

Variable Area Flowmeter V30

Installation and operating manual



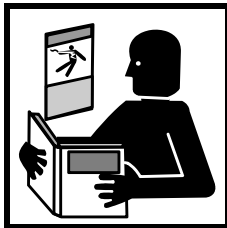
Read these Operation Instructions thoroughly and keep them available for reference!

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I. Steps prior to operation



It is essential that you read these operating instructions before installing and operating the device.

The device is to be installed and serviced by a qualified technician only.

The flowmeter V30 is to be used exclusively to measure volume flow, as well as liquid or gas, in conjunction with technical specification by Heinrichs Messtechnik.

This installation and operating manual explains how to operate, install and perform maintenance on the variable area flow meter.

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 or the local sales office responsible for your area. Please describe the problem and indicate type and serial number of the device. Heinrichs Messtechnik extends 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 web site www.heinrichs-mt.com and printing out this document is allowed only for purposes of using our V30 flowmeter. 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.

Although the materials in the present document were prepared with extreme care, errors cannot be ruled out. Hence, neither the company, the programmer nor the author can be held legally or otherwise responsible for any erroneous information and/or any loss or damage arising from the use of the information herein.

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 and in so doing 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: V30

Robert-Perthel-Straße 9
D-50739 Köln

or:

via fax: +49 221 49708-266

via E-mail: <mailto:info@heinrichs-mt.com>



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-mt.com, where you will also find contact information for the Heinrichs Messtechnik distributor nearest you. For information regarding our own sales operations, contact us at info@heinrichs-mt.com.

1.1 Safety first !

The device described herein is to be installed and serviced only by a qualified specialist such as a qualified Heinrichs Messtechnik mechanic or service technician.



Warning

Before servicing the device, it must be completely empty, and disconnected from all peripheral devices. Only original replacement parts are to be used.

Heinrichs Messtechnik GmbH accepts no liability for any loss or damage of any kind arising from improper operation of any product, improper handling or use of any replacement part, or from external electrical or mechanical effects, overvoltage or lightning. Any such improper operation, use or handling shall automatically invalidate the warranty for the product concerned.

In the event a problem arises with your device, please contact us at one of the following numbers to arrange to have your device repaired:

Phone: +49 221 49708-0

Fax: +49 221 49708-178

Contact our customer service department if your device needs repair or if you need assistance in diagnosing a problem with your device

1.2 Safety advisory for the user

The present document contains the information that you need in order to operate the product described herein properly. The document is intended for use by qualified personnel. This means personnel who are qualified to operate the device described herein safely,

- mechanic engineers,
- service technicians

who are conversant with the safety regulations pertaining to the use of Measuring and control engineering devices and with the applicable laws and regulations in their own country.

Such personnel must be authorized by the facility operator to install, commission and service the product described herein, and are to read and understand the contents of the present operating instructions before working with the device.

1.3 Hazard warnings

The purpose of the hazard warnings listed below is to ensure that device operators and maintenance personnel are not injured and that the flowmeter and any devices connected to it are not damaged.

The safety advisories and hazard warnings in the present document that aim to avoid placing operators and maintenance personnel at risk and to avoid material damage are prioritized using the terms listed below, which are defined as follows in regard to the instructions herein and the advisories pertaining to the device itself.

1.3.1 Danger

means that failure to take the prescribed precautions **will result** in death, severe bodily injury, or substantial material damage.

1.3.2 Warning

means that failure to take the prescribed precautions **could result** in death, severe bodily injury, or substantial material damage.

1.3.3 Caution

means that the accompanying text contains important information about the product, handling the product or about a section of the documentation that is of particular importance.

1.3.4 Note

means that the accompanying text contains important information about the product, handling the product or about a section of the documentation that is of particular importance.

1.4 Proper use of the device



Warning

The operator is responsible for ensuring that the material used in the sensor and housing is suitable and that such material meets the requirements for the fluid being used and the ambient site conditions. The manufacturer accepts no responsibility in regard to such material and housing.



Warning

In order for the device to perform correctly and safely, it must be shipped, stored, set up, mounted operated and maintained properly.

1.5 Returning your flowmeter for servicing or calibration

Before sending your flowmeter back to us for servicing or calibration, make sure it is completely clean. Any residues of substances that could be hazardous to the environment or human health are to be removed from all crevices, recesses, gaskets, and cavities of the housing before the device is shipped.



Warning

The operator is liable for any loss or damage of any kind, including personal injury, decontamination measures, removal operations and the like that are attributable to inadequate cleaning of the device.

