



**GEAR FLOW METER VSE EF ECOFLOW**

## ALUMINIUM FLOW METER VSE EF ECOFLOW SERIES

Based on the same meshing gear principle as the VSE series VSI and VHM, the VSE EF ecoflow sensor measures viscous media, however as in-line-device.

An integrated, magnetoresistive pick-up with PNP or NPN-switching output produces one impulse per tooth with a value of:

Volume / Impulse	Size
0.04 cm <sup>3</sup>	EF 0.04
0.1 cm <sup>3</sup>	EF 0.1
0.4 cm <sup>3</sup>	EF 0.4
2 cm <sup>3</sup>	EF 2
4 cm <sup>3</sup>	EF 4

Optional:  
LCD flow display with analogue output and two limit values, mounted on the flow meter.

The impulse frequency is proportional to the revolutions of the gear wheels, which are driven by the volume stream.

The impulse processing is made by means of VSE-made or any other electrical readout. The VSE EF ecoflow is a economical alternative to the VSI series for applications that require lower accuracy, temperature and pressure.

## TECHNICAL DATA

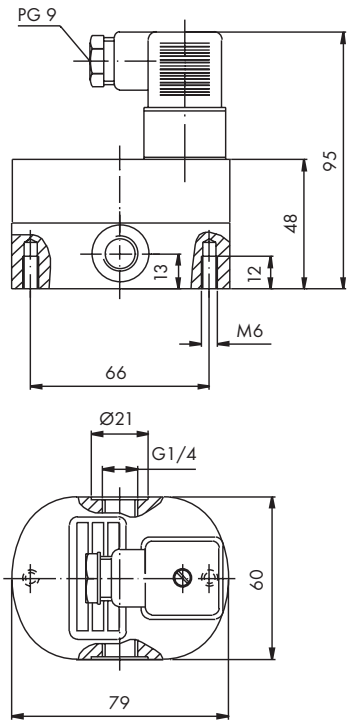
	EF 0.04	EF 0.1	EF 0.4	EF 2	EF 4
Flow range l/min	0.05 ... 4	0.1 ... 10	0.2 ... 30	0.5 ... 70	3.0 ... 150
Flow volume cm <sup>3</sup> /pulse	0.04	0.1	0.4	2.0	4.0
Frequency (Hz)	20.8 ... 1,666.7	16.7 ... 1,666.7	8.3 ... 1,250.0	4.2 ... 583.3	12.5 ... 625.0
K-Factor (pulse/l)	appr. 25,000	appr. 10,000	appr. 2,500	appr. 500	appr. 250
Accuracy at 21 mm <sup>2</sup> /s	2%	2%	2%	2%	3%
Viscosity range mm <sup>2</sup> /s	2 ... 2,000	2 ... 2,000	2 ... 5,000	2 ... 7,000	2 ... 10,000
Max. operating pressure	200 bar (2900 psi)				
Medium temperatur	0°C ... +80°C (32°F ... 176°F)				
Mounting position	unrestricted				
Filtering	20 µm	20 µm	50 µm	50 µm	100 µm
Side pipe connection	G 1/4"	G 3/8"	G 1/2"	G 3/4"	G 1"
Weight	0.62 kg	0.70 kg	1.5 kg	1.7 kg	5.24 kg

## MATERIALS

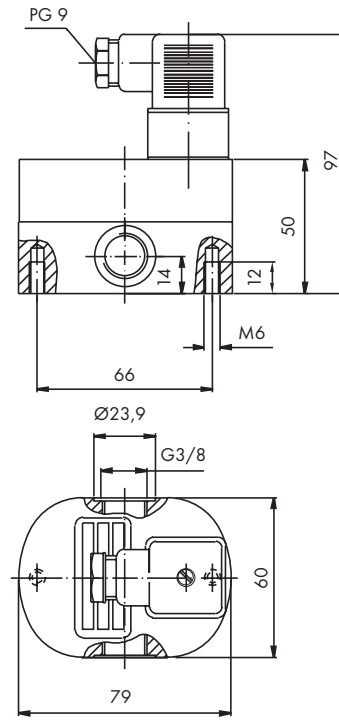
Body	Aluminium
Gear wheels	Stainless steel 1.4122, (DIN EN 1563)
Bearing	Stainless steel ball bearing, DU sleeve bearing, ball bearing or bronze sleeve bearing
Seals	FPM (standard), NBR, PTFE or EPDM (optional)

