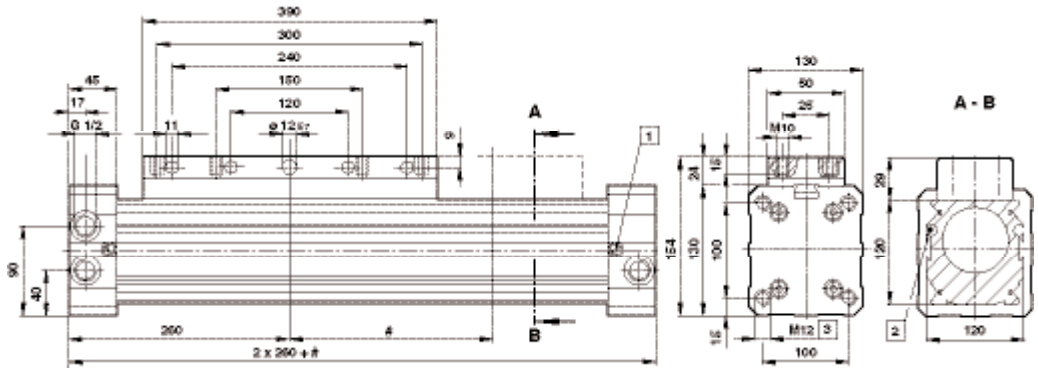
* Deep

M/146100 – cylinder with external adjustable guide (Ø 16 & 20 mm)



MODELS	Ø	A	AB	AE	AD	E	J	Ø K	L	R 2	U	Y	Weight at 0 mm	Weight per 100 mm
M/146116/...	16	62,5	–	38	7,5	80	–	–	31	18,5	–	5	0,18 kg	0,10 kg
M/146120/...	20	85	60	59	6,5	110	7,5	5,5	42	24	5,5	12	0,60 kg	0,15 kg

M/146080 – cylinder with internal guide (Ø 80 mm)



MODELS	Ø	Weight at 0 mm	Weight per 100 mm
M/146080/	80	13,20 kg	1,50 kg

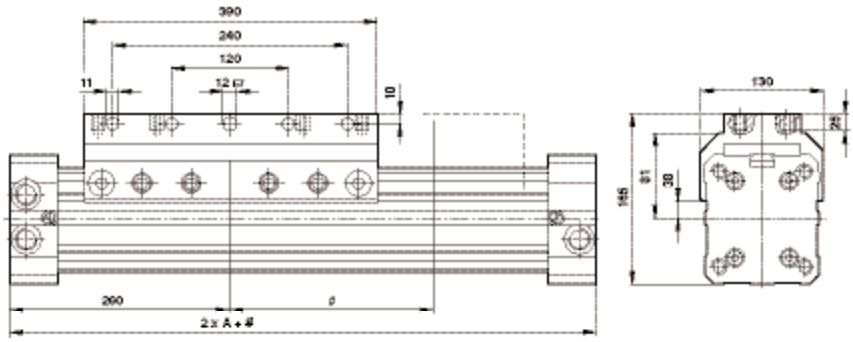
\# Stroke

1 Cushion screw

2 M/50 – switches and groove key can be mounted flush with the profile

3 26 deep

M/146180 – cylinder with external adjustable guide (Ø 80 mm)



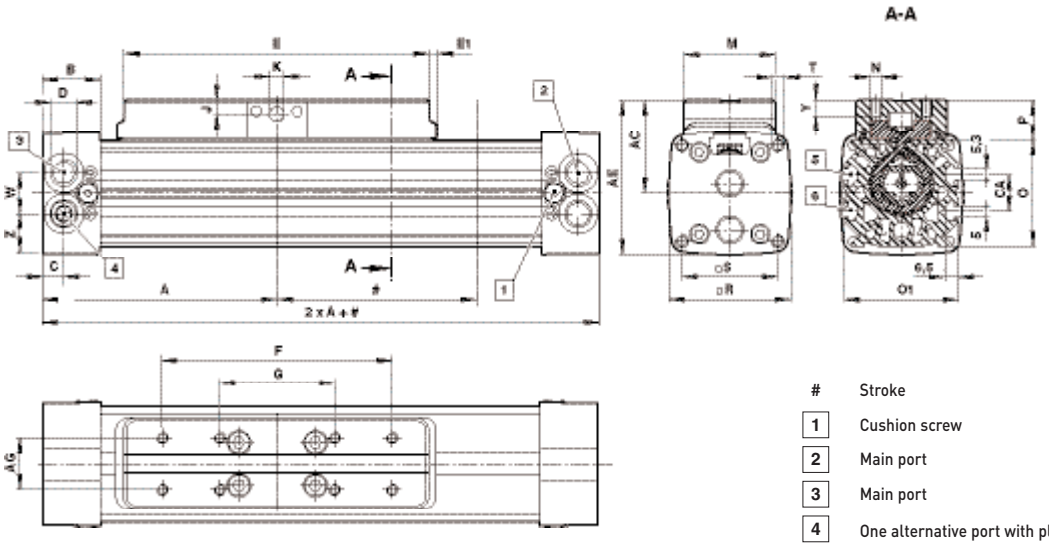
MODELS	Ø	Weight at 0 mm	Weight per 100 mm
M/146180/	80	13,40 kg	1,50 kg

\# Stroke

M/146000, M/146100, M/146200 LINTRA®PLUS rodless cylinders locking units

Double acting, magnetic and non-magnetic piston - Ø 16 ... 80 mm

M/146000 – cylinder with internal guide (ø 25 ... 63 mm)



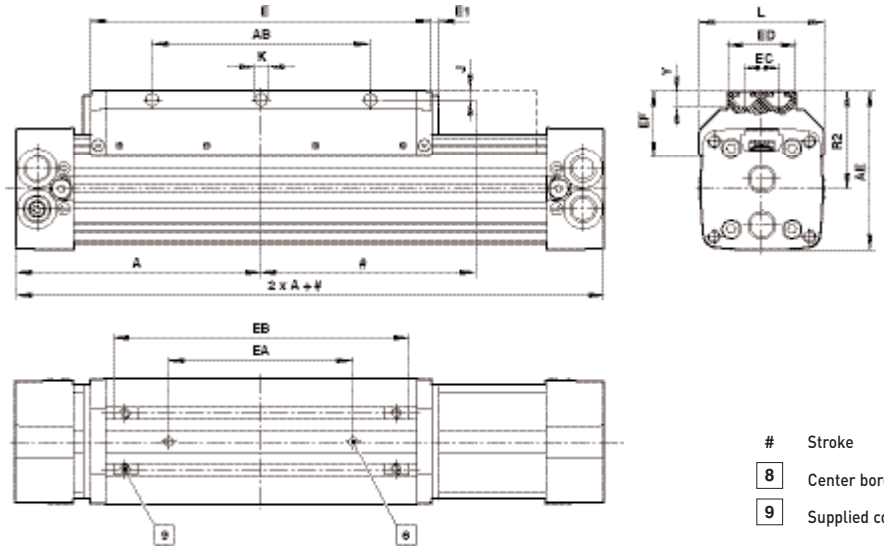
#	Stroke
1	Cushion screw
2	Main port
3	Main port
4	One alternative port with plug inserted
5	M/50 – switches and groove key can be mounted flush with the profile
6	For groove key only

MODELS	Ø	A	AC	AE	AG	B	C	CA	D	E	E1	F	G	J	Ø K^{D7}
M/146025/...	25	100	36	56	60	23	8,5	–	G1/8	130	–	90	45	4,7	5
M/146032/...	32	120	46	76	25	28,5	10,5	18	G1/4	160	3,5	120	60	7	7
M/146040/...	40	150	52,5	90	25	28,5	11,5	18	G1/4	215	–	160	80	7	7
M/146050/...	50	180	65,5	110	25	38	15	24	G3/8	250	–	190	95	9,5	9
M/146063/...	63	215	82,5	125	25	38	17	–	G1/2	320	–	240	120	9,5	9

MODELS	Ø	M	N	O	O 1	P	R	S	T	W	Y	Z	Weight at 0 mm	Weight per 100 mm
M/146025/...	25	32	M5	40	46	16	48	37	M5-13*	16	7	16	0,7 kg	0,25 kg
M/146032/...	32	45	M5	52	56	20	60	47	M6-17*	20	8	20	1,40 kg	0,30 kg
M/146040/...	40	45	M6	65	68	20	74,5	58	M8-20*	25	8	25	2,50 kg	0,42 kg
M/146050/...	50	50	M8	80	84	25,5	89	70	M8-20*	30	11	29,5	4,40 kg	0,62 kg
M/146063/...	63	50	M8	95	97	25	105	84	M10-24*	35	11	35	6,90 kg	0,9 kg

* Deep

M/146100 – cylinder with external adjustable guide (Ø 25 ... 63 mm)

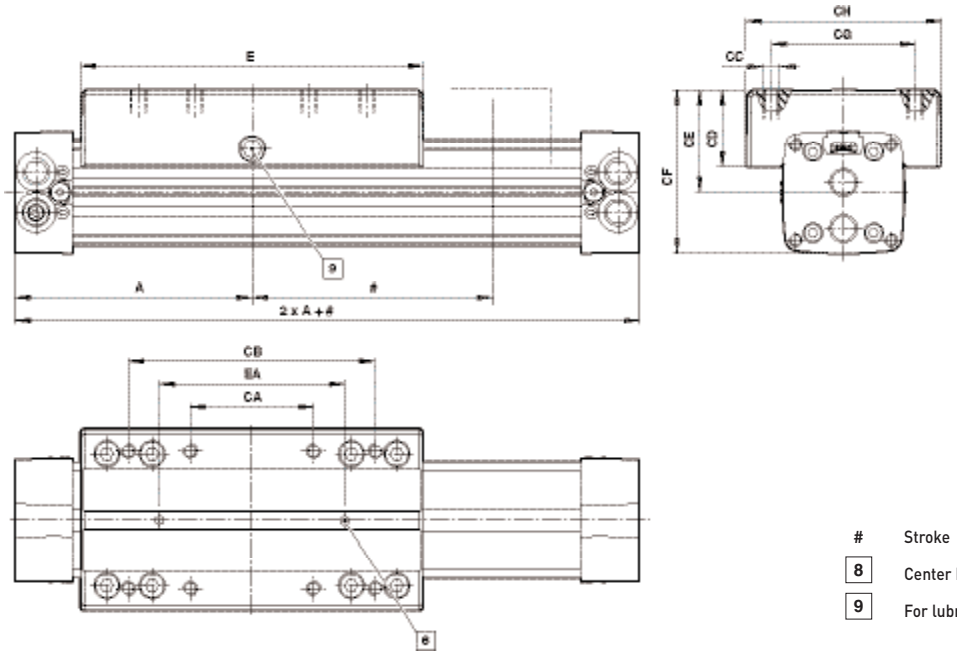


#	Stroke
8	Center bore Ø 6 H7, 4 deep
9	Supplied complete with four groove keys

MODELS	Ø	A	AB	AE	E	E1	EA ±0,05	EB	ED	EC	EF	J	Ø K	L	R 2	Y	Weight at 0 mm	Weight per 100 mm
M/146125/..	25	100	70	67,5	130	-	50	102	32	20	34	5	5,5	52		-9,5	0,75kg	0,20 kg
M/146132/..	32	120	90	82	160	4	70	138	45	25	36,5	5	5,5	64	52	6,5	1,50 kg	0,30 kg
M/146140/..	40	150	120	97,5	215	–	105	193	45	25	43	5	6,6	79	60	9,5	2,60 kg	0,42 kg
M/146150/..	50	180	160	116,5	250	–	135	228	50	25	47,5	6,5	9	92	72	11,5	4,50 kg	0,62 kg
M/146163/..	63	215	190	137	320	-	150	292	50	25	59	7,5	9	110	84,5	16,5	7,20kg	0,90 kg

Missing cylinder dimensions, see previous page 108

M/146200 – cylinder with precision roller guide (Ø 25 ... 63 mm)



#	Stroke
8	Center bore Ø 6 H7, 4 deep
9	For lubrication

MODELS	Ø	A	CA	CB	CC	CD	CE	CF	CG	CH	E	EA ±0,05	Weight at 0 mm	Weight per 100 mm
M/146225/...	25	100	45	90	M6-14*	36	42	66	60	85	150	70	1,50 kg	0,20 kg
M/146232/...	32	120	60	120	M8-16*	38	50	80	75	98	180	90	2,80 kg	0,40 kg
M/146240/...	40	150	80	150	M8-16*	42	57,5	95	92	118	215	115	4,50 kg	0,45 kg
M/146250/...	50	180	90	180	M10-20*	44	67	111,5	100	132	250	135	8,20 kg	0,90 kg
M/146263/...	63	215	120	240	M10-20*	47	74,5	127	110	140	320	200	12,50 kg	1,00 kg

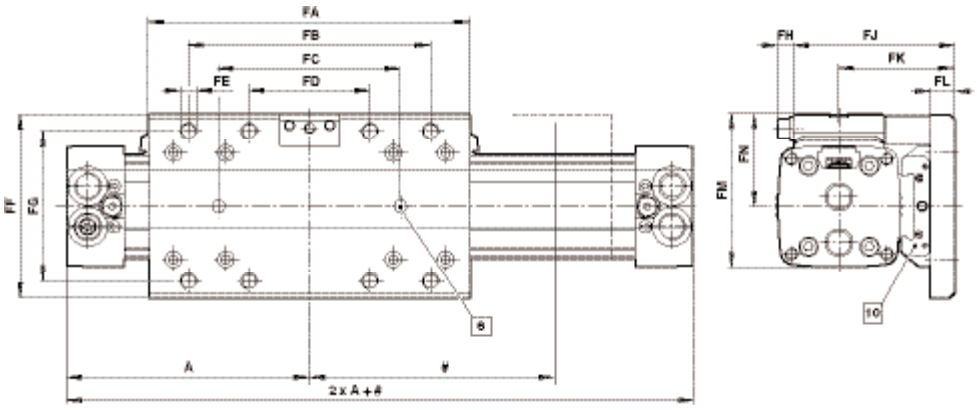
* Deep

Missing cylinder dimensions, see previous page 108

M/146000, M/146100, M/146200 LINTRA®PLUS rodless cylinders locking units

Double acting, magnetic and non-magnetic piston - Ø 16 ... 80 mm

M/146200/P, M/146200/PM – cylinder with added caged ball linear motion guide (Ø 25 ... 63 mm)



8 Center bore Ø 6 H7, 4 deep

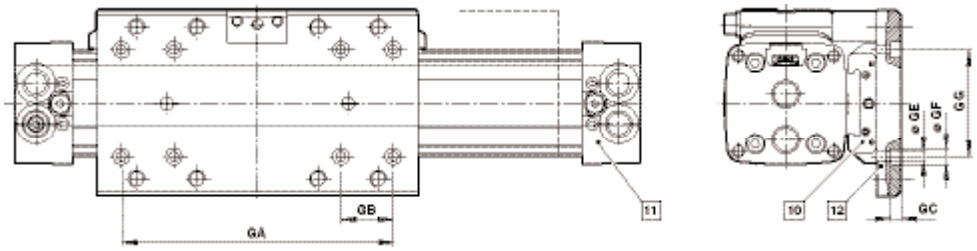
10 Recommended supplier/series for caged ball linear motion guide
Cylinder Ø 25
THK/SHW12CAM
Cylinder Ø 32 and 40
IKO/LWFF33
NSK/LW17ELZ
THK/SHW17CAM
Cylinder Ø 50 & 63
IKO/LWFF42
NSK/LW27ELZ
THK/SHW27CA

MODELS	Ø	A	FA	FB	FC ±0,05	FD	FE	FF	FG	FH	FJ	FK	FL	FM	FN	Weight at 0 mm	Weight per 100 mm
M/146225/P/..	25	100	130	90	70	45	M6	72	60	7	61	45	10	60	36	1,90 kg	0,40 kg
M/146232/P/..	32	120	160	120	90	60	M8	92	75	7,5	79,5	57	12	76	46	2,90 kg	0,50 kg
M/146240/P/..	40	150	215	150	115	80	M8	105	92	7,5	85,5	63	12	89,5	52,5	4,70 kg	0,65 kg
M/146250/P/..	50	180	250	180	135	90	M10	131	100	9,5	109	84	15	110	65,5	8,50 kg	1,10 kg
M/146263/P/..	63	215	320	240	100	120	M10	140	110	9,5	115,5	90,5	15	125	75	11,0 kg	1,40 kg

Missing cylinder dimensions, see on page 108

Note: stroke max. Ø 25 = 900, Ø 32 & 40 = 1500, Ø 50 & 63 = 2600

QM/146200/P/70 – assembly kit for caged ball linear motion guide (Ø 25 ... 63 mm)



11 Standard cylinder M/146000

12 Assembly kit for caged ball linear motion guide

Stroke

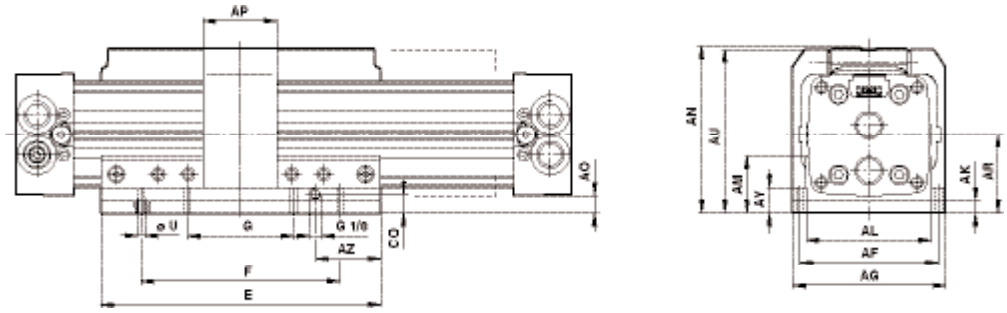
8 Center bore Ø 6 H7, 4 deep

10 Recommended supplier/series for caged ball linear motion guide
Cylinder Ø 25
THK/SHW12CAM
Cylinder Ø 32 and 40
IKO/LWFF33
NSK/LW17ELZ
THK/SHW17CAM
Cylinder Ø 50 & 63
IKO/LWFF42
NSK/LW27ELZ
THK/SHW27CA

MODELS	Ø	GA	GB	GC	Ø GE	Ø GF	GG	Weight kg
QM/146225/P/70	25	111	18	5	3,4	6,5	35	0,28
QM/146232/P/70	32	135	26	4,5	4,5	8	53	0,47
QM/146240/P/70	40	177	26	4,5	4,5	8	53	0,47
QM/146250/P/70	50	215	40	6,5	6,6	11	70	1,32
QM/146263/P/70	63	285	40	6,5	6,6	11	70	1,80

Missing cylinder dimensions, see on page 108

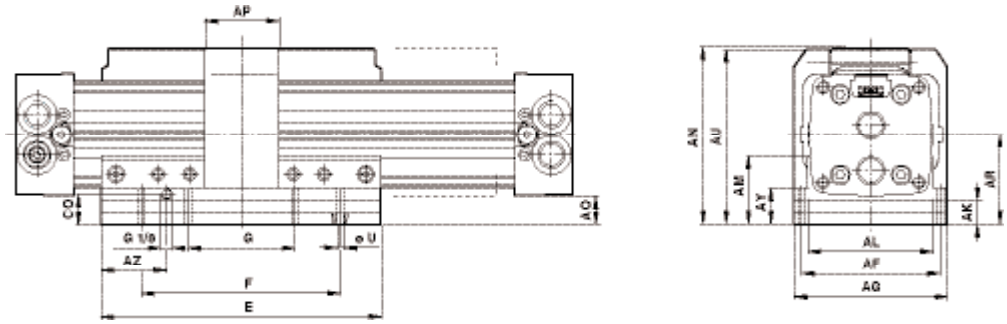
M/146000/L1, M/146000/L3 – cylinder with active brake (Ø 25 ... 63 mm)



MODELS	Ø	AF	AG	AK	AL	AM	AN	AO	AP	AR	AU	AY	AZ	CO	E	F	G	Ø U	Weight at 0 mm	Weight per 100 mm
M/146025/L.	25	62	75	12	52	28,5	73,5	13,5	45	37,5	73	16,5	30	6	130	90	45	6,6	1,60 kg	0,2 kg
M/146032/L.	32	78	92	12	64	29	90	14	55	44	89,5	17,5	32,5	6	160	120	60	9	2,50 kg	0,35 kg
M/146040/L.	40	94	112	12	81	34,5	103,5	13,5	65	51	103	18	52,5	6	215	160	80	9	4,20 kg	0,50 kg
M/146050/L.	50	112	132	12	94	35,5	124,5	14,5	75	59,5	124	18,5	65	6	250	190	95	11	6,90 kg	0,75 kg
M/146063/L.	63	113	150	12	112	42,5	140,5	15,5	90	68	140	20,5	115	6	320	240	120	13	11,5 kg	1,0 kg

Missing cylinder dimensions, see on page 108

M/146000/L2, M/146000/L4 – cylinder with passive brake (Ø 25 ... 63 mm)



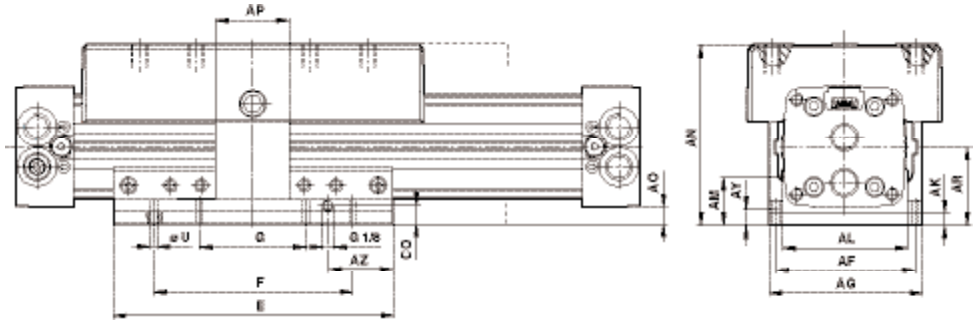
MODELS	Ø	AF	AG	AK	AL	AM	AN	AO	AP	AR	AU	AY	AZ	CO	E	F	G	Ø U	Weight at 0 mm	Weight per 100 mm
M/146025/L	25	62	75	22	52	38,5	83,5	23,5	45	47,5	83	26,5	30	16	130	90	45	6,6	1,90 kg	0,2 kg
M/146032/L	32	78	92	24	64	41	102	26	55	56	101,5	29,5	32,5	18	160	120	60	9	2,60 kg	0,35 kg
M/146040/L	40	94	112	24	81	46,5	115,5	25,5	65	63	115	30	52,5	18	215	160	80	9	4,70 kg	0,50 kg
M/146050/L	50	112	132	30	94	53,5	142,5	32,5	75	77,5	142	36,5	65	24	250	190	95	11	7,20 kg	0,75 kg
M/146063/L	63	132	150	30	112	60,5	158,5	33,5	90	86	158	38,5	115	42	320	240	120	13	12,40 kg	1,0 kg

Missing cylinder dimensions, see on page 108

M/146000, M/146100, M/146200 LINTRA®PLUS rodless cylinders locking units

Double acting, magnetic and non-magnetic piston - Ø 16 ... 80 mm

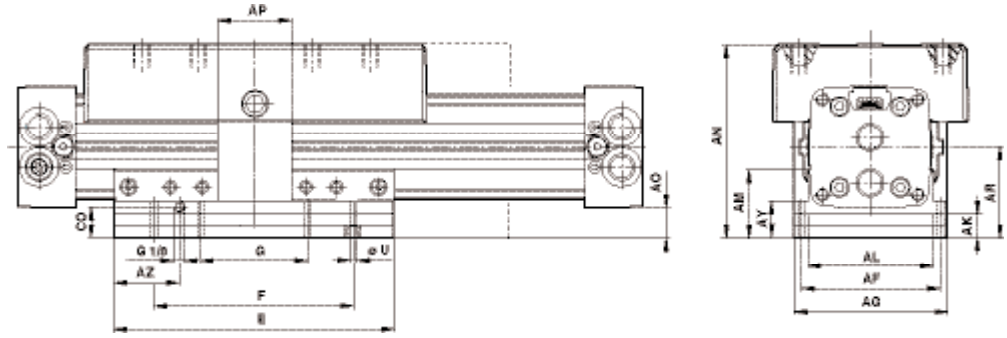
M/146200/L1, M/146200/L3 – cylinder with precision roller guide and active brake (Ø 25 ... 63 mm)



MODELS	Ø	AF	AG	AK	AL	AM	AN	AO	AP	AR	AY	AZ	CO	E	F	G	Ø U	Weight at 0 mm	Weight per 100 mm
M/146225/L.	25	62	75	12	52	28,5	79,5	13,5	40	37,5	16,5	30	6	130	90	45	6,6	1,55 kg	0,2 kg
M/146232/L.	32	78	92	12	64	29	94	14	55	44	17,5	32,5	6	160	120	60	9	3,90 kg	0,35 kg
M/146240/L.	40	94	112	12	81	34,5	108,5	13,5	65	51	18	52,5	6	215	160	80	9	6,20 kg	0,50 kg
M/146250/L.	50	112	132	12	94	35,5	126,5	14,5	75	59,5	18,5	65	6	250	190	95	11	10,70 kg	0,75 kg
M/146263/L.	63	132	150	12	112	42,5	142,5	15,5	80	68	20,5	115	6	320	240	120	13	11,50 kg	1,00 kg

Missing cylinder dimensions, see on page 108 & 109

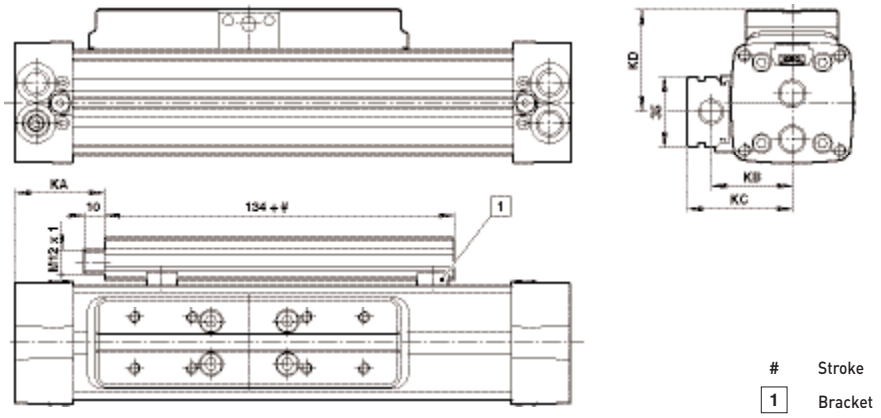
M/146200/L2, M/146200/L4 – cylinder with precision roller guide and passive brake (Ø 25 ... 63 mm)



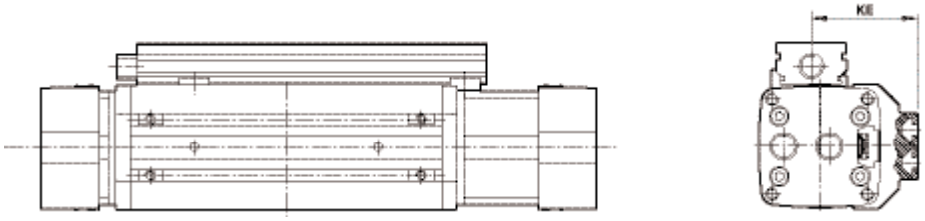
MODELS	Ø	AF	AG	AK	AL	AM	AN	AO	AP	AR	AY	AZ	CO	E	F	G	Ø U	Weight at 0 mm	Weight per 100 mm
M/146225/L	25	62	75	22	52	38,5	89,5	23,5	40	47,5	26,5	30	16	130	90	45	6,6	1,90 kg	0,20 kg
M/146232/L	32	78	92	24	64	41	106	26	55	56	29,5	32,5	18	160	120	60	9	4,00 kg	0,35 kg
M/146240/L	40	94	112	24	81	46,5	120,5	25,5	65	63	30	52,5	18	215	160	80	9	6,70 kg	0,50 kg
M/146250/L	50	112	132	30	94	53,5	144,5	32,5	75	77,5	36,5	65	24	250	190	95	11	11,00 kg	0,75 kg
M/146263/L	63	132	150	30	112	60,5	160,5	33,5	80	86	38,5	115	24	320	240	120	13	12,40 kg	1,00 kg

Missing cylinder dimensions, see on page 108 & 109

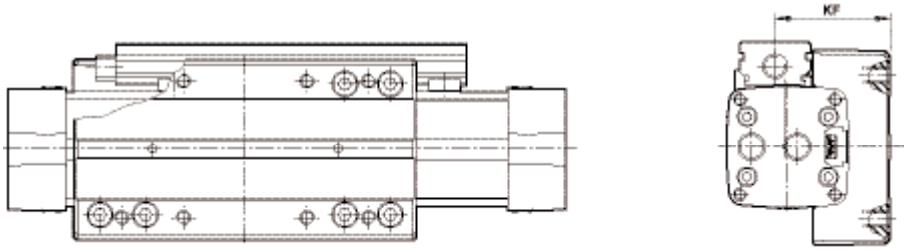
M/146000/F1 – cylinder with linear sensor and internal guide



M/146100/F1 – cylinder with linear sensor and external adjustable guide



M/146200/F1 – cylinder with linear sensor and precision roller guide



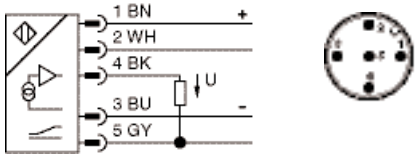
MODELS	Ø	KA	KB	KC	KD	KE	KF
M/146.32/F1/...	32	44	40	51,5	50,5	56	56,5
M/146.40/F1/...	40	74	46	57,5	56,5	64	62,5
M/146.50/F1/...	50	104	54	65,5	68,5	75	70
M/146.63/F1/...	63	139	61	72	67,5	79,5	69,5

Missing cylinder dimensions, see on page 106 & 107

ELECTRICAL DATA OF LINEAR POSITION SENSOR:

Operating voltage: 10 ... 30 V d.c.
Resolution: 16 bit
Repeat accuracy: 0,006 %
Output: 4 ... 20 mA
Linearity: 0,05 % of measuring range
Protection class: IP67
Short-circuit protection

CONNECTOR DETAILS



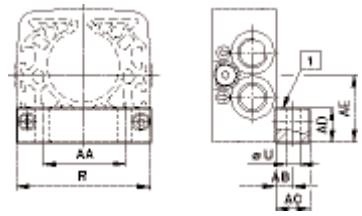
Pin-No.	Colour	Function
1	Brown	+
2	White	Program input
3	Blue	-
4	Black	Output +
5	Grey	Output -

M/146000, M/146100, M/146200 LINTRA®PLUS rodless cylinders locking units

Double acting, magnetic and non-magnetic piston - Ø 16 ... 80 mm

MOUNTINGS (Ø 16 ... 80 mm)

Foot mounting - C

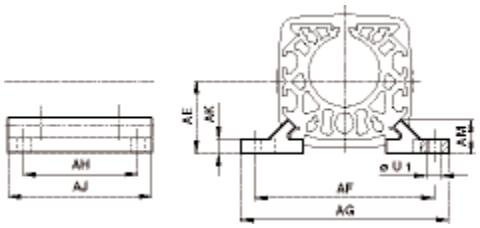


1 TOP

MODELS	Ø	AA	AB	AC	AD	AE	R	Ø U	kg
QM/146016/21	16	16	10	15	3	16	27	5,5	0,01
QM/146020/21	20	17	5	10	10	21,5	40	5,5	0,03
QM/146025/21	25	18	7	15	13,5	24 (26,5)	48	7	0,1
QM/146032/21	32	26	11	22	16,5	30,5 (33)	60	9	0,1
QM/146040/21	40	30	11	22	19,5	37,5 (40,5)	75	9	0,2
QM/146050/21	50	42	12	25	24	45 (49)	90	11	0,3
QM/146063/21	63	48	13	25	27,5	54 (57,5)	105	13	0,4
QM/146080/21	80	64	12,5	25	35	70	130	14	0,4

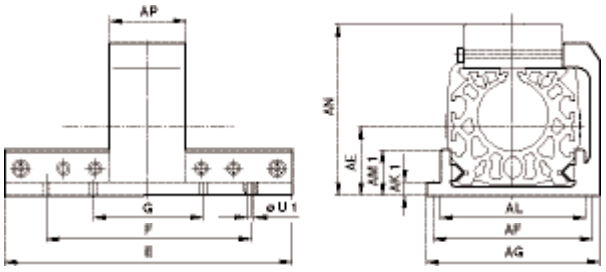
Attention:
Foot mounts can be attached to give different distances AE. When used together with a centre support mounting the word **TOP** should be visible on the top face of the mount.

Centre support - V



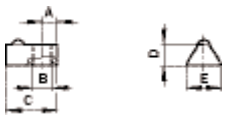
MODELS	Ø	AE	AF	AG	AH	AJ	AK	AM	Ø U1	kg
QM/146016/32	16	16	40	50	20	30	3,5	9	5,5	0,01
QM/146020/32	20	21,5	52	62	45	60	4,5	12	5,5	0,03
QM/146025/32	25	26,5	60	72	60	80	5,5	13	6,6	0,04
QM/146032/32	32	30,5	76	92	70	100	6,5	13,5	9	0,07
QM/146040/32	40	37,5	92	108	90	120	7,5	18,5	9	0,2
QM/146050/32	50	45	110	128	110	140	7,5	18,5	11	0,2
QM/146063/32	63	54	132	154	120	160	9	25	13	0,3
QM/146080/32	80	70	155	180	140	180	12	28,3	14	0,4

Carriage plate mounting - UV



MODELS	Ø	AE	AF	AG	AK1	AL	AM1	AN	AP	E	F	G	ØU1	kg
QM/146016/34	16	16	40	50	3,5	31	8,5	40,5	30	80	60	–	5,5	0,1
QM/146020/34	20	21,5	52	62	5,5	42	14,5	56	36	110	80	40	5,5	0,2
QM/146025/34	25	26,5	60	75	5,5	52	17,5	62,5	45	130	90	45	6,6	0,3
QM/146032/34	32	33	78	92	6,5	64	18	79	55	160	120	60	9	0,4
QM/146040/34	40	40,5	94	112	7,5	81	24	93	65	215	160	80	9	0,8
QM/146050/34	50	49	112	132	8	94	25	114	75	250	190	95	11	1,2
QM/146063/34	63	57,5	132	150	10	112	32	130	90	320	240	120	13	2,0
QM/146080/34	80	70	155	180	10	132	32	159	100	390	300	150	14	2,9

Groove key for carriage



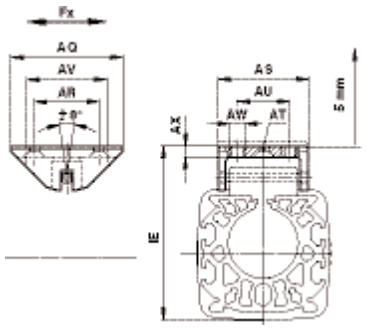
MODELS	Ø	A	B	C	D	E	Weight (kg)
M/P74065	25	4	M5	12	4,25	8	0,01
M/P74065	32	4	M5	12	4,25	8	0,01
M/P74066	40	4,5	M6	17	6,25	10,5	0,02
M/P41858	50	7,5	M8	23	7,5	13,5	0,03
M/P41858	63	7,5	M8	23	7,5	13,5	0,03

Groove key for profile barrel

MODELS	Ø	A	B	C	D	E	Weight (kg)
M/P74065	32	4	M5	12	4,25	8	0,01

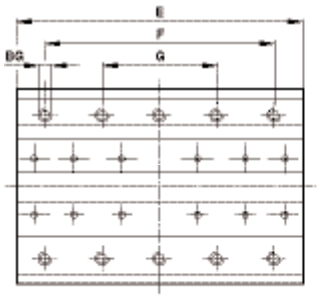
Swinging bridge - S

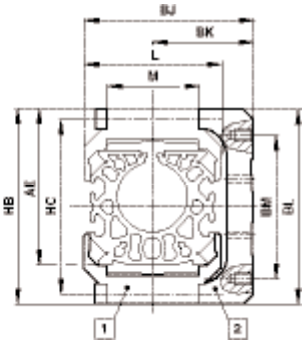
For cylinders with internal guiding only



MODELS	Ø	AQ	AR	AS	AT	AU	AV	AW	AX	IE	Fx (N)	kg
QM/146016/37	16	40	–	26	–	12	30	M4	4	48+4	100	0,02
QM/146020/37	20	50	35	38	DIN74-Bm5	20	40	M5	5	65,5+5	150	0,10
QM/146025/37	25	60	40	44	DIN74-Bm5	20	45	M5	5	70+5	250	0,20
QM/146032/37	32	80	50	59	DIN74-Bm6	30	60	M6	5,5	88,5+5	410	0,30
QM/146032/37	40	80	50	59	DIN74-Bm6	30	60	M6	5,5	102,5+5	640	0,30
QM/146050/37	50	100	60	65	DIN74-Bm8	40	80	M8	6,5	124+5	1000	0,50
QM/146050/37	63	100	60	65	DIN74-Bm8	40	80	M8	6,5	139+5	1500	0,50
QM/146080/37	80	100	60	65	DIN74-Bm8	40	80	M8	6,5	168,5+5	2400	0,50

Secondary carriage - W
Side mounting plate - UW





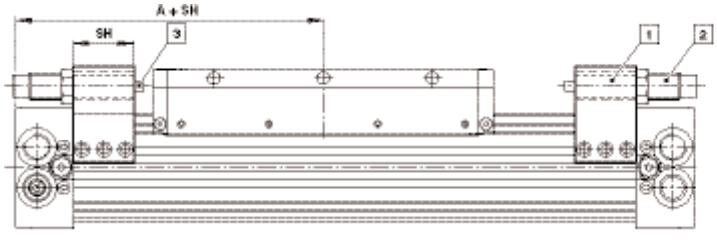
1 Secondary carriage – W
2 Side mounting plate – UW

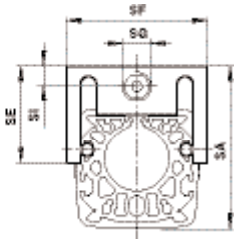
MODELS W	MODELS UW	Ø	AE	BG	BJ	BK	BL	BM	E	F	G	HB	HC	L	M	W	UW
QM/146116/35	–	16	38	–	–	–	–	–	80	–	–	49	–	–	18	0,04 kg	–
QM/146120/35	QM/146120/36	20	59	M 5 x 10*	54	33	78	55	110	80	40	79	64	42	27	0,19 kg	0,25 kg
QM/146125/35	QM/146125/36	25	67,5	M 5 x 10*	63	37	86	65	130	90	45	87	77	52	32	0,27 kg	0,33 kg
QM/146132/35	QM/146132/36	32	82	M 5 x 12*	77	45	103	80	160	120	60	104	94	64	45	0,50 kg	0,50 kg
QM/146140/35	QM/146140/36	40	97,5	M 6 x 12*	77	58,5	119	90	215	160	80	120	110	79	45	0,65 kg	1,08 kg
QM/146150/35	QM/146150/36	50	117	M 6 x 15*	98	71,5	143	120	250	190	95	144	131	92	50	1,10 kg	1,85 kg
QM/146163/35	QM/146163/36	63	137	M 8 x 20*	117,5	84,5	178	140	320	240	120	169	154	110	50	1,90 kg	3,46 kg
QM/146180/35	–	80	165	–	–	–	–	–	390	–	–	200	–	–	50	2,50 kg	–

* Deep

Adjustable stop

For M/146100, /.., ../M, M/146200/..., .../M





1 Assembly kit
2 Please order shock absorber separately, see ACE program
3 Reaction forces (Q max)
Ø 25 = 1200 N, Ø 32 = 1500 N,
Ø 40 = 1850 N

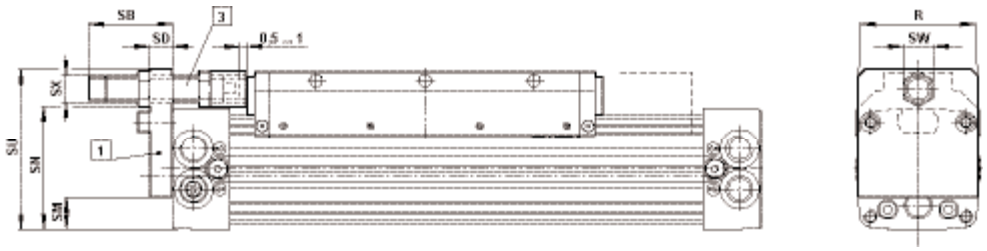
MODELS	Ø	A	SA	SE	SF	SG	SH	SI	Weight
QM/146125/75	25	100	67	48	63	M14x1,5	30	10,5	0,12 kg
QM/146132/75	32	120	80	48	70	M14x1,5	30	10,5	0,17 kg
QM/146140/75	40	150	102	62	83	M20x1,5	30	15	0,22 kg

M/146000, M/146100, M/146200 LINTRA®PLUS rodless cylinders locking units

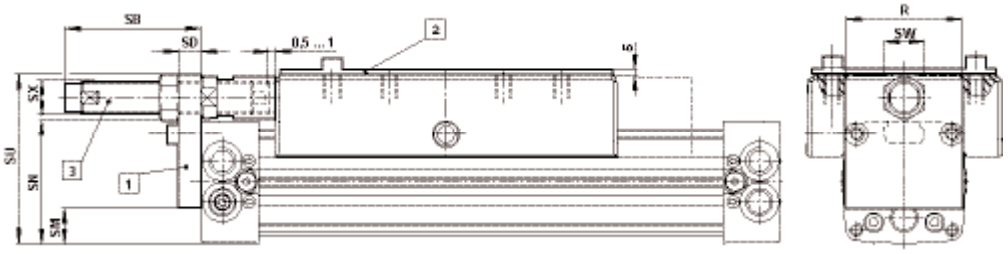
Double acting, magnetic and non-magnetic piston - Ø 16 ... 80 mm

Assembly kit for shock absorber

For cylinder series M/146100, M/146100/M



For cylinder series M/146200, M/146200/M



1 Assembly kit

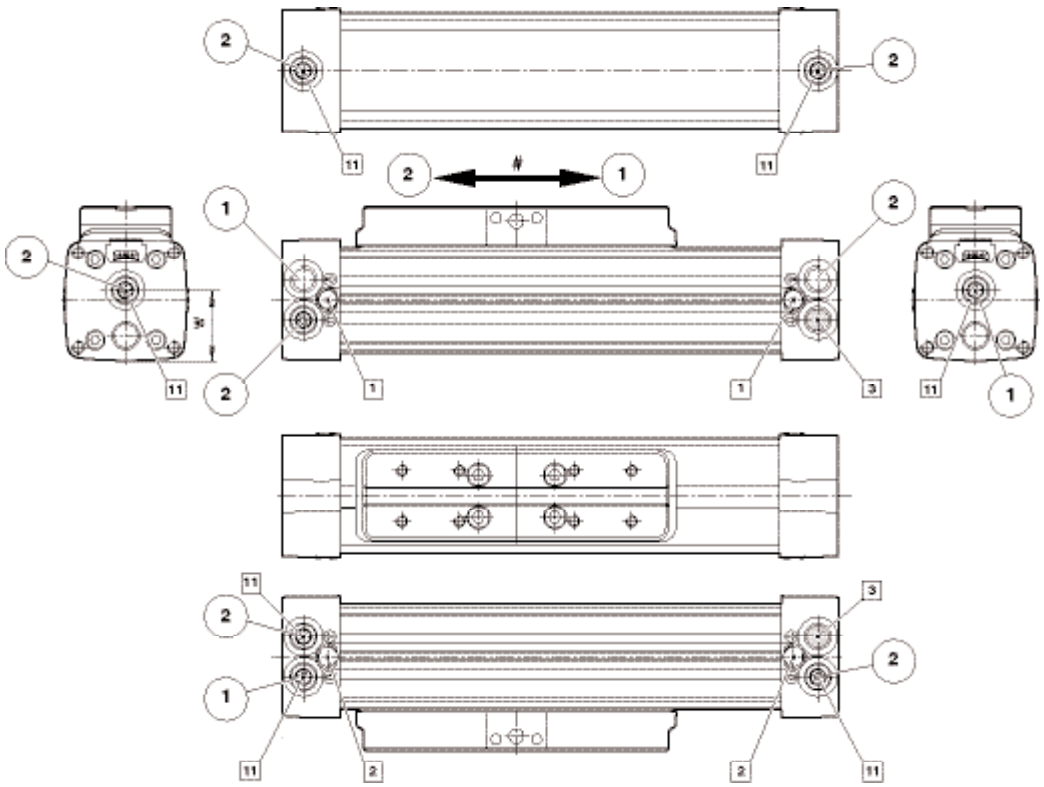
2 Plate

3 Please order shock absorber separately, see ACE program

MODELS	Ø	Assembly kit for shock absorber position 1	Plate position 2	R	SB	SD	SM	SN	SU	SW	SX
M/146125	25	QM/146125/67	–	48	45,5	12	19	49	69,5	17	M14x1,5
M/146132	32	QM/146132/67	–	60	40,5	12	24	61	81,5	17	M14x1,5
M/146140	40	QM/146140/67	–	75	81,5	15	29	74	109,5	30	M25x1,5
M/146150	50	QM/146150/67	–	90	69	15	33	91	127,5	30	M25x1,5
M/146163	63	QM/146163/67	–	105	69	15	41	105,5	141,5	30	M25x1,5
M/146180	80	QM/146180/67	–	130	85	20	53	130,5	173,5	40	M33x1,5
M/146225	25	QM/146125/67	–	48	45,5	12	19	49	69,5	17	M14x1,5
M/146232	32	QM/146132/67	–	60	40,5	12	24	61	81,5	17	M14x1,5
M/146240	40	QM/146140/67	M/P41434	75	81,5	15	29	74	109,5	30	M25x1,5
M/146250	50	QM/146150/67	M/P41435	105	69	15	33	91	127,5	30	M25x1,5
M/146263	63	QM/146163/67	M/P41436	130	69	15	41	105,5	141,5	30	M25x1,5

Please order shock absorber and plate separately.
Attention: When using M/146200 cylinders (Ø 40 ... 63 mm) an extra top plate must be mounted on to the carriage as the centre line of the shock absorbers has to be within the surface of the carriage.

M/146000/IC, .../MC; M/146100/IC, .../MC; M/146200/IC, .../MC – cylinder with alternative ports (ø 25 ... 63 mm)



MODELS	ø	W
M/146.25/..	25	28
M/146.32/..	32	34,5
M/146.40/..	40	43,5
M/146.50/..	50	53
M/146.63/..	63	59,5

Missing cylinder dimensions and weights see the corresponding series on page 108 & 109

#	Moving direction
1	Cushion screw
2	Hole without thread
3	Port without function
11	Alternative ports
(1)	Port moving direction →
(2)	Port moving direction ←

M/44000/M LINTRA® rodless cylinders

Double acting, magnetic piston - Ø 25 ... 40 mm

- New compact, space-saving design
- Proven and patented sealing system
- Integral switch mounting
- Adjustable cushioning
- Magentic piston as standard

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting, magnetic piston with adjustable cushioning

Operating pressure:
1 ... 8 bar

Operating temperature:
-30°C ... +80°C max.
Consult our Technical Service for use below +2°C

Cylinder diameters::
25, 32, 40 mm

Strokes:
max. 5000 mm

MATERIALS

Profile barrel: anodised aluminium alloy
End covers: aluminium alloy
Yoke: anodised aluminium alloy
Cover and pistons: plastic
Cover strip: polyamide
Seals: nitrile rubber & polyurethane

STANDARD MODELS

			MODELS	ACCESSORIES				
	Ø	Port size	Internal guide magnetic	Reed switch with integral 5m cable	Banjo Flow control	Straight fitting	Elbow fitting	Spares kit
					Tube diameter in bold			
								
 magnetic piston	25	G1/8	**M/44025/M/***	M/50/LSU/5V	C0K51**08**18	C0225**08**18	C0247**08**18	Q44025AACAAS788
	32	G1/8	**M/44032/M/***	M/50/LSU/5V	C0K51**08**18	C0225**08**18	C0247**08**18	Q44032AACAAS788
	40	G1/4	**M/44040/M/***	M/50/LSU/5V	C0K51**10**28	C0225**10**28	C0247**10**28	Q44040AACAAS788

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

For further information

www.norgren.com/info/en1-118

OPTIONS SELECTOR

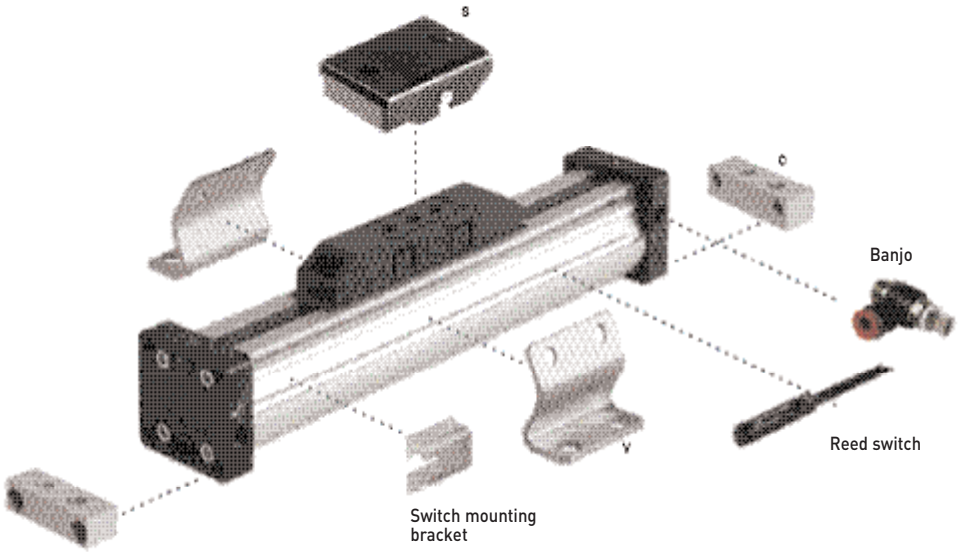
M/4400★★/M/★★★★

Cylinder diameters (mm)	Substitute
25	**25**
32	**32**
40	**40**

Stroke length in mm for ISO G-thread

5000 max.

MOUNTINGS

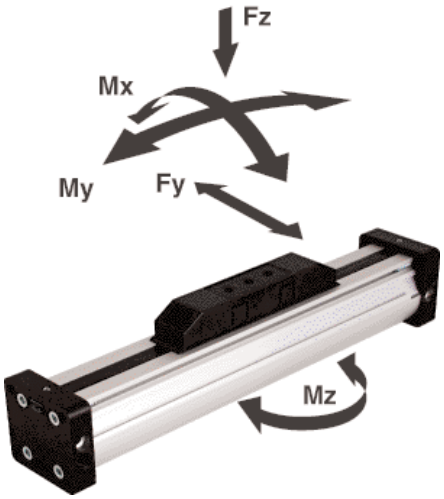


Ø	C	S	V	Switch mounting brackets
25	QM/44025/21	Q44025AAAAAM332	Q44025AAAAAM337	M/P72487
32	QM/44032/21	Q44032AAAAAM332	Q44032AAAAAM337	M/P72487
40	QM/44040/21	Q44040AAAAAM332	Q44040AAAAAM337	M/P72487

M/44000/M LINTRA® rodless cylinders

Double acting, magnetic piston - Ø 25 ... 40 mm

M/44000/M



Loading values for LINTRA® Cylinders

The values given in the table below show the forces in the directions Fy and Fz and the maximum moments Mx, My and Mz. All values are applicable for speeds up to 0,2 m/s. A requirement for using these values is a smooth movement of the mass over the whole stroke length of the cylinder. The reference point from which the moments for all cylinders should be calculated is the centre line of the piston.

Total loads

When a LINTRA® Cylinder has to take several loads and moments, an additional calculation is necessary using the following formula:

$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz}{Fz\ max} \leq 1$$

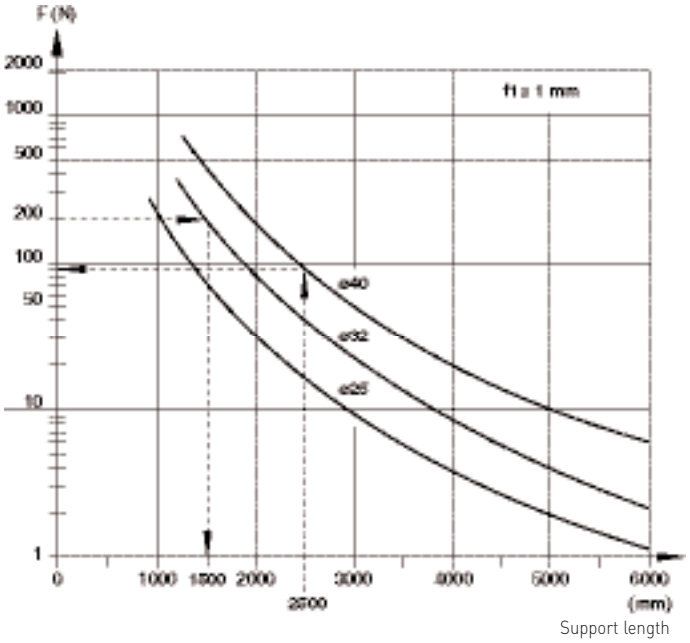
FORCES, AIR CONSUPTION AND CUSHION LENGTH

Ø	Theoretical forces (N) at 6 bar	Air consumption (l/cm) per stroke at 6 bar	Cushioning length (mm)	Loading values Fy (N)	Fz (N)	Mx (Nm)	My (Nm)	Mz (Nm)
25	250	0,035	18	90	280	1	13	4
32	410	0,056	23	120	370	2	21	6
40	640	0,088	35	240	720	4	56	16

Loading values applicable to a speed of ⩽ 0,2 m/s. Maximum working life is normally reached below a speed of 1 m/s

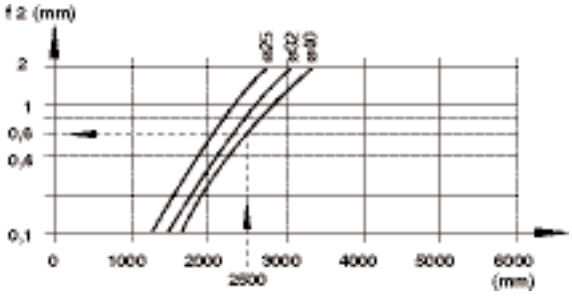
CYLINDER DEFLECTION

Deflection due to external forces



Support length

Deflection due to cylinder weight



Support length

Example:
Cylinder Ø 40 mm, external force 120 N, distance between supports 2500 mm
Required: Total deflection

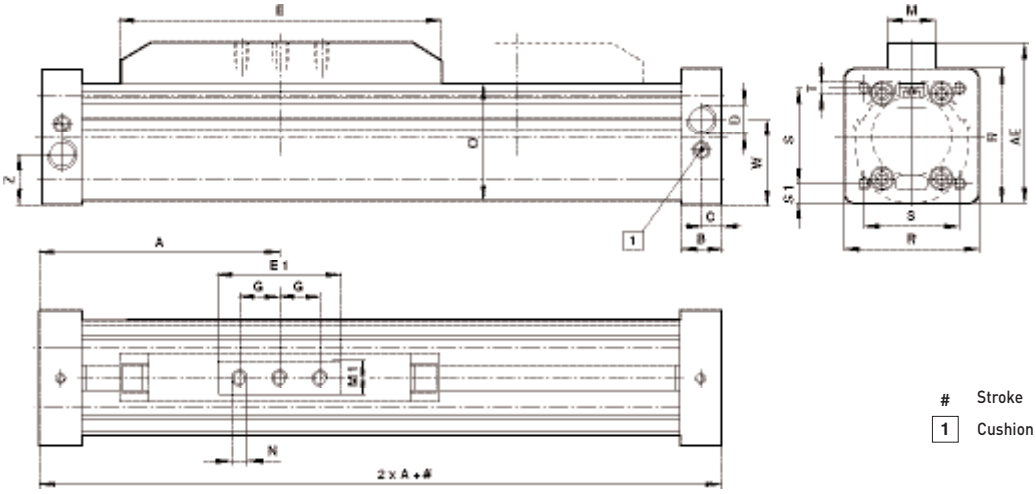
1. Deflection due to external force (f1) see Diagram 1 (1mm/90 N) · 120 N	1,8 mm
2. Deflection due to cylinder weight (f2) diagram 2	+ 0,6 mm
Total deflection:	1,9 mm

Example:
Cylinder Ø 32 mm, stroke length 3500 mm, external load 200 N
Maximum distance between supports = 1500 mm (see diagram).
Therefore additional support is required.

Maximum permitted deflection
f1 + f2 ⩽ 1 mm per 1000 mm stroke
Result:
1,9 mm are below the max. permitted deflection of 2,5 mm

BASIC DIMENSIONS

M/44000/M/... – Standard cylinders Ø 25 ... 40 mm

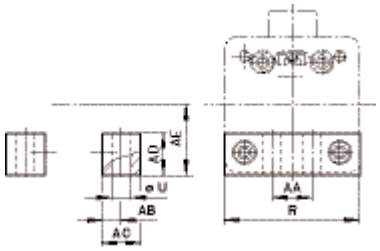


MODELS	Ø	A	AE	B	C	D ISO	E	E1	G	M	M1
M/44025/M	25	72,5	53,2	13,5	7	G 1/8	100	40	12,5	22	18
M/44032/M	32	82,5	67,8	13,5	7	G 1/8	120	50	15	24	20
M/44040/M	40	112,5	79,3	19	9,5	G 1/4	165	60	20	24	20

MODELS	Ø	N	O	R	S	S1	T	W	Z	Weight at 0 mm	Weight per 100 mm
M/44025/M	25	M5-7 deep	35	42	33	4,5	M4-13,5	25,6	16,4	0,60	0,15
M/44032/M	32	M6-10 deep	46,5	53	41	6	M6-13,5	33,5	19,5	0,90	0,25
M/44040/M	40	M6-10 deep	58	65,5	48	8,75	M6-19	40,8	24,8	1,40	0,35

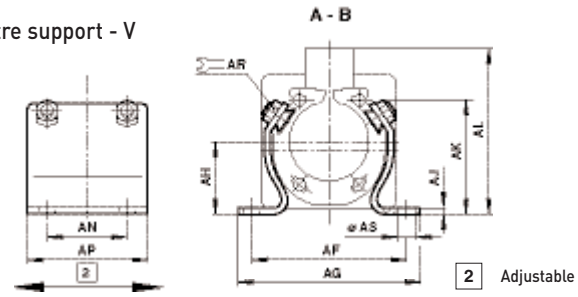
MOUNTINGS

Foot mounting - C



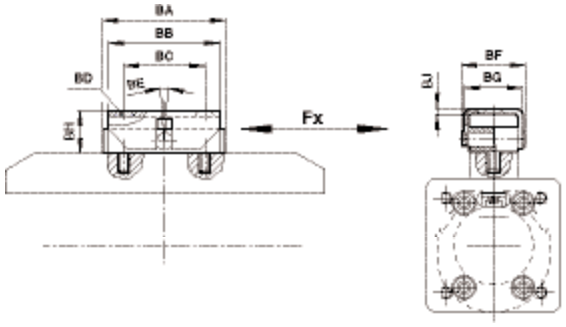
MODELS	Ø	AA	AB	AC	AD	AE	R	Ø U	kg
QM/44025/21	25	18,5	5	10	10	21,5	42	5,5	0,04
QM/44032/21	32	20	8	16	16	28,5	53	9	0,09
QM/44025/21	40	27	7,5	15	22	35	65,5	9	0,13

Centre support - V



MODELS	Ø	AF	AG	AH	AJ	AK	AL	AN	AP	Σ AR	Ø AS	kg
QM44025AAAAAM337	25	58	70	21,5	3	31	53,5	25	25	10	6,6	0,07
QM44025AAAAAM337	32	70	83	28,5	3	43	70	30	50	10	9	0,15
QM44040AAAAAM337	40	79	92	35	3	55	81,5	40	60	10	9	0,25

Swinging bridge S



MODELS	Ø	BA	BB	BC	BD (Din74)	BE	BF	BG	BH	BJ	Fx	kg
QM44025AAAAAM337	25	40	40	28	BM 5	± 8	29	28	15 +5	2	250 N	0,15
QM44032AAAAAM337	32	50	55	40	BM 6	± 8	31	30	17,5 + 5	2	410 N	0,20
QM44040AAAAAM337	40	60	55	40	BM 6	± 8	31	30	18 + 5	2	640 N	0,25

M/46800/M, M/46800/HM LINTRA® heavy duty cylinders

Double acting, magnetic piston - Ø 20 ... 40 mm

External guides for heavy loads over long distances

Rigid, reinforced aluminium profile provides greater load support

T-slots in the outer profile enable individual mounting options

Precision guidance with ball bearings on hardened trackways

Low rolling resistance

MATERIALS

Carriage and end covers: anodised aluminium

Alloy cylinder extrusion: special anodised aluminium

Piston seals and sealing strip: polyurethane

Cover strip: polyamide

Other sealing elements: nitrile rubber

TECHNICAL DATA

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

Double acting with adjustable cushioning, optional shock absorbers

Operating pressure:

1,5 ... 10 bar

Operating temperature:

-30°C ... +80°C max.

Consult our Technical Service for use below +2°C

Cylinder diameters:

M/46800/M 20, 25 mm

M/46800/HM 25, 32, 40 mm

Strokes:

M/46800/M (Ø 20, 25 mm): max. 4500 mm

M/46800/HM (Ø 25, 32, 40 mm): max. 5700 mm

STANDARD MODELS

			MODELS	ACCESSORIES				
	Ø	Port size	Internal guide magnetic	Reed switch with integral 5m cable	Banjo Flow control	Straight fitting	Elbow fitting	Spares kit
					Tube diameter in bold			
								
 Magnetic piston	20	G1/8	**M/46820/M**	M/50/LSU/5V	C0K51**08**18	C0225**08**18	C0247**08**18	QM/46820/*/88
	25	G1/8	**M/46825/M**	M/50/LSU/5V	C0K51**08**18	C0225**08**18	C0247**08**18	QM/46825/*/88
	25	G1/4	**M/46825/HM**	M/50/LSU/5V	C0K51**10**28	C0225**10**28	C0247**10**28	QM/46825/*/88
	32	G1/4	**M/46832/HM**	M/50/LSU/5V	C0K51**10**28	C0225**10**28	C0247**10**28	QM/46832/*/88
	40	G1/4	**M/46840/HM**	M/50/LSU/5V	C0K51**10**28	C0225**10**28	C0247**10**28	QM/46840/*/88

* Insert stroke length in mm

For information on additional magnetic switches see page 290

Other fittings are available, please see section 7

ACCESSORIES

MODELS	Groove key	Shock absorber
		
M/46800/M	M/P41858	11C600,SC300
M/46800/HM	M/P41858	11C600,SC650

For further information

www.norgren.com/info/en1-122

OPTIONS SELECTOR

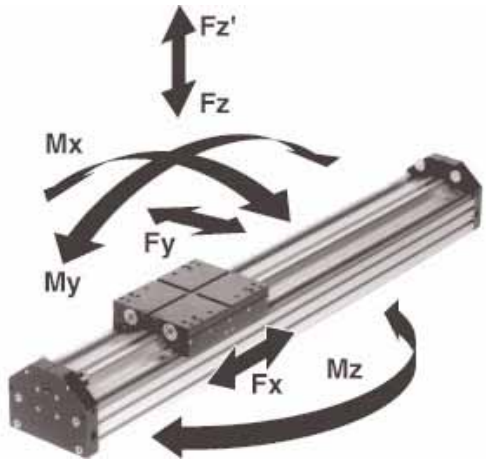
M/468/M/★★/★★/★★★★

Cylinder diameters (mm)	Substitute
25	**25**
32	**32**
40	**40**
63	**63**

Variants	Strokes (mm)
Ø 20 (M/46820/M)	**max. 4500**
Ø 25 (M/46825/M)	**max. 4500**
Ø 25 (M/46825/HM)	**max. 5700**
Ø 32 (M/46832/HM)	**max. 5700**
Ø 40 (M/46840/HM)	**max. 5700**

Guiding systems	Substitute
Heavy duty guiding system 1 (Ø 20, 25 mm)	**M**
Heavy duty guiding system 2 (Ø 25, 32, 40 mm)	**HM**

M/46800/M, M/46800/HM



Loading values for LINTRA® heavy duty cylinders

The values stated in the tables show the single forces in the directions Fy and Fz as well as the maximum moments Mx, My and Mz for a speed of ⩽ 0,2 m/s respectively. A requirement for using these values is a smooth constant movement of the mass over the whole stroke length of the cylinder. The reference point from which the moments for all cylinders should be calculated is the centerline of the carriage.

Total loads

When a LINTRA® heavy duty cilinder has to take several loads and moments, an additional calculation is necessary using the following formula:

$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz}{Fz\ max} \leq 1$$

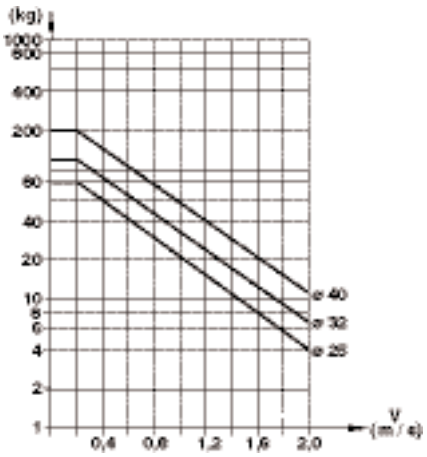
THRUST, AIR CONSUPTION AND CUSHION LENGTH

MODELS	Ø	Thrust (N) at 6 bar	Air consumption (l/cm) per stroke at 6 bar	Cushioning length (mm)	Loading values Fy (N)	Fz (N)	Fz' (N)	Mx (Nm)	My (Nm)	Mz (Nm)
M/46820/M	20	150	0,022	26	4500	5000	4500	350	410	370
M/46825/M	25	250	0,035	26	4500	5000	4500	350	410	370
M/46825/HM	25	250	0,035	26	4500	5000	4500	450	620	580
M/46832/HM	32	410	0,056	35	4500	5000	4500	450	620	580
M/46840/HM	40	640	0,088	50	4500	5000	4500	450	620	580

Loading values applicable to a speed of ⩽ 0,2 m/s. Maximum working life is normally reached below a speed of 1 m/s.

CUSHIONING PERFORMANCE

The dynamic energy of a heavy duty cylinder is caused by direct or indirect external loads which must be absorbed by pneumatic cushioning.
The cushioning ability depends to a large extent on the pneumatic circuit design (e.g. back pressure, pre-exhaust). The values given in the diagram were tested with an operating pressure of 6 bar using a 5/2 control valve. When installed horizontally, depending upon the speed, dynamic energy can be absorbed by the cylinder. Whenever the values given in the diagram are exceeded, the transported mass must be cushioned by additional shock absorbers.

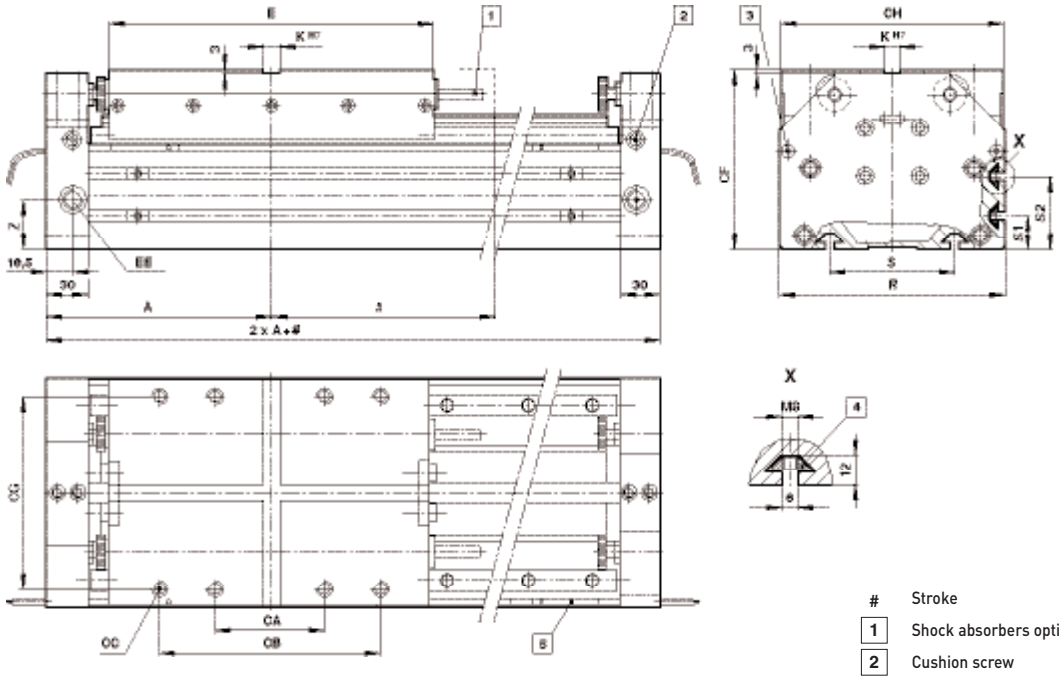


M/46800/M, M/46800/HM LINTRA® heavy duty cylinders

Double acting, magnetic piston - Ø 20 ... 40 mm

BASIC DIMENSIONS

M/46800/M, M/46800/HM – Standard Cylinders Ø 20 ... 40 mm



#	Stroke
1	Shock absorbers optional
2	Cushion screw
3	Cable conduit
4	Four tee nuts supplied as standard parts
5	Magnetically operated switch

MODELS	Ø	A	CA	CB	CC	CF	CG	CH	E	EE
M/46820/M	20	130	30	112	M 8 x 25 *	100	112	130	170	G 1/8
M/46825/M	25	130	30	112	M 8 x 25 *	100	112	132	170	G 1/8
M/46825/HM	25	162,5	80	160	M 8 x 33 *	128	136	162	235	G 1/4
M/46832/HM	32	162,5	80	160	M 8 x 33 *	128	136	162	235	G 1/4
M/46840/HM	40	162,5	80	160	M 8 x 33 *	128	136	162	235	G 1/4

MODELS	Ø	K H7	R	S	S1	S2	Z	Weight at 0 mm	Weight per 100 mm
M/46820/M	20	8	134	66	26,5	-	25,5	6,9 kg	1,49 kg
M/46825/M	25	8	134	66	26,5	-	25,5	7,2 kg	1,54 kg
M/46825/HM	25	12	164	90	24	52	35	11,2 kg	1,95 kg
M/46832/HM	32	12	164	90	24	52	35	12,0 kg	2,10 kg
M/46840/HM	40	12	164	90	24	52	35	13,1 kg	2,25 kg

* Deep

“Will it work, John?”

Carl Norgren, 1927

Carl Norgren said he was interested in everything and liked almost everything except Brussels sprouts and summer squash.

Intelligent and articulate, he described himself as essentially a businessman. He also said he was an engineer, an inventor, a manufacturer, a farmer, a cattle breeder, a naturalist, an artist and what-not and that what he was at any moment depended upon the time of the day, who he was with, and where he happened to be.

In 1927, Carl Norgren, then head of a small Denver, Colorado, manufacturing firm was waiting to make a routine sales contact with his representative, John Fauver. Fauver was troubled. “If only we could lubricate the air-operated cylinder automatically – perhaps in the air line itself ...” Norgren sketched as he listened to the special problems of lubricating foundry machinery. Showing his sketch to Fauver, he asked “will it work, John?”

We know it worked because Carl Norgren was the pioneer that invented an entire industry with the first lubricator.

EXCELON® PRO 2009

>>EXCELON® PRO flexibility, value and ease of use

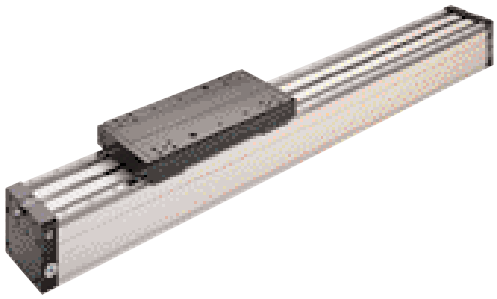
‘A value-for-money FRL’

A direct response to user needs, Excelon® Pro is a value-for-money FRL - a fully assembled pre-configured FRL that can be mounted and connected without tools. Within seconds the customer has the benefit of conditioned compressed air matched exactly to their needs.

For details and specifications visit the Excelon® Pro microsite norgren.com/excelonpro

M/46800/PM LINTRA® heavy duty pneumatic cylinders

Double acting - cylinder sizes: 16, 25, 40 and 63



Precise linear guiding

T-slots in the outer profile enable individual mounting options

Alternative driving cylinders offer versatile application possibilities

Torsional and bending resistant profiles

MATERIALS

Carriage and end covers: anodised aluminium

Alloy cylinder extrusion: special anodised aluminium

Piston seals and sealing strip: polyurethane

Cover strip: polyamide

Other sealing elements: nitrile rubber

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting with adjustable cushioning, optional with shock absorbers

Operating pressure:
1,5 ... 10 bar

Operating temperature:
-30°C ... +80°C max.
Consult our Technical Service for use below +2°C

Cylinder diameters:
16, 25, 40, 63 mm

Maximum strokes:
5700 mm (16)
5600 mm (25)
5500 mm (40)
4000 mm (63)

STANDARD MODELS

	Ø	Port size	MODELS External roller guide	ACCESSORIES Banjo flow control (Tube diameter in bold)	Straight fitting	Elbow fitting
						
 magnetic piston	16	G1/8	**M/46816/PM**	C0K51**08**18	C0225**08**18	C0247**08**18
	25	G1/8	**M/46825/PM**	C0K51**08**18	C0225**08**18	C0247**08**18
	40	G1/4	**M/46840/PM**	C0K51**10**28	C0225**10**28	C0247**10**28
	63	G1/2	**M/46863/PM**	C0K51**12**48	C0225**16**48	C0247**16**48

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

ACCESSORIES

Proximity switch	Proximity switch cable (inductive)	Connecting cable with socket M8 x 1	Connecting cable with socket M8 x 1
			
M/P70104/10 M/P70104/11	M/P70104/5 M/P70104/6	M/P73001/5, **PVC**, 3 x 0,25, 5 m M/P73002/5, **PUR**, 3 x 0,25, 5 m	M/P73372/5, **PVC**, 3 x 0,25, 5 m M/P73373/5, **PUR**, 3 x 0,25, 5 m

For information about proximity switches see page 293

For further information

www.norgren.com/info/en1-126

OPTIONS SELECTOR

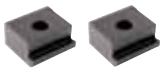
M/468★★/PM/★★★★

Cylinder diameters	Substitute
16	**16**
25	**25**
40	**40**
63	**63**

Cylinder Ø (mm)	Strokes (mm)
Ø 16	**max. 5700**
Ø 25	**max. 5600**
Ø 40	**max. 5500**
Ø 63	**max. 4000**

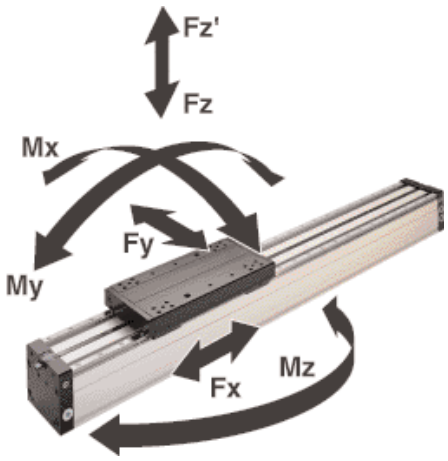
MOUNTINGS

Ø	Mounting for proximity switch	Groove key M5	Groove key M6	Groove key 2 x M6	Groove key M8	Groove key 2 x M8
						
16	QM/46816/22/64	LNS-M5	–	–	–	–
25	QM/46816/22/64	–	LNS-M6	LNS-2 x M6	M/P41858	LNS-2 x M8
40	QM/46816/22/64	–	LNS-M6	LNS-2 x M6	M/P41858	LNS-2 x M8
63	QM/46816/22/64	–	LNS-M6	LNS-2 x M6	M/P41858	LNS-2 x M8

Ø	Centering sleeve	Side mounting, short	Side mounting, long	Mounting kit for shock absorber *	Shock absorber
					
16	LZS-16-12	LBK-16-KM6	LBK-40/63-2 x KM8	QM/46816/P/67	LSD 75 M2
25	LZS-25-15	LBK-16-KM6	LBK-40/63-2 x KM8	QM/46825/P/67	LSD 150 MH
40	LZS-40-18	LBK-16-KM6	LBK-40/63-2 x KM8	QM/46840/P/67	LSD 225 MH
63	LZS-63-21	LBK-16-KM6	LBK-40/63-2 x KM8	QM/46863/P/67	LSD 600 MH

* To cushion both end positions 2 mounting kits have to be ordered

M/46800/PM



Loading values for LINTRA® heavy duty cylinders

The values stated in the tables show the single forces in the directions Fy and Fz as well as the maximum moments Mx, My and Mz for a speed of ⩽ 0,2 m/s respectively. A requirement for using these values is a smooth constant movement of the mass over the whole stroke length of the cylinder. The reference point from which the moments for all cylinders should be calculated is the centerline of the carriage.

Total loads

When a LINTRA® heavy duty cilinder has to take several loads and moments, an additional calculation is necessary using the following formula:

$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz}{Fz\ max} \leq 1$$

AIR CONSUPTION, CUSHION LENGTH AND LOADING VALUES

MODELS	Ø	Forces (N) at 6 bar	Air consumption (l/cm) per stroke at 6 bar	Cushioning length (mm)	Loading values Fy (N)	Fz (N)	Fz' (N)	Mx (Nm)	My (Nm)	Mz (Nm)
M/46816/PM	16	120	0,014	12	3000	3000	3000	80	300	300
M/46825/PM	25	250	0,035	26	4200	5000	4200	250	500	500
M/46840/PM	40	640	0,088	50	7200	8500	7200	600	1200	1200
M/46863/PM	63	1600	0,218	70	10000	12000	10000	1200	2400	2400

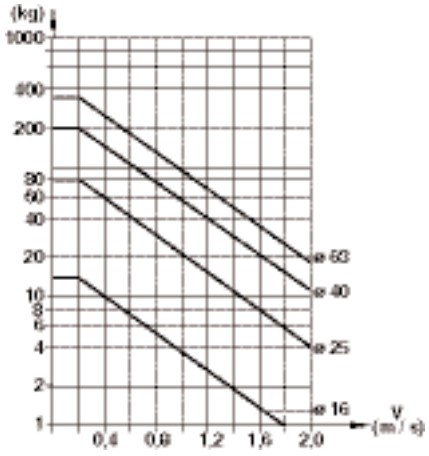
Loading values applicable to a speed of ⩽ 0,2 m/s. Maximum working life is normally reached below a speed of 1 m/s

M/46800/PM LINTRA® heavy duty pneumatic cylinders

Double acting - cylinder sizes: 16, 25, 40 and 63

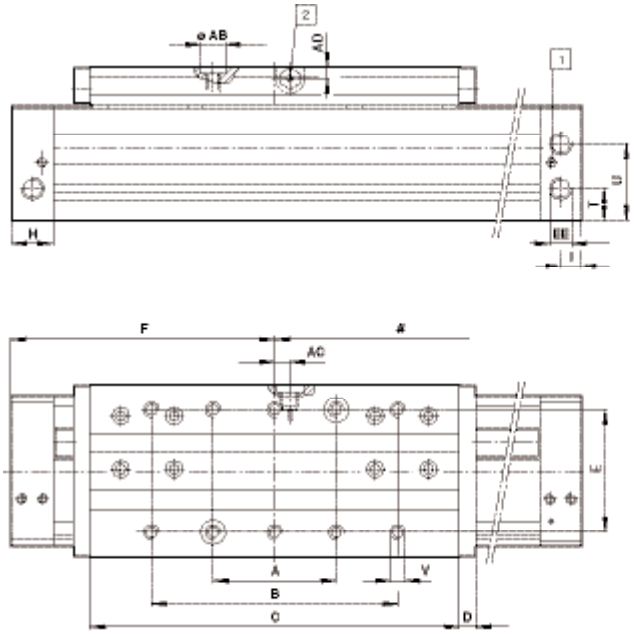
CUSHIONING PERFORMANCE

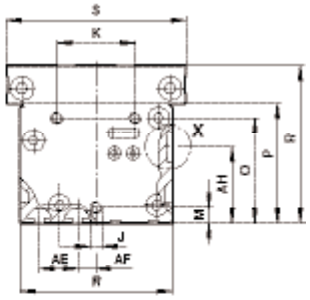
The dynamic energy of a LINTRA® heavy duty cylinder is caused by direct or partial external laods which must be absorbed by pneumatic cushioning.
The cushioning ability depends to a large extent on the pneumatic circuit (e. g. counter pressure, pre-exhaust).
The values given in the diagram were tested with an operation pressure of 87 psig (6 bar) using a 5/2 control valve. When installed horizontally, depending upon the speed, dynamic energy can be absorbed by the cylinder.
Whenever the values given in the diagram are exceeded, the transported mass must be cushioned by additional shock absorbers. These have to be located at the center of gravity of the mass.



