

## Series 167

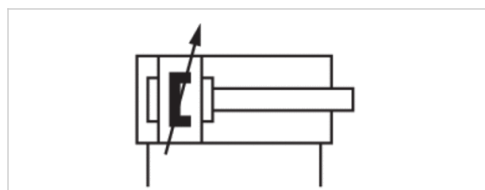


AVENTICS™ Series 167



# Tie rod cylinder ISO 6431, Series 167

- Ø 25-100 mm
- Ports G 1/8 G 1/4 G 3/8 G 1/2
- double-acting
- with magnetic piston
- Cushioning pneumatically adjustable
- Piston rod External thread



Standards	ISO 6431
Compressed air connection	Internal thread
Working pressure min./max.	2 ... 10 bar
Ambient temperature min./max.	-20 ... 75 °C
Medium temperature min./max.	-20 ... 75 °C
Medium	Compressed air
Max. particle size	50 µm
Oil content of compressed air	0 ... 5 mg/m <sup>3</sup>
Pressure for determining piston forces	6 bar

## Technical data

Piston Ø Piston rod thread Ports	25 mm M10x1,25 G 1/8	32 mm M10x1,25 G 1/8	40 mm M12x1,25 G 1/4	50 mm M16x1,5 G 1/4	63 mm M16x1,5 G 3/8	80 mm M20x1,5 G 3/8
Stroke 25	1670202000	1670302000	1670402000	1670502000	1670602000	1670802000
50	1670205000	1670305000	1670405000	1670505000	1670605000	1670805000
80	1670208000	1670308000	1670408000	1670508000	1670608000	1670808000
100	1670210000	1670310000	1670410000	1670510000	1670610000	1670810000
125	1670212000	1670312000	1670412000	1670512000	1670612000	1670812000
160	1670216000	1670316000	1670416000	1670516000	1670616000	1670816000
200	1670220000	1670320000	1670420000	1670520000	1670620000	1670820000
250	1670225000	1670325000	1670425000	1670525000	1670625000	1670825000
320	-	-	-	1670532000	1670632000	1670832000
400	-	-	-	1670540000	1670640000	1670840000
500	-	-	-	1670550000	1670650000	1670850000

Piston Ø Piston rod thread Ports	100 mm M20x1,5 G 1/2
Stroke 25	1671002000
50	1671005000

Piston Ø Piston rod thread Ports	100 mm M20x1,5 G 1/2
80	1671008000
100	1671010000
125	1671012000
160	1671016000
200	1671020000
250	1671025000
320	1671032000
400	1671040000
500	1671050000

## Technical data

Piston Ø	25 mm	32 mm	40 mm	50 mm	63 mm	80 mm	100 mm
Retracting piston force	230 N	420 N	640 N	990 N	1680 N	2720 N	4230 N
Extracting piston force	300 N	480 N	760 N	1180 N	1860 N	3000 N	4680 N
Cushioning length	11 mm	13.5 mm	15 mm	17 mm	16.5 mm	19.5 mm	19.5 mm
Cushioning energy	2.3 J	-	-	-	-	-	-
Weight 0 mm stroke	0.27 kg	0.45 kg	0.76 kg	1.1 kg	1.7 kg	2.5 kg	3.7 kg
Weight +10 mm stroke	0.018 kg	0.021 kg	0.032 kg	0.042 kg	0.054 kg	0.072 kg	0.1 kg
Stroke max.	1500 mm	1500 mm	1600 mm	1600 mm	1600 mm	1700 mm	1700 mm

## Technical information

The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C .

The oil content of compressed air must remain constant during the life cycle.

Use only the approved oils from AVENTICS. Further information can be found in the "Technical information" document (available in the MediaCentre).

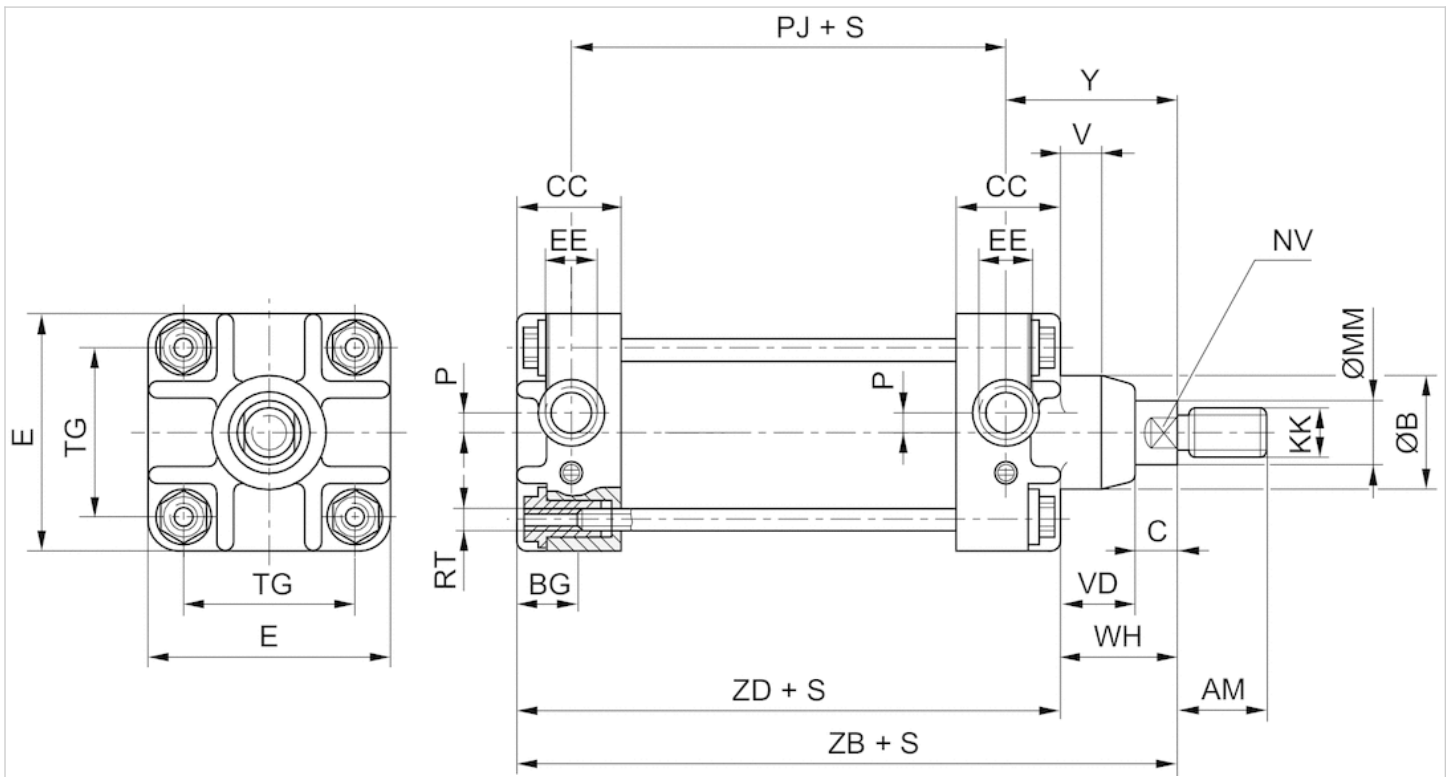
Ø25 mm is not according to ISO 6431

## Technical information

Material	
Cylinder tube	Aluminum, anodized
Piston rod	Stainless steel, chrome-plated
Front cover	Aluminum
End cover	Aluminum
Seal	Acrylonitrile butadiene rubber

## Dimensions

### Dimensions



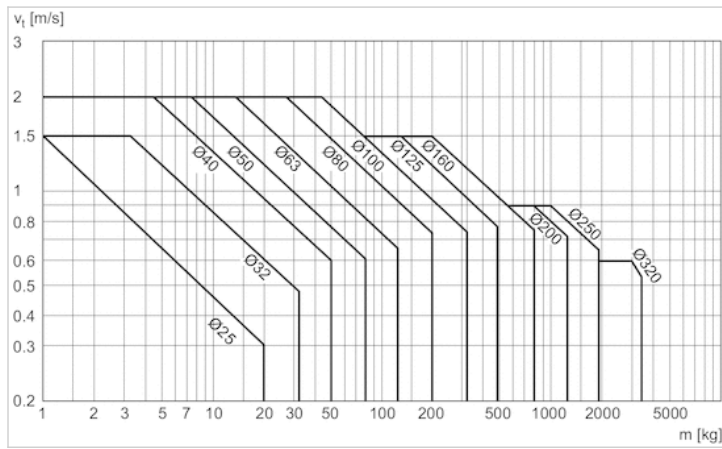
## Dimensions

Piston Ø	AM	Ø B h12	BG	C	CC	E	EE	KK	Ø MM	NV	P	PJ	RT	TG	V	VD	WH	Y
25 mm	22	23	12	8	20,0	40	G 1/8	M10x1,25	12	10	-	58	M5	27	-	16	24	31
32 mm	22	25	12	10	27,5	47	G 1/8	M10x1,25	12	10	4	65	M5	32	5	16	26	41
40 mm	24	35	15	13	30,0	56	G 1/4	M12x1,25	16	13	4	69	M6	40	5	20	33	48
50 mm	32	40	15	15	30,0	63	G 1/4	M16x1,5	20	17	4	72	M6	46	6	23	38	54
63 mm	32	40	19	14	34,0	81	G 3/8	M16x1,5	20	17	6	79	M8	59	6	27	41	58
80 mm	40	48	19	16	36,0	95	G 3/8	M20x1,5	25	22	9	86	M8	73	8	32	48	67
100 mm	40	55	23	16	40,0	115	G 1/2	M20x1,5	25	22	12	100	M10	90	8	37	53	70

Piston Ø	ZB	ZD	stroke tolerance
25 mm	98 ±1,2	74	+2/-1
32 mm	120 ±1,2	94	+2/-0
40 mm	132 ±1,2	99	+2/-0
50 mm	142 ±1,2	104	+2/-0
63 mm	154 ±1,4	113	+2,5/-0
80 mm	172 ±1,4	124	+2,5/-0
100 mm	187 ±1,4	134	+2,5/-0

# Diagrams

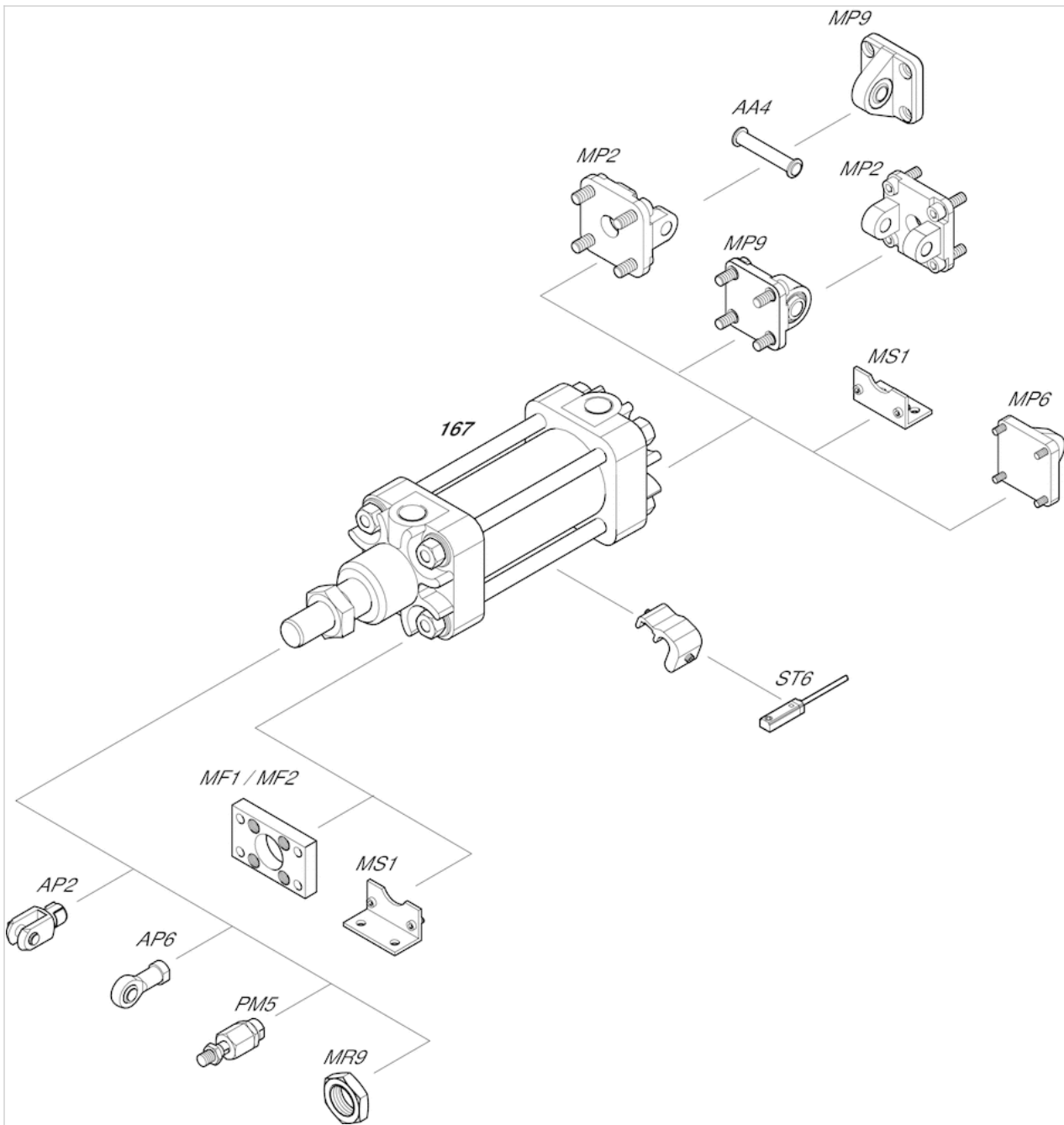
## Cushioning diagram



$V$  = velocity [m/s]  
 $m$  = mass

# Accessories overview

## Overview drawing

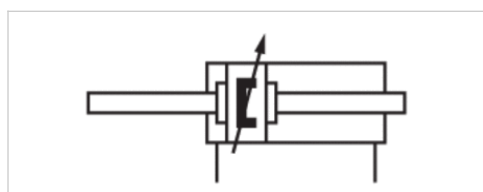


**NOTE:**

This overview drawing is only for orientation to indicate where the various accessory parts can be fastened to the cylinder. The illustration has been simplified for this purpose. It is thus not possible to derive the dimensions from this overview.

# Tie rod cylinder ISO 6431, Series 167-51

- Ø 25-100 mm
- double-acting
- with magnetic piston
- Cushioning pneumatically adjustable
- Piston rod External thread
- Piston rod through



Standards	ISO 6431
Working pressure min./max.	2 ... 10 bar
Ambient temperature min./max.	-20 ... 75 °C
Medium temperature min./max.	-20 ... 75 °C
Medium	Compressed air
Max. particle size	50 µm
Oil content of compressed air	0 ... 5 mg/m <sup>3</sup>
Pressure for determining piston forces	6 bar

## Technical data

Piston Ø	25 mm	32 mm	40 mm	50 mm	63 mm	80 mm	100 mm
Retracting piston force	230 N	420 N	640 N	990 N	1680 N	2720 N	4230 N
Extracting piston force	230 N	420 N	640 N	990 N	1680 N	2720 N	4230 N
Cushioning length	11 mm	13.5 mm	15 mm	17 mm	16.5 mm	19.5 mm	22 mm
Cushioning energy	2.3 J	-	-	-	-	-	-
Weight 0 mm stroke	0.35 kg	0.52 kg	0.88 kg	1.3 kg	2 kg	3 kg	4.3 kg
Weight +10 mm stroke	0.028 kg	0.03 kg	0.048 kg	0.067 kg	0.079 kg	0.11 kg	0.14 kg

## Technical information

The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C .

The oil content of compressed air must remain constant during the life cycle.

Use only the approved oils from AVENTICS. Further information can be found in the "Technical information" document (available in the MediaCentre).

Ø25 mm is not according to ISO 6431

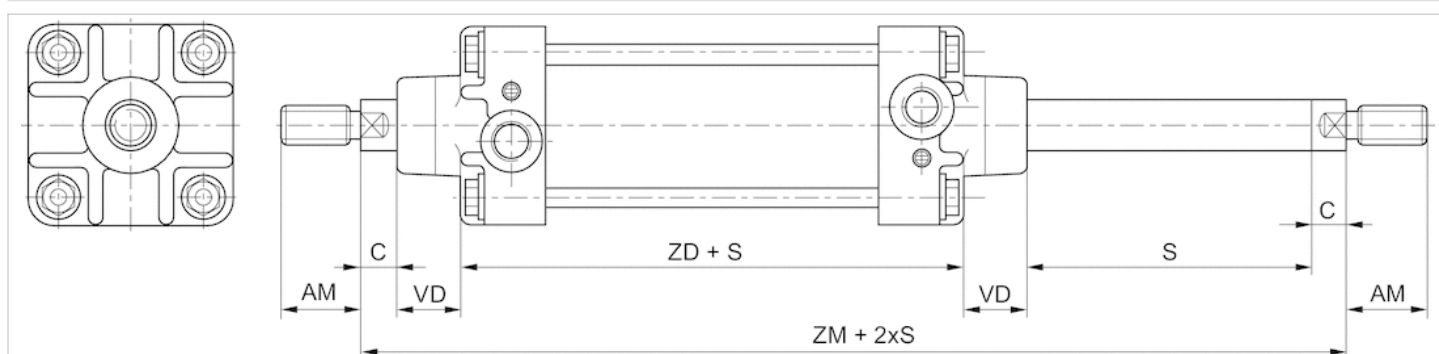
For additional technical data please see the relevant data sheets for the standard version.

## Technical information

Material	
Cylinder tube	Aluminum, anodized
Piston rod	Stainless steel, chrome-plated
Front cover	Aluminum
End cover	Aluminum
Seal	Acrylonitrile butadiene rubber

## Dimensions

### Dimensions



S = stroke

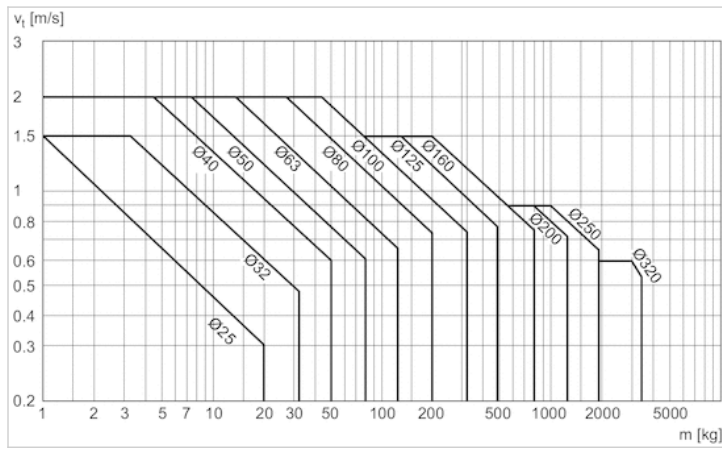
## Dimensions

Ø	25	32	40	50	63	80	100
C	8	10	13	15	14	16	16
AM	22	22	24	32	32	40	40
VD	16	16	20	23	27	32	37
ZM	122	146	165	180	195	220	240
ZD	74	94	99	104	112	124	134



# Diagrams

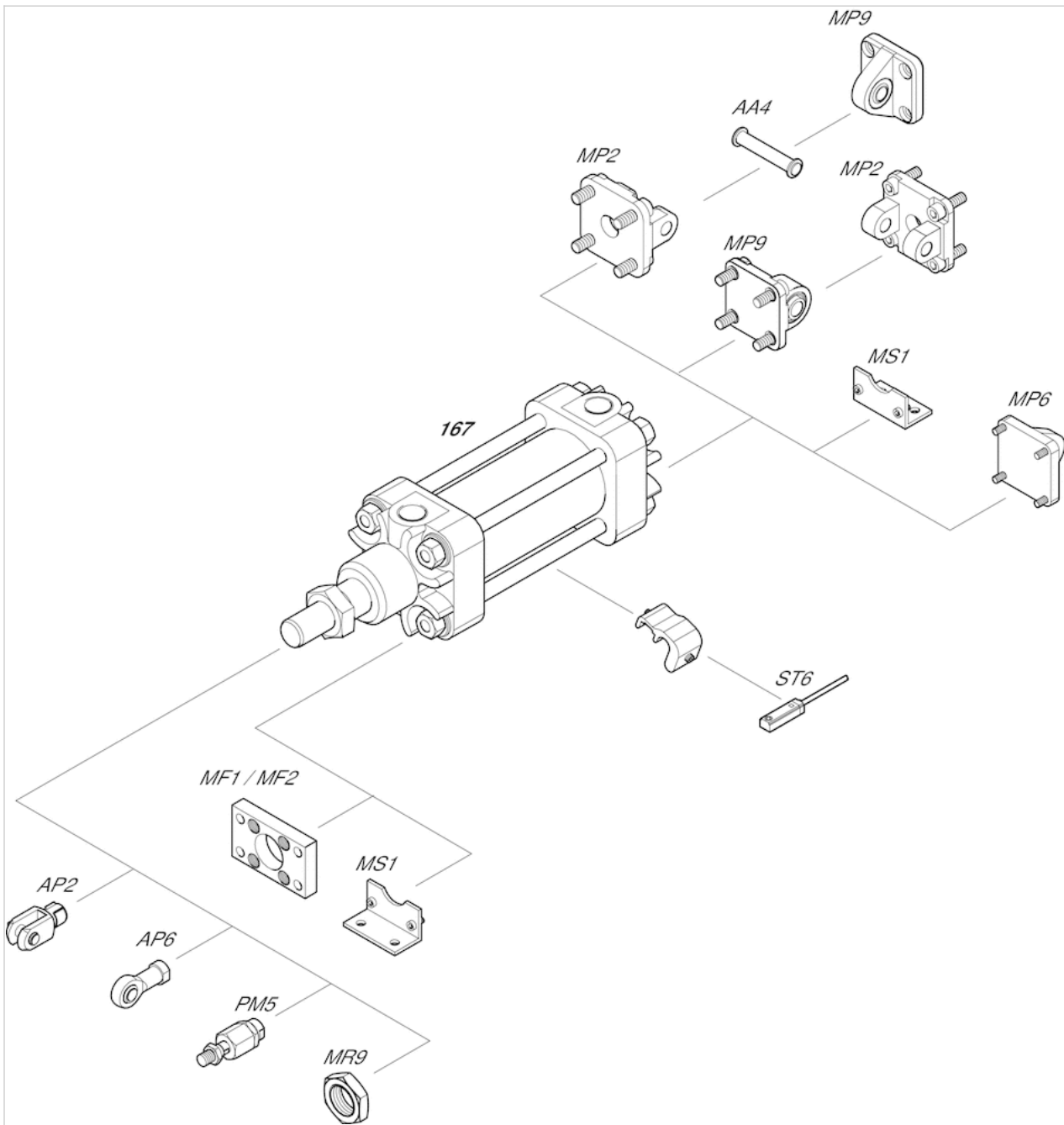
## Cushioning diagram



$V$  = velocity [m/s]  
 $m$  = mass

# Accessories overview

## Overview drawing



**NOTE:**

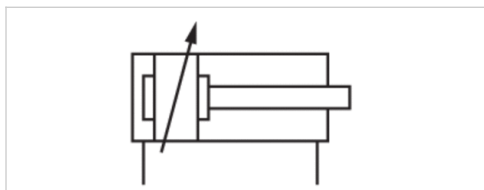
This overview drawing is only for orientation to indicate where the various accessory parts can be fastened to the cylinder. The illustration has been simplified for this purpose. It is thus not possible to derive the dimensions from this overview.

