

## ISO 6432, series MNI



AVENTICS™ ISO 6432, series MNI

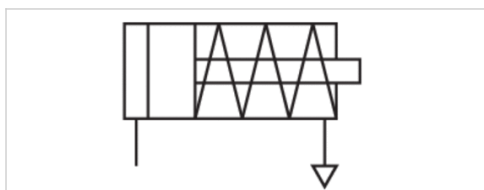


# Mini cylinder, Series MNI

- Ø 10-25 mm
- Ports M5 G 1/8
- Single-acting, retracted without pressure
- Cushioning elastic
- with integrated rear eye
- Piston rod External thread



Standards	ISO 6432
Compressed air connection	Internal thread
Working pressure min./max.	2 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below



## Technical data

	10 mm	12 mm	16 mm	20 mm	25 mm
Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Piston rod thread	M4	M6	M6	M8	M10x1,25
Ports	M5	M5	M5	G 1/8	G 1/8
Piston rod Ø	4 mm	6 mm	6 mm	8 mm	10 mm
Cylinder outer thread	M12x1,25	M16x1,5	M16x1,5	M22x1,5	M22x1,5
Stroke 10	0822430201	0822431201	0822432201	0822433201	0822434201
25	0822430202	0822431202	0822432202	0822433202	0822434202
40	0822430203	0822431209	0822432204	0822433204	0822434207
50	-	0822431203	0822432203	0822433203	0822434203

## Technical data

	10 mm	12 mm	16 mm	20 mm
Piston Ø	10 mm	12 mm	16 mm	20 mm
Extracting piston force	41 N	60.2 N	102.2 N	174.6 N
Spring force min. - max.	5.2 ... 8.4 N	6.7 ... 11 N	14.2 ... 24.4 N	12.8 ... 23.4 N
Impact energy	0.04 J	0.07 J	0.14 J	0.23 J
Weight 0 mm stroke	0.03 kg	0.06 kg	0.075 kg	0.14 kg
Weight +10 mm stroke	0.005 kg	0.006 kg	0.007 kg	0.016 kg
Stroke max.	40 mm	50 mm	50 mm	50 mm

Piston Ø	25 mm
Extracting piston force	279.6 N
Spring force min. - max.	19.2 ... 29.4 N
Impact energy	0.35 J
Weight 0 mm stroke	0.23 kg
Weight +10 mm stroke	0.024 kg
Stroke max.	50 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.

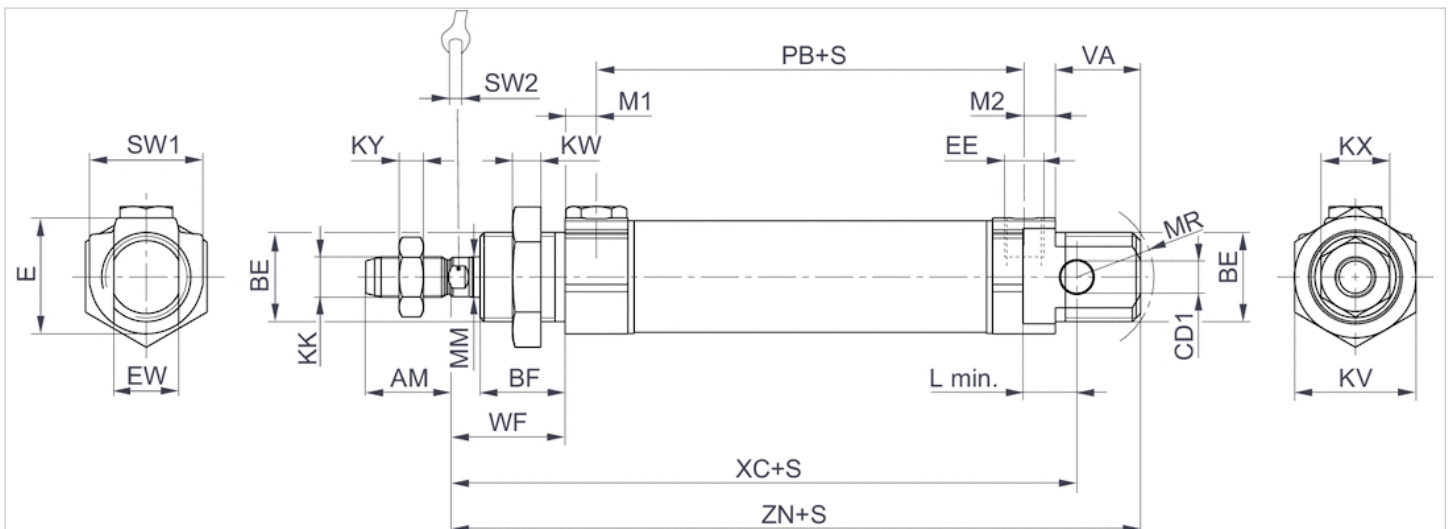
Use only the approved oils from AVENTICS. Further information can be found in the "Technical information" document (available in the MediaCentre).

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke

X = vent screw

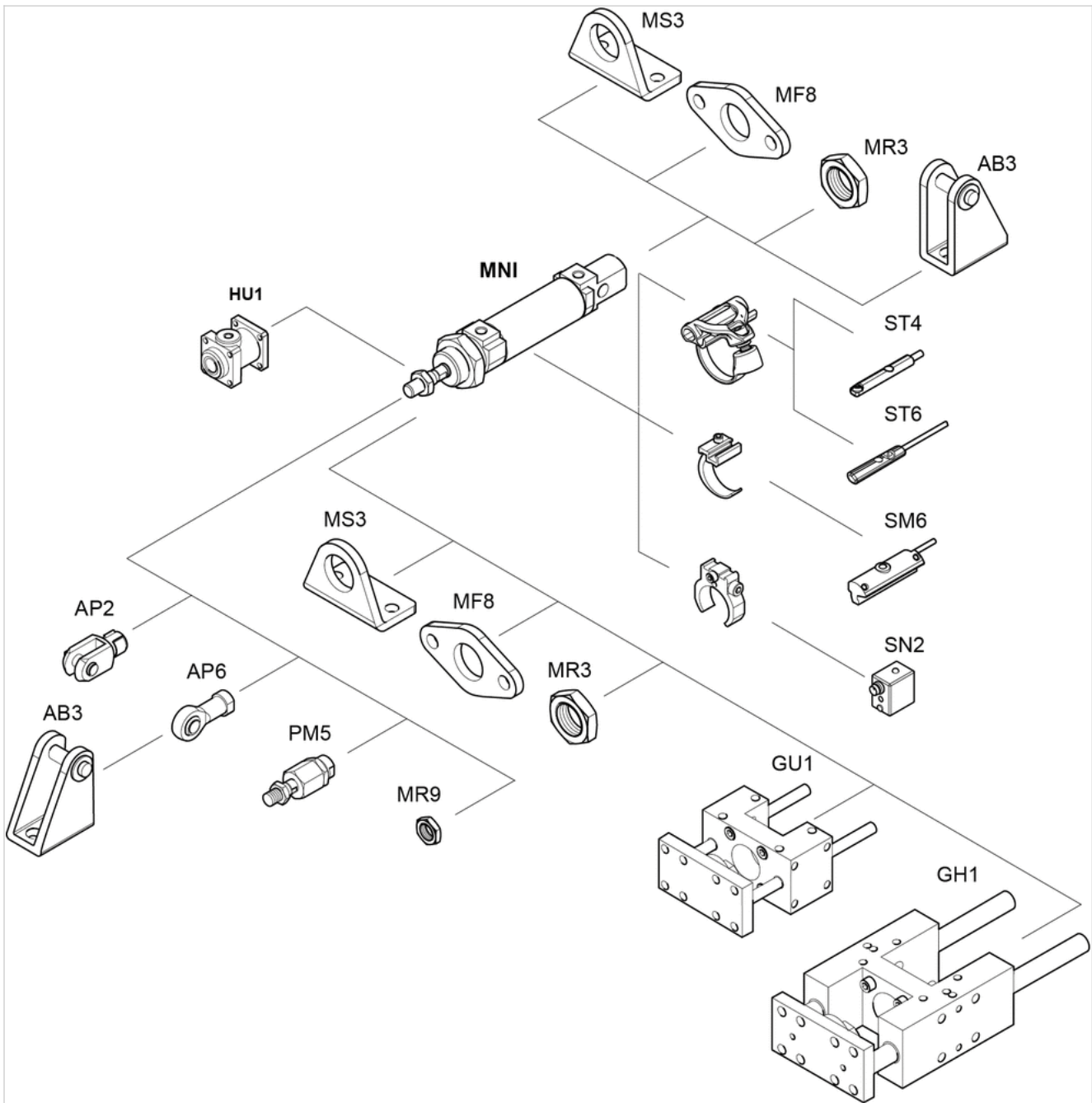
## Dimensions

Piston Ø	AM-2	BE	BF	CD1 H9	E	EE t = depth of thread	EW d13	KK	KV	KW
10 mm	12	M12x1,25	11	4	14	M5 t=5	8	M4	17	5.5
12 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6
20 mm	20	M22x1,5	18	8	28	G1/8 t=8	16	M8	30	7
25 mm	22	M22x1,5	21	8	28	G1/8 t=8	16	M10x1,25	30	7

Piston Ø	KX	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	ZN ± 1,4	SW 1	SW 2
10 mm	7	2.2	6	4	4.8	12	37	11	16	64	73.5	13	3
12 mm	10	3.2	8	6	4.8	16	41	16	22	75	88.5	19	5
16 mm	10	3.2	8	6	4.8	16	47	17	22	82	95.5	19	5
20 mm	13	4	12	8	7	18	51	19	24	95	109.5	28	6
25 mm	17	6	12	10	7	19	55	21	28	104	119.5	28	8

# Accessories overview

## Overview drawing



**NOTE:**

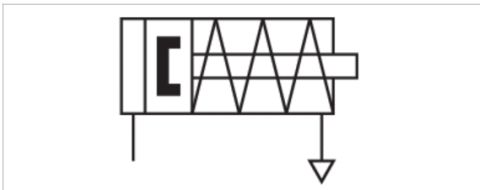
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- Ports M5 G 1/8
- Single-acting, retracted without pressure
- with magnetic piston
- Cushioning elastic
- with integrated rear eye
- Piston rod External thread



Standards	ISO 6432
Compressed air connection	Internal thread
Working pressure min./max.	2 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below



## Technical data

	10 mm	12 mm	16 mm	20 mm	25 mm
Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Piston rod thread	M4	M6	M6	M8	M10x1,25
Ports	M5	M5	M5	G 1/8	G 1/8
Piston rod Ø	4 mm	6 mm	6 mm	8 mm	10 mm
Cylinder outer thread	M12x1,25	M16x1,5	M16x1,5	M22x1,5	M22x1,5
Stroke 10	0822430301	0822431301	0822432301	0822433301	0822434301
25	0822430302	0822431302	0822432302	0822433302	0822434302
40	0822430303	R480609773	R412009548	R480609780	R480609781
50	-	0822431303	0822432303	0822433303	0822434303

## Technical data

	10 mm	12 mm	16 mm	20 mm
Piston Ø	10 mm	12 mm	16 mm	20 mm
Extracting piston force	41 N	60.2 N	102.2 N	174.6 N
Spring force min. - max.	5.2 ... 8.4 N	6.7 ... 11 N	14.2 ... 24.4 N	12.8 ... 23.4 N
Impact energy	0.04 J	0.07 J	0.14 J	0.23 J
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Stroke max.	40 mm	50 mm	50 mm	50 mm

Piston Ø	25 mm
Extracting piston force	279.6 N
Spring force min. - max.	19.2 ... 29.4 N
Impact energy	0.35 J
Weight 0 mm stroke	0.23 kg
Weight +10 mm stroke	0.024 kg
Stroke max.	50 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.

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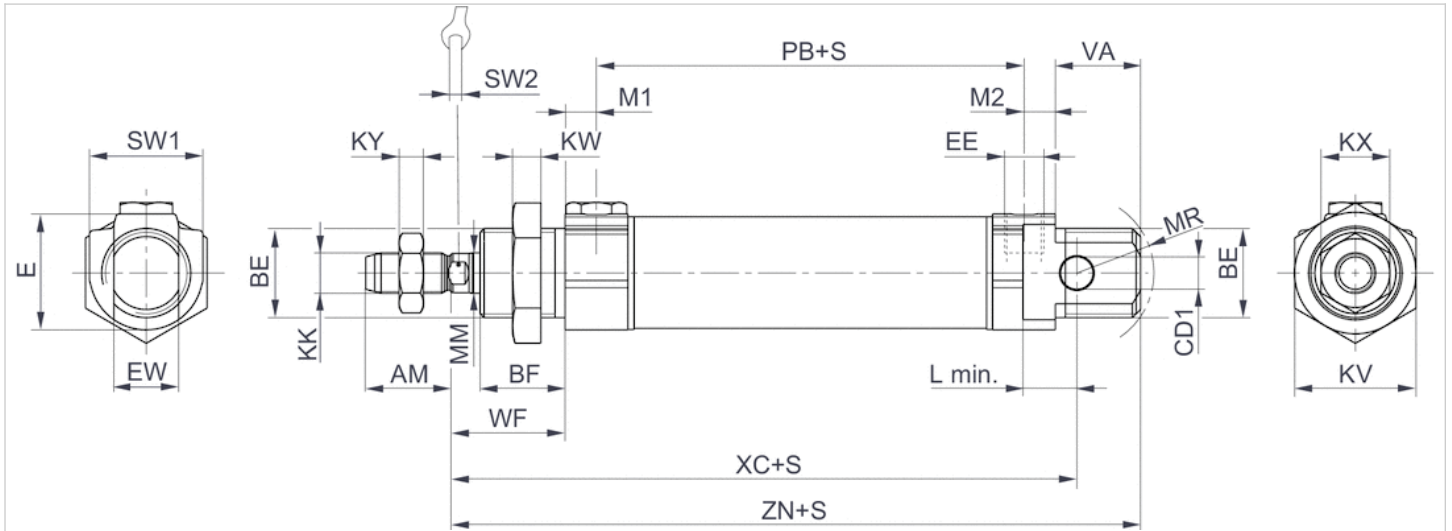
Clamping piece for magnetic field sensor necessary

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke  
X = vent screw

## Dimensions

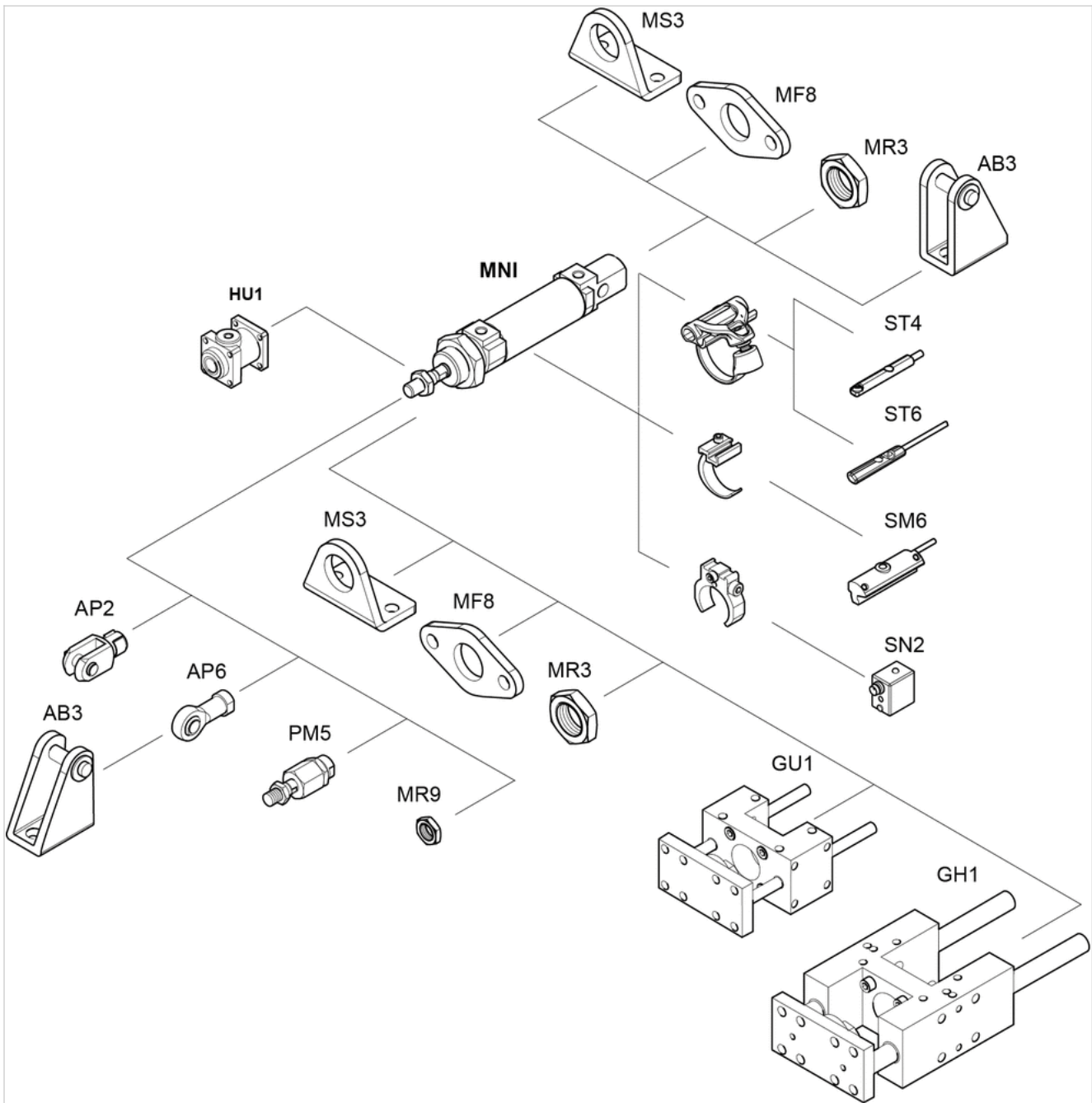
Piston Ø	AM-2	BE	BF	CD H9	E	EE t = depth of thread	EW d13	KK	KV	KW	KX
10 mm	12	M12x1,25	11	4	14	M5 t=5	8	M4	17	5.5	7
12 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6	10
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6	10
20 mm	20	M22x1,5	18	8	28	G1/8 t=8	16	M8	30	7	13
25 mm	22	M22x1,5	21	8	28	G1/8 t=8	16	M10x1,25	30	7	17

Piston Ø	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	ZN ± 1,4	SW 1	SW 2
10 mm	2.2	6	4	4.8	12	47	11	16	74	83.5	13	3
12 mm	3.2	8	6	4.8	16	41	16	22	75	88.5	19	5
16 mm	3.2	8	6	4.8	16	47	17	22	82	95.5	19	5
20 mm	4	12	8	7	18	51	19	24	95	109.5	28	6
25 mm	6	12	10	7	19	55	21	28	104	119.5	28	8



# Accessories overview

## Overview drawing



**NOTE:**

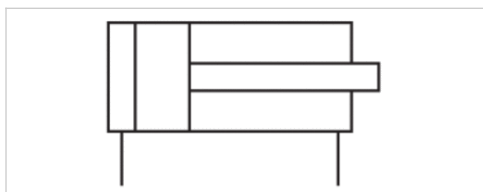
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# Mini cylinder, Series MNI

- Ø 10-25 mm
- Ports M5 G 1/8
- double-acting
- Cushioning elastic
- with integrated rear eye
- Piston rod External thread
- ATEX optional



Standards	ISO 6432
Certificates	ATEX optional
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below



## Technical data

Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Piston rod thread	M4	M6	M6	M8	M10x1,25
Ports	M5	M5	M5	G 1/8	G 1/8
Piston rod Ø	4 mm	6 mm	6 mm	8 mm	10 mm
Cylinder outer thread	M12x1,25	M16x1,5	M16x1,5	M22x1,5	M22x1,5
Stroke 10	0822030201	0822031201	0822032201	0822033201	0822034201
25	0822030202	0822031202	0822032202	0822033202	0822034202
50	0822030203	0822031203	0822032203	0822033203	0822034203
80	0822030204	0822031204	0822032204	0822033204	0822034204
100	0822030205	0822031205	0822032205	0822033205	0822034205
125	0822030211	0822031206	0822032206	0822033206	0822034206
160	0822030219	0822031207	0822032207	0822033207	0822034207
200	0822030222	0822031211	0822032208	0822033208	0822034208
250	0822030223	0822031221	0822032214	0822033209	0822034209
320	-	0822031226	0822032240	0822033210	0822034210
400	-	0822031214	0822032213	0822033240	0822034211
500	-	0822031250	0822032228	0822033221	0822034212

## Technical data

Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Retracting piston force	42 N	53 N	109 N	166 N	260 N
Extracting piston force	49 N	71 N	127 N	198 N	309 N
Impact energy	0.04 J	0.07 J	0.14 J	0.23 J	0.35 J
Weight 0 mm stroke	0.034 kg	0.063 kg	0.082 kg	0.135 kg	0.233 kg
Weight +10 mm stroke	0.002 kg	0.005 kg	0.006 kg	0.009 kg	0.013 kg
Stroke max.	250 mm	600 mm	800 mm	1100 mm	1300 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).

ATEX-certified cylinders with identification II 2G Ex h IIB T4 Gb / II 2D Ex h IIIB T135°C Db\_X can be generated in the Internet configurator.

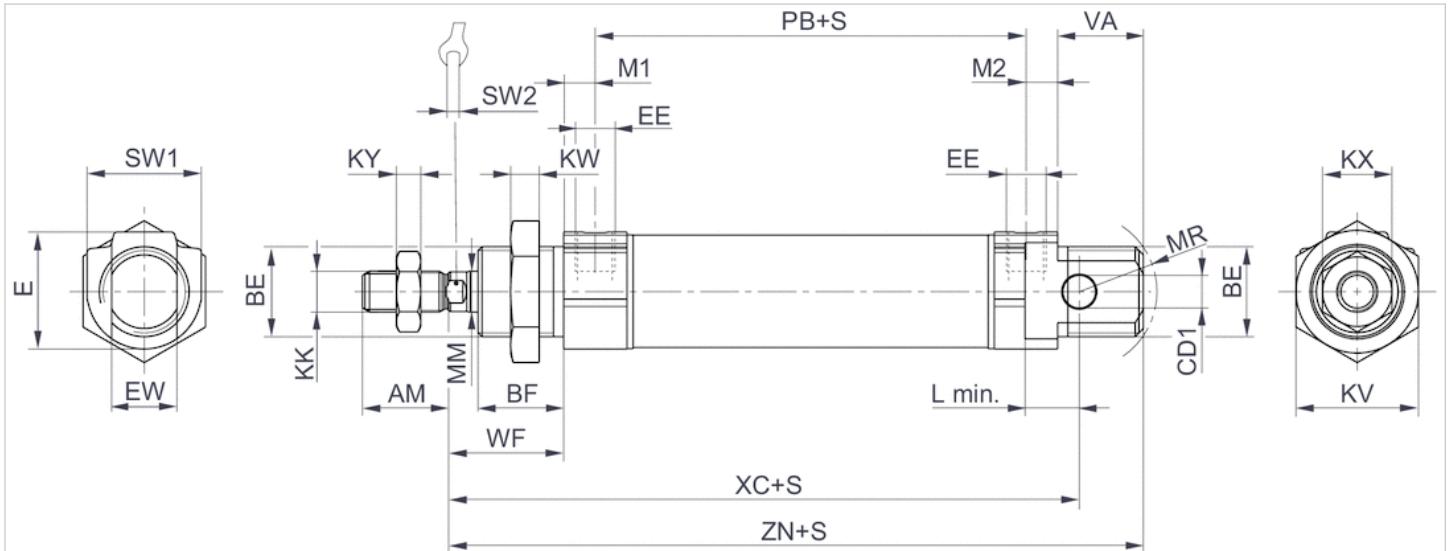
The operating temperature range for ATEX-certified cylinders is -20 °C ... 50 °C.

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke

## Dimensions

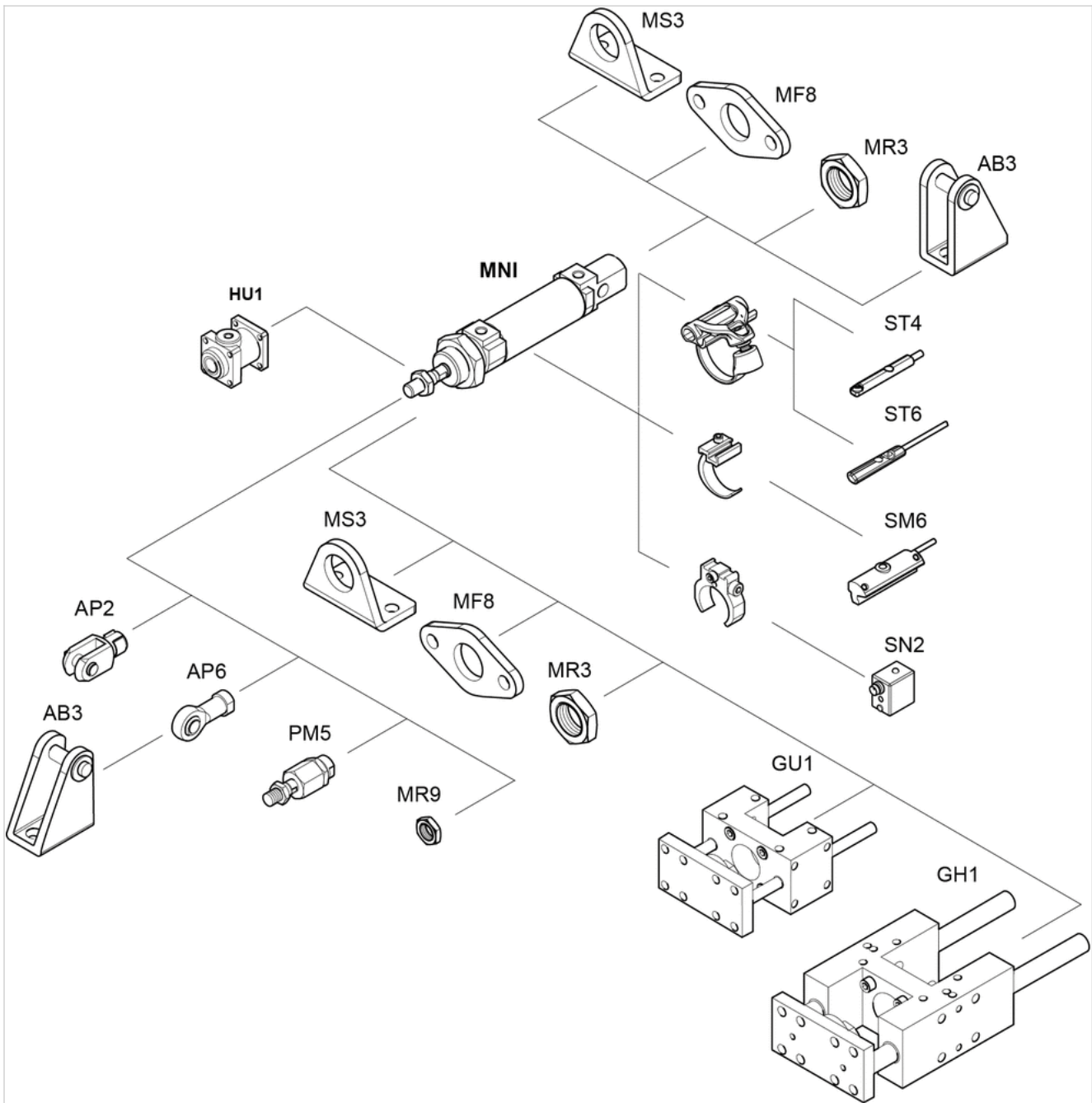
Piston Ø	AM -2	BE	BF	CD H9	E	EE t = depth of thread	EW d13	KK	KV	KW
10 mm	12	M12x1,25	11	4	14	M5 t=5	8	M4	17	5.5
12 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6
20 mm	20	M22x1,5	18	8	28	G 1/8 t=8	16	M8	30	7
25 mm	22	M22x1,5	21	8	28	G 1/8 t=8	16	M10x1,25	30	7

Piston Ø	KX	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	ZN ± 1,4	SW 1	SW 2
10 mm	7	2.2	6	4	4.8	12	37	11	16	64	73.5	13	3
12 mm	10	3.2	8	6	4.8	16	41	16	22	75	88.5	19	5
16 mm	10	3.2	8	6	4.8	16	47	17	22	82	95.5	19	5
20 mm	13	4	12	8	7	18	51	19	24	95	109.5	28	6
25 mm	17	6	12	10	7	19	55	21	28	104	119.5	28	8

# Accessories overview

## Overview drawing



**NOTE:**

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# Mini cylinder, Series MNI

- Ø 10-25 mm
- Ports M5 G 1/8
- double-acting
- with magnetic piston
- Cushioning elastic
- with integrated rear eye
- Piston rod External thread
- ATEX optional



Standards	ISO 6432
Certificates	ATEX optional
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below



## Technical data

Piston Ø Piston rod thread Ports Piston rod Ø Cylinder outer thread	10 mm M4 M5 4 mm M12x1,25	12 mm M6 M5 6 mm M16x1,5	16 mm M6 M5 6 mm M16x1,5	20 mm M8 G 1/8 8 mm M22x1,5	25 mm M10x1,25 G 1/8 10 mm M22x1,5
Stroke 10	0822330201	0822331201	0822332201	0822333201	0822334201
25	0822330202	0822331202	0822332202	0822333202	0822334202
50	0822330203	0822331203	0822332203	0822333203	0822334203
80	0822330204	0822331204	0822332204	0822333204	0822334204
100	0822330205	0822331205	0822332205	0822333205	0822334205
125	0822330215	0822331206	0822332206	0822333206	0822334206
160	0822330209	0822331207	0822332207	0822333207	0822334207
200	0822330235	0822331218	0822332208	0822333208	0822334208
250	0822330219	0822331219	0822332209	0822333209	0822334209
320	-	0822331223	0822332210	0822333210	0822334210
400	-	0822331217	0822332219	0822333214	0822334211
500	-	0822331233	0822332220	0822333220	0822334212

## Technical data

Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Retracting piston force	42 N	53 N	109 N	166 N	260 N
Extracting piston force	49 N	71 N	127 N	198 N	309 N
Impact energy	0.04 J	0.07 J	0.14 J	0.23 J	0.35 J
Weight 0 mm stroke	0.042 kg	0.073 kg	0.091 kg	0.149 kg	0.249 kg
Weight +10 mm stroke	0.002 kg	0.005 kg	0.006 kg	0.009 kg	0.013 kg
Stroke max.	250 mm	600 mm	800 mm	1100 mm	1300 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).

Clamping piece for magnetic field sensor necessary

ATEX-certified cylinders with identification II 2G Ex h IIB T4 Gb / II 2D Ex h IIIB T135°C Db\_X can be generated in the Internet configurator.

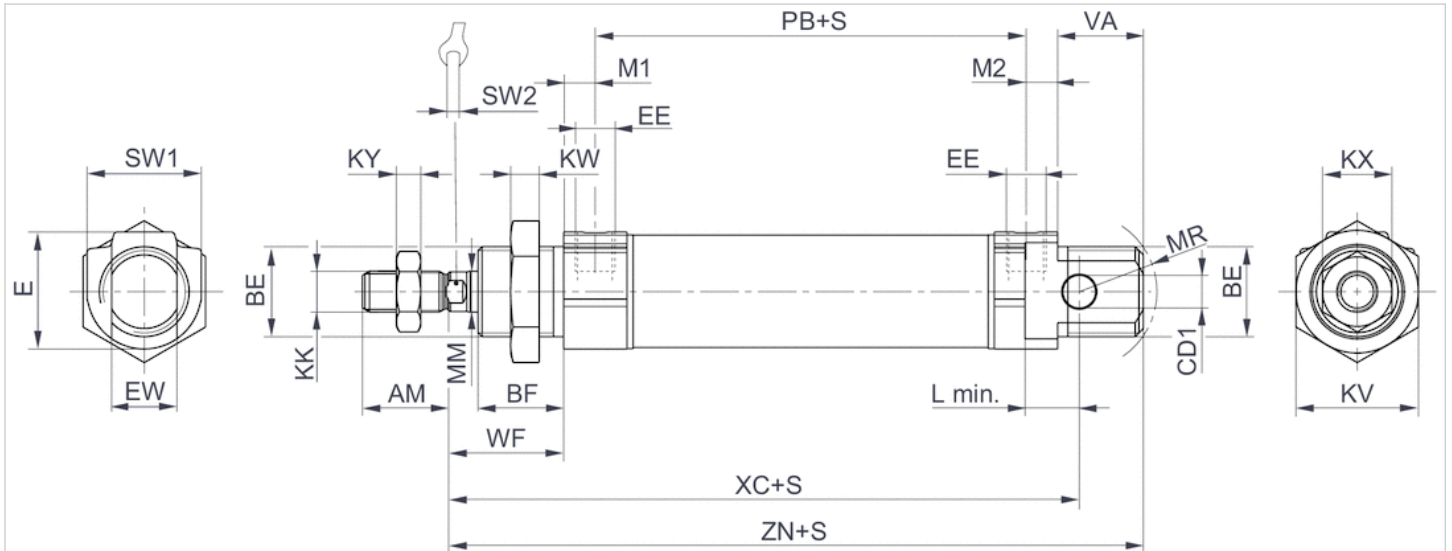
The operating temperature range for ATEX-certified cylinders is -20 °C ... 50 °C.

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke

## Dimensions

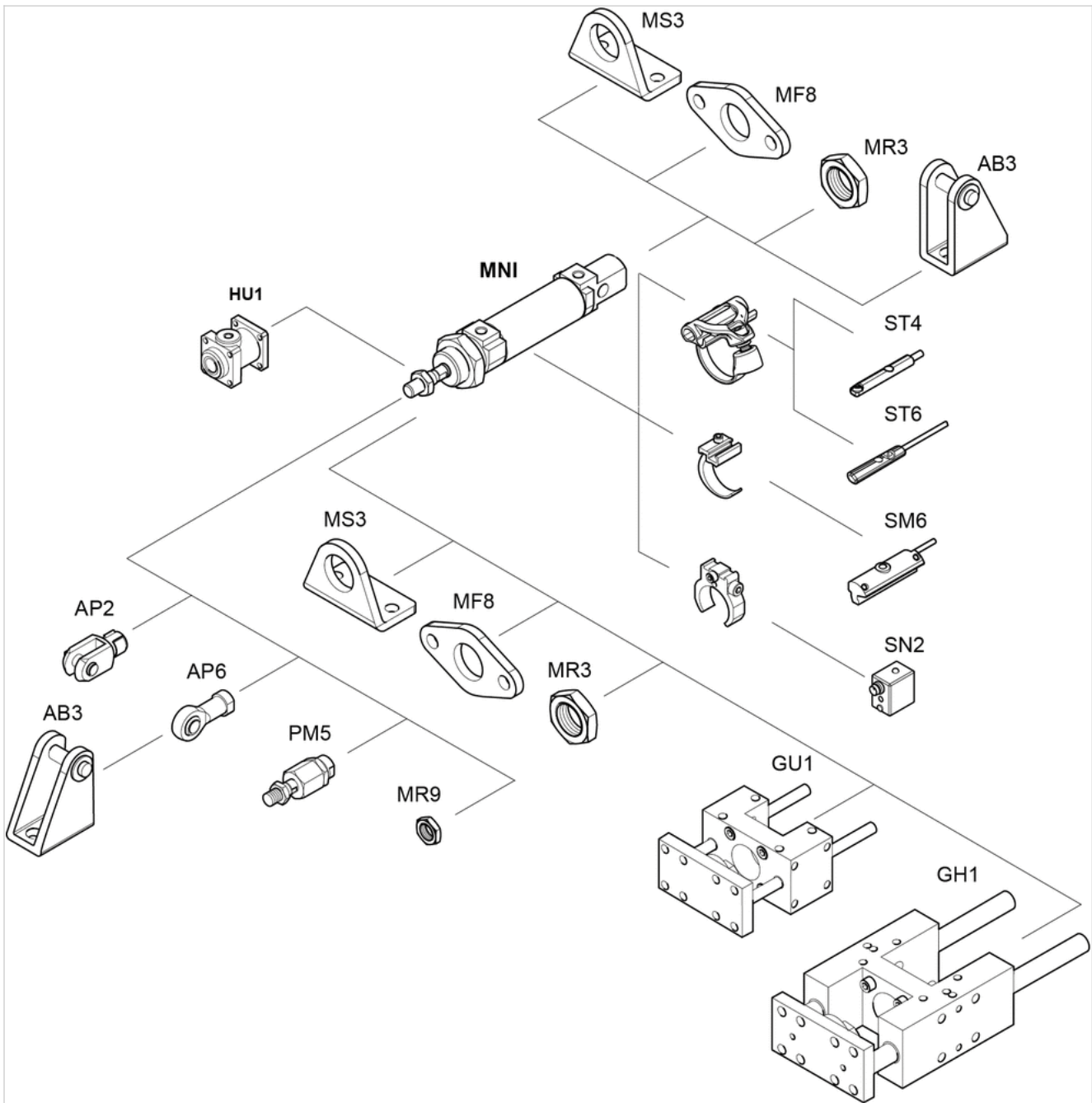
Piston Ø	AM-2	BE	BF	CD H9	E	EE t = depth of thread	EW d13	KK	KV	KW	KX
10 mm	12	M12x1,25	11	4	14	M5 t=5	8	M4	17	5.5	7
12 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6	10
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6	10
20 mm	20	M22x1,5	18	8	28	G 1/8 t=8	16	M8	30	7	13
25 mm	22	M22x1,5	21	8	28	G 1/8 t=8	16	M10x1,25	30	7	17

Piston Ø	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	ZN ± 1,4	SW 1	SW 2
10 mm	2.2	6	4	4.8	12	47	11	16	74 1)	83.5	13	3
12 mm	3.2	8	6	4.8	16	41	16	22	75	88.5	19	5
16 mm	3.2	8	6	4.8	16	47	17	22	82	95.5	19	5
20 mm	4	12	8	7	18	51	19	24	95	109.5	28	6
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# Accessories overview

## Overview drawing



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- Ø 10-25 mm
- Ports M5 G 1/8
- double-acting
- with magnetic piston
- Cushioning elastic
- with integrated rear eye
- Piston rod External thread
- Heat resistant



Standards	ISO 6432
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-10 ... 120 °C
Medium temperature min./max.	-10 ... 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	6.3 bar
Weight	See table below



## Technical data

Piston Ø Piston rod thread Ports Piston rod Ø Cylinder outer thread	10 mm M4 M5 4 mm M12x1,25	12 mm M6 M5 6 mm M16x1,5	16 mm M6 M5 6 mm M16x1,5	20 mm M8 G 1/8 8 mm M22x1,5	25 mm M10x1,25 G 1/8 10 mm M22x1,5
Stroke 10	0822330401	0822331401	0822332401	0822333401	0822334401
25	0822330402	0822331402	0822332402	0822333402	0822334402
50	0822330403	0822331403	0822332403	0822333403	0822334403
80	0822330404	0822331404	0822332404	0822333404	0822334404
100	0822330405	0822331405	0822332405	0822333405	0822334405
125	-	0822331406	0822332406	0822333406	0822334406
160	0822330407	0822331407	0822332407	0822333407	0822334407
200	-	0822331413	0822332408	0822333408	0822334408
250	0822330410	0822331408	R412000707	0822333409	0822334409
320	-	-	R412009449	0822333410	0822334410
400	-	-	0822332409	-	0822334411
500	-	-	-	0822333416	0822334412

## Technical data

Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Retracting piston force	42 N	53 N	109 N	166 N	260 N
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Stroke max.	250 mm	600 mm	800 mm	1100 mm	1300 mm

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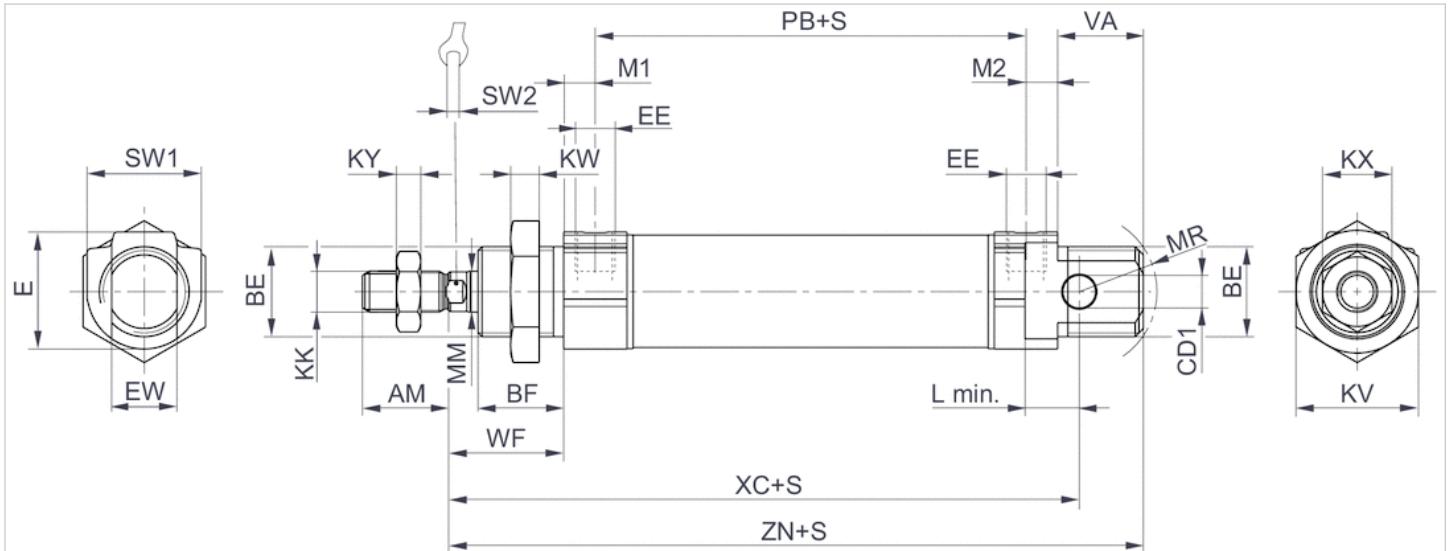
Clamping piece for magnetic field sensor necessary

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Fluorocaoutchouc
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Fluorocaoutchouc

## Dimensions

### Dimensions



S = stroke

## Dimensions

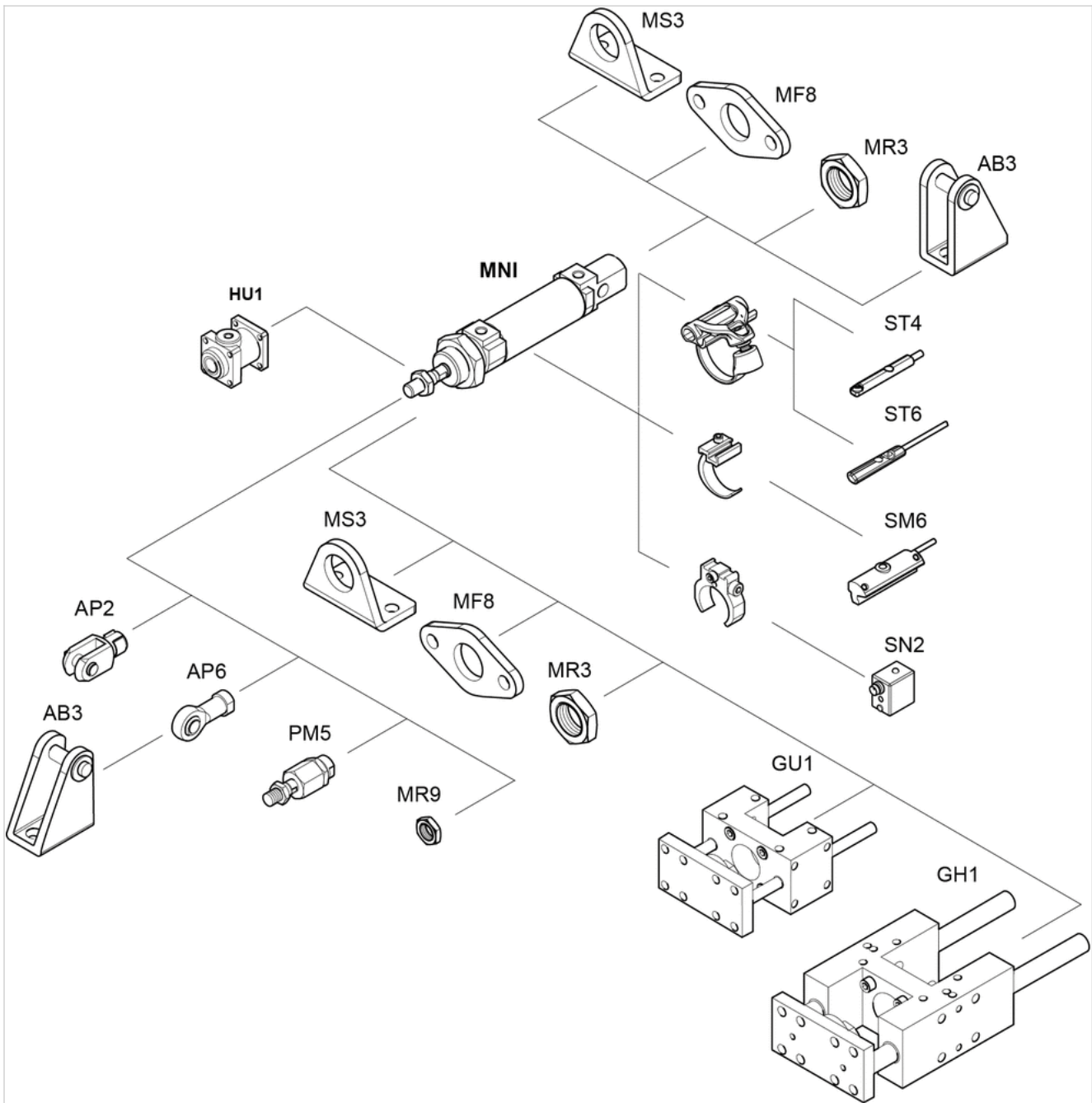
Piston Ø	AM-2	BE	BF	CD H9	E	EE t = depth of thread	EW d13	KK	KV	KW	KX
10 mm	12	M12x1,25	11	4	14	M5 t=5	8	M4	17	5.5	7
12 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6	10
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6	10
20 mm	20	M22x1,5	18	8	28	G1/8 t=8	16	M8	30	7	13
25 mm	22	M22x1,5	21	8	28	G1/8 t=8	16	M10x1,25	30	7	17

Piston Ø	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	ZN ± 1,4	SW 1	SW 2
10 mm	2.2	6	4	4.8	12	47	11	16	74	83.5	13	3
12 mm	3.2	8	6	4.8	16	41	16	22	75	88.5	19	5
16 mm	3.2	8	6	4.8	16	47	17	22	82	95.5	19	5
20 mm	4	12	8	7	18	51	19	24	95	109.5	28	6
25 mm	6	12	10	7	19	55	21	28	104	119.5	28	8

# Accessories overview

## Overview drawing



**NOTE:**

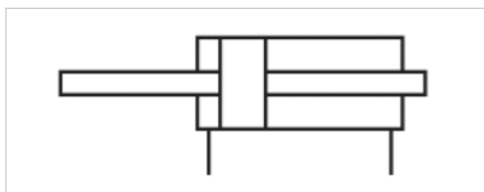
This overview drawing is only for orientation to indicate where the various accessory parts can be fastened to the cylinder. The illustration has been simplified for this purpose. It is thus not possible to derive the dimensions from this overview.

