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

Vortex Flowmeter Compact

for low viscous liquids

measuring • monitoring • analysing

DVZ

- Range: 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
- Output: switching output, frequency output, analogue output
- Compact, counter and dosing electronics

S5

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DVZ-...S300

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

DVZ-...L443

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

DVZ-...C3...
(compact electronics)

Description

The compact KOBOLD Vortex flowmeter 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 maintenancefree. 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 device can be fitted with switching, frequency or analogue outputs. There is also an optional compact electronics package that includes a digital display, and both a switching and analogue output.

The dosing and counter electronics is equipped with two switching outputs, one analogue output and a two-lined display.

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.

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)

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Technical Details (continuation)

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 pole
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)

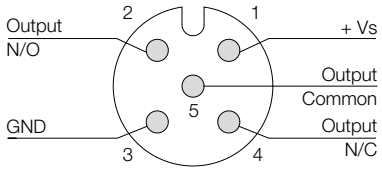
Output:	4 ... 20 mA, 3-wire
Max. load:	500 Ω (250 Ω with AUF-3000)
Power supply:	24 V_{DC} ±20 %
Electrical connection:	plug DIN 43650
Measuring range overflow:	I_{out} approx. 20.5 mA from approx. 103 % of full scale

DVZ-...C3xx (Compact electronics)

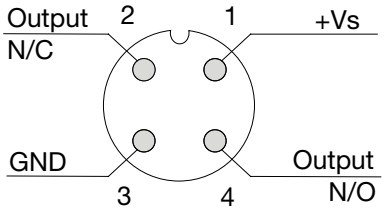
Display:	3-digit LED
Analogue output:	0(4) ... 20 mA adjustable, max. 500 Ω (only for DVZ-...C34)
Switching output:	1 or 2 Open Collector PNP or NPN factory set, max. 300 mA
Contact function:	N/C, N/O, frequency, programmable (frequency output not calibrated at f.s. approx. 500 - 600 Hz)
Programming:	via 2 buttons
Power supply:	24 V_{DC} ±20 %, 3-wire technology
Power consumption:	approx. 100 mA
Electrical connection:	plug M12, 5 pole
Measuring range overflow:	display "OF" from 105 % of full scale

Electrical Connections

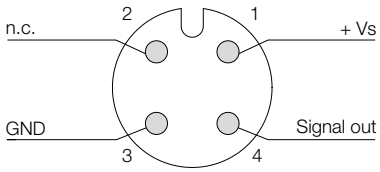
DVZ-...S300



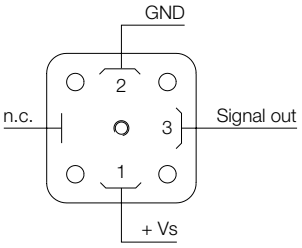
DVZ-...S30D



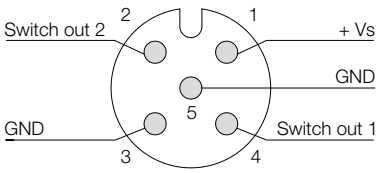
DVZ-...F300; DVZ-...L3x3



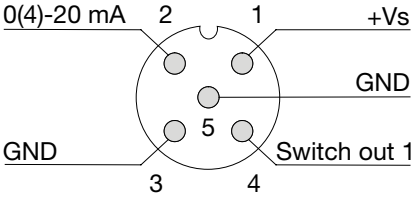
DVZ-...L443



DVZ-...C30x



DVZ-...C34



Technical Details (continuation)

DVZ-...Exxx (Counter electronics)

Display:	LCD, 2 x 8 digit, illuminated total, part and flow quantities, units selectable
Quantity meter:	8-digit
Analogue output:	0(4)...20 mA adjustable
Load:	max. 500 Ω
Switching output:	2 relays, max. 30 $V_{AC/DC}$ / 2 A / 60 VA
Settings:	via 4 buttons
Functions:	reset, MIN /MAX memory, flow monitor, monitoring for part and total quantity, language
Power supply:	24 V_{DC} ±20 %, 3-wire technology
Power consumption:	approx. 150 mA
Electrical connection:	cable connection or M 12-plug

More technical details see data sheet ZED.

