Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Vortex Flow Meter Compact

for low viscous liquids

measuring • monitoring • analysing

DVZ

IO-Link

U-PACE

C US

IEC IECEE

- Measuring range water: 0.5 - 4.5 ... 10 - 100 l/min
- Accuracy: ±2.5 % of full scale
- p_{max}: 20 bar; t_{max}: 80 °C
- Connections: G ¼ ... G 1, ¼" NPT ... 1" NPT
- Connection material: brass or stainless steel
- Switching output, frequency output, analogue output, compact electronics with digital display
- Additional for U-PACE: temperature measurement, IO-Link

S5

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KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.
Head Office:
+49(0)6192 299-0
+49(0)6192 23398
info.de@kobold.com
www.kobold.com

1/05 - 2026

DVZ-...S300

DVZ-...F300
DVZ-...L303
DVZ-...L343

DVZ-...L443

DVZ-...L443
(usage with AUF-3000)

DVZ-...C3T0...

Description

The compact KOBOLD Vortex flow meter Model DVZ is used for measuring and monitoring smaller and medium-sized flow of low viscosity, water-like liquids in pipes. The device works using the vortex principle, making it virtually maintenance free. This involves the installation of a sharp-edged object (the vortex generator) in the flow duct. Vortices are created behind the object whose frequency is proportional to the velocity of flow of the liquid. The flow volume can be determined with a very great degree of accuracy by measuring the vortex frequency. This achieves a very high linearity over the whole measuring range.

The devices can be equipped with a switching output, a frequency output or an analogue output. In addition, a universal U-PACE electronics (Universal Precision and Control Electronics, order code C3T0) is available and features two outputs arbitrarily configurable by the customer.

The compact electronics offers various diagnostic functions and the following features:

- Flow- and temperature measurement
- Monitoring, dosing and transmitter function
- Dosing function with external control input
- Coloured, multi-parameter configurable TFT-display, rotatable in 90° steps
- Bidirectional measuring
- Intuitive setup menu via 4 optical touch keys
- 2 configurable outputs (pulse-/frequency-/alarm- and analogue output)
- Grand and resettable totaliser
- IO link function

- The U-PACE electronics have CSA approval for ordinary locations (Ordloc).
- International IECEE Certification acc. to CB-Scheme with U-PACE

Areas of Application

- Monitoring the flow of low viscosity liquids
- Measuring of aggressive, high-purity or salty solutions
- Unsuitable for abrasive media or media containing a large proportion of fibres

Technical Details

Measurement process:	vortex principle
Mounting position:	any, flow in direction of arrow
Accuracy:	±2.5 % of full scale*
Repeatability:	±1 % of full scale
Inlet runs:	10 x DN / 2 x DN
Media temperature:	0 ... 80 °C
Ambient temperature:	-10 ... +60 °C
Max. media viscosity:	see table

Measur. range	Measuring range start point [l/min]					Max. viscosity
	1 cSt	1.5 cSt	2 cSt	4 cSt	7 cSt	
04	0.5	1.5	3.0	-	-	2 cST
07	0.8	1.5	3.0	-	-	2 cST
10	1.3	1.3	3.5	-	-	2 cST
16	2.0	2.0	3.5	-	-	4 cST
22	3.2	3.2	3.2	6.0	-	4 cST
32	4.0	4.0	4.0	3.2	12.5	7 cST
40	4.0	4.0	4.0	8.0	15.0	7 cST
50	5.0	5.0	5.0	9.0	16.5	7 cST
63	6.3	6.3	6.3	10.0	18.5	7 cST
80	8.0	8.0	8.0	11.0	20.5	7 cST
99	10.0	10.0	10.0	11.5	23.0	7 cST

When using viscous media the decreased Reynolds number causes a displacement of the measuring range start point to higher values. The measuring range end points values however stays unchanged.

