

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:

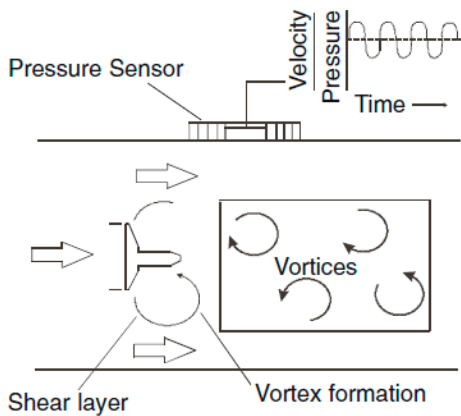
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Description

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 vortex 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 |
| Response time: | ~1 Sec. (at flow changes >10%) |
| Straight Pipe Requirement: | 10x Diameter Upstream and 2x Downstream |
| Media Temp. Range: | 32...176°F |
| Ambient Temp. Range: | 14...140°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 Reynolds number causes a displacement of the measuring range start point to a higher value. The measuring range end point values remain 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



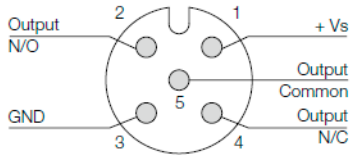
DVZ-..L443
 with AUF-3000



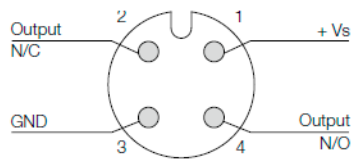
DVZ-..C3xx

Electrical Connections

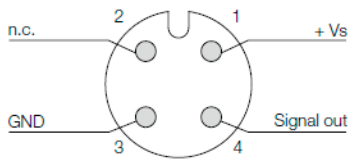
DVZ...S300



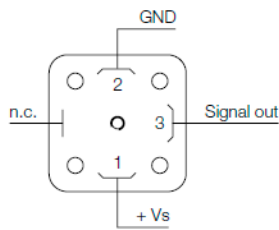
DVZ...S30D



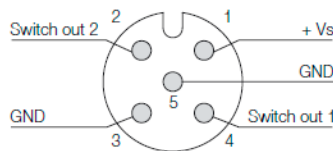
DVZ...F300, F390, L343



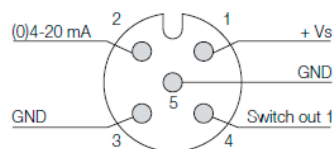
DVZ...L443



DVZ...C30R, C30M



DVZ...C34P, C34N

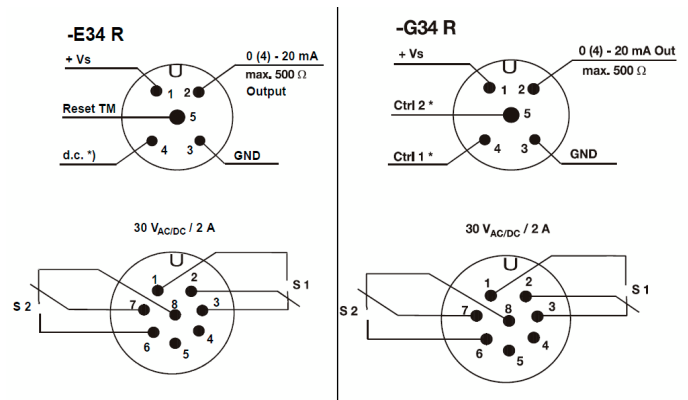


DVZ...E14R, G14R Wire Designations

| 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

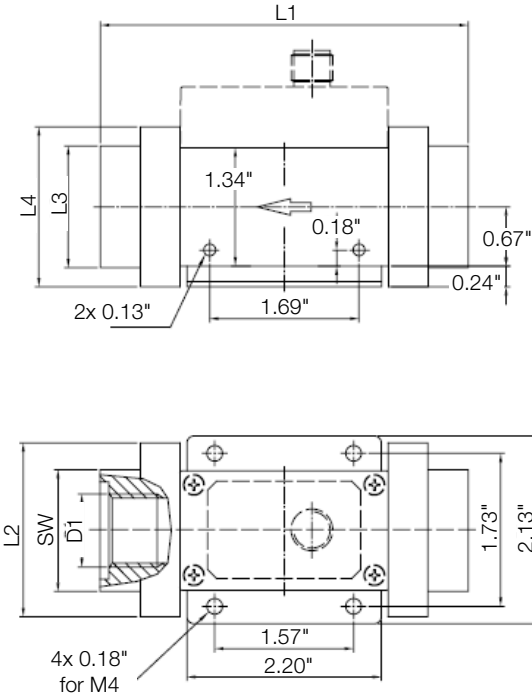
| Model | Fixed Connections | Rotatable Connections |
|---|-------------------|-----------------------|
| | 1.1 LBS | 2.0 LBS |
| DVZ...34P, C34N, C30M, C30R DVZ...E14R, G14R, E34R, G34R | 1.5 LBS | 2.5 LBS |



