



Flow- Measurement Technology

VHM series

- ▶ Paints, Dyes
- ▶ Chemicals
- ▶ Pharmaceuticals
- ▶ Two-component mixers
- ▶ Petrochemicals



VHM gear flow meter

- ▶ Were developed for high precision flow metering for a wide variety of liquids, especially liquids with high abrasiveness and poor lubricity.
- ▶ Applications include: chemical, petrochemical, pharmaceutical and cosmetic industry, two-component mixers, paints, aviation.
- ▶ Are dead spaced optimized for (easy flushing) use in the paint industry and for paint spraying systems.
- ▶ Are positive displacement units based on the meshing gear principle. Each tooth generates an impulse by recognition of the gear rotation by a non-contact detection system according to the carrier frequency principle.
- ▶ Are available with single, double or quadruple resolution, signal-output with NPN or PNP switching mode.
- ▶ Signal pick-ups with **Ex-certification** (EEx ia IIC T6...T4) and signal pick-ups with a fibre optic output are applicable for hazardous locations.

Technical Data

Type	Flow Range		K-Faktor Imp./l		Calculation Factors
	l/min	GPM	Impulses/l	Impulses/Gal.	
VHM 01	.01.....1	.003.....264	ca. 30 000	ca. 113 563.2	1 litre $\triangleq$ 0.26417 U.S. Gallon
VHM 02 - 1	.05.....2	.013.....528	ca. 8 800	ca. 33 311.872	1 U.S. Gallon $\triangleq$ 3.78544 litre
VHM 02 - 2	.10.....4	.026.....1.056	ca. 4 400	ca. 16 655.936	1 bar $\triangleq$ 14.503684 psi
VHM 02 - 3	.40.....8	.106.....2.113	ca. 2 200	ca. 8 327.968	1 psi $\triangleq$ 0.068948 bar
VHM 03 - 2	.50.....20(30)	.132...5.283 (7.925)	ca. 1 000	ca. 3 785.44	psi = pound-weight per square inch
					GPM = U.S. Gallon per minute

K-Factor: see calibration-certificate for precise data **(30) and (7.925):** with a single channel flow sensor only

Materials		Accuracy	+/- 0,5% +/- 1%	viscosity > 10mm ² /s viscosity 1-10mm ² /s
Body	Stainless Steel 316	Repeatability	+/- 0,5‰	under same operating conditions
Gears	Stainless Steel 316	Max. Operating Pressure	250 bar	3625 psi
Bearings	Tungsten Carbide	Medium Temperature	-20°....120°C	-4°....248°F
Seals	FEP-FKM (Standard) NBR (upon request) PTFE (upon request)	Viscosity Range	1-20.000mm ² /s	
K-Faktor	see calibration-certificate for precise data	Mounting Positions	free selectable	

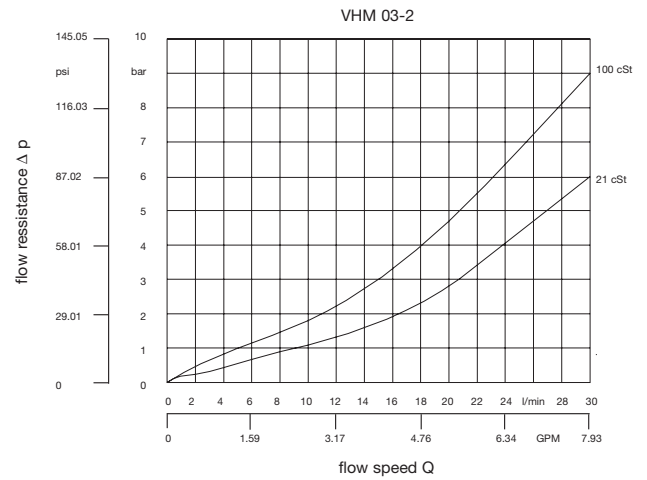
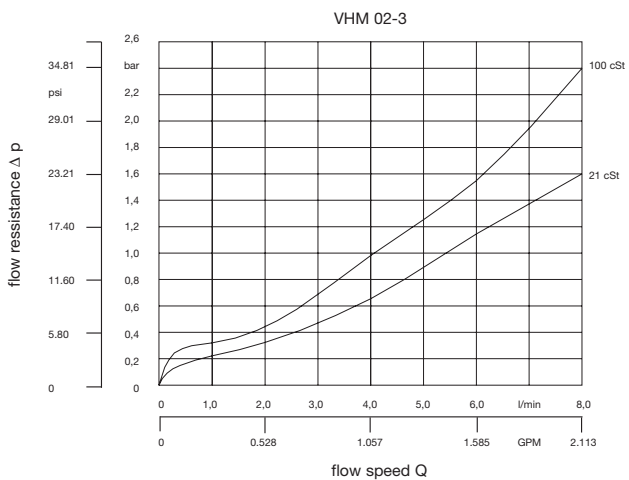
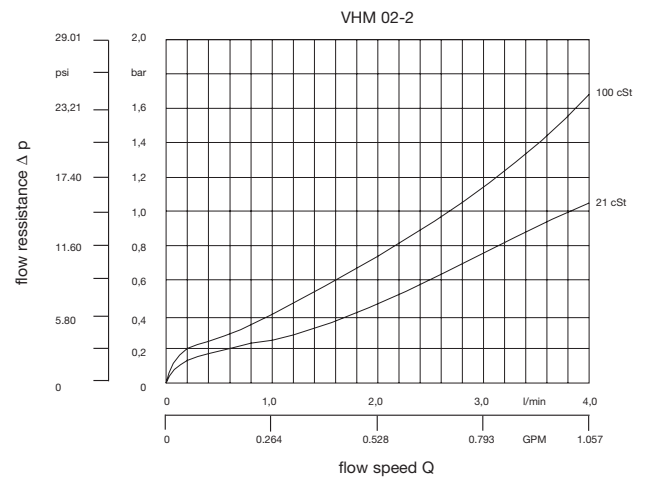
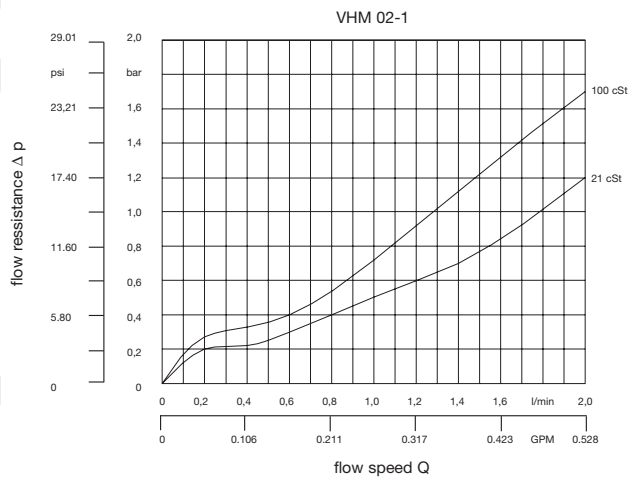
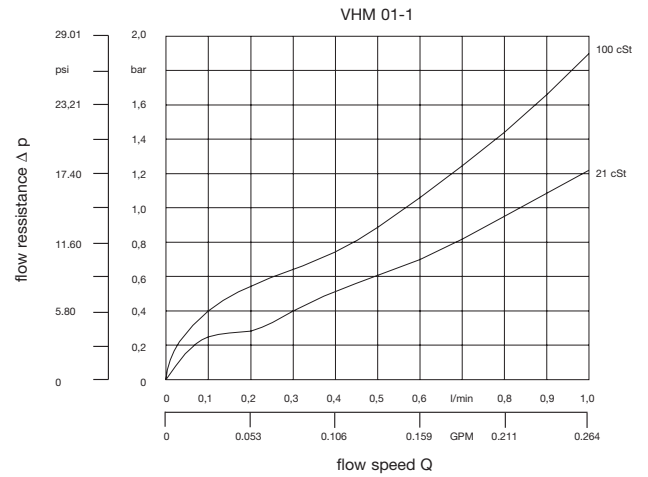
- ▶ **Special designs and materials on request**

- ▶ The installation into the pipe line can be made by means of a mounting plate or manifold.

- ▶ **General Principle of Functioning see Page 15**

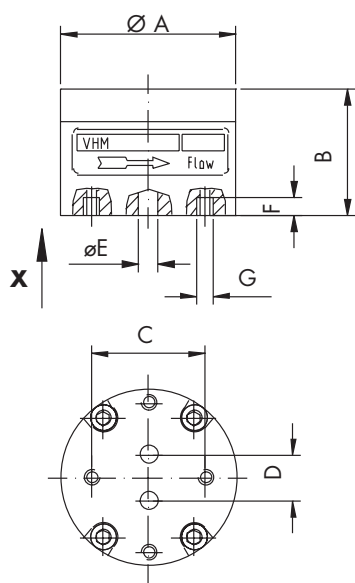
Applications

Chemical Industry	→	continuous dosing
Pharmaceutical Industry	→	mixing, batching
Cosmetic Industry	→	dosing, batching
Dyes and Paints	→	flow control, consumption monitoring
2-component mixers	→	monitoring, regulation of mixing ratio

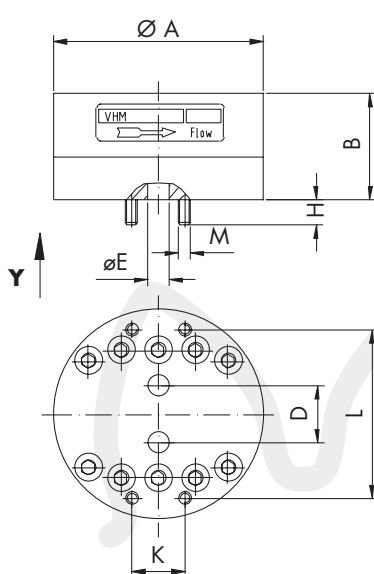


Flow Meter-Dimensions

► **VHM 01/02** View X



► **VHM 03** View Y

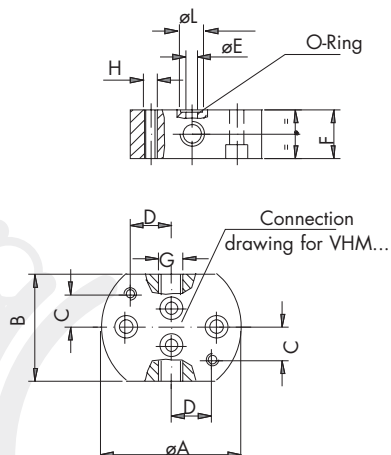


Flow Meter-Dimensions

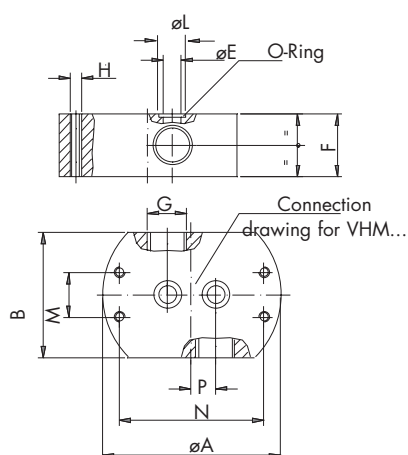
Type	A	B	C	D	E	F	G	K	L	M	H	Weight
VHM 01 - 1	Ø 68	29	44	12	Ø 4	6	M6					0,760 kg
VHM 02 - 1	Ø 68	29	44	18	Ø 6	6	M6					0,740 kg
VHM 02 - 2	Ø 68	34	44	18	Ø 6	6	M6					0,860 kg
VHM 02 - 3	Ø 68	43	44	18	Ø 6	6	M6					1,075 kg
VHM 03 - 2	Ø 99	50		27	Ø 10			25	81	M6	12	2,700 kg

► **Special designs on request**

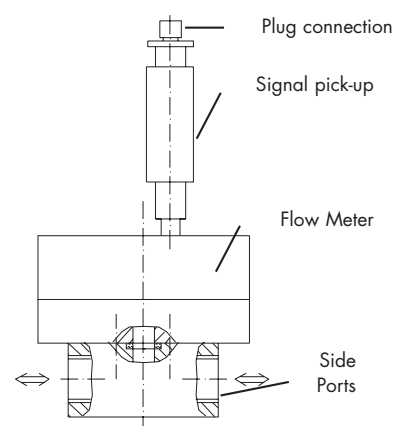
► AHM 1/2 - .S... Side ports



► AHM 3 - .S... Side ports



► Side port connection



Subplates-Dimensions Side Port Connection

Line no.	Type	Ø A	B	C	D	M	N	Ø E	G	F	H	P	O-Ring
1	AHM01-.SAN/.	68	52	16	20	-	-	4	G 1/8"	24	M 6	-	6.07 x 1.78
2	AHM01-.SBN/.	68	52	16	20	-	-	4	G 1/4"	24	M 6	-	6.07 x 1.78
3	AHM01-.SCN/.	68	52	16	20	-	-	4	G 3/8"	35	M 6	-	6.07 x 1.78
4	AHM01-.SFN/.	68	52	16	20	-	-	4	1/8"NPT	24	M 6	-	6.07 x 1.78
5	AHM01-.SGN/.	68	52	16	20	-	-	4	1/4"NPT	24	M 6	-	6.07 x 1.78
6	AHM01-.SHN/.	68	52	16	20	-	-	4	3/8"NPT	35	M 6	-	6.07 x 1.78
7	AHM02-.SAN/.	68	52	16	20	-	-	6	G 1/8"	24	M 6	-	7.65 x 1.78
8	AHM02-.SBN/.	68	52	16	20	-	-	6	G 1/4"	24	M 6	-	7.65 x 1.78
9	AHM02-.SCN/.	68	52	16	20	-	-	6	G 3/8"	35	M 6	-	7.65 x 1.78
10	AHM02-.SFN/.	68	52	16	20	-	-	6	1/8"NPT	24	M 6	-	7.65 x 1.78
11	AHM02-.SGN/.	68	52	16	20	-	-	6	1/4"NPT	24	M 6	-	7.65 x 1.78
12	AHM02-.SHN/.	68	52	16	20	-	-	6	3/8"NPT	35	M 6	-	7.65 x 1.78
13	AHM03-.SCN/.	100	70	-	-	25	81	10	G 3/8"	35	M 6	13.5	12.42 x 1.78
14	AHM03-.SDN/.	100	70	-	-	25	81	10	G 1/2"	35	M 6	13.5	12.42 x 1.78
15	AHM03-.SHN/.	100	70	-	-	25	81	10	3/8"NPT	35	M 6	13.5	12.42 x 1.78
16	AHM03-.SIN/.	100	70	-	-	25	81	10	1/2"NPT	35	M 6	13.5	12.42 x 1.78

