



DK46 - DK800

Technical Datasheet

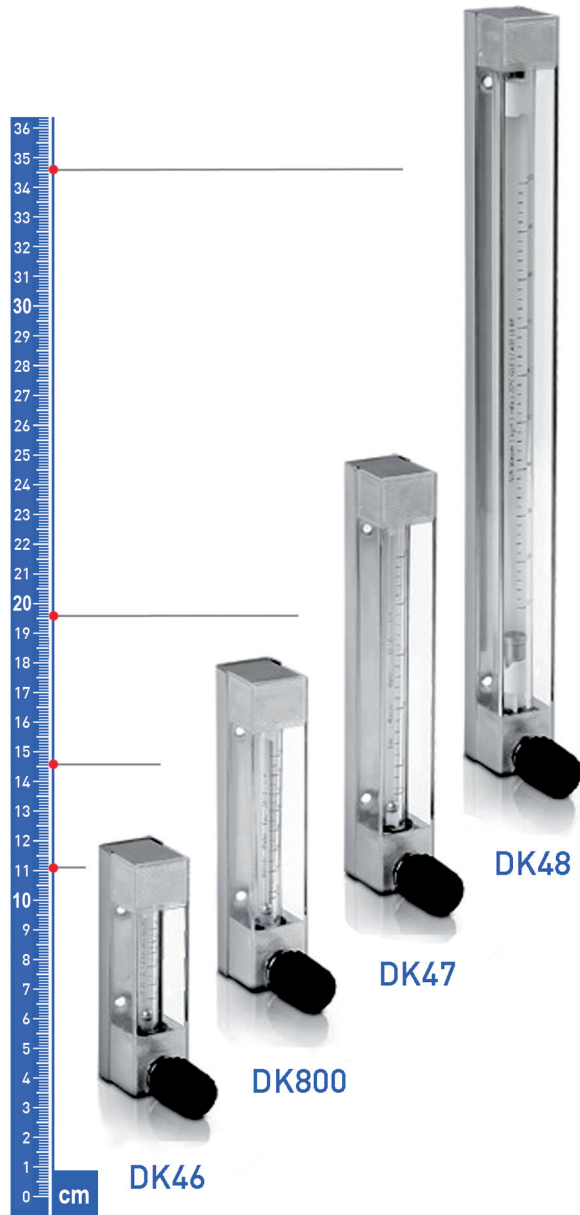
Variable-area flowmeter

- Local indication without auxiliary power
- Adaptable to meet customers' requirements
- Replaceable mounting parts that are easily assembled



DK46 - DK800 variable-area flowmeter

The DK46...DK800 flowmeters are suitable for measuring the volume flow rate of liquids and gases.



DK48 accuracy 1.0%

DK47 accuracy 2.5%

DK800 accuracy 2.5%

DK46 accuracy 4.0%

Highlights

- Simple installation and start-up
- Compact design
- Low maintenance
- Limit switches are optional
- All variants come with high quality needle valves
- No wearing parts
- Fragment protection

Industries

- Chemical
- Heating, cooling, and air conditioning
- Iron, steel and metal
- Oil & Gas
- Pharmaceutical
- Analytical technology
- Mechanical engineering
- Paper and pulp
- Water

Applications

- Fine metering
- Gas chromatography
- Minimum level monitoring and control
- In connection with a differential pressure regulator: Ensures constant flow rate in the case of variable inlet or outlet pressures

Options und variants

DK devices with limit switches



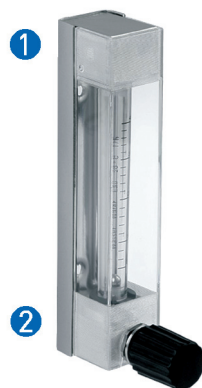
The DK devices can be provided with max. two limit switches, NAMUR or 3-wire open collector.

DK with differential pressure regulators



Differential pressure regulators are used to provide constant flow rates in the case of variable inlet or outlet pressures.

Instrument designation



Instruments with head ① and foot pieces ② made from:

Stainless steel = DK.../R

Brass = DK.../N

PVDF = DK.../PV

Technical data

Application range	Flow measurement of liquids and gases
Measuring accuracy acc. to Directive VDI / VDE 3513 sheet 2 ($q_G = 50\%$)	
DK46	4.0%
DK47	2.5%
DK48	1.0%
DK800	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 T _m	+100 °C	212 °F
Max. process temperature with limit switches	+65 °C	149 °F
Min. process temperature T _m	-5 °C	23 °F ①
Max. ambient temperature T _{amb.}	+100 °C	212 °F
Max. T _{amb.} with limit switches	+65 °C	149 °F
Min. ambient temperature T _{amb.}	-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

