

- Unique, advanced design capable of very high performance
- Extremely high speed potential is coupled with outstanding cushioning
- Reduces costs by eliminating trip valves
- Provides a simpler, more compact installation

Magnet Piston Cylinders
ISO 6431
Double Acting
Ø32 - 100 mm bore



Technical Data

Medium:

Compressed air, filtered, lubricated and non-lubricated

Standards:

ISO 6431 and corresponding BS

Operation:

Double acting with adjustable cushioning

Operating Pressure:

1 - 10 bar

Operating Temperature:

-20°C* to +80°C

*Consult our Technical Service for use below +2°C

Non-stock Strokes:

Available on request

Switches:

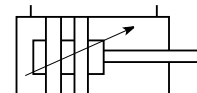
For ranges of switches please see Section 4

Cylinder Diameters

32, 40, 50, 63, 80, 100 mm

Materials

Stainless steel (Martensitic) piston rod, steel tie rods, hard anodised aluminium barrel, pressure diecast zinc alloy to BS 1004 (1972) Alloy 'A' end covers up to 50 mm bore, pressure diecast aluminium alloy on 63 to 100 mm bore, molybdenum disulphide and 30% glass filled thermoplastic polyamide piston rod bearing, cushion sleeves and wear ring, nitrile rubber seals.



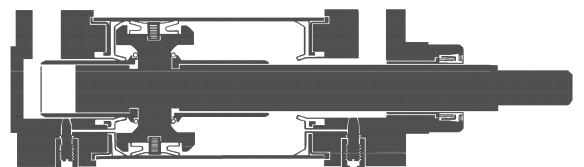
Ordering Information

To order a basic 50 mm bore cylinder with a 185 mm stroke without mounting brackets quote:

M/12050/M/185.

To order mounting brackets refer to appropriate cylinder mounting table.

Order proximity switches separately.





Theoretical Forces/Air Consumption

Air Pressure (bar)		1	2	3	4	5	6	7	8	9	10
M/12032/M Ø32	F1	80,5	161	241	321	402	482	563	643	724	804
	Q1	0,016	0,024	0,032	0,040	0,048	0,056	0,064	0,072	0,080	0,088
	F2	69	138	207	276	345	414	483	552	621	690
	Q2	0,013	0,020	0,027	0,034	0,041	0,048	0,055	0,062	0,069	0,076
M/12040/M Ø40	F1	125	251	377	502	628	754	879	1005	1130	1256
	Q1	0,025	0,037	0,050	0,062	0,075	0,087	0,100	0,113	0,125	0,138
	F2	105	211	316	422	527	633	738	844	949	1055
	Q2	0,021	0,031	0,042	0,052	0,063	0,073	0,084	0,095	0,105	0,116
M/12050/M Ø50	F1	196	393	589	786	982	1178	1375	1571	1768	1964
	Q1	0,039	0,058	0,078	0,098	0,117	0,137	0,157	0,176	0,196	0,216
	F2	170	341	512	683	854	1025	1196	1367	1538	1709
	Q2	0,034	0,051	0,068	0,085	0,103	0,120	0,137	0,154	0,171	0,188
M/12063/M Ø63	F1	312	623	935	1247	1558	1870	2182	2494	2805	3117
	Q1	0,062	0,093	0,124	0,155	0,187	0,218	0,249	0,280	0,311	0,342
	F2	272	547	821	1094	1368	1642	1915	2189	2463	2737
	Q2	0,055	0,082	0,109	0,137	0,164	0,192	0,219	0,246	0,274	0,301
M/12080/M Ø80	F1	503	1005	1508	2010	2513	3016	3518	4021	4523	5026
	Q1	0,100	0,150	0,201	0,251	0,301	0,351	0,402	0,452	0,502	0,552
	F2	454	907	1361	1814	2268	2722	3175	3629	4082	4536
	Q2	0,090	0,135	0,181	0,226	0,272	0,317	0,362	0,408	0,453	0,598
M/12100/M Ø100	F1	785	1570	2355	3140	3925	4710	5495	6280	7065	7850
	Q1	0,157	0,235	0,314	0,392	0,471	0,549	0,628	0,706	0,785	0,865
	F2	704	1409	2114	2819	3524	4229	4934	5639	6344	7049
	Q2	0,141	0,211	0,282	0,352	0,423	0,493	0,564	0,634	0,705	0,775

