Flow control valve for air
FCV...

Nominal diameter
DN 40 - DN 200

DUNGS®
Combustion Controls

FLOW CONTROL VALVE

AIR

- For high control accurary
- Reduced nominal diameter
- Directly mountable
  Flow Control Drives FCD

Technical description

The DUNGS flow control valve FCV... is a control element without zero shut-off.

The intermediate flange design allows space-saving installation upstream of the burner on pressure regulators and other actuators.

Application

The DUNGS flow control valve FCV... is used to regulate the air supply to air-consumption devices. The flow control valve is suitable for air up to 100 °C. Only non-flammable, inert media are permitted.

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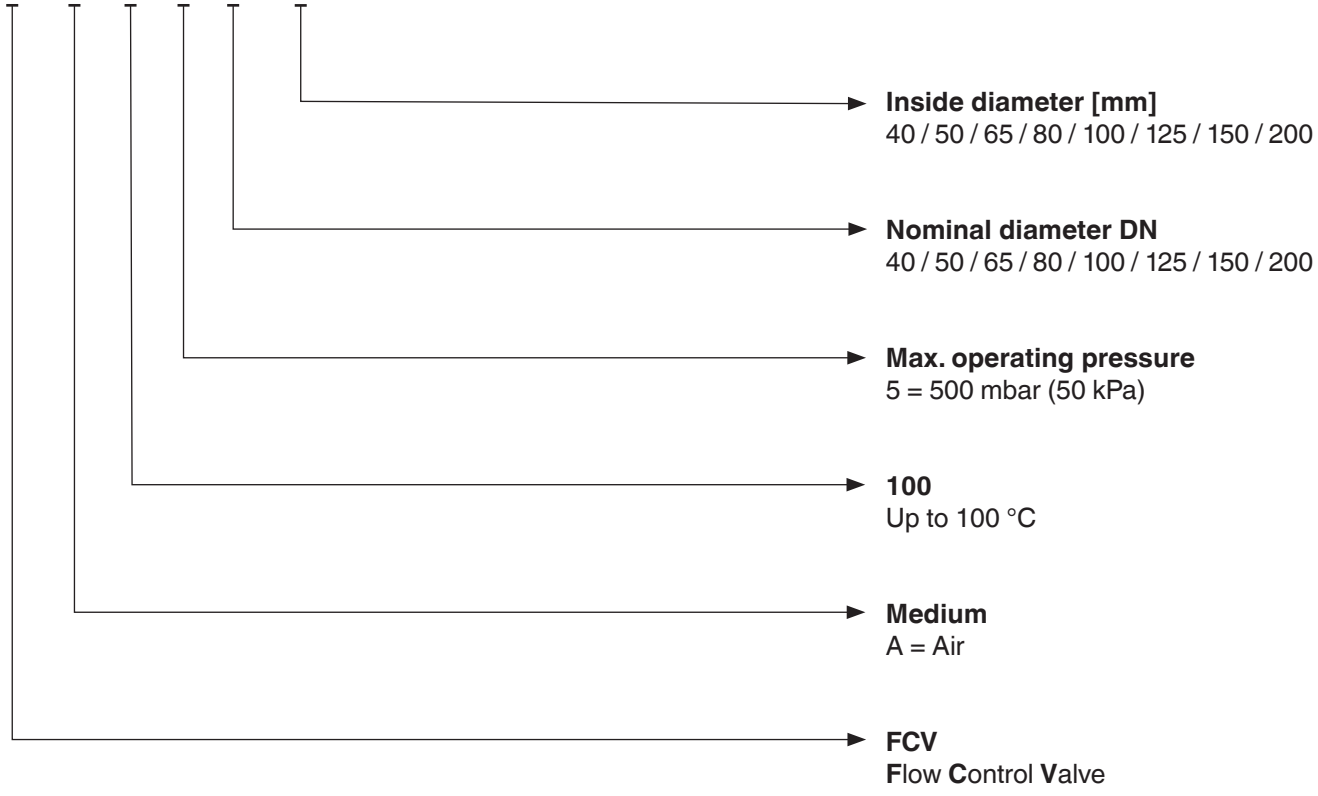
Technical data	
Nominal diameters **Flange**	DN 40 - DN 200 EN 1092-1
Max. operating pressure	500 mbar (50 kPa)
Max. differential pressure	≤ DN 100: 500 mbar ≥ DN 125: 250 mbar
Medium	Luft / Air
Ambient temperature	-20 °C to +70 °C
Medium temperature	-20 °C to +100 °C
Materials of the gas-carrying parts	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-A 100 XYYY/ZZ



