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## Variable-Area Flowmeter

**K17**

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### Operating Instructions



**Betriebsanleitung bitte durchlesen und an einem sicheren Ort aufbewahren!**

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## 1 Identification

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Internet: [www.heinrichs.eu](http://www.heinrichs.eu)  
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Product type: Miniature flow meter based on the variable area flow meter principle.

Product name: K17  
Mounting length 175 mm

File name: K17\_BA\_20.01\_EN.DOC

Version No. / 21.01  
Issue date: 18. Januar 2021

## 2 Applications

### 2.1 K17

The flow meter is suitable for the measurement of the flow of liquid and gaseous products in pipes. It displays the current flow in volume or mass per unit time.

**Applications:**

Measuring the flow of liquid and gaseous products in pipes as well as dosing, superimposing, monitoring, regulating and the controlling of them.

### 2.2 K17-.V / N differential pressure regulator

The flow meter can be used for stabilizing a constant flow of liquid and gaseous products in pipes. The flow is kept constant regardless of pressure changes during product inflow for type K17-.N or of a pressure change during product outflow for type K17-.V.

**Applications:** Constant dosing, level measurement in open and closed vessels, N<sub>2</sub> superposition of combustible media

**Caution:** The devices should be used with the greatest possible caution when measuring potentially hazardous liquids and (especially) gases. Precautionary measures must be taken to protect personnel and equipment from any potential danger or damage resulting from glass-tube breakage. The plant operator carries full responsibility for the use of the devices.

Where possible, we recommend the use of full metal devices such as type KDS.

### 3 Operational mode and system design K17

#### Float principle:

The product flows vertically through the meter from the bottom to the top. The height of the float in the measuring tube is a measure of the flow quantity.

The float is in equilibrium between the buoyant force of the flowing medium and the counteracting force of gravity on the float.

The measured value is indicated on the measuring-tube scale with the upper edge or the indicator edge of the float (ball).

#### 3.1 K17 system design

The meter consists of a conical measuring tube made of glass containing a vertically free-moving float. The height of the float in the measuring tube reproduces the calibrated flow quantities on the measuring tube.

#### 3.2 Measuring principle for K17-.V / N

##### Differential pressure regulator:

The diaphragm of the controller is in a state of equilibrium when the pressure conditions are the same on both sides. The pressure on the inlet side is determined by the pressure of the product; the pressure on the outlet side is determined by the pressure drop of the setting valve of the flow meter.

If either the inlet or outlet pressure changes, the change in pressure is compensated by the built-in diaphragm valve - thus maintaining a constant set flow rate.

**Important:** The regulator can only regulate inlet or outlet pressure fluctuations. Steady pressure conditions must prevail on each side of the regulator.

#### 3.3 K17-.V / N system design

The unit consists of a K17 variable-area flow meter, equipped with a diaphragm differential pressure flow controller. The variable-area flow meter consists of a device fitting with an integrated measuring tube made of glass that contains a vertically movable float and the valve for setting the flow rate.

The differential pressure flow controller is made of stainless steel and consists of a diaphragm made of Viton or PTFE and a compensating valve made of stainless steel.

For gaseous products, two versions are available:

- **K17-...V** for a constant inlet pressure and a variable outlet pressure
- **K17-...N** for a constant outlet pressure and a variable inlet pressure

For liquids, both versions can be used; however, the **K17-...V** version should be favoured.

## 4 Input

### 4.1 Measured variable:

Volume flow

### 4.2 Measuring range:

(lower-range and upper-range values)

#### Measuring span water 20 °C:

Smallest measuring range: 0.02-0.25 l/h water

Largest measuring range: 10-100 l/h water

#### Measuring span air 20 °C, 1,013 bar abs.

Smallest measuring range: 2-20 NI/h air

Largest measuring range: 300-3000 NI/h air

#### Measuring /regulating range for K17-..V / N

Span: 10-100 %

#### Smallest measuring/regulating range

0.02-0.25 l/h water

2-20 NI/h air

#### Largest measuring/ regulating range

10-100 l/h water

300-3000 NI/h air

### Measuring range table

All measurement range values with fully open valve

Measuring ranges water 20 °C					Measuring ranges air 1.013 bar abs. 20 °C				
Float SS 1.4401 (316L) / glass					Float SS 1.4401 (316L) / glass				
Range N°	Water l/h	Float material	Valve seat ø (mm)	Press. loss (mbar)	Range N°	air l/h	Float material	Valve seat ø (mm)	Press. loss (mbar)
A1**	0.02-0.25	glass	2.8	2	C1**	2-20	glass	2.8	1
A2**	0.08-0.7	glass	2.8	3	C2**	4-40	glass	2.8	2
B1	0.1-1	1.4401	2.8	2	D1	5-50	1.4401	2.8	1
B2	0.25-2.5	1.4401	2.8	3	D2	10-100	1.4401	2.8	2
B3	1.0-10	1.4401	2.8	3	C3**	12-120	glass	2.8	2
B4	1.5-16	1.4401	2.8	5	D3	25-250	1.4401	2.8	2
B5	2.5-25	1.4401	2.8	5	D4	30-350	1.4401	2.8	2
B6	4-40	1.4401	2.8	5	D5	50-450	1.4401	2.8	3
B7	5-65	1.4401	2.8	5	D6	60-800	1.4401	2.8	3
B8*	6-63	1.4401	2.8	6	D7	120-1200	1.4401	2.8	3
B9**	10-100	1.4401	2.8	6	D8*	200-2000	1.4401	2.8	3
					D9**	300-3000	1.4401	2.8	3

\* Limited adjustment range of the contact / contact can only be adjusted as min. contact

