



# Variable Area Flowmeter V31

## Operating Instruction



**Please read and keep instruction manual!**

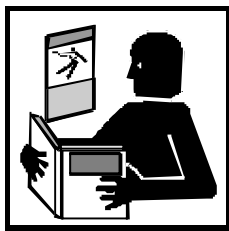
## Table of Contents

1. Steps prior to operation	4
2. Safety advisories	5
2.1 Installation, commissioning, operating personnel	5
2.2 Intended purpose	5
2.3 Packing / Storing / Transport	5
2.4 Returning the device for repair and servicing	5
3. Identification	6
3.1 Supplier / Manufacturer	6
3.2 Product type	6
3.1 Model code	6
3.3 Issue date	6
3.4 Version N°	6
3.5 Designation / Model plate	6
4. Application	7
5. Operating principle and system configuration	7
5.1 System design	8
5.1.1 Type of construction / dimensions	8
5.1.2 Materials	9
5.2 Float types	10
5.3 Contacts	11
5.3.1 Dimensions of the applied contacts [mm(inch)]	11
5.3.2 Mounting of the limit switches series K17, K33, K33i	12
5.3.3 Adjusting and wiring of the limit switches	13
5.3.4 Wiring diagrams of the limit switches K17 A/B, K33, K33i	14
6. Characteristical data	15
6.1 Mechanical data	15
6.2 Measuring ranges	16
6.2.1 Water	16
6.2.2 Air	16
6.3 Characteristical values – limit switches	17
6.3.1 K17 A/B – limit switches	17
6.3.2 K33 – limit switches	17
6.3.3 K33i – limit switches	18
7. Installation and condition for use	18
7.1 Receipt of goods, unpacking and transport to point of use	18
7.1.1 Receipt of goods	18
7.1.2 Unpacking	18
7.1.3 Transport	18
7.2 Operating conditions / Installation	19
7.2.1 Installation conditions	19
7.2.2 Startup	19
7.2.3 Pumps	19

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7.2.4	Installation	19
7.2.5	Gas metering	19
8.	Maintenance	20
9.	CE Marking	20
10.	Order information	20
10.1	Basic data	20
10.2	Available accessories	20
11.	Standards, directives, certification and authorization	20
12.	Model Code V31	21
13.	Declaration of conformity	22
14.	Decontamination certificate for device cleaning	23

## 1. Steps prior to operation



The Operating Instructions explain how to operate, install and perform maintenance on the flowmeter. Please read the manual carefully before installing the device and putting it into operation. The manual does not apply to non-standard versions or applications.

All devices are thoroughly tested and checked for order compliance prior to shipping. Upon receipt of the device, check it for shipping damage. If any problem comes to light, contact our head office in Cologne. Please describe the problem and indicate type and serial number of the device. We extend no guarantee of any kind for repair work that is undertaken without notifying us in advance of the intention to carry out such work. Unless otherwise agreed, any part or component for which a claim is lodged is to be sent to us for examination.

Downloading of the present document from our website [www.heinrichs.eu](http://www.heinrichs.eu) and printing out this document is allowed only for purposes of using our flowmeters. All rights reserved. No instructions, wiring diagrams, and/or pictures, or any portion thereof, may be produced, stored, in a retrieval system or transmitted by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of Heinrichs Messtechnik GmbH.

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We plan to optimize and improve the products described herein. We reserve the right to change the technical data herein in the light of any technical progress that might be made. For updates regarding the product herein, visit our website at [www.heinrichs.eu](http://www.heinrichs.eu). We will incorporate not only our own ideas but also, and in particular, any suggestions for improvement made by our customers. If you feel that there is any way in which our products could be improved, please send your suggestions to the following address:

Heinrichs Messtechnik GmbH  
HM-E (Development Department)  
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Fax: +49 221 49708-178  
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## 2. Safety advisories

### 2.1 Installation, commissioning, operating personnel



Mechanical and electrical installation, as well as commissioning, maintenance and operation, are to be realized solely by qualified personnel that are authorized by the installation operator to perform such work. All such personnel must read and understand the content of the applicable operating instructions before working with the device

In general, follow the conditions and provisions applicable in your country.

**Please take note of the technical data on the rating plate.**

### 2.2 Intended purpose

The variable area meter is to be used solely for measuring the volume of transparent liquids or gases. The manufacturer accepts no responsibility for any damage or loss resulting from any other use or from improper use.

Heinrichs Messtechnik extends no express or implied warranty in regard to the applicability of the present document for any purpose other than that described herein.

Before using corrosive or abrasive fluids, the operator must test the resistance of all wetted materials. We will be happy to assist you in testing the corrosion resistance of wetted parts ( for special fluids including cleaning fluids ). However, sole responsibility for ensuring that the device is used in accordance with the manufacturer's recommendations rests with the system operator. Minor changes of temperature, concentration or the degree of contamination in the process may cause changes in corrosion resistance. The manufacturer accepts no responsibility for any damage with respect to corrosion resistance of wetted materials in a certain application.

### 2.3 Packing / Storing / Transport

Be careful not to damage the device while unpacking it.

Remove the transport protection insert from the float.

Check to ensure that the technical product data indicated on the delivery note is consistent with the stipulated requirements.

The device should be stored in a clean, dry room until it is installed so as to prevent particulate matter from entering the device. Make certain that the ambient temperature in the room in which the device is stored lies within the prescribed range.

If, after the device is unpacked, it is sent elsewhere to be installed, the original packaging and transport protection inserts should be used.

### 2.4 Returning the device for repair and servicing

**Note:** According to German waste disposal legislation, it's the owner's or customer's responsibility to dispose of hazardous waste. Thus, any devices sent to us for servicing, including their crevices and cavities, must be devoid of any such material. When sending a device for repair, please confirm your compliance with this regulation in writing. (see Section 17 - Decontamination certificate.) In the event any hazardous material is detected on or inside any device sent to us for servicing, we reserve the right to bill the customer for the cost of disposing of such material. The device is to be accompanied by a document describing the problem with the device. Please include in this document the name of a contact person that our technical service department can get in touch with so that we can repair your device as expeditiously as possible and therefore minimize the cost of repairing it.

### 3. Identification

#### 3.1 Supplier / Manufacturer

Heinrichs Messtechnik GmbH  
Robert-Perthel-Str. 9  
D-50739 Köln  
Tel. +49 (221) 49708 - 0  
Fax +49 (221) 49708 - 178  
Internet: [www.heinrichs.eu](http://www.heinrichs.eu)  
E - Mail: [info@heinrichs.eu](mailto:info@heinrichs.eu)

#### 3.2 Product type

Variable Area Flow Meter with glass cone.