F1 - Force (N) outstroke
F2 - Force (N) instroke

Q1 - Air consumption (l/cm) outstroke
Q2 - Air consumption (l/cm) instroke

Cushioning

Ø	32	40	50	63	80	100
Cushion length*	30	29	29	36	40	34
Compression ratio	10,8:1	9,9:1	8,1:1	8,1:1	7:1	7,7:1

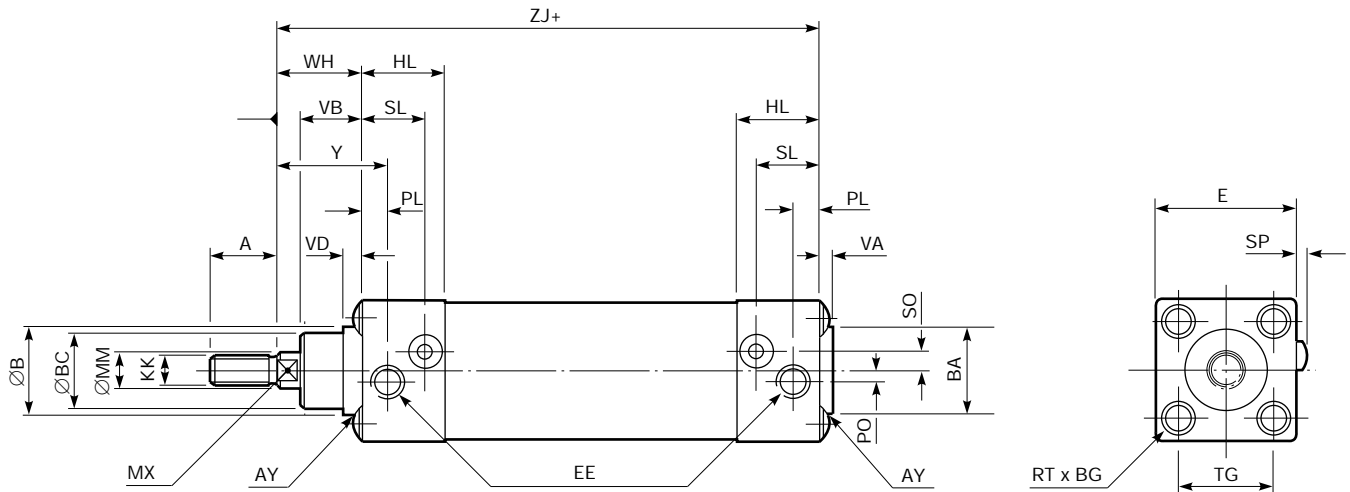
*Short stroke cylinders have modified cushioning - consult our Technical Service.

Weights of Cylinders and Mountings (kg)

Ø	Weight 0 mm	Weight per 25 mm	Weight of Mountings									
			B	C	D	F	G	H	K	L	M	R
32	0,72	0,05	0,10	0,10	0,08	0,10	0,10	0,16	0,08	0,38	0,28	0,15
40	1,07	0,07	0,13	0,11	0,12	0,16	0,13	0,37	0,12	0,68	0,55	0,25
50	1,54	0,10	0,27	0,24	0,20	0,34	0,27	0,55	0,20	0,78	1,28	0,36
63	1,74	0,12	0,26	0,22	0,28	0,34	0,26	1,00	0,28	1,57	1,28	0,64
80	2,53	0,20	0,48	0,50	0,52	0,68	0,48	0,99	0,52	1,87	2,54	1,12
100	4,16	0,26	0,60	0,60	0,82	0,68	0,60	1,97	0,82	3,39	2,54	1,75



