

# ISO MICROCYLINDERS

## Series M

### CHARACTERISTICS

Ambient temperature	-20 ÷ 80 °C
Fluid	filtered air, with or without lubrication
Working pressure	1,5 ÷ 10 bar
End-caps	aluminium, crimped on barrel
Barrel	stainless steel
Piston	brass (Ø8÷16), aluminium (Ø20-25)
Guide slide	acetalic resin
Piston rod	stainless steel
Piston seal	nitrile rubber
Guide bush for piston rod	standard supplied
Shock absorber seals	nitrile rubber
Cushionings	pneumatic adjustable (Ø16÷25)



### CODIFICATION KEY

M	1	0	0	0	2	5	0	0	5	0		
1	2	3	4		5			6	7			

1 Series	2 Type	3 Version	
M = Ø8÷25 mm - ISO 6432 Microcylinders	1 = Stainless steel piston rod (standard vesion) 2 = Chromium-plated steel piston rod (to be used only with locking unit) 3 = Reduced version with stainless steel piston rod	00 = D.A. Standard version 01 = D.A. Through piston rod 50 = D.A. With adjustable cushionings (Ø16÷25)	51 = D.A. Through piston rod with adjustable cushionings (Ø16÷25) 60 = S.A. Retracted piston rod (Ø10÷25), Max stroke 50 mm 70 = S.A. Extended piston rod (Ø16÷25), Max stroke 25 mm

D.A. = Double acting  
S.A. = Single acting

4 Bore (mm)	5 Stroke (mm)			6 Option	7 Magnetic
008 = Ø8 010 = Ø10 012 = Ø12 016 = Ø16 020 = Ø20 025 = Ø25	0010 = 10 0020 = 20 0025 = 25 0030 = 30 0040 = 40 0050 = 50 0075 = 75	0080 = 80 0100 = 100 0125 = 125 0150 = 150 0160 = 160 0175 = 175 0200 = 200	0250 = 250 0300 = 300 0320 = 320 0400 = 400 0500 = 500	F = Preset for locking unit reduced protrusion	M = Magnetic version (Ø10÷25)

Ø	Female fork with clips	Articulated self-lubricating fork	Fork with axially mounted articulated pin	Fork with angle mounted articulated pin	Floating joint	Female rear hinge	Angle bracket	Flange	Nut for end-cap	Holder for DF sensor	DF sensor
8			-	-	-					-	
10	MF-15008	MF-17008	-	-	-	MF-21008	MF-13008	MF-12008	MF-20008	-	
12	MF-15012	MF-17012	MF-22016	MF-23012	MF-24012	MF-21012	MF-13012	MF-12012	MF-20012	DH-M12DF	
16	MF-15012	MF-17012	MF-22016	MF-23012	MF-24012	MF-21016	MF-13012	MF-12012	MF-20012	DH-M16DF	
20	MF-15020	MF-17020	MF-22020	MF-23020	MF-24020	MF-21020	MF-13020	MF-12020	MF-20020	DH-M20DF	
25	KF-15032	KF-17032	KF-22025	KF-23025	KF-24032	MF-21025	MF-13020	MF-12020	MF-20020	DH-M25DF	

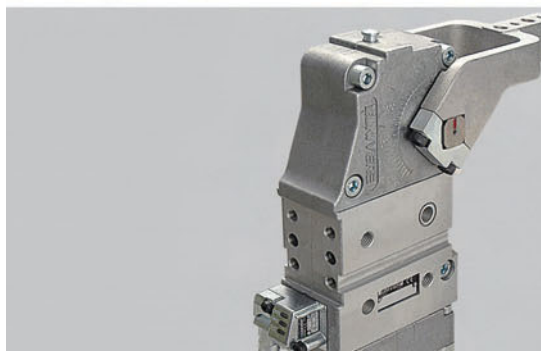
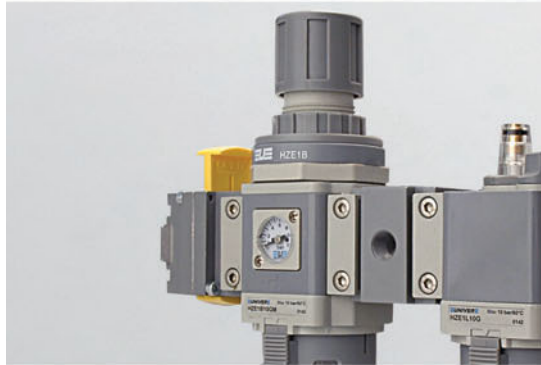
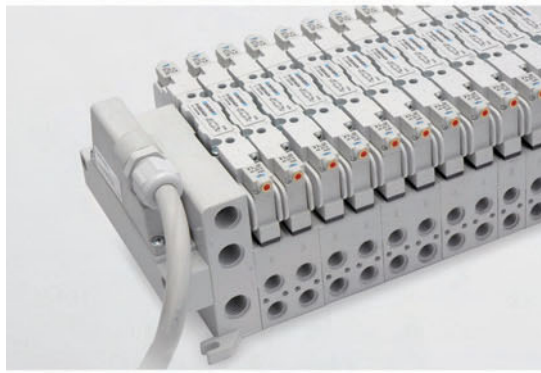
Ø	Holder for DH sensor	DH sensor
8		
10	DH-M10	
12	DH-M12	
16	DH-M16	
20	DH-M20	
25	DH-M25	