# Tie rod cylinder ISO 6431, Series 167-53

- Ø 25-100 mm
- double-acting
- Cushioning pneumatically adjustable
- Piston rod External thread
- Heat resistant



Standards	ISO 6431
Working pressure min./max.	2 ... 10 bar
Ambient temperature min./max.	-20 ... 120 °C
Medium temperature min./max.	-20 ... 120 °C
Medium	Compressed air
Max. particle size	50 µm
Oil content of compressed air	0 ... 5 mg/m <sup>3</sup>
Pressure for determining piston forces	6 bar



## Technical data

Piston Ø	25 mm	32 mm	40 mm	50 mm	63 mm	80 mm	100 mm
Retracting piston force	230 N	420 N	636 N	990 N	1680 N	2718 N	4230 N
Extracting piston force	300 N	480 N	756 N	1176 N	1860 N	3000 N	4680 N
Cushioning length	11 mm	13.5 mm	15 mm	17 mm	16.5 mm	19.5 mm	19.5 mm
Cushioning energy	2.3 J	-	-	-	-	-	-
Weight 0 mm stroke	0.27 kg	0.45 kg	0.76 kg	1.1 kg	1.7 kg	2.5 kg	3.7 kg
Weight +10 mm stroke	0.018 kg	0.021 kg	0.032 kg	0.042 kg	0.054 kg	0.072 kg	0.1 kg
Stroke max.	1500 mm	1500 mm	1600 mm	1600 mm	1600 mm	1700 mm	1700 mm

## Technical information

The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C .

The oil content of compressed air must remain constant during the life cycle.

Use only the approved oils from AVENTICS. Further information can be found in the "Technical information" document (available in the MediaCentre).

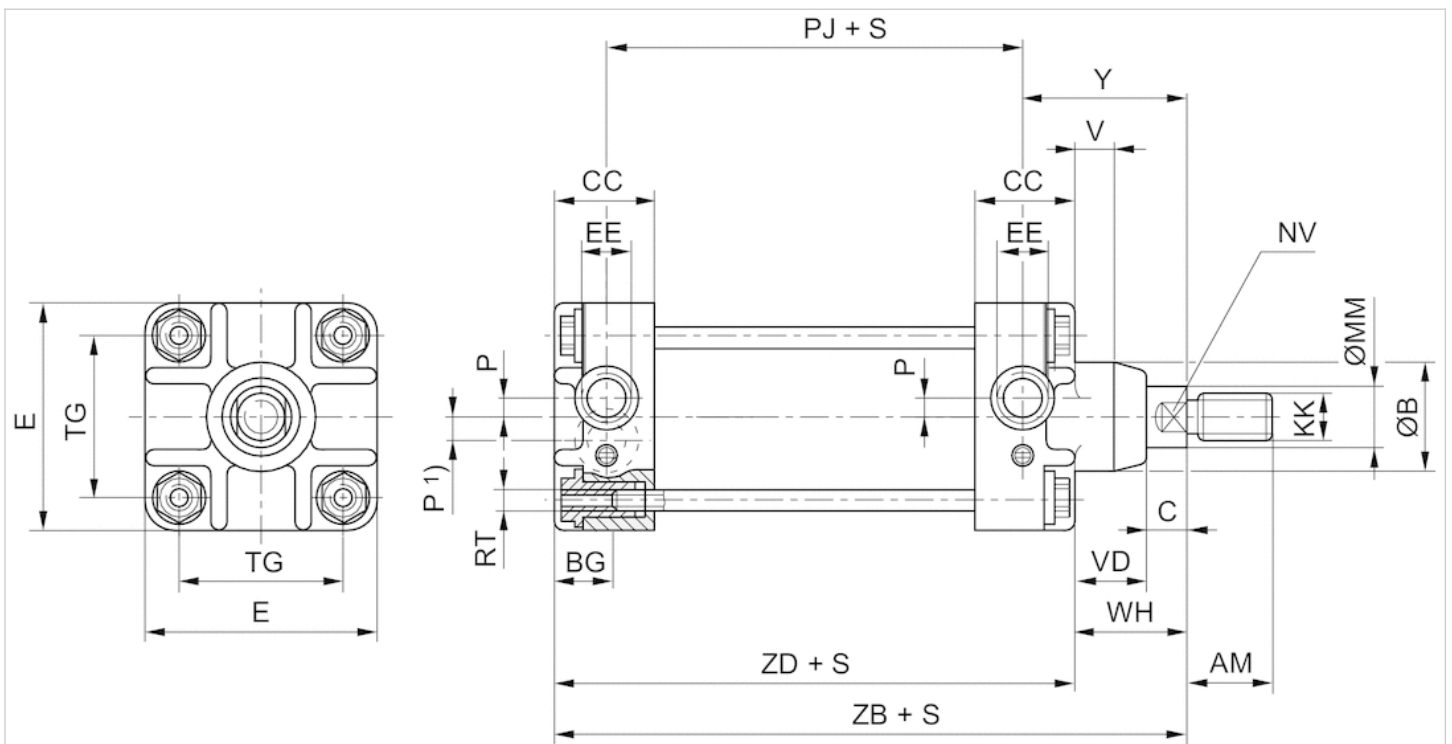
Ø25 mm is not according to ISO 6431

## Technical information

Material	
Cylinder tube	Aluminum, anodized
Piston rod	Stainless steel, chrome-plated
Front cover	Aluminum
End cover	Aluminum
Seal	Fluorocaoutchouc

## Dimensions

### Dimensions



S = stroke

P 1) = for cylinder Ø 250 and 320 mm

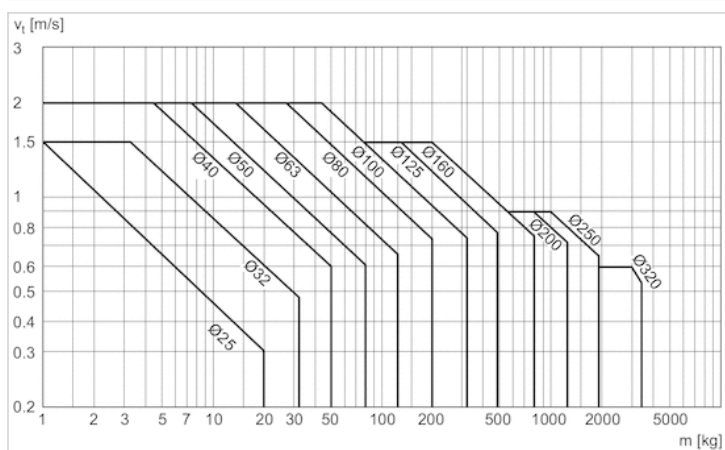
## Dimensions

Ø	25	32	40	50	63	80	100
AM	22	22	24	32	32	40	40
Ø B h12	23	25	35	40	40	48	55
BG	12	12	15	15	19	19	23
C	8	10	13	15	14	16	16
CC	20,0	27,5	30,0	30,0	34,0	36,0	40,0
E	40	47	56	63	81	95	115
EE	G 1/8	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2
KK	M10x1,25	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5
Ø MM	12	12	16	20	20	25	25

∅	25	32	40	50	63	80	100
NV	10	10	13	17	17	22	22
P	–	4	4	4	6	9	12
PJ	58	65	69	72	79	86	100
RT	M5	M5	M6	M6	M8	M8	M10
TG	27	32	40	46	59	73	90
V	–	5	5	6	6	8	8
VD	16	16	20	23	27	32	37
WH	24	26	33	38	41	48	53
Y	31	41	48	54	58	67	70
ZB	98 ±1,2	120 ±1,2	132 ±1,2	142 ±1,2	154 ±1,4	172 ±1,4	187 ±1,4
ZD	74	94	99	104	113	124	134
stroke tolerance	+2/-1	+2/-0	+2/-0	+2/-0	+2,5/-0	+2,5/-0	+2,5/-0

## Diagrams

### Cushioning diagram

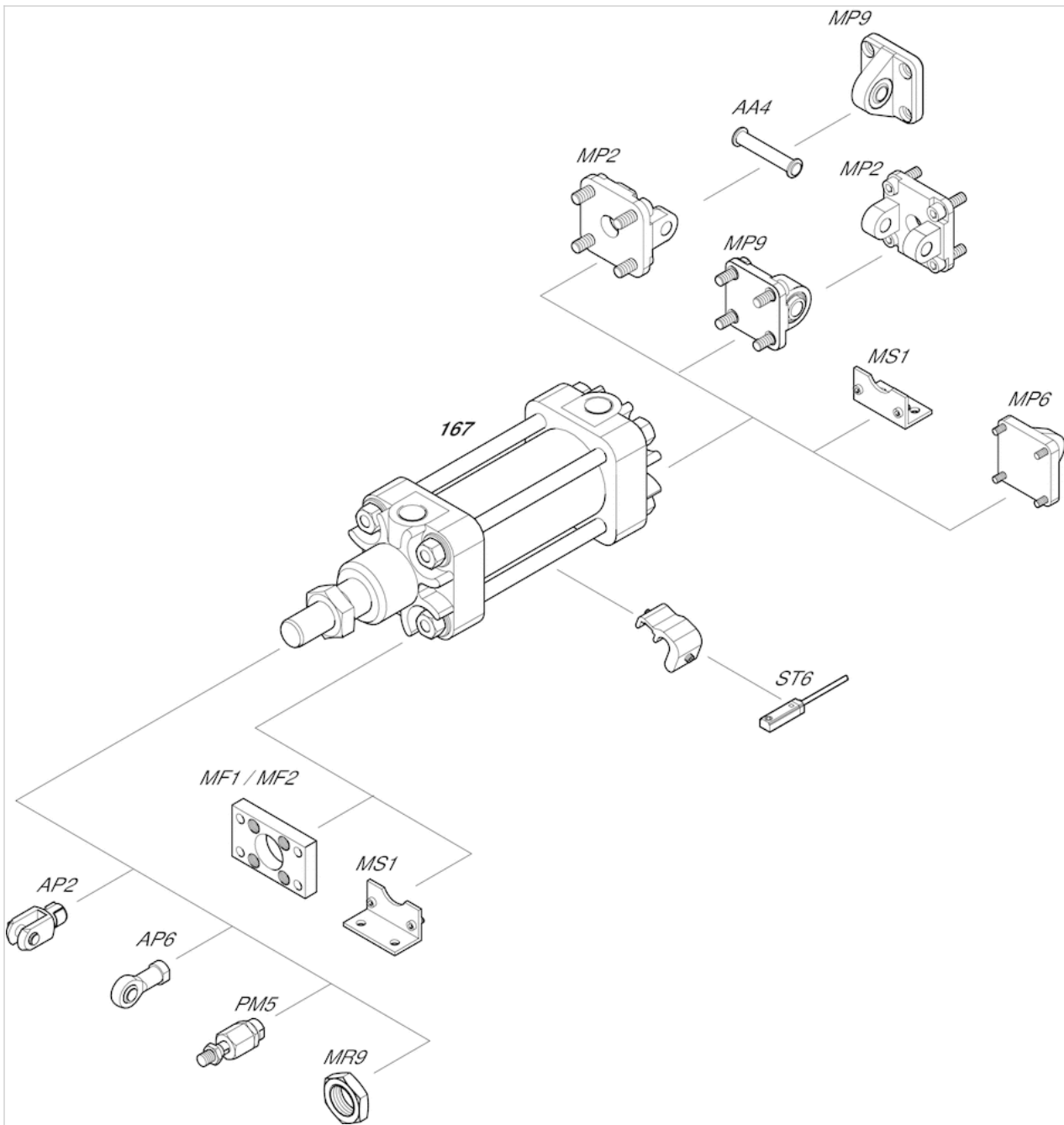


V = velocity [m/s]

m = mass

# Accessories overview

## Overview drawing



**NOTE:**

This overview drawing is only for orientation to indicate where the various accessory parts can be fastened to the cylinder. The illustration has been simplified for this purpose. It is thus not possible to derive the dimensions from this overview.

# Clevis mounting MP2, Series CM1

- for rear eye MP9 with rubber bushing
- Suitable piston Ø 25 32 40 50 63 80 100 mm
- for series 167



## Technical data

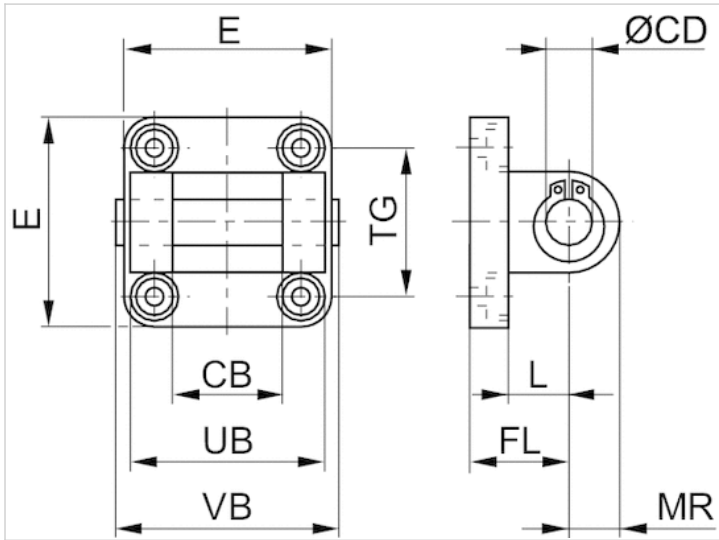
Part No.	Piston Ø	Swivel bearing Ø	Housing material
3682902590	25 mm	10 mm	Aluminum (anodized)
3672903000	32 mm	10 mm	Aluminum (forged and anodized)
3672904000	40 mm	12 mm	Aluminum (forged and anodized)
3672905000	50 mm	12 mm	Aluminum (forged and anodized)
3672906000	63 mm	16 mm	Aluminum (forged and anodized)
3672908000	80 mm	16 mm	Aluminum (forged and anodized)
3672910000	100 mm	20 mm	Aluminum (forged and anodized)

Scope of delivery: clevis mounting incl. pivot pins and mounting screws

## Technical information

Material	
Material	Aluminum (anodized) Aluminum (forged and anodized)
Screws	Stainless steel
Mounting bolts	Stainless steel

## Dimensions



## Dimensions

Part No.	CB H14	Ø CD H9	E max.	FL	L min.	MR	UB h14	VB
3682902590	18	10	40	20	14	9	36	42,5
3672903000	26	10	47,5	22	12	11	45	64
3672904000	28	12	53,5	25	15	13	52	71
3672905000	32	12	64	27	15	13	60	79
3672906000	40	16	74	32	18	17	70	93
3672908000	50	16	95	36	20	17	90	113
3672910000	60	20	113,5	41	25	21	110	133

TG \*contains elongated hole

27*
32
40*
46
59*
73
90*



# Rear eye MP6, Series CM1

- With ball joint and foot
- Cylinder mounting in accordance with ISO 21287 ISO 6431
- Suitable piston  $\varnothing$  25 32 40 50 63 80 100 mm



Standards  
Weight

See table below  
See table below

## Technical data

Part No.	Piston $\varnothing$	Swivel bearing $\varnothing$	Standardization	Housing material	Screws material
3663602000	25 mm	10 mm	ISO 21287	Aluminum (anodized)	Stainless steel
3663603000	32 mm	10 mm	ISO 6431	Aluminum	galvanized steel
3663604000	40 mm	12 mm	ISO 6431	Aluminum	galvanized steel
3663605000	50 mm	12 mm	ISO 6431	Aluminum	galvanized steel
3663606000	63 mm	16 mm	ISO 6431	Aluminum	galvanized steel
3663608000	80 mm	16 mm	ISO 6431	Aluminum	galvanized steel
3663610000	100 mm	20 mm	ISO 6431	Aluminum	galvanized steel

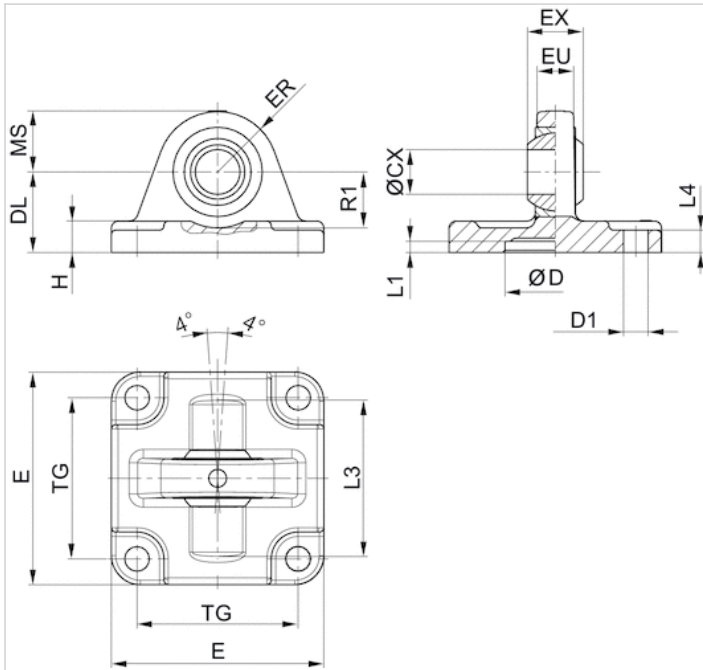
Part No.	Bearing material, inner ring	Bearing material, outer ring	Weight
3663602000	Stainless steel	Stainless steel with PTFE coating	0.1 kg
3663603000	Stainless steel	Brass with PTFE coating	0.1 kg
3663604000	Stainless steel	Brass with PTFE coating	0.1 kg
3663605000	Stainless steel	Brass with PTFE coating	0.2 kg
3663606000	Stainless steel	Brass with PTFE coating	0.3 kg
3663608000	Stainless steel	Brass with PTFE coating	0.5 kg
3663610000	Stainless steel	Brass with PTFE coating	0.8 kg

Scope of delivery: clevis incl. mounting screws

## Technical information

Material	
Material	Aluminum (anodized) Aluminum
Screws	Stainless steel galvanized steel
Bearing	Stainless steel

## Dimensions



## Dimensions

Part No.	Piston Ø	ØCX H7	ØD H11	ØD1 H13	DL ±0,2	E	EX -0,1	ER	EU	H	L1 min.	L3
3663602000	25 mm	10	18	5,5	20	40	9	14	8	6	3	-
3663603000	32 mm	10	20	5,5	22	46	9	15	8	6	0,5	42
3663604000	40 mm	12	30	6,6	28	55	12	17	9,5	8	0,5	48
3663605000	50 mm	12	40	6,6	28	62	12	17	9,5	9	0,5	55
3663606000	63 mm	16	55	9	36	80	16	25	12,5	11	0,5	70
3663608000	80 mm	16	70	9	38	94	16	28	12,5	12	0,5	80
3663610000	100 mm	20	90	11	43	114	20	35	16	15	0,5	100

L4	MS -0,5	R1 min.	TG
3	14	-	26
6	15	16	32
8	17	16	32
9	17	18	46
11	25	21	59
12	28	21	73
15	35	28	90

# Rear eye MP9, Series CM1

- With rubber bushing
- Cylinder mounting in accordance with ISO 15552 ISO 21287
- Suitable piston Ø 32 40 63 100 25 50 80 mm



Standards  
Weight

See table below  
See table below

## Technical data

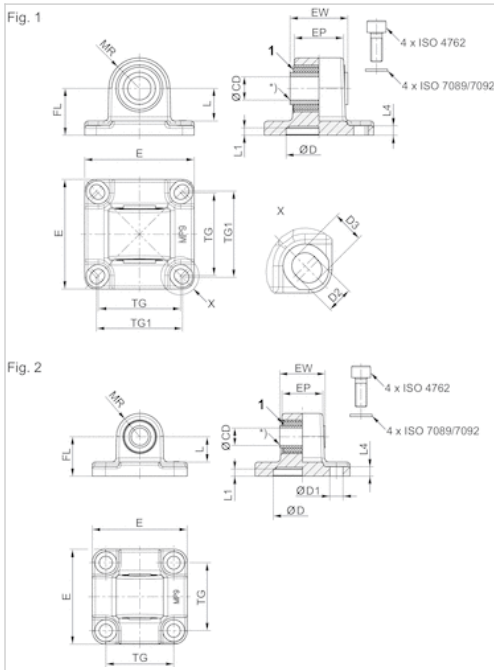
Part No.	Piston Ø	Swivel bearing Ø	Standardization	Housing material	Weight	Fig.
3683203000	32 mm	10 mm	ISO 15552	Aluminum (forged)	0.092 kg	Fig. 2
3683204000	40 mm	12 mm	ISO 15552	Aluminum (forged)	0.143 kg	Fig. 1
3683206000	63 mm	16 mm	ISO 15552	Aluminum (forged)	0.411 kg	Fig. 1
3683210000	100 mm	20 mm	ISO 15552	Aluminum (forged)	0.956 kg	Fig. 1
3683202000	25 mm	10 mm	ISO 21287	Die-cast aluminum	0.063 kg	Fig. 1
3663205000	50 mm	12 mm	-	Aluminum (forged)	0.203 kg	Fig. 2
3663208000	80 mm	16 mm	-	Aluminum (forged)	0.619 kg	Fig. 2

