



DK46 - DK800 Handbook

Variable area flowmeter

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1.1 Intended use

The variable area flowmeters manufactured by KROHNE Messtechnik GmbH & Co. KG are suitable for measuring gases, vapors and liquids.

These flowmeters are particularly suitable for measuring:

- Liquids
- Hydrocarbons
- Water
- Chemicals with low corrosiveness
- Industrial gases



DANGER!

In case of instruments which are used in explosive endangered areas please consider the supplementary installation and operating instructions mentioned in the Ex-manual.



WARNING!

The operator shall bear sole responsibility for the use of the flowmeters with regard to suitability, intended use and corrosion resistance of the materials used to the process product. The manufacturer shall not be liable for any damage resulting from improper use or use for other than the intended purpose.

Do not use any abrasive or highly viscous process products.

1.2 Safety instructions for the operator



CAUTION!

Meters from KROHNE Messtechnik GmbH & Co. KG may only be installed, commissioned, operated and maintained by properly trained and authorized personnel.

This document must be read by all users prior to installation, commissioning, operation and maintenance of the flowmeter.

1.3 Certifications



The flowmeter meets the statutory requirements of the following EC directives:

- Pressure Equipment Directive 97/23/EC
- EMC Directive 89/336/EC for instruments with electrical options
- ATEX Directive 94/9/EC for instruments in Ex-areas

KROHNE Messtechnik GmbH & Co. KG certifies successful testing of the product by providing the CE Declaration of Conformity.

1.4 Manufacturer's safety instructions

The measuring device has been built and tested in accordance with the current state of the art, and complies with the relevant safety standards. However, dangers may arise from improper use or use for other than the intended purpose. For this reason, observe all of the safety instructions in this document.

1.4.1 Notes about the documentation

In addition to the safety rules and industrial safety regulations in this documentation, national and regional safety rules and industrial safety regulations must also be observed.

1.4.2 Symbol conventions

For greater clarity, the following symbols are used in this documentation:



DANGER!

These warnings must always be observed. Even partial failure on your part to observe them can lead to serious damage to health, damage to the device, to the user's system components, or to the environment.



DANGER!

This symbol is used to identify dangers when working with electric current.



INFORMATION!

This symbol identifies important notes and information for working with the flowmeter.



LEGAL NOTICE!

This symbol identifies information on statutory directives and standards.



• Action

This symbol identifies all instructions for actions to be carried out by the operator in the specified sequence.

⇒ Consequence

This symbol indicates all important consequences of the previous actions.

2.1 Scope of supply



INFORMATION!

Please check the contents of the consignment for completeness and intactness.

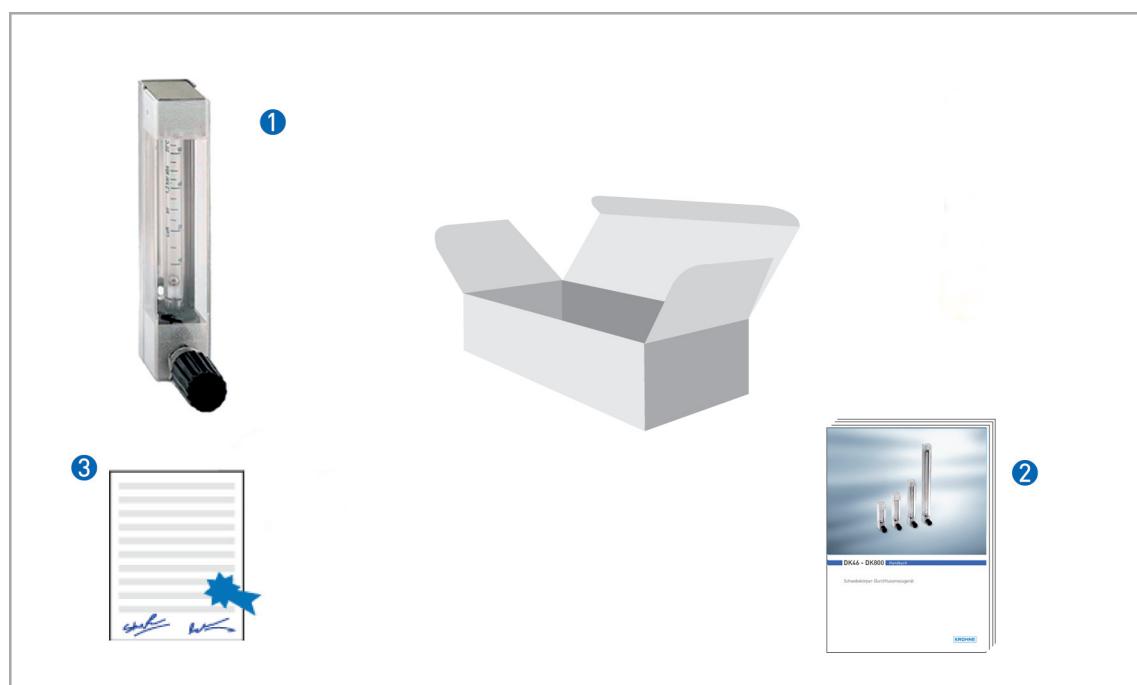


Figure 2-1: Scope of supply

- ① Flowmeter in the version ordered
- ② Manual
- ③ Certificates, calibration certificate (supplied to order only)

2.2 Device versions

- DK46 with valve and an overall length of 111 mm
- DK47 with valve and an overall length of 196 mm
- DK48 with valve and an overall length of 346 mm
- DK800 with valve and an overall length of 146 mm

The following designs are available as options:

- with inlet pressure regulator
- with outlet pressure regulator

2.2.1 Versions



Figure 2-2: Device versions

- ① DK46 with valve and an overall length of 111 mm
- ② DK47 with valve and an overall length of 196 mm
- ③ DK48 with valve and an overall length of 346 mm
- ④ DK800 with valve and an overall length of 146 mm

2.2.2 Versions with regulator



Figure 2-3: DK47 with differential pressure regulators

- ① DK47 with inlet pressure regulator
- ② DK47 with outlet pressure regulator

2.3 Nameplate



INFORMATION!

