

Compact Vortex Flowmeter for Low Viscosity Liquids



measuring
•
monitoring
•
analyzing

DVZ



- Measuring Ranges:
0.13...1.2 GPM to 2.7...26 GPM
- Accuracy: $\pm 2.5\%$ of Full Scale
- Vortex Shedding Technology with No Moving Parts
- PPS Body with Nickel Plated Brass or 316 SS Fittings
- Outputs: Analog, Frequency, Switching, Electronics with Digital Displays, Batching and Totalizing Electronics
- Economically Priced



KOBOLD companies worldwide:

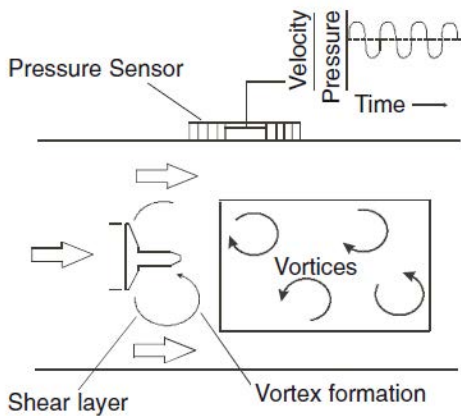
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Description

The KOBOLD DVZ series vortex flowmeters are the perfect solution for applications where reliability and low cost are desired. The DVZ senses the flow rate of low viscosity liquids using the vortex shedding principle. A small obstruction called a bluff body is placed in the flow path. As liquid flows across the bluff body, small low-pressure areas called vortices are created just behind the bluff body. The position of the vortices alternate to either side of the bluff body in a uniform pattern. The frequency of the vorticity shift is directly proportional to flow rate. This shift in the vortices is detected by a very sensitive pressure sensor and processed as a flow rate signal.



The vortex flowmeter has no moving parts and is very reliable. The DVZ series is available with a PPS body and a choice of either nickel-plated brass or 316 stainless steel fittings. The bluff body is available in either PPS or ceramic, which has excellent long term wear characteristics. The available outputs are frequency, 4-20 mA, adjustable relay, and compact electronics with digital flowrate display, 4-20 mA output and adjustable transistor switch options. The DVZ series is rounded off by an optionally available batching or totalizing electronic.

Areas of Application

- Monitoring the Flow of Low Viscosity Liquids
- Measuring Aggressive, High-purity, or Salty Solutions
- Not Suitable for Abrasive Media or Media Containing a Large Amount of Fibers

Specifications

Available Ranges:	0.13...1.2 to 2.7...26 GPM Water
Accuracy:	± 2.5% of Full Scale
Repeatability:	± 1% of Full Scale
Straight Pipe Requirement:	10x Diameter Upstream and 2x Downstream
Oper. Temp. Range:	32...176°F

Maximum Media Viscosity*

Measuring Range Code	Measuring Range Start Point					Max. Viscosity
	1 cSt	1.5 cSt	2 cSt	4 cSt	7 cSt	
..04.. / ..U1..	0.5	1.5	3.0	-	-	2 cSt
..07.. / ..U2..	0.8	1.5	3.0	-	-	2 cSt
..10.. / ..U3..	1.3	1.3	3.5	-	-	2 cSt
..16.. / ..U4..	2.0	2.0	3.5	-	-	4 cSt
..22.. / ..U5..	3.2	3.2	3.2	6.0	-	4 cSt
..32.. / ..U6..	4.0	4.0	4.0	3.2	12.5	7 cSt
..40.. / ..U7..	4.0	4.0	4.0	8.0	15.0	7 cSt
..50.. / ..U8..	5.0	5.0	5.0	9.0	16.5	7 cSt
..63.. / ..U9..	6.3	6.3	6.3	10.0	18.5	7 cSt
..80.. / ..UA..	8.0	8.0	8.0	11.0	20.5	7 cSt
..99.. / ..UB..	10.0	10.0	10.0	11.5	23.0	7 cSt

*When using viscous media, the decreased Reynold's number causes a displacement of the measuring range start point to higher values. The measuring range end point values stay unchanged.

