Flow control valve for gas
FCV...

Nominal diameter
DN 40 - DN 150

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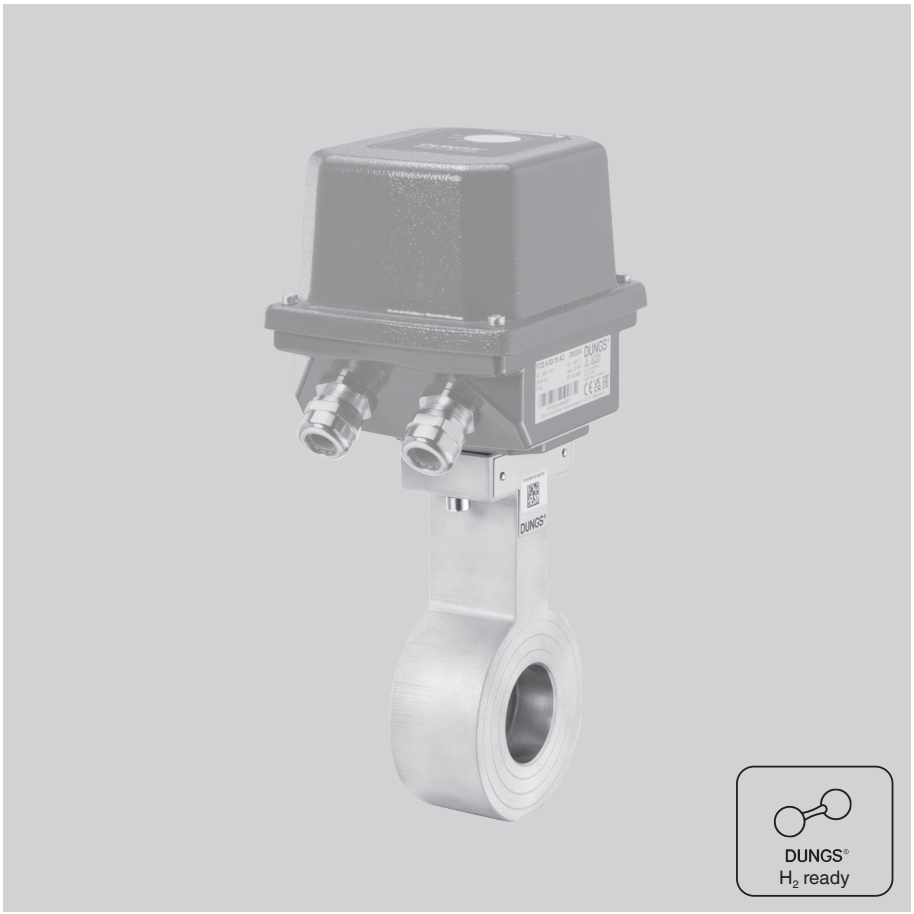
Combustion Controls

FLOW CONTROL VALVE

GAS

- For high control accurary
- Reduced nominal diameter
- Directly mountable
  Flow Control Drives FCD
- Suitable for 100 % Hydrogen
- EU Certified



Technical description
The DUNGS flow control valve FCV... is a control element without zero shut-off according to EN 13611.

The intermediate flange design allows space-saving installation.

Application
The DUNGS flow control valve FCV... is used to regulate the gas supply to gas burners and gas equipment. The flow control valve is suitable for gases of gas families 1, 2, 3, hydrogen H_2 (dry) and other neutral gases.

Certification
Type-examination certificate according to
- EU-Gas Appliances Regulation
- UKCA-Gas Appliances Regulation

