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Opis działania

The proven KOBOLD flow meters and switches model SMV-... are based on the principle of the well-known floattype flowmeters except for the conventional tapering measuring tube.

These patented instruments are provided instead with a cylindrical flow tube with conical slots around the periphery.

This eliminates the usual problems of guiding the cylindrical float within a tapering measuring glass. The novel design including the provision of an appropriately dimensioned annular gap of constant width between the float and the flow tube has enabled the sensitivity to dirt to be considerably reduced.

The float comprises permanent magnets actuating a bistable reed contact external to the flow circuit, that is, the flowing medium is hermetically separated from the electrical contact. In addition it is embedded in a height-adjustable switch housing thus ensuring that the contact cannot be damaged even by an aggressive atmosphere.

As the medium enters the instrument the float rises. Once its magnetic field reaches the contact tips of the reed switch the contact closes. As the flow increases the float rises further until it reaches its stop. This prevents the float from going beyond the contact range of the magnetic operating tube, that is, the contact remains closed thus ensuring bistable switching.

With the models SMV-2... and SMV-3... the magnetic field also activates an external, that is, hermetically separated indicator, as a result of which flows are measured accurately even at high operating pressures.

The magnetic field and the indicator are designed so as to ensure that the pointer follows even abrupt changes in flow rate.

Applications

- Lubrication circuits
- Paper-making machines
- Machine tools
- Glass-melting tanks
- Cooling circuits
- Welding machines
- Induction furnaces
- Pumps

Technical Details

Housing:	SMV-x1: SMV-x2:	brass, Ms 58 stainless steel, 1.4301
Connections:	SMV-x1: SMV-x2:	brass, Ms 58 stainless steel, 1.4301
Float:	SMV-x1: SMV-x101:	brass, Ms 58 PP
	SMV-x2: SMV-x201:	stainless steel, 1.4301 PVDF
Nozzle:	SMV-x1: SMV-x2:	brass, Ms 58 stainless steel, 1.3955
Seals:	SMV-x1: SMV-x2:	
Max. temperature:	100°C SMV01:	70°C
Max. pressure:	SMV01: SMV-x1: SMV-x2:	250 bar
Installation position:	vertical, flow	in the upward direction
Accuracy:	$\pm5\%$ of full	scale
Repeatability:	≤1%	

Contacts with SMV-1..., SMV-3... without ATEX

Electrical connection: valve connector DIN EN 175301-803 Electrical switching values: N/O contact

max. $250 V_{AC/DC}/1.5 A/100 W/100 VA$ changeover contact max. $250 V_{AC/DC}/1 A/30 W/60 VA$ N/O contact and changeover contact (cCSAus) max. $230 V_{DC}/0.26 A/60 W$, $60 V_{DC}/1 A/60 W$, max. $240 V_{AC}/0.42 A/100 W$, $100 V_{AC}/1 A/100 W$

No responsibility taken for errors;

subject to change without prior notice.