* Reference conditions: Water, 20-30°C, 1-2 bar, counter pressure according to table

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Technical Details (continuation)

Max. pressure

Connection	fixed	rotatable
Standard version	10 bar	20 bar
Reinforced version	20 bar	-

Wetted parts

Sensor housing:	PPS, fibreglass-reinforced
Sensor:	PVDF
Connections:	brass (up to 32 l/min nickel plated, from 40 l/min blank) or stainless steel 1.4404
Bluff body:	PPS, fibreglass-reinforced or oxide ceramic (non-wear version)
Seal:	NBR, EPDM or FPM
Response time:	1 s (at flow changes >10% FS)
Protection:	IP 65
Weight:	depending on version (see table)

DVZ-...S300, DVZ-...S30D

Display:	DUO-LED for switching condition and when range limit is exceeded
Switching output:	relay change over, max.1 A/30 V_{DC} or active 24 V_{DC}, N/C / N/O
Switch point:	10 ... 90 % of full scale in 10 %-steps that can be configured by the customer using a rotary switch
Power supply:	24 V_{DC} ±20 %
Power consumption:	25 mA
Electrical connection:	plug M12 x 1, 5-pin
Measuring range overflow:	flash of the DUO-LED (green/red) from 105 % of full scale

DVZ-...F300, DVZ...F390

Pulse output:	PNP, Open Collector, max. 200 mA
Frequency at FS:	500 Hz (...F300) 50 ... 1000 Hz (...F390)
Power supply:	24 V_{DC} ±20 %
Power consumption:	5 mA
Electrical connection:	plug M12x1
Measuring range overflow:	F_{out} approx. 2 kHz from 105 % of f. s.

DVZ-...L303; DVZ-...L343

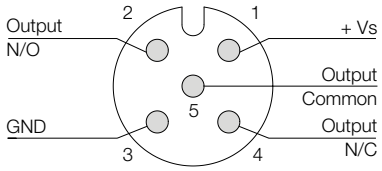
Output:	0(4) ... 20 mA, 3-wire
Max. load:	500 Ω
Power supply:	24 V_{DC} ±20 %
Electrical connection:	plug M12x1
Measuring range overflow:	I_{out} approx. 20.5 mA from approx. 103 % of full scale

DVZ-...L443 (usage with AUF-3000)

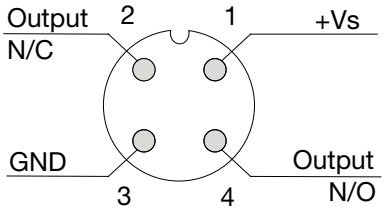
Output:	4 ... 20 mA, 3-wire
Max. load:	500 Ω (250 Ω with AUF-3000)
Power supply:	24 V_{DC} ±20 %
Electrical connection:	plug DIN 43650
Measuring range overflow:	I_{out} approx. 20.5 mA from approx. 103 % of full scale

Electrical Connections

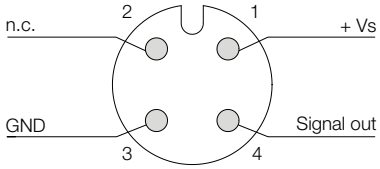
DVZ-...S300



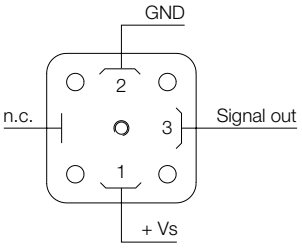
DVZ-...S30D



DVZ-...F300; DVZ-...L3x3



DVZ-...L443



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DVZ-...C3T0 (U-PACE electronics)