\*\* Not possible with contact

## 5 Electrical output (option)

1 or 2 inductive limit switches,  
mono- or bistable

### 5.1 Add-on limit switches Type RC 10/15-14-XX, Manufacturer Pepperl & Fuchs

Monostable                    Type    RC 10/15-14-N0  
Bistable                        Type    RC 10/15-14-N3

Ex-Marking                    PTB 99 ATEX 2128 X,  
II 2G Ex ia IIC T5...T6 Gb

### 5.2 Add-on limit switches Type N7R\*\*A, Manufacturer ifm electronic

Monostable                    Type    N7R28A (I7R2010-N - Inside diameter 10mm)  
    Type    N7R30A (I7R2015-N - Inside diameter 15mm)

Bistable                        Type    N7R29A (I7R2010-NL - Inside diameter 10mm)  
    Type    N7R31A (I7R2015-NL - Inside diameter 15mm)

Ex-Marking                    BVS 08 ATEX E026 / IECEx BVS 09.0016  
    II 1G Ex ia IIC T5...T6 Ga  
    II 1D Ex ia IIIC T85°C/T100°C Da

**When installing electrical equipment in hazardous areas please pay special attention to the conditions specified in the applicable approval certificate.**

## 6 Measuring accuracy

### 6.1 Reference conditions

Water 20 °C (air 20 °C ; 1.013 bar abs.)

### 6.2 Measured error (Liquid/Gas)

(Liquid/Gas):  $\pm 2\%$   $q_G=50\%$  acc.. VDE/VDI 3513 page 2

V / N (option differential pressure regulator):

Measurement error / regulator deviation:  $\pm 2.5\%$  /  $\pm 5\%$  of full-scale within 10-100% of range

### 6.3 Repeatability

(Liquid/Gas)  $\pm 1.0\%$  FS,

V / N (option differential pressure regulator):

Measurement error / regulator deviation:  $\pm 1.5\%$  /  $\pm 2.5\%$  of full-scale within 10-100% of range

### 6.4 Influence of ambient temperature

none

### 6.5 Influence of fluid temperature

Deviations in fluid temperature from that of the temperature observed during calibration can result in a proportional display fault because of the corresponding change in density.

Temperature-related changes in viscosity will cause a non-linear display fault.

## 7 Conditions of use

The VDI/VDE guidelines must be observed.

The devices can be used for:

- liquid products that are sufficiently free-flowing, are free of solids, do not bond or do not tend to settle.
- gases with linear flow behaviour and an adequate inlet pressure.

V/N(optional differential pressure regulator)

The minimum differential inlet and outlet pressures must amount to 350 mbar.

**Please refer to the instructions for potentially hazardous products in Section 2.2.**

### 7.1 Safe operation

#### 7.1.1 General conditions for safe operation

- a) If the conditions described in this document are not adhered to, or if there is any inappropriate interference with the equipment, all the manufactures warranties shall be considered void.
- b) Conditions described in this manual, as well as the permitted operating conditions which have been defined for the sensor and which are stated on the rating plates must be adhered to.
- c) Appropriate measures shall be met to prevent any unintentional or inadmissible damage to the device.
- d) The operator shall ensure that the equipment is only installed in areas which comply with the approved types of protection and environments.
- e) All connected electrical equipment must be suitable for its intended use.
- f) The operator shall ensure protection against lightning according to local regulations.
- g) The flowmeter is maintenance-free.

#### 7.1.2 Requirements for installation in all environments

- a) The installation of the intrinsically safe circuits requires a control drawing (system description), to be issued by the operator/erector.
- b) The equipment is only to be installed and connected in a de-energized state.
- c) It is to be insured that intrinsically safe circuits are not laid together with non-intrinsically safe circuits.
- d) Seized screws or adhering joints (e.g. by frost or corrosion) are not to be opened with force in the presence of a potentially explosive atmosphere.
- e) Where substances of explosion group "IIC" or "A" are present and the presence of an Ex-atmosphere is considered possible, only non-sparking tools shall be used.

#### 7.1.3 Requirements for installation dust environments

- a) In certain circumstances, the non-metallic parts of the sensor may generate an ignition-capable level of electrostatic charge. Therefore, the user/installer shall implement precautions to prevent the build-up of electrostatic charge, e.g. locate the equipment where a charge-generating mechanism (such as wind-blown dust) is unlikely to be present.
- b) Clean the flowmeter regularly with a damp cloth,
- c) Dust deposits with a thickness of more than **5 mm** are to be avoided.
- d) The flowmeter is to be electrostatically earthed. Electrostatic charging must be avoided.

#### 7.1.4 Mounting and commissioning

When installing and commissioning the flowmeter, the following points must be observed:

- a) The variable-area flow meter must be installed perpendicularly (bottom-up direction of flow).
- b) Take special care to install glass-tube devices free from strain.
- c) The size of the product line to be connected must be identical to the size of the device connection.
- d) All instruments are shipped with the valve installed at the inlet. By flipping the glass tube in its fitting and then the instrument, the valve also can be positioned at the outlet.
- e) V / N: for the measurement of gas, the "valve at the top" version for a constant inlet pressure should be used and the "valve at the bottom" version for a constant counter pressure. For liquids, the position of the valve has no impact on the function of the meter.
- f) Open the upstream and downstream shut-off valves of the flowmeter slowly.
- g) When measuring liquids, vent the pipes carefully.
- h) When measuring gases, increase pressure slowly.
- i) Avoid float impact (e.g. caused by solenoid valves), impacts may damage the measuring section or/and float.

## 7.2 Ambient conditions

### 7.2.1 Ambient temperature ranges

without limit switch      -20 °C to +100 °C

with limit switch          -20 °C to +70 °C

#### Risk of breakage due to frost

### 7.2.2 Storage temperature

-20 °C to +100 °C

### 7.2.3 Climatic category

Weather-protected and/or unheated locations,

- Class C according to IEC 654 Part 1

### 7.2.4 Degree of protection

IP65 (EN60529)

### 7.2.5 Shock resistance/vibration resistance

The meter should be protected against shocks and vibrations, which could cause damage to the glass tube.