DVZ-...Gxxx (Dosing electronics)

Display:	LCD, 2 x 8 digit, illuminated, dosing-, total-, and flow quantity, units selectable
Quantity meter:	8-digit
Dosage:	5-digit
Analogue output:	0(4)...20 mA adjustable
Load:	max. 500 Ω
Switching output:	2 relays, max. 30 $V_{AC/DC}$ / 2 A / 60 VA
Settings:	via 4 buttons
Functions:	dosing (relais S2), start, stop, reset, fine dosing, correction amount, flow switch, total quantity, language
Power supply:	24 V_{DC} ±20 %, 3-wire technology
Power consumption:	approx. 150 mA
Electrical connection:	cable connection or M 12-plug

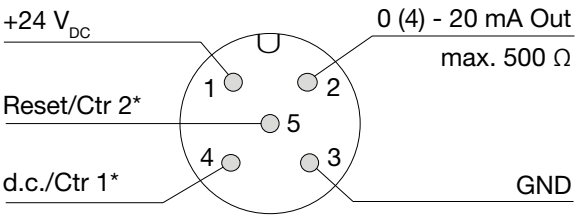
More technical details see data sheet ZED.

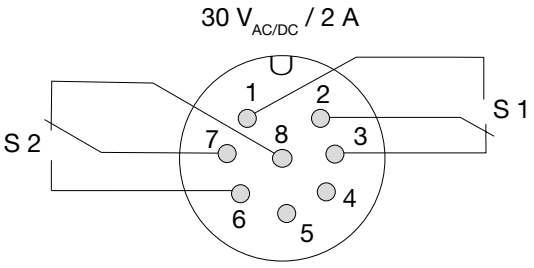
DVZ-...E14R, DVZ-...G14R Cable connection

Wire number	DVZ-...E14R Counter electronics	DVZ-...G14R Dosing electronics
1	+24 V_{DC}	+24 V_{DC}
2	GND	GND
3	4-20 mA	4-20 mA
4	GND	GND
5	n.c.	Control 1*
6	reset part quantity	Control 2*
7	relay S1 open without current	relay S1 open without current
8		
9	relay S2 open without current	relay S2 open without current
10		

Control 1 <-> GND: Start-dosing
Control 2 <-> GND: Stop-dosing
Control 1 <-> Control 2 <-> GND: Reset-dosing

Plug connection





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-…C3xx	approx. 300 g
DVZ-…Exxx DVZ-…Gxxx	approx. 250 g

Total weight = weight sensor + weight electronic

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

Storage body	Connection/ seal	Measuring range	Connections fixed	Connections rotatable	Electronics
DVZ-1..= PPS **DVZ-2..**= ceramic **DVZ-3..***= PPS/ reinforced version **DVZ-4..***= 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 **Compact electronics**** **..C30R** = 2xOpen Coll., PNP **..C30M** = 2xOpen Coll., NPN **..C34P** = 4-20 mA, 1 x Open Coll., PNP **..C34N** = 4-20 mA, 1 x Open Coll., NPN **Counter electronics** **..E14R** = LCD, 0(4)-20 mA, 2 x relays, 1 m cable **..E34R** = LCD, 0(4)-20 mA, 2 x relays, M 12-plug **Dosing electronics** **..G14R** = LCD, 0(4)-20 mA, 2 x relays, 1m cable **..G34R** = LCD, 0(4)-20 mA, 2 x relays, M 12-plug
		..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	