2/11-2024



Contacts with SMV-1..., SMV-3... use in hazardous areas

Electrical	
connection:	2 m PVC cable (option F0), all other
	models plug acc. DIN EN 175301-803
Mechanics:	The apparatus can be used as
	follows in explosive atmospheres in accordance with the applicable
	erection regulations on machines,
	devices and plants, such as e.g. EN
	1127-1, EN 60079-14 etc.:
	a) In Zone 1 (gas hazard, category
	2G) in the explosion groups IIA, IIB and IIC
	b) In Zone 2 (gas hazard, category 3G)
	in the explosion groups IIA, IIB and IIC
	c) In Zone 21 (dust hazard, category
	2D) in the explosion groups IIIA and IIIB
	d) In Zone 22 (dust hazard, category
	3D) in the explosion groups IIIA and IIIB
ATEX contactF0:	⟨€x⟩ II 2 G Ex mb IIC T6 Gb ⟨€x⟩ II 2 D Ex mb IIIC T80 °C Db
	max. 250 V _{AC} /1,5 A/100 VA
	IECEx BVS 07.0007X
ATEX N/O contact	
type 41R57	
G0 and GG:	⟨ɛ́ɤ⟩ II 3 G Ex ic IIC T4 Gc ⟨ɛ́ɤ⟩ II 3 D Ex ic IIIC T125°C Dc
	$-20^{\circ}C \le Ta \le 80^{\circ}C$
	max. 250 V _{AC/DC} /1,5 A/100 W/100 VA
ATEX changeover co	ntact
type 41R57U	
H0 and HH:	$\langle \mathbf{\xi}_{\mathbf{x}} \rangle$ II 3 G Ex ic IIC T4 Gc
	⟨ ɛx ⟩ II 3 D Ex ic IIIC T125 °C Dc -20 °C ≤Ta ≤80 °C
	max. 250 V _{AC/DC} /1 A/30 W/60 VA
Hysteresis:	approx. 3.5 mm float movement
	6-10 mm with ATEX contact
Protection:	IP 65 (electr. contact)
	IP 54 (side indicator)



Measuring range l/min	Pressure loss	Float acco to versi		Brass	Stainless steel	Contact		nection le thread
water	∆ P (bar)	Brass	St. steel					
0.11	0.02	PP	PVDF	SMV-1101H	SMV-1201H	R0 = 1 N/O contact U0 = 1 changeover contact		
0.151.7	0.04	brass, nickel-pl.	st. steel	SMV-1103H	SMV-1203H	F0 ² = 1 Ex N/O contact 2 m cable (5 m/10 m on		
14.5	0.04	st. steel	st. steel	SMV-1105H	SMV-1205H	request) C0 = 1 N/O contact (cCSAus)		
17	0.11	brass, nickel-pl.	st. steel	SMV-1107H	SMV-1207H	D0 = 1 changeover contact (cCSAus)	R08 = G ¼ R15 = G ½	N08 = ¼" NPT N15 = ½" NPT
19	0.12	st. steel	st. steel	SMV-1109H	SMV-1209H	G0 = 1 ATEX N/O contact (model 41R57) H0 = 1 ATEX changeover contact		
214	0.18	st. steel	st. steel	SMV-1111H	SMV-1211H	(model 41R57U) RR = 2 N/O contact		
2.5201)	0.06	brass, nickel-pl.	st. steel	SMV-1113H	SMV-1213H	UU = 2 h/0 contact CC = 2 N/0 contact (cCSAus)		
345	0.22	brass, nickel-pl.	st. steel	SMV-1115H	SMV-1215H	DD = 2 changeover contact (cCSAus)	R20 = G ¾	N20 = ¾" NPT
3.550	0.4	brass, nickel-pl.	st. steel	SMV-1117H	SMV-1217H	GG = 2 ATEX N/O contact (model 41R57)	R25 = G1	
10110	0.3	st. steel	st. steel	SMV-1119H	SMV-1219H	HH = 2 ATEX changeover contact (model 41R57U)	R32 = G11⁄4	N32 = 1 ¼" NPT

Order Details Flow Switches with 1 Contact Model: SMV-1... (Example: SMV-1101H R0 R08)

¹⁾ SMV-...13H & ¹/₄" connection: Measuring range 2.5 ... 18 l/min water ²⁾ Not for SMV-xx19

Order Details Flow Meter Model: SMV-2... (Example: SMV-2109H 00 R15)