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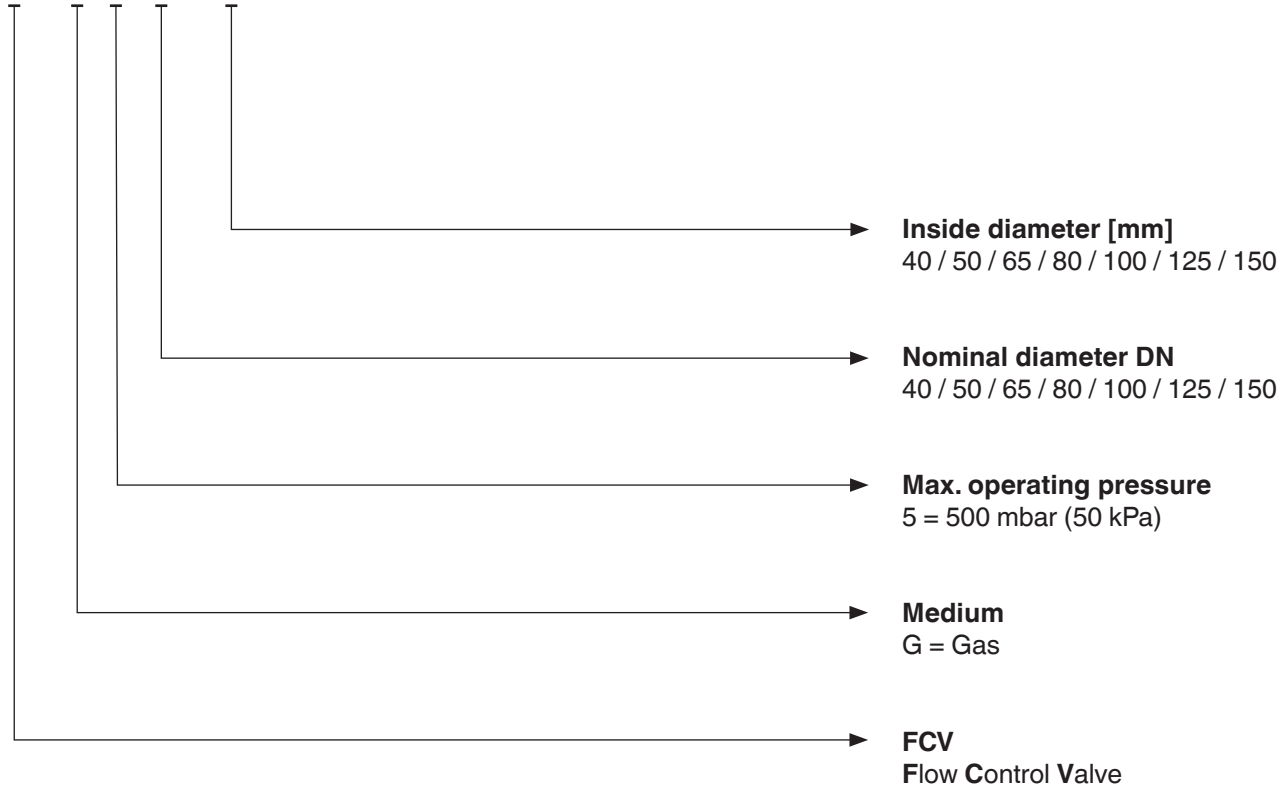
Technical data	
Nominal diameters **Flange**	DN 40 - DN 150 EN 1092-1
Max. operating pressure	500 mbar (50 kPa)
Max. differential pressure	≤ DN 100: 500 mbar ≥ DN 125: 250 mbar
Medium	Gas families 1, 2, 3, hydrogen H_2 (dry) and other neutral gaseous media
Ambient temperature	-20 °C to +70 °C
Medium temperature	-20 °C to +70 °C
Max. permissible actuating speed	5 s / 90°
Materials of the gas-carrying parts	Housing: aluminium Shaft: steel Valve disk: steel Seals: NBR
Installation position	Vertically upright to lying horizontally
Drive adoption	External square 9 x 9 mm More on request

Type code FCV

FCV-G XYYY/ZZ



For example: "FCV-G 5065/40"

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Function
The gas flow control valve FCV is used to adjust the gas supply volume to gas consumption devices.
The flow control valve is an automatic actuator operated with auxiliary energy. The corresponding electromechanical actuator determines the position of the flow control valve. The part-load and full-load setting of the flow control valve is determined by adjusting the corresponding switching cams of the actuator. The actuating time is determined by the actuator drive. If the operating voltage (auxiliary energy) is interrupted, the actuator remains in its current position.

For higher control accuracy, flow control valves with reduced nominal diameter (reduced by one or two nominal diameters) can be used. This means that reducing adapters can be dispensed with.
The desired volume flow is set via the valve position with an opening angle between 0° and 90°.
The gas flow control valve has a smooth-running, knocking valve disc.

⚠ Avoid direct contact between the flow control valve and dried masonry, concrete walls or floors!

