



Variable Area Flowmeter V31

Operating Instruction



Please read and keep instruction manual!



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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 nonstandard 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 <u>www.heinrichs.eu</u> 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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Heinrichs Messtechnik GmbH extends no express or implied warranty in regard to the applicability of the present document for any purpose other than that described herein.

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. 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) Headword: V 31 Robert-Perthel-Straße 9 D-50739 Köln

Fax: +49 221 49708-178 Email: <u>info@heinrichs.eu</u>



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 / Storaging / 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 is 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 - Decontaminationcertificate.) 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 E - Mail: info@heinrichs.eu

3.2 Product type

Variable Area Flow Meter with glass cone.

3.1 Model code

V31

3.3 Issue date

31.03.2016

3.4 Version N°

V31_BA_16.01_en

3.5 Designation / Model plate

	TYPE V31 MODELCODE	:	XX-XX-XX-Muster
Heinrichs	SER. NO.	:	1234567
	MAX. OPERATING PRESSURE	:	X bar
KOBOLD Group www.heinrichs.eu	TEMP. RANGE	:	-10°C to 80°C
WWW.Inclinicits.eu	MANUFACTURING DATE	:	01.2009
(e)	PED	:	SEP

\frown	TYPE V31 MODELCODE	:	XX-XX-XX-Muster
Heinrichs	SER. NO.	:	1234567
	MAX. OPERATING PRESSURE	:	X bar
KOBOLD Group www.heinrichs.eu	TEMP. RANGE	:	-10°C to 80°C
www.neinnens.eu	MANUFACTURING DATE	:	01.2009
Ce	PED	:	1G

Logo	Manufactrer´s logo
Adresse	Manufacturer's adress (internet adress)
CE	CE marking in accordance with applied EC directives
Туре	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:



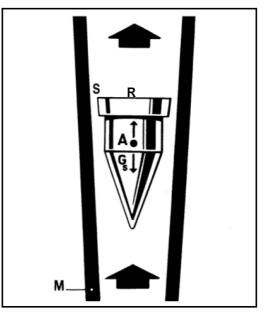
The device is of limited use for the metering of potentially hazardous liquids and gases. It is imperative that the operator takes steps to ensure that in the event the glass tube breaks, no personnel are harmed and no equipment is damaged. The system operator is legally responsible for any effects provoked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

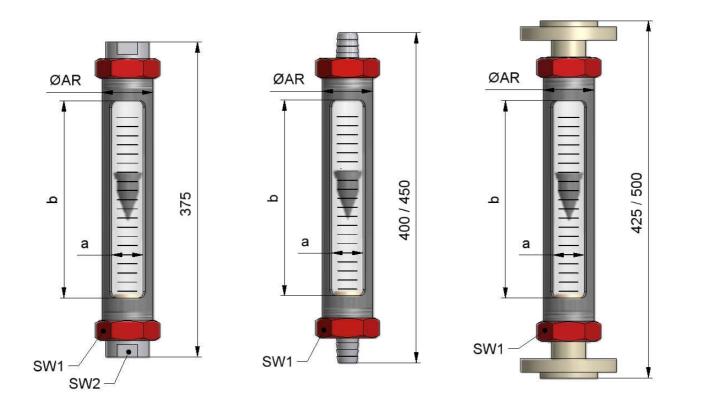
The readings obtained apply solely to the medium for which the device has been calibrated or for a medium with the same density and viscosity. The float is also optional guided by a float guide rod. The option is recommended to increase the operational safety and to protection against glass breakages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