For example: "FCV-A 100 5065/40"

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Function
The flow control valve FCV is used to adjust the air supply volume to air-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, 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 air volume 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-A 100 5040/25	293942	DN 40	25	1,00	500 mbar	500 mbar
FCV-A 100 5040/32	293943		32	0,90	500 mbar	
FCV-A 100 5040/40	293944		40	0,85	500 mbar	
FCV-A 100 5050/32	293947	DN 50	32	1,10	500 mbar	
FCV-A 100 5050/40	293948		40	1,05	500 mbar	
FCV-A 100 5050/50	293949		50	1,00	500 mbar	
FCV-A 100 5065/40	293950	DN 65	40	1,45	500 mbar	
FCV-A 100 5065/50	293951		50	1,40	500 mbar	
FCV-A 100 5065/65	293952		65	1,25	500 mbar	
FCV-A 100 5080/50	293953	DN 80	50	1,70	500 mbar	
FCV-A 100 5080/65	293954		65	1,60	500 mbar	
FCV-A 100 5080/80	293333		80	1,50	500 mbar	
FCV-A 100 5100/65	293955	DN 100	65	2,00	500 mbar	
FCV-A 100 5100/80	293956		80	1,90	500 mbar	
FCV-A 100 5100/100	293957		100	1,80	500 mbar	
FCV-A 100 5125/80	293958	DN 125	80	2,75	500 mbar	
FCV-A 100 5125/100	293959		100	2,60	500 mbar	
FCV-A 100 5125/125	293960		125	2,30	250 mbar	
FCV-A 100 5150/100	293961	DN 150	100	3,40	500 mbar	
FCV-A 100 5150/125	293962		125	3,00	250 mbar	
FCV-A 100 5150/150	293963		150	2,75	250 mbar	
FCV-A 100 5200/125	293964	DN 200	125	6,70	250 mbar	
FCV-A 100 5200/150	293965		150	6,20	250 mbar	
FCV-A 100 5200/200	293966		200	4,40	250 mbar	

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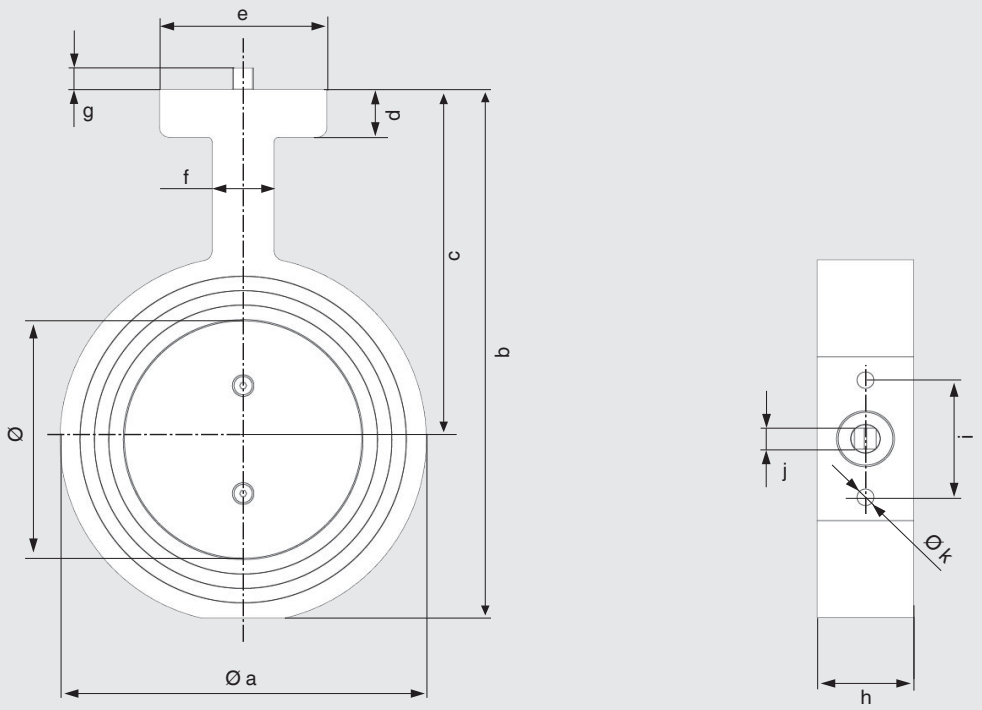
Flow control valve without actuator