#### 3.1 Model code

V31


#### 3.3 Issue date


18.10.2018

#### 3.4 Version N°

V31\_BA\_18.01\_EN

#### 3.5 Designation / Model plate

	TYPE V31	MODEL CODE	: XX-XX-XX-Muster
	SER. NO.		: 1234567
	MAX. OPERATING PRESSURE		: X bar
	TEMP. RANGE		: -10°C to 80°C
	MANUFACTURING DATE		: 01.2009
	PED		: SEP

	TYPE V31	MODEL CODE	: XX-XX-XX-Muster
	SER. NO.		: 1234567
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	TEMP. RANGE		: -10°C to 80°C
	MANUFACTURING DATE		: 01.2009
	PED		: 1G

Logo	Manufacturer's logo
Adresse	Manufacturer's adress (internet adress)
CE	CE marking in accordance with applied EC directives
Type	Typen designation
Code	Model code
Ser.N°	Serial number
P max	Max. process pressure
T max.	Temperature range
MF Date	Date of manufacturing
PED	Information about Pressure Equipment Directive

#### 4. Application

The V31 metering device is used for flow metering transparent liquids and gases media in pipes. The scale on the device shows the flow rate expressed as volume or mass per unit of time. Standard scales are available for liquids with a density of 1kg/l (62,43 lb/cu. ft ). The scales must be recalculated for all other media depending on the physical characteristics. The flow tube is also optionally available with a percentage or 2 mm (0,078 inch) scale.

Applications: flow metering, dosing, monitoring, and control of liquid and gas media.  
The device can be fitted with one or more limit switches for purposes of process monitoring.

#### Note:



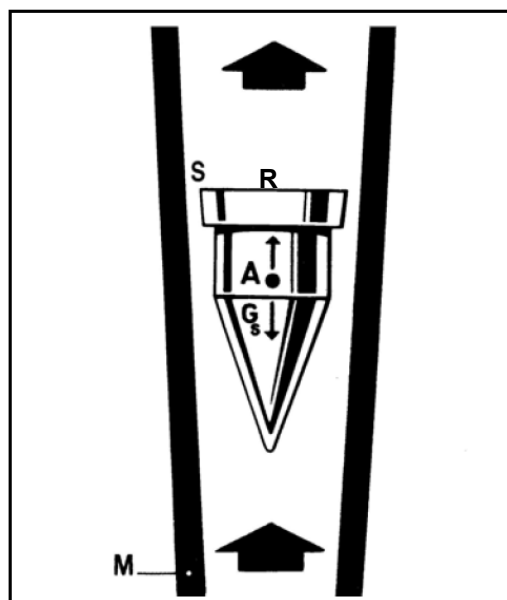
The device is of limited use for the metering of potentially hazardous liquids and gases. It is imperative that the operator takes steps to ensure that in the event the glass tube breaks, no personnel are harmed and no equipment is damaged. The system operator is legally responsible for any effects provoked by operation of the device.

#### 5. Operating principle and system configuration

The measuring element is composed of a float and a conical glass tube (M).

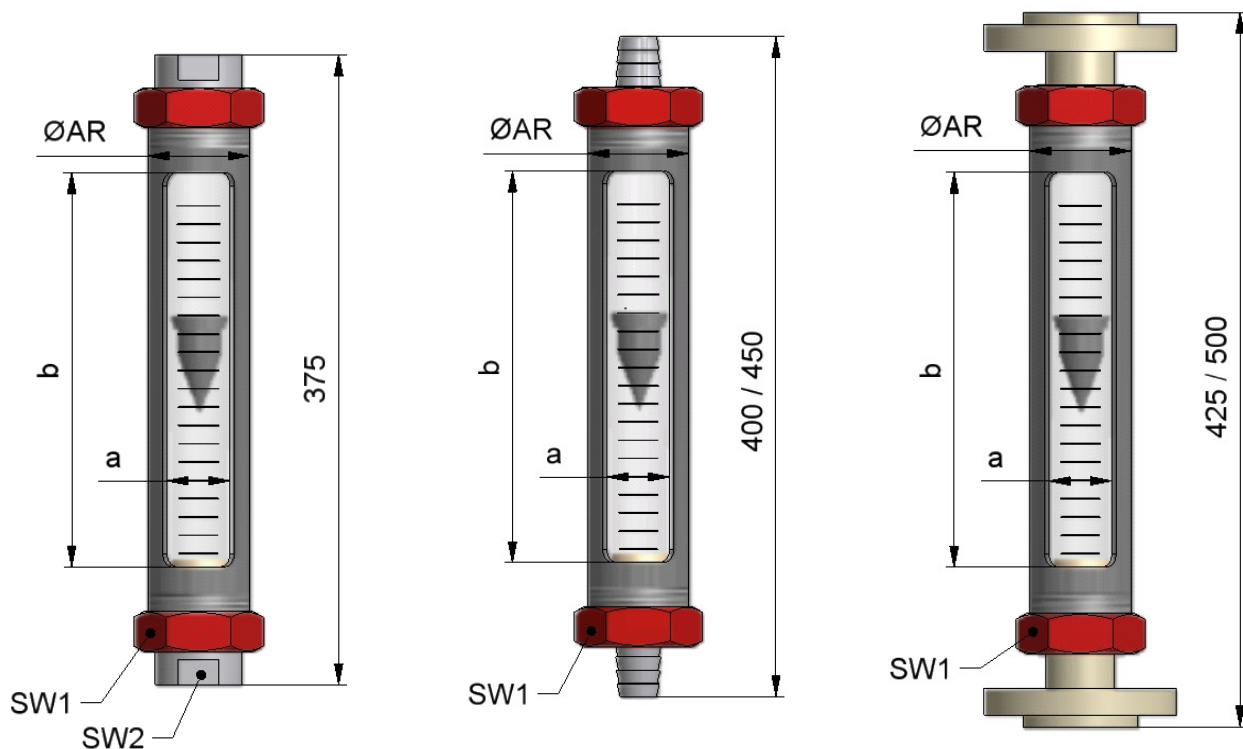
A medium flows from the bottom to the top through the measuring ring, lifting the float until the buoyancy force (A) and the weight of the float (Gs) establish equilibrium. As the height of the float varies, an annular clearance (S) proportional to the flow appears between the float and the measuring tube. The height of the float (R = reading line) in the measuring tube equals the value of the flow. The flow rate is read directly from a scale.

The readings obtained apply solely to the medium for which the device has been calibrated or for a medium with the same density and viscosity. The float is also optional guided by a float guide rod. The option is recommended to increase the operational safety and to protection against glass breakages in the case of operating conditions (solenoid valve control)