BASIC DIMENSIONS

M/46800/PM – Standard cylinders Ø 16 mm





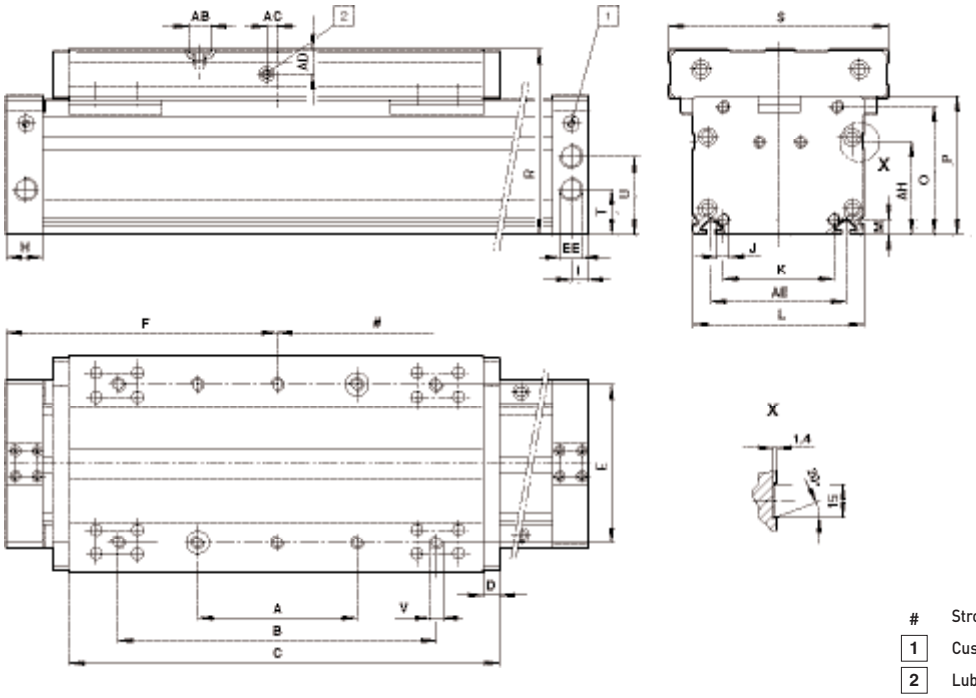
#	Stroke
1	Cushion screw
2	Lubrication

MODELS	A	Ø AB^{H7}	AC	AD	AE	AF	AH	B	C	D	E	EE	F	H	I	J	K
M/46816/...	60	12	7,5	5,5	18	9	35	120	180	8	60	G1/8	128	20	10	M5	37
MODELS	M	O	P	R	S	T	U	V	Weight at 0 mm			Weight per 100 mm					
M/46816/...	7,5	50	58	75	72	16	37,5	10 x M6	2,9			0,68					

For further information

www.norgren.com/info/en1-128

M/46800/PM – Standard Cylinders Ø 25, 40 and 63 mm



#	Stroke
1	Cushion screw
2	Lubrication

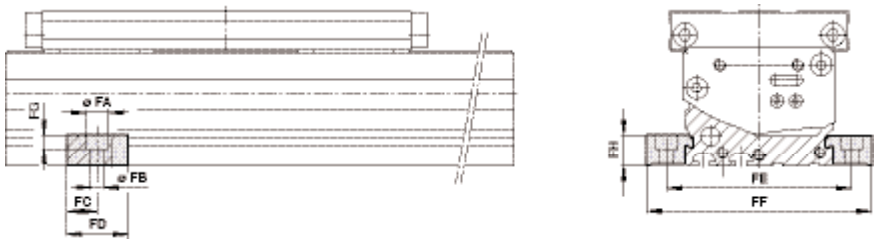
MODELS	Ø	A	Ø AB H7	AC	AD	AE	AH	B	C	D	E	EE	F	H	I	J
M/46825/...	25	90	15	7	12	80	48	180	240	10	90	G 1/8	165	25	12,5	M6
M/46840/...	40	120	18	0	18,5	108	66	240	320	12	120	G 1/4	210	30	15	M8
M/46863/...	63	154	22	0	24	140	90	308	400	15	154	G 1/2	260	35	17,5	M10

MODELS	Ø	K	L	M	O	P	R	S	T	U	V	Weight at 0 mm	Weight at per 100 mm
M/46825/...	25	68	96	7	75	82,5	105	125	30	47	10 x M 8 - 12*	6,0 kg	1,08 kg
M/46840/...	40	80	130	17	97	107	140	170	35	58,5	10 x M 10 - 15*	14,0 kg	1,95 kg
M/46863/...	63	110	165	15	125	136,50	180	210	44	76	10 x M 12 - 18*	27,7 kg	3,14kg

* Deep

MOUNTINGS

LBK-16-KM6 – Side mounting, short

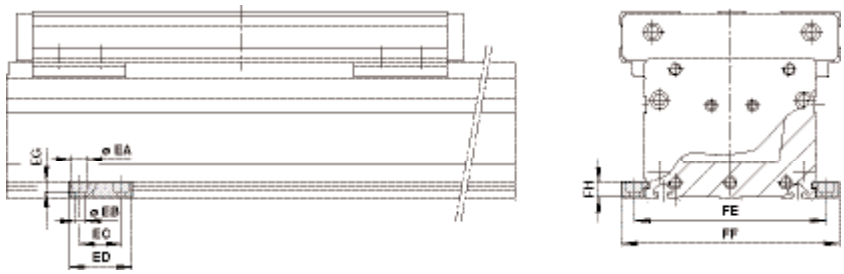


Ø	Ø FA	Ø FB	FC	FD	FE	FF	FG	FH
16	11	6,6	15	30	90	110	6,8	15
25	11	6,6	15	30	116	141	6,8	15
40	11	6,6	15	30	150	175	6,8	15
63	11	6,6	15	30	185	210	6,8	15

M/46800/PM LINTRA® heavy duty pneumatic cylinders

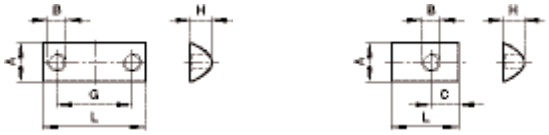
Double acting - cylinder sizes: 16, 25, 40 and 63

LBK-16-KM6 – Side mounting, short



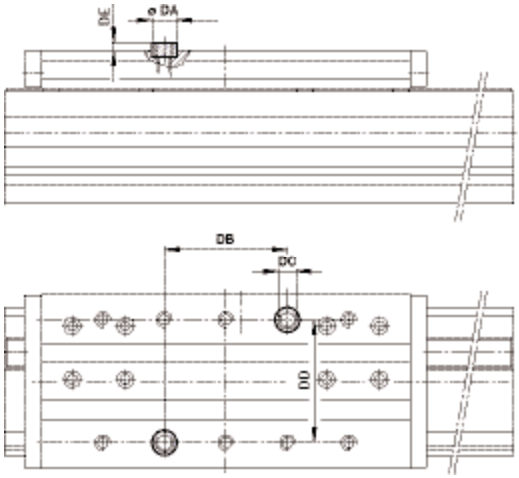
Ø	Ø EA	Ø EB	EC	ED	EG	FE	FF	FH
16	15	9	40	60	9	90	110	15
25	15	9	40	60	9	116	141	15
40	15	9	40	60	9	150	175	15
63	15	9	40	60	9	185	210	15

Groove key



MODELS	Ø	A	B	C	G	H	L	kg
LNS-M5	16	8	M5	4	–	4	11,5	0,002
LNS-M6	25...63	13,8	M6	6,5	–	7,3	23	0,011
LNS-2xM6	25...63	13,8	M6	–	26,5	–	36	0,010
LNS-2xM8	25...63	13,8	M8	–	64	7,3	76	0,036
M/P41858	25...63	13,8	M8	7,5	–	7,3	23	0,010

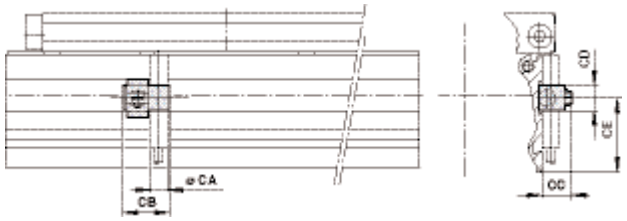
Centering sleeve



MODELS	Ø	Ø DA h6	DB ±0,01	DC	DD ±0,01	DE
LZS-16-12	16	12	60	M8	60	2,8
LZS-25-15	25	15	90	M10	90	2,8
LZS-40-18	40	18	120	M12	120	2,8
LZS-63-22	63	22	154	M16	154	2,8

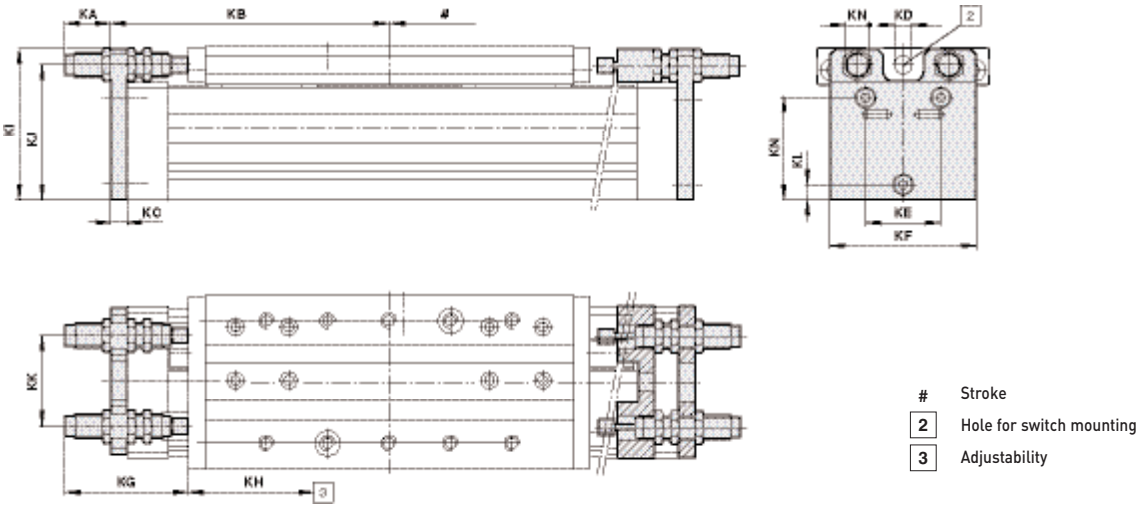
2 Centering sleeves are supplied with each toothed belt actuator

Mounting kit for proximity switch



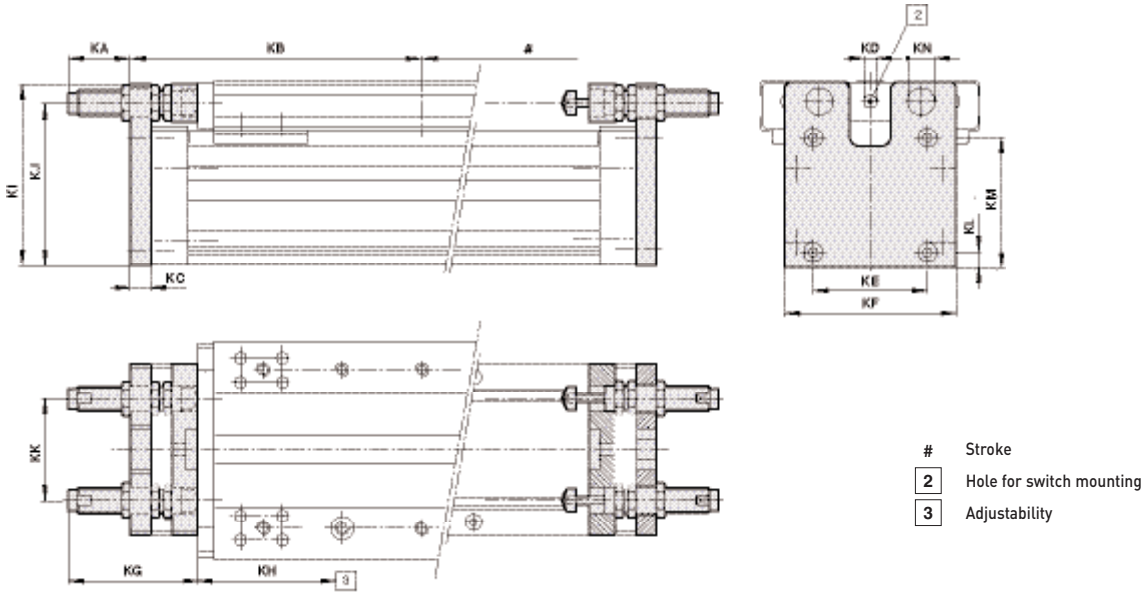
Ø	Ø CA	CB	CC	CD	CE	kg
16	8	22	15	12	35	0,05
25	8	22	15	12	48	0,05
40	8	22	15	12	66	0,05
63	8	22	15	12	90	0,05

QM/46800/P/67 – Mounting kit for shock absorbers
For cylinders with Ø 16 mm



#	Stroke
2	Hole for switch mounting
3	Adjustability

QM/46800/P/67 – Mounting kit for shock absorbers
For cylinders with Ø 25, 40 and 63 mm



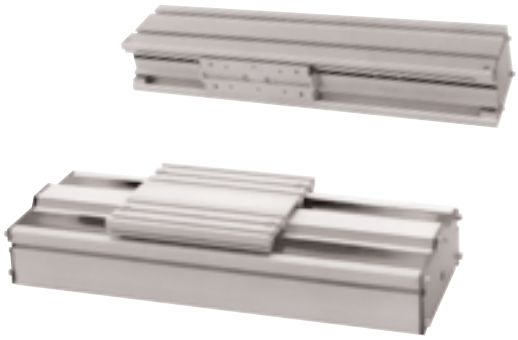
#	Stroke
2	Hole for switch mounting
3	Adjustability

MODELS	KA max.	KB	KC	Ø KD	KE	KF	KG	KH
M/46816/...	23,5	136	8	8,5	37	72	60,6	12
M/46825/...	34,5	175	10	8,5	68	96	79,5	21
M/46840/...	37,6	225	15	12,5	80	130	90,5	23
M/46863/...	57,5	280	20	12,5	110	165	124,5	40

MODELS	KI	KJ	KK	KL	KM	KN	Weight
M/46816/...	74,5	66,5	45	7,5	50,5	Ø 12,5 – M12 x 1	0,12 kg
M/46825/...	104,5	94,5	50	7	75	Ø 14,5 – M14 x 1,5	0,15 kg
M/46840/...	139	124	82	17	97	Ø 20,5 – M20 x 1,5	0,22 kg
M/46863/...	179	160,5	98	15	125	Ø 25,5 – M25 x 1,5	0,32 kg

LAP4, LAP8 Pneumatic linear drive

Cylinder sizes: 4 and 8



Torsional and bending resistant profiles

T-slots in the outer profile enable individual mounting options

Adjustable guiding system (LAP4)

Precise linear roller guiding (LAP8)

TECHNICAL DATA

Medium:
Filtered, lubricated or non-lubricated compressed air

Operation:
Double acting with cushioning

Operating pressure:
10 bar max.

Operating temperature:
-15°C ... +60°C max.
Consult our Technical Service for use below +2°C

Variants:
LAP4-50-K-A-... – 2 position cylinder, direct acting
LAP4-50-K-C-... – 2 position cylinder, double stroke
LAP8-63-K-A-... – 2 position cylinder, direct acting
LAP8-63-K-C-... – 2 position cylinder, double stroke

Maximum strokes:
2000 mm (direct acting, LAP4)
1500 mm (direct acting, LAP8)
3000 mm (double stroke, LAP4/LAP8)
Strokes longer as on request

MATERIALS

Guiding profile, anodised aluminium
End plate: steel, powder coated
Covering: polyamid
Seals: perbunan

OPTIONS SELECTOR

LAP★-★★★-★-★/★★★

Cylinder size	Substitute
Profile 100 x 135	4
Profile 250 x 110	8

Cylinder diameter (mm)	Substitute
50 (LAP4)	050
63 (LAP8)	063

Carriage variants	Substitute
Carriage length 200 mm (LAP4/LAP8)	K
Carriage length 300 (LAP4), 540 mm (LAP8)	L
Carriage length 180 mm, cross bar (only LAP8)	M

Cylinder variants	Strokes (mm)
LAP4 (direct acting)	max. 2000
LAP4 (double stroke)	max. 3000
LAP8 (direct acting)	max. 1500
LAP8 (double stroke)	max. 3000

Variants	Substitute
Direct acting	A
Double stroke	C

Note: Disregard option positions not used.
For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants. Additional variants/options are not possible.

ACCESSORIES

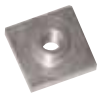
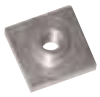
Proximity switch (inductive)	Connecting cable with socket M12 x 1
	
4314817	4542800, **PVC**, 3 x 0,25, 5 m
4314828	4542801, **PUR**, 3 x 0,25, 5 m

For information about proximity switches see page 293

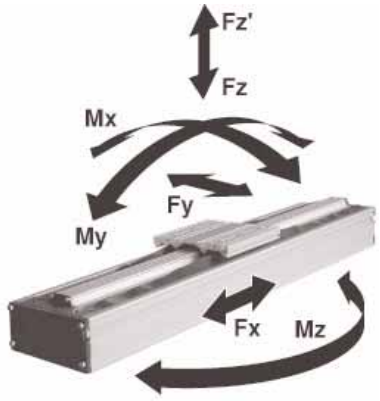
For further information

www.norgren.com/info/en1-132

MOUNTINGS

MODELS	Sensor activator LAP4	Sensor activator LAP8	Mounting for proximity switch	Mounting nut M6	Mounting nut M8
					
LAP4	11 195 73	–	11 195 72	11 112 00	11 112 01
LAP8	–	11 195 74	11 195 72	11 112 00	11 112 01

LAP4, LAP8



Loading values for pneumatic cylinders LAP4 and LAP8

The values given in the table below show the forces in the directions Fy, Fz and Fz' and the maximum moments Mx, My and Mz. All values are applicable for speeds up to 0,2 m/s. A requirement for using these values is a smooth movement of the mass over the whole stroke length of the cylinder. The reference point from which the moments for all cylinders should be calculated is the centre line of the piston.

Total loads

When a Cylinder has to take several loads and moments, an additional calculation is necessary using the following formula:

$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz\ (Fz')}{Fz\ (Fz')max} \leq 1$$

REPEATABILITY, SPEED AND LOADING VALUES

MODELS	Repeatability* (mm)	Max. speed* (m/s)	Max. operating pressure/force (bar/N)	Carriage (mm)	Loading values Fx (N)	Fy (N)	Fz/Fz' (N)	Mx (Nm)	My (Nm)	Mz (Nm)
LAP4	±1,0	1 m/s (direct acting) 2 m/s (double stroke)	6/840 (direct acting) 10/700 (double stroke)	200	870	500	500	20	40	40
				300	870	500	500	20	65	65
LAP8	±1,0	1 m/s (direct acting) 2 m/s (double stroke)	6/1440 (direct acting) 10/1200 (double stroke)	200	1440	1600	3200	450	210	160
				300	1440	2400	4800	640	1150	720
				540 (cross bar)	1440	1600	3200	320	210	160

* Dependent on stroke, load and motor.
The forces and moments indicated are max. individual loads in the elastic area. They decrease by superposition of forces and mements or by changing of the safety factor.

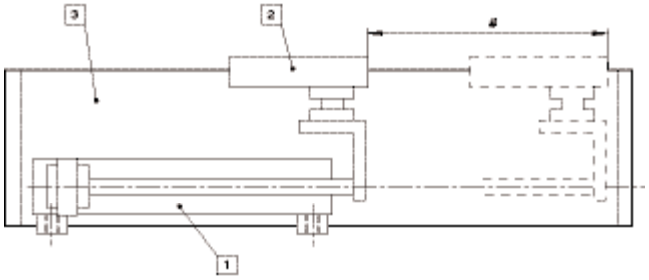
LAP4, LAP8 Pneumatic linear drive

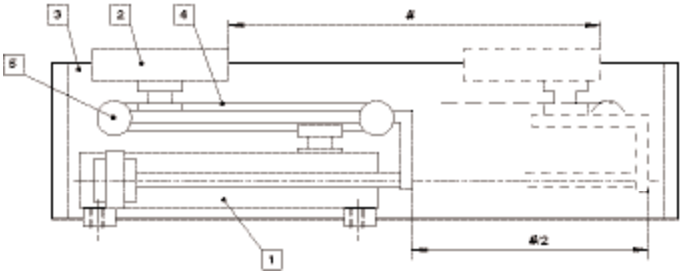
Cylinder sizes: 4 and 8

BASIC DIMENSIONS

LAP4, LAP8 – 2 position cylinder
direct acting

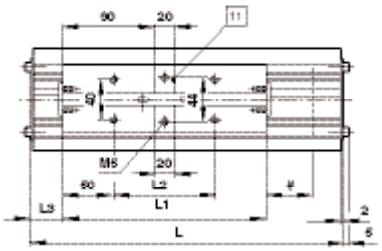
double stroke

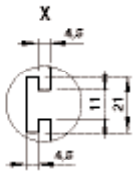


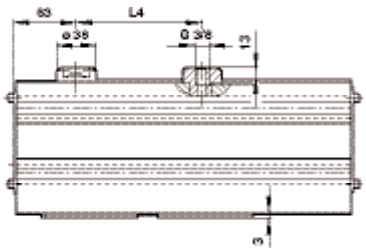


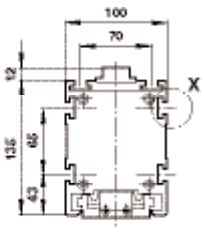
#	Stroke
1	Cylinder
2	Carrige
3	Body
4	Belt
5	Pulley

LAP4





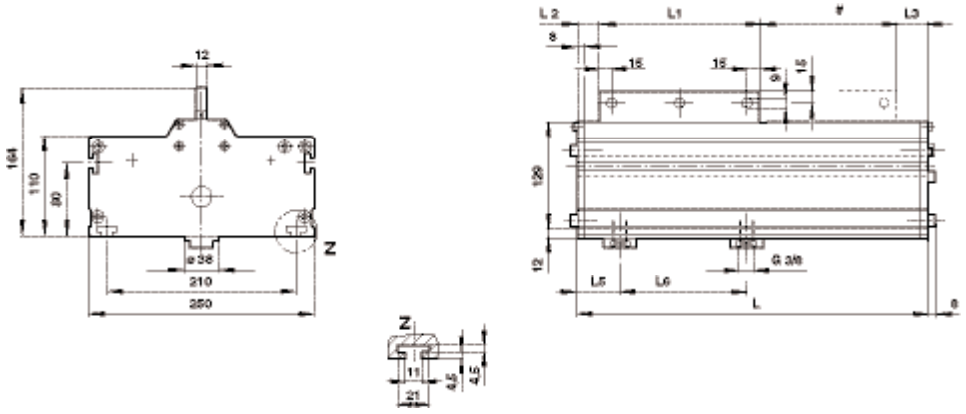




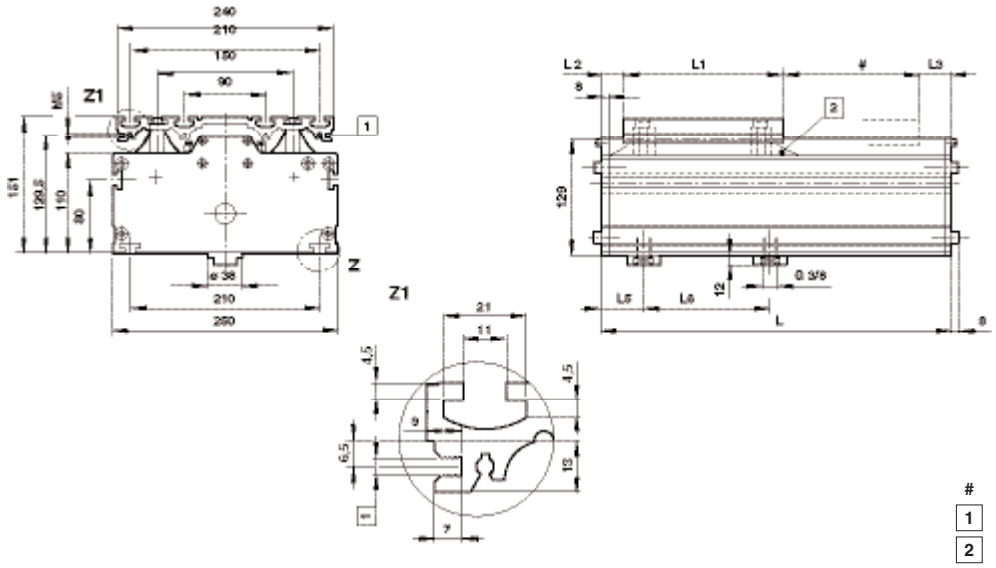
#	Stroke
11	Groove for sensor activator (1,7 mm deep)

MODELS (direct acting)	L	L1	L2	L3	L4	Weight at 0 mm	Weight per 100 mm	Weight of carriage
LAP4-50-K-A	260+(2 x stroke)	200	100	30+stroke	87+stroke	6,4 kg	2,75 kg	1,65 kg
LAP4-50-L-A	360+(2 x stroke)	300	200	30+stroke	87+stroke	7,6 kg	2,75 kg	1,95 kg
MODELS (double stroke)	**L**	**L1**	**L2**	**L3**	**L4**	**Weight at 0 mm**	**Weight per 100 mm**	**Weight of carriage**
LAP4-50-K-C	260+stroke	200	100	30	87+(1/2 x stroke)	8,2 kg	1,45 kg	1,65 kg
LAP4-50-L-C	360+stroke	300	200	30	87+(1/2 x stroke)	9,7 kg	1,45 kg	1,95 kg

LAP8 with cross bar



LAP8 with table plate



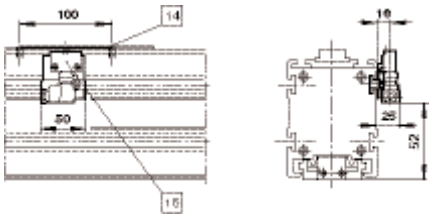
#	Stroke
1	Thread channel M5
2	Cover strip

MODELS (direct acting)	L	L1	L2	L3	L5	L6	Weight at 0 mm	Weight per 100 mm	Weight of carriage
LAP8-63-K-A	240+(2 x stroke)	200	15+stroke	25	38	74+stroke	13,8 kg	3,9 kg	5,2 kg
LAP8-63-L-A	600+(2 x stroke)	540	25+stroke	35	38	74+stroke	23,2 kg	3,9 kg	11,8 kg
LAP8-63-M-A	240+(2 x stroke)	180	25+stroke	35	38	74+stroke	13,7 kg	3,9 kg	4,8 kg
MODELS (double stroke)	**L**	**L1**	**L2**	**L3**	**L5**	**L6**	**Weight at 0 mm**	**Weight per 100 mm**	**Weight of carriage**
LAP8-63-K-C	250+stroke	200	25	25	49	74+(1/2 x stroke)	15,8 kg	1,85 kg	5,2 kg
LAP8-63-L-C	610+stroke	540	35	35	49	74+(1/2 x stroke)	25,2 kg	1,85 kg	11,8 kg
LAP8-63-M-C	250+stroke	180	35	35	49	74+(1/2 x stroke)	15,7 kg	1,85 kg	4,8 kg

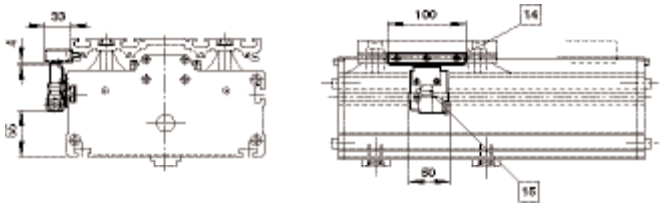
LAP4, LAP8 Pneumatic linear drive

Cylinder sizes: 4 and 8

Switch mounting LAP4



Switch mounting LAP4



14 Sensor activator

15 Proximity switch

Groove key (zinc coated steel)

MODELS	G	Weight
11 112 00	M6	0,006 kg
11 112 01	M8	0,006 kg

“Norgren reliable, durable and proven solutions”

Results-driven applications you can rely on

Norgren’s breadth and depth of industry and applications experience has been used to create a huge range of applications that have helped customers achieve competitive advantage.

Dedicated commercial and design teams work closely with customers to help them achieve strategic goals. They focus on finding answers to technically challenging problems and more efficient ways to approach existing applications.

PRINT

PET BOTTLING

COMMERCIAL VEHICLES

>>RELIABLE, DURABLE AND PROVEN technical knowledge and expertise

‘Innovative new solutions’

Skilled and dedicated resources develop smarter, more innovative, more effective solutions for a great many industry sectors such as:

Commercial vehicles • Electronics • Food • In plant Automotive • Medical care • Packaging • Paper • PET bottling • Print • Rail transportation

From ultra-fine control of a dosing valve for a child’s respirator, to the arduous environment of on-board vehicle suspension systems, Norgren optimises motion and fluid control technology performance. To find out how visit norgren.com

M/48200/H LINTRA® toothed belt cylinders

Roller guiding - cylinder sizes: 25, 40 and 63

- Proven LINTRA® precision roller guiding
- Torsional and bending resistant profiles
- High repeatability
- Alternative fixing possibilities

TECHNICAL DATA

Operation:
Actuation with toothed belt

Operating temperature:
-15°C ... +60°C max.
Consult our Technical Service for use below +2°C

Cylinder diameters:
25, 40 and 63

Maximum strokes:
3000 mm (25)
5500 mm (40 and 63)

MATERIALS

Guiding profile, carriage and end cover: anodised aluminium

Toothed belt: polyurethane with steel reinforcement

OPTIONS SELECTOR

M/482★★/H/★★/★★★★

Cylinder size	Substitute
25	**25**
40	**40**
63	**63**

Cylinder diameters (mm)	Strokes (mm)
25	**max. 3000**
40, 63	**max. 5500**

Motor position	Substitute
Right	**3**
Left	**4**

Cover strip	Substitute
With	(on request) **S**
Without	**I**

For further information

www.norgren.com/info/en1-138

ACCESSORIES

Proximity switch (inductive)	Connecting cable with socket M8 x 1	Connecting cable with socket M8 x 1
		
M/P70104/12	M/P73001/5, **PVC**, 3 x 0,25, 5 m	M/P73372/5, **PVC**, 3 x 0,25, 5 m
M/P70104/13	M/P73002/5, **PUR**, 3 x 0,25, 5 m	M/P73373/5, **PUR**, 3 x 0,25, 5 m

For information about proximity switches see page 293

MOUNTINGS

Cylinder size	Sensor activator for proximity switch	Mounting for proximity switch	Groove key M4	Groove key M5	Groove key M6	Groove key M8
						
25	QM/48225/64	QM/48225/22/64	M/P71586	LNS-M5	–	–
40	QM/48240/64	QM/48225/22/64	M/P71586	LNS-M5	–	–
63	QM/48263/64	QM/48225/22/64	–	LNS-M5	LNS-M6	M/P41858

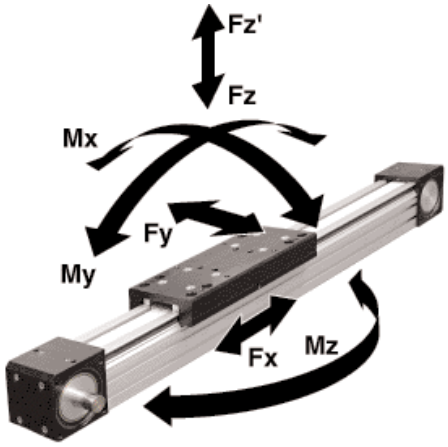
Cylinder size	Groove key 2 x M6	Groove key 2 x M8	Groove key for switch slot with M4	Groove key for switch slot with 2 x M3	Side mounting
					
25	–	–	M/P72816	LNS-2M3	QM/48225/32
40	–	–	M/P72816	LNS-2M3	QM/48240/32
63	LNS-2 x M6	LNS-2 x M8	M/P72816	LNS-2M3	QM/48263/32

Motor adaptors, motor couplings and motors are available on request

M/48200/H LINTRA® toothed belt cylinders

Roller guiding - cylinder sizes: 25, 40 and 63

M/48200/H



Loading values for LINTRA® toothed belt cylinders

The values given in the table below show the forces in the directions Fy, Fz and Fz' and the maximum moments Mx, My and Mz. All values are applicable for speeds up to 0,2 m/s. A requirement for using these values is a smooth movement of the mass over the whole stroke length of the cylinder. The reference point from which the moments for all cylinders should be calculated is the centre line of the piston.

Total loads

When a LINTRA® heavy duty cilinder has to take several loads and moments, an additional calculation is necessary using the following formula:

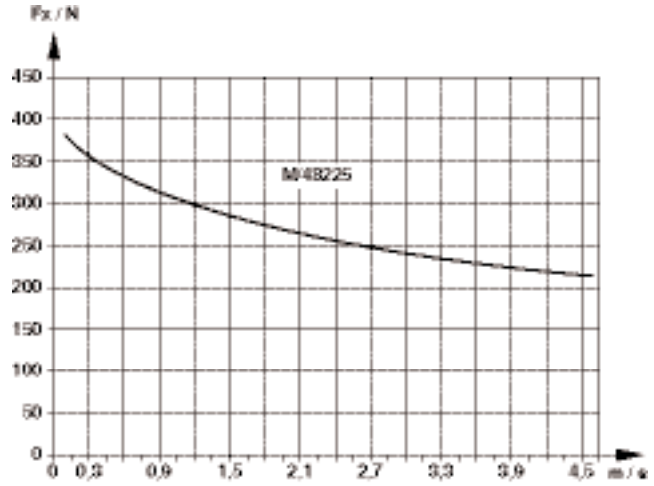
$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz\ (Fz')}{Fz\ (Fz')max} \leq 1$$

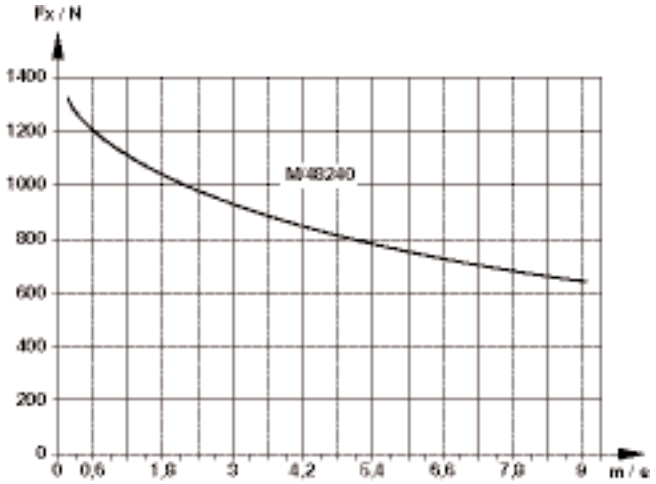
REPEATABILITY, SPEED AND LOADING VALUES

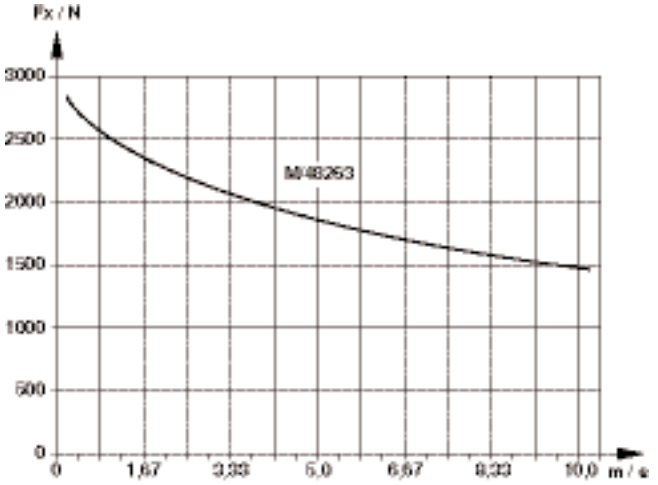
Cylinder size	Toothed belt (mm)	Repeatability*	Max. speed* (m/s)	Movement/ revolution (mm)	Strokes** (mm)	Loading values Fx (N)	Fy (N)	Fz/FZ' (N)	Mx (Nm)	My/Mz (Nm)
25	12 ATL 5	±0,1	4,5	90	3000 max.	380	590	1180	13	42
40	20 ATL 10	±0,1	8	170	5500 max.	1320	1500	3000	58	160
63	32 ATL 10	±0,1	10	250	5500 max.	2820	3200	6400	180	520

* Dependent on stroke, load and motor, ** Longer strokes on request.
The forces and moments indicated are max. individual loads in the elastic area. They decrease by superposition of forces and mements or by changing of the safety factor.

Maximum speed depending on Force or moments





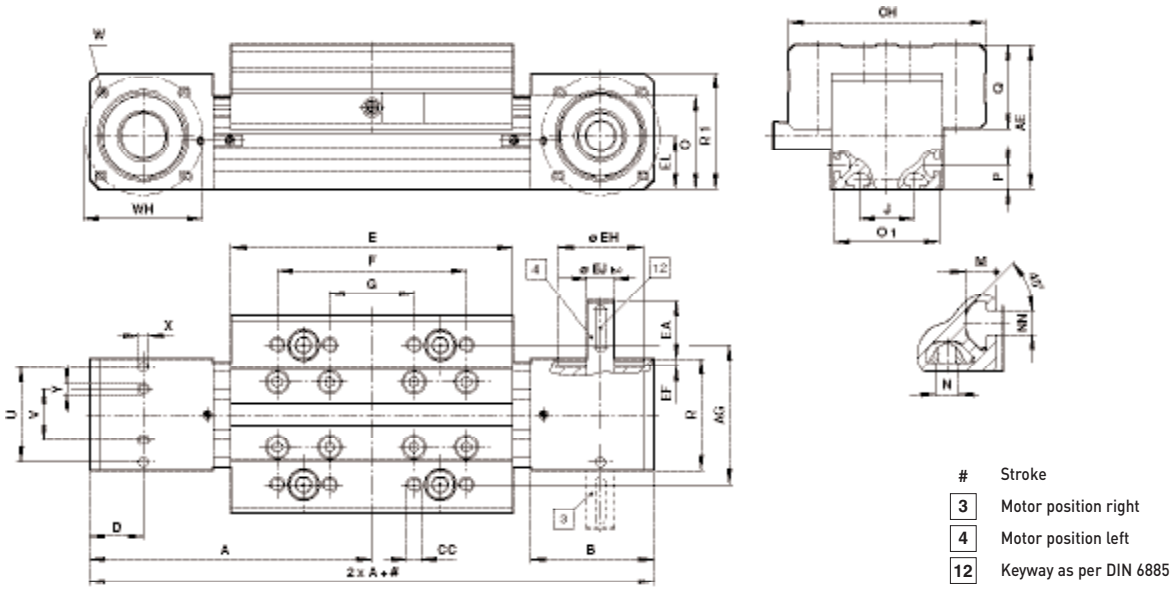


M/48200/H LINTRA® toothed belt cylinders

Roller guiding - cylinder sizes: 25, 40 and 63

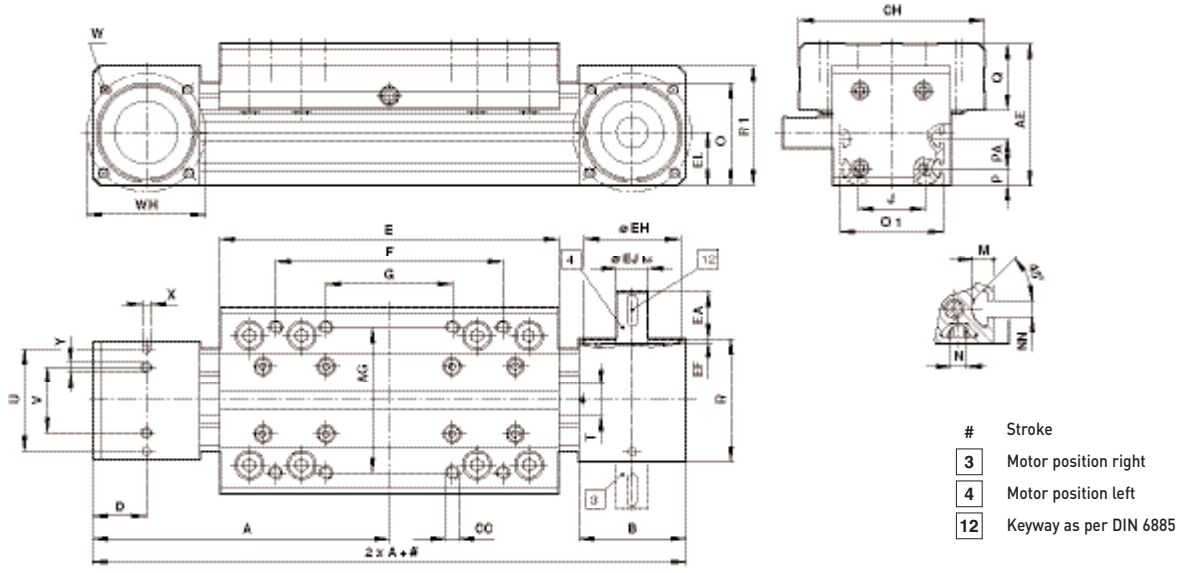
BASIC DIMENSIONS

M/48200/H – Standard Cylinders, size 25



#	Stroke
3	Motor position right
4	Motor position left
12	Keyway as per DIN 6885

M/48200/H – Standard Cylinders, sizes 40 and 63



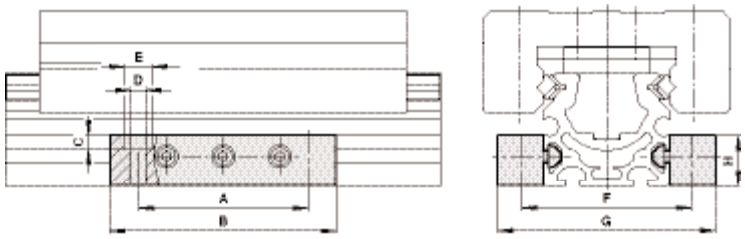
#	Stroke
3	Motor position right
4	Motor position left
12	Keyway as per DIN 6885

MODELS	A	AE	AG	B	CC	CH	D	E	EA	EF	Ø EH H7	Ø EJ h6
M/48225/H	130	62	60	53	M 6 x 14 *	85	23	130	25	2,5	37	12
M/48240/H	188	90	92	68	M 8 x 16 *	118	34	215	30	0,8	62	20
M/48263/H	275	122	110	100	M 10 x 20 *	140	50	320	40	1.9	90	25
MODELS	EL	F	G	J	M	N	NN	O	O1	P	PA	Q
M/48225/H	23	90	45	24	6,5	M 5	5	40	45	10,5	–	36
M/48240/H	33,5	150	80	43	6,5	M 5	5	65	65	11	19	42
M/48263/H	50	240	120	72	12	M 8	8	95	95	23	–	47
MODELS	R	R1	T	U	V	W	ØWH	ØX H11	Y	Weight at 0 mm	Weight per 100 mm	
M/48225/H	48	50	12	41	22	M 5 x 8 *	48	4 - 6 *	M 4 - 6 *	1,7	0,2	
M/48240/H	78	76	20	65	42	M 6 x 10 *	75	5 - 10 *	M 5 - 8 *	5,0	0,5	
M/48263/H	105	107	32	85	57	M 8 x 12 *	115	8 - 12 *	M 8 - 12 *	13,9	1,0	

* Deep

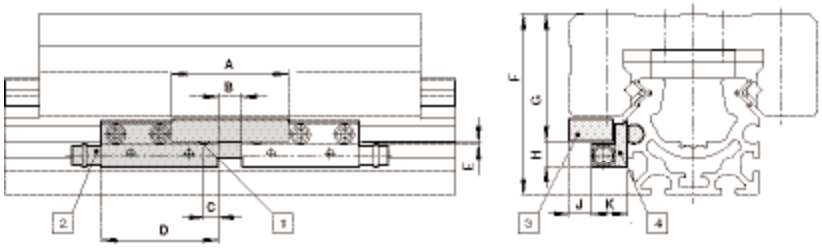
MOUNTINGS

QM/482../32 – with side mounting



MODELS	A	B	C	Ø D	Ø E	F	G	H	kg
M/48225/32	60	80	5	5,5	10	60	77	20	0,060
M/48240/32	80	100	5	5,5	10	82	97	20	0,075
M/48263/32	100	120	5	9	15	113	131	25	0,210

QM/482../64 – Sensor activator
QM/482../22/64 – Mounting kit for proximity switch



1 Active area
2 Proximity switch
3 Active area
4 Mounting kit

MODELS	A	B min.	C	D	E	F	G	H	J	K	kg
M/48225	40	8	5	40	0 - 2	52,5	43,5	9,5	8	12	0,035
M/48240	40	8	5	40	0 - 2	90	49	9,5	14,5	12	0,045
M/48263	40	8	5	40	0 - 2	122	59	9,5	10,5	12	0,060

Groove key

MODELS	Cylinder size	A	B	C	G	H	L	kg
M/P71586	25...40	8	M4	6	–	4	11,5	0,002
M/P72816	25...63	6,45	M4	7,5	–	5,3	15	0,002
LNS-M5	25...63	8	M5	4	–	4	11,5	0,002
LNS-M6	63	13,8	M6	6,5	–	7,3	23	0,011
LNS-2xM6	63	13,8	M6	–	26,5	–	36	0,010
LNS-2xM8	63	13,8	M8	–	64	7,3	76	0,036
M/P41858	63	13,8	M8	7,5	–	7,3	23	0,010

M/48800/P LINTRA® toothed belt cylinders

Heavy duty version - cylinder sizes: 16, 25, 40 and 63

- Heavy loads, precise linear guiding
- High dynamics
- Torsional and bending resistant profiles
- High repeatability
- Alternative fixing possibilites

TECHNICAL DATA

Operation:
Actuation with toothed belt

Operating temperature:
-15°C ... +60°C max.
Consult our Technical Service for use below +2°C

Cylinder diameters:
16, 25, 40 and 63

Maximum strokes:
5700 mm (16)
5600 mm (25)
5500 mm (40)
4000 mm (63)

Maximum speeds:
3 m/s
Dependent on load, stroke and speed

MATERIALS

Guiding profile, carriage and end cover: anodised aluminium
Toothed belt: polyurethane with steel reinforcement

OPTIONS SELECTOR

M/488★★/P/I★/★★★★

Cylinder size	Substitute
16	**16**
25	**25**
40	**40**
63	**63**

Cylinder diameters (mm)	Strokes (mm)
16	**max. 5700**
25	**max. 5600**
40	**max. 5500**
63	**max. 4000**

Motor position	Substitute
Right	**3**
Left	**4**

ACCESSORIES

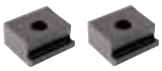
Proximity switch (inductive)	Proximity switch (inductive)	Connecting cable with socket M8 x 1	Connecting cable with socket M8 x 1
			
M/P70104/10	M/P70104/5	M/P73001/5, **PVC**, 3 x 0,25, 5 m	M/P73372/5, **PVC**, 3 x 0,25, 5 m
M/P70104/11	M/P70104/6	M/P73002/5, **PUR**, 3 x 0,25, 5 m	M/P73373/5, **PUR**, 3 x 0,25, 5 m

For information about proximity switches see page 293

For further information
www.norgren.com/info/en1-144

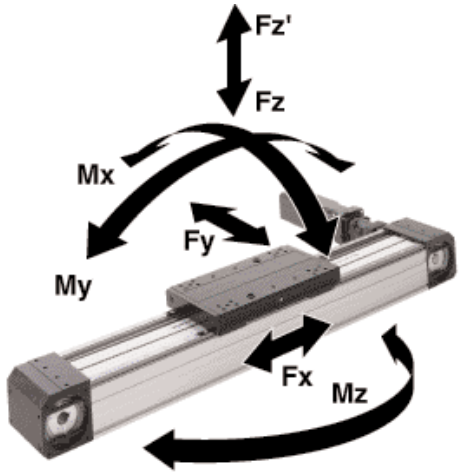
MOUNTINGS

Cylinder size	Mounting for proximity switch	T-nut M5	T-nut M6	T-nut M8	T-nut 2 x M6	T-nut 2 x M8	Centering sleeve
							
16	QM/46816/22/64	LNS-M5	–	–	–	–	LZS-16-12
25	QM/46816/22/64	–	LNS-M6	M/P41858	LNS-2 x M6	LNS-2 x M8	LZS-25-15
40	QM/46816/22/64	–	LNS-M6	M/P41858	LNS-2 x M6	LNS-2 x M8	LZS-40-18
63	QM/46816/22/64	–	LNS-M6	M/P41858	LNS-2 x M6	LNS-2 x M8	LZS-63-22

Cylinder size	Side mounting, short	Side mounting, long	Mounting kit for parabola puffer *	Parabola puffer	Mounting kit for shock absorber *	Shock absorber
						
16	LBK-16-KM6	LBK-40/63-2 x KM8	QM/48816/P/87	LPP-00	on request	on request
25	LBK-16-KM6	LBK-40/63-2 x KM8	QM/48825/P/87	LPP-25/40	on request	on request
40	LBK-16-KM6	LBK-40/63-2 x KM8	on request	on request	QM/48840/P/67	LSD 225 MH
63	LBK-16-KM6	LBK-40/63-2 x KM8	on request	on request	QM/48863/P/67	LSD 600 MH

* To cushion both end positions 2 mounting kits have to be ordered

M/48800/P



Loading values for LINTRA® toothed belt cylinders

The values stated in the tables show the single forces in the directions Fy and Fz as well as the maximum moments Mx, My and Mz for a speed of ⩽ 0,2 m/s respectively. A requirement for using these values is a smooth constant movement of the mass over the whole stroke length of the cylinder. The reference point from which the moments for all cylinders should be calculated is the centerline of the carriage.

Total loads

When a LINTRA® heavy duty cilinder has to take several loads and moments, an additional calculation is necessary using the following formula:

$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz}{Fz\ max} \leq 1$$

Cylinder size (mm)	Toothed belt	Repeatability* (mm)	Max. speed* (m/s)	Movement/ revolution (mm)	Max. Acceleration (m/s)	Max. Strokes** (mm)	Loading values Fx (N)	Fy (N)	Fz (N)	Fz' (N)	Mx (Nm)	My (Nm)	Mz (Nm)
16	1 x 25 AT5	± 0,1	3	110	10	5700	600	3000	3000	3000	80	300	300
25	2 x 16 AT10	± 0,1	3	220	10	5600	1300	4200	5000	4200	250	500	500
40	2 x 25 ATL10	± 0,1	3	260	10	5500	3000	7200	8500	7200	600	1200	1200
63	2 x 40 ATL10	± 0,1	3	350	10	4000	4500	10000	12000	10000	1200	2400	2400

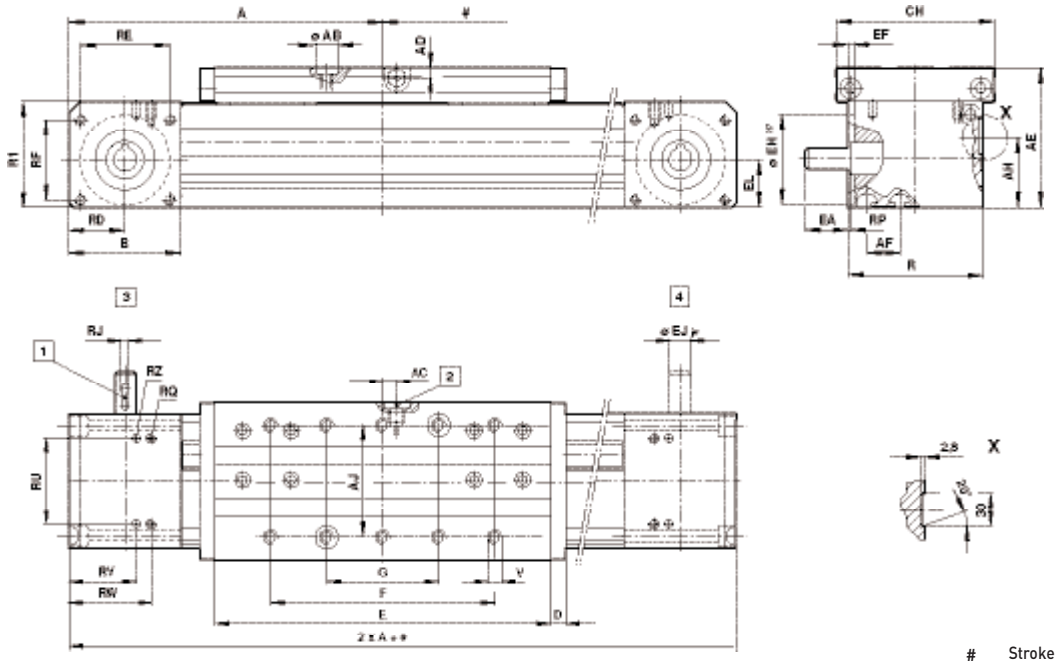
* Dependent on stroke, load and motor, ** Longer strokes on request.
Motor adaptors and couplings as well as motors are available on request.

M/48800/P LINTRA® toothed belt cylinders

Heavy duty version - cylinder sizes: 16, 25, 40 and 63

BASIC DIMENSIONS

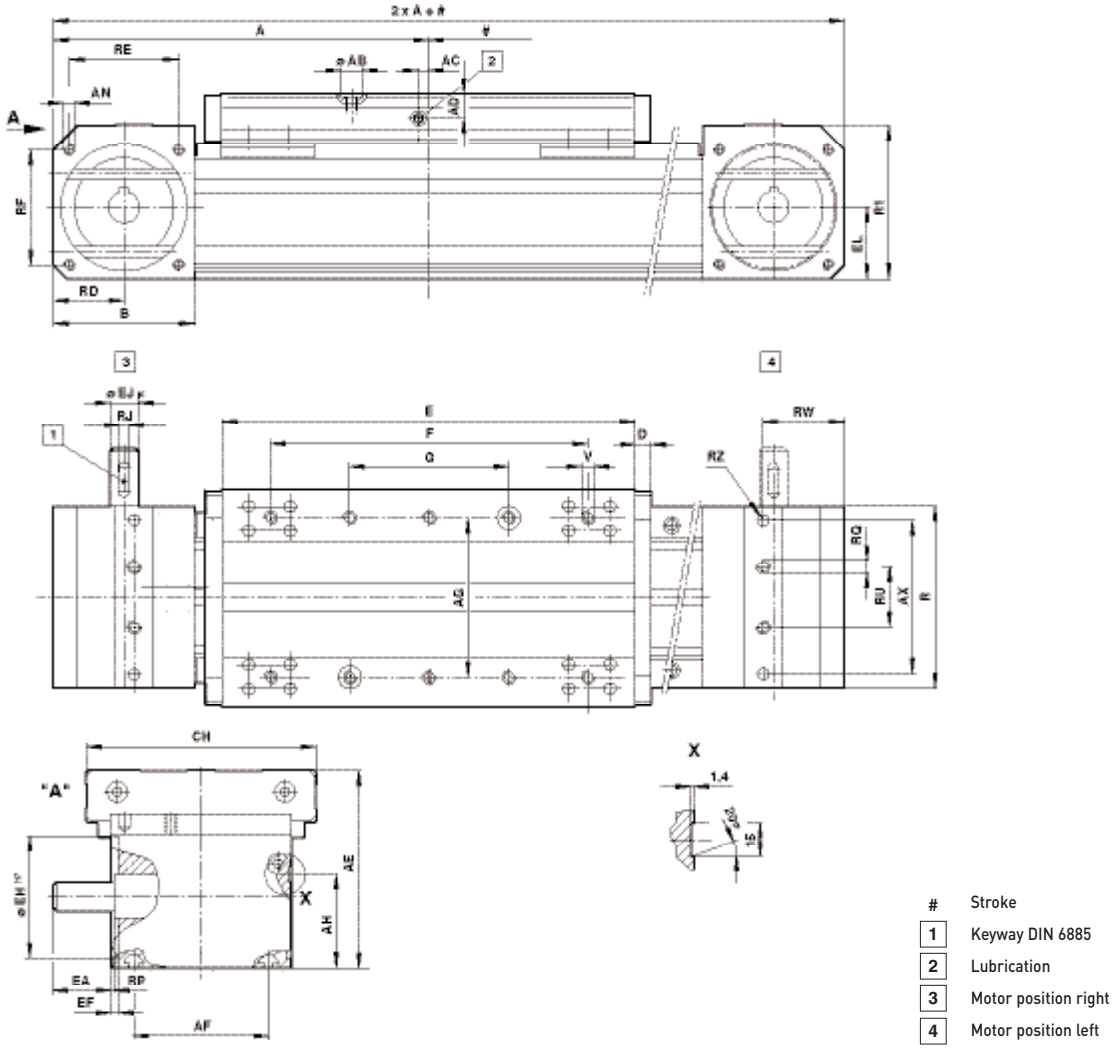
M/48800/P – Standard Cylinders, size 16



#	Stroke
1	Keyway DIN 6885
2	Lubrication
3	Motor position right
4	Motor position left

MODELS	A	AB H7	AC	AD	AE	AF	AG	AH	AI	B	CH	D
M/48816/...	168	12	7,5	5,5	75	18	60	35	18	60	85	8
MODELS	**E**	**EA**	**EF**	**Ø EH H7**	**Ø EJ j6**	**F**	**G**	**R**	**RD**	**RE**	**RF**	**RJ**
M/48816/...	180	24	3,5	48	12	120	60	72	30	48	43	4 x 4 x 22
MODELS	**R1**	**RP**	**RQ**	**RU**	**RV**	**RW**	**Ø RZ H7**	**V**	**Weight at 0 mm**		**Weight per 100 mm**	
M/48225/H	57,5	2	M5	46	36	44	4	10 x M6	2,9 kg		0,68 kg	

M/48800/P – Standard Cylinders, sizes 25, 40 and 63 mm



#	Stroke
1	Keyway DIN 6885
2	Lubrication
3	Motor position right
4	Motor position left

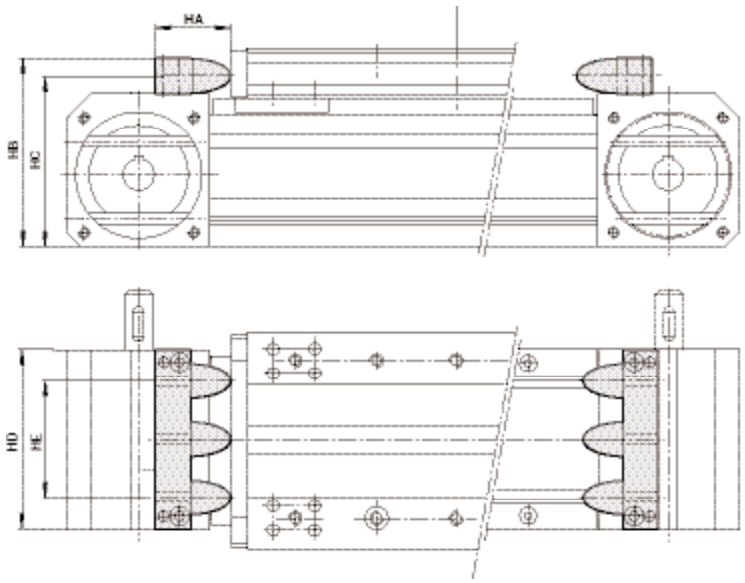
MODELS	Size	A	AB H7	AC	AD	AE	AF	AG	AH	AN	AX	B	CH	D	E
M/48825/...	25	230	15	7	12	105	67	90	48	M6-16*	83	90	125	10	240
M/48840/...	40	288	18	0	18,5	140	95	120	66	M8-16*	112	108	170	12	320
M/48863/...	63	354	22	0	24	180	130	154	90	M8-16*	140	129	210	15	400
MODELS	Size	EA	EF	Ø EH H7	Ø EJ j6	EL	F	G	R	RD	RE	RJ	RP	RQ	RU
M/48825/...	25	27,5	4,5	75	19	42,5	180	90	96	45	70	6 x 6 x 28	3,5	25M6	9,5
M/48840/...	40	31	6	90	22	51,5	240	120	130	56	80	6 x 6 x 32	5	40M8	40
M/48863/...	63	44	7	115	28	65	308	154	105	64,5	100	6 x 6 x 45	5	63M10	55
MODELS	Size	RF	RW	Ø RZ H7	R1	V	Weight at 0 mm		Weight per 100 mm						
M/48825/...	25	70	60	6	84,5	10 x M8 x 12*	6,0 kg		1,08 kg						
M/48840/...	40	80	65,5	8	108	10 x M10 x 15*	14,0 kg		1,95 kg						
M/48863/...	63	105	74	10	140,5	10 x M12 x 18*	27,7 kg		3,14 kg						

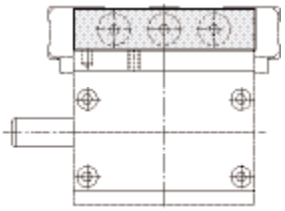
* Deep

M/48800/P LINTRA® toothed belt cylinders

Heavy duty version - cylinder sizes: 16, 25, 40 and 63

QM/488../P/87 – Mounting kit for parabola buffer



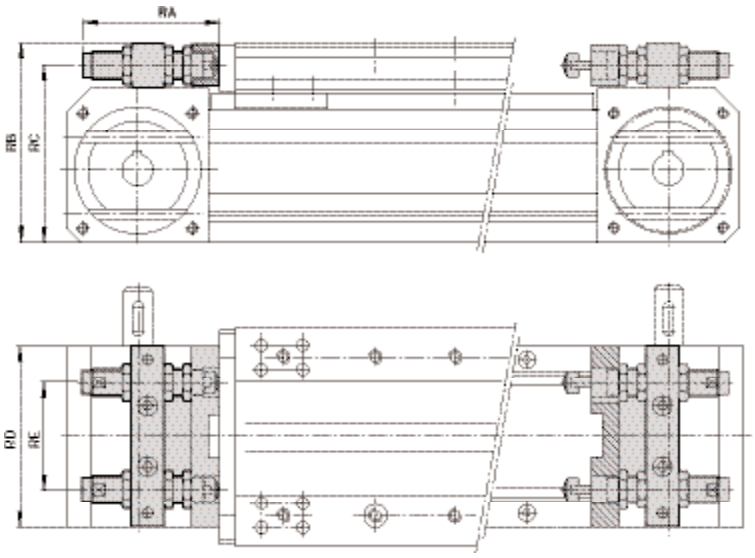


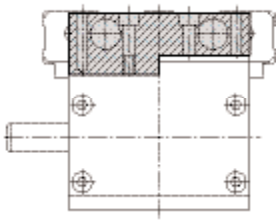
MODELS	Size	HA	HB	HC	HD	HE	kg
QM/48816/P/87	16	37	74,5	66	72	34	0,12
QM/48825/P/87	25	45	104,5	94	96	60	0,15

Parabola buffers have to be ordered separately.

Size 16, 2 pcs. for each end, Size 25, 3 pcs. for each end
(2 Mounting kits for both end positions).

QM/488../P/67 – Mounting kit for shock absorbers

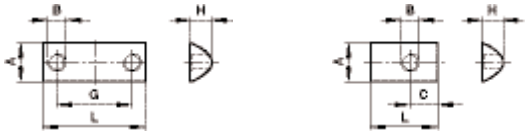




MODELS	Size	RA	RB	RC	RD	RE	kg
QM/48840/P/67	40	90,5	139	124	130	82	0,20
QM/48863/P/67	63	124,5	179	160,5	165	98	0,30

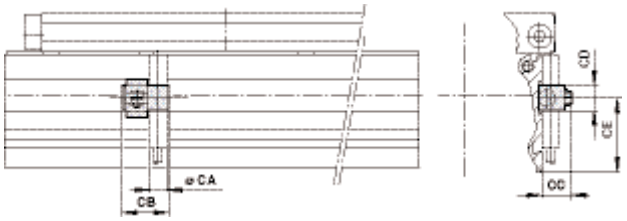
Shock absorbers have to be ordered separately.
(2 Mounting kits for both end positions).

Groove key



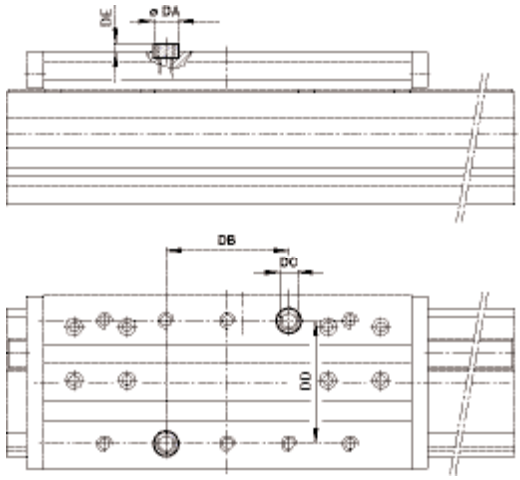
MODELS	Sizes	A	B	C	G	H	L	kg
LNS-M5	16	8	M5	4	–	4	11,5	0,002
LNS-M6	25...63	13,8	M6	6,5	–	7,3	23	0,011
LNS-2xM6	25...63	13,8	M6	–	26,5	–	36	0,010
LNS-2xM8	25...63	13,8	M8	–	64	7,3	76	0,036
M/P41858	25...63	13,8	M8	7,5	–	7,3	23	0,010

Mounting kit for proximity switch
Cylinder sizes 16 ... 63 mm



Size	Ø CA	CB	CC	CD	CE	kg
16	8	22	15	12	35	0,05
25	8	22	15	12	48	0,05
40	8	22	15	12	66	0,05
63	8	22	15	12	90	0,05

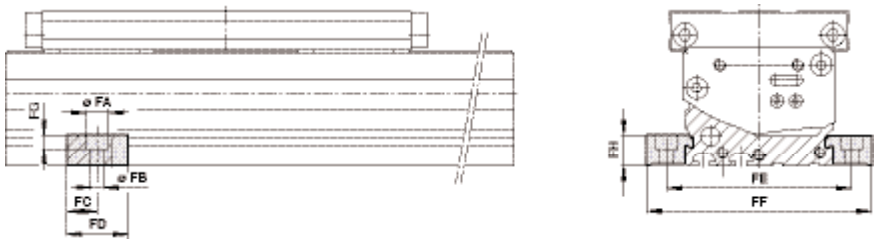
LZS – Centering sleeve
Cylinder sizes 16 ... 63 mm



MODELS	Sizes	Ø DA ^{h6}	DB $^{\pm 0,01}$	DC	DD	DE
LZS-16-12	16	12	60	M8	60	2,8
LZS-25-15	25	15	90	M10	90	2,8
LZS-40-18	40	18	120	M12	120	2,8
LZS-63-22	63	22	154	M16	154	2,8

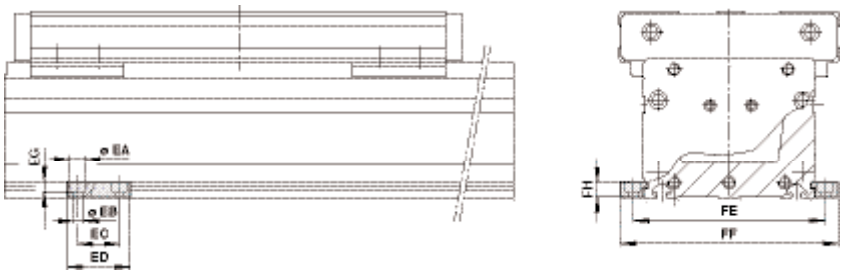
2 Centering sleeves are supplied with each toothed belt actuator

LBK-16-KM6 – Side mounting, short



Size	Ø FA	Ø FB	FC	FD	FE	FF	FG	FH
16	11	6,6	15	30	90	110	6,8	15
25	11	6,6	15	30	116	141	6,8	15
40	11	6,6	15	30	150	175	6,8	15
63	11	6,6	15	30	185	210	6,8	15

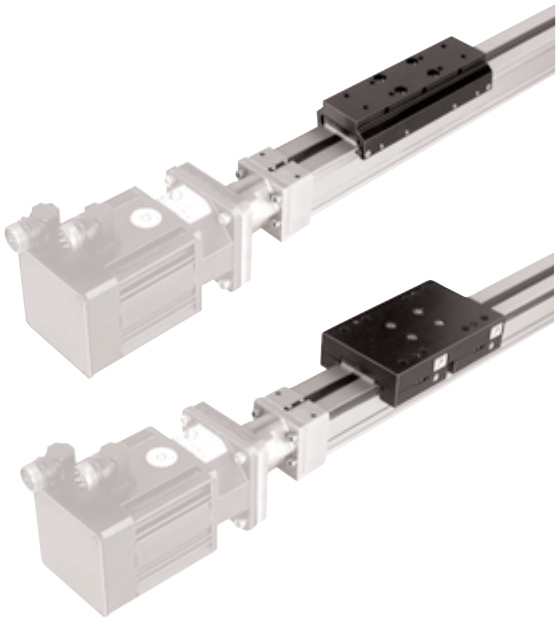
LBK-40/63-2 x KM8 – Side mounting, long



Size	Ø EA	Ø EB	EC	ED	EG	FE	FF	FH
16	15	9	40	60	9	90	110	15
25	15	9	40	60	9	116	141	15
40	15	9	40	60	9	150	175	15
63	15	9	40	60	9	185	210	15

M/49000, M/49100, M/49200 LINTRA® Spindle

Internal, external and precision roller guided - Ø 25 ... 63 mm



High forces

Precise positioning

High repeatability

Constant, defined high and low speed operation

Proven LINTRA® guiding systems

Interchangeable with LINTRA® pneumatic cylinders series M/46000

MATERIALS

End covers, yoke, carriage, cover and barrel: anodised aluminium
Cover strip: polyamide

TECHNICAL DATA

Operation:
Electric spindle drive

Cylinder variants:
M/49000
Internal guide (32, 40, 63 mm)
M/49100
External guide, external adjustable guiding (25, 32, 40, 50, 63 mm)
M/49200
Precision roller guiding (25, 32, 40, 50, 63 mm)

Operating temperature:
-20°C ... +80°C max.
Consult our Technical Service for use below +2°C

Cylinder diameters:
25, 32, 40, 50, 63 mm

Maximum strokes:
1250 mm (25)
5000 mm (32, 40, 50, 63)

Maximum speeds*:
2,5 m/s

Forces*:
500 ... 6000 N

Repeatability*:
+/-0,05 mm (single nut)
+/-0,01 mm (double nut)

* dependent on load, stroke and speed

OPTIONS SELECTOR

M/49★★★/★★/★★★/★★★★

Guiding system	Substitute
Internal	0
External, adjustable	1
Precision roller	2

Cylinder diameters (mm)	Substitute
25	25
32	32
40	40
50	50
63	63

Spindle types	Substitute
Ball screw	B
Lead screw	L

Cylinder sizes (Ball screw)	Strokes (mm)
25 mm	max. 1250
32, 40, 50, 63 mm	max. 5000
Cylinder sizes (Lead screw)	**Strokes (mm)**
25, 32 mm	max. 2700
40, 50, 63 mm	max. 2500

Number of spindle supports
0, 2, 4, 6

Thread pitch
2 ... 50 mm

Spindle nuts	Substitute
Single nut (standard)	S
Double nut (on request)	D

Note: Disregard option positions not used.
For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants.
Additional variants/options are not possible.

ACCESSORIES

Proximity switch (inductive)	Output

SPC/008001/2	Normally closed
SPC/008002/2	Normally open

For information about proximity switches see page 293

For further information

www.norgren.com/info/en1-150

MOUNTINGS

Ø	V	Sensor bracket (M/49000, M/49100, M/49200)	Sensor activator (M/49000)	Sensor activator (M/49100)	Sensor activator (M/49200)
					
25	QM/46025/32	SPC/Q008003/22	–	SPC/Q008009/21	SPC/Q008014/21
32	QM/46032/32	SPC/Q008004/22	SPC/Q008004/21	SPC/Q008010/21	SPC/Q008015/21
40	QM/46040/32	SPC/Q008004/22	SPC/Q008005/21	SPC/Q008011/21	SPC/Q008016/21
50	QM/46050/32	SPC/Q008004/22	–	SPC/Q008012/21	SPC/Q008017/21
63	QM/46063/32	SPC/Q008004/22	SPC/Q008007/21	SPC/Q008013/21	SPC/Q008018/21

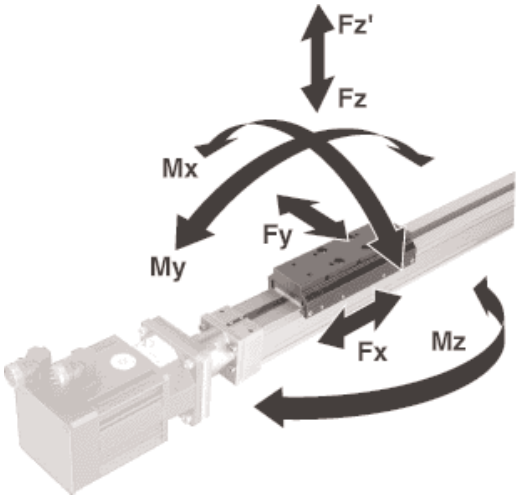
SPINDLE FEATURES

Ø	Spindle type	Repeatability *3) (mm)	Max. speed *1) (m/s)	Max. Acceleration *2) (m/s)	Neutral side load *2) (Nm)	Spindle Ø (mm)	Thread pitch (mm)
25	Ball screw	±0,05	0,25	20	0,3	12	5
	Lead screw	±0,2	0,3	5	0,4	12	2, 4, 6, 12
32	Ball screw	±0,05	1,0	20	0,6	16	5, 10, 20 *4)
	Lead screw	±0,2	0,2	5	0,7	16	4, 8
40	Ball screw	±0,05	2,5	20	0,7	20	5, 20, 50
	Lead screw	±0,2	0,2	5	0,8	20	4, 8
50	Ball screw	±0,05	1,25	20	0,9	25	5, 10, 25
	Lead screw	±0,2	0,25	5	1,0	24	5, 10
63	Ball screw	±0,05	2,0	20	1,0	32	5, 10, 20, 40
	Lead screw	±0,2	0,3	5	1,2	30	6, 12

*1) According to screw drive and length (note the rotation speed)
*2) The idle torques depend on the screw drive, the rotation speed and the adjustment of the guiding
*3) Versions with single nut, higher repeatability on request

Please note that the operation time of lead screw spindles must not exceed 30 % of the maximum time.
*4) Max. stroke: 2900 mm with pitch 20 mm
Further pitches on request

M/49000, M/49100, M/49200



Loading values for LINTRA® toothed belt cylinders

The values given in the table below show the forces in the directions Fy, Fz and Fz' and the maximum moments Mx, My and Mz. All values are applicable for speeds up to 0,2 m/s. A requirement for using these values is a smooth movement of the mass over the whole stroke length of the cylinder. The reference point from which the moments for all cylinders should be calculated is the centre line of the piston.

Total loads

When a LINTRA® Cylinder has to take several loads and moments, an additional calculation is necessary using the following formula:

$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz\ (Fz')}{Fz\ (Fz')max} \leq 1$$

Ø	Fx (N)	Internal guide M/49000 Fy, Fz/Fz' (N)	Mx - Mz (Nm)	External, adjustable guide M/49100 Fy, Fz/Fz' (N)	Mx (Nm)	My, Mz (Nm)	Precision roller guiding M/49200 Fy (N)	Fz/Fz' (N)	Mx (Nm)	My, Mz (Nm)
25	500	–	–	590	9	28	590	1180	13	42
32	1200	0	0	780	17	43	780	1560	25	64
40	3000	0	0	1500	39	110	1500	3000	58	160
50	4500	–	–	2000	65	160	2000	4000	97	240
63	6000	0	0	3200	120	350	3200	6400	180	520

Loading values applicable to a speed of ⩽ 0,2 m/s. Maximum working life is normally reached below a speed of 1 m/s

M/49000, M/49100, M/49200 LINTRA® Spindle

Internal, external and precision roller guided - Ø 25 ... 63 mm

Centre support style V

In order to prevent exceeding the max. deflection, centre support mountings have to be used. (For dimensions please see the mountings table.)

MODELS	Maximum distance between the centre support
M/49032	1500 mm
M/49040	1650 mm
M/49063	2000 mm

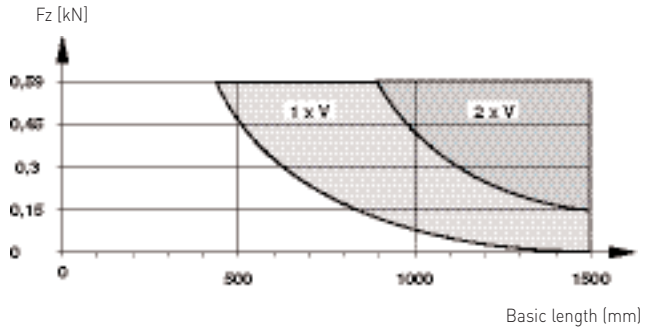
LINTRA® Spindle with internal guide Cylinder sizes 32, 40 and 63 mm

The models with internal guiding cannot take any force Fz, therefore, the maximum width between supports depends only on their own weight.

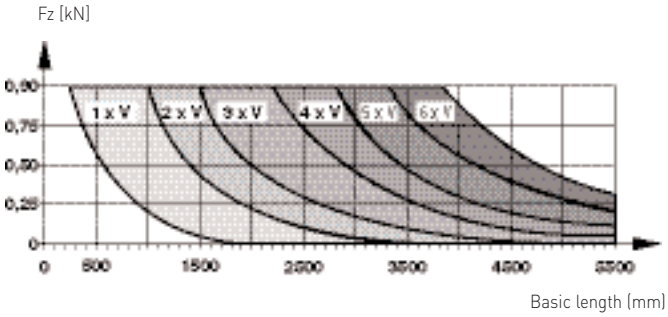
LINTRA® Spindle with external adjustable guide Cylinder sizes 25 ... 63 mm

The models with internal guiding cannot take any force Fz, therefore, the maximum width between supports depends only on their own weight.

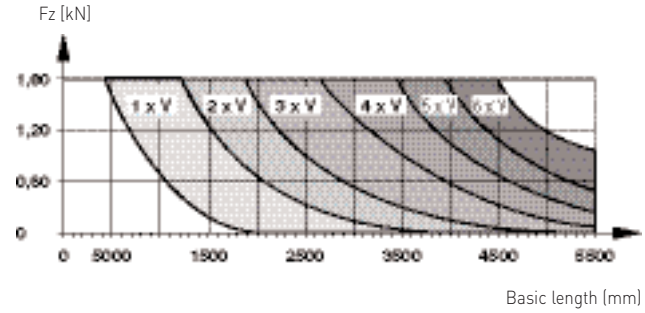
M/49125



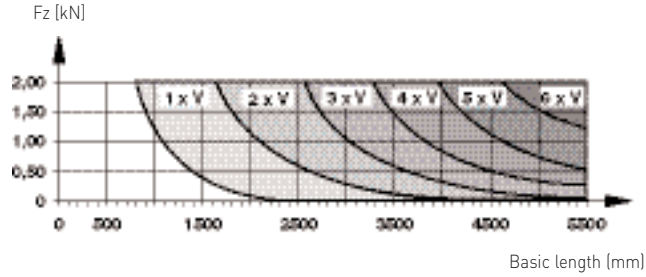
M/49132



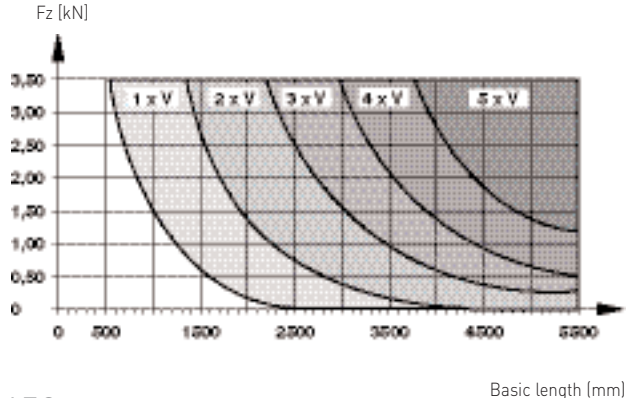
M/49140



M/49150

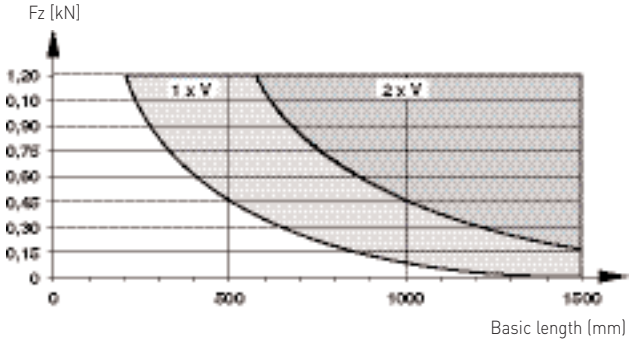


M/49163

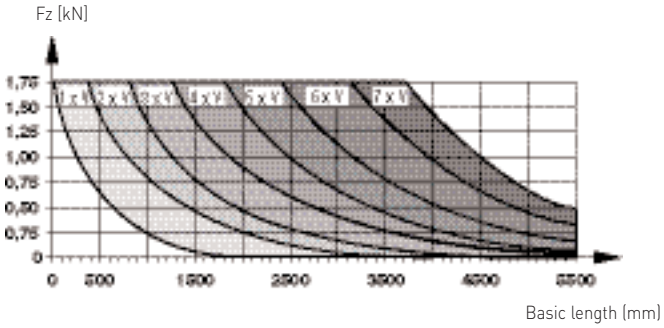


LINTRA® Spindle with precision roller guide
Cylinder sizes 25 ... 63 mm

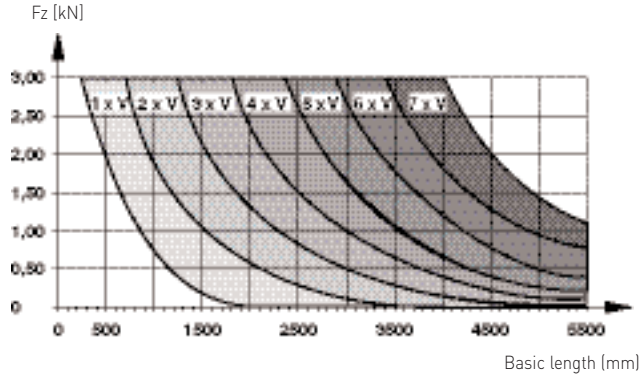
M/49225



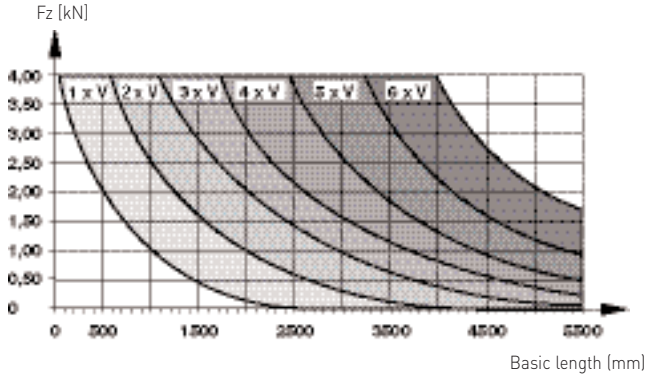
M/49232



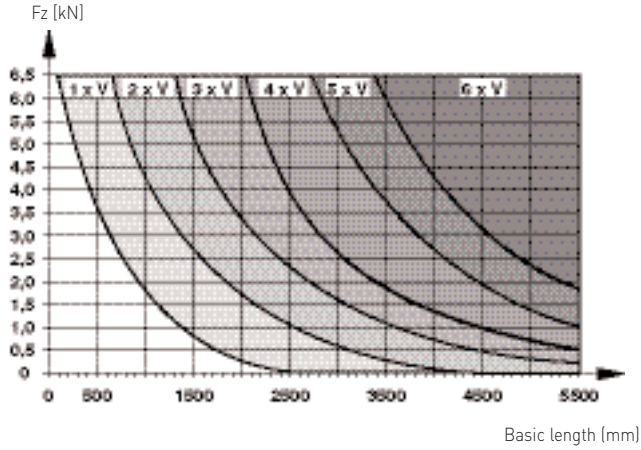
M/49240



M/49250



M/49263



M/49000, M/49100, M/49200 LINTRA® Spindle

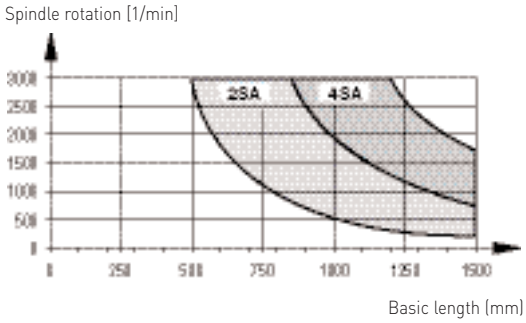
Internal, external and precision roller guided - Ø 25 ... 63 mm

Spindle support (SA)
M/49000 (32, 40, 63 mm)
M/49100 (25, 32, 40, 50, 63 mm)
M/49200 (25, 32, 40, 50, 63 mm)

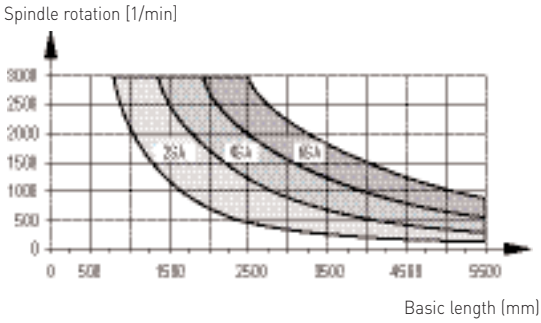
Spindle supports (SA) have to be used in order to reach high speed at longer strokes. By using SA's to support the spindle drive the critical rotation speed can be increased. Please refer to the diagrams for the number of SA's. The total length of the spindle actuator is increased by 40 mm per two SA's.