#### Through piston rod



#### Reduced version with adjustable cushionings





Working pressure: 1,5 ÷ 10 bar  
 Ambient temperature: -20 ÷ 80°C  
 Fluid: filtered air, lube or non lube  
 Barrel: stainless steel with crimped heads

Type M160... up to 50 mm stroke max  
 Type M170... up to 25 mm stroke max

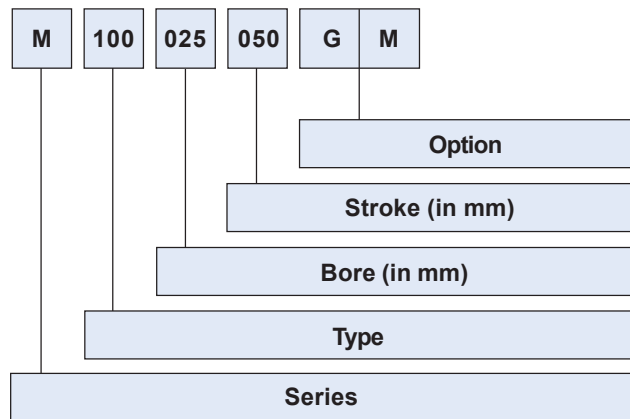
Max speed: up to 2 m/sec. without adjustable cushion  
 up to 5 m/sec. with adjustable pneumatic cushion



**Options:**

- Magnetic version Ø: 10 ÷ 25 mm
- Ø 16 ÷ 25 mm locking unit with chromium-plated rod **only**, see page 2.28
- Slide-unit from Ø 16, see page 2.26
- Magnetic sensor, see page 2.27

**Codification key**



- 1 5 0 D.A. With adjustable pneumatic cushioning from Ø 16 ÷ 25 mm
- 1 5 1 D.A. Through rod with adjustable pneumatic cushioning from Ø 16 ÷ 25 mm
- 1 6 0 S.A. Ø 10 ÷ 25 mm retracted rod with mechan. shock absorbers, 50 mm max. stroke
- 1 7 0 S.A. Ø 16 ÷ 25 mm extended rod with mechan. shock absorbers, 25 mm max. stroke

**SERIES**

M = Ø 8 ÷ 25 mm microcylinder

**TYPE**

- 1 - - Ø 8 ÷ 25 mm stainless steel rod
- 2 - - Ø 16 ÷ 25 mm chromium-plated rod used only for cylinders with locking unit
- 1 0 0 D.A. With mechanical shock absorbers
- 1 0 1 D.A. Through rod with mechanical shock absorbers

**BORE**

Ø 8 - 10 - 12 - 16 - 20 - 25

**STROKE**

Length in mm.

**OPTION**

- F = For use with locking unit with "reduced dimensions"
- M = Magnetic version from Ø 10 ÷ 25 without size variants