Supply voltage:	19 - 30 V_{DC}, internal power consumption max. 200 mA
Display:	TFT display, 128 x 128 pixels, 1.4" display orientation in 90° steps adjustable
Display repetition rate:	0.5 ... 10 s, adjustable
Pulse output	Push-Pull, freely scalable, configurable for partial and accumulated totaliser
Frequency output	Push-Pull, freely scalable, 2 kHz @ overflow f_{min} @ FS = 50 Hz f_{max} @ FS = 1000 Hz
Alarm output:	NPN, PNP, Push-Pull, configurable max. 30 V_{DC}, max. 200 mA short-circuit proof
Analogue output:	active, 3 wire, 0(4)-20 mA, max. load 500 Ω or 0(2)-10 V_{DC}, (R_i = 500 Ω) (factory calibrated with R_L = 1 MΩ)
Control input:	active signal U_{high} max. 30 V_{DC} 0 <Low <10 V_{DC} 15 V_{DC} <High <Vs
Dosing function:	Dosing output OUT2: Push-Pull, High active Control input OUT1: START/STOP 0.5 s <t_{high} <4 s RESET t_{high} >5 s
Temperature measurement:	
Sensor:	digital
Accuracy:	≤±2 °C (depending on ambient temperature; flow >0,2 m/s)
Measuring range:	Medium temperature range
Electrical connection:	plug M12x1, 4-pin
Shock resistance DIN EN 60068-2-27:2010:	20 g (11 ms)
Vibration resistance DIN EN 60068-2-6:2008:	5 g (10 ... 2000 Hz)
Environmental testing DIN EN 60068-2-30:2006:	severity level b
Approval:	for Ordinary Location (Ordloc)

When operated under the CSA Label, the equipments shall be supplied with an external power supply which fulfils the requirements of Cl. 6.3.1, 6.3.2, 9.4 of IEC/CSA/UL 61010-1 and fulfils the requirements of the national authorities.

For example, by the use of a Class 2 Limited Power Source (LPS)

Configuration of outputs

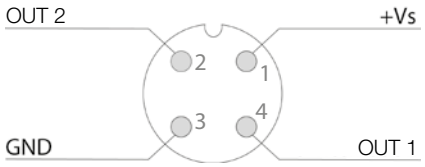
Output 1 (OUT1, PIN 4)	Output 2 (OUT2, PIN 2)
Analogue output 4-20 mA	Analogue output 4-20 mA
Analogue output 0-20 mA	Analogue output 0-20 mA
Analogue output 2-10 V	Analogue output 2-10 V
Analogue output 0-10 V	Analogue output 0-10 V
Switching output NPN/PNP/PP	Switching output NPN/PNP/PP
Pulse output PP	Pulse output PP
Frequency output PP	Frequency output PP
Communication mode KofiCom	
Communication mode IO-Link	
Control input	
Control input dosing function	Dosing output

IO-Link specification

Manufacturer ID:	1105 (decimal), 0 x 0451 (hex)
Manufacturer name:	Kobold Messring GmbH
IO-Link specification:	V1.1
Bitrate:	COM3
Minimal cycle time:	1,1 ms
SIO-Mode:	yes (OUT1 in configuration IO-Link)
Block parameterisation:	yes
Operational readiness:	10 s
Max. cable length:	20 m

Electrical Connections

DVZ-...C3T0



Weight sensor

Measuring range	Size	Connection fixed	Connection reinforced	Connection turnable
up to 32 l/min	¼", ⅜", ½"	approx. 450 g	approx. 600 g	approx. 800 g
up to 32 l/min	¾"	approx. 600 g	approx. 600 g	approx. 900 g
up to 32 l/min	1"	approx. 1050 g	approx. 950 g	approx. 950 g
40...100 l/min	¾"	approx. 1050 g	approx. 1300 g	approx. 1350 g
40...100 l/min	1"	approx. 900 g	approx. 1150 g	approx. 1400 g

Weight electronic

Model	Weight
DVZ-...F3x0 DVZ-...S30x DVZ-...Lxx3	approx. 80 g
DVZ-...C3T0	approx. 300 g

Total weight = weight sensor + weight electronic

Order Details (Example: **DVZ-1 1 04 G2 S300**)