⚠ Only set the nominal pressure on the pressure regulator. Any output-related restriction should only be performed using the flow control valve.

⚠ Check for leaks and function after installation!

Type	Order No.	Nominal diameter	Inside diameter [mm]	Weight [kg]	Max. differential pressure	Max. operating pressure
FCV-G 5040/25	293970	DN 40	25	1.00	500 mbar	500 mbar
FCV-G 5040/32	293971		32	0.90	500 mbar	
FCV-G 5040/40	293972		40	0.85	500 mbar	
FCV-G 5050/32	293973	DN 50	32	1.10	500 mbar	
FCV-G 5050/40	293974		40	1.05	500 mbar	
FCV-G 5050/50	293975		50	1.00	500 mbar	
FCV-G 5065/40	293976	DN 65	40	1.45	500 mbar	
FCV-G 5065/50	293977		50	1.40	500 mbar	
FCV-G 5065/65	293978		65	1.25	500 mbar	
FCV-G 5080/50	293979	DN 80	50	1.70	500 mbar	
FCV-G 5080/65	293980		65	1.60	500 mbar	
FCV-G 5080/80	293981		80	1.50	500 mbar	
FCV-G 5100/65	293982	DN 100	65	2.00	500 mbar	
FCV-G 5100/80	293983		80	1.90	500 mbar	
FCV-G 5100/100	293984		100	1.80	500 mbar	
FCV-G 5125/80	293985	DN 125	80	2.75	500 mbar	
FCV-G 5125/100	293986		100	2.60	500 mbar	
FCV-G 5125/125	293988		125	2.30	250 mbar	
FCV-G 5150/100	293989	DN 150	100	3.40	500 mbar	
FCV-G 5150/125	293990		125	3.00	250 mbar	
FCV-G 5150/150	293991		150	2.75	250 mbar	

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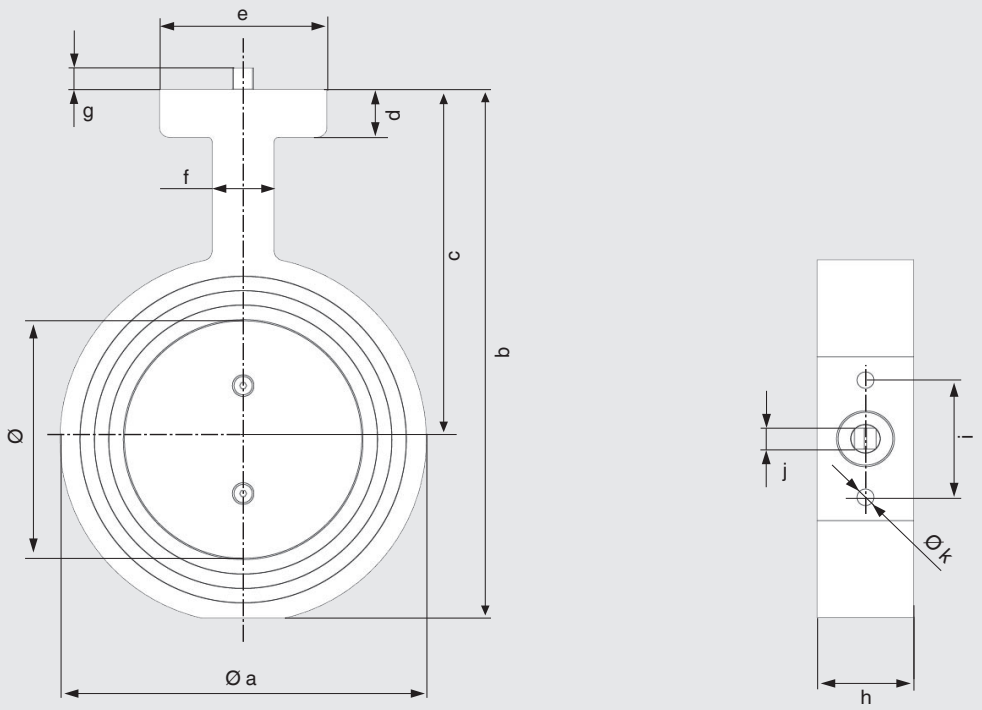
Flow control valve without actuator

Dimensions [mm]