Type Codes Flow Meter VHM + Subplates AHM

V H M	Flow Meter VHM Size	01	02	03
	Measuring range	1	1 2 3	2
		0.01 – 1 l/min 0.003 – 0.264 GPM	0.05 – 2 l/min 0.013 – 0.528 GPM 0.1 – 4 l/min 0.026 – 1.056 GPM	0.4 – 8 l/min 0.106 – 2.113 GPM 0.5 – 20 l/min 0.132 – 5.283 GPM ⊗ 0.5 – 30 l/min ⊗ 0.132 – 7.925 GPM
	Backlash (works-determined)	Reduced tolerance =		1
		Normal tolerance =		2
		Increased tolerance =		3
	Housing material: stainless steel	303 (upon request)	V 2 A	= 2
		316 (Standard)	V 4 A	= 4
	Type of connection	Subplate =		P
		Piping =		R
	Type of seal	FEP-FKM (Standard) =		F
		NBR (upon request) =		N
		PTFE (upon request) =		T
	Series	Works-determined ≥ 1		☐
	VHM mounting from top side on AHM (upon request)	Only for flow meter size VHM01/VHM02 =		Z

VHM . - / . . — Signal pick-up

⊗ 30 l/min and 7.925 GPM with a single-channel pick-up only

Short term explanation to type of seals:

FEP = Perflour Ethylene
Propylene encapsulated
O-Ring

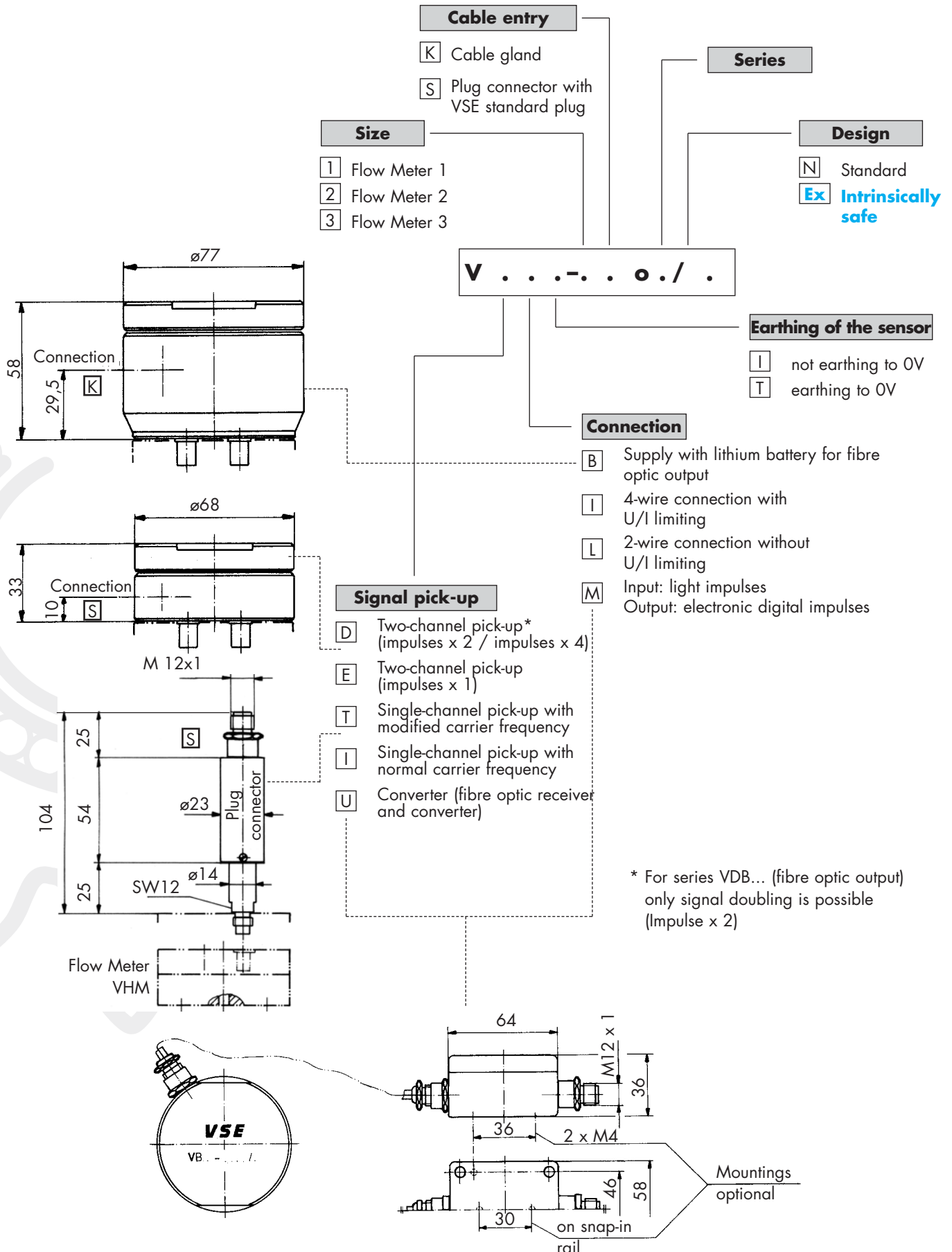
FKM = Flourcarbon Rubber
(core compound)

NBR = pure Acryl-Nitrile
Butadiene Rubber O-Ring

PTFE = pure Polytetraflour-Ethylene
Rubber O-Ring

A H M	Subplate AHM	VHM size		AHM size		
	Affiliated VHM flow meter size	01	→	01		
		02	→	02		
		03	→	03		
	Housing material: stainless steel	303 (Standard)	V 2 A	=	2	
		316 (upon request)	V 4 A	=	4	
	Connection orientation	Side connection		=	S	
		Bottom connection		=	U	
	Type of connection (other types on request) G pipe threads NPT pipe threads	G ¹ / ₈ " =		A	G ¹ / ₄ " =	B
		G ³ / ₈ " =		C	G ¹ / ₂ " =	D
		1/ ₈ "NPT=		F	1/ ₄ "NPT=	G
		3/ ₈ "NPT=		H	1/ ₂ "NPT=	I
Design	Standard		=	N		
	Special		=	S		
Series	Works-determined ≥ 1				☐	
VHM mounting from top side on AHM (upon request)	Only for flow meter size VHM01/VHM02 =				Z	

AHM . - / . .



Selection criteria - signal pick-ups

	Single pick-ups series VI.../VT...	Double pick-ups series VD.../VE...
General applications	in flow velocity measurement and volume measurement	in flow velocity measurement and volume measurement with high signal resolution
Measured volume signal resolution per conveyed tooth gap volum	1 impulse/measured volume	A. 2 impulses/measured volume or 4 impulses/measured volume optionally coded by jumpers in the pick-up B. 1 impulse/measured volume in modified series VE...
Galvanic isolation between the supply voltage and the signal output	NPN or PNP switching optocoupler outputs	NPN or PNP switching optocoupler output
When 2 single pick-ups are used in one flow meter body, the following possibilities arise	A. A high signal resolution and detection of the flow direction are possible with additional electronics. B. Or it is possible to implement a redundant system for increased safety in conjunction with the separate operation of both pick-ups. C. Separate power supply of the single pick-ups from galvanically isolated power supply units is possible.	
EX design	with intrinsic safety only in conjunction with VSE barrier amplifier. Ex designation EEx ia IIC T6...T4	with intrinsic safety only in conjunction with VSE barrier amplifier. Ex designation EEx ia IIC T6...T4

VHM single pick-ups and double pick-ups in standard design

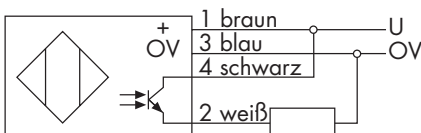
► The single pick-up operates with a carrier frequency oscillator which is modulated when a tooth passes. This modulation is detected by the amplifier and is used to generate one digital impulse per measured volume.

► The double pick-up operates with two independent carrier frequency oscillators which are modulated when a tooth passes. This modulation is detected by the amplifier and is used to generate 2 or 4 digital impulses per measured volume, which can be selected by the coding of the internal jumpers.

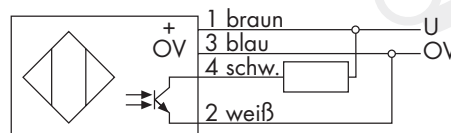
► Single and double pick-ups are equipped with an optocoupler transistor output which has a galvanic isolation between supply voltage and pick-up.

► This transistor output can be connected with the supply voltage of the pick-up as shown in the above connection diagrams or can be operated with a separate power supply. Depending on the polarity of the power supply to the transistor, either an PNP or a NPN switched output signal is generated.

► Output signal PNP switched



► Output signal NPN switched

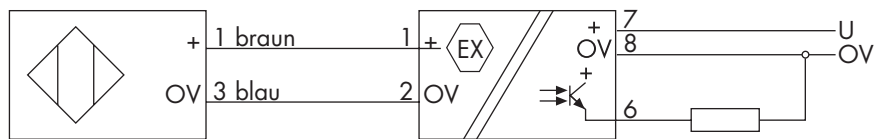


► The single pick-up operates with a carrier frequency oscillator which is modulated when a tooth passes. The double pick-up operates with two independent carrier frequency oscillators which are modulated when a tooth passes.

► This modulation is detected by the amplifier and is used to generate a pulsing current signal in the supply current. The connected barrier amplifier detects the signal and generates a digital PNP signal for further processing. The output impulses per measured volume correspond to those of the two standard designs.

► Single pick-ups and double pick-ups in Ex design are designed for intrinsic safety and may only be used in conjunction with the VSE barrier amplifier MK 13-P-Ex 0/24 V DC/K15.

► The flow meter with the single pick-up or double pick-up is located in the hazardous area. The barrier amplifier is installed outside the hazardous area in an electrical cabinet or terminal box (snap-in mounted on an installation rail DIN 50022).



Double pick-up with fibre optic output type VDB...

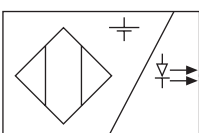
Applications under extremely difficult conditions	Applications	Measured volume signal resolution per conveyed tooth gap volume:	Battery operation with energy saving circuit
A) Environments with heavy electromagnetic interference. B) High voltage areas. C) Rooms with explosion hazards , e.g. spray painting equipment with electrostatic charge.	in flow velocity measurement and volume measurement with high signal resolution.	2 impulses/measured volume	2 years of operation without battery change.

► The double pick-up converts electrical impulses into light impulses and transmits these through a plastic optical fibre to the receiver, which is installed away from the extreme conditions. This converts the light impulses of the signal pick-up back into electrical impulses and outputs them to electronic evaluation devices for further processing. The output signal of the fibre optic receiver has a resolution of 2 impulses per measured volume with a pulse duty factor of 1 : 1.

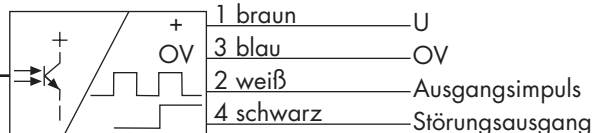
► The signal frequency of the output impulses is proportional to the speed of rotation of the gearwheel and with the flow velocity and must be processed by the connected evaluating circuitry according to the values of the impulses.

► The output impulses of the fibre optic receiver can be either a pnp or an npn switched signal. The coding of the signals is easily possible and is performed on 2 separately programmable jumper bars in the receiver.

► Double pick-up with lithium battery



► Fibre optic receiver



Signal pick-ups for VHM flow meters

Technical Data Part 1		Single pick-ups in standard design	Double pick-ups in standard design
		Deviations from EX design	Deviations from EX design
Signal pick-ups per flow meter		1 or 2	2 (1 active carrier frequency oscillator in Series VE*...)
Detection of direction of flow		Yes, by 2 signal pick-ups with a phase offset ¹ of 90° mounted on one flow meter body	No
Body data			
Dimensions		Ø = 25 mm; lenght = 115 mm	Ø = 68 mm; lenght = 33 mm; overall lenght with sensor = 43 mm
Protection type		IP 54	IP 54
Material		Stainless steel	Anodized aluminium, coil holder stainless steel
Weight		100 g	165 g
Medium temperature		-4... +248°F / -20... +120 °C	-4... +185°F / -20... +85 °C
Ex-design:		-4... +140°F / -20... +60 °C T6 -4... +176°F / -20... +80 °C T5	-4... +140°F / -20... +60 °C T6 -4... +176°F / -20... +80 °C T5
Ambient temperature		-4... +140°F / -20... +60 °C	-4... +140°F / -20... +60 °C
Ex-design:		-4... +122°F / -20... +50 °C	-4... +122°F / -20... +50 °C
Ex approval		According to onformity certificate LCIE 02 ATEX 6136 X	According to onformity certificate LCIE 02 ATEX 6136 X
Ex designation		II 1G EEx ia IIC T6...T4	II 1G EEx ia IIC T6...T4
EX ingition suppression type in conjunction with specified VSE barrier amplifier		Intrinsically safe MK 13-P-Ex 0 / 24 VDC / K 15	Intrinsically safe MK 13-P-Ex 0 / 24 VDC / K 15
Supply voltage U _{DC}		10-30 V _{DC} , ► see data sheet Page14	10-30 V _{DC} , ► see data sheet Page14
VSE barrier amplifier			
Installation site		Outside the Ex area in an electrical cabinet or terminal box. Mounted on installation rail DIN 50 022	Outside the Ex area in an electrical cabinet or terminal box. Mounted on installation rai DIN 50 022
Electrical connection		Intrinsically safe control line according to design specifications VDE 0165	Intrinsically safe control line according to design specifications VDE 0165
Supply Voltage U _{DC}	Standard	7-30 V	7-30 V
	Ex design	5-9 V (by specified VSE barrier amplifier)	5-9 V (by specified VSE barrier amplifier)
Supply current I _{DC}	Standard	3 mA max.	3 mA max.
	Ex design	<2,9 mA > 3,5 mA (modulated current signal)	<2,9 mA > 3,5 mA (modulated current signal)
Connection general	Standard	4-wire plug connection	4-wire plug connection
	Ex design	2-wire plug connection	2-wire plug connection
Plug with screened cable	Standard	4-pole standard plug, plug length=25mm, yellow cable	4-pole standard plug, plug length=25mm, yellow cable
	Ex design	4-pole standard plug, plug length=25mm, blue cable	4-pole standard plug, plug length=25mm, blue cable
Number of signal outputs		1 or 2 (when 2 single pick-ups are used in one flow meter body)	1 (the 2 signal pick-ups are evaluated by the internal amplifier and are connected to one output) 1 in series VE...
Signal resolution per conveyed tooth gap volume (measurement volume V _m)		1 impulse or 2 impulses by 2 single signal pick-ups with a phase offset of 90° and different carrier frequencies in one flow meter body	Optional 2 impulses (signal doubling) or 4 impulses (signal quadrupling) codable with internal jumpers 1 impulse in series VE...

¹Explanation of series VT...

If detection of the direction of flow and a high signal resolution with additional external circuitry is necessary, 2 single pick-ups are used in one flow meter body, which are arranged with a mechanical offset of 90° with regard to the tooth flank sequence.

To prevent mutual interference between the 2 single pick-ups, these are selected with different carrier frequencies, i.e. one with a normal (VI...) and one with a modified (VT...) carrier frequency.