Maximum Pressure

DVZ-1.. & DVZ-2..:	145 PSIG Fixed Fittings
DVZ-1.. & DVZ-2..:	290 PSIG Rotatable Fittings
DVZ-3.. & DVZ-4..:	290 PSIG

Max. Pressure Drop:

3.6 PSI at 100% Rated Flow

Wetted Parts

Sensor Housing:	PPS
Sensing Diaphragm:	PVDF
Bluff Body:	PPS or Ceramic
Seals:	NBR, EPDM, or FKM
Fittings:	Nickel-plated Brass or 316 Stainless Steel



Electrical Specifications

DVZ-..S300, S30D

Power Supply:	24 V _{DC} ± 20%
Switching Output	
DVZ-..S300:	Relay SPDT, Max. 1A, 30 V _{DC}
DVZ-..S30D:	PNP 24 V _{DC} , N/C, N/O
Electrical Connection:	Micro-DC, 4-pin or 5-pin Male
Electrical Protection:	IP 65

DVZ-..F300, F390

Power Supply:	24 V _{DC} ± 20%
Output:	PNP Open Collector, 200 mA Max.
Frequency at F.S.	
DVZ-..F300:	500 Hz
DVZ-..F390:	50...1000 Hz (User Specified)
Electrical Connection:	Micro-DC, 4-pin Male
Electrical Protection:	IP 65

DVZ-..L343, L443

Power Supply:	24 V _{DC} ± 20%
Output:	4-20 mA, 3-wire
Max. Load:	500 Ω
Electrical Connection	
L343:	Micro-DC, 4-pin Male
L443:	DIN 43650 Plug
Electrical Protection:	IP 65

DVZ-..L443 with Optional AUF-3000

Power Supply:	24 V _{DC} ± 20%
Output:	4-20 mA, 3-wire
Max. Load:	250 Ω with AUF-3000
Electrical Connection:	DIN 43650 Plug
Electrical Protection:	IP 65

DVZ-..C30R, C30M

Power Supply:	24 V _{DC} ± 20%
Output	
C30M:	NPN Open Collector Switch (2x)
C30R:	PNP Open Collector Switch (2x)
Switch Ratings:	300 mA Max.
Programming:	Switch Setpoint, Reset Point, Switching Logic, Dampening, Lock Out Code - via 2-button Keypad
Power Consumption:	Approx. 100 mA
Electronic Connection:	Micro-DC, 5-pin, Male
Electronic Protection:	IP 65

DVZ-..C34P, C34N

Power Supply:	24 VDC ± 20%
Output	
C34N:	4-20mA, 3-wire/NPN Open Collector
C30P:	4-20mA, 3-wire/PNP Open Collector 300 mA Max.
Switch Rating:	300 mA Max.
Programming:	Switch Setpoint, Reset Point, Switching Logic, 4-20 mA Span and Zero, Dampening and Lockout Code via 2 Button Keypad
Electronic Connection:	Micro-DC, 5-pin, Male
Electronic Protection:	IP 65

DVZ-..E14R, E34R

Display:	LCD, 2 x 8 Digits, Illuminated Total, Part and Flow Quantities, Unit Selectable
Totalizer Display:	8-Digit
Analog Output:	4-20 mA Adjustable
Load:	Max. 500 Ω
Switching Output:	Relay (2x), Max. 30 V, 2 A
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
Power Consumption:	Approx. 150 mA
Electrical Connection	
E14R:	1 meter Integrated Cable
E34R:	Micro-DC, 8-pin & 5-pin, Male

DVZ-..G14R, G34R

Display:	LCD, 2 x 8 Digits, Illuminated, Batching, Total, and Flow Quantity, Unit Selectable
Totalizer Display:	8-Digit
Batcher:	5-Digit
Analog Output:	4-20 mA Adjustable 0-10 VDC (Upon Request)
Load:	Max. 500 Ω
Switching Output:	Relay (2x), Max. 30 V, 2 A
Settings:	Via 4 Buttons
Functions:	Batching (Relay S2), Start, Stop, Reset, Fine Batching, Correction Amount, Flow Switch, Total Quantity, & Language
Power Supply:	24 V _{DC} ± 20 %, 3-wire
Power Consumption:	Approx. 150 mA
Electrical Connection	
G14R:	1 meter Integrated Cable
G34R:	Micro-DC, 8-pin & 5-pin, Male



Compact Vortex Flowmeter Model DVZ

Order Details (Example: DVZ-34U6N5L343 with Accessory 807.037)

