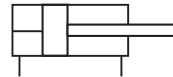


- > Ø 160 ... 320 mm
- > Position sensor provides an analogue output voltage proportional to the stroke length of the cylinder
- > Accurate read-out of piston positioning
- > Norm cylinders conforms to ISO 15552
- > Standard cylinders with a wide range of mountings offer a variety of installation options



Technical features

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.

Standard:

ISO 15552

Betriebsdruck:

1 ... 10 bar (14 ... 145 psi)

Cylinder diameters:

160, 200, 250, 320 mm

Strokes:

See page 2

Maximum input voltage:

40 V d.c.

Recommended input impedance:

100 x sensor resistance

Maximum wiper current Is:

100 µA

Sensor resistance:

8 KΔ/100 mm electrical stroke ±20%, see table on page 3

Insulation resistance:

min. 50 MΔ a 250 V d.c.

Power rating:

1 W/100 mm of electrical travel

Repeatability of potentiometer:

min. 0,013 mm

Protection:

IP67 electrical plug

Operating temperature:

-10 ... +80°C (+14 ... +176°F)

Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F)

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-off circuit 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.

Materials:

Barrel: anodised aluminium
End covers: Ø 160 die-cast aluminium
Ø 200 ... 320 mm cast aluminium
Piston rod: stainless steel (austenitic)
Piston seal, piston rod seal and 'O'-rings: NBR
Position sensor: conductive plastic strip potentiometer,
Housing: plastic

Technical data

Cylinder Ø mm	160	200	250	320
Air ports	G 3/4	G 3/4	G 1	G 1
Piston rod Ø (mm)	40	40	50	63
Piston rod thread	M36 x 2	M36 x 2	M42 x 2	M48 x 2
Cushion length (mm)	45	45	60	65
Theoretical thrusts at 6 bar outstroke N	12064	18840	29436	48228
Theoretical thrusts at 6 bar instroke N	11310	18090	28236	47292
Air consumption at 6 bar outstroke l/cm	1,41	2,2	3,44	5,63
Air consumption at 6 bar instroke l/cm	1,32	2,1	3,3	5,41

Option selector

Cylinder diameters (mm)	Substitute	Strokes (mm)*1)
160	2	600 max.
200	3	
250	4	
320	5	

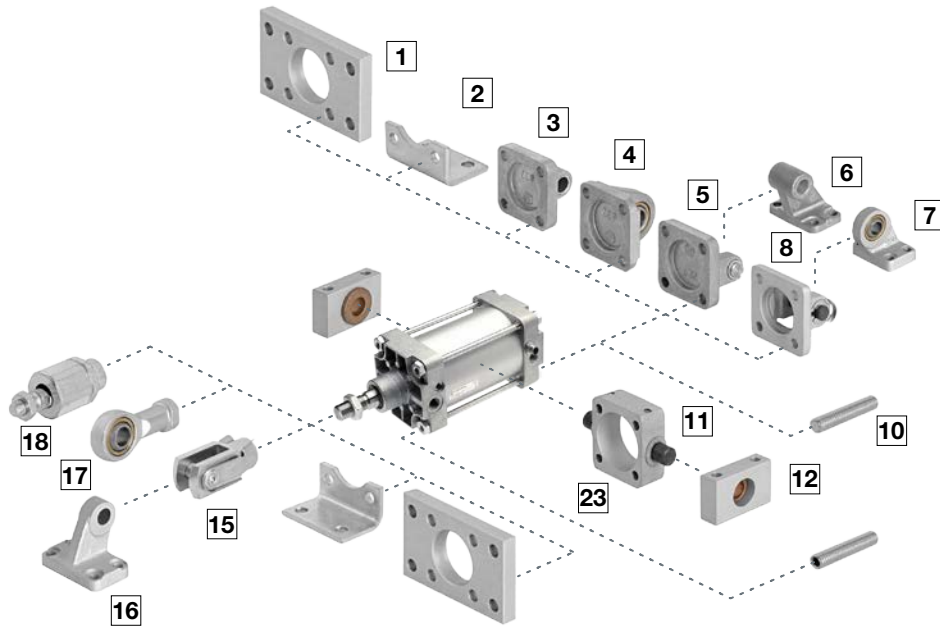
SPC/07036★/★★★

Standard strokes *1)