*** Stock types, other types on request.**

Technical Data Part 2		Single pick-ups in standard design	Double pick-ups in standard design
		Deviations from Ex design	Deviations from Ex design
Signal output voltage U_{DC}	Standard	7-30 V (depending on the supply voltage and loading of the optocoupler)	7-30 V (depending on the supply voltage and loading of the optocoupler)
	Ex design	To VSE barrier amplifier: 7,5-27,5 V; depending on the supply voltage	To VSE barrier amplifier: 7,5-27,5 V; depending on the supply voltage
Output current I_{DC}	Standard	max. 10 mA (for supply voltage > 16 V _{DC})	max. 10 mA (for supply voltage > 16 V _{DC})
	Ex design	VSE barrier amplifier: output circuit < 100 mA	VSE barrier amplifier: output circuit < 100 mA
Signal switching frequency f		3 Hz-1,0 KHz	3 Hz-1,0 KHz
Signal output circuit	Standard	Optocoupler transistor with series resistance R=1,2 k Ohms Galvanic isolation from the supply voltage potential	Optocoupler transistor with series resistance R=1,2 k Ohms Galvanic isolation from the supply voltage potential
	Ex design	VSE barrier amplifier: output short-circuit resistant - see data sheet. Connection to the barrier amplifier supply voltage potential.	VSE barrier amplifier: output short-circuit resistant - see data sheet. Connection to the barrier amplifier supply voltage potential.
Signal switching polarity	Standard	Optional NPN or PNP selectable by external connections	Optional NPN or PNP selectable by external connections
	Ex design	PNP output signal via VSE barrier amplifier, i.e. connection to the barrier amplifier supply voltage potential	PNP output signal via VSE barrier amplifier, i.e. connection to the barrier amplifier supply voltage potential
Signal pulse duty factor (p.d.f.)		p.d.f. = 1:1	Coding for signal doubling: p.d.f. = 1 : 1 Coding for signal quadrupling: p.d.f. = dependent on the flow speed (impulse frequency) by which the, impulse with remains constant. (Series VE* ..., p.d.f. = 1 : 1)

*Explanation for series VE...

If a single pick-up (1 impulse per conveyed tooth gap volume) cannot be used in an application because of the length of its body (115 mm), a **modified double pick-up** of series VE... (**body length 43 mm**) can be used, which operates with only one active carrier frequency oscillator and delivers the signals as a single pick-up.

VHM type list single and double pick-ups		Single pick-ups with OV potential not earthed		Double pick-ups with OV potential not earthed	
Preferred types		Single channel pick-ups with normal carrier frequency	Single channel pickups with modified carrier frequency	Double channel pick-ups (impulses×2/impulses×4)	Double channel pick-ups modified (impulses×1)
Available VS-connecting cable ¹	Standard	4-wire connection with U/I-limiting	4-wire connection with U/I-limiting	4-wire connection with U/I-limiting	4-wire connection with U/I-limiting
	Ex design	2-wire connection with U/I-limiting	2-wire connection with U/I-limiting	2-wire connection with U/I-limiting	2-wire connection with U/I-limiting
Plug with yellow cable ² 5/10/15/20 m	Standard	01 VIII-1S00/N	VTII-1S00/N	VDII-1S00/N	VEII-1S00/N
		02 VIII-2S00/N *	VTII-2S00/N *	VDII-2S00/N *	VEII-2S00/N
		03 VIII-2S00/N	VTII-2S00/N	VDII-3S00/N	VEII-3S00/N
Plug with blue cable ² 5/10/15/20 m	Ex design	01 VII-1S00/Ex	VTII-1S00/Ex	VDLI-1S00/Ex	VELI-1S00/Ex
		02 VILI-2S00/Ex *	VTII-2S00/Ex *	VDLI-2S00/Ex *	VELI-2S00/Ex
		03 VILI-2S00/Ex	VTII-2S00/Ex	VDLI-3S00/Ex	VELI-3S00/Ex

¹ The connecting are open at one end, but can be delivered with a second plug on request.

² Other cable lengths on request. * **Stock types, other types on request.**

Signal pick-ups with optical fibre technology for VHM flow meters

Technical Data Part 3	Double pick-ups with fibre optic output VDB...	Fibre optic receiver VUM...
Signal pick-ups per flow meter body	2	Volume impulse/fault signal – Signal voltage U_{DC} : 9-30 V (depending on the supply voltage and loading of the signal output circuit) Signal current I_{DC} : max. 10 mA (for supply voltages > 16 V _{DC})
Detection of the direction of flow	No	
Body data		
Dimensions	Ø 78 mm; height 62 mm; overall height with sensor 72 mm	Overall length with optical fibre and plug connector = 98 mm; L = 64 mm; B = 58 mm; H = 37 mm Mounting construction: 2 screws M 4 or installation rail snap-in mounting DIN 50 022
Protection type	IP 54	IP 54
Material	Anodized aluminium; coil holder stainless steel Spul	Aluminium, colour: grey RAL 7001
Weight	438 g	218 g
Medium temperature	-4... +140°F / -20... +60°C	
Ambient temperature	-4... +140°F / -20... +60°C	-13...+140°F / -25... +60°C
Ex approval	According to conformity certificate LCIE 02 ATEX 6136 X	LED indicators: LED green: ready LED red: transmission error
Ex designation	II 1G EEx ia IIC T6...T4	
Associated fibre optic receiver	VUMI-O...	Volume impulse/fault signal – Signal switching polarity: NPN or PNP programmable by 2 coding jumpers Volume impulses pulse duty factor (p.d.f.) p.d.f. = 1 : 1
Installation site of the fibre optic receiver	Outside the Ex area (or high voltage area) wall-mounted or in an electrical cabinet; with screw or installation rail mounting DIN 50022 depending on the type.	
Electrical supply	By internal, sealed lithium battery (use only original parts)	Unregulated power supply with smoothing capacitor
Supply voltage U _{DC}	Battery 3,6 V / 16,5 Ah with integrated series resistor for Ex applications	9-30 V
Operating time	2 years (integrated energy saving in stand-by mode)	Supply current I_{DC} 8 mA
Optical fibre	Silicone-free plastic optical fibre cable with double sheathing	Optical fibre signal input Signal detection: by fibre optic input transistor Signal type: Digital optical signals from double pick-up (flow meter signals; monitor signal in standby, battery status signals)
Stress relief	Aramid fibres	
Outer sheath	Orange polyurethane; flame-resistant	
Outer dimensions	3,5 mm +/- 0,2	
Bending radius	>10 mm short-term; > 50 mm permanent	
Optical fibre connector	Cable gland PG 7, length = 20 mm	
Standard cable lengths	5 / 10 / 15 / 20 m	
Number of signal outputs	1, includes information on the flow meter output impulses and status signals	2, volume impulses (flow meter) fault signals
Signal resolution per conveyed tooth gap volume (measured volume V _m)	2 impulses (signal doubling)	2 impulses (signal doubling)

Signal pick-ups with optical fibre technology for VHM flow meters

Technical Data Part 4	Double pick-ups with fibre optic output VDB...	Fibre optic receiver VUM...
Switching frequency f:	3 Hz-1,0 KHz	3 Hz-1,0 KHz
Volume impulses/fault signals – signal output circuit	Fibre optic output diode: Digital optical signals to the fibre optic receiver (volume sensor signals; monitor signals in stand-by; battery status signals)	One transistor each with series resistor $R = 1,2 \text{ k Ohms}$

VHM type list optical fibre technology

VHM	Size	Double pick-up with fibre optic output
Standard	01	VDBI – 1K00/N
	02	VDBI – 2K00/N
	03	VDBI – 3K00/N*
Ex design	01	VDBI – 1K00/EX
	02	VDBI – 2K00/EX
	03	VDBI – 3K00/EX*
*Size 03 on request		

Accessories for double pick-up		
VDBI-battery = sealed lithium battery for all double signal pick-ups		
LWL cable = plastic optical fibre cable		
LWL cable	5 m	LWL cable 20 m*
LWL cable	10 m	*other length of optical fibre cable on request
LWL cable	15 m	

Fibre optic receiver with plug connection		
Body design	Screw mounting	VUMI-OS00/N
	Installation rail snap-in mounting	VUMI-OS01/N

Performance characteristics of the fault signal output

- ▶ If a low battery state is signalled when the green LED „Ready“ extinguishes and the fault signal output becomes active, operation of the system remains possible for a certain time.
- ▶ The green LED „Ready“ is switched on and the fault signal output is reset automatically when a new battery has been installed in the signal pick-up body.
- ▶ The fault signal output also becomes active on the following transmission errors of the optical fibre, by which the red LED „transmission error“ also lights:
 - A. Interruption of the optical fibre
 - B. Incorrect connection
 - C. Weak optical signal

Flowmeter Selection

- ▶ The correct choice (interpretation) of the type and size of flowmeter is essential for a trouble-free and safe operation. Due to the large number of different applications and flowmeter models, the technical data in the VSE catalogues are of a general nature.

Certain characteristics of the devices depend on type, size and measuring range as well as the liquid to be measured. Please consult VSE for an exact choice of flowmeter.

Barrier amplifier "MK 13-P-Ex 0/24V DC/K15" for VHM flow meters

► VSE provides the barrier amplifier type „MK 13-P-Ex 0/24V DC/K15“ for the application of VHM flow meters in areas with explosion hazards. This operates in conjunction with the pick-up systems of VHM flow meters:

- **VIL-..../Ex** ; **VTL-..../Ex** Single pick-up with plug connection
- **VDL-..../Ex** ; **VEL-..../Ex** Double pick-up with plug connection

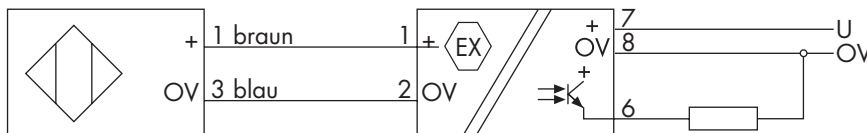
► The barrier amplifier has an intrinsically safe control circuit and is equipped with galvanic isolation between the control and output circuits to the supply. It contains a pulse-switching, short-circuit-resistant transistor output and is connected with screw terminals.

The amplifier is installed in a plastic housing and is fitted with a snap-in mounting for attachment to an installation rail.

► The barrier amplifier must be installed outside the Ex area in an electrical cabinet or terminal box. The intrinsically safe control lines must be laid and marked according to the design specifications of VDE 0165.

► Flow meter VHM...

► Barrier amplifier



► External inductors/ capacitance

[EEx ia] IIB
2/10/20 mH 5/3,5/3 µF

[EEx ia] IIC
1/5/10 mH 1,1/0,75/0,65 µF

► Technical data of the barrier amplifier MK 13-P-Ex 0/24V DC/K15:

Galvanic isolation of the control and output circuits

EX approval according to conformity certificate BVS Nr. 89.C.2010
Control circuit intrinsically safe: EEx ia IIC

Input circuit		Output circuit		Operating values	
Sensor voltage	8,2 V	Signal output	transistor output	Supply voltage	10-30 V DC
Sensor current	< 2,9 mA >3,5 mA		PNP switched	Current consumption	< 20 mA
	(modulated current signal)	Voltage drop	< 2,5 V	Short-circuit current	< 31 mA
Switching threshold	Low = < 2,9 mA	Switching current	< 100 mA		
	High = > 3,5 mA		short-circuit resistant		
Hysteresis	> 0,2 mA	Switching frequency	< 3 kHz		

LED indicators

Ready	green LED
Switching status	yellow LED

Body

Dimensions	length 89 mm, width 18 mm, height 71 mm
Material	polycarbonat / ABS
Inflammability class	V-O according to UL 94
Mounting	installation rail (DIN 50022) or G-rail (DIN 50035)
Temperature range	-13°F...+158°F / -25°C...70°C
Protection range	(DIN 40050) IP 20
Weight	70 g



VHM series

► The two gearwheels of the instrument are set into motion by the volume flow passing through the flow meter. Each tooth of the gearwheel is scanned by a single or double signal pick-up, which is screwed to the flow meter.

When the gearwheel rotates, this signal pick-up generates an electrical output impulse when a tooth of the wheel passes the scanning range.

Each conveyed tooth gap volume corresponds to one electrical output impulse for a single signal pick-up, or 2 or 4 electrical output impulses for a double signal pick-up, depending on the jumper coding.

This volume is enclosed between the tooth gaps of the wheel and the body and is conveyed to the outlet side by the

rotation of the gearwheel.

The volume conveyed out of a tooth gap is designated as the measuring volume V_m , which determines the significance of the impulses depending on the size of the flow meter.

► $V_m (l/\text{impulse}) = 1/K\text{-factor}$

The frequency of the output impulse signal is processed in the associated electronic circuit and is proportional to the speed of rotation of the gearwheel and to the flow velocity. The flow quantity corresponds to the conveyed volume, which is measured by constant electronic counting of the output impulses.

Performance features to further product range



VS series

► VSE offers a manufacturing program of flow meters in combination with electronic measuring-, control- and regulation equipment.

We will be pleased to advise you in finding the right solution for your individual project.

► Flow ranges:

0.002 ...700 l/min.
0.0005...105.7 GPM
graded unit sizes

► Measuring accuracy:

up to 0,3% of measuring value

► High resolution:

up to 50000 pulses/l

► Viscosity ranges:

1...1000000 cSt.