Measuring range l/min	Pressure loss	Float acco to versi	0	Brass	Stainless steel	Contact	Connection female thread	
water	∆ P (bar)	Brass	St. steel					
0.11	0.02	PP	PVDF	SMV-2101H	SMV-2201H	-		
0.151.7	0.04	brass, nickel-pl.	st. steel	SMV-2103H	SMV-2203H			
14.5	0.04	st. steel	st. steel	SMV-2105H	SMV-2205H		R08 = G ¼	N08 = ¼" NPT
17	0.11	brass, nickel-pl.	st. steel	SMV-2107H	SMV-2207H		R15 = G ½	NUO = ½ NPT
19	0.12	st. steel	st. steel	SMV-2109H	SMV-2209H	00 = without contact		NTS = 72 INFT
214	0.18	st. steel	st. steel	SMV-2111H	SMV-2211H			
2.520*	0.06	brass, nickel-pl.	st. steel	SMV-2113H	SMV-2213H			
345	0.22	brass, nickel-pl.	st. steel	SMV-2115H	SMV-2215H	-	R20 = G ¾	N20 = ¾" NPT
3.550	0.4	brass, nickel-pl.	st. steel	SMV-2117H	SMV-2217H		R25 = G1	INZU = 94 INPT
10110	0.3	st. steel	st. steel	SMV-2119H	SMV-2219H		R32 = G11/4	N32 = 1 ¼" NPT

* SMV-...13H & 1/4" connection: Measuring range 2.5 ... 18 l/min water

Order Details Flow Meter and Switches with 1 Contact Model: SMV-3... (Example: SMV-3205H R0 R08)

Measuring range l/min	Pressure loss	to versi	on	Brass	Stainless steel	Contact		nection e thread	
water	∆ P (bar)	Brass	St. steel					1	
0.11	0.02	PP	PVDF	SMV-3101H	SMV-3201H	R0 = 1 N/O contact			
0.151.7	0.04	brass, nickel-pl.	st. steel	SMV-3103H	SMV-3203H	U0 = 1 changeover contact F0 ²⁾ = 1 Ex N/O contact			
14.5	0.04	st. steel	st. steel	SMV-3105H	SMV-3205H	2 m cable (5 m/10 m on request)	R08 = G ¼	N08 = ¼" NPT	
17	0.11	brass, nickel-pl.	st. steel	SMV-3107H	SMV-3207H	C0 = 1 N/O contact (cCSAus)	R15 = G ½	N06 = ½ NPT	
19	0.12	st. steel	st. steel	SMV-3109H	SMV-3209H	D0 = 1 changeover contact			NTS = 72 INFT
214	0.18	st. steel	st. steel	SMV-3111H	SMV-3211H	G0 = 1 ATEX N/O contact			
2.5201)	0.06	brass, nickel-pl.	st. steel	SMV-3113H	SMV-3213H	(model 41R57) H0 = 1 ATEX changeover			
345	0.22	brass, nickel-pl.	st. steel	SMV-3115H	SMV-3215H	contact (model 41R57U) RR = 2 N/O contact	R20 = G ¾	N20 = ¾" NPT	
3.550	0.4	brass, nickel-pl.	st. steel	SMV-3117H	SMV-3217H	UU = 2 changeover contact	R25 = G1	NZU = 74 INF I	
10110	0.3	st. steel	st. steel	SMV-3119H	SMV-3219H	CC = 2 N/O contact (cCSAus) DD = 2 changeover contact (cCSAus) GG = 2 ATEX N/O contact (model 41R57) HH = 2 ATEX changeover contact (model 41R57U)	R32 = G 1 ¼	N32 = 1 ¼" NPT	

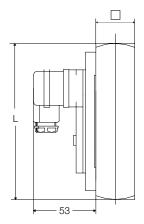
¹⁾ SMV-...13H & ¼" connection: Measuring range 2.5 ... 18 l/min water ²⁾ Not for SMV-xx19

No responsibility taken for errors; subject to change without prior notice.



Order Details and Dimensions

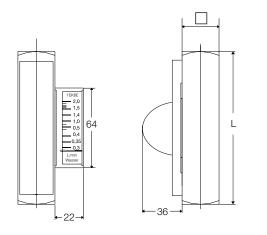
1. Flow switches with 1 contact model: SMV-1...