Storage body	Connection/ seal	Measuring range[3]	Connections fixed	Connections rotatable	Electronics
DVZ-1..= PPS **DVZ-2..**= ceramic **DVZ-3..**[1]= PPS/ reinforced version **DVZ-4..** [1] = ceramic/ reinforced version	**..1..**= brass/ NBR **..2..**= st. steel/ NBR **..4..**= brass/ EPDM **..5..**= st. steel/ EPDM **..7..**= brass/ FPM **..8..**= st. steel/ FPM	**..04..** = 0.5-4.5 l/min **..07..** = 0.8-6.5 l/min **..10..** = 1.3-10.0 l/min	**..G2..** = G ¼ **..G3..** = G ⅜ **..G4..** = G ½ **..N2..** = ¼" NPT **..N3..** = ⅜" NPT **..N4..** = ½" NPT	**..B2..** = G ¼ **..B3..** = G ⅜ **..B4..** = G ½ **..P2..** = ¼" NPT **..P3..** = ⅜" NPT **..P4..**= ½" NPT	**Switching output** **..S300** = M12-plug, relay **..S30D** = active 24 V_{DC}, M12-plug **Frequency output** **..F300** = M12-plug, 500 Hz **..F390** = M12-plug, 50...1000 Hz **Analogue output** **..L303** = M12-plug, 0-20 mA **..L343** = M12-plug, 4-20 mA **..L443** = DIN-plug, 4-20 mA **U-PACE electronics** **..C3T0**[2] = compact, TFT display, 2 outputs (current/voltage/pulse/frequency/ alarm output/IO-link configurable), M12x1 plug, with cCSAus and IECEE CB-Scheme Approval
		..16.. = 2.0-16.0 l/min	**..G3..** = G ⅜ **..G4..** = G ½ **..G5..** = G ¾ **..N3..** = ⅜" NPT **..N4..** = ½" NPT **..N5..** = ¾" NPT	**..B3..** = G ⅜ **..B4..** = G ½ **..B5..** = G ¾ **..P3..** = ⅜" NPT **..P4..** = ½" NPT **..P5..** = ¾" NPT	
		..22..= 3.2-22.0 l/min **..32..**= 4.0-32.0 l/min	**..G4..** = G ½ **..G5..** = G ¾ **..G6..** = G 1 **..N4..** = ½" NPT **..N5..** = ¾" NPT **..N6..** = 1" NPT	**..B4..** = G ½ **..B5..** = G ¾ **..B6..** = G 1 **..P4..** = ½" NPT **..P5..** = ¾" NPT **..P6..** = 1" NPT	
		..40..= 4.0-40 l/min **..50..**= 5.0-50 l/min **..63..**= 6.5-63 l/min **..80..**= 8.0-80 l/min **..99..**= 10.0-100 l/min	**..G5..** = G ¾ **..G6..** = G 1 **..N5..** = ¾" NPT **..N6..** = 1" NPT	**..B5..** = G ¾ **..B6..** = G 1 **..P5..** = ¾" NPT **..P6..** = 1" NPT	

[1] Reinforced version only in combination with fixed connection
[2] only for DVZ-1/DVZ-3
[3] The flow indication can be reduced to a value of 0 l/min by minimizing the parameter „separation“ (cutoff) in U-PACE electronics. However, the accuracy of the measured value below the measuring range start value is not guaranteed.

Order details Accessory AUF AUF

Model	Description
AUF-3000	Plug-on display, 4 - 20 mA, 3-wire

No responsibility taken for errors;
subject to change without prior notice.