Cylinder Ø (mm)	Stroke length (mm)										
	50	100	150	200	250	300	400	450	500	550	600
160	•	•	•	•	•	•	•	•	•	•	•
200	•	•	•	•	•	•	•	•	•	•	•
250	•	•	•	•	•	•	•	•	•	•	•
320	•	•	•	•	•	•	•	•	•	•	•






*1) Non-standard-strokes available from 40 ... 600 mm

Mountings and service kits



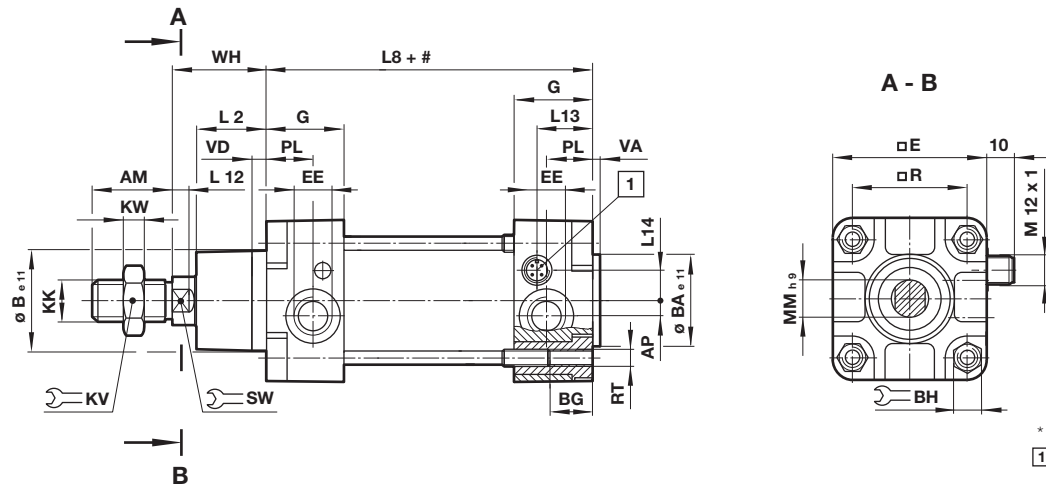
Mountings

Model	A	AK	B, G	C	D	D2	F	H	R
									
Cyl. Ø	10 Page 4	18 Page 4	1 Page 4	2 Page 4	5 Page 4	8 Page 4	15 Page 5	11 Page 5	3 Page 6
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	QM/8160/27
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	QM/8200/27
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	—

	S	SS	SW	UF	UH	UR	US	Service kit
								
Cyl. Ø	12 Page 5	16 Page 6	6 Page 7	17 Page 6	11 Page 5	4 Page 6	7 Page 7	
160	QA/8160/41	M/P19938	M/P19679	QM/8160/32	QM/8160/40	QM/8160/33	M/P71356	LQA/8160/00
200	QA/8160/41	M/P19939	M/P19683	QM/8160/32	QM/8200/40	QM/8200/33	M/P71357	LQA/8200/00
250	—	—	M/P19446	QM/8250/32	—	QM/8250/33	—	LQA/8250/00
320	—	—	M/P19447	QM/8320/32	—	QM/8320/33	—	LQA/8320/00

Dimensions

Dimensions in mm
Projection/First angle



* Stroke
1 Electrical connection

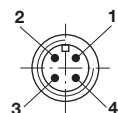
Ø	AM	AP	Ø Be11	Ø BAe11	BG	BH	q E	EE	G	KK	KV	KW	L2	L8	Model
160	72	19	65	65	28,5	32	183,5	G 3/4	50	M36x2	55	18	58	180	SPC/070362/.
200	72	19	75	75	28,5	32	224	G 3/4	50	M36x2	55	18	67	180	SPC/070363/.
250	84	22	90	90	35	36	280	G 1	58	M42x2	65	21	80	200	SPC/070364/.
320	96	22	110	110	30	46	350	G 1	60	M48x2	75	24	90	220	SPC/070365/.
Ø	L12	L13	L14	Ø MMh9	PL	q R	RT	SW	VA	VD	WH	at 0 mm	per 25 mm	Model	
160	16	35	16	40	25	140	M 16	36	4	15	80	14,9 kg	0,55 kg	SPC/070362/.	
200	16	37	15	40	26	175	M 16	36	5	15	95	21,7 kg	0,60 kg	SPC/070363/.	
250	20	32,5	30	50	28	220	M 20	41	7	13	105	32,6 kg	0,92 kg	SPC/070364/.	
320	24	35,5	30	63	31	270	M 24	55	7	13	120	59,8 kg	1,46 kg	SPC/070365/.	