Attention: Please note that the max. rotation speed for lead screws is 1500 min^{-1} and for ball screws 3000 min^{-1}.

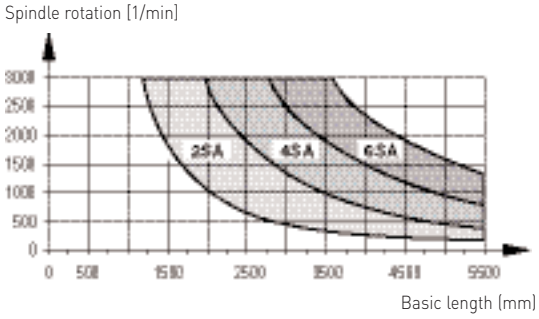
25 mm



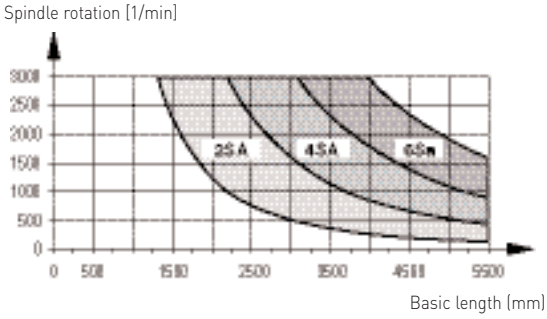
32 mm



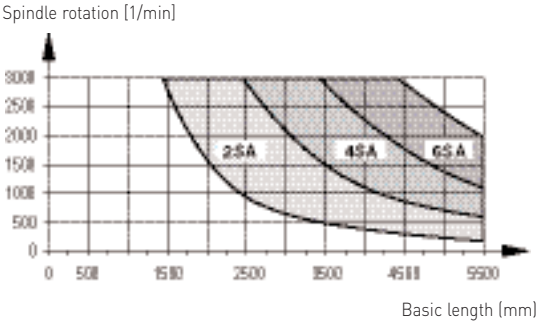
40 mm



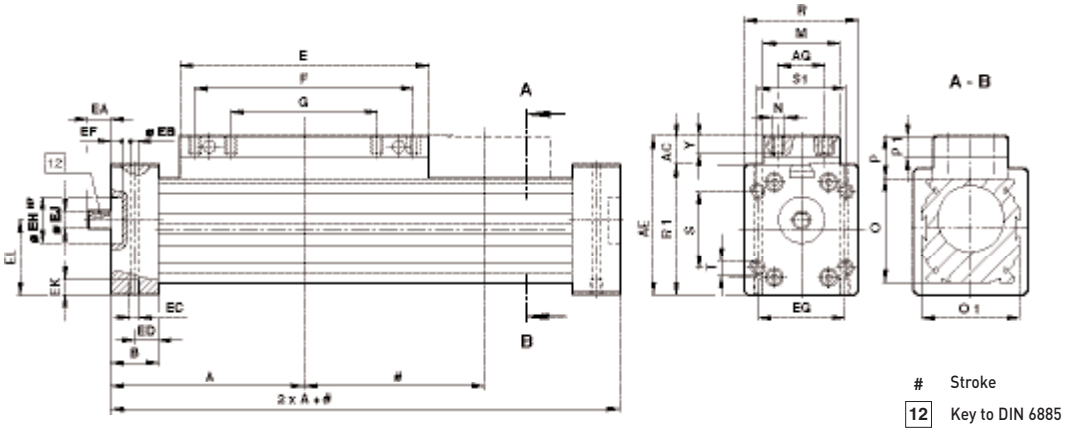
50 mm



63 mm



M/49000 – LINTRA® Spindle with internal guide, cylinder sizes 25 ... 63 mm



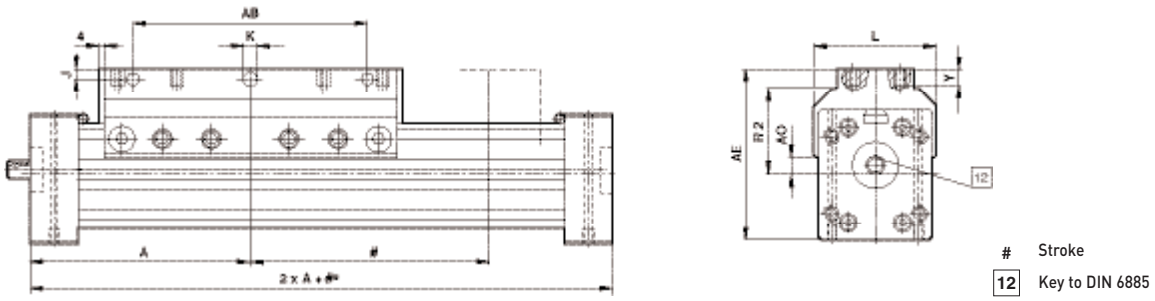
MODELS	Ø	A	AC	AE	AG	B	E	EA	EB	EC	ED	EF	EG	EH^{E7}
M/49025	25	–	–	–	20	23	130	20	5,6	M6	11,5	4	35	22
M/49032	32	120	16	76	25	27	160	20	5,6	M6	13,5	4	45	28
M/49040	40	150	15	90	25	30	215	25	6,8	M8	15	3	52	38
M/49050	50	–	–	–	25	35	250	32	8,5	M10	17,5	5	64	47
M/49063	63	215	20	125	25	40	320	40	8,5	M10	20	4	75	52

MODELS	Ø	EJ	EK	EL	F	G	M	N	O	O 1	P	P 1	R	R 1
M/49025	25	9	12	27,8	90	45	–	M5	40	40	–	–	48	48
M/49032	32	10	12	34,7	120	60	45	M5	52	52	20	10	60	60
M/49040	40	12	12	43,3	160	80	45	M6	65	65	20	10	75	75
M/49050	50	17	20	53,5	190	95	–	M8	80	80	–	–	90	90
M/49063	63	20	20	61,6	240	120	50	M8	95	95	25	14	105	105

MODELS	Ø	S	S 1	T	Y	Weight at 0 mm	Weight per 100 mm
M/49025	25	22	38	M 5-13*	7	1,8 kg	0,27 kg
M/49032	32	27,5	47,6	M 6-15*	8	2,5 kg	0,47 kg
M/49040	40	50,9	50,9	M 8-20*	8	3,4 kg	0,70 kg
M/49050	50	62,2	62,2	M 8-25*	11	6,1 kg	1,18 kg
M/49063	63	74,25	74,25	M 10-25*	11	10,5 kg	1,6 kg

* Deep
Attention: when using spindle supports (SA) the total length of the spindle actuator is increased by 40 mm per two SAs.

M/49100 – LINTRA® Spindle with external guide, cylinder sizes 25 ... 63 mm



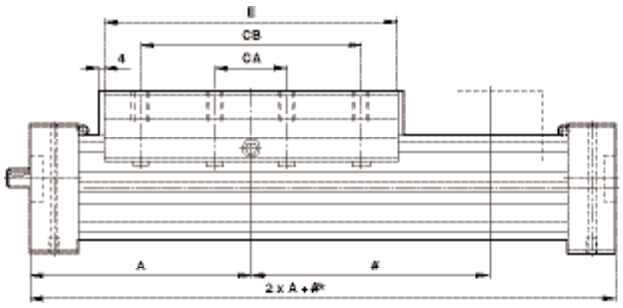
MODELS	Ø	A	AB	AE	AO	J	Ø K	L	R2	Y	Weight at 0 mm	per 100 mm
M/49125	25	100	70	67,5	9,5	5	5,5	52	34	12	1,8 kg	0,27 kg
M/49132	32	120	90	82	15,5	5	5,5	64	42,5	12	2,5 kg	0,47 kg
M/49140	40	150	120	97,5	16,5	5	6,6	79	49,5	12	3,4 kg	0,7 kg
M/49150	50	180	160	117	24	6,5	9	92	58,5	17	6,1 kg	1,18 kg
M/49163	63	215	190	137	25,5	7,5	9	110	68	20	11 kg	1,56 kg

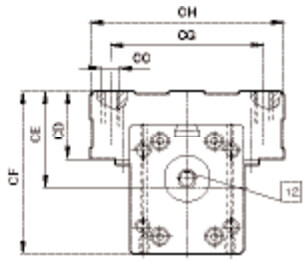
For missing dimensions see M/49000.
Attention: when using spindle supports (SA) the total length of the spindle actuator is increased by 40 mm per two SAs.

M/49000, M/49100, M/49200 LINTRA® Spindle

Internal, external and precision roller guided - Ø 25 ... 63 mm

M/49200 – LINTRA® Spindle with Precision roller, cylinder sizes 25 ... 63 mm





\# Stroke

12 Key to DIN 6885

MODELS	Ø	A	CA	CB	CC	CD	CE	CF	CG	CH	E	Weight at 0 mm	Weight per 100 mm
M/49225	25	100	45	90	M 6 - 14*	36	42	66	60	85	150	2,5 kg	0,27 kg
M/49232	32	120	60	120	M 8 - 16*	38	50	80	75	98	180	3,9 kg	0,47 kg
M/49240	40	150	80	150	M 8 - 16*	42	57,5	95	92	118	215	5,5 kg	0,7 kg
M/49250	50	180	90	180	M 10 - 20*	44	67	112	100	132	250	10,3 kg	0,18 kg
M/49263	63	215	120	240	M 10 - 20*	47	74,5	127	110	140	320	17,2 kg	1,56 kg

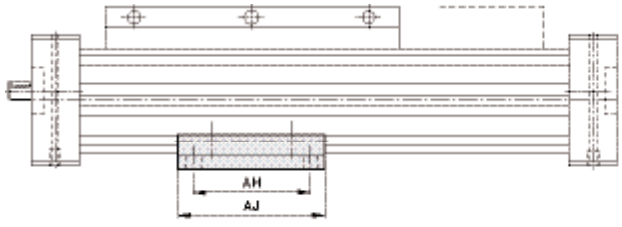
* Deep

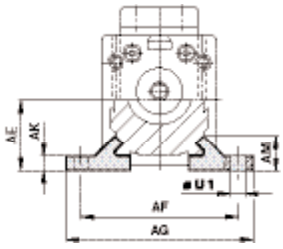
For missing dimensions see M/49000.

Attention: when using spindle supports (SA) the total length of the spindle actuator is increased by 40 mm per two SAs.

MOUNTINGS

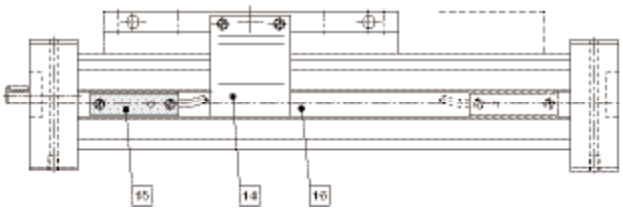
Centre support - V

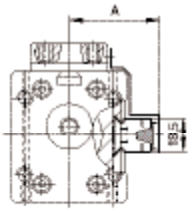




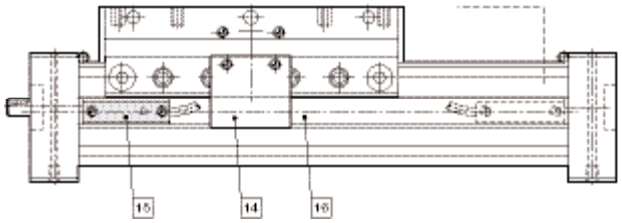
MODELS	Ø	AE	AF	AG	AH	AJ	AK	AM	Ø U1	kg
QM/46025/32	25	26,5	60	72	60	80	5,5	13	6,6	0,04
QM/46032/32	32	30,5	76	92	70	100	6,5	13,5	9	0,07
QM/46040/32	40	37,5	92	108	90	120	7,5	18,5	9	0,2
QM/46050/32	50	45	110	128	110	140	7,5	18,5	11	0,2
QM/46063/32	63	54	132	154	120	160	9	25	13	0,3

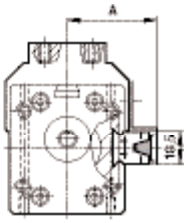
Sensor bracket, sensor activator
M/49000 series (32, 40, 63 mm) – LINTRA® Spindle with internal guide



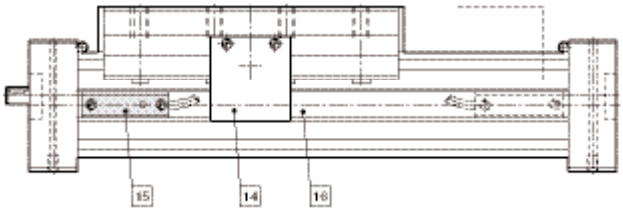


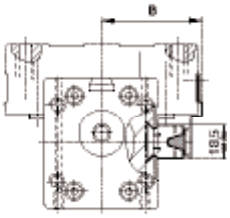
M/49100 series (25, 32, 40, 50, 63 mm) – LINTRA® Spindle with external guide





M/49100 series (25, 32, 40, 50, 63 mm) – LINTRA® Spindle with external guide





Ø	A	B
25	37	44,5
32	43	51
40	49,5	61
50	57	68
63	64,5	72

14 Sensor activator
15 Inductive proximity sensors
16 Sensor bracket

M/49800/P LINTRA® Spindle

Heavy duty version - Ø 16 ... 63 mm

High forces
High dynamics
Torsional and bending resistant profiles
High repeatability
Alternative mounting possiblities

MATERIALS

Guiding profile: carriage and end cover: anodised aluminium
Recirculating ball screw: steel, surface hardened

TECHNICAL DATA

Operation:
Actuation with ball screw

Operating temperature:
-15°C ... +60°C max.
Consult our Technical Service for use below +2°C

Cylinder diameters:
16, 25, 40, 63 mm

Maximum strokes:
3000 mm
Longer strokes on request

Maximum speeds:
2,5 m/s

Forces:
3000 ... 12000 N

Repeatability:
+/-0,05 mm (single nut)
+/-0,01 mm (double nut)
Dependent on load, stroke and speed

OPTIONS SELECTOR

M/498★★/P/B★/★★/★★★★

Cylinder diameters (mm)	Substitute
16	**16**
25	**25**
40	**40**
63	**63**

Spindle nuts	Substitute
Single nut (standard)	**S**
Double nut (on request)	**D**

Note: Disregard option positions not used.
For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants.
Additional variants/options are not possible.

Cylinder sizes (Heavy duty)	Strokes (mm)
16	**max. 3000**
25	**max. 3000**
40	**max. 3000**
63	**max. 3000**

Thread pitch (Single nut)	Substitute
16	**05,10**
25	**05, 20, 50**
40	**05, 20, 40**
63	**05, 20, 40**

Thread pitch (Double nut)	Substitute
16	**05, 10**
25	**05, 20**
40	**05, 20**
63	**05, 20**

For further information

www.norgren.com/info/en1-158

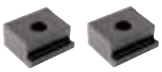
ACCESSORIES

Proximity switch (inductive)	Proximity switch (inductive)	Connecting cable with socket M8 x 1	Connecting cable with socket M8 x 1
			
M/P70104/10	M/P70104/5	M/P73001/5, **PVC**, 3 x 0,25, 5 m	M/P73372/5, **PVC**, 3 x 0,25, 5 m
M/P70104/11	M/P70104/6	M/P73002/5, **PUR**, 3 x 0,25, 5 m	M/P73373/5, **PUR**, 3 x 0,25, 5 m

For information about proximity switches see page 293

MOUNTINGS

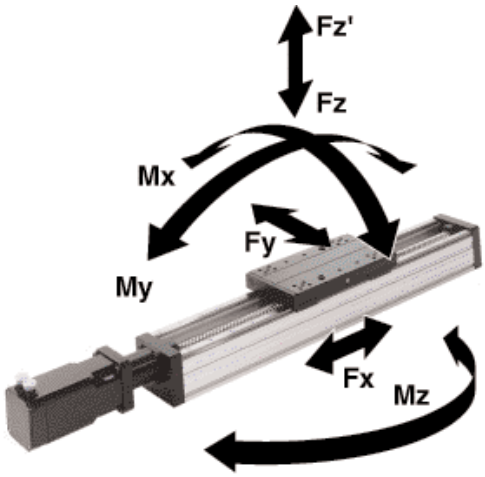
Ø	Mounting for proximity switch	Groove key M5	Groove key M6	Groove key M8	T-nut 2 x M6	T-nut 2 x M8	Centering sleeve
							
16	QM/46816/22/64	LNS-M5	–	–	–	–	LZS-16-12
25	QM/46816/22/64	–	LNS-M6	M/P41858	LNS-2 x M6	LNS-2 x M8	LZS-25-15
40	QM/46816/22/64	–	LNS-M6	M/P41858	LNS-2 x M6	LNS-2 x M8	LZS-40-18
63	QM/46816/22/64	–	LNS-M6	M/P41858	LNS-2 x M6	LNS-2 x M8	LZS-63-22

Ø	Side mounting, short	Side mounting, long
		
16	LBK-16-KM6	LBK-40/63-2 x KM8
25	LBK-16-KM6	LBK-40/63-2 x KM8
40	LBK-16-KM6	LBK-40/63-2 x KM8
63	LBK-16-KM6	LBK-40/63-2 x KM8

M/49800/P LINTRA® Spindle

Heavy duty version - Ø 16 ... 63 mm

M/49800/P



Loading values for LINTRA® toothed belt cylinders

The values stated in the tables show the single forces in the directions Fy and Fz as well as the maximum moments Mx, My and Mz for a speed of ⩽ 0,2 m/s respectively. A requirement for using these values is a smooth constant movement of the mass over the whole stroke length of the cylinder. The reference point from which the moments for all cylinders should be calculated is the centerline of the carriage.

Total loads

When a LINTRA® cylinder has to take several loads and moments, an additional calculation is necessary using the following formula:

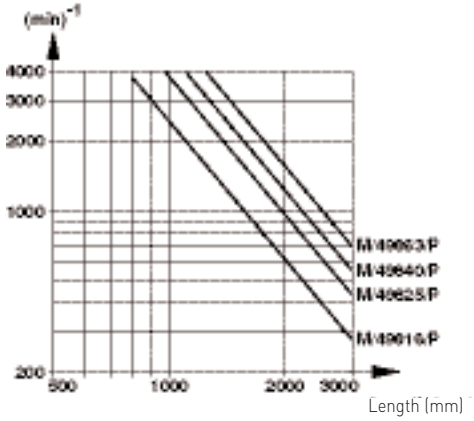
$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz}{Fz\ max} \leq 1$$

ACCELERATION, MOVEMENT/REVOLUTION AND LOADING VALUES

Cylinder diameters (mm)	Thread pitch	Repeatability*1) (mm)	Max. speed*3) (m/s)	Max. acceleration (m/s)	Max. strokes*2) (mm)	Loading values Fx (N)	Fy (N)	Fz (N)	Fz' (N)	Mx (Nm)	My (Nm)	Mz (Nm)
16	5, 10	± 0,05	0,5	10	3000	3000	3000	3000	3000	100	300	300
25	5, 20, (50)*4)	± 0,05	2,5	10	3000	5000	4200	5000	4200	250	500	500
40	5, 20, (40)	± 0,05	2,0	10	3000	8500	7200	8500	7200	600	1200	1200
63	5, 20, (40)*4)	± 0,05	2,0	10	3000	12000	10000	12000	10000	1200	2400	2400

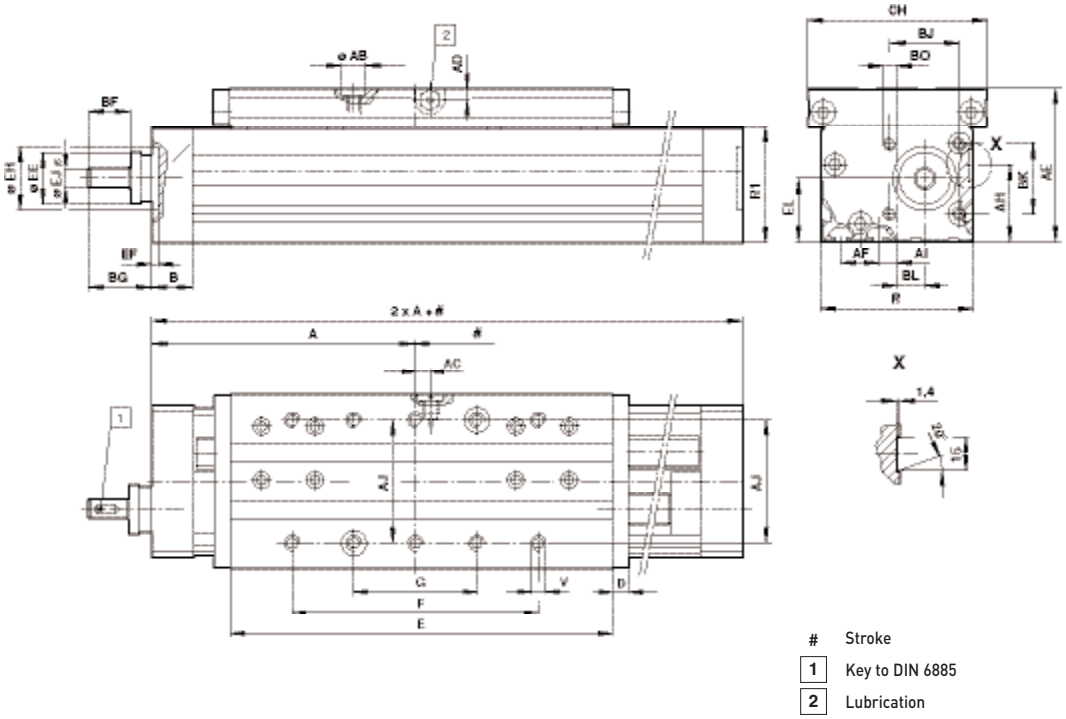
*1) Dependent on stroke, load and motor (with double nut ±0,01),
*2) Longer strokes on request
*3) Pay attention to critical revolutions of the ball screw (see diagram), max. revolutions 3000 min-1
*4) Pitch not possible for double nut

Total length dependent on the critical spindle revolutions



BASIC DIMENSIONS

M/49800/P – LINTRA® SPINDLE HEAVY DUTY, CYLINDER SIZES 16



#	Stroke
1	Key to DIN 6885
2	Lubrication

MODELS	Ø	A	Ø AB H7	AC	AD	AE	AF	AG	AH	AI	B	BF	F	G
M/49816/...	16	128	12	7,5	5,5	75	18	60	35	9	20	20	120	60
MODELS	Ø	BG	BJ	BK	BL	BO	CH	D	E	Ø EE	EF	Ø EH H7	Ø EJ j6	EL
M/49816/...	16	30	33	35	13	M5	95,5	8	180	24	3	30	9	32,5
MODELS	Ø	R	R1	V	Weight at 0 mm		Weight per 100 mm							
M/49816/...	16	72	56,5	10 x M6*	3,2		0,75							

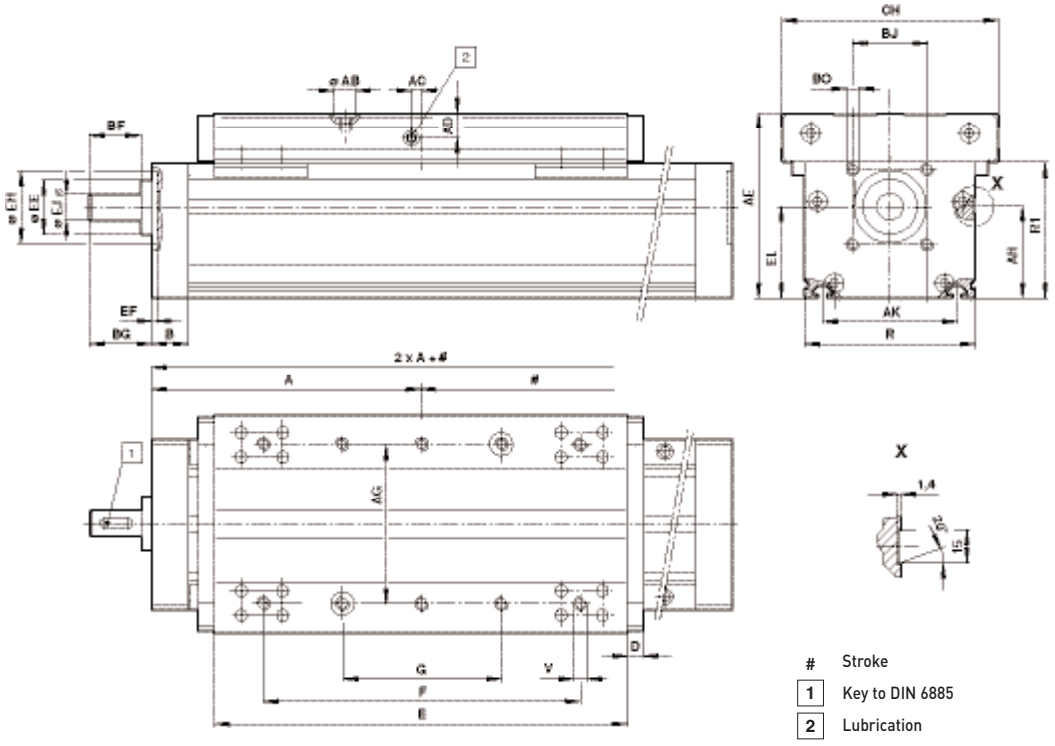
* Deep

M/49800/P LINTRA® Spindle

Heavy duty version - Ø 16 ... 63 mm

BASIC DIMENSIONS

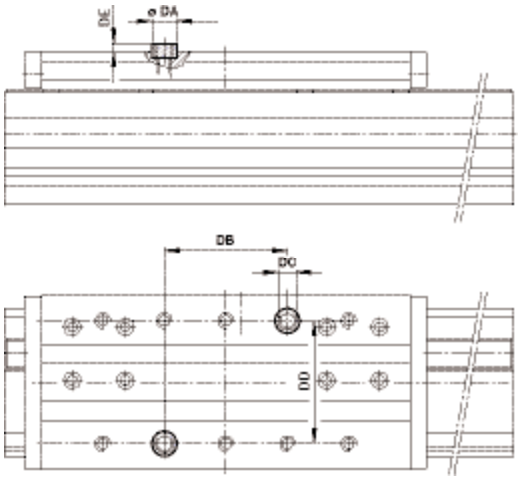
M/49800/P – LINTRA® Spindle Heavy duty, cylinder sizes 25 ... 63 mm



MODELS	Ø	A	Ø AB H7	AC	AD	AE	AG	AH	AK	B	BF	BG	BJ	BK
M/49825/...	25	165	15	7	12	105	90	48	67	25	30	40	62	32
M/49840/...	40	210	18	0	18,5	140	120	66	95	30	40	50	55	55
M/49863/...	63	260	22	0	24	180	154	90	130	35	50	60	72	72
MODELS	Ø	BO	CH	D	E	Ø EE	EF	Ø EH H7	Ø EJ j6	EL	F	G	R	R1
M/49825/...	25	M6	125	10	240	33	4	38	12	59	180	90	96	82,5
M/49840/...	40	M6	170	12	320	45	5	55	20	73	240	120	130	107
M/49863/...	63	M8	210	15	400	52	5	70	25	90	308	154	165	136,5
MODELS	Ø	V		Weight at 0 mm		Weight per 100 mm								
M/49825/...	25	10 x M8 - 12*		6,5 kg		1,2 kg								
M/49840/...	40	10 x M10 - 15*		14,5 kg		2,1 kg								
M/49863/...	63	10 x M12 - 18*		28,5 kg		3,3 kg								

* Deep

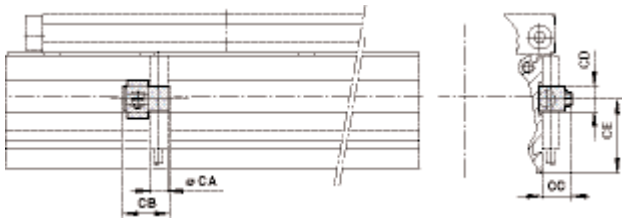
Centering sleeve



Type	Ø	Ø DA h6	DB ±0,01	DC	DD ±0,01	DE
LZS-16-12	16	12	60	M8	60	2,8
LZS-25-15	25	15	90	M10	90	2,8
LZS-40-18	40	18	120	M12	120	2,8
LZS-63-22	63	22	154	M16	154	2,8

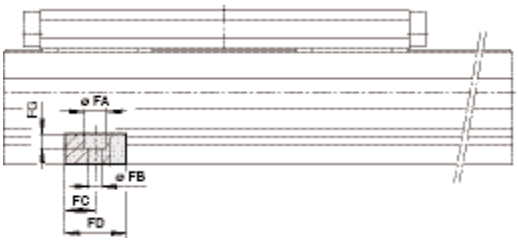
2 Centering sleeves are supplied with each toothed belt actuator.

Mounting kit for proximity switch



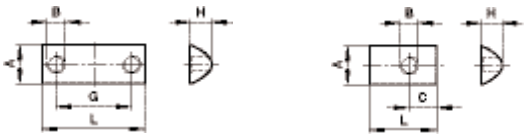
Ø	Ø CA	CB	CC	CD	CE	kg
16	8	22	15	12	35	0,05
25	8	22	15	12	48	0,05
40	8	22	15	12	66	0,05
63	8	22	15	12	90	0,05

LBK-16-KM6 – Side mounting, short



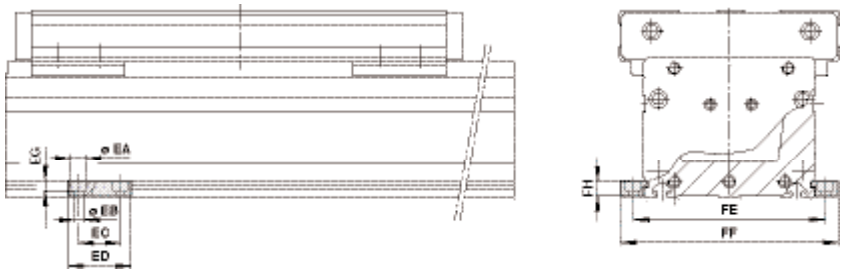
Ø	Ø FA	Ø FB	FC	FD	FE	FF	FG	FH
16	11	6,6	15	30	90	110	6,8	15
25	11	6,6	15	30	116	141	6,8	15
40	11	6,6	15	30	150	175	6,8	15
63	11	6,6	15	30	185	210	6,8	15

Groove key



Type	Ø	A	B	C	G	H	L	kg
LNS-M5	16	8	M5	4	–	4	11,5	0,002
LNS-M6	25 ... 63	13,8	M6	6,5	–	7,3	23	0,011
LNS-2xM6	25 ... 63	13,8	M6	–	26,5	–	36	0,010
LNS-2xM8	25 ... 63	13,8	M8	–	64	7,3	76	0,036
M/P41858	25 ... 63	13,8	M8	7,5	–	7,3	23	0,010

LBK-40/63-2 x KM8 – Side mounting, long



Ø	Ø EA	Ø EB	EC	ED	EG	FE	FF	FH
16	15	9	40	60	9	90	110	15
25	15	9	40	60	9	116	141	15
40	15	9	40	60	9	150	175	15
63	15	9	40	60	9	185	210	15

LAE4, LAE8 Toothed belt actuators

Cylinder sizes: 4 and 8

High speed

Carriage with bearings on hardened rails

Different carriage lengths

Covered guides

Different motor positions

MATERIALS

Guiding profile, anodised aluminium

End plate: steel, powder coated

Covering: polyamid

Motor head: aluminium

TECHNICAL DATA

Operation:

Actuation with toothed belt

Operating temperature:

-15°C ... +60°C max.

Consult our Technical Service for use below +2°C

Variants:

LAE4-0-K-1-F-A external, adjustable guided carriage

LAE8-0-K-2-F-A internal, adjustable roller guided carriage

Maximum strokes:

8000 mm (LAE 4)

7200 mm (LAE 8)

From 4500 mm dependent on mounting position

Maximum speed:

8 m/s (LAE 4)

10 m/s (LAE 8)

Dependent on load, stroke and motor

Forces:

1470 ... 3300 N

Movement/revolution:

160 mm (LAE 4)

180 mm (LAE 8)

Repeatability:

+/- 0,1 mm

Dependent on load, stroke and speed

OPTIONS SELECTOR

LAE★-0-★-★-F-★/★★★★

Cylinder size	Substitute
Profile 100 x 132	4
Profile 250 x 110	8

Carriage variants	Substitute
Carriage length 200 mm	K
Carriage length 300 mm	G
Carriage length 540 mm (only LAE8)	L

Guiding system	Substitute
External guided carriage (LAE4)	1
Internal roller guided carriage (LAE8)	2

Cylinder variants	Strokes (mm)
LAE4	max. 8000
LAE8	max. 7200

Motor positions	Substitute
Opposite carriage	A
Carriage side (only LAE8)	B
Right (only LAE8)	C
Left (only LAE8)	D

ACCESSORIES

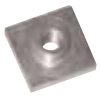
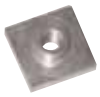
Proximity switch (inductive)	Connecting cable with socket M12 x 1
	
4314817 4314828	4542800, **PVC**, 3 x 0,25, 5 m 4542801, **PUR**, 3 x 0,25, 5 m

For information about proximity switches see page 293

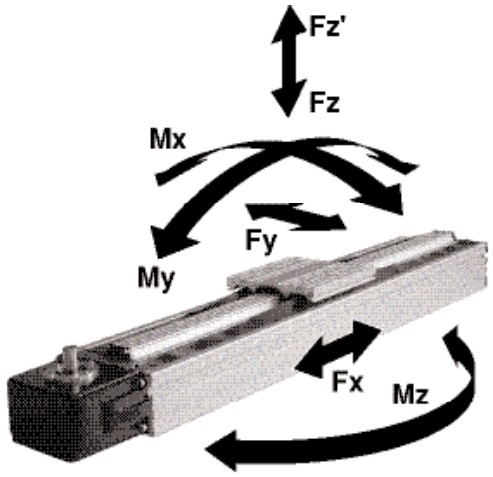
For further information

www.norgren.com/info/en1-164

MOUNTINGS

MODELS	Sensor activator LAP4	Sensor activator LAP8	Mounting for proximity switch	Mounting nut M6	Mounting nut M8
					
LAE4	11 195 73	–	11 195 72	11 112 00	11 112 01
LAE8	–	11 195 74	11 195 72	11 112 00	11 112 01

LAE4, LAE8



Loading values toothed belt cylinders LAE4 and LAE8

The values stated in the tables show the single forces in the directions Fy and Fz as well as the maximum moments Mx, My and Mz for a speed of ⩽ 0,2 m/s respectively.
A requirement for using these values is a smooth constant movement of the mass over the whole stroke length of the cylinder.
The reference point from which the moments for all cylinders should be calculated is the centerline of the carriage.

Total loads

When a Cylinder has to take several loads and moments, an additional calculation is necessary using the following formula:

$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz}{Fz\ max} \leq 1$$

REPEATABILITY, SPEED AND LOADING VALUES

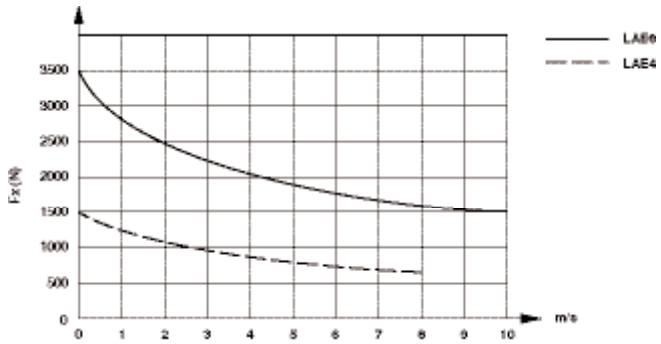
MODELS	Toothed belt	Repeatability* (mm)	Max. speed* (m/s)	Movement/revolution	Max. stroke** (mm)
LAE4	25 AT 10	±0,1	8 m/s	160	8000
LAE8	50 AT 10	±0,1	10 m/s	180	7200

* Dependent on stroke, load and motor
** From 4500 mm stroke of mounting position, longer strokes on request

MODELS	Carriage (mm)	Loading values Fx (N)	Fy (N)	Fz (N)	Mx (Nm)	My (Nm)	Mz (Nm)
LAE4	200	1470	500	500	20	40	40
	300	1470	500	500	20	65	65
LAE8	200	3300	1600	3200	450	210	160
	300	3300	1600	3200	450	350	250
	540	3300	2400	4800	640	1150	720

The forces and moments indicated are max. individual loads in the elastic area
They decrease by superposition of forces and mements or by changing of the safety factor

Force Fx dependent on the speed rate

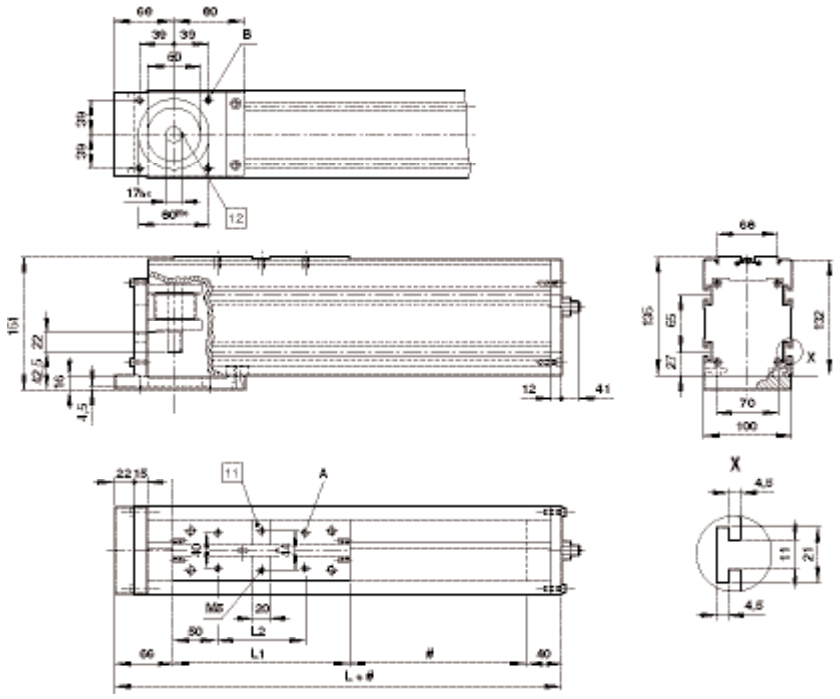


LAE4, LAE8 Toothed belt actuators

Cylinder sizes: 4 and 8

BASIC DIMENSIONS

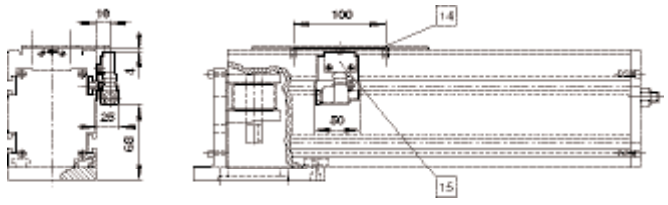
LAE 4



#	Stroke
11	Cutout for sensor activator 1,7 deep
12	Keyway DIN 6885 (L = 20 mm)

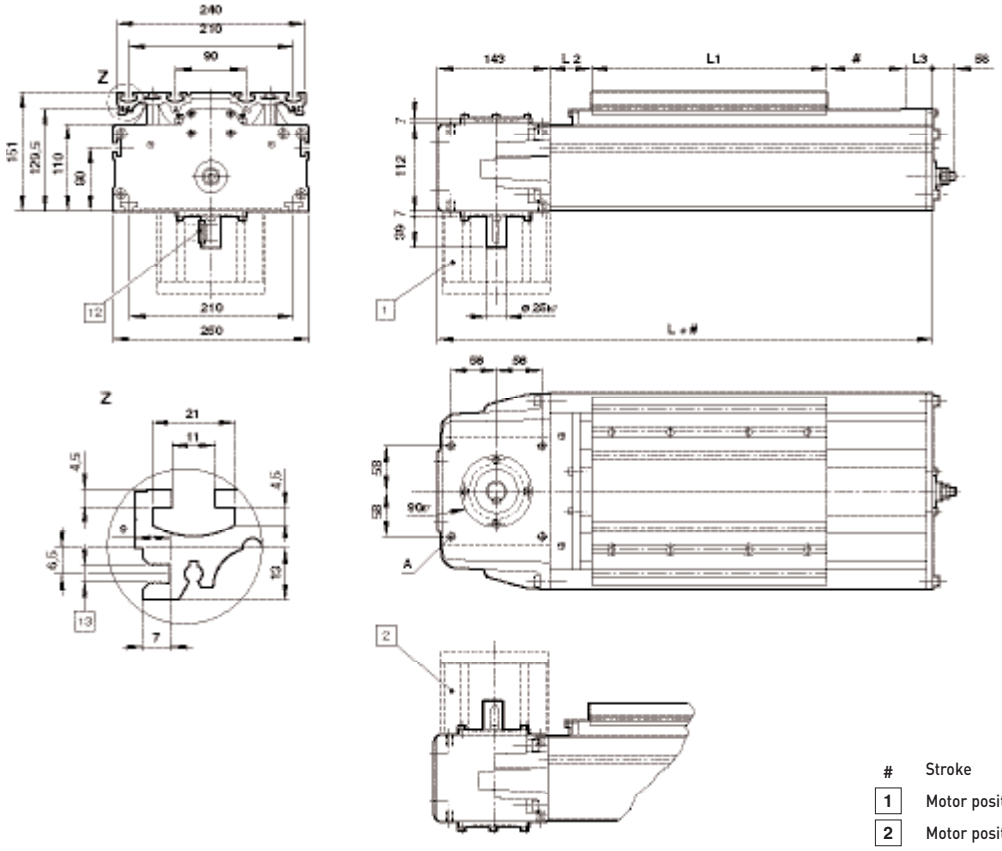
MODELS	A	B	L	L1	L2	Weight at 0 mm	Weight per 100 mm	Weight of carriage
LAE4-0-K-	M6x10 deep	M6x14 deep	306	200	100	8,4 kg	1,2 kg	1,65 kg
LAE4-0-G-	M6x10 deep	M6x14 deep	406	300	200	9,9 kg	1,2 kg	1,95 kg

Switch mounting LAE4



14	Sensor activator
15	Proximity switch

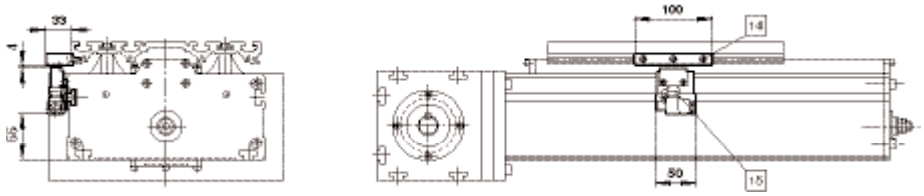
LAE8 motor position A and B



#	Stroke
1	Motor position A (opposite carriage)
2	Motor position B (carriage side)
12	Keyway DIN 6885 (L = 28 mm)
13	Thread channel M5

MODELS	A	L	L1	L2	L3	Weight at 0 mm	Weight per 100 mm	Weight of carriage
LAE8-0-K-2-F-X	M8x12 deep	412	200	44	103	14,9 kg	1,81 kg	5,2 kg
LAE8-0-G-2-F-X	M8x12 deep	532	300	54	35	17,8 kg	1,81 kg	6,7 kg
LAE8-0-L-2-F-X	M8x12 deep	772	540	54	35	24,3 kg	1,81 kg	11,8 kg

Switch mounting LAE8



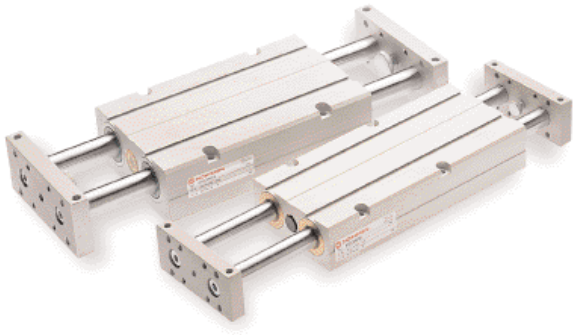
14	Sensor activator
15	Proximity switch

Groove key (zinc coated steel)

MODELS	G	Weight
11 112 00	M6	0,006 kg
11 112 01	M8	0,006 kg

M/60100/M Slide units

Double acting - Ø 10 ... 40 mm



High quality sliding bearings ensure long durable life and high guidance performance

Double piston rod provides high bending and torsional rigidity

Magnetic piston as standard

Easy to install-reduces costly design time

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting with magnetic piston and buffer cushioning

Operating pressure:
1 ... 8 bar

Operating temperature:
+80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Piston rod: hard chromed steel
Body & end covers: anodised aluminium
Seals: nitrile rubber

STANDARD MODELS

	Ø	Port size	MODELS	ACCESSORIES Reed switch with integral 5m cable	Switch mounting	Banjo flow control Tube diameter in bold	Straight fitting	Elbow fitting	Service kit
									
	10	M5	**M/60111/M/***	M/50/LSU/5V	M/P72487	C0K510**04**05	C022**504**05	C024**704**05	QM/60111/M/00
	16	M5	**M/60116/M/***	M/50/LSU/5V	M/P72487	C0K510**04**05	C022**504**05	C024**704**05	QM/60116/M/00
	25	M5	**M/60125/M/***	M/50/LSU/5V	M/P72487	C0K510**04**05	C022**504**05	C024**704**05	QM/60125/M/00
	32	G1/8	**M/60132/M/***	M/50/LSU/5V	M/P72487	C0K510**06**18	C022**506**18	C024**706**18	QM/60132/M/00
	40	G1/8	**M/60140/M/***	M/50/LSU/5V	M/P72487	C0K510**06**18	C022**506**18	C024**706**18	QM/60140/M/00

* Insert stroke length in mm

For information on additional magnetic switches see page 290

Standard strokes

Ø	25	50	75	100	125	150	175	200
10	•	•	•					
16	•	•	•	•	•			
25		•	•	•	•	•	•	
32			•	•	•	•	•	•
40				•	•	•	•	•

Other stroke lengths are not available

For further information

www.norgren.com/info/en1-168

FORCES, AIR CONSUPTION AND WEIGHTS

MODELS	Theoretical forces (N) at 6 bar	Air consumption (l/cm) per stroke at 6 bar	Weights (kg)								
		Strokes (mm)	25	50	75	100	125	150	175	200	225
M/60111/M	60	0,040	0,39	0,40	0,41	0,42	–	–	–	–	–
M/60116/M	147	0,172	0,77	0,80	1,08	1,11	1,39	1,42	–	–	–
M/60125/M	348	0,406	–	1,96	2,00	2,46	2,50	2,96	3,00	–	–
M/60132/M	588	0,686	–	–	3,74	3,80	4,51	4,57	5,28	5,34	–
M/60140/M	918	1,072	–	–	–	6,70	6,80	7,84	7,93	8,97	9,10

INTERMEDIATE STROKE LENGTH SCREW

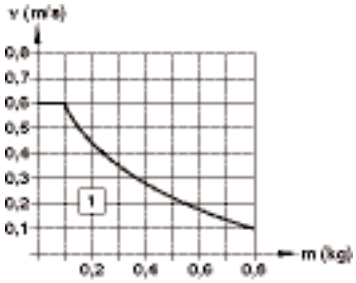
MODELS	Control range (mm)				
	5	10	15	20	25
M/60111/M	M/P70870/1	M/P70870/2	M/P70870/3	M/P70870/4	M/P70870/5
M/60116/M	M/P70870/1	M/P70870/2	M/P70870/3	M/P70870/4	M/P70870/5
M/60125/M	M/P70870/1	M/P70870/2	M/P70870/3	M/P70870/4	M/P70870/5
M/60132/M	M/P70870/6	M/P70870/7	M/P70870/8	M/P70870/9	M/P70870/10
M/60140/M	M/P70870/6	M/P70870/7	M/P70870/8	M/P70870/9	M/P70870/10

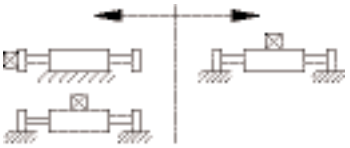
PERMISSIBLE CUSHION LOADS

Application: slide mounting

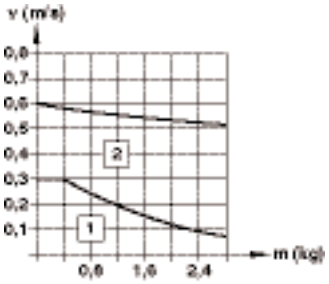
Application: end mounting

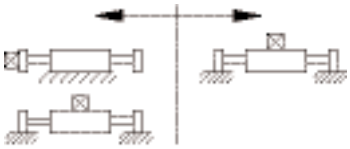
M/60111/M



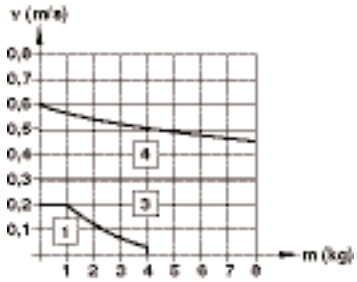


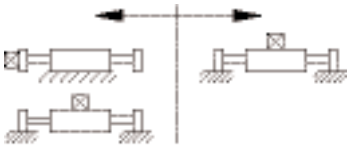
M/60116/M



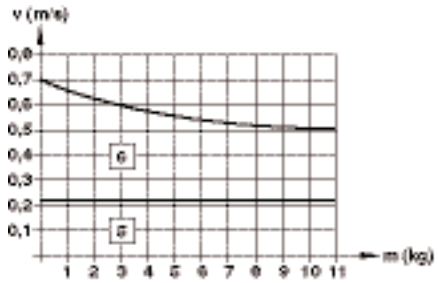


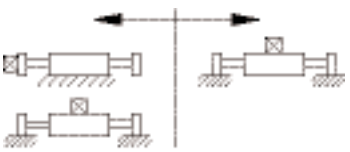
M/60125/M



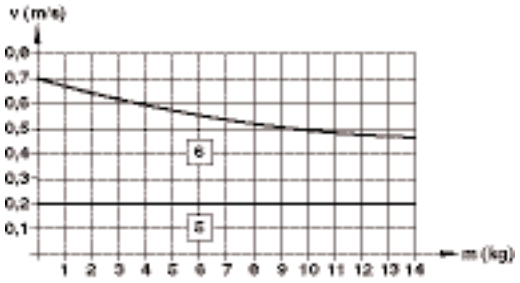


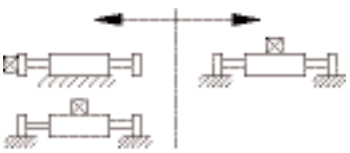
M/60132/M





M/60140/M



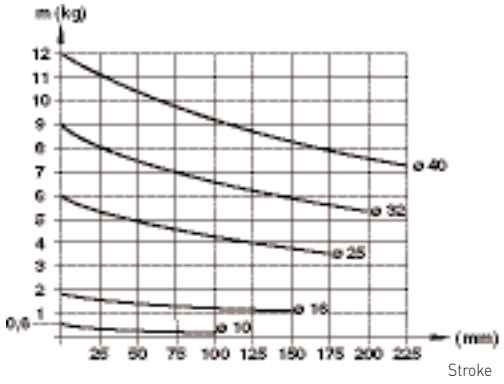


1	Buffer
2	Shock absorber MC75M-3-NB
3	Shock absorber MC150MH2
4	Shock absorber MC150MH
5	Shock absorber MC225MH2
6	Shock absorber MC225MH

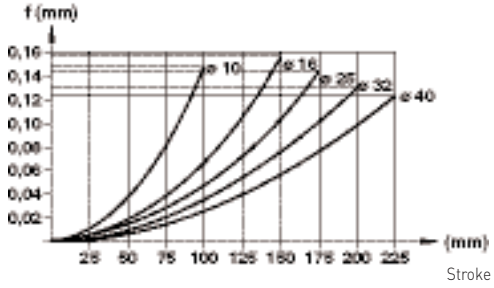
M/60100/M Slide units

Double acting - Ø 10 ... 40 mm

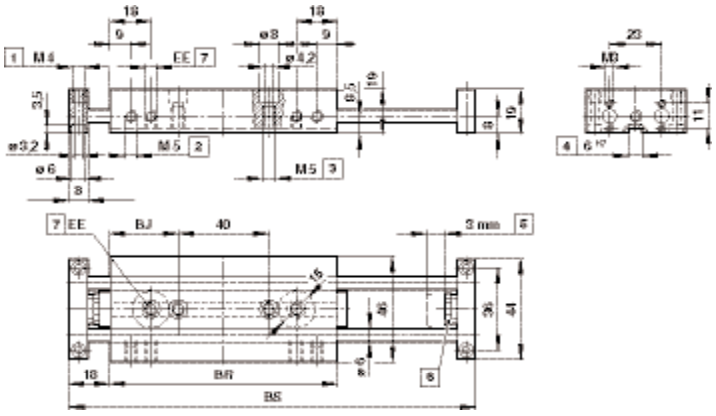
MAX. LOAD
(with constant bearing load)



DEFLECTION
(with maximum load)



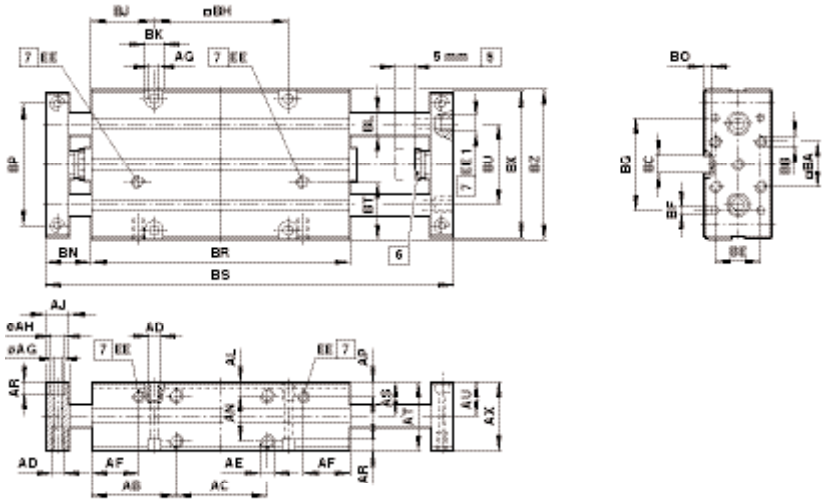
M/60111/M – Slide units



1	6 deep
2	5,5 deep
3	10 deep
4	2 deep
5	3 mm control range both ends
6	Stop screw
7	Port size (EE = M5)

	Strokes (mm)			
	25	50	75	100
BJ	30	30	55	55
BR	100	100	150	150
BS	161	186	261	286

Slide units – M/60116/M ... M/60140/M



5	5 mm control range both ends
6	Stop screw
7	Port size

MODELS	AB	AC	AD	AE	AF	Ø AG	Ø AH	AJ	AL	AN	AP	AR	AS	AT	AU	AX	□BA
M/60116/M	37	40	M5 x 8 deep	M5 x 7 deep	20,5	4,2	8	10	6	20	6,5	5	16	30	15	30	20
M/60125/M	46	60	M6 x 12 deep	M6 x 8 deep	22,5	5,3	10	12	9,5	24	7,5	6	21,5	40	20,5	40	30
M/60132/M	55	80	M8 x 16 deep	M8 x 10 deep	33	6,8	12	15	12,5	30	10	7	27,5	50	26,5	50	36
M/60140/M	68,5	100	M10 x 18 deep	M10 x 12 deep	36	8,5	15	20	14,5	36	11	9	32,5	60	31,5	60	40

MODELS	BB	BC	BD	BE	Ø BF	BG	□BH	BJ	BK	Ø BL	BN	BP	BT	BU	BX	BZ	EE	EE1
M/60116/M	M5	8 H7	3	16	3,2	40	59	27,5	8	10	20	54	25	36	64	66	M 5	M 5
M/60125/M	M5	8 H7	3	30	5,3	59	82	35	10	16	22	76	35	48	90	92	M 5	M 5
M/60132/M	M6	12 +0,12	5	36	6,4	82	104	43	11	20	28	102	46	62	116	118	G 1/8	M 5
M/60140/M	M8	12 +0,12	5	40	8,4	104	128	54,5	15	25	31	126	57	74,5	144	146	G 1/8	G 1/8

		Strokes (mm)								
MODELS		25	50	75	100	125	150	175	200	225
M/60116/M	BR	113,5	113,5	163,5	163,5	213,5	213,5	–	–	–
	BS	179	204	279	304	379	404	–	–	–
M/60125/M	BR	–	152	152	202	202	252	252	–	–
	BS	–	246	271	346	371	446	471	–	–
M/60132/M	BR	–	–	190	190	240	240	290	290	–
	BS	–	–	321	346	421	446	521	546	–
M/60140/M	BR	–	–	–	236,5	236,5	286,5	286,5	336,5	336,5
	BS	–	–	–	398	423	498	523	598	623

M/61000/M, M/61000/MR Guiding and stopper cylinder

Double acting - Ø 32 ... 100 mm

- Guiding accuracy ± 0,02 mm
- Non-rotation accuracy ± 0,02°
- Integrated heavy duty guide rods
- Linear ball bearing option provides precision guiding for higher speeds
- Plain bearing option offers higher side load capacity
- Easy installation
- Magnetic piston as standard
- Buffer pad for noise reduction

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operating pressure:
1 ... 10 bar

Operating temperature:
-10°C ... +80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Profile barrel: anodised aluminium
Piston rod: stainless steel (martensitic)
Guide rod: stainless steel martensitic (plain bearings), hardened steel, hard-chrome plated (ball bearings)
Lager: solid bronze (plain bearings), steel roller (ball bearings)
Mounting plate: stainless steel (austenitic)
Piston rod seals: polyurethane
Piston seals: nitrile rubber
'O'-ringe: nitrile rubber

STANDARD MODELS

	Ø	Port size	MODELS Plain bearings	MODELS Ball bearings	ACCESSORIES Reed switch with integral 5m cable	Banjo Flow control	Straight Fitting	Elbow Fitting
						Tube diameter in bold		
								
	32	G1/8	**M/61032/M/***	**M/61032/MR/***	M/50/LSU/5V	C0K51**06**18	C0225**06**18	C0247**06**18
	40	G1/8	**M/61040/M/***	**M/61040/MR/***	M/50/LSU/5V	C0K51**06**18	C0225**06**18	C0247**06**18
	50	G1/4	**M/61050/M/***	**M/61050/MR/***	M/50/LSU/5V	C0K51**06**28	C0225**06**28	C0247**06**28
	63	G1/4	**M/61063/M/***	**M/61063/MR/***	M/50/LSU/5V	C0K51**06**28	C0225**06**28	C0247**06**28
	80	G1/4	**M/61080/M/***	**M/61080/MR/***	M/50/LSU/5V	C0K51**06**28	C0225**06**28	C0247**06**28
	100	G1/4		**M/61100/MR/***	M/50/LSU/5V	C0K51**06**28	C0225**06**28	C0247**06**28

* Insert stroke length in mm

For information on additional magnetic switches see page 290

OPTIONS SELECTOR

M/61★★★/★★/★★★

Cylinder Ø (mm)	Substitute
32	**032**
40	**040**
50	**050**
63	**063**
80	**080**
100	**100**

Stroke length (mm)	Substitute
25	**25**
50	**50**
75	**75**
100	**100**

Variants (magnetic piston)	Substitute
Plain bearings (Ø 32 ... 80 mm)	**M**
Ball bearings (Ø 32 ... 100 mm)	**MR**
Ball bearings, special wipers (Ø 32 ... 100 mm)	**W2R**

For further information

www.norgren.com/info/en1-172

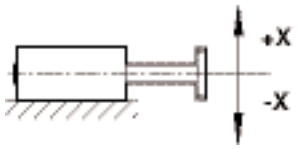
FORCES, AIR CONSUPTION AND WEIGHTS

Ø	Theoretical forces (N) at 6 bar		Air consumption (l/cm) per stroke at 6 bar	
	outstroke	instroke	outstroke	instroke
32	482	414	0,056	0,048
40	754	633	0,088	0,074
50	1178	990	0,137	0,114
63	1870	1680	0,218	0,195
80	3016	2722	0,35	0,32
100	4710	4416	0,55	0,51

Type	Ø	Strokes (mm) 25	50	75	100
M/61000/M	32	1,50	1,99	2,48	2,97
Cylinder with	40	1,70	2,21	2,72	3,23
slide bearing	50	2,40	3,10	3,80	4,50
	63	3,10	3,91	4,72	5,53
	80	6,45	7,77	9,09	10,40
M/61000/MR	32	1,25	1,65	2,05	2,45
Cylinder with	40	1,45	1,87	2,29	2,71
roller bearing	50	2,10	2,68	3,26	3,84
	63	2,60	3,27	3,94	4,61
	80	5,99	7,14	8,29	9,44
	100	9,16	10,75	12,35	13,95

GUIDING ACCURACY

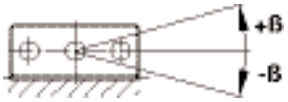
Deflection of the mounting plate at instroke and outstroke position without load.



Cylinder Ø (mm)	32		40		50		63		80		100	
	Instroke	Outstroke	Instroke	Outstroke	Instroke	Outstroke	Instroke	Outstroke	Instroke	Outstroke	Instroke	Outstroke
Position												
Slide bearing	± 0,06	± 0,11	± 0,06	± 0,11	± 0,06	± 0,11	± 0,06	± 0,11	± 0,07	± 0.11	–	–
Roller bearing	± 0,02	± 0,04	± 0,02	± 0,04	± 0,03	± 0,05	± 0,03	± 0,05	± 0,03	± 0,05	± 0,03	± 0,05

NON-ROTATION ACCURACY

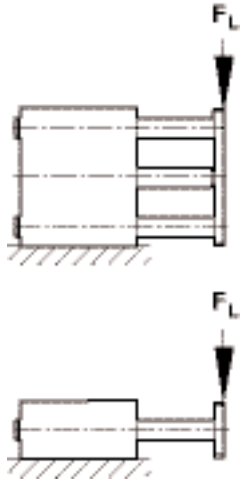
Deflection of the mounting plate ß (°) at instroke position without load.



Cylinder Ø (mm)	32	40	50	63	80	100
Slide bearing	± 0,06	± 0,06	± 0,05	± 0,05	± 0,04	–
Roller bearing	± 0,03	± 0,03	± 0,03	± 0,03	± 0,02	± 0,02

LOAD DATA GENERAL:

The combination of different load cases (e.g. load plus torque or eccentricity in two directions) will reduce the permissible load accodingly.
Keep the guide rods free from any pollution.



MAXIMUM LOAD FL* (N) AT THE FRONT PLATE

Cylinder Ø (mm)	MODELS	Stroke (mm) 25	50	75	100
32	**M/61032/M**	212	214	215	216
32	**M/61032/MR**	163	179	187	191
40	**M/61040/M**	227	224	223	222
40	**M/61040/MR**	181	191	195	198
50	**M/61050/M**	324	331	334	337
50	**M/61050/MR**	223	236	242	246
63	**M/61063/M**	343	343	343	344
63	**M/61063/MR**	251	254	256	257
80	**M/61080/M**	470	479	484	487
80	**M/61080/MR**	423	459	477	488
100	**M/61100/MR**	902	761	799	821

* Dependent on stroke

M/61000/M, M/61000/MR Guiding and stopper cylinder

Double acting - Ø 32 ... 100 mm

MAXIMUM LOAD FL' (N) AT THE DISTANCE DL

A distance Dl between the force and the front plate (e.g. force in the centre of gavity of a load) will reduce the permissible Load as follows:

$$F_{L'} = F_L \cdot \left(\frac{b}{b+\Delta l}\right)$$

$F_{L'}$ – Max. load at the distance Δl (N)

F_L – Max. load at the front plate (N)

Δl – Distance (mm)

b = a + 2 • stroke (mm)

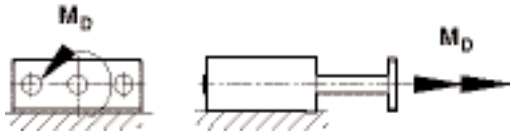
a – Constant (mm)

Cylinder Ø (mm)	32	40	50	63	80	100
a	32	39	41	46	54	59

MAXIMUM TORQUE M_D* (Nm)

Cylinder Ø (mm)	MODELS	Stroke (mm) 25	50	75	100
32	**M/61032/M**	8,5	8,5	8,6	8,6
32	**M/61032/MR**	6,5	7,1	7,5	7,6
40	**M/61040/M**	10,2	10,1	10,0	10,0
40	**M/61040/MR**	8,1	8,6	8,7	8,9
50	**M/61050/M**	16,2	16,5	16,7	16,8
50	**M/61050/MR**	11,1	11,8	12,1	12,3
63	**M/61063/M**	18,8	18,8	18,8	18,9
63	**M/61063/MR**	13,8	14,0	14,1	14,1
80	**M/61080/M**	32,9	33,5	33,9	34,1
80	**M/61080/MR**	29,6	32,1	33,4	34,1
100	**M/61100/MR**	76,7	64,7	67,9	69,8

* Dependent on stroke



CALCULATION OF PERMISSIBLE SPEED OR MAXIMUM LOAD

For a cylinder with guiding used as actuator

E_S – Max. kinetic energy (Nm)
m_E – Moved weight (kg)
m_L – Additional load (kg)
v – Speed (m/s)

$$E_S = \frac{1}{2}(m_E + m_L) \cdot v^2$$

Maximum permissable speed $v_{max.}$

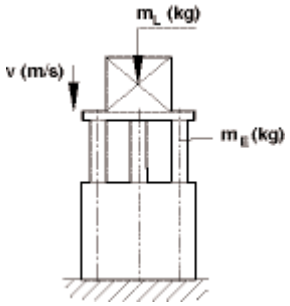
$$v_{max.} = \sqrt{\frac{2\,E_S}{m_E + m_L}}$$

v_{Zyl} = 0,6 m/s for cylinder Ø 32 ... 63 mm

v_{Zyl} = 0,4 m/s for cylinder Ø 80 ... 100 mm

Maximum additional load $m_{L\,max.}$

$$m_{L\,max.} = \frac{2\,E_S}{v^2} - m_E$$



MAXIMUM KINETIC ENERGY Es (Nm)

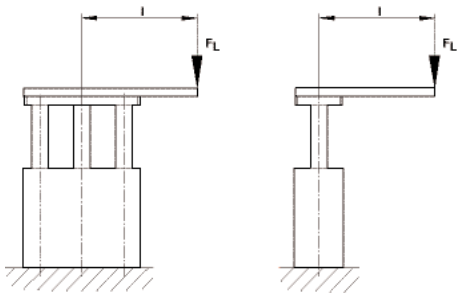
Cylinder Ø (mm)	32	40	50	63	80	100
E_S	0,40	0,58	0,67	0,67	1,33	1,33

MOVED WEIGHT mE (kg)

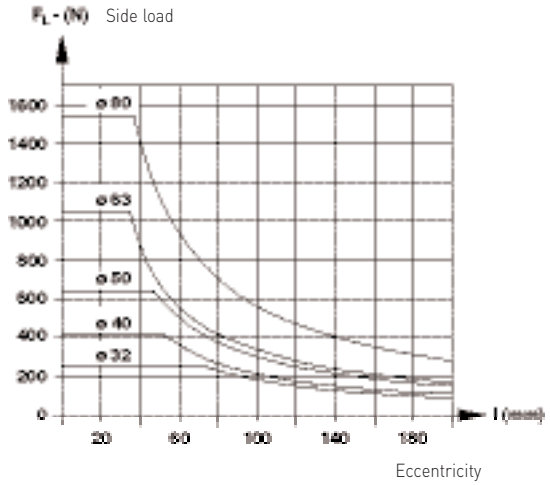
Type	Ø	Strokes (mm) 25	50	75	100
M/61000/M	32	0,92	1,19	1,46	1,73
Cylinder with	40	1,01	1,30	1,59	1,88
slide bearing	50	1,49	1,94	2,39	2,84
	63	1,90	2,35	2,80	3,25
	80	3,73	4,38	5,03	5,68
M/61000/MR	32	0,74	0,92	1,10	1,28
Cylinder with	40	0,83	1,03	1,23	1,43
roller bearing	50	1,21	1,52	1,83	2,14
	63	1,61	1,92	2,23	2,54
	80	3,35	3,83	4,32	4,80
	100	4,90	5,55	6,20	6,85

M/61000/M
USED AS STOPPER CYLINDER

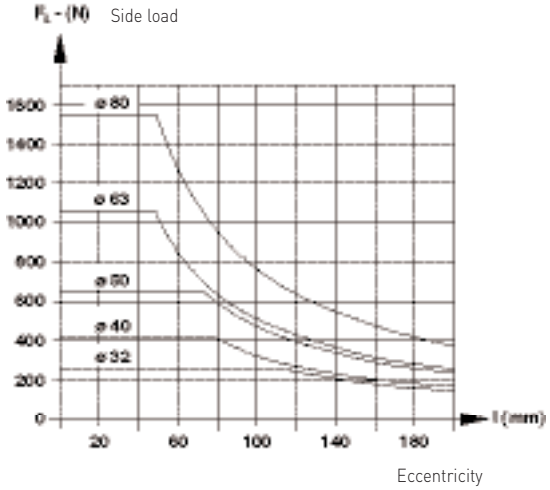
Max. side load (FL) depending on the eccentricity (l), cylinder with slide bearings.



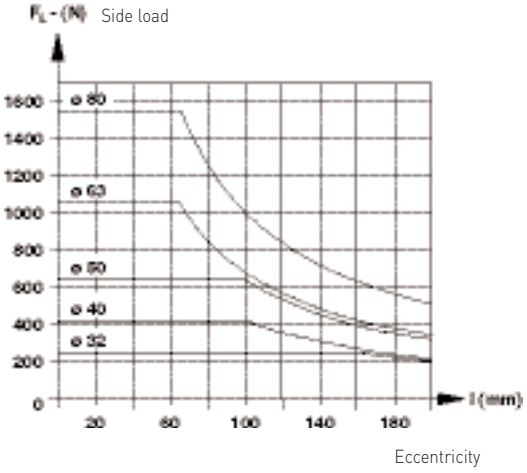
Stroke: 25 mm



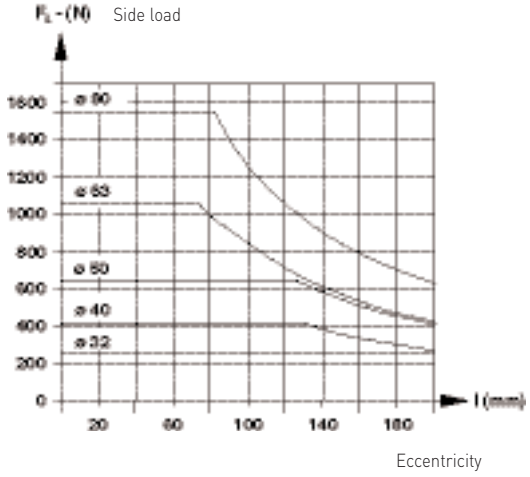
Stroke: 50 mm



Stroke: 75 mm



Stroke: 100 mm

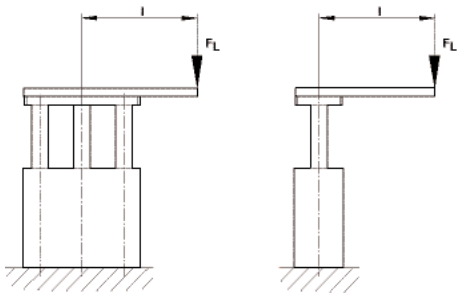


M/61000/M, M/61000/MR Guiding and stopper cylinder

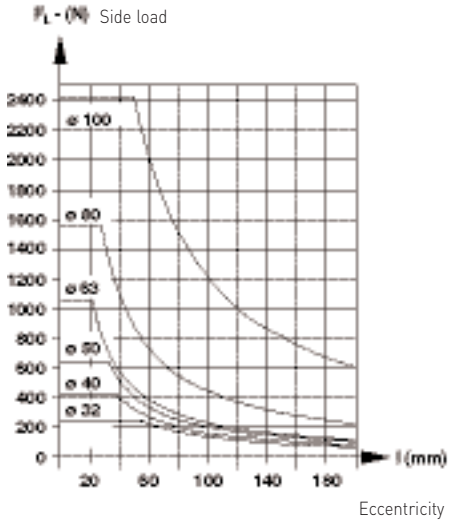
Double acting - Ø 32 ... 100 mm

M/61000/MR USED AS LIFTING CYLINDER

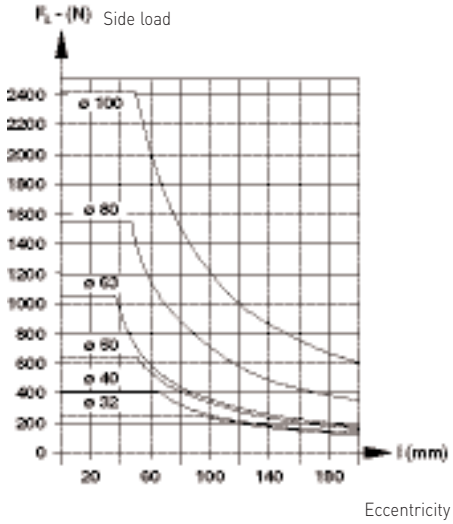
Max. side load (FL) depending on the eccentricity (l), cylinder with roller bearings



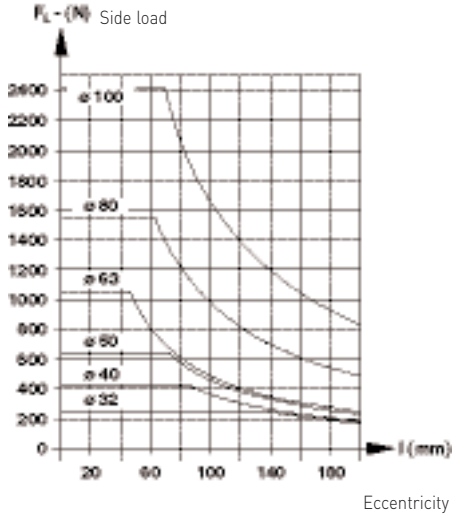
Stroke: 25 mm



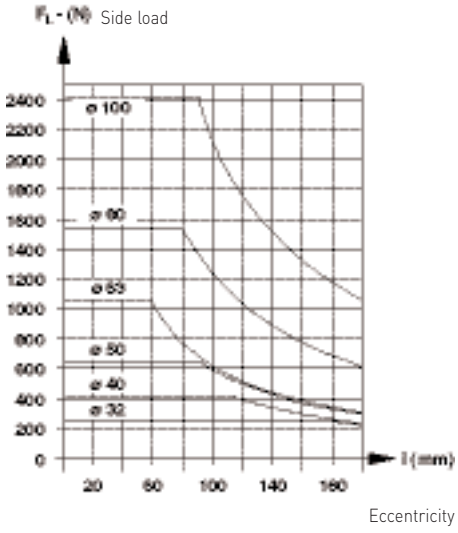
Stroke: 50 mm



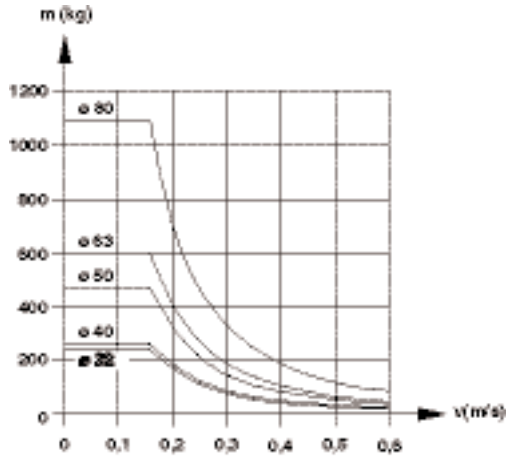
Stroke: 75 mm



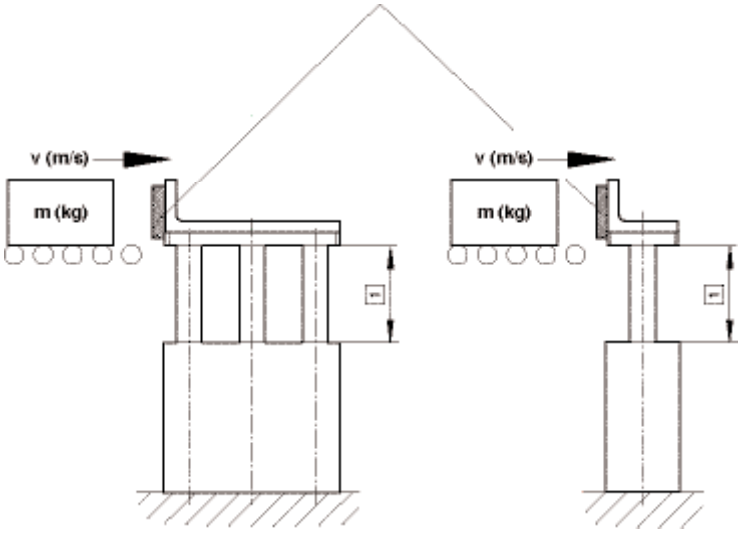
Stroke: 100 mm



Application: M/61000/M used as Stopper Cylinder
Max. impact energy (Nm)
Use only cylinders with plain bearings as stopper
The diagram mass vs. speed is based on a cushion stroke of 2,5 mm at the front plate provided e.g. by an additional cushion pad.
Insert mounting screws at the rear side of the cylinder at least 2 x diameter deep.



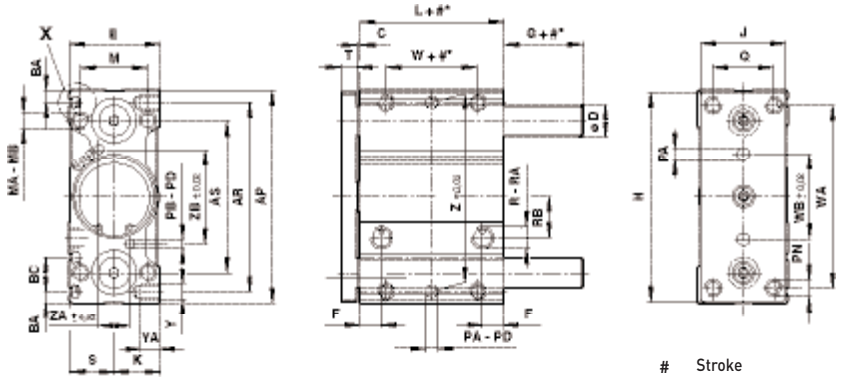
Additional cushion pad is required



1 50 mm stroke max.

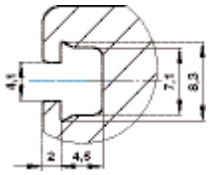
BASIC DIMENSIONS

M/61000/M, M/61000/MR



Stroke

X
Accessories mounting groove
(only cylinder Ø 32 ... 63 mm)



MODELS	Ø	AP	AR	AS	BA	BC	C	D *1)	D *2)	E	F	G *3)	H	J	K	L *3)	M	MA	MB *4)	PA
M/61032/..	32	114	100	80	7	22	1,5	16	20	51	11,5	8,5	112	48	26	38	38	M8 x 1,25	20	6^{H7}
M/61040/..	40	124	110	90	7	22	2	16	20	51	13,5	2	122	48	26	44	38	M8 x 1,25	20	6^{H7}
M/61050/..	50	140	124	100	8	22,5	2	20	25	59	14	7	138	56	30	44	44	M10 x 1,5	25	8^{H7}
M/61063/..	63	150	132	110	8	22,5	2	20	25	72	25	2	148	69	36,5	49	44	M10 x 1,5	25	8^{H7}
M/61080/..	80	188	166	140	–	–	1,5	25	30	92	17,5	2	185	88	46,5	57	56	M12 x 1,75	30	10^{H7}
M/61100/..	100	224	200	170	–	–	2	30	–	112	21	2	221	108	56,5	66	62	M14 x 2	35	10^{H7}

MODELS	Ø	PB	PD *4)	PN	Q	R	RA *4)	RB	S	T	W *3)	WA	WB ±0,02	Z ±0,02	Y	YA	ZA ±0,02	ZB ±0,02
M/61032/..	32	6^{H7}	8	M8 x 1,25	30	G1/8	7,5	15	25	8	5	96	46	100	M8 x 1,25	11	14	44
M/61040/..	40	6^{H7}	8	M8 x 1,25	30	G1/8	7,5	21	25	8	10	106	50	110	M8 x 1,25	12,5	14	54
M/61050/..	50	6^{H7}	11	M10 x 1,5	40	G1/4	11	27	29	10	10	120	56	124	M10 x 1,5	12,5	20	62
M/61063/..	63	8^{H7}	11	M10 x 1,5	50	G1/4	11	33	35,5	10	10	130	66	132	M10 x 1,5	15	30	74
M/61080/..	80	10^{H7}	13	M12 x 1,75	60	G1/4	11	37	45,5	16	15	160	84	166	M12 x 1,75	18	36	94
M/61100/..	100	10^{H7}	13	M14 x 2	80	G1/4	11	40	55,5	16	15	190	110	200	M14 x 2	21	40	116

*1) = M/61000/MR cylinder ball bearings
*2) = M/61000/M cylinder with plain bearings
*3) The dimensions of M/61100 with 25 mm of stroke are identical with 50 mm of stroke!
Cylinders with non-standard strokes have the dimensions of the cylinder with the next longer standard stroke
*4) Deep

M/61200/M, M/61200/MR Slide tables

Double acting - Ø 16 ... 32 mm

M/61200/M: Slide table with adjustable guide

M/61200/MR: Slide table with precision linear ball bearing

Stroke adjustable at each endposition

High repeatability

Compact design

TECHNICAL DATA

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

M/61200/M

Double acting with adjustable guide

M/61200/MR

Double acting with precision linear ball bearing

Operating pressure:

1 ... 10 bar

Operating temperature:

+80°C max.