## DIMENSIONS OF FLOW METERS

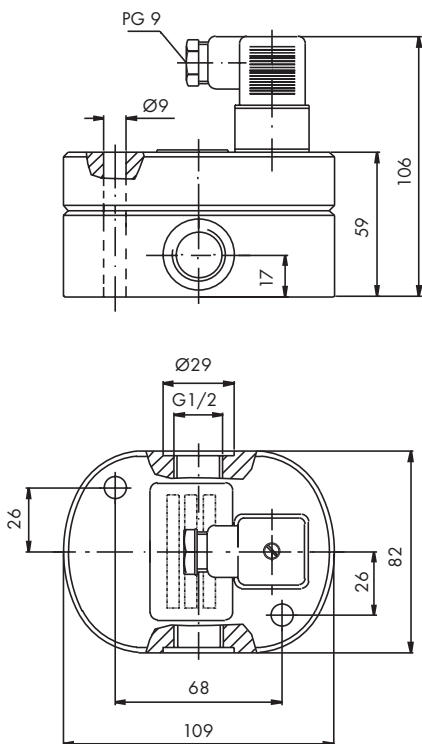
**EF 0.04**



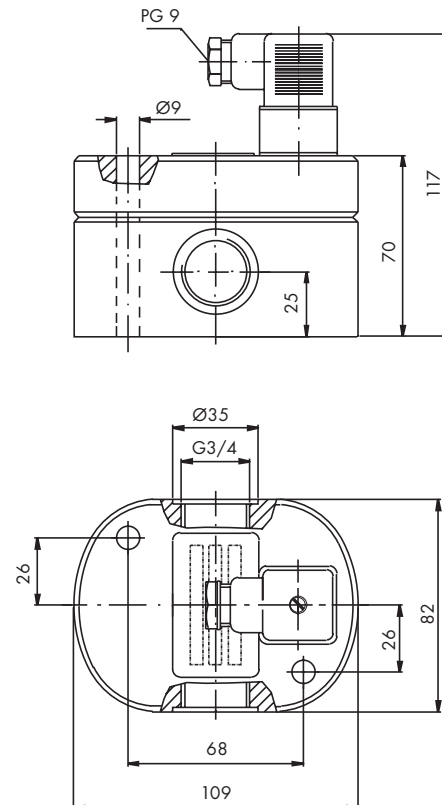
**EF 0.1**



**EF 0.4**

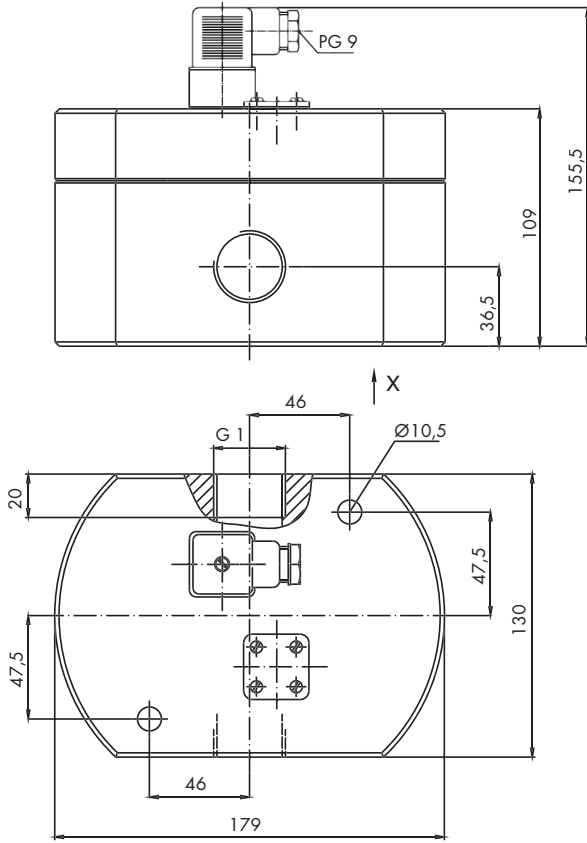


**EF 2**

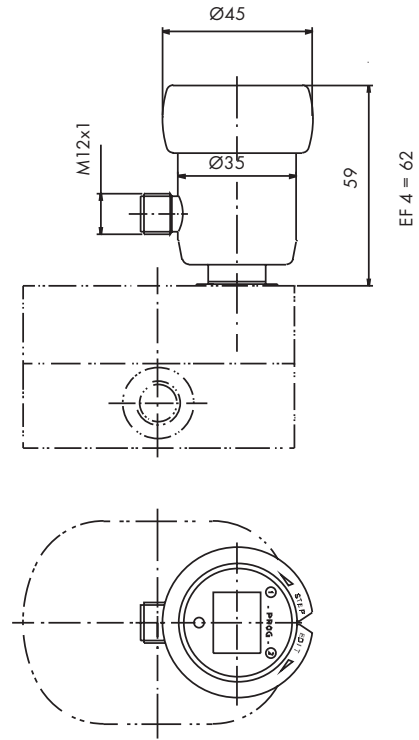


## DIMENSIONS OF FLOW METERS

### EF 4

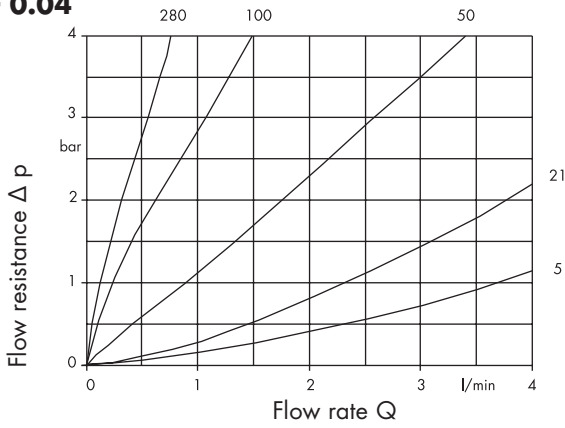


### LCD FLOW DISPLAY

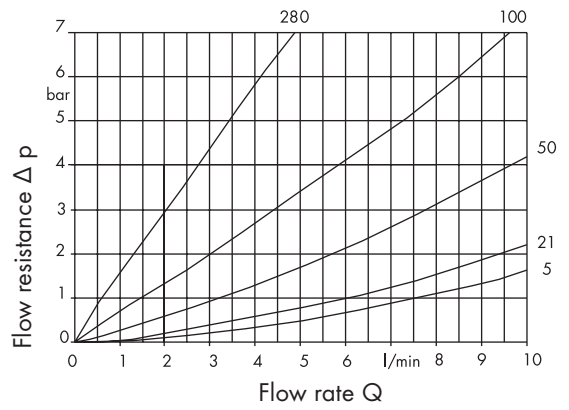


# FLOW RESPONSE CURVES

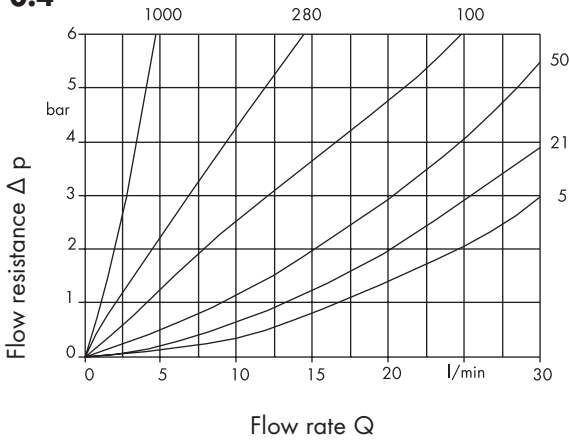
**EF 0.04**



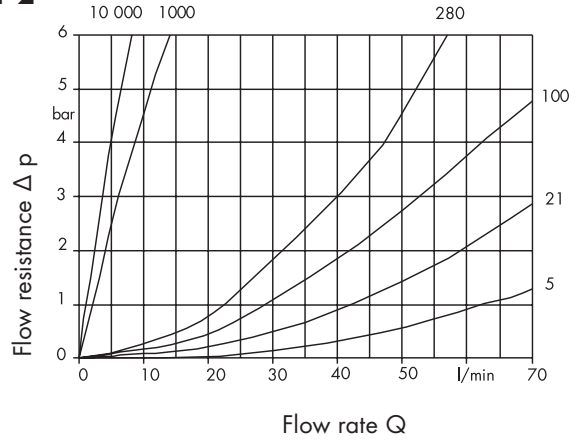
**EF 0.1**



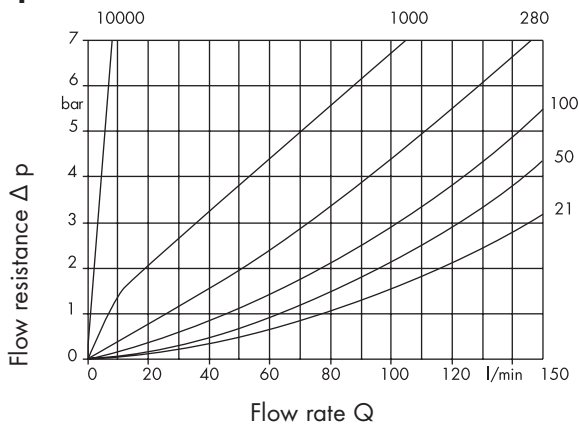
**EF 0.4**



**EF 2**



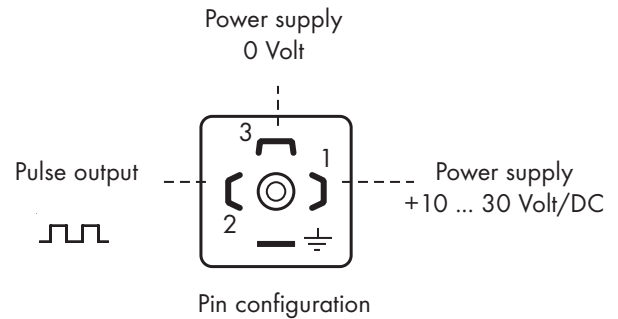
**EF 4**



Viscosity:  $\text{mm}^2/\text{s}$