Any device sent in for servicing is to be accompanied by a certificate as specified in [Decontamination certificate for device cleaning](#).

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.

2. Definition of the device

2.1 Vendor / Manufactor

Heinrichs Messtechnik GmbH
Robert-Perthel-Str. 9 · D-50739 Köln
Phone +49 (221) 49708 - 0
Fax +49 (221) 49708 - 178
Internet: <http://www.heinrichs-mt.com/>
E-Mail: <mailto:info@heinrichs-mt.com>

2.2 Product type and designation

Variable area flow meter with glass cone. V30

2.3 Manual issue date

16.05.2006

2.4 Version No.

3.4

file: V30_BA_03_eng_rev 4

3. Applications

The V30 metering device is used for flow metering, dosing, monitoring, and control of liquid and gas media in pipes. The scale on the device shows the flow rate expressed as volume or mass per unit of time.

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

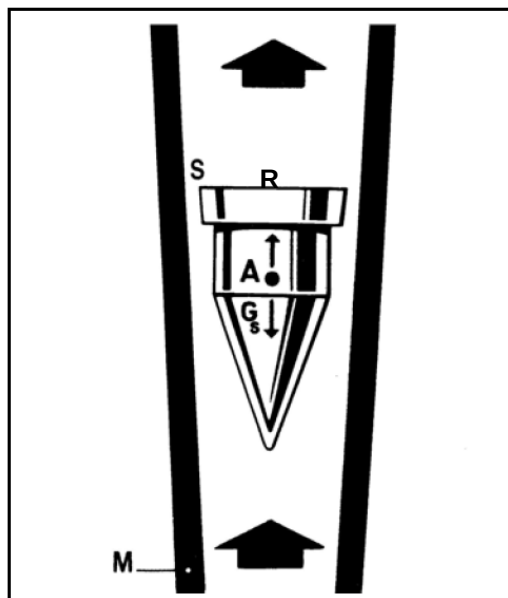
Note: The device is of limited use for the metering of potentially hazardous liquids and gases. It is imperative that the operator takes steps to ensure that in the event the glass tube breaks, no personnel are harmed and no equipment is damaged. The system operator is legally responsible for any effects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

4. 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 ring. The height of the float (R = reading line) in the measuring ring is the measure of the flow. The flow rate is read directly from a scale inscribed on the glass.

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.



5. Technical Data

Measuring range	Measuring span	10-100%
	Smallest measuring range	10 - 100 l/h of water
	Largest measuring range	1000 - 10000 l/h of water
Measuring span		10 : 1
Accuracy class		1,6
Flow direction		from bottom to top
Display		Flow rate units on glass cone
Ambient conditions	Ambient temperature	0 - 60 °C
	Storage temperature	-20 - 60 °C
	Climatic category	Weatherproof and/or unheated operation site, class C pursuant 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.
Fluid conditions	Fluid temperature	0 - 80 °C
	Inlet and outlet sections	No inlet or outlet sections are required for linear flow profiles. In the case of extremely non-linear flow profiles (e.g. caused by shut-off/control valves in front of the device), we recommend that a 250 mm inlet section be installed (see VDI/VDE 3513 guidelines).
	Physical state	Liquid or gas
	Density	Liquids: up to a maximum of 2.0 kg/l Gases: no restrictions
	Viscosity	The viscosity of the medium determines measuring results.
	Gas measuring pressure	The results apply solely to the calibrated measuring data shown on the scale. Any changes or deviations from this will yield false readings.
	Fluid pressure	See Section 6
	Pressure loss	See Section 6
	Limit switches	Limit switch KER 1 or KER 2: Reed switch (make contact)
	The device can be outfitted with up to two limit switches..	ASA - Schalttechnik Model: MA 28 SO 80, 48VAC, 1,5 A, 80 VA IP 67
Options	The switching point can range from 10 to 90 percent of throughput.	
	Chip guard	
	V30-4020	Threaded connection
	V30-104C or V30-201R	Flange connection
	V30-6210	Hose clip
Connection *	V30-4200	Bonded connection