5.1 System design

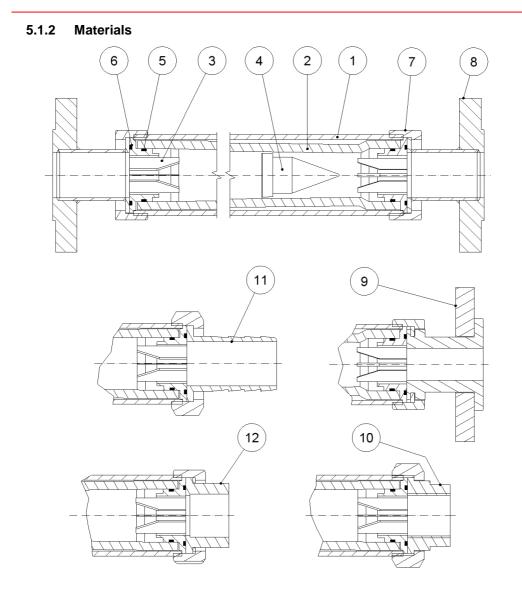
5.1.1 Type of construction / dimensions



V 31			Body			Connection				
Model	Ø AR	а	b	SW1	SW2	Female thread	Hose connector	Bonded connection	Fla	
S04	Ø 33.7	19	235	39	24	G / NPT	<i>a</i> 12 <i>a</i> 10	DN 15 d = 20 mm	DN 10/ <u>15</u> /20/25 PN	
S05	0 33.7	19	235	39	24	1⁄4", ?", <u>1⁄2"</u>	<u>Ø 13</u> , Ø 19	¹ / ₄ ", ?", <u>¹/₂"</u> <u>Ø 13</u> , Ø 19	DN 15 d = 20 mm	40
S06	Ø 60.3	38	235	67	46	G / NPT ¾", <u>1"</u> , 1¼"	Ø 19, <u>Ø 25,</u> Ø 38	DN 32 d = 40 mm	DN <u>25</u> /40 PN 40	
S07	Ø 88.9	58	235	100	65	G / NPT 1¼", 1½", <u>2"</u>	Ø 38, <u>Ø 50</u>	DN 50 d = 63 mm	DN 40/ <u>50</u> PN 40 DN 65 PN 16	
	Standard connections are underlined									

Weights	Treaded	Treaded conn.		conn
S 04	G 1/2	0,7 Kg	DN 15	2,0 Kg
S 05	G 1/3	0,7 Kg	DN 15	2,0 Kg
S 06	G 1	2,0 Kg	DN 25	3,9 Kg
S 07	G 2	4,0 Kg	DN 50	8,9 Kg





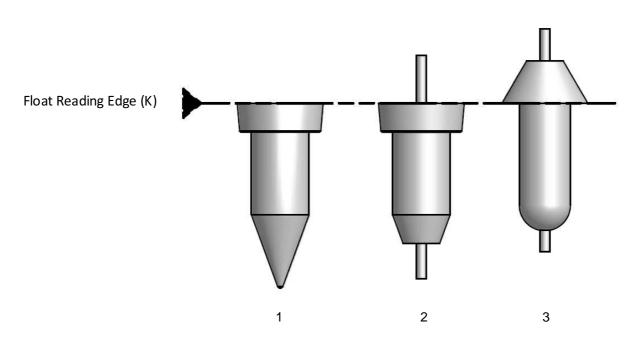
			V 31 connection			
Item	Pieces	Name	PVC	PVDF	SS	
1	1	Housing		1.4301		
2	1	Measuring tube	В	orosilicate gla	SS	
3	2	Stop	PVDF			
4	1	Float	1.4571, AL, PVDF			
5	2	O-ring	EPDM, Viton, FEP/FFKM			
6	2	O-ring	EPDM, Viton, FEP/FFKM			
7	2	Sleeve nut	AL, SS			
8	2	Flange	X			
9	2	Flange		Х		
10	2	Threaded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



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	>= 3
S06	>= 5
S07	>= 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.

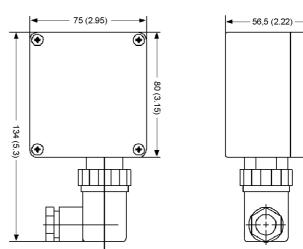
Features:

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

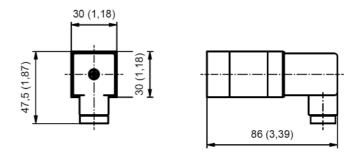
The bistable K33 contact consists of a set of contact springs inside a glass tube filled with inert gas.