Scope of delivery: clevis incl. mounting screws

## Technical information

Material	
Material	Aluminum (forged) Die-cast aluminum
Bearing	Bronze

# Dimensions



1) Rubber bushing

# Dimensions

Part No.	Piston Ø	CD H11	CD H9	E	EW	EP	TG	TG1 ±0,2	FL ±0,2	L 1)	MR	L1	L4
3683203000	32 mm	10	-	46	25.5	18,9	32.5	-	22	13.8	12.5	5	5.5
3683204000	40 mm	-	12	53	27	23,5	38	40	25	16.3	15	5	5.5
3683206000	63 mm	-	16	75	39.5	33.5	56.5	59	32	22.3	21	5	6.5
3683210000	100 mm	-	20	114	59.5	54	89	90	41	25.8	25	5	10
3683202000	25 mm	10	-	40	17.5	14,5	26	27	20	14.8	12,5	3	3

D H11	D1 H13	D2 -0,2	D3 -0,2	Fig.
30	6.6	-	-	Fig. 2
35	-	6.6	8	Fig. 1
45	6.6	-	-	Fig. 1
55	-	11	11.7	Fig. 1
18	-	5,5	6,2	Fig. 1

# Trunnion mounting MT4, Series CM1

- Suitable piston  $\varnothing$  32 40 50 63 80 100 mm

- for series 167



## Technical data

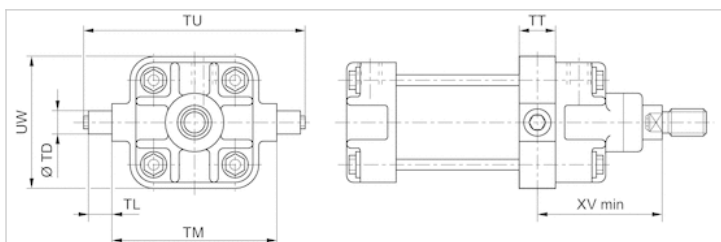
Part No.	Piston $\varnothing$
3672803000	32 mm
3672804000	40 mm
3672805000	50 mm
3672806000	63 mm
3672808000	80 mm
3672810000	100 mm

## Technical information

### Material

Material	Steel
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## Dimensions



## Dimensions

Part No.	Piston Ø	TT	TD e9	TL h14	TM h14	TU	UW	XV min
3672803000	32 mm	16	12	12	50	74	48	61,5
3672804000	40 mm	23	16	16	63	95	61	74,5
3672805000	50 mm	23	16	10	75	107	71	79,5
3672806000	63 mm	33	20	20	90	130	86	91,5
3672808000	80 mm	33	20	20	110	150	112	100,5
3672810000	100 mm	45	25	25	132	182	134	115,5

# Bearing, Series CM1

- for trunnion mounting

- Suitable piston Ø 25 32 40, 50 63, 80 100, 125 mm



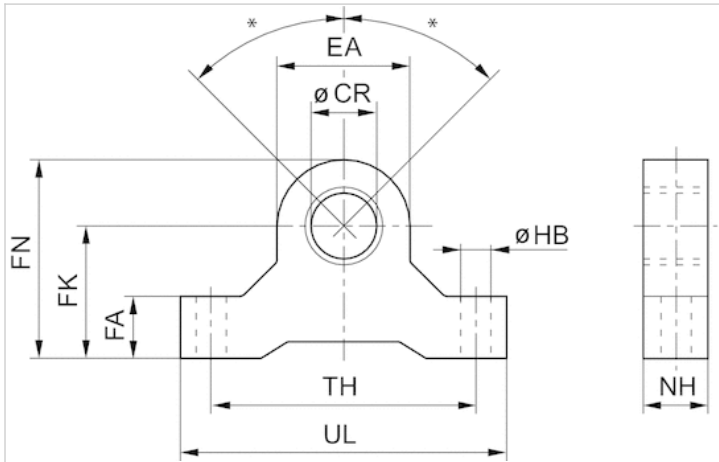
## Technical data

Part No.	Piston Ø	Swivel bearing Ø	Scope of delivery
3671202000	25 mm	10 mm	2 piece
3671203000	32 mm	12 mm	2 piece
3671204000	40, 50 mm	16 mm	2 piece
3671206000	63, 80 mm	20 mm	2 piece
3671210000	100, 125 mm	25 mm	2 piece

## Technical information

Material	
Material	Aluminum

## Dimensions



\* Max. pendulum movement for cylinders with rear eye MP6 with ball joint:  $\pm 45^\circ$

## Dimensions

Part No.	Ø CR H8	EA	FA	FK $\pm 0,1$	FN	HB	NH	TH	UL
3671202000	10	16	10	21	29	5.5	10	27	37
3671203000	12	19	11	22	32	6.6	11	44	55
3671204000	16	28	16	35	49	9	16	65	82
3671206000	20	38	19	40	59	9	19	80	99
3671210000	25	46	22	48	71	11	22	96	118



# Foot mounting MS1, Series CM1

- to mount on cylinder PRA, TRB, CCL-IS/-IC, CCI, KPZ, 167, CVI, ITS

- Suitable piston Ø 25 32 40 50 63 80 100 mm



## Technical data

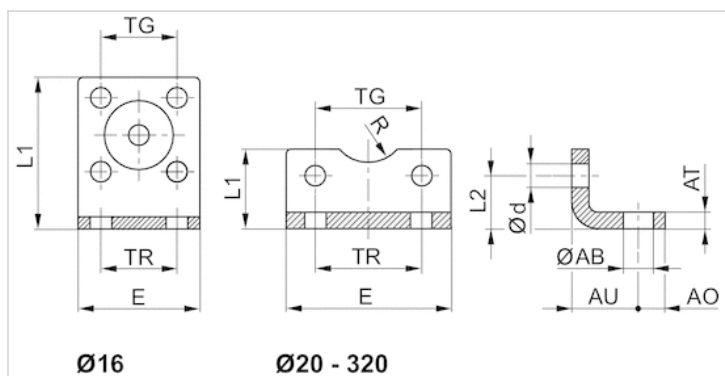
Part No.	Piston Ø	For series
3682202000	25 mm	167
3662203000	32 mm	167
3662204000	40 mm	167
3662205000	50 mm	167
3662206000	63 mm	167
3662208000	80 mm	167
3662210000	100 mm	167

Scope of delivery: 2 foot mountings incl. mounting screws

## Technical information

Material	
Material	Steel
	galvanized
Screws	Steel
	galvanized

## Dimensions



## Dimensions

Part No.	Piston Ø	ØAB	AO	AT	AU ±0,2	Ød	E	L1	L2	R	TG	TR
3682202000	25 mm	7	8	4	22	5.5	40	21	11.5	13.5	27	26
3662203000	32 mm	7	8	5	24	5.5	47	26	16	15	32	32
3662204000	40 mm	9	11	5	31	6.6	56	28	16	20	40	36
3662205000	50 mm	9	12	6	33	6.6	63	35	22	23	46	45
3662206000	63 mm	9	12	6	36	9	81	40	20.5	23	59	50
3662208000	80 mm	12	15	8	43	9	95	45	26.5	26	73	63
3662210000	100 mm	14	17	10	43	11	115	50	26	32	90	75

# Bolts AA4, Series CM1

- Suitable piston Ø 25, 32 40, 50 63, 80 100 mm



Weight

See table below

## Technical data

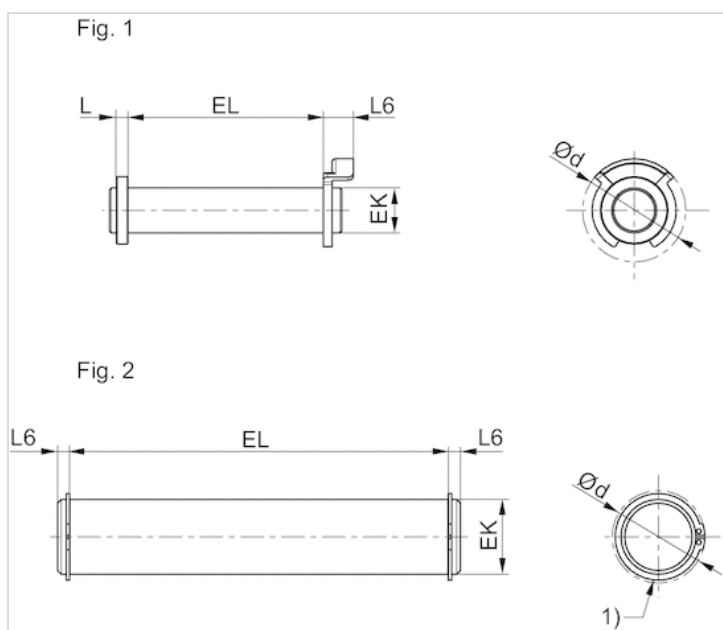
Part No.	Piston Ø	Weight	Fig.
3661302000	25, 32 mm	0.02 kg	Fig. 2
3661303000	40, 50 mm	0.03 kg	Fig. 2
3661304000	63, 80 mm	0.08 kg	Fig. 2
3661306000	100 mm	0.16 kg	Fig. 2

Scope of delivery: pivot pins incl. circlips

## Technical information

Material	
Material	Steel
	nitrocarburized

## Dimensions



## Dimensions

Part No.	Piston Ø	Fig.	Ø d max.	EK e8	EL	L max.	L6 max.
3661302000	25, 32 mm	Fig. 2	19	10	29.2	-	2.4
3661303000	40, 50 mm	Fig. 2	21	12	34.4	-	2.8
3661304000	63, 80 mm	Fig. 2	28	16	48.4	-	2.8
3661306000	100 mm	Fig. 2	40	20	58.4	-	3.3

# Piston rod nut MR9



Weight

See table below

## Technical data

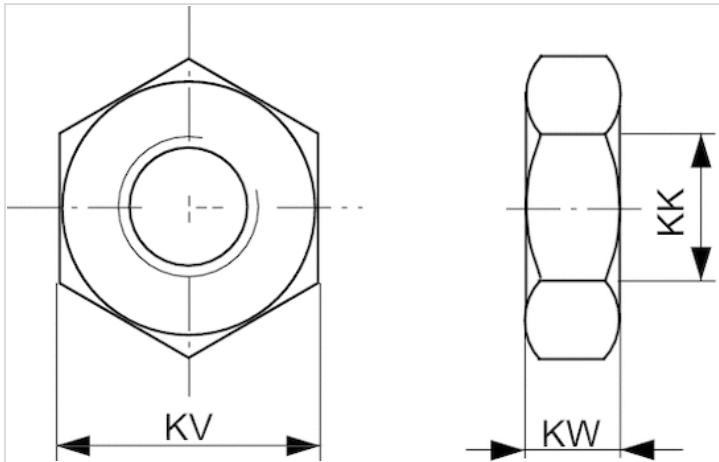
Part No.	Suitable piston rod thread	Material	Weight	
8103190394	M24x2	Steel, galvanized	0.06 kg	-
8103190434	M48x2	Steel, galvanized	0.4 kg	-
3590304000	M12x1,25	Stainless steel	0.02 kg	-
3590305000	M16x1,5	Stainless steel	0.03 kg	1)
3590308000	M20x1,5	Stainless steel	0.05 kg	-

1) 3590305000 can also be used as an MR3, nut for cylinder mounting.

## Technical information

Material	
	Steel Stainless steel
	galvanized

## Dimensions



## Dimensions

Part No.	KK	KV	KW
8103190394	M24x2	36	12
8103190434	M48x2	65	25
3590304000	M12x1,25	19	6
3590305000	M16x1,5	24	8
3590308000	M20x1,5	30	10

# Rod clevis AP2, Series CM2

- with circlip to mount on cylinder CCL-IS/IC, CCI, SSI, CSL-RD, ICM, ICS-D2, 167



Weight

See table below

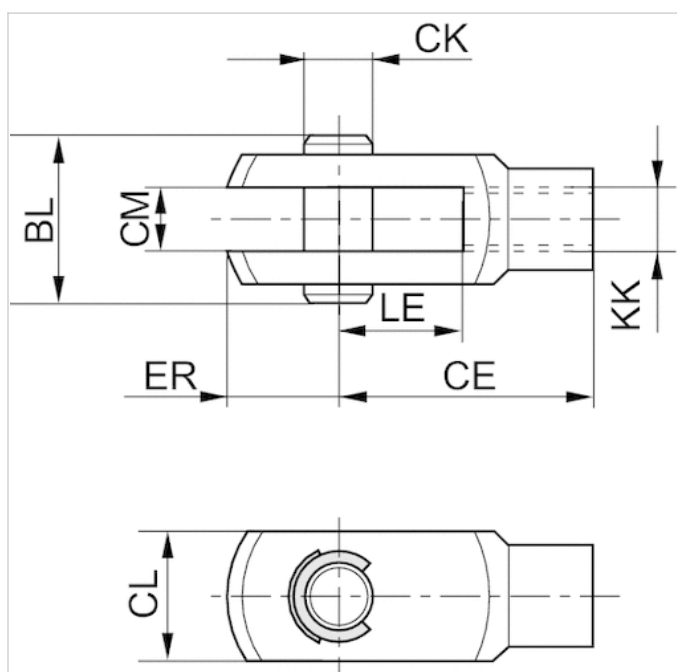
## Technical data

Part No.	Suitable piston rod thread	for	Weight
3590502000	M10x1,25	CCL-IS CCL-IC CCI CSL-RD SSI ICM ICS-D2 167	0.1 kg
3590504000	M12x1,25	CCL-IS CCL-IC CCI SSI 167 ICS-D2	0.16 kg
3590505000	M16x1,5	CCL-IS ICS-D2 167	0.4 kg
3590508000	M20x1,5	CCL-IS ICS-D2 167	0.7 kg

## Technical information

Material
Stainless steel

## Dimensions



## Dimensions

Part No.	KK	CE	CK e8	CL	CM B12	ER	BL	LE
3590502000	M10x1,25	40	10	20	10	12	26	20
3590504000	M12x1,25	48	12	24	12	14	31	24
3590505000	M16x1,5	64	16	32	16	19	39	32
3590508000	M20x1,5	80	20	40	20	20	49	40



# Rod clevis AP2, Series CM2

- to mount on cylinder PRA, TRB, CCI, MNI, ICM, KPZ, KHZ, 167, CVI, RPC, RDC, ITS



Weight

See table below

## Technical data

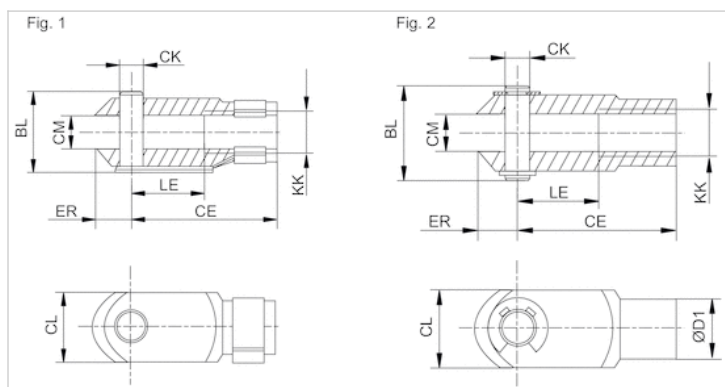
Part No.	Suitable piston rod thread	for	Weight
1822122024	M10x1,25	PRA TRB CCI MNI ICM KPZ 167 CVI RPC RDC	0.1 kg
1822122025	M12x1,25	PRA TRB CCI KPZ 167 CVI RPC 102	0.16 kg
1822122005	M16x1,5	PRA TRB CCI KPZ 167 CVI RPC RDC 102	0.4 kg
1822122004	M20x1,5	PRA TRB KPZ 167 CVI 102	0.7 kg
1827001493	M27x2	PRA TRB CCL-IS 167 CVI	2 kg

Part No.	Fig.
1822122024	Fig. 1
1822122025	Fig. 1
1822122005	Fig. 1
1822122004	Fig. 1
1827001493	Fig. 2

## Technical information

Material	
	Steel
	galvanized

## Dimensions



## Dimensions

Part No.	KK	BL	CE	ØCK e11	CL	CM	ØD1	ER	LE	Fig.
1822122024	M10x1,25	26	40	10	20	10	18	12	20	Fig. 1
1822122025	M12x1,25	31	48	12	24	12	20	14	24	Fig. 1
1822122005	M16x1,5	39	64	16	32	16	26	19	32	Fig. 1
1822122004	M20x1,5	50	80	20	40	20	34	20	40	Fig. 1
1827001493	M27x2	68	110	30	55	30	48	38	54	Fig. 2

# Rod clevis PM6, Series CM2

- for ball eye rod end AP6



## Technical data

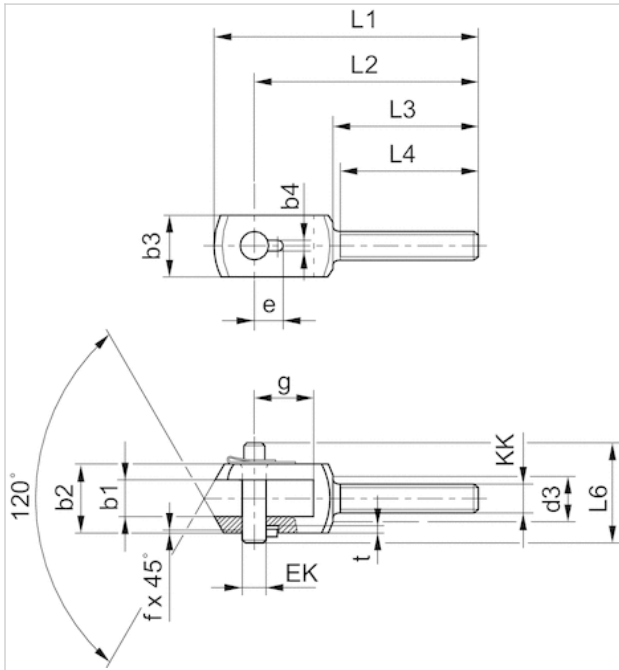
Part No.	for	Swivel bearing Ø
1822122032	AP6	14 mm
1822122033	AP6	16 mm
1822122034	AP6	21 mm
1822122035	AP6	25 mm

Scope of delivery incl. bolt

## Technical information

Material	
	Steel
	galvanized

## Dimensions



## Dimensions

Part No.	b1 B12	b2 d12	b3	b4 +0,2	d3	e +0,3	EK	f	g	L1	L2	L3	L4 +1	L6	t +0,2
1822122032	14	28	20	3.3	17	11.5	10	0.7	20	90	78	53	50	35	3
1822122033	16	30	25	4.3	19	12	12	1	26	108	92	58	55	39	3
1822122034	21	40	35	4.3	24	14	16	1	31	129	108	65	62	50	3
1822122035	25	50	40	4.3	30	16	20	1	43	156	131	73	69	60	3

# Ball eye rod end AP6, series CM2

- with flange to mount on cylinder PRA, TRB, CCI, SSI, MNI, RPC, KPZ, 167, CVI, RDC, 102, ITS



Weight

See table below

## Technical data

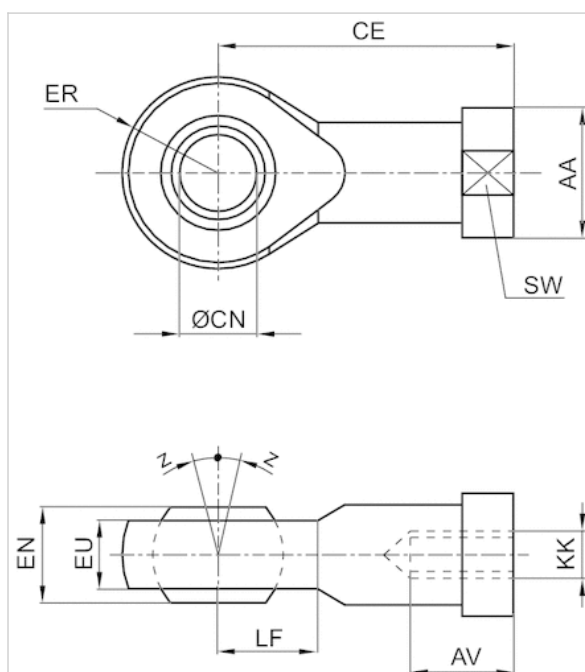
Part No.	Suitable piston rod thread	for	Swivel bearing Ø
1822124003	M10x1,25	PRA TRB MNI CCI SSI RPC KPZ 167 CVI RDC	254 mm
1822124004	M12x1,25	PRA TRB CCI SSI RPC KPZ 167 CVI 102	304.8 mm
1822124005	M16x1,5	PRA TRB CCI SSI RPC KPZ 167 CVI RDC 102	406.4 mm
1822124006	M20x1,5	PRA TRB KPZ 167 CVI 102	508 mm
1822124013	M27x2	PRA TRB 167 CVI	762 mm
1822124008	M36x2	ITS	889 mm
1822124009	M42x2	ITS	1016 mm
8958208842	M48x2	ITS	1270 mm

Part No.	Weight
1822124003	0.07 kg
1822124004	0.12 kg
1822124005	0.21 kg
1822124006	0.38 kg
1822124013	1.17 kg
1822124008	2 kg
1822124009	3.4 kg
8958208842	5.2 kg

## Technical information

Material	
	Steel
	galvanized

## Dimensions



## Dimensions

Part No.	KK	AA	AV min.	CE	Ø CN H7	EN -0,1	ER	EU max.	LF	SW	Z [°] max.
1822124003	M10x1,25	19	15	43	10	14	14	11.5	14	17	4
1822124004	M12x1,25	22	18	50	12	16	16	12.5	16	19	4
1822124005	M16x1,5	27	24	64	16	21	21	15.5	21	22	4
1822124006	M20x1,5	34	30	77	20	25	25	18.5	25	30	4
1822124013	M27x2	50	45	110	30	37	35	27	35	41	4
1822124008	M36x2	60	56	125	35	43	40	32	40	50	4
1822124009	M42x2	69	60	142	40	49	45.5	37	45	55	4
8958208842	M48x2	75	65	160	50	60	58	45	60	65	6