* Reinforced version only in combination with fixed connection

**Please specify flow direction in the order

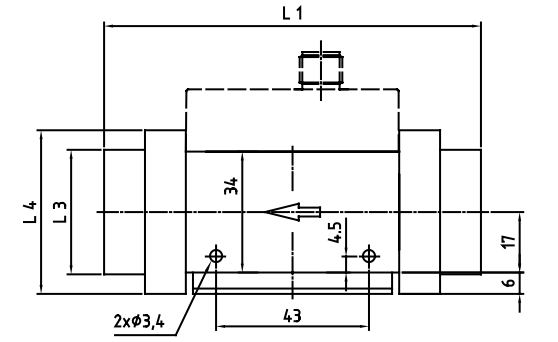
Pressure Loss at Range End Value

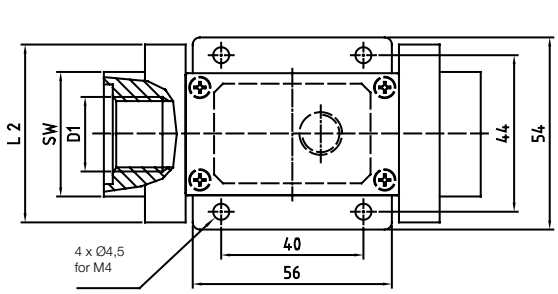
Model	Measuring range end value [l/min]	Pressure loss [mbar]
DVZ- _ _ 04	4.5	420
DVZ- _ _ 07	6.5	650
DVZ- _ _ 10	10.0	780
DVZ- _ _ 16	16.0	600
DVZ- _ _ 22	22.0	450
DVZ- _ _ 32	32.0	370
DVZ- _ _ 40	40.0	450
DVZ- _ _ 50	50.0	400
DVZ- _ _ 63	63.0	380
DVZ- _ _ 80	80.0	400
DVZ- _ _ 99	100.0	350

Dimensions [mm]