Connection



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

Output socket



Sensor resistance

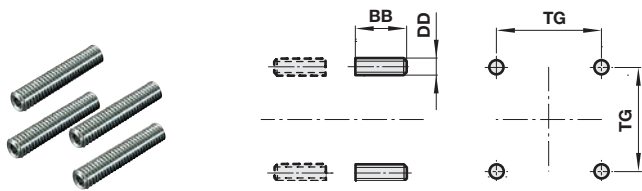
Stroke (mm)	Sensor resistance K Ω
0 ... 50	4
51 ... 100	8
101 ... 150	12
151 ... 200	16
201 ... 250	20
251 ... 300	24
301 ... 350	28
351 ... 400	32
401 ... 450	36
451 ... 500	40
501 ... 550	44
551 ... 600	48

Mountings

Dimensions in mm
Projection/First angle

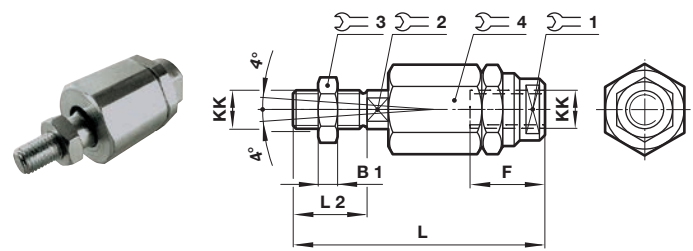
Front or rear stud mounting A

Conforms to ISO 15552, type MX1



Ø	BB	DD	TG	kg	Model
160/200	42	M16	140/175	0,31	QM/8160/35
250	50	M20	220	0,92	QM/8250/35
320	60	M24	270	1,46	QM/8320/35

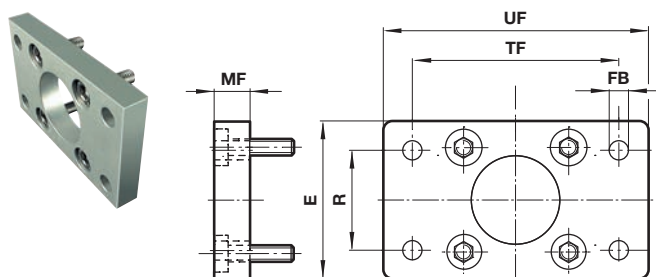
Piston rod swivel AK



Ø	KK	B1	F	L	L2	1	2	3	4	kg	Model
160/200	M36x2	18	78	251	72	50	36	55	75	5,4	QM/8160/38

Front flange B, G

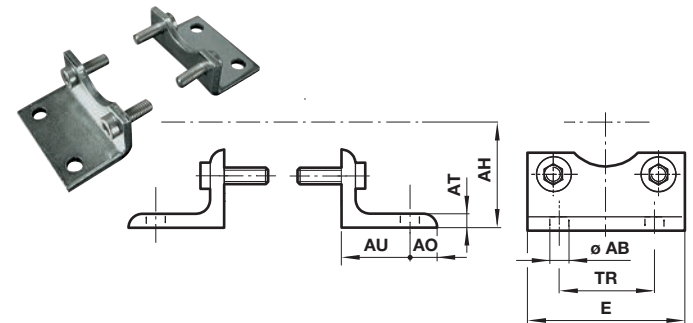
Conforms to ISO 15552, type MF1 and MF2



Ø	E	Ø FB	MF	R	TF	UF	kg	Model
160	180	18	20	115	230	280	3,1	QM/8160/22
200	220	22	25	135	270	320	4,6	QM/8200/22
250	280	26	25	165	330	395	7,4	QM/8250/22
320	350	33	30	200	400	475	13,6	QM/8320/22