Type	Nominal diameter	Ø Inside [mm]	Dimensions [mm]										
			Ø a	b	c	d	e	f	g	h	i	j	Ø k
FCV-G 5040	DN 40	40/32/25	87	155.0	113.5	20	70	26	9	40	50	9	7
FCV-G 5050	DN 50	50/40/32	97	165.0	118.5	20	70	26	9	40	50	9	7
FCV-G 5065	DN 65	65/50/40	117	182.5	126.0	20	70	26	9	40	50	9	7
FCV-G 5080	DN 80	80/65/80	133	200.5	136.0	20	70	26	9	40	50	9	7
FCV-G 5100	DN 100	100/80/65	153	220.5	146.0	20	70	26	9	40	50	9	7
FCV-G 5125	DN 125	125/10 /80	183	248.0	158.5	20	70	26	9	40	50	9	7
FCV-G 5150	DN 150	150/125/100	208	273.0	171.0	20	70	26	9	40	50	9	7

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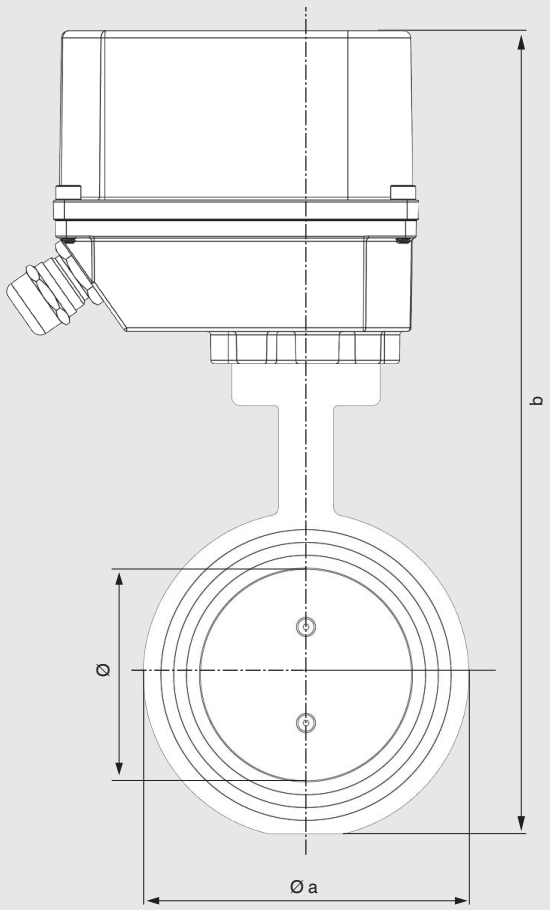
Flow control vlave with flow control drive

Dimensions [mm]



Type	Nominal diameter	Ø Inside [mm]	Ø a Outer [mm]	FCD A 00-15	FCD A 01-15
				b = Total overall height [mm]	
FCV-G 5040	DN 40	40/32/25	87	277.0	297.0
FCV-G 5050	DN 50	50/40/32	97	287.0	307.0
FCV-G 5065	DN 65	65/50/40	117	304.5	324.5
FCV-G 5080	DN 80	80/65/80	133	322.5	342.5
FCV-G 5100	DN 100	100/80/65	153	342.5	362.5
FCV-G 5125	DN 125	125/100/80	183	370.0	390.0
FCV-G 5150	DN 150	150/125/100	208	395.0	415.0

Please note: 2 assembly screws and 4 centring aids are included in the scope of supply.

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Device selection
The following values must be known for the dimensioning of the FCV:

1. Maximum volume flow $V_{max.}$
2. Pressure loss Δp at maximum volume flow
3. Minimum volume flow $V_{min.}$
4. Differential pressure in the valve closed position (= p_e)

The valve diameter can be determined either mathematically via the K_v value or via the flow diagrams 1, 2 and 3 on the next slides.
Check whether the required minimum volume flow is reached when the valve is positioned a 0°.
If the calculated or measured value is below the required minimum volume flow, the valve can be used.

If the volume flows are small, the pressure loss of upstream devices will fall. This increases the Δp available to the valve.

To obtain an optimum control response, always choose the flow control valve with the largest pressure loss (Δp > 10 mbar).