# Mini cylinder, Series MNI

- Ø 10-25 mm
- Ports M5 G 1/8
- double-acting
- Cushioning elastic
- Piston rod External thread
- Piston rod through
- ATEX optional



Standards	ISO 6432
Certificates	ATEX optional
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below



## Technical data

Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Piston rod thread	M4	M6	M6	M8	M10x1,25
Ports	M5	M5	M5	G 1/8	G 1/8
Piston rod Ø	4 mm	6 mm	6 mm	8 mm	10 mm
Cylinder outer thread	M12x1,25	M16x1,5	M16x1,5	M22x1,5	M22x1,5
Stroke 10	0822080201	0822081201	0822082201	0822083201	0822084201
25	0822080202	0822081202	0822082202	0822083202	0822084202
50	0822080203	0822081203	0822082203	0822083203	0822084203
80	0822080204	0822081204	0822082204	0822083204	0822084204
100	0822080205	0822081205	0822082205	0822083205	0822084205
125	0822080209	0822081206	0822082206	0822083206	0822084206
160	-	0822081207	0822082207	0822083207	0822084207
200	-	0822081209	0822082208	0822083208	0822084208
250	-	-	-	0822083209	0822084209
320	-	-	-	0822083210	0822084210
400	-	-	-	-	0822084211
500	-	-	-	R480641970	0822084212

## Technical data

Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Retracting piston force	42 N	53 N	109 N	166 N	260 N
Extracting piston force	42 N	53 N	109 N	166 N	260 N
Impact energy	0.04 J	0.07 J	0.14 J	0.23 J	0.35 J
Weight 0 mm stroke	0.039 kg	0.073 kg	0.091 kg	0.182 kg	0.317 kg
Weight +10 mm stroke	0.003 kg	0.005 kg	0.006 kg	0.01 kg	0.016 kg
Stroke max.	250 mm	600 mm	675 mm	675 mm	675 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).

ATEX-certified cylinders with identification II 2G Ex h IIB T4 Gb / II 2D Ex h IIIB T135°C Db\_X can be generated in the Internet configurator.

The operating temperature range for ATEX-certified cylinders is -20 °C ... 50 °C.

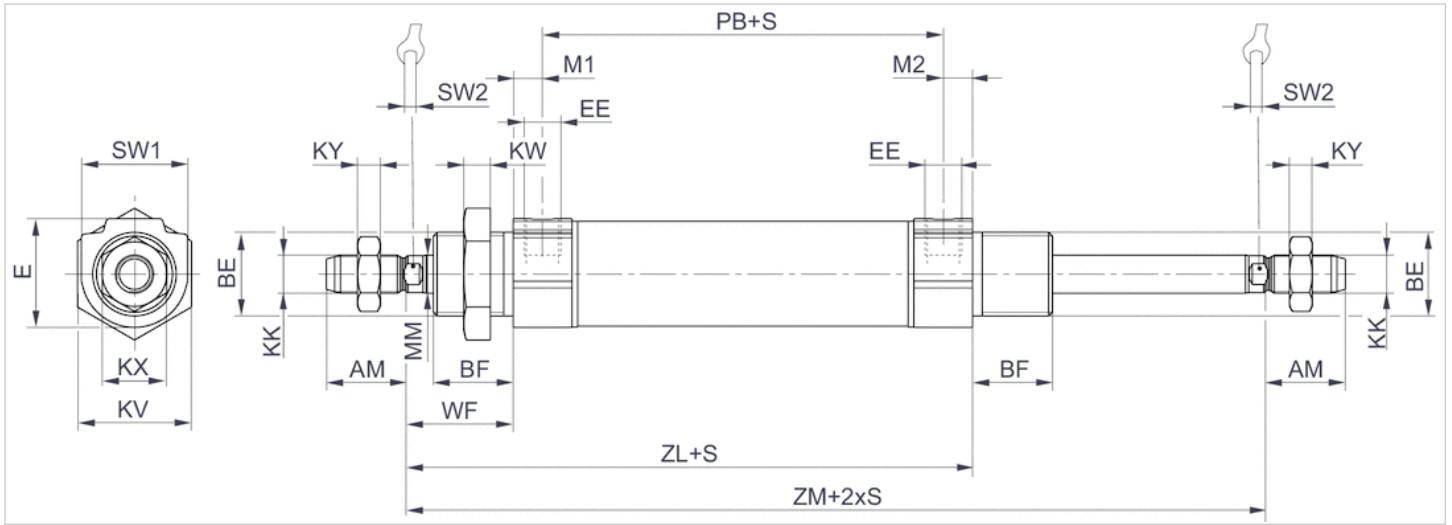
Warning: The front and rear piston rods must not be twisted against one another!

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke

## Dimensions

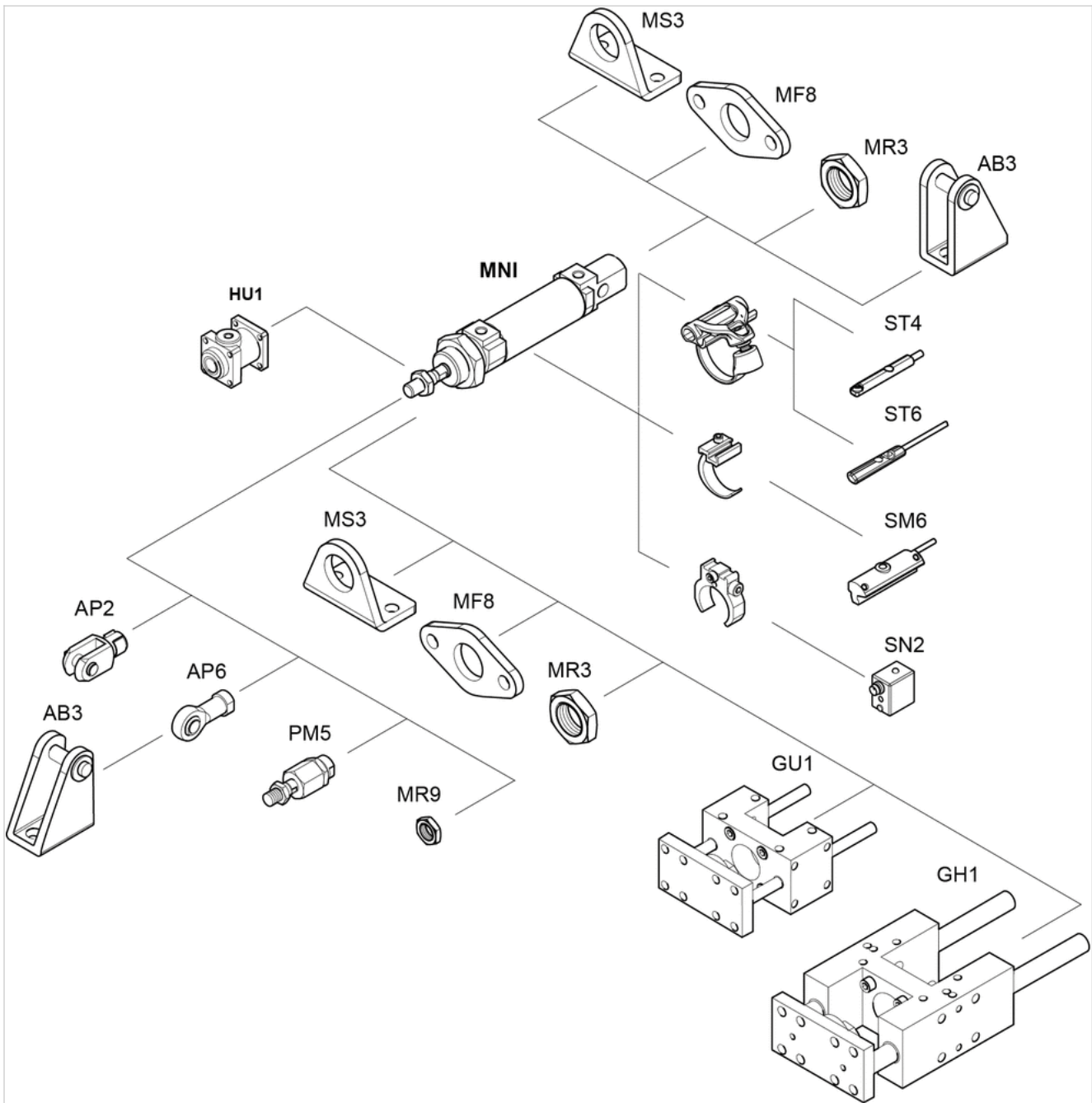
Piston Ø	AM -2	BE	BF	E	EE t = depth of thread	KK	KV	KW	KX	KY	MM f8
10 mm	12	M12x1,25	11	14	M5 t=5	M4	17	5.5	7	2.2	4
12 mm	16	M16x1,5	16	19	M5 t=5	M6	22	6	10	3.2	6
16 mm	16	M16x1,5	16	19	M5 t=5	M6	22	6	10	3.2	6
20 mm	20	M22x1,5	18	28	G1/8 t=8	M8	30	7	13	4	8
25 mm	22	M22x1,5	21	28	G1/8 t=8	M10x1,25	30	7	17	6	10

Piston Ø	M1/M2	PB ±1	SW 1	SW 2	WF±1,4	ZL ± 1,7	ZM +0/-2,5
10 mm	4.8	37	13	3	16	62.5	80.5
12 mm	4.8	41	19	5	22	72.5	96.5
16 mm	4.8	47	19	5	22	78.5	102.5
20 mm	7	51	28	6	24	90.5	116.4
25 mm	7	55	28	8	28	98.5	128.2



# 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.

# Mini cylinder, Series MNI

- Ø 10-25 mm
- Ports M5 G 1/8
- double-acting
- with magnetic piston
- Cushioning elastic
- Polymer bearing bushing in rear eye
- Piston rod External thread



Standards	ISO 6432
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below



## Technical data

Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Piston rod thread	M4	M6	M6	M8	M10x1,25
Ports	M5	M5	M5	G 1/8	G 1/8
Piston rod Ø	4 mm	6 mm	6 mm	8 mm	10 mm
Cylinder outer thread	M12x1,25	M16x1,5	M16x1,5	M22x1,5	M22x1,5
Stroke 5	-	-	-	5226644050	-
10	5226600100	5226610100	5226620100	5226644100	5226634100
15	5226600150	5226610150	5226620150	-	5226634150
18	-	-	5226620180	-	-
20	5226600200	5226610200	5226620200	5226644200	5226634200
25	5226600250	5226610250	5226620250	5226644250	5226634250
30	5226600300	5226610300	5226620300	5226644300	5226634300
35	-	5226610350	5226620350	5226644350	5226634350
40	5226600400	5226610400	5226620400	5226644400	5226634400
45	-	-	5226620450	-	-
50	5226600500	5226610500	5226620500	5226644500	5226634500
55	-	-	5226620550	-	5226634550
60	5226600600	5226610600	5226620600	-	5226634600
65	5226600650	5226610650	-	-	5226634650

Piston Ø Piston rod thread Ports Piston rod Ø Cylinder outer thread	10 mm M4 M5 4 mm M12x1,25	12 mm M6 M5 6 mm M16x1,5	16 mm M6 M5 6 mm M16x1,5	20 mm M8 G 1/8 8 mm M22x1,5	25 mm M10x1,25 G 1/8 10 mm M22x1,5
70	5226600700	5226610700	5226620700	-	5226634700
75	5226600750	5226610750	5226620750	5226644750	5226634750
80	5226600800	5226610800	5226620800	5226644800	5226634800
90	-	-	5226620900	-	5226634900
100	5226601000	5226611000	5226621000	5226645000	5226635000
110	-	-	5226621100	-	5226635100
115	-	-	5226621150	-	-
120	-	-	5226621200	-	5226635200
125	5226601250	5226611250	5226621250	5226645250	5226635250
130	-	-	-	-	5226635300
135	-	-	5226621350	-	-
140	-	-	-	-	5226635400
150	-	5226611500	5226621500	-	5226635500
160	5226601600	5226611600	5226621600	5226645600	5226635600
170	-	-	5226621700	-	5226635700
175	-	5226611750	5226621750	-	5226635750
180	-	-	5226621800	-	5226635800
190	-	-	5226621900	-	-
200	5226602000	5226612000	5226622000	-	5226636000
210	-	-	-	-	5226636100
220	-	-	5226622200	-	5226636200
225	-	-	-	-	5226636250
235	-	-	-	-	5226636350
240	-	-	5226622400	-	-
250	-	5226612500	5226622500	-	5226636500
260	-	-	-	-	5226636600
265	-	-	5226622650	-	-
270	-	-	5226622700	-	5226636700
290	-	-	-	-	5226636900
300	-	-	5226623000	5226647000	5226637000
320	-	5226613200	-	-	5226637200
335	-	-	-	-	5226637350
350	-	-	5226623500	-	5226637500
400	-	5226618020	5226628020	-	5226639000
420	-	-	-	-	5226639050
425	-	-	-	-	5226639080
440	-	-	-	-	5226639070
450	-	-	-	-	5226639020
480	-	5226618010	-	-	-
490	-	-	5226628000	-	5226639010
495	-	-	5226628010	-	-
500	-	-	-	-	5226639030
550	-	-	5226628040	-	5226639090
560	-	-	-	-	5226639040

Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Piston rod thread	M4	M6	M6	M8	M10x1,25
Ports	M5	M5	M5	G 1/8	G 1/8
Piston rod Ø	4 mm	6 mm	6 mm	8 mm	10 mm
Cylinder outer thread	M12x1,25	M16x1,5	M16x1,5	M22x1,5	M22x1,5
600	-	-	-	-	5226639190
620	-	-	-	-	5226639060
850	-	-	5226628030	-	-

## Technical data

Piston Ø	10 mm	12 mm	16 mm	20 mm	25 mm
Retracting piston force	42 N	53 N	109 N	166 N	260 N
Extracting piston force	49 N	71 N	127 N	198 N	309 N
Impact energy	0.04 J	0.07 J	0.14 J	0.23 J	0.35 J
Weight 0 mm stroke	0.042 kg	0.073 kg	0.091 kg	0.149 kg	0.249 kg
Weight +10 mm stroke	0.002 kg	0.005 kg	0.006 kg	0.009 kg	0.013 kg
Stroke max.	250 mm	600 mm	800 mm	1100 mm	1300 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).

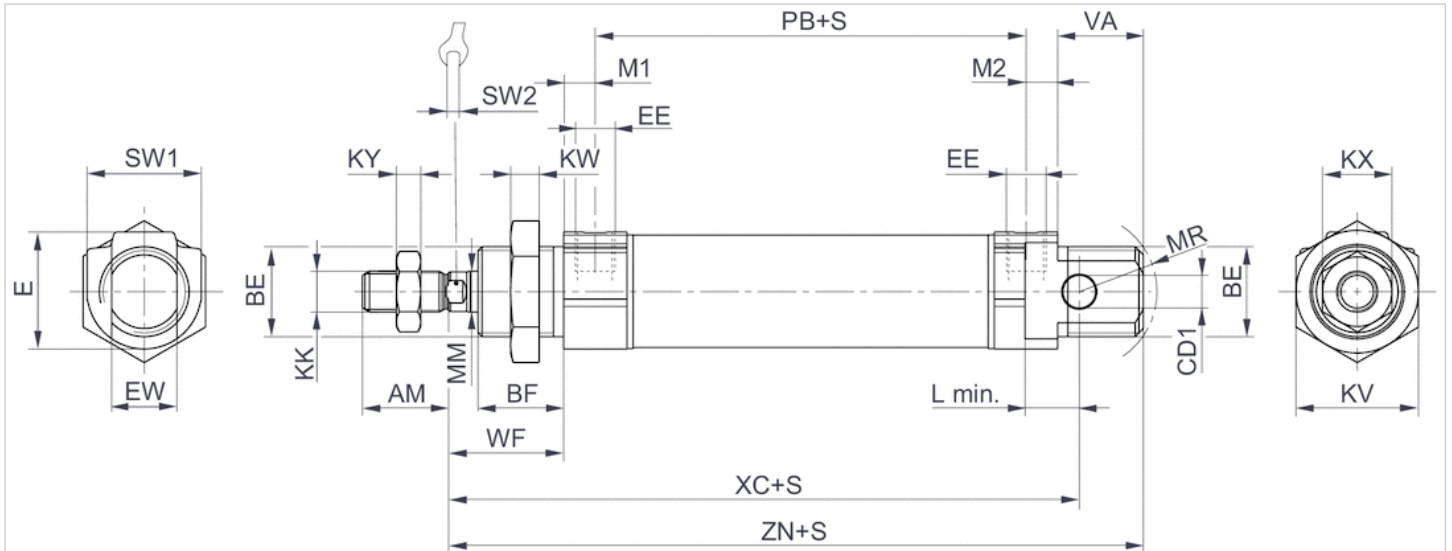
Clamping piece for magnetic field sensor necessary

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke

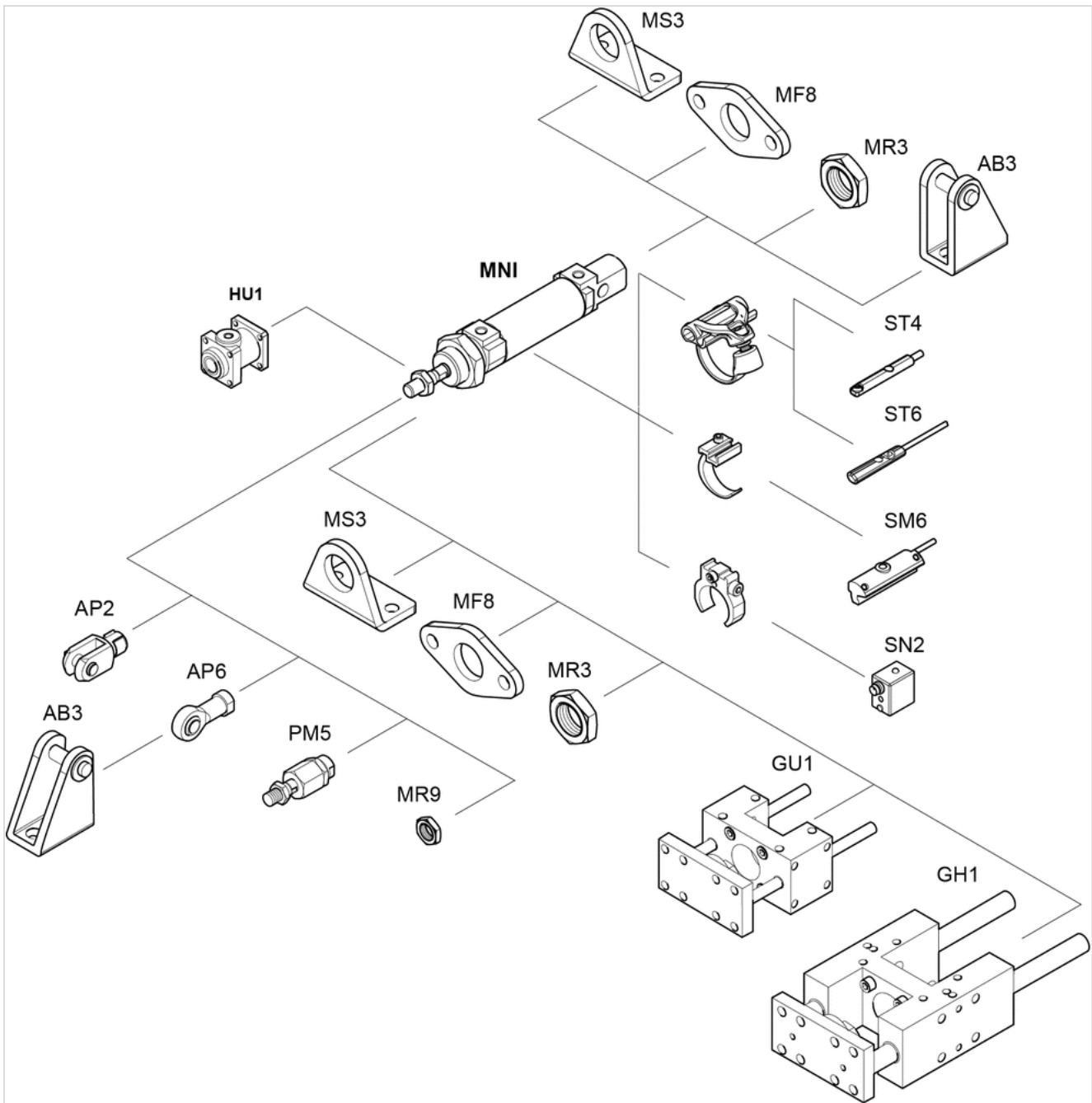
## Dimensions

Piston Ø	AM-2	BE	BF	CD1 H10	E	EE t = depth of thread	EW d13	KK	KV	KW
10 mm	12	M12x1,25	11	4	14	M5 t=5	8	M4	17	5.5
12 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6
25 mm	22	M22x1,5	21	8	28.6	G 1/8 t=8	16	M10x1,25	30	7
20 mm	20	M22x1,5	18	8	28.6	G 1/8 t=8	16	M8	30	7

Piston Ø	KX	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	ZN ± 1,4	SW 1	SW 2
10 mm	7	2.2	6	4	4.8	12	37	11	16	64	73.5	13	3
12 mm	10	3.2	9	6	4.8	16	41	16	22	75	88.5	19	5
16 mm	10	3.2	9	6	4.8	16	47	17	22	82	95.5	19	5
25 mm	17	6	12	10	7.7	19	55	21	28	104	119.5	28	8
20 mm	13	4	12	8	7.7	18	51	19	24	95	109.5	28	6

# Accessories overview

## Overview drawing

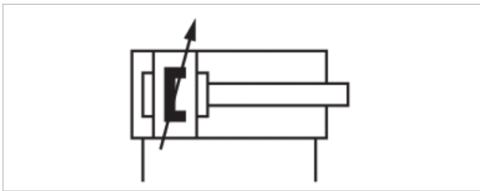


**NOTE:**

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.

# Mini cylinder, Series MNI

- Ø 16-25 mm
- Ports M5 G 1/8
- double-acting
- with magnetic piston
- Cushioning pneumatically adjustable
- with integrated rear eye
- Piston rod External thread
- ATEX optional



Standards	ISO 6432
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below

## Technical data

	16 mm	20 mm	25 mm
Piston Ø	16 mm	20 mm	25 mm
Piston rod thread	M6	M8	M10x1,25
Ports	M5	G 1/8	G 1/8
Piston rod Ø	6 mm	8 mm	10 mm
Cylinder outer thread	M16x1,5	M22x1,5	M22x1,5
Stroke 10	0822332501	0822333501	0822334501
25	0822332502	0822333502	0822334502
50	0822332503	0822333503	0822334503
80	0822332504	0822333504	0822334504
100	0822332505	0822333505	0822334505
125	0822332506	0822333506	0822334506
160	0822332507	0822333507	0822334507
200	0822332508	0822333508	0822334508
250	0822332509	0822333509	0822334509
320	0822332510	0822333510	0822334510
400	0822332511	0822333519	0822334511
500	0822332512	0822333541	0822334512

## Technical data

Piston Ø	16 mm	20 mm	25 mm
Retracting piston force	109 N	166 N	260 N
Extracting piston force	127 N	198 N	309 N
Cushioning length	9 mm	13 mm	17.5 mm
Cushioning energy	0.6 J	1.5 J	2.3 J
Weight 0 mm stroke	0.1 kg	0.16 kg	0.265 kg
Weight +10 mm stroke	0.006 kg	0.009 kg	0.013 kg
Stroke max.	800 mm	1100 mm	1300 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).

Clamping piece for magnetic field sensor necessary

ATEX-certified cylinders with identification II 2G Ex h IIB T4 Gb / II 2D Ex h IIIB T135°C Db\_X can be generated in the Internet configurator.

The operating temperature range for ATEX-certified cylinders is -20 °C ... 50 °C.

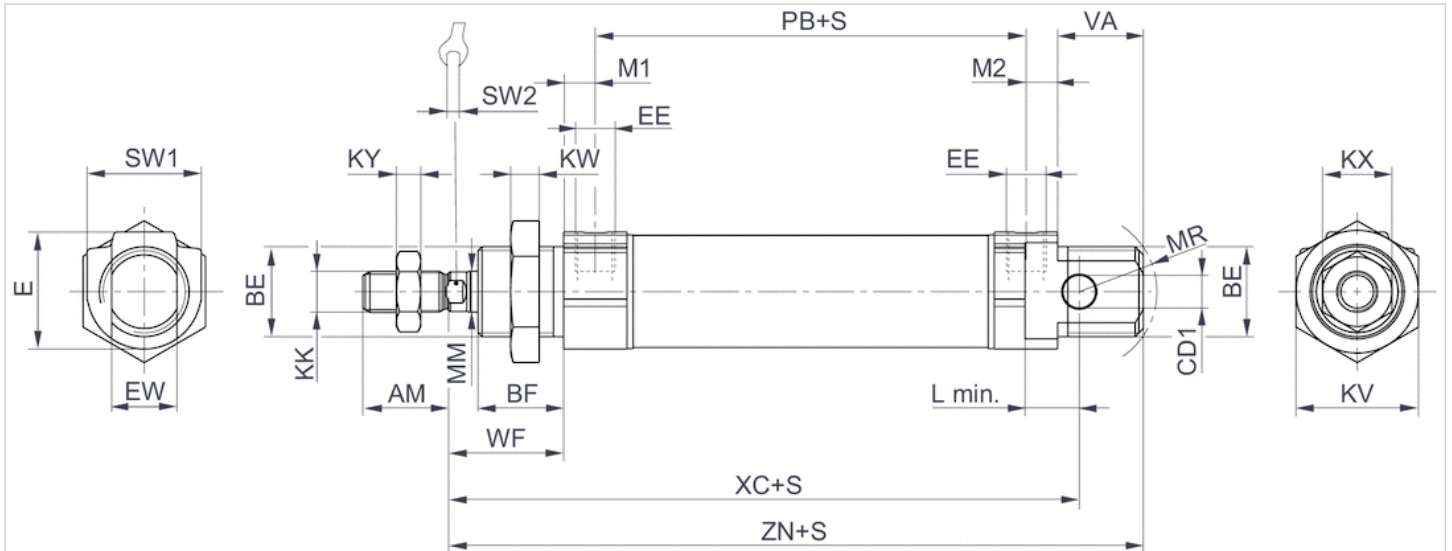
## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane



## Dimensions

### Dimensions



S = stroke

## Dimensions

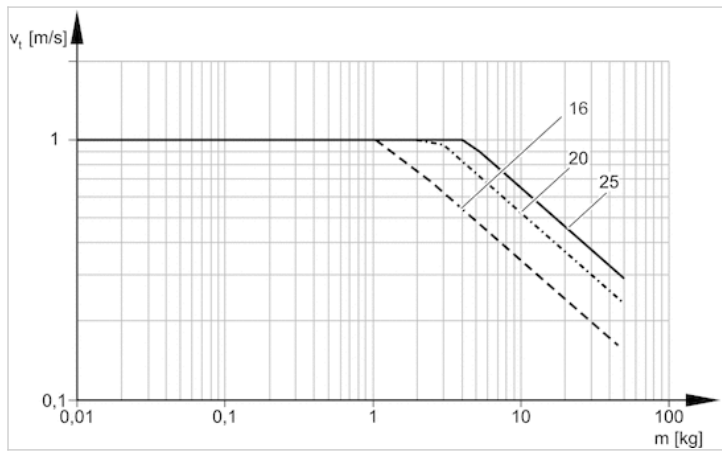
Piston Ø	AM-2	BE	BF	CD H9	E	EE t = depth of thread	EW d13	KK	KV	KW	KX
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6	10
20 mm	20	M22x1,5	18	8	28	G1/8 t=8	16	M8	30	7	13
25 mm	22	M22x1,5	21	8	28	G1/8 t=8	16	M10x1,25	30	7	17

Piston Ø	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	Y ± 1	ZN ± 1,4	SW 1
16 mm	3.2	8	6	4.8	16	47	17	22	82	27	95.5	19
20 mm	4	12	8	7	18	51	19	24	95	32	109.5	28
25 mm	6	12	10	7	19	55	21	28	104	36	119.5	28

Piston Ø	SW 2
16 mm	5
20 mm	6
25 mm	8

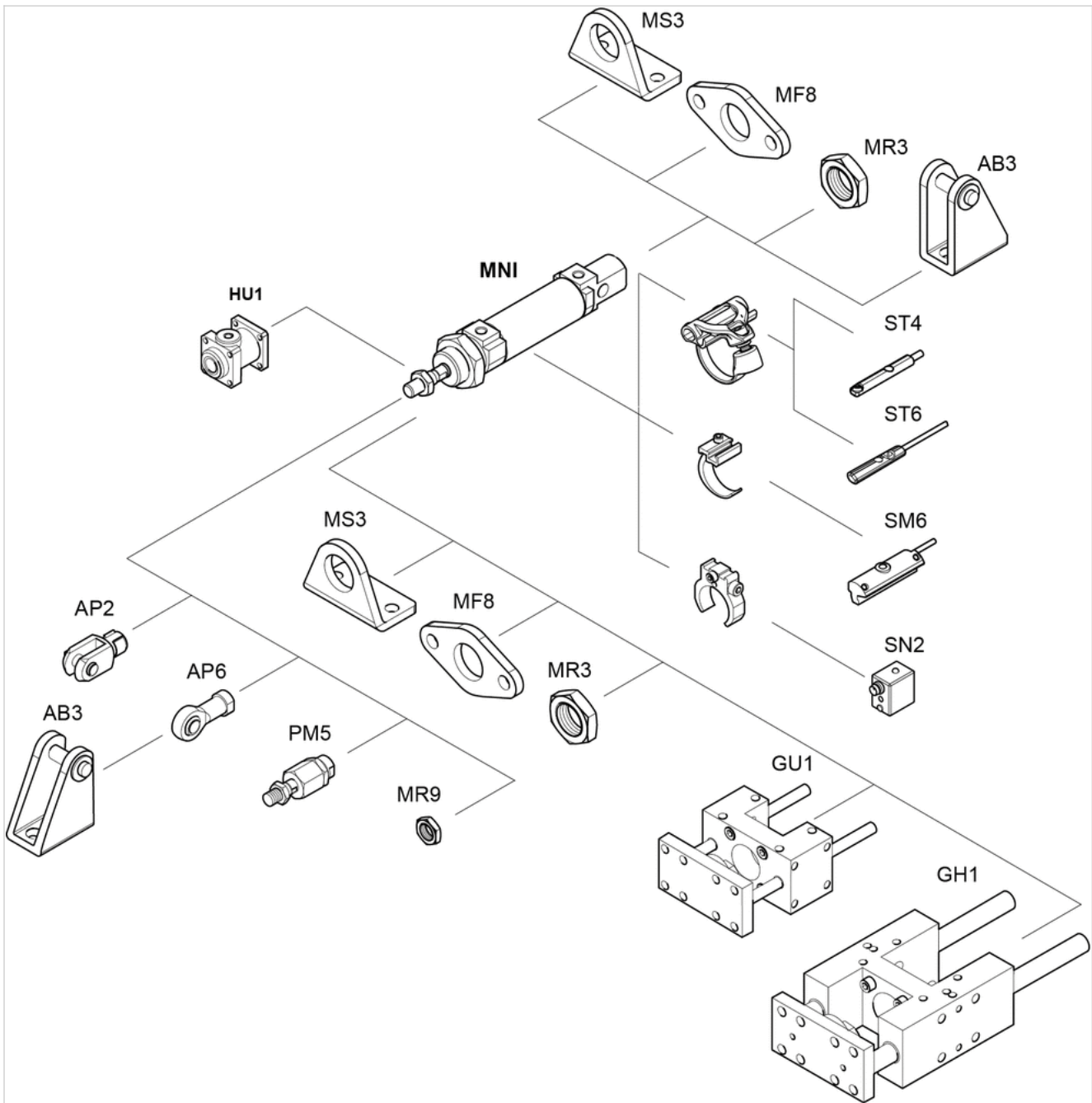
# Diagrams

## Cushioning diagram



# Accessories overview

## Overview drawing

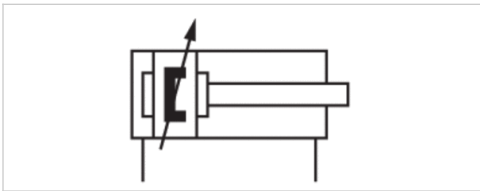


**NOTE:**

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.

# Mini cylinder, Series MNI

- Ø 16-25 mm
- Ports M5 G 1/8
- double-acting
- with magnetic piston
- Cushioning pneumatically adjustable
- with integrated rear eye
- Piston rod External thread
- Heat resistant



Standards	ISO 6432
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-10 ... 120 °C
Medium temperature min./max.	-10 ... 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	6.3 bar
Weight	See table below

## Technical data

Piston Ø Piston rod thread Ports Piston rod Ø Cylinder outer thread	16 mm M6 M5 6 mm M16x1,5	20 mm M8 G 1/8 8 mm M22x1,5	25 mm M10x1,25 G 1/8 10 mm M22x1,5
Stroke 10	0822332451	0822333451	0822334451
25	0822332452	0822333452	0822334452
50	0822332453	0822333453	0822334453
80	0822332454	0822333454	0822334454
100	0822332455	0822333455	0822334455
125	0822332456	0822333456	0822334456
160	0822332457	0822333457	0822334457
200	0822332458	0822333458	0822334458
250	R412008586	0822333459	0822334459
320	R480638873	0822333460	0822334460
400	-	0822333462	0822334461
500	R480611199	-	0822334462

## Technical data

Piston Ø	16 mm	20 mm	25 mm
Retracting piston force	109 N	166 N	260 N
Extracting piston force	127 N	198 N	309 N
Cushioning length	9 mm	13 mm	17.5 mm
Cushioning energy	0.6 J	1.5 J	2.3 J
Weight 0 mm stroke	0.1 kg	0.16 kg	0.265 kg
Weight +10 mm stroke	0.006 kg	0.009 kg	0.013 kg
Stroke max.	800 mm	1100 mm	1300 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).

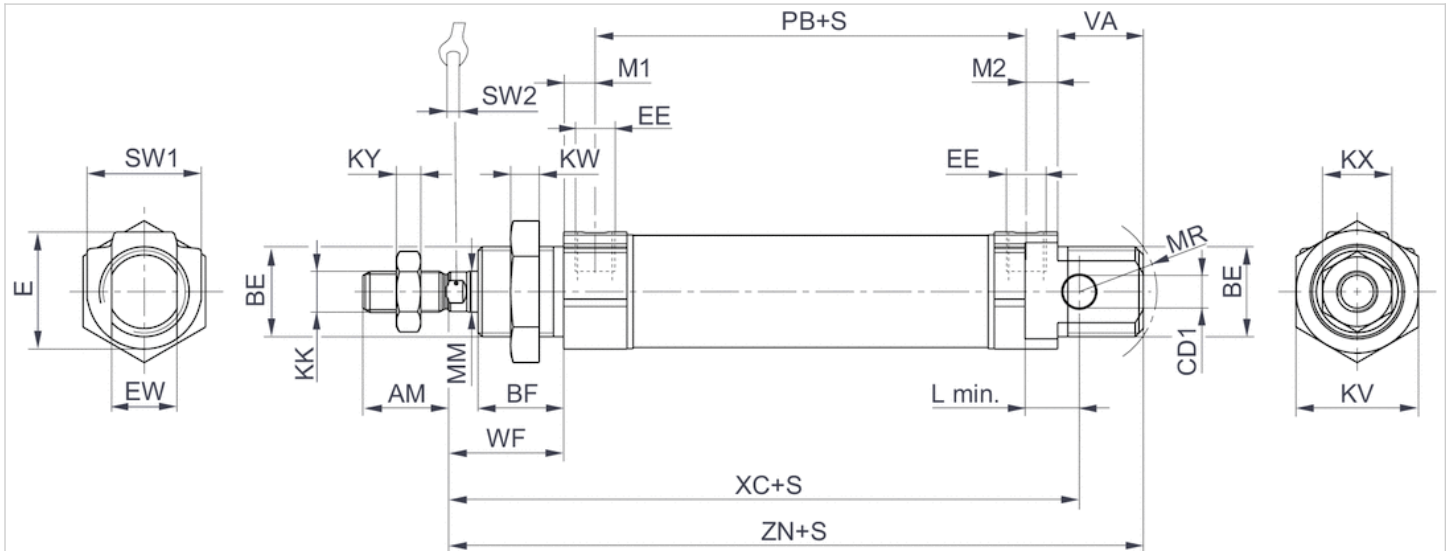
Clamping piece for magnetic field sensor necessary

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Fluorocaoutchouc
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Fluorocaoutchouc

## Dimensions

### Dimensions



S = stroke

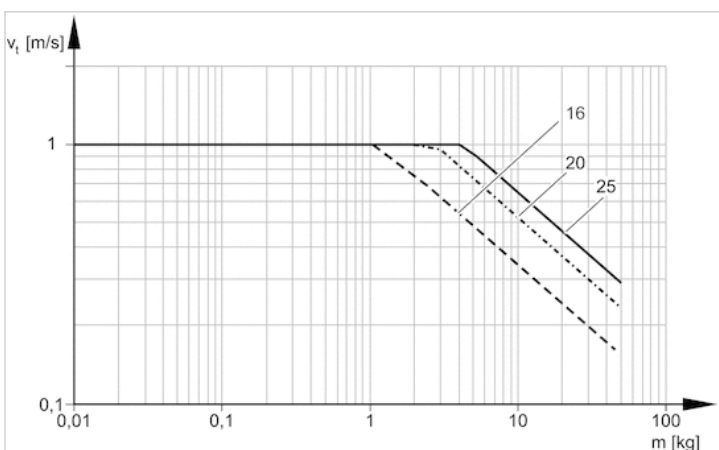
## Dimensions

Piston Ø	AM-2	BE	BF	CD H9	E	EE t = depth of thread	EW d13	KK	KV	KW	KX
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6	10
20 mm	20	M22x1,5	18	8	28	G1/8 t=8	16	M8	30	7	13
25 mm	22	M22x1,5	21	8	28	G1/8 t=8	16	M10x1,25	30	7	17

Piston Ø	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	ZN ± 1,4	SW 1	SW 2
16 mm	3.2	8	6	4.8	16	47	17	22	82	95.5	19	5
20 mm	4	12	8	7	18	51	19	24	95	109.5	28	6
25 mm	6	12	10	7	19	55	21	28	104	119.5	28	8

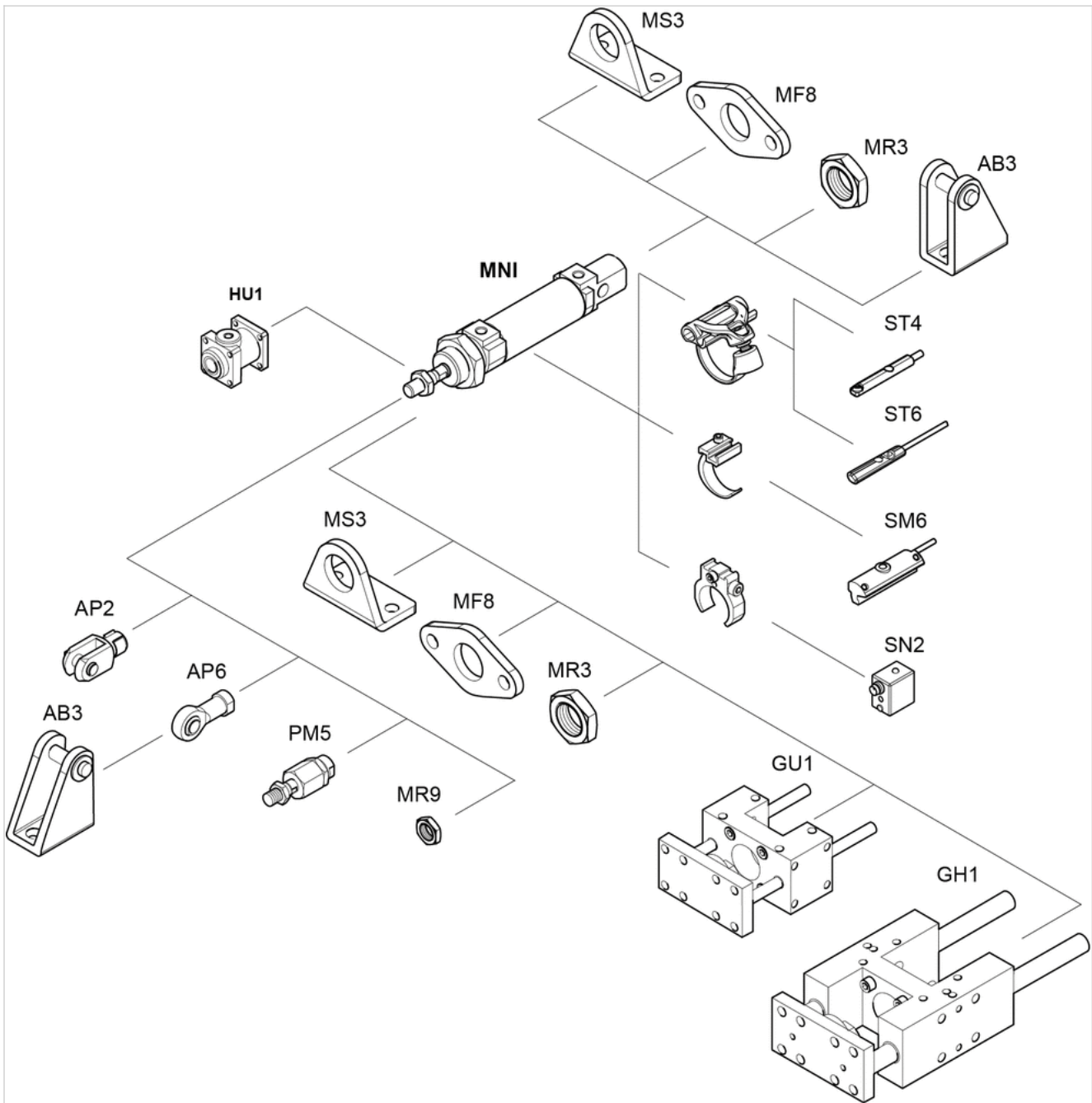
## Diagrams

### Cushioning diagram



# Accessories overview

## Overview drawing



**NOTE:**

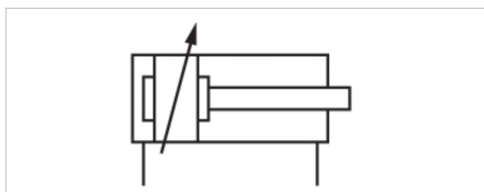
This overview drawing is only for orientation to indicate where the various accessory parts can be fastened to the cylinder. The illustration has been simplified for this purpose. It is thus not possible to derive the dimensions from this overview.

# Mini cylinder, Series MNI

- Ø 16-25 mm
- Ports M5 G 1/8
- double-acting
- Cushioning pneumatically adjustable
- with integrated rear eye
- Piston rod External thread
- ATEX optional



Standards	ISO 6432
Certificates	ATEX optional
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below



## Technical data

Piston Ø Piston rod thread Ports Piston rod Ø Cylinder outer thread	16 mm M6 M5 6 mm M16x1,5	20 mm M8 G 1/8 8 mm M22x1,5	25 mm M10x1,25 G 1/8 10 mm M22x1,5
Stroke 10	0822232001	0822233001	0822234001
25	0822232002	0822233002	0822234002
50	0822232003	0822233003	0822234003
80	0822232004	0822233004	0822234004
100	0822232005	0822233005	0822234005
125	0822232006	0822233006	0822234006
160	0822232007	0822233007	0822234007
200	0822232008	0822233008	0822234008
250	0822232009	0822233009	0822234009
320	0822232010	0822233010	0822234010
400	0822232011	0822233017	0822234011
500	0822232012	0822233041	0822234012



## Technical data

Piston Ø	16 mm	20 mm	25 mm
Retracting piston force	109 N	166 N	260 N
Extracting piston force	127 N	198 N	309 N
Cushioning length	9 mm	13 mm	17.5 mm
Cushioning energy	0.6 J	1.5 J	2.3 J
Weight 0 mm stroke	0.09 kg	0.146 kg	0.25 kg
Weight +10 mm stroke	0.006 kg	0.009 kg	0.013 kg
Stroke max.	800 mm	1100 mm	1300 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).

ATEX-certified cylinders with identification II 2G Ex h IIB T4 Gb / II 2D Ex h IIIB T135°C Db\_X can be generated in the Internet configurator.

