



VS-02

Screw Spindle Flowmeter for Viscous Fluids



Features

- / Viscosity independent up to 40k cSt
- / Light and compact design
- / Bi-directional operation
- / Switching-, analogue- or pulse outputs
- / Cost-effective
- / Ranges up to 3800 l/min
- / Applicable up to 350 bar
- / Media temperature up to +150°C

Description:

The screw spindle flowmeter series VS-02 is developed for metering lubricating and viscous fluids in accordance with volumetric principle employing two cycloid steel spindles with a screw-shaped profile to rotate as the medium passes the flow chamber. The spindles form a geometric precise defined measuring chamber, through which accurately measured fluid is forwarded which is then detected by the Hall sensor outside the flow chamber. The output of the basic version VS-02.2 is pulse signal which may be connected to serve back-end PNP or NPN inputs, it supplies a square wave signal. With further options electronic housings can be screwed on the flowmeter body. These different electronics amplify the signal and deliver current or voltage outputs and/or drive the LCD-display. The electronic sensors are replaceable during active operation since the sensors never have contact to the medium.

Application:

Typical applications for the screw spindle flowmeter series VS-02 are cost-effective measurements of large volume flow of viscous fluids up to 3800 l/min. The flowmeters are also applicable for aqueous fluids like soap, paste or emulsions, and specially for oil, which show no abrasive behavior and which are compatible to the used materials of the flowmeter. Because of the volumetric principle of the VS-02 almost no viscosity depended error occurs up to 40 000 cSt. The units can be operated according to their corresponding versions up to 350 bar and +150°C.



Technical Specifications:

Electrical Specifications:

Operating ranges /

VS-02.1:	1.4 .. 140 l/min
VS-02.2:	3.5 .. 350 l/min
VS-02.3:	5.5 .. 550 l/min
VS-02.4:	8.0 .. 800 l/min
VS-02.5:	10. .. 1000 l/min
VS-02.6:	15. .. 1500 l/min
VS-02.7:	25. .. 2500 l/min

max. Flow /

VS-02.1:	200 l/min
VS-02.2:	500 l/min
VS-02.3:	800 l/min
VS-02.4:	1200 l/min
VS-02.5:	1600 l/min
VS-02.6:	2200 l/min
VS-02.7:	3800 l/min

Accuracy /

1% of measured value (for 20 cSt
1% to 100% of nominal operating
range, see also diagram „Accuracy“)

Repeatability /

± 0.25%

max. Pressure /

connection material aluminium
> without steel SAE-flange 160 bar
> with SAE-flange 350 bar
connection material steel
> with or without steel
SAE-flange 350 bar

max. Media-temp. /

-25. .. +80°C, (+150°C possible with
separated pick-up)

Materials /

body:	aluminium 6082 anodised
connection material:	aluminium 6082 anodised or steel
main screw:	steel 355MnPb10 Uni 4838-80
subsidiary screw:	GHISA GJL-250 EN1561
ball bearing:	steel
screws:	steel, galvanised
positioning dowel:	steel
gaskets:	NBR (FKM on request)
SAE connection:	ASTM A216WCB

/ other materials are available on request.

Applicable fluids /

oils and other none-hostile, self-
lubricating liquids (a 30 µm mesh
filter should be used)

Supply voltage /

10. .. 30 VDC

Connection /

round plug M12x1, 4-pol.;
5-pol. with display

Protection class /

IP67

Conformity /

CE

VS-02.x.x.x.1 (1 switching point) /

Power consumption: < 1 W (without load)

Switching output: transistor output „push-pull“ (short-
circuit proved and polarity reversal
protected) I_{out} = 100 mA max

VS-02.x.x.x.2 (pulse output „push-pull“) /

Current consumption: approx. 20 mA (without load)

Signal output: transistor output „push-pull“ (short-
circuit proved and polarity reversal
protected) I_{out} = 100 mA max

VS-02.x.x.x.3 (analogue output 0. .. 10 VDC) /

Power consumption: < 1 W (without load)

Analogue output: 0. .. 10 VDC (short-circuit proved and
polarity reversal protected)

Output current: max. 20 mA

VS-02.x.x.x.4 (analogue output 4. .. 20 mA, 3-wire) /

Power consumption: < 1 W (without load)