# Compensating coupling PM5, series CM2

- to mount on cylinder PRA, TRB, CCL-IS/-IC, CCI, SSI, MNI, KPZ, KHZ, 167, CVI, RPC, RDC, ITS■spherical



Weight

See table below

## Technical data

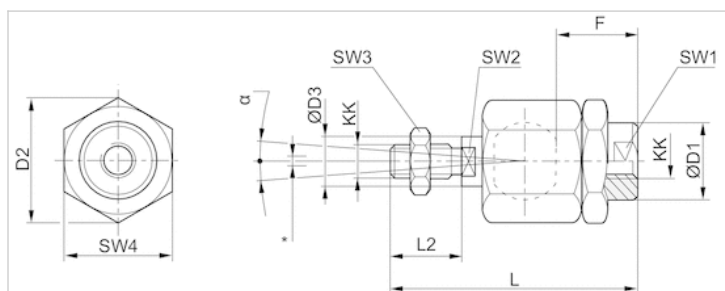
Part No.	Suitable piston rod thread	for
R412026142	M10x1,25	PRA TRB CCL-IS CCL-IC CCI SSI KPZ 167 CVI RPC
R412026143	M12x1,25	PRA TRB CCI CCL-IS CCL-IC SSI KPZ 167 CVI RPC
R412026144	M16x1,5	PRA TRB CCI CCL-IS CCL-IC KPZ 167 CVI RPC RDC
R412026145	M20x1,5	PRA TRB CCL-IS SSI KPZ 167 CVI

Part No.	Weight
R412026142	0.21 kg
R412026143	0.21 kg
R412026144	0.65 kg
R412026145	0.68 kg

## Technical information

Material
Steel
galvanized

## Dimensions



\* Radial joint

## Dimensions

Part No.	KK	$\varnothing D1$	$D2$	$\varnothing D3$	F	$L \pm 2$	L2	SW1	SW2	SW3	SW4	$\alpha$ [°]	1)	2)
R412026142	M10x1,25	22	32	14	23	74.5	23	19	12	17	30	8	0.05-0.5	0-2
R412026143	M12x1,25	22	32	14	24	75	24	19	12	19	30	7	0.05-0.5	0-2
R412026144	M16x1,5	32	45	22	30	103	30	30	20	24	41	6	0.05-0.5	0-2
R412026145	M20x1,5	32	45	22	40	119	40	30	20	30	41	6	0.05-0.5	0-2

1) Axial play

2) Radial play



# Compensating coupling PM7, series CM2

- to mount on cylinder PRA, TRB, CCL-IS/-IC, CCI, SSI, KPZ, 167, CVI, RPC, ITS with plate



Weight

See table below

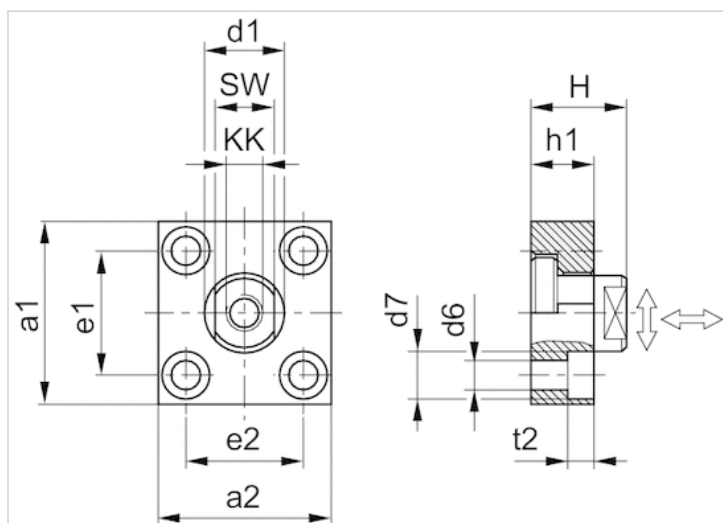
## Technical data

Part No.	Suitable piston rod thread	for	Weight
1827001629	M10x1,25	PRA TRB CCL-IS CCL-IC CCI SSI KPZ RPC 167	0.3 kg
1827001630	M12x1,25	PRA TRB CCL-IS CCL-IC CCI SSI KPZ RPC 167	0.4 kg
1827001631	M16x1,5	PRA TRB CCL-IS CCL-IC CCI SSI KPZ RPC 167	0.9 kg
1827001632	M20x1,5	PRA TRB CCL-IS SSI KPZ CVI 167	1.15 kg

## Technical information

Material	
	Steel
	galvanized

## Dimensions



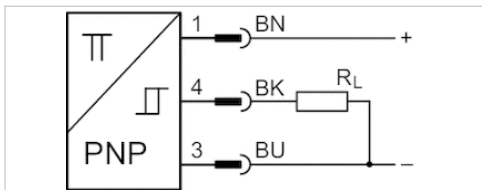
## Dimensions

Part No.	$a_1$	$a_2$	$d_1$ h11	$d_6$ H13	$d_7$ H13	$e_1$ H13	$e_2$	$h_1$	$t_2$	$H$	$SW$
1827001629	60	37	20	6.6	11	$36 \pm 0,15$	$23 \pm 0,15$	15	7	24	17
1827001630	60	56	25	9	15	$42 \pm 0,2$	$38 \pm 0,2$	20	9	30	19
1827001631	80	80	30	11	18	$58 \pm 0,2$	$58 \pm 0,2$	20	11	32	24
1827001632	90	90	40	14	20	$65 \pm 0,3$	$65 \pm 0,3$	20	13	35	36

Tightening torque for the coupling pin $M_a \pm 5\%$	Axial play min./max.	Radial play min./max.
17 Nm	0.4 0.8 mm	1.9 2.3 mm
29 Nm	0.4 0.8 mm	1.9 2.3 mm
71 Nm	0.4 0.8 mm	1.9 2.3 mm
138 Nm	0.4 0.8 mm	1.9 2.3 mm

# Sensor, Series ST6

- 6 mm T-slot
- with cable
- open cable ends, 3-pin
- ATEX
- UL certification, ATEX
- electronic PNP
- Direct mounting for series PRA, PRE, CCI, KPZ, SSI, GPC, CVI
- Indirect mounting for series TRB, ITS, CCL-IS, MNI, CSL-RD, RPC, ICS-D2, ICM, KHZ, TRR



### Certificates

- ATEX class G
- ATEX class D
- Ambient temperature min./max.
- Protection class
- Switching point precision
- Quiescent current (without load)
- Min./max. DC operating voltage
- Switching logic
- LED status display
- Vibration resistance
- Shock resistance
- Cable length L

- ATEX CE declaration of conformity cULus RoHS
- II 3G Ex nA IIC T4 Gc X
- II 3D Ex tc IIIC T135°C Dc X
- 20 ... 50 °C
- IP67
- ±0,1 mT
- 10 mA
- 10 ... 30 V DC
- NO (make contact)
- Yellow
- 10 - 55 Hz, 1 mm
- 30 g / 11 ms
- 3 5 m

## Technical data

Part No.	for	Type of contact	Cable length L
R412022854	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP	3 m
R412022856	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP	5 m

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412022854	≤ 2,5 V	0.1 A
R412022856	≤ 2,5 V	0.1 A

Part No.	Max. switching frequency
R412022854	1000 Hz
R412022856	1000 Hz

Part No.	Version
R412022854	short circuit resistant Protected against polarity reversal

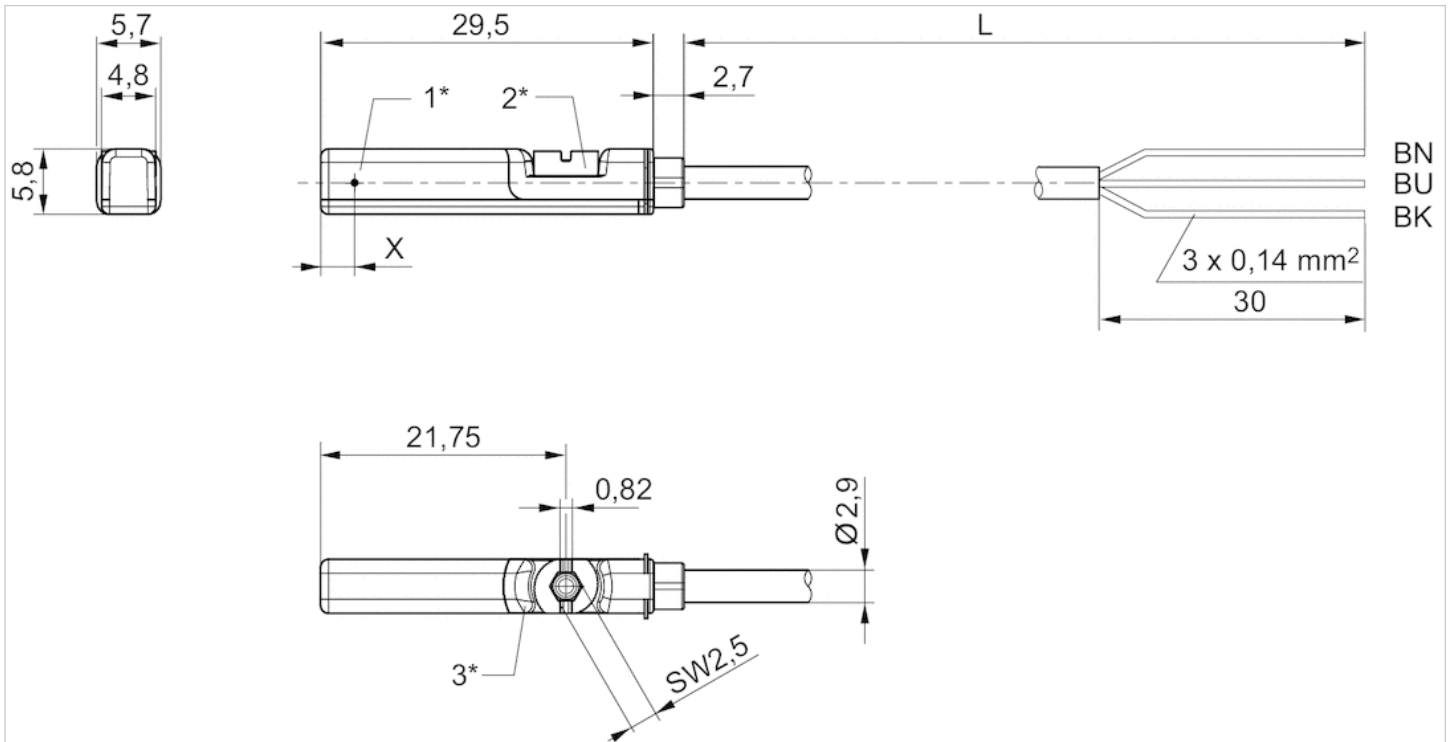
Part No.	Version
R412022856	short circuit resistant Protected against polarity reversal

## Technical information

Material	
Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel

## Dimensions

Fig. 2



1\* = switching point 2\* = locking screw 3\* = LED window, transparent  
 L = cable length  
 BN = brown, BK = black, BU = blue  
 X = electronic: 11.6 mm











## Sensor, Series ST6

- 6 mm T-slot
- with cable
- open cable ends, 2-pin open cable ends, 3-pin
- UL certification
- Reed electronic PNP electronic NPN
- Direct mounting for series PRA, PRE, CCI, KPZ, SSI, GPC, CVI
- Indirect mounting for series TRB, ITS, CCL-IS, MNI, CSL-RD, RPC, ICS-D2, ICM, KHZ, TRR



Ambient temperature min./max.	-30 ... 80 °C
Protection class	IP65, IP67, IP69K
Switching point precision	±0,1 mT
Nominal current, actuated state	30 mA
Quiescent current (without load)	8 mA
Min./max. DC operating voltage	See table below
Min./max. AC operating voltage	See table below
Hysteresis	≥ 0,2 mT
Switching logic	NO (make contact)
LED status display	Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	3 5 10 m

## Technical data

Part No.		for	Type of contact
R412022866		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412027170		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022869		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022870		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022871		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022853		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022855		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022857		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022849		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic NPN
R412022850		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic NPN

Part No.	Cable length L	Min./max. DC operating voltage	Min./max. AC operating voltage
R412022866	3 m	10 ... 230 V DC	10 ... 230 V AC
R412027170	5 m	10 ... 230 V DC	10 ... 230 V AC
R412022869	3 m	10 ... 30 V DC	10 ... 30 V AC
R412022870	5 m	10 ... 30 V DC	10 ... 30 V AC
R412022871	10 m	10 ... 30 V DC	10 ... 30 V AC
R412022853	3 m	10 ... 30 V DC	-
R412022855	5 m	10 ... 30 V DC	-
R412022857	10 m	10 ... 30 V DC	-
R412022849	3 m	10 ... 30 V DC	-
R412022850	5 m	10 ... 30 V DC	-

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412022866	≤ 3,5 V	0.13 A
R412027170	≤ 3,5 V	0.13 A
R412022869	I*Rs	0.3 A
R412022870	≤ 0,1 V	0.3 A
R412022871	I*Rs	0.3 A
R412022853	≤ 2,5 V	0.13 A
R412022855	≤ 2,5 V	0.13 A
R412022857	≤ 2,5 V	0.13 A
R412022849	≤ 2,5 V	0.13 A
R412022850	≤ 2,5 V	0.13 A

Part No.	AC switching current, max.	Switching capacity
R412022866	0.13 A	Reed, 2-pin: max. 10 W
R412027170	0.13 A	Reed, 2-pin: max. 10 W
R412022869	0.5 A	Reed, 3-pin: max. 6 W
R412022870	0.5 A	Reed, 3-pin: max. 6 W
R412022871	0.5 A	Reed, 3-pin: max. 6 W

Part No.	AC switching current, max.	Switching capacity
R412022853	-	-
R412022855	-	-
R412022857	-	-
R412022849	-	-
R412022850	-	-

Part No.	Max. switching frequency	Operating current, not switched
R412022866	400 Hz	-
R412027170	400 Hz	-
R412022869	400 Hz	-
R412022870	400 Hz	-
R412022871	400 Hz	-
R412022853	1000 Hz	8 mA
R412022855	1000 Hz	8 mA
R412022857	1000 Hz	8 mA
R412022849	1000 Hz	8 mA
R412022850	1000 Hz	8 mA

Part No.	Operating current, switched
R412022866	-
R412027170	-
R412022869	-
R412022870	-
R412022871	-
R412022853	30 mA
R412022855	30 mA
R412022857	30 mA
R412022849	30 mA
R412022850	30 mA

Part No.	Version	Fig.	
R412022866	Protected against polarity reversal	Fig. 1	1)
R412027170	Protected against polarity reversal	Fig. 1	1)
R412022869	Protected against polarity reversal	Fig. 2	2)
R412022870	Protected against polarity reversal	Fig. 2	2)
R412022871	Protected against polarity reversal	Fig. 2	2)
R412022853	short circuit resistant Protected against polarity reversal	Fig. 2	3)
R412022855	short circuit resistant Protected against polarity reversal	Fig. 2	3)
R412022857	short circuit resistant Protected against polarity reversal	Fig. 2	3)
R412022849	short circuit resistant Protected against polarity reversal	Fig. 2	3)
R412022850	short circuit resistant Protected against polarity reversal	Fig. 2	3)

1) open cable ends, 2-pin, The product of operating voltage and continuous current must not exceed the maximum switching capacity.

2) open cable ends, 3-pin, The product of operating voltage and continuous current must not exceed the maximum switching capacity.

3) open cable ends, 3-pin

## Technical information

No cULus certification for 230 V variant.

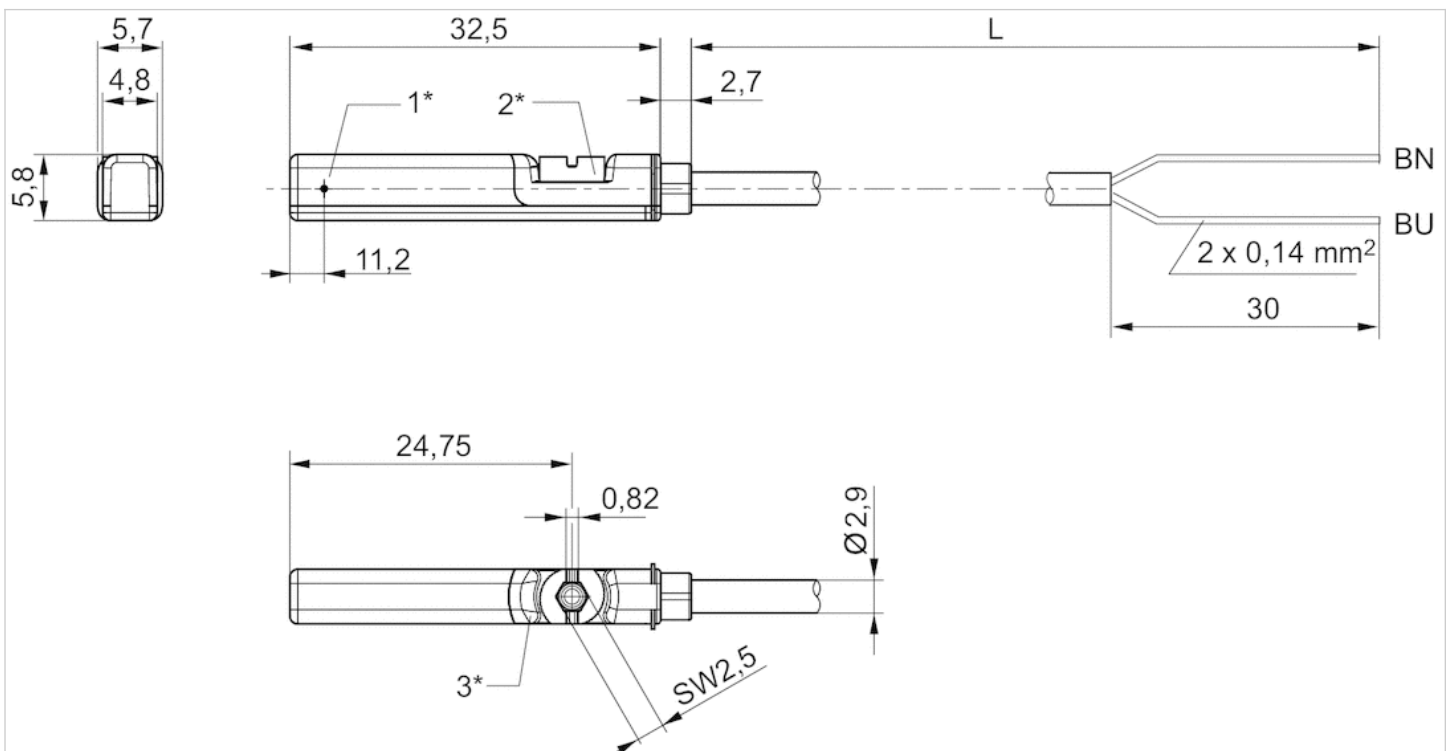
## Technical information

### Material

Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel

## Dimensions

Fig. 1



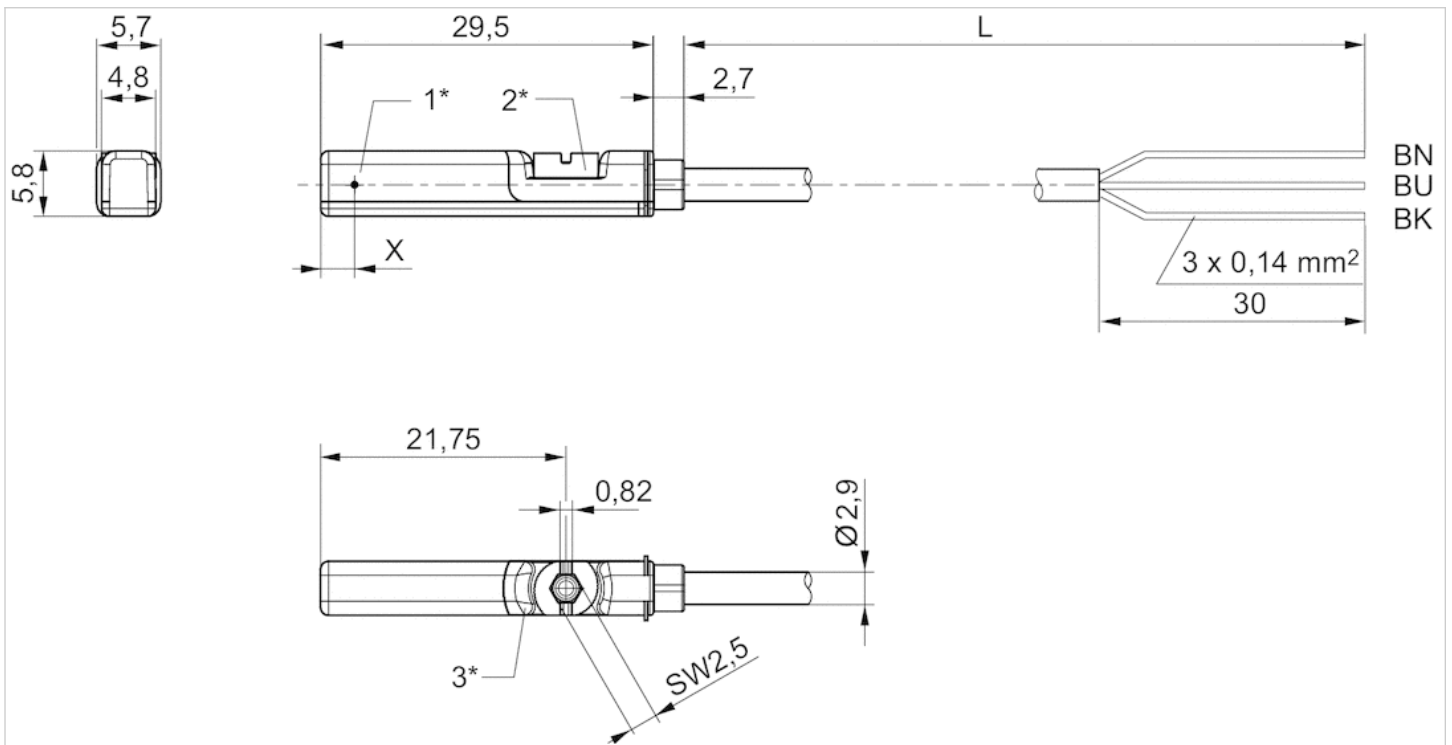
1\* = switching point 2\* = locking screw 3\* = LED window, transparent