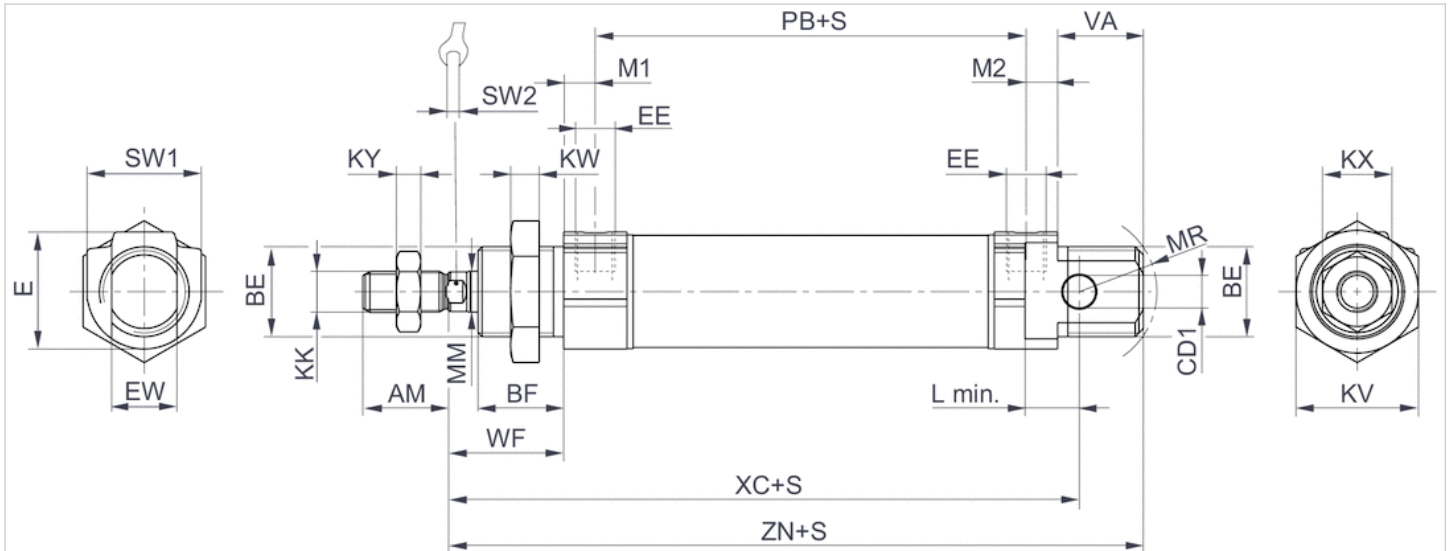
The operating temperature range for ATEX-certified cylinders is -20 °C ... 50 °C.

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke

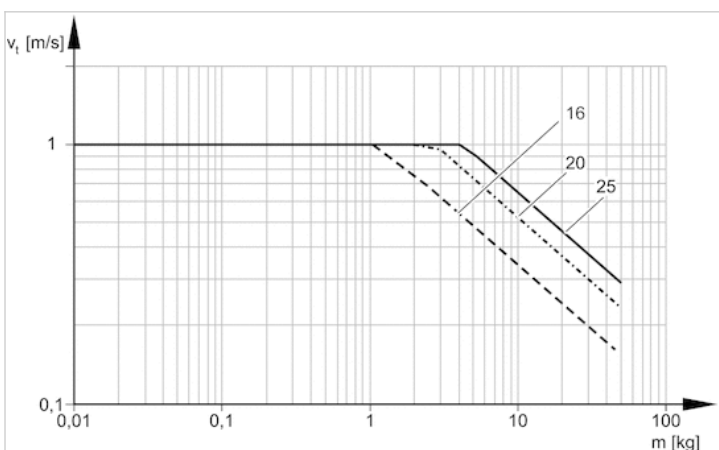
## Dimensions

Piston Ø	AM -2	BE	BF	CD H9	E	EE t = depth of thread	EW d13	KK	KV	KW	KX
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6	10
20 mm	20	M22x1,5	18	8	28	G1/8 t=8	16	M8	30	7	13
25 mm	22	M22x1,5	21	8	28	G1/8 t=8	16	M10x1,25	30	7	17

Piston Ø	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	ZN ± 1,4	SW 1	SW 2
16 mm	3.2	8	6	4.8	16	47	17	22	82	95.5	19	5
20 mm	4	12	8	7	18	51	19	24	95	109.5	28	6
25 mm	6	12	10	7	19	55	21	28	104	119.5	28	8

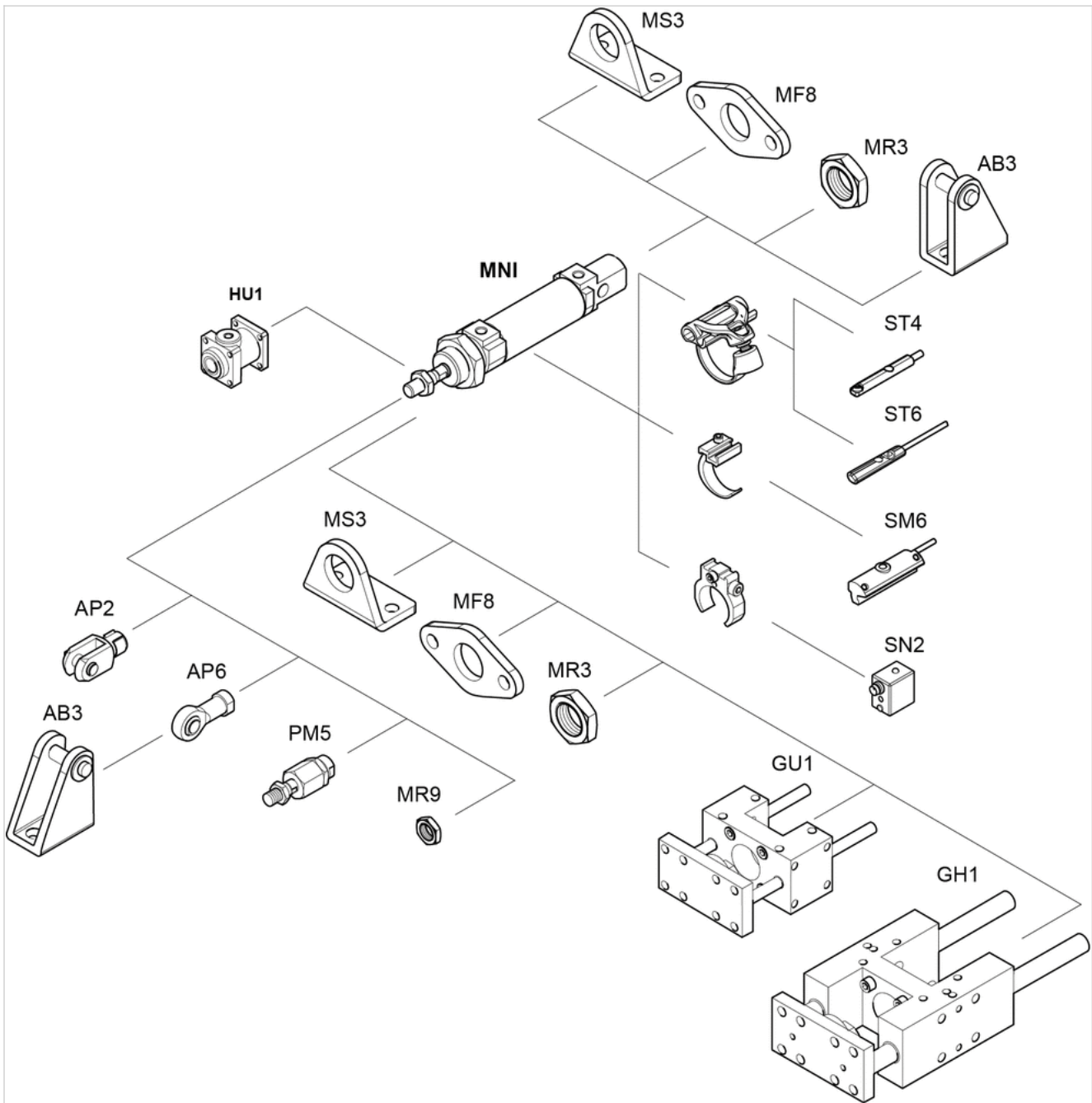
## Diagrams

### Cushioning diagram



# Accessories overview

## Overview drawing

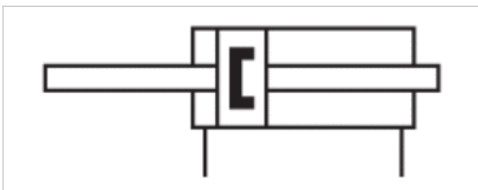


**NOTE:**

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.

# Mini cylinder, Series MNI

- Ø 16-25 mm
- Ports M5 G 1/8
- double-acting
- with magnetic piston
- Cushioning elastic
- Piston rod External thread
- Piston rod through
- ATEX optional



Standards	ISO 6432
Certificates	ATEX optional
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below

## Technical data

	16 mm M6 M5 6 mm M22x1,5	20 mm M8 G 1/8 8 mm M22x1,5	25 mm M10x1,25 G 1/8 10 mm M22x1,5
Piston Ø	16 mm	20 mm	25 mm
Piston rod thread	M6	M8	M10x1,25
Ports	M5	G 1/8	G 1/8
Piston rod Ø	6 mm	8 mm	10 mm
Cylinder outer thread	M22x1,5	M22x1,5	M22x1,5
Stroke 10	0822382001	0822383001	0822384001
25	0822382002	0822383002	0822384002
50	0822382003	0822383003	0822384003
80	0822382004	0822383004	0822384004
100	0822382005	0822383005	0822384005
125	0822382006	0822383006	0822384006
160	0822382007	0822383007	0822384007
200	0822382008	0822383008	0822384008
250	0822382010	0822383009	0822384009
320	R480623516	0822383010	0822384010
400	-	-	0822384011
500	-	-	0822384012

## Technical data

Piston Ø	16 mm	20 mm	25 mm
Retracting piston force	109 N	166 N	260 N
Extracting piston force	109 N	166 N	260 N
Impact energy	0.14 J	0.23 J	0.35 J
Weight 0 mm stroke	0.091 kg	0.182 kg	0.317 kg
Weight +10 mm stroke	0.006 kg	0.01 kg	0.016 kg
Stroke max.	675 mm	675 mm	675 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).

Clamping piece for magnetic field sensor necessary

ATEX-certified cylinders with identification II 2G Ex h IIB T4 Gb / II 2D Ex h IIIB T135°C Db\_X can be generated in the Internet configurator.

The operating temperature range for ATEX-certified cylinders is -20 °C ... 50 °C.

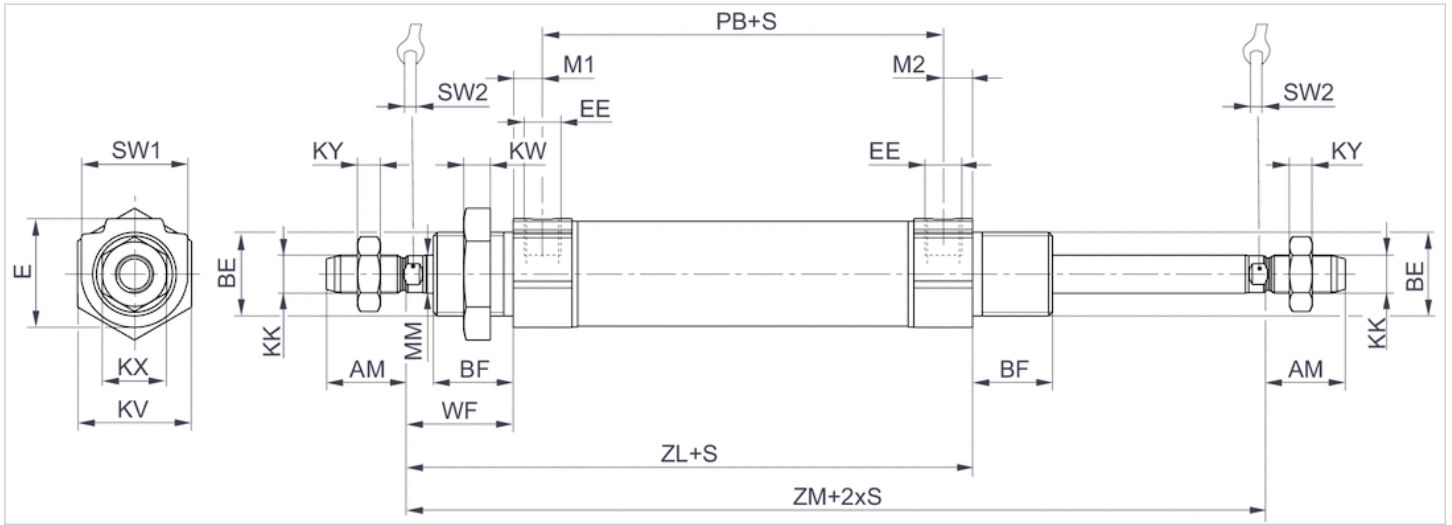
Warning: The front and rear piston rods must not be twisted against one another!

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke

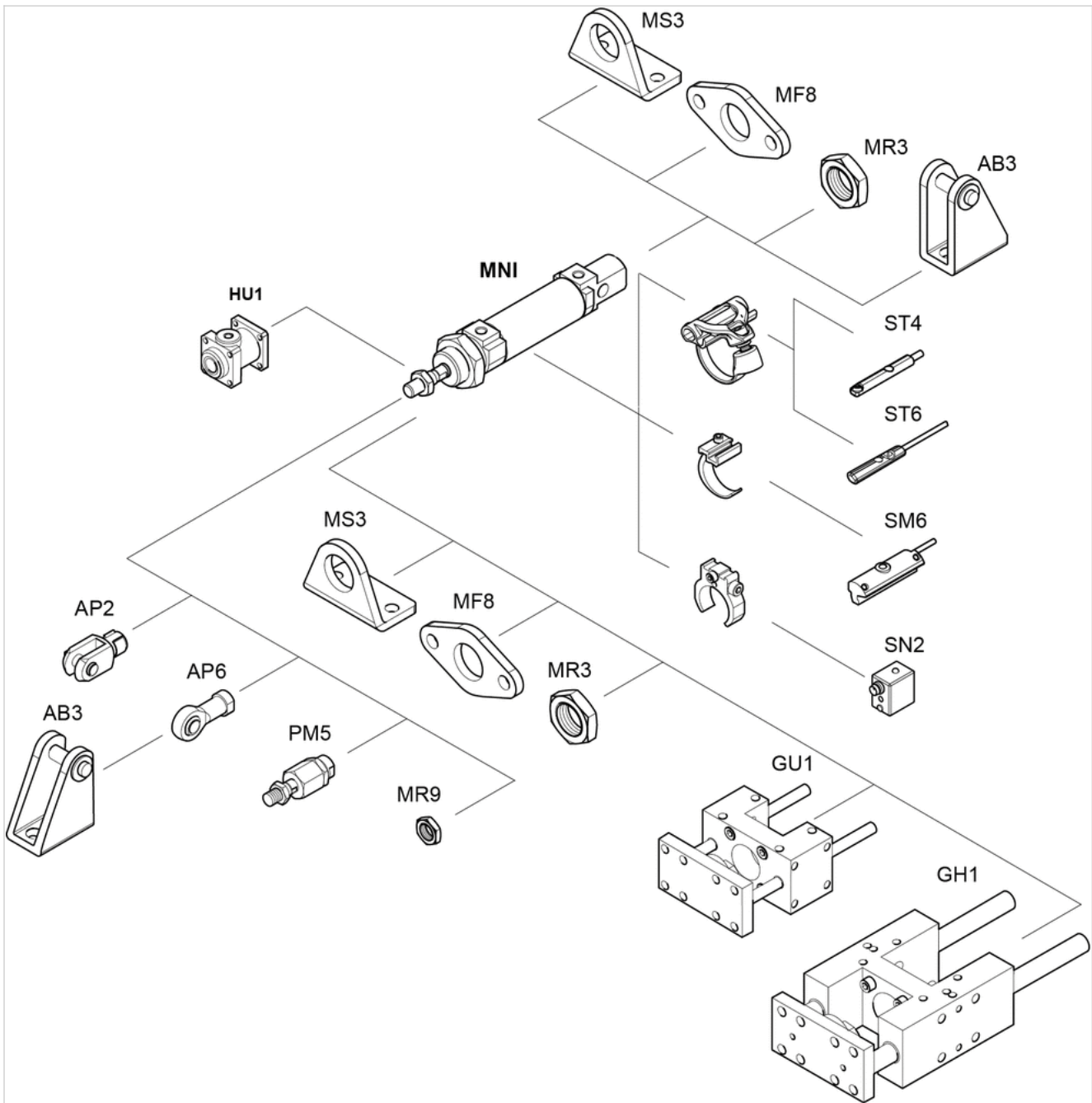
## Dimensions

Piston Ø	AM -2	BE	BF	E	EE t = depth of thread	KK	KV	KW	KX	KY	MM f8
16 mm	16	M16x1,5	16	19	M5 t=5	M6	22	6	10	3.2	6
20 mm	20	M22x1,5	18	28	G1/8 t=8	M8	30	7	13	4	8
25 mm	22	M22x1,5	21	28	G1/8 t=8	M10x1,25	30	7	17	6	10

Piston Ø	M1/M2	PB ±1	SW 1	SW 2	WF ±1,4	ZL ± 1,7	ZM +0/-2,5
16 mm	4.8	47	19	5	22	78.5	102.5
20 mm	7	51	28	6	24	90.5	116.4
25 mm	7	55	28	8	28	98.5	128.2

# Accessories overview

## Overview drawing

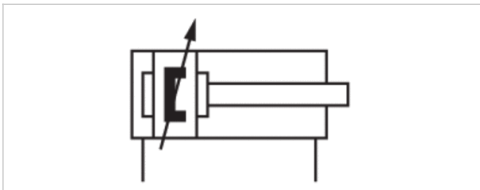


**NOTE:**

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.

# Mini cylinder, Series MNI

- Ø 16-25 mm
- Ports M5 G 1/8
- double-acting
- with magnetic piston
- Cushioning pneumatically adjustable
- Polymer bearing bushing in rear eye
- Piston rod External thread



Standards	ISO 6432
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below

## Technical data

	16 mm	20 mm	25 mm
Piston Ø	16 mm	20 mm	25 mm
Piston rod thread	M6	M8	M10x1,25
Ports	M5	G 1/8	G 1/8
Piston rod Ø	6 mm	8 mm	10 mm
Cylinder outer thread	M16x1,5	M22x1,5	M22x1,5
Stroke 10	5226720100	5226744100	5226734100
15	5226720150	5226744150	5226734150
20	-	5226744200	5226734200
25	5226720250	5226744250	5226734250
30	5226720300	5226744300	5226734300
40	5226720400	5226744400	5226734400
50	5226720500	5226744500	5226734500
60	5226720600	5226744600	5226734600
75	5226720750	5226744750	5226734750
80	5226720800	5226744800	5226734800
100	5226721000	5226745000	5226735000
125	5226721250	5226745250	5226735250
150	5226721500	5226745500	5226735500
160	5226721600	5226745600	5226735600



	16 mm	20 mm	25 mm
Piston Ø	16 mm	20 mm	25 mm
Piston rod thread	M6	M8	M10x1,25
Ports	M5	G 1/8	G 1/8
Piston rod Ø	6 mm	8 mm	10 mm
Cylinder outer thread	M16x1,5	M22x1,5	M22x1,5
200	5226722000	5226746000	5226736000
250	-	5226746500	5226736500
300	-	5226747000	5226737000
320	-	-	5226737200
350	-	-	5226737500

## Technical data

Piston Ø	16 mm	20 mm	25 mm
Retracting piston force	109 N	166 N	260 N
Extracting piston force	127 N	198 N	309 N
Cushioning length	9 mm	13 mm	17.5 mm
Cushioning energy	0.6 J	1.5 J	2.3 J
Weight 0 mm stroke	0.1 kg	0.16 kg	0.265 kg
Weight +10 mm stroke	0.006 kg	0.009 kg	0.013 kg
Stroke max.	800 mm	1100 mm	1300 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).

Clamping piece for magnetic field sensor necessary

ATEX-certified cylinders can be generated in the Internet configurator.

ATEX ID: II 2G c IIB T4

II 2D c IP65 T125°C X

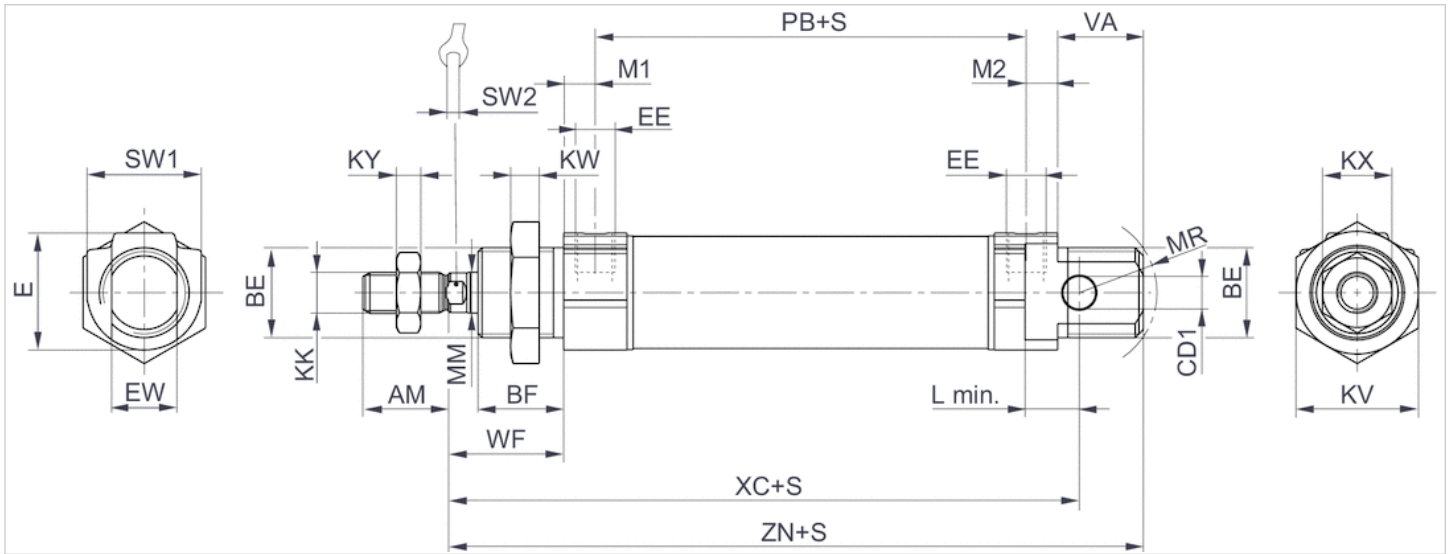
The operating temperature range for ATEX-certified cylinders is -20 °C ... 50 °C.

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke

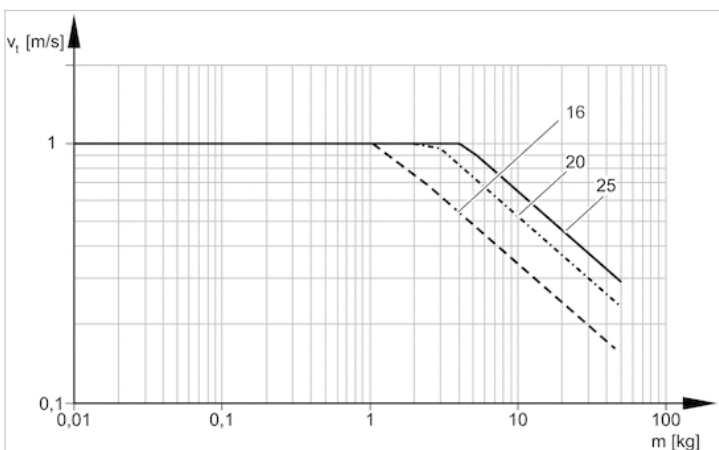
## Dimensions

Piston Ø	AM-2	BE	BF	CD1 H10	E	EE t = depth of thread	EW d13	KK	KV	KW
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6
20 mm	20	M22x1,5	18	8	28.6	G 1/8 t=8	16	M8	30	7
25 mm	22	M22x1,5	21	8	28.6	G 1/8 t=8	16	M10x1,25	30	7

Piston Ø	KX	KY	L min	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	ZN ± 1,4	SW 1	SW 2
16 mm	10	3.2	8	6	4.8	16	47	17	22	82	95.5	19	5
20 mm	13	4	12	8	7.7	18	51	19	24	95	109.5	28	6
25 mm	17	6	12	10	7.7	19	55	21	28	104	119.5	28	8

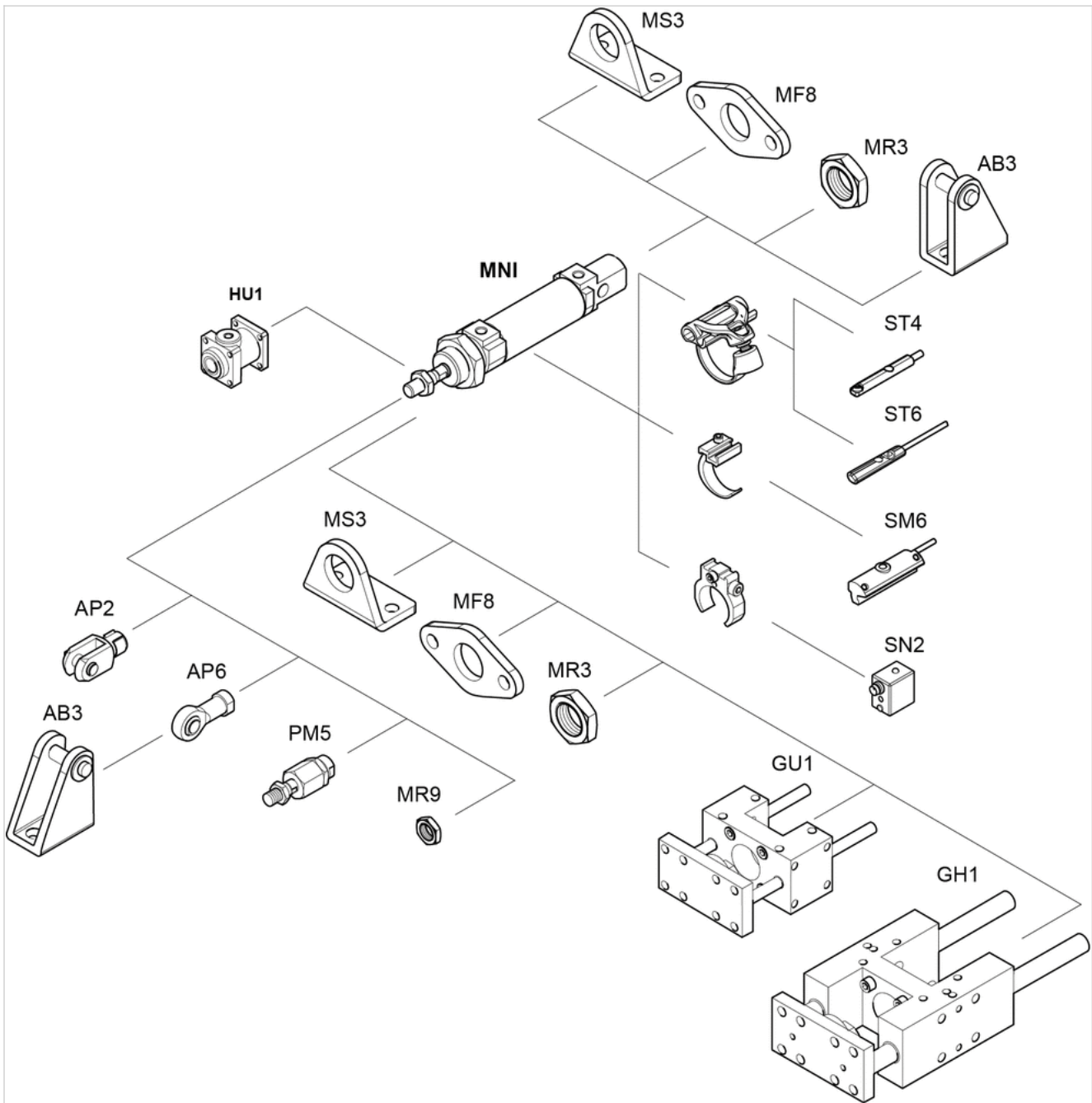
## Diagrams

### Cushioning diagram



# Accessories overview

## Overview drawing

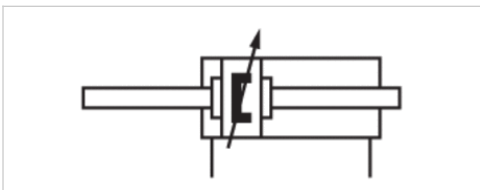


**NOTE:**

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.

# Mini cylinder, Series MNI

- Ø 16-25 mm
- Ports M5 G 1/8
- double-acting
- with magnetic piston
- Cushioning pneumatically adjustable
- Piston rod External thread
- Piston rod through
- ATEX optional



Standards	ISO 6432
Certificates	ATEX optional
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below

## Technical data

Piston Ø Piston rod thread Ports Piston rod Ø Cylinder outer thread	16 mm M6 M5 6 mm M16x1,5	20 mm M8 G 1/8 8 mm M22x1,5	25 mm M10x1,25 G 1/8 10 mm M22x1,5
Stroke 10	R480680379	R480680390	R480680402
25	R480680380	R480680391	R480680403
50	R480680381	R480680392	R480680404
80	R480680382	R480680393	R480680405
100	R480680383	R480680394	R480680406
125	R480680384	R480680395	R480680407
160	R480680385	R480680396	R480680408
200	R480680386	R480680397	R480680409
250	R480680387	R480680398	R480680410
320	R480680388	R480680399	R480680411
400	R480680389	R480680400	R480680412
500	-	R480680401	R480680413

Other versions can be ordered from AVENTICS sales offices.

## Technical data

Piston Ø	16 mm	20 mm	25 mm
Retracting piston force	109 N	166 N	260 N
Extracting piston force	109 N	166 N	260 N
Cushioning length	9 mm	13 mm	17.5 mm
Cushioning energy	0.6 J	1.5 J	2.3 J
Weight 0 mm stroke	0.1 kg	0.193 kg	0.334 kg
Weight +10 mm stroke	0.063 kg	0.102 kg	0.155 kg
Stroke max.	675 mm	675 mm	675 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).

Clamping piece for magnetic field sensor necessary

ATEX-certified cylinders with identification II 2G Ex h IIB T4 Gb / II 2D Ex h IIB T135°C Db\_X can be generated in the Internet configurator.

The operating temperature range for ATEX-certified cylinders is -20 °C ... 50 °C.

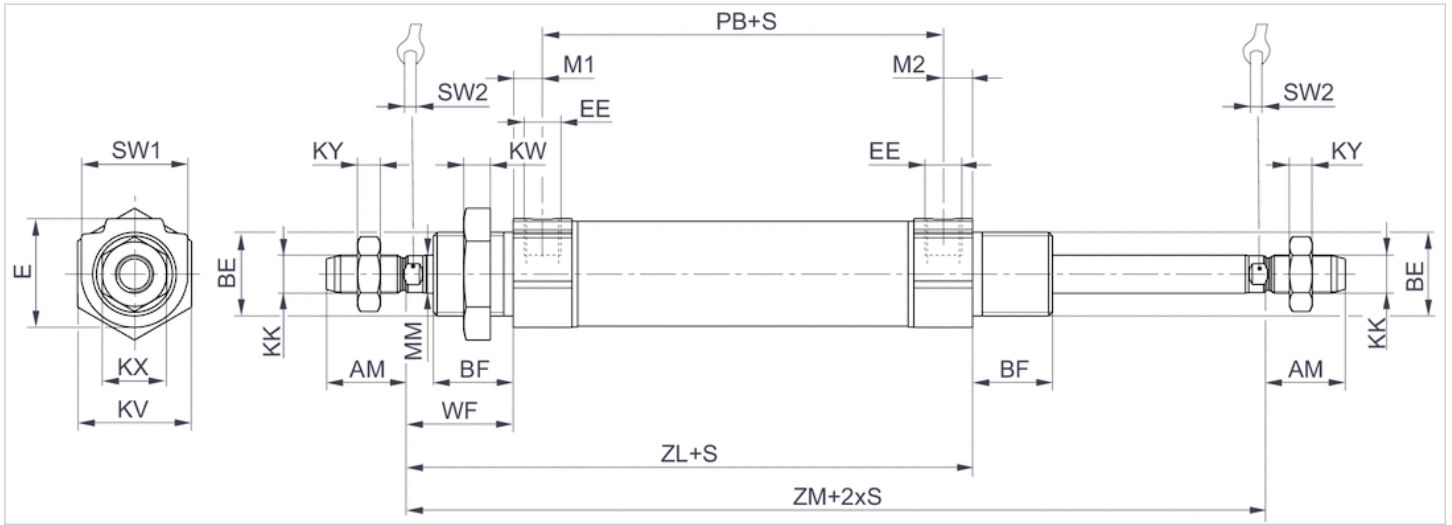
Warning: The front and rear piston rods must not be twisted against one another!

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions

### Dimensions



S = stroke

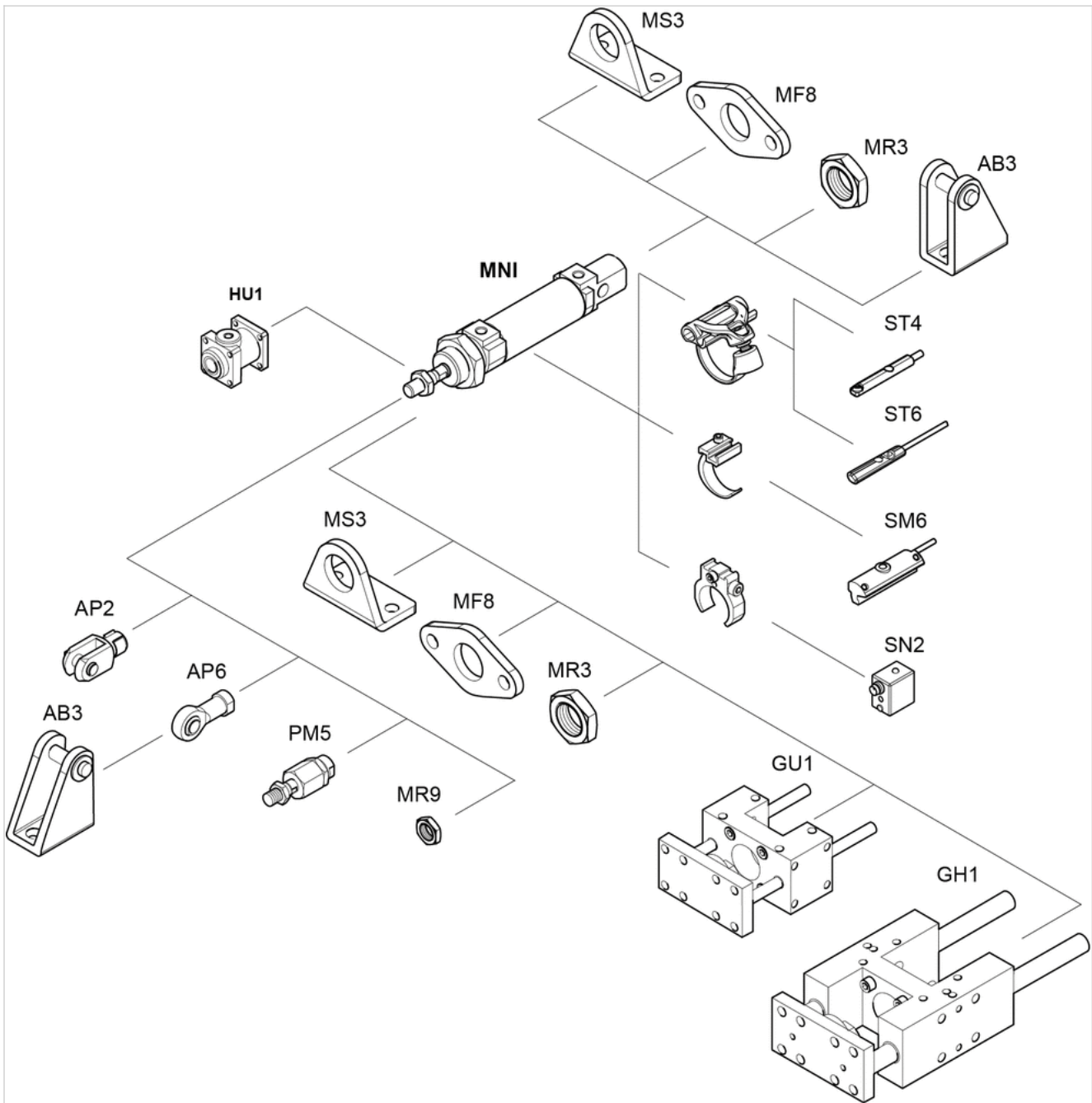
## Dimensions

Piston Ø	AM -2	BE	BF	E	EE t = depth of thread	KK	KV	KW	KX	KY	MM f8
16 mm	16	M16x1,5	16	19	M5 t=5	M6	22	6	10	3.2	6
20 mm	20	M22x1,5	18	28	G1/8 t=8	M8	30	7	13	4	8
25 mm	22	M22x1,5	21	28	G1/8 t=8	M10x1,25	30	7	17	6	10

Piston Ø	M1/M2	PB ±1	SW 1	SW 2	WF ±1,4	ZL ± 1,7	ZM +0/-2,5
16 mm	4.8	47	19	5	22	78.5	102.5
20 mm	7	51	28	6	24	90.5	116.4
25 mm	7	55	28	8	28	98.5	128.2

# Accessories overview

## Overview drawing

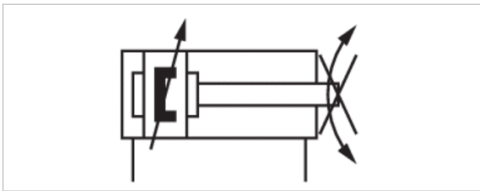


**NOTE:**

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.

# Mini cylinder, Series MNI

- Ø 16-25 mm
- Ports M5 G 1/8
- double-acting
- with magnetic piston
- Cushioning pneumatically adjustable
- with integrated rear eye
- Piston rod External thread
- Piston rod non-rotating



Standards	ISO 6432
Compressed air connection	Internal thread
Working pressure min./max.	1 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium temperature min./max.	-25 ... 80 °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	6.3 bar
Weight	See table below

## Technical data

Piston Ø Piston rod thread Ports Piston rod Ø Cylinder outer thread	16 mm M6 M5 6 mm M16x1,5	20 mm M8 G 1/8 8 mm M22x1,5	25 mm M10x1,25 G 1/8 10 mm M22x1,5
Stroke 10	R480680343	R480680355	R480680367
25	R480680344	R480680356	R480680368
50	R480680345	R480680357	R480680369
80	R480680346	R480680358	R480680370
100	R480680347	R480680359	R480680371
125	R480680348	R480680360	R480680372
160	R480680349	R480680361	R480680373
200	R480680350	R480680362	R480680374
250	R480680351	R480680363	R480680375
320	R480680352	R480680364	R480680376
400	R480680353	R480680365	R480680377
500	R480680354	R480680366	R480680378



Other versions can be ordered from AVENTICS sales offices.

## Technical data

Piston Ø	16 mm	20 mm	25 mm
Retracting piston force	110 N	171 N	265 N
Extracting piston force	127 N	198 N	309 N
Cushioning length	9 mm	13 mm	17.5 mm
Cushioning energy	0.6 J	1.5 J	2.3 J
Torque for torsion protection, max.	0.1 Nm	0.25 Nm	0.4 Nm
Rotation angle tolerance (±)	3.2 °	2.5 °	2.2 °
Weight 0 mm stroke	0.1 kg	0.16 kg	0.265 kg
Weight +10 mm stroke	0.006 kg	0.009 kg	0.013 kg
Stroke max.	800 mm	1100 mm	1300 mm

The cushioning diagram can be found in the "Technical information" document (available in the MediaCentre).

## 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).

Clamping piece for magnetic field sensor necessary

ATEX-certified cylinders can be generated in the Internet configurator.

ATEX ID: II 2G c IIB T4

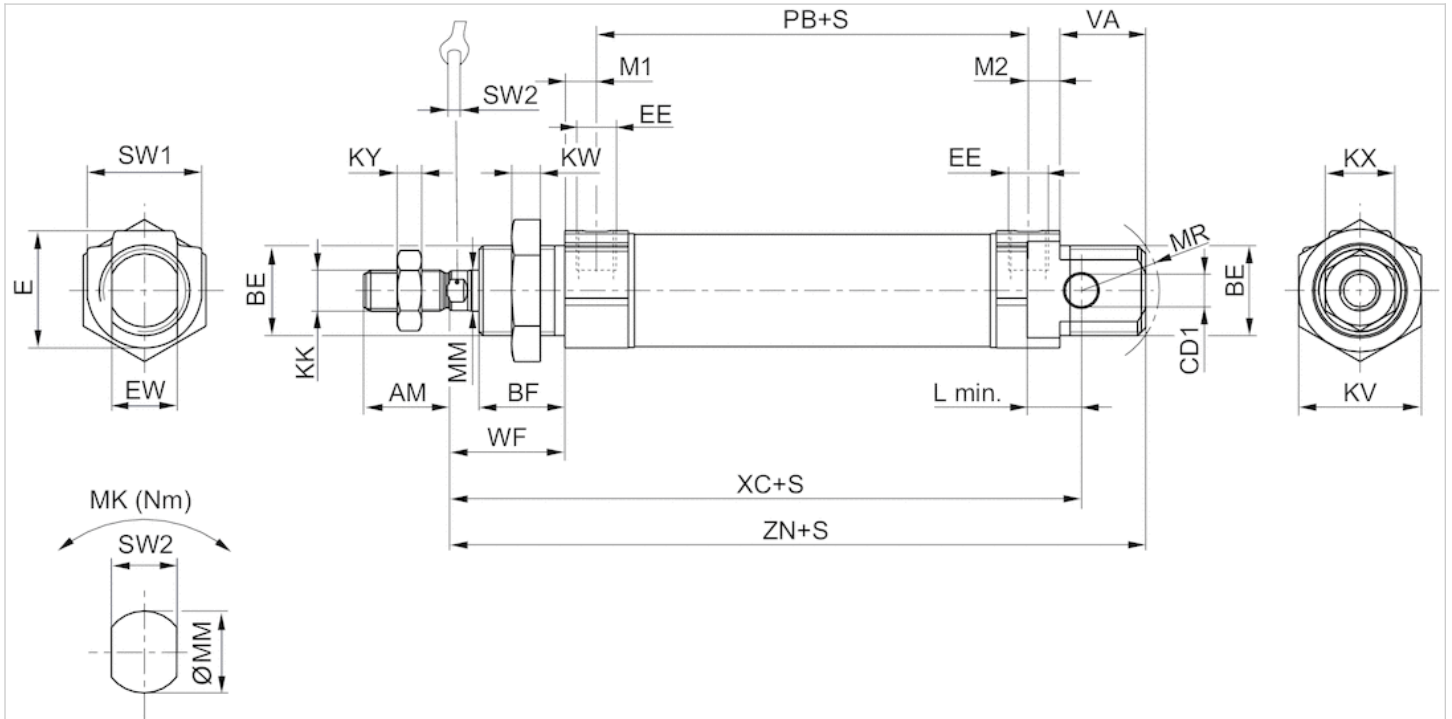
II 2D c IP65 T125°C X

The operating temperature range for ATEX-certified cylinders is -20 °C ... 50 °C.

## Technical information

Material	
Cylinder tube	Stainless steel
Piston rod	Stainless steel
Piston	Brass, Aluminum
Front cover	Aluminum, anodized
End cover	Aluminum, anodized
Seal	Acrylonitrile butadiene rubber Polyurethane
Nut for cylinder mounting	Steel, galvanized
Nut for piston rod	Steel, galvanized
Scraper	Polyurethane

## Dimensions



## Dimensions

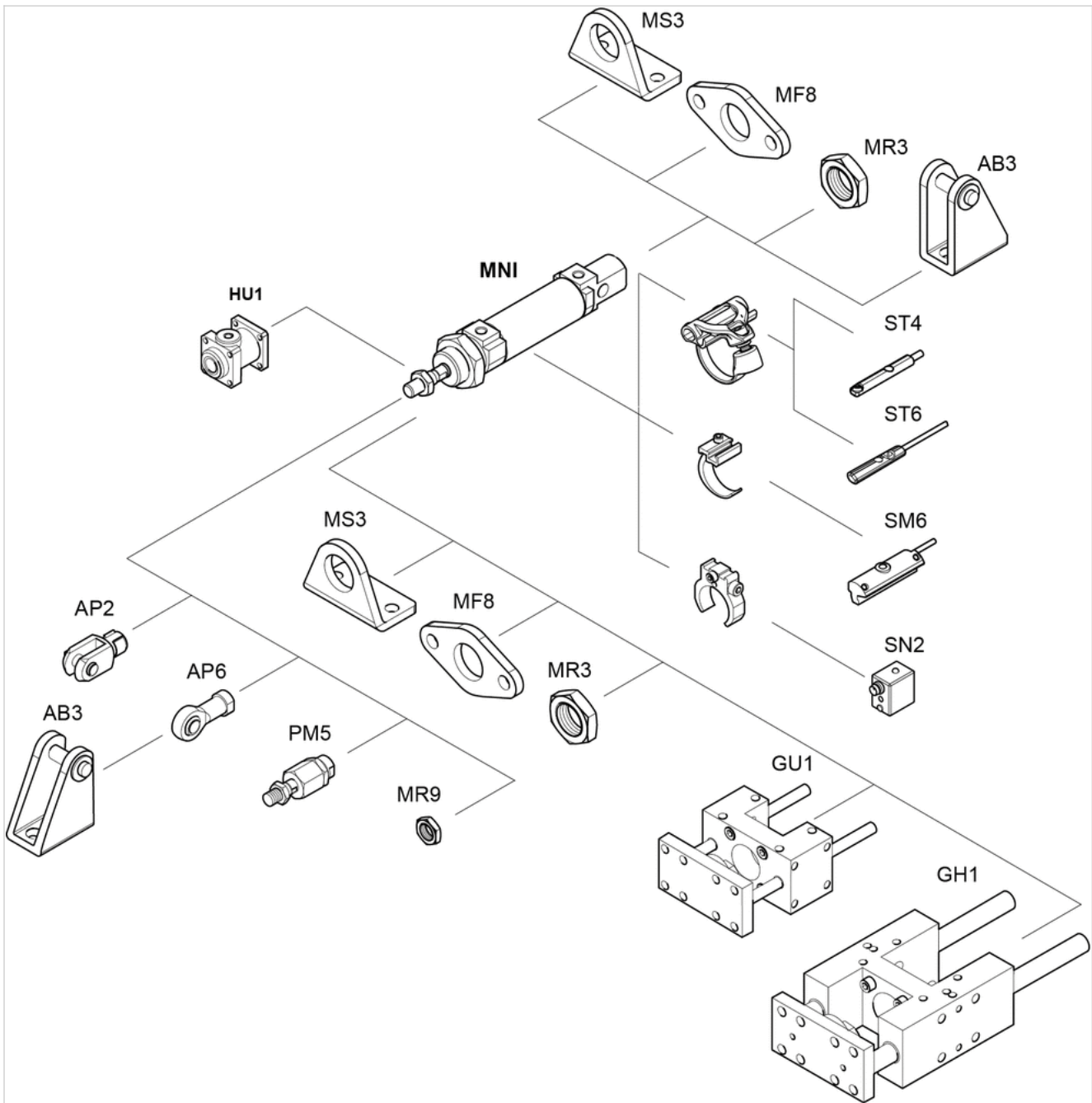
Piston Ø	AM-2	BE	BF	CD1 H9	E	EE t = depth of thread	EW d13	KK	KV	KW
16 mm	16	M16x1,5	16	6	19	M5 t=5	12	M6	22	6
20 mm	20	M22x1,5	18	8	28,6	G1/8 t=8	16	M8	30	7
25 mm	22	M22x1,5	21	8	28,6	G1/8 t=8	16	M10x1,25	30	7

Piston Ø	KX	KY	L	MK	MM f8	M1/M2	MR	PB ±1	VA	WF ±1,4	XC ±1	Y ± 1	ZN ± 1,4	SW 1
16 mm	10	3.2	8	0,1	6	4.8	16	47	17	22	82	27	95.5	19
20 mm	13	4	12	0,25	8	7	18	51	19	24	95	32	109.5	28
25 mm	17	6	12	0,4	10	7	19	55	21	28	104	36	119.5	28

Piston Ø	SW 2
16 mm	5
20 mm	6
25 mm	8

# 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 AB3, Series CM1

- Suitable piston Ø 8, 10 12, 16 20, 25 mm



The delivered product may vary from that in the illustration.