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

Dimensions K33 and K33i

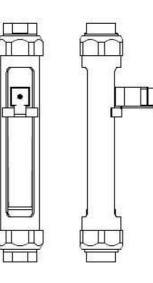


Dimensions K17 A/B

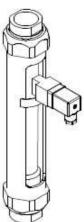


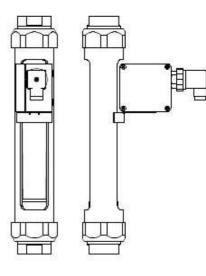


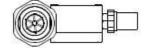
5.3.2 Mounting of the limit switches series K17, K33, K33i

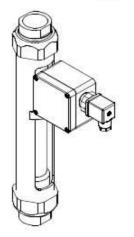














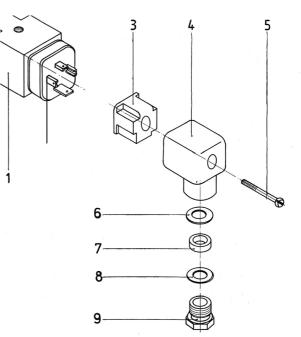
5.3.3 Adjusting and wiring of the limit switches

The limit switches are factory set at the ordered values if htey 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 slided 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:

- 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.
- Pull crew (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 cabel 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.
- The mounting of the connectors tob e 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.





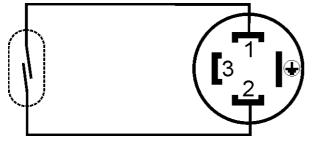
Please consider that the sealing of the cable connection hast o seal at the hull

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.

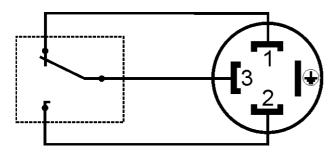
During putting into operation of the user we recommend to move the float along the contact position. Thus the correct start position of the contact will be ensured.



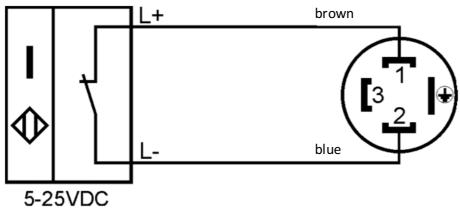
5.3.4 Wiring diagrams of the limit switches K17 A/B, K33, K33i



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	Water	3 - 30 l/ł
	range	Air	36 - 360 NI/
	Largest measuring	Water	1000 - 10000 1/
	range	Air	18000 - 180000 NI/
			l/h <= 2500l/
	Dimensions for	Water	m³/h >= 3000 l/l
	measrured variable		l/h <= 40000 NI/
		Air	m ³ /h >= 50000 Nl/h
		covered to 0 ° C and 1,013 bar abs	
		Liquids	1,69
Accuracy class (accordi	ing to VDE/VDI 3513,	Gases	2.59
sheet 2		00303	q ₆ 50%
-low direction			from bottom to to
Vaterials		Moosuring tubo	Borosilicat glas
Vidlendis		Measuring tube	
		Connections	1.4571, PVDF, PV0
		Float	1.4571, aluminium, PVD
		Float guiding	1.457
		Seals	Viton, EPDM, FEP/FFK
		Float Stop	PVDF / stainless stee
		Protection body	1.430
		Shatter protection	Polycarbona
Ambient conditions		Ambient temperature	-20+80 °C (-4+176°F)
		Ambient temperature PVC	-20+80 ℃ (-3+176年)
		Storage temperature	-20+60 ℃ (-4+140뚜)
		Climatic category	Weatherproof and/or unheated operation site, class C according to DIN IEC 654 part 1
		Shock resistance / vibration	The device should be protected against extreme shock and
Medium Conditions		resistance	vibration, either of which could cause damage
	Pressure Resistance	Ranges B1 bis C7	may 15 has (at may 00% + 170°E)
	Flessure Resistance	Ranges D1 bis D8	max. 15 bar (at max. 80°C; 176°F)
			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℃ ; 68°F)
			max. 4 bar (at max. 40℃ ; 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℃ ; 104°F)
			max. 2,5 bar (at max. 50℃ ; 122°F)
	Media Temperature	Float material st.st. / Aluminium	-10°- +150℃ (+14°- +176°F)
		Float material PVDF	-10°- +100℃ (+14°- +176°F)
		PVC Glue connection	-10°- +50℃ (+14°- +122°F)
	Status		liquid or gaseou
	Density	Liquids	<=2,0 kg
		Gases	- /
nlet and outlet straight		Inlet and outlet straight are not require	ed as long as the flow profile is laminar.
			e.g. regulating and shuttoff devices inlet
		straight of 250 mm, see also directive V	/DI/VDE 3513
Pressure Loss		see measuring ranges	
Limit contacts	Model	Switching type	Power