Before installing the flowmeter, make sure that the information given on the nameplate corresponds to the ordering data.

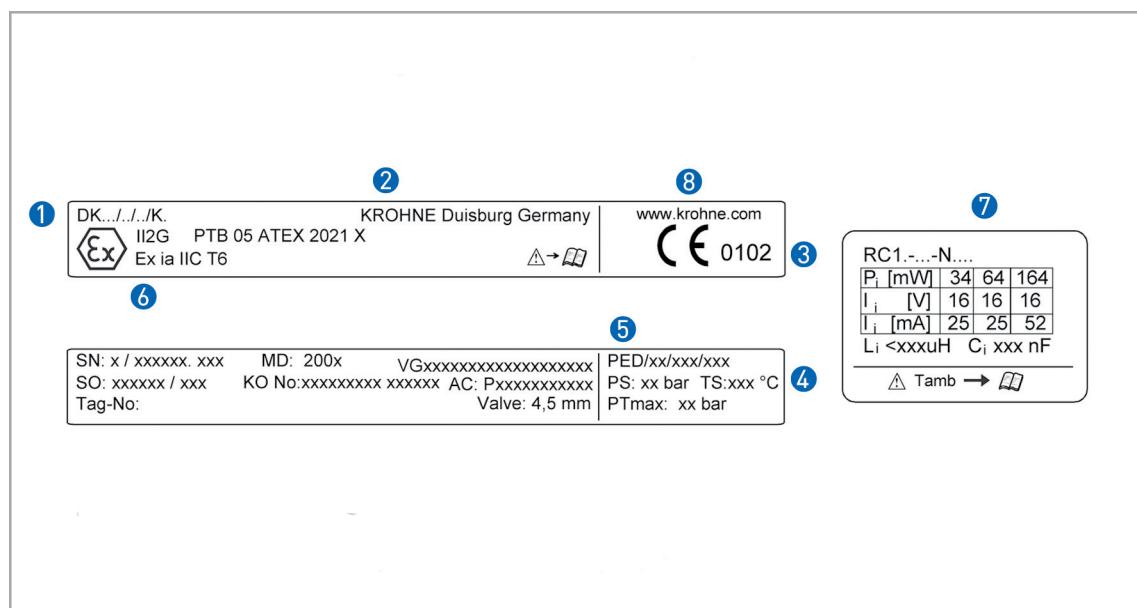


Figure 2-4: Nameplates (Examples)

- 1** Type of meter
- 2** Manufacturer
- 3** Appointed ATEX body
- 4** Design data: temperature & pressure rating
- 5** DGRL data
- 6** Ex data
- 7** Electrical connection data
- 8** KROHNE website

Additional markings on the flowmeter

- SN - serial number
- SO - sales order / item
- Tag-No - measuring point (customer spec.)
- MD - year of manufacture
- KO - KROHNE order
- Vx - product configurator code
- AC - article code

2.4 Description code

The description code consists of the following elements*:



- ① R - With integral inlet pressure regulator (only DKR46)
- ② Instrument type:
 - 46 - Measuring cone overall length 65 mm
 - 47 - Measuring cone overall length 150 mm
 - 48 - Measuring cone overall length 300 mm
 - 800 - Measuring cone overall length 100 mm
- ③ Material for top and bottom fittings:
 - N - Brass
 - R - Stainless steel
 - PV - PVDF
- ④ Differential pressure regulator:
 - RE - Inlet pressure regulator
 - RA - Outlet pressure regulator
- ⑤ K1 - one limit switch
 - K2 - two limit switches
- ⑥ Ex - Explosion-protected equipment
 - refer to Supplementary Installation and Operating Instruction

* positions which are not needed are omitted (no blank positions)

3.1 General installation instructions

**CAUTION!**

Installation, assembly, start-up and maintenance may only be performed by appropriately trained personnel. The regional occupational health and safety directives must always be observed.

**The following procedures have to be carried out before installing the flowmeter!**

- Check the packaging and the flowmeter itself for any damage.
- Check the contents of the consignment for completeness.
- Compare your order specification with the scope of delivery.

**INFORMATION!**

Comply with the application limits of the flowmeter with regard to pressure and temperature. Further information is contained in Section 6 "Technical data".

3.2 Storage

- Store the flowmeter in a dry and dust-free location.
- Avoid lasting direct exposure to the sun.
- Store the flowmeter in its original packaging.
- The permissible storage temperature is from -40 to +80°C for standard meters.

3.3 Functional principle

The flowmeter operates on the float measuring principle.

The measuring section consists of a glass cone in which a float can move freely up and down. The medium flows through the flowmeter from bottom to top.

The float adjusts itself so that the buoyancy force **A** acting on it, the form drag **W** and its weight **G** are in equilibrium.

$$G = A + W$$

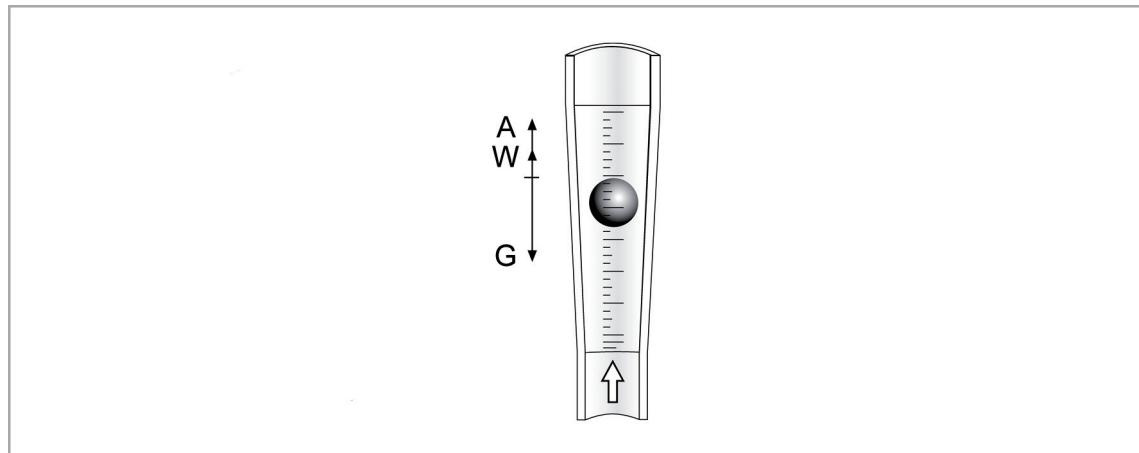


Figure 3-1: Operating principle

The flow-dependent height of the float can take reading on a scale of the measuring glass.