### 7.2.6 Electromagnetic compatibility

Built in limit switch:

- acc. NAMUR recommendation NE 21
- Product standard: EN 60947-5-2

## 7.3 Fluid conditions

### 7.3.1 Fluid temperature ranges

without limit switch      -20 °C to + 100 °C

with limit switch         -20 °C to + 70 °C

#### **Risk of breakage due to frost**

### 7.3.2 Fluid pressure limit

16 bar (at 20 °C)

#### **Important:**

All pressure values are for non-hazardous liquids and for devices installed free from strain.

For **V/N**, the maximum unilateral pressure resistance of the diaphragm is **7 bar**.

### 7.3.3 Inlet and outlet sections

Inlet and outlet sections are not required for a linear flow profile of the fluid.

### 7.3.4 Physical state:

Liquid or gaseous

### 7.3.5 Pressure for gas measurement

The measured values only apply to the calibrated fluid data stated on the scale. Any change or deviation in pressure will cause a display fault.

### 7.3.6 Pressure loss

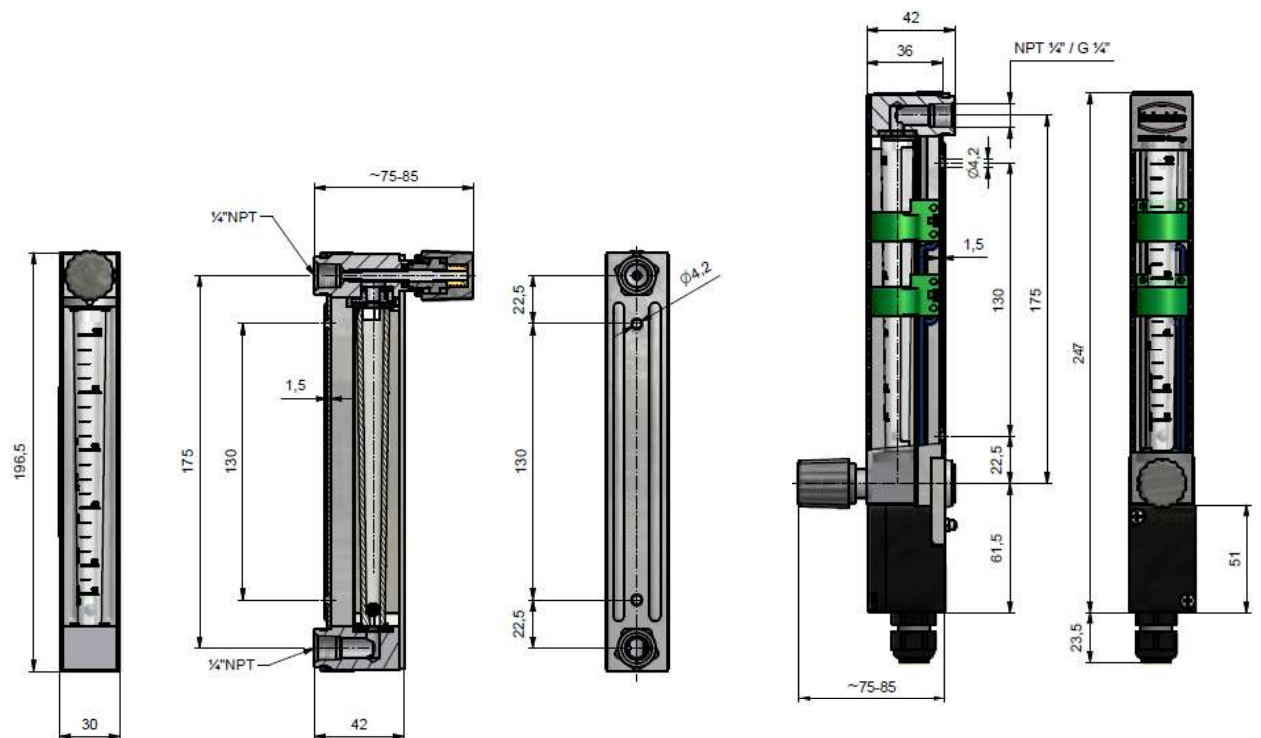
**Depends on the measuring range.** (see measuring range tables in Section 4.2)

## 8 Construction details

### 8.1 Design/dimensions K17

The meter consists of a conical measuring tube made of borosilicate glass with a vertically movable float made of stainless steel or glass. The measuring tube is mounted vertically in the device fitting, which possesses two process connections, arranged perpendicularly to the measuring tube, on its rear. The standard version of the device is equipped with an adjusting valve at the outlet

#### K17 ( dimensions in mm)



*K12 with contact terminal box*

## 8.2 Design / Dimensions / Commissioning V / N (option diff. pressure regulator)

Differential pressure regulators are used to achieve constant flow values at variable inlet and outlet pressures.

**Caution!** Differential pressure regulators are not pressure reduction valves.

The measuring device consists of a variable area flowmeter with control valve and mounted differential pressure regulator.

The flow amount can be adjusted via the integrated adjusting valve.