## 5.1 System design

### 5.1.1 Type of construction / dimensions



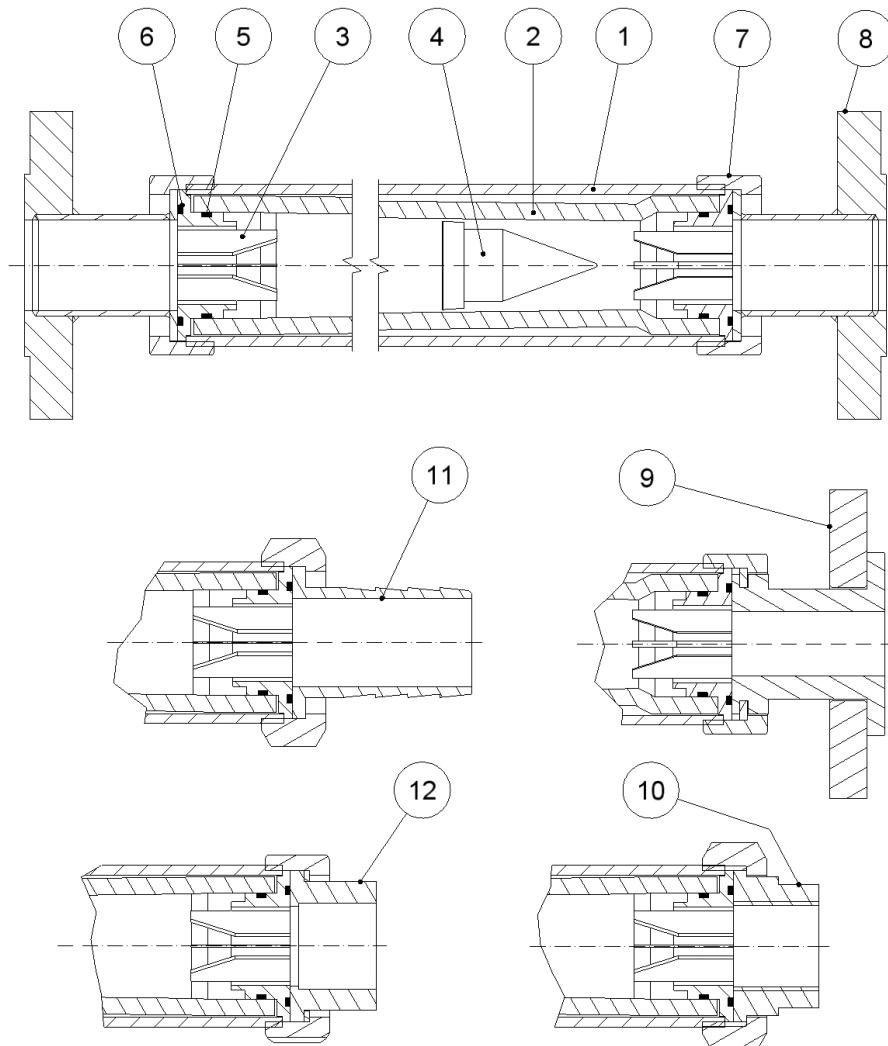
V 31		Body				Connection			
Model	Ø AR	a	b	SW1	SW2	Female thread	Hose connector	Bonded connection	Flange
S04	Ø 33.7	19	235	39	24	G / NPT 1/4", 2", 1/2"	Ø 13, Ø 19	DN 15 d = 20 mm	DN 10/15/20/25 PN 40
S05									
S06	Ø 60.3	38	235	67	46	G / NPT 3/4", 1", 1 1/4"	Ø 19, Ø 25, Ø 38	DN 32 d = 40 mm	DN 25/40 PN 40
S07	Ø 88.9	58	235	100	65	G / NPT 1 1/4", 1 1/2", 2"	Ø 38, Ø 50	DN 50 d = 63 mm	DN 40/50 PN 40 DN 65 PN 16

Standard connections are underlined

Weights	Treaded conn.		Flanged conn	
S04	G 1/2	0,7 Kg	DN 15	2,0 Kg
S05	G 1/3	0,7 Kg	DN 15	2,0 Kg
S06	G 1	2,0 Kg	DN 25	3,9 Kg
S07	G 2	4,0 Kg	DN 50	8,9 Kg



### 5.1.2 Materials

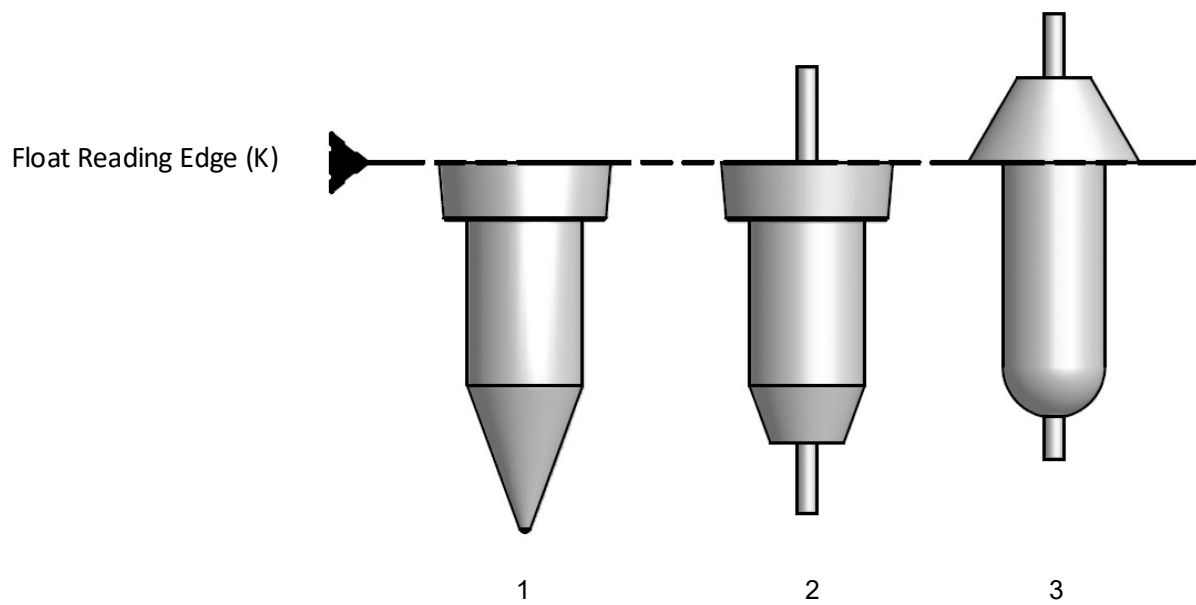


Item	Pieces	Name	V 31 connection		
			PVC	PVDF	SS
1	1	Housing	1.4301		
2	1	Measuring tube	Borosilicate glass		
3	2	Stop	PVDF		
4	1	Float	1.4571, AL, PVDF		
5	2	O-ring	EPDM, Viton, FEP/FFKM		
6	2	O-ring	EPDM, Viton, FEP/FFKM		
7	2	Sleeve nut	AL, SS		
8	2	Flange			X
9	2	Flange		X	
10	2	Threaded connection		X	X
11	2	Hose connector		X	X
12	2	Bonded connection	X		

## 5.2 Float types

There are three types of floats:

1. Unguided float
2. Guided float
3. Viscosity-stable float



The following viscosity limits require a viscosity-stable float:

Model	mPa s (cp)
S05	$\geq 3$
S06	$\geq 5$
S07	$\geq 8$

### 5.3 Contacts

The bistable magnetic contacts K17A, K17B, K33 and K33i show the position of the float, thus indicating the measured values in a non-reactive and contact-free way.