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	Ranges acc.	Pressureloss	Float 1.4571 c/w and w/o guiding	Float 1.4571+ magnet	Float 1.4571 - viscosity stable	Float PVDF weighted w. magnet	
	<u>Standard</u>	R ange code	mbar(psi)	Standard ranges for liquids - l/h - (p=1kg/l(62,43 lb/cu.ft), viskosity 1 mPas(1cp (turndown ratio 1:10)				
S 04	G	B1	10 (0,145)	3 - 30	-	-	1,1 - 11	
	1/4"	B2	1	4 - 40	-	-	1,5 - 15	
	3/8"	B3	1	5 - 50	-	-	2 - 20	
	1/2"	B4	1	6,5 - 65	-	-	2,5 - 25	
		B5	1	8 - 80	-	-	3,2 - 32	
		B6		10 - 100	-	-	4 - 40	
S 05	G	C1	20 (0,290)	12,5 - 125	12 - 120	10 - 100	6,5 - 65	
	1/4"	C2	1	16 - 160	15 - 150	12,5 - 125	9 - 90	
	3/8"	C3		20 - 200	18 - 180	16 - 160	11 - 110	
	<u>1/2"</u>	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	D1	19 (0,280)	40 - 400	40 - 400	-	32 - 320	
	1/2"	D2		65 - 650	60 - 600	40 - 400	50 - 500	
	3/4"	D3		80 - 800	75 - 750	50 - 500	60 - 600	
	<u>1"</u>	D4		100 - 1000	95 - 950	60 - 600	75 - 750	
		D5		120 - 1200	120 - 1200	75 - 750	100 - 1000	
		D6	24 (0,350)	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	E1	25 (0,360)	400 - 4000	380 - 3800	250 - 2500	320 - 3200	
	1"	E2]	500 - 5000	480 - 4800	300 - 3000	380 - 3800	
	1 1/4 "	E3		650 - 6500	640 - 6400	400 - 4000	500 - 5000	
	1 1/2 "	E4]	800 - 8000	750 - 7500	450 - 4500	640 - 6400	
	<u>2"</u>	E5		1000 - 10000	950 - 9500	550 - 5500	750 - 7500	