Model	Square [mm]	Thread G	L [mm]	Weight [kg]
SMV01H	30 x 30	1⁄4 (1⁄2*)	132 (136*)	0.9
SMV03H	30 x 30	1/4 (1/2)	132 (136)	0.9
SMV05H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV07H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV09H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV11H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV13H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV15H	40 x 40	3⁄4 (1)	156 (150)	1.7
SMV17H	40 x 40	3⁄4 (1)	156 (150)	1.7
SMV19H	50 x 50	1 1⁄4	165	2.9

* With NPT-thread

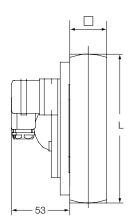
2. Flow meter model: SMV-2...



Model	Square [mm]	Thread G	L [mm]	Weight [kg]
SMV01H	30 x 30	1⁄4 (1⁄2*)	132 (136*)	0.9
SMV03H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV05H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV07H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV09H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV11H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV13H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV15H	40 x 40	³ ⁄4 (1)	156 (150)	1.7
SMV17H	40 x 40	3⁄4 (1)	156 (150)	1.7
SMV19H	50 x 50	1 1⁄4	165	2.9

* With NPT-thread

3. Flow meter and switches with 1 contact model: SMV-3...



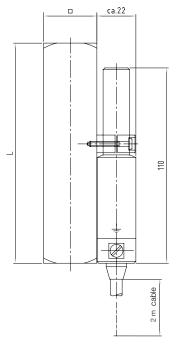
Model	Square [mm]	Thread G	L [mm]	Weight [kg]
SMV01H	30 x 30	1⁄4 (1⁄2*)	132 (136*)	0.9
SMV03H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV05H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV07H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV09H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV11H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV13H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV15H	40 x 40	3⁄4 (1)	156 (150)	1.7
SMV17H	40 x 40	3⁄4 (1)	156 (150)	1.7
SMV19H	50 x 50	1 1⁄4	165	2.9

* With NPT-thread



Order Details and Dimensions (continued)

1. Flow meter model: SMV-..F0..



Model	Square [mm]	Thread G	L [mm]	Weight [kg]
SMV01H	30 x 30	1/4 (1/2*)	132 (136*)	0.9
SMV03H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV05H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV07H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV09H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV11H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV13H	30 x 30	1⁄4 (1⁄2)	132 (136)	0.9
SMV15H	40 x 40	3⁄4 (1)	156 (150)	1.7
SMV17H	40 x 40	3⁄4 (1)	156 (150)	1.7
SMV19H	50 x 50	1 1⁄4	165	2.9

* With NPT-thread

2/11-2024



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Description

KOBOLD flow meters and -switches series SMV-...21H and SMV-...22H are equipped with a spring loaded float which is guided within a cylindical measuring pipe and in opposit to the principals known up to now it is hollow. The medium flows through a circular clearance which is built by the bore of the float and the mandrel bar (conical shaft) inside.

The float comprises permanent magnets actuating a bistable reed contact external to the flow circuit, that is, the flowing medium is hermetically separated from the electrical contact. In addition it is embedded in a height-adjustable switch housing thus ensuring that the contact cannot be damaged even by an aggressive atmosphere.

As the medium enters the instrument the float rises. Once its magnetic field reaches the contact tips of the reed switch the contact closes. As the flow increases the float rises f until it reaches its stop. This prevents the float from beyond the contact range of the magnetic operating that is, the contact remains closed thus ensuring bis switching.

With the models SMV-2... and SMV-3... the magnetic also activates an external, that is, hermetically sepa indicator, as a result of which flows are measured accu even at high operating pressures. The magnetic field ar indicator are designed so as to ensure that the pointer for even abrupt changes in flow rate.