Pressure Loss at Range End Value

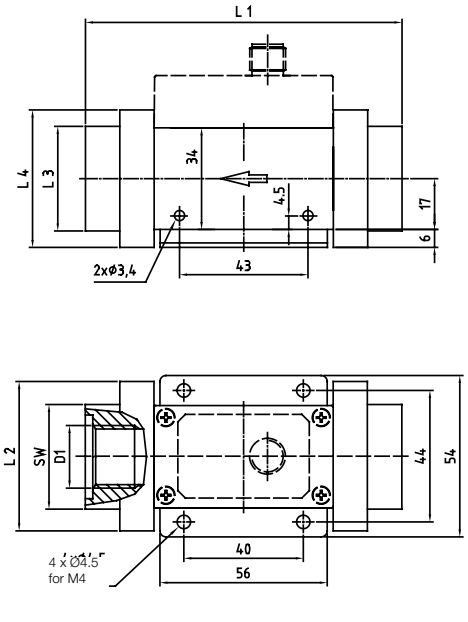
Model	Measuring range end value [l/min]	Pressure loss [mbar]	Min. required backpressure [mbar]*
DVZ- _ _ 04	4.5	420	-
DVZ- _ _ 07	6.5	650	-
DVZ- _ _ 10	10.0	780	-
DVZ- _ _ 16	16.0	600	-
DVZ- _ _ 22	22.0	450	-
DVZ- _ _ 32	32.0	370	-
DVZ- _ _ 40	40.0	450	500
DVZ- _ _ 50	50.0	400	500
DVZ- _ _ 63	63.0	380	900
DVZ- _ _ 80	80.0	400	700
DVZ- _ _ 99	100.0	350	900

* Minimum required backpressure from >80 % FS. to prevent cavitation

Dimensions [mm]

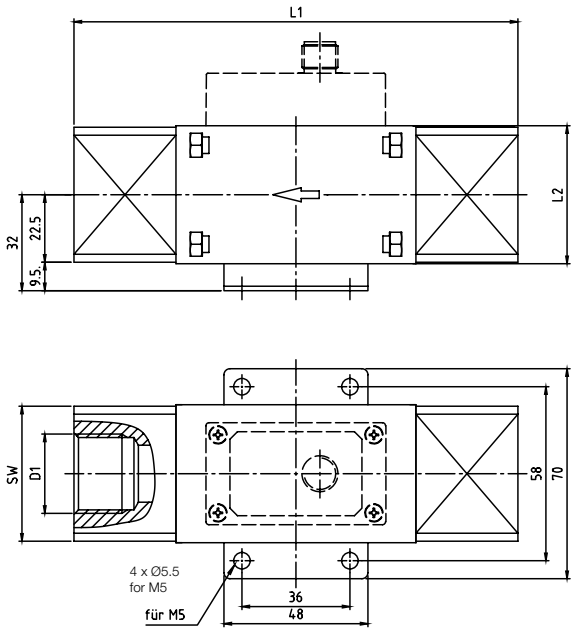
DVZ sensor with fixed connection

Measuring range up to 32 l/min



DVZ sensor with fixed connection

Measuring range from 40 l/min



MB	..04 /..07 /..10	..04 /..07 /..10 /..16	..04 /..07 /..10 /..16 /..22 /..32	..16 /..22 /..32	..22 /..32	..40 -..99	..40 -..99
D1	¼"	⅜"	½"	¾"	1"	¾"	1"
SW	35	35	35	34	-	45	45
L1	100	100	106	120	128	148	148
L2	-	-	-	50	50	46	46
L3	35	35	35	34	-	-	-
L4	-	-	-	-	46	-	-

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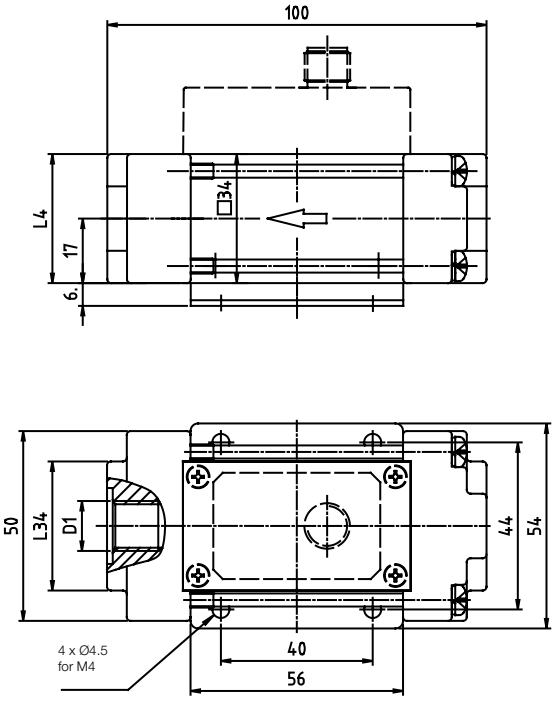
Dimensions [mm] continued