## Technical data

Part No.	Piston Ø	Swivel bearing Ø	Fig.
1827001447	8, 10 mm	4 mm	Fig. 1
1827001446	12, 16 mm	6 mm	Fig. 1
1827001445	20, 25 mm	8 mm	Fig. 1

Scope of delivery: clevis mounting incl. pivot pins

## Technical information

Material	
Material	Steel
	galvanized

## Dimensions

Fig. 1

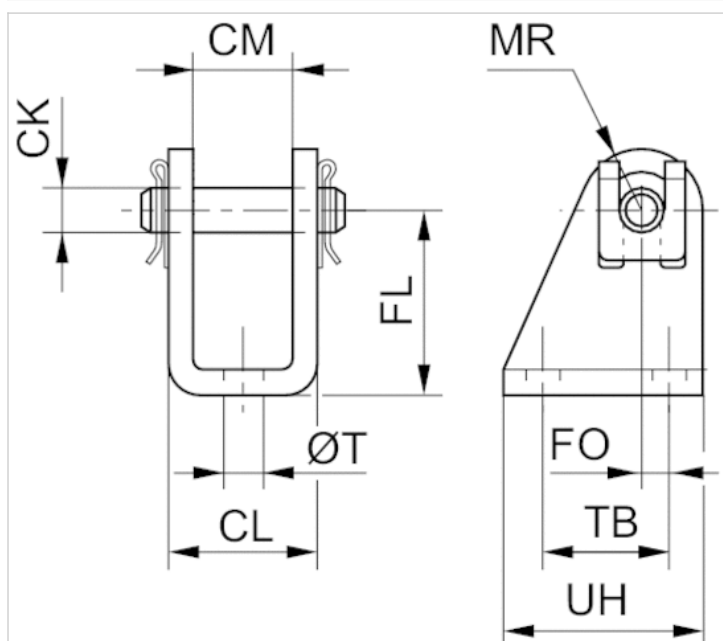
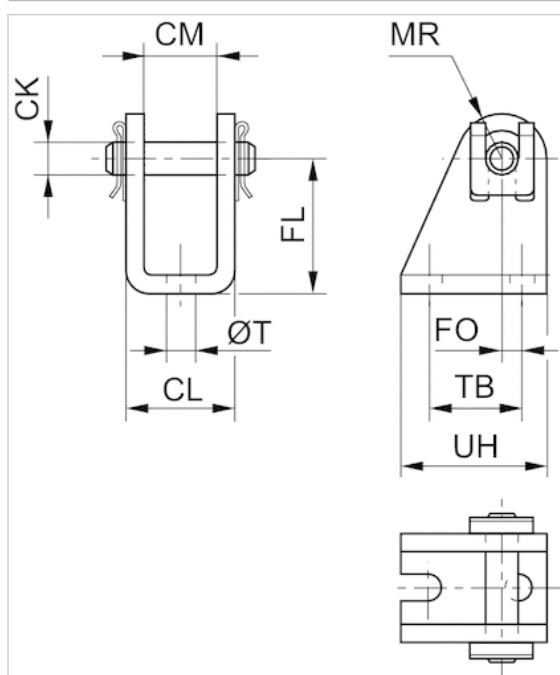


Fig. 2



## Dimensions

Part No.	Piston Ø	Fig.	CM	Ø CK	CL	FL	FO	MR	Ø T	TB	UH
1827001447	8, 10 mm	Fig. 1	8,1	4	13,1	24	1,5	5	4,5	12,5	20
1827001446	12, 16 mm	Fig. 1	12,1	6	18,1	27	2,0	7	5,5	15	25
1827001445	20, 25 mm	Fig. 1	16,1	8	24,1	30	4,0	10	6,6	20	32

# Flange mounting MF8, Series CM1

- Cylinder mounting in accordance with ISO 6432

- Suitable piston Ø 8, 10 12, 16 20, 25 mm



Standards

ISO 6432

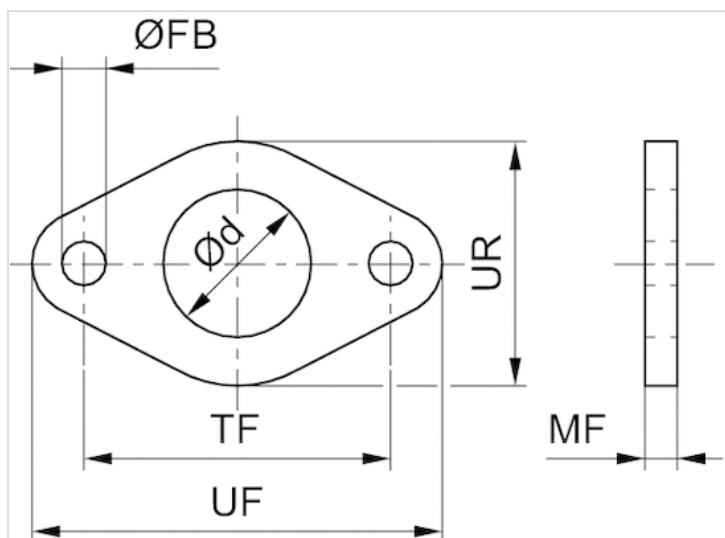
## Technical data

Part No.	Piston Ø
1821036012	8, 10 mm
1821036011	12, 16 mm
1821036010	20, 25 mm

## Technical information

Material	
Material	Steel
	galvanized

## Dimensions



## Dimensions

Part No.	Piston $\varnothing$	$\varnothing d$	$\varnothing FB$	MF	TF js14	UF	UR
1821036012	8, 10 mm	12	4.5	3	30	40	25
1821036011	12, 16 mm	16	5.5	4	40	52	30
1821036010	20, 25 mm	22	6.6	5	50	66	40

# Foot mounting MS3, Series CM1

- Cylinder mounting in accordance with ISO 6432

- Suitable piston Ø 8, 10 12, 16 20, 25 mm



Standards

ISO 6432

## Technical data

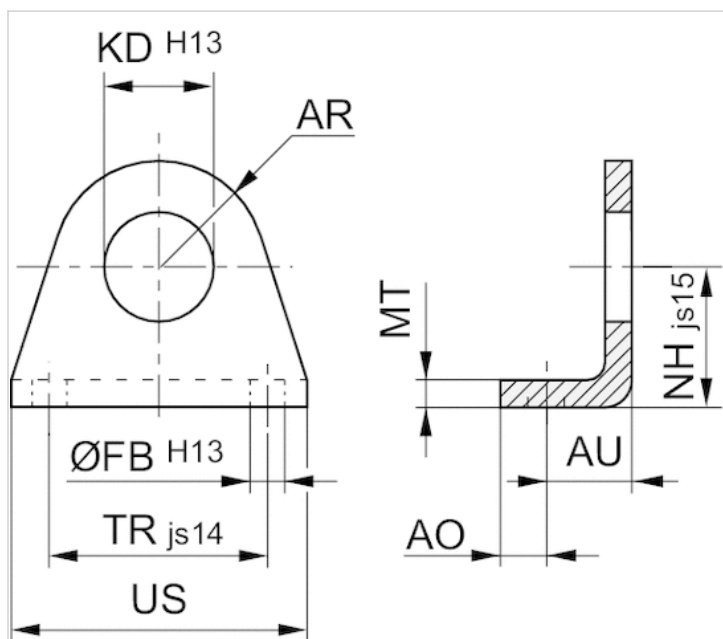
Part No.	Piston Ø
1821332029	8, 10 mm
1821332028	12, 16 mm
1821332027	20, 25 mm

## Technical information

Material	
Material	Steel galvanized



## Dimensions



## Dimensions

Part No.	Piston Ø	AO	AR	AU	Ø FB H13	Ø KD H13	MT	NH ±0,3 js15	TR js14	US
1821332029	8, 10 mm	5	10	11	4.5	12.1	3	16	25	35
1821332028	12, 16 mm	6	13	14	5.5	16.1	4	20	32	42
1821332027	20, 25 mm	8	20	17	6.6	22.1	5	25	40	54

# Nut MR3, series CM1

- for cylinder mounting
- Suitable piston  $\varnothing$  8, 10 12, 16 20, 25 mm
- for series MNI CSL-RD, MNI



Weight

See table below

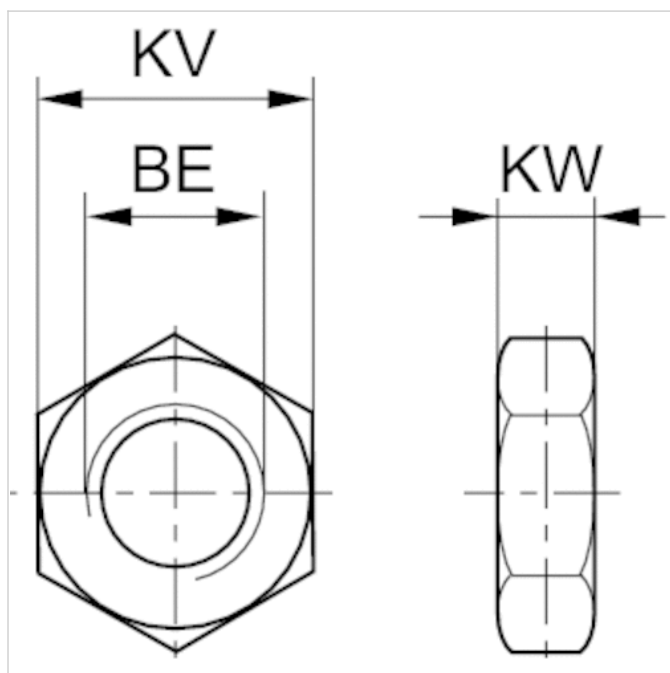
## Technical data

Part No.	Piston $\varnothing$	Thread size	Weight
1823300024	8, 10 mm	M12x1,25	0.008 kg
2915A51204	12, 16 mm	M16x1,5	0.01 kg
2915051207	20, 25 mm	M22x1,5	0.02 kg

## Technical information

Material	
Material	Steel
	galvanized

## Dimensions



## Dimensions

Part No.	Piston Ø	For series	BE	KV	KW
1823300024	8, 10 mm	MNI	M12x1,25	17	5.5
2915A51204	12, 16 mm	MNI	M16x1,5	22	6
2915051207	20, 25 mm	CSL-RD, MNI	M22x1,5	30	7

# Piston rod nut MR9



Weight

See table below

## Technical data

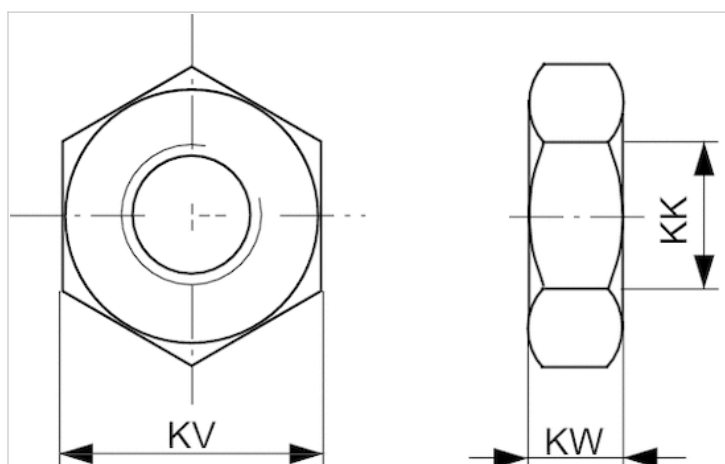
Part No.	Suitable piston rod thread	Weight
8103040114	M4	0.001 kg
1823300033	M6	0.004 kg
1823300034	M8	0.005 kg
1823A00020	M10x1,25	0.01 kg

## Technical information

### Material

Steel
galvanized

## Dimensions



## Dimensions

Part No.	KK	KV	KW
1823300033	M6	10	3.2
1823300034	M8	13	4

# 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

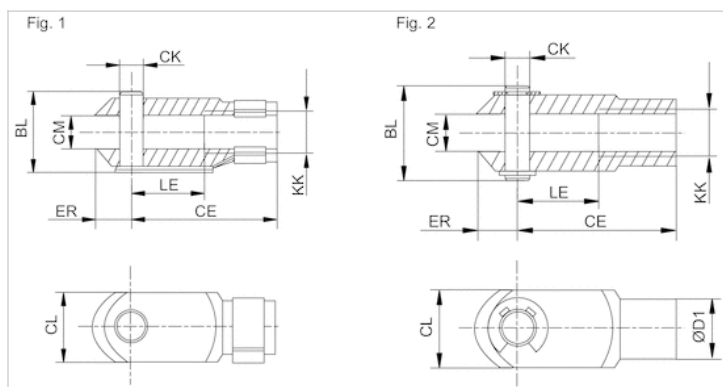
Part No.	Suitable piston rod thread	for	Weight
1822122028	M4	MNI ICM	0.01 kg
1822122009	M6	CCI MNI ICM KHZ	0.02 kg
1822122010	M8	CCI MNI ICM KHZ	0.05 kg
1822122024	M10x1,25	PRA TRB CCI MNI ICM KPZ 167 CVI RPC RDC	0.1 kg

Part No.	Fig.
1822122028	Fig. 1
1822122009	Fig. 1
1822122010	Fig. 1
1822122024	Fig. 1

## Technical information

Material	
	Steel
	galvanized

## Dimensions



## Dimensions

Part No.	KK	BL	CE	ØCK e11	CL	CM	ØD1	ER	LE	Fig.
1822122028	M4	11	16	4	8	4	8	5	8	Fig. 1
1822122009	M6	16	24	6	12	6	10	7	12	Fig. 1
1822122010	M8	21,5	32	8	16	8	14	10	16	Fig. 1
1822122024	M10x1,25	26	40	10	20	10	18	12	20	Fig. 1

# 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
1822124000	M4	MNI SSI	5 mm
1822124001	M6	MNI CCI SSI	152.4 mm
1822124002	M8	MNI CCI SSI KPZ	203.2 mm
1822124003	M10x1,25	PRA TRB MNI CCI SSI RPC KPZ 167 CVI RDC	254 mm

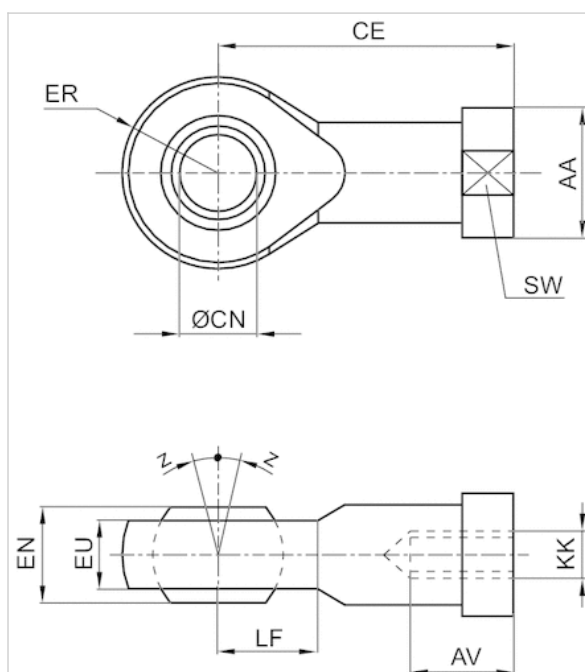
Part No.	Weight
1822124000	0.02 kg
1822124001	0.03 kg
1822124002	0.05 kg
1822124003	0.07 kg

## Technical information

Material	
	Steel
	galvanized



## Dimensions



## Dimensions

Part No.	KK	AA	AV min.	CE	$\varnothing CN H7$	EN -0,1	ER	EU max.	LF	SW	Z [°] max.
1822124000	M4	12	8	27	5	8	9	7.5	9	9	4
1822124001	M6	13	9	30	6	9	10	7.5	10	11	4
1822124002	M8	16	12	36	8	12	12	9.5	12	14	4
1822124003	M10x1,25	19	15	43	10	14	14	11.5	14	17	4

# 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

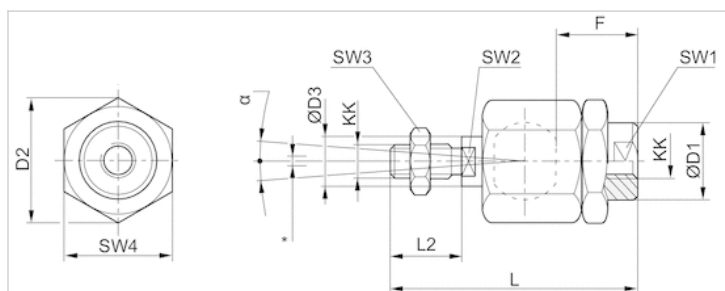
Part No.	Suitable piston rod thread	for
1826409008	M4	MNI
R412026140	M6x1	CCL-IC CCI MNI
R412026141	M8x1,25	CCL-IC CCI MNI
R412026142	M10x1,25	PRA TRB CCL-IS CCL-IC CCI SSI KPZ 167 CVI RPC

Part No.	Weight
1826409008	0.02 kg
R412026140	0.02 kg
R412026141	0.05 kg
R412026142	0.21 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)
1826409008	M4	12	13.5	4	13	33	8	12	3.2	7	12	8	0.05-0.2	0-0,5
R412026140	M6x1	8.5	14.5	6	11	36.5	11	7	5	10	13	6	0.05-0.5	0-1,5
R412026141	M8x1,25	12.5	19	8	21	58	21	11	7	13	17	8	0.05-0.5	0-1,5
R412026142	M10x1,25	22	32	14	23	74.5	23	19	12	17	30	8	0.05-0.5	0-2

1) Axial play

2) Radial play

# Guide unit GU1, Series CG1

- Ø 12-25 mm
- Plain bearing
- For standard cylinders ISO 6432



Bearing type

Plain bearing

Ambient temperature min./max.

-20 ... 80 °C

## Technical data

Suitable piston Ø	12 mm	20 mm	25 mm
Stroke 50	0821401095	0821401070	0821401080
100	0821401096	0821401071	0821401081
160	-	0821401072	0821401082
200	0821401097	0821401073	0821401083
250	-	0821401074	0821401084
400	-	0821401075	0821401085
600	-	-	0821401086
800	-	0821401077	0821401087
1000	-	0821401078	-

## Technical data

Suitable piston Ø	12 mm	20 mm	25 mm
Weight 0 mm stroke	0.247 kg	0.66 kg	0.66 kg
+10 mm stroke	0.008 kg	0.012 kg	0.012 kg

## Technical information

Guide units for cylinder Ø 12 also fit on cylinder Ø 16

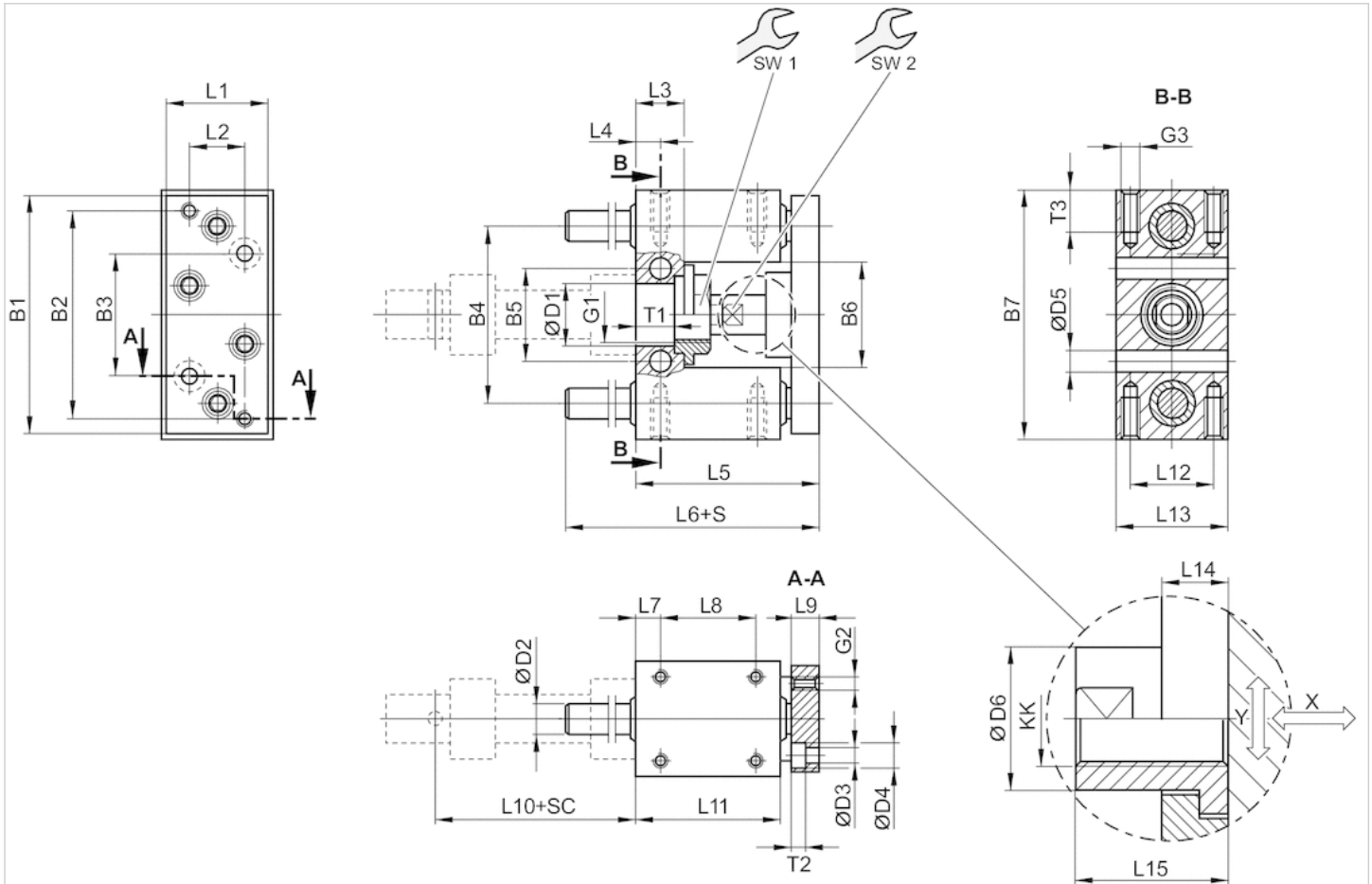
## Technical information

Material	
Bearing housings	Aluminum, colorless anodized
Bearing type	Sintered bronze
Carrying plate	Aluminum, colorless anodized

Material	
Flexible coupling in carrying plate	Stainless steel
Guide rods	Hardened heat-treated steel, ground

## Dimensions

Ø 12



S = stroke  
 SC = cylinder stroke  
 X = max. play (axial)  
 Y = min. play (radial)

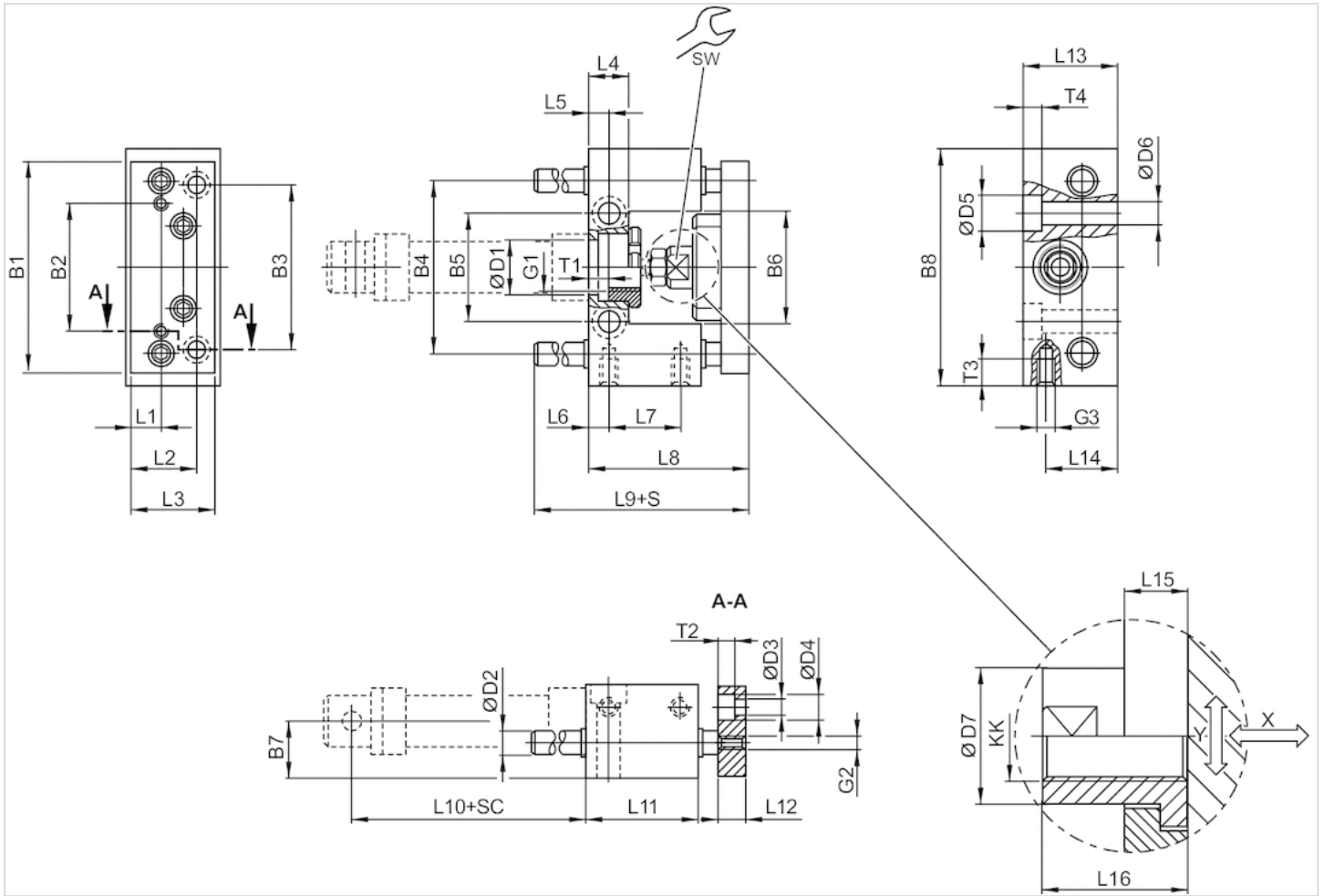
## Dimensions

Piston Ø	B1	B2	B3	B4	B5	B6	B7	D1	D2	D3	D4	D5	D6	G1	G2	G3	KK	L1	L2	L3	L4	L5	L6
12 mm	63	54	32	46	24	27	65	16 H7	8	4.5	8	5.5	10	M16x1,5	M4	M4	M6	27	15	13	6.5	53	73

Piston Ø	L7	L8	L9	L10	L11	L12	L13	L14	L15	SW1	SW2	T1	T2	T3
12 mm	6.5	25	10	52.6	38	22	30	7	18	19	8	10.6	4.6	8

## Dimensions

Ø 20 ... 25 mm



S = stroke  
 SC = cylinder stroke  
 X = max. play (axial)  
 Y = min. play (radial)

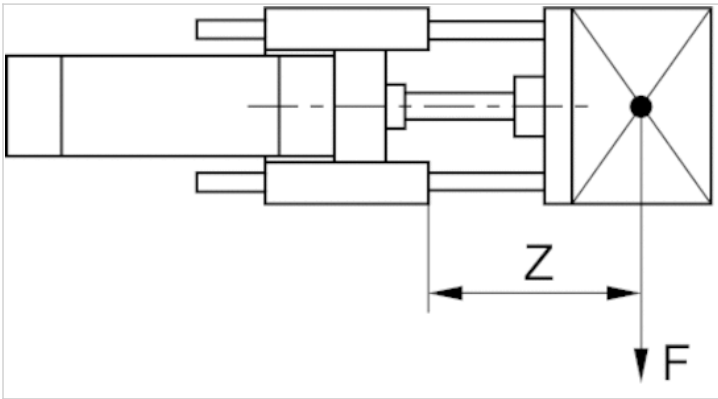
## Dimensions

Piston Ø	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D5	D6	D7	G1	G2	G3	KK	L1
20 mm	90	55	70	74	46.5	48	24	100	22 H7	10	6.6	11	15	9	18	M22x1,5	M6	M8	M8	14
25 mm	90	55	70	74	46.5	48	24	100	22 H7	10	6.6	11	15	9	18	M22x1,5	M6	M8	M10x1,25	14

Piston Ø	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	T1	T2	T3	T4	SW
20 mm	29	38	17	8.5	8	32	65	77	71	48	12	40	30	14	22	8	7	14	9	15
25 mm	29	38	17	8.5	8	32	71	77	76	48	12	40	30	14	22	8	7	14	9	15

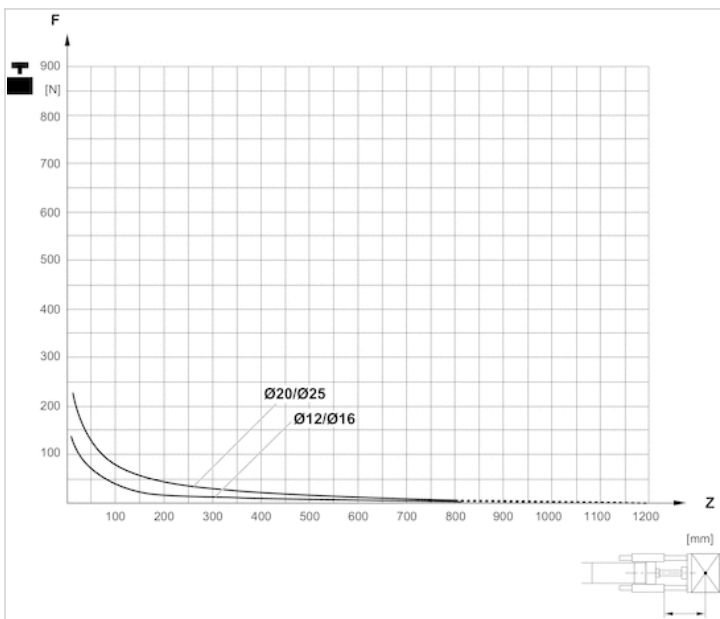
# Diagrams

## Useful load



F = Useful load, Z = Projection

## Useful load



F = Useful load, Z = Projection

# Guide unit GH1, Series CG1

- Ø 12-25 mm
- Plain bearing
- For standard cylinders ISO 6432



Bearing type	Plain bearing
Ambient temperature min./max.	-20 ... 80 °C

## Technical data

Suitable piston Ø	12 mm	20 mm	25 mm
Stroke 50	0821401295	0821401200	0821401210
100	0821401296	0821401201	0821401211
160	-	0821401202	0821401212
200	0821401297	0821401203	0821401213
250	-	0821401204	0821401214
400	-	0821401205	0821401215
600	-	0821401206	0821401216
800	-	0821401207	0821401217

## Technical data

Suitable piston Ø	12 mm	20 mm	25 mm
Weight 0 mm stroke	0.395 kg	0.73 kg	0.73 kg
+10 mm stroke	0.008 kg	0.012 kg	0.012 kg

## Technical information

Guide units for cylinder Ø 12 also fit on cylinder Ø 16

## Technical information

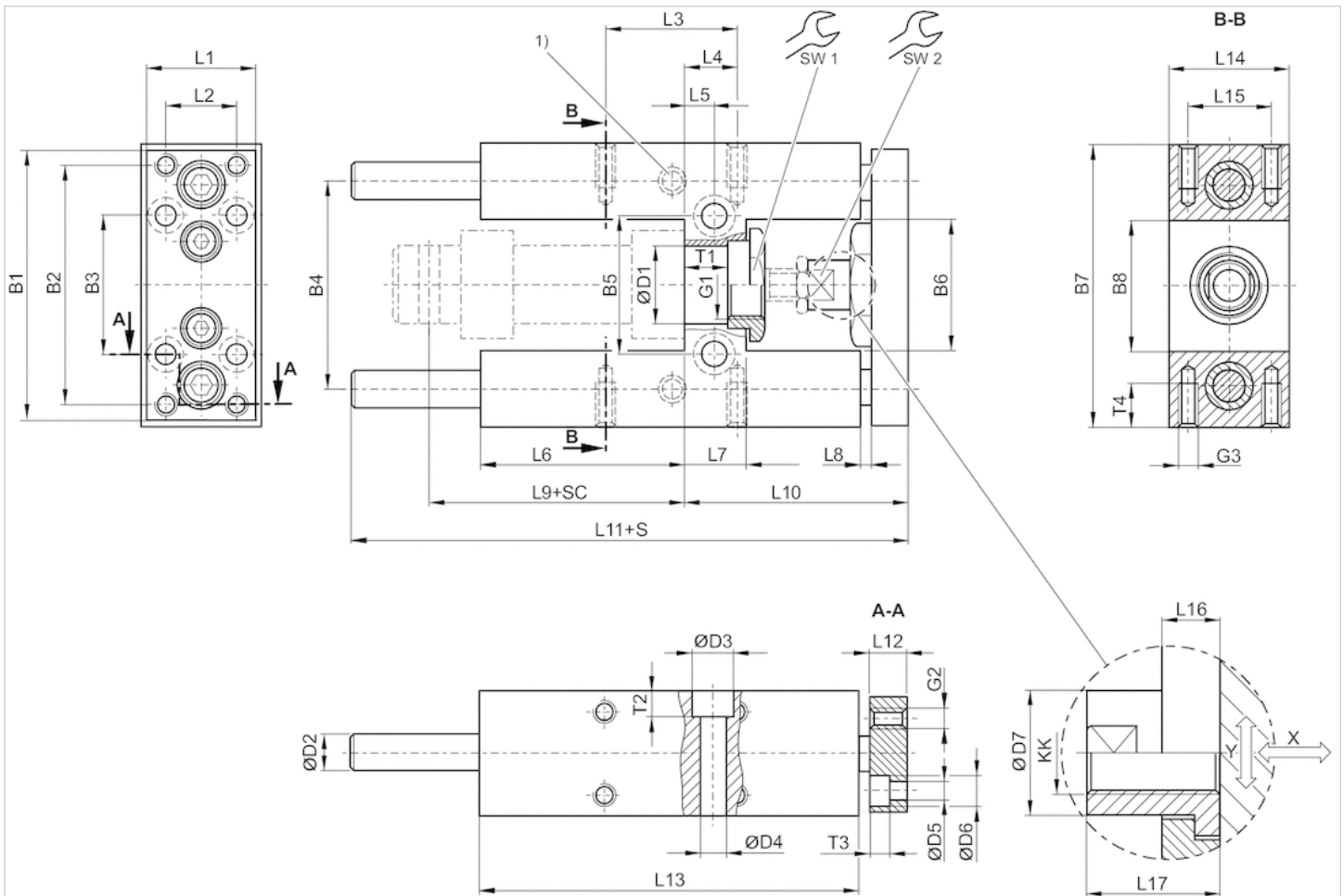
Material	
Bearing housings	Aluminum, colorless anodized
Bearing type	Sintered bronze
Carrying plate	Aluminum, colorless anodized
Flexible coupling in carrying plate	Stainless steel



Material	
Guide rods	Hardened heat-treated steel, ground

## Dimensions

Ø 12 ... 25 mm



- 1) Lube nipple
- S = stroke
- SC = cylinder stroke
- X = max. play (axial)
- Y = min. play (radial)

## Dimensions

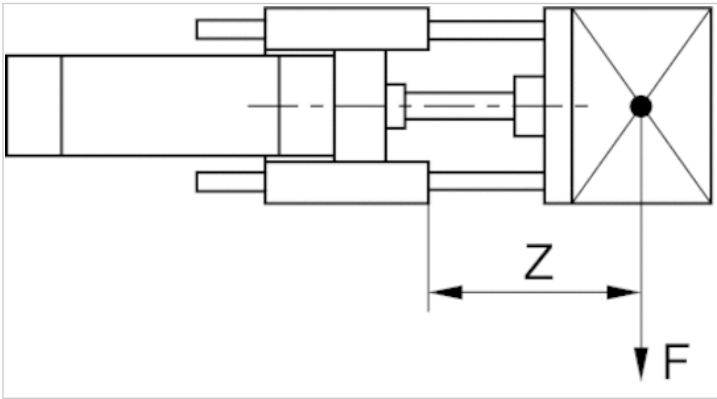
Piston Ø	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D5	D6	D7	G1	G2	G3	KK	L1
12 mm	63	54	32	46	24	27	65	27	16 H7	8	-	5.5	4.5	8	10	M16x1,5	M4	M4	M6	27
20 mm	76	68	40	58	38	37	79	37	22 H7	10	11	6.6	5.5	10.5	14.5	M22x1,5	M5	M6	M8	32
25 mm	76	68	40	58	38	37	79	37	22 H7	10	11	6.6	5.5	10.5	14.5	M22x1,5	M5	M6	M10x1,25	32

Piston Ø	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	SW1	SW2	T1	T2	T3
12 mm	15	32.5	11	6.5	37	13	3	52.6	51	133	10	75	30	22	7	18	19	8	10.6	-	4.6
20 mm	20	32.5	15	8.5	58	17	3	71	65	160.5	12	108	34	23	6	22	27	13	11	7	5.7
25 mm	20	32.5	15	8.5	58	17	3	76	65	160.5	12	108	34	23	6	17	27	13	11	7	5.7

Piston Ø	T4
12 mm	8
20 mm	14
25 mm	14

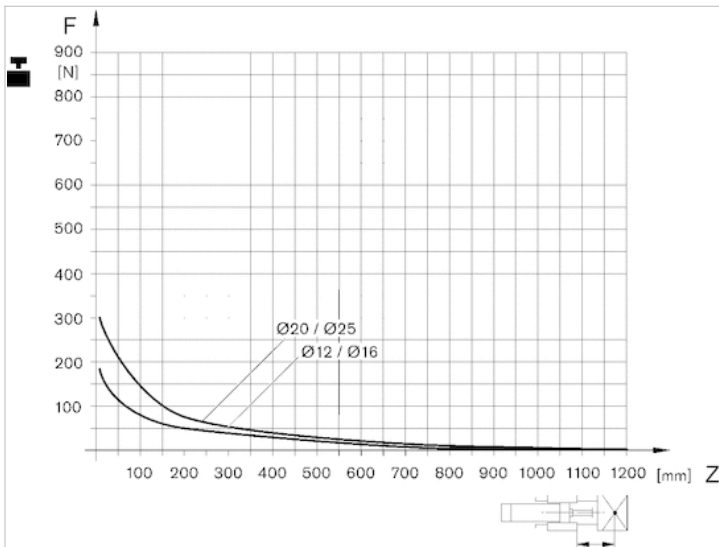
## Diagrams

### Useful load



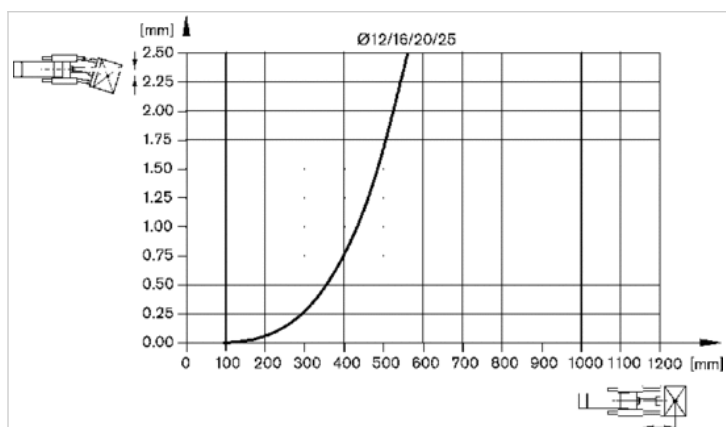
F = Useful load, Z = Projection

### Useful load

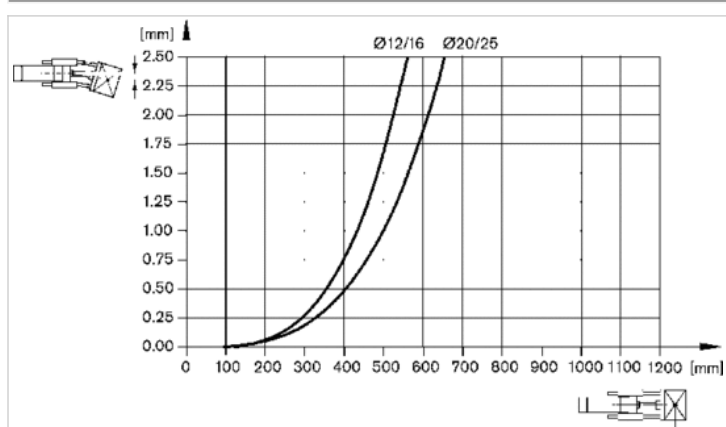


F = Useful load, Z = Projection

## Bending due to own load



## Bending due to 10 N load



# Guide unit GH2, Series CG1

- Ø 12-25 mm
- Linear ball bearing
- For standard cylinders ISO 6432



Bearing type

Linear ball bearing

Ambient temperature min./max.