Housing/Bluff Body	Fitting/Seals	Flow Ranges	Connections		Output
			Fixed	Rotatable	
DVZ-1.. = PPS/PPS DVZ-2.. = PPS/Ceramic DVZ-3.. = PPS/PPS, Reinforced Design ** DVZ-4.. = PPS/Ceramic, Reinforced Design **	..1.. = Brass/NBR	..04.. = 0.5...4.5 LPM ..07.. = 0.8...6.5 LPM ..10.. = 1.3...10 LPM ..U1.. = 0.13...1.2 GPM ..U2.. = 0.2...1.7 GPM ..U3.. = 0.4...2.6 GPM	..G2.. = G 1/4 ..G3.. = G 3/8 ..G4.. = G 1/2 ..N2.. = 1/4" NPT ..N3.. = 3/8" NPT ..N4.. = 1/2" NPT	..B2.. = G 1/4 ..B3.. = G 3/8 ..B4.. = G 1/2 ..P2.. = 1/4" NPT ..P3.. = 3/8" NPT ..P4.. = 1/2" NPT	Switching Output ..S300 = Relay, M12-plug ..S30D = PNP 24 V _{DC} , M12-plug Frequency Output ..F300 = M12-plug, 500 Hz ..F390 = M12-plug, 50...1000 Hz * Analog Output ..L343 = M12-plug, 4-20 mA ..L443 = DIN-plug, 4-20 mA Compact Electronics*** ..C30R = Open Coll., PNP (2x) ..C30M = Open Coll., NPN (2x) ..C34P = 4-20 mA, Open Coll., PNP ..C34N = 4-20 mA, Open Coll., NPN Totalizer Electronics ..E14R = LCD, 4-20 mA, Relay (2x), 1 m Cable ..E34R = LCD, 4-20 mA, Relay (2x), M12 (2x) Batching Electronics ..G14R = LCD, 4-20 mA, Relay (2x), 1 m Cable ..G34R = LCD, 4-20 mA, Relay (2x), M12 (2x)
	..2.. = SS/NBR	..16... = 2.0...16 LPM ..U4.. = 0.6...4.2 GPM	..G3.. = G 3/8 ..G4.. = G 1/2 ..G5.. = G 3/4 ..N3.. = 3/8" NPT ..N4.. = 1/2" NPT ..N5.. = 3/4" NPT	..B3.. = G 3/8 ..B4.. = G 1/2 ..B5.. = G 3/4 ..P3.. = 3/8" NPT ..P4.. = 1/2" NPT ..P5.. = 3/4" NPT	
	..4.. = Brass/EPDM ..5.. = SS/EPDM	..22.. = 3.2...22 LPM ..32.. = 4.0...32 LPM ..U5.. = 0.9...5.8 GPM ..U6.. = 1.1...8.5 GPM	..G4.. = G 1/2 ..G5.. = G 3/4 ..G6.. = G 1 ..N4.. = 1/2" NPT ..N5.. = 3/4" NPT ..N6.. = 1" NPT	..B4.. = G 1/2 ..B5.. = G 3/4 ..B6.. = G 1 ..P4.. = 1/2" NPT ..P5.. = 3/4" NPT ..P6.. = 1" NPT	
	..7.. = Brass/FKM ..8.. = SS/FKM	..40.. = 4...40 LPM ..50.. = 5...50 LPM ..63.. = 6.5...63 LPM ..80.. = 8...80 LPM ..99.. = 10...100 LPM ..U7.. = 1.1...10.5 GPM ..U8.. = 1.3...13 GPM ..U9.. = 1.7...16 GPM ..UA.. = 2.1...21 GPM ..UB.. = 2.7...26 GPM	..G5.. = G 3/4 ..G6.. = G 1 ..N5.. = 3/4" NPT ..N6.. = 1" NPT	..B5.. = G 3/4 ..B6.. = G 1 ..P5.. = 3/4" NPT ..P6.. = 1" NPT	

Accessories: 807.037 = Mating 4-Pin Micro-DC Plug with 6 foot Cable for Output F300, F390, S30D & L343
 807.007 = Mating 5-pin Micro-DC Plug with 6 foot Cable for Output C30M, C30R, C34N, C34P, S300, E34R, & G34R
 807.087 = Mating 8-pin Micro-DC Plug with 6 foot Cable for Output E34R & G34R

