



DK46 - DK800

Technical Datasheet

Variable-area flowmeter

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



KROHNE

DK46 - DK800 variable-area flowmeter

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



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



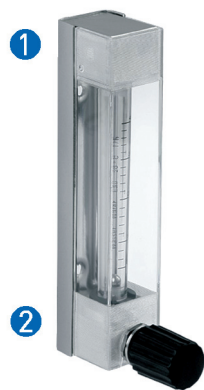
The DK devices can be provided with max. two limit switches, NAMUR or 3-wire open collector.

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	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	
DK.../R (head piece and foot piece made from stainless steel)	10 bar ①
DK.../N (head piece and foot piece made from brass)	10 bar ①
DK.../PV (head piece and foot piece made from PVDF)	4 bar
① higher pressures upon request	

Materials

Head piece, foot piece	CrNi steel 1.4404 / 316 L, nickle-plated brass, PVDF
Head piece, foot piece optional	Hastelloy C4
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	FPM
Seals	PTFE / FFKM
Seals	EPDM
Protective cover	Polycarbonate

Temperatures

Max. temperature of medium T _m	+100°C
Max. T _m with limit switches	+65°C
Min. temperature of medium T _m	-5°C ①
Max. ambient temperature T _{amb.}	+100°C
Max. T _{amb.} with limit switches	+65°C
Min. ambient temperature T _{amb.}	-20°C 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	8V	8V	8V	8V	
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 V
Output Ua - passage ↑					≥ Ub – 3 V

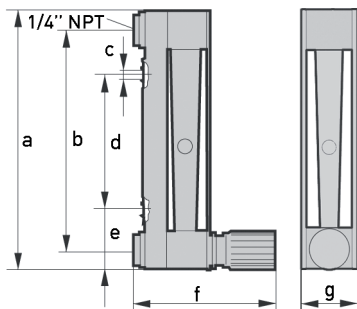
Application range of limit switches

DK46, DK47, DK800		DK48	
Sphere	Limit switches	Cone no.	Limit switches
Ø 4mm	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).

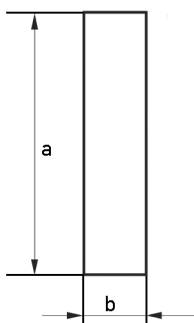
Dimensions and weights

Dimensions



[mm]	a	b ± 0.25	c	d	e	f approx.
DK46	111	90	4,3	45	33	82
DK47	196	175	4,3	130	33	82
DK48	346	325	4,3	280	33	82
DK800	146	125	4,3	80	33	82

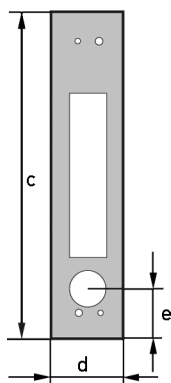
Switchboard panel cutout



Switchboard installation dimensions

[mm]	a	b	c	d	e
DK46	128	32	145	40	27,5
DK47	213	32	230	40	27,5
DK48	363	32	380	40	27,5
DK800	163	32	180	40	27,5

Face plate



Weights

Device	DK46	DK47	DK48	DK800
Weight [kg]	0,4	0,6	0,7	0,5
Weight with regulator	2,1	2,3	2,4	2,2

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	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, 1.2 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	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 ①	16	-	250	500
G 17.12 ①	25	-	400	800
G 18.06 ①	40	400	600	1200
G 18.08 ①	63	600	1000	2000
G 18.12 ①	100	1000	1600	3000

① not for DK 48 PV (head and foot piece made from PVDF)

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.

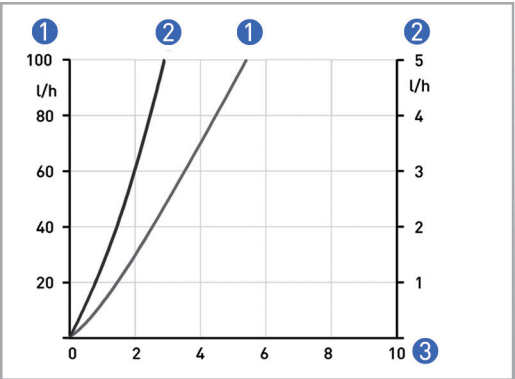
The conversion of other materials or operating data (pressure, temperature, density, viscosity) is done with the help of the calculation procedure as detailed in Directive VDI /VDE 3513