L = cable length

BN=brown, BU=blue



Fig. 2



1\* = switching point 2\* = locking screw 3\* = LED window, transparent  
 L = cable length  
 BN = brown, BK = black, BU = blue  
 X = electronic: 11.6 mm






# Sensor, Series ST6

- 6 mm T-slot
- with cable
- Plug, M8, 3-pin Plug, M8, 2-pin
- UL certification
- Reed electronic PNP electronic NPN
- Direct mounting for series PRA, PRE, CCI, KPZ, SSI, GPC, CVI
- Indirect mounting for series TRB, ITS, CCL-IS, MNI, CSL-RD, RPC, ICS-D2, ICM, KHZ, TRR



Certificates	CE declaration of conformity cULus RoHS
Ambient temperature min./max.	-30 ... 80 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Nominal current, actuated state	30 mA
Quiescent current (without load)	8 mA
Min./max. DC operating voltage	10 ... 30 V DC
Min./max. AC operating voltage	See table below
Hysteresis	≥ 0,2 mT
Switching logic	NO (make contact)
LED status display	Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	0.3 m

## Technical data

Part No.		for	Type of contact
R412022868		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412027172		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022872		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022858		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022851		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic NPN

Part No.	Cable length L	Min./max. AC operating voltage	Voltage drop U at I <sub>max</sub>
R412022868	0.3 m	10 ... 30 V AC	≤ 3,5 V
R412027172	0.3 m	10 ... 30 V AC	≤ 3,5 V
R412022872	0.3 m	10 ... 30 V AC	≤ 0,1 V
R412022858	0.3 m	-	≤ 2,5 V
R412022851	0.3 m	-	≤ 2,5 V

Part No.	DC switching current, max.	AC switching current, max.
R412022868	0.13 A	0.13 A
R412027172	0.13 A	0.13 A
R412022872	0.3 A	0.5 A
R412022858	0.13 A	-

Part No.	DC switching current, max.	AC switching current, max.
R412022851	0.13 A	-

Part No.	Switching capacity	Max. switching frequency
R412022868	Reed, 2-pin: max. 10 W	400 Hz
R412027172	Reed, 2-pin: max. 10 W	400 Hz
R412022872	Reed, 3-pin: max. 6 W	400 Hz
R412022858	-	1000 Hz
R412022851	-	1000 Hz

Part No.	Operating current, not switched	Operating current, switched
R412022868	-	-
R412027172	-	-
R412022872	-	-
R412022858	8 mA	30 mA
R412022851	8 mA	30 mA

Part No.	Version	
R412022868	Protected against polarity reversal	1)
R412027172	Protected against polarity reversal	1)
R412022872	Protected against polarity reversal	1)
R412022858	short circuit resistant Protected against polarity reversal	-
R412022851	short circuit resistant Protected against polarity reversal	-

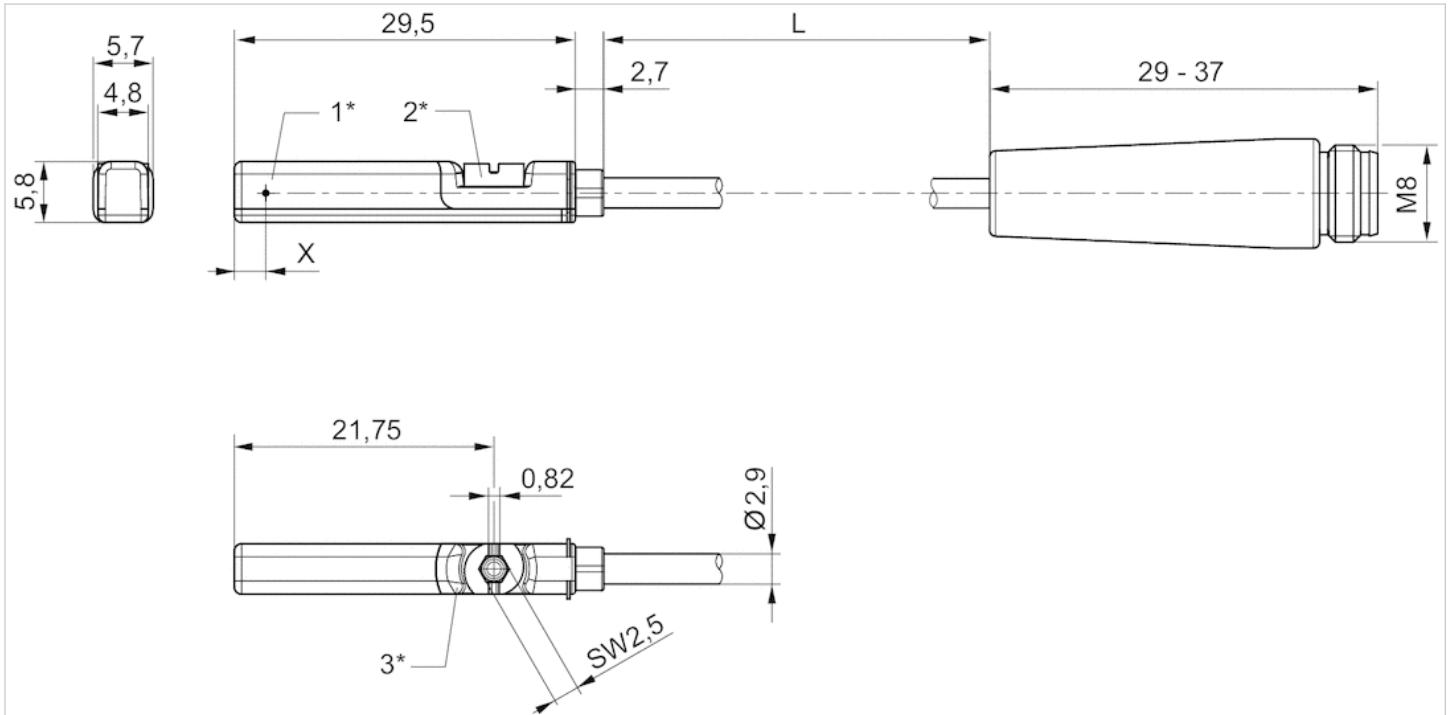
1) The product of operating voltage and continuous current must not exceed the maximum switching capacity.

## Technical information

Material	
Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel

## Dimensions

### Dimensions



1\* = switching point 2\* = locking screw 3\* = LED window, transparent

L = cable length

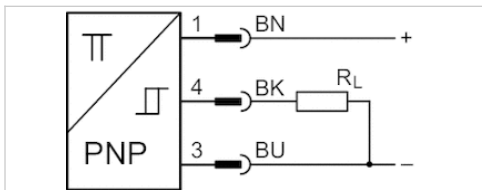
X = electronic: 11,6 mm, Reed: 8,3 mm

# Sensor, Series ST6

- 6 mm T-slot
- with cable
- Plug, M12, 3-pin, with knurled screw
- ATEX
- UL certification, ATEX
- electronic PNP
- Direct mounting for series PRA, PRE, CCI, KPZ, SSI, GPC, CVI
- Indirect mounting for series TRB, ITS, CCL-IS, MNI, CSL-RD, RPC, ICS-D2, ICM, KHZ, TRR



Certificates	ATEX CE declaration of conformity cULus RoHS
ATEX class G	II 3G Ex nA IIC T4 Gc X
ATEX class D	II 3D Ex tc IIIC T135°C Dc X
Ambient temperature min./max.	-20 ... 50 °C
Protection class	IP67
Switching point precision	±0,1 mT
Quiescent current (without load)	10 mA
Min./max. DC operating voltage	10 ... 30 V DC
Switching logic	NO (make contact)
LED status display	Yellow Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	0.3 m



## Technical data

Part No.	for	Type of contact	Cable length L
R412022864	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP	0.3 m

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412022864	≤ 2,5 V	0.1 A

Part No.	Max. switching frequency
R412022864	1000 Hz

Part No.	Version
R412022864	short circuit resistant Protected against polarity reversal

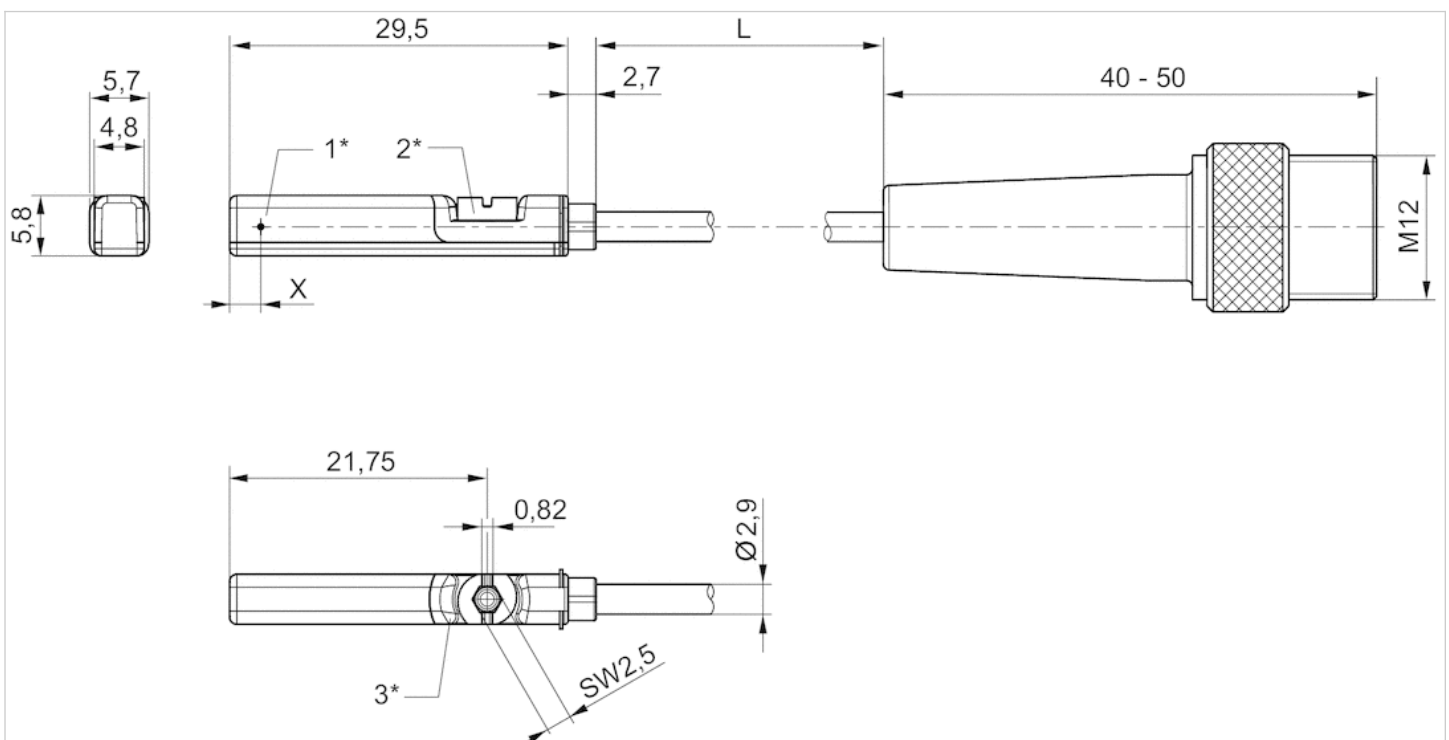
## Technical information

### Material

Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel

## Dimensions

### Dimensions



1\* = switching point 2\* = locking screw 3\* = LED window, transparent

L = cable length

X = PNP: 11,6 mm, reed: 8,3 mm

## Pin assignments

### Pin assignments



Pin	1	3	4
Allocation	(+)	(-)	(OUT)







# Sensor, Series ST6

- 6 mm T-slot
- with cable
- Plug, M12, 2-pin, with knurled screw Plug, M12, 4-pin, with knurled screw
- UL certification
- Reed electronic PNP
- Direct mounting for series PRA, PRE, CCI, KPZ, SSI, GPC, CVI
- Indirect mounting for series TRB, ITS, CCL-IS, MNI, CSL-RD, RPC, ICS-D2, ICM, KHZ, TRR



Certificates	CE declaration of conformity cULus RoHS
Ambient temperature min./max.	-30 ... 80 °C
Protection class	See table below
Switching point precision	±0,1 mT
Nominal current, actuated state	30 mA
Quiescent current (without load)	8 mA
Min./max. DC operating voltage	10 ... 30 V DC
Min./max. AC operating voltage	See table below
Hysteresis	≥ 0,2 mT
Switching logic	NO (make contact)
LED status display	Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	0.3 0.1 3 5 m

## Technical data

Part No.		for	Type of contact
R412027171		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022876		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022879		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022863		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022877		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022878		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP

Part No.	Cable length L	Min./max. AC operating voltage	Voltage drop U at I <sub>max</sub>
R412027171	0.3 m	10 ... 30 V AC	≤ 3,5 V
R412022876	0.3 m	10 ... 30 V AC	≤ 0,1 V
R412022879	0.1 m	-	≤ 2,5 V
R412022863	0.3 m	-	≤ 2,5 V
R412022877	3 m	-	≤ 2,5 V
R412022878	5 m	-	≤ 2,5 V

Part No.	DC switching current, max.	AC switching current, max.
R412027171	0.13 A	0.13 A
R412022876	0.3 A	0.5 A

Part No.	DC switching current, max.	AC switching current, max.
R412022879	0.13 A	-
R412022863	0.13 A	-
R412022877	0.13 A	-
R412022878	0.13 A	-

Part No.	Switching capacity	Max. switching frequency
R412027171	Reed, 2-pin: max. 10 W	400 Hz
R412022876	Reed, 3-pin: max. 6 W	400 Hz
R412022879	-	1000 Hz
R412022863	-	1000 Hz
R412022877	-	1000 Hz
R412022878	-	1000 Hz

Part No.	Operating current, not switched	Operating current, switched	Protection class
R412027171	-	-	IP65, IP67
R412022876	-	-	IP65, IP67
R412022879	8 mA	30 mA	IP65, IP67
R412022863	8 mA	30 mA	IP65, IP67, IP69K
R412022877	8 mA	30 mA	IP65, IP67
R412022878	8 mA	30 mA	IP65, IP67

Part No.	Version	
R412027171	Protected against polarity reversal	1)
R412022876	Protected against polarity reversal	1)
R412022879	short circuit resistant Protected against polarity reversal	-
R412022863	short circuit resistant Protected against polarity reversal	-
R412022877	short circuit resistant Protected against polarity reversal	-
R412022878	short circuit resistant Protected against polarity reversal	-

1) The product of operating voltage and continuous current must not exceed the maximum switching capacity.

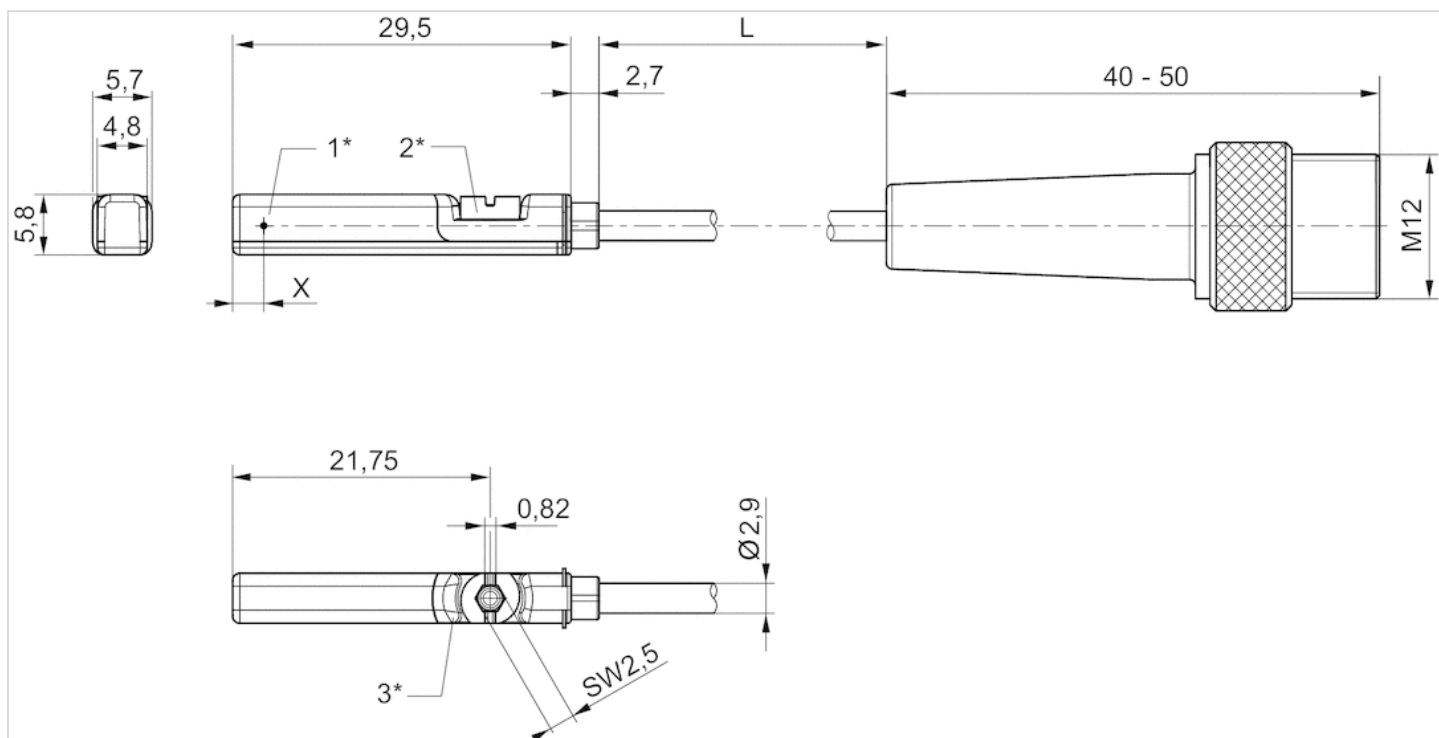
## Technical information

Material	
Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel



## Dimensions

### Dimensions



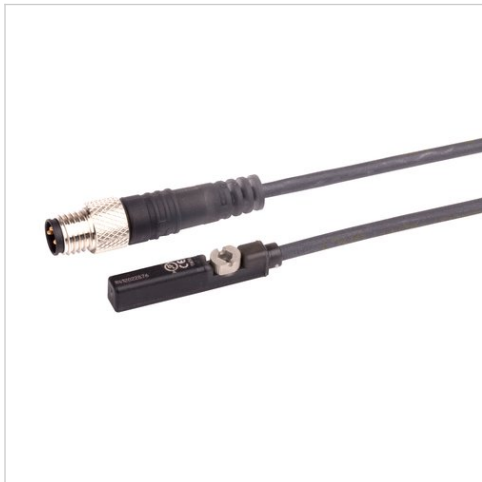
1\* = switching point 2\* = locking screw 3\* = LED window, transparent

L = cable length

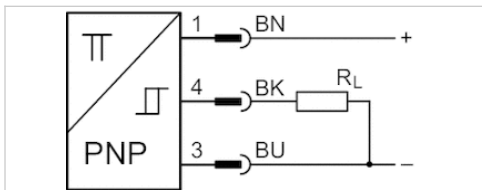
X = PNP: 11,6 mm, reed: 8,3 mm

# Sensor, Series ST6

- 6 mm T-slot
- with cable
- Plug, M8, 3-pin, with knurled screw
- ATEX
- UL certification, ATEX
- electronic PNP
- Direct mounting for series PRA, PRE, CCI, KPZ, SSI, GPC, CVI
- Indirect mounting for series TRB, ITS, CCL-IS, MNI, CSL-RD, RPC, ICS-D2, ICM, KHZ, TRR



Certificates	ATEX CE declaration of conformity cULus RoHS
ATEX class G	II 3G Ex nA IIC T4 Gc X
ATEX class D	II 3D Ex tc IIIC T135°C Dc X
Ambient temperature min./max.	-20 ... 50 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Quiescent current (without load)	10 mA
Min./max. DC operating voltage	10 ... 30 V DC
Switching logic	NO (make contact)
LED status display	Yellow Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	0.3 m



## Technical data

Part No.	for	Type of contact	Cable length L
R412022860	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP	0.3 m

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412022860	≤ 2,5 V	0.1 A

Part No.	Max. switching frequency
R412022860	1000 Hz

Part No.	Version
R412022860	short circuit resistant Protected against polarity reversal