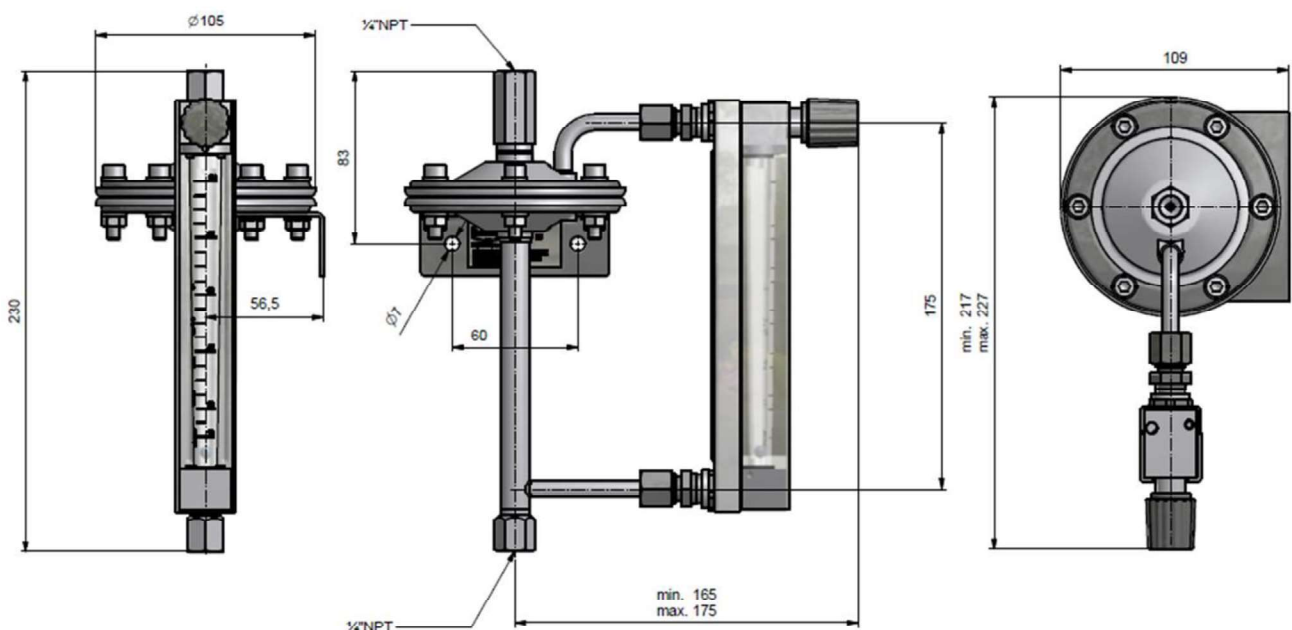
The max.one side pressure resistance of the regulator membrane is 7 bar. If the operating pressure exceeds 7 bar, the control valve must not be fully closed as this leads into overstressing the membrane.

### IMPORTANT OPERATION DETAILS

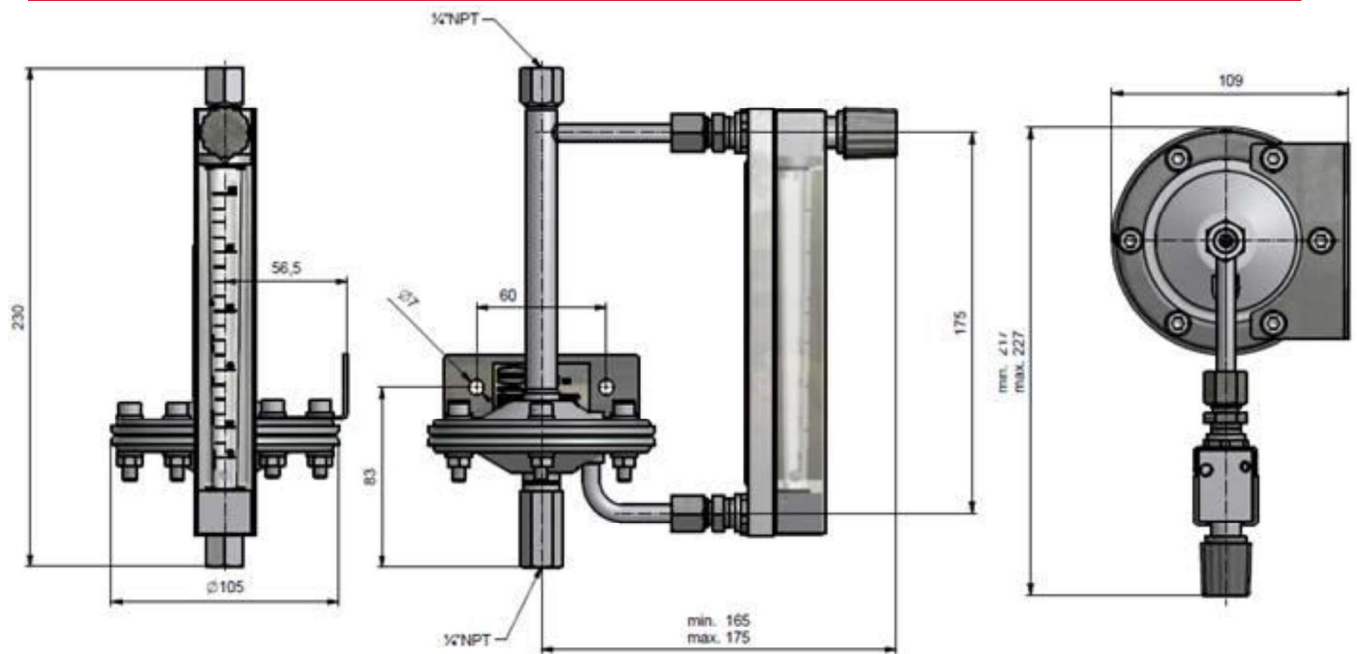
- The installation of a valve before the inlet and outlet of the instrument shall be avoided
- Initial operation / start-up of the process only with opened control valve
- When operating with gas the inlet pressure shall be increased slowly to avoid strong pressure peaks.
- To prevent excessive acceleration of the float, operation of the instrument by means of solenoid valves should be avoided.
- For the operation of the regulator minimum inlet pressures are required.
 