► Max. pressure:

450 bar / 6500 psi
higher pressures
»specials

► Temperature ranges:

-60°C...210°C
-76°F...410°F

► EX-protection:

Special flow meters for hazardous areas with Ex approval
Ex ia IIC T6...T4

► Option:

with fibre optic transmission



VTR series



Offshore



Process control



Car Industry

► **Special designs on request**

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德国威仕容积式齿轮流量计

可靠、高精度、耐高压的精密仪器



威仕流量计工作原理

威仕流量计根据齿轮啮合原理设计：两个精密配合的齿轮封闭在坚固的腔体内，工作时，被测液体推动齿轮旋转，由非接触式的检测器检测齿轮的转动。齿轮间的间隙形成测量腔室。每齿经过检测器时，检测器产生一个脉冲。输出的脉冲信号经仪表容积/脉冲（Vm）换算和处理，显示为满足用户要求的读数。此流量计特别适用于精密、高压、高粘度环境。



VS 不锈钢系列

特 点

- ◆ 以齿轮啮合原理设计的容积式流量计
- ◆ 利用双检波倍乘方法提高分辨率，并能辨别流向
- ◆ 能在高压下进行精密计量
- ◆ 探头不接触流体，检测系统易于连接二次仪表
- ◆ 外壳与齿轮采用同一材料，温度变化不致影响计量精度
- ◆ 流量计输出信号为双工，便于其他电子设备，SPS 控制或计算机处理
- ◆ 压力损失比同类产品低（专利设计）
- ◆ 量程大，可靠性好，适用面广
- ◆ 德国精密设计和机械加工

威仕流量计 VS,VHM 和 EF 系列主要技术指标

规格 参数	VS 系列 (双通道输出)	VHM 系列 (单/双通道输出)	EF 系列 (单通道输出)
工作压力	铸 铁：315 巴 不锈钢：450 巴	250 巴	200 巴
温度范围	-30℃~210℃(100℃以上 带独立前置放大器)	-20℃~+120℃	80℃（最高温度）
粘度范围	1~100,000cSt	1~20,000cSt	1~8,000cSt
精 度	±0.3%测量值 (粘度>20cSt,)	±0.5%测量值 (粘度>10cSt)	±2%测量值 (粘度>20cSt)
重复精度	±0.05%(相同工作条件)		
流量范围	0.002--300 升 / 分钟	0.01--20.00 升 / 分钟	0.05--150 升 / 分钟
机身材料	铸铁或不锈钢	不锈钢	铝质

VS 系列具体型号、规格

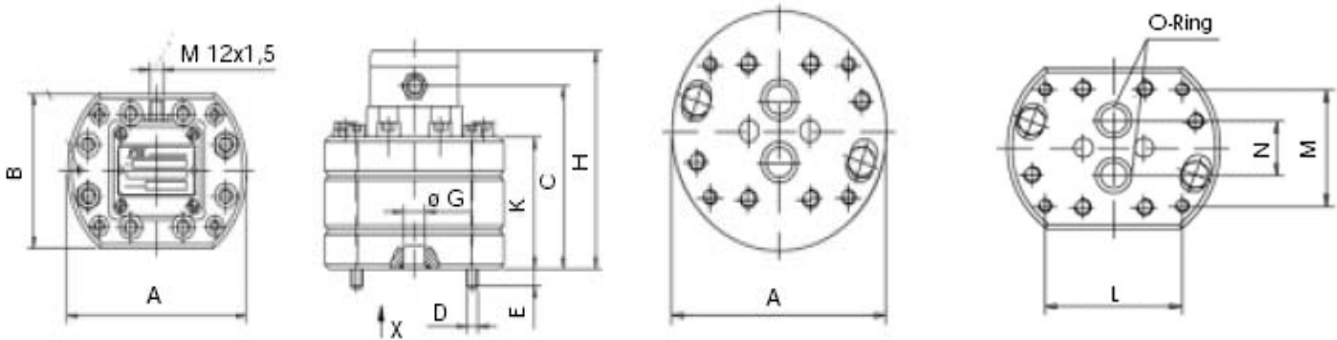
型号	流量范围 (L/min)	脉冲数/升	重量/Kg		底板型号	外接管径	
			铸铁	不锈钢		mm	inch
VS 0.02	0.002 ~ 2	50,000	2.8	3.4	APG/APE02	8	G1/4"
VS 0.04	0.004 ~ 4	25,000	2.8	3.4		10	G3/8"
VS 0.1	0.01 ~ 10	10,000	2.8	3.4		15	G1/2"
VS 0.2	0.02 ~ 18	5,000	3.0	3.7			
VS 0.4	0.03 ~ 40	2,500	4.0	5.0	APG/APE04	15	G1/2"
						20	G3/4"
VS 1	0.05 ~ 80	1,000	5.3	6.8	APG/APE 1	15	G1/2"
VS 2	0.1 ~ 150	500	6.7	8.4		20	G3/4"
						25	G1"
VS 4	1 ~ 300	250	14.7	18.4	APG/APE 4	32	G1 1/4"
						40	G1 1/2"

流量计材料

机 身：GGG 40 铸铁或 DIN 1.4305 不锈钢
轴 承：滚珠/普通滚动轴承（无铜），由被测液体决定
密 封：氟橡胶（FPM, 标准），丁晴橡胶（NBR），三元乙丙橡胶（EPDM），聚四氟乙烯（PTFE）
安装姿态：无限制，装于具有侧边或底部联结的底板上

噪声等级：最大 72dB
前 放：短路保护和反极性保护
电 源：24VDC/40mA(20-28VDC)
12VDC/30mA(10-16VDC)
电气连接：标准插头连接（具有 4 芯屏蔽电缆）
选 择：4-针插头

流量计外型尺寸



型 号	A	B	C	D	E	Ø G	H	K	L	M	N	O-Ring
VS 0.02	1 0 0	8 0	91	M6	12.5	Ø9	114	5 8	70	40	20	1 1 × 2
VS 0.04			92		11.5		115	5 9				
VS 0.1		8 0	94		9		117	6 1				
VS 0.2												
VS 0.4	1 1 5	9 0	96.5	M8	16.5	Ø16	120	63.5	80	38	34	18×2.62
VS 1	1 3 0	100	101		12		124	6 8	84	72		
VS 2			118		15		141	8 5				
VS 4	1 8 0	140	143	M12	20	Ø30	166	110	46	95	45	36.17×2.62

VHM 系列具体型号、规格

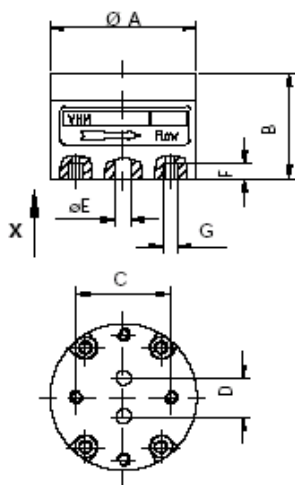
型号	流量范围 (升/分钟)	脉冲数/升	底板型号	外接管径 (inch)
VHM 01	0.01~1	30000	AHM 01	G1/8" G1/4"
VHM 02-1	0.05~2	8800	AHM 02	G1/8"
VHM 02-2	0.10~4	4400		G1/4"
VHM 02-3	0.40~8	2200		
VHM 03-2	0.50~20(30)* 仅在单通道检测情况下	1000	AHM 03	G3/8" G1/2"

流量计材料:

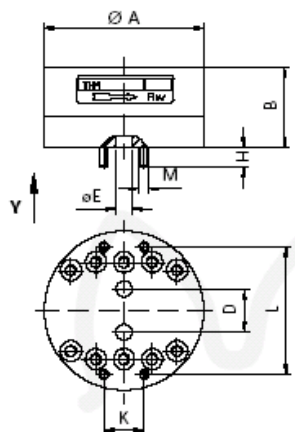
机 身: 不锈钢
齿 轮: 不锈钢
轴 承: 碳化钨
(合金)
密 封: FEP-FKM

流量计外型尺寸

► VHM 01/02 View X



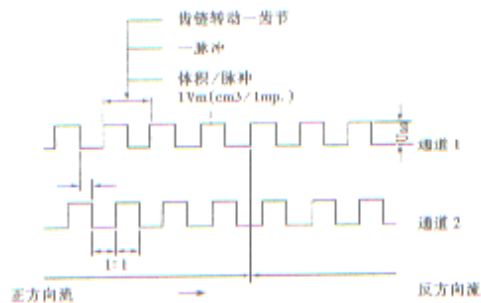
► VHM 03 View Y



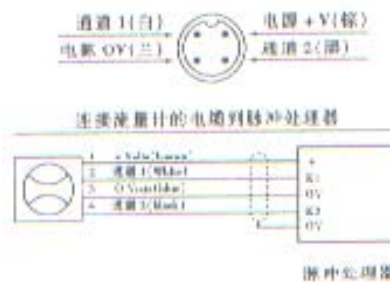
型 号	A	B	C	D	E	F	G	K	L	M	N	重量(kg)
VHM 01-1	Ø68	29	44	12	Ø4	6	M6	—	—	—	—	0.760
VHM 02-1	Ø68	29	44	18	Ø6	6	M6	—	—	—	—	0.740
VHM 02-2	Ø68	34	44	18	Ø6	6	M6	—	—	—	—	0.860
VHM 02-3	Ø68	43	44	18	Ø6	6	M6	—	—	—	—	1.075
VHM 03-2	Ø99	50	—	27	Ø10	—	—	25	81	M6	12	2.700

VS、VHM 的应用

双通道检波器输出信号



插头连接图



威仕流量计的应用范围

功 能：体积和流量测量
精确配料、混料
系统监测、混料成分比例控制
过程控制、开/闭环控制
连续定量控制

适用行业：液压行业、聚氨脂工业
汽车制造及相关行业
航空航天工业
漂漆、涂料、油漆行业
制药行业、食品行业
美容、化妆品行业

适用液体：一切可被吸入和已知润滑性质的流体，例如：
特种液压工作油、航空液压油
汽油、石蜡、煤油
墨水、染料、油漆
胶、浆糊、奶油
矿物油、阻燃水压油
柴油、异氰酸脂
合成树脂粘结、润滑油
聚亚安脂、多元醇
树脂、蜡状物等等

威仕流量计二次仪表

≈ 流量 ∑ 累计 ✕ 双流量计 →A 输出模拟信号 →D 输出数字信号

应用于单/双通道检波流量计 (VS, VHM系列)

(* 仅适用于双通道流量计)

PAXI 流量/累计器



配合两个单/双通道流量传感器

- ◆ 可切换显示 A, B 流量计的流量、累计, (A+B), (A-B) 累计
- ◆ 可显示正负向
- ◆ 可设 4 个报警点输出
- ◆ 模拟输出: 0—10 V 或 4—20 mA
- ◆ 可提供流量计电源 12VDC±10%, Max100mA
- ◆ 串口接口: RS232 或 485



MF1 流量显示器



配合单/双通道流量传感器

- ◆ 流向显示, 并有 0V/5V 的开关输出
- ◆ 上下限流量值输出, 限制值可独立调整
- ◆ 可根据有向流速选择几种电压/电流模拟输出
0-(±)10V、0-(±)20mA、4-20mA
- ◆ 可提供流量计电源 24VDC/50mA



404 流量/累计/定量控制器



配合单/双通道流量传感器

- ◆ 显示实际流量累计值、2 个累计预设值、定量和流量
- ◆ 2 个预设值和 1 个定量预置值其中两个报警输出
- ◆ 可对方波信边沿编程计算，辨别双通道相位差
- ◆ 可在程序中选择 4 种控制输入

忽略预设限定值、由信号上升沿触发输出、几种反设定功能、
几种记数编程和取消设定功能

- ◆ 可提供流量计电源 12VDC $\pm$ 25%，Max100mA
- ◆ 串口接口：RS485，可通过接口控制计数器的多种功能



* VFM320 多功能监控器



配合动态过程测量和闭环控制

- ◆ 测量和控制双成分混合系统的体积和质量的流量、累计和比率
- ◆ 处理两个双通道流量传感器的输出信号
- ◆ 2 个具有 16 位数模转换的独立动态模拟输出

数/模转换时间：<3ms(0Hz $\rightarrow$ 2Hz $\rightarrow$ 0Hz)

有流向性的累计和流量值的输出由以下确定：

(0V $\xleftarrow{\text{两个流向}}$ 5V $\xrightarrow{\text{1个流向}}$ 10V) 或流向独立输出
(10V $\xleftarrow{\text{两个流向}}$ 0V $\xrightarrow{\text{1个流向}}$ 10V) 电压值模拟输出

- ◆ 实时模拟输出和数字测量值
- ◆ 串口接口：1 个 RS232，2 个 RS485



DIGFU 1 频率/模拟信号转换器



配合单/双通道流量传感器

- ◆ 模拟输出：0-10V/0-20mA，0-10V/4-20mA，0 $\pm$ 10V/0 $\pm$ 20mA
- ◆ 数字输出：5V (TTL)，15V (CMOS)，24V
- ◆ 可输出倍乘脉冲：x1, x2, x4
- ◆ 可提供流量计电源 24VDC/60mA



PGW-1 频率/峰值转换器

配合单/双通道流量传感器转化流量输出信号为其它电压值

- ◆ 经转换的脉冲信号可直接与前向/反向计算器、计算机、PC 和 PLC 控制器相连接
- ◆ 可用输出电压：TTL5V，8V，12V，CMOS 15V
- ◆ 所需电源/电流消耗：10—30VDC，20mA (不接流量传感器)
- ◆ 在两通道之中，正、反输出信号是与一个微分计算输入电路相连，以避免在长距离传输时出现信号失真



GEL103 累计/定量控制器



配合单/双通道流量传感器

- ◆ 同时显示流量累计值和 2 个预设值
- ◆ 2 个预设报警输出，1 个定量预置输出
- ◆ 可对方波信边沿编程计算，辨别双通道相位差
- ◆ 可提供流量计电源 24VDC $\pm$ 10%，Max 60mA



应用于单通道检波流量计 (VHM、EF 系列)

405S 流量/累计器



配合两个单通道流量传感器

- ◆ 可切换显示 A，B 流量计的流量、累计，(A+B)，(A-B) 累计
- ◆ (A-B) 累计上下限报警输出
- ◆ 模拟输出：0-10V/2-10V，0-20mA/4-20mA
- ◆ 可提供流量计电源 8-24VDC，Max50mA
- ◆ 串口接口：RS232 或 RS422/485



特殊应用流量计



其它产品



◆VTR 涡轮流量计系列

重复精度: $\pm 0.05\%$ (相同条件)

粘度范围: $\leq 40\text{cSt}$

精度: $0.5\%R$ ($< 5\text{cSt}$ 时)

测量范围: $0.11 \sim 7000 \text{ m}^3/\text{h}$

工作温度: $-50^\circ\text{C} \sim 180^\circ\text{C}$



◆德国百利泵 beinlichpumpen

◆外齿轮泵:

排量: $0.12 \sim 2900 \text{ ccm/rev}$

◆内齿轮泵:

排量: $1 \sim 207 \text{ ccm/rev}$

耐压: $\leq 200 \text{ bar}$



◆径向柱塞泵:

排量: $1 \sim 42.9 \text{ ccm/rev}$

耐压: $\leq 700 \text{ bar}$

◆轴向变量柱塞泵:

排量: $2 \sim 125 \text{ ccm/rev}$



◆DSI 磁联轴器

特点: 磁力传动, 非机械传动

传递扭矩: $1 \sim 2000 \text{ Nm}$

优点: 过载保护, 无泄漏, 无需维护



 RÖTELMANN

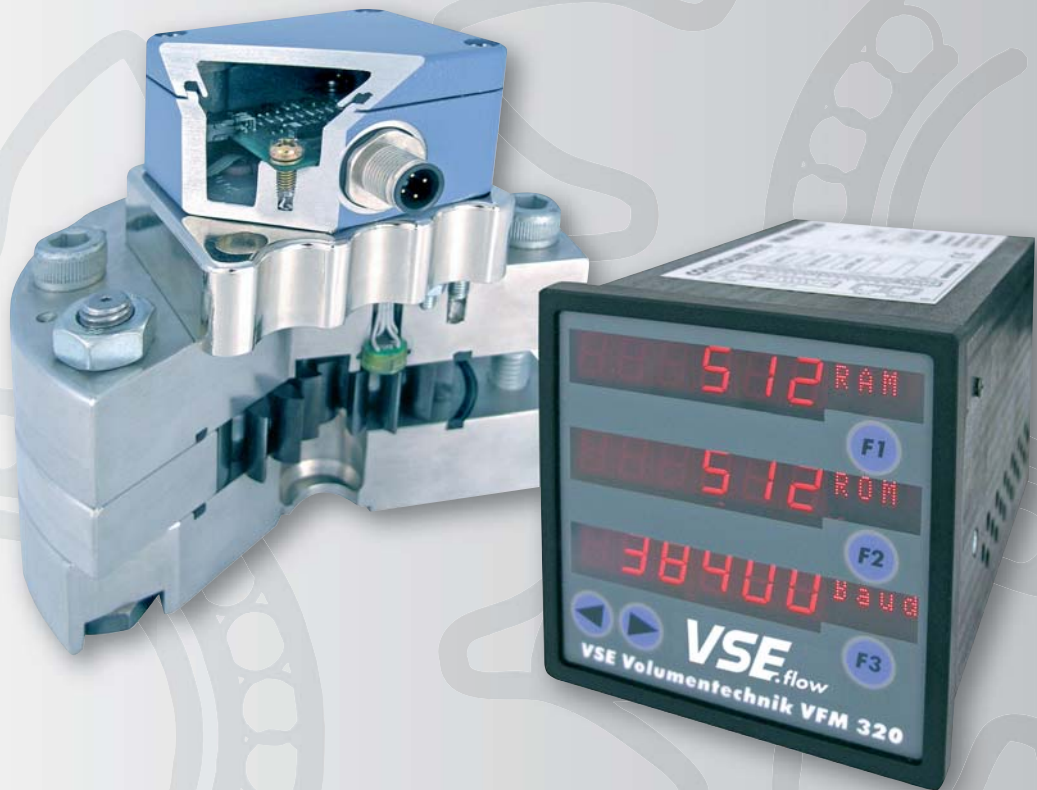
- ◆耐压 $\leq 1400\text{bar}$
- ◆满足多种接口标准
- ◆满足各种油路切换
- ◆满足内嵌管道需要
- ◆安全, 可靠, 泄露小
- ◆满足密集管道需要



 HBE



流量计量 技术



VS 系列

► 正排量流量计

VS 流量计

- VS 流量计为容积计量传感器，适用于液体。工作原理：两个精密配合的齿轮被封闭在一个密闭壳体里，非接触式传感器检测齿轮的转动，每转过一个齿，产生一个脉冲。

- 两个齿与壳体之间形成一个个计量腔。液体流动推动齿轮转动，液体进入计量腔。换句话说，每个计量腔内的液体刚好推动齿轮转过一个齿距。

- 体积/脉冲 (V) 单位为毫升/脉冲，用于标识流量计规格。

前置放大器(信号采集处理系统)介绍

- 非接触式传感器由两个磁电阻组成，被固定在相差 1/4 齿距的圆周上。两个传感器的信号由后续放大电路数字化，由推挽电路输出。双向方波信号可被外部仪器，PLC 或计算机采集并处理。两路相差 90 度相位的信号可以用于标识方向或 1,2 和 4 倍频处理。

- 不同规格的流量计在量程范围内输出的信号频率与流量成正比，范围为 0-2000 赫兹。若正负极接反或接线错误，电路板有自我保护功能。输送介质的温度在 -40 至 120 度范围内，电气盒直接集成在流量计端盖上。

高温传感器

特殊的高温传感器可用于温度高达 210 度的液体。

VSI 高分辨率前置放大器

- VSI 系列的放大器输出数字信号。在一个齿距间可细分成 4 至 64 等份并输出相应信号。与 VS 系列对比，相当于 16 倍。若将两路信号再 4 倍频，K 系数可达 64 倍！最高频率输出可达 26 K 赫兹！

本安型(防爆型)

- 本安型符合  EEx ia IIC T4-T6 规范。适合易燃易爆的场合。配合安全栅 MK 13 P Ex Ex O/ 21 VDC / K15. 一起使用。

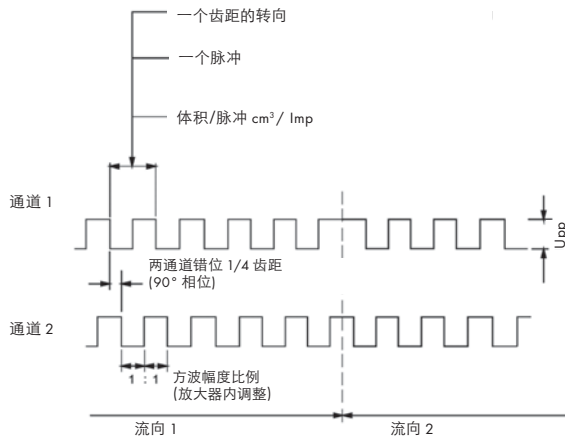
VS 系列流量计选型

- 选择正确的型号和规格，可以避免问题和故障的发生。我们的样品仅列举了标准的技术参数。具体的应用如粘度、量程、压力、温度等参数千变万化，请联系我们选择合适的流量计。



前置放大器输出信号

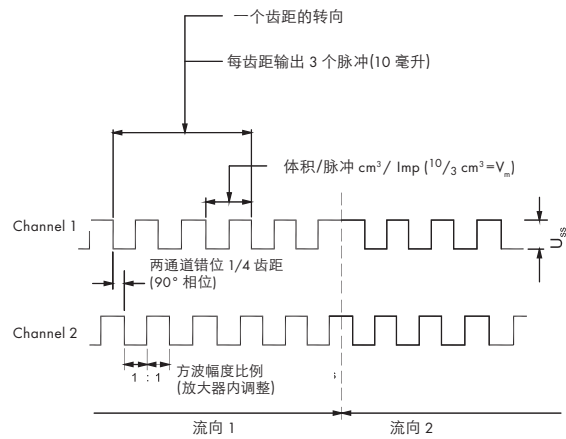
规格 VS 0,02 ... VS 4



* 电压范围

供电电压: $U_v = 10 \dots 28 \text{ V DC}$
方波电压: $U_{pp} = U_v - 1 \text{ V}$

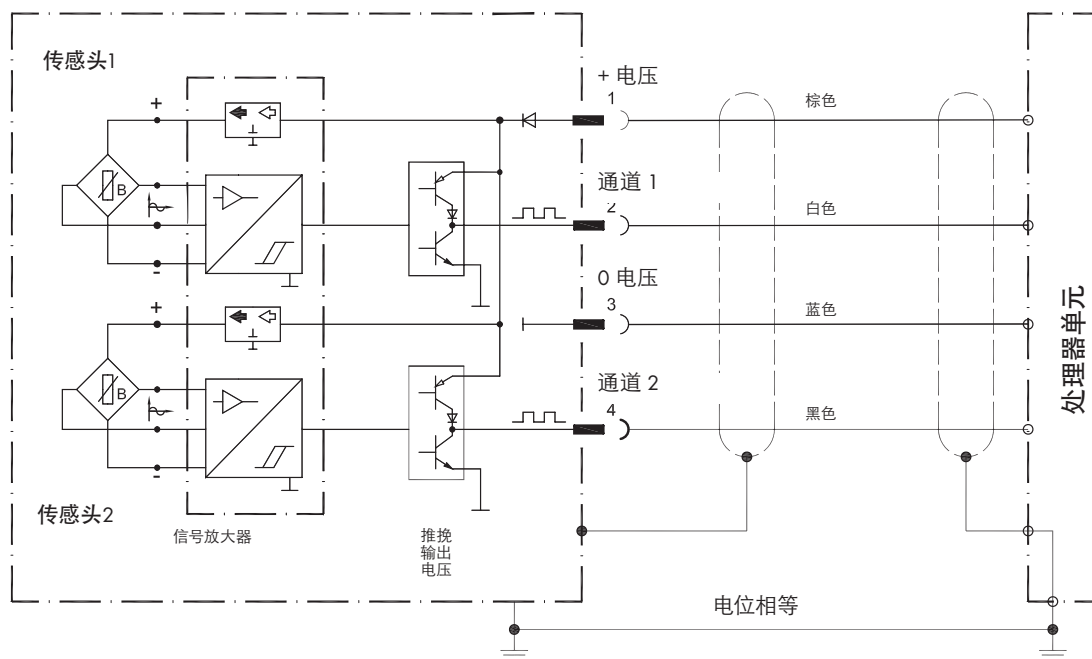
VS 10 规格



* 电压范围

供电电压: $U_v = 10 \dots 28 \text{ V DC}$
方波电压: $U_{pp} = U_v - 1 \text{ V}$

电气原理图



VSE



► 应用范围

应用

- 所有已知润滑特性的液体都可计量，如汽油,石蜡,航空煤油,柴油,航空液压油,矿物油,液压油,抗燃液压油,油墨,染料,油脂,聚亚安酯,多元醇和异氰酸酯,环氧树脂,粘胶剂,浆糊和面霜,树脂,蜡....等等。

汽车领域

刹车系统测试台

- 燃油消耗计量
- 内饰件聚氨酯发泡
- 喷涂系统
- 转向系统
- 发动机机油,刹车液,防冻液,防腐液和蜡状物的定量加注
- 挡风玻璃,车头灯和发动机壳体等的粘合

液压领域

- 体积和流量计量
- 泄漏和破裂监控
- 液压缸速度和位置测量
- 定位和步进控制
- 流速和体积的计量,控制和调节
- 泵,电机,阀门,比例阀和伺服阀测试台
- 多个液压缸同步监控
- 助剂添加

涂料领域

- 喷涂系统
- 定量加注
- 体积,流速和消耗
- 比例混合监控

塑胶领域

- 单组分,多组分流体的混比,浇注和定量系统
- 消耗量计量 如: 变压器,电感线圈,继电器,电容器,电枢,启动器等环氧粘合剂,填充物(树脂和固化剂)的计量
- 单组分和多组分的计量,控制和调节
- 硅胶混合物
- 聚氨酯发泡(多元醇和异氰酸酯),如: 方向盘,车轮,座椅,鞋帮,滑板,家具,计算机外壳和绝缘物等
- 热熔胶

化工领域

- 处理厂的流速和体积计量
- 化工品的混合和加注,如: 粘合剂,树脂,固化剂,混合物,溶剂,燃料,泡沫液,
- 塑胶液,染料,油品和合成物等。
- 实验室和加工厂(普通或防爆区)
- 单组分,多组分混合和消耗的控制和调节
- 工厂泄漏计量和监控
- 产品质量控制的数据测量,显示和录入

特殊设计要求

以此版本为准,早期版本所有参数作废。威仕(VSE)公司保留变更的权利,不承担印刷错误的责任。复制或引用需得到威仕公司的书面许可。版本:05/2010



► 技术参数表

规格	流量范围*	流量范围*	K 系数	K 系数
	升/分钟	加仑/分钟	脉冲/升	脉冲/加仑
VS 0.02	0.002 2	0.0005 0.53	50 000	189272
VS 0.04	0.004 4	0.0011 1.06	25 000	94636
VS 0.1	0.01 10	0.0026 2.64	10 000	37854.4
VS 0.2	0.02 18	0.0053 4.76	5 000	18927.2
VS 0.4	0.03 40	0.0079 10.57	2 500	9463.6
VS 1	0.05 80	0.0132 21.13	1 000	3785.44
VS 2	0.1 120	0.0264 31.70	500	1892.72
VS 4	1 250	0.2642 66.00	250	946.36
VS 10	1.5 525	0.39 138.00	300	1135
	*bei 21 cSt	*bei 21 cSt		

转换系数

- 1升 = 0.26417 美制加仑
- 1美制加仑 = 3.78544 升
- 1巴 = 14.503684 磅/英寸2(psi)
- 1磅/英寸2(psi) = 0.068948 巴

$$^{\circ}\text{C} = \frac{5}{9} \times (^{\circ}\text{F} - 32) \quad \text{psi} = \text{磅/英寸}^2$$

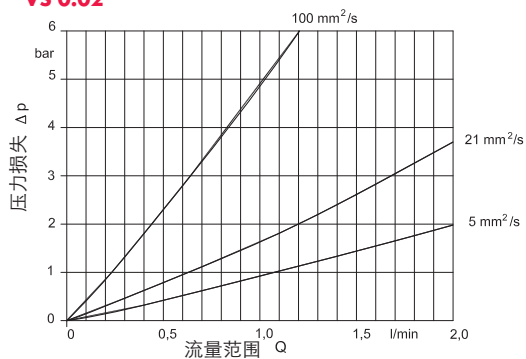
$$^{\circ}\text{F} = \frac{9}{5} \times ^{\circ}\text{C} + 32 \quad \text{GPM} = \text{美制加仑/分钟}$$

计量精度	± 0.3 %R (粘度>20cSt)(<20cSt精度下降)		
重复精度	± 0,05 % 相同条件下		
材料	壳体 球墨铸铁 (国标QT400-15) 不锈钢 (美标303)	轴承 滚珠/滑动/滑动(无铜) 视介质定	密封 FPM (标准) NBR, PTFE, EPDM
最大工作压力	铸铁 315 bar / 4568 psi	不锈钢 450 bar / 6526 psi	
介质温度	标准型 本安型 高温型	-40 ≤ ... 120 °C -20 ≤ ... 100 °C -40 ≤ ... 210 °C	
粘度范围	1 ... 100 000 cSt		
安装姿态	任意,板式安装,侧进式或底进式		
过滤要求 (滚珠轴承型)	VS 0.02/0.04/0.1	10 微米	其它 特殊公差的流量计,视情况定
	VS 0.2/0.4	20 微米	
	VS 1/2	50 微米	
	VS 4	50 微米	
噪音等级	最大 72 分贝		
前置放大器	10 - 28 Volt (DC)		