The top edge of the float marks the reading line for flow values.

3.4 Installation requirements

3.4.1 Installing in the pipeline



CAUTION!

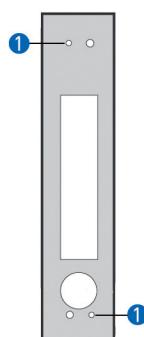
When installing the flowmeter in the pipeline please observe the following points:

- The variable area flowmeter has to be installed vertically (float measuring principle), flow direction from bottom to top.
For installation recommendations please also refer to the Directive VDI/VDE 3513, Sheet 3.
- Before installing the flowmeter, blow or flush out the pipeline leading to the flowmeter.
- Pipelines for gas flow are to be dried before the flowmeter is installed.
- Use connectors appropriate to the flowmeter version for the connection.
- Align the pipes axially with the bolt holes on the flowmeter without incurring stresses.
- If necessary, support the pipeline on both sides of the flowmeter in order to prevent vibration from being transferred to the flowmeter.
- Do not lay signal cables directly next to cables for the power supply.

3.4.2 Panel mounting

Prepare the panel cut-out as shown in the drawing (see Technical data; Dimensions).

To mount in the panel, slacken the two screws ① on the face plate of the flowmeter, insert the device from the front into the panel cut-out, align and fasten with the two screws ①.



3.5 Start-up



CAUTION!

When starting up the flowmeter, the following points must be observed:

- Compare the actual operating pressure and the process temperature of the system with the specifications on the nameplate (PS and TS); these limits must not be exceeded.
- Make sure materials are compatible.
- Close the needle valve at the flowmeters.
- Slowly open the shut-off valve upstream and downstream of the flowmeter.
- When measuring liquids, vent the pipes carefully.
- When measuring gases, increase pressure slowly.
- void float impact (e.g. caused by solenoid valves), as this is likely to damage the measuring section or float.
- Open needle valve at the flowmeters and set the required flow rate.
- The top edge of the float marks the reading line for flow values:

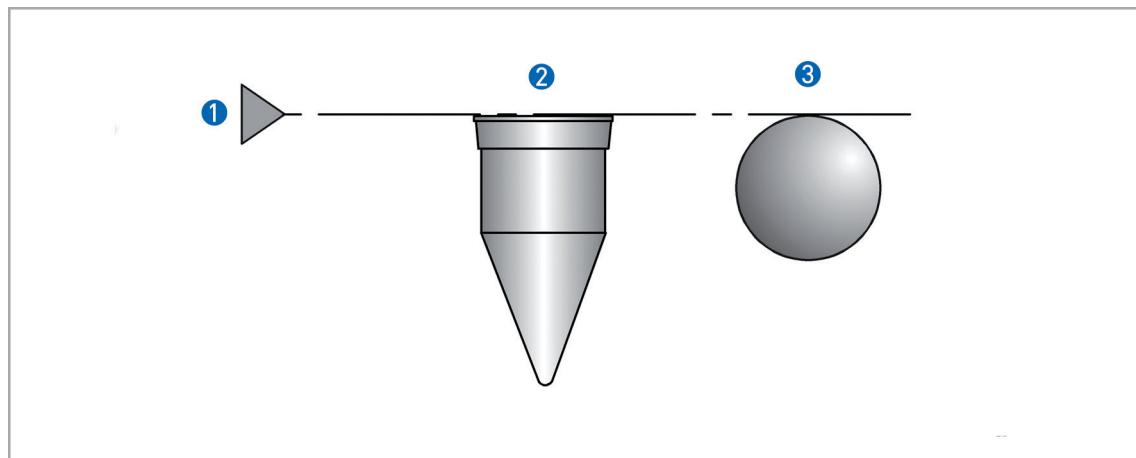


Figure 3-2: Reading edge

- ① Reading edge
- ② DK48 - floatform AIII
- ③ Dk46, DK47, DK800 - floatform ball

4.1 Safety instructions



CAUTION!

All work on the flowmeter electrical equipment may only be carried out by appropriately trained personnel. The regional occupational health and safety directives must always be observed.



DANGER!

Only perform work on the electrical connections in the de-energized state.



DANGER!

Observe the national and international regulations for electrical installations!



DANGER!

In case of instruments which are used in explosive endangered areas please consider the supplementary installation and operating instructions mentioned in the Ex-manual.

4.2 Limit switches

The flowmeter can be equipped with a maximum of two limit switches

Type RC...-N3 and RB...-E2 with bistable function

Type RC...-NO with monostable function

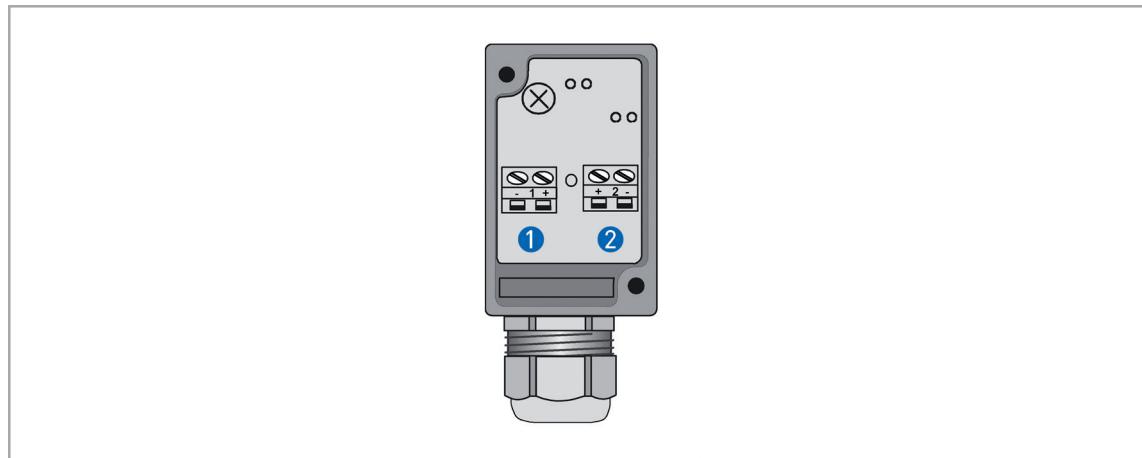
Function monostable: Switching pulse by transit of the float in the operating point, independently of the moving direction.