Regulator with constant outlet pressure:	350 mbar
Regulator with constant inlet pressure:	350 mbar

#### 8.2.1 Dimension drawing K17-...N as regulator c/w constant outlet pressure



#### 8.2.2 Dimension drawing K17-...V as regulator c/w constant inlet pressure



### 8.3 Weights:

K17:	0,5 kg,
K17- V/N:	0.9 kg

### 8.4 Materials:

Fitting, connections, setting valve:	1.4404 (SS316L)
Float:	1.4401 (SS304) / glass
Seals	
measuring tube:	viton, FFKM (option)
Valve:	PTFE,
Hose-fittings:	PVC
V/N (option differential pressure regulator)	
Regulator/control pipes:	1.4301(SS304)
Membrane:	Viton or PTFE

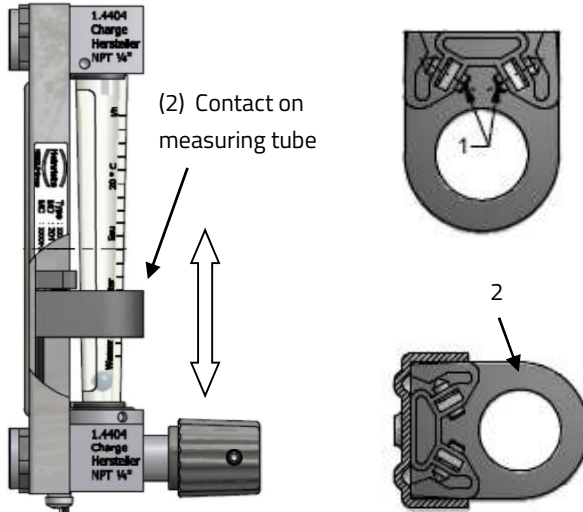
### 8.5 Process connection:

Standard:	NPT $\frac{1}{4}$ " (F)
Special connections:	Ermeto, Swagelok, G $\frac{1}{4}$ ", Hose connector 8 mm

**Note:** Other connections are available as special versions

## 9 Electrical connection for limit switch (option)

with cable end length of 2 m



The limit switch (ring form) can be adjusted alongside of the measuring tube. It is fixed via a screw (1) at the back wall of the instrument.

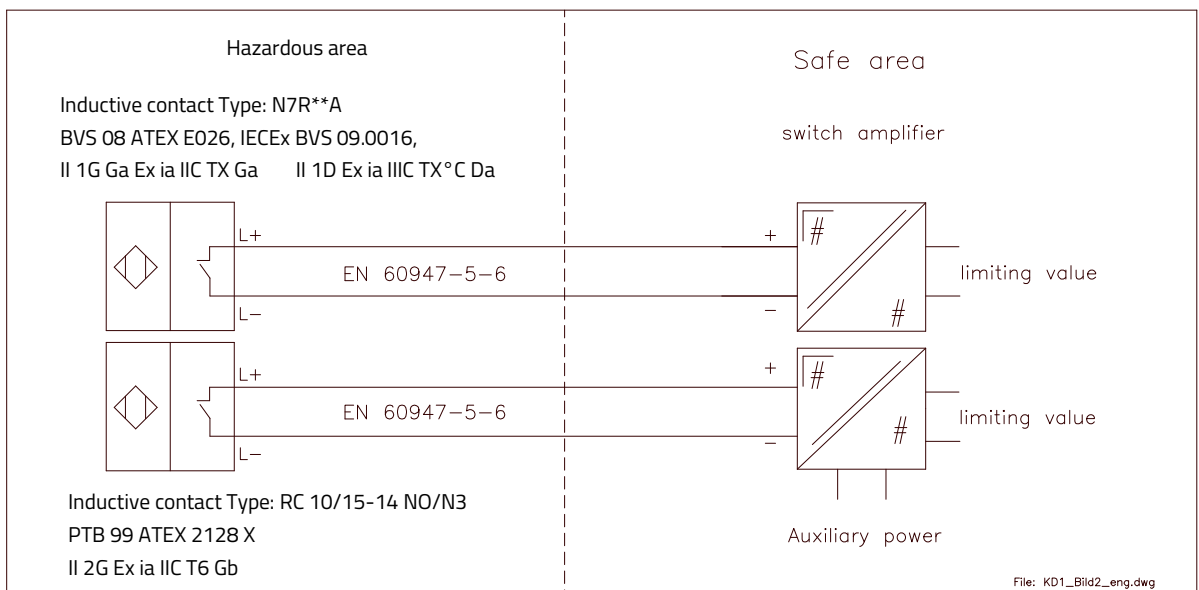
### Adjusting of the contact:

- unlock the fixing screws (1)
- move contact (2) to bottom or top
- lock fixing screws (1)

### ATTENTION: (limited switching range)

Measuring ranges B9, D9 and all ranges with glass float cannot be equipped with contact. For the measuring tubes N° B8 and D8 the contact cannot be moved to the max. flow range.

### Wiring diagram for 2 limit switches



When using two switch contacts the distance between both contacts must be minimum 16 mm.

## 10 Indicator unit

Direct indication via the position of the float in the measuring tube.

## 11 Use in hazardous areas

Only devices with Ex-markings may be operated within areas with potentially explosive atmospheres.