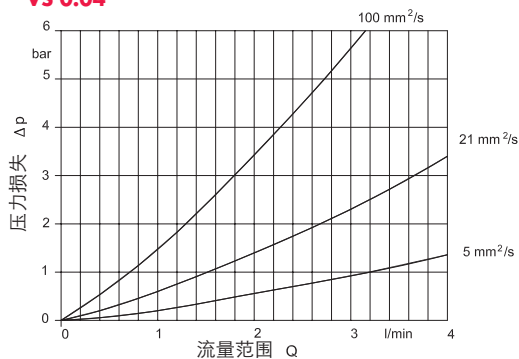


► 流量曲线

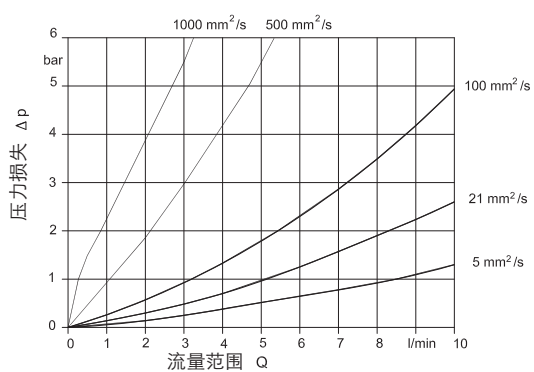
VS 0.02



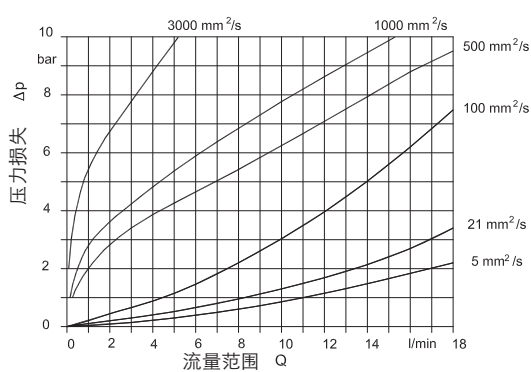
VS 0.04



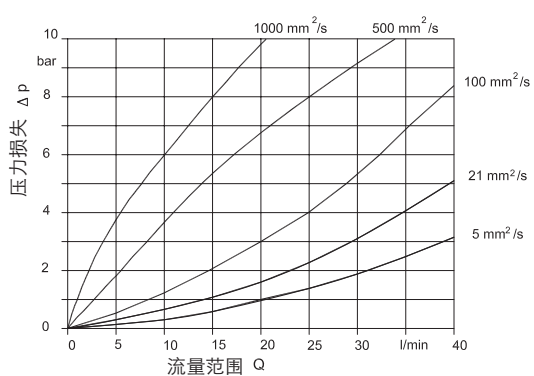
VS 0.1



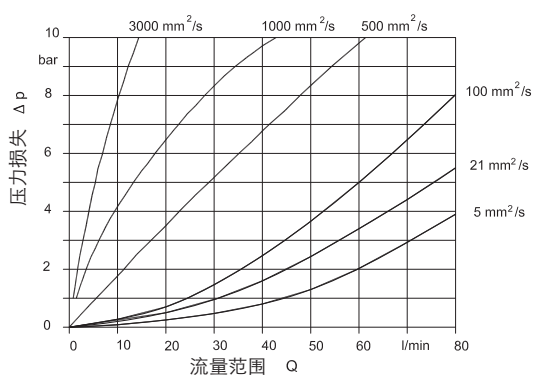
VS 0.2



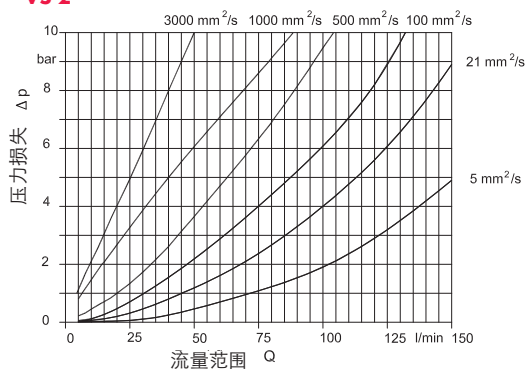
VS 0.4



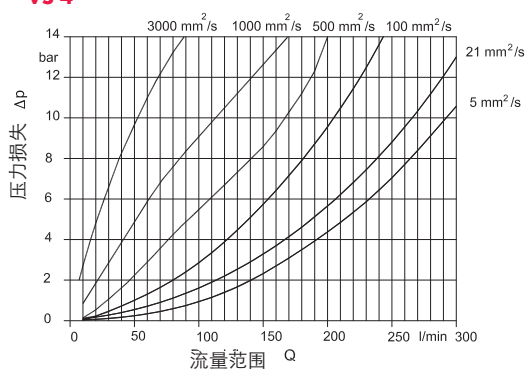
VS 1



VS 2



VS 4

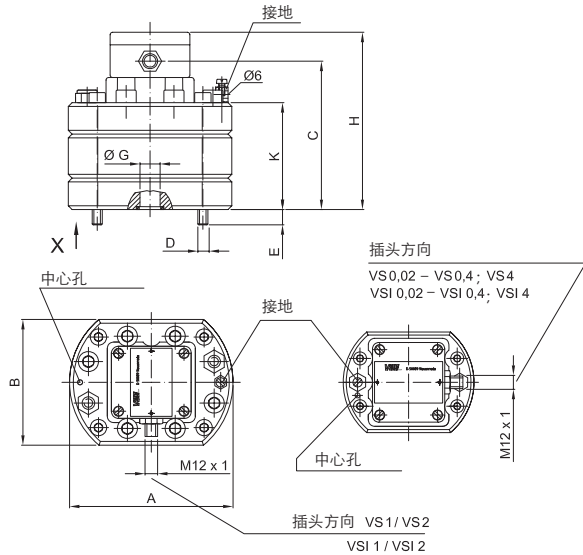




► VS 系列尺寸图

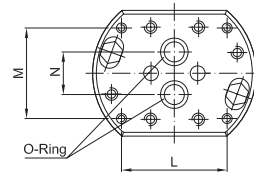
铸铁型

- 壳体(切边)



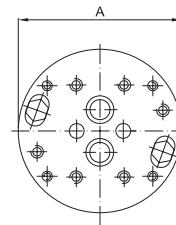
铸铁型

- 底视图



不锈钢型

- 壳体(无切边)
- 底视图



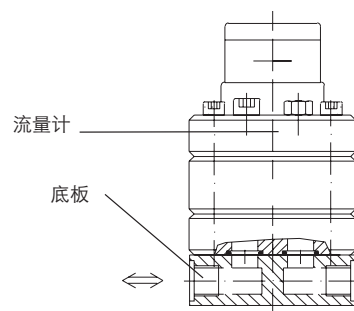
规格 VS/VS1	A	B	C	D	E	Ø G	H	K	L	M	N	O型圈	DD	
													GG*	E**
0.02	100	80	91	M 6	12,5	Ø 9	114	58	70	40	20	11 x 2	2,8	3,4
0.04	100	80	91,5	M 6	11,5	Ø 9	114,5	58,5	70	40	20	11 x 2	2,8	3,4
0.1	100	80	94	M 6	9	Ø 9	117	61	70	40	20	11 x 2	2,8	3,4
0.2	100	80	93,5	M 6	9,5	Ø 9	116,5	60,5	70	40	20	11 x 2	3,0	3,7
0.4	115	90	96,5	M 8	11,5	Ø 16	119,5	63,5	80	38	34	17,96 x 2.62	4,0	5,0
1	130	100	101	M 8	12	Ø 16	124	68	84	72	34	17,96 x 2.62	5,3	6,8
2	130	100	118	M 8	15	Ø 16	141	85	84	72	34	17,96 x 2.62	6,7	8,4
4	180	140	143	M 12	20	Ø 30	166	110	46	95	45	36,17 x 2.62	14,7	18,4

* GG = 球墨铸铁 (EN 1563)

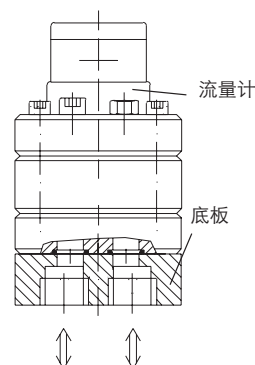
** E = 不锈钢 (303)

尺寸单位: 毫米(mm)

侧进式



底进式



VSE

► 底板尺寸

侧进式		底进式 *	
铸铁 / APG.S.../.	不锈钢 / APE.S.../.	铸铁 / APG.U.../.	不锈钢 / APE.U.../.

* APG 4 U 和 APE 4 U底板的出入料口（G）与上述视图成90度！

相关规格	VS / VSI	G-螺纹类别	G	F	Ø H	E ①
	0.02 / 0.04		G 1 / 4	35	Ø 20	26
	0.1 / 0.2					
	0.02 / 0.04		G 3 / 8	35	Ø 23	30
	0.1 / 0.2					
	0.02 / 0.04		G 1 / 2	35	Ø 28	38
	0.1 / 0.2					
	0.4 / 1 / 2		G 1 / 2	35	Ø 28	46
	0.4 / 1 / 2		G 3 / 4	40	Ø 33	52
	1 / 2		G 1 "	55	Ø 41	55
	4		G 1 1 / 4	70	Ø 51	60
	4		G 1 1 / 2	AP..U=70	Ø 56	72
	4					
	4		G 1 1 / 2	AP..S=80	Ø 56	72

规格							深度	重量
VS / VSI	AP	A	B	C	D	L ②	M	kg
0.02 / 0.04	AP.02	80	90	40	70	100	M6/12	1,8
0.1 / 0.2								
0.4	AP.04	90	100	38	80	115	M8/15	2,7
1 / 2	AP.1	100	110	72	84	130	M8/15	3,6
4	APG4	120	130	100	110	-	M8/15	7,4
	APG4 UG	140	120	120	100	-	M8/15	7,4
	APE.4	140	-	100	110	180	M8/15	12

① 仅适用 APG.U ..././ ; APE.U ..././

② 仅适用 APE.S ..././ ; APE.U ..././

特殊要求请咨询

► VS 10 流量计

技术参数

规格	流量范围 升/分钟	加仑/分钟	K系数 脉冲/升	脉冲/加仑
VS 10	1,5 ... 525	0,3963 ... 138,69	300	1135,63

计量精度	± 0,3 % R (粘度>20cSt)(<20cSt精度下降)		
重复精度	± 0,05 % （相同条件下）		
材料	壳体	轴承	密封
	球墨铸铁(国标QT600-3) 球墨铸铁(德标 EN 1563)	滚珠/滑动 视介质定	FPM (标准) NBR, PTFE, EPDM
最大工作压力	400 bar / 6000 psi		
介质温度	标准型 -40 ≤ ... 120° C		
	本安型 -20 ≤ ... 100° C		
	高温型 无		
粘度范围	1 ... 100 000 mm² / s		
安装姿态	任意,板式安装,侧进式或底进式		
过滤要求	50 微米		
前置放大器	短路保护,反极向保护 10 to 28 Volt (DC)/45 mA, 接负载时, 最大电流输出 20 mA		

输出信号

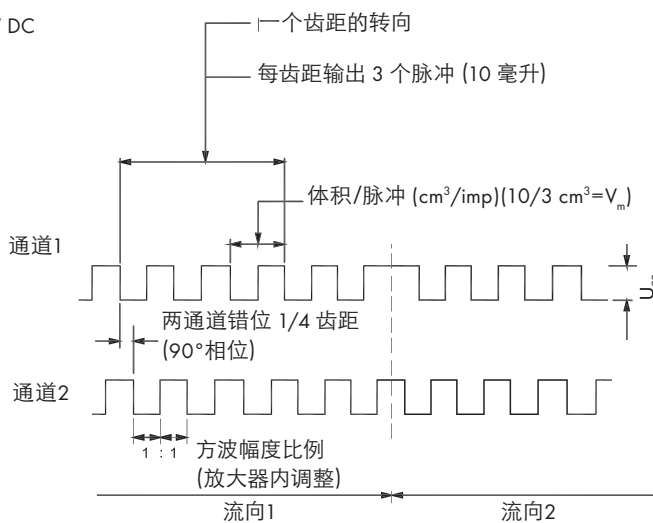
电压范围

工作电源:

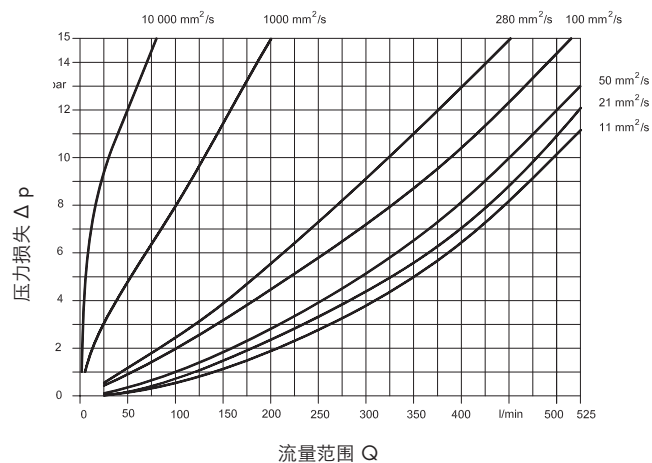
方波电压:

$$U_v = 10 \dots 28 \text{ V DC}$$

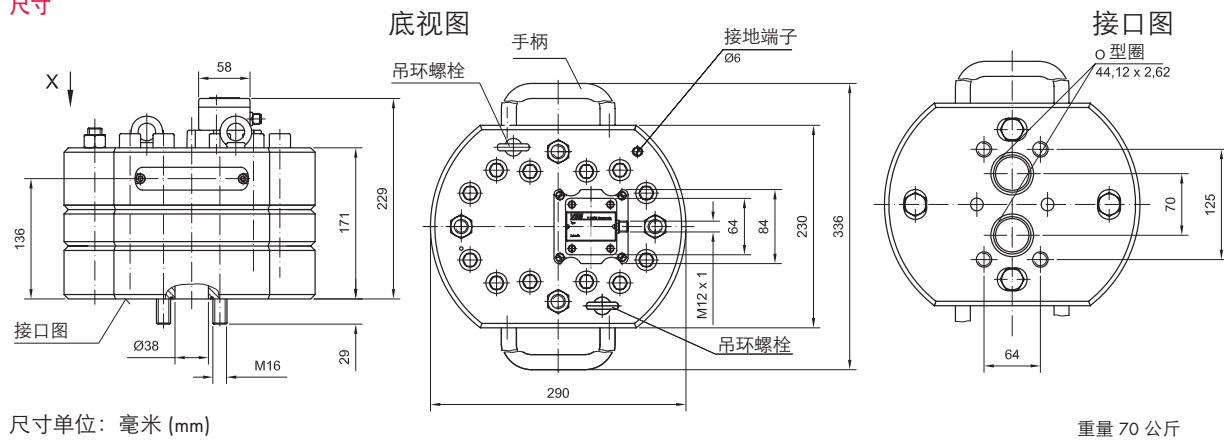
$$U_{pp} = U_v - 1 \text{ V}$$



流量曲线

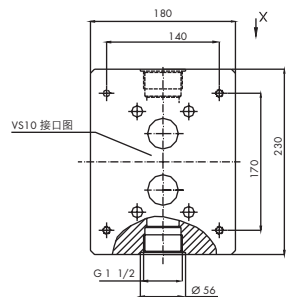


尺寸

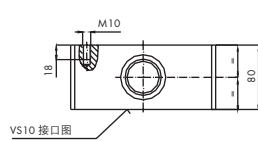


底板尺寸

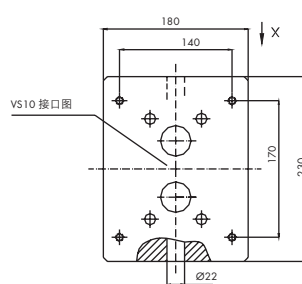
APG 10 S GON/1



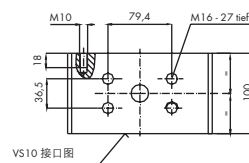
底视图



APG 10 S WON/1

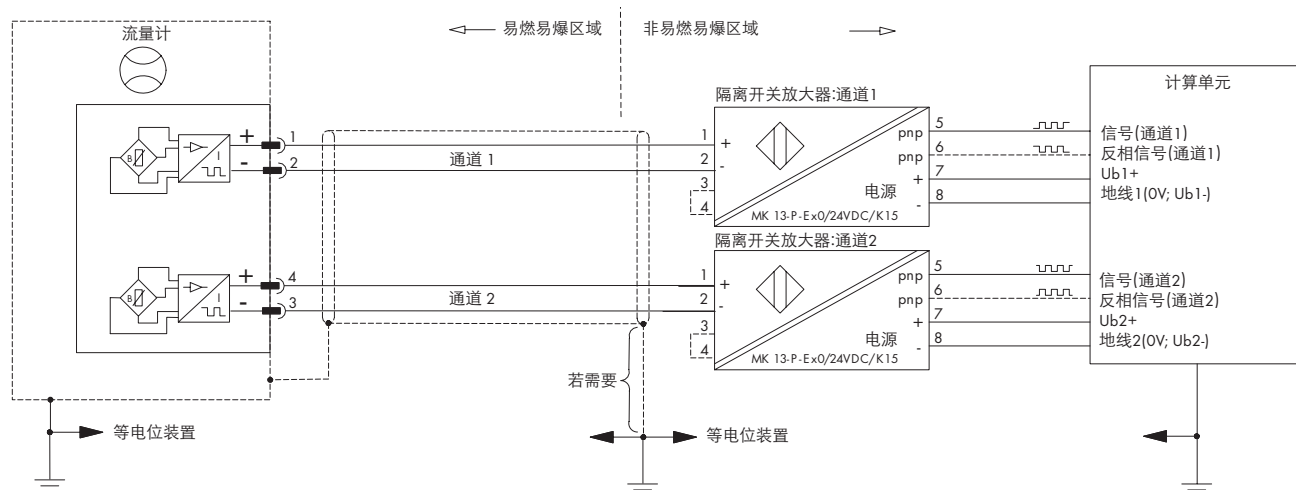


底视图



尺寸单位：毫米 (mm)