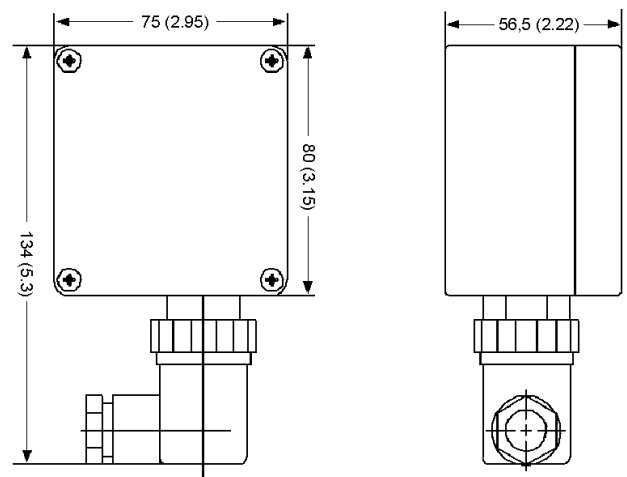
Features:

- Bistable behavior
- High vibration resistance
- Non-reactive and nearly inertialess switching
- No interaction between the contacts
- Simple plug-in connection

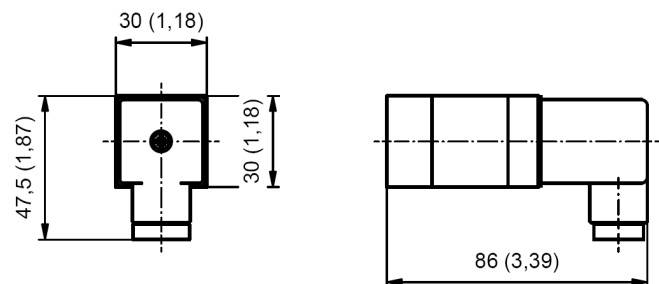
The bistable K33 contact consists of a set of contact springs inside a glass tube filled with inert gas.

#### 5.3.1 Dimensions of the applied contacts [mm(inch)]

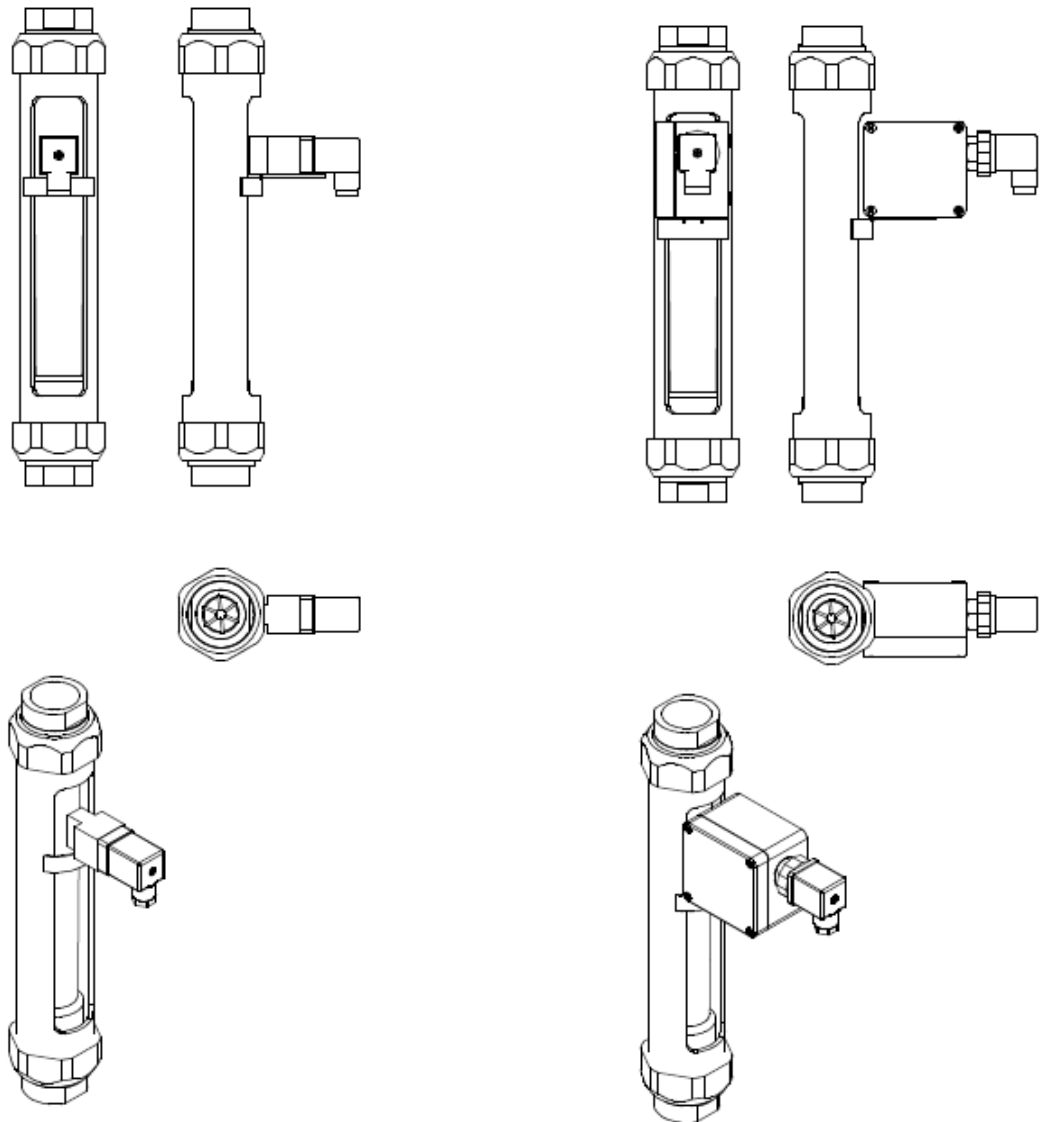
##### Dimensions K33 and K33i



##### Dimensions K17 A/B



### 5.3.2 Mounting of the limit switches series K17, K33, K33i



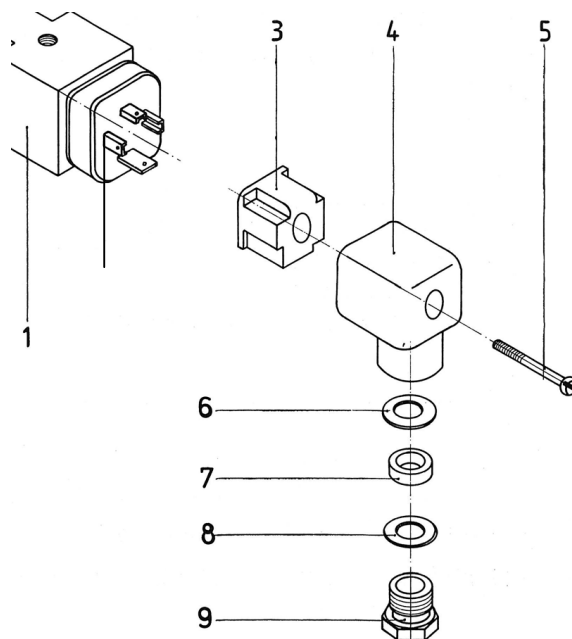
### 5.3.3 Adjusting and wiring of the limit switches

The limit switches are factory set at the ordered values if they have been ordered. They can be adjusted afterwards.

For readjusting an M4 nut (SW7) must be released until the clamping can be adjusted. Now the limit switch can be slid onto a new position. After sliding of the switch please tighten the nut (SW7) until contact cannot be moved.