Basic Cylinder Dimensions



Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
∅	32	20	50	63	80	100
A	22	24	32	32	40	40
B ^{±.05}	26,9	30	32	40	45	56
E	43	51	61	73	93	113
Y	35	42	52	52	62	69
AY R	1	1,5	1,5	2	2	3
BA ^{±.05}	26,9	30	32	40	45	56
BC	25	27,5	31	39	43	55
BG	7	7	10	10	12	12
EE	G ¹ / ₈	G ¹ / ₄	G ¹ / ₄	G ³ / ₈	G ³ / ₈	G ¹ / ₂
HL	27,5	30	29	31	33	37
KK	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5
MM	12	16	18	22	25	32
MX A/F	11	13	15	19	22	27
PL	9	10	13	13	16	18
PO	3,5	5	7	10	8	7
RT	M6	M6	M8	M8	M10	M10
SL	20	22	22	22	24	27
SO	6	9	10	12	15	18
SP	3	3	3	4	4	4
TG	29,7	37	45	54,5	69	86
VA	3	4	4	4	5	6
VB	18	23	23	30	33	34
VD	6	8	8	10	11	11
WH	26	32	39	39	46	51
ZJ+	120	133	141	156	174	189

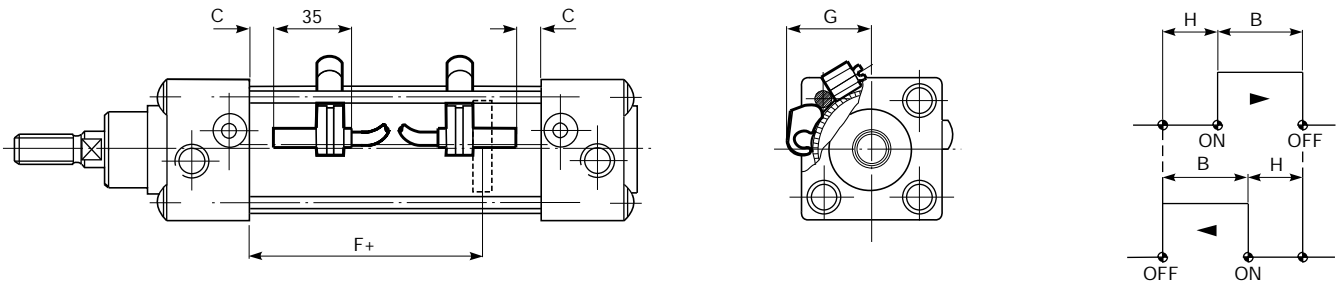
Mountings

B	C	D	F	G	H	K	L
M	R						



Basic Cylinder Dimensions Magnetic Piston Operation

For units fitted with M/27 and M/28



Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
∅	32	40	50	63	80	100
B	10	12	11	12	15	11,5
C	0,5	1,5	1	6	7,5	12
F+	19,5	20,5	22	27,5	31	32
G	29	33	38	44	51	59
H	2	2	2	2,5	2,5	3

Dimension 'C' is the minimum required for full stroke of cylinder when cable is facing inwards and is increased by the appropriate amount to obtain intermediate switch positions.

Schematic representation of switching

Arrow indicates direction of piston travel.

Dimension 'H' is the length during which switch contact is maintained in the 'ON' condition when the piston direction is reversed. This is normally termed 'Hysteresis'.

Dimension 'B' is the distance from the point at which the switch makes contact, i.e. 'ON', to the point of breaking contact, i.e. 'OFF'.

Response time

Switch closure will take place within approximately 1 to 2 milliseconds of the piston magnet reaching the required position.

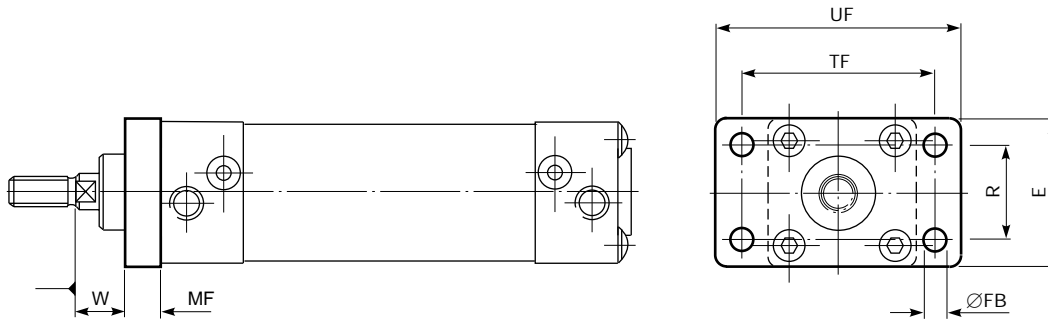
Duration of switch closure is dependent upon instantaneous piston speed and an approximate closure time can be determined using the following formula:

$$T = \frac{B}{u} \text{ (ms)}$$

- Where
- T = Time of closure in milliseconds
 - u = Piston speed in vicinity of switch in metres/second
 - B = Bandwidth in mm