6.2.2 Air

V31 model	Connection Sizes Standard	Ranges acc. Range code	Pressure loss	Float Aluminum c/w and w/o guiding	Float Aluminum + magnet	Float PVDF	Float PVDF weighted w. magnet
	<u></u>	nango oodo	mbar(psi)		for air - NI/h - (Pabs : 93kg/m³, V=0,0181 m		
S 04	G	B1	4 (0,058)	5 - 500	-	36 - 360	-
	1/4"	B2		65 - 650	-	50 - 500	-
	3/8"	B3		80 - 800	-	65 - 650	-
	1/2 "	B4		110 - 1100	-	80 - 800	-
		B5		140 - 1400	-	100 - 1000	-
	1	B6		160 - 1600	-	125 - 1250	-
S 05	G	C1		200 - 2000	250 - 2500	150 - 1500	200 - 2000
	1/4"	C2	1	300 - 3000	320 - 3200	200 - 2000	300 - 3000
	3/8"	C3		360 - 3600	400 - 4000	250 - 2500	360 - 3600
	1/2 "	C4	1	400 - 4000	500 - 5000	300 - 3000	450 - 4500
	1 T	C5	40 (0,580)	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	D1	19 (0,280)	750 - 7500	850 - 8500	520 - 5200	750 - 7500
	1/2"	D2		1000 - 10000	1200 - 12000	800 - 8000	1000 - 10000
	3/4"	D3		1300 - 13000	1500 - 15000	900 - 9000	1300 - 13000
	<u>1"</u>	D4		1600 - 16000	2000 - 20000	1200 - 12000	1600 - 16000
	1 r	D5		2000 - 20000	2400 - 24000	1500 - 15000	2000 - 20000
		D6	24 (0,350)	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	E1	25 (0,360)	6400 - 64000	7500 - 75000	5000 - 50000	6400 - 64000
	1"	E2	1	8000 - 80000	10000 - 100000	6500 - 65000	8000 - 80000
	1 1/4"	E3]	10000 - 100000	12500 - 125000	8000 - 80000	10000 - 100000
	1 1/2"	E4]	14000 - 140000	15000 - 150000	10000 - 100000	14000 - 140000
	2"	E5	1	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
	AC 250 V/0,5 A/10 VA
max. Schaltleistung	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
Housing	Aluminum
Switching principle	Bistable magnetic contact, reed contact
Temperature range	-40 ℃ to +80 ℃ (-40 ℉ 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
Switching capacity	[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 ⁸ 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 ℃ to +80 ℃ (-40 ℉ to +176 ° F)
Function of switching element	N/C
Output polartiy	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 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 value 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
Measu	ring 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