Function bistable: Stable changeover by transit of the float through the operating point.

Example: Float above limit: output "High"

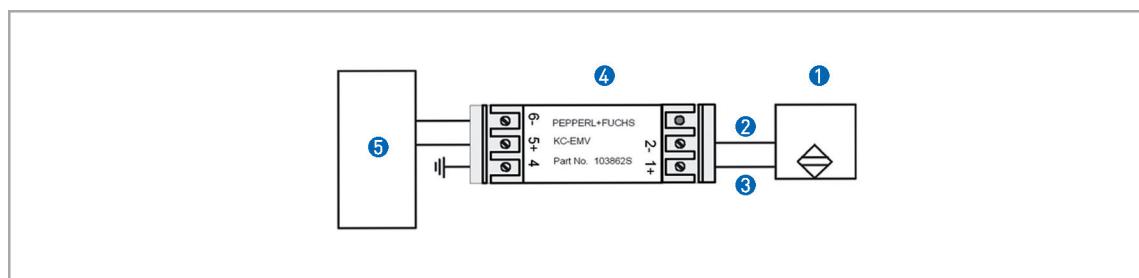
 Float below limit: output "Low"

Electrical connection limit switches - 2-wire terminal box



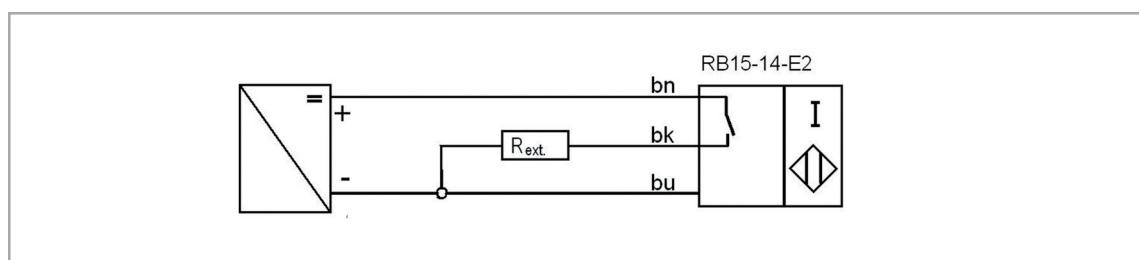
- ① lower limit switch - to terminal 1
- ② upper limit switch - to terminal 2

The junction box includes an EMC filter unit.

Electrical connection limit switches - 2-wire without terminal box

- ① Limit switch (without terminal box)
- ② Colour coding blue -
- ③ Colour coding brown +
- ④ external EMC filter
- ⑤ Receiver device

EMC filter unit and back rail of the flowmeter must be galvanically connected and grounded.

Electrical connection limit switch - 3-wire (RB...-E2)

- bn - brown: supply voltage +
- bk - black - switch
- bu - blue: supply voltage -

4.3 Setting the limit switch



Following procedure is to perform (DK../..K):

- Detach clamping screws ①
- Slide the limit switches over the measuring glass.
- Use the two clamping screws ① to fasten the limit switch ③ to the back rail ① of the measuring device.
- Reinstall the protection cover after installation.



To install, first remove the measuring glass as described under chapter Maintenance.



CAUTION!

*When setting the ring sensor, make sure the cable is laid such that it cannot be damaged!
Avoid CANT - glass breakage!*

The connecting lead for the limit switch is routed the hole in the device bottom fitting and sealed.

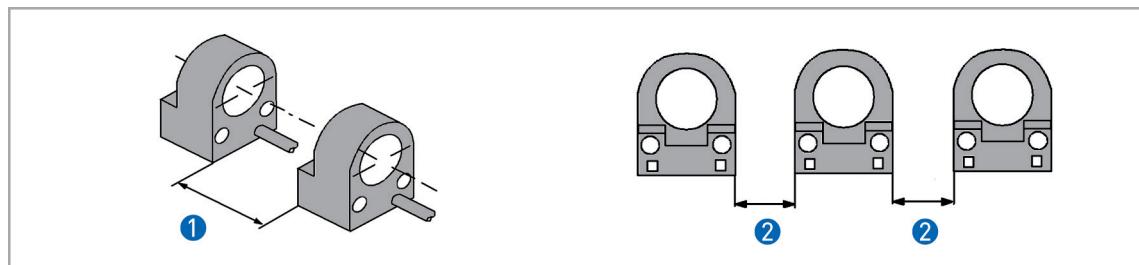
For bistable limit switches with external EMC filter in separate DIN-rail housing, observe the following:

EMC filter unit and back rail of the flowmeter must be galvanically connected and grounded.

An isolation switching amplifier with intrinsically safe control circuits NAMUR is necessary for operation of the NAMUR limit switches.

4.4 Minimum clearance between two limit switches

Where two sensors are in one device, and also where DK glass devices with limit switches are arranged close together, minimum clearances must be maintained in order to avoid mutual influence of the switches.



Min. clearance	RC... 2-wire	RB... 3-wire
①	16 mm (0.63")	45 mm (1.773")
②	6 mm (0.236")	30 mm (1.182")

4.5 Switching performance

Limit switch RC...-N0

Ball outside sensor: Signal ≥ 3 mA
Ball inside sensor: Signal ≤ 1 mA

Limit switch RC...-N3

Independent of ball position see image ① : Signal ≥ 3 mA
Pre condition: The ball is located outside the sensor.