For trouble-free and safe operation of the flow meters, a correct selection of type and size is decisive. Due to the great number of different applications and flow meter versions, the technical data in the VSE catalogues are of general character. Certain characteristics of the devices depend on type, size and measuring range as well as on the medium to be measured. For an exact flow meter selection please contact VSE.

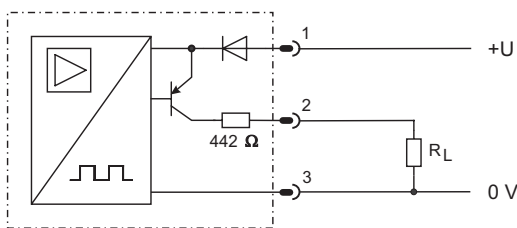
## STANDARD: VSE EF ECOFLOW FLOW METER, WITH PULSE OUTPUT



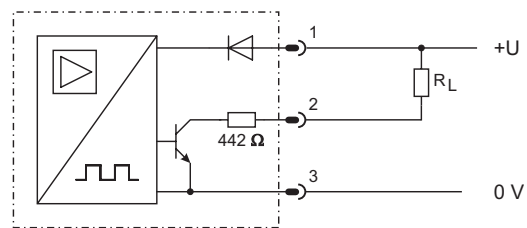
### DESCRIPTION

The rotation of the flow meter gear wheels is sensed by a non-contact magneto-resistive pickup, amplified and emitted as pulses. The passing of each individual gear tooth produces a pulse corresponding to a precise positively displaced measured volume. The pulse output can be produced as PNP or NPN signals. The frequency is proportional to the momentary flow.

### CONNECTION DIAGRAM



Pulse output - PNP version

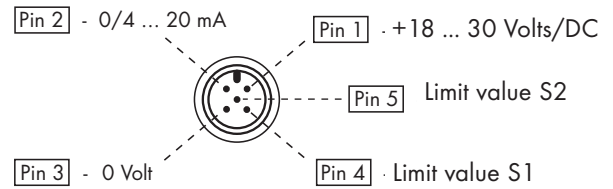


Pulse output - NPN version

<b>Power supply</b>	10 ... 30 Volts/DC
<b>Power consumption</b>	18 mA (no load)
<b>Pulse output</b>	PNP or NPN switching, 20 mA max. Short-circuit-proof (internal protective resistor 442 Ω) Square wave signal, 0 ... 1667 Hz, depending upon flow meter size
<b>Temperature range</b>	0°C ... +80°C (32°F ... 176°F)
<b>Electrical connection</b>	Square connector according to DIN EN 175301-803-A Cable gland Pg9, Cable diameter 6 - 8 mm, Wire gauge max. 1.5 mm <sup>2</sup>
<b>Protection class</b>	IP 65 (with mounted connection plug)