Consult our Technical Service for use below +2°C

MATERIALS

Body: anodised aluminium

Carriage: anodised aluminium

End covers: anodised aluminium

Piston rod: stainless steel (Martensitic)

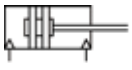
Seals: nitrile rubber, polyurethane

Linear guide: stainless steel

Guide rail: plastic

Buffer: elastomer

STANDARD MODELS

			MODELS		ACCESSORIES			
	Ø	Port size	Adjustable guide	Precision linear ball bearings	Reed switch with integral 5m cable	Banjo flow control	Straight fitting	Elbow fitting
						Tube diameter in bold		
								
	16	M5	**M/61216/M/***	**M/61216/MR/***	M/50/LSU/5V	C0K51**04**05	C022**50**405	C024**70**405
	20	M5	**M/61220/M/***	**M/61220/MR/***	M/50/LSU/5V	C0K51**04**05	C022**50**405	C024**70**405
	25	M5	**M/61225/M/***	**M/61225/MR/***	M/50/LSU/5V	C0K51**04**05	C022**50**405	C024**70**405
	32	G1/8	**M/61232/M/***	**M/61232/MR/***	M/50/LSU/5V	C0K51**06**18	C022**50**618	C024**70**618

* Insert stroke length in mm

For information on additional magnetic switches see page 290

ACCESSORIES

Ø	Groove key	Groove cover
		
16	M/P72816	M/P72725/1000
20	M/P72816	M/P72725/1000
25	M/P72816	M/P72725/1000
32	M/P72816	M/P72725/1000

STANDARD STROKES

Ø	25	50	75	100
16	•	•	•	•
20	•	•	•	•
25	•	•	•	•
32	•	•	•	•

For further information

www.norgren.com/info/en1-178

OPTIONS SELECTOR

M/612★★/★★/★★★

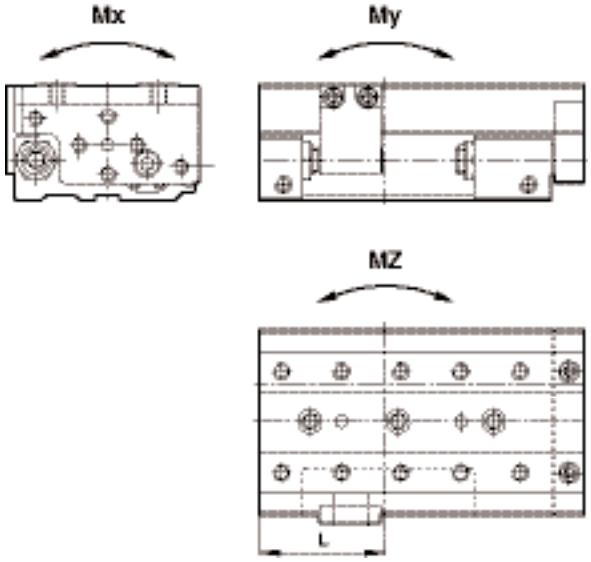
Cylinder Ø (mm)	Substitute
16	**16**
20	**20**
25	**25**
32	**32**

Stroke length (mm)
150 max.

Variants	Substitute
Magnetic piston, adjustable guide	**M**
Magnetic piston, precision linear ball bearing	**MR**
Magnetic piston, adjustable cushioning, adjustable guide or linear roller bearing	on request

FORCES AND THEORETICAL MOMENTS

MODELS	Theoretical forces (N) at 6 bar outstroke	instroke
M/61216/...	120	102
M/61220/...	188	158
M/61225/...	294	247
M/61232/...	482	414



MODELS	Theoretical moments (Nm) Mx	My	Mz	L (mm)
M/61216/M/25	10	14	14	29
M/61216/M/50	10	14	14	29
M/61216/M/75	10	14	14	29
M/61216/M/100	10	14	14	29
M/61220/M/25	14	14	14	29
M/61220/M/50	14	14	14	29
M/61220/M/75	20	20	20	39
M/61220/M/100	28	28	28	53
M/61220/M/150	28	28	28	53
M/61225/M/25	26	20	20	29
M/61225/M/50	26	20	20	29
M/61225/M/75	52	40	40	53
M/61225/M/100	52	40	40	53
M/61225/M/150	52	40	40	53
M/61232/M/25	32	20	20	29
M/61232/M/50	32	20	20	29
M/61232/M/75	64	40	40	53
M/61232/M/100	64	40	40	53
M/61232/M/150	64	40	40	53

MODELS	Theoretical moments (Nm) Mx	My	Mz	L (mm)
M/61216/MR/25	24	14	14	28
M/61216/MR/50	24	14	14	28
M/61216/MR/75	24	14	14	28
M/61216/MR/100	24	14	14	28
M/61220/MR/25	26	10	10	33
M/61220/MR/50	26	10	10	33
M/61220/MR/75	26	10	10	33
M/61220/MR/100	26	10	10	33
M/61220/MR/150	26	10	10	33
M/61225/MR/25	66	34	34	42
M/61225/MR/50	66	34	34	42
M/61225/MR/75	66	34	34	42
M/61225/MR/100	66	34	34	42
M/61225/MR/150	66	34	34	42
M/61232/MR/25	120	48	48	47
M/61232/MR/50	120	48	48	47
M/61232/MR/75	120	48	48	47
M/61232/MR/100	120	48	48	47
M/61232/MR/150	120	48	48	47

Loading values for Slide Tables

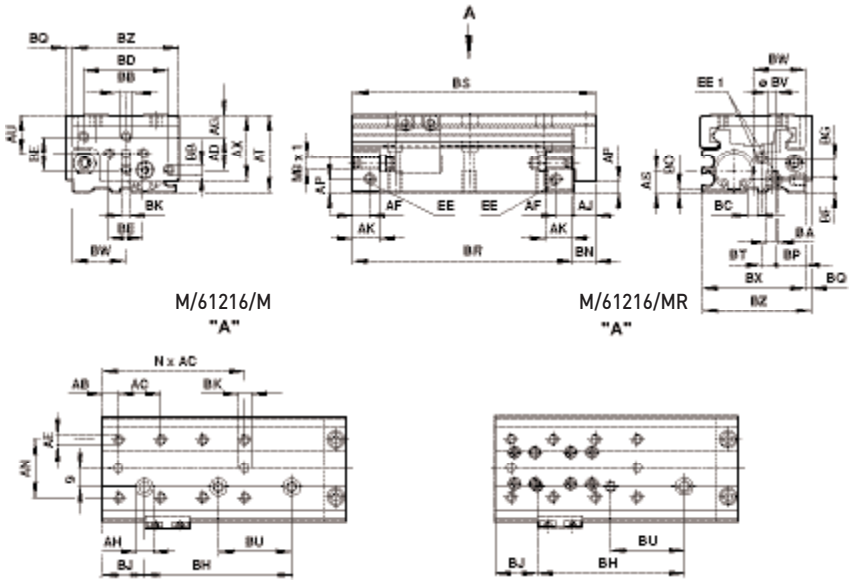
A requirement for best using these slide tables please use our calculation programme Slide-Calc. It is available on request. Slide-Calc is suitable for all PC's having Windows '95 and higher.?

M/61200/M, M/61200/MR Slide tables

Double acting - Ø 16 ... 32 mm

BASIC DIMENSIONS

M/61200/M, M/61200/MR – Ø16 (mm)



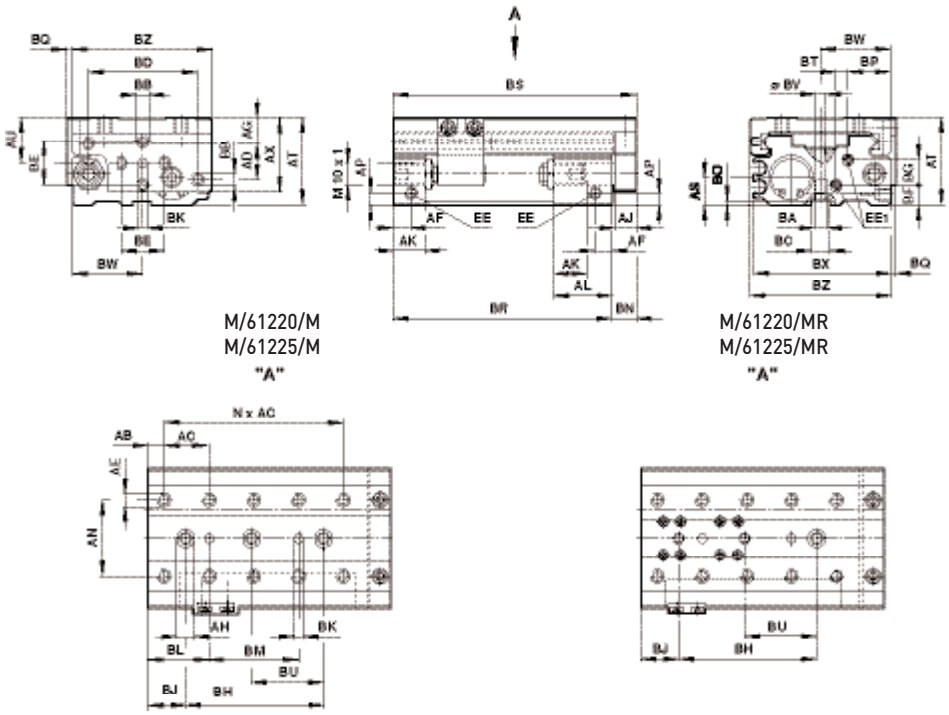
Ø	AB	AC	AE	AD	AG	Ø AH	AJ	AN	AP	AS	AT	AU	AX	BA	BB	Ø BC^{H7}
16	7,5	20	M4 – 5,5*	16	10,5	8	10	28	6	10,5	37	18,5	31,5	M5 – 8*	M4	5
Ø	**BD**	**BE**	**BF**	**BG**	**Ø BK^{H7}**	**BN**	**BO**	**BP**	**BQ**	**BT**	**Ø BV**	**BW**	**BX**	**BZ**	**EE**	**EE 1**
16	40	16	7	9,3	4	11	2	14	2,5	6,6	4,2	25	49	50	M5 – 5,5*	M5 – 7*

* Deep

Ø 16 mm

MODELS	Stroke (mm)	AF	AK	BH	BJ	BR	BS	BU	N	kg
M/61216/M/25	25	8	14	40	20	81	92	–	2	0,28
M/61216/MR/25	25	8	14	40	20	81	92	–	2	0,34
M/61216/M/50	50	8	14	70	20	106	117	35	3	0,35
M/61216/MR/50	50	8	14	70	20	106	117	35	3	0,41
M/61216/M/75	75	8	14	80	20	131	142	40	4	0,45
M/61216/MR/75	75	8	14	80	20	131	142	40	4	0,54
M/61216/M/100	100	8	14	120	20	156	167	60	5	0,52
M/61216/MR/100	100	8	14	120	20	156	167	60	5	0,62

M/61200/M, M/61200/MR – Ø 20 ... 25 (mm)



Ø	AB	AC	AE	AD	AG	Ø AH	AJ	AN	AP	AS	AT	AU	AX	BA	BB	Ø BC^{H7}
20	7,5	25	M5 – 6,5*	16,5	12	8	10	35	5,5	12,5	40	20	34	M5 – 10*	M5	10
25	7,5	25	M5 – 8,0*	20	14	9	12	40	7	15	48	24	40	M6 – 10*	M5	10
Ø	**BD**	**BE**	**BF**	**BG**	**Ø BK^{H7}**	**BN**	**BO**	**BP**	**BQ**	**BT**	**Ø BV**	**BW**	**BX**	**BZ**	**EE**	**EE 1**
20	50	20	9	11,5	4	11	2	19,5	2,5	5,5	4,2	32	62,5	64	M5 – 5,5*	M5 – 7*
25	65	22	12	11,5	4	13	2	19,5	3,5	12	5,1	39,5	76,2	79	M5 – 5,5*	M5 – 7*

* Deep

Ø 20 mm

MODELS	Stroke (mm)	AF	AK	AL	BH	BJ	BL	BM	BR	BS	BU	N	kg
M/61220/M/25	25	9	13,5	13,5	25	22,5	7,5	25	75	86	–	2	0,41
M/61220/MR/25	25	9	14,5	26,5	50	22,5	7,5	50	100	111	25	2	0,50
M/61220/M/50	50	9	13,5	13,5	50	22,5	7,5	50	100	111	25	3	0,53
M/61220/MR/50	50	9	14,5	26,5	75	22,5	32,5	50	125	136	37,5	3	0,62
M/61220/M/75	75	9	14,5	14,5	100	22,5	32,5	75	145	156	50	4	0,66
M/61220/MR/75	75	9	14,5	21,5	100	22,5	32,5	75	145	156	50	4	0,79
M/61220/M/100	100	9	14,5	14,5	100	22,5	32,5	100	180	191	50	5	0,78
M/61220/MR/100	100	9	14,5	31,5	100	22,5	32,5	100	180	191	50	5	0,94
M/61220/M/150	150	9	14,5	14,5	150	22,5	32,5	100	240	251	75	5	1,03
M/61220/MR/150	150	9	14,5	41,5	150	22,5	32,5	100	240	251	75	5	1,24

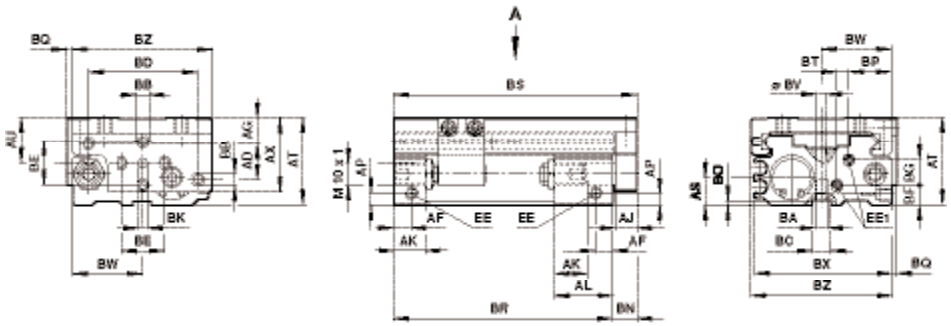
Ø 25 mm

MODELS	Stroke (mm)	AF	AK	AL	BH	BJ	BL	BM	BR	BS	BU	N	kg
M/61225/M/25	25	9,5	14,5	14,5	50	17,5	7,5	50	85	98	25	2	0,65
M/61225/MR/25	25	9,5	14,5	41,5	75	22,5	32,5	50	115	128	37,5	3	0,78
M/61225/M/50	50	9,5	14,5	14,5	75	20	32,5	50	115	128	37,5	3	0,85
M/61225/MR/50	50	9,5	14,5	41,5	100	22,5	32,5	75	140	153	50	4	0,92
M/61225/M/75	75	9,5	14,5	14,5	100	22,5	32,5	100	165	178	50	5	1,05
M/61225/MR/75	75	9,5	14,5	41,5	100	22,5	32,5	100	165	178	50	5	1,26
M/61225/M/100	100	9,5	14,5	14,5	150	22,5	32,5	125	190	203	75	6	1,20
M/61225/MR/100	100	9,5	14,5	41,5	150	22,5	32,5	125	190	203	75	6	1,20
M/61225/M/150	150	9,5	14,5	14,5	150	22,5	32,5	125	240	253	75	6	1,60
M/61225/MR/150	150	9,5	14,5	41,5	150	22,5	32,5	125	240	253	75	6	1,60

M/61200/M, M/61200/MR Slide tables

Double acting - Ø 16 ... 32 mm

M/61200/M, M/61200/MR – Ø 32 (mm)

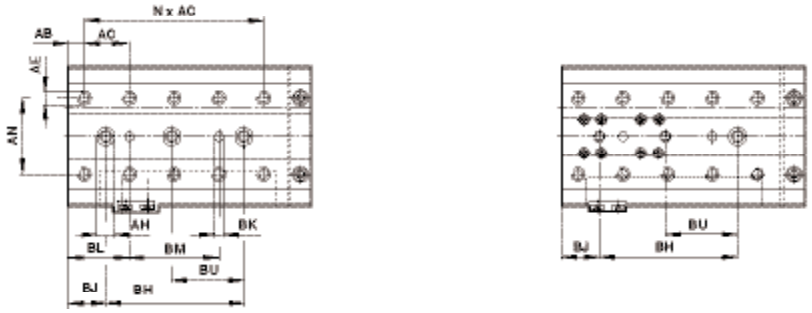


M/61216/M

"A"

M/61216/MR

"A"



Ø	AB	AC	AE	AD	AG	Ø AH	AJ	AN	AP	AS	AT	AU	AX	BA	BB	Ø BC^{H7}
32	7,5	30	M6 – 8,5*	26	15	11	12	50	10	19	57	28	48	M8 – 14*	M6	10
Ø	**BD**	**BE**	**BF**	**BG**	**Ø BK^{H7}**	**BN**	**BO**	**BP**	**BQ**	**BT**	**Ø BV**	**BW**	**BX**	**BZ**	**EE**	**EE 1**
32	75	28	17,5	13,5	5	13	2	24,5	3,5	12	6,6	46	90,5	92	G1/8 – 10*	G1/8 – 10*

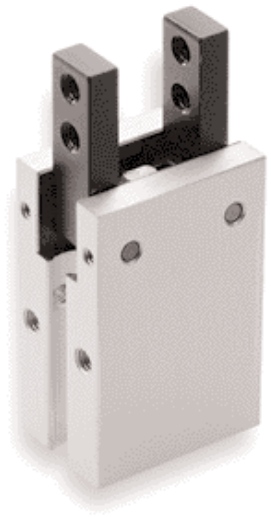
* Deep

Ø 32 mm

MODELS	Stroke (mm)	AF	AK	AL	BH	BJ	BL	BM	BR	BS	BU	N	kg
M/61232/M/25	25	8	16	16	50	20	7,5	50	90	103	25	2	1,00
M/61232/MR/25	25	8	19	43	75	22,5	37,5	50	120	133	37,5	3	1,20
M/61232/M/50	50	11	19	43	90	30	40	60	145	158	45	3	1,32
M/61232/MR/50	50	11	19	43	90	30	37,5	60	145	158	45	3	1,70
M/61232/M/75	75	11	19	43	120	30	40	90	170	183	50	4	1,63
M/61232/MR/75	75	11	19	43	120	30	37,5	90	170	183	50	4	1,96
M/61232/M/100	100	11	19	43	130	30	40	100	195	208	60	5	1,86
M/61232/MR/100	100	11	19	43	130	30	37,5	100	195	208	60	5	2,23
M/61232/M/150	150	11	19	43	150	30	40	120	245	258	75	5	2,48
M/61232/MR/150	150	11	19	43	150	30	37,5	120	245	258	75	5	2,98

M/160300/M/11, M/160300/M/12 Angular grippers

Single acting, double acting - Magnetic piston - Ø 8 ... 25 mm



- **Smooth, accurate movement**
- **Long, uninterrupted service life**
- **Low weight**
- **Compact size**
- **Integral magnets for positional feedback**

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Single acting, angular, magnetic piston (M/160300/M/11)
Double acting angular, magnetic piston (M160300/M/12)

Operating pressure:
2 ... 7 bar
(Ø 8 mm 3,6 ... 7 bar
Ø 10 mm 3 ... 7 bar)

Operating temperature:
+60°C
Consult our Technical Service for use below +2°C

Mounting:
Mounting holes on three faces

MATERIALS

Body: aluminium alloy
Fingers: carbon steel
Elastomers: nitrile

STANDARD MODELS - SINGLE ACTING

Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
								
8	M3	0,6	1,0	**M/160305/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**03	M0247**04**03
10	M3	1,0	1,4	**M/160306/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**03	M0247**04**03
16	M5	2,8	10,0	**M/160307/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05
20	M5	6,0	18,0	**M/160308/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05
25	M5	10,0	38,0	**M/160309/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05

* Grip point L= 30 mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

STANDARD MODELS - DOUBLE ACTING

Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
								
8	M3	2,6	1,6	**M/160305/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**03	M0247**04**03
10	M3	3,8	2,5	**M/160306/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**03	M0247**04**03
16	M5	17,0	12,8	**M/160307/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05
20	M5	32,0	24,0	**M/160308/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05
25	M5	62,0	48,0	**M/160309/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05

* Grip point L= 30 mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

For further information

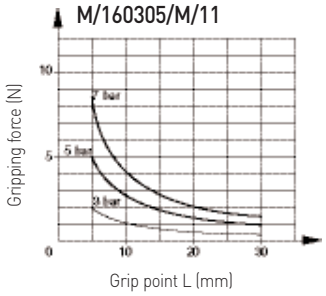
www.norgren.com/info/en1-183

M/160300/M/11, M/160300/M/12 Angular grippers

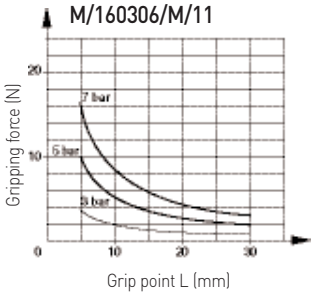
Single acting, double acting - Magnetic piston - Ø 8 ... 25 mm

THEORETICAL CLOSING GRIPPING FORCES

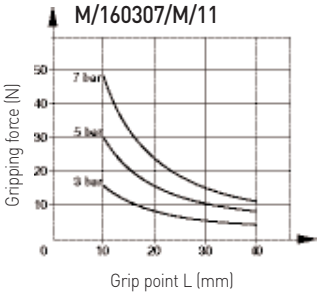
M/160305/M/11



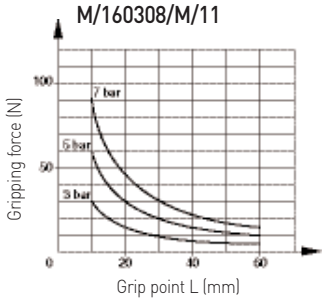
M/160306/M/11



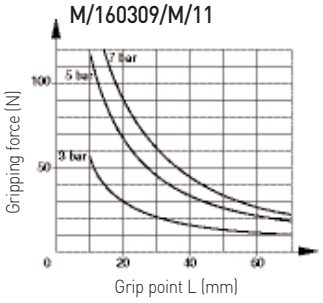
M/160307/M/11



M/160308/M/11

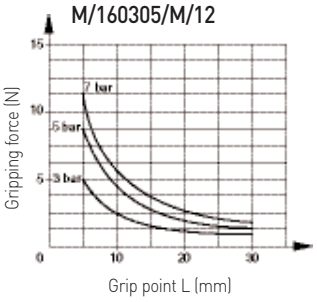


M/160309/M/11

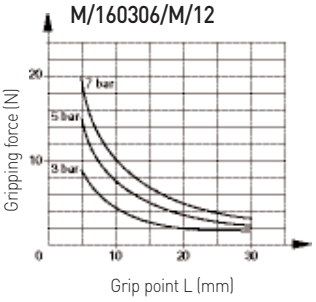


Effective closing gripping forces = Theoretical closing gripping force x 0,85

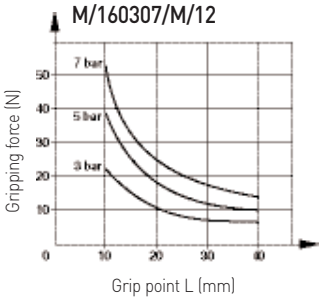
M/160305/M/12



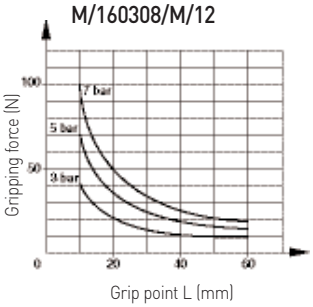
M/160306/M/12



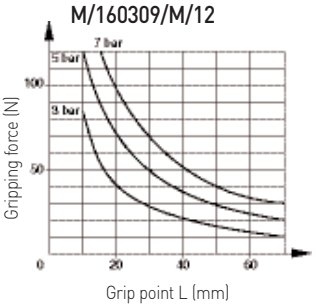
M/160307/M/12



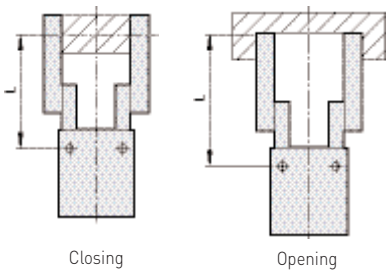
M/160308/M/12



M/160309/M/12

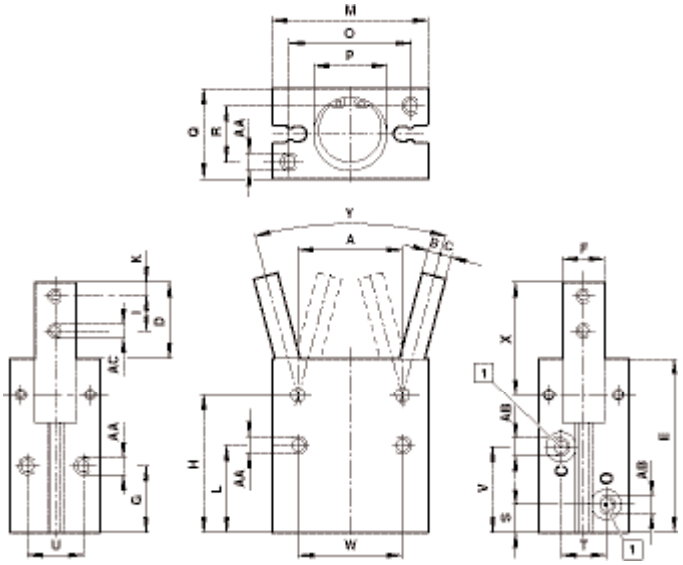


Workpiece



Effective closing gripping forces = Theoretical closing gripping force x 0,85

BASIC DIMENSIONS
M/160300/M/



1 Port size

MODELS	Ø	A	B	C	D	E	F	G	H	I	K
M/160305/M/..	8	12	1,5	2,0	12,5	29	5,5 -0,03	13	24	5,5	2,5
M/160306/M/..	10	14	1,5	2,5	14,5	36	7 -0,03	16	30	6	3
M/160307/M/..	16	24	3	3	17,5	42,5	9 -0,03	18	35	8	3
M/160308/M/..	20	30	3,5	3,5	22	50	12 -0,03	19	39,5	10	4
M/160309/M/..	25	36	4	5	26	58	14 -0,03	21,5	45,5	12	5

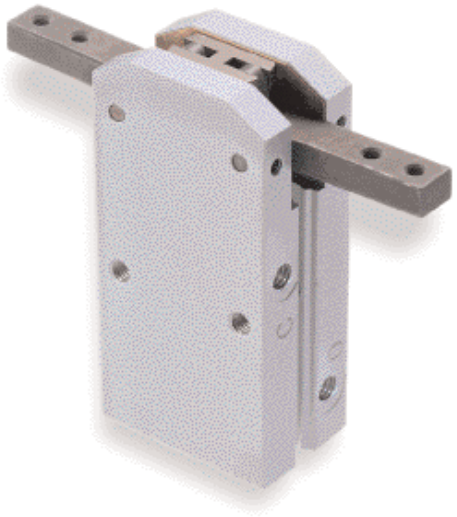
MODELS	Ø	L	M	O	P	Q	R	S	T	U	V
M/160305/M/..	8	18,5	20	15	Ø 9 + 0,05; 1*	13	9	4,5	-	-	14,5
M/160306/M/..	10	20	23	17	Ø 11 + 0,05; 1,5*	16	10	7,5	10	10	19
M/160307/M/..	16	22,5	34	26	Ø 17 + 0,05; 1,5*	22	14	7,5	12	14	22
M/160308/M/..	20	25	45	35	Ø 21 + 0,05; 1,5*	26	16	8	13	16	24,5
M/160309/M/..	25	28,5	52	40	Ø 26 + 0,05; 1,5*	32	20	9	18	20	28

MODELS	Ø	W	X	Y	AA	AB	AC	kg
M/160305/M/..	8	15	17,5	30° -10°	M2,5; 4,5* (base); M3; 3,5* (side); Ø 3,2 (front)	M3	M2,5	0,02
M/160306/M/..	10	18	20,5	30° -10°	M3; 5*	M3	M3	0,04
M/160307/M/..	16	24	25	30° -10°	M4; 7*	M5	M3	0,10
M/160308/M/..	20	30	32,5	30° -10°	M5; 8*	M5	M4	0,18
M/160309/M/..	25	36	38.5	30° -10°	M6; 10*	M5	M5	0,31

* Deep

M/160330/M/12 180° Angular grippers

Double acting. Magnetic piston - Ø 16 ... 20 mm



- **Smooth, accurate movement**
- **Long, uninterrupted service life**
- **Low weight**
- **Compact size**
- **Integral magnets for positional feedback**

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting, angular, magnetic piston

Operating pressure:
2 ... 7 bar

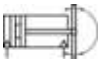
Operating temperature:
+60°C
Consult our Technical Service for use below +2°C

Mounting:
Mounting holes on three surfaces

MATERIALS

Body: aluminium alloy
Fingers: carbon steel
Slide plate: carbon steel
Elastomers: nitrile

STANDARD MODELS

	Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight fitting	Elbow fitting
								Tube diameter in bold	
	16	M5	64/L	55,0/L	**M/160335/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05
	20	M5	134,0/L	113,0/L	**M/160336/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05

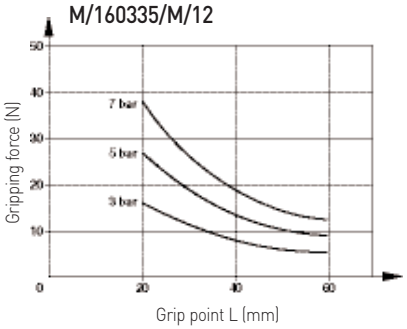



* Example - calculating the effective closing gripping force (N) at 5 bar for the M/160335/M/12.
Establish the approximate grip point in cm (not mm), example 4 cm.
Calculation = 55 / L
= 55 / 4
Effective closing gripping force = 13,75N.

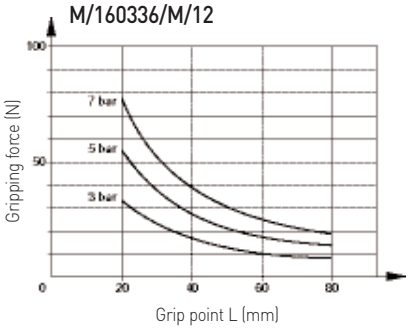
For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

Theoretical closing gripping forces

M/160335/M/12

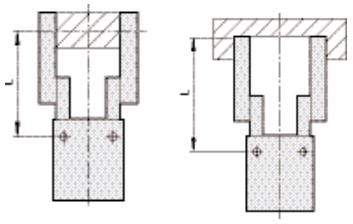


M/160336/M/12



Effective closing gripping forces = Theoretical closing gripping force x 0,85

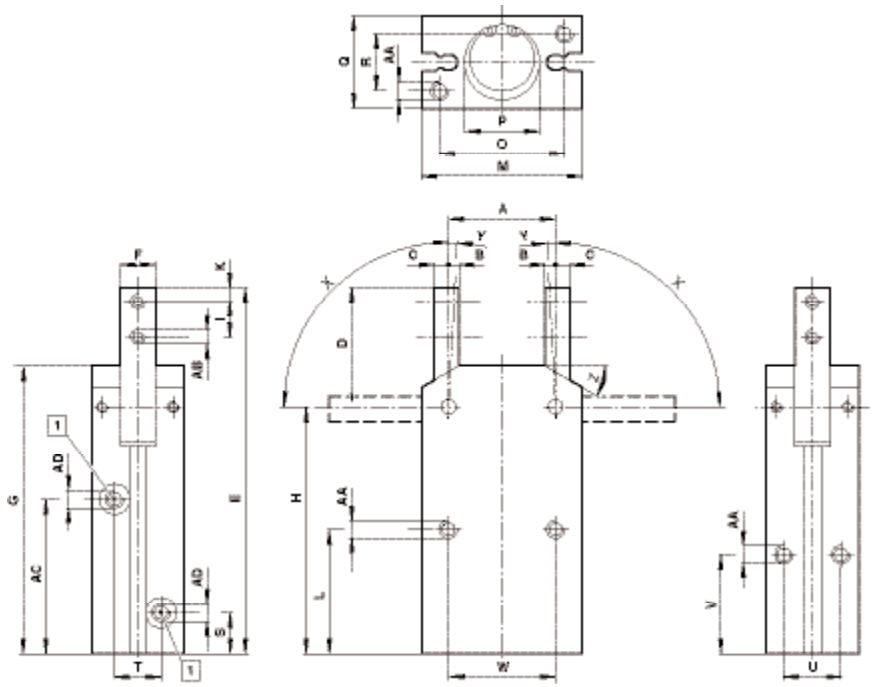
Workpiece



For further information

www.norgren.com/info/en1-186

BASIC DIMENSIONS
M/160330/M/12



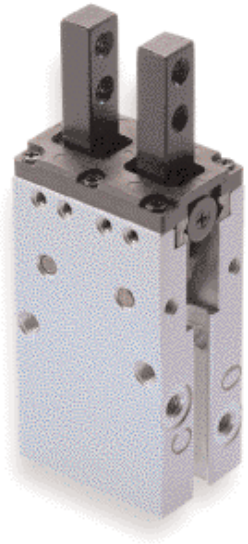
1 Port size

MODELS	Ø	A	B	C	D	E	F	G	H	I	K
M/160335/M/12	16	24	3	2,5	28,5	87,5	8 - 0,03	69	59	8	4
M/160336/M/12	20	30	4	3	33,5	103	10 - 0,03	81	69,5	10	4
MODELS	Ø	L	M	O	P	Q	R	S	T	U	V
M/160335/M/12	16	30	34	26	Ø 17 + 0,05; 1,5*	22	14	10,5	12	14	25
M/160336/M/12	20	35	45	35	Ø 21 + 0,05; 1,5*	26	16	11,5	13	16	28
MODELS	Ø	W	X	Y	Z	AA	AB	AC	AD	kg	
M/160335/M/12	16	24	90°	3°	30°	M4; 7*	M3	37,5	M5	0,15	
M/160336/M/12	20	30	90°	3°	30°	M5; 8*	M4	43,5	M5	0,28	

* Deep

M/160340/M/11, M/160340/M/12 Parallel grippers

Single acting, double acting.- Magnetic piston - Ø 10 ... 25 mm



Ideal for general purpose gripping applications

Smooth, accurate movement

Long, uninterrupted service life

Low weight

Compact size

Integral magnets for positional feedback

MATERIALS

Body: aluminium alloy
Top plate: carbon steel
Fingers: carbon steel
External screws: carbon steel
Elastomers: nitrile

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

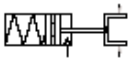
Operation:
Single acting, parallel, magnetic piston (M/160340/M/11)
Double acting, parallel, magnetic piston (M/160340/M/12)

Operating pressure:
2,5 ... 7 bar (Ø 10 mm 3,5 ... 7 bar)
M/160340/M/12: 1 ... 7 bar
(Ø 10 mm 1,8 ... 7 bar Ø 16 mm 1,2 ... 7 bar)

Operating temperature:
+60°C
Consult our Technical Service for use below +2°C

Mounting:
Mounting holes on three faces
Gripping repeatability:
+/- 0,01 mm

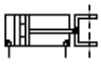
STANDARD MODELS - SINGLE ACTING

	Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
									
	10	M3	2	4,9	**M/160343/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**03	M024**70**403
	16	M5	3,9	21,0	**M/160344/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405
	20	M5	6,9	36,4	**M/160345/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405
	25	M5	13,7	54,0	**M/160346/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405

* Grip point L= 30 mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

STANDARD MODELS - DOUBLE ACTING

	Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
									
	10	M3	14,6	9,4	**M/160343/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**03	M024**70**403
	16	M5	34,0	25,5	**M/160344/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405
	20	M5	60,9	45,7	**M/160345/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405
	25	M5	87,0	67,0	**M/160346/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405

* Grip point L= 30 mm

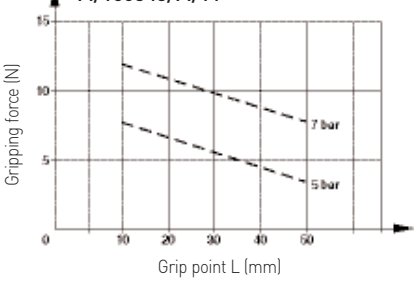
For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

For further information

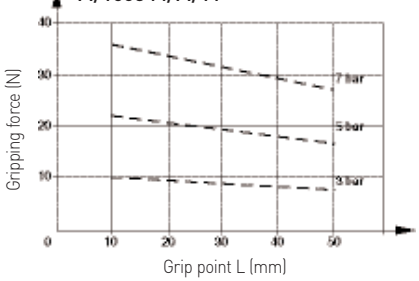
www.norgren.com/info/en1-188

THEORETICAL CLOSING GRIPPING FORCES

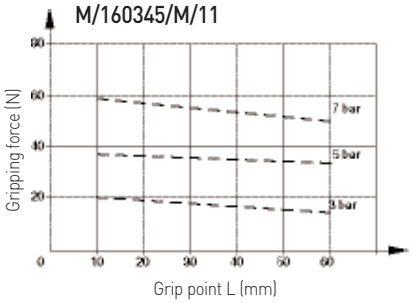
M/160343/M/11



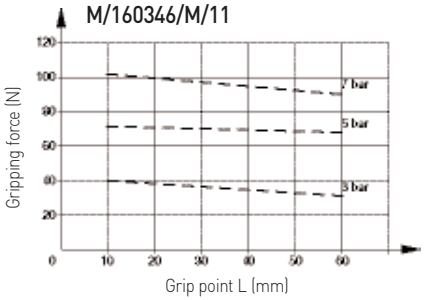
M/160344/M/11



M/160345/M/11

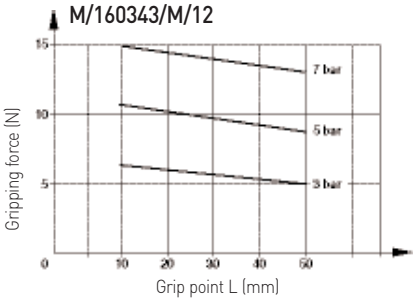


M/160346/M/11

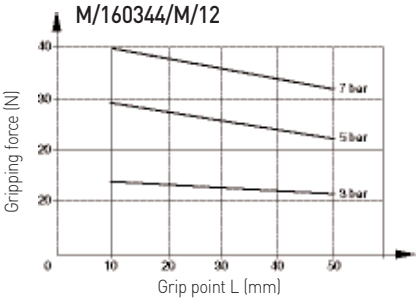


Effective closing gripping forces = Theoretical closing gripping force x 0,85

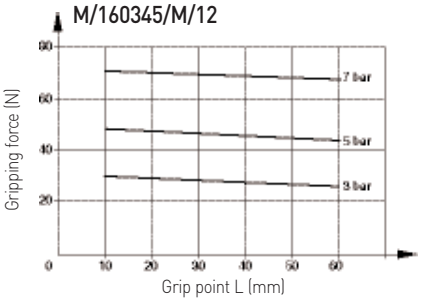
M/160343/M/12



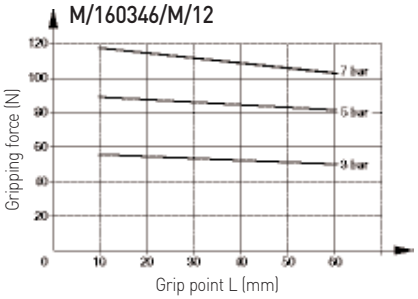
M/160344/M/12



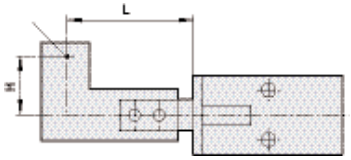
M/160345/M/12



M/160346/M/12



Workpiece grip point



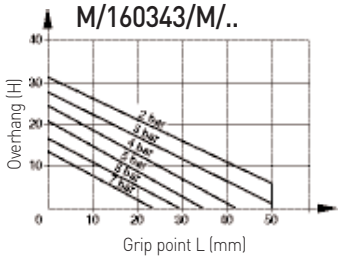
Criteria of workpiece weight

When chucking a workpiece, weight should be within the range between 1/10 and 1/20 of the above gripping force.
When chucking and then moving a workpiece, the workpiece may protrude or drop. Therefore, workpiece weight should be less than the above mentioned value. (Reference value is 1/30-1/50)
Weight depends on the operational condition, such as material and shape of workpiece or claw, speed and direction of moving workpiece (straight advance, rotation or swing, etc.)

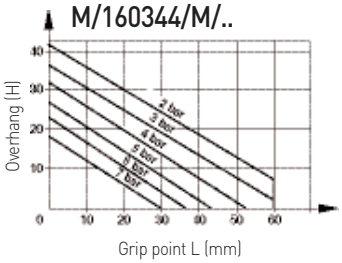
Effective closing gripping forces = Theoretical closing gripping force x 0,85

GRIP POINT LIMITATION RANGE

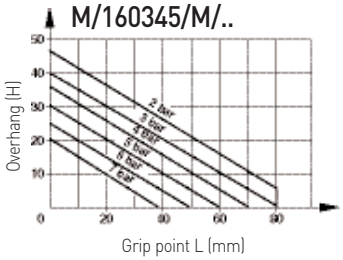
M/160343/M/..



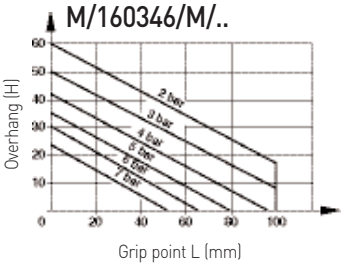
M/160344/M/..



M/160345/M/..



M/160346/M/..

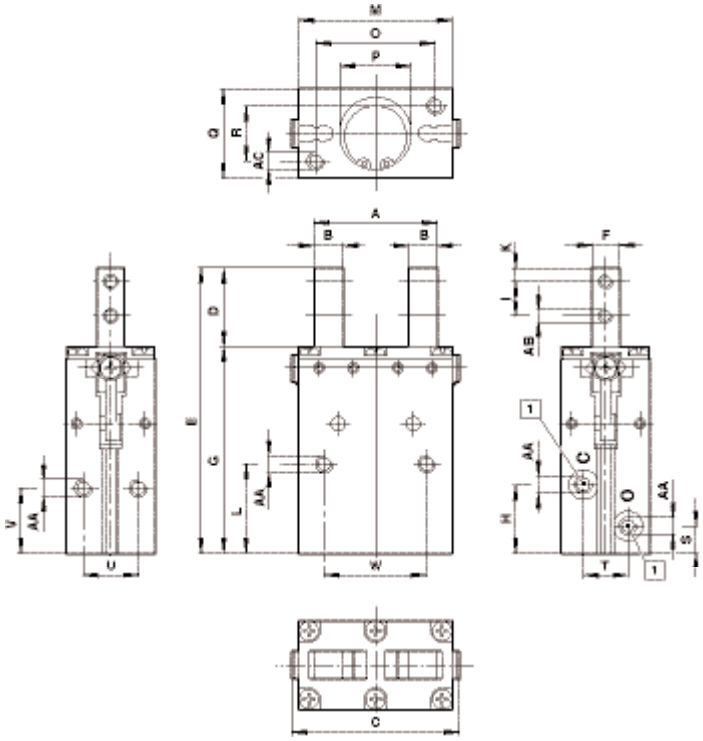


M/160340/M/11, M/160340/M/12 Parallel grippers

Single acting, double acting.- Magnetic piston - Ø 10 ... 25 mm

BASIC DIMENSIONS

M/160340/M/



1 Port size

MODELS	Ø	A	B	C max	D	E	F	G	H	I	K
M/160343/M/..	10	17** + 1,6 / -0,2; 13*** ± 0,4	4,5	25	16,5	59,5	5,5 - 0,03	43	15	6	3
M/160344/M/..	16	26** + 2,3; 18*** + 0,6 / -0,2	6,5	37,5	19	71	7 - 0,03	52	17,5	8	3
M/160345/M/..	20	36** + 1,5 / -0,9; 24*** + 0,1 / -0,9	8,5	49	23	83,5	8 - 0,04	60,5	20	10	4
M/160346/M/..	25	42** + 1,0 / -0,7; 28*** ± 0,4	10	57,5	27	95	10 - 0,03	68	23	12	5

MODELS	Ø	L	M	O	P	Q	R	S	T	U	V	W	AA
M/160343/M/..	10	20	23	17	Ø 11 + 0,05; 1,5*	16	10	7,5	10	10	16	18	M3
M/160344/M/..	16	23	34	26	Ø 17 + 0,05; 1,5*	22	14	7,5	12	14	18	24	M5
M/160345/M/..	20	26	45	35	Ø 21 + 0,05; 1,5*	26	16	8	13	16	19	30	M5
M/160346/M/..	25	30	52	40	Ø 26 + 0,05; 1,5*	32	20	9	18	20	22	36	M5

MODELS	Ø	AB	AC	kg
M/160343/M/..	10	M3; 5*	M3	0,05
M/160344/M/..	16	M4; 7*	M3	0,12
M/160345/M/..	20	M5; 8*	M4	0,22
M/160346/M/..	25	M6; 10*	M5	0,37

* Deep
** Open
*** Closed

M/160350/M/11, M/160350/M/12 Parallel grippers - precision

Single acting, double acting - Magnetic piston - Ø 8 ... 50 mm

Ideal for applications demanding accuracy and precise repeatability

Smooth, accurate movement

Long, uninterrupted service life

Low weight

Compact size

Integral magnets for positional feedback

MATERIALS

Body: aluminium alloy
Fingers: stainless steel
Guide rail: stainless steel
Elastomers: nitrile

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Single acting, parallel, magnetic piston (M/160350/M/11)
Double acting, parallel, magnetic piston (M/160350/M/12)

Operating pressure:
M/160354/M/.. 2,2 bar ... 7 bar max.
M/160355/M/.. 2,0 bar ... 7 bar max.
M/160356/M/.. 1,2 bar ... 7 bar max.
M/160357/M/.. to M/160359/M/..
1,0 bar ... 7 bar max.

Operating temperature:
+60°C
Consult our Technical Service for use below +2°C

Mounting:
Mounting holes on three faces

Gripping repeatability:
+/- 0,01 mm

Accuracy to centre:
+/- 0,07 mm

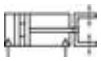
STANDARD MODELS - SINGLE ACTING

Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
								
8	M3	2,7	4,1	**M/160354/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**03	M024**70**403
10	M3	2,4	6,8	**M/160355/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**03	M024**70**403
16	M5	5,4	20,0	**M/160356/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405
20	M5	7,3	34,0	**M/160357/M/11**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

STANDARD MODELS - DOUBLE ACTING

Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
								
8	M3	9,9	5,8	**M/160354/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**03	M024**70**403
10	M3	15,0	9,4	**M/160355/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**03	M024**70**403
16	M5	39,0	26,0	**M/160356/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405
20	M5	60,0	45,0	**M/160357/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405
32	M5	176,0	157,0	**M/160358/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M022**04**05	M024**70**405
50	Rc 1/8	414,0	347,0	**M/160359/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	C012**04**18	C014**70**418



* Grip point L= 30 mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

For further information

i PDF CAD

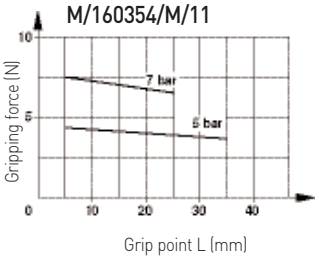
www.norgren.com/info/en1-191

M/160350/M/11, M/160350/M/12 Parallel grippers - precision

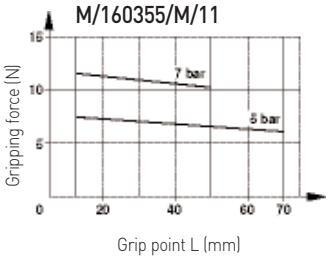
Single acting, double acting - Magnetic piston - Ø 8 ... 50 mm

THEORETICAL CLOSING GRIPPING FORCES

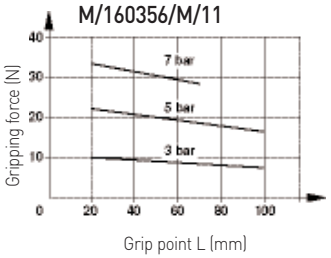
M/160354/M/11



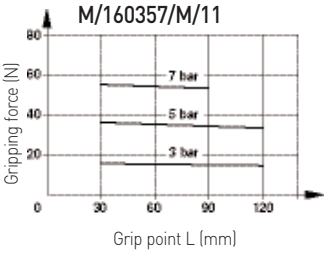
M/160355/M/11



M/160356/M/11

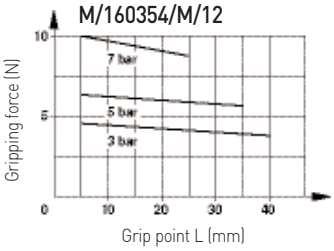


M/160357/M/11

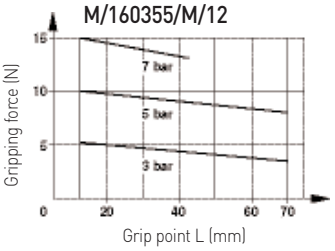


THEORETICAL CLOSING GRIPPING FORCES

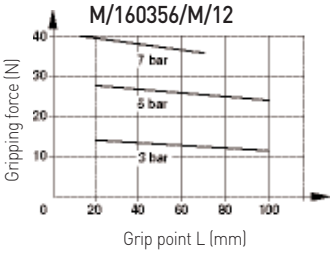
M/160354/M/12



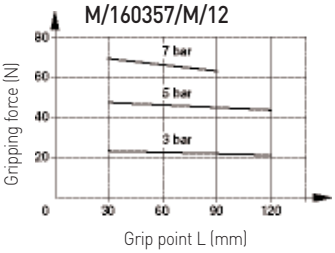
M/160355/M/12



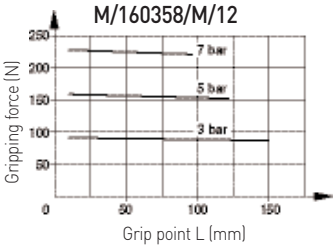
M/160356/M/12



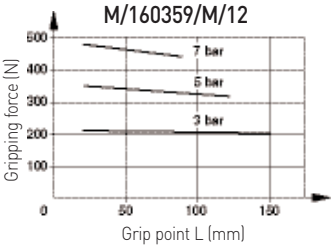
M/160357/M/12



M/160358/M/12



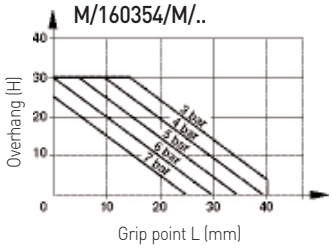
M/160359/M/12



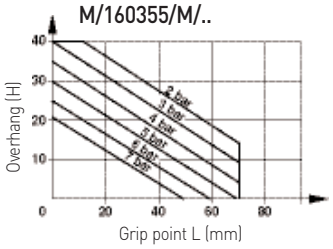
Effective closing gripping forces = Theoretical closing gripping force x 0,85

GRIP POINT LIMITATION RANGE

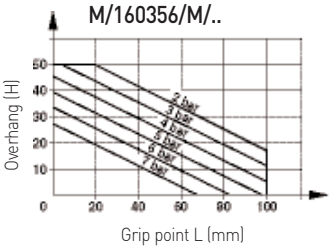
M/160354/M/..



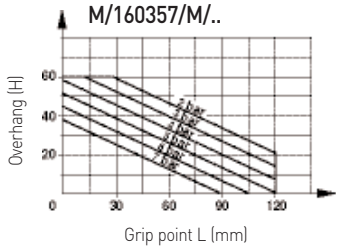
M/160355/M/..



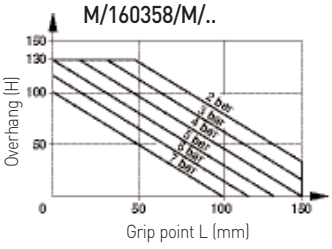
M/160356/M/..



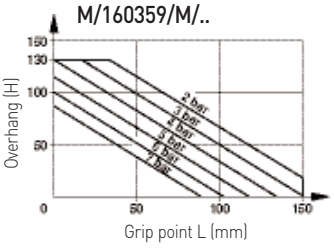
M/160357/M/..



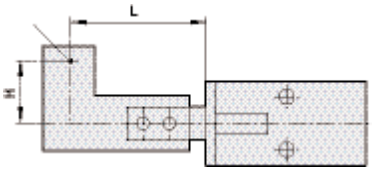
M/160358/M/..



M/160359/M/..

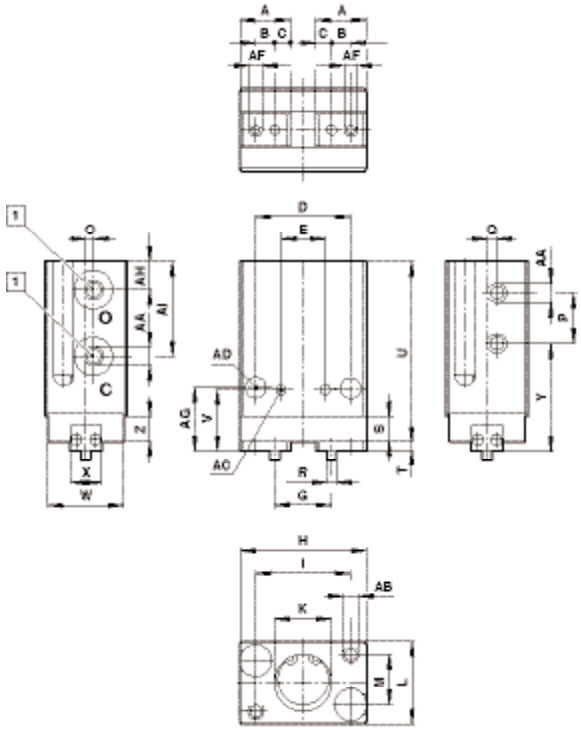


Workpiece



BASIC DIMENSIONS

M/160354/M/..



1 Port size

MODELS	Ø	A	B	C	D	E	G	H	I	K	L	M
M/160354/M/..	8	8	3	2,5	15	7 ± 0,03	9** + 1,5; 5*** +0,5	20	15	Ø9+0,05, 1*	3 ± 0,05	9

MODELS	Ø	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
M/160354/M/..	8	1,2	8	1,5	Ø 1,5 -0,03	4	1,5	28,5	9,7	12	5 ± 0,025	17	4	M3

MODELS	Ø	AB	AC	AD	AF	AG	AH	AI	AL	kg
M/160354/M/..	8	M2,5; 4*	Ø 1,5 + 0,02; 1*	Ø 3,2	M2; 3,5*	10	4,5	15	M3, 3*	0,02

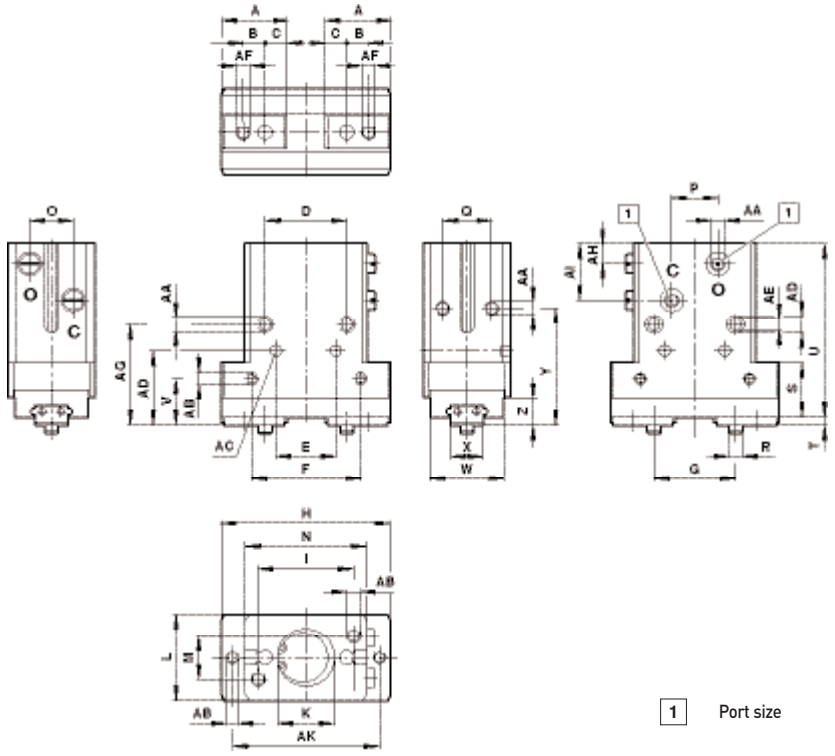
* Deep
** Open
*** Closed

M/160350/M/11, M/160350/M/12 Parallel grippers - precision

Single acting, double acting - Magnetic piston - Ø 8 ... 50 mm

BASIC DIMENSIONS

M/160355/M/..
M/160356/M/..
M/160357/M/..
M/160358/M/..



1 Port size

MODELS	Ø	A	B	C	D	E	F	G	H	I	K
M/160355/M/..	10	14,7	5	4,5	17	12 ± 0,03	20	15,5** + 1,5; 9*** + 0,5	36	17	Ø 11 + 0,05; 1,5*
M/160356/M/..	16	20	8	6	24	16 ± 0,03	30	22** + 1,8; 12*** + 1,3	50	26	Ø 17 + 0,05; 1,5*
M/160357/M/...	20	24	8	8	30	22 ± 0,03	40	30** + 2,4/-0,5; 16*** + 1,4	62	35	Ø 21 + 0,05; 1,5*
M/160358/M/..	32	31	14	9,5	30	30 ± 0,03	50	41** + 1,80; 19*** + 1,30	85	40	Ø 34 + 0,05; 2*

MODELS	Ø	L	M	N	O	P	Q	R	S	T	U
M/160355/M/..	10	20 ± 0,05	10	23	9	7	12	Ø 3 - 0,03	12,5	1,5	47,5
M/160356/M/..	16	25 ± 0,05	14	34	12	15	15	Ø 4 - 0,03	15	2	54
M/160357/M/..	20	32 ± 0,05	16	45	16	17	18	Ø 5 - 0,03	20	3	64
M/160358/M/..	32	40 ± 0,05	30	52	20	20	20	Ø 6 - 0,03	31	4	79

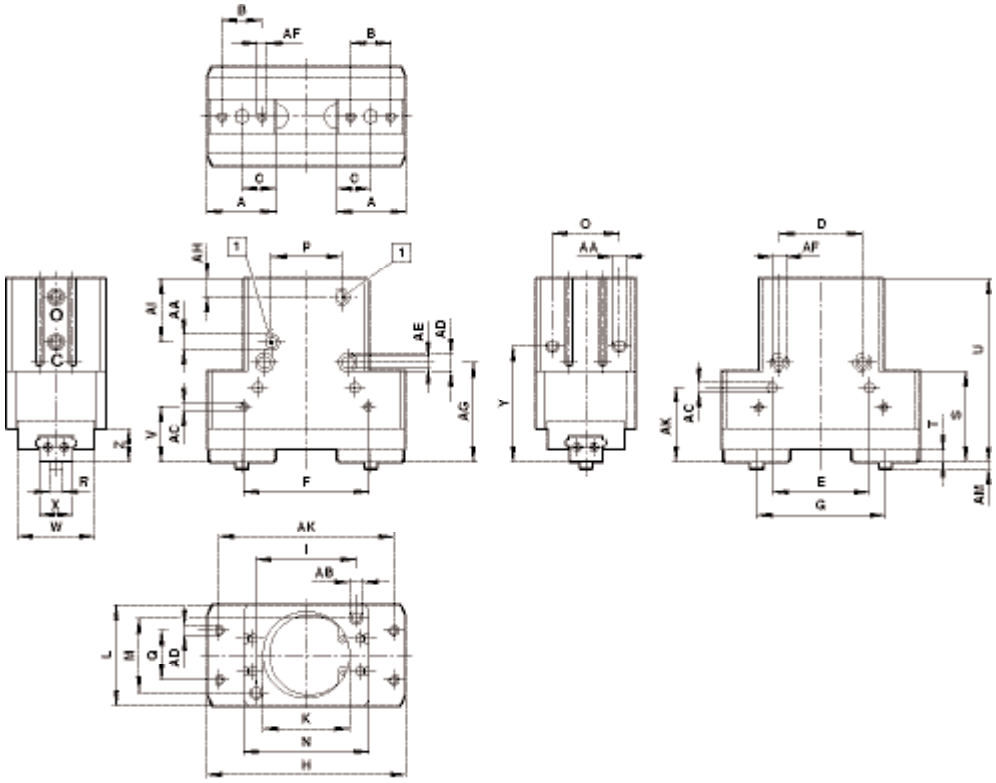
MODELS	Ø	V	W	X	Y	Z	AA	AB	AC	AD	AE
M/160355/M/..	10	11	17	7 ± 0,025	29	6	M3	M3; 4,5*	Ø 2,5 + 0,02; 2,5*	M4; 6*	Ø 3,4
M/160356/M/..	16	14	20	9 ± 0,025	36	8	M5	M4; 5*	Ø 3 + 0,02; 3*	M4; 6*	Ø 3,4
M/160357/M/..	20	17	27	12 ± 0,025	43	8	M5	M4; 7*	Ø 4 + 0,02; 3,5*	M5; 8*	Ø 4,2
M/160358/M/..	32	20	32	15 ± 0,025	53	13	M5	M8; 9*	Ø 5 + 0,03; 4*	M6; 9*	Ø 5,2

MODELS	Ø	AF	AG	AH	AI	AK	AL	AM	AN	AO	kg
M/160355/M/..	10	M3, 4*	24	7,5	17	30	M3; 5*	M3; 6*	16	M3; 5*	0,08
M/160356/M/..	16	M4, 5*	31	7,5	19	42	M4; 6*	M4; 7*	21	M3; 5*	0,16
M/160357/M/..	20	M5, 7*	37	7,5	21	54	M5; 8*	M5; 9*	27,3	M4; 6*	0,33
M/160358/M/..	32	M6, 9*	46	9	28,5	70	M6; 8*	M6; 9*	31	M5; 8*	0,66

* Deep
** Open
*** Closed

BASIC DIMENSIONS

M/160359/M/12



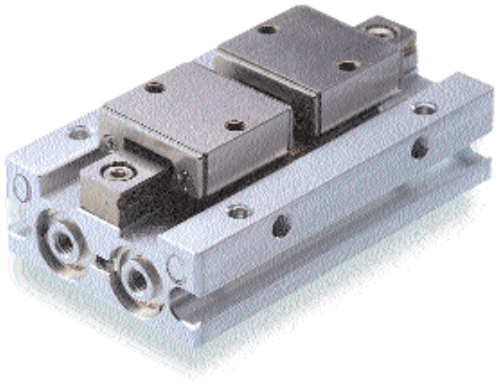
1 Port size

MODELS	Ø	A	B	C	D	E	F	G	H	I	K
M/160359/M/12	50	41	24	20,5	50	58 ± 0,03	75	77** + 1,8/-0,2; 41*** + 0,4	119	60	Ø 52+0,05, 3*
MODELS	Ø	L	M	N	O	P	Q	R	S	T	U
M/160359/M/12	50	60 ± 0,05	45	75	40	42	30	Ø 8 - 0,02	55	7,5	110
MODELS	Ø	V	W	X	Y	Z	AA	AB	AC	AD	AE
M/160359/M/12	50	33	46	20 -0,025	70	20	Rc1/8	M6; 12*	Ø 6+0,03; 7*	M8; 12*	Ø 11; 6,5*
MODELS	Ø	AF	AG	AH	Al	AK	AL	AM	AN	AO	AP	kg
M/160359/M/12	50	M6; 12*	60	11	38	105	M8; 12*	4	45	M5; 8 *	M8; 15*	1,85

* Deep
** Open
*** Closed

M/160360/M/12 Parallel grippers - low profile

Double acting - Magnetic piston - Ø 8 & 12 mm



Ideal for applications where operating space is restricted

Smooth, accurate movement

Long, uninterrupted service life

Low weight

Compact size

Integral magnets for positional feedback

MATERIALS

Body: aluminium alloy
Fingers: carbon steel
Bearings: stainless steel
Elastomers: nitrile

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operating pressure:
M/160364/M/12: 2 ... 7 bar
M/160365/M/12: 1,5 ... 7 bar

Operating temperature:
+60°C
Consult our Technical Service for use below +2°C

Mounting:
Mounting holes on three faces

Gripping repeatability:
+/- 0,07 mm
Accuracy to centre:
+/- 0,1 mm

STANDARD MODELS

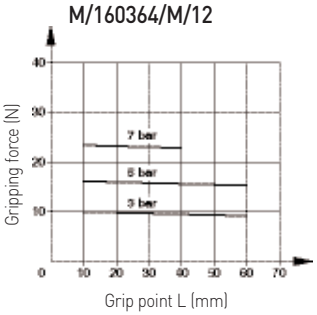
	Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
									
	8	M3 x 0,5	16,7	16,7	**M/160364/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**03	M0247**04**03
	12	M5 x 0,8	44,0	44,0	**M/160365/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05

* Grip point L= 30 mm

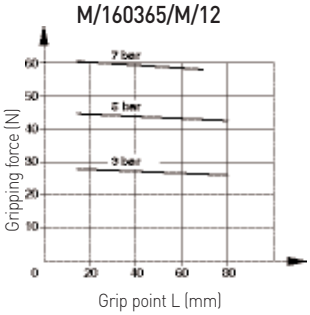
For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

THEORETICAL GRIPPING FORCES

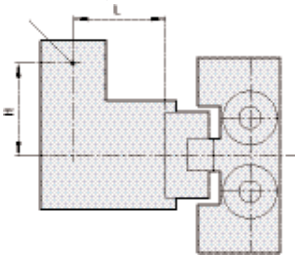
M/160364/M/12



M/160365/M/12



Workpiece grip point

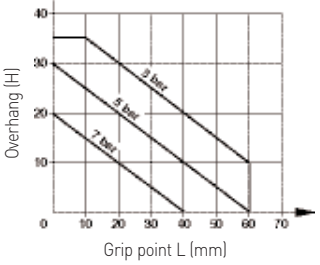


For further information

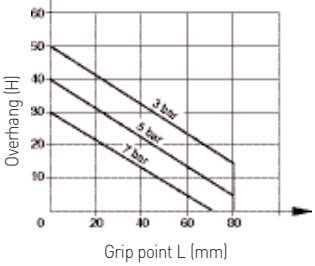
www.norgren.com/info/en1-196

GRIP POINT LIMITATION RANGE

M/160364/M/12

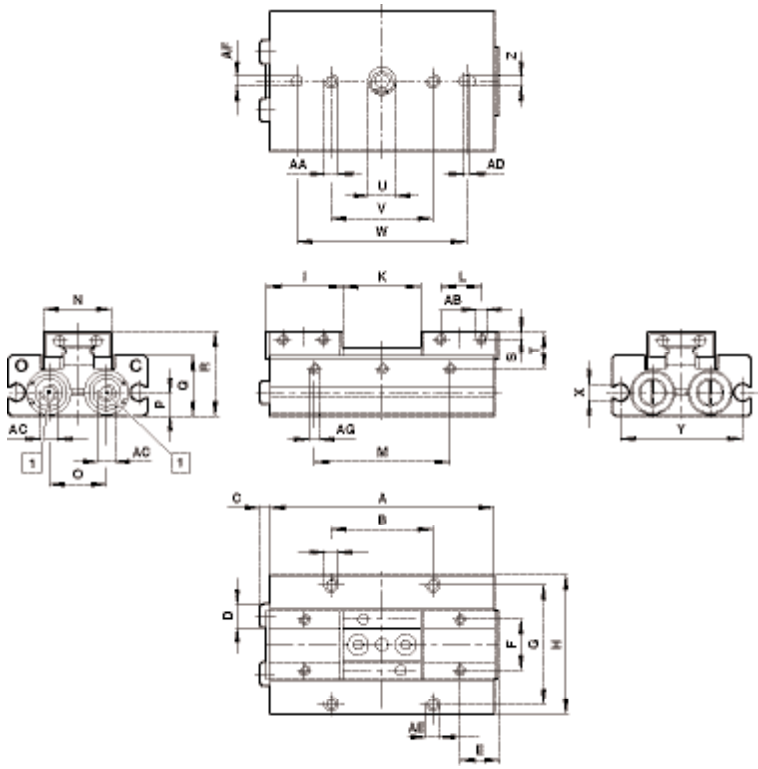


M/160365/M/12



BASIC DIMENSIONS

M/160360/M/12



1 Port size

MODELS	Ø	A	B	C	D	E	F	G	H	I	K	
M/160364/M/12	8	52	32	2,5	Ø 5	8,1	13	26	32	16,2	17** +1,7/-0,5; 1*** +0,7/-1,0	
M/160365/M/12	12	66	30	3	Ø 7	11,4	15	35	41	22,8	23** +1,9/-0,5; 1*** +0,9/-1,0	
MODELS	Ø	L	M	N	O	P	Q	R	S	T	U	
M/160364/M/12	8	10	24	17	12	5	13	19	2	8,5	Ø 8+0,05; 1*	
M/160365/M/12	12	12	40	20	17	7	18	25	2	11	Ø 8+0,05; 1*	
MODELS	Ø	V	W	X	Y	Z	AA	AB	AC	AD	AE	
M/160364/M/12	8	24	40	Ø 5	27	2,5+0,03; 2,5*	M3; 5*	M2,5; 3*	M3	2	M3; 5*	
M/160365/M/12	12	30	50	Ø 5	36	3+0,03; 3*	M4; 8*	M3; 3*	M5	2	M4; 6*	
MODELS	Ø	AF	AG	kg								
M/160364/M/12	8	Ø 2,5+0,03; 2,5*	M3; 5*	0,09								
M/160365/M/12	12	Ø 3+0,03; 3*	M3; 5*	0,2								

* Deep
** Open
*** Closed

M/160380/M/12 Parallel grippers - three jaw

Double acting - Magnetic piston - Ø 16 & 20 mm

- **Ideal for gripping spheres or components with circular faces**
- **Smooth, accurate movement**
- **Long, uninterrupted service life**
- **Low weight**
- **Compact size**
- **Integral magnets for positional feedback**

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting, three jaw parallel, magnetic piston

Operating pressure:
2 ... 7 bar
1,5 ... 7 bar M/160386/M/12

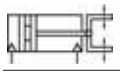
Operating temperature:
+60°C
Consult our Technical Service for use below +2°C

Mounting:
Mounting holes on base
Gripping repeatability:
+/- 0,01 mm

MATERIALS

Body: aluminium alloy
Top plate: carbon steel
Fingers: carbon steel
External screws: carbon steel
Elastomers: nitrile

STANDARD MODELS

	Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight Fitting (Tube diameter in bold)	Elbow Fitting
										
	16	M5	27	20,0	**M/160385/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05
	20	M5	36,0	27,0	**M/160386/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05

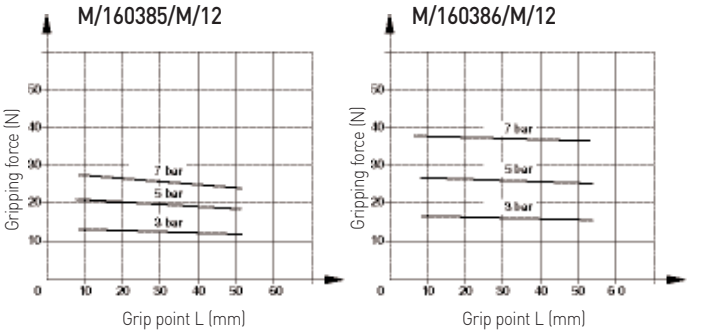
* Grip point L= 30 mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

For further information

www.norgren.com/info/en1-198

THEORETICAL CLOSING GRIPPING FORCES

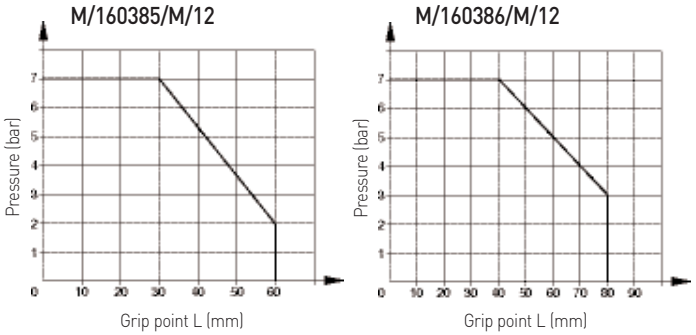


Effective closing gripping forces = Theoretical closing gripping force x 0,85

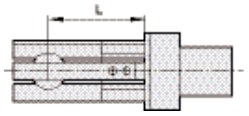
Criteria of workpiece weight

When chucking a workpiece, weight should be within the range between 1/10 and 1/20 of the above gripping force.
When chucking and then moving a workpiece, the workpiece may protrude or drop. Therefore, workpiece weight should be less than the above mentioned value. (Reference value is 1/30-1/50)
Weight depends on the operational condition, such as material and shape of workpiece or claw, speed and direction of moving workpiece (straight advance, rotation or swing, etc.)

GRIP POINT LIMITATION RANGE

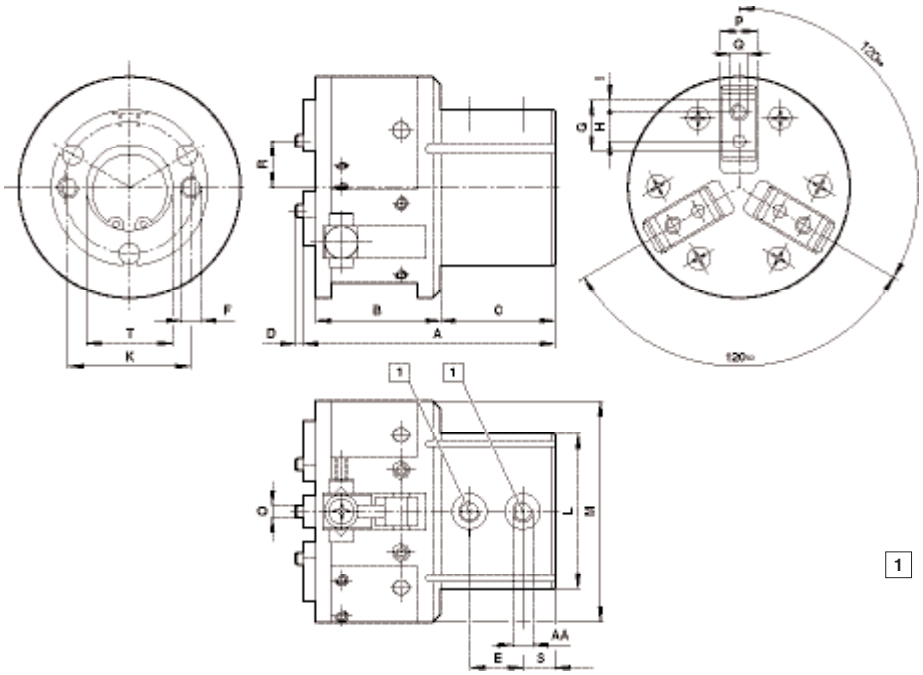


Workpiece grip point



BASIC DIMENSIONS

M/160380/M/12



1 Port size

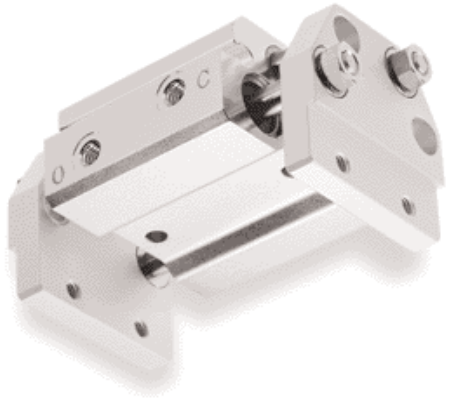
MODELS	Ø	A	B	C	D	E	F	G	H	I	K	L	M	O
M/160385/M/12	16	53	23	27	2	12,5	M4; 7*	10	5	2,5	24	Ø 32	Ø 42	Ø 3 - 0,005
M/160386/M/12	20	61,5	30,5	28	2	13	M5; 8*	12,5	7	3,0	30	Ø 38	Ø 54	Ø 3 - 0,005

MODELS	Ø	P	Q	R	S	T	AA	kg
M/160385/M/12	16	7 - 0,03	M3	9,5** + 0,9/-0,4; 5,5*** + 0,9/-0,4	7,5	Ø 17+0,05; 1,5*	M5	0,16
M/160386/M/12	20	8 - 0,04	M4	13 **+ 1,6/-0,4; 7*** + 1,2/-0,4	8	Ø 21+0,05; 5*	M5	0,28

* Deep
** Open
*** Closed

M/160390/M/12 Parallel grippers - long stroke

Double acting - Magnetic piston - Ø 12 ... 25 mm



- **Ideal for handling wide components**
- **Smooth, accurate movement**
- **Long, uninterrupted service life**
- **Low weight**
- **Compact size**
- **Integral magnets for positional feedback**

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operating pressure:
2 ... 7 bar

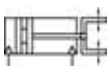
Operating temperature:
+60°C
Consult our Technical Service for use below +2°C

Mounting:
Mounting holes on two faces

MATERIALS

Body: aluminium alloy
Piston rods: stainless steel
External nuts: carbon steel
Elastomers: nitrile

STANDARD MODELS

	Ø	Port size	Effective gripping force (N) at 5 bar* Opening	Closing	MODELS	ACCESSORIES Switch with straight integral 3m cable	Switch with elbow integral 3m cable	Straight fitting (Tube diameter in bold)	Elbow fitting
									
	12	M5	27	27	**M/160394/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05
	16	M5	55,0	55,0	**M/160395/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05
	20	M5	85	85	**M/160396/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05
	25	M5	135,0	135,0	**M/160397/M/12**	M/344/EAU/3PV	M/344/EAU/3APV	M0225**04**05	M0247**04**05

* Grip point L= 30 mm

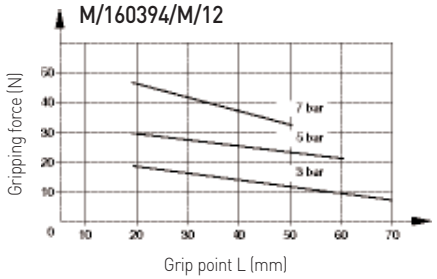
For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

For further information

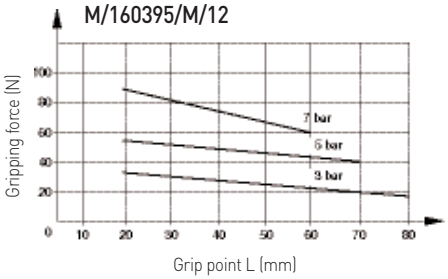
www.norgren.com/info/en1-200

EFFECTIVE GRIPPING FORCES

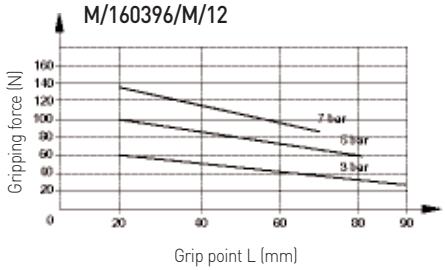
M/160394/M/12



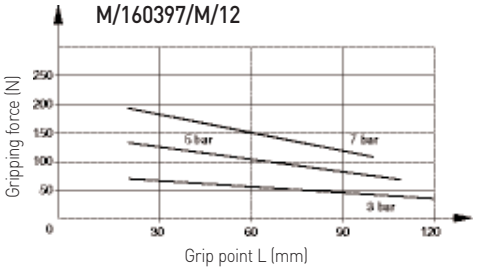
M/160395/M/12

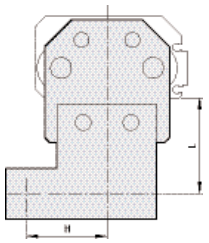


M/160396/M/12



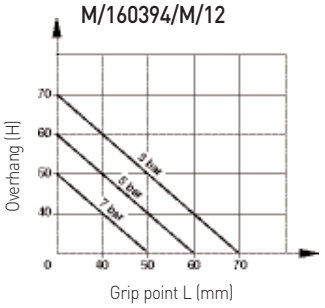
M/160397/M/12



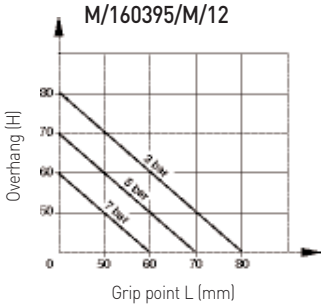


GRIP POINT LIMITATION RANGE

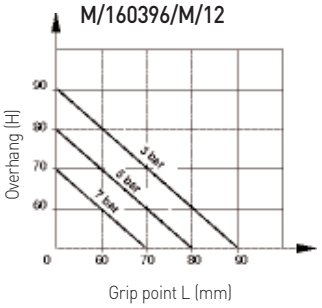
M/160394/M/12



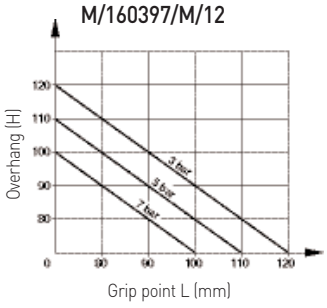
M/160395/M/12



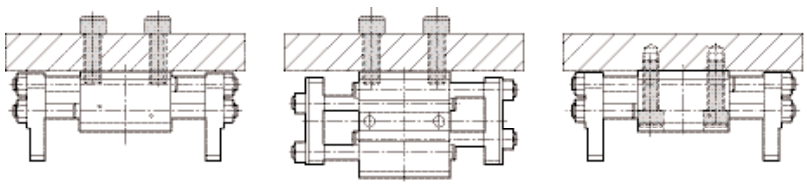
M/160396/M/12



M/160397/M/12



MOUNTING EXAMPLES

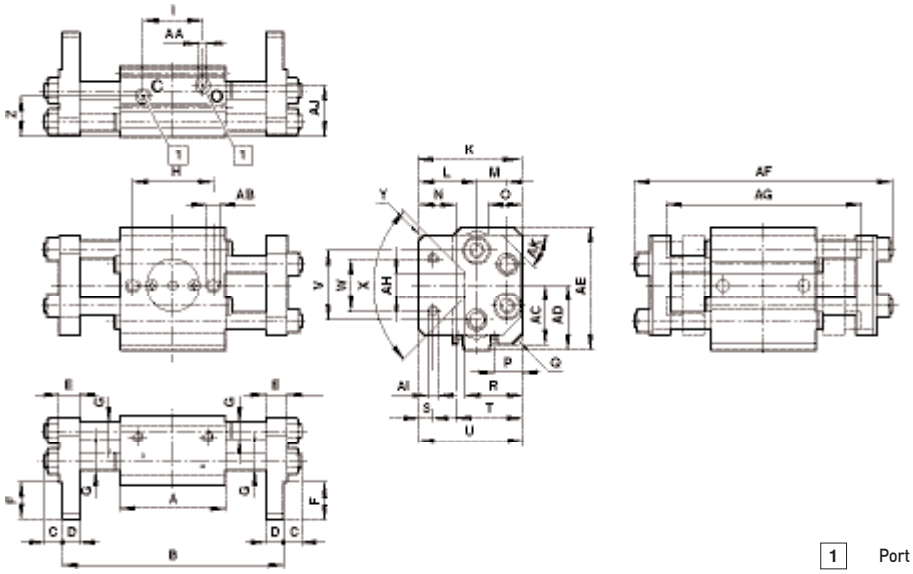


M/160390/M/12 Parallel grippers - long stroke

Double acting - Magnetic piston - Ø 12 ... 25 mm

BASIC DIMENSIONS

M/160390/M/12



1 Port size

MODELS	Ø	A	B	C	D	E	F	G	H	I	K	L
M/160394/M/12	12	44	84,5** + 1,4/-1,0; 60*** + 1,0/-0,9	6,5	6	8	12	Ø 6	34	21	38,5	21
M/160395/M/12	16	50	102,5** + 1,4/-1,0; 70*** + 1,0/-1,8	8	8	10	13,5	Ø 8	38	28	43,5	23,5
M/160396/M/12	20	60	124,5** + 1,5/-1,1; 84*** + 1,1/-1,9	10,5	10	12	21	Ø 10	46	34	58	33
M/160397/M/12	25	66	145** + 1,5/-1,1; 94,5*** + 1,1/-1,9	11	12	14	26	Ø 10 & 12	52	39	67,5	41

MODELS	Ø	M	O	P	Q	R	S	T	U	V	W	X	Y	Z
M/160394/M/12	12	11,5	15	9,5	3,5	24	4	27	39	29	20	90°	1	16
M/160395/M/12	16	14	15	11	3,5	27	5	32	45	34	20	90°	1	19,5
M/160396/M/12	20	17,5	-	16	5	32,5	8	40	59	40	30	90°	3	23
M/160397/M/12	25	18,5	-	16,5	10	35,5	10	44	69	49	30	90°	3	25

MODELS	Ø	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	kg
M/160394/M/12	12	M5	M5	22,7	27	50	99	76	16	M4	20	30°	0,23
M/160395/M/12	16	M5	M6	27,5	32,5	60	123	93	9,5	M5	23,5	30°	0,40
M/160396/M/12	20	M5	M8	34	37	70	147	112	14	M6	29	45°	0,76
M/160397/M/12	25	M5	M10	40,5	44	84	169	124	14	M8	31	45°	1,10

** open
*** closed

“Sales and manufacturing facilities in 75 countries give us the global reach, understanding and capabilities that customers look for”

Norgren’s global footprint

Specialist technical centres are located in Asia, England, Germany and the USA.