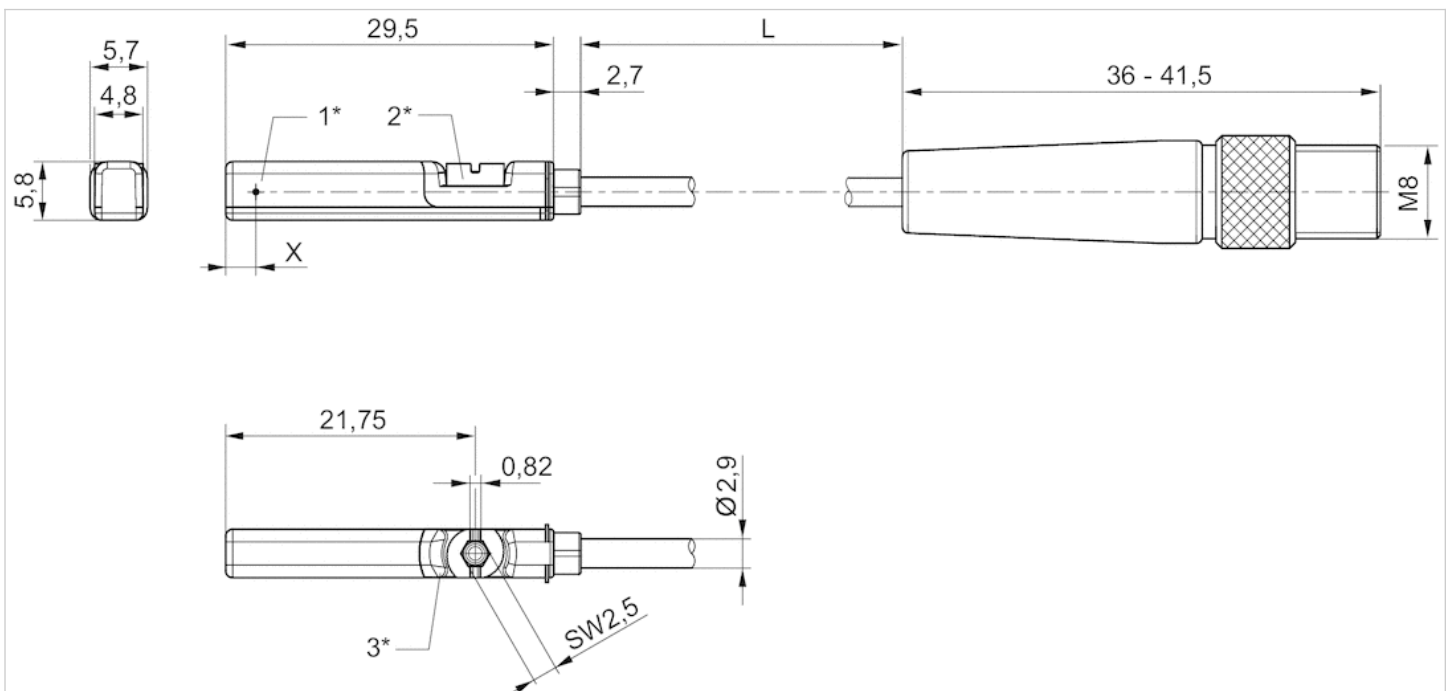
## Technical information

### Material

Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel

## Dimensions

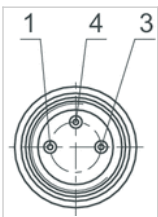
### Dimensions



1\* = switching point 2\* = locking screw 3\* = LED window, transparent  
 L = cable length  
 X = electronic: 11,6 mm, Reed: 8,3 mm

## Pin assignments

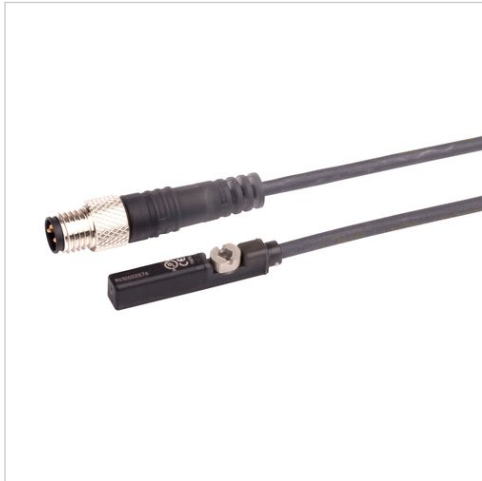
### Pin assignments



Pin	1	3	4
Allocation	(+)	(-)	(OUT)








# Sensor, Series ST6

- 6 mm T-slot
- with cable
- Plug, M8, 3-pin, with knurled screw
- UL certification
- Reed electronic PNP electronic NPN
- Direct mounting for series PRA, PRE, CCI, KPZ, SSI, GPC, CVI
- Indirect mounting for series TRB, ITS, CCL-IS, MNI, CSL-RD, RPC, ICS-D2, ICM, KHZ, TRR



Certificates	CE declaration of conformity cULus RoHS
Ambient temperature min./max.	-30 ... 80 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Nominal current, actuated state	30 mA
Quiescent current (without load)	8 mA
Min./max. DC operating voltage	10 ... 30 V DC
Min./max. AC operating voltage	See table below
Hysteresis	≥ 0,2 mT
Switching logic	NO (make contact)
Switching capacity	Reed, 3-pin: max. 6 W
LED status display	Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	0.3 0.5 m

## Technical data

Part No.		for	Type of contact
R412022873		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022875		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022874		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Reed
R412022859		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022862		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022861		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic PNP
R412022852		PRA, PRE, CCI, KPZ, SSI, GPC, CVI	electronic NPN

Part No.	Cable sheath	Cable length L	Min./max. AC operating voltage
R412022873	Polyurethane	0.3 m	10 ... 30 V AC
R412022875	Polyvinyl chloride	0.3 m	10 ... 30 V AC
R412022874	Polyurethane	0.5 m	10 ... 30 V AC
R412022859	Polyurethane	0.3 m	-
R412022862	Polyvinyl chloride	0.3 m	-
R412022861	Polyurethane	0.5 m	-
R412022852	Polyurethane	0.3 m	-

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412022873	I*Rs	0.3 A
R412022875	I*Rs	0.3 A
R412022874	I*Rs	0.3 A
R412022859	≤ 2,5 V	0.13 A
R412022862	≤ 2,5 V	0.13 A
R412022861	≤ 2,5 V	0.13 A
R412022852	≤ 2,5 V	0.13 A

Part No.	AC switching current, max.	Max. switching frequency
R412022873	0.5 A	400 Hz
R412022875	0.5 A	400 Hz
R412022874	0.5 A	400 Hz
R412022859	-	1000 Hz
R412022862	-	1000 Hz
R412022861	-	1000 Hz
R412022852	-	1000 Hz

Part No.	Operating current, not switched	Operating current, switched
R412022873	-	-
R412022875	-	-
R412022874	-	-
R412022859	8 mA	30 mA
R412022862	8 mA	30 mA
R412022861	8 mA	30 mA
R412022852	8 mA	30 mA

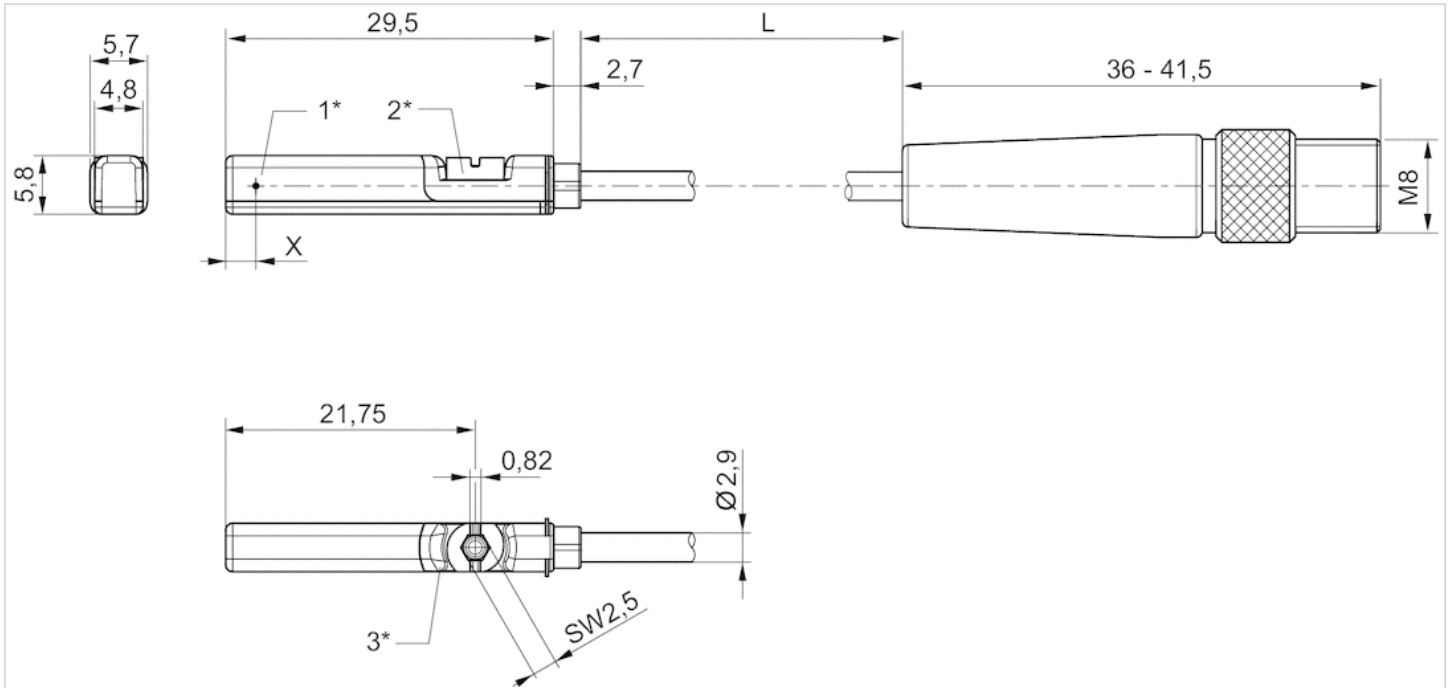
Part No.	Version
R412022873	Protected against polarity reversal
R412022875	Protected against polarity reversal
R412022874	Protected against polarity reversal
R412022859	short circuit resistant Protected against polarity reversal
R412022862	short circuit resistant Protected against polarity reversal
R412022861	short circuit resistant Protected against polarity reversal
R412022852	short circuit resistant Protected against polarity reversal

## Technical information

Material	
Housing	Polyamide
Cable sheath	Polyurethane Polyvinyl chloride
Locking screw	Stainless steel

## Dimensions

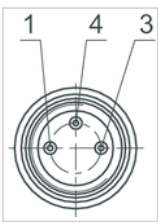
### Dimensions



1\* = switching point 2\* = locking screw 3\* = LED window, transparent  
 L = cable length  
 X = electronic: 11,6 mm, Reed: 8,3 mm

## Pin assignments

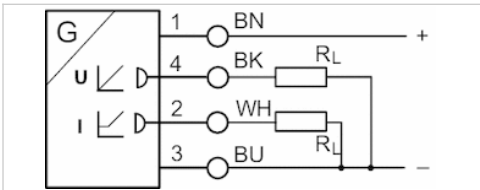
### Pin assignments



Pin	1	3	4
Allocation	(+)	(-)	(OUT)

# Sensors, Series SM6

- 6 mm groove
- with cable
- without wire end ferrule, tin-plated, 4-pin
- with distance measuring sensor, measurement range 32 ... 256 mm
- Analog
- Direct mounting for series PRA, PRE, CCI, KPZ, SSI, GPC, CVI
- Indirect mounting for series TRB, ITS, 167, MNI, ICM, TRR



Certificates	cULus
Ambient temperature min./max.	-20 ... 70 °C
Protection class	IP67
Output signal	0 - 10 V DC, 4 - 20 mA
Quiescent current (without load)	25 mA
Maximum load (analog current output)	500 Ω
Residual ripple	≤ 10 %
sampling interval	1 ms
Resolution max. measuring range	0,05 mm
Repetitive precision max. measuring range	0.1 mm
Linearity deviation	0,3 mm
Sampling speed	3 m/s
Display	LED
LED status display	Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	2 m

## Technical data

Part No.	for	Type of contact	Cable length L
R412010141	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	2 m
R412010143	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	2 m
R412010262	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	2 m
R412010264	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	2 m
R412010411	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	2 m
R412010413	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	2 m
R412010415	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	2 m
R412010417	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	2 m

Part No.	max. measuring range	Overall length Sensor A
R412010141	32 mm	45 mm
R412010143	64 mm	77 mm
R412010262	96 mm	109 mm
R412010264	128 mm	141 mm
R412010411	160 mm	173 mm
R412010413	192 mm	205 mm

Part No.	max. measuring range	Overall length Sensor A
R412010415	224 mm	237 mm
R412010417	256 mm	269 mm

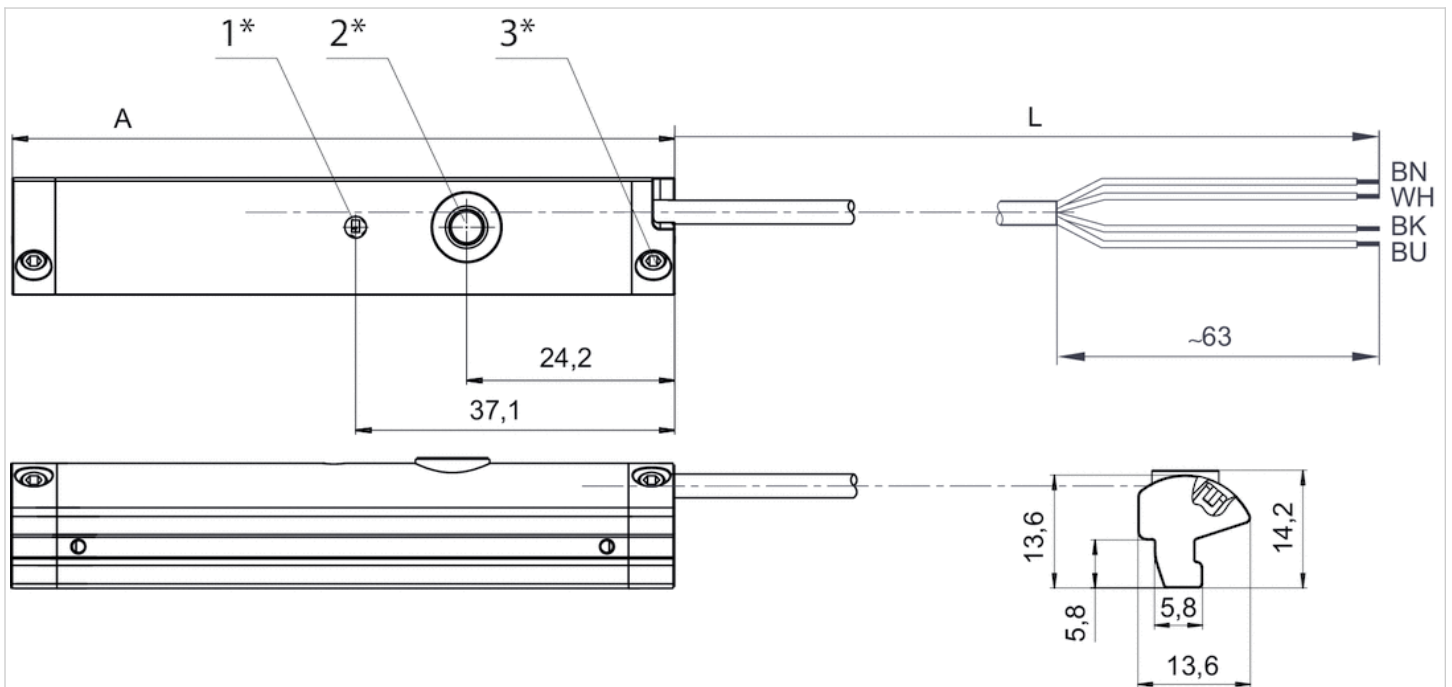
Part No.	Version
R412010141	short circuit resistant Protected against polarity reversal Overload protection
R412010143	short circuit resistant Protected against polarity reversal Overload protection
R412010262	short circuit resistant Protected against polarity reversal Overload protection
R412010264	short circuit resistant Protected against polarity reversal Overload protection
R412010411	short circuit resistant Protected against polarity reversal Overload protection
R412010413	short circuit resistant Protected against polarity reversal Overload protection
R412010415	short circuit resistant Protected against polarity reversal Overload protection
R412010417	short circuit resistant Protected against polarity reversal Overload protection

## Technical information

Material	
Housing	Polyamide fiber-glass reinforced
Cable sheath	Polyurethane

## Dimensions

### Dimensions



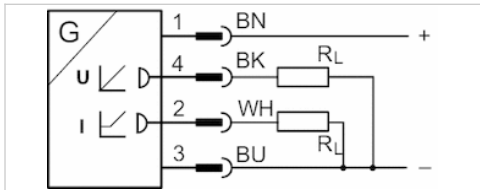
- 1\* = LED 2\* = teach button 3\* = threaded pin M3x11
- L = cable length
- (1) BN=brown
- (2) WH=white
- (3) BU=blue



(4) BK=black  
A = sensor length

# Sensors, Series SM6

- 6 mm groove
- with cable
- Plug, M8x1, 4-pin, with knurled screw
- with distance measuring sensor, measurement range 32 ... 256 mm
- Analog
- Direct mounting for series PRA, PRE, CCI, KPZ, SSI, GPC, CVI
- Indirect mounting for series TRB, ITS, 167, MNI, ICM, TRR



Certificates	cULus
Ambient temperature min./max.	-20 ... 70 °C
Protection class	IP67
Output signal	0 - 10 V DC, 4 - 20 mA
Quiescent current (without load)	25 mA
Min./max. DC operating voltage	15 ... 30 V DC
sampling interval	1 ms
Resolution max. measuring range	0,05 mm
Repetitive precision max. measuring range	0.1 mm
Linearity deviation	0,3 mm
Sampling speed	3 m/s
Display	LED
LED status display	Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	0.3 m

## Technical data

Part No.	for	Type of contact	Cable length L
R412010142	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	0.3 m
R412010144	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	0.3 m
R412010263	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	0.3 m
R412010265	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	0.3 m
R412010410	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	0.3 m
R412010412	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	0.3 m
R412010414	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	0.3 m
R412010416	PRA, PRE, CCI, KPZ, SSI, GPC, CVI	Analog	0.3 m

Part No.	max. measuring range	Overall length Sensor A
R412010142	32 mm	45 mm
R412010144	64 mm	77 mm
R412010263	96 mm	109 mm
R412010265	128 mm	141 mm
R412010410	160 mm	173 mm
R412010412	192 mm	205 mm

Part No.	max. measuring range	Overall length Sensor A
R412010414	224 mm	237 mm
R412010416	256 mm	269 mm

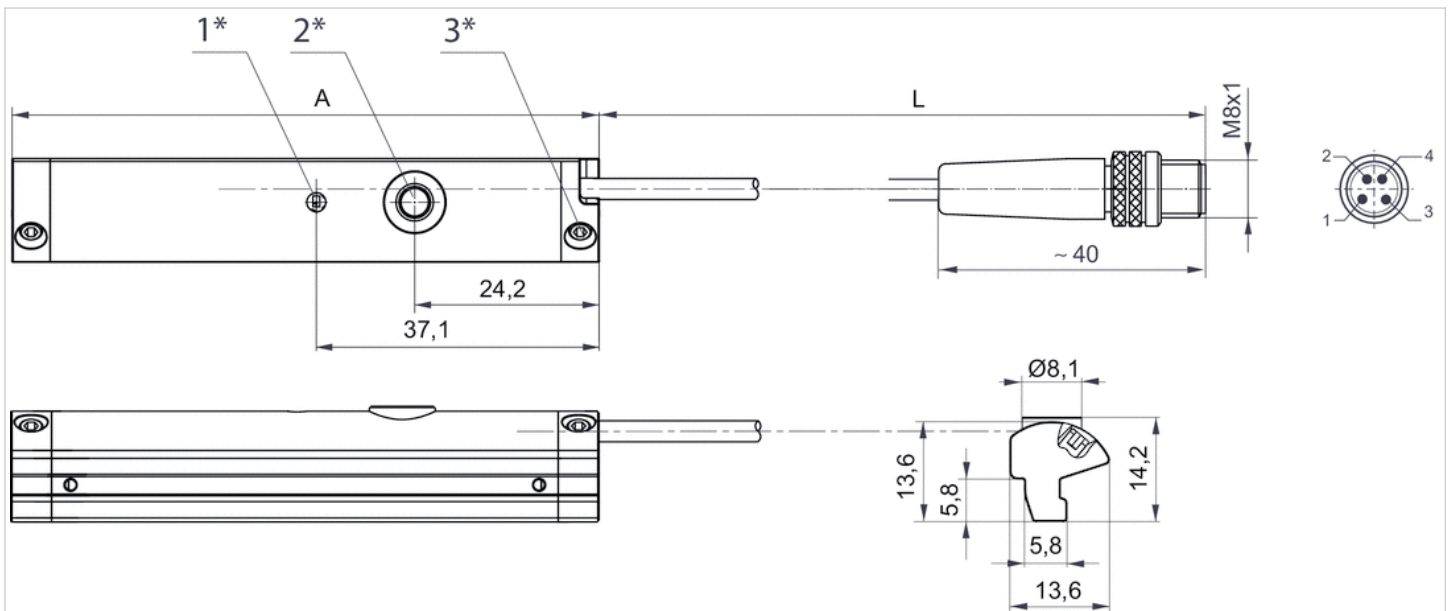
Part No.	Version
R412010142	short circuit resistant Protected against polarity reversal Overload protection
R412010144	short circuit resistant Protected against polarity reversal Overload protection
R412010263	short circuit resistant Protected against polarity reversal Overload protection
R412010265	short circuit resistant Protected against polarity reversal Overload protection
R412010410	short circuit resistant Protected against polarity reversal Overload protection
R412010412	short circuit resistant Protected against polarity reversal Overload protection
R412010414	short circuit resistant Protected against polarity reversal Overload protection
R412010416	short circuit resistant Protected against polarity reversal Overload protection

## Technical information

Material	
Housing	Polyamide fiber-glass reinforced
Cable sheath	Polyurethane

## Dimensions

### Dimensions



1\* = LED 2\* = teach button 3\* = threaded pin M3x11  
 L = cable length  
 Pin assignment: 1 = (+), 2 = (OUT 1) 3 = (GND), 4 = (OUT 2), EN 60947-5-7  
 A = sensor length