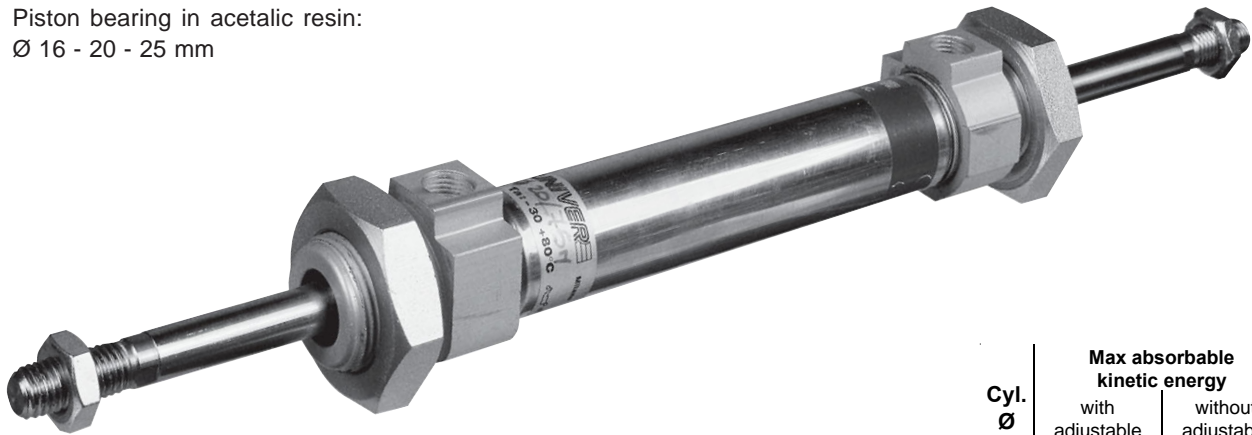
Technical modifications keep in reserve !

(2020/10)

### Some construction features

- Stainless steel barrel
- Anodized aluminium extrusion heads, crimped on the barrel
- Ø 12 ÷ 25 mm fixed mechanical rubber shock absorbers on heads (M100 ... Series)
- Ø 16 - 20 - 25 mm pneumatic adjustable cushion with brass adjustment screw (M150 ... Series)
- Seals in self-lubricating nitrile
- Piston bearing in acetalic resin: Ø 16 - 20 - 25 mm

- X10CrNi S 18.09 (AISI 303) stainless steel rolled rod
- Ø 20 ÷ 25 mm aluminium piston  
Ø 8 ÷ 16 mm brass piston
- Microcylinders are supplied complete with a nut on the rod (**MF - 16 + Ø**) and a nut on the front head (**MF - 20 + Ø**)



Cyl. Ø	Max absorbable kinetic energy	
	with adjustable cushions	without adjustable cushions
16	0,9 J	0,12 J
20	1,3 J	0,16 J
25	1,8 J	0,22 J

### Single-acting microcylinder

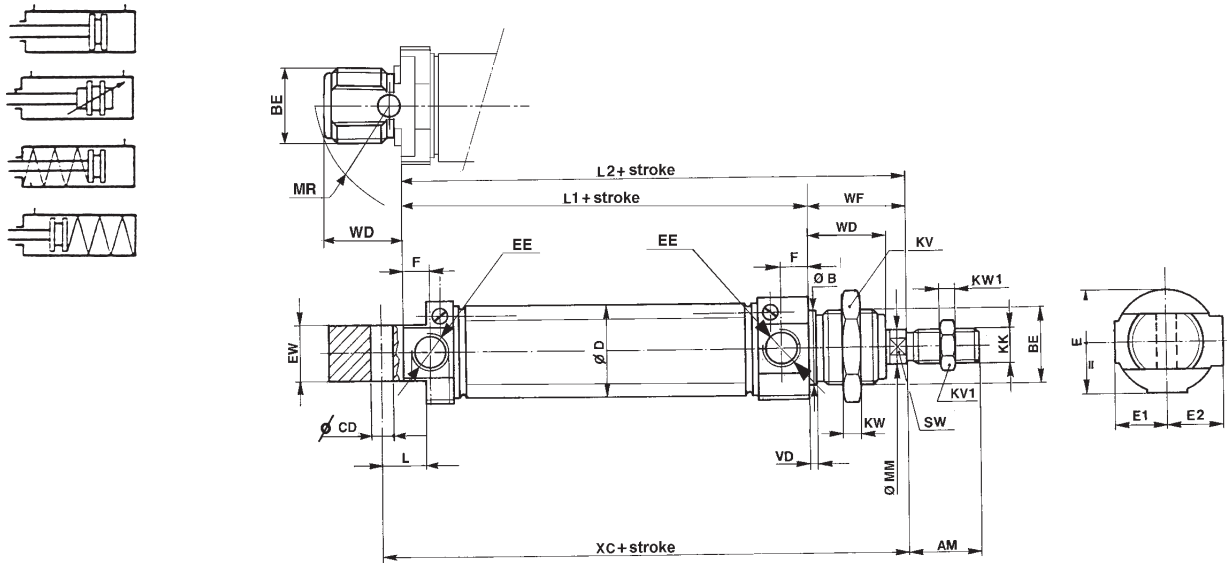
Cyl. Ø	Standard stroke (preferable values according to UNI 4393 in black)		Traction force (min-max) of the spring in N								Mobile parts mass (g)		Mass (g)	
	160	170	Stroke 10		Stroke 25		Stroke 40		Stroke 50		Stroke 0	Increase by mm	Stroke 0	Increase by mm
10	10 - 25 40 - 50		6,9	7,6	5,8	7,6	4,7	7,6	4	7,6	8,6	1	55	0,27
12	10 - 25 40 - 50		8,1	8,7	7,3	8,7	6,5	8,7	5,9	8,7	23,05	2,2	102	0,4
16	10 - 25 40 - 50	10 - 25	14,4	16	11,9	16	9,4	16	7,8	16	23,4	2,2	73	0,55
20	10 - 25 40 - 50	10 - 25	18,6	20	16,5	20	14,4	20	13	20	44,94	4,1	151,5	0,85
25	10 - 25 40 - 50	10 - 25	21,8	23,5	19,3	23,5	16,7	23,5	15	23,5	79,55	6,1	208,4	1,15