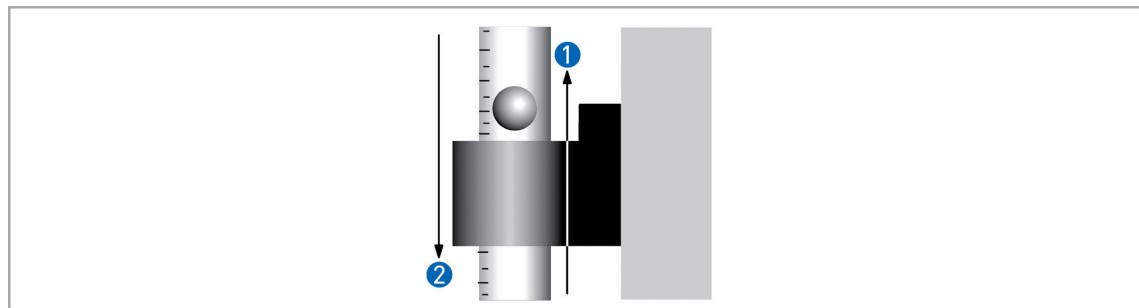


NOTE!

To get a correct mode of operation after power on the limit switches **RC...-N3** have to pass through for one time ① and ②.

Limit switch RB...-E2

Independent of ball position like transit ②: Signal ≤ 1 V
Pre condition: The ball is located outside the sensor.



4.6 Conversion of the function

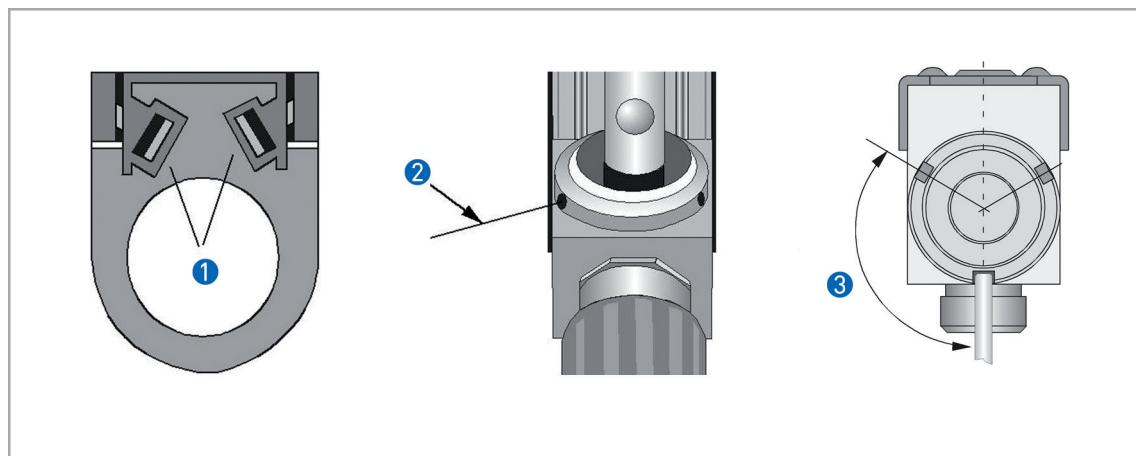
The bistable limit switch RC 10...N3 can be changed from NO to NC function.

The precut cable with connectors must be sufficiently long for this!

When setting the limit switch, make sure the cable is laid such that it cannot be damaged!



- Detach clamping screws ①
- Detach tensioning screw ②. Turn anti-clockwise.
- Carefully pull out the measuring glass together with the limit switch.
- Turn the limit switch 180°.
- Assemble in reverse order.
- Turn tensioning screw ② hand-screwed
- Use a 3mm pin to tighten the lock nut with **4x ... max. 5x, 120° turns** ③ clockwise.



CAUTION!

To avoid glass breakage, the measuring glass must be inserted concentrically between the gaskets.

Before restarting the flowmeter, check leak-tightness by suitable means.

5.1 Technical data

Application range	Flow measurement of liquids and gases
Measuring accuracy	Directive VDI / VDE 3513, sheet 2
DK46	Class 4
DK47	Class 2.5
DK48	Class 1.0
DK800	Class 2.5
Operating pressure PS	Pressure equipment directive 97/23/EC
Test pressure PT	Pressure equipment directive 97/23/EC
Max. permitted operating gauge pressure PS at TS = 100°C (212 °F)	
DK.../R (head and foot pieces made of stainless steel)	10 bar ①
DK.../N (head and foot pieces made of brass)	10 bar ①
DK.../PV (head and foot pieces made of PVDF)	4 bar

① higher pressures upon request

Materials

Head piece, foot piece	CrNi steel 1.4404 / 316 L, nickle-plated brass, PVDF ①
Head piece, foot piece optional	Hastelloy
Measuring tube	Borosilicate glass
Float (sphere)	CrNi steel 1.4401 / 316
Float options	Glass, POM, titanium, Hastelloy C4
DK48 float (All)	CrNi steel 1.4571 / 316 titanium, aluminum, PEEK, glass
Metering unit	CrNi steel 1.4571 / 316 Ti
Valve spindle	CrNi steel 1.4404 / 316 L
Standard seals	PTFE / FPM
Seals options	PTFE / FFKM, PTFE / EPDM
Seals options	EPDM, FFKM
Protective cover	Polycarbonate

① Head and foot pieces PVDF not applicable for DK48

Temperatures

Max. process temperature Tm	+100 °C	212 °F
Max. process temperature with limit switches	+65 °C	149 °F
Min. process temperature Tm	-5 °C	23 °F ①
Max. ambient temperature Tamb.	+100 °C	212 °F
Max. Tamb. with limit switches	+65 °C	149 °F
Min. ambient temperature Tamb.	-20 °C	-4 °F ①

① other temperatures upon request

Technical data limit switches

Clamp-type terminal	Connection box M16 x 1.5 - Cable diameter 5...10 mm				
Limit switches	RC10-14-N3	RC15-14-N3	RC10-14-N0	RC15-14-N0	RB15-14-E2
Switching function	Bistable	Bistable	Monostable	Monostable	Bistable, 3-wire
Connection technology	NAMUR, two-wire	NAMUR, two-wire	NAMUR, two-wire	NAMUR, two-wire	Three-wire
Rated voltage U0	8 VDC	8 VDC	8 VDC	8 VDC	
Current consumption	1 mA passage ↓		3 mA - sphere beyond		
Current consumption	3 mA passage ↓		1 mA - sphere is in limit monitor		
Operating voltage Ub					10...30 VDC
Operating current Ib					0...100mA
No-load current					20mA
Output Ua - passage ↓					≤ 1 VDC
Output Ua - passage ↑					≥ Ub – 3 VDC