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ATEX IIG (Staub Zone 2) - in preperation only for mech. version Signine w/o st.st plate 40 x 20 mm Supplementary w/o								
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				Hose Conn. /				
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on requ.	on requ.	on requ.	on requ.	1		6010	4000	1/4"
				6215		6020	4010	3/8"
				6210	201R	6030	4020	1/2"
					202R			3/4"
					203R		-	1"
				4200	301B 305B			DN10 DN15
				4200	305B 3A5B			DN15 DN20
				-	3A3B 309B			DN25
			ath	Mounting Len	0000			DINEO
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1 2	.) 400 mm	(hose conr						
3	425 mm							
5	500 mm							
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10	Im c/w Magnet Special	Aumini						
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B1- C7	leasuring Tables	see N						
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	ith general part	go on v	V31-	asic Code S06 /	E			31-
TRI- Clamp DIN	ith general part TRI- Clamp DIN 32676	go on v TRI- Clamp ISO 2852	Val- Hygenic Conn DIN 11851	asic Code 506 / Hose Conn. / Glue Conn.	Flange	NPT	G	31-
TRI- Clamp DIN 32677	TRI- Clamp DIN 32676	TRI- Clamp ISO 2852	Hygenic Conn DIN 11851	Hose Conn. /				
TRI- Clamp DIN	TRI- Clamp	TRI- Clamp	Hygenic Conn DIN	Hose Conn. /	Flange	NPT 6040 6050	G 4030 4040	31- 3/4" 1"
TRI- Clamp DIN 32677	TRI- Clamp DIN 32676	TRI- Clamp ISO 2852	Hygenic Conn DIN 11851	Hose Conn. /		6040 6050	4030 4040	3/4" 1"
TRI- Clamp DIN 32677	TRI- Clamp DIN 32676	TRI- Clamp ISO 2852	Hygenic Conn DIN 11851	Hose Conn. /	Flange	6040	4030	3/4"
TRI- Clamp DIN 32677	TRI- Clamp DIN 32676	TRI- Clamp ISO 2852	Hygenic Conn DIN 11851	Hose Conn. / Glue Conn.	Flange 203R	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25
TRI- Clamp DIN 32677	TRI- Clamp DIN 32676	TRI- Clamp ISO 2852	Hygenic Conn DIN 11851	Hose Conn. / Glue Conn.	Flange 203R 205R 309B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677	TRI- Clamp DIN 32676	TRI- Clamp ISO 2852	Hygenic Conn DIN 11851 on requ.	Hose Conn. / Glue Conn.	Flange 203R 205R	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ.	Hygenic Conn DIN 11851 on requ.	Hose Conn. / Glue Conn.	Flange 203R 205R 309B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ.	Hygenic Conn DIN 11851 on requ.	Hose Conn. / Glue Conn.	Flange 203R 205R 309B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ.	Hygenic Conn DIN 11851 on requ.	Hose Conn. / Glue Conn.	Flange 203R 205R 309B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PVi (hose conn. PVi (hose conn. PVi (hose conn. PVi)	Hygenic Conn DIN 11851 on requ. Gin (G and NPT ;	Hose Conn. / Glue Conn.	Flange 203R 205R 309B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ.	Hygenic Conn DIN 11851 on requ. Gin (G and NPT ;	Hose Conn. / Glue Conn.	Flange 203R 205R 309B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
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TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PVi (hose conn. PVi (hose conn. PVi (hose conn. PVi)	Hygenic Conn DIN 11851 on requ. gth (G and NPT ; (F	Hose Conn. / Glue Conn.	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PVi (hose conn. PVi (hose conn. PVi (hose conn. PVi)	Hygenic Conn DIN 11851 on requ. gth (G and NPT ; (F	Hose Conn. / Glue Conn.	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PVi (hose conn. PVi (hose conn. PVi (hose conn. PVi)	Hygenic Conn DIN 11851 on requ. gth (G and NPT ; (F	Hose Conn. / Glue Conn. 4220 4220 4240 Mounting Len	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PVi (hose conn. PVi (hose conn. PVi (hose conn. PVi)	Hygenic Conn DIN 11851 on requ. gth (G and NPT ; (F	Hose Conn. / Glue Conn.	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. (hose conn. PV) (hose conn. PV) (Flange conr (Flange	Hygenic Conn DIN 11851 on requ. gth (G and NPT ; (F	Hose Conn. / Glue Conn. 4220 4220 4240 Mounting Len	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. (hose conn. PV) (hose conn. PV) (Flange conr (Flange	Hygenic Conn DIN 11851 on requ. gth (G and NPT ; (F	Hose Conn. Glue Conn. Glue Conn. 4220 4220 Mounting Len ion Material (M Ranges	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