We have a global network of technical centres close to our key markets where skilled and experienced design and development engineers produce custom-built solutions to give our customers competitive advantage.

With established manufacturing facilities globally Norgren has the manufacturing and support capabilities to be able to cope with the most demanding international projects. Drawing on many years of experience of handling major projects across national boundaries, Norgren can harness global resources to match its customers’ own operations.

>>GLOBAL REACH World leading pneumatic and fluid control technologies

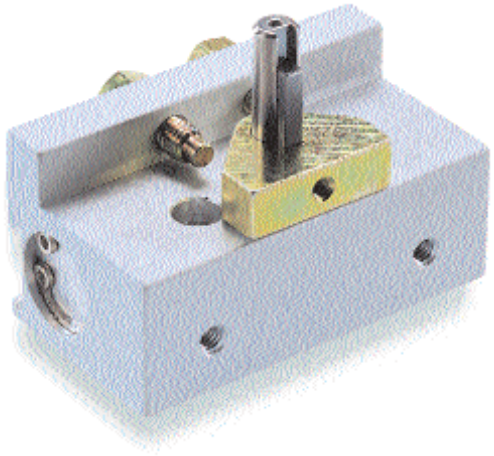
‘Global manufacturing and support’

With an established sales and service network in 75 countries, we have the reach and capability to ensure continuity of supply and local support where it is needed for customers involved in export markets or multi-site operations. Front-line sales and technical support engineers share our knowledge and skills with customers around the world.

For details and information visit norgren.com

M/60210/M Miniature rotary actuators

Double acting - Magnetic piston - Ø 12 and 20 mm



- **Smooth operation with zero backlash**
- **Lightweight**
- **Compact envelope dimensions**
- **Integral magnets for positional feedback**

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operating pressure:
1 ... 7 bar

Operating temperature:
+5°C ... +60°C
Consult our Technical Service for use below +2°C

Mounting:
Mounting holes in body

MATERIALS

Body: aluminium alloy
End covers: aluminium alloy
Shaft: carbon steel
External stop: carbon steel
External nuts: mild steel
External screws: chrome molybdenum steel
Elastomers: nitrile

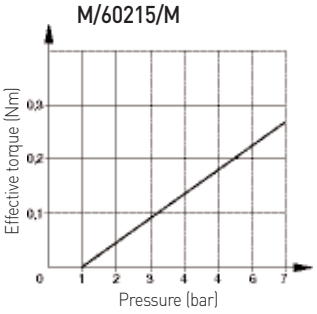
STANDARD MODELS

	Ø	Port size	Effective torque (Nm) at 6 bar	Angle of rotation	MODELS	ACCESSORIES Switch with straight integral 5m cable	Switch with elbow integral 5m cable	Straight fitting	Elbow fitting
								Tube diameter in bold	
									
	12	M5	0,23	90°	**M/60215/M/90**	M/346/LAU/5PV	M/346/EAU/5APV	M02250**4**405	M02470**4**405
	12	M5	0,23	180°	**M/60215/M/180**	M/346/LAU/5PV	M/346/EAU/5APV	M02250**4**405	M02470**4**405
	20	M5	1,00	90°	**M/60216/M/90**	M/346/LAU/5PV	M/346/EAU/5APV	M02250**4**405	M02470**4**405
	20	M5	1,00	180°	**M/60216/M/180**	M/346/LAU/5PV	M/346/EAU/5APV	M02250**4**405	M02470**4**405

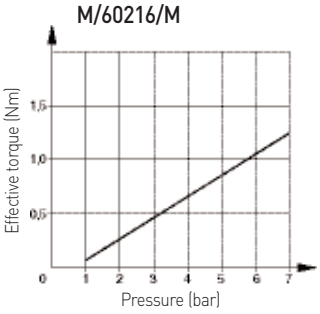
For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

EFFECTIVE TORQUE

M/60215/M



M/60216/M

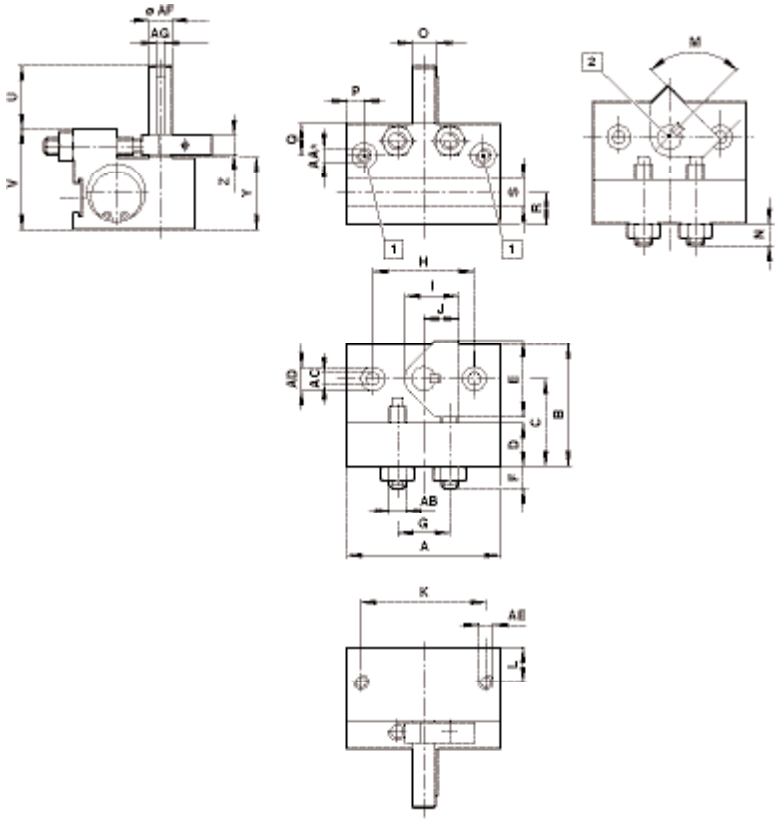


For further information

www.norgren.com/info/en1-204

BASIC DIMENSIONS

M/60210/M/



1 Port size

2 Key position for 90°

MODELS	Ø	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
M/60215/M/90	12	42	30	20	7,5	22	6	14	24	15,3	10	34	8	90°	5,5	7,2
M/60215/M/180	12	55	30	20	7,5	22	6	14	24	15,3	10	34	8	90°	5,5	7,2
M/60216/M/90	20	53	42	30	15	26	8	18	35	18,5	12	43	12	90°	6,5	9,2
M/60216/M/180	20	20	72	42	30	15	26	8	18	35	18,5	12	43	12	90°	9,2

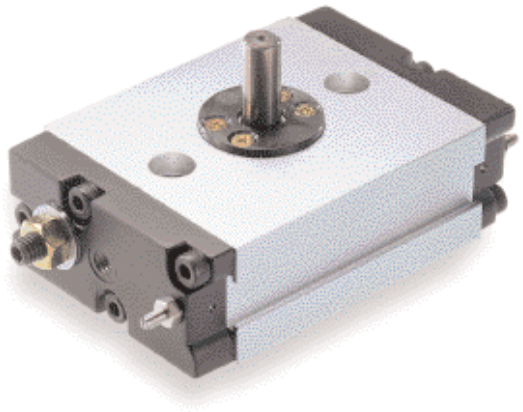
MODELS	Ø	P	Q	R	S	U	V	Y	Z	AA	AB	AC	AD	AE
M/60215/M/90	12	6	10,5	8	10	15	28	20	7	M5	M5	Ø 3,3	Ø 6,5; 3,5* (M4; 10**)	M4, 8*
M/60215/M/180	12	6	8	8	10	15	28	20	7	M5	M5	Ø 3,3	Ø 6,5; 3,5* (M4; 10**)	M4, 8*
M/60216/M/90	20	6	11	11	10	20	35	25,5	7	M5	M6	Ø 4,2	Ø 8; 3,5* (M5; 15**)	M5, 10*
M/60216/M/180	20	6	11	11	10	20	35	25,5	7	M5	M6	Ø 4,2	Ø 8; 3,5* (M5; 15**)	M5, 10*

MODELS	Ø	AF	AG	kg
M/60215/M/90	12	Ø 6 + 0,01/- 0,03	3 - 0,025	0,11
M/60215/M/180	12	Ø 6 + 0,01/- 0,03	3 - 0,025	0,14
M/60216/M/90	20	Ø 8 + 0,01/- 0,03	3 + 0,03	0,25
M/60216/M/180	20	Ø 8 + 0,01/- 0,03	3 + 0,03	0,32

* Deep
** Deep, on rear face

M/60270/M Compact rotary actuators

Double acting - Magnetic piston - Ø 14 and 22 mm



- **High torque levels from a compact product**
- **Minimal radial or thrust shudder means smooth operation**
- **Adjustable angle of rotation**
- **Integral magnets for positional feedback**

TECHNICAL DATA

Medium:
Compressed air filtered, lubricated or non-lubricated

Operating pressure:
1 ... 7 bar

Operating temperature:
+5°C ... +60°C
Consult our Technical Service for use below +2°C

Mounting:
Mounting holes on three faces

MATERIALS

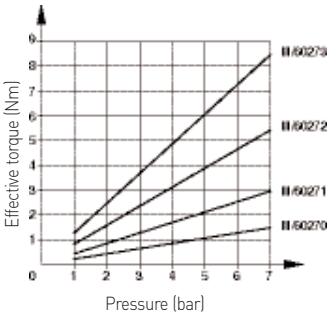
Body: aluminium alloy
End covers: aluminium alloy
Shaft: carbon steel
External shaft cover and screws: mild steel
External nuts: mild steel
External screws: chrome molybdenum steel

STANDARD MODELS

	Ø	Port size	Effective torque (Nm) at 6 bar	Angle of rotation	Angle adjustment range	MODELS	ACCESSORIES Switch with straight integral 5m cable	Switch with elbow integral 5m cable	Straight fitting	Elbow fitting
									Tube diameter in bold	
										
	14	M5	1,50	90°	70°...95°	**M/60215/M/90**	M/346/LAU/5PV	M/346/EAU/5APV	M0225**04**05	M0247**04**05
	14	M5	1,50	180°	160°...185°	**M/60215/M/180**	M/346/LAU/5PV	M/346/EAU/5APV	M0225**04**05	M0247**04**05
	16	M5	2,60	90°	70°...95°	**M/60216/M/90**	M/346/LAU/5PV	M/346/EAU/5APV	M0225**04**05	M0247**04**05
	16	M5	2,60	180°	160°...185°	**M/60216/M/180**	M/346/LAU/5PV	M/346/EAU/5APV	M0225**04**05	M0247**04**05
	18	M5	4,60	90°	70°...95°	**M/60215/M/90**	M/346/LAU/5PV	M/346/EAU/5APV	M0225**04**05	M0247**04**05
	18	M5	4,60	180°	160°...185°	**M/60215/M/180**	M/346/LAU/5PV	M/346/EAU/5APV	M0225**04**05	M0247**04**05
	22	M5	7,40	90°	70°...95°	**M/60216/M/90**	M/346/LAU/5PV	M/346/EAU/5APV	M0225**04**05	M0247**04**05
	22	M5	7,40	180°	160°...185°	**M/60216/M/180**	M/346/LAU/5PV	M/346/EAU/5APV	M0225**04**05	M0247**04**05

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

EFFECTIVE TORQUE

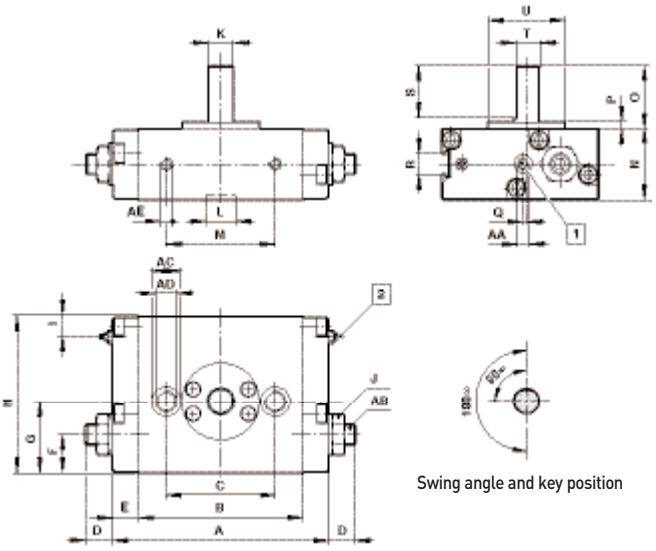


For further information

www.norgren.com/info/en1-206

BASIC DIMENSIONS

M/60270/M



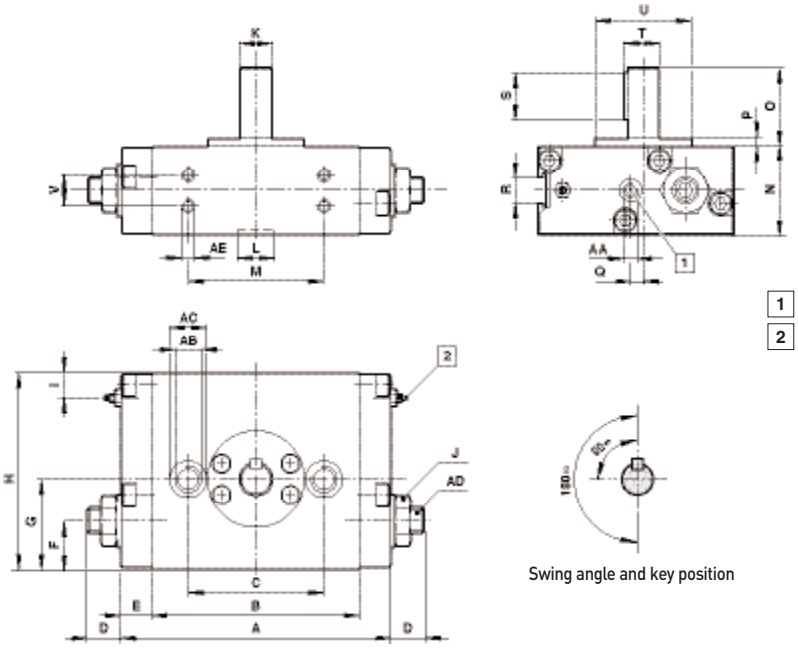
Swing angle and key position

1 Port size
2 Air cushion adjusting needle

MODELS	Ø	A	B	C	D	E	F	G	H	I	J	K	L		
M/60270/M/*	14	88	68	48	11	10	17	29	60	8	10 A/F	Ø 8h7 - 0,015	Ø 10 + 0,05; 1,5*		
MODELS	Ø	M	N	O	P	Q	R	S	T	U	AA	AB	AC	AD	AE	kg
M/60270/M/*	14	45	28	20	2	1,5	10	16	7	Ø 26 - 0,05	M5	M6	Ø 9,5; 5*	M6 x 1	M5; 6*1)	0,46

* Deep

M/60271/M ... M/60273/M



Swing angle and key position

1 Port size
2 Air cushion adjusting needle

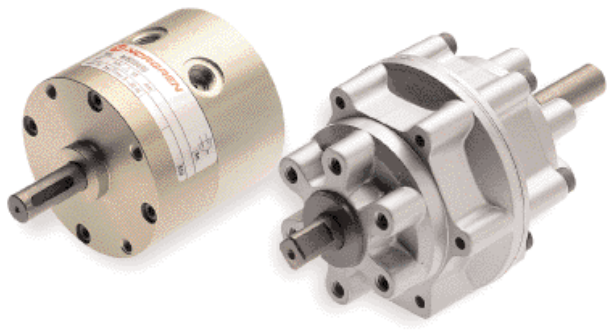
MODELS	Ø	A	B	C	D	E	F	G	H	I	J ⌐Σ	K	L	M	N
M/60271/M/90	16	98	74	45	14	12	17,5	31	68	9,5	13	Ø 10h7 - 0,015	Ø 12 + 0,05; 2*	45	32
M/60271/M/180	16	111	87	45	14	12	17,5	31	68	9,5	13	Ø 10h7 - 0,015	Ø 12 + 0,05; 2*	45	32
M/60272/M/90	18	103	79	52	14	12	18,5	34,5	75	9,5	17	Ø 12h7 - 0,018	Ø 14 + 0,05; 1,8*	52	34
M/60272/M/180	18	135	111	52	14	12	18,5	34,5	75	9,5	17	Ø 12h7 - 0,018	Ø 14 + 0,05; 1,8*	52	34
M/60273/M/90	22	115	87	60	15	14	22	41	87,5	10	17	Ø 15h7 - 0,018	Ø 17 + 0,05; 2*	60	39
M/60273/M/180	22	158	130	60	15	14	22	41	87,5	10	17	Ø 15h7 - 0,018	Ø 17 + 0,05; 2*	60	39

MODELS	Ø	O	P	Q	R	S	T	U	V	AA	AB	AC	AD	AE	kg
M/60271/M/90	16	25	2,5	2	10	18	11,5	Ø 32 - 0,05	10	M5	M8	Ø 11; 6,5*	M8	M4; 6*	0,7
M/60271/M/180	16	25	2,5	2	10	18	11,5	Ø 32 - 0,05	10	M5	M8	Ø 11; 6,5*	M8	M4; 6*	0,8
M/60272/M/90	18	30	3	5	10	18	13,5	Ø 37 - 0,05	12	M5	M10	Ø 14; 8,5*	M10	M5; 7*	1,0
M/60272/M/180	18	30	3	5	10	18	13,5	Ø 37 - 0,05	12	M5	M10	Ø 14; 8,5*	M10	M5; 7*	1,2
M/60273/M/90	22	35	3	5	10	20	17	Ø 44 - 0,05	14	M5	M10	Ø 14; 8,5*	M10	M6; 8*	1,6
M/60273/M/180	22	35	3	5	10	20	17	Ø 44 - 0,05	14	M5	M10	Ø 14; 8,5*	M10	M6; 8*	1,8

* Deep

M/60280 Rotary vane actuators

Double acting - 30° ... 270° rotation angles



Compact design

Suitable for torques from 0,058 to 402,46 Nm

Fixed and adjustable rotation angles

Single and double vane construction

MATERIALS

Body: cast aluminium
Shaft: steel
Shaft bearing: sintered bronze
Seals: nitrile rubber

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting rotary vane with buffer cushioning
M/60280 – M/60288 and IE models – single vane
M/60284/TI – M/60288/TI and TE models – double vane

Operating pressure:
2 ... 10 bar
3 ... 7 bar
(M/60280, M/60281, M/60281/IE)
2 ... 7 bar
(M/60282, M/60283, M/60282/IE,)

Operating temperature:
+5°C ... +60°C
Consult our Technical Service for use below +2°C

Rotation tolerance:
0° ... +4°: M/60280 - M/60283
0° ... +3°: M/60284 - M/60288, M/60284/TI – M/60288/TI
-9° ... +3°: M/60281/IE – M/60284/IE, M/60284/TE

STANDARD MODELS

Mini rotary vane actuators - Models with fixed or adjustable rotation angles

Port size	Single vane	Double vane	Rotation angle 90°	Rotation angle 180°	Rotation angle 270°	MODELS	ACCESORIES Straight fitting (Tube diameter in bold)	ACCESORIES Elbow fitting (Tube diameter in bold)
								
M5	•		•	•		**M/60280/***	C022**50**405	C024**70**405
M5	•		•	•		**M/60281/***	C022**50**405	C024**70**405
M5	•			•[*1]		**M/60281/IE**	C022**50**405	C024**70**405
M5	•		•	•		**M/60282/***	C022**50**405	C024**70**405
M5	•			•[*1]		**M/60282/IE**	C022**50**405	C024**70**405
G 1/8	•		•	•		**M/60283/***	C022**50**618	C024**70**618
G 1/8	•			•[*1]		**M/60283/IE**	C022**50**618	C024**70**618
G 1/8	•		•	•	•	**M/60284/***	C022**50**618	C024**70**618
G 1/8	•				•[*2]	**M/60284//IE**	C022**50**618	C024**70**618
G 1/8		•	•			**M/60284/TI**	C022**50**618	C024**70**618
G 1/8		•	•[*3]			**M/60284/TE**	C022**50**618	C024**70**618

* Insert rotation angle in degrees. [*1] Adjustable from 30° ... 180° [*2] Adjustable from 30° ... 270° [*3] Adjustable from 30° ... 90°

Other fittings are available, please see section 7

For further information

www.norgren.com/info/en1-208

Rotary vane actuators - Models with fixed rotation angles

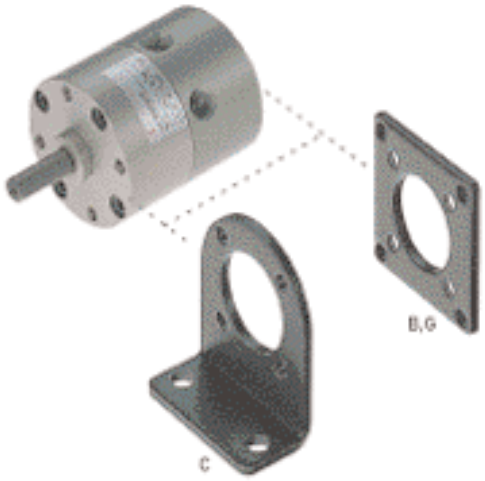
Port size	Single vane	Double vane	Rotation angle 90°	180°	270°	MODELS	ACCESORIES Straight fitting	Elbow fitting
							Tube diameter in bold	
								
G 1/8	•		•	•	•	M/60285/*	C0225**06**18	C0247**06**18
G 1/8		•	•			M/60285/TI	C0225**06**18	C0247**06**18
G 1/4	•		•	•	•	M/60286/*	C0225**06**28	C0247**06**28
G 1/4		•	•			M/60286/TI	C0225**06**28	C0247**06**28
G 3/8	•		•	•	•	M/60287/*	C0225**08**38	C0247**08**38
G 3/8		•	•			M/60287/TI	C0225**08**38	C0247**08**38
G 1/2	•		•	•	•	M/60288/*	C0225**08**48	C0247**08**48
G 1/2		•	•			M/60288/TI	C0225**08**48	C0247**08**48

* Insert rotation angle in degrees

Other fittings are available, please see section 7

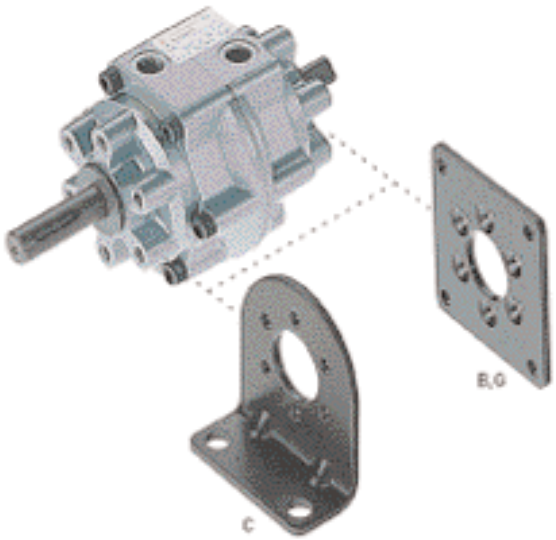
MOUNTINGS

M/60280



MODELS	B, G	C
M/60280	QM/60280/22	QM/60280/21
M/60281, .../TI	QM/60281/22	QM/60281/21
M/60282, .../TI	QM/60282/22	QM/60282/21
M/60283, .../TI	QM/60283/22	QM/60283/21
M/60284, .../TI	QM/60284/22	QM/60284/21

M/60285



MODELS	B, G	C
M/60285, .../TI	QM/60285/22	QM/60285/21
M/60286, .../TI	QM/60286/22	QM/60286/21
M/60287, .../TI	–	QM/60287/21
M/60288, .../TI	–	QM/60288/21

M/60280 Rotary vane actuators

Double acting - 30° ... 270° rotation angles

THEORETICAL FORCES, AIR CONSUMPTION, ACTUATORS WEIGHT (KG)

MODELS	Theoretical torque at 6 bar (Nm)	Permissable forces *1) axial (N)	radial (N)	Permissable rotation energy *2) (Nm)	Maximum frequency *3) (1/min)	Air consumtion (cm^3) 90°	180°	270°	Weight (kg)
M/60280	0,15	3	30	0,6 x 10^{-3}	180 (at 180°)	1,4	1,4	-	0,04
M/60281	0,38	4	40	1,5 x 10^{-3}	150 (at 180°)	3,4	3,4	4	0,07
M/60281/TI	0,86	4	40	1,5 x 10^{-3}	240 (at 90°)	2,8	-	-	0,08
M/60282	1,20	4	50	3,0 x 10^{-3}	150 (at 180°)	9,8	9,8	12	0,14
M/60282/TI	2,54	4	50	3,0 x 10^{-3}	240 (at 90°)	8,1	-	-	0,14
M/60283	2,10	25	300	15,0 x 10^{-3}	120 (at 180°)	17	17	21	0,25
M/60283/TI	4,70	25	300	15,0 x 10^{-3}	180 (at 90°)	15	-	-	0,26
M/60284	4,10	30	400	25,0 x 10^{-3}	90 (at 180°)	37	37	43	0,47
M/60284/TI	9,50	30	400	25,0 x 10^{-3}	180 (at 90°)	34	-	-	0,48

MODELS	Theoretical torque at 6 bar (Nm)	Permissable forces *1) axial (N)	radial (N)	Permissable rotation energy *2) (Nm)	Maximum frequency *3) (1/min)	Air consumption (cm^3)	Weight (kg)
M/60281/IE	0,38	4	40	1,0 x 10^{-3}	180 (at 180°)	4	0,09
M/60282/IE	1,20	4	50	2,0 x 10^{-3}	150 (at 180°)	12	0,17
M/60283/IE	2,10	25	300	3,0 x 10^{-3}	120 (at 180°)	21	0,28
M/60284/IE	4,10	30	400	7,0 x 10^{-3}	60 (at 270°)	43	0,51
M/60284/TE	9,50	30	400	7,0 x 10^{-3}	180 (at 90°)	34	0,53

MODELS	Theoretical torques at 6 bar (Nm)	Permissable forces *1) axial (N)	radial (N)	Permissable rotation energy *2) (Nm)	Maximum frequency *3) (1/min) 90°	180°	270°	Air consumption (cm^3) 90°	180°	270°	Weight (kg) 90°	180°	270°
M/60285	5,8	44,1	588	49 x 10^{-3}	180	90	60	51	51	61	0,82	0,79	0,73
M/60285/TI	12,8				180			42			0,82		
M/60286	18,0	88,2	1176	225,4 x 10^{-3}	120	78	48	146	146	179	2,00	1,90	1,70
M/60286/TI	41,5				120			127			2,00		
M/60287	34,5	147	1960	1078 x 10^{-3}	90	60	42	244	283	352	3,70	3,70	3,70
M/60287/TI	83,0				90			244			4,30		
M/60288	123,0	490	4900	3920 x 10^{-3}	66	45	30	754	869	1036	12,70	12,20	11,20
M/60288/TI	247,0				66			754			12,70		

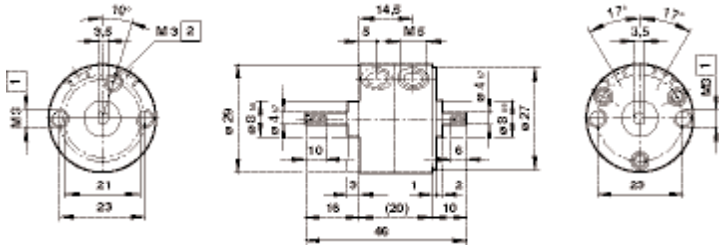
*1) Permissable load on rotary vane shaft

*2) Permissible rotational energy in Nm which may be applied to shaft. It can be calculated as follows: Permissible rotational energy ≥1/2 Iω², I=Angular moment, ω = Mean angular velocity

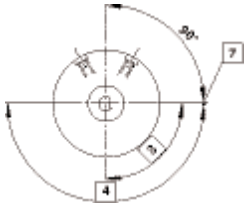
*3) Maximum frequency at 5 bar pressure, no load

BASIC DIMENSIONS

M/60280

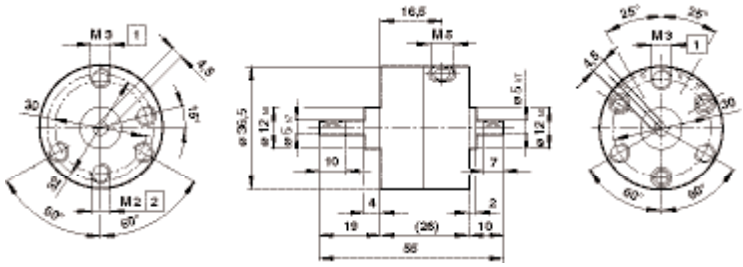


ROTATION START POINT



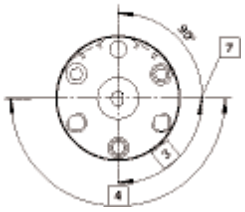
1	6 deep
2	3,5 deep
3	Rotation angle 90° + 4°
4	Rotation angle 180° + 4°
7	Rotation start point

BASIC DIMENSIONS
M/60281

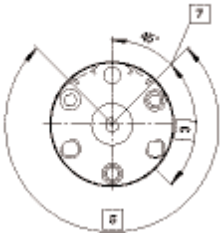


ROTATION START POINT

M/60281/90, M/60281/180

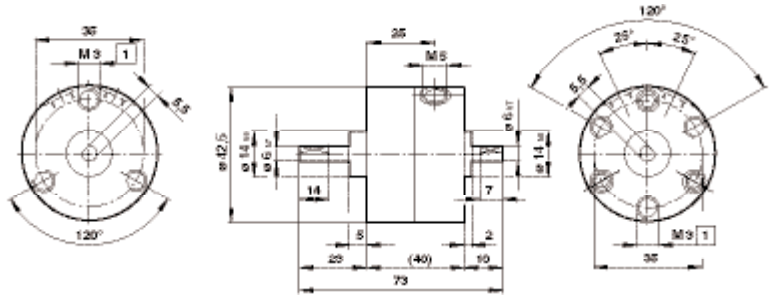


M/60281/270, M/60281/TI



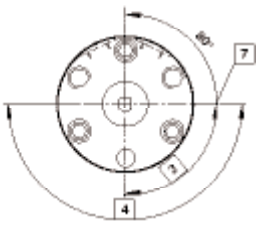
1	6 deep
2	3 deep
3	Rotation angle 90° + 4°
4	Rotation angle 180° + 4°
5	Rotation angle 270° + 4°
7	Rotation start point

BASIC DIMENSIONS
M/60282

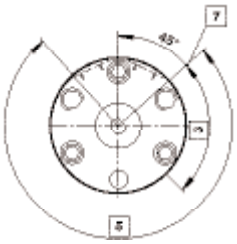


ROTATION START POINT

M/60282/90, M/60282/180



M/60282/270, M/60282/TI

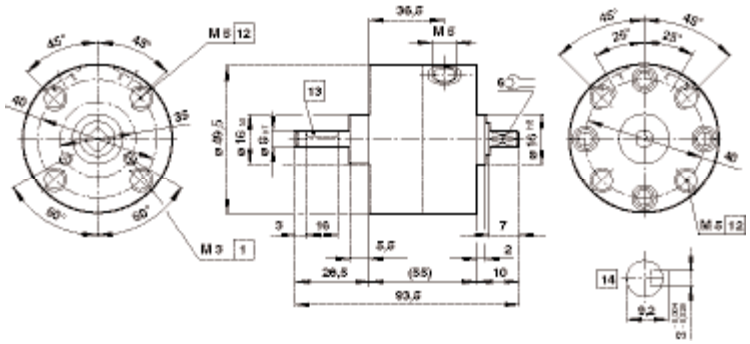


M/60280 Rotary vane actuators

Double acting - 30° ... 270° rotation angles

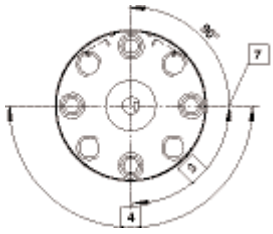
BASIC DIMENSIONS

M/60283

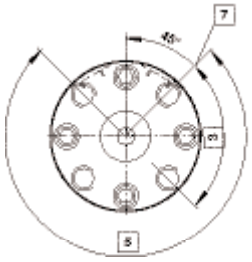


ROTATION START POINT

M/60283/90, M/60283/180



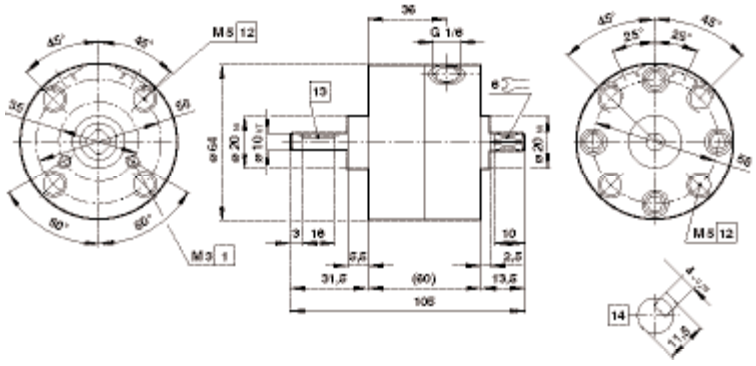
M/60283/270, M/60283/TI



1	6 deep
3	Rotation angle 90° + 4°
4	Rotation angle 180° + 4°
5	Rotation angle 270° + 4°
7	Rotation start point
12	8 deep
13	Featherkey
14	Featherkey situation

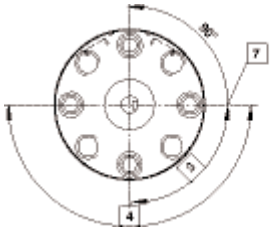
BASIC DIMENSIONS

M/60284

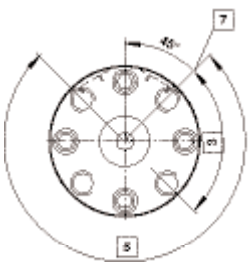


ROTATION START POINT

M/60284/90, M/60284/180



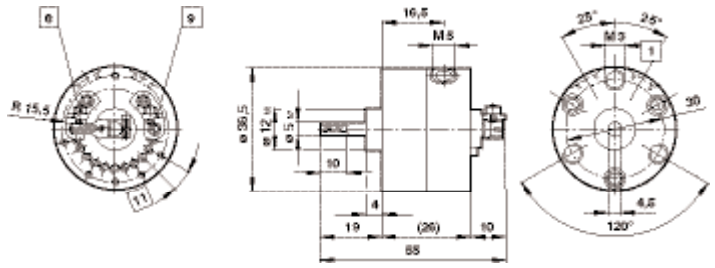
M/60284/270, M/60284/TI



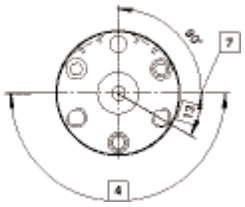
1	6 deep
3	Rotation angle 90° + 4°
4	Rotation angle 180° + 4°
5	Rotation angle 270° + 4°
7	Rotation start point
12	8 deep
13	Featherkey
14	Featherkey situation

BASIC DIMENSIONS

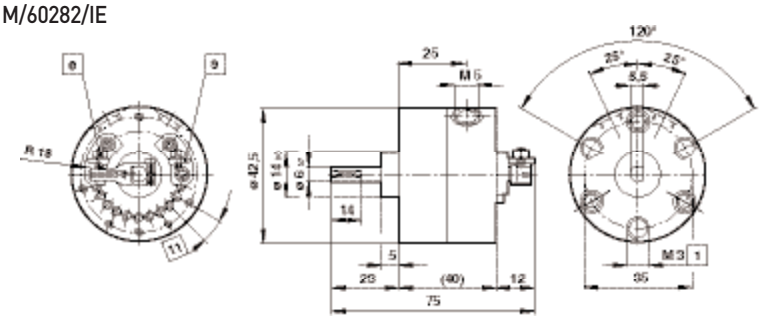
M/60281/IE

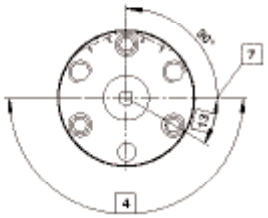


ROTATION START POINT

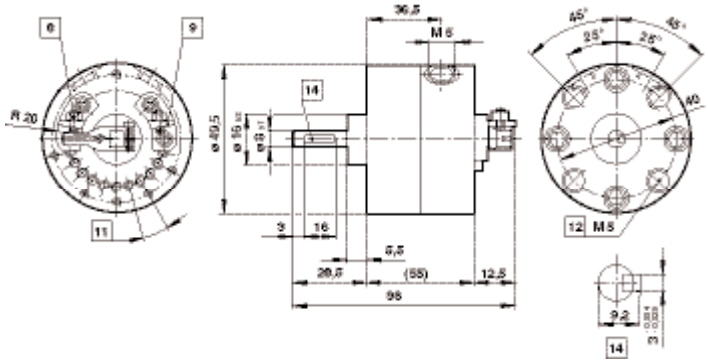


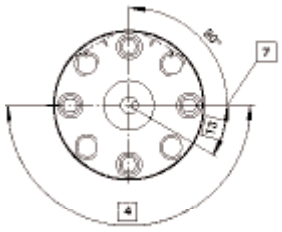
M/60282/IE





M/60283/IE





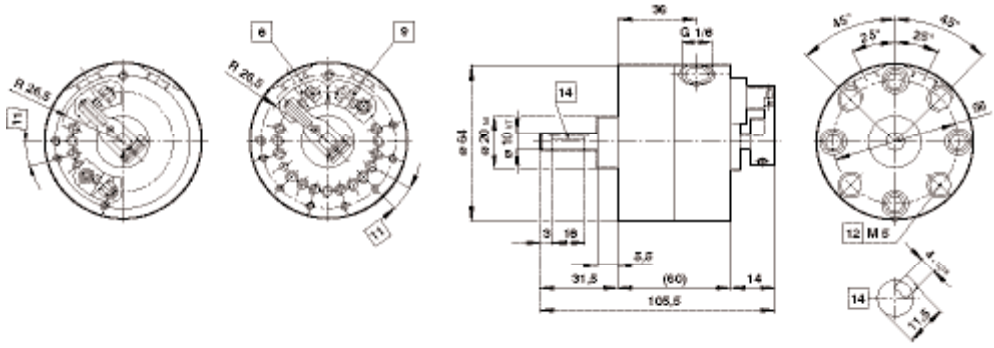
1	6 deep
4	Rotation angle 180° max
7	Rotation start point
8	Rotation angle fine adjustment
9	Angle setting stop
11	Angle of rotation setting range 15°
12	8 deep
13	Rotation angle 30° min
14	Featherkey situation

M/60280 Rotary vane actuators

Double acting - 30° ... 270° rotation angles

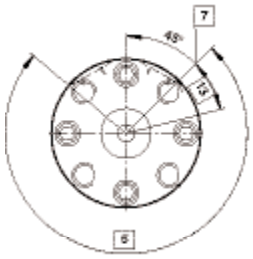
BASIC DIMENSIONS

M/60284/IE and M/60284/TE

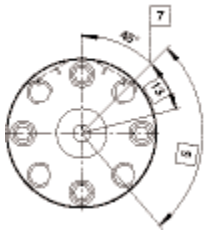


ROTATION ANGLE START POINT

M/60284/IE

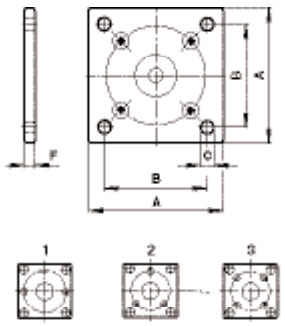


M/60284/TE



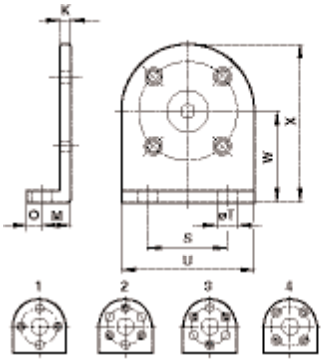
1	6 deep
3	Rotation angle 90° max
5	Rotation angle 270° max
7	Rotation start point
8	Rotation angle fine adjustment
9	Angle setting stop
11	Angle of rotation setting range 15°
12	8 deep
13	Rotation angle 30° min
14	Featherkey situation

Rear flange - B, front flange - G



MODELS	A	B	Ø C	F	Hole pattern	Rotation angle	kg
QM/60280/22	30	24	3,4	2	1	180°	0,04
QM/60281/22	37	30	3,4	2,5	2	120°	0,07
QM/60282/22	42	34	3,5	3,0	2	120°	0,14
QM/60283/22	50	41	5,5	3,5	3	90°	0,36
QM/60284/22	64	52	5,5	3,5	3	90°	0,47

Foot - C

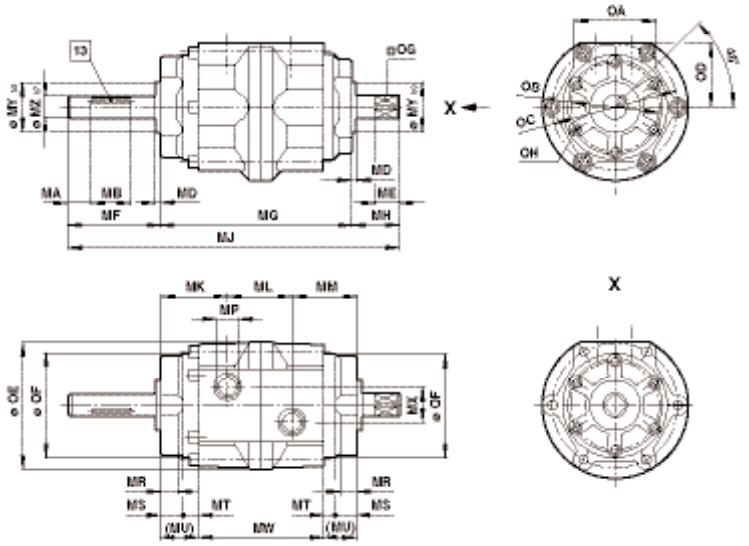


MODELS	K	M	O	S	Ø T	U	W	X	Hole pattern	Rotation angle	kg
QM/60280/21	2	10	5	20	4,8	30	22	37	1	90°	0,04
QM/60281/21	2,5	11	7	26	4,8	36	25	43	2	60°	0,05
QM/60282/21	3,0	12	8	30	5,8	42	30	51	3	60°	0,09
QM/60283/21	3,5	15	10	36	7	49	34	58,5	4	90°	0,20
QM/60284/21	4,5	18	12	48	6,5	66	42	75	4	90°	0,20

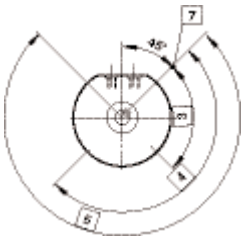
The mountings can be rotated through the angle shown

BASIC DIMENSIONS

M/60285 ... M/6



ROTATION START POINT



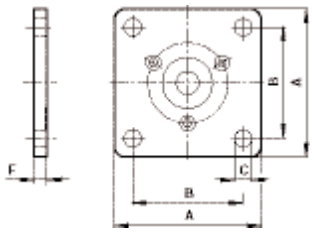
3	Rotation angle 90° +3°
4	Rotation angle 180° +3°
5	Rotation angle 270° +3°
7	Rotation start point
13	Featherkey

MODELS	MA	MB	MD	ME	MF	MG	MH	MJ	MK	ML	MM	MP	MR	MS	MT	MU
M/60285/ .../TI	5	20	2,5	13	39,5	86	19,5	145	29	28	29	G1/8	11	14	6	20
M/60286/ .../TI	5	36	3	16	53,5	103	23,5	180	34,5	34	34,5	G1/4	10,5	15,5	8	23,5
M/60287/ .../TI	5	40	3,5	22	65	125	30	220	41,5	4	41,5	G3/8	13	17,5	10	27,5
M/60288/ .../TI	10	40	4,5	35	69,5	171	44,5	285	53,5	64	53,5	G1/2	14,5	21	11,5	32,5

MODELS	MW	MX	Ø MY_{h8}	Ø MZ_{h7}	OA	Ø OB	Ø OC	OD	Ø OE	Ø OF	$OG_{-0,1}$	OH	Featherkey	kg
M/60285/ .../TI	46	16	25	12	44	45	68	36	79	58	10	M6 x 9*	4 -0,03 x 2,5 + 0,1*	0,82
M/60286/ .../TI	56	24	30	17	61	70	97	51	110	85,5	13	M8 x 12*	5 -0,03 x 3 + 0,1*	2,0
M/60287/ .../TI	70	32	45	25	78	80	125	66	141,5	110	19	M10 x 15*	7 -0,038 x 4 + 0,2*	4,3
M/60288/ .../TI	106	44	70	40	110	120	173	90	196	152	32	M12 x 18*	12 -0,043 x 5 + 0,2*	12,7

* Deep

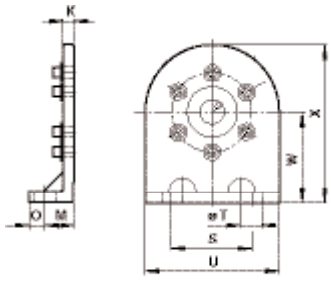
Rear flange - B, front flange - G



MODELS	A	B	Ø C	F	Rotation angle *2)	kg
QM/60285/22	80	64	7	4,5	60°	0,20
QM/60286/22	110	88	9	6	60°	0,51

*2) The mountings can be rotated through the angle shown

Foot - C

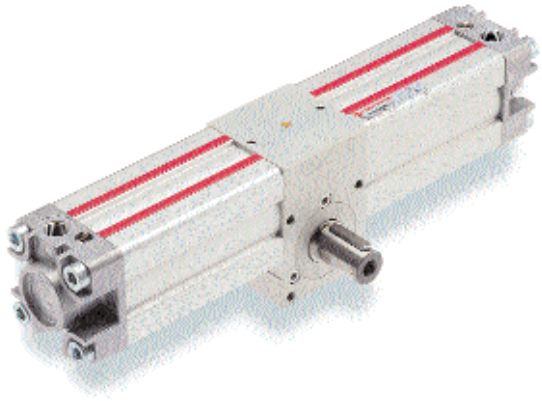


MODELS	K	M	O	S	Ø T	U	W	X	Rotation angle *	kg
QM/60285/21	4,5	25	10	55	11	75	45	82,5	60°	0,26
QM/60286/21	10	28	12	80	13	110	65	115	60°	1,14
QM/60287/21	12	32	13	100	15	140	80	135	60°	1,24
QM/60288/21	15	35	15	140	15	200	110	200	60°	4,45

* The mountings can be rotated through the angle shown

M/162000/MI Rack & pinion version - Rotary cylinders

Double acting - Ø 32 ... 125 mm



Torques from 1,2 ... 51,0 Nm/bar

Rotation angles 90°, 180°, 270°, 360°

Switches can be mounted flush with the profile

ISO 15552 pitch to use standard mountings

MATERIALS

Profile barrel: anodised aluminium

End covers: pressure diecast aluminium

Central body: anodised aluminium

Rack: normalized steel

Pinion: surface hardened high strength steel

Pinion bearings: ball bearings (Ø 32 teflon bronze bearings)

Rack guide shoe: acetal resin

Piston seals: polyurethane O-rings: nitrile rubber

TECHNICAL DATA

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

Double acting, magnetic piston, adjustable cushioning

Operating pressure:

1,5 ... 10 bar

Operating temperature:

-5°C ... +80°C max.

Consult our Technical Service for use below +2°C

Rotation angles:

90, 180, 270, 360°

Fixed up to +8°

STANDARD MODELS

	Ø	Theoretical torque (Nm) at 6 bar	Cushion length (mm)	Initial cushion volume (cm^3)	MODELS	ACCESSORIES Reed switch with integral 5 m cable	Banjo flow control (Tube diameter in bold)	Straight fitting (Tube diameter in bold)	Elbow fitting (Tube diameter in bold)
									
	32	7,2	19	12,3	**M/162032/MI/***	M/50/LSU/5V	C0K51**06**18	C022**50**618	C024**70**618
	40	13,8	22	20,7	**M/162040/MI/***	M/50/LSU/5V	C0K51**06**28	C022**50**628	C024**70**628
	50	23,4	24	36	**M/162050/MI/***	M/50/LSU/5V	C0K51**08**28	C022**50**828	C024**70**828
	63	43,8	24	64,0	**M/162063/MI/***	M/50/LSU/5V	C0K51**08**38	C022**50**838	C024**70**838
	80	94,2	27	116	**M/162080/MI/***	M/50/LSU/5V	C0K51**10**38	C022**51**038	C024**71**038
	100	157,8	34	242,0	**M/162100/MI/***	M/50/LSU/5V	C0K51**12**48	C022**51**248	C024**71**248
	125	306	41	451	**M/162125/MI/***	M/50/LSU/5V	C0K51**12**48	C022**51**248	C024**71**248

* Insert rotation angle in degrees

For information on additional magnetic switches see page 290

Other fittings are available, please see section 7

Rotation angle

Ø	90°	180°	270°	360°
32	•	•	•	•
40	•	•	•	•
50	•	•	•	•
63	•	•	•	•
80	•	•	•	•
100	•	•	•	•
125	•	•	•	•

For further information

www.norgren.com/info/en1-216

OPTIONS SELECTOR

M/162★★★/★★★/★★★

Cylinder diameters (mm)	Substitute
32	**032**
40	**040**
50	**050**
63	**063**
80	**080**
100	**100**
125	**125**

Cylinder variants	Substitute
Non-magnetic piston	**I**
Magnetic piston	**M**

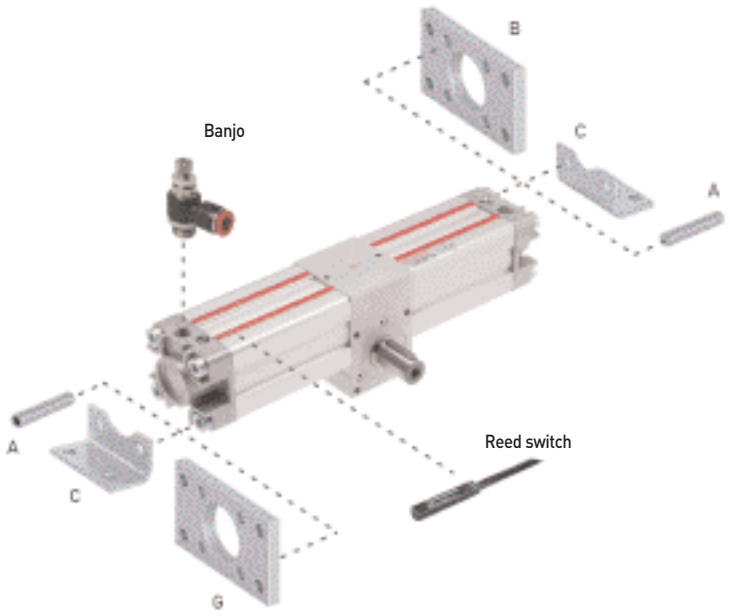
Standard rotation angle	Substitute
90°	**90**
180°	**180**
270°	**270**
360°	**360**

Pinion variants	Substitute
Male pinion	**None**
Female pinion	**X**

Tolerances of rotation angle	Substitute
Adjustable ± 5°	**E**
Fixed up to +8°	**I**

Note: If option is not required, disregard option position within part number eg. M/162100/ME/90
This options selector explains only the cylinder variants. Additional variants/options are not possible.

MOUNTINGS



Ø	A	B, G	C
32	QM/8032/35	QA/8032/22	QA/8032/21
40	QM/8032/35	QA/8040/22	QA/8040/21
50	QM/8050/35	QA/8050/22	QA/8050/21
63	QM/8050/35	QA/8063/22	QA/8063/21
80	QM/8080/35	QA/8080/22	QA/8080/21
100	QM/8080/35	QA/8100/22	QA/8100/21
125	QM/8125/35	QM/8125/22	QM/8125/21

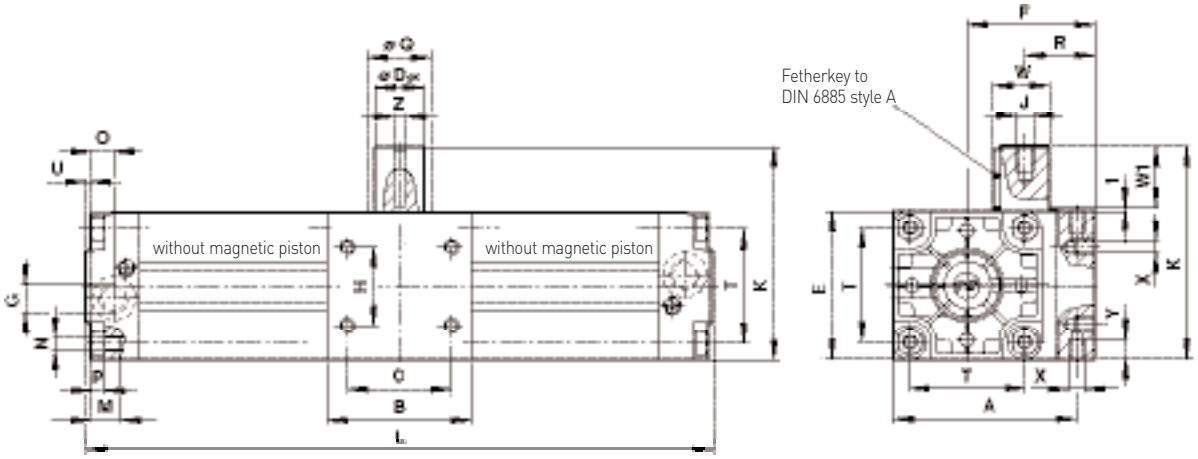
For details of mountings see page 92

M/162000/MI Rack & pinion version - Rotary cylinders

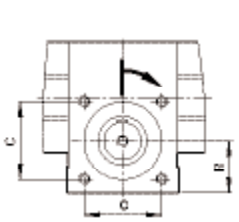
Double acting - Ø 32 ... 125 mm

BASIC DIMENSIONS

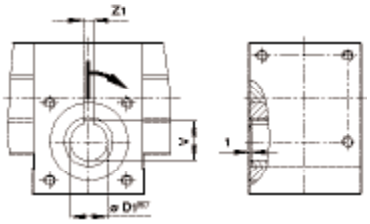
M/162000/*/*/Angle - Rotary cylinders with fixed angle (up to +8°)



Rotary cylinders with male pinion



Rotary cylinders with female pinion



MODELS	Ø	A	B	C	Ø D_{g6}	Ø $D1^{H7}$	E	F	G	H	J	K	L (90°)	(180°)	(270°)	(360°)
M/162032/.	32	71,5	50	33	14	14	50	46,5	G 1/8	18	M 5	81	227	274	321	368,5
M/162040/.	40	82	60	40	14	14	60	54,5	G 1/4	22	M 5	91	266	323	379,5	436
M/162050/.	50	94	70	50	19	19	65	60,5	G1/4	25	M 6	106	282	345	408	471
M/162063/.	63	110	75	60	24	19	75	71	G3/8	35	M 8	116	331	406	480,5	555
M/162080/.	80	142	99	80	28	24	99	93,5	G3/8	50	M 8	150	396	495	594	693
M/162100/.	100	156,5	115	80	38	28	115	99	G 1/2	60	M 10	166	414	521	628	735
M/162125/.	125	188	125	90	38	28	140	118	G 1/2	70	M 10	191	483,5	615,5	747,5	879,5
MODELS	**Ø**	**M**	**N**	**O**	**P**	**Ø Q**	**R**	**T**	**U**	**V**	**W**	**W1**	**X**	**Y**	**Z**	**Z1**
M/162032/.	32	18	M 6	13	4	25	25	32,5	3	16,3	16	30	M 6	10	5	5
M/162040/.	40	18	M 6	15	4	25	30	38	3,5	16,3	16	30	M 6	10	5	5
M/162050/.	50	18	M 8	18,5	5	30	32,5	46.5	3,5	21,8	21,5	40	M 8	13	6	6
M/162063/.	63	17,5	M 8	19	5	30	37	56.5	4	21,8	27	40	M 8	13	8	6
M/162080/.	80	21,5	M 10	19	–	45	50	72	4	27,3	31	50	M 10	16	8	8
M/162100/.	100	21,5	M 10	18	–	50	54	89	4	31,3	41	50	M 10	16	10	8
M/162125/.	125	32	M 12	20	–	60	60	110	6	31,3	41	50	M 12	20	10	8

“We can respond quickly and positively to a customer’s unique need”

Norgren’s global engineering

Norgren’s global engineering infrastructure enables it to respond quickly and positively to a customer’s unique needs; to develop high-quality proprietary engineering solutions for target markets as well as products to satisfy the general needs of the pneumatic industry.

We have 20 sites world wide with engineering design capabilities, 7 of which are centres of excellence each with a specific focus:

- Global Vehicle Technologies
- Life Sciences
- Oil, Chemical & Gas
- Pneumatics (Fittings, Valves, Actuators, FRL’s)

RAIL

OIL, CHEMICAL & GAS

GLOBAL VEHICLE TECHNOLOGIES

LIFE SCIENCES

>>MAKE AN IMPACT in a crowded market

‘Take advantage’

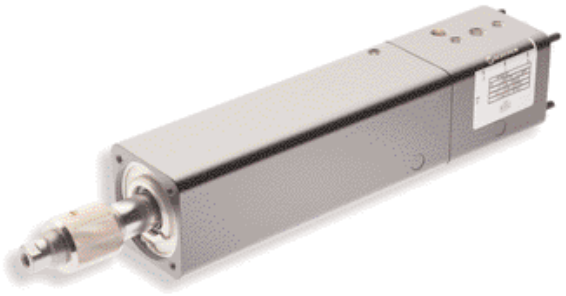
New product development is an essential component of Norgren’s current and long-term growth plans. New products are classified as either ‘customer specific engineering projects’ or as ‘standard products’ i.e. those products used throughout the pneumatics industry.

Whilst there can be no doubt global connectivity has improved communications immeasurably, it will always be a second-best alternative to a face-to-face meeting or a dialogue in the native language.

If you have a need for a custom solution contact your local representative.

M/1525 & M/1540 In-line positioner cylinders

Double acting, Ø 2 1/2" and 4"



- Position directly proportional to input signal
- High speeds with good repeatability
- Vibration resistant – can be used in adverse conditions
- Fail instroke on signal failure

TECHNICAL DATA

Medium:
Compressed air, filtered, non-lubricated

Response time:
10 secs max. for 200 mm stroke

Steady state air consumption:
Less than 0,35 dm^3/sec.

Installation:
Air supply must incorporate a pre-filter and a high efficiency 5 µm filter

Operating pressure:
2 ... 10 bar

Control pressure:
0,2 ... 1,0 bar

Operating temperature:
-20°C ... +80°C
Consult our Technical Service for use below +2°C

Sensitivity:
Within 0,007 bar

Repeatability:
Within 0,075% full stroke

MATERIALS

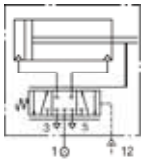
Piston rod & valve spool: stainless steel

Piston rod end & zero adjuster: zinc plated steel

Valve bush: brass

Cylinder barrel, piston & valve body: aluminium alloy

STANDARD MODELS

	MODELS			ACCESSORIES		
	Cyl. Ø	Port size		Banjo flow control	Straight fitting	Elbow fitting
				Tube diameter in bold		
						
	2 1/2"	G1/4	**M/1525/***	C0K51**08**28	C0225**08**28	C0247**08**28
	4"	G1/4	**M/1540/***	C0K51**08**28	C0225**08**28	C0247**08**28

* Insert stroke length in mm

Other fittings are available, please see section 7

Standard strokes

Ø	75	125	160	200	250	320
2 1/2"	•	•	•	•	•	•
4"	•	•	•	•	•	•

Other strokes available

For further information

www.norgren.com/info/en1-220

OPTIONS SELECTOR

M/15★★/★★★

Cylinder diameters (inch)	Substitute
2 1/2	25
4	40

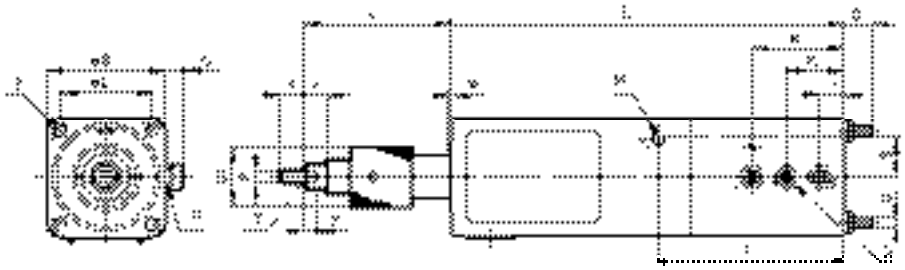
Stroke length in mm
320 max.

MOUNTINGS

Ø	B	BG	C	D	G	L
						
2 1/2"	QM/1063	QM/1065	QM/1066	QM/1067	QM/1064	QM/1069
4"	QM/1075	QM/1077	QM/1078	QM/1079	QM/1076	QM/1084

Ø	R	UF	UR
			
2 1/2"	QM/1086	QM/1073	QM/1074
4"	QM/1087	QM/1073	QM/1085

BASIC DIMENSIONS



For piped exhaust discard exhaust filters fitted to threads 'H'.

Ø	Stroke	A	B	C	D	E	F	G	H	J	K	L	M	N	P
2 1/2"	75	15	76,8	93	17,5	55,9	38	11	G1/8 x 13 deep	16,5	38	288	G1/8	59	M10 x 1,5
2 1/2"	125	15	76,8	93	17,5	55,9	38	11	G1/8 x 13 deep	16,5	38	338	G1/8	59	M10 x 1,5
2 1/2"	200	15	76,8	93	17,5	55,9	38	11	G1/8 x 13 deep	16,5	38	413	G1/8	59	M10 x 1,5
4"	75	15	115	84,4	30,5	89	38	15	G1/4 x 20 deep	16,5	37,6	298,5	G1/8	59	M10 x 1,5
4"	125	15	115	84,4	30,5	89	38	15	G1/4 x 20 deep	16,5	37,6	348,5	G1/8	59	M10 x 1,5
4"	200	15	115	84,4	30,5	89	38	15	G1/4 x 20 deep	16,5	37,6	423,5	G1/8	59	M10 x 1,5

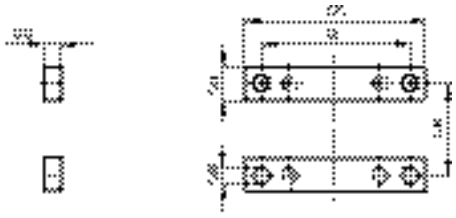
Ø	Q	S	U	V	W max.	X	Y ⌭	Z	kg
2 1/2"	G1/4	23	M6 x 1	15	0,36	8	17	M6 x 1 x 22 deep	4,5
2 1/2"	G1/4	23	M6 x 1	15	0,36	8	17	M6 x 1 x 22 deep	5,1
2 1/2"	G1/4	23	M6 x 1	15	0,36	8	17	M6 x 1 x 22 deep	5,8
4"	G1/4	34	M8 x 1,25	15	1,1	8	17	M8 x 1,25 x 22 deep	9,2
4"	G1/4	34	M8 x 1,25	15	1,1	8	17	M8 x 1,25 x 22 deep	10,2
4"	G1/4	34	M8 x 1,25	15	1,1	8	17	M8 x 1,25 x 22 deep	11,3

M/1525 & M/1540 In-line positioner cylinders

Double acting, Ø 2 1/2" and 4"

MOUNTINGS

Rear flange – B
Front flange – G
Front and rear flange – BG

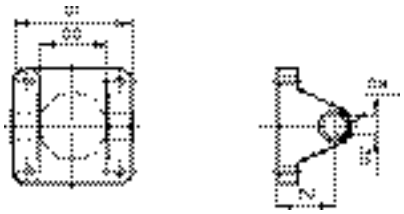


MODELS	Cyl Ø	BC	GH	GK	GL	Ø GM	GN	kg
QM/1063	2 1/2"	10	56	113	93,5	8,7	20	0,25
QM/1075	4"	16	89	178	146	13,5	32	1,0

Foot – C

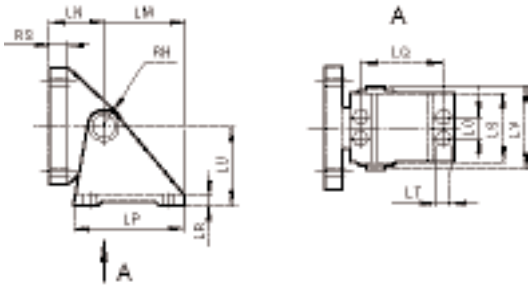
MODELS	Cyl Ø	Ø CE	CF	CG	kg
OM/1066	2 1/2"	8,7	47	55,6	0,25
OM/1078	4"	13,5	70	50,8	0,50

Rear clevis – D



MODELS	Cyl Ø	DE	DF	DG	DH	DJ	kg
OM/1067	2 1/2"	16	74	42,9	13	28,5	0,25
OM/1078	4"	22	117,5	69,8	19	57	1,25

Rear hinge – L



MODELS	Cyl Ø	LM	LN	LP	LQ	LR	LO	LS	Ø LT	LU	LV	RH	RS	kg
OM/1069	2 1/2"	51	35	67	47,5	8	19	68,5	8,3	47,5	73	14,5	9,5	1,25
OM/1084	4"	78	51	102	76	9,5	22	70	11,9	74,5	82,5	21	21	3,5

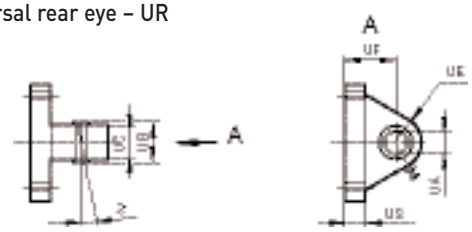
Rear eye – R

MODELS	Cyl Ø	RN	RH	RS	RT	RY	kg
OM/1086	2 1/2"	35	14,5	9,5	38,1	16	0,80
OM/1087	4"	51	21	21	44,5	18	2,60

Universal piston rod eye – UF

MODELS	UG	UH	UJ	UK	Σ=	UN	Z	kg
OM/1073	14	10,5	10	15	17	15	10°	0,07

Universal rear eye – UR



MODELS	Cyl Ø	UA	UB	UC	UE	UF	US	Z	kg
OM/1074	2 1/2"	14	19	15	26	35	9	10°	0,6
OM/1085	4"	14	19	15	26	50,8	21	10°	2,4

M/3000 Impact cylinders

Energy at 5,5 bar operating pressure. 24,5-253 Joule

High energy output

Ideally suited to a wide range of marking, piercing and light presswork applications

Rugged, corrosion-resistant construction

TECHNICAL DATA

Medium:
Compressed air, filtered, non-lubricated

Operating pressure:
2,7 ... 10 bar
(2,0 ... 10 bar M3060)

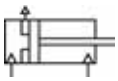
Operating temperature:
-20°C ... +80°C
Consult our Technical Service for use below +2°C

Mounting position:
Vertical

MATERIALS

Rear end cover: Aluminium
Front end cover: Aluminium or steel
Piston: Steel
Piston rod: Hardened steel
Centre piece: Aluminium or steel
Seals: Nitrile rubber

STANDARD MODELS

	Ø	Max. cycle rate/min	Energy in joule at 5,5 bar	MODELS	ACCESSORIES Straight fitting Tube diameter in bold	Elbow fitting	Service kit
							
	2 inch	60	24,5	**M/3020M**	C022**50**628	C024**70**628	QM/3020/00
	3 inch	50	63	**M/3030M**	C022**50**838	C024**70**838	QM/3030/00
	4 inch	40	136	**M/3040M**	C022**51**038	C024**71**038	QM/3040/00
	6 inch	35	252	**M/3060M**	C022**51**248	C024**71**248	QM/3060/00

MOUNTINGS

Ø	B, G
2"	QM/871
3"	QM/984
4"	QM/987
6"	QM/990

For further information

www.norgren.com/info/en1-223

M/3000 Impact cylinders

Energy at 5,5 bar operating pressure. 24,5-253 Joule

Operation:

For a fraction of the capital outlay, the Impact Cylinder provides a power unit capable of carrying out an infinite variety of presswork applications traditionally performed by flypresses, kickpresses, drop stampings, crankpresses, etc. In fact many applications benefit from Impact working, as the high tool velocity and rate of energy application can produce results such as cleaner edges when cutting, and improved grain structure when forging.

The construction and principle of operation is extremely simple, inherently giving reliability and long life, the only moving part being the piston rod assembly.

Coupled to simple control circuit, an Impact Cylinder will operate from a normal factory air line, and can either be mounted on a suitable frame to form a self-contained press, or built in to form part of a special purpose machine, and pneumatically interlocked with automatic feed and eject mechanisms. For special purpose applications or to double up on energy output, two Impact Cylinders can be used vertically in opposition, and operated together. With this arrangement reaction in the framework is neutralised and the velocity is doubled.

Important

For all applications complete guarding must be incorporated, either fixed or interlocked with the control circuit. For further information consult Norgren technical sales.

An Impact Cylinder gives an output rated in energy i.e. thrust x distance. This energy is by rapidly accelerating the piston rod and tool assembly over a free stroke of approximately 65 mm, before contacting the work. The rapid is produced by the differential area arrangement which exposes the full area of the piston to high pressure air built up in the reservoir at rear end of the cylinder. These must NEVER reach the end of their stroke.

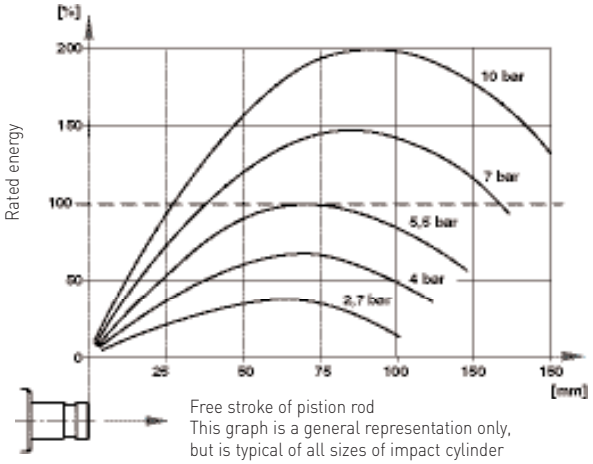
Theoretical forces

MODELS	Ø Cylinder	Max. cycle per minute	Energy in joule at 5,5 bar operating pressure	Air consumtion in l/cycle at 5,5 bar vertically by the piston rod	Max. recommmended weight to be carried	Weight
M/3020M	2 inch	60	24,5	5,7	3,6 kg	3,5 kg
M/3030M	3 inch	50	63	12,8	9 kg	7,7 kg
M/3040M	4 inch	40	125,5	22,8	15,8 kg	11,4 kg
M/3060	6 inch	35	253	51,3	36,2 kg	33,3 kg

The energy output from an impact cylinder can be controlled by adjusting the air pressure. The graph on the right shows in principle how the output is achieved as a percentage of the total energy by variations in air pressure. The point of stroke giving maximum energy corresponds to the highest point on the appropriate pressure curve. This is the point of the stroke at the tool should contact the component.

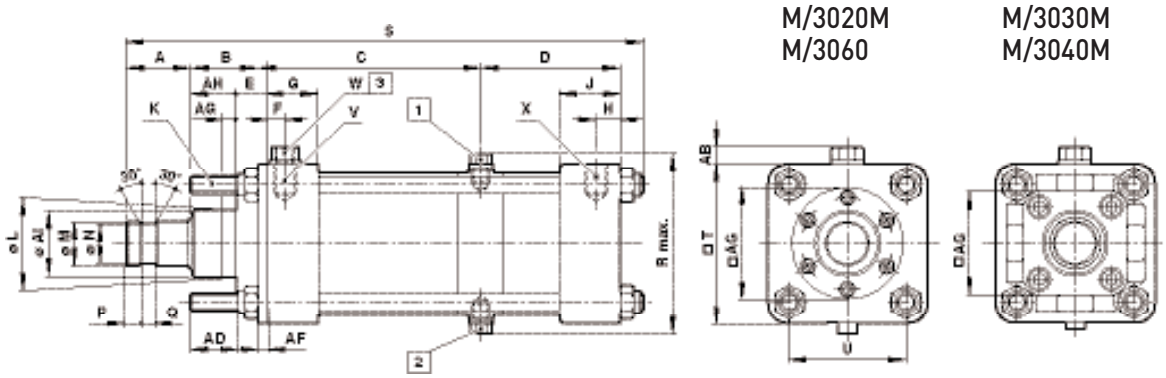
For normal factory airline pressures ranging from 4 bar to 7 bar this contact point can be said to occur anywhere between 50 mm and 75 mm. If the impact cylinder requires only to effect an application, this means that a unit of the next smaller size will be powerful enough at the rated pressure. If an impact cylinder is being used for a number of and the maximum pressure of is still too powerful, then the energy given can be further reduced by decreasing the contact point to perhaps 25 mm or less. Alternatively a special circuit will allow operation.

Operating pressure



Free stroke of pistion rod
This graph is a general representation only, but is typical of all sizes of impact cylinder

BASIC DIMENSIONS



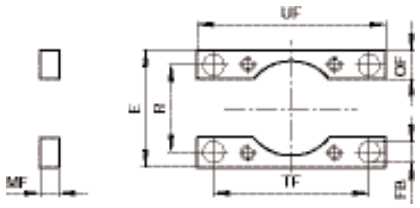
1	Plug
2	Orifice plug as supplied, but can be reserved if desired
3	M/3060 with adaptor fitted

MODELS	Ø	A	B	C	D	E	F	G	H	J	K
M/3020M	2 inch	37,5	35	279	103	14,3	9,5	24	9,5	24	M 8
M/3030M	3 inch	37,5	38	299	121,4	12,7	13,5	35	13,5	35	M 10
M/3040M	4 inch	44,5	44,5	297	117,5	12,7	13,5	35	13,5	35	M 11
M/3060	6 inch	63,5	68	302	132	15,9	24	43	18,5	41	M 16

MODELS	Ø	Ø L	Ø M	Ø N	P	Q	R max.	S	□T	U	V
M/3020M	2 inch	31,72/31,67	20	17,5	9,5	6	76	461	63,5	48	G 1/4
M/3030M	3 inch	38,07/38,02	25	23	9	8	103	506	89	67	G 3/8
M/3040M	4 inch	44,42/44,37	32	28,5	11	9,5	129	516	114	89	G 3/8
M/3060	6 inch	69,82/69,75	44,5	40,5	19	12,5	181	587	167	129	-

MODELS	Ø	W	X	AB	AG	AD	AF	AG	AH	Ø AI	kg
M/3020M	2 inch	-	G 1/4	0	Ø 40	17	5,5	8	20,5	31,5	3,5
M/3030M	3 inch	-	G 3/8	0	□ 60	27,5	–	8	25,5	37,5	7,7
M/3040M	4 inch	-	G 3/8	0	□ 62,5	34,5	–	8	31,5	44	11,4
M/3060	6 inch	G 1/2	G 1/2	10	Ø 127	48	–	9,5	35	69,5	33,3

Rear flange- B, front flange - G



MODELS	Ø	E	FB	MF	OF	R	TF	UF	kg
QM/871	2 inch	64	9	10	16	47,5	86	104	0,20
QM/984	3 inch	114	11	15	25	66,5	112	134	0,45
QM/987	4 inch	121	14	16	32	89	146	178	1,00
QM/990	6 inch	114	17	20	40	128,5	204	242	2,40

RM/900/M Imperial cylinders

Double acting, Ø 1 1/4" ... 14"

Ideal for a wide range of industrial applications

Extensive range of mountings

Rugged, reliable long established design

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
RM/900: double acting, adjustable cushioning and non-magnetic
RM/900/M: double acting, adjustable cushioning and magnetic piston

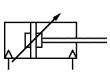
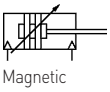
Operating pressure:
1 ... 10 bar

Operating temperature:
-20°C ... +80°C
Consult our Technical Service for use below +2°C

MATERIALS

Barrel: Anodised aluminium except Ø 14 inch which is steel
End cover: Diecast aluminium
Bearing housing: Brass for 1 1/4 inch to 3 inch (Ø 4 inch to 14 inch aluminium)
Piston: Aluminium
Piston rod and tie rods: Stainless steel (Martensitic)
Seals: Nitrile rubber
O-rings: Nitrile rubber

STANDARD MODELS

	Ø inch	Piston rod Ø	Port size	MODELS Non-magnetic	MODELS Magnetic	ACCESSORIES Reed switch integral with 5m cable	Switch mounting	Banjo flow control	Straight fitting	Elbow fitting	Service kit
								Tube diameter in bold			
											
	1 1/4	12 mm	G1/8	**RM/9125/***	**RM/9125/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**06**18	C0225**06**18	C0247**06**18	QM/9125/00
	1 3/4	16 mm	G1/4	**RM/9175/***	**RM/9175/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**06**28	C0225**06**28	C0247**06**28	QM/9175/00
	2	20 mm	G1/4	**RM/920/***	**RM/920/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**08**28	C0225**08**28	C0247**08**28	QM/920/00
	2 1/2	25 mm	G3/8	**RM/925/***	**RM/925/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**08**38	C0225**08**38	C0247**08**38	QM/925/00
	3	25 mm	G3/8	**RM/930/***	**RM/930/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**10**38	C0225**10**38	C0247**10**38	QM/930/00
	4	32 mm	G3/8	**RM/940/***	**RM/940/M/***	M/50/LSU/5V	QM/27/2/1	C0K51**10**38	C0225**10**38	C0247**10**38	QM/940/00
 Non-magnetic	5	1 1/2 inch	G1/2	**RM/950/***	–	–	–	C0K51**12**48	C0225**12**48	C0247**12**48	QM/950/00
	6	1 1/2 inch	G1/2	**RM/960/***	–	–	–	C0K51**12**48	C0225**12**48	C0247**12**48	QM/960/00
	8	1 3/4 inch	G3/4	**RM/980/***	–	–	–	–	–	–	QM/980/00
 Magnetic	10	2 1/4 inch	G1	**RM/9100/***	–	–	–	–	–	–	QM/9100/00
	12	2 1/4 inch	G1	**RM/9120/***	–	–	–	–	–	–	QM/9120/00
	14	2 1/4 inch	G1	**RM/9140/***	–	–	–	–	–	–	QM/9140/00

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings are available, please see section 7

For further information

www.norgren.com/info/en1-226

Theoretical forces, cushioning, air consumption

MODELS	Ø inch	Cushion length (mm)	Cushion volume (cm^3)	Theoretical forces (N) at 6 bar outstroke	intstroke	Air consumption (l/cm) per stroke at 6 bar outstroke	intstroke
RM/9125/..	1 1/4	20	12	482	406	0,056	0,047
RM/9175/..	1 3/4	20	25	933	812	0,109	0,095
RM/920/..	2	20	29	1225	1055	0,143	0,124
RM/925/..	2 1/2	21	48	1930	1626	0225	0,190
RM/930/..	3	29	109	2721	2417	0,318	0,282
RM/940/..	4	38	265	4902	4420	0,572	0,516
RM/950/..	5	29	314,7	7600	6920	0,887	0,807
RM/960/..	6	32	538,5	10887	10207	1,270	1,191
RM/980/..	8	44	1428	19419	18486	2,266	2,157
RM/9100/..	10	50	2754	30402	28871	3,547	3,368
RM/9120/..	12	50	4257	43837	42306	5,114	4,936
RM/9140/..	14	50	6725	59723	58192	6,968	6,789

OPTIONS SELECTOR

★★M/9★★★/★★/★★★★

Special variants	Substitute
High temperature version: 150°C max.	**T**

Piston rod material	Substitute
Stainless steel (martensitic)	**R**
Stainless steel (austenitic)	**S**

Cylinder diameters Ø (inch)	Substitute
1 1/4	**125**
1 3/4	**175**
2	**20**
2 1/2	**25**
3	**30**
4	**40**
5	**50**
6	**60**
8	**80**
10	**100**
12	**120**
14	**140**

Strokes (mm)
2500 max.

Variants (non-magnetic piston)	Substitute
Standard	**None**
Female piston rod thread	**X**
Full piston rod thread	**Y**
Piston rod bellow	**G**
Double ended piston rod	**J**

Variants (magnetic piston)	Substitute
Standard	**M**
Female piston rod thread	**MX**
Full piston rod thread	**MY**
Piston rod bellow	**MG**
Double ended piston rod	**JM**

Note: If option is not required, disregard option position within part number, eg. RM/920/100. For combinations of cylinder variants consult our Technical Service.
Please note that heat resistant seals are not available for all variants.
This options selector explains only the cylinder variants. Additional variants/options can not be derived from.

RM/900/M Imperial cylinders

Double acting, Ø 1 1/4" ... 14"

MOUNTINGS

Cylinder Ø inch	B	B + G	C	D	F	G	H	K	L
									
1 1/4	M/P6938	QM/819	QM/754	M/P6937	QM/402	M/P6938	M/P14001	M/P6937	QM/394
1 3/4	QM/888	QM/1181	QM/753	M/P7457	QM/404	QM/986	M/P11224	M/P7457	QM/922
2	QM/875	QM/1182	QM/752	M/P10228	QM/405	QM/871	M/P8635	QM/962	QM/909
2 1/2	QM/876	QM/1184	QM/748	M/P10311	QM/407	QM/877	M/P8636	QM/964	QM/910
3	QM/878	QM/1185	QM/983	M/P10229	QM/407	QM/984	M/P8637	QM/966	QM/911
4	QM/887	QM/1187	QM/982	QM/758	QM/408	QM/987	M/P8638	QM/758	QM/912
5	QM/886	QM/1188	QM/981	QM/759	QM/409	QM/988	M/P8639	QM/759	QM/913
6	QM/884	QM/1189	QM/826	QM/761	QM/409	QM/884	M/P8640	QM/761	QM/914
8	QM/883	QM/1190	QM/825	QM/762	QM/410	QM/883	M/P8645	QM/762	QM/915
10	QM/882	–	QM/824	–	QM/411	QM/882	M/P8667	–	QM/917
12	QM/889	–	QM/756	–	QM/411	QM/889	M/P8670	–	QM/918
14	QM/741	–	QM/755	–	QM/411	QM/741	M/P11819	–	QM/924

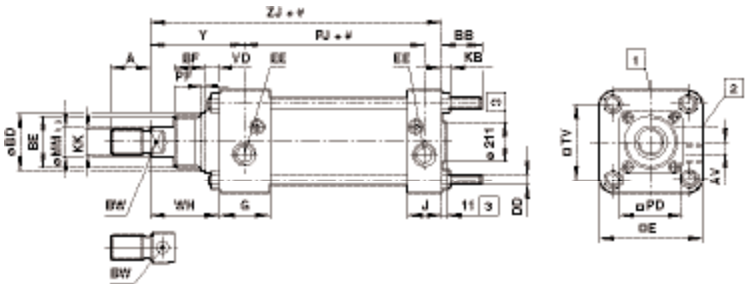
Cylinder Ø inch	M	N	R	UF	UH	UR
						
1 1/4	QM/393	M/P11716	M/P11966	QM/1141	QM/9125/40	QM/1161
1 3/4	QM/923	M/P7955	M/P11219	QM/1142	QM/9175/40	QM/1162
2	QM/908	M/P9969	M/P10349	QM/1143	QM/920/40	QM/1163
2 1/2	QM/901	M/P9905	M/P10351	QM/1144	QM/925/40	QM/1164
3	QM/901	M/P9905	M/P10353	QM/1144	QM/930/40	QM/1165
4	QM/902	QM/1475*	QM/763	QM/1146	QM/940/40	QM/1166
5	QM/903	QM/997*	QM/764			QM/950/33
6	QM/903	QM/997*	QM/765			QM/960/33
8	QM/904		QM/766			QM/980/33
10	QM/919		QM/767			
12	QM/919		QM/768			
14	QM/919		QM/769			

Note: When fitted with a Foot Mounting Style 'C' the maximum pressure for the 14 inch bore model is 8 bar.