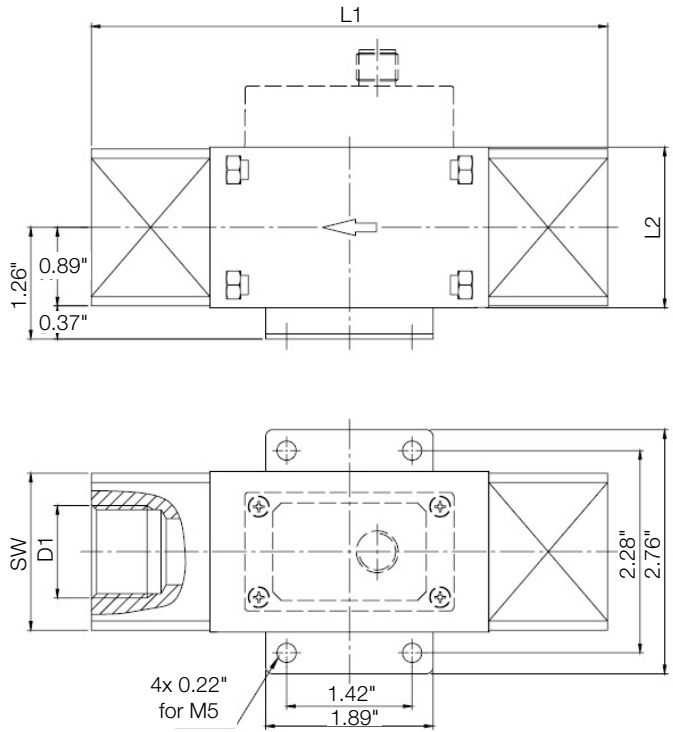
Compact Vortex Flowmeter Model DVZ

Dimensions

DVZ Flowmeters with Fixed Connections
Flow Range up to 8.5 GPM



DVZ Flowmeters with Fixed Connections
Flow Range from 10.5 GPM

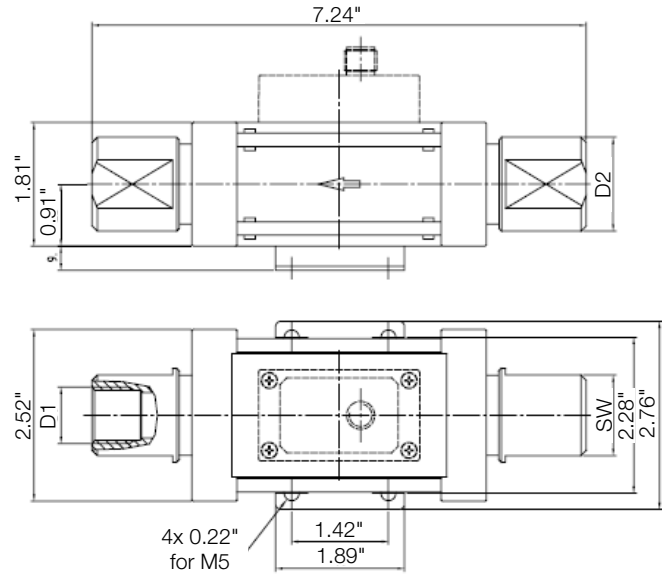
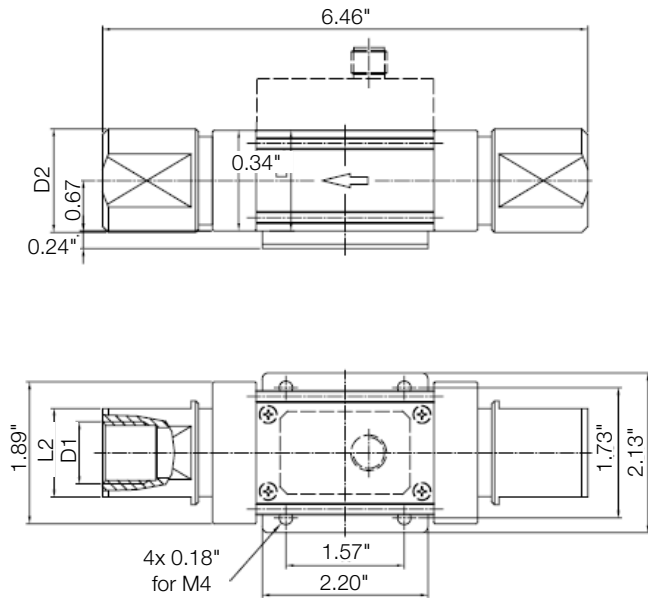