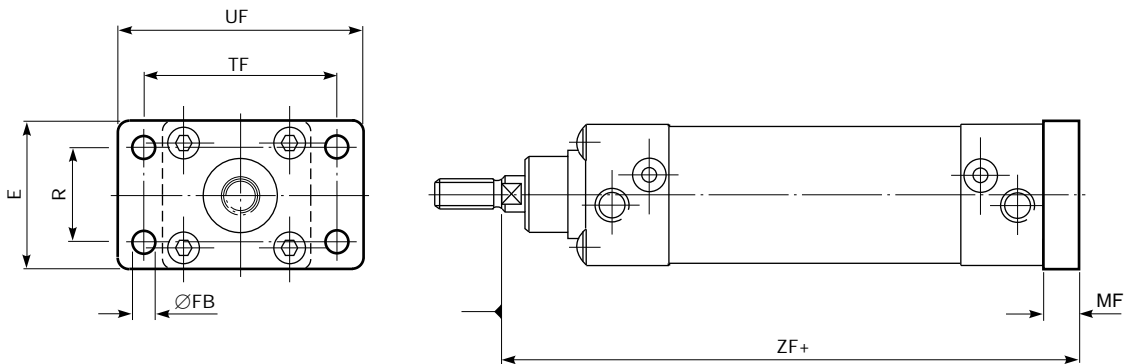
Front Flange Mounting Style 'G'
ISO 6431, Style MF1



Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
Reference	QM/13032/30	QM/13040/30	QM/13050/30	QM/13063/30	QM/13080/30	QM/13100/30
E	50	56	66	78	96	120
R	32	36	45	50	63	75
W	16	20	25	25	30	35
FB	7	9	9	9	12	14
MF	10	12	14	14	16	16
TF	64	72	90	100	126	150
UF	82	92	110	128	156	195

To order a Front Flange Mounting Style 'G', quote Reference, e.g. QM/13050/30 for M/12050/M.

Rear Flange Mounting Style 'B'
ISO 6431, Style MF2

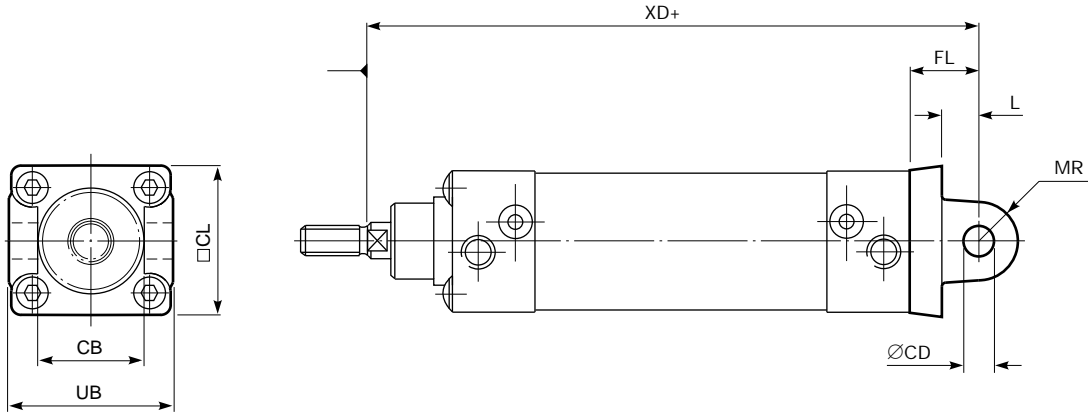


Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
Reference	QM/13032/22	QM/13040/22	QM/13050/22	QM/13063/22	QM/13080/22	QM/13100/22
E	50	56	66	78	96	120
R	32	36	45	50	63	75
FB	7	9	9	9	12	14
MF	10	12	14	14	16	16
TF	64	72	90	100	126	150
UF	82	92	110	128	156	195
ZF+	130	145	156	170	190	205

To order a Rear Flange Mounting Style 'B', quote Reference, e.g. QM/13050/22 for M/12050/M.