### Double-acting microcylinder

Cyl. Ø	Standard strokes (preferable values according to UNI 4393 in black)	Thrust force (min) at 6 bar N	Traction force at 6 bar N	Mobile parts mass (g)		Mass (g)		Length of deceleration mm
				Stroke 0	Increase by mm	Stroke 0	Increase by mm	
8	10 20 25 30 40 50 75 100	20	16	7	0,1	53	0,24	-
10	10 20 25 30 40 50 75 100 125 150 160	35	32	8,6	0,1	55	0,27	-
12	10 20 25 30 40 50 75 100 125 150 160	50	38	23,05	0,22	102	0,4	-
16	10 20 25 30 40 50 75 100 125 150 160 175 200 250	90	87	23,4	0,22	73	0,55	16
116	25 30 40 50 75 100 125 150 160 175 200 250 300 400 500			124,9				
20	10 20 25 30 40 50 75 100 125 150 160 175 200 250 300	148	140	44,94	0,41	151,5	0,85	18
120	25 30 40 50 75 100 125 150 160 175 200 250 300 400 500			147,8				
25	10 20 25 30 40 50 75 100 125 150 160 175 200 250 300 400 500	250	220	79,55	0,61	208,4	1,15	22
125	25 30 40 50 75 100 125 150 160 175 200 250 300 400 500			187,23				

<sup>1</sup> Version with adjustable pneumatic cushions

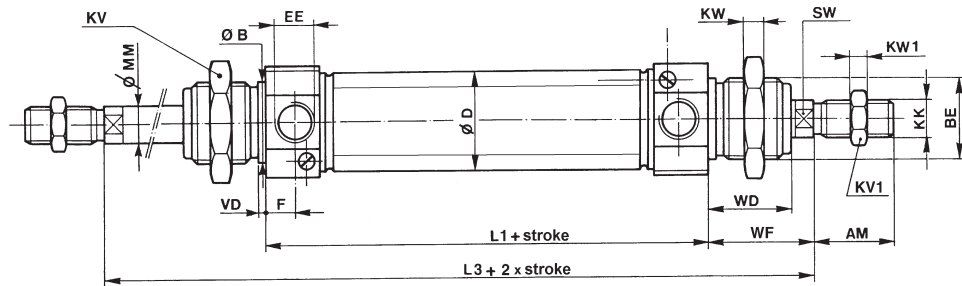
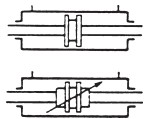
## Double/single acting cylinders



## Double acting through rod cylinders



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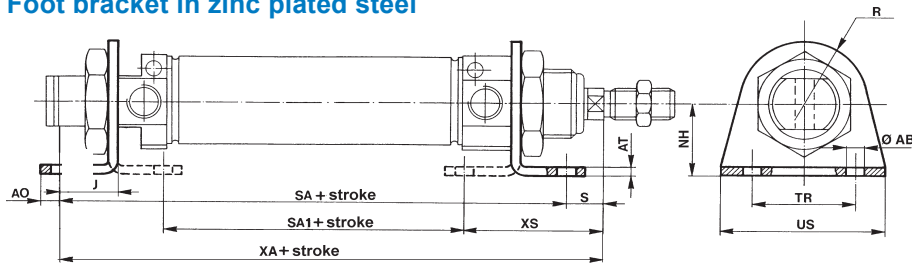