Cable mounting and wiring K17 A/B, K33 and K23i:

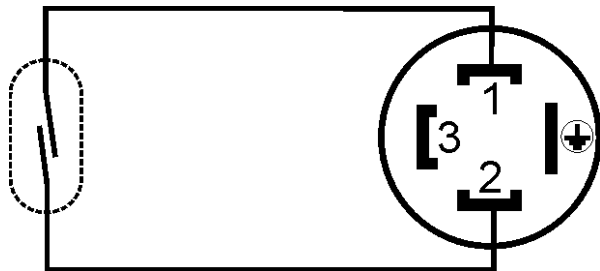
1. Unscrew locking screw (5) from the cover (4) and lift total cover (4) from the contact housing (1). Caution – do not lose or damage sealing (10) between plug / housing
2. Unscrew cable connection (9) and remove sealing inserts (6,7,8) from the cover.
3. Pull screw (5) out of the plug (4) and lever insertion part (3) carefully out. (remove from plug (4) inside)
4. Pull connection cable Ø 4-7,5mm through the cable connection and insert sealing inserts into the plug. Dismantle the cable at the needed length and fix wiring sockets. Afterwards wire up acc. wiring diagram at the terminals of the insertion part.
5. The mounting of the connectors to be carried out contrariwise. The insertion part can be mounted in 90° steps so that the cable – after plugging – will be guided to the left, right, top or bottom.



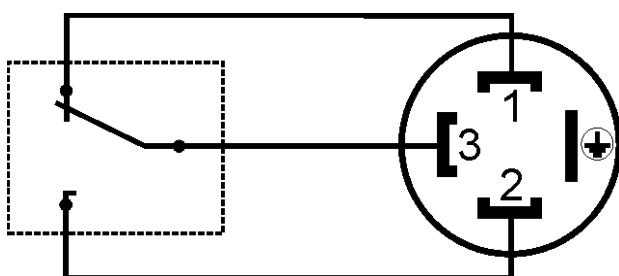
Please consider that the sealing of the cable connection has a seal at the hull of the cable. Please torque cable connection appropriately. Damaged seals (10) plug / housing (1. and 4) must be replaced categorical with similar sealings and housing parts.

During putting into operation of the user we recommend to move the float along the contact position. Thus the correct start position of the contact will be ensured.

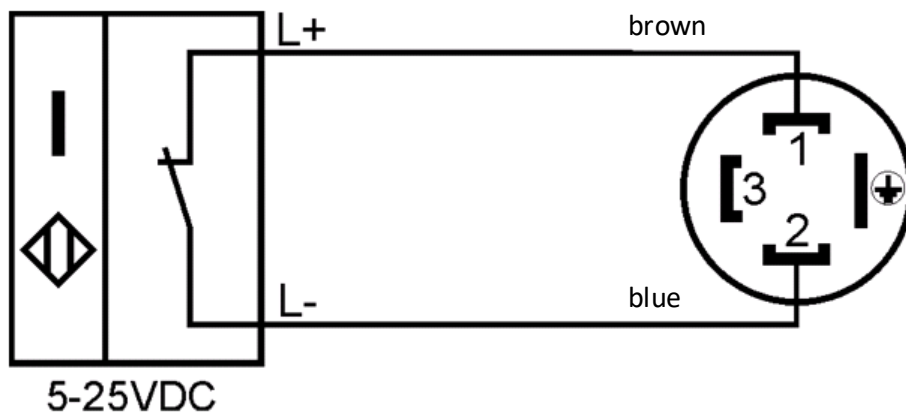
#### 5.3.4 Wiring diagrams of the limit switches K17 A/B, K33, K33i



Wiring Diagram K17 A/B



Wiring Diagram K33



Wiring diagram K33i

## 6. Characteristical data

### 6.1 Mechanical data

Measuring range	Turndown ratio		1:10
	Smallest measuring range	Water	3 - 30 l/h
		Air	36 - 360 NI/h
	Largest measuring range	Water	1000 - 10000 l/h
		Air	18000 - 180000 NI/h
	Dimensions for measured variable	Water	l/h <= 2500l/h
			m³/h >= 3000 l/h
Air		l/h <= 40000 NI/h	
		m³/h >= 50000 NI/h	
covered to 0 ° C and 1,013 bar abs			
Accuracy class (according to VDE/VDI 3513, sheet 2)		Liquids	1,6%
		Gases	2,5%
qG 50%			
Flow direction		from bottom to top	
Materials	Measuring tube		Borosilicat glass
	Connections		1.4571, PVDF, PVC
	Float		1.4571, aluminium, PVDF
	Float guiding		1.4571
	Seals		Viton, EPDM, FEP/FFKM
	Float Stop		PVDF / stainless steel
	Protection body		1.4301
	Shatter protection		Polycarbonat
Ambient conditions	Ambient temperature		-20...+80 °C (-4...+176°F)
	Ambient temperature PVC		-20...+80 °C (-3...+176°F)
	Storage temperature		-20...+60 °C (-4...+140°F)
	Climatic category	Weatherproof and/or unheated operation site, class C according to DIN IEC 654 part 1	
	Shock resistance / vibration resistance	The device should be protected against extreme shock and vibration, either of which could cause damage	
Medium Conditions			
	Pressure Resistance	Ranges B1 bis C7	max. 15 bar (at max. 80°C ; 176° F)
		Ranges D1 bis D8	max. 10 bar (at max. 80°C ; 212° F)
		Ranges E1 bis E5	max. 6 bar (at max. 80°C ; 176° F)
		Connections in PVDF	max. 10 bar (at max. 20°C ; 68° F)
			max. 4 bar (at max. 40°C ; 104° F)
			max. 2,5 bar (at max. 50°C ; 122° F)
		Connections in PVC	max. 10 bar (at max. 20°C ; 68° F)
			max. 4 bar (at max. 40°C ; 104° F)
			max. 2,5 bar (at max. 50°C ; 122° F)
	Media Temperature	Float material st.st. / Aluminium	-10° - +150°C (+14° - +176° F)
		Float material PVDF	-10° - +100°C (+14° - +176° F)
		PVC Glue connection	-10° - +50°C (+14° - +122° F)
	Status	liquid or gaseous	
	Density	Liquids	<=2,0 kg/l
		Gases	- / -
Inlet and outlet straight		Inlet and outlet straight are not required as long as the flow profile is laminar. On strongly non laminar flow profiles e.g. regulating and shuttuff devices inlet straight of 250 mm, see also directive VDI/VDE 3513	
Pressure Loss		see measuring ranges	
Limit contacts	Model	Switching type	Power
	K17A	reed contact N/O	AC 250 V/ 0,5 A / 10 VA
	K17B	reed contact N/C	DC 250 V/0,5 A / 5W
	K33	reed contact SPDT	250 V AC/DC/1,5A/150VA/100W
	K33i	inductive contact N/C	5-25 V DC