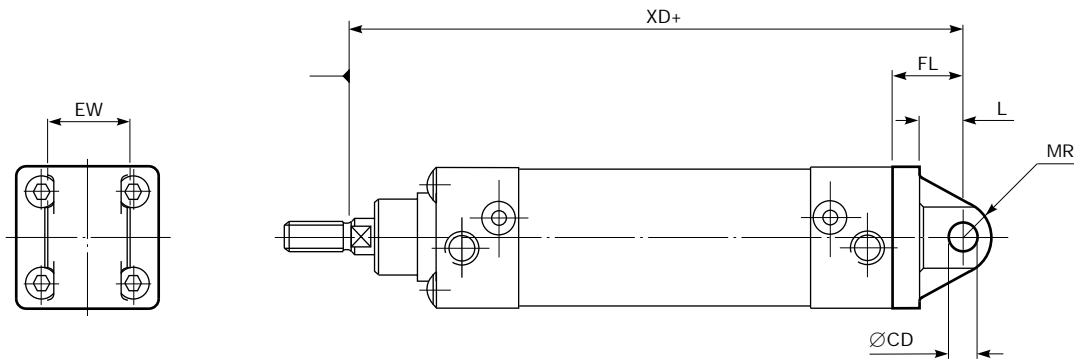
Rear Clevis Mounting Style 'D'
ISO 6431, Style MP2



Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
Reference	QM/13032/23	QM/13040/23	QM/13050/23	QM/13063/23	QM/13080/23	QM/13100/23
L	12	15	15	20	20	25
CB	26	28	32	40	50	60
CDH9	10	12	12	16	16	20
CL	45	53	63	75	96	116
FL	22	27	29	34	36	41
MR	11	14	16	18	21	27
UB	45	52	60	70	90	110
XD+	142	160	170	190	210	230

To order a Rear Clevis Mounting Style 'D', quote Reference, e.g. QM/13040/23 for M/12040/M.

Rear Eye Mounting Style 'R'
ISO 6431, Style MP4



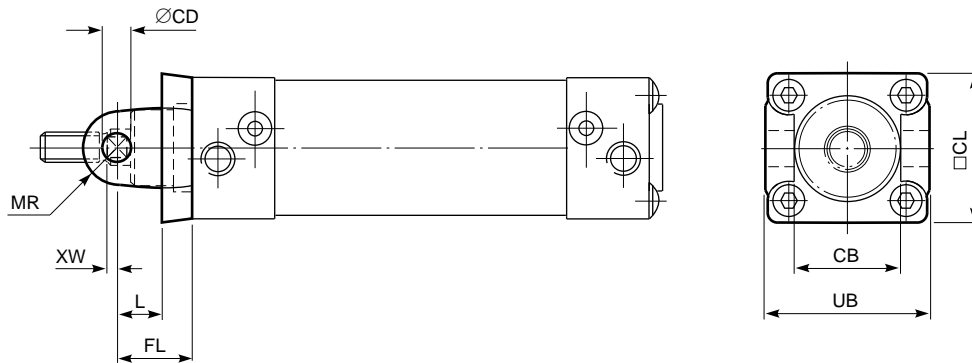
Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
Reference	QM/13032/32	QM/13040/32	QM/13050/32	QM/13063/32	QM/13080/32	QM/13100/32
L	14	18	19	24	24	29
CDG7	10	12	12	16	16	20
EW	25,8	27,8	31,7	39,7	49,7	59,7
FL	22	27	29	34	36	41
MR	9	12	12	15	15	20
XD+	142	160	170	190	210	230

To order a Rear Eye Mounting Style 'R', quote Reference, e.g. QM/13080/32 for M/12080/M.