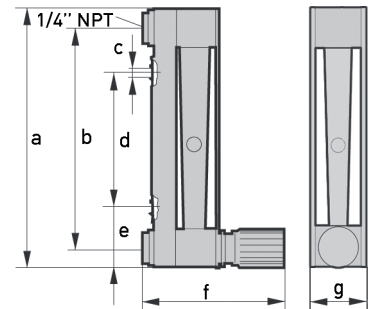
DK46, DK47, DK800		DK48	
Sphere	Limit switches	Cone no.	Limit switches
Ø 4 mm	RC10	G 13.11	-
Ø 6 mm	RC15 / RB15	G 14.06	-
Ø 8 mm	-	G 14.08	-
		G 15.07	RC10
		G 15.09	RC10
		G 15.12	RC10
		G 16.06	RC10
		G 16.12	RC10
		G 17.08	RC15 / RB15
		G 17.12	RC15 / RB15
		G 18.06	-
		G 18.08	-
		G 18.12	-

The limit switches RC15 and RB15 (as max. contact) can only be used for up to 60 l/h water or 2400 l/h air (external diameter of the measuring glass).

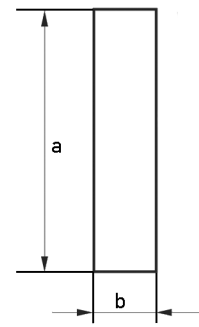
Dimensions and weights

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 panel cutout



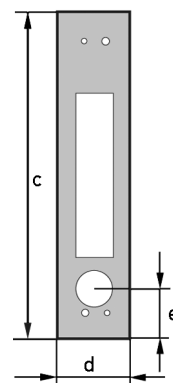
Switchboard installation dimensions

[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

Face plate



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

Measuring ranges

Measuring span 10 : 1

Flow values 100%

	DK46	DK47	DK800	DK(R)46	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 ①	-	1000
6	100	100	100	-	-	1800
6	-	-	120	-	-	2400
6	-	-	160	-	-	3000
6	-	-	-	-	-	4000
6	-	-	-	-	-	5000
8	120	-	-	-	-	-
8	160	-	-	-	-	-

① not for DKR46

Reference condition:

water 20°C

air 20°C, 1.2 bar abs. (in a standard state)

Other flow rate measuring ranges can be provided upon request.

The conversion of other materials or operating data (pressure, temperature, density, viscosity) is done with the help of the calculation procedure as detailed in Directive VDI /VDE 3513



Measuring ranges DK48

Measuring span 10 : 1

Flow values 100%

Materials ▶	Water [l/h]	Air [l/h]		
	Stainless steel	Hard rubber	Aluminium	Stainless steel
DK48 cone no.				
G 13.11 ①	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

① reduced accuracy : 2.5%

Reference condition:

water 20°C

air 20°C, 1.013 bar abs. (in a standard state)

Other flow rate measuring ranges can be provided upon request.

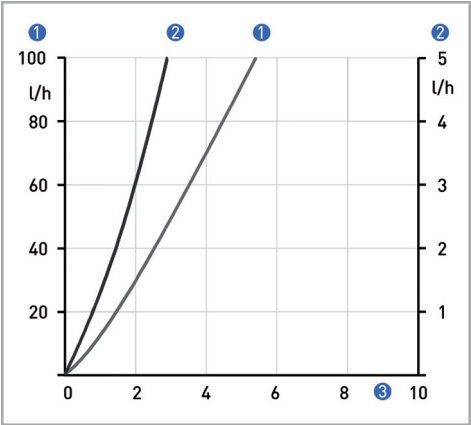
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Valves

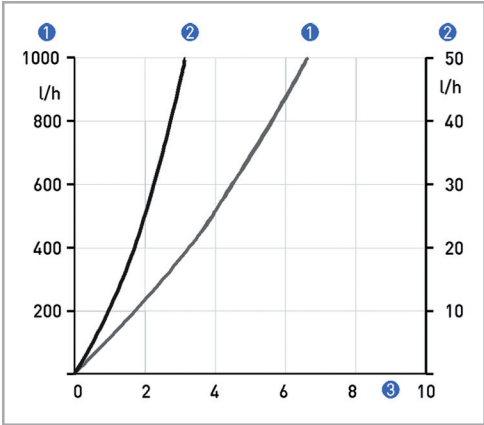
	Max flowrate		Kv valve characteristic value
Spindle Ø [mm]	Water [l/h]	Air [l/h]	[m3/h]
1	5	100	0.018
2.5	50	1000	0.15
4.5	160	5000	0.48

Valve characteristics

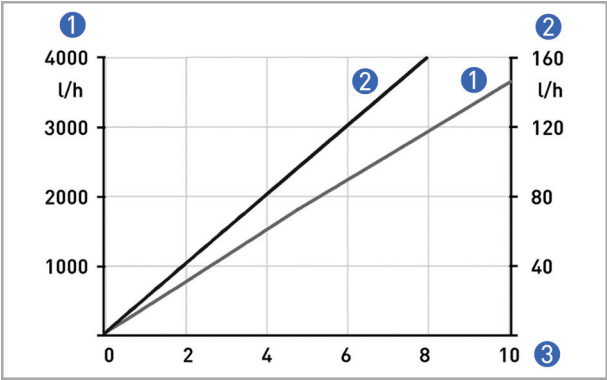
spindle Ø 1.0mm



spindle Ø 2.5mm



spindle Ø 4.5mm



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

Differential pressure regulators

Differential pressure regulators are used to provide constant flow rates in the case of variable inlet or outlet pressures. Minimum pressure levels are necessary to operate the regulators (see regulator characteristics).