► 本安型流量计/安全栅



本安型流量计

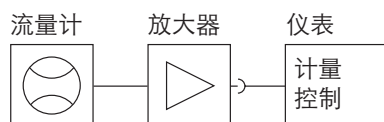
VS系列的本安型流量计和一或两个安全栅配套使用，用在易燃易爆危险场合。电气盒用蓝色标识，铭牌上标示符合 DIN EN 50014 规范的技术参数。配套安全栅型号为 MK 13-P-Ex 0/24 VDC/K15。

安全栅 MK 13-P-EX 0/24 VDC/K15

安全栅 MK 13-P-Ex 0/24 VDC/K15符合EX II(1) GD (EExia) IIC 标准。本安控制回路，可提供隔离电流的双重开关状态：控制回路，输出回路和电源之间互相隔离。若需输送两路信号，则需两个安全栅。我们可监控控制回路是否线路中断或短路(可通过跳线开关关闭监控)。当有故障时，信号输出终止。短路校对的两个晶体管（PNP输出）闪烁显示。

流量计	电缆,蓝色,聚氨酯材料	安全栅						
Typ VS***-32 Q1*/*	屏蔽线; 4 x 0,34 mm²	型号 MK 13-P-Ex 0/24 VDC/K15						
BVS 05 ATEX E 071 X	PUR	PTB 06ATEX 2025						
Ex II 1G EEx ia II C T4-T6		Ex II (1) G [EEx ia] II C						
U _i = 18,5 V	R = 0,053 Ω/m	U _o = 9,9 V						
I _i = 24 mA	L = 0,85 µH/m (x)	I _o = 22 mA						
P _i = 100 mW	C _{A-A} = 55 pF/m (x)	P _o = 54 mW						
R _i = 0	C _{A-S} = 105 pF/m (x)							
L _i = 0	[(x) = 在 1000 Hz 测量]							
C _i = 0,27 µF		IIC				IIB		
		Lo/mH	1	5	10	2	10	20
		Co/µF	1,5	0,75	0,65	5	3,5	3
温度等级		T4		T5		T6		
环境温度		- 20 °C ≤ T _{amb} ≤ 95 °C		- 20 °C ≤ T _{amb} ≤ 70 °C		- 20 °C ≤ T _{amb} ≤ 55 °C		
流体温度		- 20 °C ≤ T _{Med} ≤ 100 °C		- 20 °C ≤ T _{Med} ≤ 75 °C		- 20 °C ≤ T _{Med} ≤ 60 °C		

► 高温传感器系统



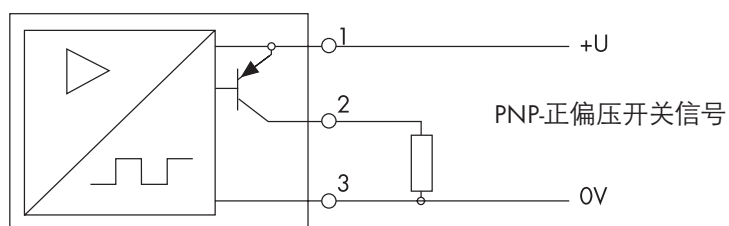
适用于不锈钢型号 VS 0.04 ... VS 4

• 传感器系统由一或两个传感器组成。磁感头部分上紧在流量计端盖上，放大器通过耐高温电缆连接，远离高温区。但环境温度应不超过 50 度。(122 华氏度)

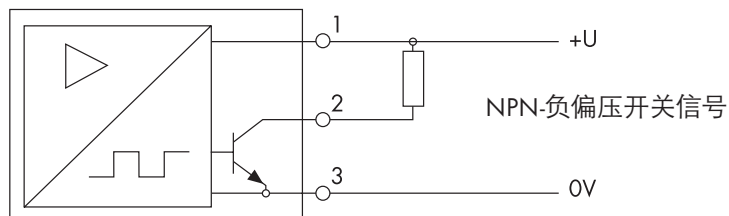
• 信号输出可选 PNP 或 NPN 开关信号。下图分别显示两种信号的接线图：

• 若信号输送更远距离或仪表阻抗较高,则建议采用屏蔽线和含负载的 PNP 或 NPN 信号。

接线图:PNP开关



接线图:NPN开关





► 技术参数/尺寸

技术参数:传感器

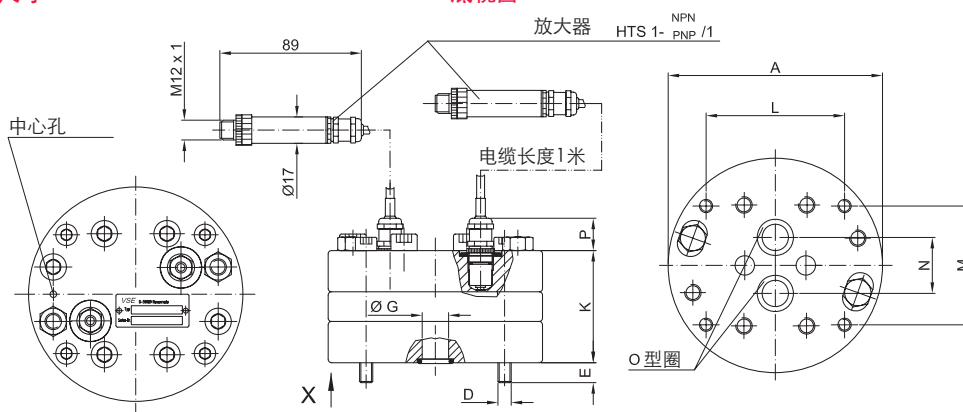
介质温度	-40° C ... 210° C
传感器数量	1或2个
传感器	磁阻型
电气接线	PG 接口
绝缘保护	IP 64

技术参数:放大器

工作电压	$U_b = 10 \dots 30 \text{ V}$ DC $\pm 10\%$
电流消耗	$I_b =$ 约15毫安(空载时)
PNP 信号输出	高电平: $-U_s = U_b - 1 \text{ V}$, $I_s = 25$ 毫安(最大)
NPN 信号输出	低电平: $-U_s = 0 \text{ V}$, $I_s = 25$ 毫安(最大)
电气接线	插头M12,电缆4芯
最大环境温度	50° C
保护等级	IP 64
下拉电阻	4,7 ... 10 K Ω
上拉电阻	4,7 ... 10 K Ω

流量计尺寸

底视图



规格	A	D	E	$\varnothing G$	K	L	M	N	P	O型圈	重量 kg
VS 0.04*	100	M 6	11,5	$\varnothing 9$	58,5	70	40	20	22	11 x 2	3,5
VS 0.1	100	M 6	9	$\varnothing 9$	61	70	40	20	22	11 x 2	3,3
VS 0.2	100	M 6	9,5	$\varnothing 9$	60,5	70	40	20	22	11 x 2	3,6
VS 0.4	115	M 8	11,5	$\varnothing 16$	63,5	80	38	34	22	17,96 x 2,62	4,9
VS 1	130	M 8	12	$\varnothing 16$	68	84	72	34	22	17,96 x 2,62	6,7
VS 2	130	M 8	15	$\varnothing 16$	85	84	72	34	22	17,96 x 2,62	8,3
VS 4	180	M 12	20	$\varnothing 30$	110	46	95	45	12	36,17 x 2,62	18,3

*请注意: VS004 只可配一路传感器





举例

H		T		高温型传感器 (210 度), PNP 或 NPN 信号					
-	H	T				/	X		

VS 1	G	P	0	1	2	V	-	3	2	N	1	1	/	X	
规格				工况决定	密封圈材料	公差等级	传感器类型	传感器数量	工作电压	放大器形式	电缆接口	系列号	修改版本(内部编号)		
													1	VSE-4 芯电缆	
													0	不带放大器	
													1	集成放大器	
													2	外置放大器	
													N	10-28 VDC (标准型)	
													Q	5- 10 VDC (本安型)	
													1	1 个传感器	
													2	2 个传感器	
													3	GMR- 传感器	
													V	FPM (氟橡胶) 标准	
													P	NBR (丁腈橡胶)	
													T	PTFE (聚四氟乙烯)	
													E	EPDM (三元乙丙橡胶)	
													接口方式	材料	齿轮工艺
2	标准公差														
3	加大公差														
4	钢质滑动轴承公差														
1	滚珠轴承														
2	滚针轴承														
3	铜质滑动轴承														
4	渗碳滑动轴承														
5	钢质滑动轴承														
O	表面无处理(标准)														
C	表面渗碳处理														
T	表面镀钛处理														
P	接口方式														
R	板式安装														
G	球墨铸铁QT400-15(VS10:QT600-3) DIN EN 1563 标准														
E	不锈钢(303)														
H	球墨铸铁 QT600-3 (高压) EN 1563 标准														
VS 0.02															
VS 0.04															
VS 0.1															
VS 0.2															
VS 0.4															
VS 1															
VS 2															
VS 4															
VS 10															



► AP底板

AP底板

举例

A	P	G	1	-	S	C	0	N	/	X		
底板						连接螺纹	辅助连接	类型		系列号		
										X	修改版本(内部编号)	
								N	标准			
								S	特殊			
							0	无清洗口				
							A	G 1/4				
							B	G 3/8				
							C	G 1/2				
							D	G 3/4				
							E	G 1				
						F	G 1 1/4					
						G	G 1 1/2					
						J	1/4 NPT					
						K	3/8 NPT					
						L	1/2 NPT					
						M	3/4 NPT					
						N	1 NPT					
						O	1 1/4 NPT					
						P	1 1/2 NPT					
						接口方式	S	SAE 1/2				
							T	SAE 3/4				
							U	SAE 1				
							V	SAE 1 1/4				
							W	SAE 1 1/2				
							X	3/8 NPT				
						规格	S	侧进式				
							U	底进式				
							0.2	VS 0.02 - VS 0.2 / VSI 0.02 - VSI 0.2				
							0.4	VS 0.4 / VSI 0.4				
1	VS 1 / VS 2 / VSI 1 / VSI 2											
4	VS 4 / VSI 4											
材料	10	VS 10 / VSI 10										
	G	球墨铸铁 (QT250,QT400-15,DIN EN 1561/1563 标准)										
	E	不锈钢 (303)										
	H	球墨铸铁 QT600-3 EN 1563 标准 (高压)										

► 高分辨率型流量计

高分辨率型流量计

标准 VS 系列的放大器每转一个齿距输出一个脉冲。齿间容积 V_z 对应计量容积 V_m ($V_m = V_z / \text{脉冲}$)。若双通道输出,可对两路信号组合信号脉冲的上升沿和下降沿 4 倍频处理,分辨率最高可达 $1/4 V_z$, 但该放大器无法再提高分辨率。

更精确的计量需要更高的分辨率,传统的放大器已经满足不了要求。威仕公司开发出可插值的放大器,每个计量周期最高分辨率可达 64 倍 (16 脉冲)。这意味着可以分辨出 $1/64 V_m$ 的流量。在该分辨率下,可根据脉冲信号的边沿计量出 $1/64 V_m$ 的流量 (四倍频或计量脉冲边沿)。或者根据脉冲信号计量出 $1/16 V_m$ (插值系数 $V_m/16$)。

客户可以根据自己的应用设置最佳的 V_m 分辨率值。另外, 高分辨率型可适用于更多新应用。

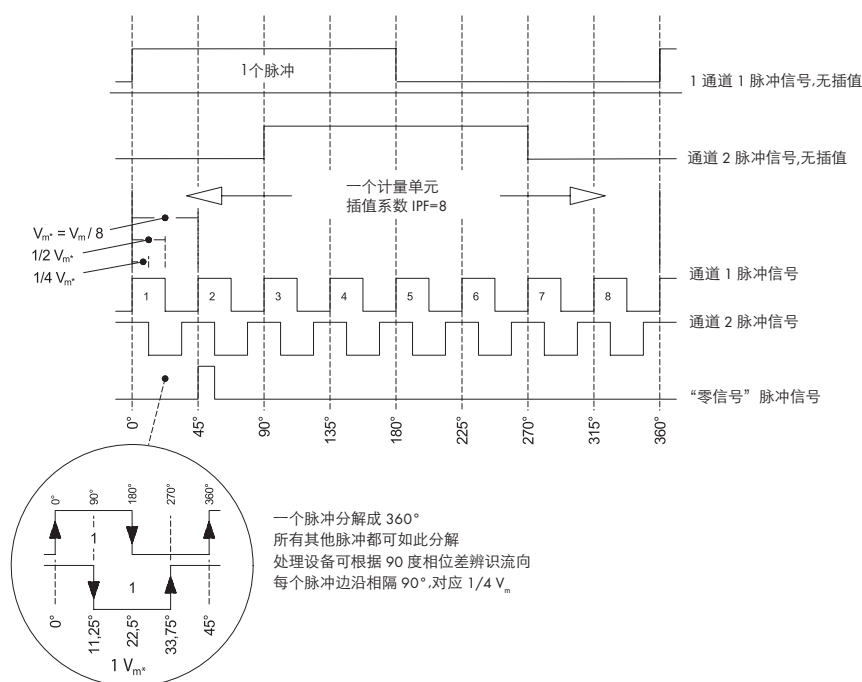
- 小流量的计量,控制和调节
- 零流量的计量,控制和调节
- 双向流的计量,控制和调节
- 微流量的计量,控制和定量加注