## 6.2 Measuring ranges

### 6.2.1 Water

V31 model	Connection Sizes <u>Standard</u>	Ranges acc. Range code	Pressure loss mbar(psi)	Float 1.4571 c/w and w/o guiding	Float 1.4571+ magnet	Float 1.4571 - viscosity stable	Float PVDF weighted w. magnet
				Standard ranges for liquids - l/h - (p=1kg/l(62,43 lb/cu.ft), viscosity 1 mPas(1cp)) (turndown ratio 1:10)			
S 04	G 1/4" 3/8" 1/2"	B1	10 (0,145)	3 - 30	-	-	1,1 - 11
		B2		4 - 40	-	-	1,5 - 15
		B3		5 - 50	-	-	2 - 20
		B4		6,5 - 65	-	-	2,5 - 25
		B5		8 - 80	-	-	3,2 - 32
		B6		10 - 100	-	-	4 - 40
S 05	G 1/4" 3/8" 1/2"	C1	20 (0,290)	12,5 - 125	12 - 120	10 - 100	6,5 - 65
		C2		16 - 160	15 - 150	12,5 - 125	9 - 90
		C3		20 - 200	18 - 180	16 - 160	11 - 110
		C4		25 - 250	24 - 240	20 - 200	14 - 140
		C5	40 (0,580)	31,5 - 315	30 - 300	24 - 240	17,5 - 175
		C6		40 - 400	36 - 360	30 - 300	22 - 220
		C7		50 - 500	48 - 480	36 - 360	25 - 250
S 06	G 3/4" 1" 1 1/4"	D1	19 (0,280)	40 - 400	40 - 400	-	32 - 320
		D2		65 - 650	60 - 600	40 - 400	50 - 500
		D3		80 - 800	75 - 750	50 - 500	60 - 600
		D4		100 - 1000	95 - 950	60 - 600	75 - 750
		D5	24 (0,350)	120 - 1200	120 - 1200	75 - 750	100 - 1000
		D6		160 - 1600	150 - 1500	100 - 1000	125 - 1250
		D7		200 - 2000	180 - 1800	120 - 1200	160 - 1600
		D8	33 (0,480)	250 - 2500	240 - 2400	140 - 1400	200 - 2000
		D9		300 - 3000	280 - 2800	180 - 1800	240 - 2400
S 07	G 1 1/4" 1 1/2" 2"	E1	25 (0,360)	400 - 4000	380 - 3800	250 - 2500	320 - 3200
		E2		500 - 5000	480 - 4800	300 - 3000	380 - 3800
		E3		650 - 6500	640 - 6400	400 - 4000	500 - 5000
		E4		800 - 8000	750 - 7500	450 - 4500	640 - 6400
		E5		1000 - 10000	950 - 9500	550 - 5500	750 - 7500

### 6.2.2 Air

V31 model	Connection Sizes <u>Standard</u>	Ranges acc. Range code	Pressure loss mbar(psi)	Float Aluminum c/w and w/o guiding	Float Aluminum + magnet	Float PVDF	Float PVDF weighted w. magnet
				Standard ranges for air - NI/h - (Pabs =1,013 bar(14,69psi) at T= 20°C(68° F), p=1,293kg/m³, V=0,0181 mPas) (Turndown ratio 1:10)			
S 04	G 1/4" 3/8" 1/2"	B1	4 (0,058)	5 - 500	-	36 - 360	-
		B2		65 - 650	-	50 - 500	-
		B3		80 - 800	-	65 - 650	-
		B4		110 - 1100	-	80 - 800	-
		B5		140 - 1400	-	100 - 1000	-
		B6		160 - 1600	-	125 - 1250	-
S 05	G 1/4" 3/8" 1/2"	C1	40 (0,580)	200 - 2000	250 - 2500	150 - 1500	200 - 2000
		C2		300 - 3000	320 - 3200	200 - 2000	300 - 3000
		C3		360 - 3600	400 - 4000	250 - 2500	360 - 3600
		C4		400 - 4000	500 - 5000	300 - 3000	450 - 4500
		C5		500 - 5000	640 - 6400	360 - 3600	600 - 6000
		C6		640 - 6400	800 - 8000	500 - 5000	700 - 7000
		C7		800 - 8000	1000 - 10000	550 - 5500	950 - 9500
S 06	G 3/4" 1" 1 1/4"	D1	19 (0,280)	750 - 7500	850 - 8500	520 - 5200	750 - 7500
		D2		1000 - 10000	1200 - 12000	800 - 8000	1000 - 10000
		D3		1300 - 13000	1500 - 15000	900 - 9000	1300 - 13000
		D4		1600 - 16000	2000 - 20000	1200 - 12000	1600 - 16000
		D5	24 (0,350)	2000 - 20000	2400 - 24000	1500 - 15000	2000 - 20000
		D6		2800 - 28000	3200 - 32000	2000 - 20000	2800 - 28000
		D7		3600 - 36000	4000 - 40000	2500 - 25000	3600 - 36000
		D8	33 (0,480)	4000 - 40000	5000 - 50000	3000 - 30000	4000 - 40000
		D9		5000 - 50000	6000 - 60000	3600 - 36000	5000 - 50000
S 07	G 1 1/4" 1 1/2" 2"	E1	25 (0,360)	6400 - 64000	7500 - 75000	5000 - 50000	6400 - 64000
		E2		8000 - 80000	10000 - 100000	6500 - 65000	8000 - 80000
		E3		10000 - 100000	12500 - 125000	8000 - 80000	10000 - 100000
		E4		14000 - 140000	15000 - 150000	10000 - 100000	14000 - 140000
		E5		16000 - 160000	18000 - 180000	12500 - 125000	16000 - 160000



## 6.3 Characteristical values – limit switches

### 6.3.1 K17 A/B – limit switches

- K17 A: Contact is made when the current value falls below the limit value
- K17 B: Contact is made when the current value exceeds the limit value

Schaltprinzip	Magnetische Kontakteinrichtung, bistabil - Ausführung als Reedkontakt
Temperaturbereich	-40 °C - +80 °C (-40 °F - +176 °F)
Gehäuse/Stecker	PP/PA 6
Kontaktwerkstoff	Rhodium
Schutzart	IP65
Umgebungstemperatur	-20 bis +80 °C / -4 bis 176 °F
max. Schalthäufigkeit	5/min
max. Schaltleistung	AC 250 V/0,5 A/10 VA
	DC 250 V/0,5 A/5 W



**Caution:**

The maximum switching capacity and the maximum permissible peak inrush current must not be exceeded. Otherwise the contact reeds will weld together. Such contact welding constitutes the end-of-life of the switch.

### 6.3.2 K33 – limit switches

Housing	Aluminum
Switching principle	Bistable magnetic contact, reed contact
Temperature range	-40 °C to +80 °C (-40 °F to +176 °F)
Contact material	AgPd
Degree of protection	IP 54
Inert gas filling	
Switching voltage	[V~] 230
	[V=] 250
Continuous current	[A] 1.5
Switching capacity	[V~] 230 max.150 VA
	[V=] 250 max.100 W
Contact resistance	[Ω] 0.2 Ohm
Insulating resistance	[Ω] 50 M Ohm
Breakdown voltage	[V] 1150
Mechanical life-time	10 <sup>8</sup> switching operations
Max. switching rate	7200/h

### 6.3.3 K33i – limit switches

- K33i: The contact is an inductive contact that makes or breaks a circuit when the current value reaches the set value.