Dimensions [mm]



Type	Nom-inal diame-ter	Ø Inside [mm]	Dimensions [mm]										
			Ø a	b	c	d	e	f	g	h	i	j	Ø k
FCV-A 5040	DN 40	40/32/25	87	155.0	113.5	20	70	26	9	40	50	9	7
FCV-A 5050	DN 50	50/40/32	97	165.0	118.5	20	70	26	9	40	50	9	7
FCV-A5065	DN 65	65/50/40	117	182.5	126.0	20	70	26	9	40	50	9	7
FCV-A 5080	DN 80	80/65/80	133	200.5	136.0	20	70	26	9	40	50	9	7
FCV-A 5100	DN 100	100/80/65	153	220.5	146.0	20	70	26	9	40	50	9	7
FCV-A 5125	DN 125	125/100/80	183	248.0	158.5	20	70	26	9	40	50	9	7
FCV-A 5150	DN 150	150/125/100	208	273.0	171.0	20	70	26	9	40	50	9	7
FCV-A 5200	DN 200	200/150/125	263	325.5	196.0	20	70	26	11	40	50	9	7

Flow control valve for air
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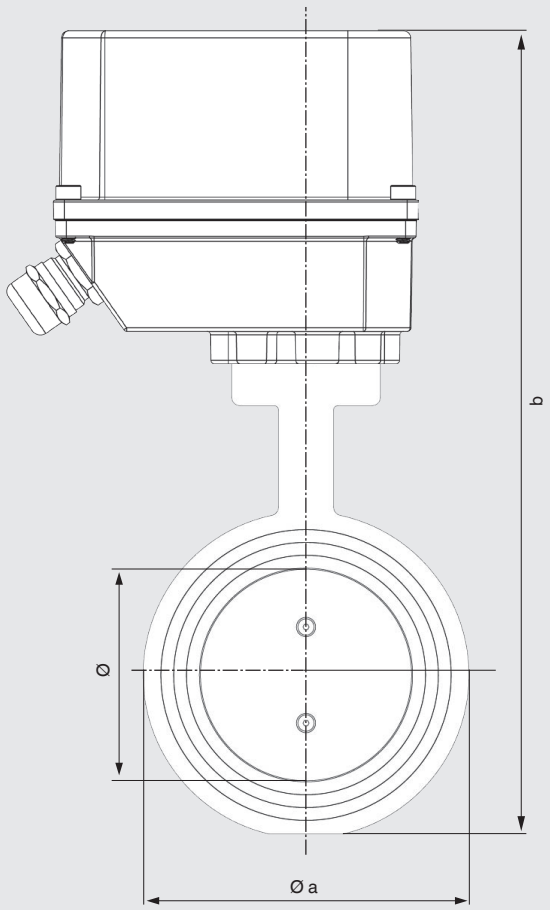
Flow control valve with flow control drive

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-A 5040	DN 40	40/32/25	87	277.0	297.0
FCV-A 5050	DN 50	50/40/32	97	287.0	307.0
FCV-A 5065	DN 65	65/50/40	117	304.5	324.5
FCV-A 5080	DN 80	80/65/80	133	322.5	342.5
FCV-A 5100	DN 100	100/80/65	153	342.5	362.5
FCV-A 5125	DN 125	125/100/80	183	370.0	390.0
FCV-A 5150	DN 150	150/125/100	208	395.0	415.0
FCV-A 5200	DN 200	200/150/125	263	447.5	467.5

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
DN 200	200	2.5	26.0	144.2	287.8	447.7	689.9	1047.0	1627.3	2429.9	3285.0

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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
DN 200/150	150	1.5	24.4	144.8	267.6	391.7	553.3	762.6	1031.7	1239.3	1374.5

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
DN 200/125	125	0.7	9.2	74.8	175.9	285.6	393.4	493.8	588.9	638.1	655.0