*Please specify frequency out at max. flow when ordering
 **Reinforced design only available with fixed connections
 ***Please specify flow direction when ordering



DVZ-..S30x
 DVZ-..F3x0
 DVZ-..L3x3



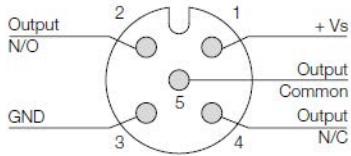
DVZ-..L443
 with AUF-3000



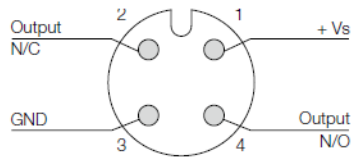
DVZ-..C3xx

Electrical Connections

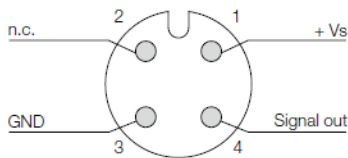
DVZ...S300



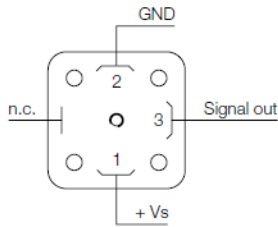
DVZ...S30D



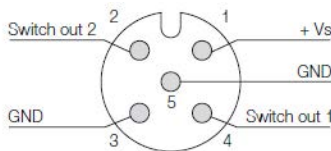
DVZ...F300, F390, L343



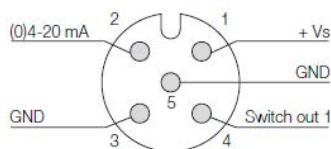
DVZ...L443



DVZ...C30R, C30M



DVZ...C34P, C34N

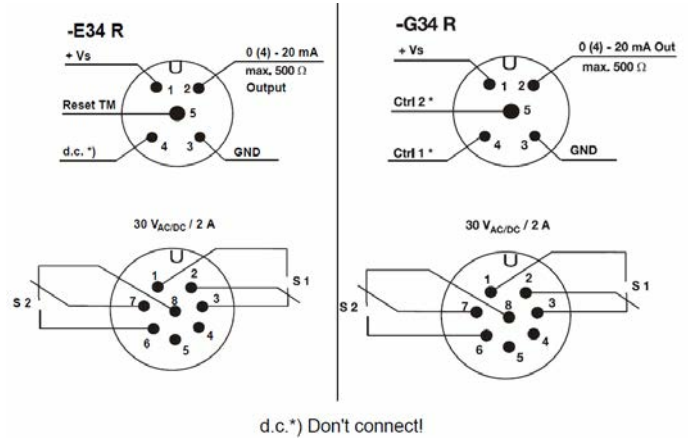


DVZ...E14R, G14R Wire Designations

Wire Number	DVZ...E14R Totalizer	DVZ...G14R Batcher
1	24 VDC	24 VDC
2	GND	GND
3	4-20 mA	4-20 mA
4	n.c.	Control 1*
5	GND	GND
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-Batching
 Control 2 <-> GND: Stop-Batching
 Control 1 <-> Control 2 <-> GND: Reset-Batching

DVZ...E34R, G34R Cable Connections



d.c.*) Don't connect!

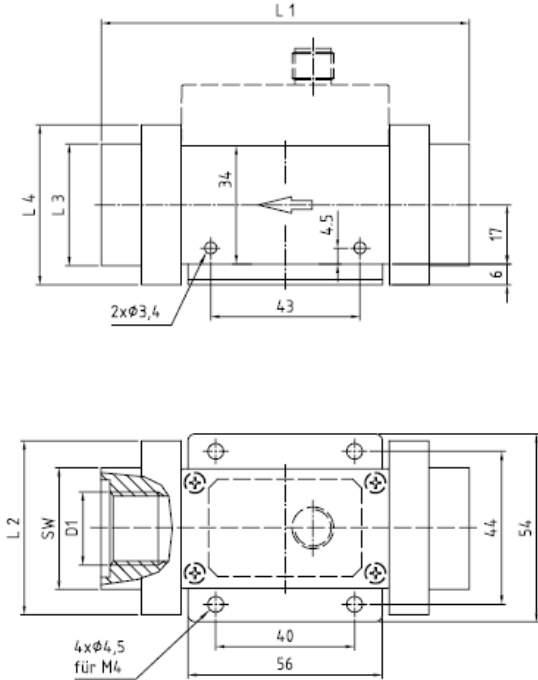
Approximate Weight

Model	Fixed Connections	Rotatable Connections
	1.1 LBS	2.0 LBS
DVZ...34P, C34N, C30M, C30R DVZ...E14R, G14R, E34R, G34R	1.5 LBS	2.5 LBS