Front Clevis Mounting Style 'K'

ISO 6431, Style MP7



Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
Reference	QM/13032/29	QM/13040/29	QM/13050/29	QM/13063/29	QM/13080/29	QM/13100/29
L	12	15	15	20	20	25
CB	26	28	32	40	50	60
CDG7	10	12	12	16	16	20
CL	45	53	63	75	96	116
FL	22	27	29	34	36	41
MR	11	14	16	18	21	27
UB	45	52	60	70	90	110
XW	4	5	10	5	10	10

To order a Front Clevis Mounting Style 'K', quote Reference, e.g. QM/13100/29 for M/12100/M.

Note: For Double Ended Piston Rod models, -/J, add 2x stroke length to dimension XD.

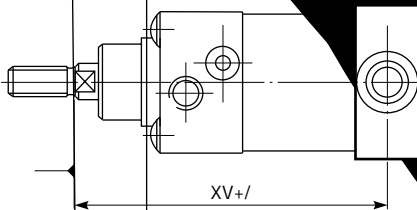
M/12000/M

F
IS

Model	
Reference	
AB	
AH	
AO	
AT	
AU	
DB	
DG	
SA+	
TR	
UL	45
XA+	144

To order a Foot Mounting Style

Central Trunnion Mounting Style 'H'
ISO 6431, Style MT4



Model	M/12032/M	M/12040/M	M/12063/M	M/12080/M
Reference	QM/13032/28	QM/13040/28	QM/13063/28	QM/13080/28
TDe9	12	16	16	16
TLh14	12	16	16	16
TMh14	50	63	75	75
TN	18	20	27	27
UM	74	95	107	130
UV	45	57	70	81
UW	45	65	70	81
XV+/'	73	82,5	90	97,5

Note: These mountings are only supplied assembled complete with the cylinder.

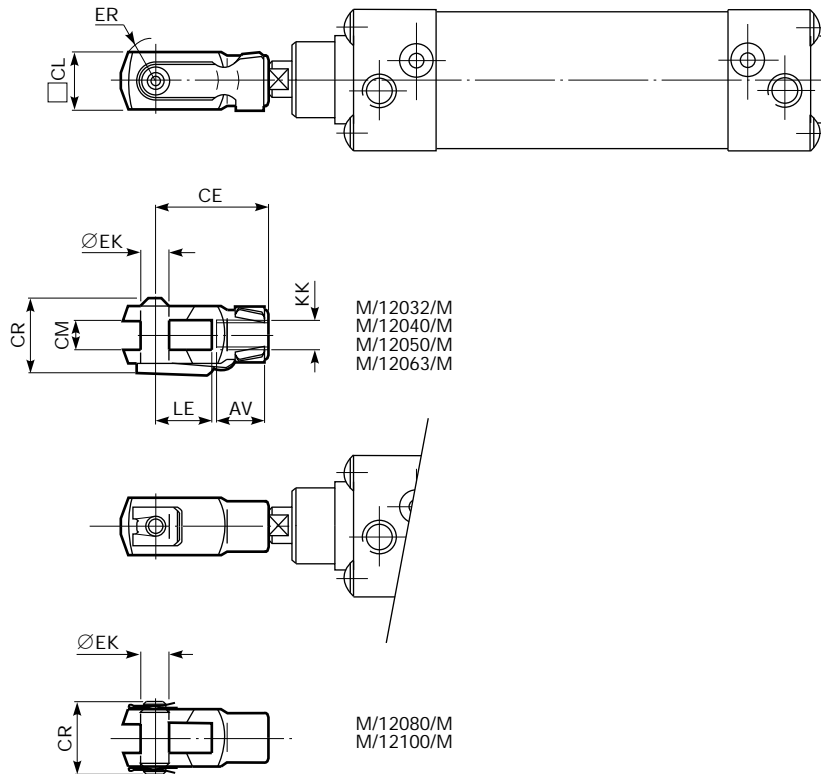
To order a cylinder complete with Central Trunnion Mounting Style 'H', quote cylinder model number with mounting Reference, e.g. M/12063/M/300 complete with QM/13063/28. Unless otherwise specified, units will be supplied with dimension 'XV' plus half stroke length.