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Flow diagram 1

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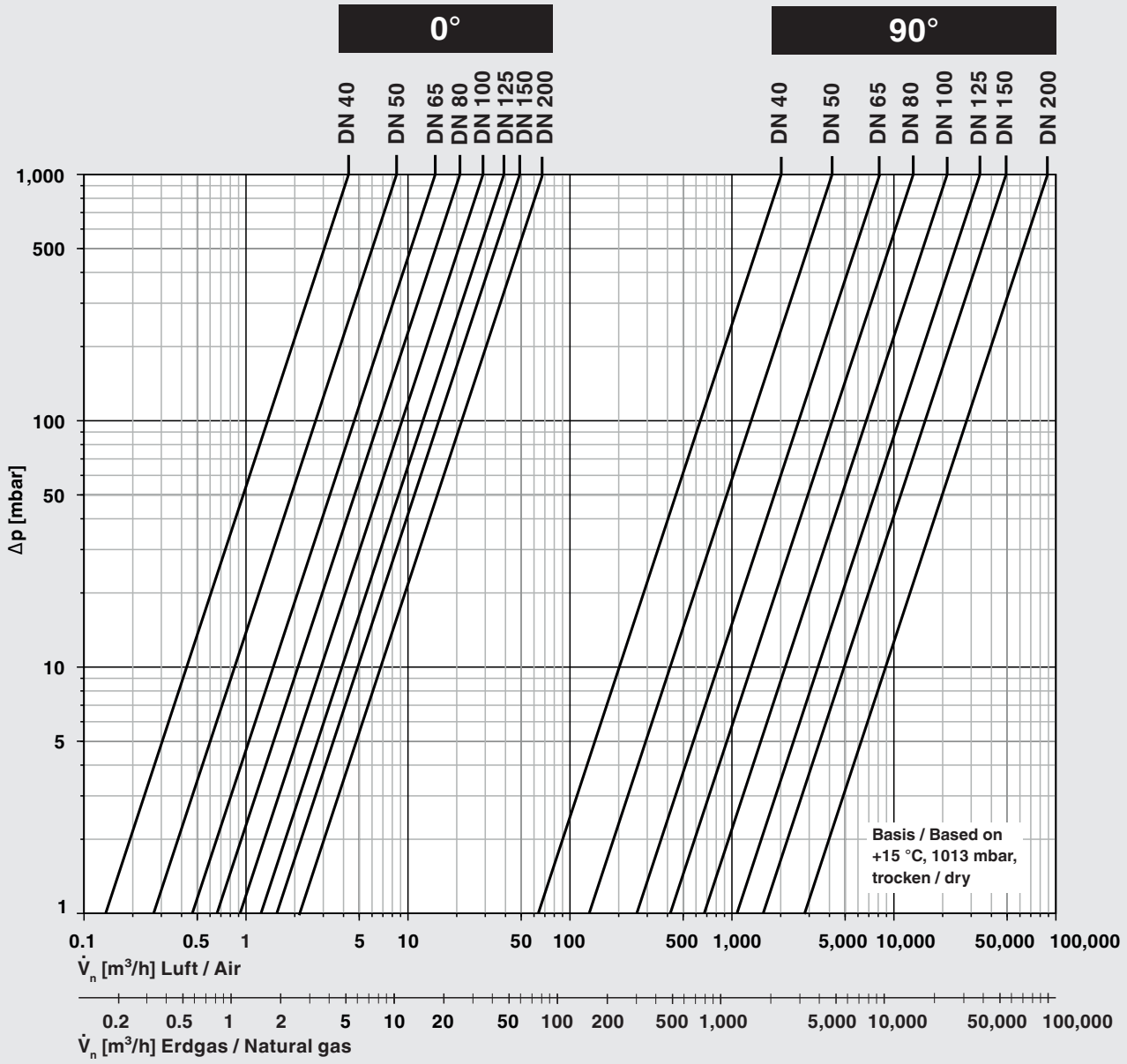
Inside diameter corresponds with the nominal diameter, no zero shut-off



Flow control valve for air
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Flow diagram 2