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

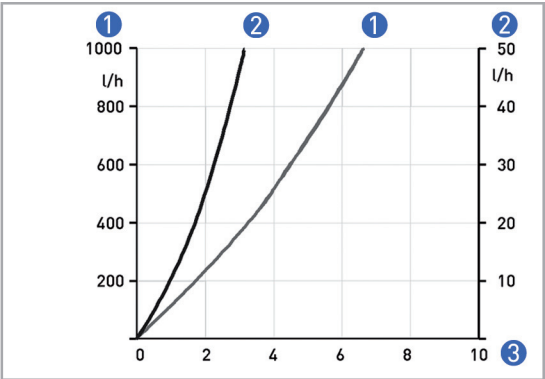
Valve characteristics

spindle Ø 1,0mm

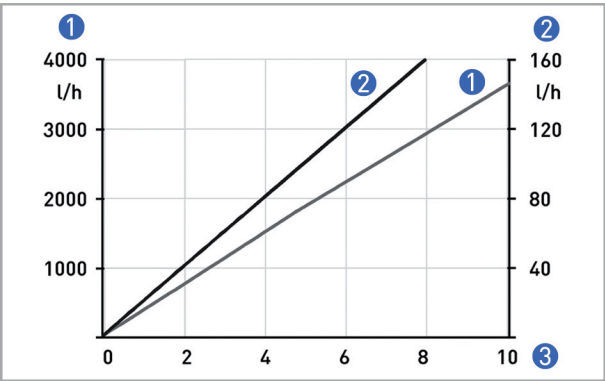


- 1 Flow, air
- 2 Flow, water
- 3 Spindle rotation n

spindle Ø 2,5mm



spindle Ø 4.5 mm



- 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

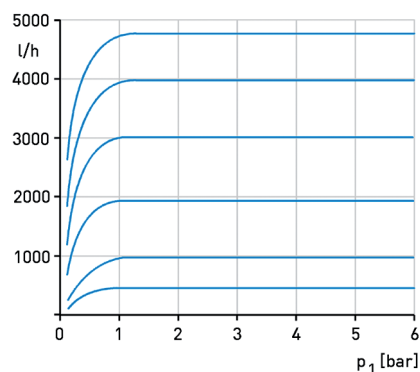
The regulators keep the flow rate constant in the case of a constant inlet pressure and a variable outlet pressure. There must be a pressure differential between the inlet and the outlet pressure for the outlet pressure regulator to function. The inlet pressure p1 must always be greater than the outlet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

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

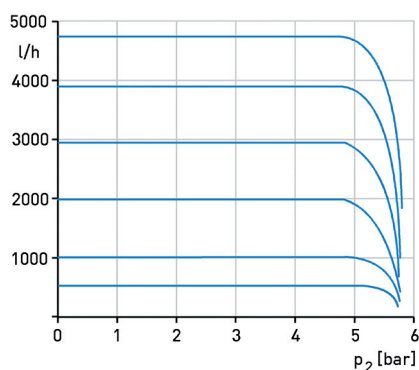
The flow rate is constant in the device in the case of a fluctuating outlet pressure of 0 ... 5.5 bar.

Regulator characteristics

① Inlet pressure regulators, type RE and NRE



② Outlet pressure regulators, type RA and NRA



Control ranges

Inlet pressure regulator			
	Max flow rate		
	Water	Air	Min. inlet pressure
	[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

Outlet pressure regulator			
	Max flow rate		
	Water	Air	Min. pressure diff.
	[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

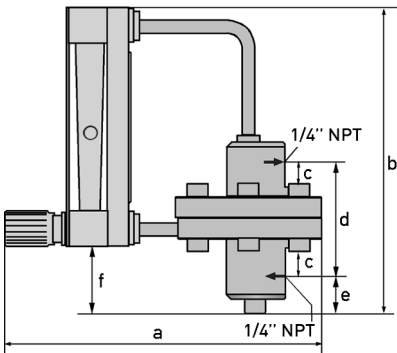
Technical data, differential pressure regulator

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
Material	CrNi-Steel 1.4404
Temperature	TS = 100 °C ③
① other connections upon request ② higher pressures upon request ③ higher temperatures upon request	