* Example

6. Measuring ranges

V 30	Model	Stainless steel float (7,95)		Aluminium float (2,85)		PTFE float		PVDF float (6,5)	
		Water [l/h] at 20°C	Air* [Nm ³ /h]	Water [l/h] at 20°C	Air* [Nm ³ /h]	Water [l/h] at 20°C	Air* [Nm ³ /h]	Water [l/h] at 20°C	Air* [Nm ³ /h]
½"	J	10 - 100	0,3 – 3	5-50	0,17-1,7	5-64		8,8-88	0,25-2,5
	K	16 - 160	0,45 – 4,5	8-80	0,25-2,5	8-104		14-140	0,4-4
	L	25 - 250	0,7 – 7	12,5-125	0,4-4	13-164		22-220	0,65-6,5
¾"	M	40 - 400	1,1 – 11	20-200	0,7-7	15-280		35-350	1-10
	N	60 - 630	1,8 – 18	30-300	1-10	30-440		50-500	1,6-16
	P	100 - 1000	3 – 30	50-500	1,7-17	60-720		88-880	2,5-25
1"	P	100 - 1000	3 – 30	50-500	1,7-17	60-720		88-880	2,5-25
	Q	160 - 1600	4,5 – 45	80-800	2,5-25	120-1230		140-1400	4-40
	R	250 - 2500	7 – 70	125-1250	4-40	190-1900		220-2200	6,5-65
2"	S	400 - 4000	11 – 110	200-2000	7-70	310-3100		350-3500	10-100
	T	630 - 6300	18 – 180	300-3000	10-100	490-4900		550-5500	16-160
	U	1000 - 10000	30 – 300	500-5000	17-170	780-7800		880-8800	25-250

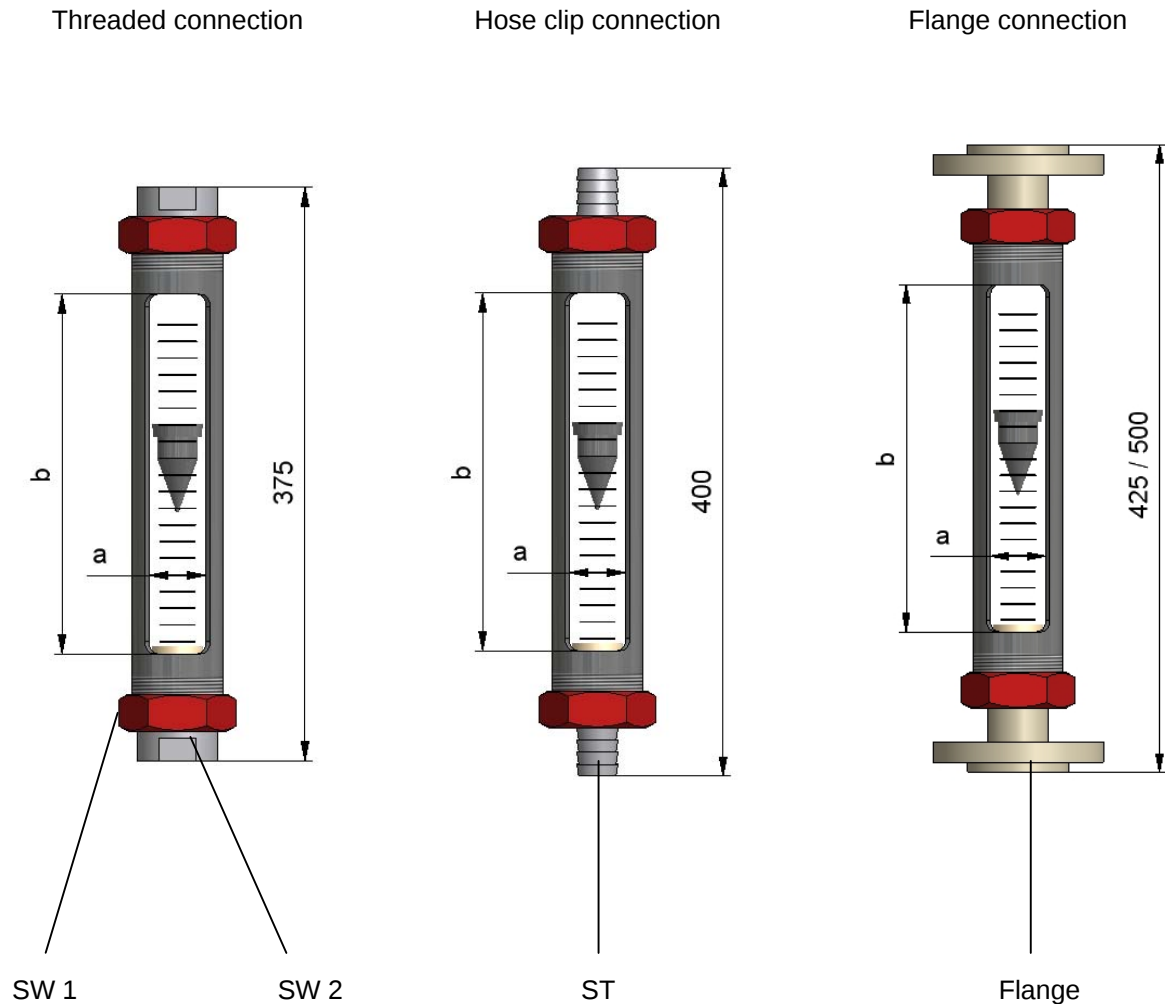
* of standard conditions 1,013 bar abs; 20°C