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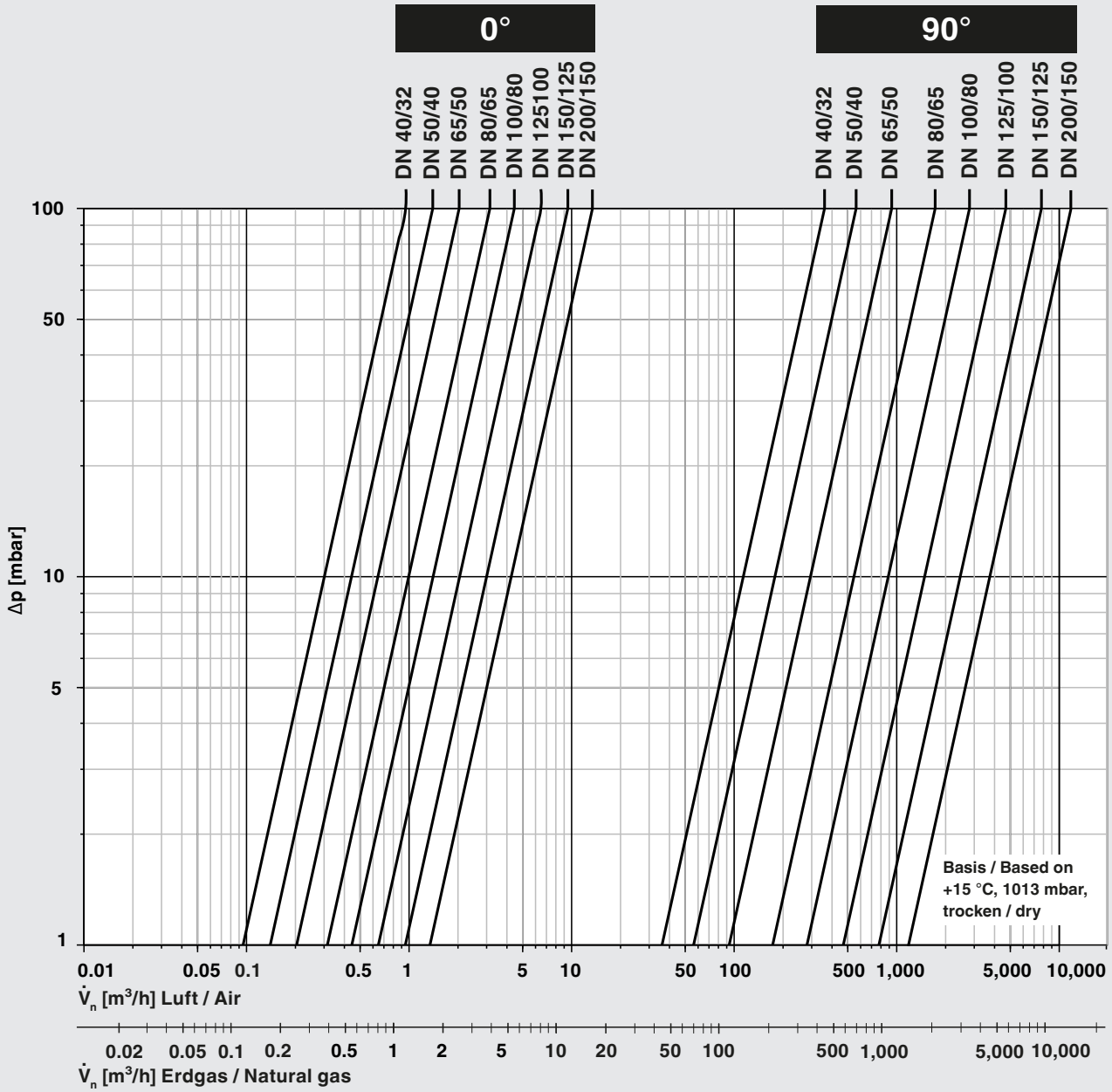
1-Fold reduced nominal diameter, no zero shut-off



Flow control valve for air
FCV...