Cyl. Ø	AM	B	BE	CD	D	E	E1	E2	* EE	EW	KV	KV1
		h 10		H9		max				d 13		
8	12	Ø 12	M12 X 1.25	4	9.3	14	8	8.5	M5 x 0.8	8	19	7
10	12	Ø 12	M12 X 1.25	4	11.3	14	8	8.5	M5 x 0.8	8	19	7
12	16	Ø 16	M16 X 1.5	6	13.3	17	9.5	10	M5 x 0.8	12	24	10
16	16	Ø 16	M16 X 1.5	6	17.3	20.8	10.4	9.6	M5 x 0.8	12	24	10
20	20	Ø 22	M22 X 1.5	8	21.6	27.7	13.85	12	G 1/8	16	32	13
25	22	Ø 22	M22 X 1.5	8	26.6	30.7	15.35	13.75	G 1/8	16	32	17

Cyl. Ø	F	KK	KW	KW1	L	L1	L2	L3	MM	MR	SW	VD	WD	WF	XC
														± 1,2	± 1
8	5	M4 X 0,7	7	2,8	7	46	62	78	4	12	3	1,5	12	16	64
10	5	M4 X 0,7	7	2,8	7	46	62	78	4	12	3	1,5	12	16	64
12	5	M6 X 1	8	4	9	50	72	94	6	16	5	1,5	17	22	75
16	5,5	M6 X 1	8	4	8	56	78	100	6	16	5	1,5	17	22	82
20	8	M8 X 1,25	10	5	11	68	92	116	8	18	7	2	19	24	95
25	8	M10 X 1,25	10	6	15	69	97	125	10	18	9	2	22	28	104

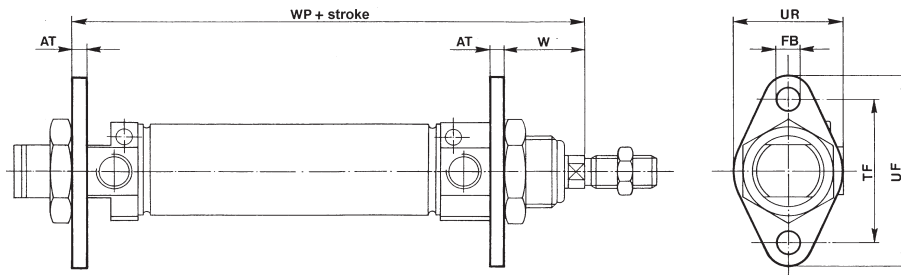
\* The series with dimensions in inches is chosen in compliance with UNI-ISO 228/1 standard

### Foot bracket in zinc plated steel



Cyl. Ø	AB	AO	AT	AU	NH	R	S	SA	SA1	TR	US	XA	XS	Weight-Mass (g.)	Part no.
	H13				±0,3					Js14			±1,4		
8-10	4.5	5	3	11	16	10	5	68	30	25	35	73	24	20	MF - 13008
12	5.5	6	4	14	20	13	8	78	30	32	42	86	32	40	MF - 13012
16	5.5	6	4	14	20	13	8	84	36	32	42	92	32	40	MF - 13012
20	6.6	8	5	17	25	20	7	102	44	40	54	109	36	90	MF - 13020
25	6.6	8	5	17	25	20	11	103	45	40	54	114	40	90	MF - 13020

### Flange in zinc-plated steel



Cyl. Ø	AT	FB	TF	UF	UR	W	WP	Weight-Mass (g.)	Part no.
	H13	Js14				±1.4			
8-10	3	4.5	30	40	25	13	65	12	MF - 12008
12	4	5.5	40	53	30	18	76	25	MF - 12012
16	4	5.5	40	53	30	18	82	25	MF - 12012
20	5	6.6	50	66	40	19	97	49	MF - 12020
25	5	6.6	50	66	40	23	102	49	MF - 12020

### Piston Rod nut in zinc-plated steel



Cyl. Ø	KK	KV1	KW1	Part no.
8-10	M4 X 0.7	7	2.8	MF - 16008
12-16	M6 X 1	10	4	MF - 16012
20	M8 X 1.25	13	5	MF - 16020
25	M10 X 1.25	17	6	KF - 16032