K_v-values for flow control valve FCV
The flow control valve FCV is limited by the following parameters:

Max. operating pressure
500 mbar (50 kPa)

Differential pressure
≤ DN 100: 500 mbar (50 kPa)
≥ DN 125: max. 250 mbar (25 kPa)

When the valve is used in subcritical flow states, the following applies:

V_n [m³ / h]
volume flow, standard state
Δp [bar]
pressure drop across FCV
p_2 [bar]
absolute pressure downstream of FCV
ρ_n [kg / m³]
standard gas density
T_1 [K]
Gas temperature before FCV, absolute K_V [m³/h]
Valve coefficient, value from the following table

$$V_n = 514 \cdot K_v \cdot \sqrt{\frac{\Delta p \cdot p_2}{\rho_n \cdot T_1}}$$

Diameter reduction, none

Nominal diameter	Inside Ø (mm)	K_V [m³/h] / Opening angle									
		0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
DN 40	40	0.2	1.1	3.4	8.2	14.0	23.3	36.9	55.1	68.2	75.2
DN 50	50	0.3	1.7	5.5	12.8	23.9	41.0	65.0	101.1	132.9	155.0
DN 65	65	0.5	2.9	10.3	22.9	43.0	73.4	115.9	183.2	250.8	305.0
DN 80	80	0.8	4.4	17.1	36.9	67.3	113.1	177.3	280.9	393.5	491.1
DN 100	100	1.1	6.8	29.3	61.5	107.8	177.2	275.6	435.5	622.5	795.7
DN 125	125	1.5	10.4	49.6	102.0	171.3	275.4	424.7	668.0	970.8	1267.0
DN 150	150	1.8	14.9	75.5	153.2	249.1	393.6	602.9	944.2	1388.2	1839.0

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Diameter reduction, simple

Nominal diameter	Inside Ø (mm)	K_V [m³/h] / Opening angle									
		0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
DN 40/32	32	0.1	1.0	2.9	5.4	10.2	16.9	24.9	32.9	38.8	42.5
DN 50/40	40	0.2	1.2	3.8	7.9	17.3	29.3	42.2	53.6	61.5	66.4
DN 65/50	50	0.2	1.6	5.9	14.0	30.1	49.7	70.6	89.0	101.9	109.9
DN 80/65	65	0.4	2.4	9.9	29.9	57.5	90.5	127.0	162.3	187.6	203.5
DN 100/80	80	0.5	4.3	21.4	53.5	94.2	143.6	200.2	259.6	303.2	331.0
DN 125/100	100	0.8	8.2	45.0	97.2	158.0	233.4	323.7	426.7	504.0	553.7
DN 150/125	125	1.1	15.2	87.6	171.5	261.6	376.3	519.9	695.8	830.0	917.0

Diameter reduction, double

Nominal diameter	Inside Ø (mm)	K_V [m³/h] / Opening angle									
		0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
DN 40/25	25	0.1	0.3	1.3	2.7	4.9	7.6	10.7	13.4	15.4	16.7
DN 50/32	32	0.1	0.6	2.0	4.1	7.5	12.6	19.2	25.8	30.7	33.9
DN 65/40	40	0.2	0.9	3.6	7.7	13.8	22.4	33.5	45.1	53.4	58.6
DN 80/50	50	0.2	1.5	6.8	15.2	26.2	40.7	58.5	76.9	89.6	97.0
DN 100/65	65	0.3	2.5	14.2	32.5	54.6	80.9	110.5	140.7	160.2	170.6
DN 125/80	80	0.4	3.8	24.7	57.3	94.7	136.2	180.0	223.8	250.4	263.2
DN 150/100	100	0.6	5.9	43.5	101.8	166.5	233.7	300.0	364.6	401.0	416.2