Foot mounting C

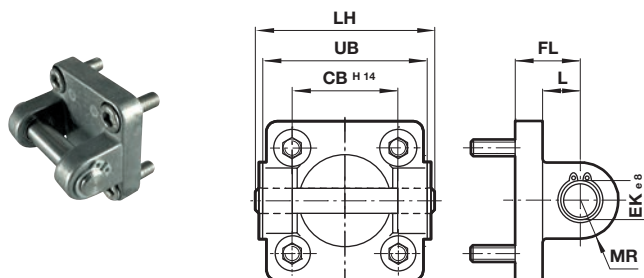
Conforms to ISO 15552, type MS1



Ø	Ø AB	AH	AO	AT	AU	E	TR	kg	Model
160	18	115	20	8	60	180	115	3,5	QM/8160/21
200	22	135	30	9	70	220	135	5,25	QM/8200/21
250	26	165	35	10	75	280	165	9,5	QM/8250/21
320	33	200	45	16	85	350	200	22	QM/8320/21

Rear clevis D

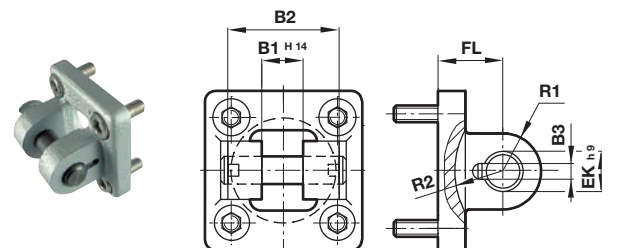
Conforms to ISO 15552, type MP2



Ø	CB H14	Ø EK h9	FL	L	LH	MR	UB	kg	Model
160	90	30	55	35,5	181	30	170	4,3	QM/8160/23
200	90	30	60	36	181	30	170	6,1	QM/8200/23
250	110	40	70	45	218	40	200	19	QM/8250/23
320	120	45	80	50	238	45	220	30,5	QM/8320/23

Rear clevis D2

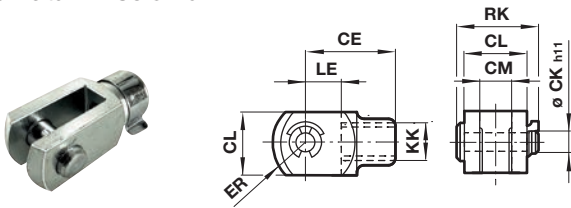
Conforms to ISO 15552, type AB6



Ø	B1 H14	B2	B3	Ø EK h9	FL	R1	R2	kg	Model
160	43	122	6,3	35	55	36	46	4,3	QA/8160/42
200	43	122	6,3	35	60	38	49	6,1	QA/8200/42

Piston rod clevis F

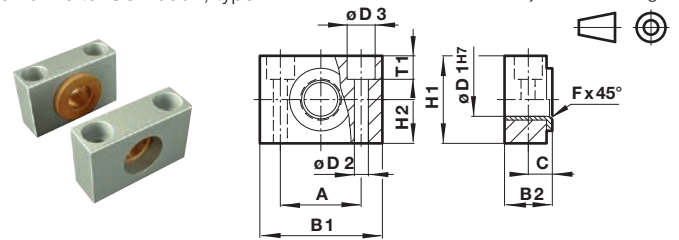
Conforms to DIN ISO 8140



\varnothing	KK	CE	$\varnothing CK_{h11}$	CL	CM	ER	LE	RK	kg	Model
160/200	M36x2	144	35	70	35	57	72	95	3	QM/8160/25
250	M42x2	168	40	85	40	68	84	106	6,4	QM/8250/25
320	M48x2	192	50	96	50	85	96	121	8,7	QM/8320/25