Differential pressure regulators are not pressure reducing valves.

1 Inlet pressure regulators, type RE, NRE

The regulators keep the flow rate constant in the case of a variable inlet pressure and a constant outlet pressure.

Example - inlet pressure regulator RE1000:	Current flow rate:	1000 l/h air
	Outlet pressure p2 constant:	1.013 bar abs.

The flow rate is constant in the device in the case of a fluctuating inlet pressure greater than 0.5 bar.

2 Outlet pressure regulator, type RA, NRA

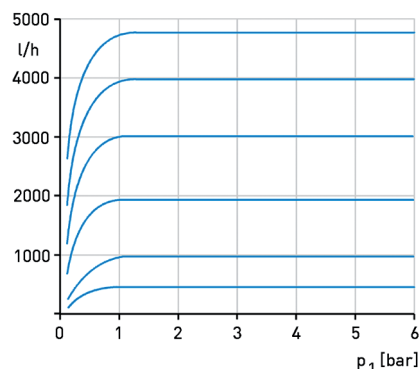
The regulators keep the flow rate constant in the case of a constant inlet pressure and a variable outlet pressure. There must be a pressure differential between the inlet and the outlet pressure for the outlet pressure regulator to function. The inlet pressure p1 must always be greater than the outlet pressure p2.

Example - outlet pressure regulator NRA 800	Current flow rate:	800 l/h air
	Inlet pressure constant:	6 bar

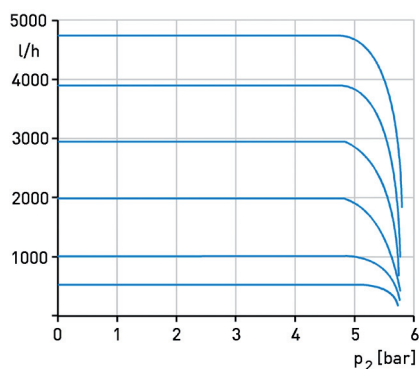
The flow rate is constant in the device in the case of a fluctuating outlet pressure of 0 ... 5.5 bar.

Regulator characteristics

1 Inlet pressure regulators, type RE and NRE



2 Outlet pressure regulators, type RA and NRA



Control ranges

① Inlet pressure regulator	Max flow rate		Min. inlet pressure
	Water	Air	
	[l/h]	[l/h]	Δp_1 [bar]
RE-1000	...40	...1000	0.5
RE-4000	...80	...2000	1
	...100	...3000	1.5
	...160	...4000	2
NRE-100	...2.5	...100	0.1
NRE-800		...250	0.1
		...800	0.2
	...25		0.4

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

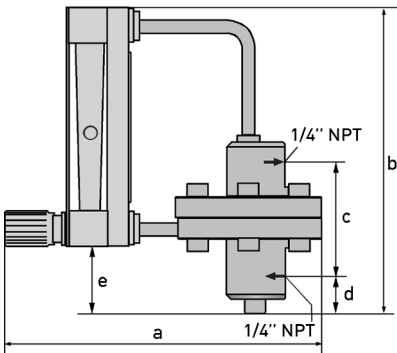
③ higher temperatures upon request

④ other materials on request

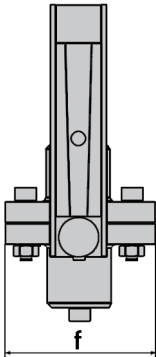
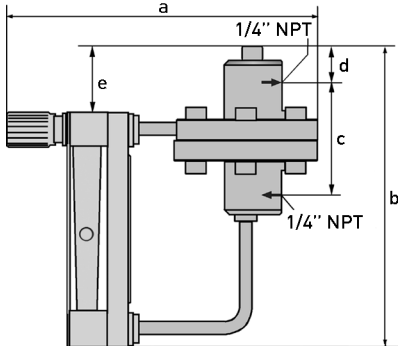
Dimensions with the differential pressure regulator

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

DK with inlet pressure regulator



DK with outlet pressure regulator







KROHNE measuring technology - Product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Mass flowmeters
- Ultrasonic flowmeters
- Vortex flowmeters
- Flow controllers
- Level measuring instruments
- Temperature measuring instruments
- Pressure measuring instruments
- Analysis
- Oil and gas industry

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