# Sensor mounting, Series CB1

- for series ST6, SM6

Weight

0.01 kg

- to mount on cylinder 167

## Technical data

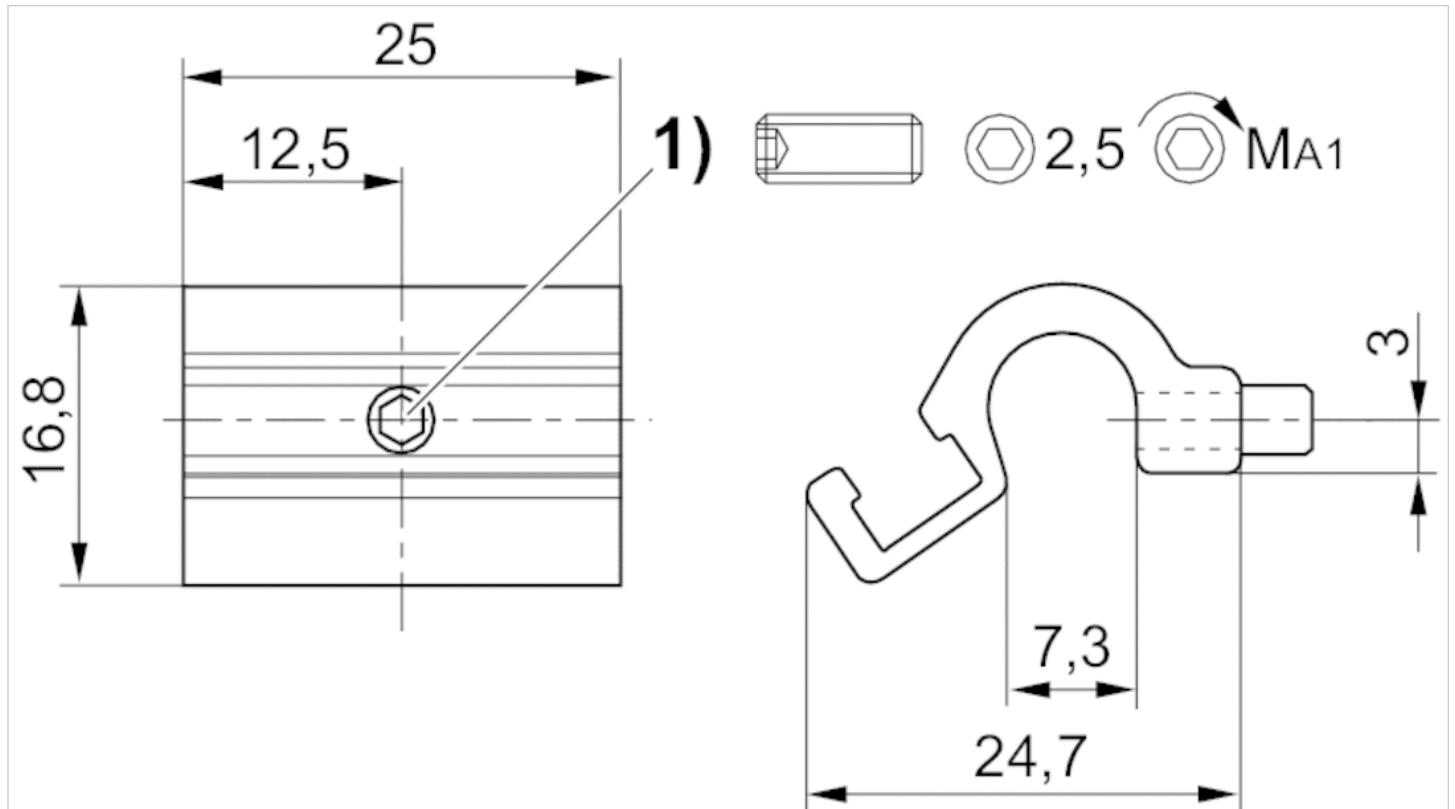
Part No.	Cylinders Ø	for series	Scope of delivery
	max.		
R412022357	25 mm	ST6, SM6	1 piece

## Technical information

Material

Aluminum

## Dimensions



1) Mounting screw

## Dimensions

Part No.	MA1 [Nm]
R412022357	1 + 0,3

# Sensor mounting, Series CB1

- for series ST6, SM6

- to mount on cylinder TRB, C12P, 167, CVI, TRR, 523



Weight

See table below

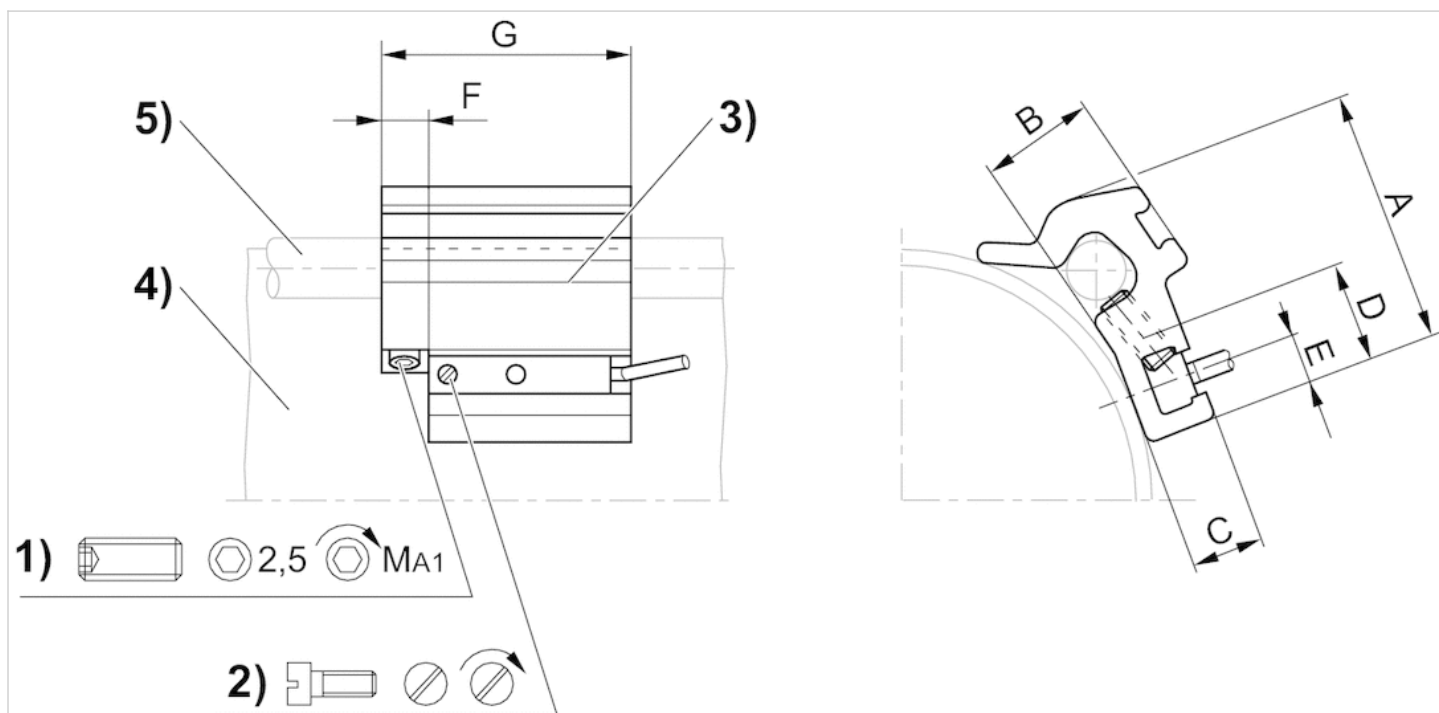
## Technical data

Part No.	Cylinders Ø		for series	Weight
	min.	max.		
1827020282	32 mm	40 mm	ST6, SM6	0.016 kg
1827020283	50 mm	63 mm	ST6, SM6	0.029 kg
1827020284	80 mm	100 mm	ST6, SM6	0.042 kg

## Technical information

Material	
	Aluminum

## Dimensions



1) Clamping threaded pin 2) Mounting screw for sensor 3) Sensor 4) Cylinder profile 5) Tie rod

## Dimensions

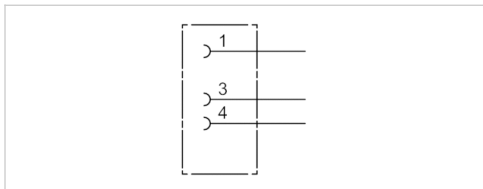
Part No.	A	B	C	D	E	F	G	1)	MA1 [Nm]
1827020282	26	10	7	14	5	8	40	M5x8	2 ±0,2
1827020283	32.5	15.5	7	14	5	8	40	M5x10	2 ±0,2
1827020284	43	17	6.9	14	5	8	40	M5x16	2 ±0,2

# Round plug connector, Series CON-RD

- Socket, M8x1, 3-pin, A-coded, straight, 180°
- UL (Underwriters Laboratories)
- unshielded



Connection type	Soldering
Ambient temperature min./max.	-25 ... 80 °C
Operational voltage	48 V AC/DC
Protection class	IP67
Weight	0.009 kg



## Technical data

Part No.	Max. current	suitable cable-Ø min./max
1834484173	4 A	3.5 / 5 mm

## Technical information

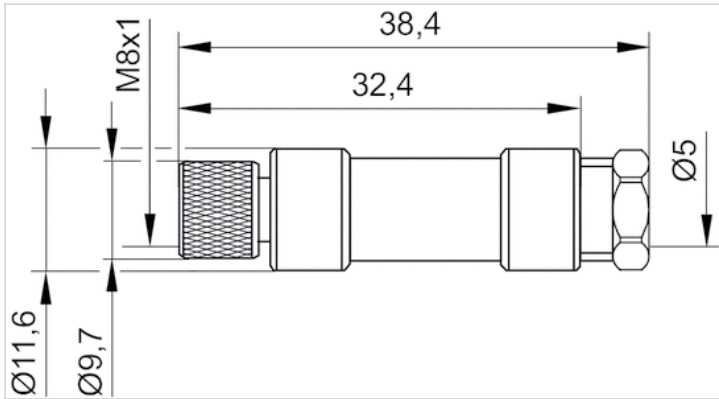
The specified protection class is only valid in assembled and tested state.

## Technical information

Material	
Housing	Polyamide

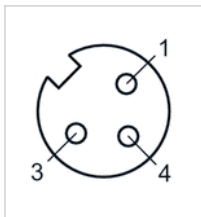
## Dimensions

### Dimensions



## Pin assignments

### Pin assignment, socket



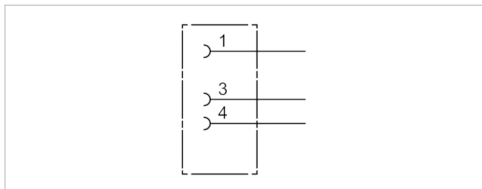


# Round plug connector, Series CON-RD

- Socket, M8x1, 3-pin, A-coded, angled, 90°
- UL (Underwriters Laboratories)
- unshielded



Connection type	Soldering
Ambient temperature min./max.	-40 ... 85 °C
Operational voltage	48 V AC/DC
Protection class	IP67
Weight	0.01 kg



## Technical data

Part No.	Max. current	Contact assignment	suitable cable-Ø min./max
1834484174	4 A	3	3.5 / 5 mm

## Technical information

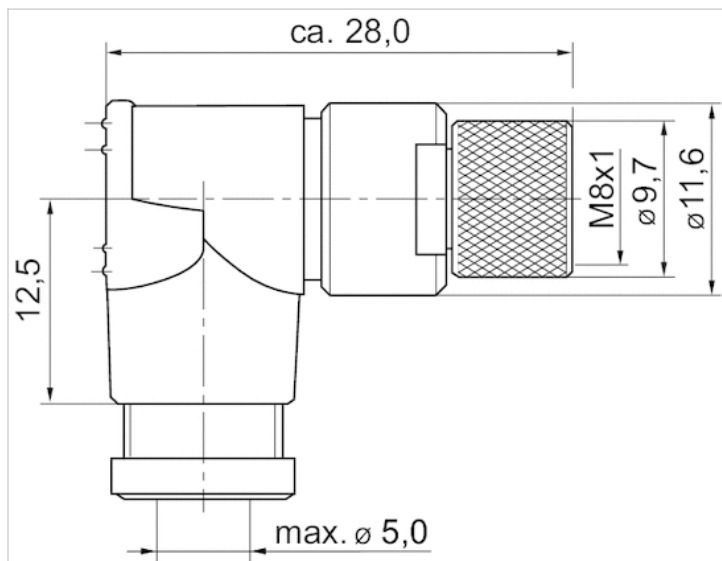
The specified protection class is only valid in assembled and tested state.

## Technical information

Material	
Housing	Polyamide

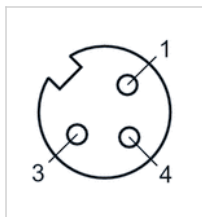
## Dimensions

### Dimensions



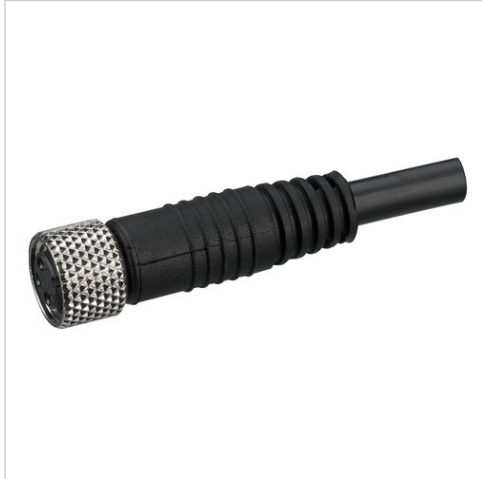
## Pin assignments

### Pin assignment, socket

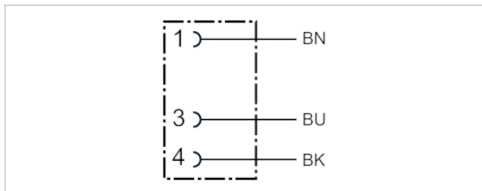


# Round plug connector, Series CON-RD

- Socket M8x1 3-pin A-coded straight 180°
- open cable ends
- with cable
- UL (Underwriters Laboratories)
- unshielded



Ambient temperature min./max.	-25 ... 85 °C
Operational voltage	48 V AC/DC
Protection class	IP67
Wire cross-section	0.24 mm <sup>2</sup>
Weight	See table below



## Technical data

Part No.	Max. current	Number of wires	Cable-Ø	Cable length	Certification	Weight
1834484166	4 A	3	4.5 mm	3 m	UL (Underwriters Laboratories)	0.087 kg
1834484168	4 A	3	4.5 mm	5 m	UL (Underwriters Laboratories)	0.141 kg
1834484247	4 A	3	4.5 mm	10 m	UL (Underwriters Laboratories)	0.277 kg

## Technical information

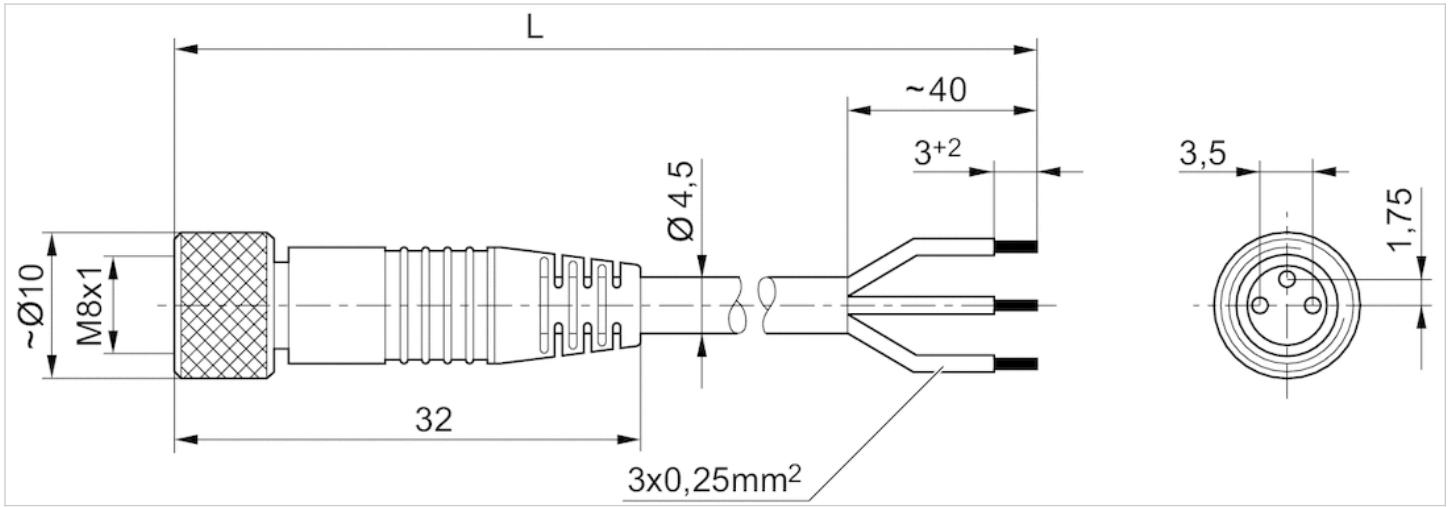
The specified protection class is only valid in assembled and tested state.

## Technical information

Material	
Housing	Polyurethane
Cable sheath	Polyurethane

## Dimensions

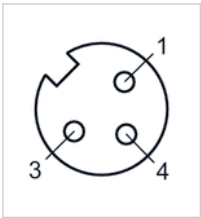
### Dimensions



L = length

## Pin assignments

### Pin assignment, socket



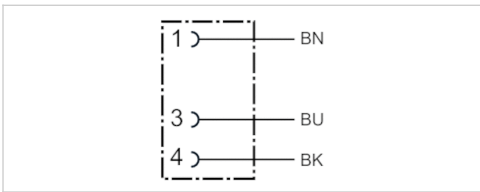
- (1) BN=brown
- (3) BU=blue
- (4) BK=black

# Round plug connector, Series CON-RD

- Socket M8x1 3-pin A-coded angled 90°
- open cable ends
- with cable
- unshielded



Ambient temperature min./max.	-40 ... 85 °C
Operational voltage	48 V AC/DC
Protection class	IP67
Wire cross-section	0.24 mm <sup>2</sup>
Weight	See table below



## Technical data

Part No.	Max. current	Number of wires	Cable-Ø	Cable length	Weight
1834484167	4 A	3	4.5 mm	3 m	0.087 kg
1834484169	4 A	3	4.5 mm	5 m	0.139 kg
1834484248	4 A	3	4.5 mm	10 m	0.279 kg

## Technical information

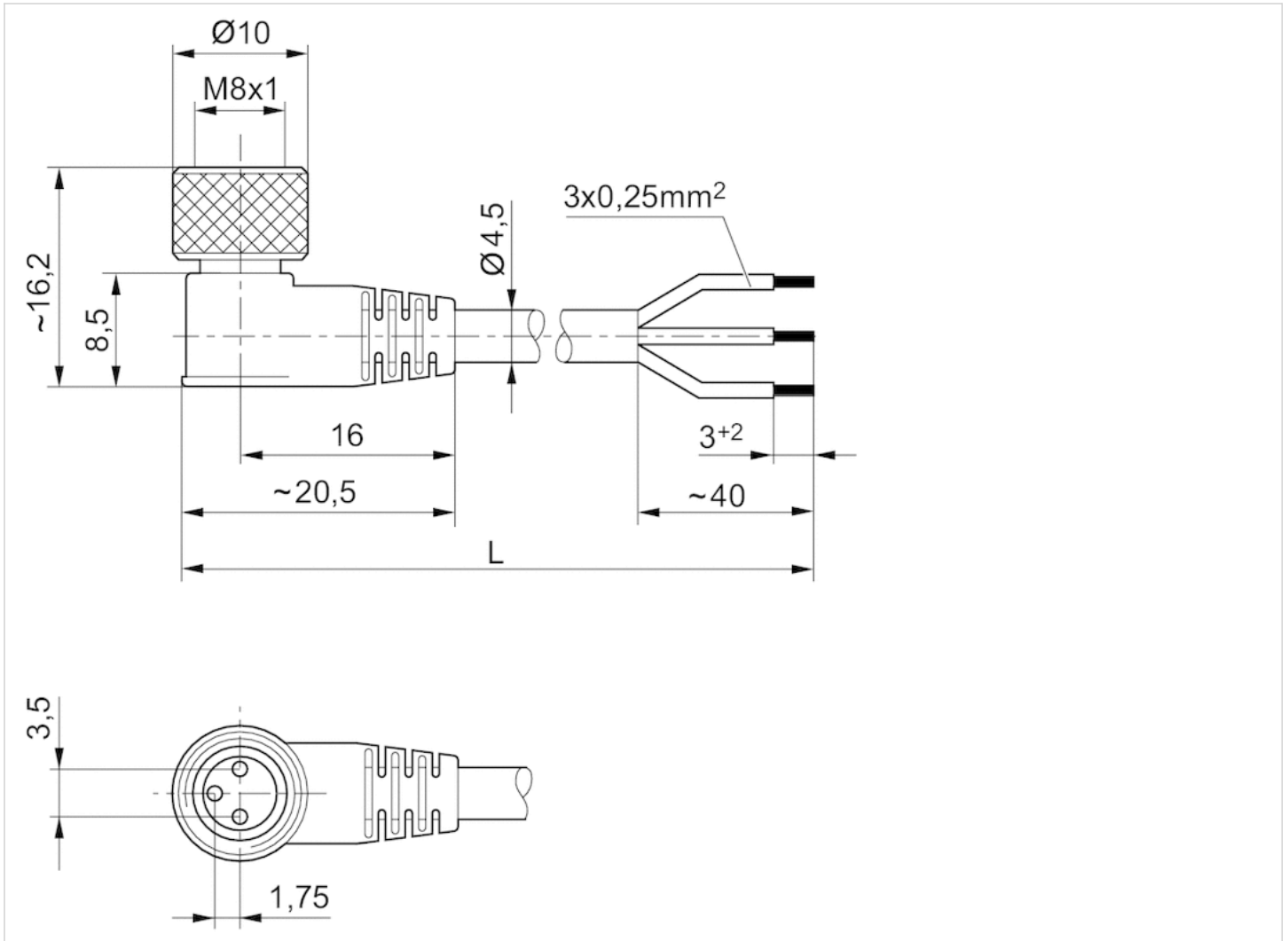
The specified protection class is only valid in assembled and tested state.

## Technical information

Material	
Housing	Polyurethane
Cable sheath	Polyurethane

## Dimensions

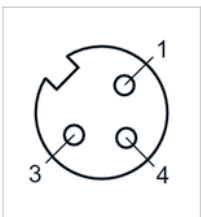
### Dimensions



L = length

## Pin assignments

### Pin assignment, socket



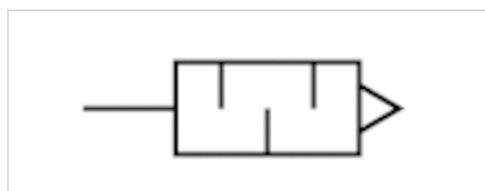
- (1) BN=brown
- (3) BU=blue
- (4) BK=black

# Silencers, series SI1

- G 1/8
- Sintered bronze



Working pressure min./max.	0 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium	Compressed air
Sound pressure level	75 dB
Weight	0.01 kg
Comment	Flow characteristic curves can be found under "Diagrams".