| MB | ..U1/..U2/..U3 | ..U1/..U2/..U3/..U4 | ..U1/..U2/..U3/ ..U4/..U5/..U6 | ..U4/..U5/..U6 | ..U5/..U6 | ..U7/..U8/..U9/..UA/..U9 | ..U7/..U8/..U9/..UA/..U9 |
|----|----------------|---------------------|--------------------------------|----------------|-----------|--------------------------|--------------------------|
| D1 | 1/4" | 3/8" | 1/2" | 3/4" | 1" | 3/4" | 1" |
| SW | 1.38" | 1.38" | 1.38" | 1.34" | - | 1.77" | 1.77" |
| L1 | 3.94" | 3.94" | 4.17" | 4.72" | 5.04" | 5.83" | 5.83" |
| L2 | - | - | - | 1.97" | 1.97" | 1.81" | 1.81" |
| L3 | 1.38" | 1.38" | 1.38" | 1.34" | - | - | - |
| L4 | - | - | - | - | 1.81" | - | - |

Dimensions

DVZ Flowmeters with Rotatable Connections
Flow Range up to 8.5 GPM

DVZ Flowmeters with Rotatable Connections
Flow Range from 10.5 GPM

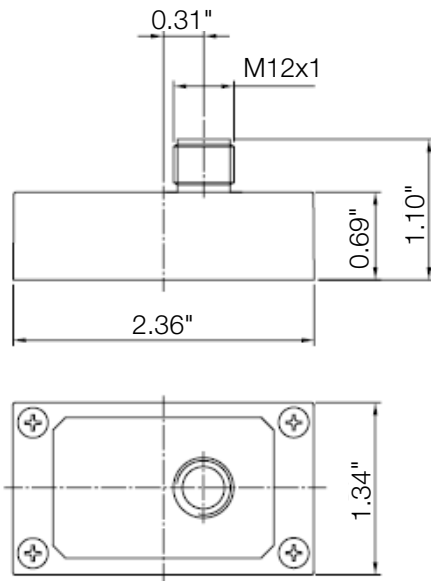


| MB | ..U1/..U3/..U3 | ..U1/..U2/..U3/..U4 | ..U1/..U2/..U3/..U4/..U5/..U6 | ..U4/..U5/..U6 | ..U5/..U6 | ..U7/..U8/..U9/..UA/..UB | ..U7/..U8/..U9/..UA/..UB |
|----|----------------|---------------------|-------------------------------|----------------|-----------|--------------------------|--------------------------|
| D1 | 1/4" | 3/8" | 1/2" | 3/4" | 1" | 3/4" | 1" |
| D2 | 0.94" | 1.10" | 1.38" | 1.57" | 1.77" | 1.57" | 1.77" |
| SW | 0.75" | 0.94" | 1.18" | 1.41" | 1.61" | 1.41" | 1.61" |

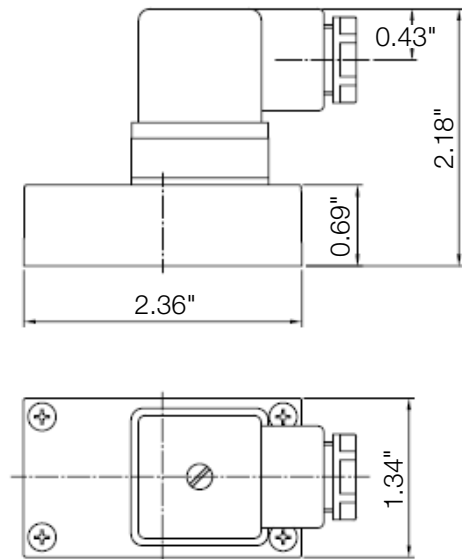


Dimensions: Electronics

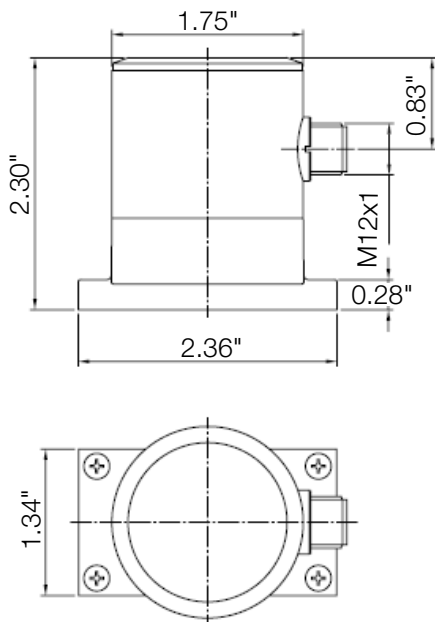
DVZ-..S30x, F3x0, L3x3



DVZ-..L443



DVZ-..C3xx



DVZ-..Ex4R, Gx4R