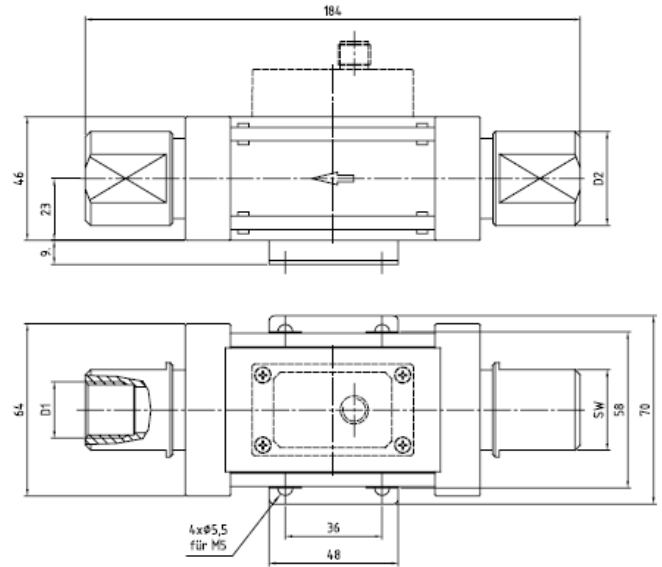


Dimensions (mm)

DVZ Flowmeters with Fixed Connections
Flow Range up to 8.5 GPM



DVZ Flowmeters with Fixed Connections
Flow Range from 10.5 GPM

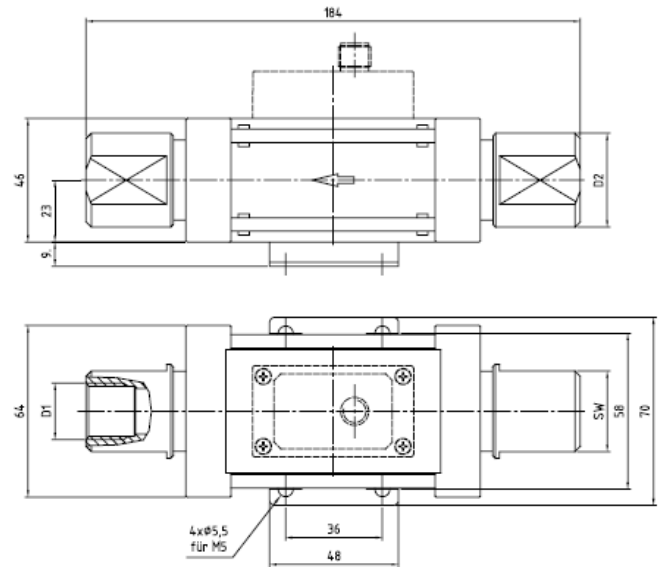
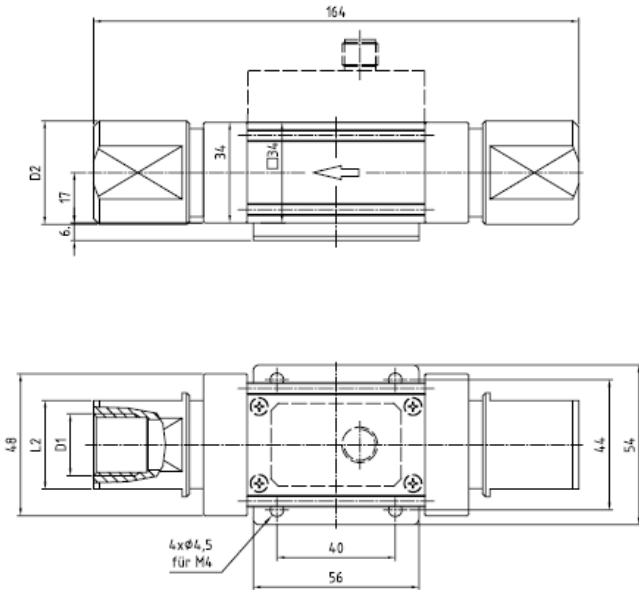