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Flow diagram 1

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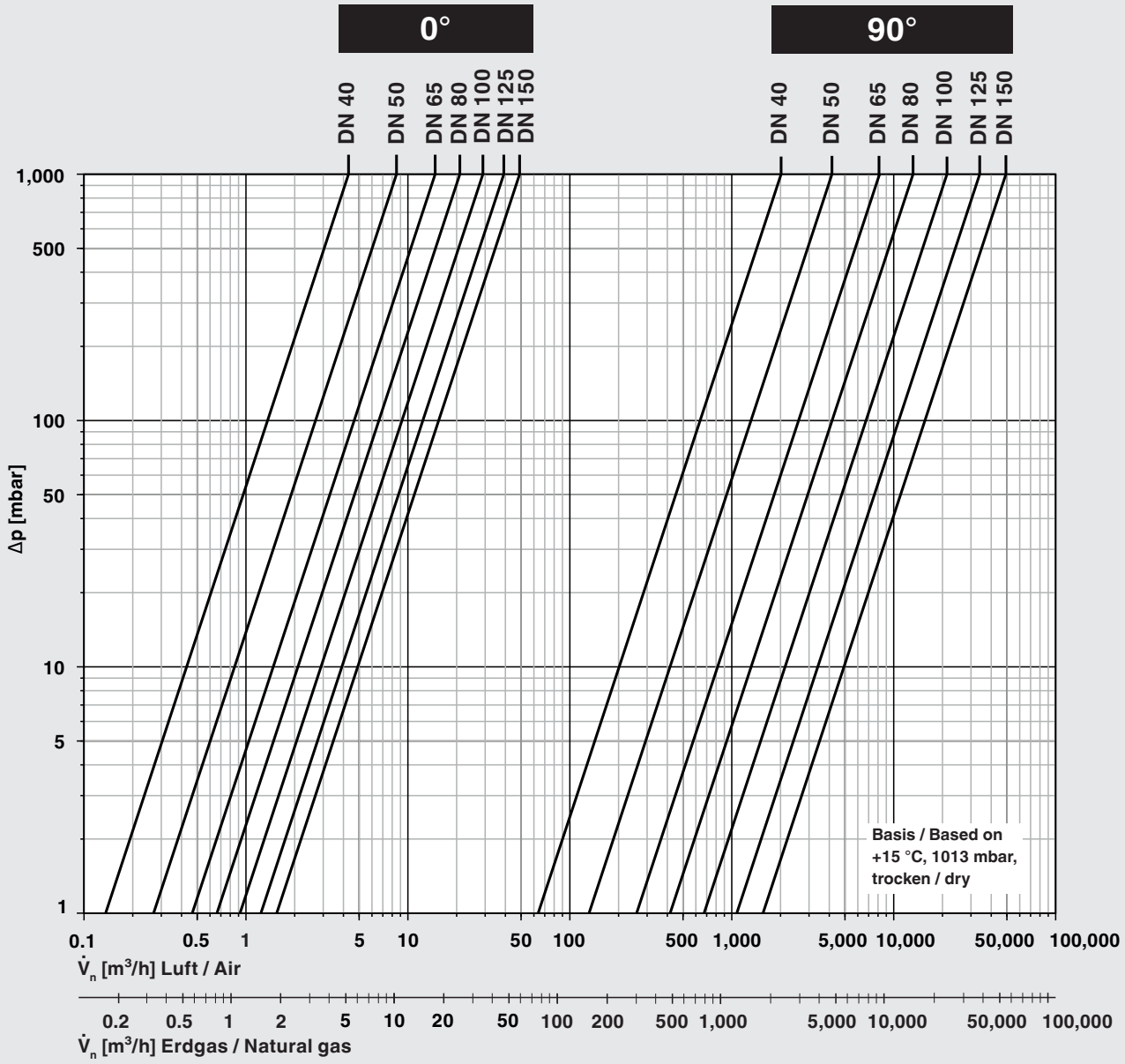
Inside diameter corresponds with the nominal diameter, no zero shut-off



Flow control valve for gas
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Flow diagram 2