带插值电路的流量计 (VSI) 输出两路相差 90 度相位的分辨率可调的数字信号。另外额外输出一路“零信号”,该信号对应一个完整容积 V_m 。

插值放大器的信号输出

下图所示,齿容积 V_m 和分辨率系数为 8。在该分辨率下,可将齿容积分成 8 等份。因此通道 1 或通道 2 输出的脉冲信号对应的容积为 $V_m^* = V_m / 8 = 1/8 V_m / \text{脉冲}$ 。当两倍频 (每路脉冲边沿) $1/2 V_m^* = V_m / 16 = 1/16 V_m$ 。当四倍频 (两路信号的脉冲边沿) $1/4 V_m^* = V_m / 32 = 1/32 V_m / \text{边沿}$ 。信号

处理设备还可根据 90 度相位差辨识流向。VSI 系列的放大器可让客户设定不同的插值系数 (IPF) 得到不同的分辨率。因此可获得每个齿容积的 4 到 64 倍的分辨率 (见图 4)。频率系数 “f*” 从 1 到 16 (见图表)。





► 插值系数和分辨率

插值系数	脉冲/齿容积	最高分辨率 (脉冲边沿赋值)	分辨率 V_m^* (计量单元 V_m) [毫升]	最高分辨率 (角度值)	频率 f_{max}^*
1	1	4 (四倍频)	$V_m / 4$	90°	$f_{max} \times 1$
2	2	8	$V_m / 8$	45°	$f_{max} \times 2$
3	3	12	$V_m / 12$	30°	$f_{max} \times 3$
4	4	16	$V_m / 16$	22,5°	$f_{max} \times 4$
5	5	20	$V_m / 20$	18°	$f_{max} \times 5$
8	8	32	$V_m / 32$	11,25°	$f_{max} \times 8$
10	10	40	$V_m / 40$	9°	$f_{max} \times 10$
12	12	48	$V_m / 48$	7,5°	$f_{max} \times 12$
16	16	64	$V_m / 64$	5,625°	$f_{max} \times 16$

第 1 列：可设定的插值系数 IPF（出厂前设定）

第 2 列：每个齿容积 V_m 的脉冲数

第 3 列：脉冲信号边沿的最高分辨率，
两路信号一起计算。

第 4 列：对应最高分辨率时的计量单元 V_m^*

第 5 列：角度值最高分辨率

第 6 列：最大频率值 f_{max}^* ，
对应最大量程 Q_{max} 和相应插值系数 IPF。

通常流量计的满量程很少用上，因此实际频率值稍低。
最大的频率值可以用以下公式计算：

$$f_{\text{最大值}} = \frac{(Q_{\text{最大值}}) \cdot \text{IPF}}{V_m} \quad \text{公式 1}$$

f_{max}^* 最高频率
 Q_{max} 实际应用的最大流量
IPF 可编程插值系数
 V_m 流量计齿容积

例子： 在应用中系统的最大流量

$$Q_{max} = 40 \text{ 升/分钟} = 666,667 \text{ 毫升/秒}; \text{IPF} = 10;$$

$$V_m = 1 \text{ 毫升/脉冲};$$

$$f_{max}^* = 6666,67 \text{ 赫兹} = 6,66667 \text{ 千赫兹}$$

在最大流量 $Q_{max} = 40$ 升/分钟，

VSI 1/10... 的最大输出频率

$$f_{max}^* = 6666,67 \text{ 赫兹}$$



► 数字仪表(带模拟输出)

MF1 仪表, 流速计量, 双通道



- 流向标识, 开关量输出 (0V/5V)
- 两个光耦幅值输出, 幅值可独立设定
- 电压或电流模拟输出, 极性与流向对应
 - 0 ... (±) 10 V
 - 0 ... (±) 20 mA
 - 4 ... 20 mA
- 输出供电电压 24 VDC/50 mA

DPZ-F 仪表, 流速计量, 单双通道



- 菜单选择流量计规格
- 流向标识
- 16 位模拟输出
 - 0 ... ± 10 V
 - 0 ... ± 20 mA
 - 0/4 ... 20 mA
- 两个幅值输出
- 半导体
- PC 接口 RS 232 或 RS 485
- 输出供电电压 24 VDC/100 mA

PAXI 仪表, 流速和累积计量, 单双通道



- 流速, 累计值显示, 带线性修正功能
- 12 位模拟输出
 - 0 ... 10 V
 - 0 ... 20 mA
 - 4 ... 20 mA
- 两个幅值继电器输出
- PC 接口 RS 232
- 输出供电电压 12 VDC/100 mA

DPZ-IMP



DPZ-IMP 仪表, 单双通道

- 菜单选择流量计规格
- 16 位模拟输出
 - 0 ... ± 10 V
 - 0 ... ± 20 mA
 - 0/4 ... 20 mA
- 两个幅值输出
- 半导体
- PC 接口 RS 232 或 RS 485
- 输出供电电压 24 VDC/100 mA

VFM 320



全功能仪表 VFM 320, 动态响应测试及闭环控制

- 流量, 累计和比例计量, 双组份混合的体积, 质量注射量计量和控制
- 两个双通道流量计的信号处理
- 两个独立的数模 (D/A) 转换器, 16 位动态模拟输出:
 - <3 毫秒 (0 赫兹 → 2K 赫兹 → 赫兹)

流量和累计值 方向指示关联

(0 V ← 2. 独立方向指示 5 V → 1. 独立方向指示 10 V)

独立方向指示

(10 V ← 2. 独立方向指示 0 V → 1. 独立方向指示 10 V)

- 实时输出模拟或数字测量值
- PC 接口: 1 个 RS 232, 2 个 RS 485
- 可按要求定做

► 数字仪表(无模拟输出)

GEL 103



仪表,预设和批量计算,单双通道

- 同时显示实际累计值和两个预设值
- 2 个累计预设值输出, 1 个批量预设值输出
- 可识别相位差,对流量计的两路脉冲信号的边沿进行 2 倍频或 4 倍频处理
- 输出供电电压 $24 \text{ VDC} \pm 10\%$, 最大 60mA

► 脉冲处理仪表

DIGFU1

仪表, 频率/模拟转换



- 单通道信号的模拟输出
 $0 \dots 10 \text{ V}$
 $0 \dots 20 \text{ mA}$
 $4 \dots 20 \text{ mA}$
- 双通道信号的模拟输出
(带极性)
 $0 \dots \pm 10 \text{ V}$
 $0 \dots \pm 20 \text{ mA}$
- 双通道信号输入时,
辨别流向及数字输出
- 可对接收的频率输入修正系数

PGW-1

仪表,脉冲电压值变换,单双通道



- 例如: 脉冲输入的制图仪,正/反计数器, PC 或 PLC 控制
- 可输出电压值:
 $\text{TTL } 5 \text{ V}, 8 \text{ V}, 12 \text{ V}, \text{CMOS } 15 \text{ V}$
- 工作电源/电流消耗:
 $10 \dots 30 \text{ V DC}, 20 \text{ mA}$ 空载
- 可接收不同脉冲信号输入并输出变换或不变换的信号,长距离输送也不失真。

安全栅 MK-13



- 经济的隔离装置,用于本安区域和非本安区域的电路安全
- 必须安装在安全区域
- 用于将电源限制在本安电路,避免电火花或发热造成事故
- 接线图和完整订货号请查看 11 页。



► 附件/客户特殊方案

客户特殊定做



- 我们可在最短时间内按客户要求定做流量计,价格合理。我们可使用各种材料如碳钢,不锈钢,钛, 铝或铜。

过程控制



- 我们标准的产品,可计量染料,涂料,(热熔)粘胶剂,环氧树脂类或聚氨酯类,甚至含填料。压力可达 700 bar ,温度可达 210 度。

汽车工业



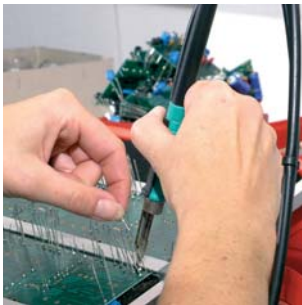
- 我们的产品可安装在汽车上或户外小测试箱里。我们有各种计量应用的解决方案。我们的产品可靠性高,小巧,高精度,适用各种难处理介质和恶劣的环境。

附件



- 连接阀块,可加热; 集成块集成球阀和加热装置, 预留压力和温度检测接口。 **MCS** Mini Control System

维修/标定服务



- 我厂自身可标定 0.002 - 600 升/分钟,也可提供 DKD 标定证书。我们会在维修或标定期间临时借流量计给客户。我们也可进行别的品牌产品和仪表的维修和标定。

EXAM
BBG Prüf- und Zertifizier GmbH



VSE



NEU / NEW

Schraubenspindel-Volumensensor
Helical screw flow meter

Rotorsensor – Serie RS
Rotor sensor – RS Series

VSE.flow
measurement

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- **COMPLEX ELECTRONIC READOUTS**
- **CUSTOMER SPECIFIC SOLUTIONS**

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- Test Benches, Quality-, Consumption-, Volume- and Flow Measurement, Dosing, Batching, Positioning, Control, Leakage-, Failure-, Limit Value- and Real-time Monitoring

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mit VSI High Definition System

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für explosionsgefährdete Räume



II 1G EEx ia IIC T6 ... T4



Class I, Division 1, Groups A, B, C + D

OPTIONAL

mit Lichtleiter-Übertragung

NEUE SERIE RS

Neues innovatives Rotorprofil

Pulsationsfreie Messung

Niedrige Druckverluste

Geringe Ansprechzeit und reduzierte Massen

Höchste Funktionalität durch neue „intelligente“ Sensorik

FLOW RANGES

0.002 ... 2,500 l/min.

0.0005 ... 666 GPM

graded unit sizes

MEASURING ACCURACY

up to 0.3 % of measuring value

HIGH RESOLUTION

VSI High Definition System

VISCOSITY RANGES

1 ... 1,000,000 cSt.

MAX. PRESSURE

450 bar/6,500 psi

higher pressures » VSE special solutions

TEMPERATURE RANGES

-40°C ... 210°C

-40°F ... 410°F

EX-PROTECTION

Special flow meters for explosion-hazardous

areas with Ex approval



II 1G EEx ia IIC T6 ... T4



Class I, Division 1, Groups A, B, C + D

OPTION

with fibre optic transmission

NEW RS SERIES

New innovative rotor profile

Pulsation-free measurement

Lowest pressure losses

Short response time and reduced mass

Highest functionality due to new "intelligent" sensor technology

► ANWENDUNGEN

► APPLICATIONS

SERIE VS

Messtechnik
Dosiertechnik
Hydraulik
Überwachungstechnik
Steuer- und Regeltechnik
Verfahrenstechnik
Automobilindustrie
Kunststofftechnik

VS SERIES

Flow measurement
Precision dosing
Hydraulic systems
Systems monitoring
Open/closed loop control
Process control
Automobile industry
Plastics technology



Serie VS
VS Series

SERIE RS

Verfahrenstechnik
Hydraulik
Hochviskose, pastöse, abrasive
Kleb- und Dichtstoffe

RS SERIES

Process control
Hydraulic systems
Highly viscous, paste-like, abrasive
adhesives and sealants



Serie RS
RS Series

SERIE VHM

Farben, Lacke
Chemie
Pharma
2-K-Anlagen
Petrochemie

VHM SERIES

Paints, dyes
Chemicals
Pharmaceuticals
Two-component mixers
Petrochemicals



Serie VHM
VHM Series

SERIE EF

Öle
Schmierfette
Druckfarben

EF SERIES

Oils
Greases
Printing inks



Serie EF
EF Series

SERIE VTR

Wasserähnliche Stoffe
Wasser
Öle
Petrochemie

VTR SERIES

Waterbased liquids
Water
Oils
Petrochemicals



Serie VTR
VTR Series

KUNDENSPEZIFISCHE SONDERLÖSUNGEN

CUSTOMER SPECIFIC SOLUTIONS

**NEU
NEW**



Prozessmesstechnik
Process Control



Offshore
Offshore



Verfahrenstechnik
Process Control

ANFORDERUNGSORIENTIERT

Sondergeräte für
spezielle Anwendungen

ANWENDUNGSBEIPIELE

Sonderlösungen
Hydraulik
Offshore
Fahrzeugtechnik
Prozessmesstechnik
Weitere Beispiele auf Anfrage

TECHNISCHE DATEN: BEISPIELE

Temperaturen bis 210°C
Drücke bis 700 bar
Gewichtsoptimierung
< 400 g möglich

SONDERWERKSTOFFE

z. B. Titan
Weitere Materialien auf Anfrage

SYSTEMLÖSUNGEN DURCH KOOPERATION IN DER GRUPPE

Beinlich Pumpen GmbH

Zahnrad- + Radialkolbenpumpen
Spezial- + Sonderpumpen

DST Dauermagnet- SystemTechnik GmbH

Dauermagnetkupplungen
► **NEU** 30 % Energieeinsparung mit
Hartglasspaltpf BOROHCAN®
Umbausätze
Kundenspezifische Lösungen

APPLICATION-ORIENTED

Customer specific
solutions

APPLICATION EXAMPLES

Special solutions
Hydraulics
Offshore
Automobile technology
Process control
Further examples on request

TECHNICAL DATA: EXAMPLES

Temperatures up to 210°C (410°F)
Pressures up to 700 bar (10,000 psi)
Weight improvement down to
< 400 g possible

SPECIAL MATERIALS

e. g. titanium
Other materials on request

SYSTEM SOLUTIONS BY COOPERATION WITHIN THE GROUP

Beinlich Pumpen GmbH

Gear pumps + radial piston pumps
Special pumps

DST Dauermagnet- SystemTechnik GmbH

Permanent magnetic couplings
► **NEW** 30 % Energy savings with
Borosilicate-canister BOROHCAN®
Conversion kits
Customer specific solutions

**KOMPETENTE
ANWENDUNGSBERATUNG**

Medium-Applikation
Kompatibilität
Mechanik + Elektronik

**KUNDENSPEZIFISCHE
SONDERLÖSUNGEN**

Kurze Entwicklungszeiten durch
eigene Konstruktion + Produktion

**BENUTZERORIENTIERTE
DOKUMENTATION**

Für Anschluss,
Bedienung + Wartung

**INSTALLATION +
INBETRIEBNAHMEN**

Auf Wunsch weltweit

WARTUNGSSERVICE

Rekalibrierung
Leihgeräte-Service
24 h Service bei Bedarf

QUALITÄT

DIN EN ISO 9001:2008

MADE IN GERMANY

100% Qualitätskontrolle

**COMPETENT
APPLICATION ADVICE**

Medium-application
Compatibility
Mechanics + electronics

**CUSTOMER SPECIFIC
SOLUTIONS**

Short development times through
in-house design and production

**CUSTOMER ORIENTATED
DOCUMENTATION**

For installation,
operation and maintenance

**INSTALLATION +
SERVICE**

On request world-wide

MAINTENANCE SERVICE

Re-calibration
Loan equipment
24 h service on request

QUALITY

DIN EN ISO 9001:2008

MADE IN GERMANY

100% quality control



Anwendungsberatung
Application service



Konstruktion + Entwicklung
Construction + Development



100% Qualitätskontrolle
100% Quality control

官方授权经销商

ROKEN®

HYDRO-TECH

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