Trunnion support S

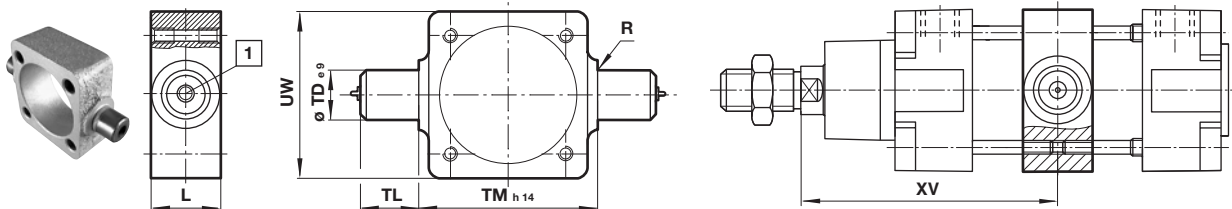
Conforms to ISO 15552, type AT4

 Dimensions in mm
Projection/First angle


\varnothing	A	B1	B2	C	$\varnothing D_{1H7}$	$\varnothing D2$	$\varnothing D3$	F x 45°	H1	H2	T1	kg	Model
160/200	60	92	39	21,5	32	18	26	2,5	60	25	15,5	1,9	QA/8160/41

Centre trunnion H

Conforms to ISO 15552, type MT4

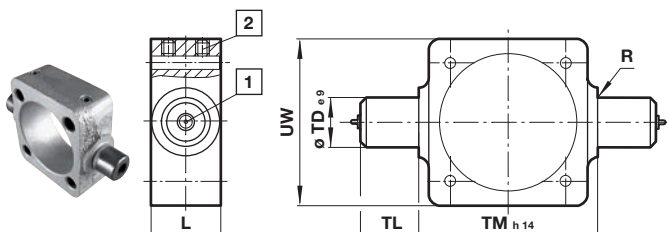


\varnothing	L	R	$\varnothing TD_{e9}$	TL	TM_{h14}	UW	XV min.	XV max.	kg	Model
160	50	2,5	32	32	200	192	155	185	5,3	QM/8160/28
200	50	2,5	32	32	250	240	170	200	9,4	QM/8200/28
250	60	3,2	40	40	320	318	193	217	18	QM/8250/28
320	70	3,2	50	50	400	400	215	245	30	QM/8320/28

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 trunnion mounting - UH

Conforms to ISO 15552, type MT4

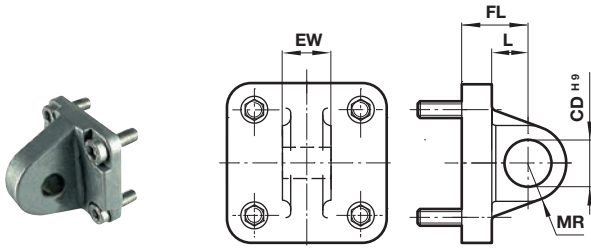


- 2 Grease nipple
 - 3 Locking screws
- Torque max
 $\varnothing 160 \text{ \& } 200 \text{ mm} = 40 \text{ Nm}$

\varnothing	L	R	$\varnothing TD_{e9}$	TL	TM_{h14}	UW	XV min.	XV max.	kg	Model
160	50	2,5	32	32	200	192	155	185	5,3	QM/8160/40
200	50	2,5	32	32	250	240	170	200	9,4	QM/8200/40

Rear eye R

Conforms to ISO 15552, type MP4



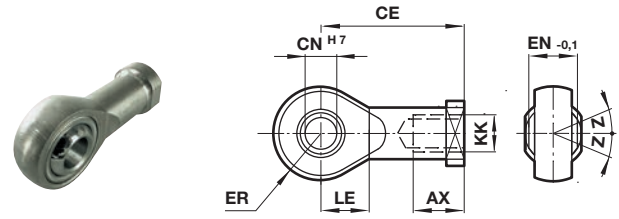
Ø	Ø CDH9	EW	FL	L	MR	kg	Model
160	30	89,7	55	35,5	30	6,1	QM/8160/27
200	30	89,7	60	37	30	6,8	QM/8200/27