### End-Cap nut in zinc-plated steel

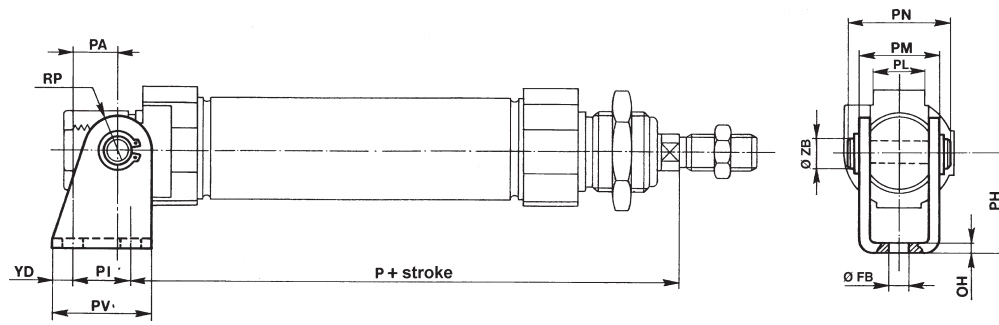


Cyl. Ø	BE	KV	KW	Part no.
8-10	M12 X 1.25	19	7	MF - 20008
12-16	M16 X 1.5	24	8	MF - 20012
20-25	M22 X 1.5	32	10	MF - 20020

Technical modifications keep in reserve !

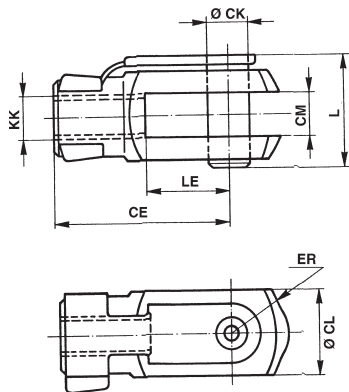
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### Rear female hinge in zinc-plated steel with pin and 2 circlips



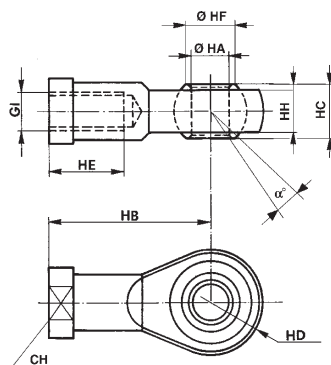
Cyl. Ø	Ø FB	OH	P	PA	PH	PI	PL	PM	PN	PV	RP	YD	ZB	Weight-Mass (g.)	Part no.
	H13					E9							h9		
8-10	4.5	2.5	62.5	11	24	12.5	8.1	13.1	17	20	5.3	3.8	4	19	MF - 21008
12	5.5	3	73	13	27	15	12.1	18.1	23	25	7	5	6	37	MF - 21012
16	5.5	3	80	13	27	15	12.1	18.1	23	25	7	5	6	37	MF - 21012
20	6.6	4	91	16	30	20	16.1	24.1	30	32	10	6	8	80	MF - 21020
25	6.6	4	100	16	30	20	16.1	24.1	30	32	10	6	8	80	MF - 21020

### Double hinge for rod in zinc-plated steel complying with ISO 8140 standard (with pin)



Cyl. Ø	CE	CK	CL	CM	ER	KK	L	LE	Weight-Mass (g.)	Part no.
				B12						
8-10	16	4	8	4	5	M4 X 0.7	11	8	7	MF - 15008
12-16	24	6	12	6	7	M6 X 1	16	12	19	MF - 15012
20	32	8	16	8	10	M8 X 1.25	22	16	46	MF - 15020
25	40	10	20	10	12	M10 X 1.25	26	20	90	KF - 15032

### Articulated clevis in self-lubricating zinc-plated steel



Cyl. Ø	α°	CH	KK	HA	HB	HC	HD	HE	HF	HH	Weight-Mass (g.)	Part no.
				H7								
8-10	13°	9	M4 X 0.7	5	27	8	9	10	7.7	6	18	MF - 17008
12-16	13°	11	M6 X 1	6	30	9	10	12	9	6.8	26	MF - 17012
20	14°	14	M8 X 1.25	8	36	12	12	16	10.4	9	46	MF - 17020
25	13°	17	M10 X 1.25	10	43	14	14	20	12.9	10.5	76	KF - 17032

Technical modifications keep in reserve !

(2020/10)