Ambient temp.	Process-Temp.	Marking	Zone	Description
-20 °C ...+70 °C	-25 °C ...+70 °C	II 2G Ex h IIC T6 Gb II 2D Ex h IIIC T85°C Db	1	With built-in switch, observe the type certificate of the contact manufacturer!
-20 °C ...+100 °C	-40 °C ...+100 °C	II 2G Ex h IIC T6...T5 Gb II 2D Ex h IIIC T85°C...T100°C Db	1	As a pure mechanical device

### 11.1 Atmospheric Conditions

According to EN 1127-1, a “potentially explosive atmosphere” is defined as a mixture of air and combustible gases, vapour, mist or dust under atmospheric conditions. These conditions are defined in DIN EN ISO 80079-36, para. 1, with values  $T_{atm} = -20\text{ °C}$  to  $+60\text{ °C}$  and  $P_{atm} = 0.8$  to  $1.1\text{ bar}$ . Outside of this range, safety parameters for most ignition sources are not available.

The operating conditions inside the measuring tubes of variable-area flow meters generally lie outside the atmospheric conditions of 0.8 to 1.1 bar. Therefore, due to the lack of safety parameters, the explosion protection does not apply to the process conditions inside of the measuring tube, irrespective of the zone classification.

Operation with combustible products is therefore only permissible if a potentially explosive air mixture is not formed inside the flow meter. Where this condition is not met, the operator is required to assess the ignition hazard in each individual case giving due consideration to existing parameters (e.g. pressure, temperature, process product, materials)

### 11.2 Electrostatic charge of non-conductive parts



In hazardous areas pay attention to the risk of the electrostatic charge in a danger threatening amount at cleaning works of the synthetic material housing and glasses. Devices where explosive electrostatic charges can be expected to be generated due to cleaning action are marked with an adhesive label:

**Caution!** Danger of electrostatic charge! Do not rub!

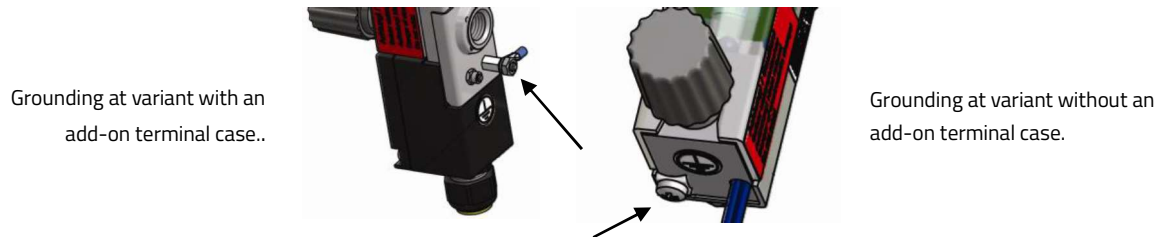
#### 11.2.1 Grounding



In variable-area flow meters, under operating conditions it is possible for charge separation to occur in the measuring tube due to the transport of non-conductive fluids.

For this reason, variable-area flow meters must be permanently grounded by the operator by way of the process connections (flanges) to ensure the discharge of electrostatic build-up. If grounding cannot be guaranteed via the process connections (e.g. plastic process connections), the flow meter

must be connected to the local ground potential via the flanges. This connection only ensures electrostatic grounding of the device and does not meet the requirements for equipotential bonding.



### 11.3 Mechanical strength



The device with its glass measuring tube is to be mounted in such a way that it is protected from mechanical damages.

### 11.4 Without electrical equipment

The basic version of the flow meter is a non-electrical device without its own ignition source and meets DIN EN ISO 80079-36 requirements. It can be used in hazardous areas that require Category 2 equipment.

Markings		II 2G Ex h IIC TX Gb
		II 2D Ex h IIIC TX °C Db
		Reg. No.: BVS 10 ATEX H-B 034
		Tech. File Reg. No. HM-K09-32-ATEX-10-02-X

Since the device does not possess its own power sources that could lead to a temperature increase, the fluid temperature is decisive for the maximum surface temperature.

### 11.5 With limit switch

With the installation of a limit switch, the device becomes an electrical assembly and receives an additional marking in accordance with DIN EN 60079-0.

The electrical and thermal data and the special conditions of the relevant EU Type Examination Certificate must be observed.

#### Marking of the limit transducer:

Manufacturer Pepperl & Fuchs		PTB 99 ATEX 2128 X
Type: RC 10/15-14 NO/N3		II 2G Ex ia IIC T6 Gb
Manufacturer ifm electronic		BVS 08 ATEX E026 / IECEx BVS 09.0016,
Type: N7R**A		II 1G Ex ia IIC T6 Ga II 1D Ex ia IIIC T85 °C Da

**The influence of the fluid temperature on the built-in limit transducer must be observed.**

## 12 CE marking

The measuring system meets the statutory requirements of the following EU directives:

- 2014/34/EU (ATEX) Equipment for Use in Potentially Explosive Atmospheres
- 2014/30/EU (EMC) Electromagnetic Compatibility.

With respect to the Pressure Equipment Directive 2014/68/EU, the devices fall within the scope of application of Article 4, Paragraph 3, and therefore requires no CE marking in accordance with this directive.

By attaching the CE logo, Heinrichs Messtechnik confirms compliance with these directives.

### 13 Available accessories

- 1 inductive limit switch ; mono-stable or bi-stable
- Special connections

### 14 Order information

Please include the following information in your order:

Product data,(specific weight, temperature, pressure, viscosity) material design, connection size, measuring range, desired accessories, required approvals and material certificates.

### 15 Standards and directives

VDE/VDI 3513	Measuring range rated and converted to other products
Directive 2014/34/EU	ATEX: directive
DIN EN ISO 80079-36	Non-electrical equipment for use in potentially Explosive Atmospheres

#### For the electrical sensor

EN 60079-0	Explosion protection; General regulations
EN 60079-11	Explosion protection; intrinsic safety
Directive 2014/30/EU	EMC directive
EN 60529	Degrees of protection through housing (IP code)
EN 61010-1	Safety requirements for electrical measure, control & laboratory devices
NAMUR NE 21	recommendation: EMC for industrial processes and laboratory
EN 60947-5-6:2000	Low voltage switchgear and controlgear (NAMUR)

## **16 Safety instructions**

### **16.1 Intended use**

The K17 variable-area flow meter may be used only for flow measurements of fluid and gaseous media. The manufacturer shall not be liable for damage which results from improper or unintended use. When dealing with an aggressive medium, the material durability of all wetted parts is to be clarified.