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TRI- Clamp DIN 32677 on requ.	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PIV (hase conr (Flange conr))	Hygenic Conn DIN 11851 on requ. gth (G and NPT ; (F	Hose Conn. Glue Conn. Glue Conn. 4220 4220 Mounting Len ion Material (M Ranges	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 0 or requ. 0 1 2 3 4 4 5 5 7 V V DI- DI- DI- DI- 0 2 0 1 0 1 0 1 0 1 0 1	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PVD (hose conn. PVD (Flange conr (Flange conr (Flange conr) (Flange conr)	Hygenic Conn DIN 11851 on requ. (G and NPT ; () ediaberührt)	Hose Conn. Glue Conn. Glue Conn. 4220 4220 Mounting Len ion Material (M Ranges	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
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TRI- Clamp DIN 0 1 0 1 0 2 3 3 4 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PV (hose conn. PV (hose conn. (Flange con (Flange	Hygenic Conn - DIN 11851 on requ. Gin (G and NPT ; () stilaberührt)	Hose Conn. Glue Conn. Glue Conn. 4220 4220 Mounting Len ion Material (M Ranges	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ. 1 2 3 4 4 5 5 5 V V D1- D9 0 2 5 V V D1- D9 0 0 1 2 2 3 4 4 5 5 V V 0 1 0 1 2 6 7 7 1 2 6 7 7 1 0 1 1 2 6 7 7 1 2 6 7 7 1 2 6 7 7 1 2 6 7 7 1 2 6 7 7 1 2 6 7 7 1 2 6 7 7 1 2 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PV (hose conn. PV (hose conn. (Flange con (Flange	Hygenic Conn - DIN 11851 on requ. Gin (G and NPT ; () stilabertihrt)	Hose Conn. Glue Conn. Glue Conn. 4220 4220 Mounting Len ion Material (M Ranges	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ. 33677 on requ. 4 5 5 5 5 5 7 7 9 0 1 0 9 0 1 0 9 0 1 0 9 0 9 0 1 0 9 0 9	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. hose conn. PVM (hase conr (Flange conr)) (Flange conr) (Flange conr) (Hygenic Conn - DIN 11851 on requ. Gin (G and NPT ; () stilabertihrt)	Hose Conn. Glue Conn. Glue Conn. 4220 4220 Mounting Len ion Material (M Ranges	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
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TRI- Clamp DIN 32677 on requ. 1 2 3 3 4 5 5 5 6 7 7 7 9 0 1 0 1 0 2 0 2 0 1 0 1 0 1 0 1 0 1 1 2 7 7 7 1 1 2 7 7 7 1 1 1 2 7 7 7 1 1 1 1	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. (hose conn. PVD (flange conr (Flange conr)) (Flange conr (Flange conr)) (Flange conr) (Flange	Hygenic Conn - DIN 11851 on requ. Gin (G and NPT ; () stilabertihrt)	Hose Conn. Glue Conn. 4220 4220 Mounting Len Mounting Len Ranges Float	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 0 or requ. 0 1 2 3 4 4 5 5 7 7 7 9 9 0 1 0 7 9 9 10 0 9 9 9	TRI- Clamp DIN 32676 on requ. on requ.) 400 mm) 400 mm) 402 mm) 500 mm) 500 mm) 500 mm) 500 mm) 500 mm) 500 mm) 450 mm) 450 mm) 450 mm) 450 mm) 450 mm) 500 mm	TRI- Clamp ISO 2852 on requ. (hose conn. PVD (flange conr (Flange conr)) (Flange conr (Flange conr)) (Flange conr) (Flange	Hygenic Conn - DIN 11851 on requ. Gin (G and NPT ; () stilabertihrt)	Hose Conn. Glue Conn. Glue Conn. 4220 4220 Mounting Len ion Material (M Ranges	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ. 1 2 3 4 5 5 7 8 9 9 0 1 1 0 0 5 9 9 9 9 9 9	TRI- Clamp DIN 32676 on requ.	TRI- Clamp ISO 2852 on requ. (hose conn. PVD (flange conr (Flange conr)) (Flange conr (Flange conr)) (Flange conr) (Flange	Hygenic Conn - DIN 11851 on requ. Gin (G and NPT ; () stilabertihrt)	Hose Conn. Glue Conn. 4220 4220 Mounting Len Mounting Len Ranges Float	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32
TRI- Clamp DIN 32677 on requ. 1 2 3 4 5 5 7 8 9 9 0 1 1 0 0 5 9 9 9 9 9 9	TRI- Clamp DIN 32676 on requ. on requ.) 400 mm) 400 mm) 402 mm) 500 mm) 500 mm) 500 mm) 500 mm) 500 mm) 500 mm) 450 mm) 450 mm) 450 mm) 450 mm) 450 mm) 500 mm	TRI- Clamp ISO 2852 on requ. (hose conn. PVD (flange conr (Flange conr)) (Flange conr (Flange conr)) (Flange conr) (Flange	Hygenic Conn - DIN 11851 on requ. Gin (G and NPT ; () stilabertihrt)	Hose Conn. Glue Conn. 4220 4220 Mounting Len Mounting Len Ranges Float	Flange 203R 205R 309B 317B	6040 6050	4030 4040	3/4" 1" 1 1/4" 1 1/2" DN25 DN32

Basic Code S04/S05 / V31-



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 responsibillity, 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 atmosheres 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

 EN61326-1:2006
 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

Köln, den 31.03.2016

Frank Schramm

Un

(Geschäftsführung / General Management)

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



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 *:



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:

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