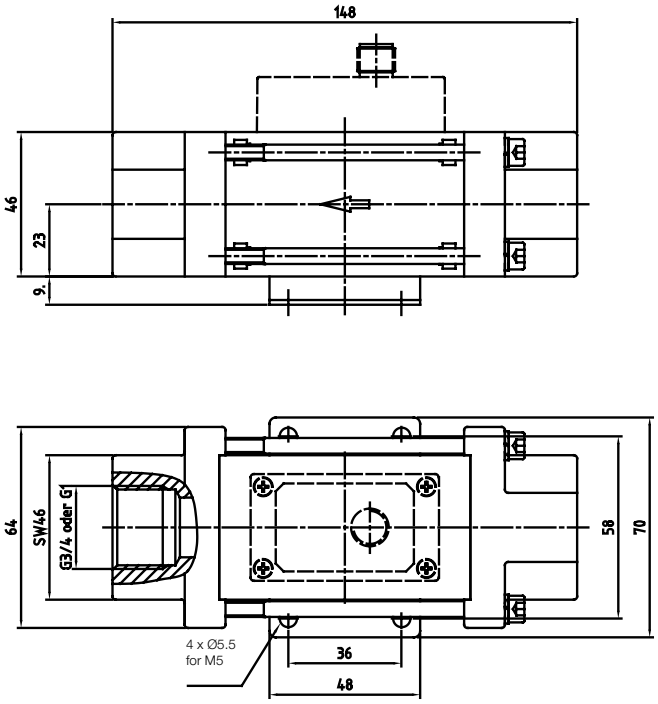
DVZ sensor with reinforced connection

Measuring range up to 32 l/min



DVZ sensor with reinforced connection

Measuring range from 40 l/min



MB	..04 /..07 /..10	..04 /..07 /..10 /..16	..04 /..07 /..10 / ..16 /..22 /..32	..16 /..22 /..32	..22 /..32
D1	¼"	⅜"	½"	¾"	1"
SW	34	34	34	34	-
L1	100	100	106	120	128
L4	34	34	34	34	46

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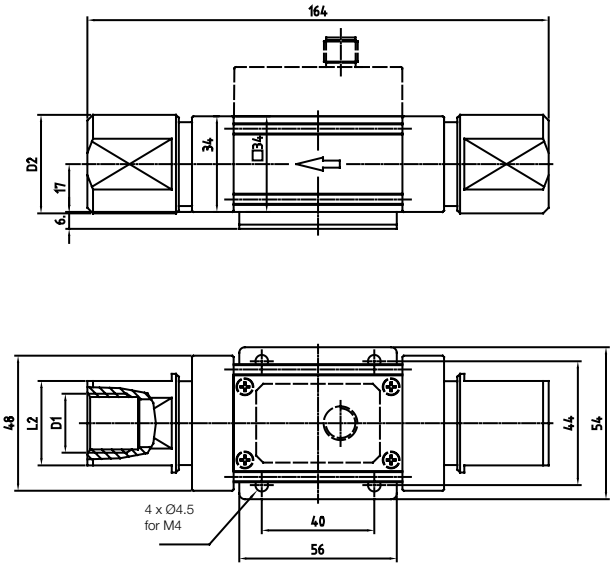
Dimensions [mm] continued