N/UK 1.5.132.08

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.
For your local Norgren Technical Sales Centre phone 0345 662266. For your local Norgren Distributor phone 0345 227777.
IMI Norgren Limited, PO Box 22, Eastern Avenue, Lichfield, Staffordshire WS13 6SB



Piston Rod Clevis Mounting Style 'F'

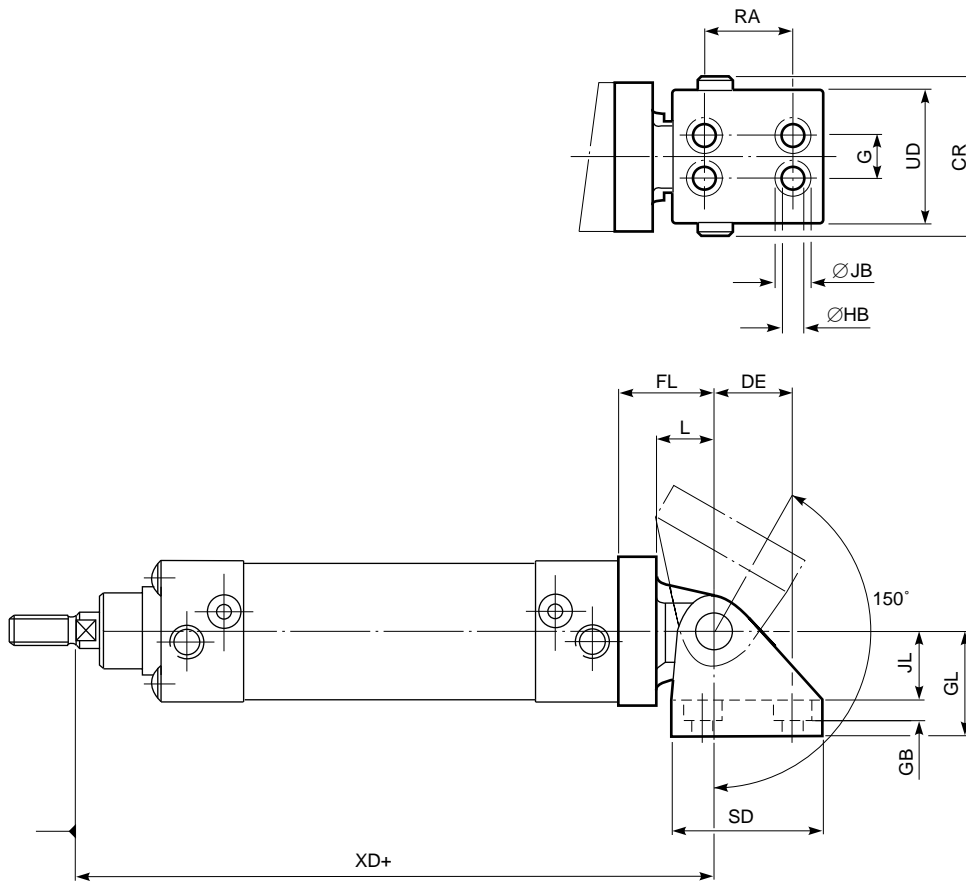


Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
Reference	QM/13032/25	QM/13040/25	QM/13063/25	QM/13063/25	QM/13100/25	QM/13100/25
AV	20	24	32	32	40	40
CE	40	48	64	64	80	80
CL	20	24	32	32	40	40
CMB12	10,33 10,15	12,33 12,15	16,33 16,15	16,33 16,15	20,37 20,16	20,37 20,16
CR	26	31	39	39	52,5	52,5
ER	13,5	16	21,5	21,5	28	28
EKh11	10	12	16	16	20	20
KK	M10x1,25-6H	M12x1,25-6H	M16x1,5-6H	M16x1,5-6H	M20x1,5-6H	M20x1,5-6H
LE	18	24	32	32	40	40

To order a Piston Rod Clevis Mounting Style 'F', quote Reference, e.g. QM/13100/25 for M/12100/M



Rear Hinge Mounting Style 'L'