SMV-x1..: 250 bar SMV-x2..: 350 bar

± 5% of full scale

≤1%

Applications

- Lubrication circuits
- Paper-making machines
- Machine tools
- Glass-melting tanks
- Cooling circuits
- Welding machines
- Induction furnaces
- Pumps

Housing:

Float:

Spring:

Technical Details

Pin and o-ring:

Max. temperature:

Installation position: independent

Max. pressure:

Accuracy: Repeatability:

Contacts with SMV-1..., SMV-3... without ATEX

Electrical connection	valve connector DIN EN 175301-803
Electrical switching	
values:	N/O contact
	max. $250V_{AC/DC}/1.5A/100W/100VA$
	changeover contact
	max. 250V _{AC/DC} /1A/30W/60VA
	N/O contact and
	changeover contact (cCSAus)
	max. 230V _{DC} /0.26A/60W,
	60 V _{DC} /1 A/60 W,
	max. 240V _{AC} /0.42A/100W,
	100V _{AC} /1A/100W
• · · · · • • • • • •	

Contacts with SMV-1..., SMV-3... use in hazardous areas

he flow increases the float rises further top. This prevents the float from going range of the magnetic operating tube, remains closed thus ensuring bistable AV-2 and SMV-3 the magnetic field atternal, that is, hermetically separated of which flows are measured accurately ag pressures. The magnetic field and the d so as to ensure that the pointer follows is in flow rate.	Mechanics:	 The apparatus can be used as follows in explosive atmospheres in accordance with the applicable erection regulations on machines, devices and plants, such as e.g. EN 1127-1, EN 60079-14 etc.: a) In Zone 1 (gas hazard, category 2G) in the explosion groups IIA, IIB and IIC b) In Zone 2 (gas hazard, category 3G) in the explosion groups IIA, IIB and IIC c) In Zone 21 (dust hazard, category 	
s chines		2D) in the explosion groups IIIA and IIIB	
KS		 d) In Zone 22 (dust hazard, category 3D) in the explosion groups IIIA and IIIB 	
SMV-x1: brass, Ms 58	ATEX N/O contact type 41R57 G0 and GG:	 ⟨x⟩ II 3 G Ex ic IIC T4 Gc ⟨x⟩ II 3 D Ex ic IIIC T125 °C Dc -20 °C ≤ Ta ≤ 80 °C max. 250 V_{AC/DC}/1,5 A/100 W/100 VA 	
SMV-x2: stainless steel, 1.4301 SMV-x1: brass, Ms 58 SMV-x2: stainless steel, 1.4301 oxide, ceramic (magnets) and	ATEX changeover cc type 41R57U H0 and HH:	pntact $\langle \widehat{\mathbf{Ex}} \rangle$ II 3 G Ex ic IIC T4 Gc $\langle \widehat{\mathbf{Ex}} \rangle$ II 3 D Ex ic IIIC T125 °C Dc -20 °C \leq Ta \leq 80 °C max. 250 V _{AC/DC} /1 A/30 W/60 VA	
SMV-x1: brass, Ms 58 SMV-x2: stainless steel, 1.4301 stainless steel, 1.4310 100 °C SMV-x1 : 250 bar	Hysteresis: Protection:	approx. 3.5 mm float movement 6 - 10 mm with ATEX contact IP 65 (electr. contact) IP 54 (side indicator)	

No responsibility taken for errors; subject to change without prior notice.



Order Details

Flow switches with 1 contact model: SMV-1... (Example: SMV-1121H R0 R32)