Application range of limit switches

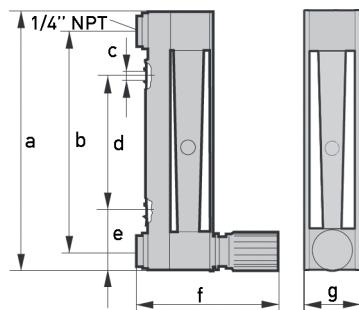
DK46, DK47, DK800		DK48	
Sphere	Limit switches	Cone no.	Limit switches
Ø 4 mm	RC10	G 13.11	-
Ø 6 mm	RC15 / RB15	G 14.06	-
Ø 8 mm	-	G 14.08	-
		G 15.07	RC10
		G 15.09	RC10
		G 15.12	RC10
		G 16.06	RC10
		G 16.12	RC10
		G 17.08	RC15 / RB15
		G 17.12	RC15 / RB15
		G 18.06	-
		G 18.08	-
		G 18.12	-

The RC15 and RB15 limit switches are only suitable for use up to 60 l/h (15851 US GPH) water or 2400 l/h (634020 US GPH) air (tapered measuring glass).

5.2 Dimensions and weights

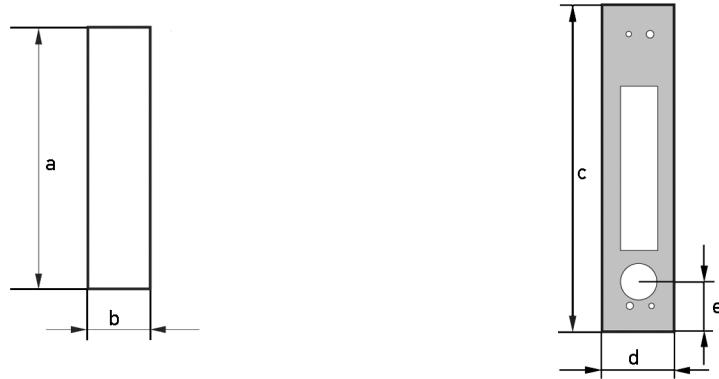
Dimensions

[mm]	a	b ± 0.25	c	d	e	f approx.	g
DK46	111	90	4.3	45	33	82	28
DK800	146	125	4.3	80	33	82	28
DK47	196	175	4.3	130	33	82	28
DK48	346	325	4.3	280	33	82	28



Switchboard installation dimensions

[mm]	a	b	c	d	e
DK46	128	32	145	40	27.5
DK800	163	32	180	40	27.5
DK47	213	32	230	40	27.5
DK48	363	32	380	40	27.5



Weights

Device	DK46	DK800	DK47	DK48
Weight [kg]	0.4	0.5	0.6	0.7
Weight with regulator	2.1	2.2	2.3	2.4

Process connection

Standard	1/4" NPT internal thread
Options	G 1/4, Ermeto 6 or 8, tube connection 6 mm or 8 mm, Dilo, Gyrolok, Swagelok ①

① other connections upon request

5.3 Flow table

Measuring span 10 : 1

Flow values 100%

	DK46	DK47	DK800	DK46	DK47	DK800
Sphere Ø mm	Water [l/h]			Air [l/h]		
4	2.5	-	2.5	5	-	5
4	-	-	-	8	-	8
4	-	-	-	16	16	16
4	-	-	-	40	40	40
4	-	-	-	60	100	60
6	5	5	5	100	250	100
6	12	12	12	250	500	250
6	25	25	25	500	800	500
6	40	40	40	800	-	800
6	60	60	60	1200	-	1000
6	100	100	100	-	-	1800
6	-	-	120	-	-	2400
6	-	-	160	-	-	3000
6	-	-	-	-	-	4000
6	-	-	-	-	-	5000
8	120	-	-	-	-	-
8	160	-	-	-	-	-

Reference condition:

Water 20°C

Air 20°C - 1.013 bar abs.

Other flow ranges on request

Conversion for other materials or operating data (pressure, temperature, density, viscosity) is performed at KROHNE using the calculation method in accordance with VDI /VDE Directive 3513

Flow table DK48

Measuring span 10 : 1
Flow values 100%

Materials ▶	Water [l/h]	Air [l/h]		
		Stainless steel	Hard rubber	Aluminium
DK48 cone no.				
G 13.11	0.4	-	7	16
G 14.06	0.6	-	12	25
G 14.08	1	-	20	40
G 15.07	1.6	-	30	60
G 15.09	2.5	-	40	90
G 15.12	4	-	60	140
G 16.08	6	-	100	200
G 16.12	10	-	160	300
G 17.08	16	-	250	500
G 17.12	25	-	400	800
G 18.06	40	400	600	1200
G 18.08	63	600	1000	2000
G 18.12	100	1000	1600	3000

Reference condition:

Water 20°C

Air 20°C - 1.013 bar abs.

Other flow ranges on request

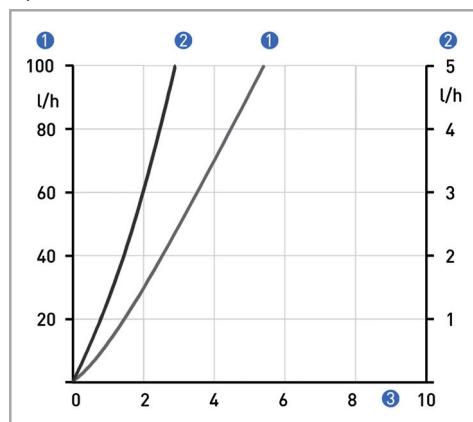
Conversion for other materials or operating data (pressure, temperature, density, viscosity) is performed at KROHNE using the calculation method in accordance with VDI /VDE Directive 3513