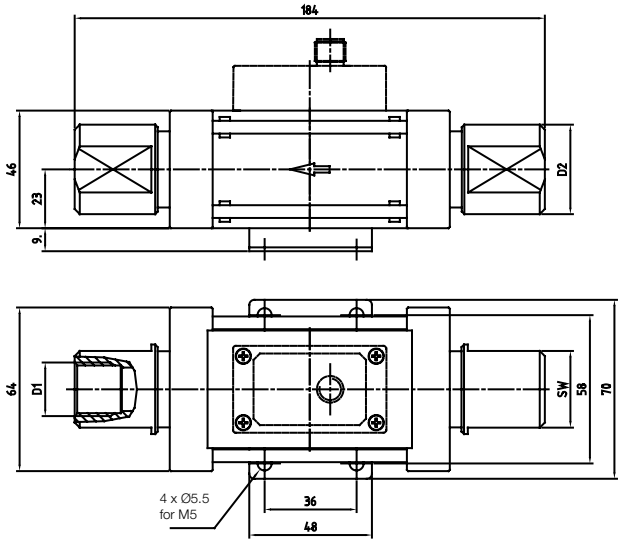
DVZ sensor with turnable connection

Measuring range up to 32 l/min



DVZ sensor with turnable connection

Measuring range from 40 l/min



MB	..04 /..07 /..10	..04 /..07 /..10 /..16	..04 /..07 /..10 / ..16 /..22 /..32	..16 /..22 /..32	..22 /..32	..40 /..50 /..60 /..80 /..99	..40 /..50 /..60 /..80 /..99
D1	¼"	⅜"	½"	¾"	1"	¾"	1"
D2	24	28	35	40	45	40	45
SW	19	24	30	36	41	36	41

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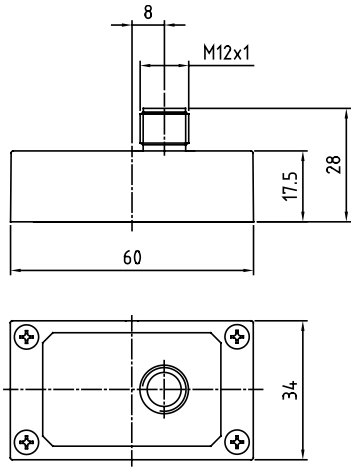
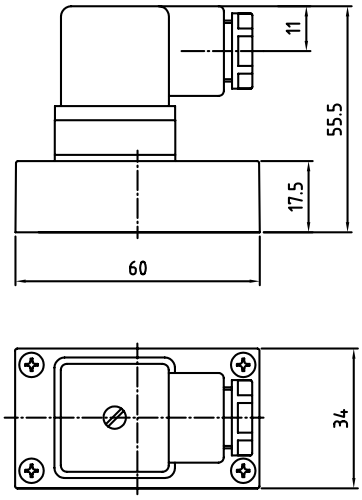
Dimensions [mm] continued

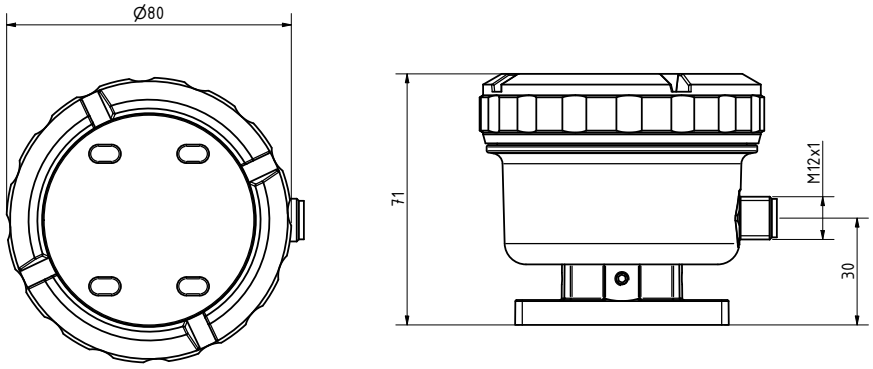
DVZ-…S30x, DVZ-…F3x0, DVZ-…L3x3



DVZ-…L443



DVZ-...C3T0



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