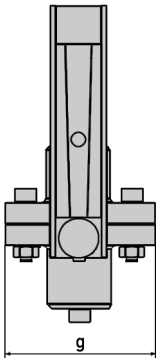
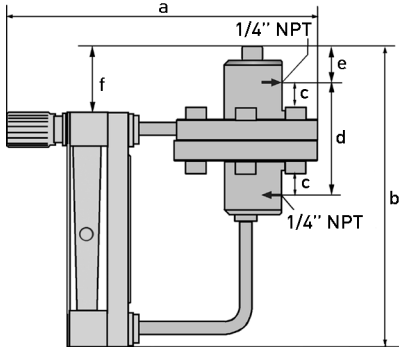
Dimensions with the differential pressure regulator

Dimensions [mm]	a approx.	b	c approx.	d	e	f approx.	g
DK46	210	163	13	70	19	39	90
DK47	210	233	13	70	19	39	90
DK48	210	383	13	70	19	39	90
DK800	210	183	13	70	19	39	90

DK with inlet pressure regulator



DK with outlet pressure regulator







KROHNE Product Overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Mass flowmeters
- Ultrasonic flowmeters
- Vortex flowmeters
- Flow controllers
- Level measuring instruments
- Pressure gauges
- Temperature measuring instruments
- Water solutions & analysis
- Oil and gas turnkey solutions

Addresses:

Germany

Northern sales office

KROHNE Messtechnik GmbH & Co. KG
Bremer Str. 133
D-21073 Hamburg
Phone: +49 (0)40 767 3340
Fax: +49 (0)40 767 33412
nord@krohne.de
ZIP code: 10000 - 29999, 49000 - 49999

Western and middle sales office

KROHNE Messtechnik GmbH & Co. KG
Ludwig-Krohne-Straße
D-47058 Duisburg
Phone: +49 (0)203 301 416
Fax: +49 (0)203 301 10416
west@krohne.de
ZIP code: 30000 - 34999, 37000 - 48000, 50000 - 53999, 57000 - 59999, 98000 - 99999

Southern sales office

KROHNE Messtechnik GmbH & Co. KG
Landsberger Str. 392
D-81241 Munich
Phone: +49 (0)89 121 5620
Fax: +49 (0)89 129 6190
sued@krohne.de
ZIP code: 0 - 9999, 80000 - 89999, 90000 - 97999

Southwestern sales office

KROHNE Messtechnik GmbH & Co. KG
Rüdesheimer Str. 40
D-65239 Hochheim/Main
Phone: +49 (0)6146 827 30
Fax: +49 (0)6146 827 312
rhein-main@krohne.de
ZIP code: 35000 - 36999, 54000 - 56999, 60000 - 79999

Instrumentation and control equipment catalog

TABLAR Messtechnik GmbH
Ludwig-Krohne-Straße 5
D-47058 Duisburg
Phone: +49 (0)2 03 305 880
Fax: +49 (0)2 03 305 8888
kontakt@tablar.de www.tablar.de

KROHNE sales companies

International

Australia

KROHNE Australia Pty Ltd
Quantum Business Park 10/287
Victoria Rd Rydalmere NSW 2116
Phone: +61 2 8846 1700
Fax: +61 2 8846 1755
krohne@krohne.com.au

Austria

KROHNE Gesellschaft m.b.H.
Modecenterstraße 14
A-1030 Vienna
Phone: +43 (0)1/203 45 32
Fax: +43 (0)1/203 45 32 99
info@krohne.at

Belgium

KROHNE Belgium N.V.
Brusselstraat 320
B-1702 Groot Bijgaarden
Phone: +32 (0)2 4 66 00 10
Fax: +32 (0)2 4 66 08 00
krohne@krohne.be

Brazil

KROHNE Conaut Controles
Automaticos Ltda.
Estrada Das Águas Espraiadas, 230
C.P. 56 06835 - 080 EMBU - SP
Phone: +55 (0)11-4785-2700
Fax: +55 (0)11 4785-2768
conauti@conaut.com.br

China

KROHNE Measurement Instruments
[Shanghai] Co. Ltd., [KMIC]
Room 1501
1033 Zhaojiabang Road
Shanghai 200030
Phone: +86 21 6487 9611
Fax: +86 21 6438 7110
info@krohne-asia.com

Czech Republic

Krohne CZ, spol. s r.o.
Sobiesická 156
63800 Brno
Phone: +420 (0)545.242 627
Fax: +420 (0)545 220 093
brno@krohne.cz