Valves

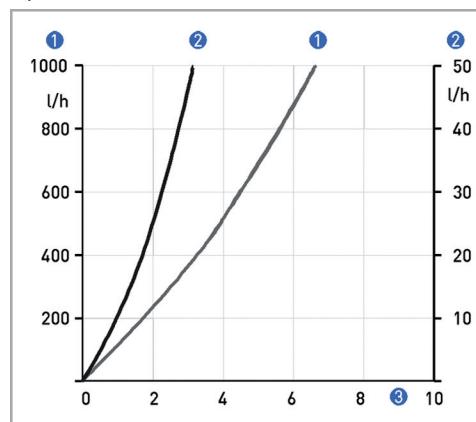
Spindle Ø [mm]	Max flowrate		Kv valve characteristic value
	Water [l/h]	Air [l/h]	[m ³ /h]
1	5	100	0.018
2.5	50	1000	0.15
4.5	160	5000	0.48

Valve characteristics

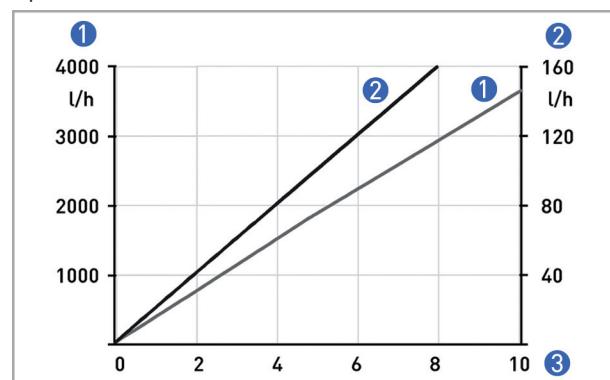
Spindle Ø 1.0mm



Spindle Ø 2.5mm



Spindle Ø 4.5mm



- ① Flow, air
- ② Flow, water
- ③ Spindle rotation n

5.4 Differential pressure regulators

Differential pressure regulators are used (DK32 and DK37 only) to help maintain constant flow rates in the case of fluctuating inlet or outlet pressures. Minimum pressure levels are required to permit operation of the regulators (see Regulator characteristics).

Differential pressure regulators are not pressure reducing valves!

① Inlet pressure regulators, types RE, NRE

The regulators maintain a constant flow rate at variable inlet pressure and constant outlet pressure.

Example: Inlet pressure regulator RE-1000:	Current flow rate:	1000 l/h air
	Constant outlet pressure p2:	1.013 bar abs.

With a variable inlet pressure greater than 0.5 bar the flow rate in the device is constant.

② Outlet pressure regulators types RA, NRA

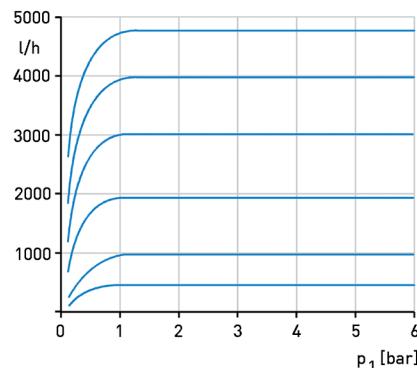
The regulators maintain a constant flow rate at constant inlet pressure and variable outlet pressure. In order to function, there must be pressure difference between the inlet pressure and the outlet pressure. The inlet pressure p1 must always be greater than the outlet pressure p2.

Example: Outlet pressure regulator NRA-800	Current flow rate:	800 l/h air
	Constant inlet pressure:	6 bar

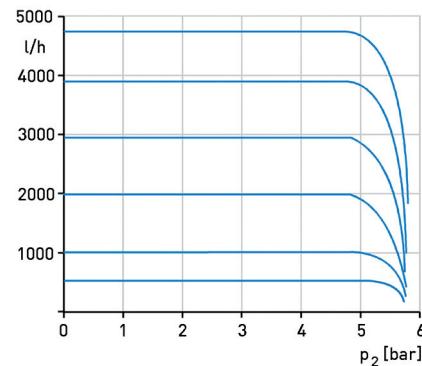
With a variable outlet pressure of 0...5.5 bar the flowrate in the device remains constant.

Regulator characteristics

① Inlet pressure regulators, types RE and NRE



② Outlet pressure regulators, types RA and NRA



Control ranges

① Inlet pressure regulator	Max flow rate		Min. inlet pressure	② Outlet pressure regulator	Max flow rate		Min. pressure diff.
	Water [l/h]	Air [l/h]			Water [l/h]	Air [l/h]	
RE-1000	...40	...1000	0.5	RA-1000	...40	...1000	0.5
RE-4000	...80	...2000	1	RA-4000	...100	...2000	1
	...100	...3000	1.5			...3000	1.5
	...160	...4000	2		...160	...4000	2
NRE-100	...2.5	...100	0.1	NRA-800	...1	...250	0.1
NRE-800		...250	0.1			...500	0.2
		...800	0.2		...25	...800	0.4
	...25		0.4				

Technical data, differential pressure regulator

Standard connection	1/4" NPT
Option	Serto, Ermeto 6 or 8, tube nozzle 6 mm or 8 mm, Dilo, Gyrolok, Swagelok, G 1/4 ①
Max. operating gauge pressure PS	10 bar DK.../PV 4bar ②
Process temperature	TS = 100 °C ③
Material	CrNi-Steel 1.4404
Gasket	PTFE, partly filled with carbon/graphite FPM ④

① other connections upon request

② higher pressures upon request

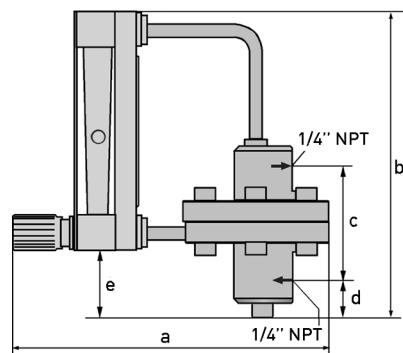
③ higher temperatures upon request

④ other materials on request

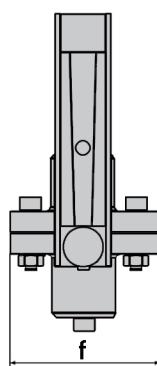
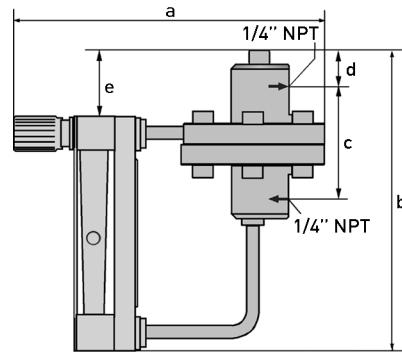
Dimensions with the differential pressure regulator