* These cannot be supplied separately. If a spare Nose Mounting is required, specify basic cylinder reference with 'Q' prefix and -/06 suffix, e.g. QM/950/N/06.

BASIC DIMENSIONS

RM/900, RM/900/M – Standard cylinder



#	Stroke
1	Cushion screw Ø 5 ... 14 inch
2	Cushion screw Ø 1 1/4 ... 4 inch
3	For Ø 14 inch only

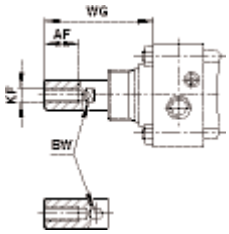
MODELS	Ø inch	A	AV	BB	Ø BD	BE	BF	⌀ BW	DD	□E	EE	G	J	KB
RM/9125	1 1/4	14,5	6	22	22	M 22 x 2	19	10	M 6	45	G 1/8	25	22	5
RM/9175	1 3/4	19	8,5	26,5	27	M 27 x 2	19	12	M 8	57	G 1/4	29	25	6,5
RM/920	2	24	7,5	25	34	M 33 x 2	20	17	M 8	63,5	G 1/4	29,5	24	6,5
RM/925	2 1/2	33,5	8	25	40	M 39 x 2	25,5	22	M 8	74,5	G 3/8	30	25	6,5
RM/930	3	33,5	7	33	40	M 39 x 2	25,5	22	M 10	91	G 3/8	35	35	8
RM/940	4	38	12	32	-	Ø 43	-	27	M 10	114	G 3/8	35	35	8
RM/950	5	47,5	-	48	-	Ø 58,5	-	Ø 10	M 12	140	G 1/2	41	41	10
RM/960	6	47,5	-	49,5	-	Ø 58,5	-	Ø 10	M 16	167	G 1/2	41	41	13
RM/980	8	57	-	53,5	-	Ø 63,5	-	Ø 10	M 18	219	G 3/4	52	52	15
RM/9100	10	76	-	70,5	-	Ø 77	-	Ø 10	M 24	270	G 1	60	60	19
RM/9120	12	76	-	70,5	-	Ø 77	-	Ø 10	M 24	321	G 1	60	60	19
RM/9140	14	76	-	93	-	Ø 89	-	Ø 10	M 30	375	G 1	60	60	24

MODELS	Ø inch	KK	Ø MM$_{h9}$	□PD	PF	PJ	TV	VD	WH	Y	ZJ	at 0 mm	per 25 mm
RM/9125	1 1/4	M 10	12	-	-	69	30,5	8	37	49,5	125,5	0,47 kg	0,06 kg
RM/9175	1 3/4	M 12	16	-	-	70	43	8	37	52	132,5	0,91 kg	0,10 kg
RM/920	2	M 16	20	-	3	67	47,5	9,5	46	60,5	137	1,15 kg	0,13 kg
RM/925	2 1/2	M 22	25	-	3	73	55,5	8	53	68,5	152,5	1,93 kg	0,17 kg
RM/930	3	M 22	25	59	3	95	66,5	13	56,5	71	179,5	3,02 kg	0,20 kg
RM/940	4	M 24	32	63,5	-	97	89	13	64	77,5	187,5	4,01 kg	0,26 kg
RM/950	5	M 30	1 1/2 inch	82,5	-	109	108	18	83	101	228,5	9,10 kg	0,55 kg
RM/960	6	M 30	1 1/2 inch	82,5	-	115,5	128,5	18	83	101	235	12,80 kg	0,80 kg
RM/980	8	M 36	1 3/4 inch	89	-	145,5	168,5	19	86	108,5	276	23,00 kg	1,00 kg
RM/9100	10	M 48	2 1/4 inch	111	-	173,5	209,5	22	109	139,5	343	73,40 kg	1,90 kg
RM/9120	12	M 48	2 1/4 inch	111	-	173,5	246	22	109	139,5	343	98,60 kg	2,10 kg
RM/9140	14	M 48	2 1/4 inch	-	-	187,5	292	32	128	153,5	366,5	99,80 kg	3,00 kg

ALTERNATIVE VARIANTS

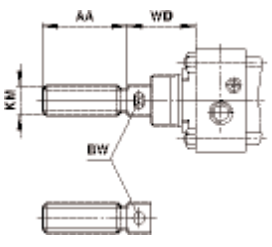
RM/900/X, RM/900/MX – Piston rod end style X

MODELS	Ø inch	AF	⌀ BW	KF	WG
RM/9125	1 1/4	14	10	M 10	50,5
RM/9175	1 3/4	14	12	M 10	54,5
RM/920	2	19	17	M 12	64,5
RM/925	2 1/2	29	22	M 18	84,5
RM/930	3	29	22	M 18	89,5
RM/940	4	38	27	M 24	105
RM/950	5	48	Ø 10	M 30	133,5
RM/960	6	48	Ø 10	M 30	133,5
RM/980	8	57	Ø 10	M 30	149,5
RM/9100	10	76	Ø 10	M 42	191,5
RM/9120	12	76	Ø 10	M 42	191,5
RM/9140	14	76	Ø 10	M 42	210,5



RM/900/X, RM/900/MX – Piston rod end style X

MODELS	Ø inch	AA	⌀ BW	KM	WD
RM/9125	1 1/4	29,5	10	M 12	39,5
RM/9175	1 3/4	35,5	12	M 16	41
RM/920	2	43	17	M 18	56,5
RM/925	2 1/2	58	22	M 24	55
RM/930	3	58	22	M 24	60
RM/940	4	73	27	M 30	67
RM/950	5	88	Ø 10	M 36	87
RM/960	6	88	Ø 10	M 36	87
RM/980	8	103	Ø 10	M 42	91
RM/9100	10	134	Ø 10	M 56	111,5
RM/9120	12	134	Ø 10	M 56	111,5
RM/9140	14	134	Ø 10	M 56	130,5

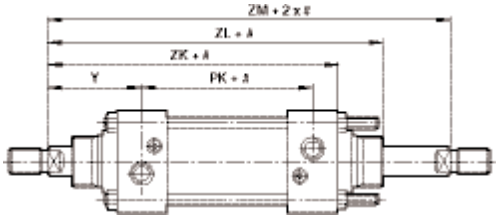


RM/900/M Imperial cylinders

Double acting, Ø 1 1/4" ... 14"

RM/900/J, RM/900/JM – Cylinder with double ended piston rod

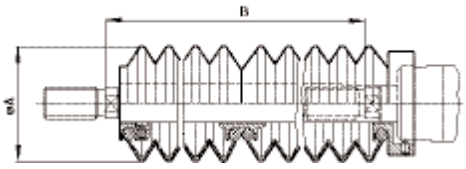
MODELS	Ø inch	PK	ZK	ZL	ZM	Y	at 0 mm	per 25 mm
RM/9125	1 1/4	66,5	128,5	155,5	165,5	49,5	0,65 kg	0,08 kg
RM/9175	1 3/4	69,5	136,5	163,5	173,5	52	1,21 kg	0,13 kg
RM/920	2	67	142,5	172	187,5	60,5	1,66 kg	0,19 kg
RM/925	2 1/2	72,5	157	190,5	210	68,5	2,82 kg	0,27 kg
RM/930	3	95	179,5	218	237	71	3,86 kg	0,30 kg
RM/940	4	96,5	187,5	232	251,5	77,5	5,31 kg	0,41 kg
RM/950	5	109	228,5	292	311,5	101	11,85 kg	0,77 kg
RM/960	6	115,5	235	298,5	318	101	15,60 kg	1,20 kg
RM/980	8	145,5	276	339,5	362	108,5	26,91 kg	1,30 kg
RM/9100	10	173,5	343	419	452	139,5	81,10 kg	2,39 kg
RM/9120	12	173,5	343	419	452	139,5	105,30 kg	2,59 kg
RM/9140	14	187,5	366,5	462	494,5	153,5	109,00 kg	3,30 kg



Stroke

RM/900/G und RM/900/MG – Cylinder with piston rod bellows

MODELS	Ø inch	Ø A	Max. stroke per bellow	Piston rod extension B for first bellow	for further bellow
RM/9125/.G/..	1 1/4	40	60	30	25
RM/9175/.G/..	1 3/4	63	145	50	32
RM/920/.G/..	2	63	145	40	32
RM/925/.G/...	2 1/2	63	145	40	32
RM/930/.G/..	3	80	250	50	45
RM/940.G/..	4	80	250	50	45
RM/950/.G/..	5	80	250	50	45
RM/960/.G/..	6	116	350	70	60
RM/980/.G/..	8	116	350	70	60
RM/9120/.G/..	10	116	350	70	60

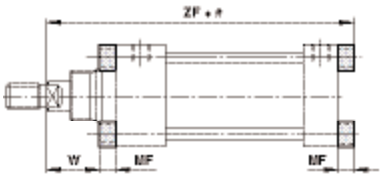


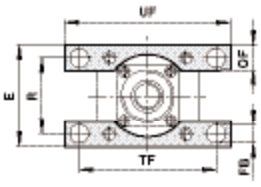
MOUNTINGS

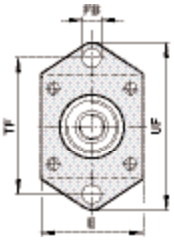
Front flange - B or G

Front flange - BG

For 9125 cylinder only



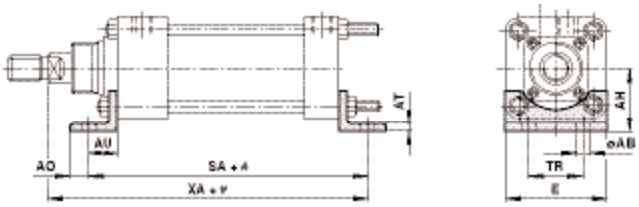




Stroke

MODELS B	MODELS BG	MODELS G	Ø inch	E	FB	MF	OF	R	TF	UF	W	ZF	Weight
M/P6938	QM/819	M/P6938	1 1/4	45	8	9,5	-	-	63,5	79	27,5	135	0,15 kg
QM/888	QM/1181	QM/986	1 3/4	59	9	10	16	43	81	98,5	27	142,5	0,20 kg
QM/875	QM/1182	QM/871	2	64	9	10	16	47,5	85,5	105	35,5	147	0,20 kg
QM/876	QM/1184	QM/877	2 1/2	75,5	9	10	20	55,5	93,5	113	43	162,5	0,25 kg
QM/878	QM/1185	QM/984	3	88,5	11,5	16	22	66,5	111	133,5	41,5	195,5	0,45 kg
QM/887	QM/1187	QM/987	4	121	14	16	32	89	146	178	48	203,5	1,00 kg
QM/886	QM/1188	QM/988	5	148	14,5	20	40	108	171,5	203	63	248,5	1,50 kg
QM/884	QM/1189	QM/884	6	168,5	18	20	40	128,5	205	243	63	255	2,40 kg
QM/883	QM/1190	QM/883	8	218,5	22	25	50	168	263,5	314,5	61	301	5,50 kg
QM/882	–	QM/882	10	274,5	26	30	65	209,5	333,5	397	79	373	12,00 kg
QM/889	–	QM/889	12	311	26	30	65	246	384	448	79	373	14,00 kg
QM/741	–	QM/741	14	368	33	38	76	292	457	533	90	405	23,00 kg

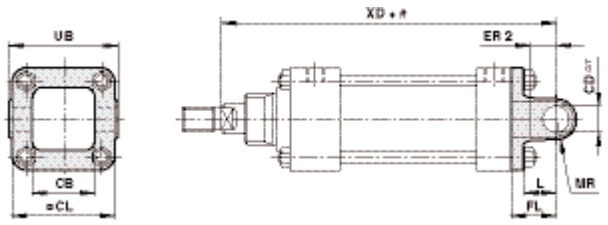
Foot mounting - C



Stroke

MODELS	Ø inch	Ø AB	AH	AO	AT	AU	E	SA	TR	XA	Weight
QM/754	1 1/4	6,8	24	6,5	6,5	14,5	45	117	-	139,5	0,06 kg
QM/753	1 3/4	10,5	37,5	11	5	19	57	133,5	-	151,5	0,20 kg
QM/752	2	13	40	11	5	19	63	129,5	-	156	0,20 kg
QM/748	2 1/2	13	46,5	11	5	19	74	137,5	30	171,5	0,25 kg
QM/983	3	13	52,5	11	5	19	91	160	28,5	198,5	0,30 kg
QM/982	4	13,5	70	24,5	8	25,5	114	174	51	212,5	0,65 kg
QM/981	5	17,5	82,5	21,5	8	28,5	140	202,5	57	257	1,00 kg
QM/826	6	17,5	99,5	25	10	35	167	222	70	270	2,50 kg
QM/825	8	17,5	122	22	10	38	219	266	82,5	314	3,50 kg
QM/824	10	26	159	46	15	54	270	341,5	114,5	397	8,00 kg
QM/756	12	26	177	46	15	54	320	341,5	139,5	397	9,50 kg
QM/755	14	33,5	212,5	33,5	15	66,5	375	372	159	433,5	20,50 kg

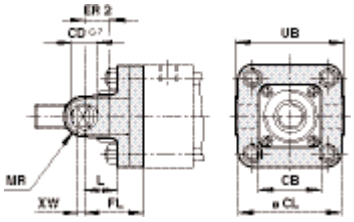
Foot mounting - D



Stroke

MODELS	Ø inch	CB	Ø CD^{G7}	□CL	ER 2	FL	L	MR	UB	XD	Weight
M/P6937	1 1/4	25,4	6	44,5	9,5	14,5	9,5	6,5	-	139,5	0,08 kg
M/P7457	1 3/4	34,9	12	57	14,5	19	14,5	10	-	151,5	0,15 kg
M/P10228	2	34,9	16	62,5	20,5	28,5	20,5	13	-	165,5	0,25 kg
M/P10311	2 1/2	42,9	16	74	20,5	28,5	20,5	13	-	181	0,25 kg
M/P10229	3	44,5	20	88	25,5	35	25,5	14	-	214,5	0,75 kg
QM/758	4	69,9	22	114,5	36,5	57	38	19	122,5	244,5	1,25 kg
QM/759	5	92,1	25	139,5	32	70	44,5	24	152,5	298,5	2,50 kg
QM/761	6	106,4	32	166,5	35	76	49	29	181	311	3,50 kg
QM/762	8	122,2	38	217,5	38	85,5	57	38	237	362	7,00 kg

Foot mounting - K



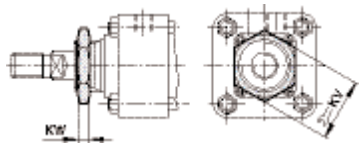
Stroke

MODELS	Ø inch	CB	Ø CD^{G7}	□CL	ER 2	FL	L	MR	UB	XW	Weight
M/P6937	1 1/4	25,4	6	44,5	9,5	14,5	9,5	6,5	-	22,5	0,08 kg
M/P7457	1 3/4	34,9	12	57	14,5	19	14,5	10	-	18	0,15 kg
QM/962	2	34,9	16	62,5	20,5	28,5	20,5	13	-	7,5	0,25 kg
QM/964	2 1/2	42,9	16	74	20,5	28,5	20,5	13	-	16,5	0,25 kg
QM/966	3	44,5	20	88	25,5	35	25,5	14	-	6,5	0,75 kg
QM/758	4	69,9	22	114,5	36,5	57	38	19	122,5	7	1,25 kg
QM/759	5	92,1	25	139,5	32	70	44,5	24	152,5	13	2,50 kg
QM/761	6	106,4	32	166,5	35	76	49	29	181	6,5	3,50 kg
QM/762	8	122,2	38	217,5	38	85,5	57	38	237	0	7,00 kg

RM/900/M Imperial cylinders

Double acting, Ø 1 1/4" ... 14"

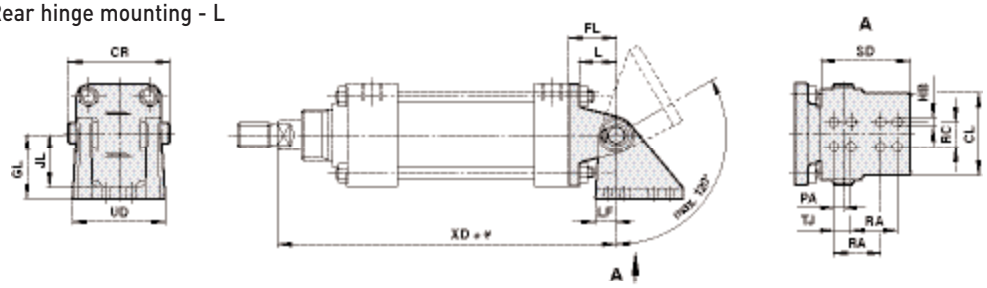
Nose mounting - N



MODELS	Ø inch	KV	KW	Weight
M/P11716	1 1/4	28	6,5	0,02 kg
M/P7955	1 3/4	38	8	0,04 kg
M/P9969	2	43	8	0,04 kg
M/P9905	2 1/2	48	8	0,04 kg
M/P9905	3	48	8	0,04 kg
QM/1475*	4	57	8	0,06 kg
QM/997*	5	70	12,5	0,18 kg
QM/997*	6	70	12,5	0,18 kg

* These cannot be supplied separately. If a spare Nose Mounting is required, specify basic cylinder reference with 'Q' prefix and -/06 suffix, e.g. QM/950/N/06.

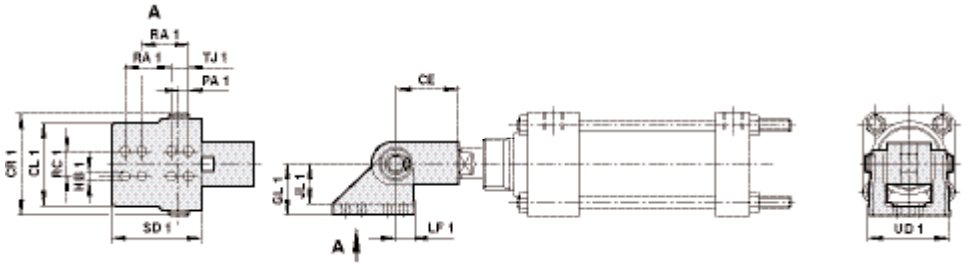
Rear hinge mounting - L



Stroke

MODELS	Ø inch	CL	CR	FL	GL	Ø HB	JL	L	LF	PA	RA	RC	SD	TJ	UD	XD	Weight
QM/394	1 1/4	31	39,5	25,5	28,5	7,2	20,5	19	9,5	1,5	25,5	–	41,5	–	–	151	0,25 kg
QM/922	1 3/4	32	44,5	32	32	8,7	25,5	24	13	5	32	–	47,5	–	–	164,5	1,10 kg
QM/909	2	60	73	35	47,5	8,5	39,5	25,5	15,5	6,5	47,5	19	66,5	–	68,5	172	1,20 kg
QM/910	2 1/2	60	73	35	47,5	8,5	39,5	25,5	15,5	6,5	47,5	19	66,5	–	68,5	187,5	1,25 kg
QM/911	3	60	73	35	47,5	8,5	39,5	25,5	15,5	6,5	47,5	19	66,5	–	68,5	214,5	1,50 kg
QM/912	4	70	82,5	51	74,5	12	65	30	23,5	11	76	22	101,5	–	82,5	238	3,50 kg
QM/913	5	70	82,5	57	74,5	12	65	33,5	23,5	11	76	22	101,5	–	82,5	285,5	5,00 kg
QM/914	6	98,5	114,5	70	89	13,5	76	43	28	12,5	101,5	32	165	32	108	305	11,00 kg
QM/915	8	100	114,5	79,5	116	16,7	100	47,5	31,5	16	114,5	32	184	38	117,5	355,5	17,50 kg
QM/917	10	151	178	95,5	171,5	27	151	57	44,5	16	133,5	51	247,5	57	159	438	25,00 kg
QM/918	12	151	178	95,5	171,5	27	151	57	44,5	16	133,5	51	247,5	57	159	438	30,00 kg
QM/924	14	210	239	120,5	232	27	209,5	73	63,5	28,5	139,5	63,5	279,5	70	210	487,5	61,00 kg

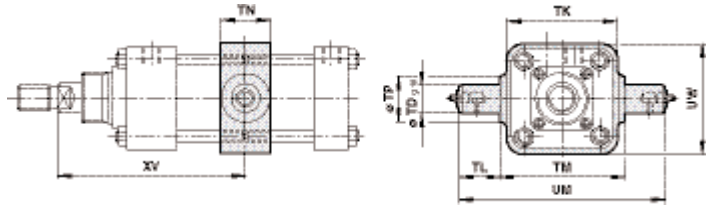
Rear hinge mounting - M



Stroke

MODELS	Ø inch	CE	CL 1	CR 1	GL 1	Ø HB 1	JL 1	LF 1	PA 1	RA 1	RC 1	SD 1	TJ 1	UD 1	Weight
QM/393	1 1/4	25,5	31	39,5	28,5	7,2	20,5	9,5	1,5	25,5	–	41,5	–	–	0,17 kg
QM/923	1 3/4	33,5	32	44,5	32	8,7	25,5	13	5	32	–	47,5	–	–	0,30 kg
QM/908	2	41,5	43	54	32	8,5	24	14	5	32	–	51	–	49	0,40 kg
QM/901	2 1/2	58,5	60	73	47,5	8,5	39,5	16	6,5	47,5	19	67	–	68,5	1,00 kg
QM/901	3	58,5	60	73	47,5	8,5	39,5	16	6,5	47,5	19	67	–	68,5	1,00 kg
QM/902	4	66,5	70	82,5	74,5	12	65	24	11	76	22	102	–	82,5	2,00 kg
QM/903	5	79,5	79,5	92	89	10,3	79,5	28,5	16	89	22	114,5	–	–	3,00 kg
QM/903	6	79,5	79,5	92	89	10,3	79,5	28,5	16	89	22	114,5	32	–	3,00 kg
QM/904	8	95,5	98,5	114,5	89	13,5	76	28,5	12,5	102	32	165	32	108	6,00 kg
QM/919	10	120,5	124	139,5	116	20	100	35	12,5	120,5	38	206,5	41,5	–	9,00 kg
QM/919	12	120,5	124	139,5	116	20	100	35	12,5	120,5	38	206,5	41,5	–	9,00 kg
QM/919	14	120,5	124	139,5	116	20	100	35	12,5	120,5	38	206,5	41,5	–	10,50 kg

Centre trunnion - H

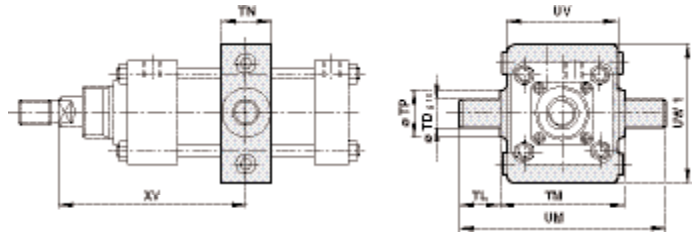


Stroke

MODELS	Ø inch	Ø TD_{g10}	TK	TL	TM	TN	Ø TP	UM	UW	XV min	XV max	Weight
M/P14001	1 1/4	12	45	17,5	50,5	20,5	18	85,5	45	72,5	93	0,16 kg
M/P11224	1 3/4	16	65	24	73	25,5	22	120,5	65	79	94,5	0,50 kg
M/P8635	2	18	70	25,5	79,5	32	29	130	70	90,5	97	0,60 kg
M/P8636	2 1/2	22	81	32	90,5	38	35	154	81	102	108,5	0,90 kg
M/P8637	3	25	95	38	108	38	38	184	95	111,5	125,5	1,25 kg
M/P8638	4	32	127	41,5	139,5	44,5	44,5	222,5	127	121,5	130	2,50 kg
M/P8639	5	38	152	51	165	51	51	266,5	152	149,5	162	3,50 kg
M/P8640	6	38	187	51	192	51	51	293,5	187	149,5	168,5	5,00 kg
M/P8645	8	45	241,5	54	247,5	70	64	355,5	245	173	189	10,00 kg
M/P8667	10	65	330	76	330	76	114	482,5	318	207	245	25,00 kg
M/P8670	12	75	381	76	381	89	127	533,5	368	213,5	238,5	35,00 kg
M/P11819	14	90	457	101,5	457	101,5	140	660,5	432	239	255,5	51,50 kg

Note: These mountings are only supplied assembled complete with the cylinder.
Unless otherwise specified, units will be supplied with dimension 'XV' plus half the stroke length. Grease nipple supplied as standard on cylinders 9175 to 9140.

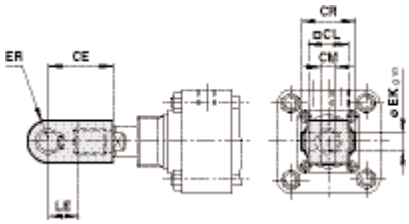
Centre trunnion - UH



MODELS	Ø TD_{g10}	Ø TP	TL	TM	TN	UM	UV	UW 1	XV min	XV max	Torque Nm	Weight
QM/9125/40	12	18	17,5	50,5	20,5	85,5	45	60	72,5	93	4	0,24 kg
QM/9175/40	16	22	24	73	25,5	120,5	57	74	79	94,5	8	0,43 kg
QM/920/40	18	29	25,5	79,5	32	130	70	87	90,5	97	8	0,70 kg
QM/925/40	22	35	32	90,5	38	154	81	95	102	108,5	8	1,14 kg
QM/930/40	25	38	38	108	38	184	95	110	111,5	125,5	10	1,30 kg
QM/940/40	32	44,5	41,5	139,5	44,5	222,5	127	131	121,5	130	10	2,32 kg

Note: It is most important that the locking screws which secure the mounting to the tie rods are tightened to the torque figures shown in the above table. For maximum energy input, consult our Technical Service.

Piston rod clevis - F

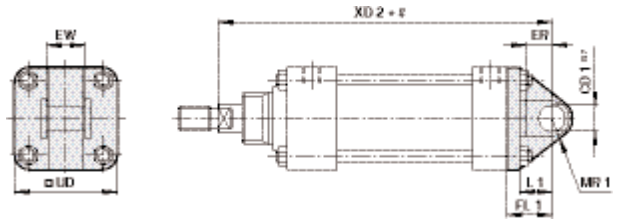


MODELS	Ø inch	CE	□CL	CM	CR	Ø EK_{g10}	ER	LE	Weight
QM/402	1 1/4	25,5	12,5	6,4	18	6	6,5	11	0,03 kg
QM/404	1 3/4	33,5	19	10	26	10	10	12,5	0,05 kg
QM/405	2	41,5	25,5	11	33	12	13	19	0,10 kg
QM/407	2 1/2	58,5	38	14	47	16	19	25,5	0,40 kg
QM/407	3	58,5	38	14	47	16	19	25,5	0,40 kg
QM/408	4	66,5	44,5	16	53	18	22	28,5	0,90 kg
QM/409	5	79,5	51	20	60	22	25	32	1,25 kg
QM/409	6	79,5	51	20	60	22	25	32	1,25 kg
QM/410	8	95,5	63,5	25	74	25	32	38	1,70 kg
QM/411	10	120,5	76	32	87	32	38	44,5	2,75 kg
QM/411	12	120,5	76	32	87	32	38	44,5	2,75 kg
QM/411	14	120,5	76	32	87	32	38	44,5	4,50 kg

RM/900/M Imperial cylinders

Double acting, Ø 1 1/4" ... 14"

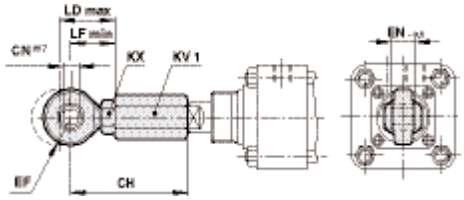
Rear eye - R



Stroke

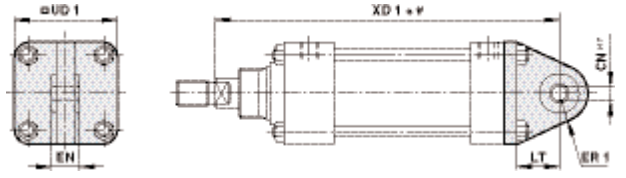
MODELS	Ø inch	Ø CD 1 G7	ER	EW	FL 1	L 1	MR 1	□UD	XD 2	Weight
M/P11966	1 1/4	6	19	19	25,5	19	9	45	151	0,10 kg
M/P11219	1 3/4	10	14,5	19	32	24	10	57	164,5	0,26 kg
M/P10349	2	16	19	38,1	35	25,5	14	62	172	0,55 kg
M/P10351	2 1/2	16	19	38,1	35	25,5	14	74	187,5	0,80 kg
M/P10353	3	16	19	38,1	35	25,5	16	87,5	214,5	0,90 kg
QM/763	4	18	25,5	44,5	51	30	21	112,5	238	2,60 kg
QM/764	5	18	28,5	44,5	57	33,5	21	138	285,5	3,60 kg
QM/765	6	25	28,5	63,5	70	43	25,5	165	305	6,20 kg
QM/766	8	25	32	63,5	79,5	47,5	25,5	217,5	355,5	11,50 kg
QM/767	10	38	44,5	101,6	95,5	57	41	268,5	438	12,60 kg
QM/768	12	38	44,5	101,6	95,5	57	41	319	438	17,30 kg
QM/769	14	57	73	127	120,5	73	54	375	487,5	32,80 kg

Universal piston rod eye - UF



MODELS	Ø inch	CH	Ø CN H7	EF	EN -0,1	KV 1	KX	LD max.	LF min.	Z	Weight
QM/1141	1 1/4	59	8	13	12	14	13	30	24	17°	0,07 kg
QM/1142	1 3/4	74	10	15	14	17	17	33	28	16°	0,13 kg
QM/1143	2	74	10	15	14	22	17	33	28	16°	0,17 kg
QM/1144	2 1/2	96,5	14	19	19	32	22	39	36	18°	0,43 kg
QM/1144	3	96,5	14	19	19	32	22	39	36	18°	0,43 kg
QM/1146	4	101	14	19	19	32	22	39	36	18°	0,44 kg

Universal rear eye - UR

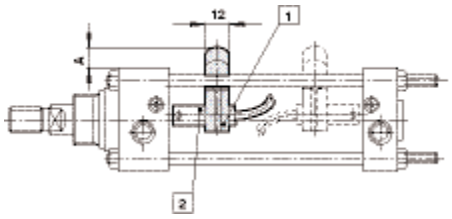


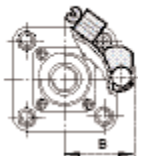
Stroke

MODELS	Ø inch	Ø CN H7	EN	ER 1	LT	□UD 1	XD 1	Z	Weight
QM/1161	1 1/4	8	12	16	19	44,5	151,5	13°	0,18 kg
QM/1162	1 3/4	10	14	18	26	56,5	166,5	12°	0,30 kg
QM/1163	2	10	14	18	27	63	172	12°	0,43 kg
QM/1164	2 1/2	14	19	26	26	73	187,5	12°	0,60 kg
QM/1165	3	14	19	26	26	87,5	214,5	12°	0,75 kg
QM/1166	4	14	19	26	30	114	238	12°	2,40 kg
QM/950/33	5	25	31	36	36	138	279	12°	2,70 kg
QM/960/33	6	30	37	43	39	176	290	12°	4,60 kg
QM/980/33	8	30	37	48	42	216	337	12°	7,30 kg

BRACKETS

QM/27/2/1 – Bracket
Switches: M/50

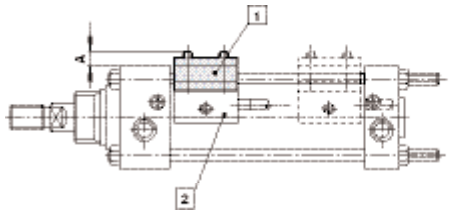


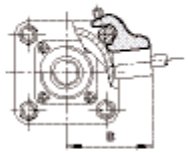


1 Bracket
2 Switch

Cylinder Ø	A	B	Weight
1 1/4	9	30,5	0,010 kg
1 3/4	8	35,5	0,010 kg
2	7	38	0,010 kg
2 1/2	7	44,5	0,010 kg
3	4	49,5	0,010 kg
4	2	59	0,010 kg

QM/31/000/22 – Bracket
Switches: QM/32, QM/132





1 Bracket
2 Switch

Cylinder Ø	A	B	Weight
1 1/4	4,5	42	0,010 kg
1 3/4	1,5	47	0,010 kg
2	3,5	52	0,010 kg
2 1/2	0,5	58	0,010 kg
3	-4,5	64	0,010 kg
4	-10	70	0,010 kg

M/1000 Heavy duty cylinders

Double acting, Ø 2" ... 12"

Extremely rugged heavy duty construction - ideal for use in the most arduous conditions

Long, adjustable cushioning

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting with adjustable cushioning

Operating pressure:

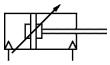
2 ... 17 bar	up to Ø 8 inch
2 ... 13,5 bar	Ø 10 and 12 inch

Operating temperature:
-20°C ... +80°C
Consult our Technical Service for use below +2°C

MATERIALS

Barrel: hard chrome plated steel
End cover: Cast iron
Piston: Steel (up to Ø 3 inch cast iron)
Piston rod: hard chrome plated steel
Tie rods: Steel
Piston rod seals: Nitrile rubber
Piston seals: Nitrile rubber
Barrel gaskets: Aluminium
O-rings: Nitrile rubber

STANDARD MODELS

	Ø inch	Piston rod Ø inch	Port size	MODELS Non-magnetic	ACCESSORIES Straight fitting (Tube diameter in bold)	Elbow fitting	Service kit
							
	2	1	G1/4	**M/1020/***	432250828	431450828	QM/1020/00
	2 1/2	1	G3/8	**M/1025/***	432250838	431450838	QM/1025/00
	2 1/2	1 1/4	G3/8	**M/1026/***	432250838	431450838	QM/1026/00
	3	1	G1/2	**M/1030/***	432251448	431451448	QM/1030/00
	3	1 1/4	G1/2	**M/1031/***	432251448	431451448	QM/1031/00
	4	1 1/4	G1/2	**M/1040/***	432251448	431451448	QM/1040/00
	4	1 1/2	G1/2	**M/1041/***	432251448	431451448	QM/1041/00
	5	1 1/4	G1/2	**M/1050/***	432251448	431451448	QM/1050/00
	5	1 3/4	G1/2	**M/1051/***	432251448	431451448	QM/1051/00
	6	1 3/4	G3/4	**M/1060/***	432252268	431452268	QM/1060/00
	6	2 1/4	G3/4	**M/1061/***	432252268	431452268	QM/1061/00
Non-magnetic	8	1 3/4	G1	**M/1080/***	432252288	–	QM/1080/00
	8	2 1/4	G1	**M/1081/***	432252288	–	QM/1081/00
	10	3	G1	**M/1101/***	432252288	–	QM/1101/00
	12	3	G1	**M/1121/***	432252288	–	QM/1121/00

* Insert stroke length in mm
Other fittings are available, please see section 7

For further information

www.norgren.com/info/en1-236

Theoretical forces, cushioning, air consumption

MODELS	Ø inch	Cushion length (mm)	Cushion volume (cm^3)	Theoretical forces (N) at 6 bar outstroke	intstroke	Air consumption (l/cm) per stroke at 6 bar outstroke	intstroke
M/1020	2	25,5	34,3	1225	1055	0,143	0,107
M/1025	2 1/2	25,5	85,2	1930	1626	0,225	0,189
M/1030	3	25,5	126,2	2721	2417	0,317	0,282
M/1040	4	38	339	4902	4420	0,572	0,515
M/1050	5	38	528	7600	7118	0,886	0,830
M/1060	6	38	737	10887	9954	1,270	1,161
M/1080	8	51	895	19419	18486	2,265	2,157
M/1101	10	63,5	1554	30402	27680	3,547	3,229
M/1121	12	63,5	2368	43837	41115	5,114	4,797

OPTIONS SELECTOR

★M/1★★★/★/★★★★

Special variants	Substitute
High temperature version: 150°C max.	**T**

Cylinder diameters, piston rod Ø (inch)	(inch)	Substitute
2	1	**020**
2 1/2	1	**025**
2 1/2	1 1/4	**026**
3	1	**030**
3	1 1/4	**031**
4	1 1/4	**040**
4	1 1/2	**041**
5	1 1/4	**050**
5	1 3/4	**051**
6	1 3/4	**060**
6	2 1/4	**061**
8	1 3/4	**080**
8	2 1/4	**081**
10	3	**101**
12	3	**121**

Strokes (mm)
2500 max.

Variants	Substitute
Standard	**None**
Piston rod bellow*	**K**
Double ended piston rod	**J**
Female piston rod thread	**X**
Full piston rod thread	**Y**

* Please contact our technical service.
Note: If option is not required, disregard option position within part number, eg. M/1020/100. For combinations of cylinder variants consult our Technical Service.
Please note that heat resistant seals are not available for all variants.
This options selector explains only the cylinder variants. Additional variants/options can not be derived from.

M/1000 Heavy duty cylinders

Double acting, Ø 2" ... 12"

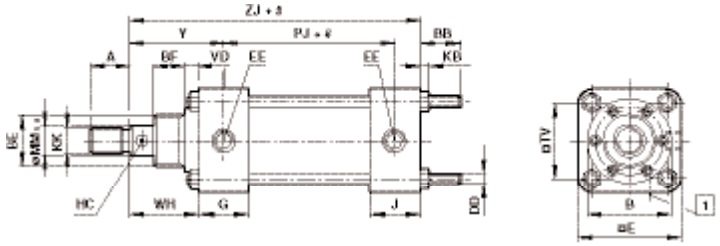
MOUNTINGS

Cylinder Ø inch	Piston rod Ø	B	B + G	C	D	F	G	H	K
									
2	1	QM/871	QM/1182	QM/751	M/P9822	QM/407	QM/875	M/P8635	QM/963
2 1/2	1	QM/877	QM/1184	QM/748	M/P9825	QM/407	QM/876	M/P8636	QM/965
2 1/2	1 1/4	QM/984	QM/1185	QM/747	M/P9828	QM/408	QM/878	M/P8636	QM/967
3	1	QM/987	QM/1187	QM/746	QM/758/2	QM/407	QM/887	M/P8637	QM/758/1
3	1 1/4	QM/988	QM/1188	QM/981	QM/759/2	QM/408	QM/886	M/P8637	QM/759/1
4	1 1/4	QM/884/1	QM/1189	QM/826	QM/761/2	QM/408	QM/884/2	M/P8638	QM/761/1
4	1 1/2	QM/889/1	–	QM/745	QM/762/2	QM/409	QM/883/2	M/P8638	QM/762/1
5	1 1/4	QM/882/2	–	QM/744	–	QM/408	QM/882/2	M/P8639	–
5	1 3/4	QM/889/1	–	QM/743	–	QM/410	QM/889/2	M/P8639	–
6	1 3/4	–	–	–	–	QM/410	–	M/P8640	–
6	2 1/4	–	–	–	–	QM/411	–	M/P8640	–
8	1 3/4	–	–	–	–	QM/410	–	M/P8645	–
8	2 1/4	–	–	–	–	QM/411	–	M/P8645	–
10	3	–	–	–	–	QM/412	–	M/P8667	–
12	3	–	–	–	–	QM/412	–	M/P8670	–

Cylinder Ø inch	Piston rod Ø	L	M	N	R
					
2	1	QM/909	QM/901	M/P9693/1	M/P10349
2 1/2	1	QM/910	QM/901	M/P9693/2	M/P10351
2 1/2	1 1/4	QM/910	QM/902	M/P9693/2	M/P10353
3	1	QM/911	QM/901	M/P9693/4	QM/763
3	1 1/4	QM/911	QM/902	–	QM/764
4	1 1/4	QM/912	QM/902	–	QM/765
4	1 1/2	QM/912	QM/903	–	QM/766
5	1 1/4	QM/913	QM/902	–	QM/767
5	1 3/4	QM/913	QM/904	–	QM/768
6	1 3/4	QM/914	QM/904	–	–
6	2 1/4	QM/914	QM/906	–	–
8	1 3/4	QM/915	QM/904	–	–
8	2 1/4	QM/915	QM/906	–	–
10	3	QM/917	QM/921	–	–
12	3	QM/918	QM/921	–	–

BASIC DIMENSIONS

M/1000 – Standard cylinder



#	Stroke
1	Cushion screw

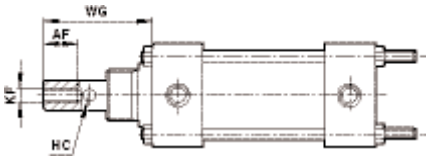
MODELS	Ø inch	A	B	BB	BE	BF	DD	□E	EE	G	Ø HC	J
M/1020	2	33,5	51	28	M 45 x 2	30	M 8	63,5	G 1/4	37	8	37
M/1025	2 1/2	33,5	58	31	M 52 x 2	35	M8	76	G 3/8	37	8	37
M/1026	2 1/2	38	58	31	M 52 x 2	35	M8	76	G 3/8	37	8	37
M/1030	3	33,5	64	37	M 52 x 2	38	M10	90	G 1/2	38	8	38
M/1031	3	38	64	37	M 52 x 2	38	M10	90	G 1/2	38	8	38
M/1040	4	38	89	29	M 64 x 2	46	M 10	114	G 1/2	46	8	46
M/1041	4	47,5	89	29	M 64 x 2	46	M 10	114	G 1/2	46	8	46
M/1050	5	38	108	39	-	41	M 12	140	G 1/2	48	8	48
M/1051	5	57	108	39	-	41	M 12	140	G 1/2	48	8	48
M/1060	6	57	127	48	-	52,5	M 16	167	G 3/4	43	10	43
M/1061	6	76	127	48	-	52,5	M 16	167	G 3/4	43	10	43
M/1080	8	57	168	57	-	65	M 18	219	G1	60	10	60
M/1081	8	76	168	57	-	65	M 18	219	G1	60	10	60
M/1101	10	95,5	210	68	-	76,5	M 24	270	G1	70	16	70
M/1121	12	95,5	210	68	-	76,5	M 24	321	G1	70	16	70

MODELS	Ø inch	KB	KK	Ø MM h9	PJ	□TV	VD	WH	Y	ZJ	at 0 mm	per 25 mm
M/1020	2	7,5	M 22	1 inch	90,5	47,5	9,5	55,5	71	178	3,27 kg	0,27 kg
M/1025	2 1/2	7,5	M 22	1 inch	92,5	55,5	12,5	63	80,5	190,5	4,49 kg	0,35 kg
M/1026	2 1/2	7,5	M 24	1 1/4 inch	92,5	55,5	12,5	63	80,5	190,5	4,57 kg	0,41 kg
M/1030	3	9	M 22	1 inch	98,5	66,5	14,5	68	85,5	201,5	5,63 kg	0,45 kg
M/1031	3	9	M 24	1 1/4 inch	98,5	66,5	14,5	68	85,5	201,5	5,73 kg	0,50 kg
M/1040	4	9	M 24	1 1/4 inch	98,5	89	11	76	103	228,5	10,92 kg	0,62 kg
M/1041	4	9	M 30	1 1/2 inch	98,5	89	11	76	103	228,5	11,33 kg	0,69 kg
M/1050	5	11	M 24	1 1/4 inch	114,5	108	13	73	100	241,5	15,26 kg	0,79 kg
M/1051	5	11	M 36	1 3/4 inch	114,5	108	13	76	103	244,5	15,82 kg	0,94 kg
M/1060	6	14	M 36	1 3/4 inch	114,5	128,5	16	100	123,5	262	27,23 kg	1,17 kg
M/1061	6	14	M 48	2 1/4 inch	114,5	128,5	16	100	123,5	262	28,00 kg	1,37 kg
M/1080	8	16,5	M 36	1 3/4 inch	140	168,5	19	115,5	150,5	325,5	61,18 kg	1,57 kg
M/1081	8	16,5	M 48	2 1/4 inch	140	168,5	19	115,5	150,5	325,5	62,00 kg	1,77 kg
M/1101	10	20,5	M 64 x 4	3 inch	197	209,5	22	130	174,5	416	122,00 kg	2,75 kg
M/1121	12	20,5	M 64 x 4	3 inch	197	246	22	130	174,5	416	160,00 kg	3,74 kg

ALTERNATIVE VARIANTS

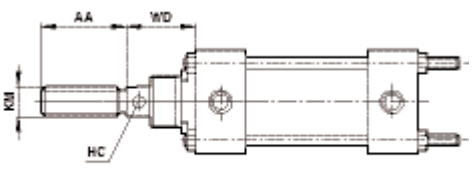
M/1000/X – Piston rod end style X

MODELS	Ø inch	AF	Ø HC	KF	WG
M/1020	2	29	8	M 18	84
M/1025	2 1/2	29	8	M 18	91,5
M/1026	2 1/2	38	8	M 24	104,5
M/1030	3	29	8	M 18	99,5
M/1031	3	38	8	M 24	109,5
M/1040	4	38	8	M 24	117
M/1041	4	48	8	M 30	127
M/1050	5	38	8	M 24	114
M/1051	5	57	8	M 30	133
M/1060	6	57	10	M 30	157
M/1061	6	76	10	M 42	176
M/1080	8	57	10	M 30	173
M/1081	8	76	10	M 42	195
M/1101	10	95	16	M 64 x 4	228,5
M/1121	12	95	16	M 64 x 4	228,5



RM/900/X, RM/900/MX – Piston rod end style X

MODELS	Ø inch	AA	Ø HC	KM	WD
M/1020	2	58	8	M 24	58
M/1025	2 1/2	58	8	M 24	65,5
M/1026	2 1/2	73	8	M 30	66,5
M/1030	3	58	8	M 24	70,5
M/1031	3	73	8	M 30	71
M/1040	4	73	8	M 30	79
M/1041	4	88	8	M 36	80
M/1050	5	73	8	M 30	76
M/1051	5	103	8	M 42	77,5
M/1060	6	103	10	M 42	101,5
M/1061	6	134	10	M 56 x 4	102
M/1080	8	103	10	M 42	117
M/1081	8	134	10	M 56 x 4	118
M/1101	10	180	16	M 76 x 4	134
M/1121	12	180	16	M 76 x 4	134

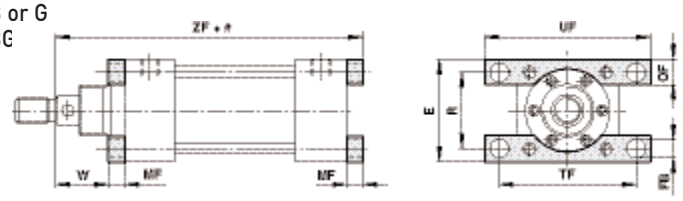


M/1000 Heavy duty cylinders

Double acting, Ø 2" ... 12"

MOUNTINGS

Front flange - B or G
Front flange - BG

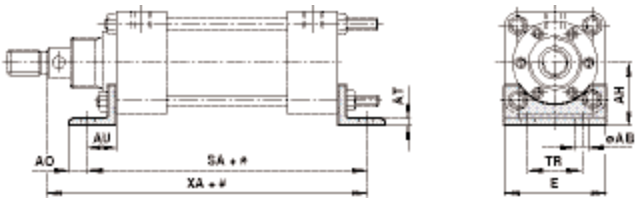


Stroke

MODELS B	MODELS BG	MODELS G	For cylinder	Ø inch	E	Ø FB	MF	OF	R	TF	UF	W	ZF	Weight
QM/871	QM/1182	QM/875	1020	2	63,5	8,7	10	16	47,5	85,5	105	45,5	187,5	0,20 kg
QM/877	QM/1184	QM/876	1025	2 1/2	75,5	8,7	10	20	55,5	93,5	113	53	200,5	0,25 kg
QM/877	QM/1184	QM/876	1026	2 1/2	75,5	8,7	10	20	55,5	93,5	113	53	200,5	0,25 kg
QM/984	QM/1185	QM/878	1030	3	88,5	10,3	16	22	66,5	111	133,5	52	217,5	0,45 kg
QM/984	QM/1185	QM/878	1031	3	88,5	10,3	16	22	66,5	111	133,5	52	217,5	0,45 kg
QM/987	QM/1187	QM/887	1040	4	121	13,5	16	32	89	146	178	60	244	1,00 kg
QM/987	QM/1187	QM/887	1041	4	121	13,5	16	32	89	146	178	60	244	1,00 kg
QM/988	QM/1188	QM/886	1050	5	148	13,5	20	40	108	171,5	203	53 (56,5)*	261(264,5)*	1,50 kg
QM/988	QM/1188	QM/886	1051	5	148	13,5	20	40	108	171,5	203	53 (56,5)*	261(264,5)*	1,50 kg
QM/884/1	QM/1189	QM/884/2	1060	6	168,5	16,7	20	40	128,5	205	243	80	282,5	2,40 kg
QM/884/1	QM/1189	QM/884/2	1061	6	168,5	16,7	20	40	128,5	205	243	80	282,5	2,40 kg
QM/889/1	–	QM/883/2	1080	8	218,5	20	25	50	168,5	263,5	314,5	90,5	350	5,50 kg
QM/889/1	–	QM/883/2	1081	8	218,5	20	25	50	168,5	263,5	314,5	90,5	350	5,50 kg
QM/882/2	–	QM/882/2	1101	10	274,5	26,2	30	65	209,5	333,5	397	100	446,5	12,00 kg
QM/889/1	–	QM/889/2	1121	12	311	26,2	30	65	246	384	448	100	446,5	14,00 kg

* Values for M/1051

Foot mounting - C

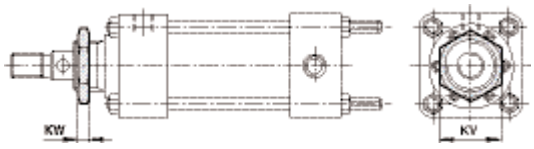


Stroke

MODELS	Ø inch	For cylinder	Ø AB	AH	AO	AT	AU	E	SA	TR	XA	Weight
QM/751	2	1020	13	43	11	5	19	63,5	160	–	196,5	0,20 kg
QM/748	2 1/2	1025	13	47	11	5	19	75,5	165	–	209,5	0,25 kg
QM/748	2 1/2	1026	13	47	11	5	19	75,5	165	–	209,5	0,25 kg
QM/747	3	1030	12	52,5	11	5	19	88,5	171	28,5	220,5	0,40 kg
QM/747	3	1031	12	52,5	11	5	19	88,5	171	28,5	220,5	0,40 kg
QM/746	4	1040	13,5	70	24,5	8	25,5	121	203	51	253,5	0,50 kg
QM/746	4	1041	13,5	70	24,5	8	25,5	121	203	51	253,5	0,50 kg
QM/981	5	1050	16,5	82,5	21,5	8	28,5	148	225	57	269,5 (273)*	1,00 kg
QM/981	5	1051	16,5	82,5	21,5	8	28,5	148	225	57	269,5 (273)*	1,00 kg
QM/826	6	1060	16,5	99,5	25	10	35	168,5	232	70	297,5	2,50 kg
QM/826	6	1061	16,5	99,5	25	10	35	168,5	232	70	297,5	2,50 kg
QM/745	8	1080	16,5	122	22	10	38	218,5	285	82,5	363	3,80 kg
QM/745	8	1081	16,5	122	22	10	38	218,5	285	82,5	363	3,80 kg
QM/744	10	1101	26	159	46	15	54	274,5	394	114,5	470,5	9,50 kg
QM/743	12	1121	26	177	46	15	54	311	394	139	470,5	11,50 kg

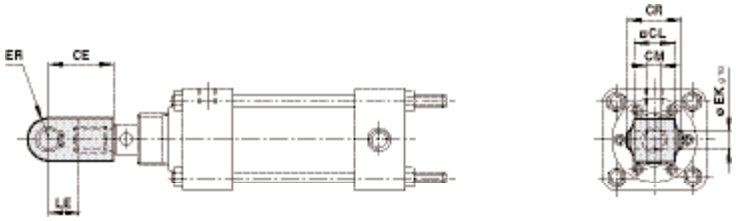
* Values for M/1051

Nose mounting - N



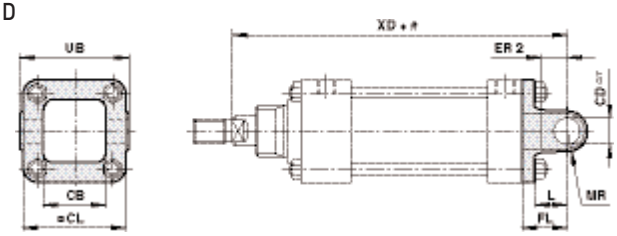
MODELS N	For cylinder	Ø inch	KV	KW	Weight
M/P9693/1	1020	2	56	8	0,06
M/P9693/2	1025	2 1/2	65,5	9,5	0,06
M/P9693/2	1026	2 1/2	65,5	9,5	0,06
M/P9693/2	1030	3	65,5	9,5	0,06
M/P9693/2	1031	3	65,5	9,5	0,06
M/P9693/4	1040	4	80	16	0,18
M/P9693/4	1041	4	80	16	0,18

Piston rod clevis - F



MODELS	For cylinder	Ø inch	CE	□CL	CM	CR	Ø EKg10	ER	LE	Weight
QM/407	1020	2	58,5	38	14	47	16	19	25,5	0,40 kg
QM/407	1025	2 1/2	58,5	38	14	47	16	19	25,5	0,40 kg
QM/408	1026	2 1/2	66,5	44,5	16	53	18	22	28,5	0,40 kg
QM/407	1030	3	58,5	38	14	47	16	19	25,5	0,40 kg
QM/408	1031	3	66,5	44,5	16	53	18	22	28,5	0,40 kg
QM/408	1040	4	66,5	44,5	16	53	18	22	28,5	0,90 kg
QM/409	1041	4	79,5	51	20	60	22	25	32	0,90 kg
QM/408	1050	5	66,5	44,5	16	53	18	22	28,5	0,90 kg
QM/410	1051	5	95,5	63,5	25	74	25	32	38	0,90 kg
QM/410	1060	6	95,5	63,5	25	74	25	32	38	1,70 kg
QM/411	1061	6	120,5	76	32	87	32	38	44,5	1,70 kg
QM/410	1080	8	95,5	63,5	25	74	25	32	38	1,70 kg
QM/411	1081	8	120,5	76	32	87	32	38	44,5	1,70 kg
QM/412	1101	10	146	89	38	99	38	45	51	7,00 kg
QM/412	1121	12	146	89	38	99	38	45	51	7,00 kg

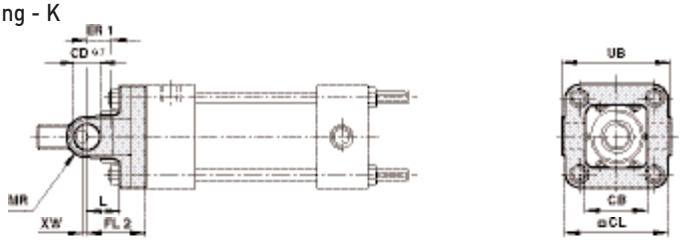
Rear clevis mounting - D



\# Stroke

MODELS	For cylinder	Ø inch	CB	Ø CD^{G7}	□CL	ER 1	FL	L	MR	UB	XD	Weight
M/P9822	1020	2	47,5	16	63,5	19	28,5	20,5	14	69,9	206	0,25 kg
M/P9825	1025	2 1/2	54	16	76	19	28,5	20,5	13	82,6	219	0,50 kg
M/P9825	1026	2 1/2	54	16	76	19	28,5	20,5	13	82,6	219	0,50 kg
M/P9828	1030	3	57	20	89	22	32	24	14	95,3	233,5	1 ,00 kg
M/P9828	1031	3	57	20	89	22	32	24	14	95,3	233,5	1 ,00 kg
QM/758/2	1040	4	70	22	114,5	36	57	38	19	122,5	285,5	1,25 kg
QM/758/2	1041	4	70	22	114,5	36	57	38	19	122,5	285,5	1,25 kg
QM/759/2	1050	5	92	25	139,5	31	70	44,5	24	152,5	311*	2,50 kg
QM/759/2	1051	5	92	25	139,5	31	70	44,5	24	152,5	311*	2,50 kg
QM/761/2	1060	6	106,5	32	166,5	34	76	49	29	181	338,5	3,50 kg
QM/761/2	1061	6	106,5	32	166,5	34	76	49	29	181	338,5	3,50 kg
QM/762/2	1080	8	122	38	217,5	38	85,5	57	38	237	411	7,00 kg
QM/762/2	1081	8	122	38	217,5	38	85,5	57	38	237	411	7,00 kg

Front clevis mounting - K



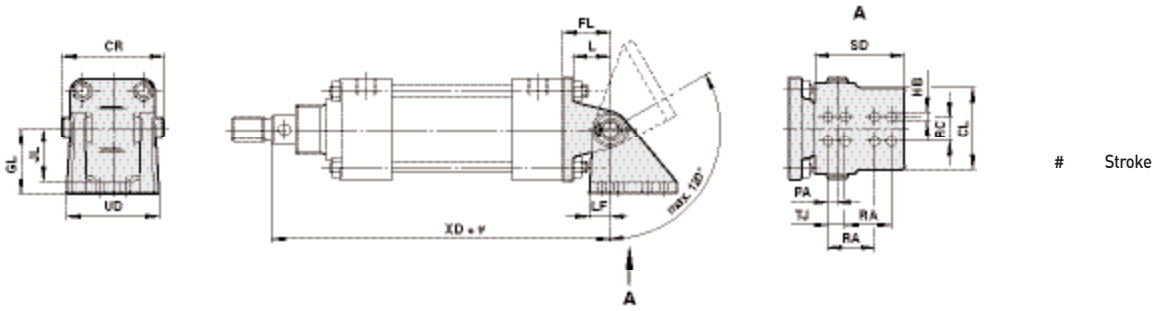
\# Stroke

MODELS	For cylinder	Ø inch	CB	Ø CD^{G7}	□CL	ER 1	FL 2	L	MR	UB	XW	Weight
QM/963	1020	2	47,5	16	63,5	19	38,5	20,5	14	69,9	17	0,25 kg
QM/965	1025	2 1/2	54	16	76	19	44,5	20,5	13	82,6	19	0,50 kg
QM/965	1026	2 1/2	54	16	76	19	44,5	20,5	13	82,6	19	0,50 kg
QM/967	1030	3	57	20	89	22	47	24	14	95,3	21,5	1 ,00 kg
QM/967	1031	3	57	20	89	22	47	24	14	95,3	21,5	1 ,00 kg
QM/758/1	1040	4	70	22	114,5	36	57	38	19	122,5	19	1,25 kg
QM/758/1	1041	4	70	22	114,5	36	57	38	19	122,5	19	1,25 kg
QM/759/1	1050	5	92	25	139,5	31	70	44,5	24	152,5	3	2,50 kg
QM/759/1	1051	5	92	25	139,5	31	70	44,5	24	152,5	3	2,50 kg
QM/761/1	1060	6	106,5	32	166,5	34	76	49	29	181	24	3,50 kg
QM/761/1	1061	6	106,5	32	166,5	34	76	49	29	181	24	3,50 kg
QM/762/1	1080	8	122	38	217,5	38	85,5	57	38	237	30,5	7,00 kg
QM/762/1	1081	8	122	38	217,5	38	85,5	57	38	237	30,5	7,00 kg

M/1000 Heavy duty cylinders

Double acting, Ø 2" ... 12"

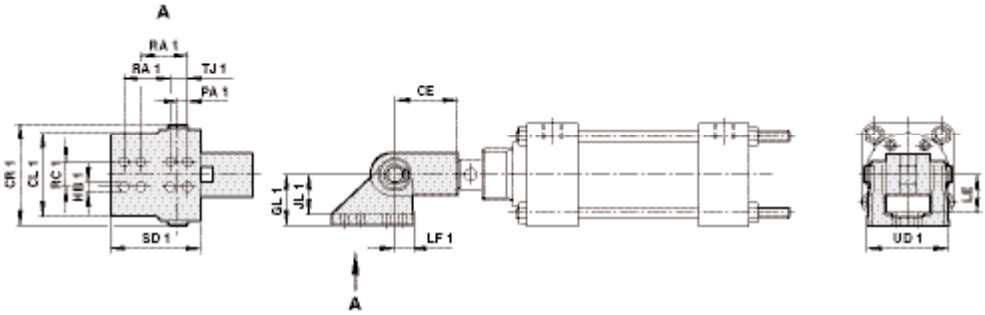
Rear hinge mounting - L



Stroke

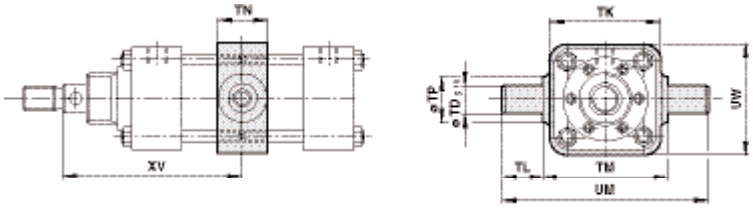
MODELS	For cylinder	Ø inch	CL	CR	FL	GL	Ø HB	JL	L	LF	PA	RA	RC	SD	TJ	UD	XD	Weight
QM/909	1020	2	60	73	35	47,5	8,3	39,5	25,5	15,5	6,5	47,5	19	66,5	–	68,5	212,5	1,20 kg
QM/910	1025	2 1/2	60	73	35	47,5	8,3	39,5	25,5	15,5	6,5	47,5	19	66,5	–	68,5	225,5	1,25 kg
QM/910	1026	2 1/2	60	73	35	47,5	8,3	39,5	25,5	15,5	6,5	47,5	19	66,5	–	68,5	225,5	1,25 kg
QM/911	1030	3	60	73	35	47,5	8,3	39,5	25,5	15,5	6,5	47,5	19	66,5	–	68,5	236,5	1,50 kg
QM/911	1031	3	60	73	35	47,5	8,3	39,5	25,5	15,5	6,5	47,5	19	66,5	–	68,5	236,5	1,50 kg
QM/912	1040	4	70	82,5	51	74,5	12	39,5	30	23,5	11	76	22	101,5	–	82,5	279	3,50 kg
QM/912	1041	4	70	82,5	51	74,5	12	39,5	30	23,5	11	76	22	101,5	–	82,5	279	3,50 kg
QM/913	1050	5	70	82,5	57	74,5	12	65	33,5	23,5	11	76	22	101,5	–	82,5	298	5,00 kg
QM/913	1051	5	70	82,5	57	74,5	12	65	33,5	23,5	11	76	22	101,5	–	82,5	301,5	5,00 kg
QM/914	1060	6	98,5	114,5	70	89	13,5	76	43	28	12,5	101,5	32	165	32	108	332	11,00 kg
QM/914	1061	6	98,5	114,5	70	89	13,5	76	43	28	12,5	101,5	32	165	32	108	332	11,00 kg
QM/915	1080	8	100	114,5	79,5	116	16,5	100	47,5	31,5	16	114,5	32	184	38	117,5	404,5	17,50 kg
QM/915	1081	8	100	114,5	79,5	116	16,5	100	47,5	31,5	16	114,5	32	184	38	117,5	404,5	17,50 kg
QM/917	1101	10	151	178	95,5	171,5	27	151	57	44,5	16	133,5	51	247,5	57	159	511,5	25,00 kg
QM/918	1121	12	151	178	95,5	171,5	27	151	57	44,5	16	133,5	51	247,5	57	159	511,5	30,00 kg

Rear hinge mounting - M



MODELS	For cylinder	Ø inch	CE	CL 1	CR 1	GL 1	Ø HB 1	JL 1	LE	LF 1	PA 1	RA 1	RC 1	SD 1	TJ 1	UD 1	Weight
QM/901	1020	2	58,5	60	73	47,5	8,5	39,5	35	16	6,5	47,5	19	67	–	68,5	1,00 kg
QM/901	1025	2 1/2	58,5	60	73	47,5	8,5	39,5	35	16	6,5	47,5	19	67	–	68,5	1,00 kg
QM/902	1026	2 1/2	66,5	70	82,5	74,5	12	65	57	24	11	76	22	102	–	82,5	1,00 kg
QM/901	1030	3	58,5	60	73	47,5	8,5	39,5	35	16	6,5	47,5	19	67	–	68,5	1,00 kg
QM/902	1031	3	66,5	70	82,5	74,5	12	65	57	24	11	76	22	102	–	82,5	1,00 kg
QM/902	1040	4	66,5	70	82,5	74,5	12	65	57	24	11	76	22	102	–	82,5	2,00 kg
QM/903	1041	4	79,5	79,5	92	89	10,3	79,5	79,5	28,5	16	89	22	114,5	–	79,5	2,00 kg
QM/902	1050	5	66,5	70	82,5	74,5	12	65	57	24	11	76	22	102	–	82,5	2,00 kg
QM/904	1051	5	95,5	98,5	114,5	89	13,5	76	55,5	28,5	12,5	102	32	165	32	108	2,00 kg
QM/904	1060	6	95,5	98,5	114,5	89	13,5	76	55,5	28,5	12,5	102	32	165	32	108	2,00 kg
QM/906	1061	6	120,5	114,5	132	116	13,5	103	103	35	16	121	38	159	–	114,5	6,00 kg
QM/904	1080	8	95,5	98,5	114,5	89	13,5	76	55,5	28,5	12,5	102	32	165	32	108	6,00 kg
QM/906	1081	8	120,5	114,5	132	116	13,5	103	103	35	16	121	38	159	–	114,5	6,00 kg
QM/921	1101	10	146	146	165	116	23	100	100	45	19	114,5	41	210	44,5	146	11,50 kg
QM/921	1121	12	146	146	165	116	23	100	100	45	19	114,5	41	210	44,5	146	11,50 kg

Centre trunnion - H

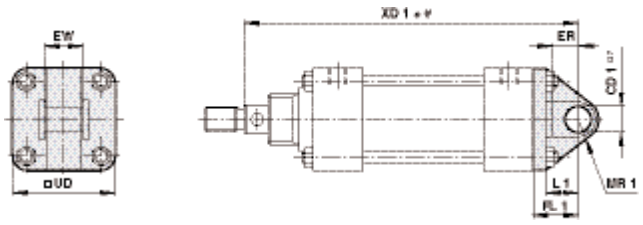


Stroke

MODELS	For cylinder	Ø inch	Ø TD$_{g10}$	TK	TL	TM	TN	Ø TP	UM	UW	XV min	XV max	Weight
M/P8635	1020	2	18	70	25,5	79,5	32	29	130	70	108,5	123	0,60 kg
M/P8636	1025	2 1/2	22	81	32	90,5	38	35	154	81	119	134,5	0,90 kg
M/P8636	1026	2 1/2	22	81	32	90,5	38	35	154	81	119	134,5	0,90 kg
M/P8637	1030	3	25	95	38	108	38	38	184	95	125	144,5	1,25 kg
M/P8637	1031	3	25	95	38	108	38	38	184	95	125	144,5	1,25 kg
M/P8638	1040	4	32	127	41,5	139,5	44,5	45	222,5	127	144,5	160	2,50 kg
M/P8638	1041	4	32	127	41,5	139,5	44,5	45	222,5	127	144,5	160	2,50 kg
M/P8639	1050	5	38	152,5	51	165	51	51	266,5	152,5	146,5	168	3,50 kg
M/P8639	1051	5	38	152,5	51	165	51	51	266,5	152,5	149,5	171	3,50 kg
M/P8640	1060	6	38	187,5	51	192	51	51	293,5	187,5	168,5	193,5	5,00 kg
M/P8640	1061	6	38	187,5	51	192	51	51	293,5	187,5	168,5	193,5	5,00 kg
M/P8645	1080	8	45	241,5	54	247,5	70	64	355,5	245	210,5	230,5	10,00 kg
M/P8645	1081	8	45	241,5	54	247,5	70	64	355,5	245	210,5	230,5	10,00 kg
M/P8667	1101	10	65	330	76	330	76	114,5	482,5	318	238	308	25,00 kg
M/P8670	1121	12	75	381	76	381	89	127	533,5	369	244,5	301,5	35,00 kg

Note: These mountings are only supplied assembled complete with the cylinder.
Unless otherwise specified, units will be supplied with dimension 'XV' plus half the stroke length.

Rear eye - R



Stroke

MODELS	For cylinder	Ø inch	Ø CD 1$_{G7}$	ER	EW	FL 1	L 1	MR 1	□UD	XD 1	Weight
M/P10349	1020	2	16	19	38,1	35	25,5	14	62	212,5	0,55 kg
M/P10351	1025	2 1/2	16	19	38,1	35	25,5	14	74	225,5	0,80 kg
M/P10351	1026	2 1/2	16	19	38,1	35	25,5	14	74	225,5	0,80 kg
M/P10353	1030	3	16	19	38,1	35	25,5	16	87,5	236,5	0,90 kg
M/P10353	1031	3	16	19	38,1	35	25,5	16	87,5	236,5	0,90 kg
QM/763	1040	4	18	25,5	44,5	51	30	21	112	279	2,60 kg
QM/763	1041	4	18	25,5	44,5	51	30	21	112	279	2,60 kg
QM/764	1050	5	18	28,5	44,5	57	33,5	21	138	298*	3,60 kg
QM/764	1051	5	18	28,5	44,5	57	33,5	21	138	298*	3,60 kg
QM/765	1060	6	25	28,5	63,5	70	43	25,5	165	332	6,20 kg
QM/765	1061	6	25	28,5	63,5	70	43	25,5	165	332	6,20 kg
QM/766	1080	8	25	32	63,5	79,5	47,5	25,5	217,5	404,5	11,50 kg
QM/766	1081	8	25	32	63,5	79,5	47,5	25,5	217,5	404,5	11,50 kg
QM/767	1101	10	38	44,5	101,6	95,5	57,5	41	268,5	511,5	12,60 kg
QM/768	1121	12	38	44,5	101,6	95,5	57,5	41	319	511,5	17,30 kg

M/55900 Air/oil pressure converter

Converter volume 0,25 ... 5 dm^3

- **Basic module to convert pneumatic pressure into hydraulic pressure**
- **Simple to install**
- **Corrosion resistant construction**
- **Integrated oil level indicator**

TECHNICAL DATA

Medium:
Compressed air: Filtered, lubricated or non-lubricated
Oil filling: Mineralic hydraulic oils ISO VG 32 or ISO VG 46 according to DIN 51524

Installation position:
Only vertical, oil port below

Operating pressure:
10 bar max.

Operating temperature:
-20°C ... +60°C
Consult our Technical Service for use below +2°C

MATERIALS

Barrel: Anodised aluminium alloy
End covers: Anodised aluminium alloy
Baffle plates: Anodised aluminium alloy
Fittings: Brass
Screws and nuts: Zinc plated steel
Oil level indicator: PA-tube
Seals: Nitrile rubber

STANDARD MODELS

	Volumes (dm^3)	Port size	MODELS	ACCESSORIES Straight fitting (Tube diameter in bold)	Elbow fitting	Service kit	Mountings A	C
								
	0,25	G1/2	**M/55903**	4312510**48**	4314510**48**	QM/55901/00	QM/8032/35	QA/8040/21
	0,50	G1/2	**M/55905**	4312510**48**	4314510**48**	QM/55901/00	QM/8032/35	QA/8040/21
	0,75	G1/2	**M/55908**	4312510**48**	4314510**48**	QM/55901/00	QM/8032/35	QA/8040/21
	1,00	G1/2	**M/55910**	4312510**48**	4314510**48**	QM/55901/00	QM/8032/35	QA/8040/21
	1,50	G1/2	**M/55915**	4312514**48**	4314514**48**	QM/55901/00	QM/8032/35	QA/8040/21
	2,00	G1/2	**M/55920**	4312514**48**	4314514**48**	QM/55901/00	QM/8032/35	QA/8040/21
	3,00	G1/2	**M/55930**	4312514**48**	4314514**48**	QM/55902/00	QM/8050/35	QA/8063/21
	4,00	G1/2	**M/55940**	4312514**48**	4314514**48**	QM/55902/00	QM/8050/35	QA/8063/21
	5,00	G1/2	**M/55950**	4312514**48**	4314514**48**	QM/55902/00	QM/8050/35	QA/8063/21

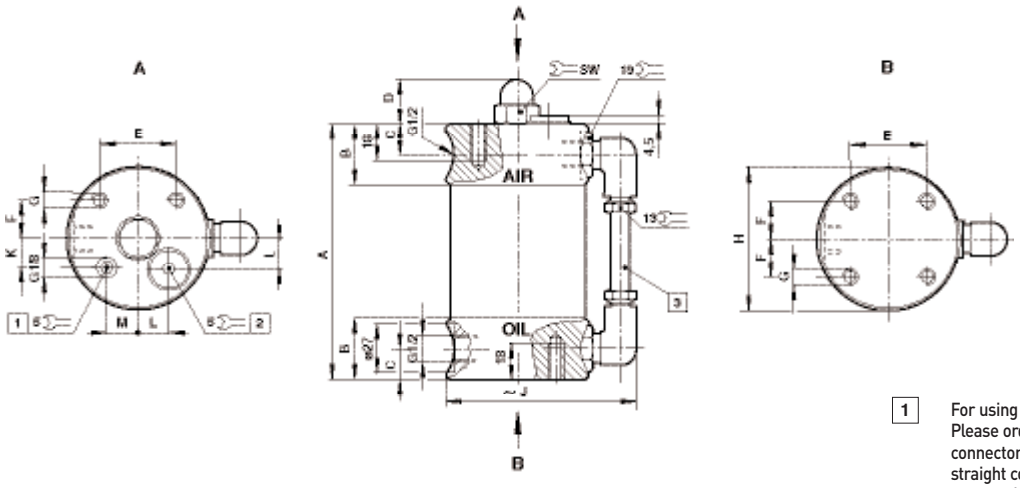
Note: To calculate the volume of the pressure converter 50% must be added to the volume of the cylinder

For further information

www.norgren.com/info/en1-244

BASIC DIMENSIONS

M/55900 – Air/oil pressure converter



1 For using gauge:
Please order gauge, nippled connector (150201818) and straight connector (160221818) separately.

2 Oil filling plug

3 Oil level indicator

MODELS	A	B	C	D	E	F	G	Ø H	J	K	L	M	SW	Weights
M/55903	150	30	15	23	38	19	M 6	69	95	17	16	13	19	1,10 kg
M/55905	232	30	15	23	38	19	M 6	69	95	17	16	13	19	1,28 kg
M/55908	315	30	15	23	38	19	M 6	69	95	17	16	13	19	1,46 kg
M/55910	400	30	15	23	38	19	M 6	69	95	17	16	13	19	1,64 kg
M/55915	564	30	15	23	38	19	M 6	69	95	17	16	13	19	2,00 kg
M/55920	730	30	15	23	38	19	M 6	69	95	17	16	13	19	2,36 kg
M/55930	472	35	17,5	35	56,5	32,5	M 8	108	135	25	25	25	30	4,36 kg
M/55940	604	35	17,5	35	56,5	32,5	M 8	108	135	25	25	25	30	5,04 kg
M/55950	736	35	17,5	35	56,5	32,5	M 8	108	135	25	25	25	30	5,72 kg

PM/31000 Compact air bellows

Single acting - Ø 2 3/4 ... 12 inch

Frictionless operation

No maintenance or lubrication

Ideal for short stroke, high-force applications

High vibration isolation level

Easy, compact installation

Important instructions:

The design of these air bellows allows an operation at an angle of 5° ... 25°. The top and bottom plate can be out of alignment, depending on the height of the air bellow and the number of convolutions.

To avoid damage mechanical stops at **both** end positions have to be used. To return Air Bellows to their minimum height an external return force must be used. The thrust depends directly on the height of the air bellow: When height increases – the thrust decreases. As the outside diameter varies in operation there must be enough clearance around the air bellow.

TECHNICAL DATA

Medium:

Compressed air, non-lubricated

Operating pressure:

8 bar maximum

Operating temperature:

-40°C ... +70°C for PM/31000

-25°C ... +90°C for TPM/31000

-20°C ... +115°C for EPM/31000

Consult our Technical Service for use below +2°C

MATERIALS

End plates: plastic Ø 2 3/4, 6 inch, aluminium Ø 4 inch; steel, chromated Ø 8, 9 1/4, 12 inch

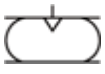
Central ring: plastic, aluminium or steel, chromated

Bellow: PM/31000: fabric reinforced NR-, SBR-,

BR-compound rubber

STANDARD MODELS

Nominal Ø (inch) x convolutions	Maximum stroke (mm)	Port size	MODELS Standard	Butyl	Epichlore
2 3/4 x 1	20	G1/4	**PM/31021**	**TPM/31021**	**EPM/31021**
2 3/4 x 2	45	G1/4	**PM/31022**	**TPM/31022**	**EPM/31022**
2 3/4 x 3	65	G1/4	**PM/31023**	**TPM/31023**	**EPM/31023**
4 1/2 x 1	40	G3/8	**PM/31041**	**TPM/31041**	**EPM/31041**
4 1/2 x 2	80	G3/8	**PM/31042**	**TPM/31042**	**EPM/31042**
6 x 1	55	G1/2	**PM/31061**	**TPM/31061**	**EPM/31061**
6 x 2	115	G1/2	**PM/31062**	**TPM/31062**	**EPM/31062**
8 x 1	95	G3/4	**PM/31081**	**TPM/31081**	**EPM/31081**
8 x 2	185	G3/4	**PM/31082**	**TPM/31082**	**EPM/31082**
9 1/2 x 1	105	G3/4	**PM/31091**	**TPM/31091**	**EPM/31091**
9 1/2 x 2	230	G3/4	**PM/31092**	**TPM/31092**	**EPM/31092**
12 x 1	105	G3/4	**PM/31121**	**TPM/31121**	**EPM/31121**
12 x 2	215	G3/4	**PM/31122**	**TPM/31122**	**EPM/31122**



Safety note: These actuators must not be pressurised when unrestrained.
For exact calculation for compact air bellows please contact our Technical Service.

OPTIONS SELECTOR

★PM/31★★★

Air bellow materials	Substitute
NR-, SBR-, BR-Materials	**None**
High temperature (Butyl)	**T**
Extreme temperature (Epichlore)	**E**

Number of convolutions	Substitute
1	**1**
2	**2**
3	**3**

Nominal diameters (inches)	Substitute
2 3/4	**02**
4 1/2	**04**
6	**06**
8	**08**
9 1/4	**09**
12	**12**

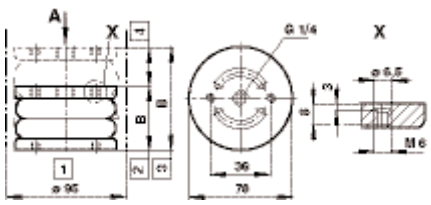
Note: If option is not required, disregard option position within part number e.g. PM/31023. For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants. Additional variants/options are not possible.
Information about variants see data sheet.