DVZ sensor with fixed connection

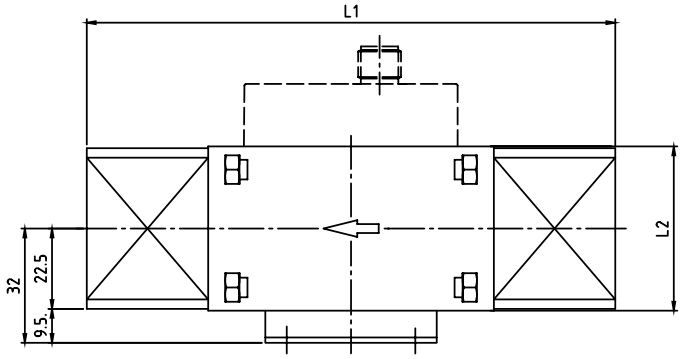
Measuring range up to 32 l/min

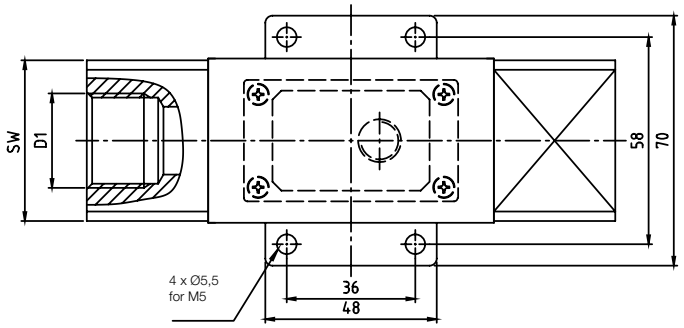




DVZ sensor with fixed connection

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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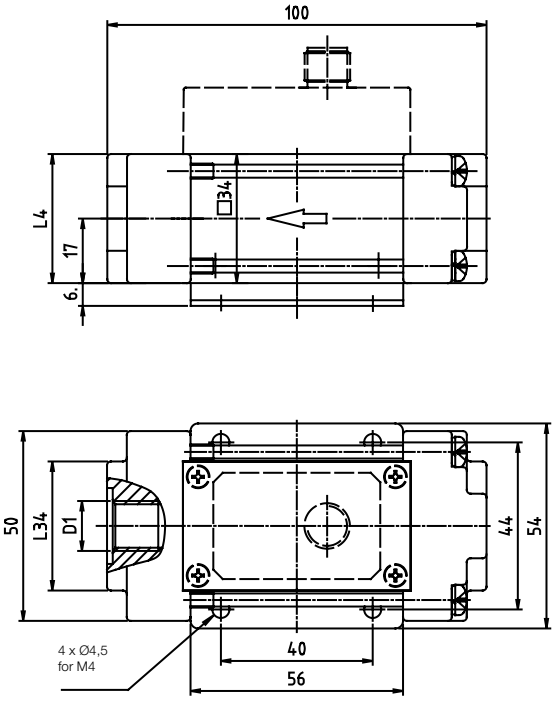
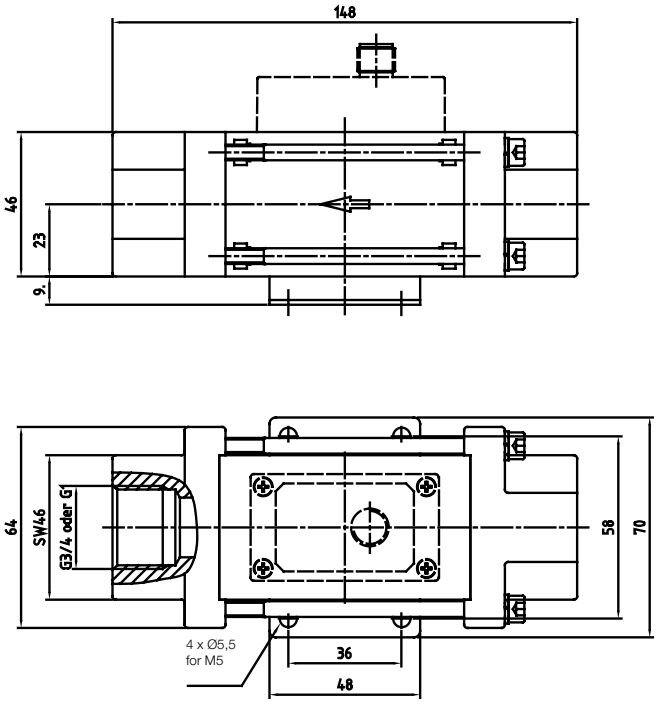
DVZ sensor with reinforced connection