-20 ... 80 °C

## Technical data

Suitable piston Ø	12 mm	20 mm	25 mm
Stroke 50	0821401395	0821401300	0821401310
100	0821401396	0821401301	0821401311
200	0821401397	-	-
250	-	0821401302	0821401312
400	-	0821401303	0821401313
600	-	0821401304	0821401314
800	-	0821401305	0821401315

## Technical data

Suitable piston Ø	12 mm	20 mm	25 mm
Weight 0 mm stroke	0.395 kg	0.73 kg	0.73 kg
+10 mm stroke	0.008 kg	0.012 kg	0.012 kg

## Technical information

Guide units for cylinder Ø 12 also fit on cylinder Ø 16

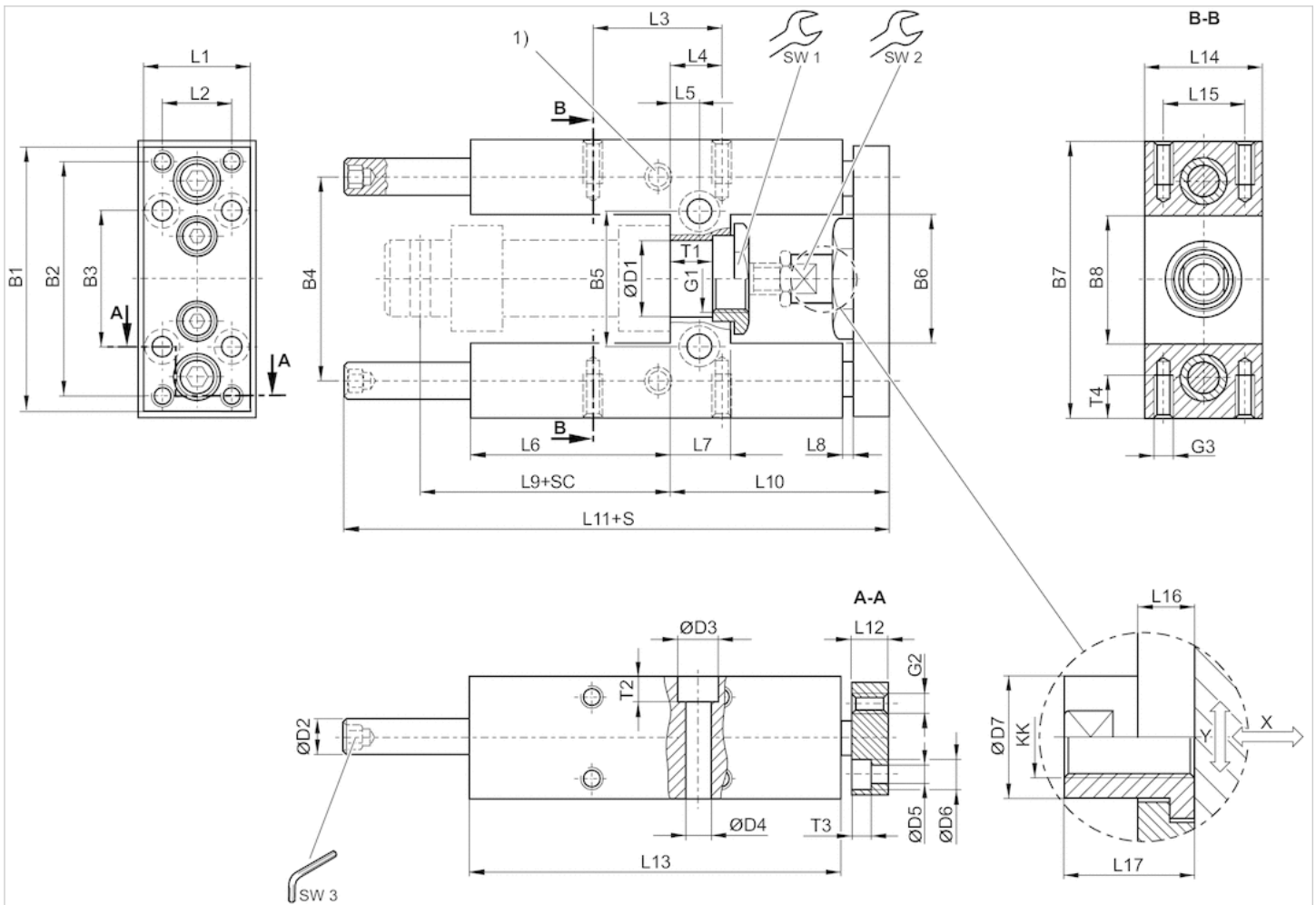
## Technical information

Material	
Bearing housings	Aluminum, colorless anodized
Bearing type	Steel
Carrying plate	Aluminum, colorless anodized
Flexible coupling in carrying plate	Stainless steel

Material	
Guide rods	Hardened heat-treated steel

## Dimensions

Ø 12 ... 25 mm



1) Lube nipple

S = stroke

SC = cylinder stroke

X = max. play (axial)

Y = min. play (radial)

Hexagon in guide rod

## Dimensions

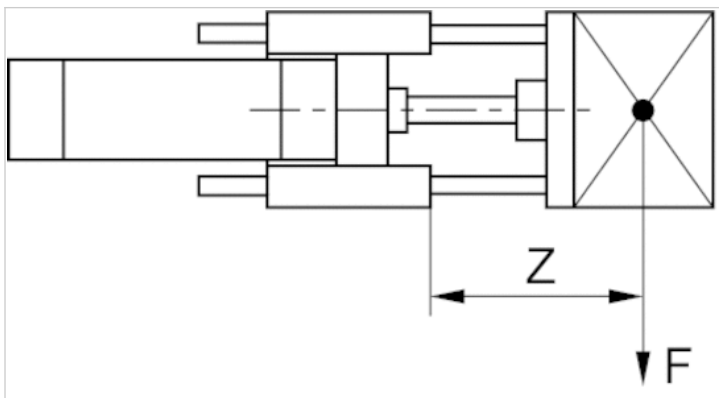
Piston Ø	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D5	D6	D7	G1	G2	G3	KK	L1
12 mm	63	54	32	46	24	27	65	27	16 H7	8	-	5.5	4.5	8	10	M16x1,5	M4	M4	M6	27
20 mm	76	68	40	58	38	37	79	37	22 H7	10	11	6.6	5.5	10.5	14.5	M22x1,5	M5	M6	M8	32
25 mm	76	68	40	58	38	37	79	37	22 H7	10	11	6.6	5.5	10.5	14.5	M22x1,5	M5	M6	M10x1,25	32

Piston Ø	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	SW1	SW2	SW3	T1
12 mm	15	32.5	11	6.5	37	13	3	52.6	51	133	10	75	30	22	7	18	19	8	4	10.6
20 mm	20	32.5	15	8.5	58	17	3	71	65	160.5	12	108	34	23	6	22	27	13	5	11
25 mm	20	32.5	15	8.5	58	17	3	76	65	160.5	12	108	34	23	6	17	27	13	5	11

Piston Ø	T2	T3	T4
12 mm	-	4.6	8
20 mm	7	5.7	14
25 mm	7	5.7	14

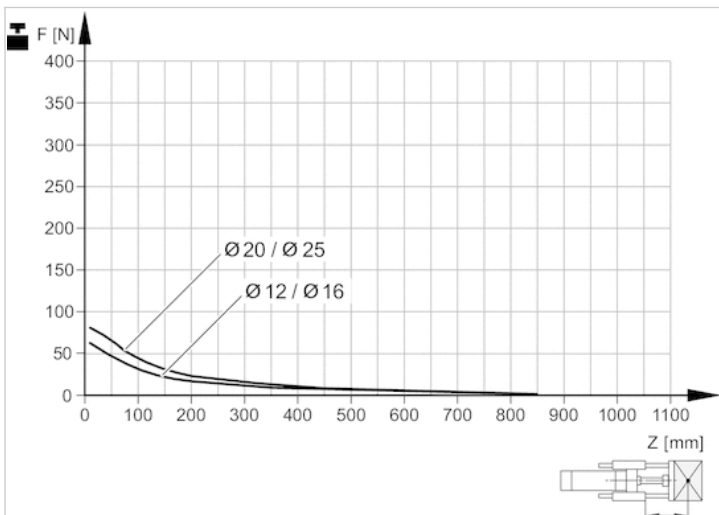
## Diagrams

### Useful load



F = Useful load, Z = Projection

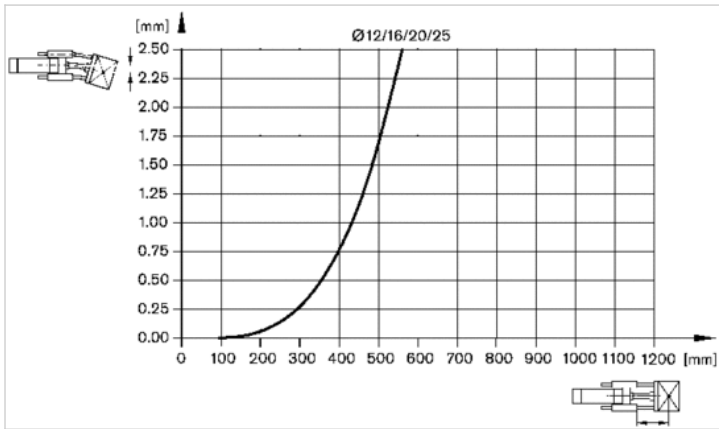
### Useful load



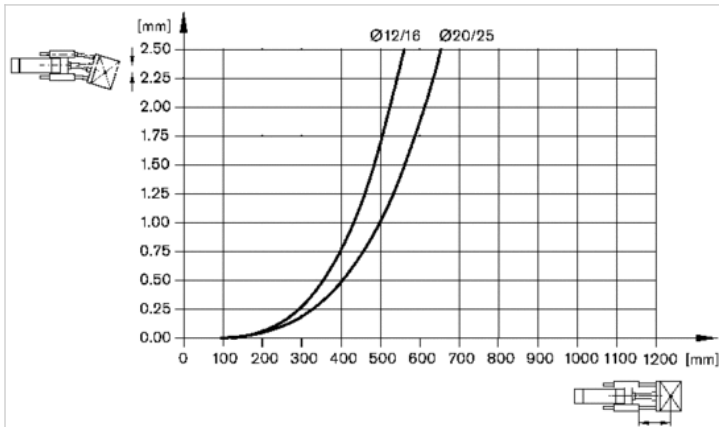
Service life 5x10<sup>6</sup> m

F = Useful load, Z = Projection

### Bending due to own load



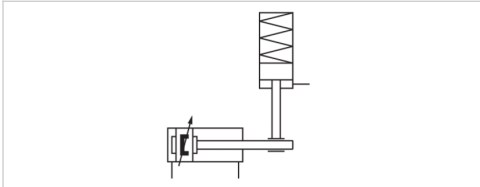
### Bending due to 10 N load



# Holding unit, Series HU1

- Ø 20-25 mm

- hold: spring force, release: compressed air



Function	Hold with clamping jaws
Release pressure	4 ... 8 bar
Ambient temperature min./max.	-10 ... 60 °C
Medium temperature min./max.	-10 ... 60 °C
Medium	Compressed air
Max. particle size	5 µm
Oil content of compressed air	0 ... 5 mg/m <sup>3</sup>
Weight	0.11 kg

## Technical data

Part No.	Piston Ø	suitable piston rod Ø	Piston rod extension	Compressed air connection	Static holding force
0821401163	20 mm	8 mm	54 mm	M5	300 N
0821401164	25 mm	10 mm	51 mm	M5	400 N

Holding force at 0 bar

## Technical information

Warning: The holding unit may not be used for the following applications:

- 1) for dynamic holding
- 2) in or as safety equipment

Holding unit may only be unlocked when turned off.

Make sure that the load direction does not change during a holding interval. A change in the direction of force, as well as external forces such as impacts, strong vibrations, or torsional forces, will briefly release the piston rod and may destroy the HU1 holding unit. When clamped, there must be no residual pressure on the holding unit ( 0 bar ).

Note:

The minimum control pressure is  $\geq$  the working pressure of the cylinder!

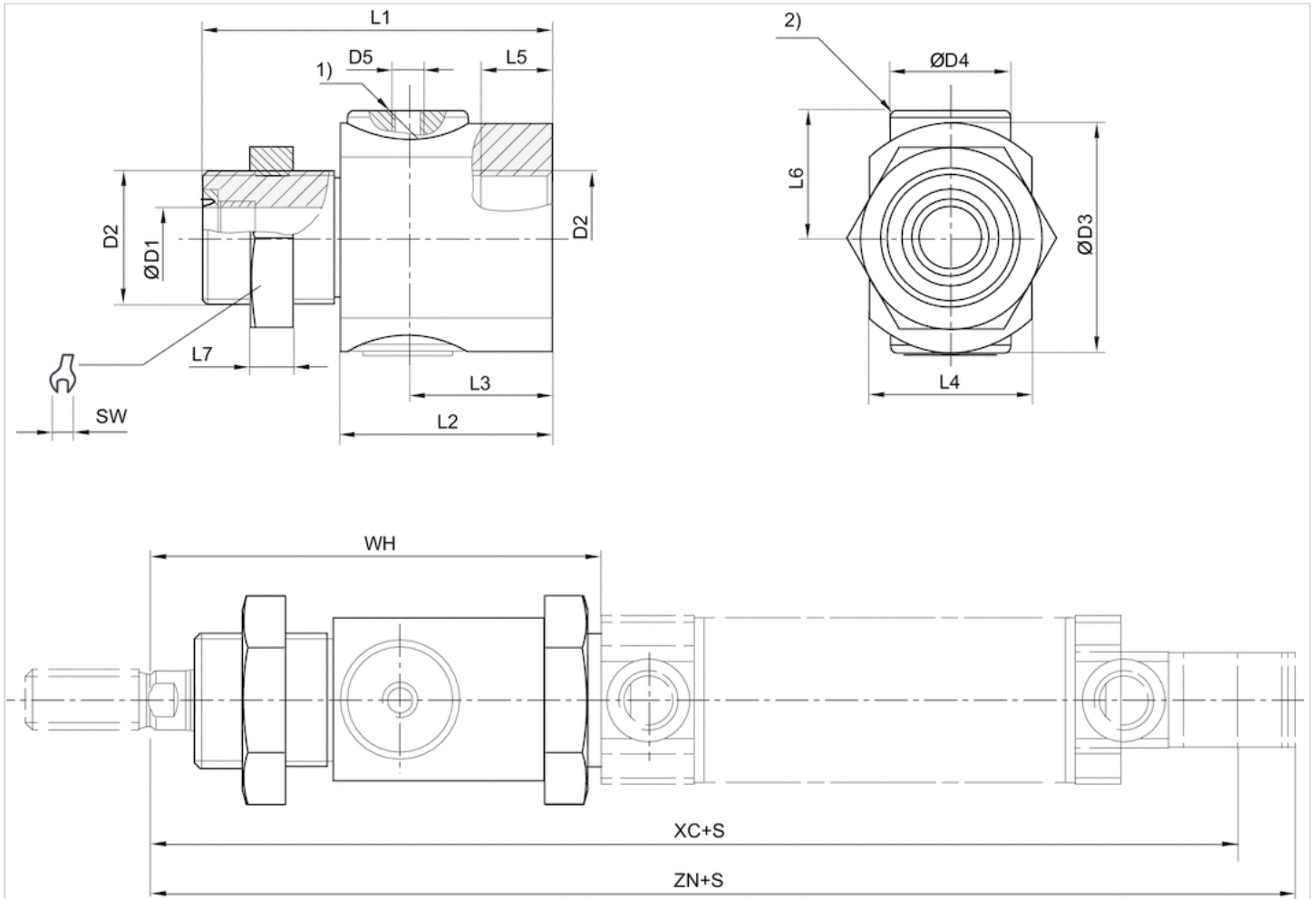
## Technical information

Material	
Housing	Aluminum, black anodized



## Dimensions

### Dimensions



- 1) air connection
- 2) Holding cartridge
- S = stroke

## Dimensions

Piston Ø	ØD1	D2	ØD3	ØD4	D5	L1	L2	L3	L4	L5	L6	L7	SW	WH	XC	ZN
20 mm	8	M22x1,5	38	20	M5	58	35	24	27	12	21	7	30	78	149	163.5
25 mm	10	M22x1,5	38	20	M5	58	35	24	27	12	21	7	30	79	155	170.5


# Sensor, Series ST4

- 4 mm T-slot
- with cable
- open cable ends, 3-pin
- UL certification
- Reed electronic PNP electronic NPN
- Direct mounting for series PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
- Indirect mounting for series MNI, CSL-RD, ICM



Certificates	UL (Underwriters Laboratories) cULus RoHS
Ambient temperature min./max.	-30 ... 80 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Min./max. DC operating voltage	See table below
Switching logic	NO (make contact)
Display	LED
LED status display	Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	3 5 m
Mounting screw	Combination: slotted and hexagon socket

## Technical data

Part No.		for
R412019488		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
R412019489		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
R412019680		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
R412019681		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
R412019684		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
R412019685		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI

Part No.	Type of contact	Cable length L	Min./max. DC operating voltage
R412019488	Reed	3 m	5 ... 30 V DC
R412019489	Reed	5 m	5 ... 30 V DC
R412019680	electronic PNP	3 m	10 ... 30 V DC
R412019681	electronic PNP	5 m	10 ... 30 V DC
R412019684	electronic NPN	3 m	10 ... 30 V DC
R412019685	electronic NPN	5 m	10 ... 30 V DC

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412019488	≤ 0,5 V	0.13 A
R412019489	≤ 0,5 V	0.13 A
R412019680	≤ 2,5 V	0.1 A
R412019681	≤ 2,5 V	0.1 A

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412019684	≤ 2,5 V	0.1 A
R412019685	≤ 2,5 V	0.1 A

Part No.	AC switching current, max.	Switching capacity
R412019488	0.13 A	3 W / 3 VA
R412019489	0.13 A	3 W / 3 VA
R412019680	-	-
R412019681	-	-
R412019684	-	-
R412019685	-	-

Part No.	Version
R412019488	Protected against polarity reversal
R412019489	Protected against polarity reversal
R412019680	short circuit resistant Protected against polarity reversal
R412019681	short circuit resistant Protected against polarity reversal
R412019684	short circuit resistant Protected against polarity reversal
R412019685	short circuit resistant Protected against polarity reversal

## Technical information

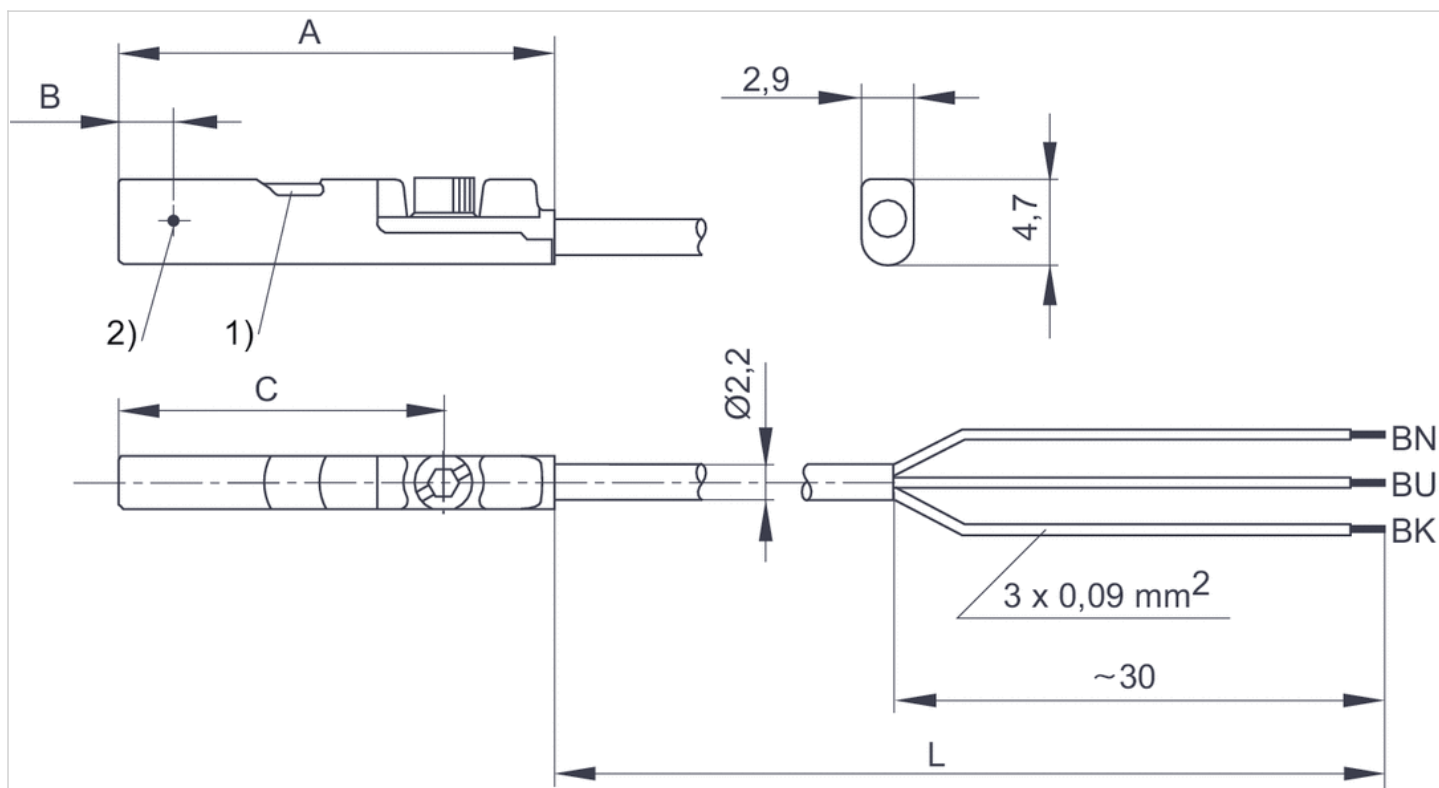
The max. switching capacity must not be exceeded.

## Technical information

Material	
Housing	Polyamide fiber-glass reinforced
Cable sheath	Polyurethane

## Dimensions

### Dimensions



1) LED 2) Switching point

L = cable length

BN = brown, BK = black, BU = blue

## Dimensions

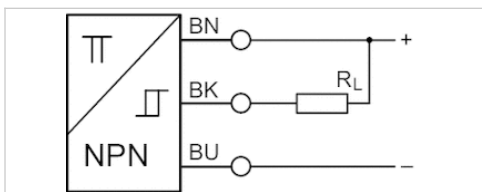
Part No.	A	B	C
R412019488	26.3	6.3	20.3
R412019489	26.3	6.3	20.3
R412019680	23.7	2.8	17.7
R412019681	23.7	2.8	17.7
R412019684	23.7	2.8	17.7
R412019685	23.7	2.8	17.7

# Sensor, Series ST4

- 4 mm T-slot
- with cable
- open cable ends
- With stretched impulse
- With stretched impulse
- electronic PNP
- Direct mounting for series PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
- Indirect mounting for series MNI, CSL-RD, ICM



Certificates	RoHS
Ambient temperature min./max.	-30 ... 80 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Min./max. DC operating voltage	10 ... 30 V DC
Switching logic	NO (make contact)
Pulse stretching	20 ms
Display	LED
LED status display	Yellow
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	5 m
Mounting screw	Combination: slotted and hexagon socket



## Technical data

Part No.	for	Type of contact
R412024124	PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI	electronic PNP

Part No.	Cable length L	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412024124	5 m	≤ 2,5 V	0.1 A

Part No.	Switch signal
R412024124	With stretched impulse

## Technical information

The max. switching capacity must not be exceeded.

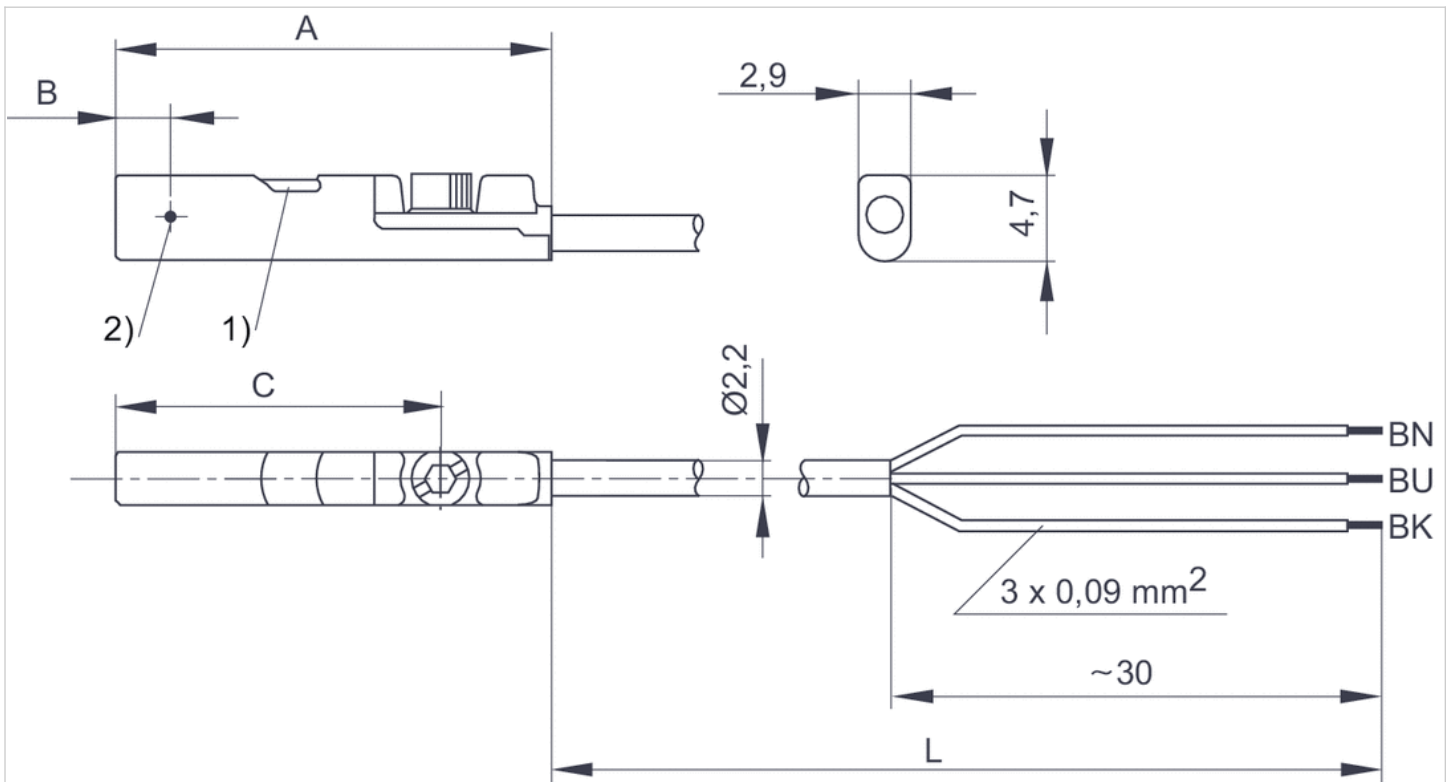
## Technical information

### Material

Housing	Polyamide fiber-glass reinforced
Cable sheath	Polyurethane

## Dimensions

### Dimensions



1) LED 2) Switching point

L = cable length

BN = brown, BK = black, BU = blue

## Dimensions

Part No.	A	B	C
R412024124	23.7	2.8	17.7

# Sensor, Series ST4

- 4 mm T-slot
- with cable
- Plug, M8, 3-pin
- UL certification
- Reed electronic PNP electronic NPN
- Direct mounting for series PRA, SSI, GSU, RTC, CKP, GSP, MSC, MSN, RCM, CVI
- Indirect mounting for series MNI, CSL-RD, ICM



Certificates	UL (Underwriters Laboratories) cULus RoHS
Ambient temperature min./max.	-30 ... 80 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Min./max. DC operating voltage	See table below
Switching logic	NO (make contact)
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
Mounting screw	Combination: slotted and hexagon socket

## Technical data

Part No.		for
R412019682		PRA, SSI, GSU, RTC, CKP, GSP, MSC, MSN, RCM, CVI
R412019683		PRA, SSI, GSU, RTC, CKP, GSP, MSC, MSN, RCM, CVI
R412019694		PRA, SSI, GSU, RTC, CKP, GSP, MSC, MSN, RCM, CVI

Part No.	Type of contact	Cable length L	Min./max. DC operating voltage
R412019682	Reed	0.3 m	5 ... 30 V DC
R412019683	electronic PNP	0.3 m	10 ... 30 V DC
R412019694	electronic NPN	0.3 m	10 ... 30 V DC

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412019682	≤ 0,5 V	0.13 A
R412019683	≤ 2,5 V	0.1 A
R412019694	≤ 2,5 V	0.1 A

Part No.	AC switching current, max.	Switching capacity
R412019682	0.13 A	3 W / 3 VA
R412019683	-	-
R412019694	-	-

Part No.	Version
R412019682	Protected against polarity reversal
R412019683	short circuit resistant Protected against polarity reversal
R412019694	short circuit resistant Protected against polarity reversal

## Technical information

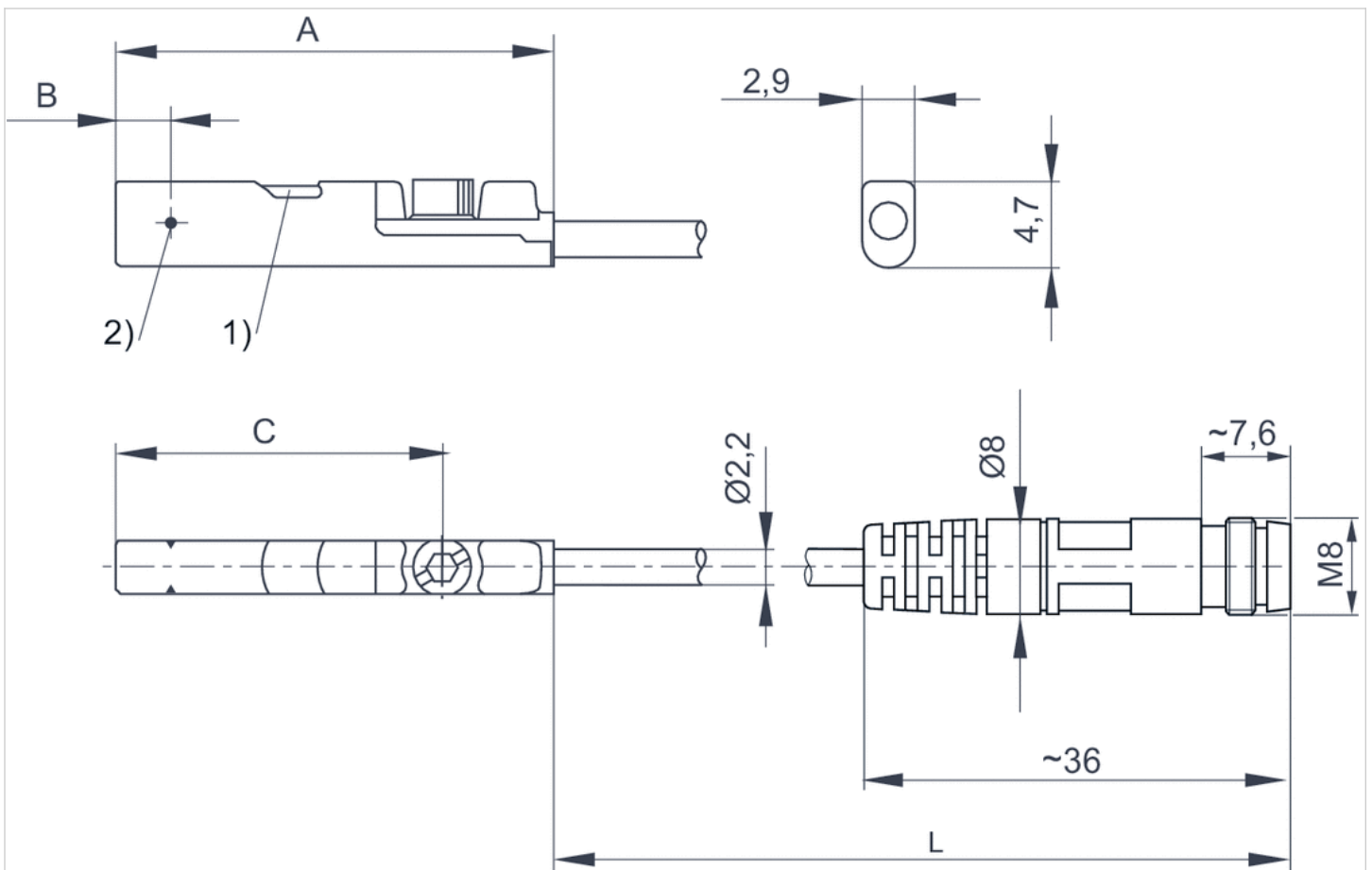
The max. switching capacity must not be exceeded.

## Technical information

Material	
Housing	Polyamide fiber-glass reinforced
Cable sheath	Polyurethane

## Dimensions

### Dimensions



1) LED 2) Switching point  
L = cable length

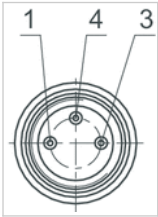


## Dimensions

Part No.	A	B	C
R412019682	26.3	6.3	20.3
R412019683	23.7	2.8	17.7
R412019694	23.7	2.8	17.7

## Pin assignments

### Pin assignments



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

# Sensor, Series ST4

- 4 mm T-slot
- with cable
- Plug, M8, 3-pin, with knurled screw
- UL certification
- Reed electronic PNP
- Direct mounting for series PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
- Indirect mounting for series MNI, CSL-RD, ICM



Certificates	UL (Underwriters Laboratories) cULus RoHS
Ambient temperature min./max.	-30 ... 80 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Min./max. DC operating voltage	See table below
Switching logic	NO (make contact)
Display	LED
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
Mounting screw	Combination: slotted and hexagon socket

## Technical data

Part No.		for
R412019490		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
R412019686		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
R412019493		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
R412019687		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI

Part No.	Type of contact	Cable length L	Min./max. DC operating voltage
R412019490	Reed	0.3 m	5 ... 30 V DC
R412019686	Reed	0.5 m	5 ... 30 V DC
R412019493	electronic PNP	0.3 m	10 ... 30 V DC
R412019687	electronic PNP	0.5 m	10 ... 30 V DC

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412019490	≤ 0,5 V	0.13 A
R412019686	≤ 0,5 V	0.13 A
R412019493	≤ 2,5 V	0.1 A
R412019687	≤ 2,5 V	0.1 A

Part No.	AC switching current, max.	Switching capacity
R412019490	0.13 A	3 W / 3 VA

Part No.	AC switching current, max.	Switching capacity
R412019686	0.13 A	3 W / 3 VA
R412019493	-	-
R412019687	-	-

Part No.	Version
R412019490	Protected against polarity reversal
R412019686	Protected against polarity reversal
R412019493	short circuit resistant Protected against polarity reversal
R412019687	short circuit resistant Protected against polarity reversal

## Technical information

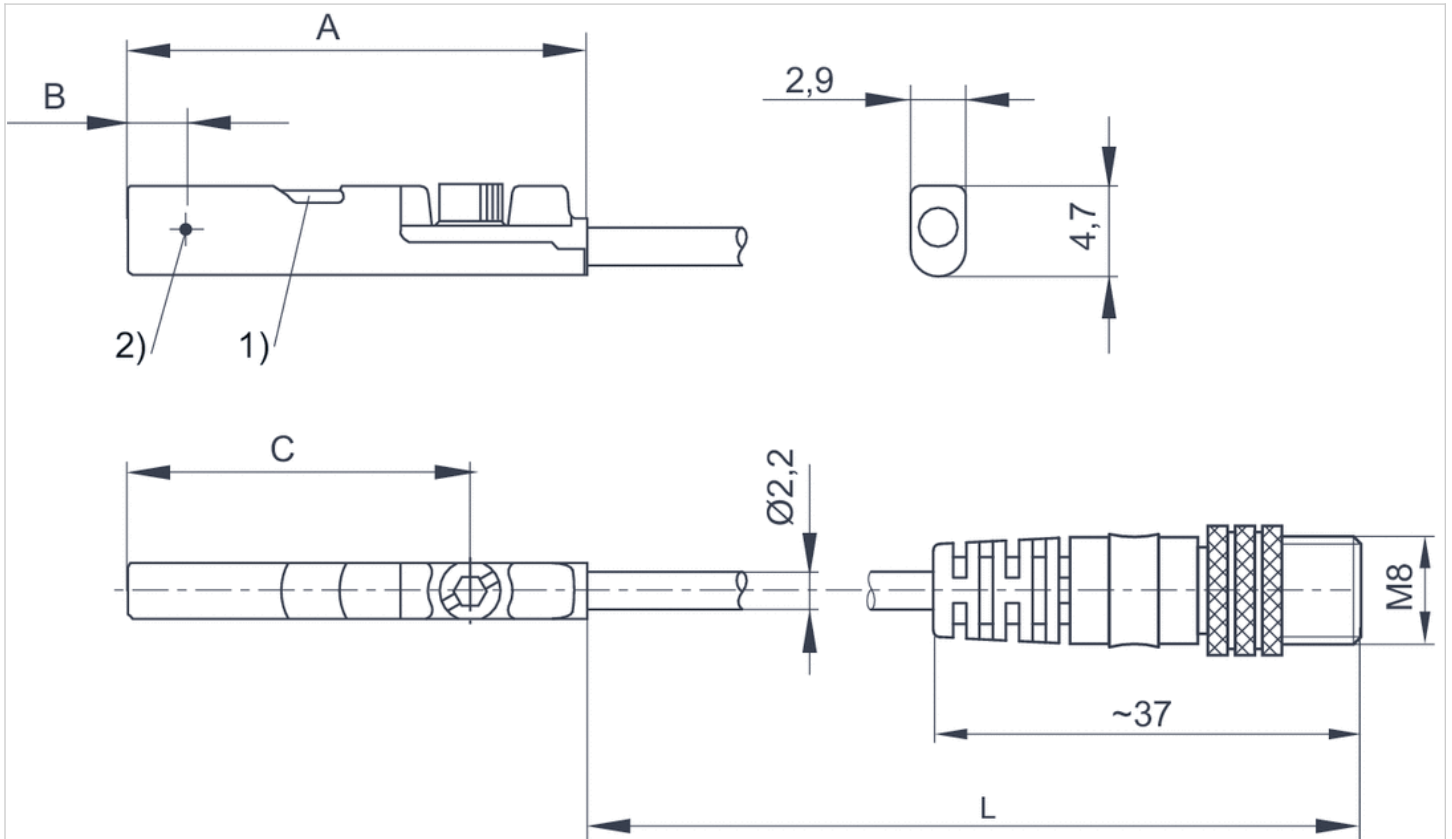
The max. switching capacity must not be exceeded.

## Technical information

Material	
Housing	Polyamide fiber-glass reinforced
Cable sheath	Polyurethane

## Dimensions

### Dimensions



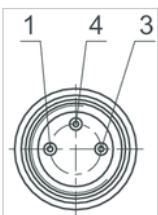
1) LED 2) Switching point  
L = cable length

## Dimensions

Part No.	A	B	C
R412019490	26.3	6.3	20.3
R412019686	26.3	6.3	20.3
R412019493	23.7	2.8	17.7
R412019687	23.7	2.8	17.7

## Pin assignments

### Pin assignments



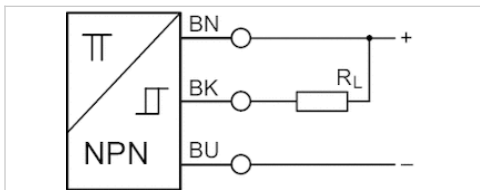
Pin	1	3	4
Allocation	(+)	(-)	(OUT)

# Sensor, Series ST4

- 4 mm T-slot
- with cable
- Plug, M8, 3-pin Plug, M8, 3-pin, with knurled screw
- With stretched impulse
- With stretched impulse
- electronic NPN electronic PNP
- Direct mounting for series PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
- Indirect mounting for series MNI, CSL-RD, ICM



Certificates	RoHS
Ambient temperature min./max.	-30 ... 80 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Min./max. DC operating voltage	10 ... 30 V DC
Switching logic	NO (make contact)
Pulse stretching	20 ms
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
Mounting screw	Combination: slotted and hexagon socket



## Technical data

Part No.	for	Type of contact
R412024123	PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI	electronic NPN
R412024125	PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI	electronic PNP

Part No.	Cable length L	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412024123	0.3 m	≤ 2,5 V	0.1 A
R412024125	0.3 m	≤ 2,5 V	0.1 A

Part No.	Switch signal	
R412024123	With stretched impulse	1)
R412024125	With stretched impulse	2)

1) Plug M8, 3-pin

2) Plug M8, 3-pin, with knurled screw

## Technical information

The max. switching capacity must not be exceeded.

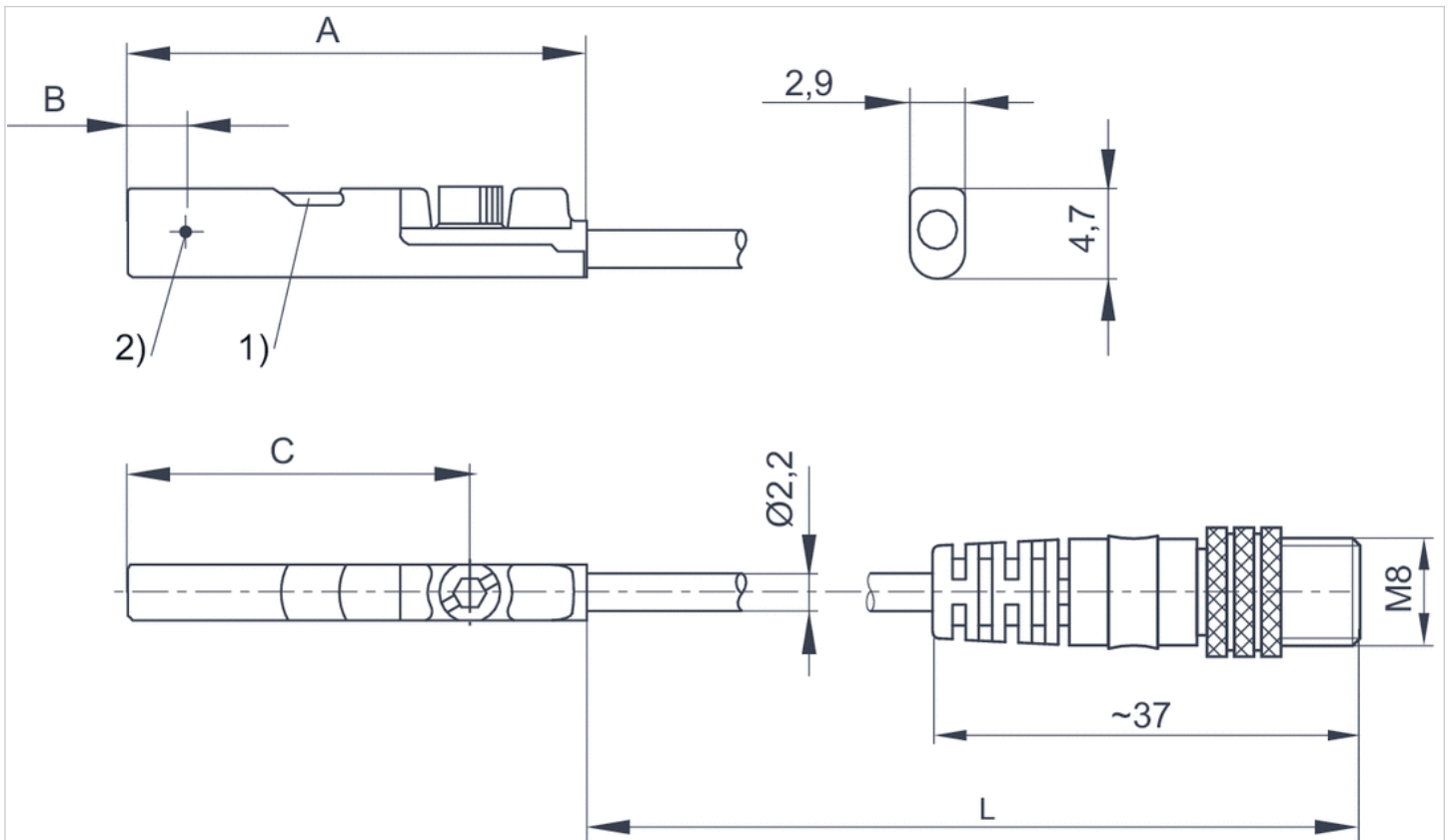
## Technical information

### Material

Housing	Polyamide fiber-glass reinforced
Cable sheath	Polyurethane

## Dimensions

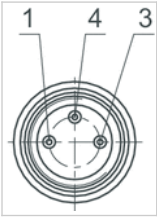
### Dimensions



1) LED 2) Switching point  
L = cable length

## Pin assignments

### Pin assignments



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





# Sensor, Series ST4

- 4 mm T-slot
- with cable
- Plug, M12, 3-pin, with knurled screw
- UL certification
- Reed electronic PNP
- Direct mounting for series PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
- Indirect mounting for series MNI, CSL-RD, ICM



Certificates	UL (Underwriters Laboratories) cULus RoHS
Ambient temperature min./max.	-30 ... 80 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Min./max. DC operating voltage	See table below
Switching logic	NO (make contact)
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
Mounting screw	Combination: slotted and hexagon socket

## Technical data

Part No.		for
R412019688		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI
R412019689		PRA, SSI, GSU, RTC, CKP, GPC, MSC, MSN, RCM, CVI

Part No.	Type of contact	Cable length L	Min./max. DC operating voltage
R412019688	Reed	0.3 m	5 ... 30 V DC
R412019689	electronic PNP	0.3 m	10 ... 30 V DC

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412019688	≤ 0,5 V	0.13 A
R412019689	≤ 2,5 V	0.1 A

Part No.	AC switching current, max.	Switching capacity
R412019688	0.13 A	3 W / 3 VA
R412019689	-	-

Part No.	Version
R412019688	Protected against polarity reversal

Part No.	Version
R412019689	short circuit resistant Protected against polarity reversal

## Technical information

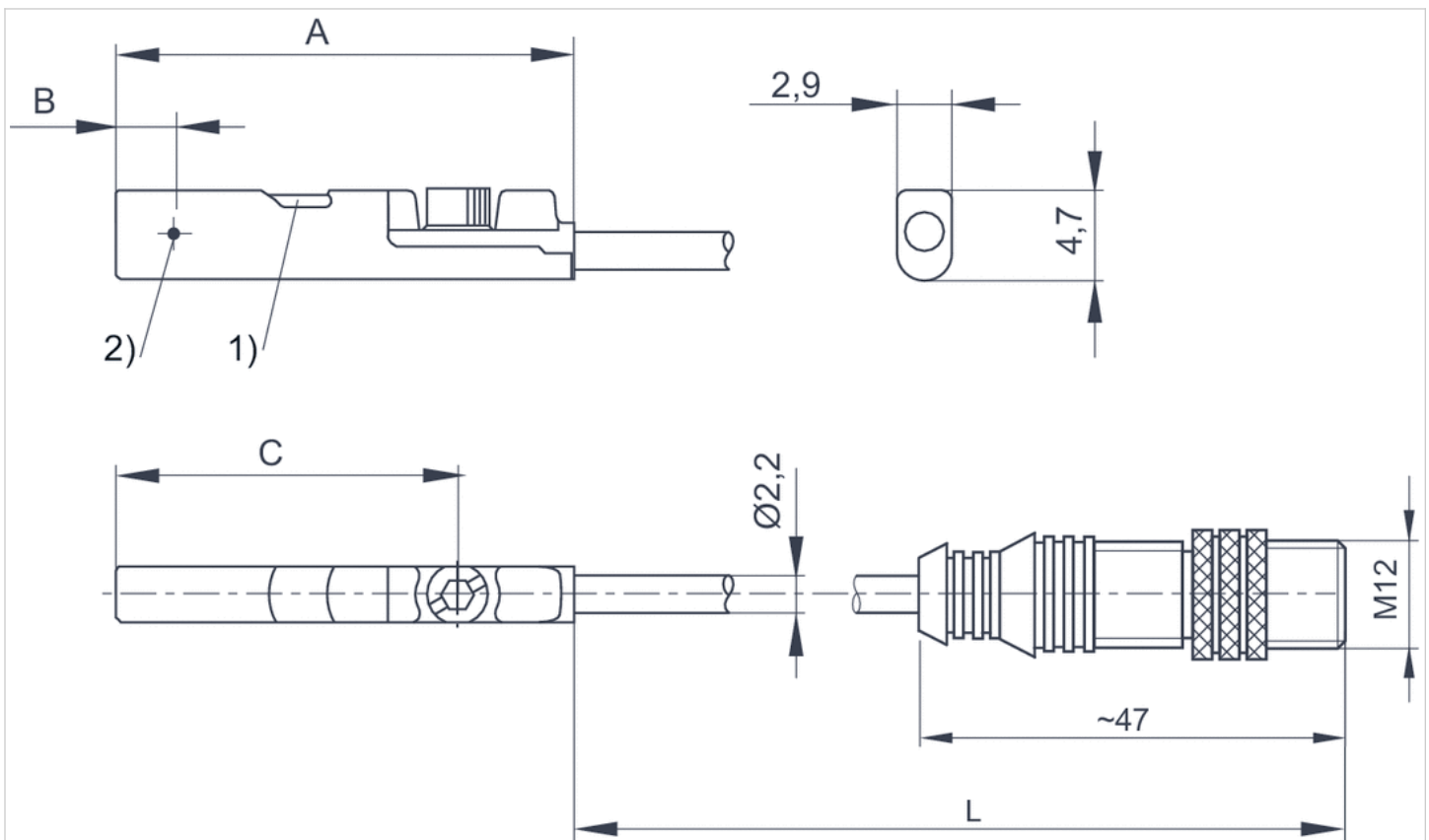
The max. switching capacity must not be exceeded.