## Technical data

Part No.	Compressed air connection	Flow	Delivery unit
		Qn	
1827000000	G 1/8	1623 l/min	10 piece

Weight per piece

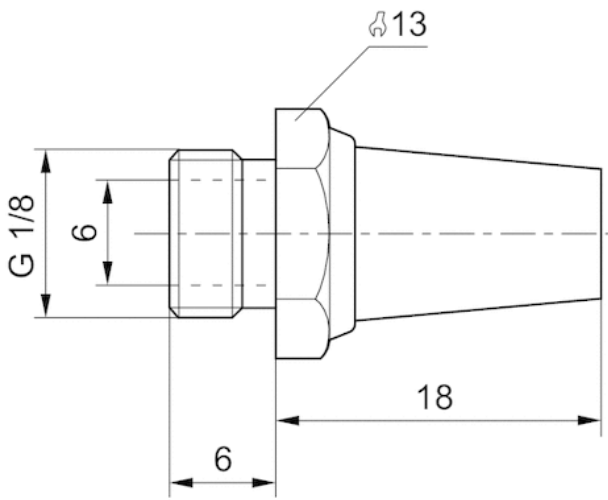
Nominal flow Qn at p1 = 6 bar (absolute) freely discharged. Sound pressure level measured at 6 bar against atmosphere at 1 m distance.

## Technical information

Material	
Silencer	Sintered bronze
Thread	Brass

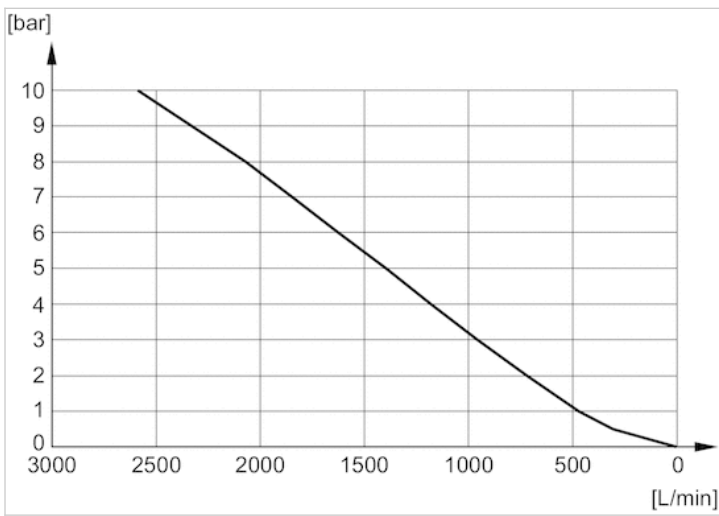
## Dimensions

### Dimensions in mm



## Diagrams

### Flow diagram, 1827000000



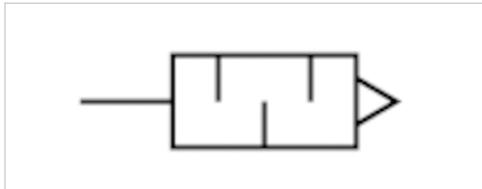


# Silencers, series SI1

- G 1/4
- Sintered bronze



Working pressure min./max.	0 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium	Compressed air
Sound pressure level	79 dB
Weight	0.02 kg
Comment	Flow characteristic curves can be found under "Diagrams".



## Technical data

Part No.	Compressed air connection	Flow	Delivery unit
		Qn	
1827000001	G 1/4	3390 l/min	10 piece

Weight per piece

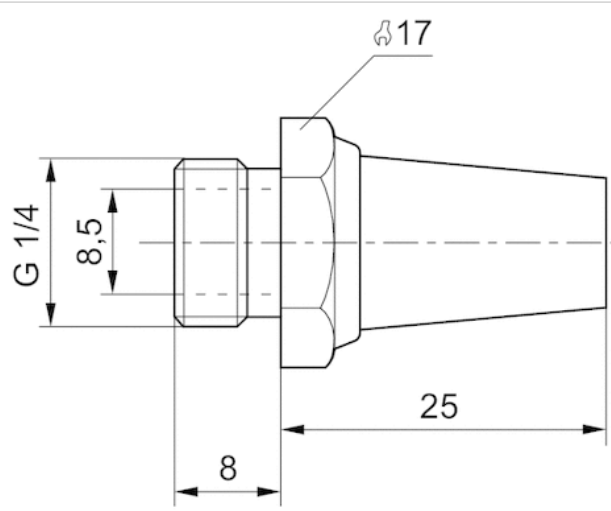
Nominal flow Qn at p1 = 6 bar (absolute) freely discharged. Sound pressure level measured at 6 bar against atmosphere at 1 m distance.

## Technical information

Material	
Silencer	Sintered bronze
Thread	Brass

## Dimensions

### Dimensions in mm

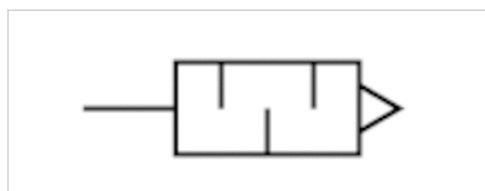


# Silencers, series SI1

- G 3/8
- Sintered bronze



Working pressure min./max.	0 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium	Compressed air
Sound pressure level	84 dB
Weight	0.05 kg
Comment	Flow characteristic curves can be found under "Diagrams".



## Technical data

Part No.	Compressed air connection	Flow	Delivery unit
		Qn	
1827000002	G 3/8	6554 l/min	5 piece

Weight per piece

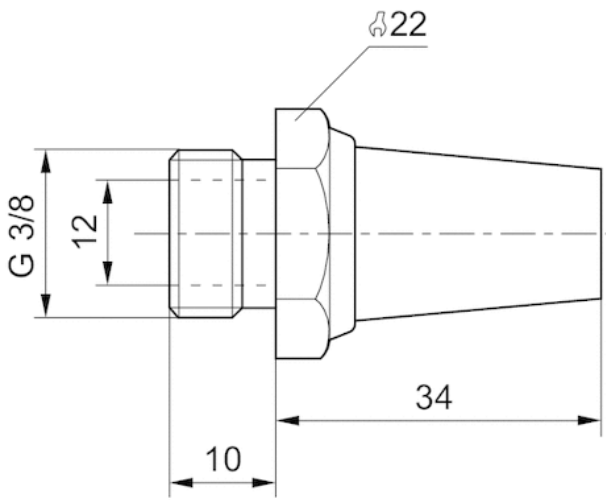
Nominal flow Qn at p1 = 6 bar (absolute) freely discharged. Sound pressure level measured at 6 bar against atmosphere at 1 m distance.

## Technical information

Material	
Silencer	Sintered bronze
Thread	Brass

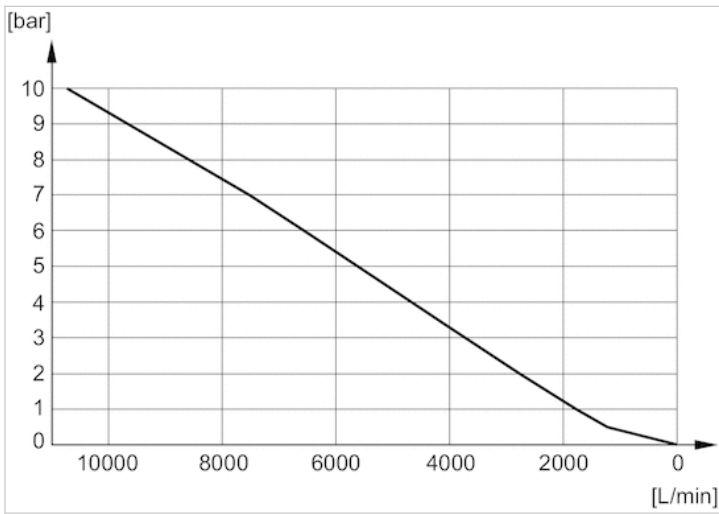
## Dimensions

### Dimensions in mm



## Diagrams

### Flow diagram, 1827000002

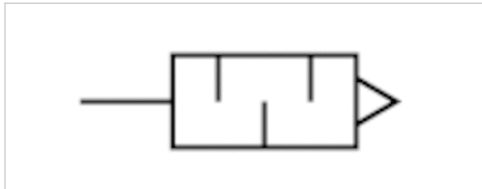


# Silencers, series SI1

- G 1/2
- Sintered bronze



Working pressure min./max.	0 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium	Compressed air
Sound pressure level	90 dB
Weight	0.08 kg
Comment	Flow characteristic curves can be found under "Diagrams".



## Technical data

Part No.	Compressed air connection	Flow	Delivery unit
		Qn	
1827000003	G 1/2	7223 l/min	2 piece

Weight per piece

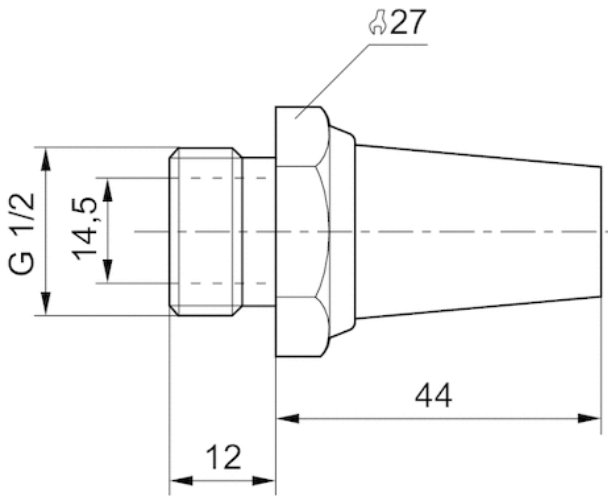
Nominal flow Qn at p1 = 6 bar (absolute) freely discharged. Sound pressure level measured at 6 bar against atmosphere at 1 m distance.

## Technical information

Material	
Silencer	Sintered bronze
Thread	Brass

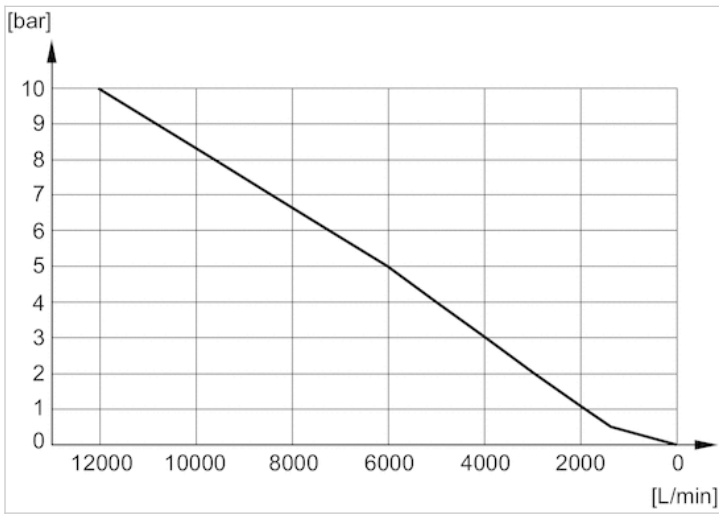
## Dimensions

### Dimensions in mm



## Diagrams

### Flow diagram, 1827000003



# Silencers, series SI1

- G 1/8 G 1/4 G 3/8 G 1/2

- Sintered bronze



Working pressure min./max.

0 ... 10 bar

Ambient temperature min./max.

-25 ... 80 °C

Medium

Compressed air

Sound pressure level

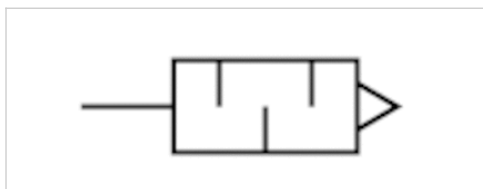
See table below

Weight

See table below

Comment

Flow characteristic curves can be found under "Diagrams".



## Technical data

Part No.	Compressed air connection	Sound pressure level	Flow	Delivery unit	Weight
			Qn		
1827000031	G 1/8	85 dB	700 l/min	10 piece	0.001 kg
1827000033	G 1/4	88 dB	1116 l/min	10 piece	0.01 kg
1827000034	G 3/8	90 dB	1706 l/min	5 piece	0.016 kg
1827000035	G 1/2	85 dB	2568 l/min	2 piece	0.035 kg

Weight per piece

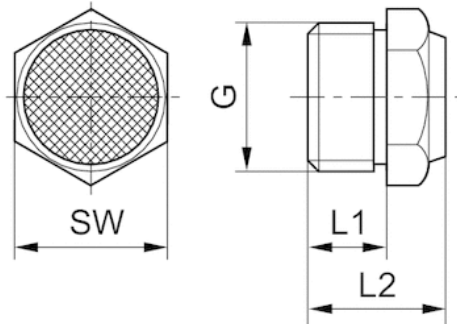
Nominal flow Qn at p1 = 6 bar (absolute) freely discharged. Sound pressure level measured at 6 bar against atmosphere at 1 m distance.

## Technical information

Material	
Silencer	Sintered bronze
Thread	Brass

## Dimensions

### Dimensions



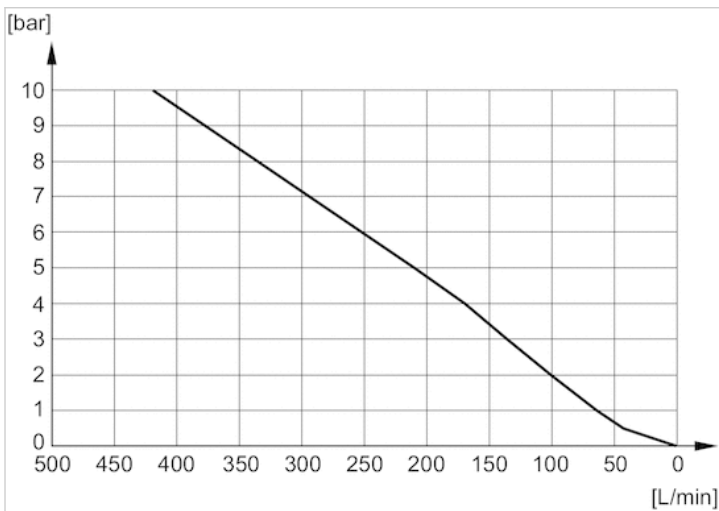
## Dimensions

Part No.	Port G	L1	L2	SW
1827000031	G 1/8	6	11.5	13
1827000033	G 1/4	8	13.5	17
1827000034	G 3/8	10	17.5	22
1827000035	G 1/2	12	19.5	27

Sound pressure level measured at 6 bar at 1 m distance

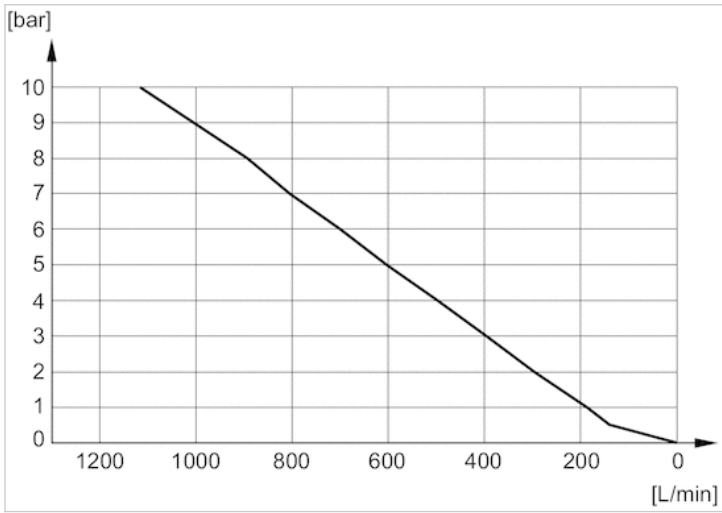
## Diagrams

### Flow diagram, 1827000032

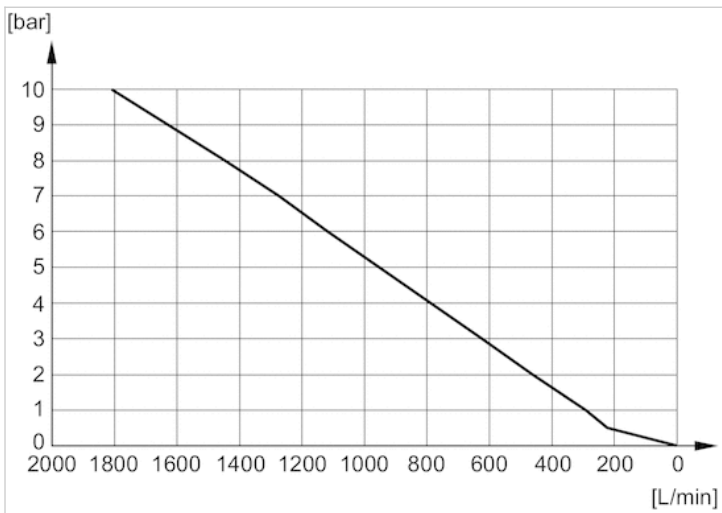




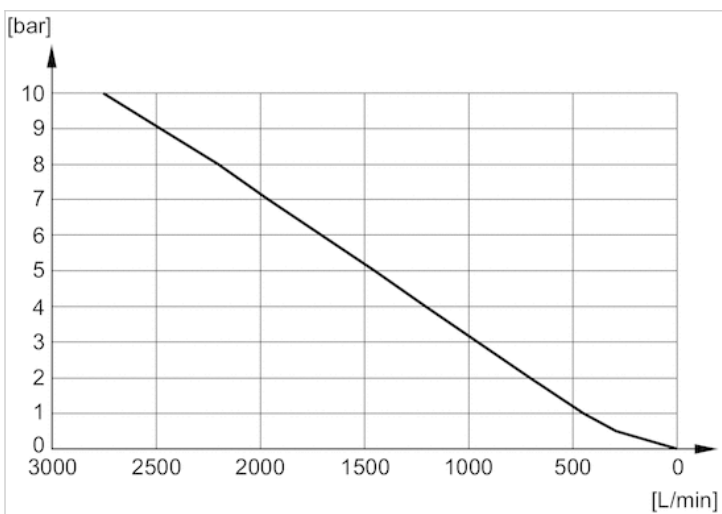
Flow diagram, 1827000031



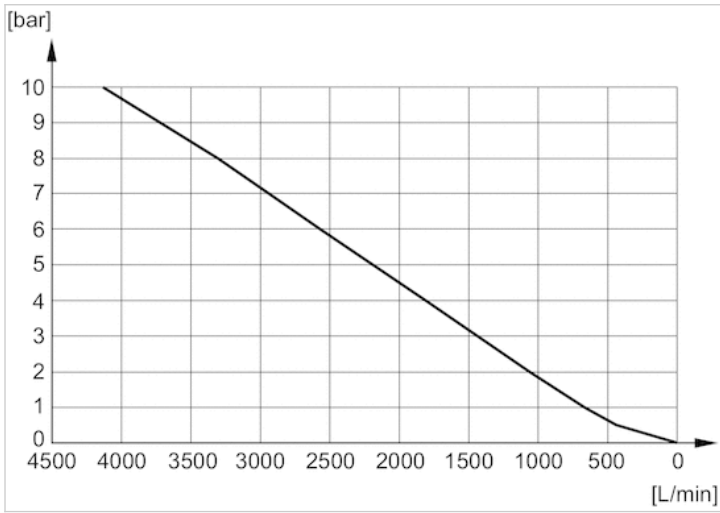
Flow diagram, 1827000033



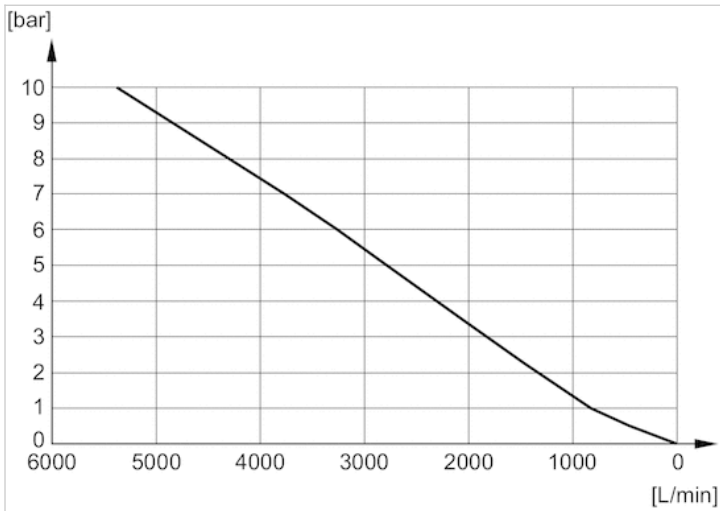
Flow diagram, 1827000034



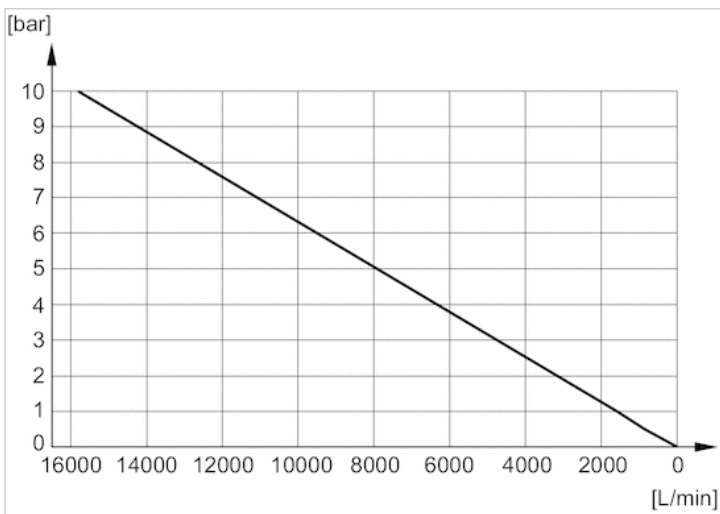
Flow diagram, 1827000035



Flow diagram, 8145003400



Flow diagram, 8145001000



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