## OPTION: LCD FLOW DISPLAY FOR VSE EF ECOFLOW

### WITH ANALOGUE OUTPUT AND TWO LIMIT VALUES

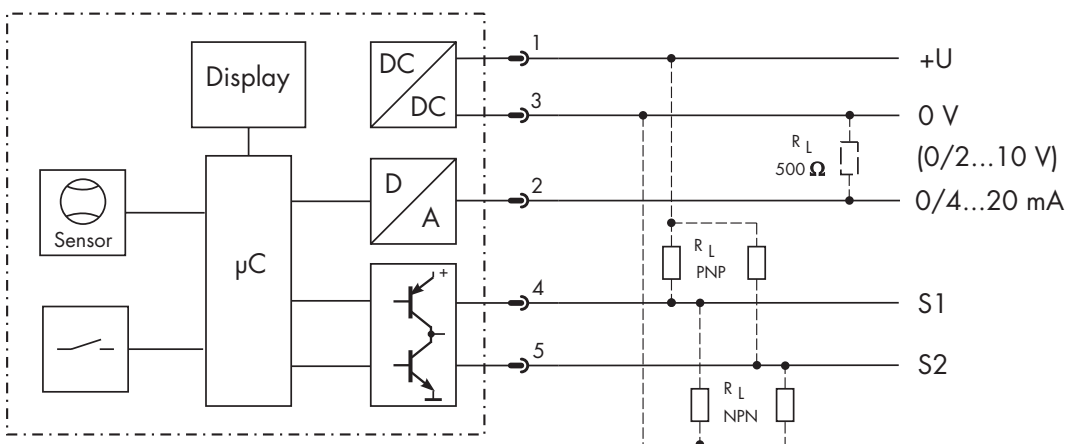


Pin configuration

### DESCRIPTION

The programmable flow display evaluates the pulses from the magnetoresistive pickup and shows the chosen units on a backlit LCD-display. Alarm and condition reports are signalled in the display by a red LED with additional text. The measured values are transmitted by means of an analogue output, 0 or 4 up to 20 mA, and 0 or 2 up to 10 Volt by means of a resistor (500 Ohm). The limit values are signalled through two transistor switching outputs.

### CONNECTION DIAGRAM



<b>Graphic display</b>	LCD display, 4-digit with backlit; shows value, dimension and dialogue-message; red, flashing LED indicator
<b>Analogue output</b>	0 or 4 ... 20 mA; 12 bit A/D converter (0 or 2 ... 10 Volt, with external 500 $\Omega$ resistor)
<b>Switch points</b>	S1 and S2; Transistor output 30 V/100 mA max. Push-pull output, PNP or NPN selectable with external connection Short-circuit proof and reverse-polarity proof Hysteresis adjustable in value and direction
<b>Power supply</b>	18 ... 30 Volt DC/<1 Watt
<b>Temperature range</b>	0°C ... +70°C (32°F ... 158°F)
<b>Electrical connection</b>	Round connector M12 x 1, 5-pole
<b>Protection class</b>	IP 62
<b>Material</b>	Stainless steel 1.4305; mineral glass screen POM-programming ring; FPM-seals
<b>Accessory</b>	PUR-connection, cable 5-pole shielded, 5 or 10 m long alternative: VSE standard plug, 5-pole

Customer specific designs on request



## TYPE CODE

EF .....-./.

<b>Size</b>	0.05 ... 4 l/min.	= 0.04
	0.1 ... 10 l/min.	= 0.1
	0.2 ... 30 l/min.	= 0.4
	0.5 ... 70 l/min.	= 2
	3.0 ... 150 l/min.	= 4

<b>Material</b>	Aluminium (standard)	= A
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<b>Connection type</b>	Subplate ①	= P
	Piping	= R

<b>Version</b>	Standard	= 0
	With sight glass ①	= 2

<b>Gear bearings</b>	Ball bearing	= 1
	Bronze sleeve bearing	= 3
	DU sleeve bearing ②	= 6

<b>Gear tolerance</b>	Reduced tolerance	= 1
	Normal tolerance	= 2
	Increased tolerance	= 3
	Tolerance sleeve bearing ②	= 4

<b>Seal type</b>	FPM (≥ FKM) Standard	= V
	NBR ②	= P
	PTFE	= T
	EPDM	= E

= Series (factory preset) 1

<b>PNP</b>	= Pulse output PNP
<b>NPN</b>	= Pulse output NPN
<b>LCD</b>	= LCD-Flow Display

### Short term explanation to type of seals

FPM (≥ FKM)	= Fluorine carbon rubber O-ring
NBR	= Acrylnitrile butadiene rubber O-ring
PTFE	= Polytetrafluorethylene rubber O-ring
EPDM	= Ethylen propylene diene rubber O-ring

- ⊛ Other type no. = special design
- ① Special design upon request
- ② Factory preset to the application



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