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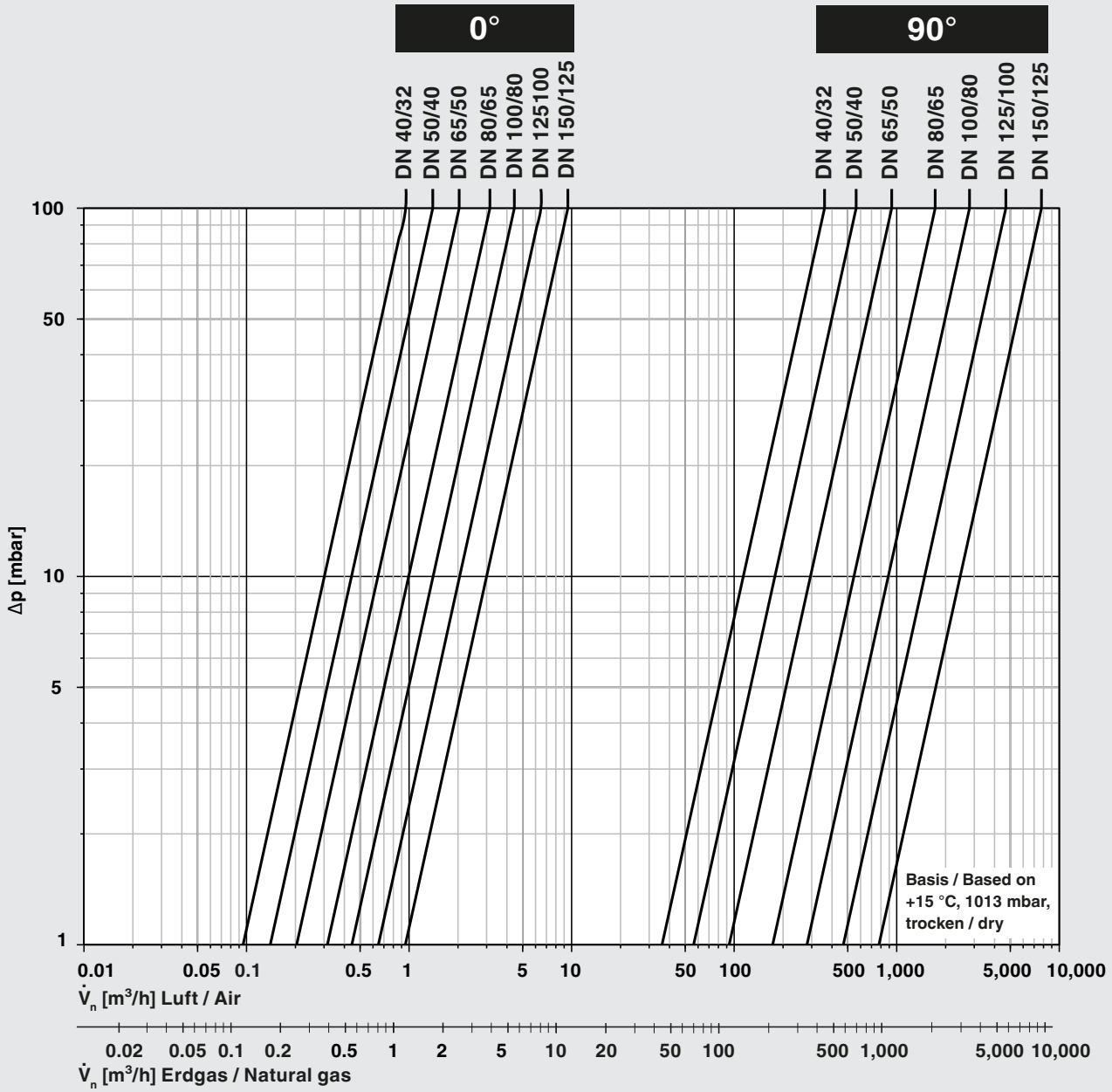
1-Fold reduced nominal diameter, no zero shut-off



Flow control valve for gas
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Flow diagram 3