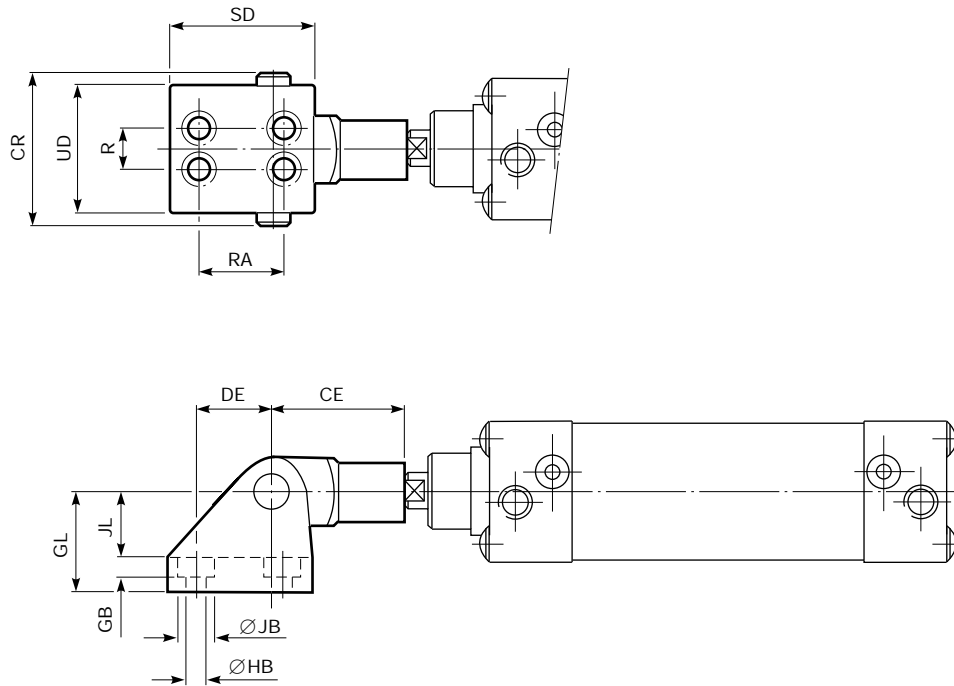


Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
Reference	QM/13032/24	QM/13040/24	QM/13050/24	QM/13063/24	QM/13080/24	QM/13100/24
G	-	-	-	20	20	20
L	14	18	19	24	24	29
CR	45	55	55	76	76	87
DE	22	30	30	41	41	65
FL	22	27	29	34	36	41
GB	6	8	8	8	8	10
GL	30	40	40	60	60	80
HB	7	9	9	9	9	12
JB	11	14	14	14	14	18
JL	20	28	28	46	46	64
RA	25	35	35	50	50	75
SD	43	55	55	72	72	103
UD	38	52	52	70	70	82
XD+	148	168	181	201	224	244

To order a Rear Hinge Mounting Style 'L', quote Reference, e.g. QM/13040/24 for M/12040/M.



Front Hinge Mounting Style 'M'



Model	M/12032/M	M/12040/M	M/12050/M	M/12063/M	M/12080/M	M/12100/M
Reference	QM/13032/26	QM/13040/26	QM/13050/26	QM/13063/26	QM/13080/26	QM/13100/26
R	-	-	20	20	20	20
CE	40	48	64	64	80	80
CR	45	55	76	76	87	87
DE	22	30	41	41	65	65
GB	6	8	8	8	10	10
GL	30	40	60	60	80	80
HB	7	9	9	9	12	12
JB	11	14	14	14	18	18
JL	20	28	46	46	64	64
RA	25	35	50	50	75	75
SD	43	55	72	72	103	103
UD	38	52	70	70	82	82

To order a Front Hinge Mounting Style 'M', quote Reference, e.g. QM/13040/26 for M/12040/M.



Spares

Model	Barrel	Piston & Piston rod Assembly	Spares kit
M/12032/M	M/P18863/*	QM/12032/M*/05	QM/13032/00
M/12040/M	M/P22088/*	QM/12040/M*/05	QM/13040/00
M/12050/M	M/P18886/*	QM/12050/M*/05	QM/13050/00
M/12063/M	M/P18872/*	QM/12063/M*/05	QM/13063/00
M/12080/M	M/P22017/*	QM/12080/M*/05	QM/13080/00
M/12100/M	M/P18947/*	QM/12100/M*/05	QM/13100/00

*Insert stroke length

Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where *pressures* and *temperatures* can exceed those listed under 'Technical Data'.

Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult NORGREN.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.