## Technical information

Material	
Housing	Polyamide fiber-glass reinforced
Cable sheath	Polyurethane

## Dimensions

### Dimensions

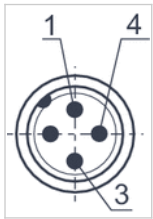


1) LED 2) Switching point  
L = cable length

## Dimensions

Part No.	A	B	C
R412019688	26.3	6.3	20.3
R412019689	23.7	2.8	17.7

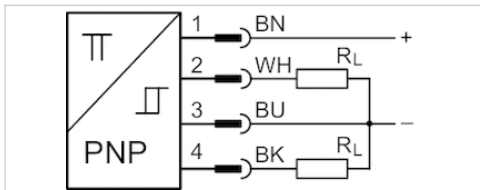
## Pin assignments



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

# Sensors, Series ST4-2P

- 4 mm T-slot
- number of switching points 2
- with cable
- without wire end ferrule, tin-plated, 4-pin
- electronic PNP
- 2 switching points
- electronic PNP
- Direct mounting for series PRA, SSI, RTC, GPC, MSC, MSN, RCM, CVI
- Indirect mounting for series MNI, CSL-RD, ICM



Certificates	RoHS
Ambient temperature min./max.	-20 ... 75 °C
Protection class	IP65, IP67
number of switching points	2
Power consumption	15 mA
Min./max. DC operating voltage	12 ... 30 V DC
Repetitive precision max. measuring range	0,1 mT
Hysteresis	1 mT
Switching logic	NO (make contact)
Display	LED
LED status display	Yellow
Display	2 LED
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	2 m
Mounting screw	with hexagon socket

## Technical data

Part No.	for	Type of contact	Cable length L
R412010139	PRA, SSI, RTC, GPC, MSC, MSN, RCM, CVI	electronic PNP	2 m

Part No.	Detection range max.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
R412010139	50 mm	≤ 2,2 V	0.15 A

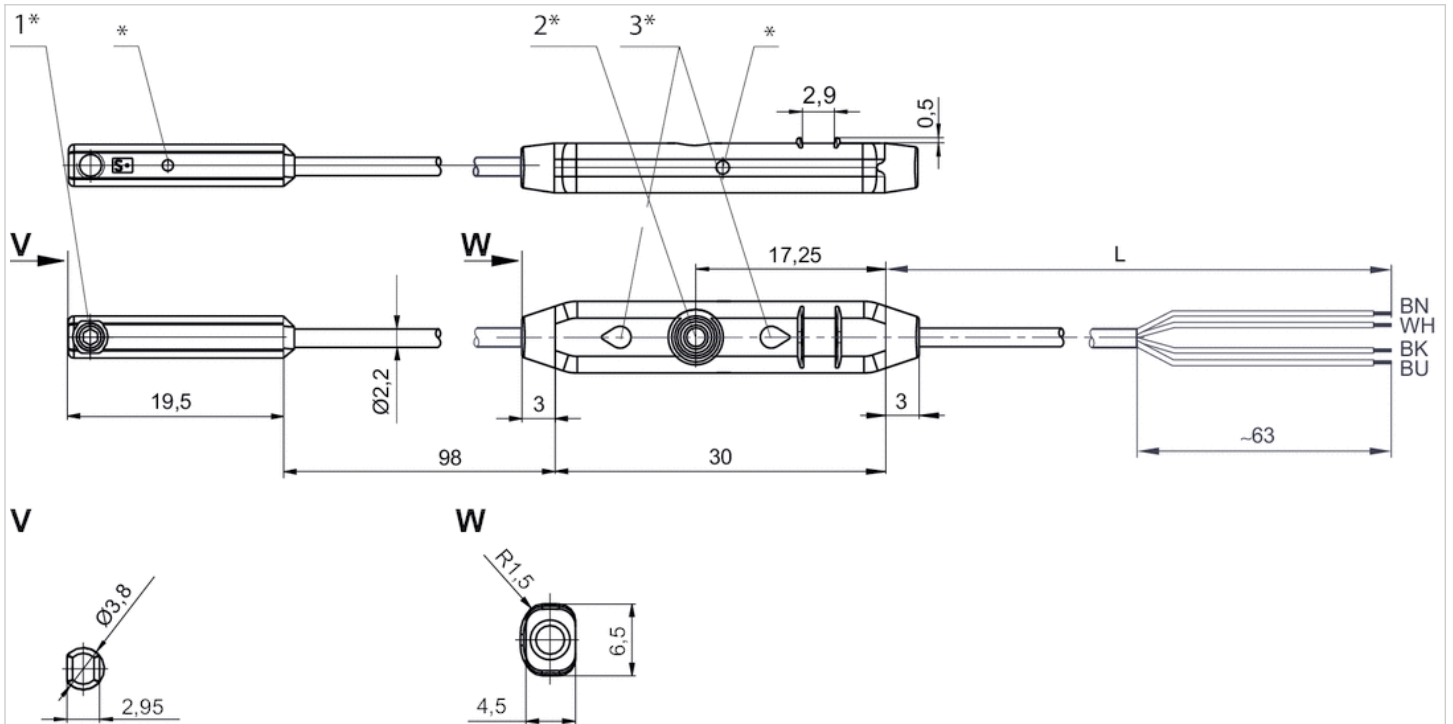
Part No.	Function	Version
R412010139	electronic PNP	short circuit resistant Protected against polarity reversal

## Technical information

Material	
Housing	Polyamide
Cable sheath	Polyurethane

# Dimensions

## Dimensions



1\* = mounting screw 2\* = teach button 3\* = LED

L = cable length

(1) BN=brown

(2) WH=white

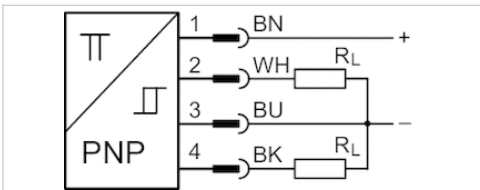
(3) BU=blue

(4) BK=black

\* Switching point

# Sensors, Series ST4-2P

- 4 mm T-slot
- number of switching points 2
- with cable
- Plug, M8x1, 4-pin, with knurled screw
- electronic PNP
- 2 switching points
- electronic PNP
- Direct mounting for series PRA, SSI, RTC, GPC, MSC, MSN, RCM, CVI
- Indirect mounting for series MNI, CSL-RD, ICM



Certificates	RoHS
Ambient temperature min./max.	-20 ... 75 °C
Protection class	IP65, IP67
number of switching points	2
Power consumption	15 mA
Min./max. DC operating voltage	12 ... 30 V DC
Repetitive precision max. measuring range	0,1 mT
Hysteresis	1 mT
Switching logic	NO (make contact)
Display	LED
LED status display	Yellow
Display	2 LED
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	0.3 m
Mounting screw	with hexagon socket

## Technical data

Part No.	for	Type of contact	Cable length L
R412010140	PRA, SSI, RTC, GPC, MSC, MSN, RCM, CVI	electronic PNP	0.3 m

Part No.	Detection range max.	Voltage drop U at I <sub>max</sub>	Function
R412010140	50 mm	≤ 2,2 V	electronic PNP

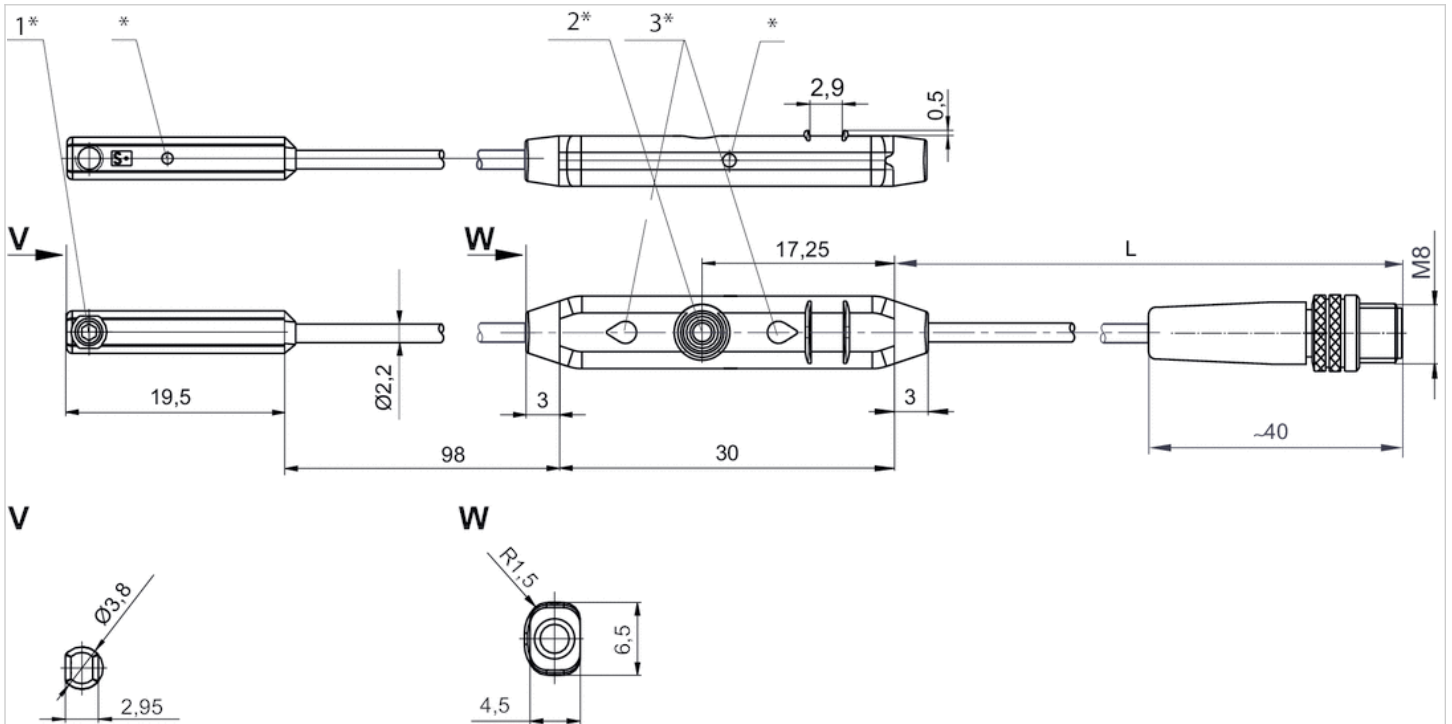
Part No.	Version
R412010140	short circuit resistant Protected against polarity reversal

## Technical information

Material	
Housing	Polyamide
Cable sheath	Polyurethane

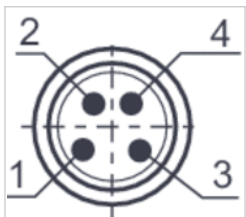
## Dimensions

### Dimensions



1\* = mounting screw 2\* = teach button 3\* = LED  
 L = cable length  
 \* Switching point

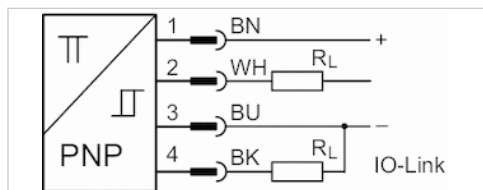
## Pin assignments



Pin	1	2	3	4
Allocation	(+)	(OUT)	(-)	(OUT)

# Sensors, Series ST4-2P

- 4 mm T-slot
- number of switching points 2
- with cable
- Plug, M12x1, 4-pin, with knurled screw
- IO-Link, 2 switching points
- electronic PNP
- Direct mounting for series PRA, SSI, RTC, GPC, MSC, MSN, RCM, CVI
- Indirect mounting for series MNI, CSL-RD, ICM



Certificates	RoHS
Ambient temperature min./max.	-20 ... 75 °C
Protection class	IP67
number of switching points	2
Power consumption	15 mA
Min./max. DC operating voltage	12 ... 30 V DC
Repetitive precision max. measuring range	0,1 mT
Hysteresis	1 mT
Switching logic	NO (make contact)
LED status display	Yellow
Display	2 LED
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	0.3 m
Mounting screw	with hexagon socket

## Technical data

Part No.	for	Type of contact	Cable length L
R412023459	PRA, SSI, RTC, GPC, MSC, MSN, RCM, CVI	electronic PNP	0.3 m

Part No.	Detection range max.	Voltage drop U at I <sub>max</sub>
R412023459	50 mm	≤ 2,2 V

Part No.	Version
R412023459	Wire break protection Short circuit resistance Reverse polarity protection Switch-on pulse suppression

## Technical information

The IO-Link device description (IODD) for the ST4-2P proximity sensor is available for download in the Media Centre.



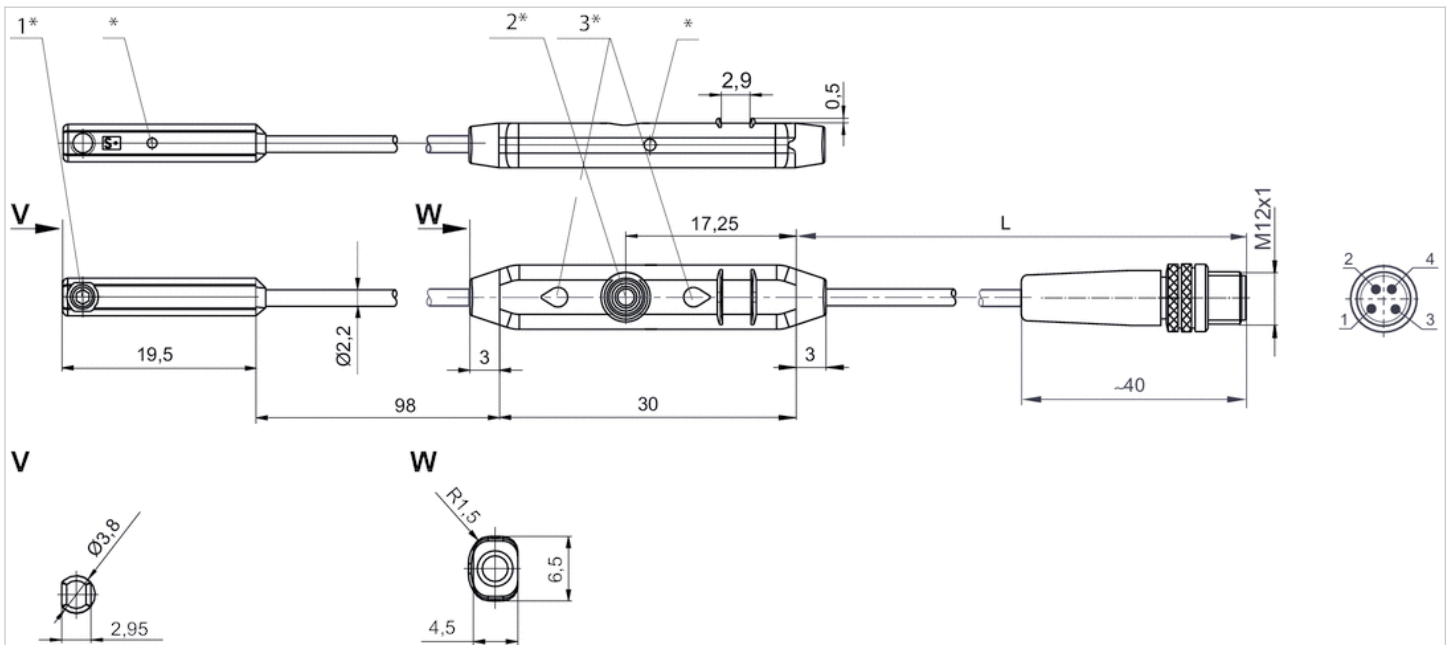
## Technical information

### Material

Housing	Polyamide
Cable sheath	Polyurethane

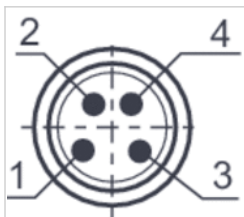
## Dimensions

### Dimensions



1\* = mounting screw 2\* = teach button 3\* = LED  
 L = cable length  
 PIN assignment: 1 = (+), 2 = (OUT), 3 = (-), 4 = (OUT) IO-Link  
 \* Switching point

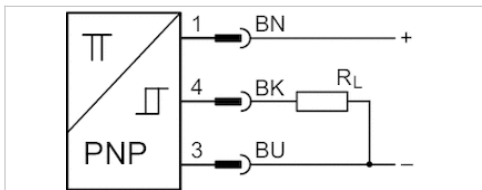
## Pin assignments



Pin	1	2	3	4
Allocation	(+)	(OUT)	(-)	IO-Link (OUT)

# 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

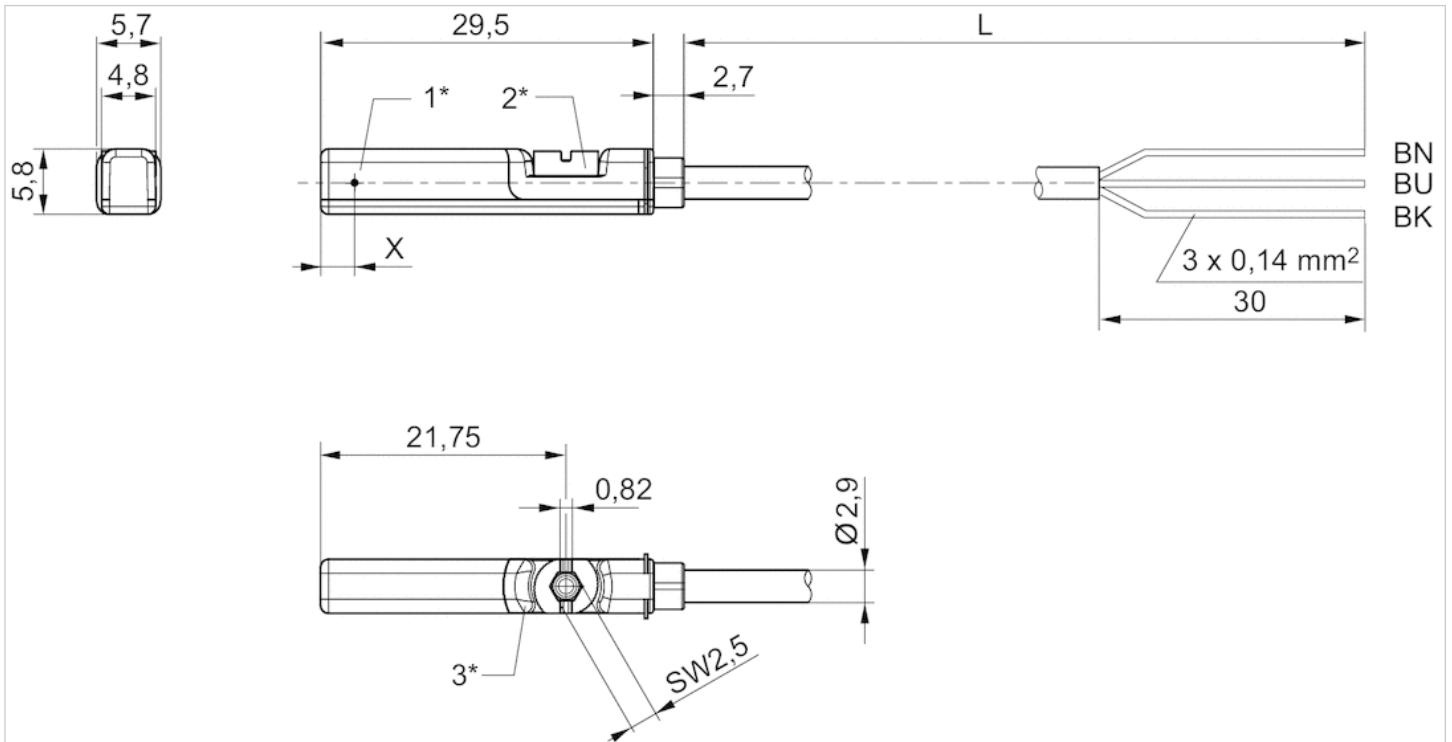
Part No.	Version
R412022856	short circuit resistant Protected against polarity reversal

## 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.

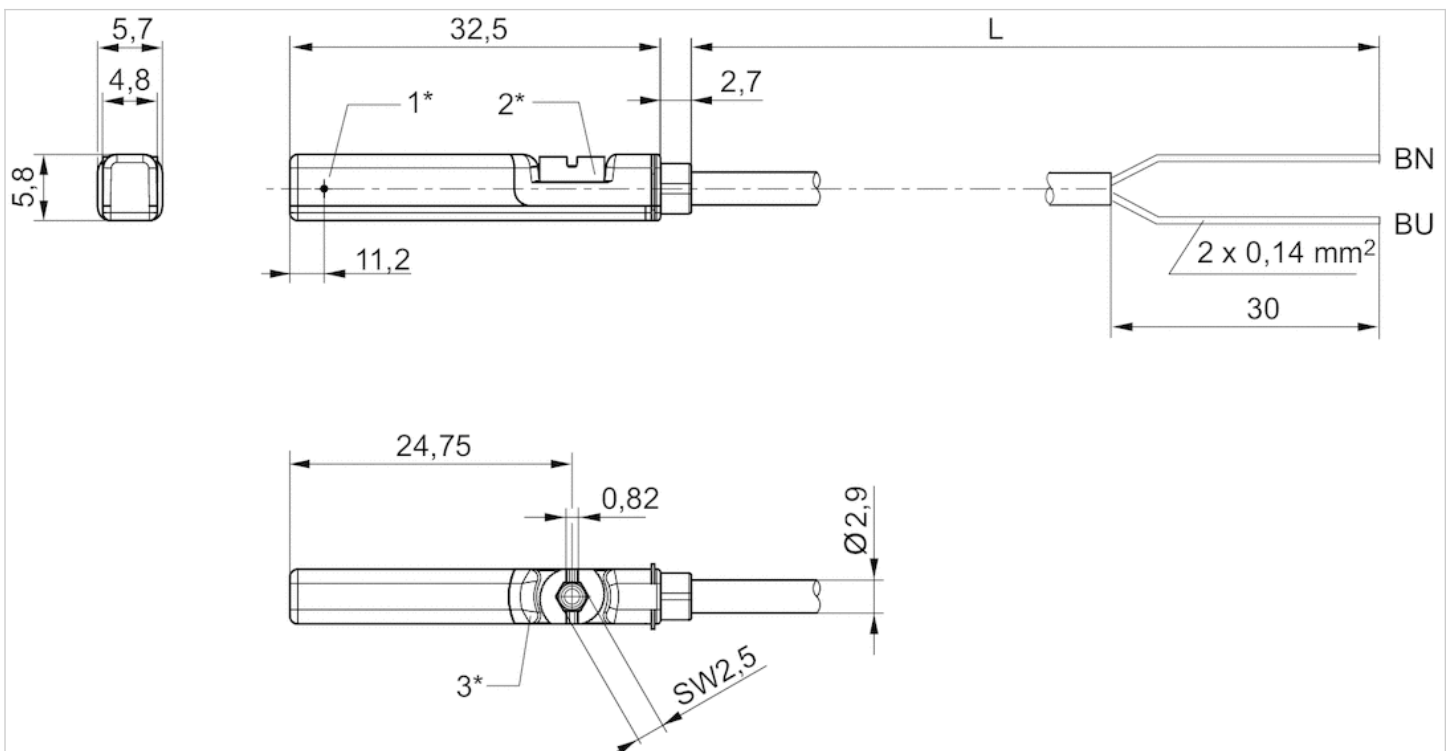
## Technical information

### Material

Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel

## Dimensions

Fig. 1

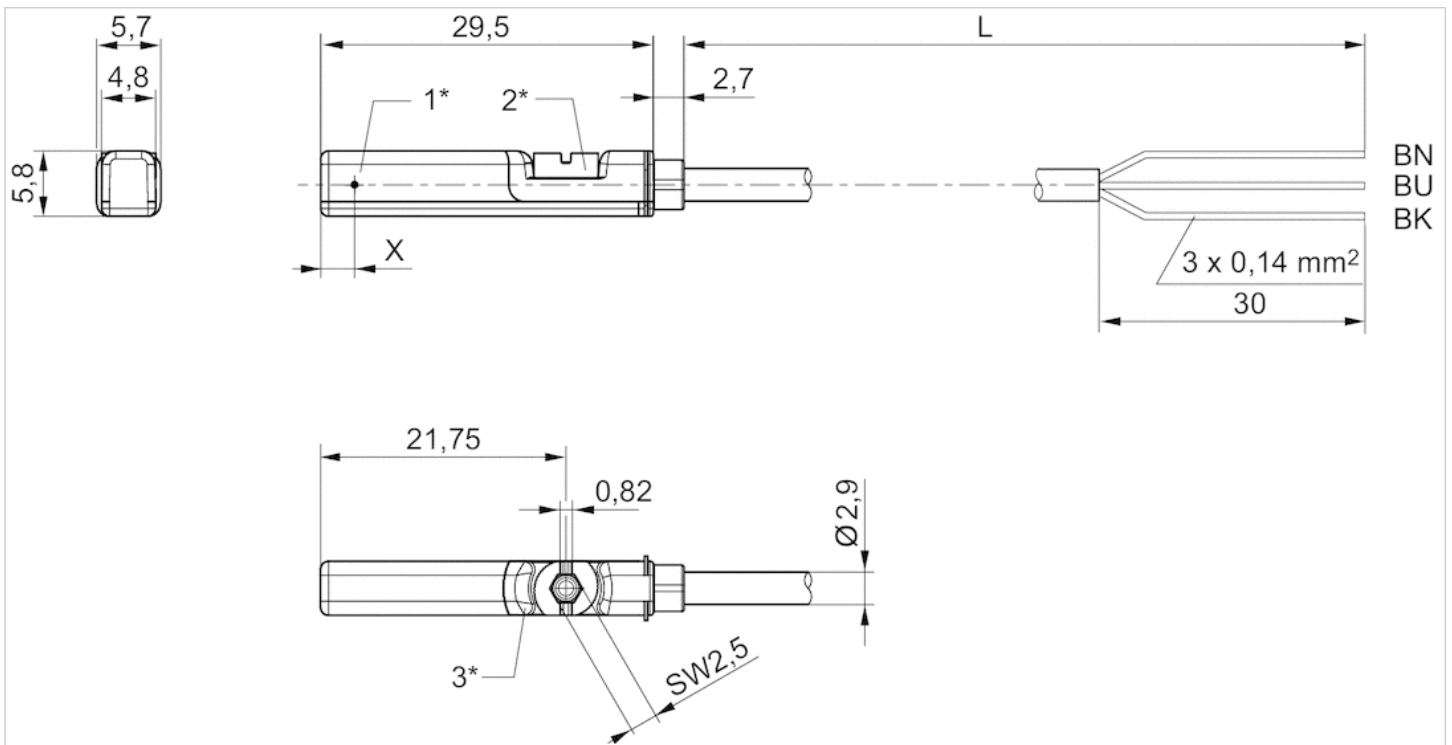


1\* = switching point 2\* = locking screw 3\* = LED window, transparent

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	-

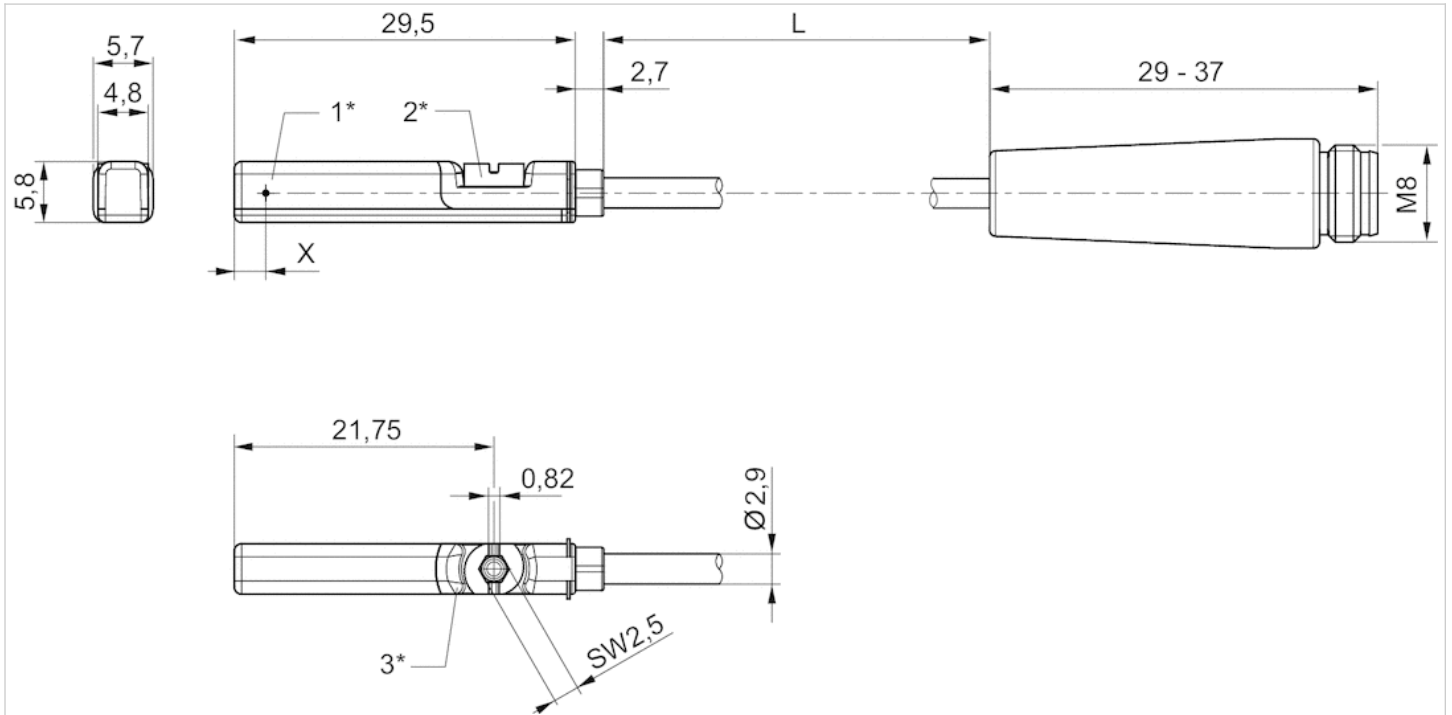
1) The product of operating voltage and continuous current must not exceed the maximum switching capacity.

## 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

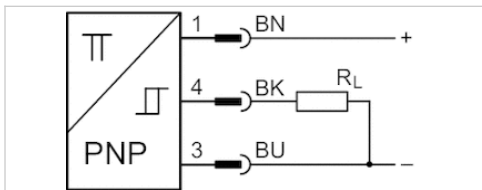
X = electronic: 11,6 mm, Reed: 8,3 mm

# 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

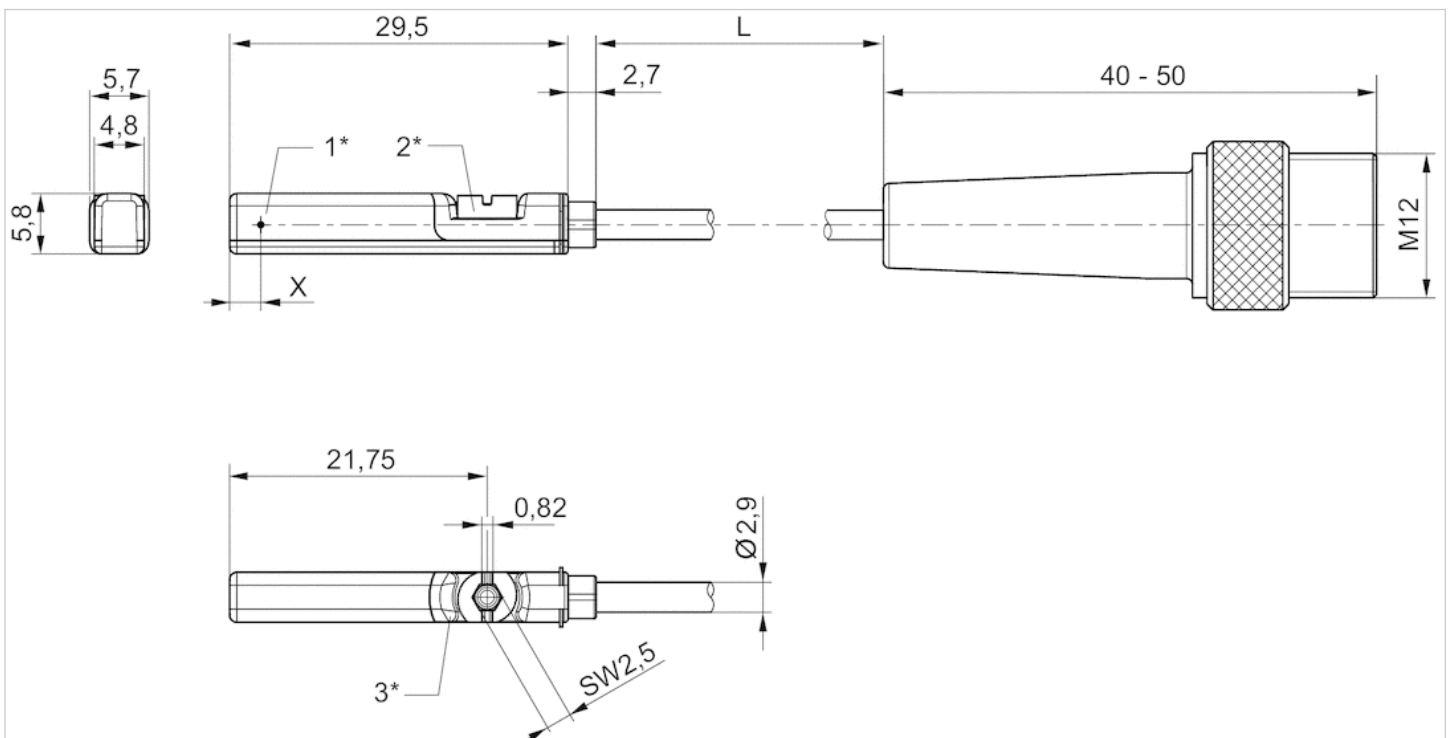
## Technical information

### Material

Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel

## Dimensions

### Dimensions



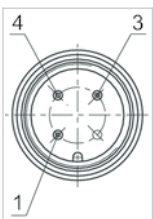
1\* = switching point 2\* = locking screw 3\* = LED window, transparent

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	-

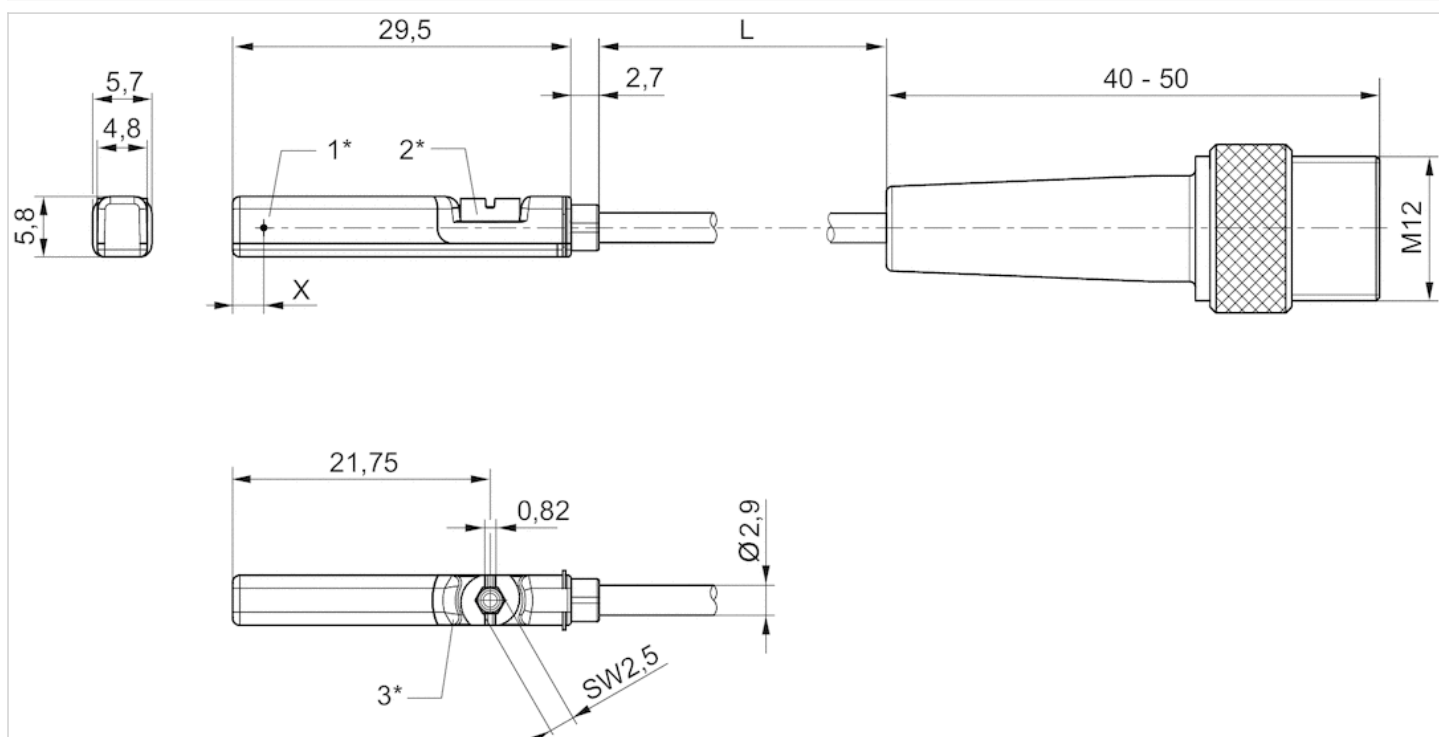
1) The product of operating voltage and continuous current must not exceed the maximum switching capacity.

## 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

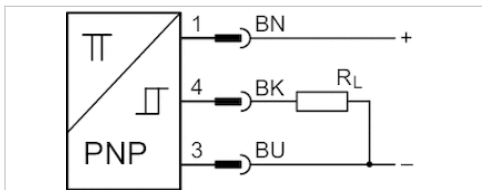


# Sensor, Series ST6

- 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

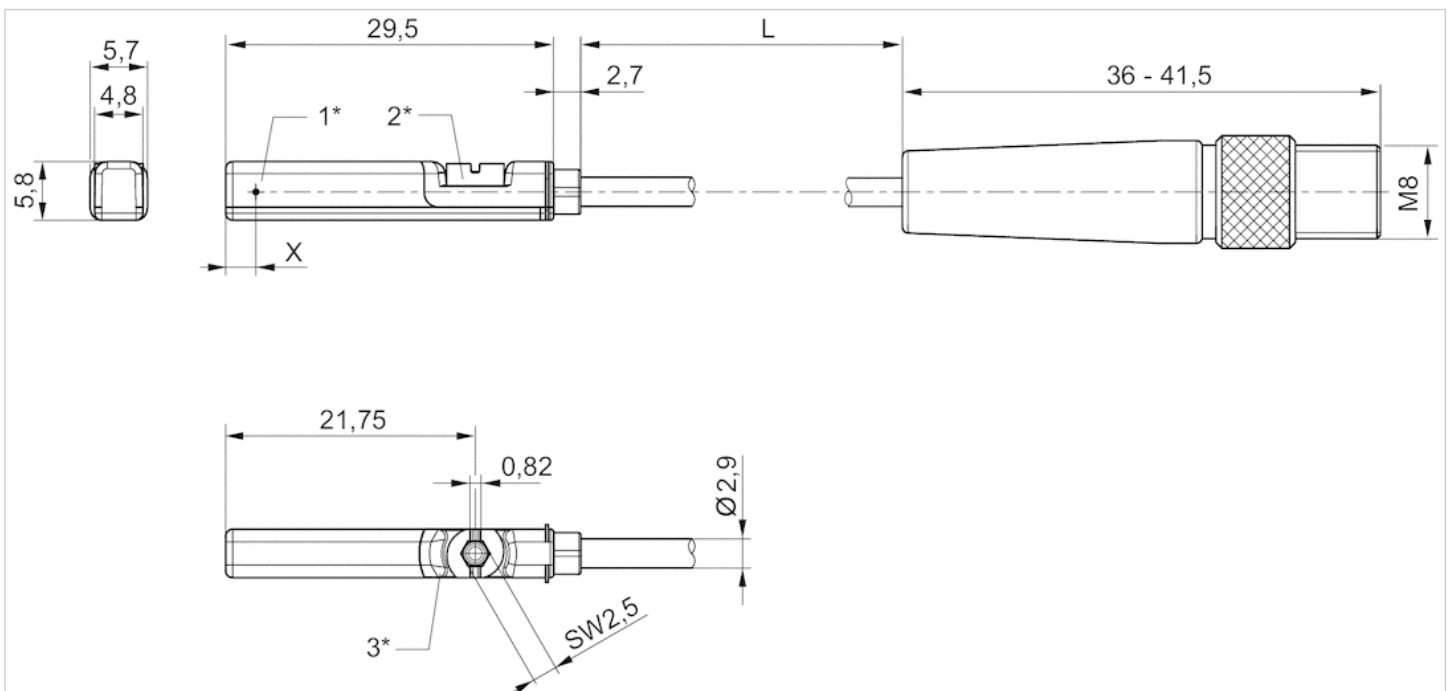
## Technical information

### Material

Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel

## Dimensions

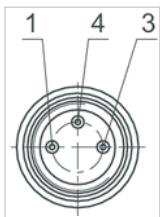
### Dimensions



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

## Pin assignments

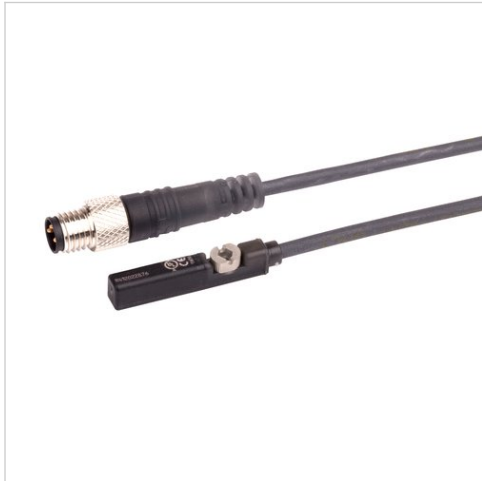
### Pin assignments



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

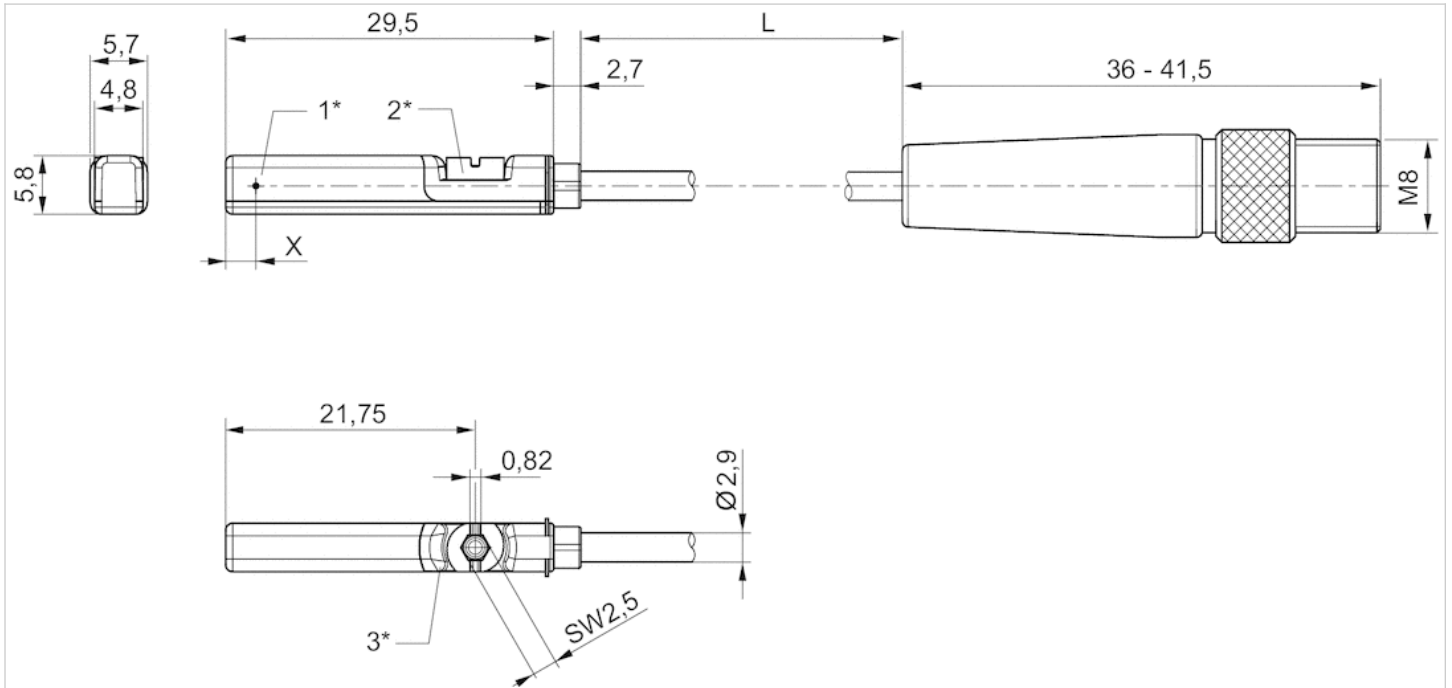
Part No.	Version
R412022873	Protected against polarity reversal
R412022875	Protected against polarity reversal
R412022874	Protected against polarity reversal
R412022859	short circuit resistant Protected against polarity reversal
R412022862	short circuit resistant Protected against polarity reversal
R412022861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