Flow diagram 3

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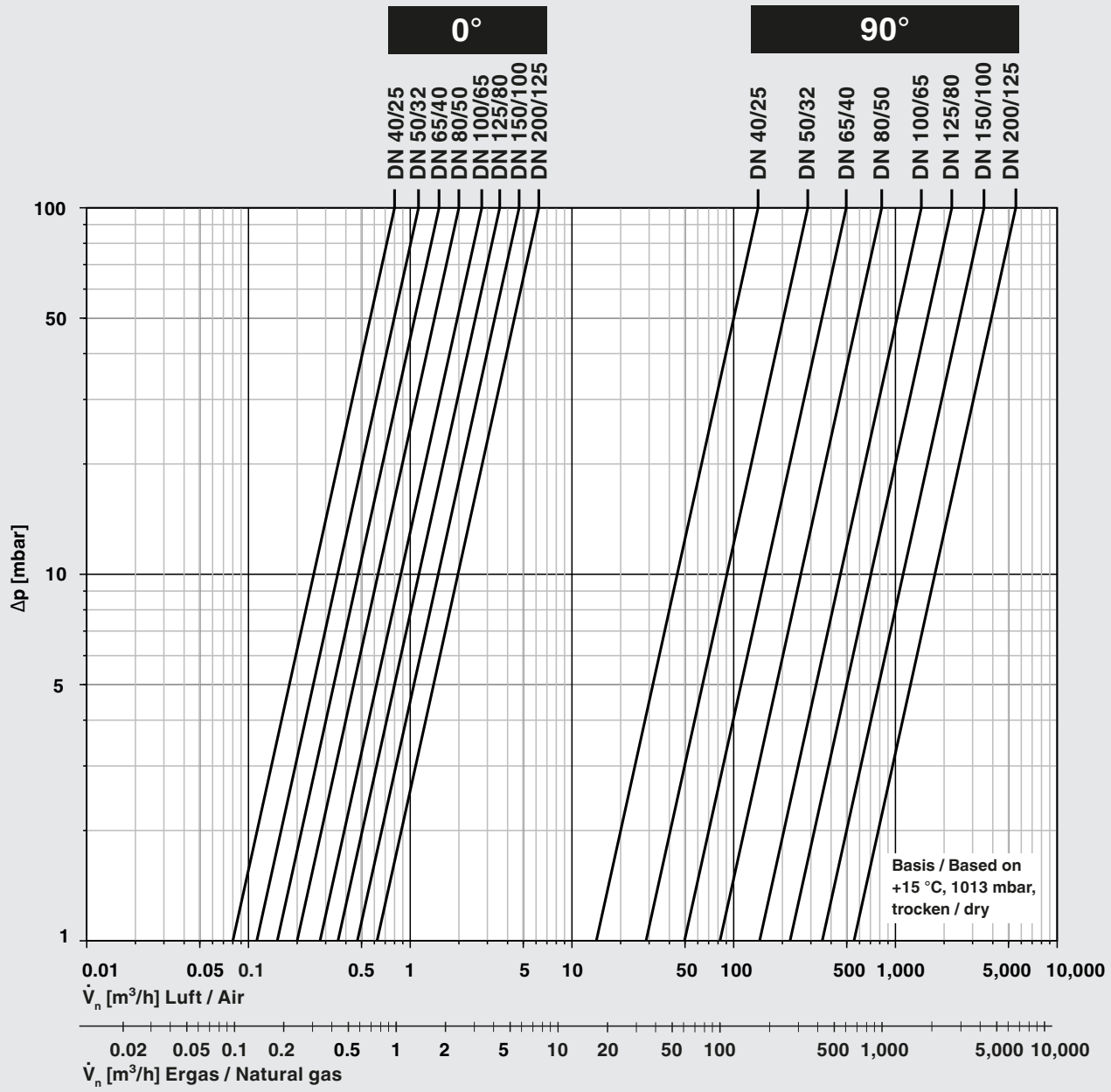
2-Fold reduced nominal diameter, no zero shut-off



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Recommended combination
Flow control valve with flow control drive FCD

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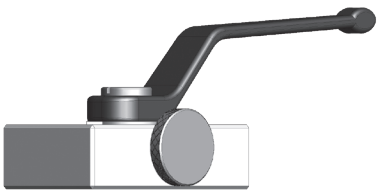
Type	Order No.	Type	AC	DC
FCV-A 5040 / 25	293942	FCD A 00-15 xx	293334	293911
FCV-A 5040 / 32	293943			
FCV-A 5040 / 40	293944			
FCV-A 5050 / 32	293947			
FCV-A 5050 / 40	293948			
FCV-A 5050 / 50	293949			
FCV-A 5065 / 40	293950			
FCV-A 5065 / 50	293951			
FCV-A 5065 / 65	293952			
FCV-A 5080 / 50	293953			
FCV-A 5080 / 65	293954			
FCV-A 5080 / 80	293333			
FCV-A 5100 / 65	293955	FCD A 01-15 xx	293916	293917
FCV-A 5100 / 80	293956			
FCV-A 5100 / 100	293957			
FCV-A 5125 / 80	293958			
FCV-A 5125 / 100	293959			
FCV-A 5125 / 125	293960			
FCV-A 5150 / 100	293961			
FCV-A 5150 / 125	293962			
FCV-A 5150 / 150	293963			
FCV-A 5200 / 125	293964			
FCV-A 5200 / 150	293965			
FCV-A 5200 / 200	293966			

Replacement parts / Accessories	Order No.
Handle FCV	297283



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