MB	..U1/..U3/..U3	..U1/..U2/ ..U3/..U4	..U1/..U2/..U3/ ..U4/.. U5/..U6	..U4/..U5/..U6	..U5/..U6
D1	1/4"	3/8"	1/2"	3/4"	1"
SW	35 mm	35 mm	35 mm	34 mm	-
L1	100 mm	100 mm	106 mm	120 mm	128 mm
L2	-	-	-	50 mm	50 mm
L3	35 mm	35 mm	35 mm	34 mm	-
L4	-	-	-	-	46 mm

Dimensions (mm)

DVZ Flowmeters with Rotatable Connections
Flow Range up to 8.5 GPM

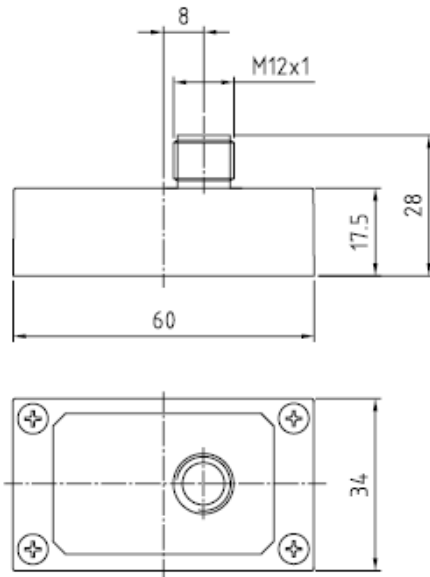
DVZ Flowmeters with Rotatable Connections
Flow Range from 10.5 GPM



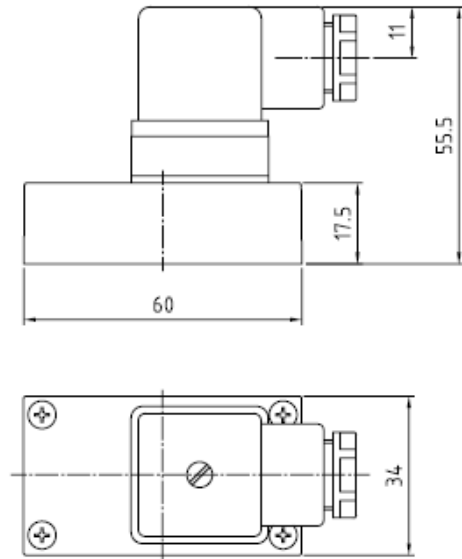
MB	..U1/..U3/..U3	..U1/..U2/..U3/..U4	..U1/..U2/..U3/..U4/..U5/..U6	..U4/..U5/..U6	..U5/..U6	..U7/..U8/..U9/..UA/..UB	..U7/..U8/..U9/..UA/..UB
D1	1/4"	3/8"	1/2"	3/4"	1"	3/4"	1"
D2	24 mm	28 mm	35 mm	40 mm	45 mm	40 mm	45 mm
SW	19 mm	24 mm	30 mm	36 mm	41 mm	36 mm	41 mm

Dimensions: Electronics (mm)

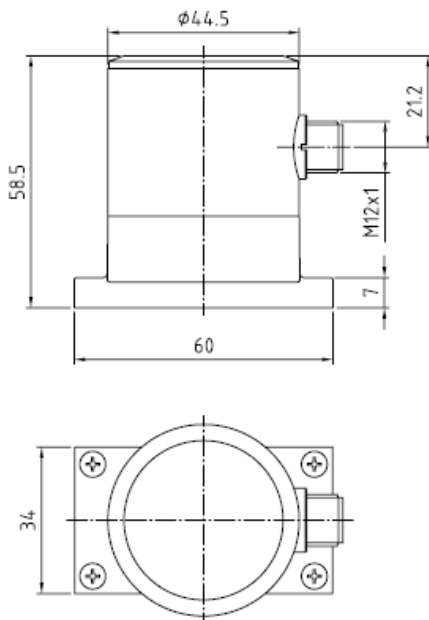
DVZ-..S30x, F3x0, L3x3



DVZ-..L443



DVZ-..C3xx



DVZ-..Ex4R, Gx4R