### **16.2 Installation, commissioning and operating personnel**

Only trained specialists authorized by the system operator may carry out the montage, electrical installations, commissioning, maintenance and operation. They must have read and understood the operating manual and follow its instructions.

Always adhere to the conditions and provisions applicable in the country of installation.

## **17 Packaging, storage and shipment**

Take care whilst unpacking the device to avoid damaging it. With the help of the delivery note enclosed in the packaging, check whether all technically relevant data coincide with your requirements.

Storage and installation must be performed in a clean and dry room to avoid – especially of the interior of the fitting – contamination.

The boundary values for the ambient temperature are to be adhered to.

When transporting the device to a remote mounting location, we recommend to reuse the factory-issued packaging and the transport protection.

## 18 Maintenance

If you use the meter in the intended manner no special maintenance is required. However, the variable area flow meter should be checked in the context of the routine maintenance of the facility and the pipelines. Special attention should be paid to dirt, corrosion denudation, mechanical wear as well damage to the glass cone. We recommend checking the meter once a year.

In the recurrent pressure test of the system, the maximum allowed pressure test PT (see rating plate) must not be exceeded.

### Attention!

Should it become necessary due to contamination to clean the float or the measuring cone, please observe the following precautions:

- Before removing a device, make sure that the pipe line is empty (no product residues) depressurized and has cooled down.
- For devices that are used to measure corrosive or hazardous media, appropriate security precautions must be taken regarding any remaining liquid in the measuring unit.
- Avoid electrostatic charging of surfaces when cleaning non-conductive surfaces (e.g. protective hood). Use a damp cloth.
- Having dismantled the device, dirt or impurities on the inside of glass measuring cones should be gently cleaned with a brush and appropriate media.
- When assembling and reinstalling the system new gaskets must always be used.

### 18.1 Replacing the measuring cone

Images depicting the disassembly and assembly of the device can be found on page 22 in section 18.1.3

#### 18.1.1 Removal:

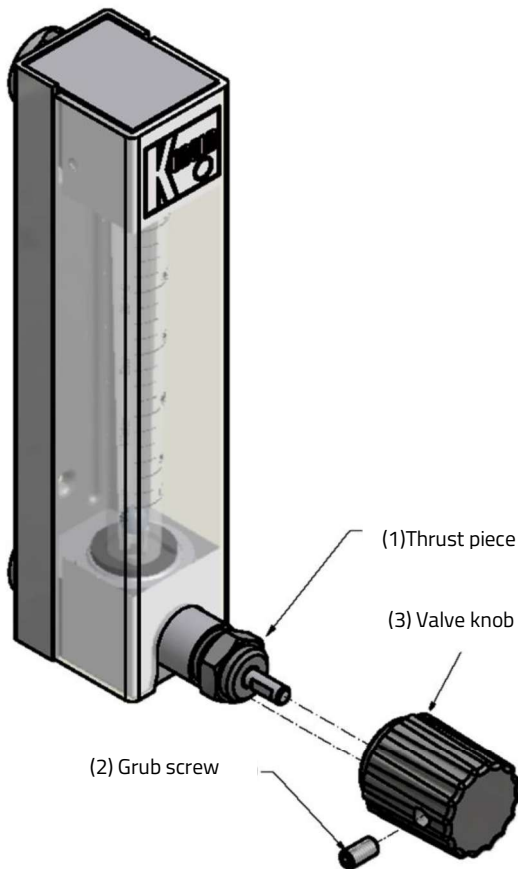
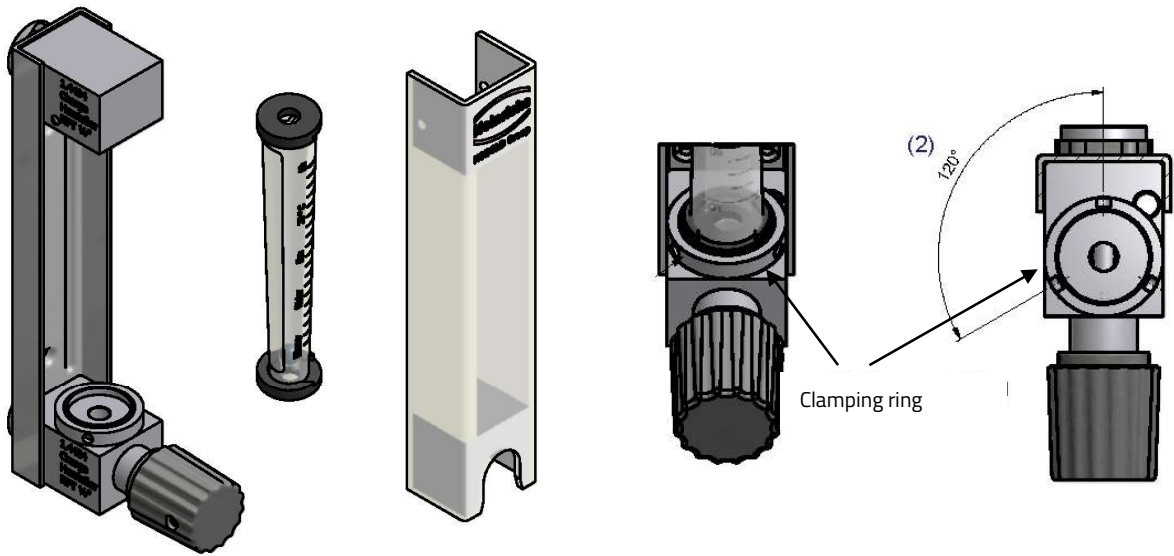
- Close valve in front and behind the unit
- Close needle valve of the device
- Shift protective cover upwards and remove to the front.
- By turning the adjusting ring at the unit base counterclockwise the measuring glass can be loosened and removed.