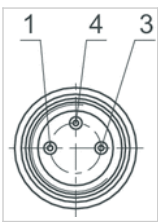
### Dimensions



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

## Pin assignments

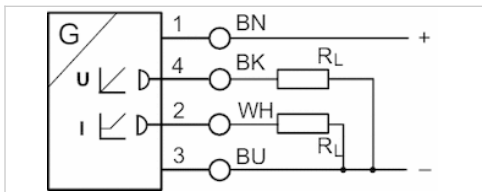
### Pin assignments



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

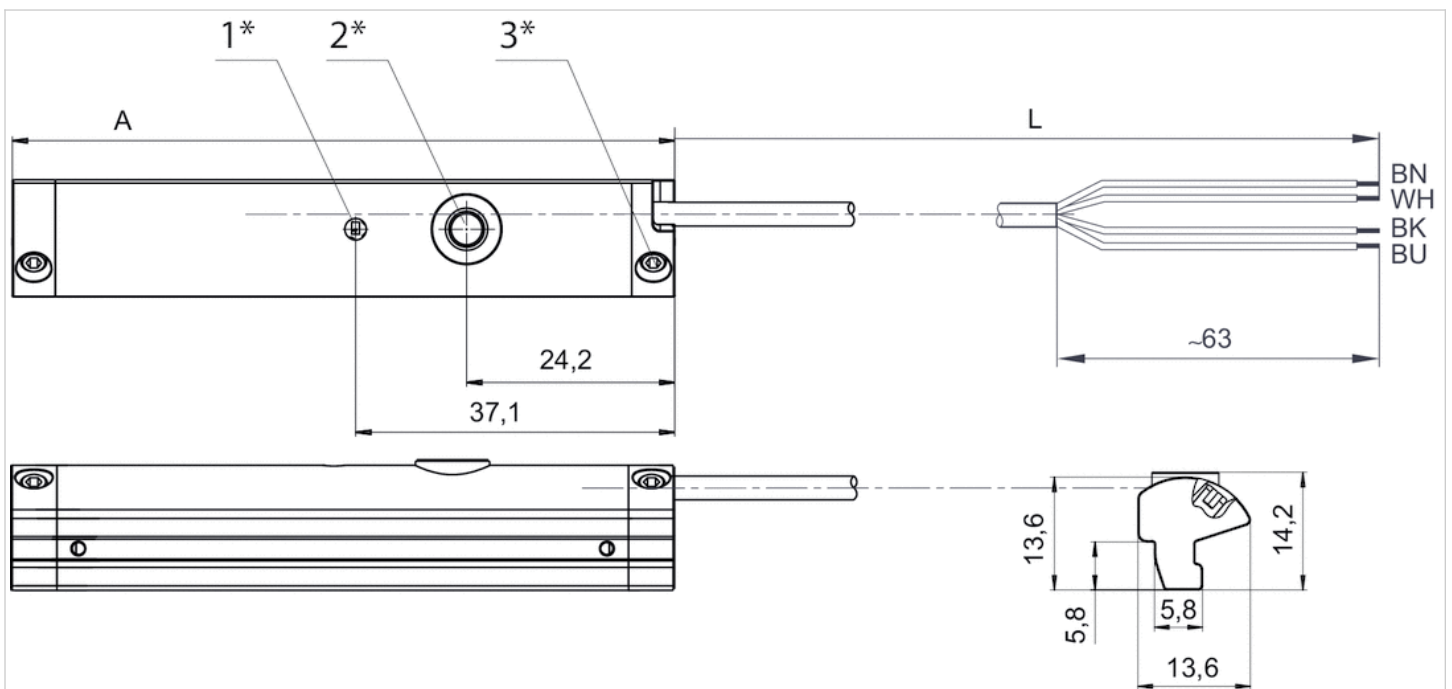
Part No.	Version
R412010141	short circuit resistant Protected against polarity reversal Overload protection
R412010143	short circuit resistant Protected against polarity reversal Overload protection
R412010262	short circuit resistant Protected against polarity reversal Overload protection
R412010264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



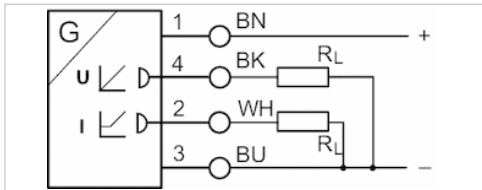
- 1\* = LED 2\* = teach button 3\* = threaded pin M3x11
- L = cable length
- (1) BN=brown
- (2) WH=white
- (3) BU=blue

(4) BK=black  
A = sensor length



# Sensors, Series SM6

- 6 mm groove
- with cable
- 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

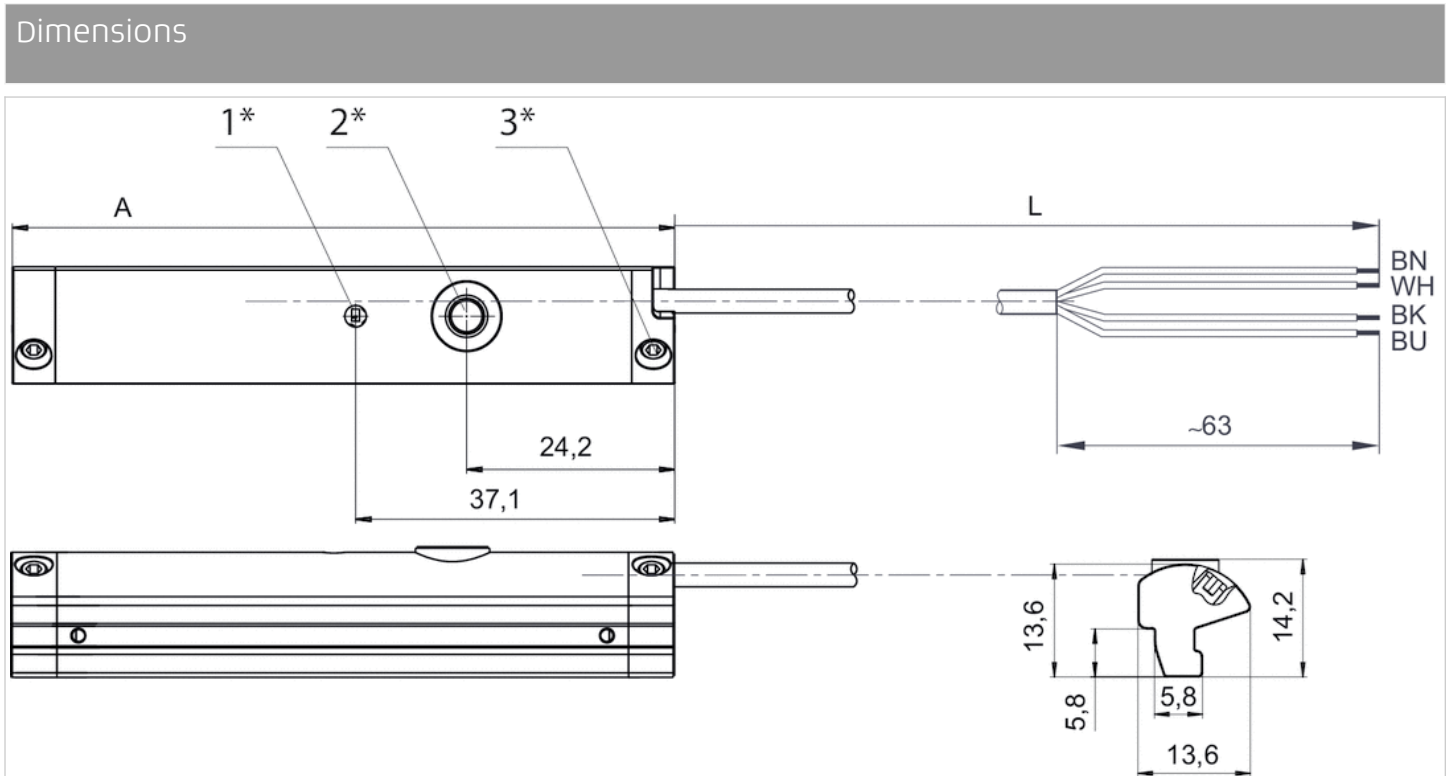
Part No.	max. measuring range	Overall length Sensor A
R412010415	224 mm	237 mm
R412010417	256 mm	269 mm

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

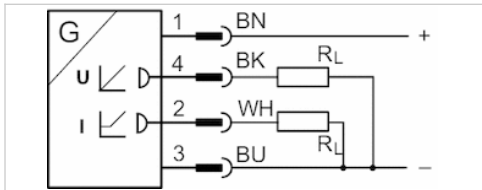


- 1\* = LED 2\* = teach button 3\* = threaded pin M3x11
- L = cable length
- (1) BN=brown
- (2) WH=white
- (3) BU=blue

(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

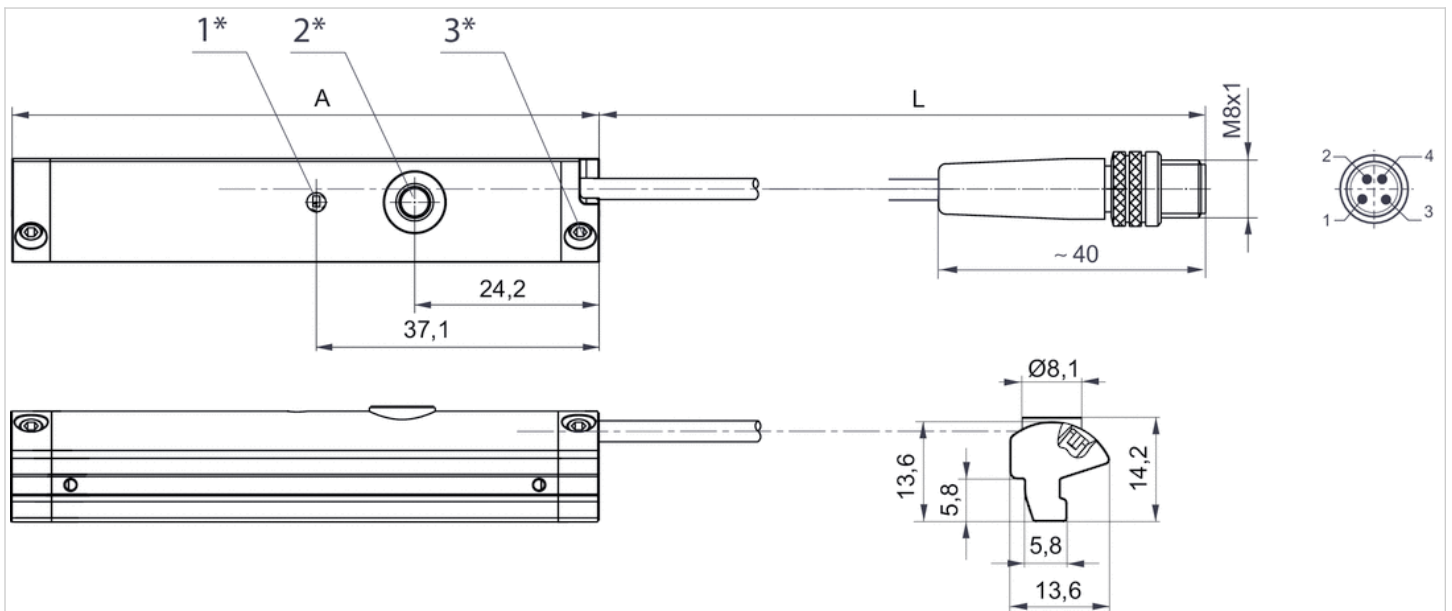
Part No.	Version
R412010142	short circuit resistant Protected against polarity reversal Overload protection
R412010144	short circuit resistant Protected against polarity reversal Overload protection
R412010263	short circuit resistant Protected against polarity reversal Overload protection
R412010265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

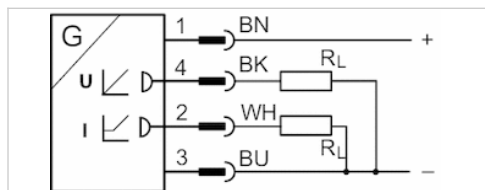
### Dimensions



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

# 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

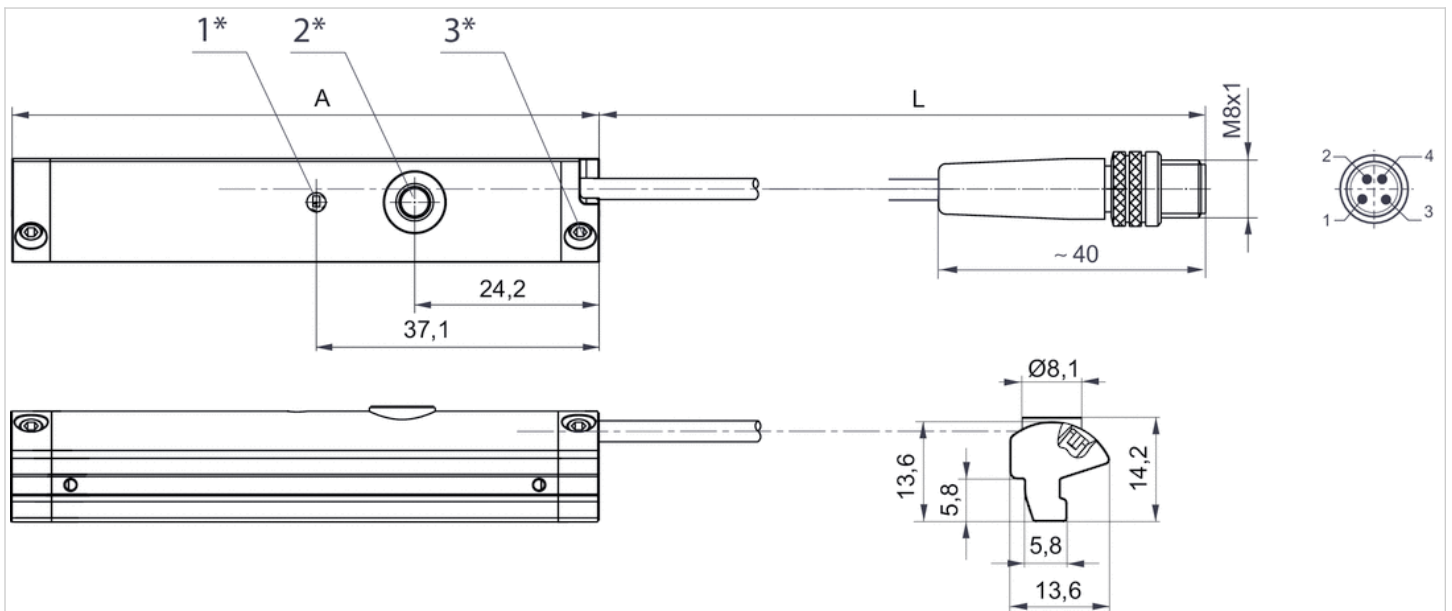
Part No.	Version
R412010142	short circuit resistant Protected against polarity reversal Overload protection
R412010144	short circuit resistant Protected against polarity reversal Overload protection
R412010263	short circuit resistant Protected against polarity reversal Overload protection
R412010265	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, Series SN2





















- with cable
- without wire end ferrule, tin-plated, 2-pin without wire end ferrule, tin-plated, 3-pin
- Heat resistant
- Reed electronic PNP
- Indirect mounting for series TRB, PRA, ITS, MNI, CSL-RD, ICM, RPC, TRR, FLT, CVI



Ambient temperature min./max.	See table below
Protection class	IP67
Switching point precision	±0,1 mT
Nominal current, actuated state	15 mA
Quiescent current (without load)	10 mA
Min./max. DC operating voltage	See table below
Min./max. AC operating voltage	See table below
LED status display	See table below
Cable length L	3 5 7 10 11 20 m



## Technical data

Part No.		Type of contact	Cable sheath	Cable length L
0830100315		Reed	Polyvinyl chloride	3 m
0830100365		Reed	Polyvinyl chloride	3 m
0830100368		Reed	Polyvinyl chloride	3 m
0830100370		Reed	Polyurethane	3 m
0830100316		Reed	-	3 m
0830100373		Reed	-	3 m
0830100367		Reed	Polyurethane	3 m
0830100317		Reed	Thermoplastic elastomer	3 m
0830100366		Reed	Polyvinyl chloride	5 m
0830100369		Reed	Polyvinyl chloride	5 m
0830100327		Reed	Polyvinyl chloride	7 m
0830100325		Reed	Polyvinyl chloride	10 m
0830100326		Reed	Thermoplastic elastomer	11 m
R412004848		Reed	Polyvinyl chloride	20 m
0830100371		Reed	Polyvinyl chloride	3 m
0830100372		Reed	Polyvinyl chloride	5 m
0830100375		electronic PNP	Polyvinyl chloride	3 m
0830100378		electronic PNP	Thermoplastic elastomer	3 m
0830100377		electronic PNP	Polyurethane	3 m
0830100376		electronic PNP	Polyvinyl chloride	5 m

Part No.	Min./max. DC operating voltage	Min./max. AC operating voltage
0830100315	0 ... 60 V DC	0 ... 240 V AC
0830100365	12 ... 60 V DC	12 ... 240 V AC
0830100368	12 ... 60 V DC	12 ... 240 V AC
0830100370	12 ... 60 V DC	12 ... 240 V AC
0830100316	0 ... 60 V DC	0 ... 240 V AC
0830100373	0 ... 60 V DC	0 ... 240 V AC
0830100367	12 ... 60 V DC	12 ... 240 V AC
0830100317	12 ... 60 V DC	12 ... 240 V AC
0830100366	12 ... 60 V DC	12 ... 240 V AC
0830100369	12 ... 60 V DC	12 ... 240 V AC
0830100327	12 ... 60 V DC	12 ... 240 V AC
0830100325	12 ... 60 V DC	12 ... 240 V AC
0830100326	12 ... 60 V DC	12 ... 240 V AC
R412004848	12 ... 60 V DC	12 ... 240 V AC
0830100371	12 ... 42 V DC	12 ... 42 V AC
0830100372	12 ... 42 V DC	12 ... 42 V AC
0830100375	10 ... 30 V DC	10 ... 30 V AC
0830100378	10 ... 30 V DC	-
0830100377	10 ... 30 V DC	10 ... 30 V AC
0830100376	10 ... 30 V DC	10 ... 30 V AC

Part No.	Voltage drop U at I <sub>max</sub>	DC switching current, max.
0830100315	$R_s \cdot I_{max}$ .	0.13 A
0830100365	2,1 V + I*Rs	0.13 A
0830100368	2,1 V + I*Rs	0.3 A
0830100370	2,1 V + I*Rs	0.3 A
0830100316	$R_s \cdot I_{max}$ .	0.13 A
0830100373	$R_s \cdot I_{max}$ .	0.13 A
0830100367	2,1 V + I*Rs	0.13 A
0830100317	2,1 V + I*Rs	0.12 A
0830100366	2,1 V + I*Rs	0.13 A
0830100369	2,1 V + I*Rs	0.3 A
0830100327	2,1 V + I*Rs	0.3 A
0830100325	2,1 V + I*Rs	0.13 A
0830100326	2,1 V + I*Rs	0.12 A
R412004848	2,1 V + I*Rs	0.13 A
0830100371	I*Rs	0.13 A
0830100372	I*Rs	0.13 A
0830100375	≤ 2,0 V	0.13 A
0830100378	2,1 V + I*Rs	0.12 A
0830100377	≤ 2,0 V	0.13 A
0830100376	≤ 2,0 V	0.13 A

Part No.	AC switching current, max.	Ambient temperature min./max.	Switching capacity
0830100315	0.13 A	-20 ... 80 °C	10 W / 10 VA
0830100365	0.13 A	-20 ... 80 °C	10 W / 10 VA
0830100368	0.5 A	-20 ... 80 °C	10 W / 10 VA
0830100370	0.5 A	-20 ... 80 °C	10 W / 10 VA
0830100316	-	-20 ... 80 °C	10 W / 10 VA
0830100373	-	-20 ... 80 °C	10 W / 10 VA
0830100367	0.13 A	-20 ... 80 °C	10 W / 10 VA
0830100317	0.12 A	-20 ... 120 °C	10 W / 10 VA
0830100366	0.13 A	-20 ... 80 °C	10 W / 10 VA
0830100369	0.5 A	-20 ... 80 °C	10 W / 10 VA
0830100327	0.5 A	-20 ... 80 °C	10 W / 10 VA
0830100325	0.13 A	-20 ... 80 °C	10 W / 10 VA
0830100326	0.12 A	-20 ... 120 °C	10 W / 10 VA
R412004848	0.13 A	-20 ... 80 °C	10 W / 10 VA
0830100371	0.13 A	-20 ... 80 °C	5,5 W / 5,5 VA
0830100372	0.13 A	-20 ... 80 °C	5,5 W / 5,5 VA
0830100375	-	-10 ... 70 °C	-
0830100378	-	-20 ... 120 °C	10 W / 10 VA
0830100377	-	-10 ... 70 °C	-
0830100376	-	-10 ... 70 °C	-

Part No.	Protective resistor for reed	Vibration resistance	Shock resistance
0830100315	27 Ω	-	-

Part No.	Protective resistor for reed	Vibration resistance	Shock resistance
0830100365	27 Ω	30 g (50 - 1000 Hz)	50 g / 11 ms
0830100368	1,3 Ω	30 g (50 - 1000 Hz)	50 g / 11 ms
0830100370	1,3 Ω	30 g (50 - 1000 Hz)	50 g / 11 ms
0830100316	1,3 Ω	-	-
0830100373	100 Ω	-	-
0830100367	27 Ω	30 g (50 - 1000 Hz)	50 g / 11 ms
0830100317	27 Ω	30 g (50 - 1000 Hz)	100 g / 11 ms
0830100366	27 Ω	30 g (50 - 1000 Hz)	50 g / 11 ms
0830100369	1,3 Ω	30 g (50 - 1000 Hz)	50 g / 11 ms
0830100327	1,3 Ω	30 g (50 - 1000 Hz)	50 g / 11 ms
0830100325	27 Ω	30 g (50 - 1000 Hz)	50 g / 11 ms
0830100326	27 Ω	30 g (50 - 1000 Hz)	100 g / 11 ms
R412004848	27 Ω	30 g (50 - 1000 Hz)	50 g / 11 ms
0830100371	27 Ω	30 g (50 - 1000 Hz)	100 g / 11 ms
0830100372	27 Ω	30 g (50 - 1000 Hz)	100 g / 11 ms
0830100375	-	-	-
0830100378	27 Ω	30 g (50 - 1000 Hz)	100 g / 11 ms
0830100377	-	-	-
0830100376	-	-	-

Part No.	Max. switching frequency	Operating current, not switched
0830100315	300 Hz	-
0830100365	-	-
0830100368	-	-
0830100370	-	-
0830100316	300 Hz	-
0830100373	300 Hz	-
0830100367	-	-
0830100317	-	-
0830100366	-	-
0830100369	-	-
0830100327	-	-
0830100325	-	-
0830100326	-	-
R412004848	-	-
0830100371	-	-
0830100372	-	-
0830100375	2000 Hz	10 mA
0830100378	-	-
0830100377	2000 Hz	10 mA
0830100376	2000 Hz	10 mA

Part No.	Operating current, switched	Material Housing	LED status display
0830100315	-	Polyamide	-
0830100365	-	Polyamide	Yellow

Part No.	Operating current, switched	Material Housing	LED status display
0830100368	-	Polyamide	Yellow
0830100370	-	Polyamide	Yellow
0830100316	-	Polyamide	-
0830100373	-	Polyamide	-
0830100367	-	Polyamide	Yellow
0830100317	-	Polyamide	-
0830100366	-	Polyamide	Yellow
0830100369	-	Polyamide	Yellow
0830100327	-	Polyamide	Yellow
0830100325	-	Polyamide	Yellow
0830100326	-	Polyamide	-
R412004848	-	epoxy resin	Yellow
0830100371	-	Polyamide	Yellow
0830100372	-	Polyamide	Yellow
0830100375	15 mA	Polyamide	Yellow
0830100378	-	Polyamide	-
0830100377	15 mA	Polyamide	Yellow
0830100376	15 mA	Polyamide	Yellow

Part No.	Version	
0830100315	Protected against polarity reversal	1)
0830100365	Protected against polarity reversal	1)
0830100368	Protected against polarity reversal	1)
0830100370	Protected against polarity reversal	1)
0830100316	Protected against polarity reversal	1)
0830100373	Protected against polarity reversal	1)
0830100367	Protected against polarity reversal	1)
0830100317	Protected against polarity reversal	1)
0830100366	Protected against polarity reversal	1)
0830100369	Protected against polarity reversal	1)
0830100327	Protected against polarity reversal	1)
0830100325	Protected against polarity reversal	1)
0830100326	Protected against polarity reversal	1)
R412004848	Protected against polarity reversal	1)
0830100371	Protected against polarity reversal	1)
0830100372	Protected against polarity reversal	1)
0830100375	short circuit resistant Protected against polarity reversal	2)
0830100378	Protected against polarity reversal	2)
0830100377	short circuit resistant Protected against polarity reversal	2)
0830100376	short circuit resistant Protected against polarity reversal	2)

1) without wire end ferrule, tin-plated, 2-pin

2) without wire end ferrule, tin-plated, 3-pin

## Technical information

If reed sensors are used, we recommend using a short-circuit protective device (SCPD).

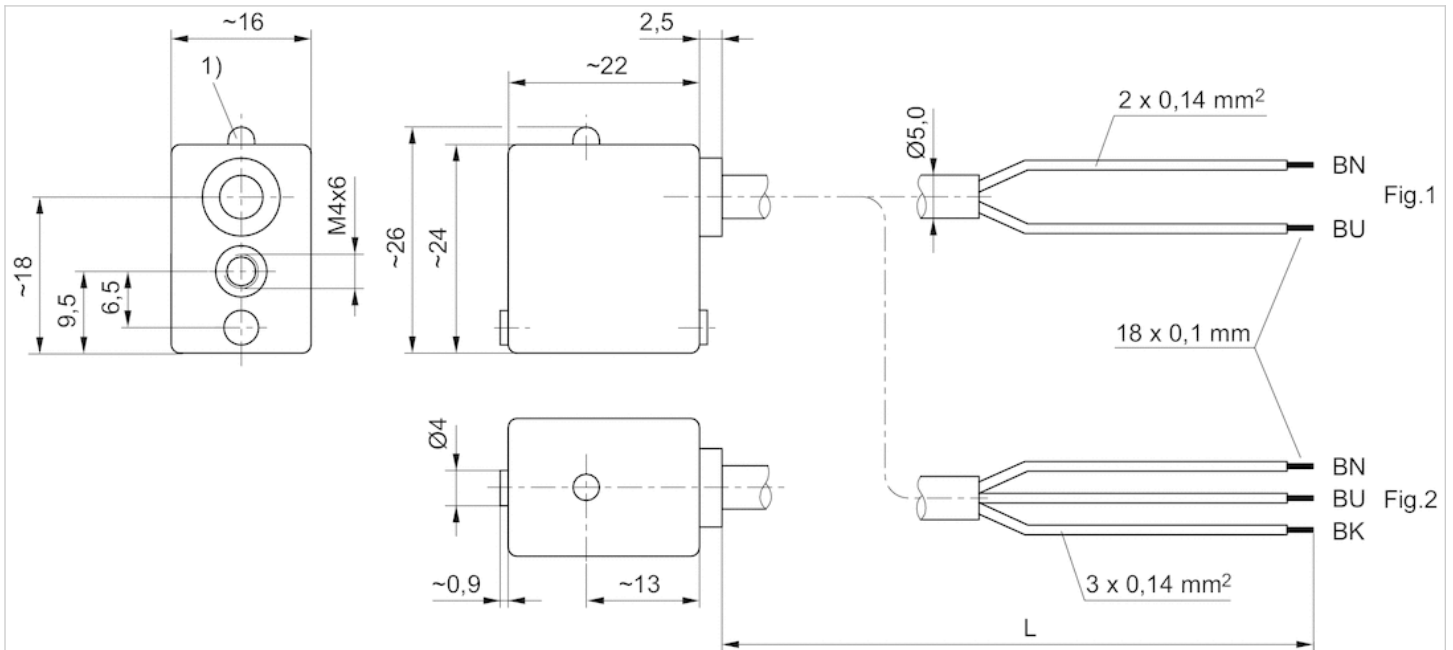
## Technical information

### Material

Housing	Polyamide epoxy resin
Cable sheath	Polyvinyl chloride Polyurethane Thermoplastic elastomer

## Dimensions

### Dimensions



1) LED  
 L = cable length  
 BN = brown, BK = black, BU = blue











## Sensor, Series SN2

- Plug, M8, 2-pin Plug, M8, 3-pin Plug, M8, 4-pin
- Reed 2-Wire Reed 3-Wire Reed 3-Wire, with pulse stretching Reed 4-Wire electronic PNP
- With stretched impulse
- With stretched impulse
- Reed electronic PNP
- Indirect mounting for series TRB, PRA, ITS, MNI, CSL-RD, ICM, RPC, TRR, FLT, CVI



Ambient temperature min./max.	See table below
Protection class	IP67
Switching point precision	±0,1 mT
Nominal current, actuated state	15 mA
Quiescent current (without load)	10 mA
Min./max. DC operating voltage	See table below
Min./max. AC operating voltage	See table below
LED status display	See table below

## Technical data

Part No.		Type of contact	Min./max. DC operating voltage
0830100465		Reed	12 ... 36 V DC
0830100468		Reed	12 ... 36 V DC
R412004299		Reed	12 ... 36 V DC
0830100466		Reed	12 ... 36 V DC
0830100469		Reed	12 ... 36 V DC
R412004820		Reed	12 ... 36 V DC
0830100472		Reed	12 ... 36 V DC
0830100467		Reed	12 ... 36 V DC
0830100480		electronic PNP	10 ... 30 V DC
R412004800		electronic PNP	10 ... 30 V DC

Part No.	Min./max. AC operating voltage	Voltage drop U at I <sub>max</sub>
0830100465	12 ... 30 V AC	2,1 V + I*Rs
0830100468	12 ... 30 V AC	2,1 V + I*Rs
R412004299	12 ... 30 V AC	2,1 V + I*Rs
0830100466	12 ... 30 V AC	2,1 V + I*Rs
0830100469	12 ... 30 V AC	≤ 0,5 V
R412004820	12 ... 30 V AC	I*Rs
0830100472	12 ... 30 V AC	≤ 1,5 V
0830100467	12 ... 30 V AC	≤ 3,5 V
0830100480	12 ... 30 V AC	≤ 2,0 V
R412004800	-	≤ 2,0 V

Part No.	DC switching current, max.	AC switching current, max.
0830100465	0.13 A	0.13 A
0830100468	0.3 A	0.5 A
R412004299	0.13 A	0.13 A
0830100466	0.13 A	0.13 A
0830100469	0.13 A	0.13 A
R412004820	0.13 A	0.13 A
0830100472	0.2 A	0.13 A
0830100467	0.13 A	0.13 A
0830100480	0.13 A	-
R412004800	0.13 A	-

Part No.	Function	Ambient temperature min./max.
0830100465	Reed 2-Wire	-20 ... 80 °C
0830100468	Reed 2-Wire	-20 ... 80 °C
R412004299	Reed 3-Wire	-20 ... 80 °C
0830100466	Reed 3-Wire	-20 ... 80 °C
0830100469	Reed 3-Wire	-20 ... 80 °C

Part No.	Function	Ambient temperature min./max.
R412004820	Reed 3-Wire	-20 ... 80 °C
0830100472	Reed 3-Wire, with pulse stretching	-20 ... 70 °C
0830100467	Reed 4-Wire	-20 ... 80 °C
0830100480	electronic PNP	-10 ... 70 °C
R412004800	electronic PNP	-10 ... 70 °C

Part No.	Switching capacity	Protective resistor for reed	Vibration resistance
0830100465	10 W / 10 VA	27 Ω	30 g (50 - 2000 Hz)
0830100468	10 W / 10 VA	1,3 Ω	30 g (50 - 2000 Hz)
R412004299	10 W / 10 VA	27 Ω	30 g (50 - 2000 Hz)
0830100466	10 W / 10 VA	100 Ω	30 g (50 - 2000 Hz)
0830100469	5,5 W / 5,5 VA	27 Ω	30 g (50 - 1000 Hz)
R412004820	10 W / 10 VA	27 Ω	30 g (50 - 2000 Hz)
0830100472	5 W / 5 VA	-	35 g (50 - 2000 Hz)
0830100467	10 W / 10 VA	27 Ω	35 g (50 - 2000 Hz)
0830100480	-	-	-
R412004800	-	-	-

Part No.	Shock resistance	Max. switching frequency	Operating current, not switched
0830100465	100 g / 11 ms	-	-
0830100468	100 g / 11 ms	-	-
R412004299	100 g / 11 ms	-	-
0830100466	100 g / 11 ms	-	-
0830100469	100 g / 11 ms	-	-
R412004820	100 g / 11 ms	-	-
0830100472	50 g / 11 ms	-	-
0830100467	50 g / 11 ms	-	-
0830100480	-	2000 Hz	10 mA
R412004800	-	2000 Hz	10 mA

Part No.	Operating current, switched	Material Housing	LED status display
0830100465	-	Polyamide	Yellow
0830100468	-	Polyamide	Yellow
R412004299	-	Polyamide	Yellow
0830100466	-	Polyamide	Yellow
0830100469	-	Polyamide	Yellow
R412004820	-	epoxy resin	Yellow
0830100472	-	-	Red
0830100467	-	epoxy resin	Red
0830100480	15 mA	Polyamide	Yellow
R412004800	15 mA	epoxy resin	Yellow



Part No.	Version
0830100465	Protected against polarity reversal
0830100468	Protected against polarity reversal
R412004299	Protected against polarity reversal
0830100466	Protected against polarity reversal
0830100469	Protected against polarity reversal
R412004820	Protected against polarity reversal
0830100472	Protected against polarity reversal
0830100467	Protected against polarity reversal
0830100480	short circuit resistant Protected against polarity reversal
R412004800	short circuit resistant Protected against polarity reversal

Part No.	Switch signal	Fig.	
0830100465	-	Fig. 1	1)
0830100468	-	Fig. 1	1)
R412004299	-	Fig. 1	2)
0830100466	-	Fig. 1	1)
0830100469	-	Fig. 1	2)
R412004820	-	Fig. 1	2)
0830100472	With stretched impulse	Fig. 1	2)
0830100467	-	Fig. 2	3)
0830100480	-	Fig. 1	2)
R412004800	-	Fig. 1	2)

1) Plug M8, 2-pin

2) Plug M8, 3-pin

3) Plug M8, 4-pin

## Technical information

If reed sensors are used, we recommend using a short-circuit protective device (SCPD).

## Technical information

### Material

Housing	Polyamide epoxy resin
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## Dimensions

Fig. 1

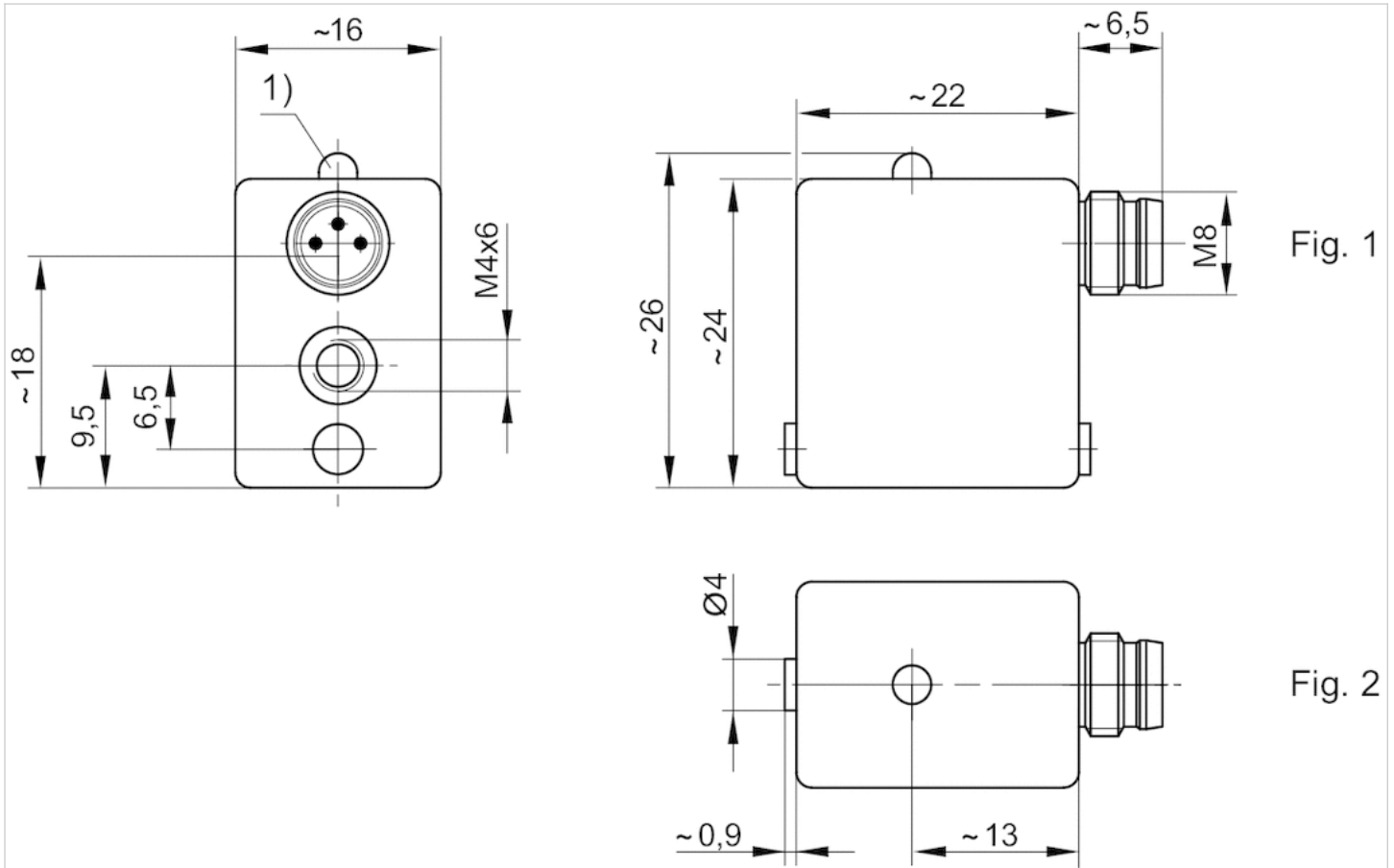


Fig. 1

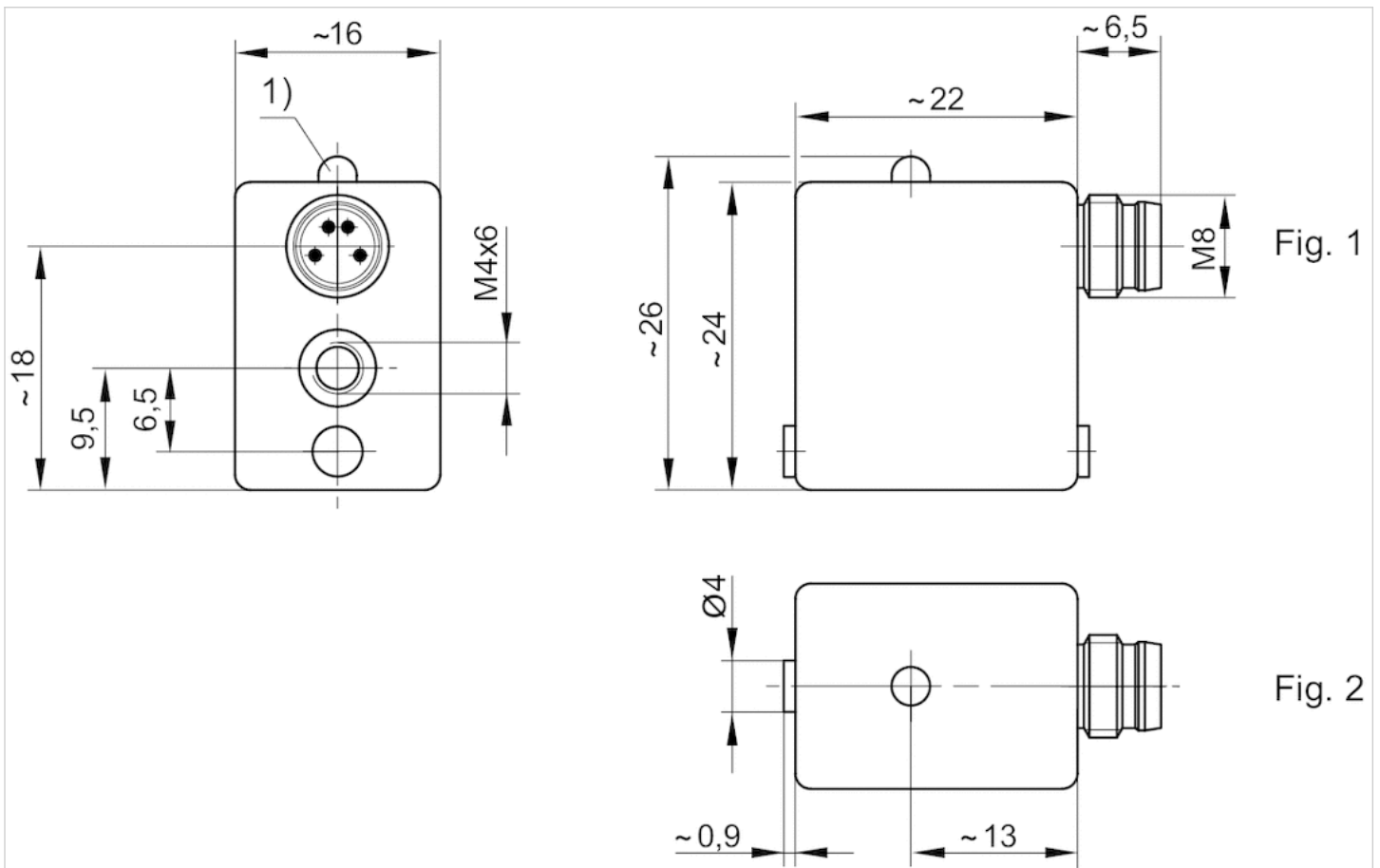
Fig. 2

1) LED

M8: combination plug can be combined with valve plug connectors  $\varnothing 6.5$  mm and M8.

Pin assignments: 1 = (+), 3 = (-), 4 = (OUT), EN 60947-5-2:1998

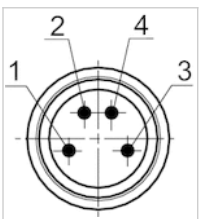
Fig. 2



1) LED

M8: combination plug can be combined with valve plug connectors Ø6.5 mm and M8.

## Pin assignments

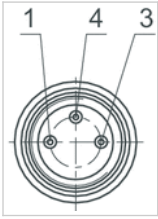


Pin	1	3	4
Allocation	(+)	(-)	(OUT)

EN 60947-5-2:1998

## Pin assignments

### Pin assignments



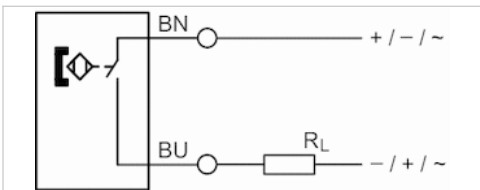
Pin	1	3	4
Allocation	(+)	(-)	(OUT)

# Sensor, Series ST6-HT

- 6 mm T-slot
- with cable
- open cable ends, 2-pin
- Heat resistant
- UL certification
- Reed
- Direct mounting for series PRA, PRE, CCI, KPZ
- Indirect mounting for series TRB, ITS, CCL-IS, MNI, CSL-RD, RPC



Certificates	CE declaration of conformity RoHS
Ambient temperature min./max.	-20 ... 120 °C
Protection class	IP65, IP67
Switching point precision	±0,1 mT
Min./max. DC operating voltage	0 ... 30 V DC
Min./max. AC operating voltage	0 ... 30 V AC
Switching logic	NO (make contact)
Switching capacity	Reed, 2-pin: max. 10 W
Vibration resistance	10 - 55 Hz, 1 mm
Shock resistance	30 g / 11 ms
Cable length L	3 10 m



## Technical data

Part No.	for	Type of contact	Cable length L	Voltage drop U at I <sub>max</sub>
R412022865	PRA, PRE, CCI, KPZ	Reed	3 m	≤ 3,5 V
R412022867	PRA, PRE, CCI, KPZ	Reed	10 m	≤ 3,5 V

Part No.	DC switching current, max.	AC switching current, max.
R412022865	0.13 A	0.13 A
R412022867	0.13 A	0.13 A

Part No.	Max. switching frequency	Version
R412022865	400 Hz	Protected against polarity reversal
R412022867	400 Hz	Protected against polarity reversal

Part No.	Temperature resistance
R412022865	Heat resistant

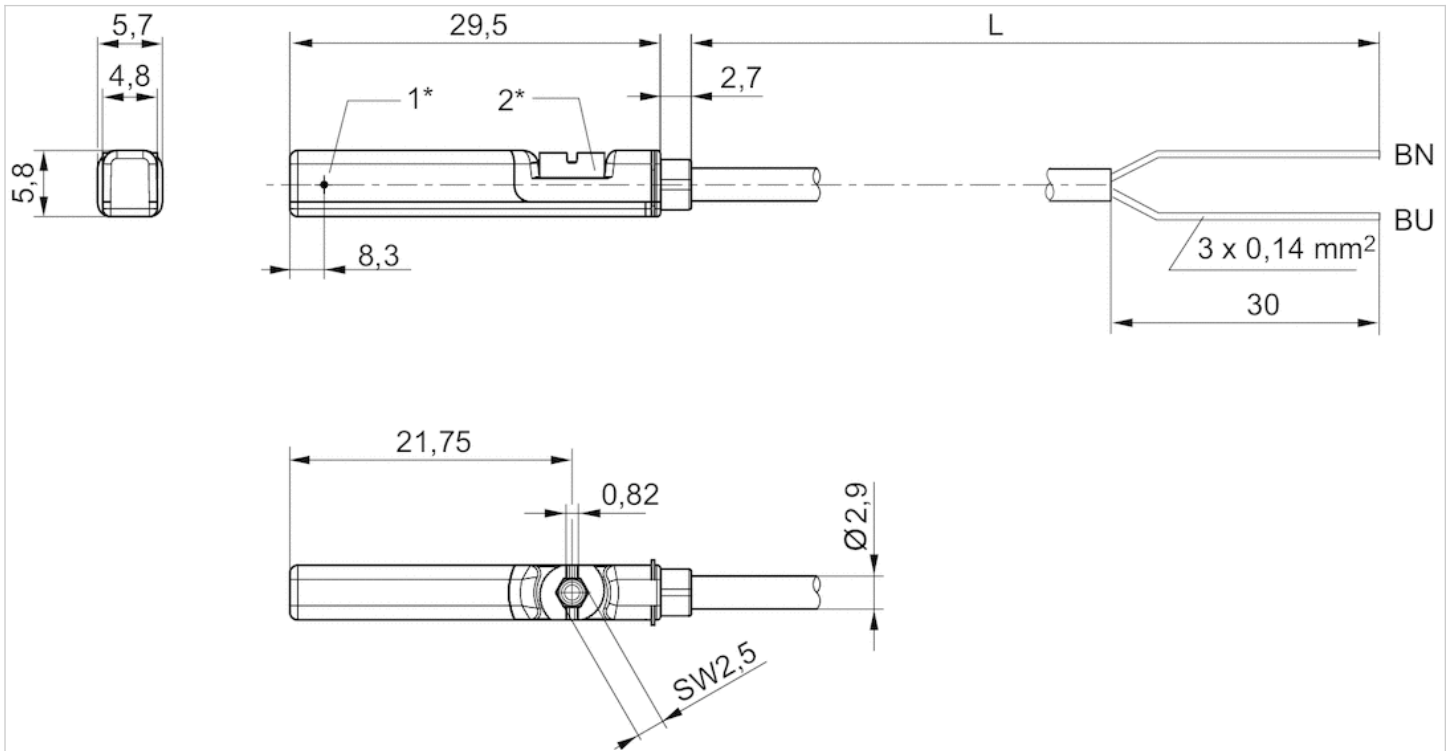
Part No.	Temperature resistance
R412022867	Heat resistant

## Technical information

Material	
Housing	Polyamide
Cable sheath	Polyurethane
Locking screw	Stainless steel

## Dimensions

### Dimensions



1\* = switching point 2\* = locking screw

L = cable length

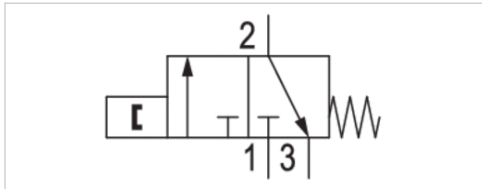
BN=brown, BU=blue

# Pneumatic sensor, Series SP1

- Qn 40 l/min
- Mounting orientation Any



Mounting orientation	Any
Working pressure min./max.	2 ... 6 bar
Ambient temperature min./max.	-15 ... 60 °C
Medium	Compressed air
Max. particle size	40 µm
Switching point precision	±0,2 mT
Switching time on	12 ms
Switching time off	25 ms
Weight	0.015 kg



## Technical data

Part No.
0820212201

## 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).

Notice: This product may only be operated with oil-free, dry compressed air.