Housing	Aluminum
Switching principle	Inductive contact, magnetically coupled, proximity switch
Temperature range	-40 °C to +80 °C (-40 °F to +176 °F)
Function of switching element	N/C
Output polarity	NAMUR (DIN EN 60947-5-6)
Degree of protection	IP 54
Welded without gaps - Sensor cast free of shrink holes	
Nominal voltage $U_0$	[V =] 8
Operating voltage $U_B$	[V =] 5 .. 25
Max. switching frequency	3000 Hz



**Caution:**  
The maximum operating voltage must not be exceeded. Otherwise the sensor will be destroyed.

## 7. Installation and condition for use

### 7.1 Receipt of goods, unpacking and transport to point of use

#### 7.1.1 Receipt of goods

- Check the packaging and contents for damage.
- Inspect the supplied goods to ensure complete delivery and compare the consignment with your order specifications.

#### 7.1.2 Unpacking

- Depending on unit version the float is locked against transport damage of the unit. These transport lockings must be removed before operation.

#### 7.1.3 Transport

- For the transport to the measuring point on-site we recommend the use of the factory freight packing and transport locking.

## 7.2 Operating conditions / Installation

### 7.2.1 Installation conditions

The device should be operated pursuant to the stipulations of VDE/VDI Code 3513, sh. 3.

Measurable media are:

- 1) Liquids that exhibit sufficient flowability are devoid of solids, do not bond and do not tend to settle.
- 2) Gases that flow laminarly (laminar flow behavior) and exhibit sufficient pre-pressure.

Mount the device vertically so as to allow for upward flow. Make sure to leave enough space for subsequent removal of the flowmeter.

Inlet and outlet sections in front of and behind the device are generally unnecessary for laminar flows. Avoid installation of any components that narrow the flow on one side in front of the device. If this is not possible, implement a straight 5 x DN inlet section in front of the device. If possible, control valves should be installed behind the metering device in the direction of flow. Make sure that the float is not being shot against the upper float stop. For further information in this regard, see the installation recommendations in VDE/VDI Code 3513, sh. 3. Do not mount the flowmeter on the suction side of a pump. (Danger of vacuum!)

### 7.2.2 Startup



Any particular matter in the process lines should be rinsed out before startup to prevent these particles from clogging the device. Ferromagnetic particles such as welding beads can cause the device to malfunction. If the presence of such particles during normal operating conditions cannot be ruled out with certainty, a magnetic filter (optional accessory) should be installed in front of the device. When the system is put into operation, slowly open the valves and purge the system so as to avoid irregular medium flow (spurting).

Device with flange connection tighten the union before installation. The device mustn't be cleaned of the outside with cleaning liquid which contains solvent! Use only normal house-hold cleaners!

### 7.2.3 Pumps

Do not mount measuring unit into suck side of any pump. (vacuum, measuring error)

### 7.2.4 Installation

Screws, bolts, nuts and seals are not supplied by Heinrichs Messtechnik GmbH and must therefore be provided by the operator. Install the sensor between the pipes. Mounted seals must not reach into the pipe cross section.

### 7.2.5 Gas metering

Raise the operating pressure gradually when metering gas. Use the control valve to vary the pressure in such a way that the float is not bumped/will not bump against the side of the tube, as this could result in damage to the measuring element.

## 8. Maintenance

The device requires no serving insofar as it is operated in accordance with the manufacturer's recommendations. If, however, the float becomes clogged or the float needs to be cleaned, the service technician should take note of the following:

- Before dismantling the device, check to ensure that all pipes are devoid of media, have been depressurized and have cooled down.
- The inside of the devices containing foreign matter should be cleaned carefully with a brush and suitable cleaning agent. Any deposits should be carefully removed.

## 9. CE Marking

The limit switches in the measuring system comply with the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC. In as much as the devices are classified under Article 3 par. 3 of Pressure Equipment Directive 97/23/EC, they do not bear the CE mark for this guideline.

The CE mark indicates that the device complies with the aforementioned directives.

## 10. Order information

### 10.1 Basic data

All orders should contain the following information: product data, specific weight, standard density (for gases), temperature, pressure, viscosity, material used, connection sizes, flow rate range, accessories desired.

### 10.2 Available accessories

All orders should contain the following information: product data, specific weight, standard density (for gases), temperature, pressure, viscosity, material used, connection sizes, flow rate range, accessories desired.

Accessories:

- 1 or 2 limit switches
- Shatter protection

## 11. Standards, directives, certification and authorization

Certification of the manufacturing facility

-	DIN EN 9001:2000	
-	Directive 97/23/EG	Pressure Equipment Directive
-	AD 2000 Bulletins	Regulations for pressure vessel calculations
Measuring range & conversion calculations for third party products in acc. with VDE/VDI 3513		


Certification of limit switches

-	EMC Directive 2004/108/EC	
-	Low Voltage Directive 2006/95/EC	
-	EN 61000-6-2: 2006	Immunity for industrial environment
-	EN 61000-6-3: 2006	Emitted interference residential environment
-	EN 55011: 2007 + A2: 2007	Group 1, Class B, radio interference
-	EN 60529 : 2000	Degrees of protection through housing (IP code)
-	EN 60947-5-6: 2000	Low voltage switchgear and control gear
-	EN 61010-1: 2004	Safety requirements for electrical metering, control and laboratory devices


## Model Code V31

Basic Code 504/505 / V31-								
V31-	G	NPT	Flange	Hose Conn. Glue Conn.	Hygienic Conn. - DIN 11851	TRI- Clamp ISO 2852	TRI- Clamp DIN 32676	TRI- Clamp DIN 32677
1/4"	4000	6010			on requ.	on requ.	on requ.	on requ.
3/8"	4010	6020		6215				
1/2"	4020	6030	201R	6210				
3/4"			202R					
1"			203R					
DN10			301B					
DN15			305B	4200				
DN20			3A5B					
DN25			309B					
Mounting Length								
	(G and NPT)						375 mm	1
	(hose conn.)						400 mm	2
							425 mm	3
							500 mm	5
Connection Material(wetted)								
							PVDF	F
							Edelstahl	S
							PVC	V
Float								
	1.4571 (316 Ti) (316 Ti)						01	
	1.4571 (316 Ti) guided						02	
	1.4571 (316 Ti) - c/w Magnet						03	
	1.4571 (316 Ti) - viscosity stable - guided						04	
	PVDF						05	
	PVDF weighted						06	
	PVDF c/w Magnet						07	
	Aluminum						08	
	Aluminum guided						09	
	Aluminum c/w Magnet						10	
	Special						99	
Range								
	see Measuring Tables						B1-	
							C7	
Media								
							Water	W
							Air	L
go on with general part								

go on with general part

Basic Code 506 / V31-								
V31-	G	NPT	Flange	Hose Conn. Glue Conn.	Hygienic Conn. - DIN 11851	TRI- Clamp ISO 2852	TRI- Clamp DIN 32676	TRI- Clamp DIN 32677
3/4"	4030	6040			on requ.	on requ.	on requ.	on requ.
1"	4040	6050	203R					
1 1/4"	4050	6060						
1 1/2"			205R					
DN25			309B	4220				
DN32				4230				
DN40			317B	4240				
Mounting Length								
	(G and NPT ; hose conn. PVC)						375 mm	1
	(hose conn.)						400 mm	2
	(Flange conn.)						425 mm	3
	(hose conn. PVDF)						450 mm	4
	(Flange)						500 mm	5
Connection Material (Medienberührt)								
							PVDF	F
							Edelstahl	S
							PVC	V
Ranges								
	see Measuring Tables						D1-	
							D9	
Float								
	1.4571 (316 Ti)						01	
	1.4571 (316 Ti) guided						02	
	1.4571 (316 Ti) - c/w Magnet						03	
	1.4571 (316 Ti) - viscosity stable - guided						04	
	PVDF						05	
	PVDF weighted						06	
	PVDF c/w Magnet						07	
	Aluminum						08	
	Aluminum guided						09	
	Aluminum c/w Magnet						10	
	Special						99	
Media								
							Water	W
							Air	L
go on with general part 								