7. Pressure resistance and pressure loss

Device size	Model	Max. process pressure [bar]	Pressure loss		
			Stainless steel float	Aluminium float	PTFE float
			$\rho\Delta$ [mbar]	$\rho\Delta$ [mbar]	$\rho\Delta$ [mbar]
½"	J	15	9	3,5	
	K				
	L				
¾"	M	15	12,5	5	
	N				
	P				
1"	P	10	17,5	7,5	
	Q				
	R				
2"	S	6	30	12,5	
	T				
	U				

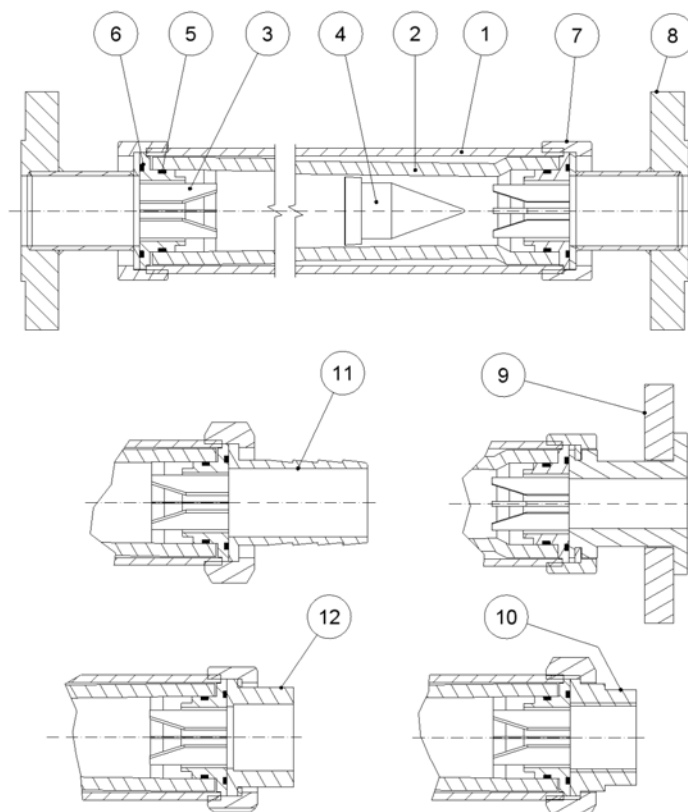
8. Construction details

8.1 Type of construction / Dimension



V 30	a in mm	Threaded connection		Hose clip connection	Flange	
		SW 1	SW 2	ST		
1/2"	19	39	24	1/2"-13Ø	DN 15 PN 16	1/2" 150lbs
3/4"	29	55	36	3/4"-19Ø	DN 25 PN 40	1" 150lbs
1"	37	67	46	1"- 25Ø	DN 25 PN 40	1" 150 lbs
				1/2"- 38Ø		
2"	58	95	65	/	DN 50 PN 40	2" 150 lbs
b = 235mm						

8.2 Materials



Item	pieces	Name	V 30-V PVC	V 30-F PVDF	V 30-K PP	V 30-S stainless steel
1	1	Device/housing	1.4301			
2	1	Glass tube	Borosilicate glass			
3	2	Float stop	PP / PVDF			
4	1	Float	1.4404, AL, PVDF, PTFE			
5	2	Sealing – Ring	Perbunan, Viton, FEP/FFKM, PFA			
6	2	Sealing - Ring	Perbunan, Viton, FEP/FFKM, PFA			
7	2	Sleeve nut	Steel			
8	2	Flange				X
9	2	Flange		X	X	
10	2	Threaded connection	X	X		X
11	2	Hose clip connection		X		X
12	2	Bonded connection	X			

9. Weight

Weight in kg			
V30	Threaded connection	Hose clip connection	Flange
1/2"	1		
3/4"	1,8		
1"	3	2,6	4,8
2"	5,3	/	

10. Limit switches

The variable area flow meter can be outfitted with limit switches that indicate specific flow values. Only with PVDF float available.