France

KROHNE S.A.S.
Les Ors BP 98
F-26103 ROMANS Cedex
Phone: +33 (0)4 75 05 44 00
Fax: +33 (0)4 75 05 00 48
info@krohne.fr

Great Britain

KROHNE Ltd.
Rutherford Drive
Park Farm Industrial Estate
Wellingborough
Northants NN8 6AE
Phone: +44 (0)19 33 408 500
Fax: +44 (0)19 33 408 501
info@krohne.co.uk

CIS

Kanex KROHNE Engineering AG
Business-Centre Planeta
Office 404 ul.
Marxistskaja 3
109147 Moscow/Russia
Phone: +7 (0)095 911 7165
Fax: +7 (0)095 742 8873
krohne@dol.ru

India

Krohne Marshall Ltd.
A-34/35, M.I.D.C. Industrial Area,
H-Block
Pimpri Poona 411018
Phone: +91 (0)202 744 2020
Fax: +91 (0)202 744 2020
pcu@vsnl.net

Iran

KROHNE Liaison Office
North Sohrevardi Ave. 26,
Sarmad St., Apt. #9
Tehran 15539
Phone: +9821 8874 5973
Fax: +9821 8850 1268
krohne@krohneiran.com

Italy

KROHNE Italia Srl.
Via V. Monti 75
I-20145 Milan
Phone: +39 02 4300 661
Fax: +39 02 4300 6666
info@krohne.it

Korea

KROHNE Korea
Room 508 Miwon Bldg 43
Yoido-Dong Youngdeungpo-Ku
Seoul, Korea
Phone: 00-82-2-782-1900
Fax: 00-82-2-780-1749
mail@krohne.co.kr

Netherlands

KROHNE Nederland B.V.
Kerkeplaat 14
NL-3313 LC Dordrecht
Phone: +31 (0)78 630 6200
Fax: +31 (0)78 630 6405
Service Direct: +31 (0)78 630 6222
info@krohne.nl

Norway

KROHNE Norway A.S.
Ekholtveien 114
NO-1521 Moss
Phone: +47 (0)69 264 860
Fax: +47 (0)69 267 333
postmaster@krohne.no

Poland

KROHNE Polska Sp.z.o.o.
ul. Stary Rynek Oliwski 8a
80-324 Gdansk
Phone: +48 (0)58 520 9211
Fax: +48 (0)58 520 9212
info@krohne.pl

Switzerland

KROHNE AG
Uferstr. 90
CH-4019 Basel
Phone: +41 (0)61 638 30 30
Fax: +41 (0)61 638 30 40
info@krohne.ch

Singapore

Tokyo Keiso - KROHNE (Singapore)
Pte. Ltd.
14, International Business Park,
Jurong East
Chiyoda Building, #01-01/02
Singapore 609922
Phone: (65) 6567 4548
Fax: (65) 6567 9874
tks@tokyokeiso-krohne.com.sg

Republic of South Africa

KROHNE Pty. Ltd.
Bushbuck Close
Corporate Park South
Midrand, Gauteng
P.O. Box 2069
Midrand, 1685
Tel.: +27 (0)11 314 1391
Fax: +27 (0)11 314 1681
midrand@krohne.co.za

Spain

I.I. KROHNE IBERIA, S.r.l.
Polígono Industrial Nilo
Calle Brasil, nº. 5
28806 Alcalá de Henares Madrid
Phone: +34 (0)91 883 2152
Fax: +34 (0)91 883 4854
krohne@krohne.es

USA

KROHNE, Inc.
7 Dearborn Road
Peabody, MA 01960
Phone: +1 (800) FLOWING
Phone: +1 (978) 535 6060 (in MA)
info@krohne.com

Representatives

Algeria
Argentina
Cameroon
Canada
Chile
Columbia
Croatia
Denmark
Ecuador
Egypt
Finland
Gabon
Ghana
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Romania
Saudi Arabia
Senegal
Slovakia
Slovenia
Sweden
Taiwan
Thailand
Tunisia
Turkey
Venezuela
Yugoslavia

Other countries

KROHNE Messtechnik GmbH & Co. KG
Ludwig-Krohne-Str. 5
D-47058 Duisburg
Phone: +49 (0)203 301 0
Fax: +49 (0)203 301 389
export@krohne.de