Measuring range l/min	Pressure loss	Float acco to versi	•	Brass	Stainless steel	Contact	Connection female thread	
water	ΔP (bar)	Brass	St. steel					
10 180	0.9	brass, nickel-pl.	st. steel	SMV-1121H	SMV-1221H	 R0 = 1 N/O contact U0 = 1 changeover contact C0 = 1 N/O contact (cCSAus) D0 = 1 changeover contact (cCSAus) G0 = 1 ATEX N/O contact (model 41R57) H0 = 1 ATEX changeover contact (model 41R57U) RR = 2 N/O contact UU = 2 changeover contact CC = 2 N/O contact (cCSAus) DD = 2 changeover contact (cCSAus) DD = 2 changeover contact (cCSAus) DD = 2 changeover contact (cCSAus) DD = 2 ATEX N/O contact (model 41R57) HH = 2 ATEX changeover contact (model 41R57U) 	R32 = G 1 ½	N32 = 1 ¼ NPT
10250	2.0	brass, nickel-pl.	st. steel	SMV-1122H	SMV-1222H		R32 = G 1 ¼	N32 = 1 ¼ NPT

Flow meter model: SMV-2... (Example: SMV-2121H 00 R32)

Measuring range l/min	Pressure loss	Float according to version		Brass	Stainless steel	Contact	Connection female thread	
water	∆ P (bar)	Brass	St. steel					
10180	0.9	brass, nickel-pl.	st. steel	SMV-2121H	SMV-2221H	00 = without contact	R32 = G 1 ¼	N32 = 1 ¼ NPT
10250	2.0	brass, nickel-pl.	st. steel	SMV-2122H	SMV-2222H		R32 = G 1 ¼	N32 = 1 ¼ NPT

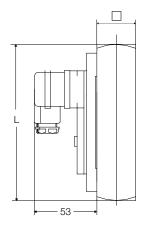
Flow meter and switches with 1 contact model: SMV-3... (Example: SMV-3121H R0 R32)

Measuring range l/min	Pressure loss	Float according to version		Brass	Stainless steel	Contact		nection le thread
water	ΔP (bar)	Brass	St. steel					
10 180	0.9	brass, nickel-pl.	st. steel	SMV-3121H	SMV-3221H	 .R0 = 1 N/O contact U0 = 1 changeover contact C0 = 1 N/O contact (cCSAus) D0 = 1 changeover contact (cCSAus) G0 = 1 ATEX N/O contact (model 41R57) H0 = 1 ATEX changeover contact (model 41R57U) RR = 2 N/O contact UU = 2 changeover contact (cCSAus) DD = 2 ATEX N/O contact (model 41R57) HH = 2 ATEX changeover contact (model 41R57) 	R32 = G 1 ¼	N32 = 1 ¼ NPT
10250	2.0	brass, nickel-pl.	st. steel	SMV-3122H	SMV-3222H		R32 = G 1 ¼	N32 = 1 ¼ NPT



Order Details and Dimensions

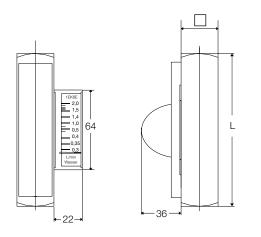
1. Flow switches with 1 contact model: SMV-1...



Model	Square [mm]	Thread G / NPT	L [mm]	Weight [kg]
SMV-1.21H	50 x 50	1 1⁄4	165 (175*)	2.6
SMV-1.22H	50 x 50	1 1⁄4	165 (175*)	2.6
* Mith NDT throad				

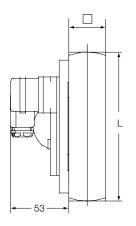
* With NPT-thread

2. Flow meter model: SMV-2...



Model	Square [mm]	Thread G / NPT	L [mm]	Weight [kg]	
SMV-2.21H	50 x 50	1 1⁄4	165 (175*)	2.6	
SMV-2.22H	50 x 50	1 1⁄4	165 (175*)	2.6	
* With NPT-thread					

3. Flow meter and switches with 1 contact model: SMV-3...



Model	Square [mm]	Thread G / NPT	L [mm]	Weight [kg]
SMV-3.21H	50 x 50	1 1⁄4	165 (175*)	2.6
SMV-3.22H	50 x 50	1 1⁄4	165 (175*)	2.6

* With NPT-thread