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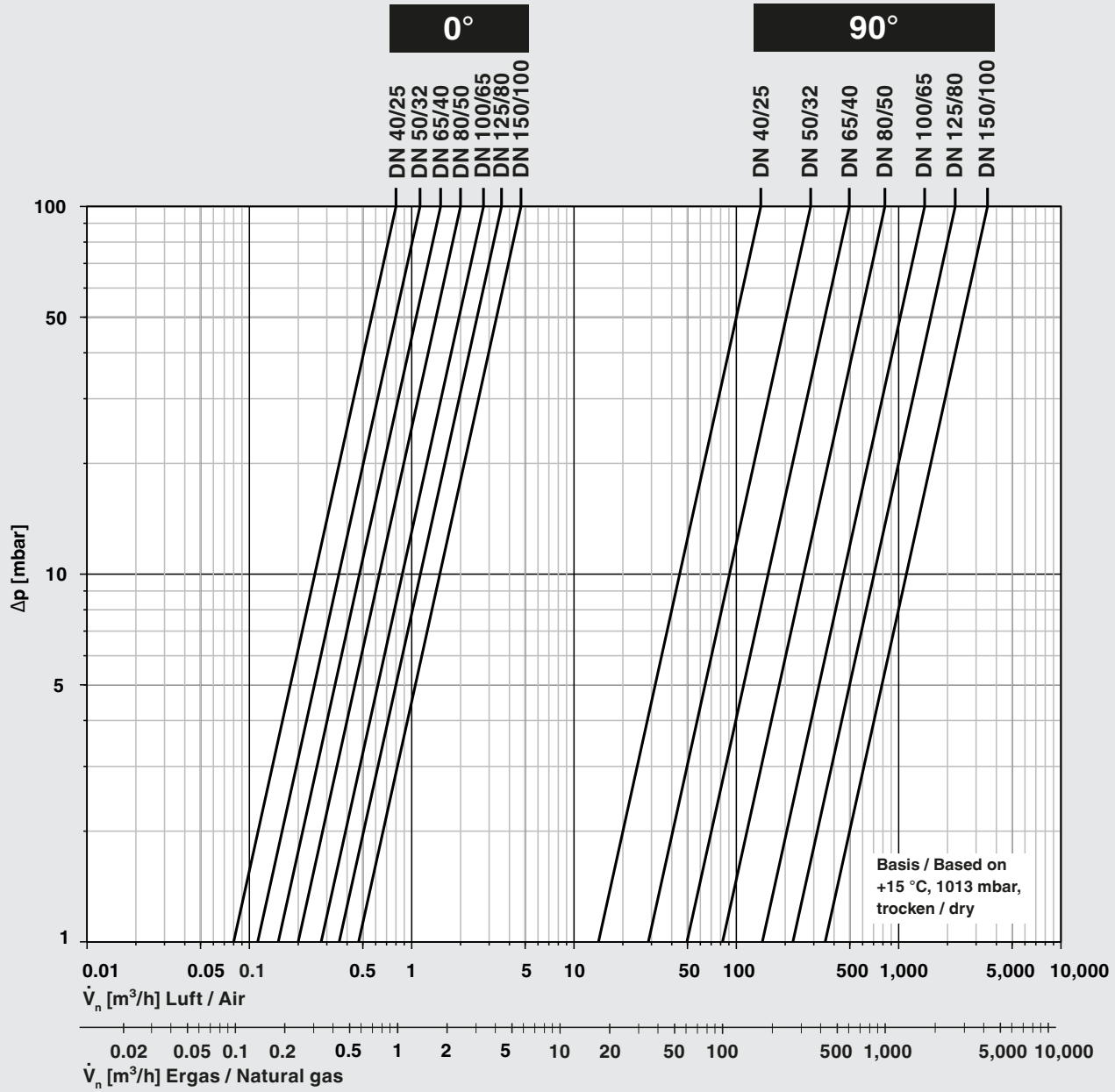
2-Fold reduced nominal diameter, no zero shut-off



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Recommended combination
Flow control valve with flow control drive FCD

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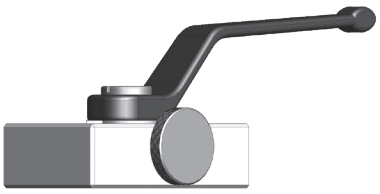
Type	Order No.	Type	AC	DC
FCV-G 5040/25	293970	FCD A 00-15 xx	293334	293911
FCV-G 5040/32	293971			
FCV-G 5040/40	293972			
FCV-G 5050/32	293973			
FCV-G 5050/40	293974			
FCV-G 5050/50	293975			
FCV-G 5065/40	293976			
FCV-G 5065/50	293977			
FCV-G 5065/65	293978			
FCV-G 5080/50	293979			
FCV-G 5080/65	293980			
FCV-G 5080/80	293981			
FCV-G 5100/65	293982	FCD A 01-15 xx	293916	293917
FCV-G 5100/80	293983			
FCV-G 5100/100	293984			
FCV-G 5125/80	293985			
FCV-G 5125/100	293986			
FCV-G 5125/125	293988			
FCV-G 5150/100	293989			
FCV-G 5150/125	293990			
FCV-G 5150/150	293991			

Replacement parts / Accessories	Order No.
Handle FCV	297283



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