Measuring range up to 32 l/min



DVZ sensor with reinforced connection

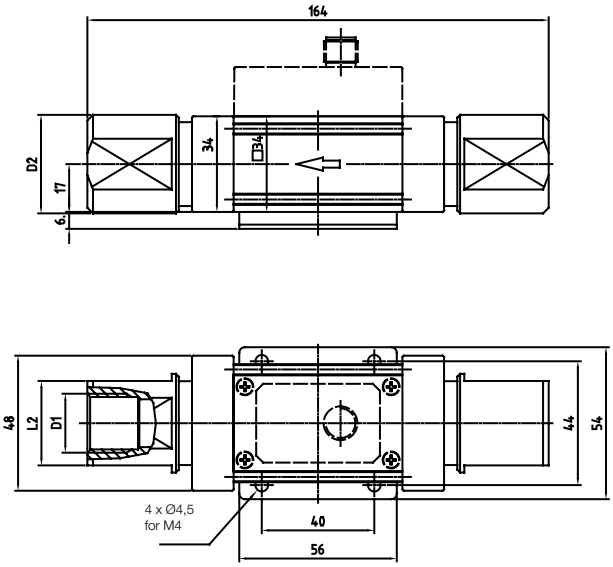
Measuring range from 40 l/min



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

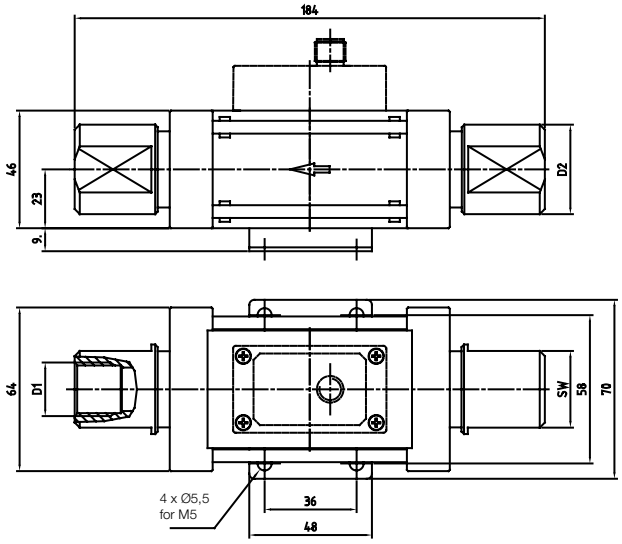
DVZ sensor with turnable connection

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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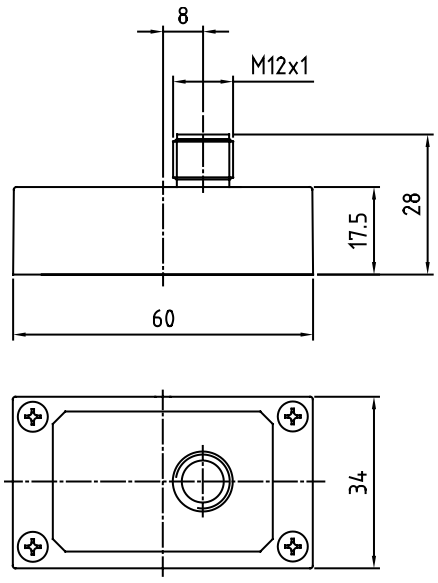
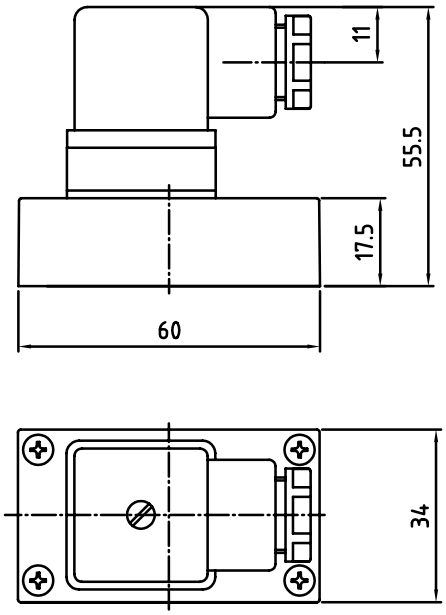
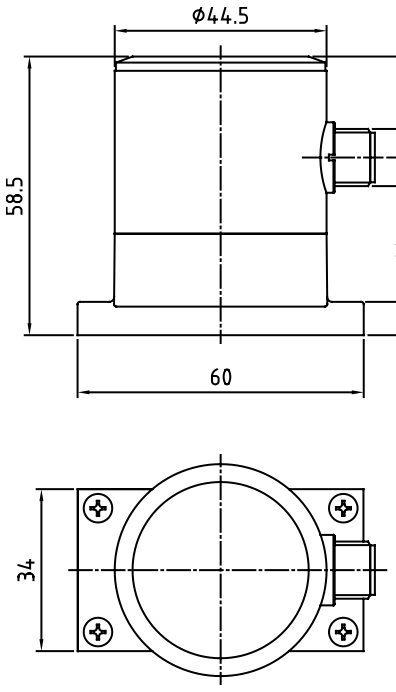
DVZ-…S30x, DVZ-…F3x0, DVZ-…L3x3



DVZ-…L443



DVZ-…C3xx



DVZ-…Exxx, DVZ-…Gxxx