Dimensions [mm]	a approx.	b	c approx.	d	e	f approx.
DK46	210	163	70	19	39	90
DK47	210	233	70	19	39	90
DK48	210	383	70	19	39	90
DK800	210	183	70	19	39	90

① DK with inlet pressure regulator



② DK with outlet pressure regulator



6.1 Maintenance

Within the scope of routine maintenance of the system and pipelines, the flowmeter should also be inspected for signs of fouling, corrosion, mechanical wear and leaks, as well as damage to the measuring tube and indicator.

We advise that inspections be carried out at least once a year.

The device must be removed from the piping before cleaning.



CAUTION!

Pressurized pipes must be depressurized before removing the device.

In the case of flowmeters used for measuring aggressive or hazardous products, appropriate safety precautions must be taken with regard to residual liquids in the measuring section.

Always use new gaskets when reinstalling the flowmeter in the pipeline.



CAUTION!

Under certain circumstances the valve packing gland may have to be adjusted during its service life. This means that the union nut has to be retightened. If necessary, press the retaining pin against its internal spring.

Apply a tightening torque of not more than 5 Nm.



CAUTION!

Valves that have not been actuated for a longer period of time may exhibit a higher initial actuation torque.

Changing the measuring cone



- Close valve upstream and downstream of the device.
- Close needle valve.
- Push protective cover upwards and remove to front.
- Turn the lock nut in the device base ① anti-clockwise.
Devices with a top and bottom fitting made of PVDF (DK.../PV) have a tensioning screw in the device head (Allen key 6mm).
This can be unlocked with approx. 1 full turn.

The measuring glass can be removed to the front.

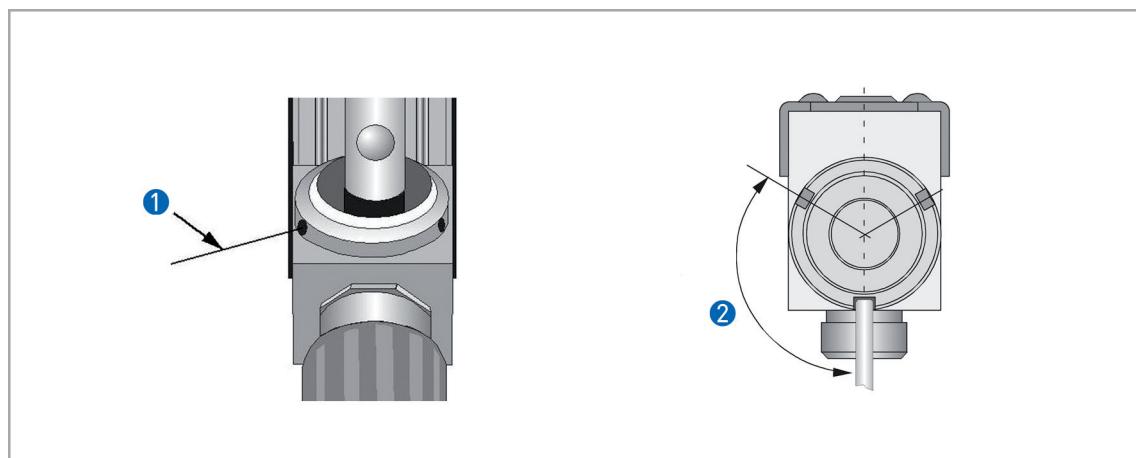


Figure 6-1: Maintenance



CAUTION!

Residual liquid or gas may leak out!



- Install in the reverse order:
- Fix the measuring glass in position by tightening the lock nut finger-tight in the device base ① first of all.
- Use a 3mm pin to tighten the lock nut with **4x ... max. 5x 120° turns clockwise**. ②



CAUTION!

To avoid glass breakage, the measuring glass must be inserted concentrically between the gaskets.

Before restarting the flowmeter, check leak-tightness by suitable means.

6.2 Returning the device to the manufacturer

Information on returning a device

This device has been carefully manufactured and repeatedly tested. If installed and operated in accordance with these instructions, it will rarely present any problems.



CAUTION!

Should you nevertheless need to return a meter to us for checking or repair, please pay strict attention to the following points:

- *Due to statutory regulations on environmental protection and safeguarding the health and safety of our personnel, KROHNE Messtechnik GmbH & Co. KG may only transport, test or repair returned meters that have been in contact with liquid products if this can be done without risk to personnel and the environment.*
- *This means that KROHNE Messtechnik GmbH & Co. KG can only service your returned item if it is accompanied by a certificate (see next section) confirming that the device is safe to handle.*



CAUTION!

If the device has been operated with products which are toxic, caustic, flammable or hazardous to waters, you must perform the following procedures:

- *Check that all cavities are free of these hazardous substances.*
- *If necessary, flush or neutralize these cavities.*
- *Enclose a certificate with the device confirming that it is safe to handle and stating the liquid used.*

6.3 Form [for copying] to accompany a returned device

Company:	Address:
Department:	Name:
Tel. no.:	Fax no.:
Manufacturer's order no. or serial no.:	
The device has been operated with the following medium:	
This medium is:	water-hazardous
	toxic
	caustic
	flammable
	We checked that all cavities in the device are free from such substances.
	We have flushed out and neutralized all cavities in the device.
We hereby confirm that there is no risk to persons or the environment through any residual media contained in the device when it is returned.	
Date:	Signature:
Stamp:	

KROHNE measuring technology - Product overview

- Electromagnetic flowmeters
- Variable area flowmeters
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- Ultrasonic flowmeters
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- Level measuring instruments
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- Pressure measuring instruments
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