Universal piston rod eye UF

Conforms to DIN ISO 8139

Dimensions in mm

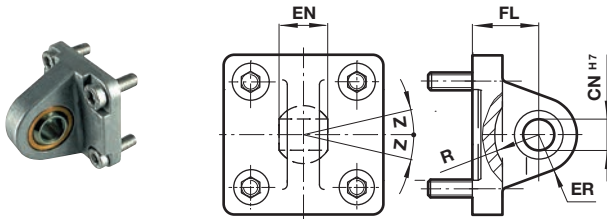
Projection/First angle



Ø	Thread KK	AX	CE	Ø CN H7	EN -0,1	ER	LE	Z	kg	Model
250	M42x2	60	142	40	49	45	46	17°	6,4	QM/8250/32
320	M48x2	65	160	50	60	58	59	12°	8,7	QM/8320/32

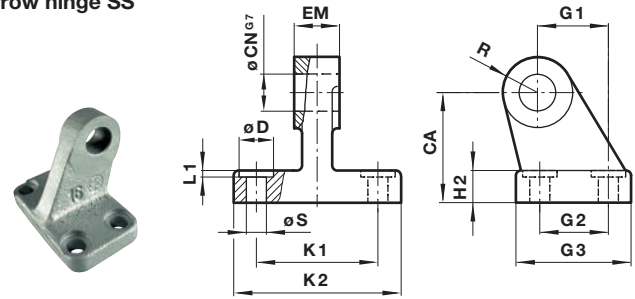
Universal rear eye UR

Conforms to ISO 15552, type MP6



Ø	Ø CN H7	EN	ER	FL	R	Z	kg	Model
160	35	43	44	55	41	16°	4,6	QM/8160/33
200	35	43	48	60	42	16°	7,3	QM/8200/33
250	40	49	50	70	47	10°	16,5	QM/8250/33
320	50	60	58	80	52	8°	26	QM/8320/33

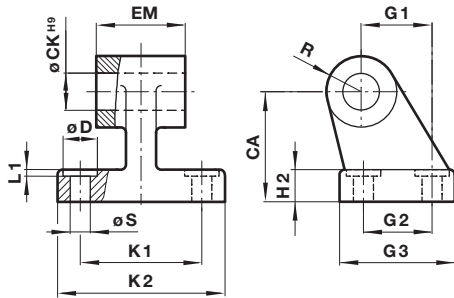
Narrow hinge SS



Ø	CA	Ø CN G7	Ø D	H2	EM	G1	G2	G3	K1	K2	L1	R	Ø S	kg	Model
160	115	35	20	25	35	97	88	126	118	156	4	31	14	6	MP19938
200	135	35	26	30	35	105	90	130	122	162	4	31	18	7,6	MP19939

Wide hinge SW

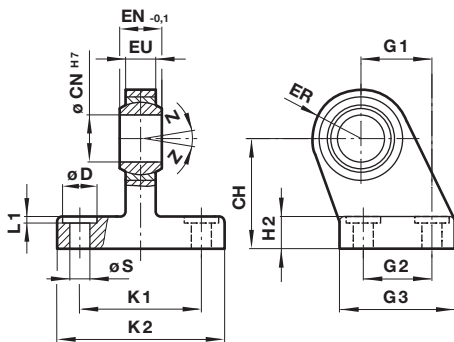
Conforms to ISO 15552, type AB7

 Dimensions in mm
Projection/First angle


Ø	CA	Ø CK H9	Ø D	H2	EM	G1	G2	G3	K1	K2	L1	R	Ø S	kg	Model
160	115	30	20	25	89,5	97	88	126	118	156	4	31	14	6,3	M/P19679
200	135	30	26	30	89,5	105	90	130	122	162	4	31	18	8	M/P19683
250	165	40*1)	40	35	109,5	128	110	160	150	200	4	39	22	13,4	M/P19446
320	200	45*1)	48	40	119,5	150	122	186	170	234	4	44	26	22	M/P19447

Swivel hinge US

Conforms to VDMA 24562 part 2



Ø	CH	Ø cNH7	Ø D	EN -0,1	ER	EU	G1	G2	G3	H2	K1	K2	L1	Ø S	Z	kg	Model
160	115	35	20	43	44	28	97	88	126	25	118	159	4	14	15°	6,4	M/P71356
200	135	35	26	43	48	28	105	90	130	30	122	162	4	18	15°	9,1	M/P71357

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 features/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 IMI 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.