Analogue output: 4. .. 20 mA (short-circuit proved and
polarity reversal protected)

VS-02.x.x.x.5 (display with analogue + switching output) /

Supply voltage: 18. .. 30 VDC

Power consumption: < 1 W

Analogue output: 4. .. 20 mA / load max. 500 Ω or
0. .. 10 VDC / load min. 1 kΩ

Setpoints S1 + S2: transistor output „push-pull“ (short-
circuit proved and polarity reversal
protected) I_{out} = 100 mA max

Hysteresis: adjustable, position of the hysteresis
depends on minimum or maximum

Display: backlit graphical LCD-display
32 x 16 pixels, background
illumination, displays value and
unit, flashing LED signal lamp with
simultaneous message

Operating temperature: -20°C. .. +70°C

Connection: round plug M12x1, 5-pol.

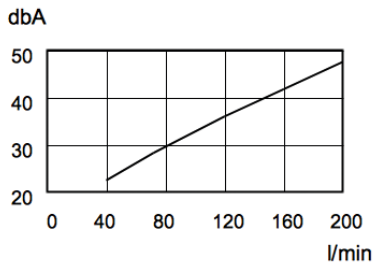
Protection class: IP67 (IP 68 for oil)

Conformity: CE

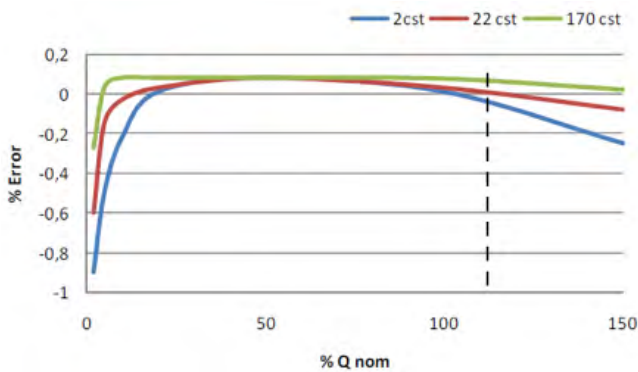
Selection table:

Type	Operating range 1...100% Q _{nom}	Volume / pulse	Pulse / litre	Output frequency at Q _{nom}	Output frequency at Q _{max}	Q _{max} (recomm.)	Body with aluminium connections	Body with steel connections	SAE-flanges (weight per pair)
	l/min	cm ³		Hz	Hz	l/min	kg	kg	kg
VS-02.1	1.4...140	13.10	76.340	178.1	254.5	200	3.44	4.76	5.76
VS-02.2	3.5...350	29.00	34.480	201.1	287.4	500	6.35	8.50	9.55
VS-02.3	5.5...550	48.58	20.590	188.7	274.5	800	10.50	13.60	15.10
VS-02.4	8.0...800	72.00	13.890	185.2	277.8	1200	14.20	18.50	18.80
VS-02.5	10.0...1000	103.63	9.650	160.6	257.3	1600	20.70	27.70	30.30
VS-02.6	15.0...1500	133.00	7.519	188.0	275.7	2200	25.00	33.20	34.60
VS-02.7	25.0...2500	238.82	4.187	174.5	265.2	3800	42.70	56.10	60.70

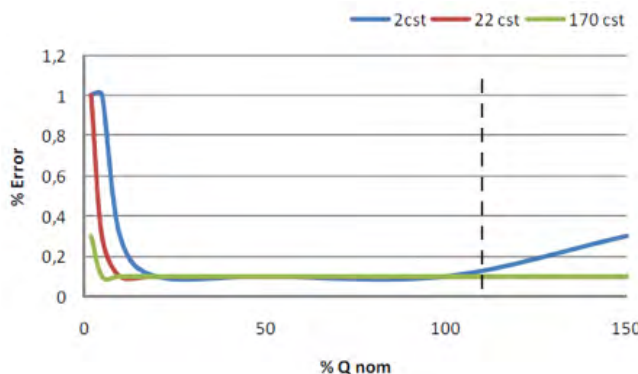
Sound level:



Linearity:



Accuracy:



Ordering Codes:

Order number VS-02. 1. 2. 1. 4. 0

VS-02 Screw Spindle Flowmeter
for Viscous Fluids

Size and operating range /

- 1 = 1" up to 140 (200) l/min
- 2 = 1 1/4" up to 350 (500) l/min
- 3 = 1 1/2" up to 550 (800) l/min
- 4 = 1 1/2" up to 800 (1200) l/min
- 5 = 2" up to 1000 (1600) l/min
- 6 = 2" up to 1500 (2200) l/min
- 7 = 2 1/2" up to 2500 (3800) l/min

Process connection /

- 1 = female thread BSP
- 2 = steel SAE-flange* with female thread G

Connection material /

- 1 = aluminium, anodised
- 2 = steel

Output signal /

- 1 = screwed-in frequency pick-up with one Push-Pull switching output (Min or Max)
- 2 = pulse output Push-Pull
- 3 = screwed-in frequency pick-up with analog output 0 to 10 VDC
- 4 = screwed-in frequency pick-up with analog output 4 to 20 mA, 3-wire
- 5a = digital display unit with 2 transistor switching outputs, graphic display and 4 to 20 mA
- 5b = digital display unit with 2 transistor switching outputs, graphic display and 0 to 10 VDC-output

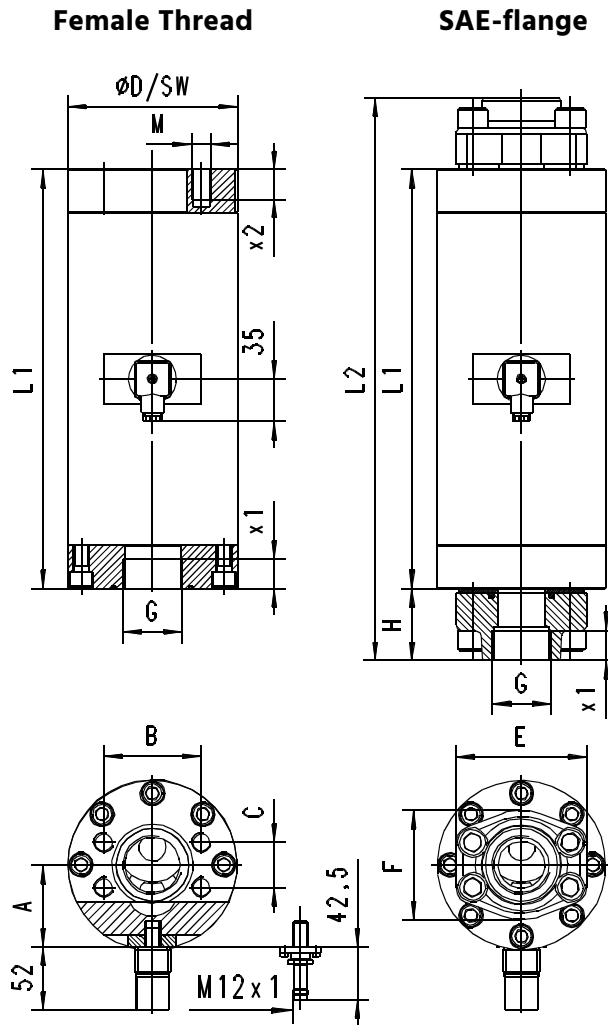
Options /

- 0 = none
- HT = high-temperature up to +150°C

* The use of steel SAE flanges enables the sensor to be installed and removed more easily and increases the stability to pressure. In conjunction with connection material aluminum 6082 anodised only.



Dimensions in mm:



G	DN. . . range	L1	Ø D	SW	A	M	x2	B	C	L2	H	E	F
G 1	025...0140	220	88	78	49,0	12	20	57,1	27,8	324	52	80	69
G 1¼	032...0350	285	103	-	55,0	14	22	66,7	31,6	381	48	94	77
G 1½	040...0550	332	122	-	58,8	16	24	79,4	36,5	448	58	106	89
G 1½	040...0800	340	138	-	66,5	16	24	79,4	36,5	456	58	106	89
G 2	050...1000	396	155	-	71,0	20	35	96,8	44,4	544	74	135	116
G 2	050...1500	405	168	-	77,3	20	35	96,8	44,4	553	74	135	116
G 2 ½	065...2500	475	203	-	86,0	24	42	123,8	58,7	633	79	166	150