go on with general part

Basic Code 507 / V31 -								
V31-	G	NPT	Flange	Hose	Hygienic	TRI-	TRI-	TRI-
1 1/4"	4050	6060			on requ.	on requ.	on requ.	on requ.
1 1/2"	4060	6070	225R					
2"	4070	6080	226R	6260				
2 1/2"			227R					
DN40			317B					
DN50			320B	4250				
DN65			325B					
Mounting Length								
(G and NPT, glue conn. PVC)							375 mm	1
(hose conn.)							425 mm	3
							450 mm	4
							500 mm	5
Connection Material (wetted)								
PVDF								F
Edelstahl								S
PVC								V
Float								
1.4571 (316 Ti)								01
1.4571 (316 Ti) guided								02
1.4571 (316 Ti) - c/w Magnet								03
1.4571 (316 Ti) - viscosity stable - guided								04
PVDF								05
PVDF weighted								06
PVDF c/w Magnet								07
Aluminum								08
Aluminum guided								09
Aluminum c/w Magnet								10
Special								99
Range								
							see Measuring Tables	E1 -
								E5
Media								
Water								W
Air								L
go on with general part								
								

go on with general part

General Part		
O-Ring		
	EPDM	B
	Viton® FKM	F
	FEP/Perfluor® FFKM	V
Float Stop		
	PVDF	F
	Edelstahl	S
	Specialwerkst.	X
Sleeve Nut		
	Aluminum lackiert	A
	Dedelstahl	5
Chip Guard		
	c/w	0
	w/o	1
Contacts		
	w/o	0
	K17 A	1
	K17 B	2
	K33	3
	K33	4
	2x K33	5
	Special	6
Scale		
	%-Scale (H2O)	1
	MB-Scale (H2O)	2
	%-Scale Media	3
	Range-Scale Media	4
	engraved Scale	5
	Special	6
Certificat		
	2.1 certificate acc. EN10204	1
	3.1 certificate (DIN EN 10204:2004 for wetted st.st. Parts	2
Calibration report		
	w/o	0
	Standard 3-point confirmation of the accuracy class	1
	5-point cal. Report	2
	Special scaling accuracy class 1%	3
	Special calibration acc. Customer request	9
Cleaning acc. Company Norm (oxygen service)		
	w/o	0
	cleaning class VA c/w marking oil and grease free	1
Pressure and Leak Test reports		
	w/o	0
	Pressure test acc. EN 10204 c/w AP2 3.1	1
	leak testing acc. EN 10204 c/w AP2 3.2	2
Approvals		
	w/o	0
	ATEX IIG (Gas Zone 1) - in preperation only for mech. version	1
	ATEX IIG (Gas Zone 2) - in preperation only for mech. version	2
	ATEX IIG (Staub Zone 1) - in preperation only for mech. version	3
	ATEX IIG (Staub Zone 2) - in preperation only for mech. version	4
Signing		
	w/o	0
	st.st plate 40 x 20 mm	1
Supplementary		
	w/o	0
	c/w (separate specification required)	1

## 12. Declaration of conformity



### Konformitätserklärung Declaration of conformity

Heinrichs Messtechnik GmbH, Robert-Perthel-Straße 9, 50739 Köln

erklärt in alleiniger Verantwortung, dass das Produkt / declares in sole responsibility, that the product

#### **Schwebekörper-Durchflussmesser / Variable Area Flowmeter**

Typ / type **V31**

mit den Vorschriften folgender Europäischer Richtlinien übereinstimmt:  
conforms with the regulations of the European Directives:

Druckgeräterichtlinie 97/23/EG, Pressure Equipment Directive 97/23/EC

AD 2000-Merkblätter Auslegung und Berechnung von Druckbehältern/Regulations for pressure vessel calculations  
97/23/EG, Gas 1, SEP, gültig/valid f. ≤ DN25  
97/23/EG, Gas 1, Modul H, gültig/valid f. > DN25

Ex-Richtlinie 94/9/EG

EN 1127-1:2008-02 Explosionsfähige Atmosphäre, Grundlagen und Methodik  
Explosive atmospheres - Explosion prevention and protection -  
Part 1: Basic concepts and methodology

EN 13463-1:2009-07 Nicht-elektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen -  
Teil 1: Grundlagen und Anforderungen  
Non-electrical equipment for use in potentially explosive atmospheres  
Part 1: Basic method and requirements

Für angebaute elektrische Sensoren/ For add-on electrical sensors:

EMV-Richtlinie 2004/108/EG, EMC Directive 2004/108/EC

Angewandte harmonisierte Normen oder normative Dokumente:/ Applied harmonised standards or normative documents:

EN 61000-6-2:2005 Störfestigkeit Industriebereich / immunity industrial environment  
EN 61000-6-3:2007 Störaussendung Wohnbereich / emission residential, commercial  
EN 55011:2007+A2:2007 Gruppe 1, Klasse B, Funkstörungen / ISM ratio-frequency equipment  
EN 61326-1:2006 Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV-Anforderungen /  
Electrical equipment for measurement, control and laboratory use - EMC requirements

EN 61010-1: 2004 Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- Laborgeräte  
Safety requirements for electrical measuring, control and laboratory devices

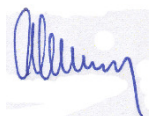
Name und Anschrift der benannten Stellen der QS-Überwachung / Name and address of the notified body of the QS supervision

DEKRA EXAM GmbH  
Carl-Beyling-Haus  
Dinnendahlstraße 9  
D-44809 Bochum  
Identifikationsnummer RL 94/9/EG: 0158

TÜV- Industrie Service GmbH  
TÜV Rheinland Group  
Am Grauen Stein  
D-51105 Köln

Köln, den 31.03.2016

Frank Schramm



(Geschäftsführung / General Management)

### 13. Decontamination certificate for device cleaning

Company name:.....

Address:.....

Department:.....

Name of contact person:.....

Phone: .....

Information pertaining to the enclosed V31

Model V31.....

Was operated using the following fluid:

.....

In as much as this fluid is \*:

☐

toxic

☐

health hazard-

☐

corrosive

☐

radioactive

☐

safe

☐

explosive

☐

combustible

☐

bio hazard

We have done the following:

- Checked all cavities in the device to ensure that they are free of fluid residues\* ☐
- Washed and neutralized all cavities in the device\* ☐
- Cleaned all seals / gaskets and other components that come into contact with the fluid\* ☐
- Cleaned the housings and all surfaces\* ☐

\*cross all applicable items.

We hereby warrant that no health or environmental hazard will arise from any fluid residues on or in the enclosed device.

Date: .....

Signature: .....