10.1 Model KER limit switch

The limit switch is a bistable reed switch. In this configuration, the float contains a magnet whose South Pole points toward the flow direction. When the float moves upward and pass the limit switch, the switch closes and remains in this position until the float moves back pass the switch in a downward direction.

Technical data:

Switching voltage	48 V AC
Switching current	1A
Switching capacity	80 VA
Switching function	Make contact
Ambient temperature range	-20 bis 60 °C
Degree of protection	IP 67

10.1.1 Mounting limit switches on model KER



10.1.2 Resetting the limit switches

The contacts are set at the factory in accordance with the parameters stipulated in the order, but they can be reset by the user. To do this, slightly loosen the mounting bolts that hold the limit switch on the guide rails. Slide the switch to the desired new position and then tighten down the bolts.

10.2 Operating conditions

The device should be operated pursuant to the stipulations of VDE/VDI 3513 page 3:

Measuring fluids:

- 1) Metering of liquids that exhibit sufficient flow ability, are devoid of solids, do not bond and do not tend to settle.
- 2) Gases that flow linearly (linear flow behavior) and exhibit sufficient pre-pressure.

10.3 Installation

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

Inlet and outlet sections in front of and behind the device are generally unnecessary for linear 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. For further information in this regard, see the installation recommendations in Directive VDE/VDI 3513 page 3.

10.3.1 Transport locks

Plastic tubes are fitted as transport locks to protect the float during transportation. These need to be removed before installation of the device in the process line.

To remove the inserts, take the upper yellow cap off the device.

10.3.2 Startup

Any particulate 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).



Devices 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!

10.3.2.1 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 up against the side of the tube, as this could result in damage to the measuring element.

11. CE marking

The limit switches in the metering system comply with the Electromagnetic Compatibility Directive 89/336/EEC.

In as much as the devices are classified under Article 3 par. 3 of Pressure Equipment Directive 97/23/EEC, they do not bear the CE mark for this guideline.

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

11.1 Type designation

 50739 Köln, Germany CE 0036	TYP V30	MODEL CODE	: XX-XX-XX-XX
	SER. No.		: 123456789
	MAX. OPERATING PRESSURE		: 10 bar
	TEMP. RANGE		: -10°C to 80°C
	MANUFACTURING DATE		: 1.9.2005
	PED -SEP		

12. Order information

All orders should contain the following product information:

Specific weight, nom density (only air), temperature, pressure, viscosity, material used, connection sizes, flow rate range, accessories desired.

12.1 Accessories

- 1 or 2 limit switches
- chip guard, acryl glass

13. Standards, directives, certification and authorization

The manufacturing facility has certified that the device complies with the following:

- DIN-EN 9001:2000
- Pressure Equipment Directive RL 97/23/EG

Reading scale length and conversion calculations for third party products pursuant to VDE/VDI 3513 guidelines.

The following EU directives apply to operation with the limit switch or switches:

Directive 89/336/EEC (EMC Directive)

EN 61000-6-2:1999 (immunity for industrial environments)

EN 50 081-1 (emitted interference)

EN 55011:1998+A1:1999 (group 1, class B)

EN 60529 (ingress protection class)

EN 61010 (safety requirements for electrical metering, control and laboratory devices)

EN 60947-5-6:2000 (low voltage switchgear and control gear)

14. Safety advisories

14.1 Intended purpose

The device is to be used solely for metering the flows of gas and liquid media. The manufacturer accepts no responsibility for any damage or loss resulting from any other use or from improper use. The durability of the material in all wetted parts should be tested prior to the use of any aggressive media.

Sole responsibility for ensuring that the device is used in accordance with the manufacturer's recommendations rests with the system operator.

14.2 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.

15. Maintenance

The device requires no servicing insofar as it is operated in accordance with the manufacturer's recommendations. If, however, the measuring ring 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 devices containing foreign matter should be cleaned carefully with a brush and a suitable cleaning agent. Any deposits should be carefully removed.

16. Packaging, storage, 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.

17. Returning the device for servicing

Note: According to German waste disposal legislation, it 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. 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.

18. Sales offices

See Homepage: <http://www.heinrichs-mt.com/>

[illegible]

20. Decontamination certificate for device cleaning

Company name:..... Address:.....
Departement:..... Name of contact person:.....
Phone:

Information pertaining to the enclosed V30

Model V30.....

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:

Stamp

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Subject to modifications of the dimensions,
weight, and other technical data.
Printed in the Federal Republic of Germany

file:
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