## Technical information

Material	
Housing	Polyamide





# Series CAT

- Measuring instrument for adjusting the pneumatic cushioning
- for MNI, CSL-RD, CCL-IS, ICS, RPC, PRA/TRB, ITS



Certificates	CE declaration of conformity
Ambient temperature min./max.	0 ... 40 °C
Measurement range Min.	0.2 m/s
Measurement range Max.	2 m/s
LED status display	Green Yellow Red
Protection class	IP50
Weight	0.12 kg

## Technical data

Part No.	for series
R412026160	MNI, CSL-RD, CCL-IS, ICS, RPC, PRA/TRB, ITS

Scope of delivery: 1 measuring instrument, 2 fastening strips, 1 power pack 3.7 V, 1 USB charging cable, Operating instructions, QR code notice, 1 case with foam inlay

## Technical information

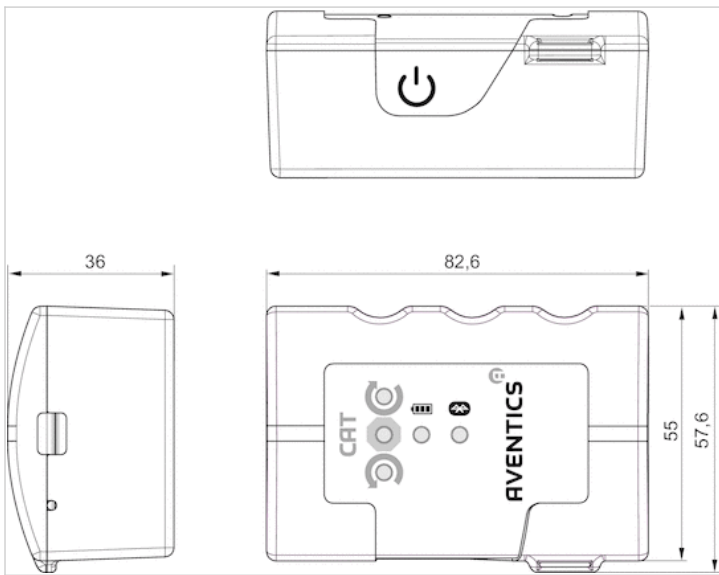
The CAT measuring instrument uses Bluetooth radio technology for wireless connection with the "Aventics" app, which is available free of charge in the Android/Play Store and/or the IOS/App Store.

## Technical information

Material	
Housing	Luran S

## Dimensions

### Dimensions



# Sensor mounting, Series CB1

- for series ST4, ST6

- to mount on cylinder MNI, ICM, CSL-RD



Ambient temperature min./max.

-30 ... 80 °C

Weight

0.007 kg

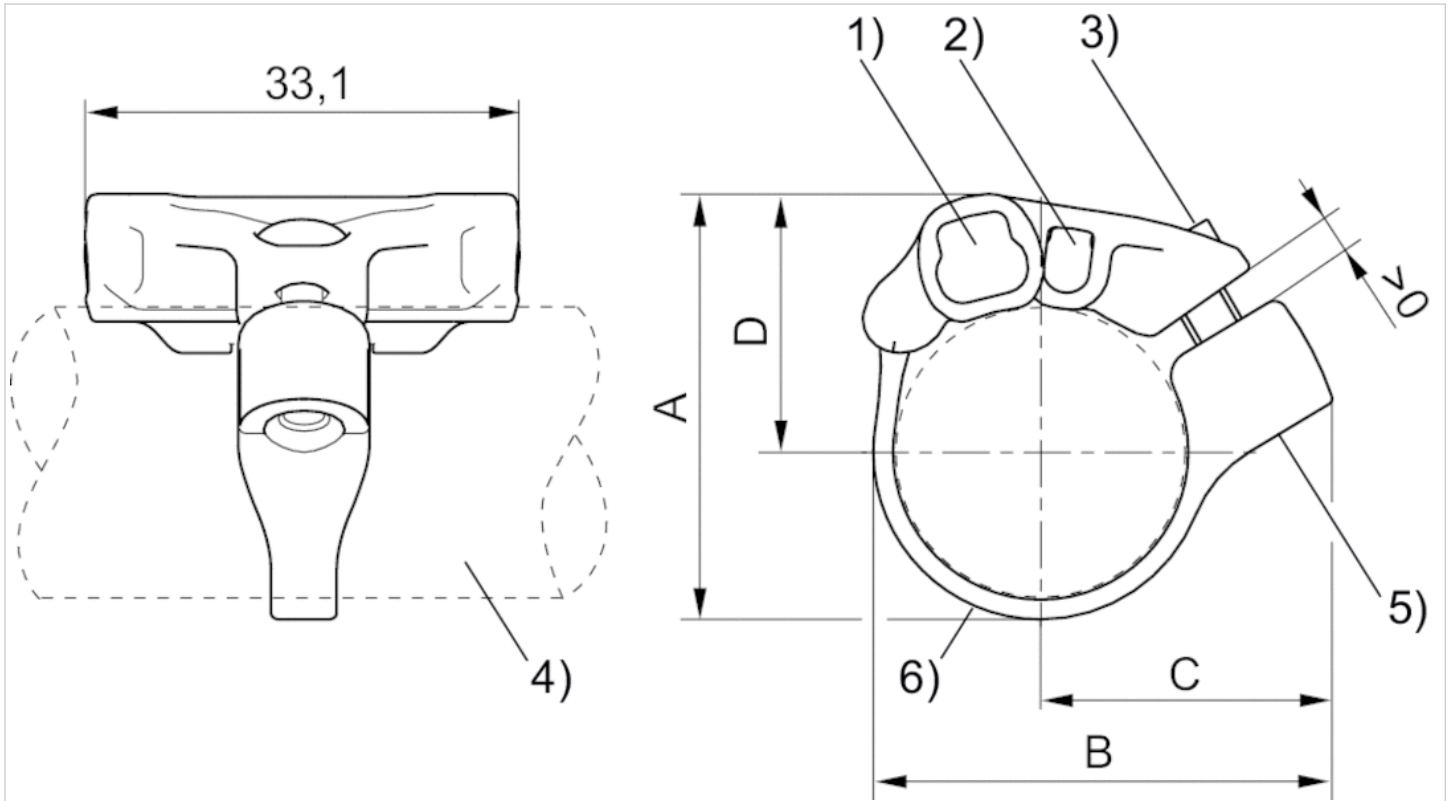
## Technical data

Part No.	Cylinders Ø	for series	Scope of delivery
	min.		
R412021791	16 mm	ST4, ST6	1 piece
R412021792	20 mm	ST4, ST6	1 piece
R412021793	25 mm	ST4, ST6	1 piece

## Technical information

Material	
	Polyamide Stainless steel

## Dimensions



1) Sensor slot for ST6 2) Sensor slot for ST4 3) Mounting screw (made of stainless steel) 4) Cylinder profile 5) Thread insert (made of stainless steel) 6) Tightening strap

## Dimensions

Part No.	A	B	C	D
R412021791	27.7	32.5	22.1	17.3
R412021792	32.4	35	22.4	19.7
R412021793	37.4	39.5	24.3	22.2

# Sensor mounting, Series CB1

- for series SN1, SN2
- to mount on cylinder MNI



Weight

See table below

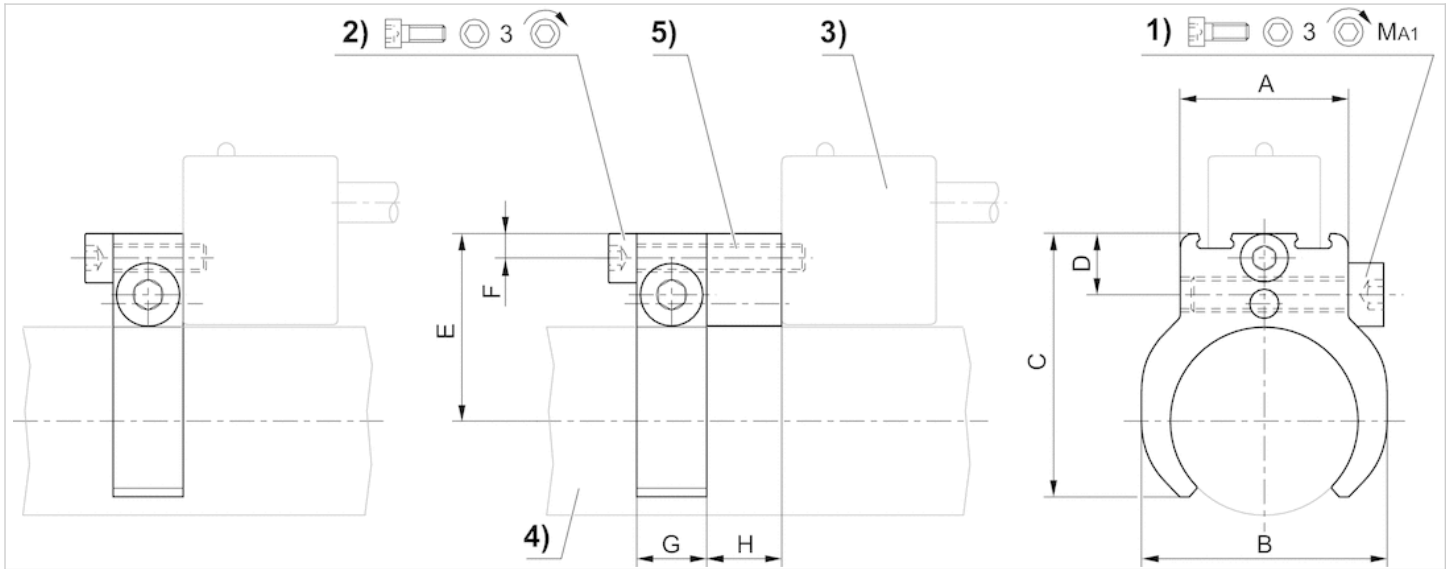
## Technical data

Part No.	Cylinders Ø		for series	Weight
	min.	max.		
1827020065	10 mm	10 mm	SN1, SN2	0.016 kg
1827020066	12 mm	12 mm	SN1, SN2	0.018 kg
1827020067	16 mm	16 mm	SN1, SN2	0.02 kg
1827020068	20 mm	20 mm	SN1, SN2	0.021 kg
1827020069	25 mm	25 mm	SN1, SN2	0.025 kg

## Technical information

Material	
	Aluminum

## Dimensions



1) Clamping screw 2) Mounting screw for sensor 3) Sensor 4) Cylinder profile 5) Insert (on request)

## Dimensions

Part No.	Cylinders Ø mm	A	B	C	D	E	F	G	H	1)	MA1 [Nm]
1827020065	10 mm	16	16	23.5	8.2	18.7	3.5	10	10.7	M4x14	1 +0,3
1827020066	12 mm	16	20	25.5	8.2	19.9	3.5	10	10.7	M4x14	1 +0,3
1827020067	16 mm	20	24	29.7	8.7	21.9	3.5	10	10.7	M4x25	1 +0,3
1827020068	20 mm	20	28	33	8.7	24.1	3.5	10	10.7	M4x25	1 +0,3
1827020069	25 mm	24	35	37.5	8.7	26.6	3.5	10	10.7	M4x25	1 +0,3

# Sensor mounting, Series CB1

- for series ST6, SM6

- to mount on cylinder MNI, ICM



Weight

See table below

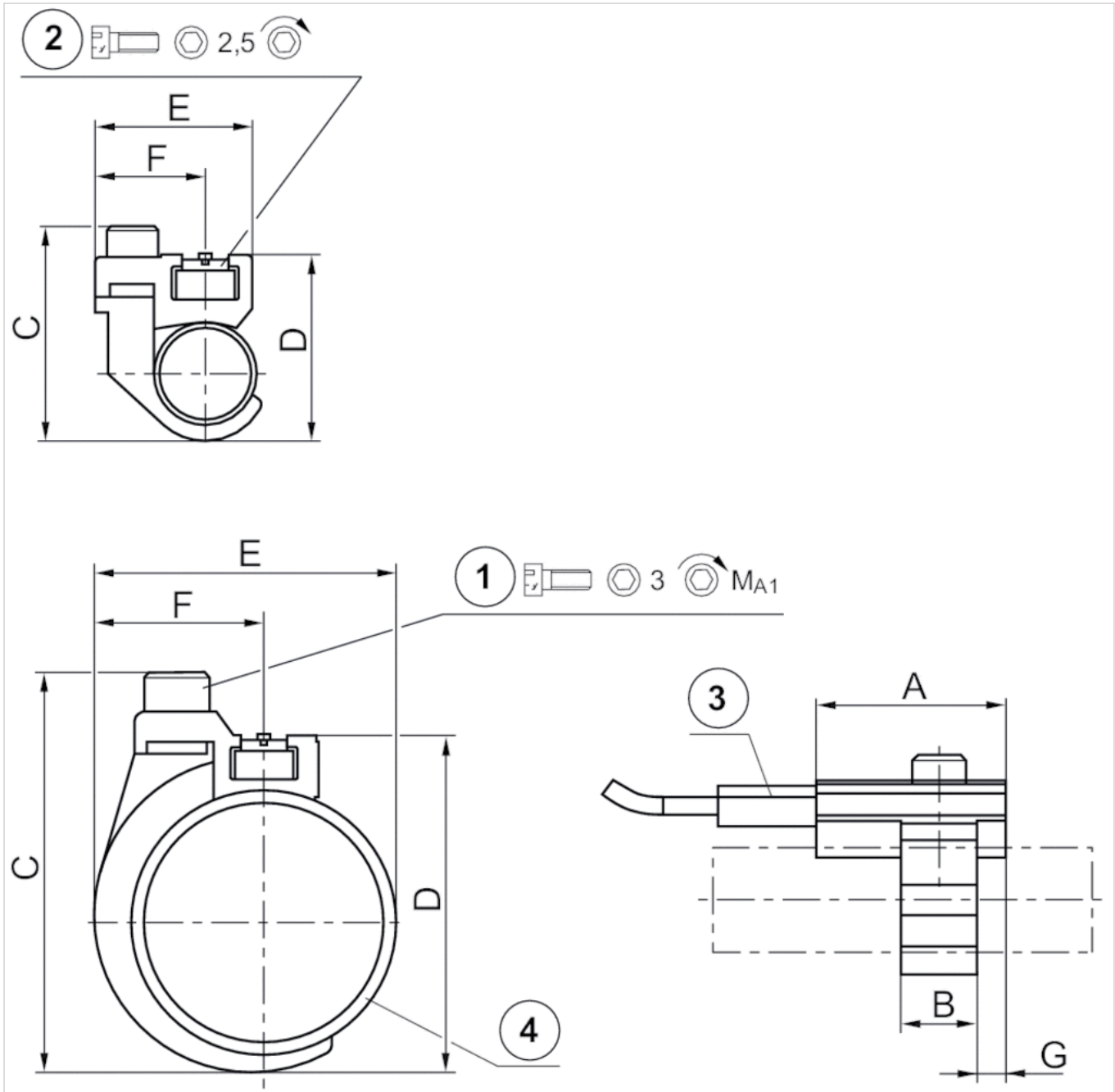
## Technical data

Part No.	Cylinders Ø	for series	Weight
	min.		
1827020296	10 mm	ST6, SM6	0.009 kg
1827020297	12 mm	ST6, SM6	0.01 kg
1827020298	16 mm	ST6, SM6	0.014 kg
1827020299	20 mm	ST6, SM6	0.014 kg
1827020300	25 mm	ST6, SM6	0.015 kg

## Technical information

Material	
	Aluminum

## Dimensions



1) Mounting screw 2) Mounting screw for sensor 3) Sensor 4) Cylinder pipe

## Dimensions

Part No.	A	B	C	D	E	F	G	1)	MA1 [Nm]
1827020296	20	8	24	19	17.5	11.8	3	M3x8	1 +0,2
1827020297	20	8	26	22	19	11.8	3	M3x8	1 +0,2
1827020298	20	12	34	30	23	13.8	4	M4x10	2 +0,3
1827020299	20	12	38	32	26	13.8	4	M4x10	2 +0,3
1827020300	20	12	43	37	31	13.8	4	M4x10	2 +0,3

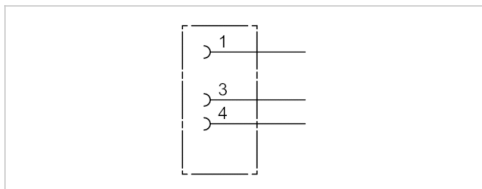


# Round plug connector, Series CON-RD

- 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

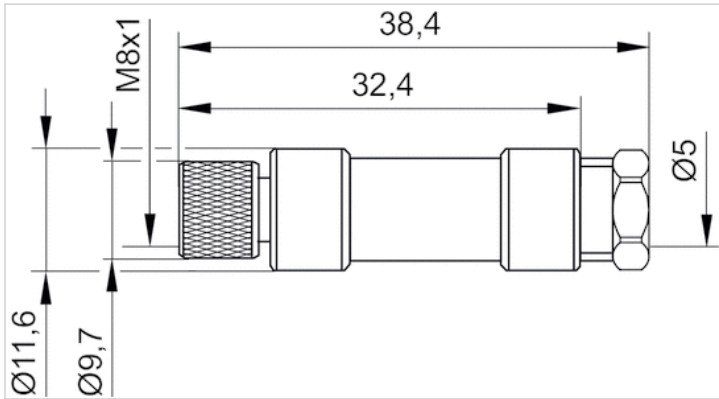
The specified protection class is only valid in assembled and tested state.

## Technical information

Material	
Housing	Polyamide

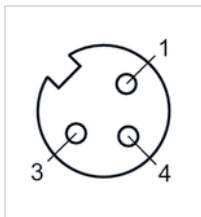
## Dimensions

### Dimensions



## Pin assignments

### Pin assignment, socket

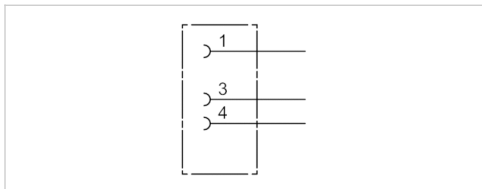


# Round plug connector, Series CON-RD

- 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

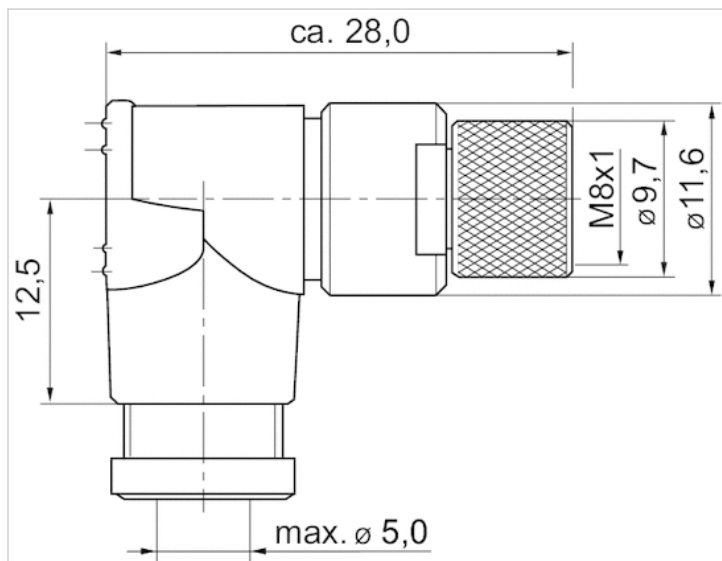
The specified protection class is only valid in assembled and tested state.

## Technical information

Material	
Housing	Polyamide

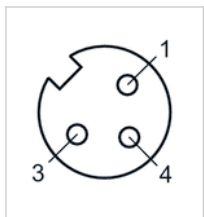
## Dimensions

### Dimensions



## Pin assignments

### Pin assignment, socket

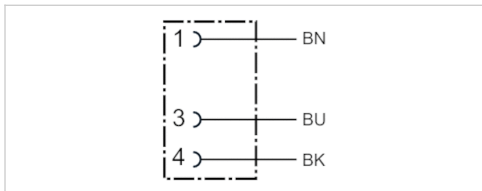


# Round plug connector, Series CON-RD

- 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

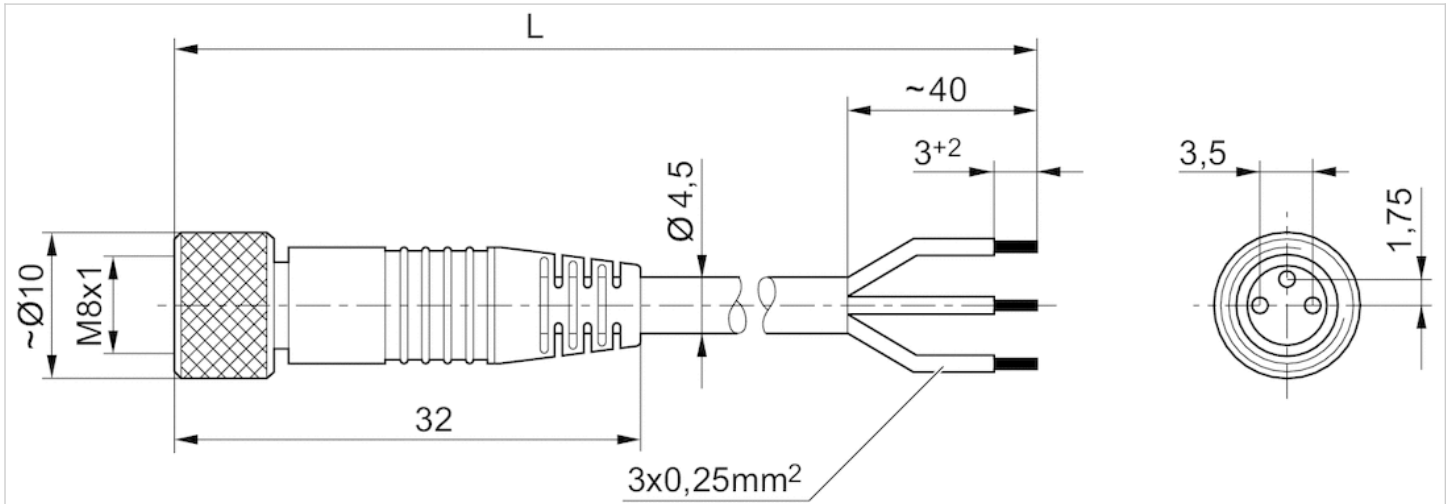
The specified protection class is only valid in assembled and tested state.

## Technical information

Material	
Housing	Polyurethane
Cable sheath	Polyurethane

## Dimensions

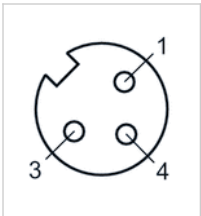
### Dimensions



L = length

## Pin assignments

### Pin assignment, socket



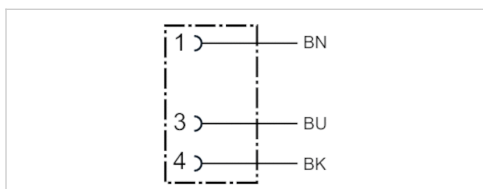
- (1) BN=brown
- (3) BU=blue
- (4) BK=black

# 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

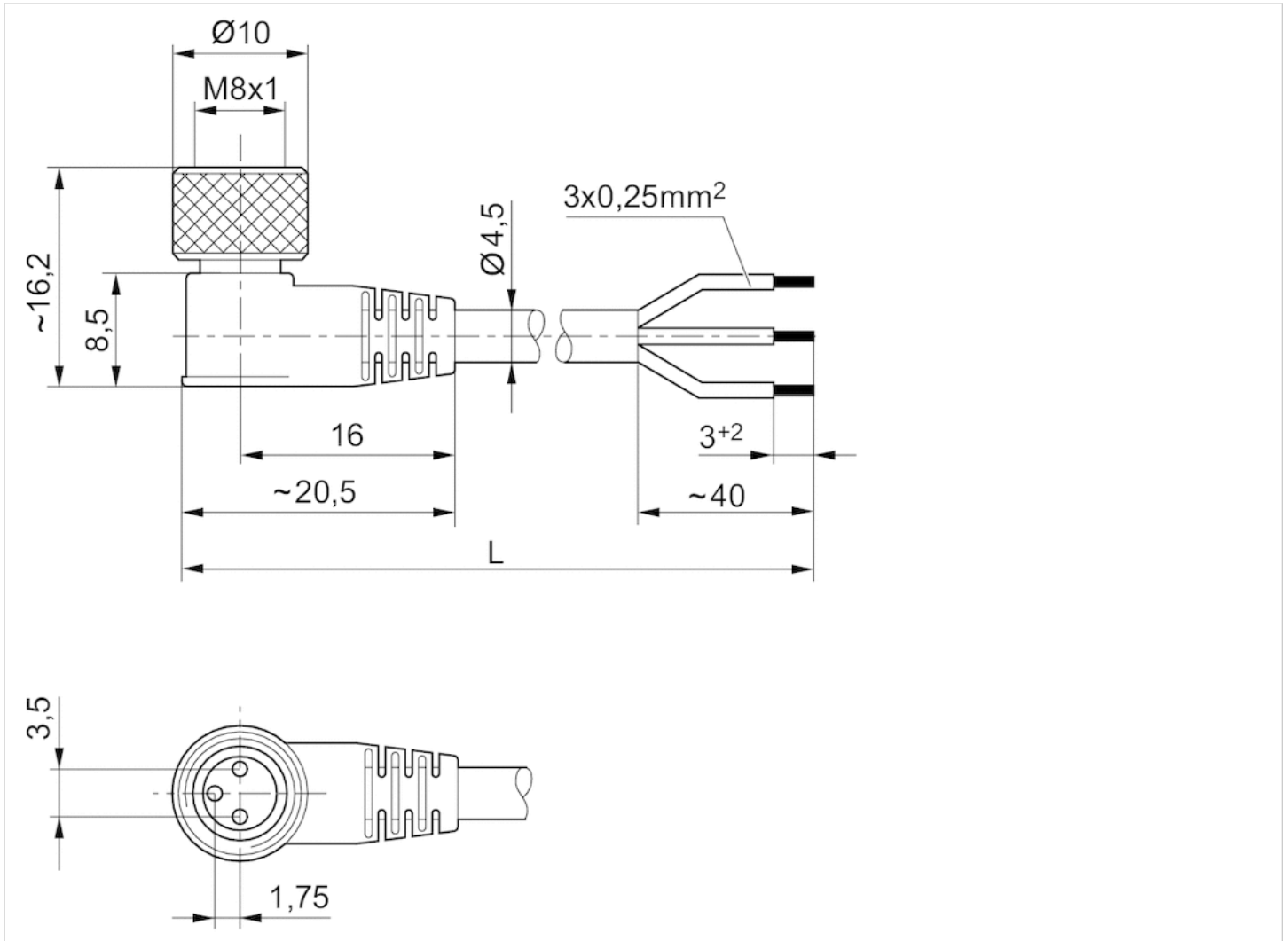
The specified protection class is only valid in assembled and tested state.

## Technical information

Material	
Housing	Polyurethane
Cable sheath	Polyurethane

## Dimensions

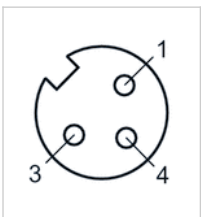
### Dimensions



L = length

## Pin assignments

### Pin assignment, socket



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

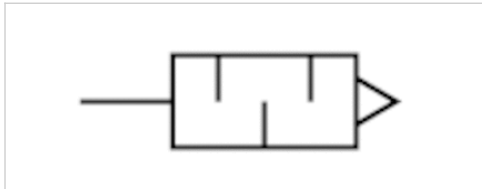


# Silencers, series SI1

- M5
- Sintered bronze



Working pressure min./max.	0 ... 10 bar
Ambient temperature min./max.	-25 ... 80 °C
Medium	Compressed air
Sound pressure level	72 dB
Weight	0.004 kg
Comment	Flow characteristic curves can be found under "Diagrams".



## Technical data

Part No.	Compressed air connection	Flow	Delivery unit
		Qn	
1827000006	M5	398 l/min	10 piece

Weight per piece

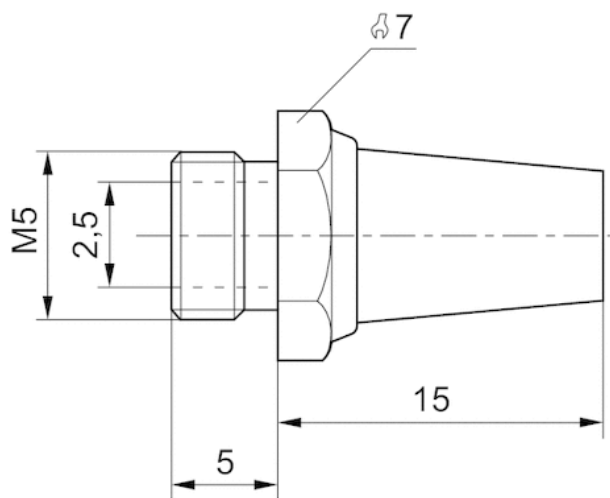
Nominal flow Qn at p1 = 6 bar (absolute) freely discharged. Sound pressure level measured at 6 bar against atmosphere at 1 m distance.

## Technical information

Material	
Silencer	Sintered bronze
Thread	Brass

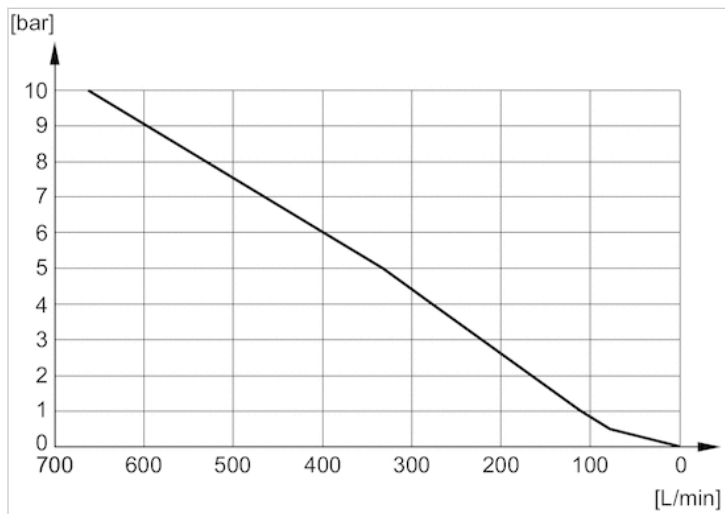
## Dimensions

### Dimensions in mm



## Diagrams

### Flow diagram, 1827000006

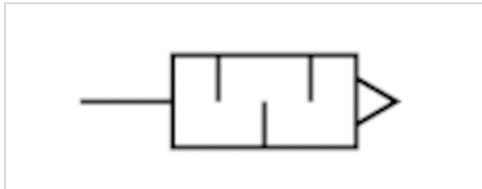


# Silencers, series SI1

- 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

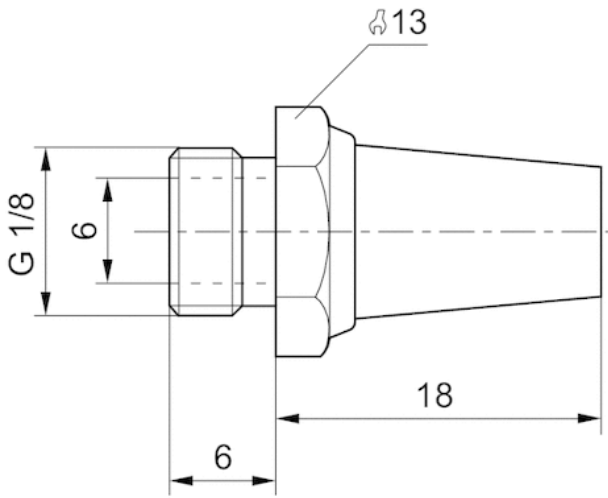
Nominal flow Qn at p1 = 6 bar (absolute) freely discharged. Sound pressure level measured at 6 bar against atmosphere at 1 m distance.

## Technical information

Material	
Silencer	Sintered bronze
Thread	Brass

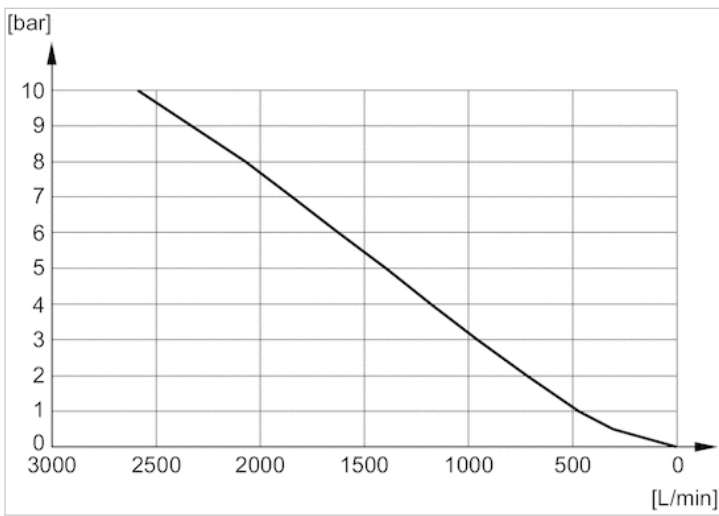
## Dimensions

### Dimensions in mm



## Diagrams

### Flow diagram, 1827000000

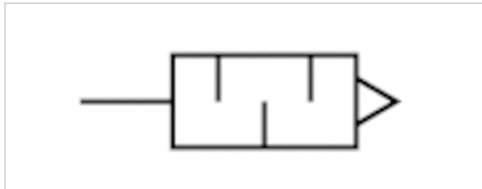


# Silencers, series SI1

- M5 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	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		
1827000032	M5	79 dB	252 l/min	10 piece	0.005 kg
1827000031	G 1/8	85 dB	700 l/min	10 piece	0.001 kg

Weight per piece

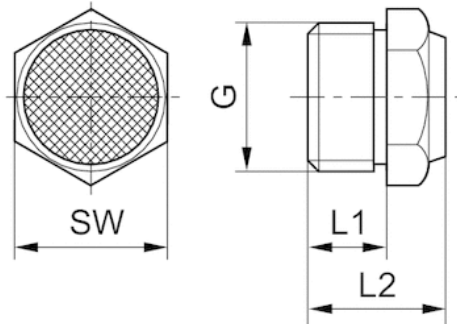
Nominal flow Qn at p1 = 6 bar (absolute) freely discharged. Sound pressure level measured at 6 bar against atmosphere at 1 m distance.

## Technical information

Material	
Silencer	Sintered bronze
Thread	Brass

## Dimensions

### Dimensions



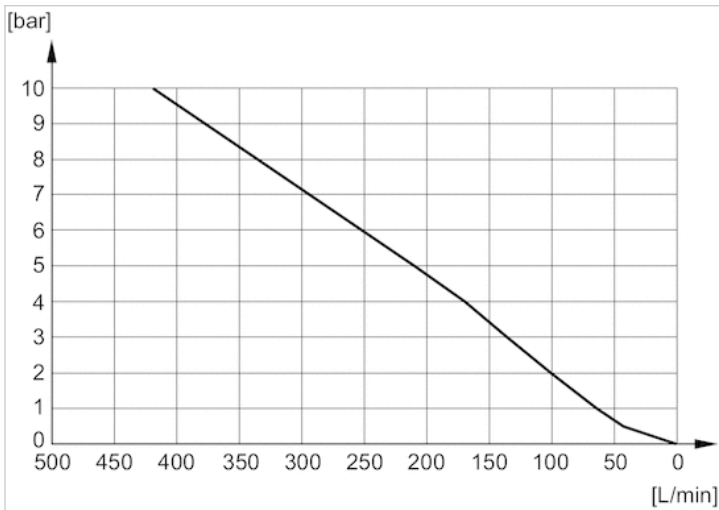
## Dimensions

Part No.	Port G	L1	L2	SW
1827000032	M5	5	10.3	7
1827000031	G 1/8	6	11.5	13

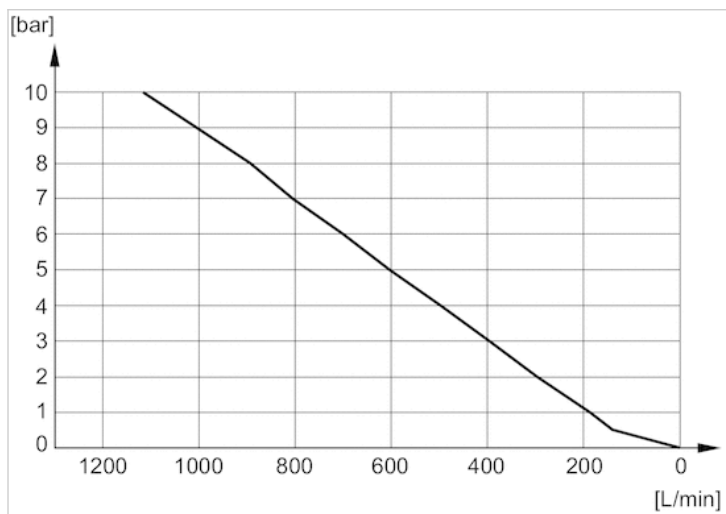
Sound pressure level measured at 6 bar at 1 m distance

## Diagrams

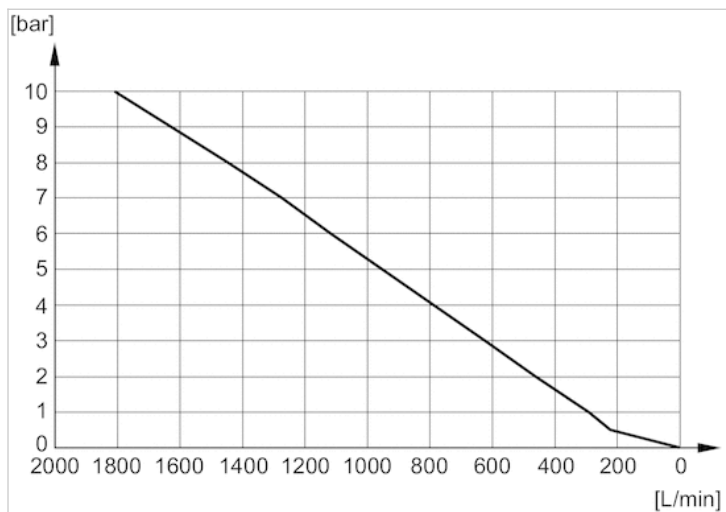
### Flow diagram, 1827000032



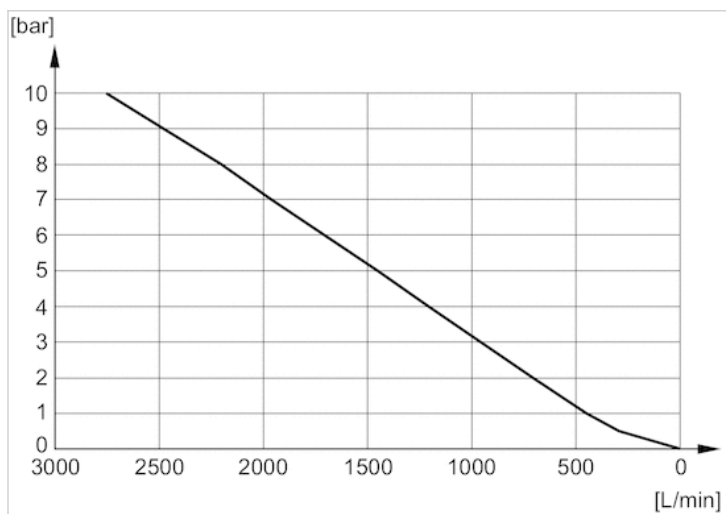
Flow diagram, 1827000031



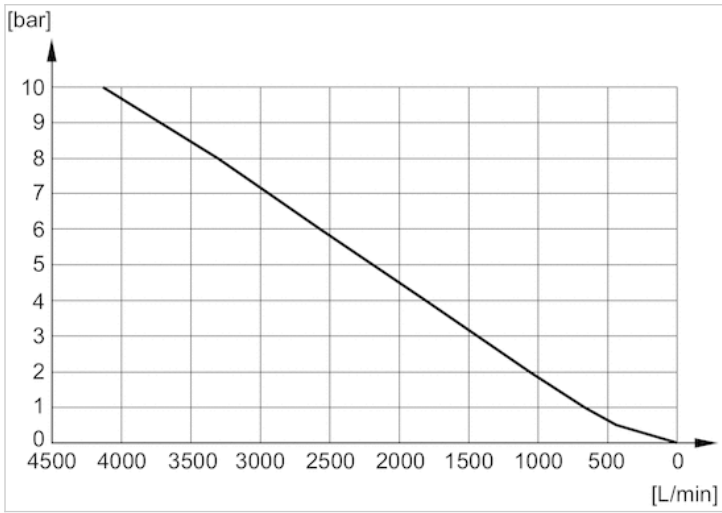
Flow diagram, 1827000033



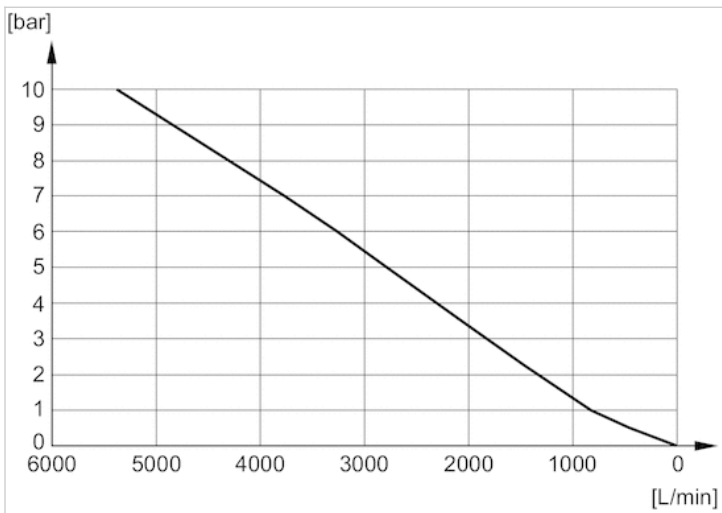
Flow diagram, 1827000034



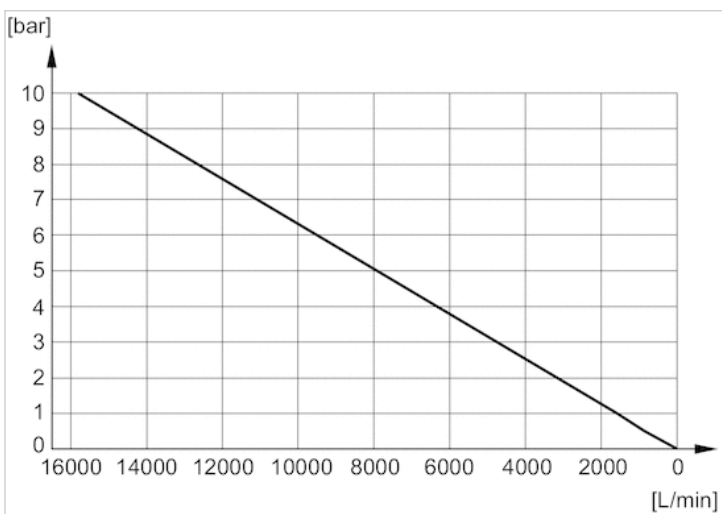
Flow diagram, 1827000035



Flow diagram, 8145003400



Flow diagram, 8145001000





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