#### 18.1.2 Installation:

The assembly is performed in the reverse order to the disassembly

- The measuring glass is fixed by clamping the adjusting ring on the unit base hand tightened
- With a 3 mm pin the clamping ring is fixed by **4, max. 5 120° turns** clockwise.
- The torque should be max 2, 8 to 3 Nm.
- Caution! To avoid breaking of the glass flow tube it has to be installed centrally between the seals.
- Before re-commissioning the tightness of the measuring device has to be checked by suitable means.

18.1.3 Abbildungen des Aus- / Einbaus



**Attention**

The shaft packing of the valve must be readjusted during the life cycle. This requires tightening of the thrust piece (1)

Loosen grub screw (2) M4x8 with hexagon 2mm and remove valve knob (3).

Tighten thrust piece (1) SW14 with a torque of 3,8 Nm - 4,0 Nm

**Caution!**

Valves that have not been operated for a long time may require a higher operating torque.



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## 19 Returning devices for repair and service

**Note:**

In accordance with the applicable waste disposal legislation, the owner/client is responsible for the disposal of special waste and hazardous materials. Consequently, all devices sent to Heinrichs Messtechnik for repair must be free of any hazardous materials. This also applies to possible cavities and fissures in the devices.

If repair is necessary, the above-mentioned requirement is to be confirmed in writing. **Please use the form in section 20.**

If hazardous materials remain in or on the device after it has been returned, Heinrichs Messtechnik is authorized to remove them at the client's expense without further inquiry.

## 20 Decontamination certificate for device cleaning

Company name: ..... Address: .....

Department: ..... Contact person: .....

Phone: .....

The enclosed variable-area flowmeter, Model .....

was operated using the following fluid:

.....

In as much as this fluid is water-hazardous / toxic / corrosive / combustible / a health hazard / environmentally hazardous

we have performed the following steps:

- 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 came into contact with the measured medium\*
- Cleaned the housings and all surfaces\*

\*tick 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: .....

Company Stamp

## 21 Model Code

L		Accessories	
K17-	Mounting length 175 mm		<b>Panel Mount (not with terminal conn. Box)</b>
		0	w/o
		S	c/w
	<b>Connection</b>		<b>Contacts</b>
N	Internal thread	0	without
G	Internal thread (not with V / N regulator.)	M	Inductive contact ring type mono-stable
X	Special conn. (on request)	B	Inductive contact ring type bi-stable
	<b>Connection-</b>		<b>N° of contacts</b>
0	without	0	without
1	1/2"-NPT Hose for Ø8mm,angled	1	1x
2	1/2"-NPT hose for Ø8mm,angled	2	2x
	<b>Valve position</b>		<b>Terminal box</b>
0	without	0	without
1	outlet Standard	A	c/w
2	inlet		<b>Flow - differential pressure regulator</b>
	<b>Ranges</b>	0	without
	Air (NI/h) 2-20	VV	inlet pressure constant / outlet pressure variable (HV)
	Air (NI/h) 4-40	NV	Outlet pressure constant / inlet pressure variable (HN)
	Air (NI/h) 5-50	VP	inlet pressure constant / outlet pressure variable (HV)
	Air (NI/h) 10-100	NP	Outlet pressure constant / inlet pressure variable (HN)
	Air (NI/h) 12-120		<b>Approvals</b>
	Air (NI/h) 25-250	0-	without
	Air (NI/h) 30-350	1-	ATEX II2G (Gas Zone 1)
	Air (NI/h) 50-450		
	Air (NI/h) 60-800		
	Air (NI/h) 120-1200		
	Air (NI/h) 200-2000		<b>Labeling</b>
	Air (NI/h) 300-3000	H	Heinrichs
	H <sub>2</sub> O: (l/h) 0.02-0.25	K	Kobold
	H <sub>2</sub> O: (l/h) 0.08-0.7	N	neutral
	H <sub>2</sub> O: (l/h) 0.1-1.0	X	Special
	H <sub>2</sub> O: (l/h) 0.25-2.5		<b>Marking</b>
	H <sub>2</sub> O: (l/h) 0.6-6.3	0	without
	H <sub>2</sub> O: (l/h) 1.0-10	1	st.st. plate 40x20mm
	H <sub>2</sub> O: (l/h) 1.6-16		<b>Certificates</b>
	H <sub>2</sub> O: (l/h) 2.5-25	0	without
	H <sub>2</sub> O: (l/h) 4-40	1	Certificate of compliance acc. EN10204 2.1
	H <sub>2</sub> O: (l/h) 6-63	2	Certificate of compliance acc. EN10204 2.2
	H <sub>2</sub> O: (l/h) 10-100		<b>Pressure and leak testing</b>
XX	Special range On request	0	without
		1	Supplier test report M acc. DIN 55350 incl. pressure test
		2	Supplier test report M acc. DIN 55350 incl. leak test (air)
	<b>Scaling</b>		<b>Calibration report</b>
0	Standard - range	0	without
1	%-scale (H <sub>2</sub> O)		
2	Product scale	1	Confirmation of the accuracy class
3	Product scale %	2	5 point calibration report
X	Special	4	Special acc. request
	<b>Sealing class</b>		<b>Cleaning</b>
V-	Viton standard	0	without
P-	FFKM	1	Cleaning (oxveen service) "oil and grease free"
M-	PTFE	2	Cleaning (oxveen service) incl. Marking "oil and grease free"
X-	Special		