For further information

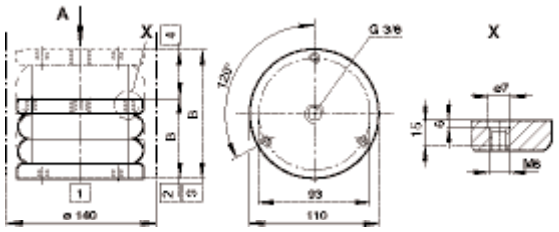
www.norgren.com/info/en1-246

BASIC DIMENSIONS

PM/31021, PM/31022, PM/31023



PM/31041, PM/31042



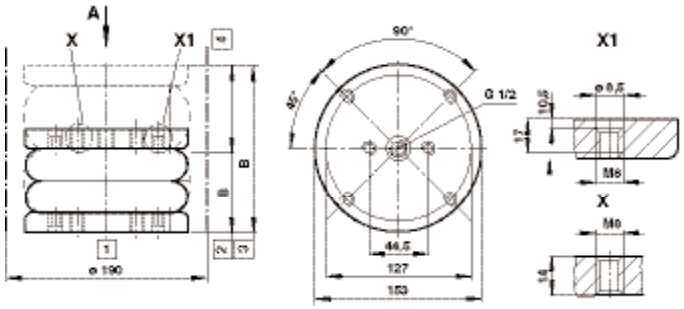
1 Installation diameter min.
2 Installation height min.
3 Installation height max.
4 Stroke

Table 1.1

MODELS	Nominal diameter (inch) x convolutions	Stroke (mm)	Installation height B min. (mm)	Installation height B max. (mm)	Weight (kg)
PM/31021	2 3/4 x 1	20	50	70	0,22
PM/31022	2 3/4 x 2	45	65	110	0,26
PM/31023	2 3/4 x 3	60	80	140	0,30
PM/31041	4 1/2 x 1	40	50	90	0,75
PM/31042	4 1/2 x 2	85	65	150	0,95
PM/31043	4 1/2 x 3	100	100	200	1,20

BASIC DIMENSIONS

PM/31061
to PM/31063



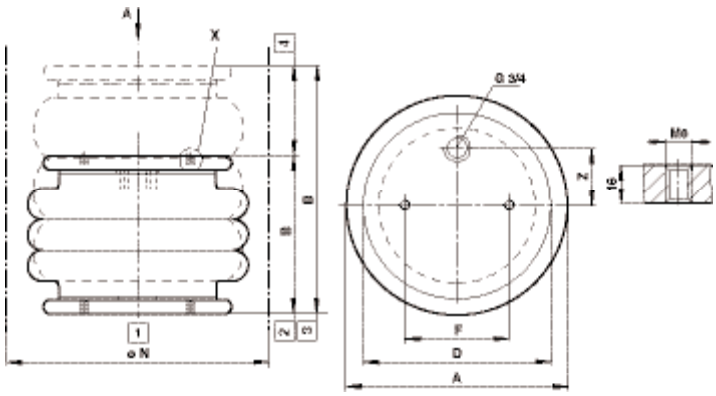
1 Installation diameter min.
2 Installation height min.
3 Installation height max.
4 Stroke

Table 1.2

MODELS	Nominal diameter (inch) x convolutions	Stroke (mm)	Installation height B min. (mm)	Installation height B max. (mm)	Weight (kg)
PM/31061	6 x 1	55	55	110	0,95
PM/31062	6 x 2	115	80	195	1,30
PM/31063	6 x 3	190	100	290	1,63

BASIC DIMENSIONS

PM/31081
to PM/31123



1 Installation diameter min.
2 Installation height min.
3 Installation height max.
4 Stroke

Table 1.3

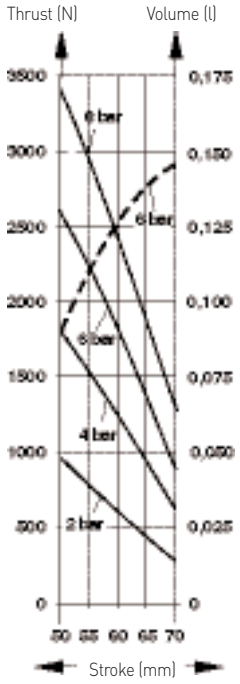
MODELS	Nominal diameter (inch) x air bellows	(mm)	Stroke B min. (mm)	Installation height B max. (mm)	Ø A	Ø D	Ø F	Ø N	Z	Weight (kg)
PM/31081	8 x 1	95	60	155	225	135	70	240	0	1,80
PM/31082	8 x 2	185	80	265	220	135	70	240	0	2,50
PM/31091	9 1/4 x 1	105	55	160	255	160	89	275	38,1	2,30
PM/31092	9 1/4 x 2	220	80	300	255	160	89	275	38,1	2,80
PM/31121	12 x 1	105	60	165	335	228	157,5	360	73	3,90
PM/31122	12 x 2	215	85	300	325	228	157,5	350	73	5,30
PM/31123	12 x 3	345	120	465	325	228	157,5	350	73	7,00

PM/31000 Compact air bellows

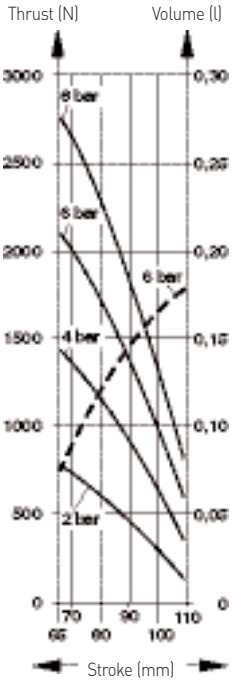
Single acting - Ø 2 3/4 ... 12 inch

Thrust (at 2, 4, 6, 8 bar), volume (at 6 bar)

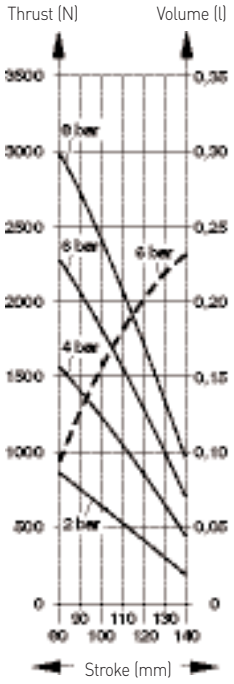
PM/31021



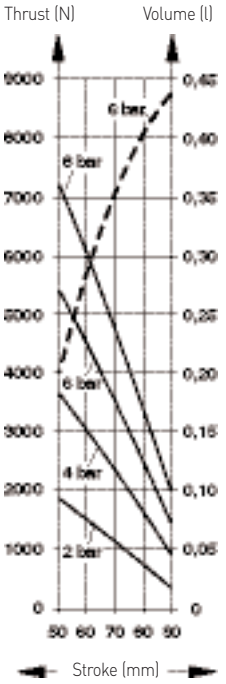
PM/31022



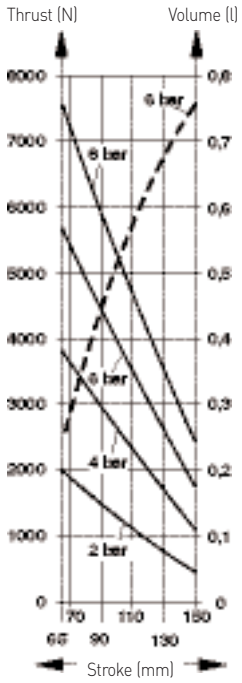
PM/31023



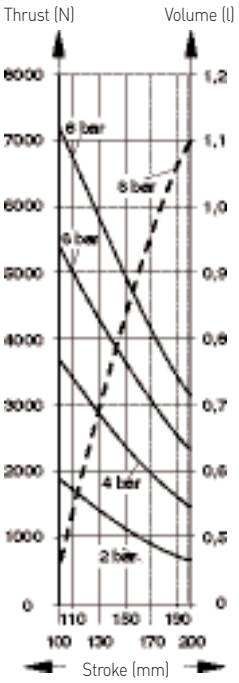
PM/31041



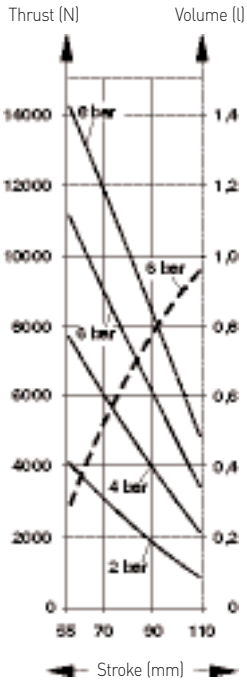
PM/31042



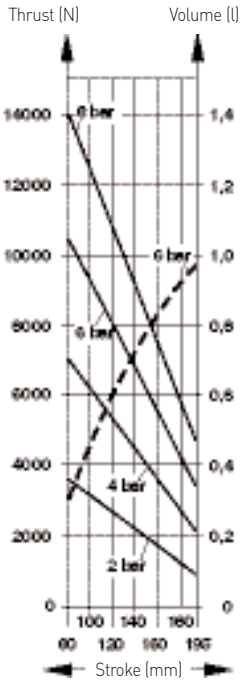
PM/31043



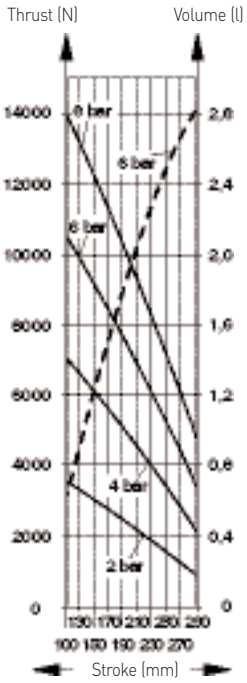
PM/31061



PM/31062



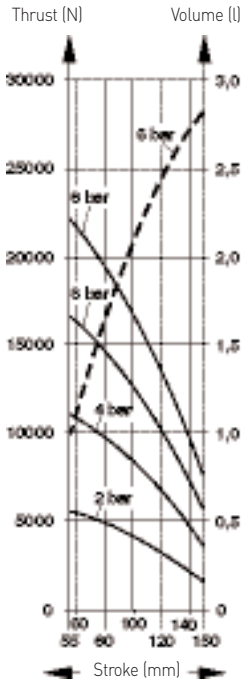
PM/31063



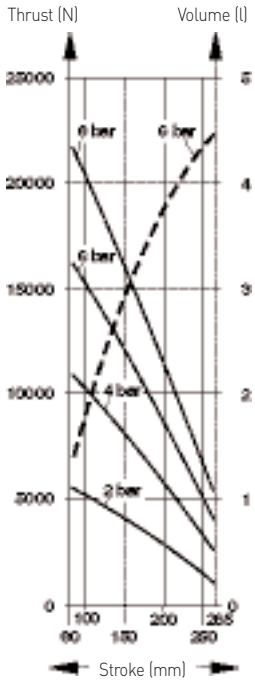
-- Thrust (N) – – Volume (l)

Thrust (at 2, 4, 6, 8 bar), volume (at 6 bar)

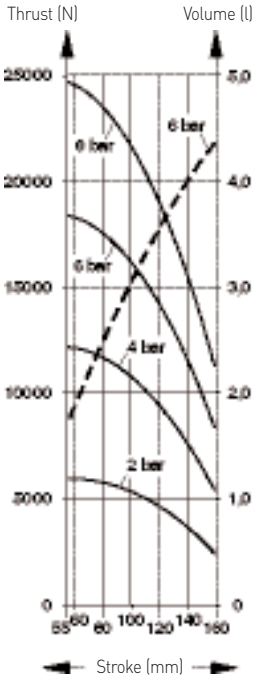
PM/31081



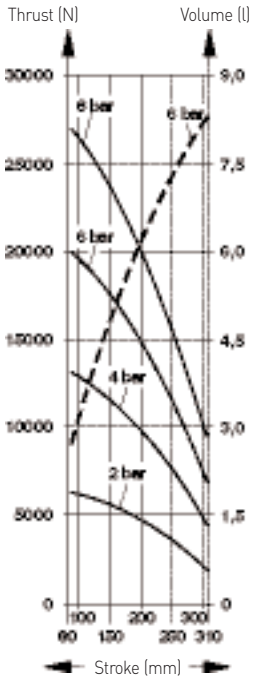
PM/31082



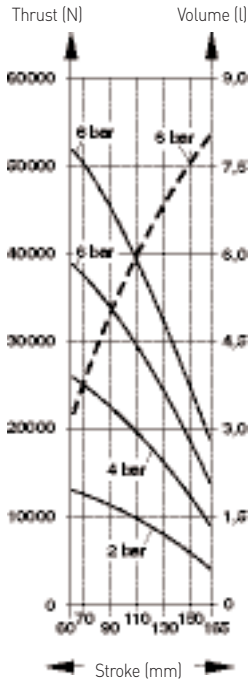
PM/31091



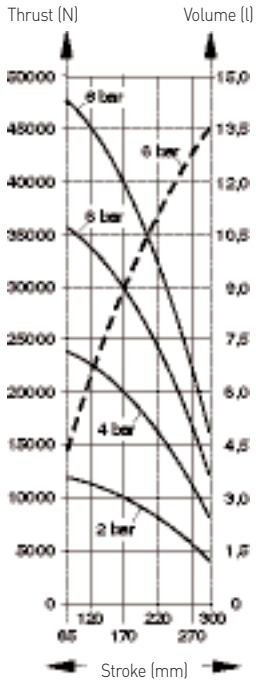
PM/31092



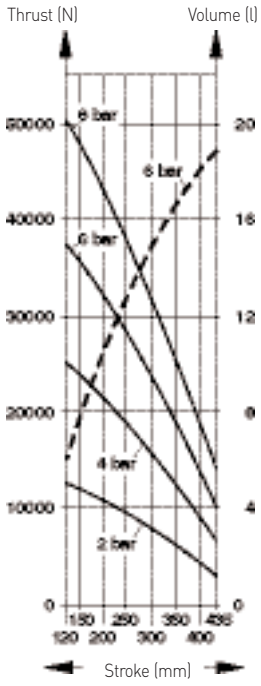
PM/31121



PM/31122



PM/31123



–– Thrust (N) – – Volume (l)

PM/31000 Compact air bellows

Single acting - Ø 2 3/4 ... 12 inch

CALCULATION OF COMPACT AIR BELLOWS USED AS ACTUATORS

Datasheet

a) Total weight to be lifted: F = (_____ kg) • 10 m/s^2 = _____ N
b) Number of air bellows: n = _____
c) Thrust per air bellow: f = $\frac{F}{n}$ = _____ N
d) Operating pressure: P = _____ bar
e) Required stroke: S = _____ mm
f) Vertical space: Xv = _____ mm
g) Horzontal space: Xh = _____ mm
h) Operating temperature: T = _____ °C
i) Operation angle: α = _____ °
j) Out of alignment: A = _____ mm
k) Chemical resistance: _____

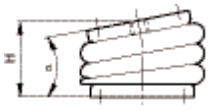
Important instructions

Thrust: The thrust depends on the height of the bellow. When height increases – the thrust decreases.
Stops: To avoid damage when the bellow is compressed or extended mechanical stops at both end positions have to be used.
Clearance: There must be enough clearance around the Air Bellow.

TABLE 2: THRUST, INSTALLATION HEIGHT, RETRACTING FORCE

MODELS	Nominal Ø (inch) x convolutions	Stroke (mm)	Installation height B min. (mm)	Thrust at 6 bar (N)	Retracting force to reach min. height (N)	Installation height B max. (mm)	Thrust at 6 bar (N)
PM/31021	2 3/4 x 1	20	50	2600	200	70	920
PM/31022	2 3/4 x 2	45	65	2130	310	110	540
PM/31023	2 3/4 x 3	60	80	23000	300	140	700
PM/31041	4 1/2 x 1	40	50	5500	120	90	1400
PM/31042	4 1/2 x 2	85	65	5750	240	150	1700
PM/31043	4 1/2 x 3	100	100	5350	220	200	2300
PM/31061	6 x 1	55	55	11400	200	110	3330
PM/31062	6 x 2	115	80	10600	220	195	3400
PM/31063	6 x 3	190	100	10550	250	290	2950
PM/31081	8 x 1	95	60	16300	60	155	4600
PM/31082	8 x 2	185	80	16500	110	265	3950
PM/31091	9 1/4 x 1	105	55	19600	150	160	8250
PM/31092	9 1/4 x 2	220	80	20150	170	300	4900
PM/31121	12 x 1	105	60	39000	50	165	13850
PM/31122	12 x 2	215	85	35800	100	300	11750
PM/31123	12 x 3	345	120	38100	140	465	6600

Operation angle



Out of alignment

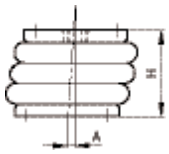


TABLE 3

MODELS	Nominal Ø (inches) x Convolutions	Height H (mm) at α = 5°	α = 10°	α = 15°	α = 20°	α = 25°
PM/31021	2 3/4 x 1	–	–	–	–	–
PM/31022	2 3/4 x 2	75 – 100	80 – 95	–	–	–
PM/31023	2 3/4 x 3	90 – 120	95 – 110	–	–	–
PM/31041	4 1/2 x 1	60 – 75	–	–	–	–
PM/31042	4 1/2 x 2	75 – 130	80 – 125	90 – 120	100 – 115	–
PM/31043	4 1/2 x 3	120 – 170	135 – 160	–	–	–
PM/31061	6 x 1	65 – 90	70 – 85	–	–	–
PM/31062	6 x 2	–	95 – 160	100 – 155	110 – 150	115 – 140
PM/31063	6 x 3	145 – 245	165 – 225	–	–	–
PM/31081	8 x 1	85 – 130	100 – 125	–	–	–
PM/31082	8 x 2	130 – 250	175 – 245	180 – 240	185 – 230	–
PM/31091	9 1/4 x 1	75 – 140	100 – 130	–	–	–
PM/31092	9 1/4 x 2	145 – 270	160 – 265	190 – 255	210 – 240	–
PM/31121	12 x 1	90 – 140	115 – 135	–	–	–
PM/31122	12 x 2	140 – 285	155 – 275	160 – 265	170 – 260	–
PM/31123	12 x 3	200 – 400	300 – 375	310 – 350	–	–

MODELS	Height H (mm) at A = 5 mm	A = 10 mm	A = 20 mm	A = 30 mm	A = 40 mm	A = 50 mm
PM/31021	–	–	–	–	–	–
PM/31022	80 – 100	85 – 95	–	–	–	–
PM/31023	90 – 125	100-115	–	–	–	–
PM/31041	60 – 80	–	–	–	–	–
PM/31042	85 – 135	95 – 130	–	–	–	–
PM/31043	110 – 170	120 – 160	–	–	–	–
PM/31061	–	75 – 85	–	–	–	–
PM/31062	–	115 – 170	130 – 160	–	–	–
PM/31063	120 – 255	125 – 245	130 – 235	–	–	–
PM/31081	–	95 – 140	110 – 135	–	–	–
PM/31082	–	130 – 250	160 – 240	170 – 235	180 – 230	–
PM/31091	–	70 – 150	115 – 145	–	–	–
PM/31092	–	150 – 270	165 – 265	180 – 260	190 – 250	–
PM/31121	–	100 – 155	115 – 150	120 – 140	–	–
PM/31122	–	135 – 280	160 – 270	180 – 265	190 – 260	–
PM/31123	–	170 – 3854	200 – 365	220 – 355	230 – 350	235 – 345

SELECTING COMPACT AIR BELLOWS

Example: used as actuators

A 1000 kg conveyor carrying a 550 kg pallet needs to be lifted by 80 mm (stroke) in order to transfer the pallet to another level. Four (4) air bellows should be used. The available operating pressure is 5 bar. The operating temperature is 60°C. There is a 270 mm square space to house each air bellow. Compression and extension stops are provided. The air bellows have to be mounted between in a space which are 85 mm apart. During the lifting operation the conveyor may tilt in the second half of the stroke by a max. of 9°.

Step 1: Fill in and complete the datasheet

a) Total weight to be lifted:
b) Number of air bellows:
c) Thrust per air bellow:

d) Operating pressure:
e) Required stroke:
f) Vertical space:
g) Horzontal space:
h) Operating temperature:
i) Operation angle:
j) Out of alignment:
k) Chemical resistance:

F = (1000 kg + 550 kg) • 10 m/s^2 = 15500 N
n = 4
f = $\frac{15500\ N}{4}$ = 3875 N
P = 5 bar
S = 80 mm
Xv = 85 mm
Xh = 270 mm
T = 60°C
a = 9°
A = 0 mm
normal environment

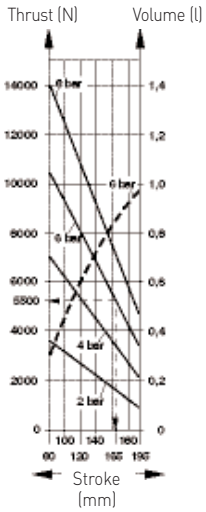
Step 2: From table 1.1. and 1.3. (page 2 + 3) air bellows have to be selected, that have a min. 80 mm stroke and clearance around the air bellows smaller than Xh = 270 mm. We select: PM/31042, PM/31062, PM/31081 and M/31082

Step 3: Calculate the total height at which the air bellow should be used, see step 1:

Vertical space	Xv	85 mm
Stroke	S	80 mm
Total height		165 mm

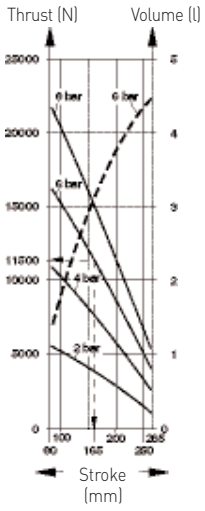
By refering to the total height of 165 mm and the vertical space of 85 mm, only PM/31062 (installation height 80 ... 195 mm) and PM/31082 (installation height 80 ... 265 mm) can be used from table 1.1 ... 1.3 (datasheet 2 and 3)

Step 4: Check the thrust at 6 bar at a height of 165 mm.
From the charts in the datasheet 4 and 5 we can see that:



PM/31062 will provide 5500 N at 6 bar. To get the figure for 5 bar, we have to calculate:

$\frac{55060\ N \bullet 5}{6}$ = 4580 N at 5 bar



PM/31082 will provide 11500 N at 6 bar. To get the figure for 5 bar, we have to calculate:

$\frac{115060\ N \bullet 5}{6}$ = 9200 N at 5 bar

Result:
Both air bellows can provide the required thrust of 3875 N.

Step 5: Check the angle acceptance when the air bellow can tilt during the second half of the stroke between 125 and 165 mm by approx. 10° from table 3 (page 6). At 9° we are well within the limits.

i) PM/31062 can sustain an angle of 9° between 70 and 85 mm
i) PM/31082 can sustain an angle of 9° between 140 and 220 mm
Only PM/31082 can be used in this application,
PM/31062 will not accept 9° at 165 mm.

Step 6: Check all remaining parameters

h) At 60°C Standard rubber material (-40 ... +70°C) can be used
j) No horizontal miss-alignmenta
k) No special chemical resistance is required

Result: PM/31082 is the chosen compact air bellow, because it meets all requirements.

PM/31000 Compact air bellows

Single acting - Ø 2 3/4 ... 12 inch

CALCULATION OF COMPACT AIR BELLOWS USED AS VIBRATION ISOLATORS

Datasheet

a) Total weight to be isolated: F = (_____ kg) • 10 m/s^2 = _____ N

b) Number of air bellows: n = _____

c) Thrust per air bellow: f = $\frac{F}{n}$ = _____ N

d) Operating pressure: P = _____ bar

f) Vertical space: Xv = _____ mm

g) Horizontal space: Xh = _____ mm

h) Operating temperature: T = _____ °C

k) Chemical resistance: normal environment

m) Isolation rate: I = _____ %

o) Airspring natural frequency: fn = _____ Hz

p) Excitation frequency: fe = _____ Hz

Important instructions

Air Bellows with two convolutions will provide better isolation because of the greater volume of air in comparison to air belows with one convolution. Air bellows used for vibration isolation should be operated at a «vibration height».

This height is the result of tests and represents the optimum height where the air bellow gives the best performance.

The airspring natural frequency (fn) remains nearly constant at the «vibration height». An increase of the height will result in less isolation, a lower height may influence the horizontal (lateral) stability. The optimum pressure for vibration isolation is from 4 ... 6 bar (60 ... 90 psi). The lower the airspring natural frequency (fn) of an Air Bellow the better the vibration isolation. The lateral stability of air bellows decreases with the number of convolutions. It is important to note:

air bellows with three convolutions should not be used without consulting Norgren. Ideally air bellows should be located at the same horizontal plane (at the same height) as the centre of gravity of the machine in order to be vibration isolated.

For the purpose of calculation the following assumptions have been made:

1. Vibrations are all vertical

2. The excitation frequency (fe) varies along a sine curve

3. The object and its base are rigid

TABLE 4:
PRESSURE, VIBRATION HEIGHT, THRUST, VOLUME, STIFFNESS, AIRSPRING NATURAL FREQUENCY, ISOLATION RATE

MODELS	Nominal Ø (inch) x convolutions	Pressure (bar)	Vibration height (mm)	Thrust (N)	Volume (l)	Stiffness (N/cm)	Airspring natural frequency fn (Hz)	Isolation rate I (%) at 10 Hz and 6 bar
PM/31021	2 3/4 x 1	4	62	1050	0,122	961	4,79	70,3
		6	62	1550	0,130	1337	4,60	73,1
PM/31022	2 3/4 x 2	4	90	900	0,140	525	3,76	83,6
		6	90	1400	0,145	725	3,60	85,1
PM/31041	4 1/2 x 1	4	72	2200	0,340	1318	3,87	82,4
		6	72	3350	0,365	1849	3,73	84,0
PM/31042	4 1/2 x 2	4	130	1700	0,655	495	2,71	92,1
		6	130	2600	0,683	714	2,62	92,6
PM/31043	4 1/2 x 3	4	195	1500	1,010	255	2,04	95,7
		6	195	2400	1,080	368	1,96	96,0
PM/31061	6 x 1	4	90	3950	0,750	1919	3,47	86,3
		6	90	6100	0,8780	2722	3,33	87,5
PM/31062	6 x 2	4	160	3650	1,610	794	2,33	94,3
		6	160	5600	1,660	1140	2,25	94,7
PM/31063	6 x 3	4	225	3600	2,300	527	1,91	96,2
		6	225	5450	2,420	755	1,85	96,5
PM/31081	8 x 1	4	115	7150	2,300	1857	2,54	93,1
		6	115	10800	2,360	2653	2,47	93,5
PM/31082	8 x 2	4	200	5800	3,700	873	1,93	96,1
		6	200	8750	3,760	1251	1,89	96,3
PM/31091	9 1/4 x 1	4	115	9850	3,300	2007	2,25	94,7
		6	115	6700	3,430	2814	2,17	95,0
PM/31092	9 1/4 x 2	4	215	8800	6,300	784	1,71	97,0
		6	215	13400	6,520	1206	1,65	97,2
PM/31121	12 x 1	4	125	17050	6,500	3700	2,32	94,3
		6	125	25750	6,640	5300	2,26	94,6
PM/31122	12 x 2	4	220	16250	10,68	1940	1,72	96,9
		6	220	24400	11,04	2760	1,68	97,1

Values for air bellows with three convolutions are not given as they cannot be used as vibration isolators.

Example for selecting compact air bellows used as vibration isolators

A hydraulic power unit with an excitation frequency (fe) between 1200 and 3000 cycles/min (= 20 Hz – 50 Hz) must be vibration isolated. The total weight of the power unit is 6000 kg. The supporting area under the unit is 1,2 m x 0,8 m.

The operating temperature is 50°C. The space for the installation is 220 mm high. Four air bellows will be used. The max. operating pressure is 6 bar. A minimum of 97% vibration isolation has to be reached.

Step 1: Fill in and complete the datasheet

a)	Total weight to be isolated:	F	=	6000 kg • 10 m/s^2 = 60000 N
b)	Number of air bellows:	n	=	4
c)	Thrust per air bellow:	f	=	$\frac{60000\ N}{4}$ = 15000 N
d)	Operating pressure:	P	=	6 bar
f)	Vertical space:	Xv	=	250 mm
g)	Horizontal space:	Xh	=	400 mm
h)	Operating temperature:	T	=	50°C
k)	Chemical resistance:			normal environment
m)	Isolation rate:	I	=	97%
o)	Airspring natural frequency:	fn	=	Hz
p)	Excitation frequency:	fe	=	min. 20 Hz, max. 50 Hz

Two types of air bellows are chosen. Each one has to carry 15000 N at the vibration height. From table 4 (page 8) we select:

1. PM/31121 – 25750 N at 6 bar – 2,26 Hz airspring natural frequency (fn)
2. PM/31122 – 24400 N at 6 bar – 1,68 Hz airspring natural frequency (fn)

Step 2:
Take the air bellow with the lowest airspring natural frequency fn = 1,68 Hz in order to get the highest isolation rate refering to fe min. = 20 Hz. Air Bellow PM/31122 is chosen.

Step 3:
Calculate the isolation rate (I) of the PM/31122 by using the formula:

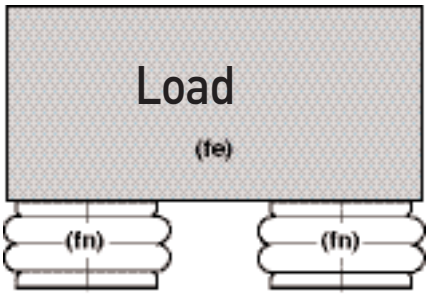
Formula:

$$I = 1 - \frac{1}{\left(\frac{fe}{fn}\right)^2 - 1}$$

Example:

$$I = 1 - \frac{1}{\left(\frac{20}{1,68}\right)^2 - 1} = 1 - \frac{1}{140,72} = 0,993$$

I = 99,3%



fe = Excitation frequency of load
fn = Airspring natural frequency

Step 4:
Check all remaining parameters

e) The installation height of the air bellow PM/31122 is between B min.= 85 mm and B max.= 300 mm (table 1). The vertical space for installation is 220 mm.
The 'vibration height' at which the air bellows operates best is 220 mm (table 4).

f) The clearance around the air bellows. The horizontal space for installation is 400 mm for each air bellows.
The clearance around the air bellow is 350 mm (table 1.3).

h) At 50°C Standard rubber material (-40 ... +70°C) can be used.

g) No special chemical resistance is required.

i) Isolation rate at 10 Hz and 6 bar is 97,1% (table 4). At 20 Hz and 6 bar I= 99,3% is reached.

Result: 4 x PM/31122 compact air bellows are chosen. They will provide 99,3% vibration isolation.

M/31000 Serviceable air bellows

Single acting - Ø 6 ... 26 inch

Frictionless operation

No maintenance or lubrication

Ideal for short stroke, high-force applications

High vibration isolation level

Simple to install

Important instructions:

The design of these air bellows allows an operation at an angle of 5° ... 25°. The top and bottom plate can be out of alignment, depending on the height of the air bellow and the number of convolutions.

To avoid damage mechanical stops at **both** end positions have to be used. To return Air Bellows to their minimum height an external return force must be used. The thrust depends directly on the height of the air bellow: When height increases – the thrust decreases. As the outside diameter varies in operation there must be enough clearance around the air bellow.

TECHNICAL DATA

Medium:

Compressed air, non-lubricated

Operating pressure:

8 bar maximum

Operating temperature:

-40°C ... +70°C for M/31000

-25°C ... +90°C for TM/31000

-20°C ... +115°C for EM/31000

Consult our Technical Service for use below +2°C

MATERIALS

End plates: steel, chromated

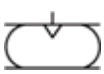
Studs: steel, chromated

Central ring: aluminium or steel, chromated

Bellow: M/31000: fabric reinforced NR-, SBR-, BR-compound rubber

STANDARD MODELS

Nominal Ø (inch) x convolutions	Maximum stroke (mm)	Port size	MODELS Standard	Butyl	Epichlore
6 x 1	55	G1/2	**M/31061**	**TM/31061**	**EM/31061**
6 x 2	115	G1/2	**M/31062**	**TM/31062**	**EM/31062**
8 x 1	80	G1/2	**M/31081**	**TM/31081**	**EM/31081**
8 x 2	175	G1/2	**M/31082**	**TM/31082**	**EM/31082**
10 x 1	100	G1/2	**M/31101**	**TM/31101**	**EM/31101**
10 x 2	225	G1/2	**M/31102**	**TM/31102**	**EM/31102**
10 x 3	330	G1/2	**M/31103**	**TM/31103**	**EM/31103**
12 x 1	100	G1/2	**M/31121**	**TM/31121**	**EM/31121**
12 x 2	225	G1/2	**M/31122**	**TM/31122**	**EM/31122**
12 x 3	330	G1/2	**M/31123**	**TM/31123**	**EM/31123**
14 1/2 x 1	125	G1/2	**M/31141**	**TM/31141**	**EM/31141**
14 1/2 x 2	265	G1/2	**M/31142**	**TM/31142**	**EM/31142**
14 1/2 x 3	380	G1/2	**M/31143**	**TM/31143**	**EM/31143**
16 x 2	315	G1/2	**M/31162**	**TM/31162**	**EM/31162**
16 x 3	430	G1/2	**M/31163**	**TM/31163**	**EM/31163**
21 x 2	280	G3/4	**M/31212**	**TM/31212**	**EM/31212**
26 x 2	410	G3/4	**M/31262**	**TM/31262**	**EM/31262**



Safety note: These actuators must not be pressurised when unrestrained.

For exact calculation for compact air bellows please contact our Technical Service.

For further information

www.norgren.com/info/en1-254

OPTIONS SELECTOR

★M/31★★★

Air bellow materials	Substitute
NR-, SBR-, BR-Materials	None
High temperature (Butyl)	T
Extreme temperature (Epichlore)	E

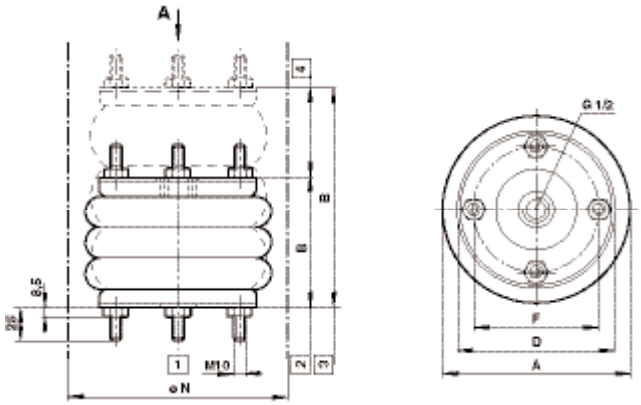
Nominal diameters (inches)	Substitute
6	06
8	08
10	10
12	12
14 1/2	14
16	16
21	21
26	26

Number of convolutions	Substitute
1	1
2	2
3	3

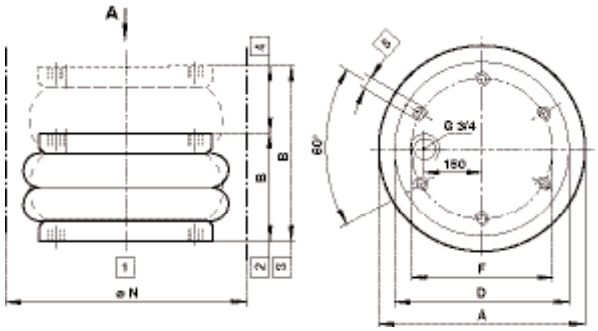
Note: If option is not required, disregard option position within part number e.g. M/31023. For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants. Additional variants/options are not possible.
Information about variants see data sheet.

BASIC DIMENSIONS

M/31061 ... M/31063



M/31212 ... M/31262



1 Installation diameter min.
2 Installation height min.
3 Installation height max.
4 Stroke
5 M10 x 15 deep

Table 1

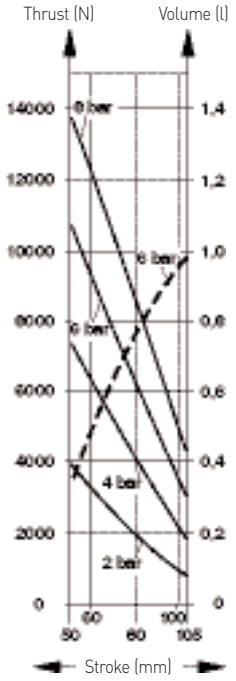
MODELS	Nominal Ø (inch) x convolutions	Stroke (mm)	Installation height B min. (mm)	B max. (mm)	Ø A	Ø D	Ø F	Ø N	Weight (kg)
M/31061	6 x 1	55	50	105	175	153,5	127	190	2,3
M/31062	6 x 2	115	75	190	175	153,5	127	190	2,6
M/31081	8 x 1	80	50	130	230	184	155,5	245	3,0
M/31082	8 x 2	175	75	250	220	184	155,5	245	3,7
M/31101	10 x 1	100	50	150	280	210	181	300	3,9
M/31102	10 x 2	225	75	300	270	210	181	300	5,0
M/31103	10 x 3	330	100	430	270	210	181	300	5,6
M/31121	12 x 1	100	50	150	330	260	232	350	5,2
M/31122	12 x 2	225	75	300	325	260	232	350	6,7
M/31123	12 x 3	330	100	430	325	260	232	350	8,1
M/31141	14 1/2 x 1	125	50	175	395	310	282,5	425	6,9
M/31142	14 1/2 x 2	265	75	340	400	310	282,5	425	9,1
M/31143	14 1/2 x 3	380	100	480	400	310	282,5	425	10,7
M/31162	16 x 2	315	75	390	440	310	282,5	460	9,7
M/31163	16 x 3	430	120	550	425	310	282,5	450	12,9
M/31212	21 x 2	280	90	370	580	489,5	470	630	20,6
M/31262	26 x 2	410	90	500	700	489,5	470	750	23,0

M/31000 Serviceable air bellows

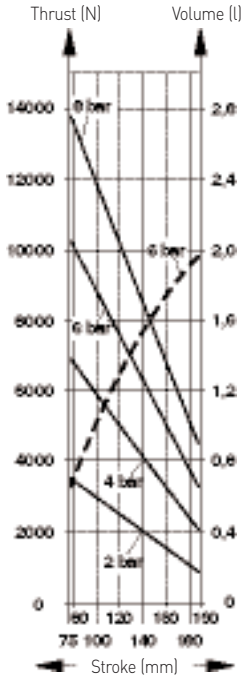
Single acting - Ø 6 ... 26 inch

Thrust (at 2, 4, 6, 8 bar), volume (at 6 bar)

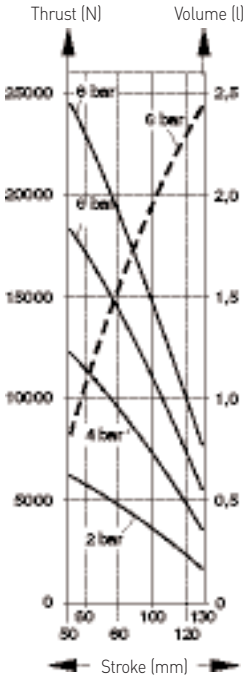
M/31061



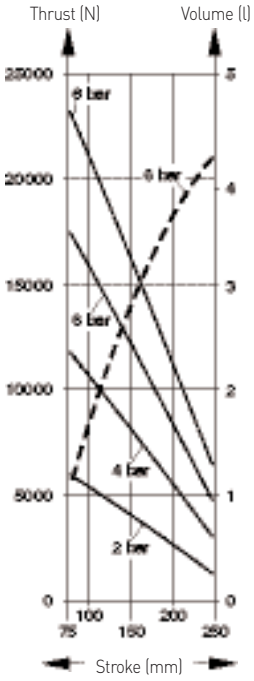
M/31062



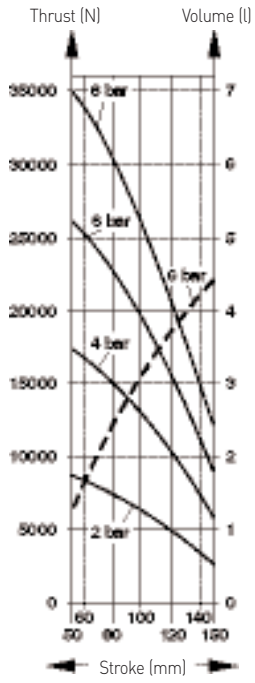
M/31081



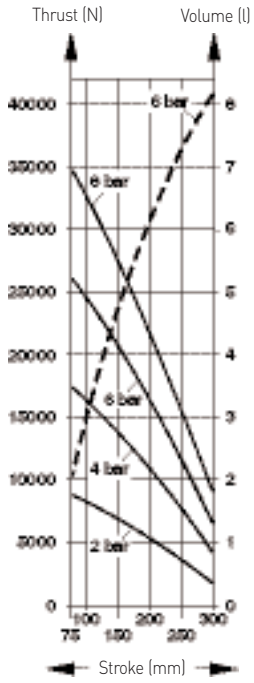
M/31082



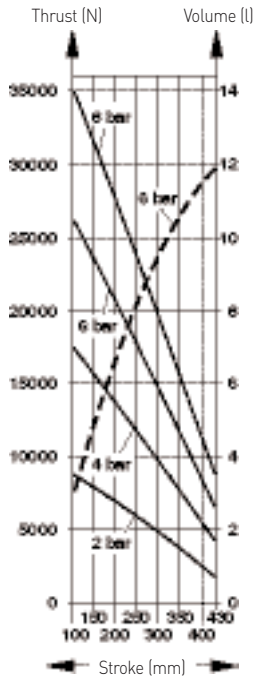
M/31101



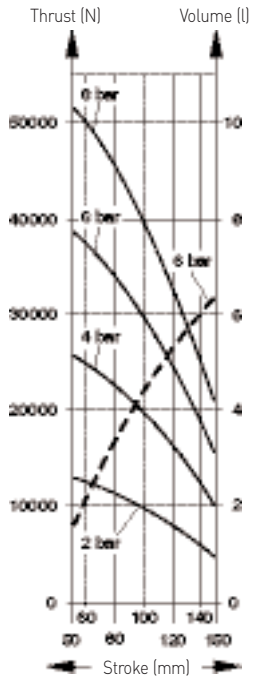
M/31102



M/31103



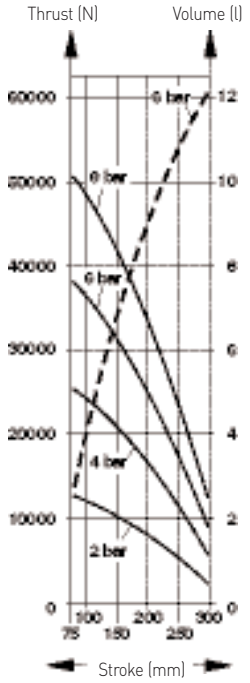
M/31121



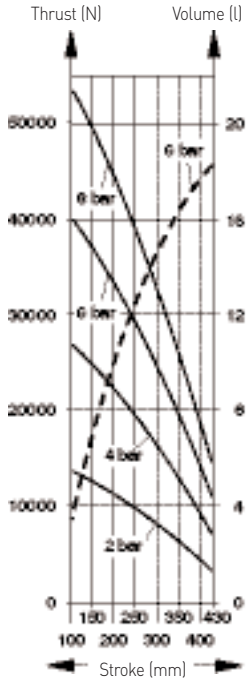
-- Thrust (N) - - Volume (l)

Thrust (at 2, 4, 6, 8 bar), volume (at 6 bar)

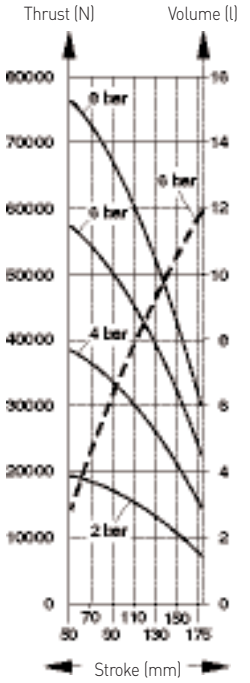
M/31122



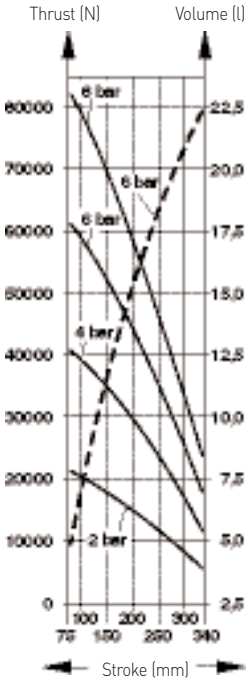
M/31123



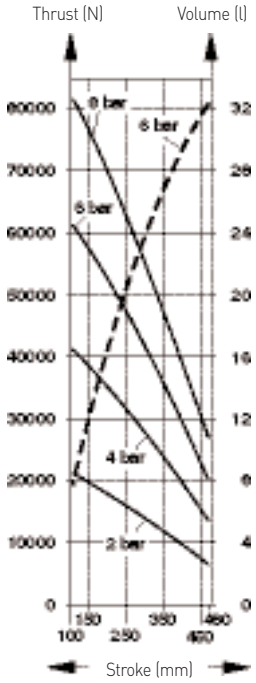
M/31141



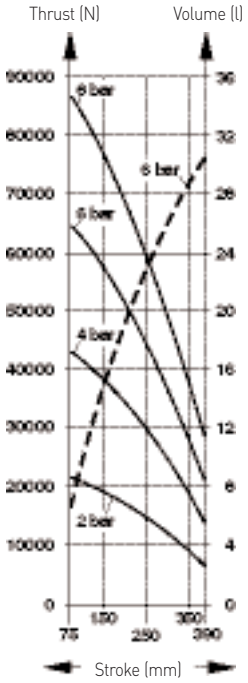
M/31142



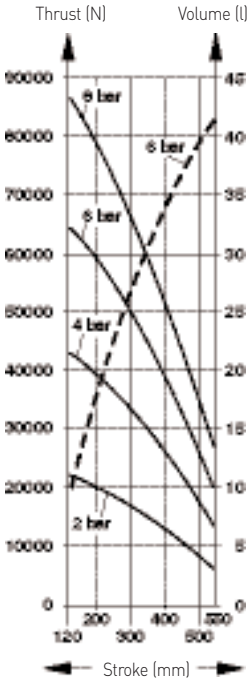
M/31143



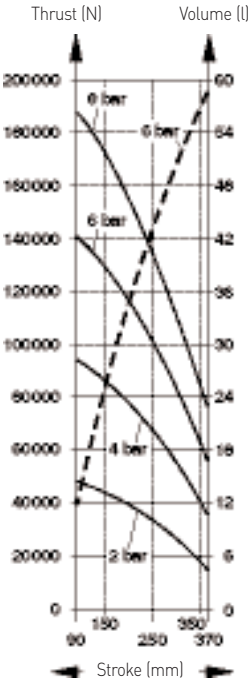
M/31162



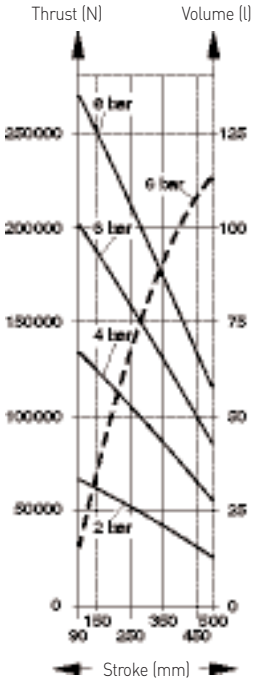
M/31163



M/31212



M/31262



-- Thrust (N) - - Volume (l)

M/31000 Serviceable air bellows

Single acting - Ø 6 ... 26 inch

CALCULATION OF COMPACT AIR BELLOWS USED AS ACTUATORS

Datasheet

a) Total weight to be lifted: F = (_____ kg) • 10 m/s^2 = _____ N
b) Number of air bellows: n = _____
c) Thrust per air bellow: f = $\frac{F}{n}$ = _____ N
d) Operating pressure: P = _____ bar
e) Required stroke: S = _____ mm
f) Vertical space: Xv = _____ mm
g) Horzontal space: Xh = _____ mm
h) Operating temperature: T = _____ °C
i) Operation angle: α = _____ °
j) Out of alignment: A = _____ mm
k) Chemical resistance: _____

Important instructions

Thrust: The thrust depends on the height of the bellow. When height increases – the thrust decreases.
Stops: To avoid damage when the bellow is compressed or extended mechanical stops at both end positions have to be used.
Clearance: There must be enough clearance around the Air Bellow.

Examples of calculation see page 251

TABLE 2: THRUST, INSTALLATION HEIGHT, RETRACTING FORCE

MODELS	Nominal Ø (inch) x convolutions	Stroke (mm)	Installation height B min. (mm)	Thrust at 6 bar (N)	Retracting force to reach min. height (N)	Installation height B max. (mm)	Thrust at 6 bar (N)
M/31061	6 x 1	55	50	10950	140	105	2900
M/31062	6 x 2	115	75	10400	240	190	3200
M/31081	8 x 1	80	50	18600	120	130	5350
M/31082	8 x 2	175	75	17650	250	250	4550
M/31101	10 x 1	100	50	26450	100	150	9000
M/31102	10 x 2	225	75	26350	100	300	6450
M/31103	10 x 3	330	100	26600	190	430	6450
M/31121	12 x 1	100	50	38850	100	150	15100
M/31122	12 x 2	225	75	38500	110	300	8550
M/31123	12 x 3	330	100	40600	180	430	10900
M/31141	14 1/2 x 1	125	50	57600	100	175	21550
M/31142	14 1/2 x 2	265	75	61950	90	340	16900
M/31143	14 1/2 x 3	380	100	62550	290	480	19200
M/31162	16 x 2	315	75	65250	990	390	20200
M/31163	16 x 3	430	120	64950	750	550	19050
M/31212	21 x 2	280	90	141000	480	370	53450
M/31262	26 x 2	410	90	203700	150	500	84450

Operation angle

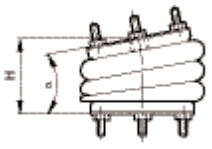
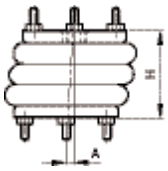


Table 3

MODELS	Nominal Ø (inch) x convolutions	Height H (mm) at α = 5°	α = 10°	α = 15°	α = 20°	α = 25°
M/31061	6 x 1	60-85	65-80	–	–	–
M/31062	6 x 2	–	90-155	95-150	105-145	110-135
M/31081	8 x 1	60-105	70-100	–	–	–
M/31082	8 x 2	–	90-210	100-205	110-200	115-190
M/31101	10 x 1	60-125	70-115	80-105	–	–
M/31102	10 x 2	–	95-260	115-250	135-245	155-235
M/31103	10 x 3	185-390	245-370	280-350	–	–
M/31121	12 x 1	60-125	75-115	90-105	–	–
M/31122	12 x 2	–	100-255	110-245	115-235	160-225
M/31123	12 x 3	200-375	230-340	250-310	–	–
M/31141	14 1/2 x 1	65-145	85-135	–	–	–
M/31142	14 1/2 x 2	–	105-300	115-290	135-275	170-260
M/31143	14 1/2 x 3	280-430	300-390	310-370	–	–
M/31162	16 x 2	–	125-350	150-340	185-325	225-310
M/31163	16 x 3	200-510	350-480	370-450	–	–

Out of alignment



MODELS	Height H (mm) at A = 10 mm	A = 20 mm	A = 30 mm	A = 40 mm	A = 50 mm
M/31061	70-80	–	–	–	–
M/31062	110-165	125-155	–	–	–
M/31081	65-115	70-95	–	–	–
M/31082	95-230	95-220	115-210	130-195	–
M/31101	70-135	80-130	90-115	–	–
M/31102	105-280	125-275	145-265	170-250	–
M/31103	165-390	200-380	220-365	230-350	240-345
M/31121	70-135	80-130	90-115	–	–
M/31122	105-270	130-260	150-245	175-230	–
M/31123	150-400	175-385	195-375	215-360	235-345
M/31141	85-160	95-145	105-125	–	–
M/31142	120-330	140-320	165-315	185-305	–
M/31143	180-450	205-440	225-425	245-410	260-385
M/31162	180-380	205-375	225-365	245-355	–
M/31163	230-520	255-510	275-500	290-485	305-475

CALCULATION OF BELLOWS USED AS VIBRATION ISOLATORS

Datasheet

a) Total weight to be isolated: F = (_____ kg) • 10 m/s^2 = _____ N
b) Number of air bellows: n = _____
c) Thrust per air bellow: f = $\frac{F}{n}$ = _____ N
d) Operating pressure: P = _____ bar
f) Vertical space: Xv = _____ mm
g) Horizontal space: Xh = _____ mm
h) Operating temperature: T = _____ °C
k) Chemical resistance: normal environment
m) Isolation rate: I = _____ %
o) Airspring natural frequency: fn = _____ Hz
p) Excitation frequency: fe = _____ Hz

Important instructions

Air Bellows with two convolutions will provide better isolation because of the greater volume of air in comparison to air belows with one convolution. Air bellows used for vibration isolation should be operated at a «vibration height».

This height is the result of tests and represents the optimum height where the air bellow gives the best performance.

The airspring natural frequency (fn) remains nearly constant at the «vibration height». An increase of the height will result in less isolation, a lower height may influence the horizontal (lateral) stability. The optimum pressure for vibration isolation is from 4 to 6 bar (60 to 90 psi). The lower the airspring natural frequency (fn) of an Air Bellow the better the vibration isolation. The lateral stability of air bellows decreases with the number of convolutions. It is important to note:

air bellows with three convolutions should not be used without consulting Norgren. Ideally air bellows should be located at the same horizontal plane (at the same height) as the centre of gravity of the machine in order to be vibration isolated.

For the purpose of calculation the following assumptions have been made:

1. Vibrations are all vertical
2. The excitation frequency (fe) varies along a sine curve
3. The object and its base are rigid

Examples of calculation see page 253

TABLE 4:
PRESSURE, VIBRATION HEIGHT, THRUST, VOLUME, STIFFNESS, AIRSPRING NATURAL FREQUENCY, ISOLATION RATE

MODELS	Nominal Ø (inch) x convolutions	Pressure (bar)	Vibration height (mm)	Thrust (N)	Volume (l)	Stiffness (N/cm)	Airspring natural frequency fn (Hz)	Isolation rate I (%) at 10 Hz and 6 bar
M/31061	6 x 1	4	85	3650	0,78	1740	3,43	86,6
		6	85	5700	0,81	2490	3,30	87,8
M/31062	6 x 2	4	150	3750	1,59	817	2,33	94,3
		6	150	5750	1,64	1169	2,25	94,7
M/31081	8 x 1	4	100	7250	1,90	2379	2,86	91,1
		6	100	11050	1,96	3421	2,77	91,6
M/31082	8 x 2	4	200	5450	3,54	882	2,00	95,8
		6	200	8400	3,66	1281	1,95	96,0
M/31101	10 x 1	4	120	10450	3,53	2710	2,54	93,1
		6	120	15800	3,69	3850	2,46	93,5
M/31102	10 x 2	4	220	9600	6,44	1254	1,80	96,6
		6	220	14550	6,67	1788	1,75	96,8
M/31121	12 x 1	4	120	16250	5,12	4130	2,51	93,3
		6	120	24550	5,28	5880	2,44	93,7
M/31122	12 x 2	4	220	14650	9,52	2000	1,84	96,5
		6	220	22250	9,85	2850	1,78	96,7
M/31141	14 1/4 x 1	4	130	26350	8,97	5590	2,30	94,4
		6	130	39400	9,28	7840	2,22	94,8
M/31142	14 1/4 x 2	4	250	23800	17,8	2640	1,66	97,2
		6	250	35600	18,4	3730	1,61	97,3
M/31143	14 1/4 x 3	4	370	22350	26,97	1630	1,35	98,1
		6	370	33650	27,86	2330	1,31	98,2
M/31162	16 x 2	4	290	25750	24,85	2280	1,48	97,8
		6	290	38650	25,46	3230	1,44	97,9
M/31212	21 x 2	4	300	54800	49,1	5380	1,56	97,5
		6	300	83350	50,8	7560	1,50	97,7
M/31262	26 x 2	4	350	85900	88,9	5600	1,27	98,4
		6	350	130000	91,5	7920	1,23	98,5

Values for air bellows with three convolutions are not given as they cannot be used as vibration isolators

KM/8000/M Stainless steel roundline cylinders (ISO)

Double acting, ISO 6432 - Ø 12 to 25 mm

- High corrosion and acid resistance
- Magnetic piston as standard
- Conforms to ISO 6432
- Suitable for applications in the food industry
- Buffer or adjustable cushioning
- Nose mounting nut and piston rod locknut as standard

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting, magnetic piston with buffer or adjustable cushioning

Operating pressure:
1 ... 10 bar

Operating temperature:
-10°C ... +80°C max.
Consult our Technical Service for use below +2°C

MATERIALS

Cylinder barral: X5 Cr Ni 18 10 (1.4301; AISI 304)
End covers: X10 Cr Ni S 18 9 (1.4305; AISI 303)
Piston rod: X10 Cr Ni S 18 9 (1.4305; AISI 303)
Piston: POM
Buffer: Polyurethane
Piston rod seal: Polyurethane
Piston ans cushion seal: nitrile rubber
'O'-rings: nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Buffer cushioning	MODELS Adjustable cushioning	ACCESSORIES Reed switch with integral 5m cable	Switch mounting > 15 mm stroke	Switch mounting < 15 mm stroke	Banjo flow control	Straight fitting	Elbow fitting
									Nickel plated brass fittings Tube diameter in bold		
Buffer Cushion											
Adjustable Cushion	12	6	M5	**KM/8012/M/***	–	M/50/LSU/5V	QM/33/012/22	QM/33/010/23	10K51**04**05	10225**04**05	10247**04**05
	16	6	M5	**KM/8016/M/***	–	M/50/LSU/5V	QM/33/016/22	QM/33/016/23	10K51**04**05	10225**04**05	10247**04**05
	20	8	G1/8	**KM/8020/M/***	**KM/8021/M/***	M/50/LSU/5V	QM/33/020/22	QM/33/020/23	10K51**06**18	10225**06**18	10247**06**18
	25	10	G1/8	**KM/8025/M/***	**KM/8026/M/***	M/50/LSU/5V	QM/33/025/22	QM/33/025/23	10K51**06**18	10225**06**18	10247**06**18

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings e.g. plastic or stainless steel are available, please see section 7

For further information

www.norgren.com/info/en1-260

OPTIONS SELECTOR

KM/8★★★/★★/★★/★★★

Cylinder diameters (mm) Variants with buffer cushioning	Substitute
12	012
16	016
20	020
25	025

Cylinder diameters (mm) Variants with adjustable cushioning	Substitute
20	021
25	026

Strokes (mm)
500 max.

Mounting variants	Substitute
Cylinder with integrated rear eye mounting	R
Cylinder with integrated universal rear eye mounting	UR

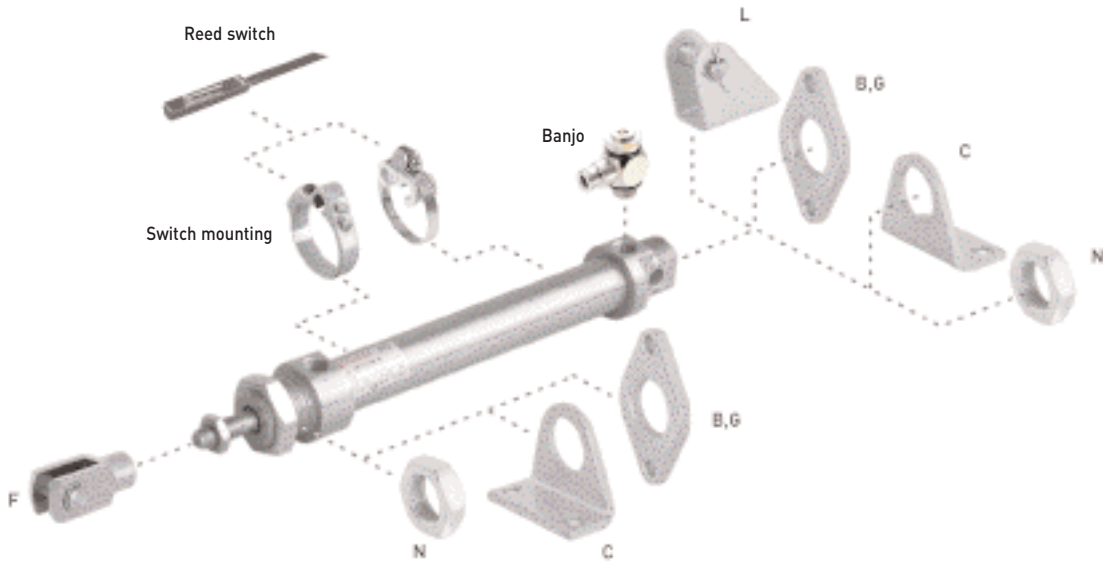
Variants	Substitute
Standard	M
Flat rear cover	MF
Double ended piston rod	JM
Extended piston rod	MU

KM/8***/MU/***/***

→ Extention (mm)

Note: If option is not required, disregard option position within part number e.g. KM/8025/M/50. For combinations of cylinder variants consult our Technical Service. Please note that heat resistant seals are not available for all variants. This options selector explains only the cylinder variants. Additional variants/options are not possible. Information about variants see data sheet.

MOUNTINGS



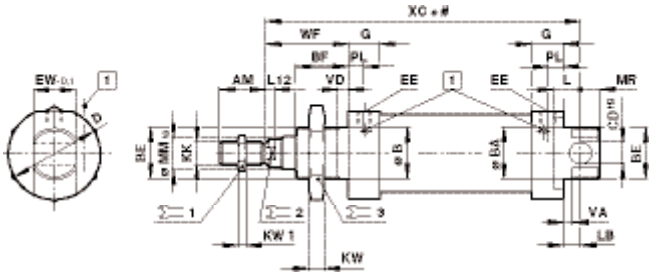
Ø	B, G	C	F	L	N
12	M/P72405	M/P72403	KQM/8012/25	KQM/8012/24	M/P72398
16	M/P72405	M/P72403	KQM/8012/25	KQM/8012/24	M/P72398
20	M/P72406	M/P72404	KQM/8020/25	KQM/8020/24	M/P72399
25	M/P72406	M/P72404	KQM/55433/25	KQM/8020/24	M/P72399

KM/8000/M Stainless steel roundline cylinders (ISO)

Double acting, ISO 6432 - Ø 12 ... 25 mm

BASIC DIMENSIONS

KM/8000/M - Standard



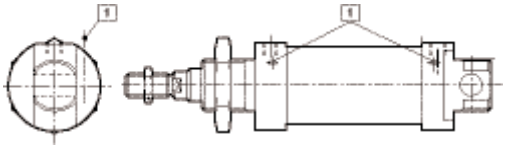
#	Stroke
1	Cushion screw

MODELS	Ø	AM	Ø B/BA	BE	BF	Ø CD H9	Ø D	EE	EW-0,1	G	KK	⌀ 3	⌀ 2	KW
KM/8012/M/.	12	16	16	M16x1,5	17	6	20	M5	11,9	9,5	M6	22	10	5
KM/8016/M/.	16	16	16	M16x1,5	17	6	20	M5	11,9	9,5	M6	22	10	5
KM/8020/M/.	20	20	22	M22x1,5	20	8	30	G1/8	15,9	15	M8	27	13	8
KM/8025/M/.	25	22	22	M22x1,5	22	8	30	G1/8	15,9	15	M10x1,25	27	17	8

MODELS	Ø	KW1	L	L12	LB	Ø MM h9	MR	PL	⌀ 1	WF	VA/VD	XC	at 0 mm	per 25 mm
KM/8012/M/.	12	3	9	3	3	6	8	5,5	5	22	2	75	0,116 kg	0,011 kg
KM/8016/M/.	16	3	9	3	4	6	7	5,5	5	22	2	82	0,137 kg	0,012 kg
KM/8020/M/.	20	4	12	3	3	8	11	8	7	24	2	95	0,306 kg	0,018 kg
KM/8025/M/.	25	5	12	4	7	10	9	8	9	28	2	104	0,383 kg	0,028 kg

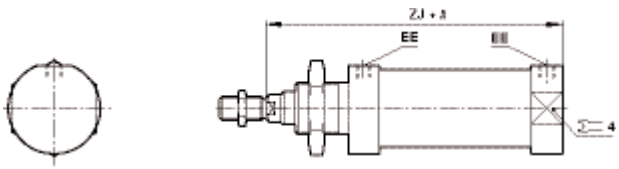
ALTERNATIVE VARIANTS

KM/8021/M, KM/8026/M – Cylinder with adjustable cushioning



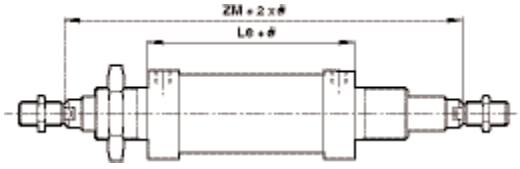
#	Stroke
1	Cushion screw

KM/8000/MF – Cylinder flat rear cover



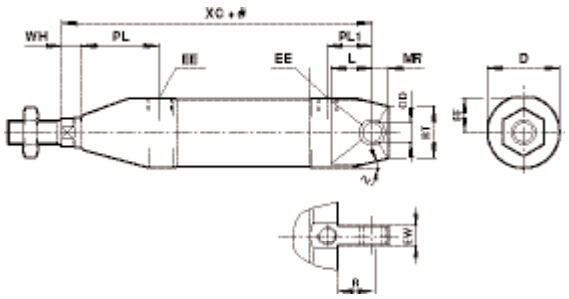
MODELS	Ø	EE	ZJ	⌀ 4	kg at 0 mm	kg per 25 mm
KM/8012/MF	12	M5	72	17	0,109	0,011
KM/8016/MF	16	M5	78	17	0,130	0,012
KM/8020/MF	20	G1/8	92	27	0,299	0,018
KM/8025/MF	25	G1/8	97	27	0,370	0,028

KM/8000/JM – Cylinder with double ended piston rod



MODELS	Ø	L8	ZM	kg at 0 mm	kg per 25 mm
KM/8016/JM	16	56	100	0,140	0,018
KM/8020/JM	20	68	116	0,360	0,028
KM/8025/JM	25	69	125	0,440	0,043

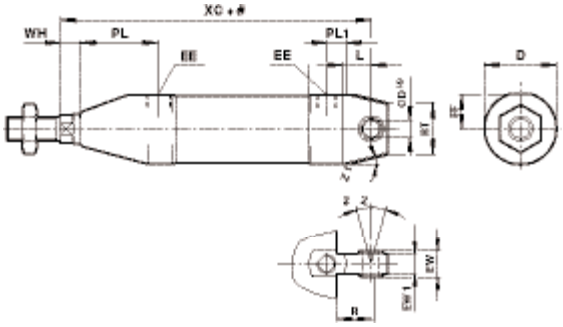
KM/8000/M/R – Cylinder with intergrated rear eye mounting



MODELS	Ø	Ø CD^{H9}	Ø D	EE	EW$_{-0,1}$	FF	L	MR	PL	PL1	RT	WH	XC	Z	at 0 mm	per 25 mm
KM/8012/M/R/.	12	6	20	M5	11,9	9	9	11,5	23,5	15,5	10	4	75	5x45°	0,106 kg	0,011 kg
KM/8016/M/R/.	16	6	20	M5	11,9	9	9	10,5	22,5	15	10	5	82	5x45°	0,130 kg	0,012 kg
KM/8020/M/R/.	20	8	30	G1/8	15,9	13,5	12	12,5	18,5	18,5	13,5	4	95	30°	0,300 kg	0,018 kg
KM/8025/M/R/.	25	8	30	G1/8	15,9	13,5	12	12,5	19,5	26,5	11,5	6	104	30°	0,360 kg	0,028 kg

For missing dimensions see page 262

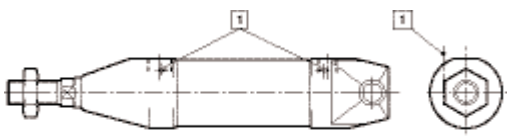
KM/8000/M/UR – Cylinder with intergrated universal rear eye mounting



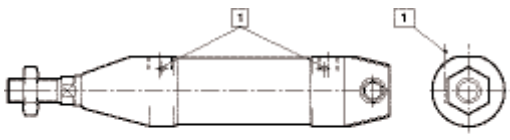
MODELS	Ø	Ø CD^{H9}	Ø D	EE	EW$_{-0,1}$	EW1	FF	L	MR	PL	PL1	RT	WH	XC	Z	Z1	at 0 mm	per 25 mm
KM/8012/M/UR/.	12	6	20	M5	9	6,8	9	9	11,5	23,5	15,5	-	4	75	13°	5X45°	0,106 kg	0,011 kg
KM/8016/M/UR/.	16	8	20	M5	9	6,8	9	9	10,5	22,5	15	-	5	82	13°	5X45°	0,130 kg	0,012 kg
KM/8020/M/UR/.	20	8	30	G1/8	12	9	13,5	12	12,5	20,5	18,5	14	4	95	13°	30°	0,300 kg	0,018 kg
KM/8025/M/UR/.	25	8	30	G1/8	12	9	13,5	12	12,5	25,5	19,5	14	6	104	13°	30°	0,360 kg	0,028 kg

For missing dimensions see page 262

KM/8021/M/R, KM/8026/M/R – Cylinder with intergrated rear eye mounting and adjustable cushioning



KM/8021/M/UR, KM/8026/M/UR – Cylinder with intergrated universal rear eye mounting and adjustable cushioning



Stroke

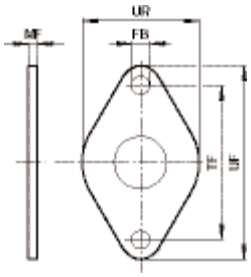
1 Cushion screw

KM/8000/M Stainless steel roundline cylinders (ISO)

Double acting, ISO 6432 - Ø 12 ... 25 mm

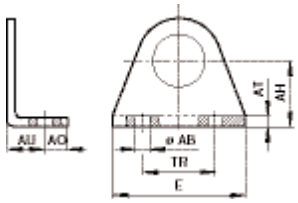
MOUNTINGS

Rear flange - B, Front flange - G
Corresponds to DIN ISO 6432



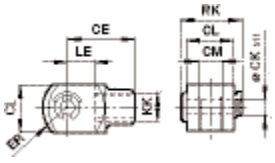
MODELS	Ø	Ø FB	MF	TF	UF	UR	kg
M/P72405	12/16	5,5	4	40	52	30	0,03
M/P72406	20/25	6,6	5	50	66	40	0,05

Foot - C
Corresponds to DIN ISO 6432



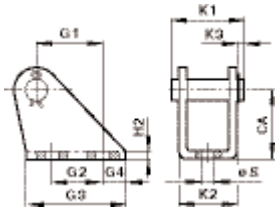
MODELS	Ø	Ø AB	AH	AO	AT	AU	E	TR	kg
M/P72403	12/16	5,5	20	6	3	13	43	32	0,03
M/P72404	20/25	6,5	25	7,5	4	16	53	40	0,06

Piston rod clevis - F



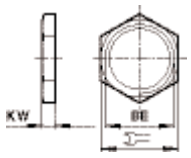
MODELS	Ø	KK	CE	Ø CK$_{h11}$	CL	CM	ER	LE	RK	kg
KQM/8012/25	12/16	M6	24	6	12	6	9,5	12	17,5	0,02
KQM/8020/25	20	M8	32	8	16	8	13	16	22	0,06
KQM/55433/25	25	M10x1,25	40	10	20	10	16	20	28	0,10

Rear hinge - L



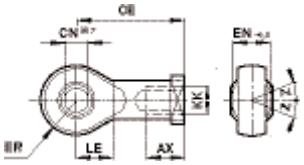
MODELS	Ø	CA	G1	G2	G3	G4	H2	K1	K2	K3	Ø S	kg
KQM/8012/24	12/16	27	13	15	25	4	3	23	18	3	5,5	0,035
KQM/8020/24	20/25	30	16	20	32	6	4	29,5	24	3	6,6	0,077

Nose nut - N



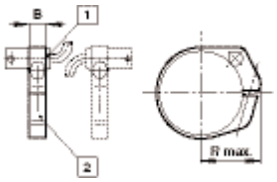
MODELS	Ø	BE	KV	KW	kg
M/P72398	12/16	M16x1,5	22	5	0,009
M/P72399	20/25	M22x1,5	27	8	0,020

Piston rod eye - UF



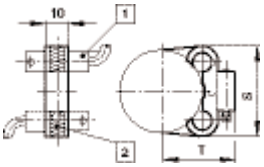
MODELS	Ø	KK	CE	CN H7	EN -0,1	ER	AX	LE	Z	kg
KQM/8012/32	12/16	M6	30	6	9	10,5	12	10	13°	0,02
KQM/8020/32	20	M8	36	8	12	12,5	16	12	13°	0,05
KQM/8032/32	25	M10x1,25	43	10	14	14,5	20	14	13°	0,08

Switch mounting bracket ≥ 15 mm stroke
For M/50



MODELS	Ø	B	R max.	kg
QM/33/012/22	12	8	18	0,01
QM/33/012/22	12	8	18	0,04
QM/33/016/22	16	10	20	0,01
QM/33/020/22	20	10	22	0,01
QM/33/025/22	25	10	24	0,01

Switch mounting bracket < 15 mm stroke
For M/50



MODELS	Ø	S	T	kg
QM/33/012/23	12	28,5	21,5	0,001
QM/33/016/23	16	29,5	23,5	0,001
QM/33/020/23	20	29,5	26	0,001
QM/33/025/23	25	31,5	28,5	0,001

KM/55001/M Stainless steel roundline cylinders

Double acting - Ø 32 ... 125 mm

- Clean line design
- High corrosion and acid resistance
- Magnetic piston as standard
- Conforms to ISO 6431
- Suitable for applications in the food industry
- Special wiper/seal as standard

TECHNICAL DATA

Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
Double acting with magnetic piston, adjustable cushioning

Operating pressure:
1 ... 10 bar

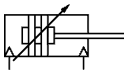
Operating temperature:
-20°C ... +80°C max
Consult our Technical Service for use below +2°C

Strokes:
Non-standard strokes
(1600 mm max. available)

MATERIALS

Barrel: X5 Cr Ni 18 10
(1.4301; AISI 304)
End covers: X10 Cr Ni S 18 9
(1.4305; AISI 303)
Piston rod: X10 Cr Ni S 18 9
(1.4305; AISI 303)
O-rings: FPM
Pistonseal: polyurethane
Cushion seal: nitrile rubber

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS	ACCESSORIES Reed switch with integral 5m cable	Switch mounting	Banjo flow control Nickel plated brass fittings Tube diameter in bold	Straight fitting	Elbow fitting
									
	32	12	G1/8	**KM/55033/M/***	M/50/LSU/5V	QM/33/432/22	10K51**06**18	10225**06**18	10247**06**18
	40	16	G1/4	**KM/55041/M/***	M/50/LSU/5V	QM/33/440/22	10K51**06**28	10225**06**28	10247**06**28
	50	20	G1/4	**KM/55051/M/***	M/50/LSU/5V	QM/33/450/22	10K51**08**28	10225**08**28	10247**08**28
	63	20	G3/8	**KM/55064/M/***	M/50/LSU/5V	QM/33/463/22	10K51**08**38	10225**08**38	10247**08**38
	80	25	G3/8	**KM/55081/M/***	M/50/LSU/5V	QM/33/480/22	10K51**10**38	10225**10**38	10247**10**38
	100	25	G1/2	**KM/55101/M/***	M/50/LSU/5V	QM/33/100/22	10K51**12**48	10225**12**48	10247**12**48
	125	32	G1/2	**KM/55126/M/***	M/50/LSU/5V	QM/33/125/22	10K51**12**48	10225**12**48	10247**12**48

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings e.g. plastic or stainless steel are available, please see section 7

For further information

www.norgren.com/info/en1-266

OPTIONS SELECTOR

★KM/55★★★/★★/★★/★★★★

Special variants	Substitute
High temperature version: 150°C max.	T

Cylinder diameters (mm)	Substitute
32	033
40	041
50	051
63	064
80	081
100	101
125	126

Note: If option is not required, disregard option position within part number e.g. KM/55033/M/50. For combinations of cylinder variants consult our Technical Service. Please note that heat resistant seals are not available for all variants. This options selector explains only the cylinder variants. Additional variants/options are not possible. Information about variants see data sheet.

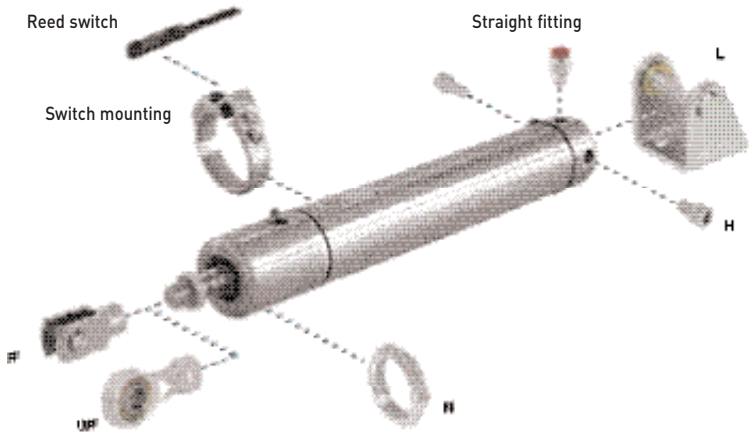
Strokes (mm)
1600 max.

Cylinder with integral mountings	Substitute
Rear clevis mounting	D2
Rear eye mounting	R
Universal rear eye mounting	UR

Variants	Substitute
Standard	M
Threaded front end cover	MF
Front threads for central trunning mounting	MFT
Double ended piston rod (Ø 32 ... 63 mm)	JM
Extended piston rod	MU

*KM/55***/MU/***/**** → Extension (mm)

MOUNTINGS



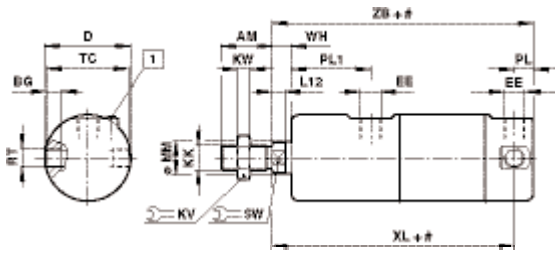
Ø	F	H	L	N	UF
32	KQA/55433/25	QM/55232/28	KQM/55032/24	M/P34276	KQM/8032/32
40	KQA/55441/25	QM/55240/28	KQM/55040/24	M/P34277	KQM/8040/32
50	KQA/55451/25	QM/55250/28	KQM/55050/24	M/P34278	KQM/8050/32
63	KQA/55451/25	QM/55263/28	KQM/55063/24	M/P34278	KQM/8050/32
80	KQM/8080/25	QM/55480/28	KQM/55080/24	–	KQM/8080/32
100	KQM/8080/25	QM/55410/28	KQM/55100/24	–	KQM/8080/32
125	KQM/8125/25	QM/55125/28	KQM/55125/24	–	KQM/8125/32

KM/55001/M Stainless steel roundline cylinders

Double acting - Ø 32 ... 125 mm

STANDARD CYLINDERS

KM/55001/M



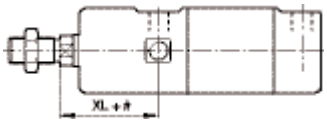
\# Stroke

1 Cushion screw

MODELS	Ø	AM	BG	Ø D	EE	KK	KV	KW	L12	Ø MM	PL	PL1	RT	SW	TC	WH	XL	XH	ZB	at 0 mm	per 25 mm
KM/55033/M	32	22	6	36	G 1/8	M10 x 1,25	17	5	6	12	9	39	M8 x 1	10	34,5	8	124,5	47	132	0,78 kg	0,06kg
KM/55041/M	40	24	8	44	G 1/4	M12 x 1,25	19	6	6,5	16	15	50	M10 x 1	13	42	10	142	57	154	1,36 kg	0,09 kg
KM/55051/M	50	32	9,5	54	G 1/4	M16 x 1,5	24	8	8	20	12	50	M12 x 1,5	17	52	12	152	62	164	2,25 kg	0,13 kg
KM/55064/M	63	32	10	68	G 3/8	M16 x 1,5	24	8	8	20	13	51	M14 x 1,5	17	66	13	159	64	172	3,78 kg	0,16 kg
KM/55081/M	80	40	18	86	G 3/8	M20 x 1,5	30	10	10	25	16	47	M16 x 1,5	22	83,5	13	160	60	176	5,99 kg	0,25 kg
KM/55101/M	100	40	22	106	G 1/2	M20 x 1,5	30	10	10	25	19	47	M20 x 1,5	22	102,5	15	178	62	197	10,36 kg	0,29 kg
KM/55126/M	125	54	29	133	G 1/2	M27 x 2	41	13,5	13	32	17,5	62,5	M24 x 1,5	27	128,5	20	207,5	82,5	225	22,97 kg	0,48 kg

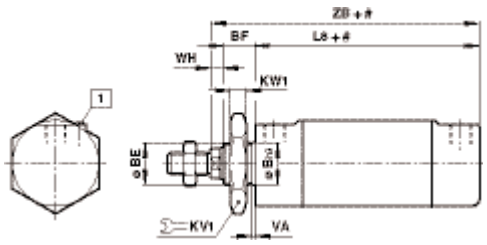
ALTERNATIVE VARIANTS

KM/55001/MRT – Cylinder with front threads for central mounting



MODELS	Ø	XL1
KM/55033/M	32	47
KM/55041/M	40	57
KM/55051/M	50	62
KM/55064/M	63	64
KM/55081/M	80	60
KM/55101/M	100	62
KM/55126/M	125	82,5

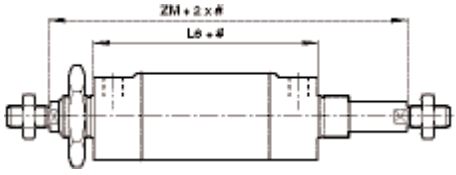
KM/55001/MF – Cylinder with threaded front end cover



1 Cushion screw

MODELS	Ø	Ø B h9	BE	BF	KV1	KW1	L8	VA	WH	ZB
KM/55033/MF	32	30	M30x1,5	30	36	8	94	3	8	132
KM/55041/MF	40	38	M38x1,5	35	46	10	109	3	10	154
KM/55051/MF	50	45	M45x1,5	38	55	10	114	3	12	164
KM/55064/MF	63	45	M45x1,5	38	55	10	121	3	13	172

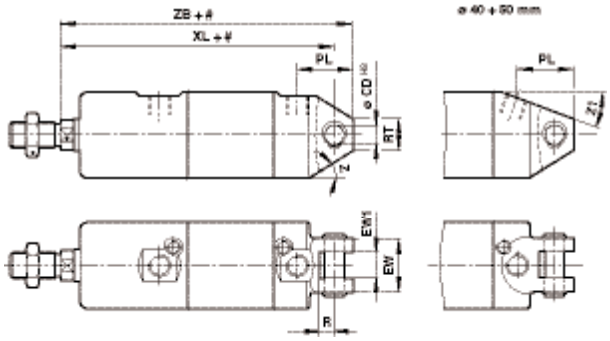
KM/55001/JM – Cylinder with double ended piston rod



\# Stroke

MODELS	Ø	L8	ZM
KM/55033/JM	32	94	170
KM/55041/JM	40	109	199
KM/55051/JM	50	114	214
KM/55064/JM	63	121	223

KM/55001/M/D2 – Cylinder with rear clevis mounting

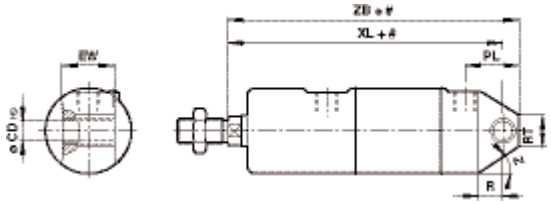


Stroke

MODELS	Ø	Ø CD^{H9}	EW	EW1$^{+0,2}$	PL	R	RT	XL	Z	Z1	ZB	at 0 mm	per 25 mm
KM/55033/M/D2	32	10	26	14	30,5	16,5	19	142	20°	–	151	0,78 kg	0,06 kg
KM/55041/M/D2	40	12	32	16	36,5	19,5	18	160	25°	15°	172	1,35 kg	0,09 kg
KM/55051/M/D2	50	12	41	21	36,5	21,5	24	170	30°	20°	182	2,24 kg	0,13 kg
KM/55064/M/D2	63	16	41	21	46	23,5	25,5	190	30°	–	205	3,74 kg	0,16 kg

For missing dimensions see page 268

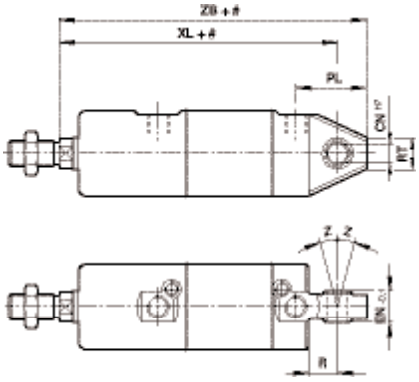
KM/55001/M/R – Cylinder with rear eye mounting



MODELS	Ø	Ø CD^{H9}	EW	PL	R	RT	XL	Z	ZB	at 0 mm	per 25 mm
KM/55033/M/R	32	10	25,8	29	14,5	19	142	20°	151	0,94 kg	0,06 kg
KM/55041/M/R	40	12	27,8	34	16	18	160	25°	172	1,47 kg	0,09 kg
KM/55051/M/R	50	12	31,7	33,5	19	24	170	30°	182	2,32 kg	0,13 kg
KM/55064/M/R	63	16	39,7	46	22	25,5	190	30°	205	3,98 kg	0,16 kg
KM/55081/M/R	80	16	49,7	65	24	41	210	30°	225	7,40 kg	0,25 kg
KM/55101/M/R	100	20	59,7	71	27	51	230	30°	250	12,54 kg	0,29 kg

For missing dimensions see page 268

KM/55001/M/UR – Cylinder with universal rear mounting



MODELS	Ø	Ø CN^{H7}	EN$_{-0,1}$	PL	R	RT	XL	Z	ZB	at 0 mm	per 25 mm
KM/55033/M/UR	32	10	14	36	14,5	17,5	142	13°	158	0,84 kg	0,06 kg
KM/55041/M/UR	40	12	16	41	16	28,5	160	13°	178	1,41 kg	0,09 kg
KM/55051/M/UR	50	16	21	42,5	19	34	170	13°	191	2,31 kg	0,13 kg
KM/55064/M/UR	63	16	21	55	22	35,5	190	15°	213	3,82 kg	0,16 kg
KM/55081/M/UR	80	20	25	78	24	37,5	210	15°	238	7,32 kg	0,25 kg
KM/55101/M/UR	100	20	25	81	27	40,5	230	15°	260	12,26 kg	0,29 kg

For missing dimensions see page 268

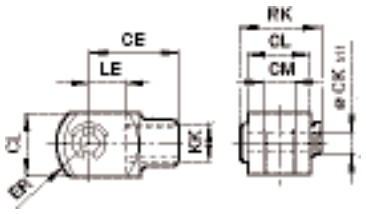
KM/55001/M Stainless steel roundline cylinders

Double acting - Ø 32 ... 125 mm

MOUNTINGS

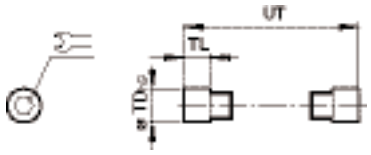
Piston rod clevis - F

(Corresponds to DIN ISO 8140)



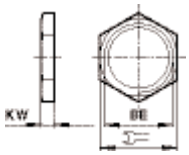
MODELS	Ø	CE	Ø CK h11	CL	CM	ER	KK	LE	RK	kg
KQM/55433/25	32	40	10	20	10	16	M10 x 1,25	20	28	0,09
KQM/55441/25	40	48	12	24	12	19	M12 x 1,25	24	32	0,13
KQM/55451/25	50	64	16	32	16	25	M16 x 1,5	32	41,5	0,33
KQM/55451/25	63	64	16	32	16	25	M16 x 1,5	32	41,5	0,33
KQA/8080/25	80	80	20	40	20	32	M20 x 1,5	40	58	0,67
KQA/8080/25	100	80	20	40	20	32	M20 x 1,5	40	58	0,67
KQA/8125/25	125	110	30	55	30	45	M27 x 2	54	72	1,35

Central trunnion - H



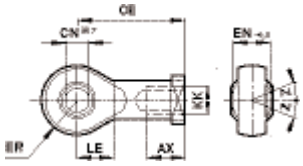
MODELS	Ø	Ø TDh9	TL	UT	Σ=	kg
QM/55232/28	32	10	8	51	5	0,02
QM/55240/28	40	12	9,5	63	6	0,03
QM/55250/28	50	14	11	76	6	0,05
QM/55263/28	63	16	13	93	8	0,07
QM/55480/28	80	18	13	111,5	8	0,09
QM/55410/28	100	20	14	131,5	10	0,25
QM/55125/28	125	25	20	168,5	10	0,32

Lock nut - N



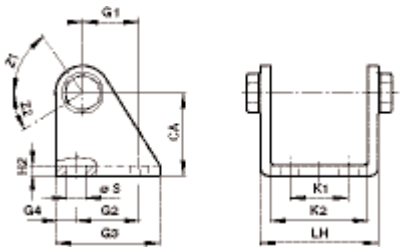
MODELS	Ø	BE	Σ=	KW	kg
M/P34276	32	M30 x 1,5	36	8	0,03
M/P34277	40	M38 x 1,5	46	10	0,06
M/P34278	50	M45 x 1,5	55	10	0,08
M/P34278	63	M45 x 1,5	55	10	0,08

Piston rod eye - UF



MODELS	Ø	Thread KK	CE	CN H7	EN -0,1	ER	AX	LE	Z	kg
KQM/8032/32	32	M10x1,25	43	10	14	14,5	20	14	13°	0,07
KQM/8040/32	40	M12x1,5	50	12	16	16,5	22	16	13°	0,11
KQM/8050/32	50	M16x1,5	64	16	21	21,5	28	21	15°	0,21
KQM/8080/32	80	M20x1,5	77	20	25	25,5	33	25	15°	0,38
KQM/8125/32	125	M27x2	110	30	37	35	51	35	15°	1,15

Rear hinge - L

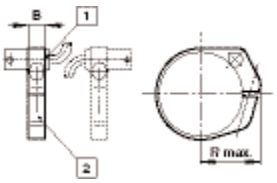


MODELS	Ø	CA	G1	G2	G3	G4	Ø S	H2
KQM/55032/24	32	35	20	24	40	8	7	4
KQM/55040/24	40	40	27	30	50	10	9	5
KQM/55050/24	50	45	30	34	54	10	9	5
KQM/55063/24	63	50	34	35	65	15	9	5
KQM/55080/24	80	65	47,5	55	80	12,5	11	6
KQM/55100/24	100	77	63	70	100	15	11	6
KQM/55125/24	125	90	82,5	90	125	17,5	13,5	8

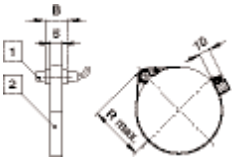
MODELS	Ø	K1	K2	LH	Z1	Z2	kg
KQM/55032/24	32	20	46,5	59,5	65°	36°	0,15
KQM/55040/24	40	28	56,5	71	55°	32°	0,26
KQM/55050/24	50	36	68,5	83	60°	30°	0,33
KQM/55063/24	63	42	82,5	99	189°	25°	0,51
KQM/55080/24	80	55	102,5	125,5	193°	27°	0,96
KQM/55100/24	100	70	122,5	145,5	191°	25°	1,37
KQM/55125/24	125	90	152,5	175,5	188°	22°	2,51

QM/33/***/22 – switch mounting bracket

Ø 32 ... 80 mm



Ø 100 & 125 mm



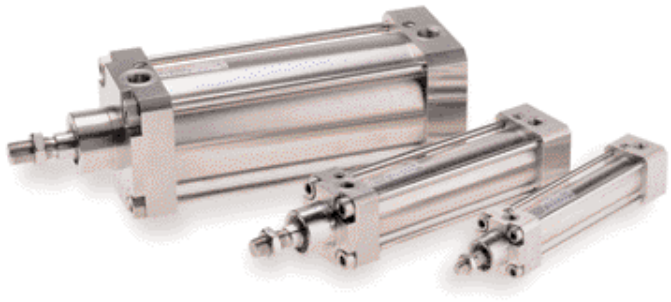
1 Magnetically operated switch

2 Switch mounting bracket

MODELS	Ø	B	R max.	kg
QM/33/432/22	32	10	29	0,07
QM/33/440/22	40	10	32	0,07
QM/33/450/22	50	10	38	0,08
QM/33/463/22	63	10	46	0,08
QM/33/480/22	80	12	54	0,09
QM/33/100/22	100	10	59	0,09
QM/33/125/22	125	10	72,5	0,10

KA/8000, KA/8000/M Stainless steel ISO/VDMA cylinders

Double acting - Ø 32 ... 200 mm



High corrosion and acid resistant

Conforming to Standards ISO 15552, ISO 6431, VDMA 24562 and NFE 49-003-1

Ideal for applications in the food industry

MATERIALS

Barrel: X5 Cr Ni 18 10 (1.4301; AISI 304)
End covers: X10 Cr Ni S 18 9 (1.4305; AISI 303)
Piston rod: X10 Cr Ni S 18 9 (1.4305; AISI 303)
Nuts and screws: X10 Cr Ni S 18 9 (1.4305; AISI 303)
Tie rods: X5 Cr Ni Mo 17 12 2 (1.4401; AISI 316)
Piston rod seals: FPM
Piston seals: polyurethane Ø 32 ... 100 mm, nitrile rubber Ø 125 ... 200 mm
Cushion seals: nitrile rubber
O-rings: FPM

TECHNICAL DATA

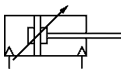
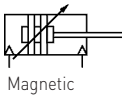
Medium:
Compressed air, filtered, lubricated or non-lubricated

Operation:
KA/8000: double acting, adjustable cushioning
KA/8000/M: double acting, adjustable cushioning and magnetic piston

Operating pressure:
1 ... 16 bar

Operating temperature:
80°C max.
Consult our Technical Service for use below +2°C

STANDARD MODELS

	Ø	Piston rod Ø	Port size	MODELS Non-magnetic	MODELS Magnetic	ACCESSORIES Reed switch integral with 5m cable	Switch mounting	Banjo flow control	Straight fitting	Elbow fitting	Service kit
								Nickel plated brass fittings Tube diameter in bold			
											
	32	12	G1/8	**KA/8032/***	**KA/8032/M/***	M/50/LSU/5V	QM/27/2/1	10K51**06**18	10225**06**18	10247**06**18	KQA/8032/00
	40	16	G1/4	**KA/8040/***	**KA/8040/M/***	M/50/LSU/5V	QM/27/2/1	10K51**06**28	10225**06**28	10247**06**28	KQA/8040/00
	50	20	G1/4	**KA/8050/***	**KA/8050/M/***	M/50/LSU/5V	QM/27/2/1	10K51**08**28	10225**08**28	10247**08**28	KQA/8050/00
	63	20	G3/8	**KA/8063/***	**KA/8063/M/***	M/50/LSU/5V	QM/27/2/1	10K51**08**38	10225**08**38	10247**08**38	KQA/8063/00
Non-magnetic	80	25	G3/8	**KA/8080/***	**KA/8080/M/***	M/50/LSU/5V	QM/27/2/1	10K51**10**38	10225**10**38	10247**10**38	KQA/8080/00
	100	25	G1/2	**KA/8100/***	**KA/8100/M/***	M/50/LSU/5V	QM/27/2/1	10K51**12**48	10225**12**48	10247**12**48	KQA/8100/00
	125	32	G1/2	**KA/8125/***	**KA/8125/M/***	M/50/LSU/5V	QM/27/2/1	10K51**12**48	10225**12**48	10247**12**48	KQA/8125/00
	160	40	G3/4	**KA/8160/***	**KA/8160/M/***	M/50/LSU/5V	QM/27/2/1	–	–	–	KQA/8160/00
Magnetic	200	40	G3/4	**KA/8200/***	**KA/8200/M/***	M/50/LSU/5V	QM/27/2/1	–	–	–	KQA/8200/00

* Insert stroke length in mm

For information on additional magnetic switches see page 290
Other fittings e.g. plastic or stainless steel are available, please see section 7

Standard strokes

Ø	25	50	80	100	125	160	200	250	320	400	500
32	•	•	•	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•	•	•	•
80	•	•	•	•	•	•	•	•	•	•	•
100	•	•	•	•	•	•	•	•	•	•	•
125	•	•	•	•	•	•	•	•	•	•	•

Other strokes available

For further information

www.norgren.com/info/en1-272

OPTIONS SELECTOR

★KA/8★★★★/★★/★★

Special variants	Substitute
High temperature version: 150°C max.	T

Cylinder diameter (mm)	Substitute
32	032
40	040
50	050
63	063
80	080
100	100
125	125
160	160
200	200

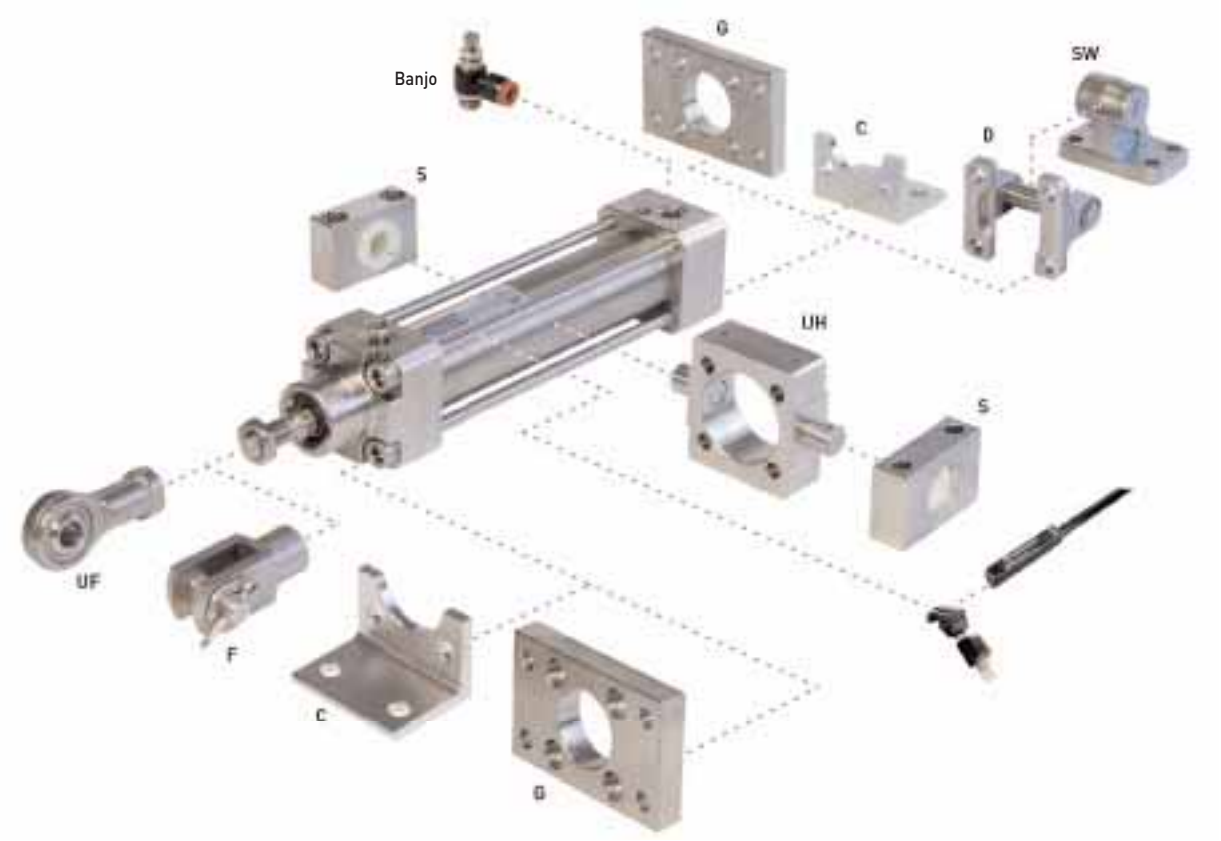
Strokes (mm)
2500 max.

Variants (non-magnetic piston)	Substitute
Standard	
Special wiper/seal	W1
Without cushion	W
Double ended piston rod	J
Special wiper/seal, double ended piston rod	W3

Variants (magnetic piston)	Substitute
Standard	M
Special wiper/seal	W2
Without cushion	MW
Double ended piston rod	JM
Special wiper/seal, double ended piston rod	W4

Note: If option is not required, disregard option position within part number eg. KA/8100/100. For combinations of cylinder variants consult our Technical Service.
This options selector explains only the cylinder variants. Additional variants/options can not be derived from. Information about variants see data sheet.

MOUNTINGS



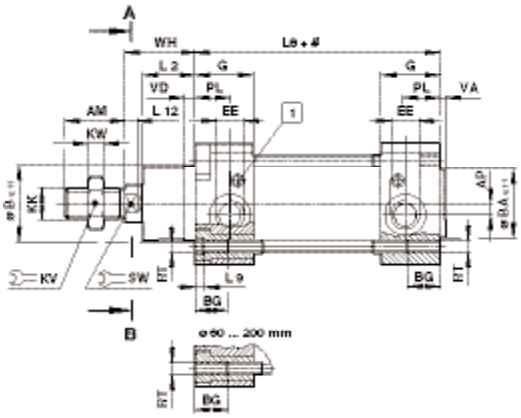
Ø	B, G	C	D	F	S	SW	UF	UH
32	KQA/8032/22	KQA/8032/21	KQA/8032/23	KQM/55433/25	KQA/8032/41	M/P72288	KQM/8025/32	KQA/8032/40
40	KQA/8040/22	KQA/8040/21	KQA/8040/23	KQM/55441/25	KQA/8040/41	M/P72289	KQM/8040/32	KQA/8040/40
50	KQA/8050/22	KQA/8050/21	KQA/8050/23	KQM/55451/25	KQA/8040/41	M/P72290	KKQM/8050/32	KQA/8050/40
63	KQA/8063/22	KQA/8063/21	KQA/8063/23	KQM/55451/25	KQA/8063/41	M/P72291	KQM/8050/32	KQA/8063/40
80	KQA/8080/22	KQA/8080/21	KQA/8080/23	KQM/8080/25	KQA/8063/41	M/P72292	KQM/8080/32	KQA/8080/40
100	KQA/8100/22	KQA/8100/21	KQA/8100/23	KQM/8080/25	KQA/8100/41	M/P72293	KQM/8080/32	KQA/8100/40
125	KQM/8125/22	KQM/8125/21	KQM/8125/23	KKQM/8125/25	KQA/8100/41		KQM/8125/32	KQA/8125/40

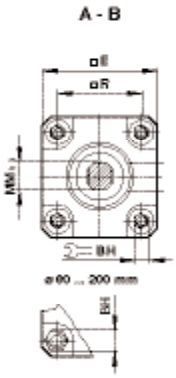
KA/8000, KA/8000/M Stainless steel ISO/VDMA cylinders

Double acting - Ø 32 ... 200 mm

BASIC DIMENSIONS

KA/8000/M - Standard





\# Stroke

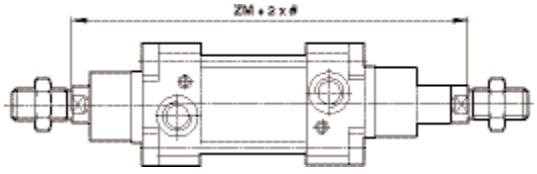
1 Cushion screw

MODELS	Ø	AM	AP	Ø B_{e11}	Ø BA_{e11}	BG	⌀ BH	❑ E	EE	G	KK	⌀ KV	KW	L2
KA/8032/M/.	32	22	3,5	30	30	18	6	47	G 1/8	27,5	M10x1,25	17	5	20
KA/8040/M/.	40	24	4,5	35	35	18	6	53	G 1/4	32	M12x1,25	19	6	22
KA/8050/M/.	50	32	6	40	40	18	8	65	G 1/4	31	M16x1,5	24	8	27
KA/8063/M/.	63	32	10	45	45	17,5	8	75	G 3/8	33	M16x1,5	24	8	29
KA/8080/M/.	80	40	8,5	45	45	21,5	19	95	G 3/8	33	M20x1,5	30	10	33
KA/8100/M/.	100	40	9	55	55	21,5	19	115	G 1/2	37	M20x1,5	30	10	36
KA/8125/M/.	125	54	10	60	60	32	24	140	G 1/2	46	M27x2	41	13,5	45
KA/8160/M/.	160	72	18	65	65	28,5	32	180	G 3/4	50	M36x2	55	18	58
KA/8200/M/.	200	72	18	75	75	28,5	32	220	G 3/4	50	M36x2	55	18	67

MODELS	Ø	L8	L9	L12	Ø MM_{h9}	PL	❑ R	RT	⌀ SW	VA	VD	WH	at 0 mm	per 25 mm
KA/8032/M/.	32	94	4	6	12	13	32,5	M 6	10	3	6	26	1,12 kg	0,06 kg
KA/8040/M/.	40	105	4	6,5	16	15	38	M 6	13	3,5	6	30	1,65 kg	0,08 kg
KA/8050/M/.	50	106	5	8	20	18,5	46,5	M 8	17	3,5	6	37	2,57 kg	0,13 kg
KA/8063/M/.	63	121	5	8	20	19	56,5	M 8	17	4	6	37	3,95 kg	0,14 kg
KA/8080/M/.	80	128	-	10	25	19	72	M 10	22	4	6	46	6,64 kg	0,30 kg
KA/8100/M/.	100	138	-	10	25	20,5	89	M 10	22	4	6	51	10,67 kg	0,34 kg
KA/8125/M/.	125	160	-	13	32	20,5	110	M 12	27	6	15,5	65	20,82 kg	0,51 kg
KA/8160/M/.	160	180	-	16	40	21	140	M 16	36	4	15	80	37,3 kg	0,88 kg
KA/8200/M/.	200	180	-	16	40	21	175	M 16	36	5	15	95	59,0 kg	1,14 kg

ALTERNATIVE VARIANTS

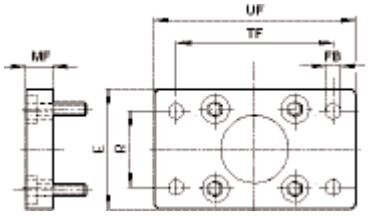
KA/8000/JM – Cylinder with double ended piston rod



MODELS	Ø	ZM	at 0 mm	per 25 mm
KA/8032/JM/.	32	146	1,17 kg	0,08 kg
KA/8040/JM/.	40	165	1,80 kg	0,12 kg
KA/8050/JM/.	50	180	2,81 kg	0,19 kg
KA/8063/JM/.	63	195	4,22 kg	0,20 kg
KA/8080/JM/.	80	220	7,18 kg	0,40 kg
KA/8100/JM/.	100	240	11,21 kg	0,44 kg
KA/8125/JM/.	125	290	21,94 kg	0,67 kg
KA/8160/JM/.	160	340	39,54 kg	1,13 kg
KA/8200/JM/.	200	370	61,39 kg	1,39 kg

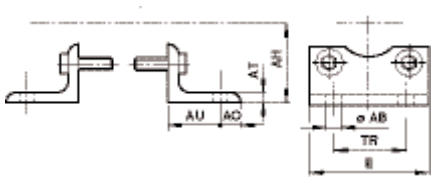
MOUNTINGS

Rear flange - B, front flange - G
Corresponds to ISO 15552, type MF1 and MF2



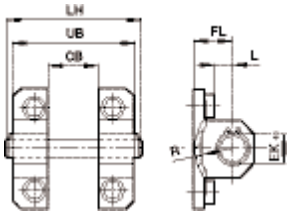
MODELS	Ø	E	Ø FB	MF	R	TF	UF	kg
KQA/8032/22	32	50	7	10	32	64	80	0,26
KQA/8040/22	40	55	9	10	36	72	90	0,31
KQA/8050/22	50	65	9	12	45	90	110	0,56
KQA/8063/22	63	75	9	12	50	100	125	0,73
KQA/8080/22	80	100	12	16	63	126	154	1,73
KQA/8100/22	100	120	14	16	75	150	186	2,51
KQA/8125/22	125	140	16	20	90	180	224	4,48

Foot - C
Corresponds to ISO 15552, type MS1



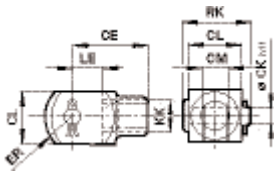
MODELS	Ø	Ø AB	AH	AO	AT	AU	E	TR	kg
KQA//8032/21	32	7	32	11	4	24	48	32	0,22
KQA//8040/21	40	9	38	12	4	28	53	36	0,31
KQA//8050/21	50	9	45	13	5	32	64	45	0,43
KQA//8063/21	63	9	50	13	5	32	74	50	0,49
KQA//8080/21	80	12	63	19	6	41	98	63	1,06
KQA//8100/21	100	14	71	19	6	41	115	75	1,25
KQA//8125/21	125	16	90	25	7	45	140	90	1,90

Rear clevis mounting - D
Corresponds to ISO 15552, type MP2



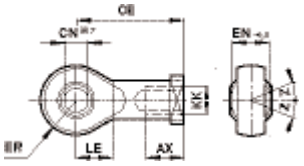
MODELS	Ø	CB	Ø EK f8	FL	L	LH	UB	kg
KQA/8032/23	32	26	10	22	10	52	45	0,13
KQA/8040/23	40	28	12	25	13	60	52	0,20
KQA/8050/23	50	32	12	27	12	68	60	0,31
KQA/8063/23	63	40	16	32	17	79	70	0,54
KQA/8080/23	80	50	16	36	16	99	90	0,95
KQA/8100/23	100	60	20	41	21	119	110	1,06
KQM/8125/23	125	70	25	50	28	140	130	2,44

Piston rod clevis mounting - F
Corresponds to DIN ISO 8140



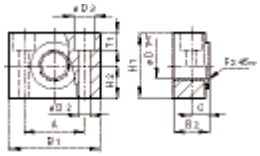
MODELS	Ø	KK	CE	Ø CK h11	CL	CM	ER	LE	RK	kg
KQM/55433/25	32	M10x1,25	40	10	20	10	16	20	28	0,09
KQM/55441/25	40	M12x1,25	48	12	24	12	19	24	32	0,13
KQM/55451/25	50/63	M16x1,5	64	16	32	16	25	32	41,5	0,33
KQM/8080/25	80/100	M20x1,5	80	20	40	20	32	40	50	0,67
KQM/8125/25	125	M27x2	110	30	55	30	45	54	62	1,35

Universal piston rod eye - UF
Corresponds to DIN ISO 8139



MODELS	Ø	KK	AX	CE	Ø CN H7	EN -0,1	ER	LE	Z	kg
KQM/8032/32	32	M10x1,25	20	43	10	14	14,5	14	13°	0,07
KQM/8040/32	40	M12x1,25	22	50	12	16	16,5	16	13°	0,11
KQM/8050/32	50/63	M16x1,5	28	64	16	21	21,5	21	15°	0,21
KQM/8080/32	80/100	M20x1,5	33	77	20	25	25,5	25	15°	0,38
KQM/8125/32	125	M27x2	51	110	30	37	35	35	15°	1,15

Swivel bearing - S
Corresponds to ISO 15552, type AT4

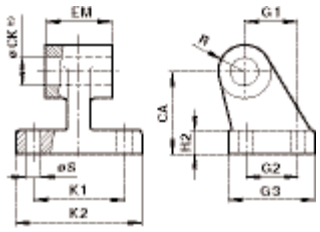


MODELS	Ø	A	B1	B2	C	Ø D1 H7	Ø D2	Ø D3	Fx45°	H1	H2	T1	kg
KQA/8032/41	32	32	46	18	10,5	12	6,6	11	1	30	15	6,8	0,10
KQA/8040/41	40/50	36	55	21	12	16	9	15	1,6	36	18	9	0,14
KQA/8063/41	63/80	42	65	23	13	20	11	18	1,6	40	20	11	0,18
KQA/8100/41	100/125	50	75	28,5	16	25	14	20	2	50	25	13	0,34

KA/8000, KA/8000/M Stainless steel ISO/VDMA cylinders

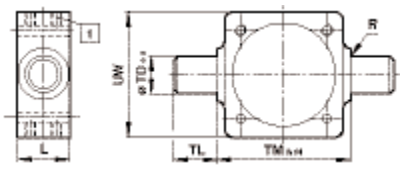
Double acting - Ø 32 ... 200 mm

Bracket for clevis mounting - SW
Corresponds to ISO 15552, type AB7



MODELS	Ø	CA	Ø CK^{H9}	H2	EM	G1	G2	G3	K1	K2	R	Ø S	kg
M/P72288	32	32	10	8	26	21	18	31	38	1,6	10	6,6	0,15
M/P72289	40	36	12	10	28	24	22	35	41	1,6	11	6,6	0,21
M/P72290	50	45	12	12	32	33	30	45	50	1,6	13	9	0,41
M/P72291	63	50	16	12	40	37	35	50	52	1,6	15	9	0,53
M/P72292	80	63	16	14	50	47	40	60	66	2,5	15	11	0,82
M/P72293	100	71	20	15	60	55	50	70	76	2,5	19	11	1,22

Adjustable intermediate trunnion mounting - UH
Corresponds to ISO 15552, type MT4



1 locked torque

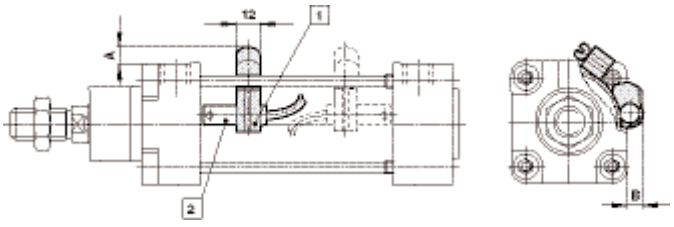
MODELS	Ø	L	R	Ø TD$_{e9}$	TL	TM$_{h14}$	UW	XV min.	XV max.	kg
KQA/8032/40	32	20	1	12	12	50	53	63,5	82,5	0,24
KQA/8040/40	40	24	1,6	16	16	63	65	74	91	0,48
KQA/8050/40	50	28	1,6	16	16	75	75	82	98	0,70
KQA/8063/40	63	28	1,6	20	20	90	95	84	111	1,35
KQA/8080/40	80	28	1,6	20	20	110	115	93	127	1,46
KQA/8100/40	100	38	2	25	25	132	140	112	128	2,76
KQA/8125/40	125	50	2	25	25	160	143	136	154	3,28

Note: style 'UH': It is most important that the locking screws which secure the mounting to the cylinder barrel are tightened to the torque figures shown in the table below.
For maximum energy input, consult our Technical Service.

Mountings for switches

QM/27/2/1 – Bracket, Magnetically operated switch: M/50

Ø	A	B	Weight
32	9	7	0,010 kg
40	8	8	0,010 kg
50	7	5	0,010 kg
63	7	7	0,010 kg
80	7	4	0,010 kg
100	2	2	0,010 kg
125	-4	-3	0,010 kg
160	-10	-9	0,010 kg
200	-17	-14	0,010 kg



1 Bracket
2 Switch

“We will be honest, fair and open in our dealings with customers.”

Norgren’s customer value proposition

Customer service is at the top of Norgren’s business value proposition of increasing its market share and growing revenue by:

- Providing superior customer service
- Product differentiation
- Operational efficiency

Our goal is to be honest, fair and open in our dealings with customers and endeavour to help them at all times. And when things go wrong, as they sometimes do, we will resolve problems as quickly and fairly as we can. Culture aside, customer service relies on sensible service and pricing strategies and the processes to sell and deliver them and to sort out problems. What makes the real difference is how you involve and treat people within these processes.

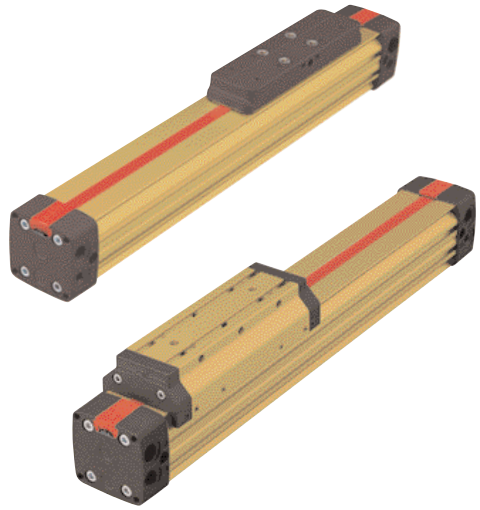
>>CUSTOMER CENTRIC CULTURE Delivery, timeliness, information and attitude

‘Customer service excellence’

Our objective is to achieve customer service excellence which research has indicated are a priority for customers, with particular focus on delivery, timeliness, information, professionalism and staff attitude. There is also emphasis placed on developing customer insight, understanding the user’s experience and robust measurement of service satisfaction.

Norgren is committed to providing customers with value for money products, designed and promoted in a simple and transparent way, and made as widely available as possible. To find out more visit norgren.com

VM/146000, VM/146100 LINTRA®PLUS
Corrosion-resistant rodless cylinders
Double acting, magnetic and non-magnetic piston - Ø 20 ... 80 mm



New lightweight design extrusion with universal mounting grooves

Proven and patented sealing system

Dust protection as standard

Interchangeability with series M/46000

MATERIALS

End covers, closer, carriage and Top cover: aluminium diecast HCR® coated*

Yoke, guiding bridge and profile barrel: anodised aluminium HCR® coated*

Seal strip, wiper and piston seal: polyurethane

Cover strip: polyamide

Other seals: nitrile rubber

Mounting screws: stainless steel (A2)

Shim ring: stainless steel (A2)

* **HCR®: high technology synergistic coating**

TECHNICAL DATA

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

VM/146000, VM/146100
Double acting, with adjustable cushioning
VM/146000/M, VM/146100/M
Double acting with adjustable cushioning and magnetic piston

Operating pressure:

1 ... 8 bar

Operating temperature:

-30°C ... +80°C max.
Consult our Technical Service for use below +2°C

Max strokes:

Made to order
3500 mm max

STANDARD MODELS

	Piston rod Ø	Port size	MODELS Internal guide non-magnetic	MODELS External guide non-magnetic	ACCESSORIES Banjo flow control	Straight fitting	Elbow fitting	Service kit
					Tube diameter in bold			
								
 Non-magnetic piston	20	G1/8	**VM/146020/***	**VM/146120/***	C0K51**08**18	C0225**08**18	C0247**08**18	QM/1460../88/*
	25	G1/8	**VM/146025/***	**VM/146125/***	C0K51**08**18	C0225**08**18	C0247**08**18	QM/1460../88/*
	32	G1/4	**VM/146032/***	**VM/146132/***	C0K511028	C022510**28**	C024710**28**	QM/1460../88/*
	40	G1/4	**VM/146040/***	**VM/146140/***	C0K511028	C022510**28**	C024710**28**	QM/1460../88/*
	50	G3/8	**VM/146050/***	**VM/146150/***	C0K511**2**38	C02251**2**38	C02471**2**38	QM/1460../88/*
	63	G1/2	**VM/146063/***	**VM/146163/***	C0K511**2**48	C02251**2**48	C02471**2**48	QM/1460../88/*
	80	G1/2	**VM/146080/***	**VM/146180/***	C0K511**2**48	C02251**2**48	C02471**2**48	QM/1460../88/*

* Insert stroke length in mm

Other fittings are available, please see section 7

	Piston rod Ø	Port size	MODELS Internal guide magnetic	MODELS External guide magnetic	ACCESSORIES Reed switch with integral 5m cable	Banjo flow control	Straight fitting	Elbow fitting	Service kit
						Tube diameter in bold			
									
 Magnetic piston	20	G1/8	**VM/146020/M/***	**VM/146120/M/***	M/50/LSU/5V	C0K51**08**18	C0225**08**18	C0247**08**18	QM/1460../88/*
	25	G1/8	**VM/146025/M/***	**VM/146125/M/***	M/50/LSU/5V	C0K51**08**18	C0225**08**18	C0247**08**18	QM/1460../88/*
	32	G1/4	**VM/146032/M/***	**VM/146132/M/***	M/50/LSU/5V	C0K511028	C022510**28**	C024710**28**	QM/1460../88/*
	40	G1/4	**VM/146040/M/***	**VM/146140/M/***	M/50/LSU/5V	C0K511028	C022510**28**	C024710**28**	QM/1460../88/*
	50	G3/8	**VM/146050/M/***	**VM/146150/M/***	M/50/LSU/5V	C0K511**2**38	C02251**2**38	C02471**2**38	QM/1460../88/*
	63	G1/2	**VM/146063/M/***	**VM/146163/M/***	M/50/LSU/5V	C0K511**2**48	C02251**2**48	C02471**2**48	QM/1460../88/*
	80	G1/2	**VM/146080/M/***	**VM/146180/M/***	M/50/LSU/5V	C0K511**2**48	C02251**2**48	C02471**2**48	QM/1460../88/*

* Insert stroke length in mm

Other fittings are available, please see section 7
For information on additional magnetic switches see page 290

For further information

www.norgren.com/info/en1-278

OPTIONS SELECTOR

VM/146★★★/★★/★★★★

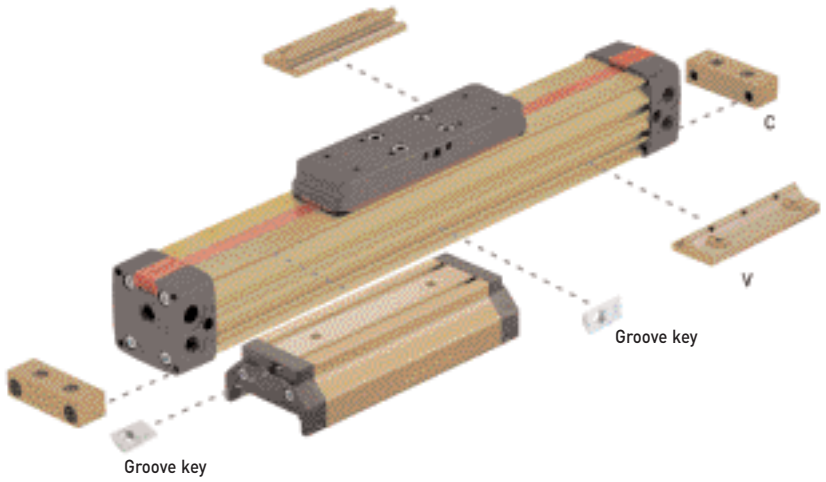
Guiding system	Substitute
Internal	0
External	1

Cylinder Ø (mm)	Substitute
20, 25, 32, 40, 50, 63, 80	

Strokes (mm)
On request, 3500 max

Variants	Substitute
Non-magnetic piston	None
Magnetic piston	M

MOUNTINGS



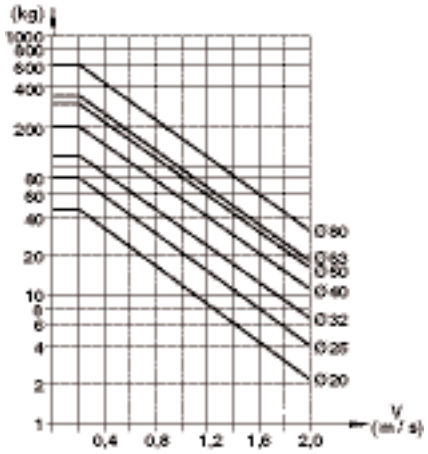
Ø	C	V	Groove key for profile barrel	Groove key for guiding bridge
20	VQM/146020/21	VQM/146020/32	-	-
25	VQM/146025/21	VQM/146025/32	M/P74110	M/P74110
32	VQM/146032/21	VQM/146032/37	M/P74110	M/P74110
40	VQM/146040/21	VQM/146040/37	M/P74110	M/P74111
50	VQM/146050/21	VQM/146050/37	M/P74110	M/P74112
63	VQM/146063/21	VQM/146063/32	M/P74110	M/P74112
80	VQM/146080/21	VQM/146080/32	-	-

VM/146000, VM/146100 LINTRA®PLUS Corrosion-resistant rodless cylinders

Double acting, magnetic and non-magnetic piston - Ø 20 ... 80 mm

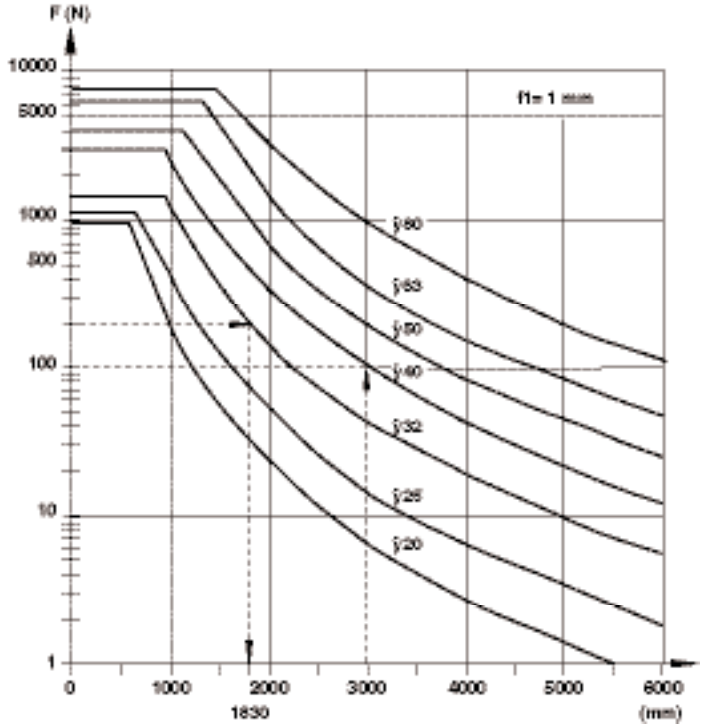
CUSHIONING PERFORMANCE

The dynamic energy of a LINTRA® cylinder is caused by direct or partial external loads which must be absorbed by pneumatic cushioning.
The cushioning ability depends to a large extent on the pneumatic circuit (e. g. counter pressure, pre-exhaust). The values given in the diagram were tested with an operation pressure of 6 bar using a 5/2 control valve. When installed horizontally, depending upon the speed, dynamic energy can be absorbed by the cylinder. Whenever the values given in the diagram are exceeded, the transported mass must be cushioned by additional shock absorbers. These have to be located at the center of gravity of the mass.



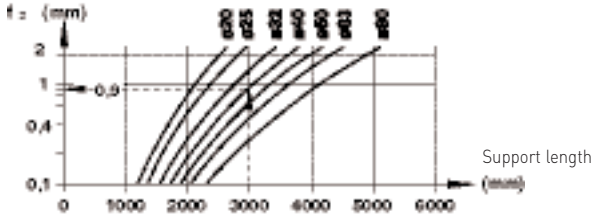
CYLINDER DEFLECTION

Deflection due to external forces



Support length (mm)

Deflection due to cylinder weight



Example:
Cylinder Ø 32 mm, stroke length 3500 mm, external load 200 N and a deflection about 1 mm.
Maximum distance between supports = 1830 mm (see diagrams).
Therefore an additional support is required.

Example:
Cylinder Ø 40 mm, external force 180 N,
distance between supports 3000 mm
Required: total deflection

1. Deflection due to external force (f1) see Diagram 1 (1mm/100 N) · 180 N	**1,8 mm**
2. Deflection due to cylinder weight diagram 2	**+ 0,9 mm**
Total deflection:	**2,7 mm**

Max. permitted deflection (f1 + f2) **1 mm** / **1000 mm Stroke**

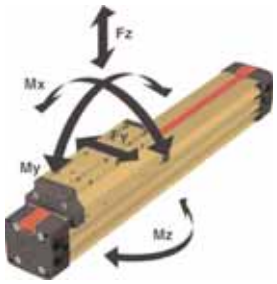
A deflection of more than 3 mm is not permitted.

THEORETICAL FORCES, AIR CONSUMPTION, CUSHIONING LENGTH

Ø mm	Theoretical forces (N) at 6 bar	Air consumption (l/cm) of stroke at 6 bar	Cushioning length (mm)
20	188	0,022	26
25	294	0,035	26
32	482	0,056	35
40	754	0,088	50
50	1178	0,137	60
63	1870	0,218	70
80	3016	0,350	75

Loading values applicable to a speed of ⩽ 0,2 m/s. Maximum working life is normally reached below a speed of 1 m/s

VM/146000, VM/146100



Ø mm	Internal guide VM/146000 Fy (N)	Fz (N)	Mx (Nm)	My (Nm)	Mz (Nm)	External adjustable guide VM/146000 Fy, Fz (N)	Mx (Nm)	My, Mz (Nm)
20	90	280	0,9	12	3,6	470	6	18
25	125	385	1,5	19	5,6	590	9	28
32	165	500	3	33	10	780	17	43
40	330	990	6,5	84	24	1600	39	110
50	440	1320	11	120	35	2000	65	160
63	690	2000	20	240	70	3200	120	350
80	780	2300	27	360	100	3900	180	520

Loading values applicable to a speed of ⩽ 0,2 m/s. Maximum working life is normally reached below a speed of 1 m/s.
* The forces and moments refers to the centre of the guide. They must not be exceeded in dynamic applications.

LOADING VALUES FOR LINTRA® CYLINDERS WITH DOUBLE CARRIAGES

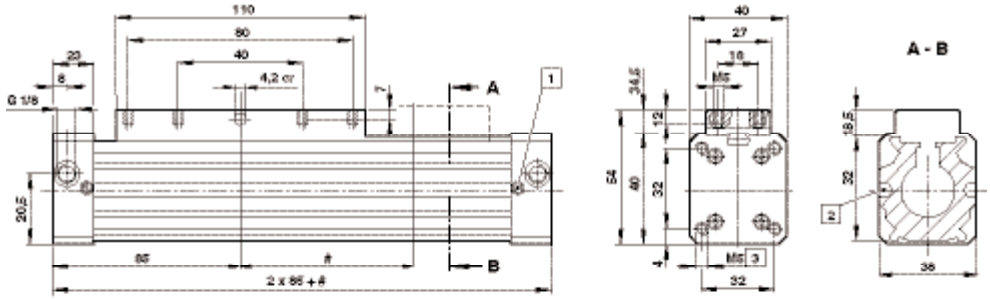
The values given in the table below show the single forces in the directions Fy and Fz and the maximum moments Mx, My and Mz.
All values are applicable only for speeds of max. 0,2 m/s.
A requirement for using these values is a smooth constant movement of the mass over the stroke length of the cylinder.
The reference point from which the moments for all cylinders should be calculated is the centre line of the pistons.

For speeds up to 2 m/s please use our calculation programme LINTRA® PNEUCALC. It is available upon request.
When a LINTRA® cylinder has to take several loads and moments, an additional calculation is necessary using this formula:

$$\frac{Mx}{Mx\ max} + \frac{My}{My\ max} + \frac{Mz}{Mz\ max} + \frac{Fy}{Fy\ max} + \frac{Fz}{Fz\ max} \leq 1$$

BASIC DIMENSIONS

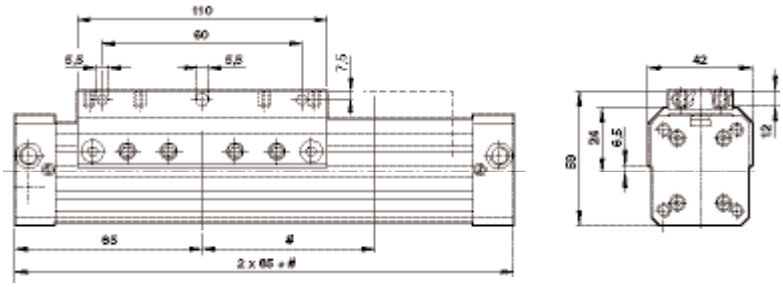
VM/14620 – cylinder with internal guide, cylinder Ø 20 mm



MODELS	Ø	Weight at 0 mm	Weight per 100 mm
VM/146020/...	20	0,50 kg	0,15 kg

\# Stroke
1 Cushion screw
2 M/50 – switches and groove key can be mounted flush with the profile

VM/14620 – cylinder with external adjustable guide ø 20 mm



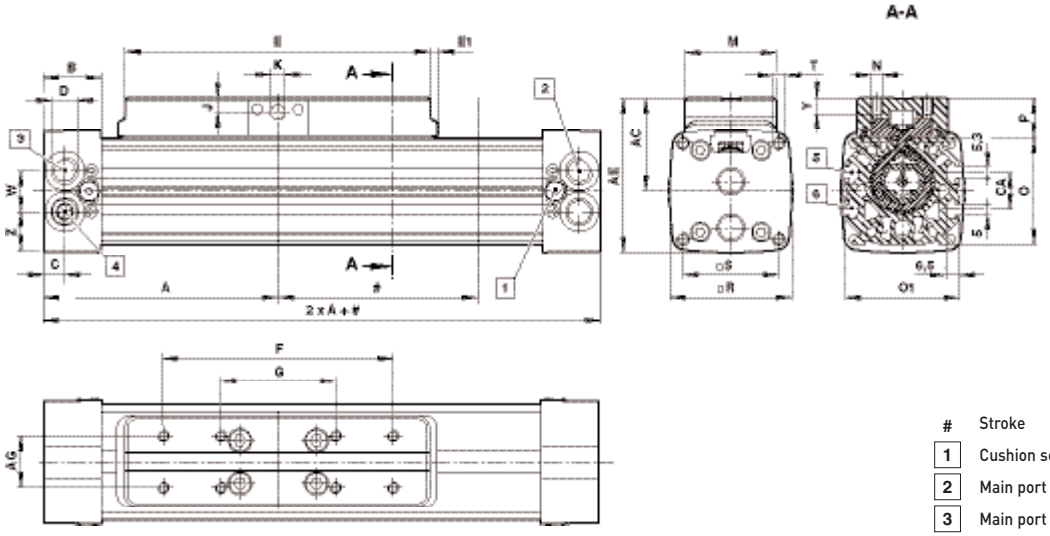
\# Stroke

MODELS	Ø	Weight at 0 mm	Weight per 100 mm
VM/146120/...	20	0,60 kg	0,15 kg

VM/146000, VM/146100 LINTRA®PLUS Corrosion-resistant rodless cylinders

Double acting, magnetic and non-magnetic piston - Ø 20 ... 80 mm

VM/146000 – cylinder with internal guide (Ø 25 ... 63 mm)



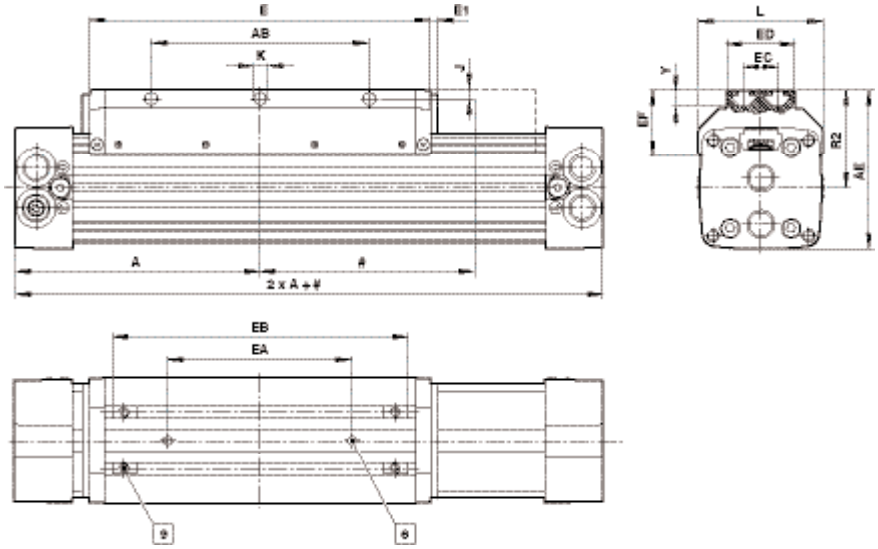
#	Stroke
1	Cushion screw
2	Main port
3	Main port
4	Alternative port with plug inserted
5	M/50 – switches and groove key can be mounted flush with the profile
6	For groove key only

MODELS	Ø	A	AC	AE	AG	B	C	CA	D	E	E1	F	G	J	Ø K^{D7}
VM/146025/...	25	100	36	56	60	23	8,5	–	G1/8	130	–	90	45	4,7	5
VM/146032/...	32	120	46	76	25	28,5	10,5	18	G1/4	160	3,5	120	60	7	7
VM/146040/...	40	150	52,5	90	25	28,5	11,5	18	G1/4	215	–	160	80	7	7
VM/146050/...	50	180	65,5	110	25	38	15	24	G3/8	250	–	190	95	9,5	9
VM/146063/...	63	215	82,5	125	25	38	17	–	G1/2	320	–	240	120	9,5	9

MODELS	Ø	M	N	O	O 1	P	❑ R	❑ S	T	W	Y	Z	Weight at 0 mm	Weight per 100 mm
VM/146025/...	25	32	M5	40	46	16	48	37	M5-13*	16	7	16	0,70 kg	0,25 kg
VM/146032/...	32	45	M5	52	56	20	60	47	M6-17*	20	8	20	1,40 kg	0,30 kg
VM/146040/...	40	45	M6	65	68	20	74,5	58	M8-20*	25	8	25	2,50 kg	0,42 kg
VM/146050/...	50	50	M8	80	84	25,5	89	70	M8-20*	30	11	29,5	4,40 kg	0,62 kg
VM/146063/...	63	50	M8	95	97	25	105	84	M10-24*	35	11	35	6,90 kg	0,90 kg

* Deep

VM/146100 – cylinder with external adjustable guide (Ø 25 ... 63 mm)

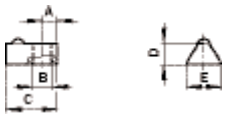


#	Stroke
8	Center bore Ø 6^{H7}, 4 deep
9	Supplied complete with four groove keys

MODELS	Ø	A	AB	AE	E	E1	EA$^{\pm 0,05}$	EB	ED	EC	EF	J	Ø K	L	R 2	Y	Weight at 0 mm	Weight per 100 mm
VM/146125/..	25	100	70	67,5	130	-	50	102	32	20	34	5	5,5	52	43,5	9,5	0,75kg	0,20 kg
VM/146132/..	32	120	90	82	160	4	70	138	45	25	36,5	5	5,5	64	52	6,5	1,50 kg	0,30 kg
VM/146132/..	32	120	90	82	160	4	70	138	45	25	36,5	5	5,5	64	52	6,5	1,50 kg	0,30 kg
VM/146140/..	40	150	120	97,5	215	–	105	193	45	25	43	5	6,6	79	60	9,5	2,60 kg	0,42 kg
VM/146150/..	50	180	160	116,5	250	–	105	228	50	25	47,5	6,5	9	92	72	11,5	4,50 kg	0,62 kg
VM/146163/..	63	215	190	137	320	-	150	292	50	25	59	7,5	9	110	84,5	16,5	7,20 kg	0,90 kg

Groove key for carriage (pos. 9)

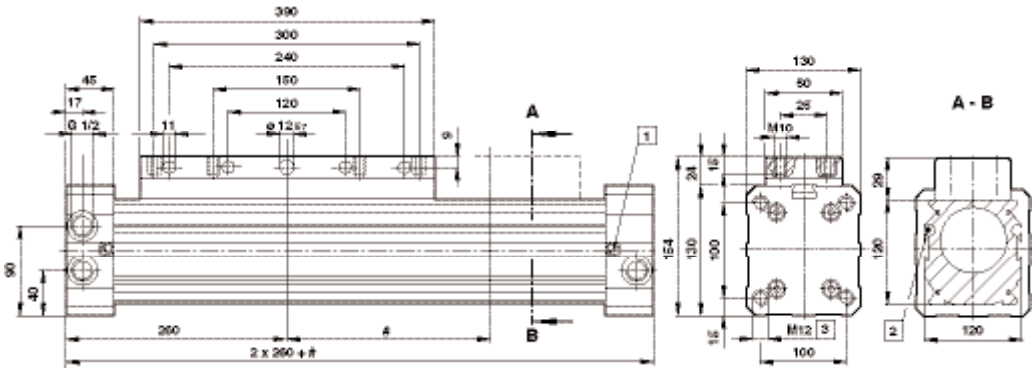
MODELS	Ø	A	B	C	D	E	kg
M/P74110	32	4	M5	12	9	8	0,01
M/P74111	40	4,5	M6	17	12	10,5	0,02
M/P41112	50	7,5	M8	23	7,5	13,5	0,03



VM/146000, VM/146100 LINTRA®PLUS Corrosion-resistant rodless cylinders

Double acting, magnetic and non-magnetic piston - Ø 20 ... 80 mm

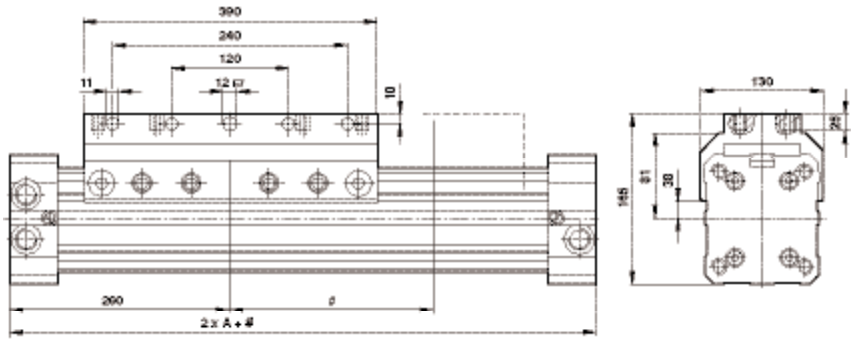
VM/146080 – cylinder with internal guide, cylinder Ø 80 mm



MODELS	Ø	Weight at 0 mm	Weight per 100 mm
VM/146080/...	80	13,20 kg	1,50 kg

#	Stroke
1	Cushion screw
2	M/50 – switches and groove key can be mounted flush with the profile
3	26 deep

VM/146180 – cylinder with external adjustable guide Ø 80 mm

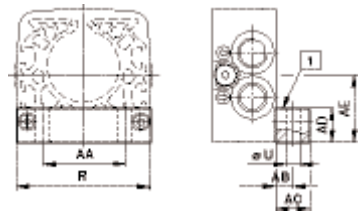


MODELS	Ø	Weight at 0 mm	Weight per 100 mm
VM/146180/...	80	13,20 kg	1,50 kg

#	Stroke

MOUNTINGS

Foot mounting - C

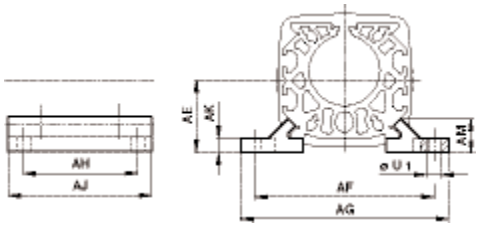


1 TOP

MODELS C	Ø	AA	AB	AC	AD	AE	R	Ø U	kg
VQM/146020/21	20	17	5	10	10	21,5	40	5,5	0,03
VQM/146025/21	25	18	7	15	13,5	24 (26,5)	48	7	0,1
VQM/46032/21	32	26	11	22	16,5	30,5 (33)	60	9	0,1
VQM/46040/21	40	30	11	22	19,5	37,5 (40,5)	75	9	0,2
VQM/46050/21	50	42	12	25	24	45 (49)	90	11	0,3
VQM/146063/21	63	48	13	25	27,5	54 (57,5)	105	13	0,4
VQM/146080/21	80	64	12,5	25	35	70	130	14	0,4

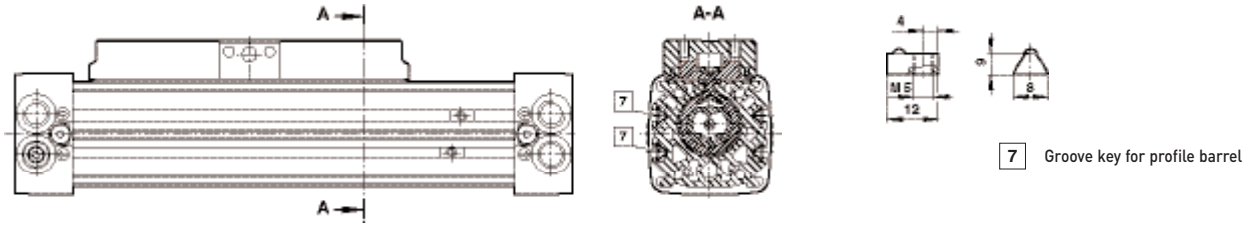
Attention:
Foot mounts can be attached to give different distances AE. When used together with a centre support mounting the word **TOP** should be visible on the top face of the mount.

Centre support - S



MODELS S	Ø	AE	AF	AG	AH	AJ	AK	AM	Ø U1	kg
VQM/146020/32	20	21,5	52	62	45	60	4,5	12	5,5	0,03
VQM/146025/32	25	26,5	60	72	60	80	5,5	13	6,6	0,04
VQM/46032/32	32	30,5	76	92	70	100	6,5	13,5	9	0,07
VQM/46040/32	40	37,5	92	108	90	120	7,5	18,5	9	0,2
VQM/46050/32	50	45	110	128	110	140	7,5	18,5	11	0,2
VQM/146063/32	63	54	132	154	120	160	9	25	13	0,3
VQM/146080/32	80	70	155	180	140	180	12	28,3	14	0,4

M/P74110 – Groove key for profile barrel
Weight: 0,01 kg



7 Groove key for profile barrel

KM/31000 Stainless steel serviceable air bellows

Single acting - Ø 8 to14 inch

- Stainless steel end plates
- Frictionless operation
- No maintenance or lubrication
- Ideal for short stroke, high-force applications
- High isolation level for vibrating machines
- Very easy to install – no alignment problems

TECHNICAL DATA

Medium:
Compressed air, filtered, non-lubricated

Operating pressure:
8 bar maximum

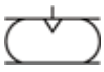
Operating temperature:
-40°C ... +70°C max.

Consult our Technical Service for use below +2°C

Important instructions:
The design of these air bellows allows an operation at an angle of 5° ... 25°. The top and bottom plate can be out of alignment, depending on the height of the air bellow and the number of convolutions. To avoid damage mechanical stops at both end positions have to be used. To return Air Bellows to their minimum height an external return force must be used. The thrust depends directly on the height of the air bellow: When height increases – the thrust decreases. As the outside diameter varies in operation there must be enough clearance around the air bellow.

STANDARD MODELS

Nominal Ø (inch) x convolutions	Maximum stroke (mm)	Port size	MODELS
8 X 1	80	G1/2	**KM/31081**
8 X 2	175	G1/2	**KM/31082**
10 X 1	100	G1/2	**KM/31101**
10 X 2	225	G1/2	**KM/31102**
10 X 3	330	G1/2	**KM/31103**
12 X 1	100	G1/2	**KM/31121**
12 X 2	225	G1/2	**KM/31122**
12 X 3	330	G1/2	**KM/31123**
14 1/2 X 1	125	G1/2	**KM/31141**
14 1/2 X 2	265	G1/2	**KM/31142**
14 1/2 X 3	380	G1/2	**KM/31143**



Safety note: These actuators must not be pressurised when unrestrained.
For exact calculation for compact air bellows please contact our Technical Service.

For further information

www.norgren.com/info/en1-286

OPTIONS SELECTOR

★KM/31★★★

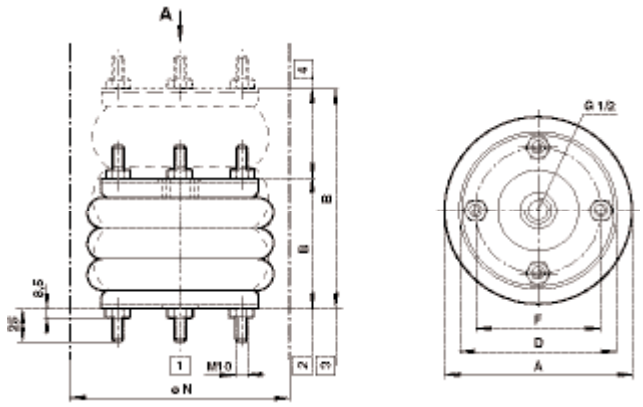
Air bellow materials	Substitute
NR-, SBR-, BR-Materials	None
High temperature (Butyl)	T
Extreme temperature (Epichlore)	E

Number of convolutions	Substitute
1	1
2	2
3	3

Nominal diameters (inches)	Substitute
8	08
10	10
12	12
14 1/2	14

This options selector explains only the cylinder variants.
Additional variants/options are not possible.
Information about variants see data sheet.

BASIC DIMENSIONS
KM/31081 ... KM/31143



1 Installation diameter min.
2 Installation height min.
3 Installation height max.
4 Stroke

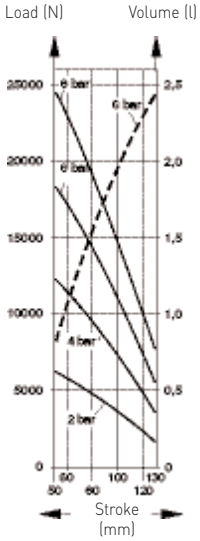
MODELS	Nominal diameter (inch) x air bellows	Strokes (mm)	Installation height B min. (mm)	B max. (mm)	Ø A	Ø D	Ø F	Ø N	Weights (kg)
KM/31081	8 x 1	80	50	130	230	184	156	245	6,4
KM/31082	8 x 2	175	75	250	220	184	156	245	7,3
KM/31101	10 x 1	100	50	150	280	210	181	300	8,5
KM/31102	10 x 2	225	75	300	270	210	181	300	9,7
KM/31103	10 x 3	330	100	430	270	210	181	300	10,9
KM/31121	12 x 1	100	50	150	330	260	232	350	13,2
KM/31122	12 x 2	225	75	300	325	260	232	350	14,8
KM/31123	12 x 3	330	100	430	325	260	232	350	16,3
KM/31141	14 1/2 x 1	125	50	175	395	310	283	425	18,6
KM/31142	14 1/2 x 2	275	75	340	400	310	283	425	19,6
KM/31143	14 1/2 x 3	380	100	480	400	310	283	425	20,5

KM/31000 Stainless steel serviceable air bellows

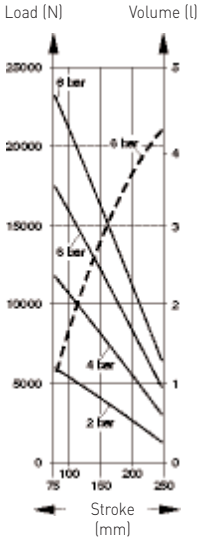
Single acting - Ø 8 to14 inch

THRUST (AT 2, 4, 6, 8 BAR), VOLUME (AT 6 BAR)

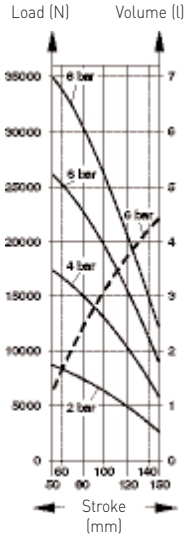
KM/31081



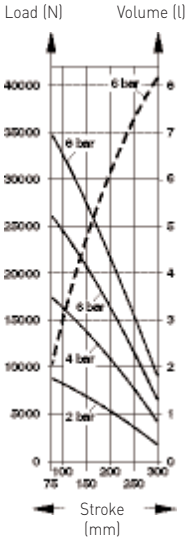
KM/31082



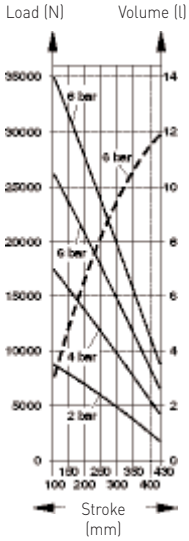
KM/31101



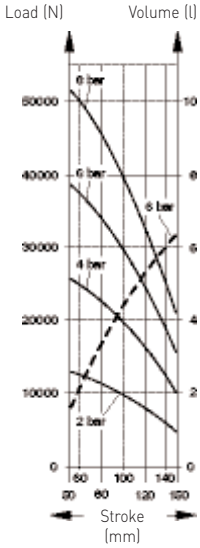
KM/31102



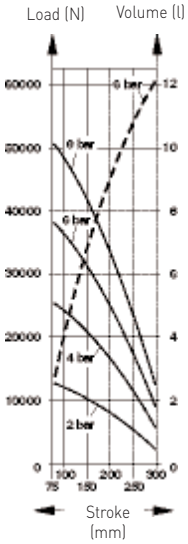
KM/31103



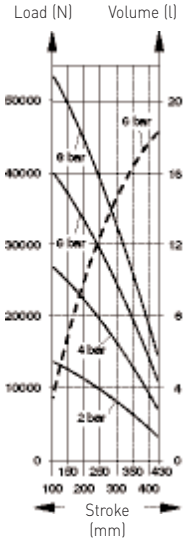
M/31121



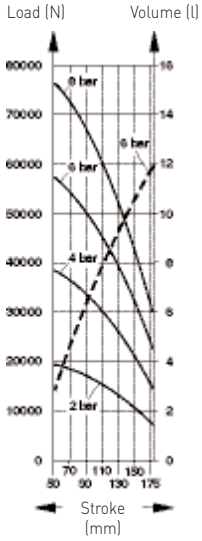
KM/31122



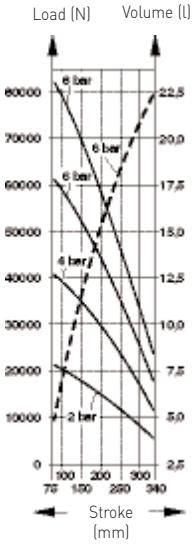
KM/31123



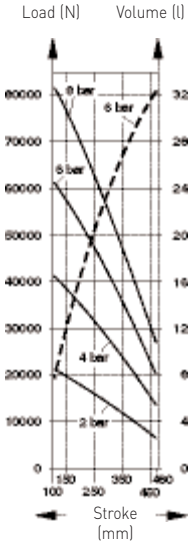
KM/31141



KM/31142



KM/31143



–– Thrust (N) – – Volume (l)

Examples of calculation see page 251 & 253

“Innovation that improved reliability also improved performance and passenger safety”

Door control assembly

Pneumatic door systems mounted separately in the ceiling of class 14X, 15X and 170 vehicles along with piping and regulators suffered from poor reliability, causing frequent delays to schedules.

A Norgren custom-built replacement was designed to be easier to replace and engineered to a higher specification to eliminate the need for individually piped and wired valves. The simplified design comprised a single plug-in block that housed Nugget 40 valves with T20 regulators.

The ‘modular door control assembly’ achieved the customers’ goal of a key system with greater reliability that took less time to replace. In addition, the new replacement improved performance and safety.

FOUR STAGE FILTRATION SYSTEM

ALUMINIUM FITTINGS ARE 65% LIGHTER

MODULAR DOOR CONTROL ASSEMBLY

‘Rail industry innovation’

FOUR STAGE FILTRATION SYSTEM

Designed to remove oil and water carried through to the vehicle sub-systems, increased reliability and reduced both maintenance and system failure costs.

ALUMINIUM FITTINGS ARE 65% LIGHTER

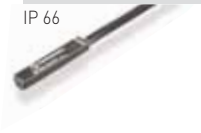
Lighter than conventional brass fittings, Norgren aluminium fittings are installed without specialist tools and connections can be re-made without damaging tubing. They can replace conventional
fittings in most pneumatic applications including auxiliary systems, door controls and brakes.

Visit norgren.com/rail

MAGNETICALLY OPERATED SWITCHES M/50

For roundline, ISO/VDMA, VDMA compact, Lintra® rodless cylinders and slide tables

These switches are delivered with an adaptor as standard.
This combination allows you to use M/50 switches instead of QM/33, QM/34 and QM/134.

	MODELS	Type	Voltage V a.c.*[1]	V d.c.*[2]	Current max.	Temperature °C	LED	Features	Cable length	Cable type	Plug-in cable straight
 IP 66	**M/50/LSU/*V**	Reed	10 ... 240	10 ... 170	180 mA	-20 ... +80	•	–	2, 5, 10 m	PVC 2 x 0,25	–
	M/50/LSU/5U	Reed	10 ... 240	10 ... 170	180 mA	-20 ... +80	•	–	5 m	PUR 2 x 0,25	–
	TM/50/RAU/2S	Reed	10 ... 240	10 ... 170	180 mA	-20 ... +150	–	High temperature	2 m	Silicon 2 x 0,25	–
	M/50/RAC/5V	Reed	10 ... 240	10 ... 170	180 mA	-20 ... +80	–	Changeover	5 m	PVC 3 x 0,25	–
	M/50/LSU/CP	Reed	10 ... 60	10 ... 75	180 mA	-20 ... +80	•	Plug M8x1	~0,27 m	PVC 3 x 0,25	M/P73001/5
 IP 66 with plug-in cable	**M/50/EAP/*V**	Solid state	–	10 ... 30	150 mA	-20 ... +80	•	PNP	2, 5, 10 m	PVC 3 x 0,25	–
	M/50/EAP/CP	Solid state	–	10 ... 30	150 mA	-20 ... +80	•	PNP, Plug M8x1	~0,27 m	PVC 3 x 0,25	M/P73001/5
	M/50/EAN/*V	Solid state	–	10 ... 30	150 mA	-20 ... +80	•	NPN	2, 5, 10 m	PVC 3 x 0,25	–
	M/50/EAN/CP	Solid state	–	10 ... 30	150 mA	-20 ... +80	•	NPN, Plug M8x1	5 m	PVC 3 x 0,25	M/P73001/5

* 5 m is the length of the plug-in cable. The switch features an M8 x 1 plug with a 0,3m cable

*[1] 10 VA

*[2] Reed 10 W; Solid state 4,5 W

DIRECT MOUNTED SWITCHES






Ø 32 ... 125 mm	Ø 16 ... 80 mm	Ø 32 ... 125 mm	Ø 32 ... 100 mm	Ø 20 ... 63 mm	Ø 16 ... 32 mm
PRA/181000/M	M/146000/M	M/162000/M	M/61000/M, .../MR	RA/191000/M, .../MX	M/61200/M, .../MR
PRA/182000/M	M/146100/M	–	–	RA/193000/M, .../MX	–
–	M/146200/M	–	–	RA/192000/M, .../MX	–

BRACKET MOUNTED SWITCHES







Ø 32 ... 200 mm	Ø 32 ... 100 mm	Ø 10 ... 63 mm	Ø 10 ... 25 mm	Ø 12 ... 100 mm	Ø 10 ... 40 mm	Ø 25 ... 40 mm
RA/8000/M	RM/55401/M	RT/57100/M	RM/8000/M	RM/91000/M	M/60100/M	M/44000/M
KA/8000/M	KM/55001/M	RT/57200/M	RM/28000/M	RM/92000/M	–	–
RM/900/M	–	–	KM/8000/M	–	–	–








Ø mm	inch	MODELS	Ø mm	MODELS	Ø mm	MODELS	Ø mm	Stroke length ⩾ 15 mm	< 15 mm	Ø mm	MODELS	Ø mm	MODELS	Ø mm	MODELS
Ø32	Ø1 1/4	**QM/27/2/1**	Ø32	**QM/33/432/22**	Ø10	**QM/33/010/22**	Ø10	**QM/33/010/22**	**QM/33/010/23***	Ø12	**M/P72487**	Ø10	**M/P72487**	Ø25	**M/P72487**
Ø40	Ø1 3/4	**QM/27/2/1**	Ø40	**QM/33/440/22**	Ø12	**QM/33/012/22**	Ø12	**QM/33/012/22**	**QM/33/016/23***	Ø16	**M/P72487**	Ø16	**M/P72487**	Ø32	**M/P72487**
Ø50	Ø2	**QM/27/2/1**	Ø50	**QM/33/450/22**	Ø16	**QM/33/016/22**	Ø16	**QM/33/016/22**	**QM/33/016/23***	Ø20	**M/P72487**	Ø25	**M/P72487**	Ø40	**M/P72487**
Ø63	Ø2 1/2	**QM/27/2/1**	Ø63	**QM/33/463/22**	Ø20	**QM/33/020/22**	Ø20	**QM/33/020/22**	**QM/33/020/23***	Ø25	**M/P72487**	Ø32	**M/P72487**	–	–
Ø80	Ø3	**QM/27/2/1**	Ø80	**QM/33/480/22**	Ø25	**QM/33/025/22**	Ø25	**QM/33/025/22**	**QM/33/025/23***	Ø32	**M/P72487**	Ø40	**M/P72487**	–	–
Ø100	Ø4	**QM/27/2/1**	Ø100	**QM/33/410/22**	Ø32	**QM/33/032/22**	–	–	–	Ø40	**M/P72487**	–	–	–	–
Ø125	–	**QM/27/2/1**	–	–	Ø40	**QM/33/040/22**	–	–	–	Ø50	**M/P72487**	–	–	–	–
Ø160	–	**QM/27/2/1**	–	–	Ø50	**QM/33/050/22**	–	–	–	Ø63	**M/P72487**	–	–	–	–
Ø200	–	**QM/27/2/1**	–	–	Ø63	**QM/33/063/22**	–	–	–	Ø80	**M/P72487**	–	–	–	–
–	–	–	–	–	–	–	–	–	–	Ø100	**M/P72487**	–	–	–	–

* Only 1 required per cylinder

For further information

www.norgren.com/info/en1-290

MAGNETICALLY OPERATED SWITCHES

FOR SERIES RA/8000/M AND RM/900/M

	MODELS	Type	Voltage V a.c.*1)	V d.c.*2)	Current max.	Temperature °C	Function	LED	Features	Cable length	Cable type	Plug-in cable
	**TQM/31/2**	Reed	10 ... 240	10 ... 240	2 A	-20 ... +150	NO	–	–	2 m	Silicon 2x0,75	–
	TQM/31/5	Reed	10 ... 240	10 ... 240	2 A	-20 ... +150	NO	–	–	5 m	Silicon 2x0,75	–
	TQM/31/10	Reed	10 ... 240	10 ... 240	2 A	-20 ... +150	NO	–	–	10 m	Silicon 2x0,75	–
	QM/32/2	Reed	10 ... 240	10 ... 240	1 A	-20 ... +80	NO	•	–	2 m	PVC 2x0,75	–
	QM/32/5	Reed	10 ... 240	10 ... 240	1 A	-20 ... +80	NO	•	–	5 m	PVC 2x0,75	–
	QM/32/10	Reed	10 ... 240	10 ... 240	1 A	-20 ... +80	NO	•	–	10 m	PVC 2x0,75	–
	QM/32/2/PU	Reed	10 ... 240	10 ... 240	1 A	-20 ... +80	NO	•	–	2 m	PUR 2x0,75	–
	QM/32/P	Reed	10 ... 240	10 ... 240	1 A	-20 ... +80	NO	•	–	–	–	•
	**QM/132/2**	Solid state	–	10 ... 30	200 mA	-20 ... +80	NO	•	PNP	2 m	PVC 3x0,5	–
	QM/132/5	Solid state	–	10 ... 30	200 mA	-20 ... +80	NO	•	PNP	5 m	PVC 3x0,5	–
	QM/132/10	Solid state	–	10 ... 30	200 mA	-20 ... +80	NO	•	PNP	10 m	PVC 3x0,5	–
	QM/132/5/PU	Solid state	–	10 ... 30	200 mA	-20 ... +80	NO	•	PNP	5 m	PUR 3x0,34	–
	QM/132/E/5	Solid state	–	10 ... 30	200 mA	-20 ... +80	NO	•	PNP, Pulse stretcher	5 m	PUR 3x0,34	–
	QM/132/P	Solid state	–	10 ... 30	200 mA	-20 ... +80	NO	•	PNP	–	–	•

*1) 50 VA
*2) Reed 50 W; Solid state 6 W

PLUG WITH CABLE FOR QM/32/P AND QM/132/P

MODELS	Cable type
M/P34692/5	PVC 3x0,34
M/P34694/5	PUR 3x0,34

BRACKET MOUNTED SWITCHES TQM/31, QM/32, QM/132

Ø 32 ... 320 mm	Ø 1 1/4 ... 4 inch
RA/8000/M	RM/900/M

Ø mm	MODELS	Ø inch	MODELS
32 ... 63	**QM/31/032/22**	Ø 1 1/4 ... 2 1/2	**QM/31/032/22**
80 ... 125	**QM/31/080/22**	Ø 3 ... 4	**QM/31/080/22**
160 & 200	**QM/31/160/22**	–	–
250	**QM/31/250/22**	–	–
320	**QM/31/320/22**	–	–

For further information

www.norgren.com/info/en1-291

MAGNETICALLY OPERATED SWITCHES

FOR GRIPPERS

MODELS	Type	Voltage V d.c.	Current max.	Temperature °C	LED	Signal output	Cable length	Cable type	Straight cable connection	90° elbow cable connection
M/344/EAU/1APV	2-wire solid state	10 ... 28	20 mA	0 ... +60	•	–	1 m	PVC	–	•
M/344/EAU/1PV	2-wire solid state	10 ... 28	20 mA	0 ... +60	•	–	1 m	PVC	•	–
M/344/EAU/3APV	2-wire solid state	10 ... 28	20 mA	0 ... +60	•	–	3 m	PVC	–	•
M/344/EAU/3PV	2-wire solid state	10 ... 28	20 mA	0 ... +60	•	–	3 m	PVC	•	–
M/344/EAN/1APV	3-wire solid state	4,5 ... 28	50 mA	0 ... +60	•	NPN	1 m	PVC	–	•
M/344/EAN/1PV	3-wire solid state	4,5 ... 28	50 mA	0 ... +60	•	NPN	1 m	PVC	•	–
M/344/EAN/3APV	3-wire solid state	4,5 ... 28	50 mA	0 ... +60	•	NPN	3 m	PVC	•	•
M/344/EAN/3PV	3-wire solid state	4,5 ... 28	50 mA	0 ... +60	•	NPN	3 m	PVC	•	–

FOR MINIATURE AND COMPACT ROTARY ACTUATORS

MODELS	Type	Voltage V d.c.	V a.c.	Current max.	Temperature °C	LED	Signal output	Cable length	Cable type	Straight cable connection	90° elbow cable connection
M/346/LAU/1PV	Reed	12 ... 100	12 ... 125	40 mA	-10 ... +60	•	–	1,5 m	PVC	–	•
M/346/LAU/5PV	Reed	12 ... 100	12 ... 125	40 mA	-10 ... +60	•	–	5 m	PVC	–	•
M/346/EAU/1APV	2-wire solid state	4,5 ... 28	–	70 mA	-10 ... +60	•	–	1,5 m	PVC	–	•
M/346/EAU/5APV	2-wire solid state	4,5 ... 28	–	70 mA	-10 ... +60	•	–	5 m	PVC	–	•
M/345/EAU/1PV	2-wire solid state	10 ... 28	–	40 mA	0 ... +60	•	–	1 m	PVC	•	–
M/345/EAU/3PV	2-wire solid state	10 ... 28	–	40 mA	0 ... +60	•	–	3 m	PVC	•	–
M/345/EAN/1PV	3-wire solid state	4,5 ... 28	–	100 mA	0 ... +60	•	NPN	1 m	PVC	•	–
M/345/EAN/3PV	3-wire solid state	4,5 ... 28	–	100 mA	0 ... +60	•	NPN	3 m	PVC	•	–

DIRECT MOUNTED SWITCHES

Ø 8 ... 50 mm
M/1603**/M/11

Ø 8 ... 50 mm
M/1603**/M/12

Ø 8 & 12 mm
M/160360/M/12

Ø 12 ... 25 mm
M/160390/M/12

Ø 16 & 20 mm
M/160380/M/12

Ø 12 ... 20 mm
M/60210/M

Ø 14 ... 22 mm
M/60270/M

For further information

www.norgren.com/info/en1-292

INDUCTIVE PROXIMITY SWITCHES

	MODELS	Voltage V d.c.	Current max.	Temperature °C	LED	Output	Cable length	Plug	Cable type
	**SPC/008001/2**	10 ... 30	200 mA	-30 ... +70	•	Normally open	2 m	-	PVC 3 x 0,14
	SPC/008002/2 .	10 ... 30	200 mA	-30 ... +70	•	Normally closed	2 m	-	PVC 3 x 0,14
	For Cylinder series M/49000/BS, ...LS – M/49100/BS, ...LS – M/49200/BS, ...LS								
	**M/P70104/5**	10 ... 30	200 mA	-25 ... +70	•	Normally closed	2 m	-	PVC 3 x 0,14
	M/P70104/6 .	10 ... 30	200 mA	-25 ... +70	•	Normally open	2 m	-	PVC 3 x 0,14
	For Cylinder series M/49800/P/BS .../BD – M/48800/P – M/46800/PM								
	**M/P70104/10**	10 ... 30	150 mA	-25 ... +70	•	Normally open	-	M8 x 1	-
	M/P70104/11 .	10 ... 30	150 mA	-25 ... +70	•	Normally closed	-	M8 x 1	-
	For Cylinder series M/49800/P/BS .../BD – M/48800/P – M/46800/PM								
	**M/P70104/12**	10 ... 30	150 mA	-25 ... +70	•	Normally open	-	M8 x 1	-
	M/P70104/13 .	10 ... 30	150 mA	-30 ... +70	•	Normally closed	-	M8 x 1	-
	For Cylinder series M/48200/H .../I								
	**4314817**	10 ... 30	400 mA	-25 ... +70	•	Normally open	-	M12 x 1	-
	4314828 .	10 ... 30	400 mA	-30 ... +70	•	Normally closed	-	M12 x 1	-
	For Cylinder series LAE4/LAE8 – LAP4/LAP8								

For information on sensors (technical data, cable material, dimensions, etc.) please consult our Technical Service

DIRECT MOUNTED



Ø 32 ... 63 mm	Ø 25... 63 mm	Ø 25... 63 mm
M/49000/BS, ...LS	M/49100/BS, ...LS	M/49200/BS, ...LS

BRACKET MOUNTED SWITCHES






Ø mm	M/49800/P/BS .../BD	M/48200/H .../I	M/48800/P	M/46800/PM
16	QM/46816/22/64	–	QM/46816/22/64	QM/46816/22/64
25	QM/46816/22/64	QM/48225/22/64	QM/46816/22/64	QM/46816/22/64
40	QM/46816/22/64	QM/48225/22/64	QM/46816/22/64	QM/46816/22/64
50	QM/46816/22/64	–	–	–
63	QM/46816/22/64	QM/48225/22/64	QM/46816/22/64	QM/46816/22/64

Size	LAE4/LAE8	LAP4/LAP8
4	11 195 72	11 195 72
8	11 195 72	11 195 72