Flow Control Valve Linear
FCVL…

Nominal diameter
Rp ½ - Rp 2

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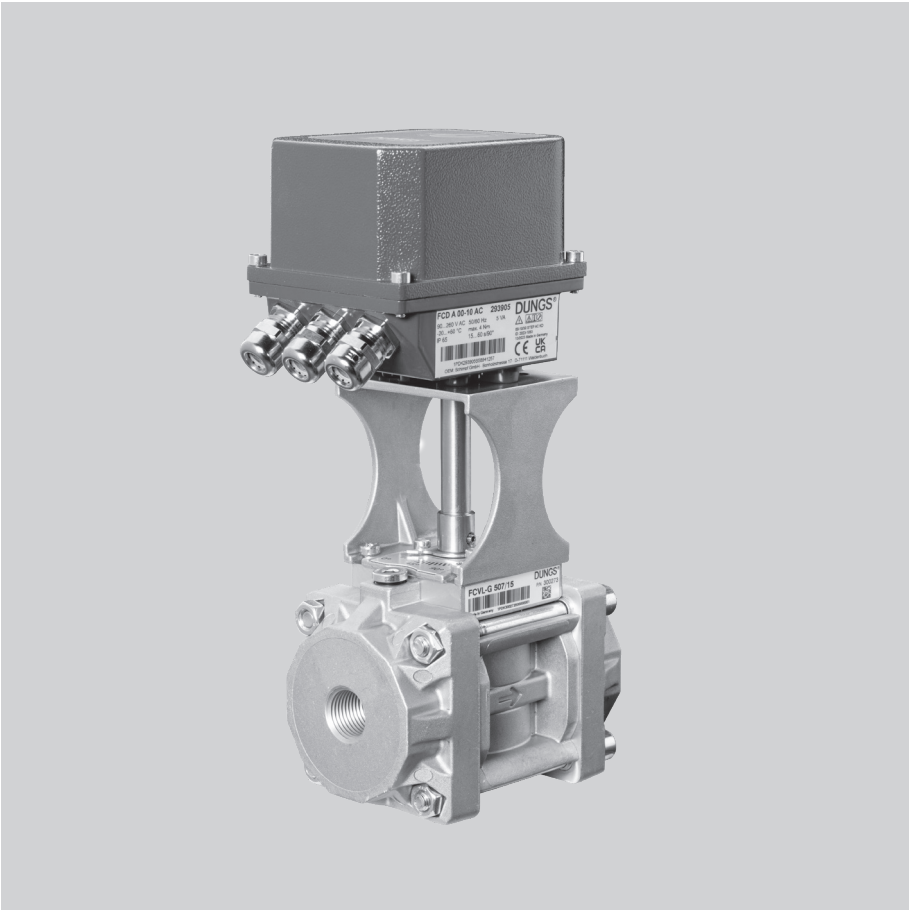
Combustion Controls

FLOW CONTROL VALVE LINEAR

GAS

- Linear relationship between flow rate and opening angle
- For high control accurary
- Directly mountable Flow Control Drives FCD
- Suitable for 100 % Hydrogen
- EU Certified



Technical description
The DUNGS flow control valve linear FCVL… is a control valve without zero shut-off according to EN 13611.

The compact construction consists of flow rate bodies with mounting threaded flanges, which allow for simple assembly with the pipeline infront of the burner.

Application
The DUNGS flow control valve linear FCVL… is used to control the gas supply to gas burners and gas appliances. The control valve is suitable for gases in gas families 1, 2 and 3, hydrogen (H_2, dry) and other neutral gases.

Certification
Examination certificate according to
- EU Gas Appliances Regulation
- UKCA Gas Appliances Regulation

Printed in Germany • Edition 2026.02 • No. 301224

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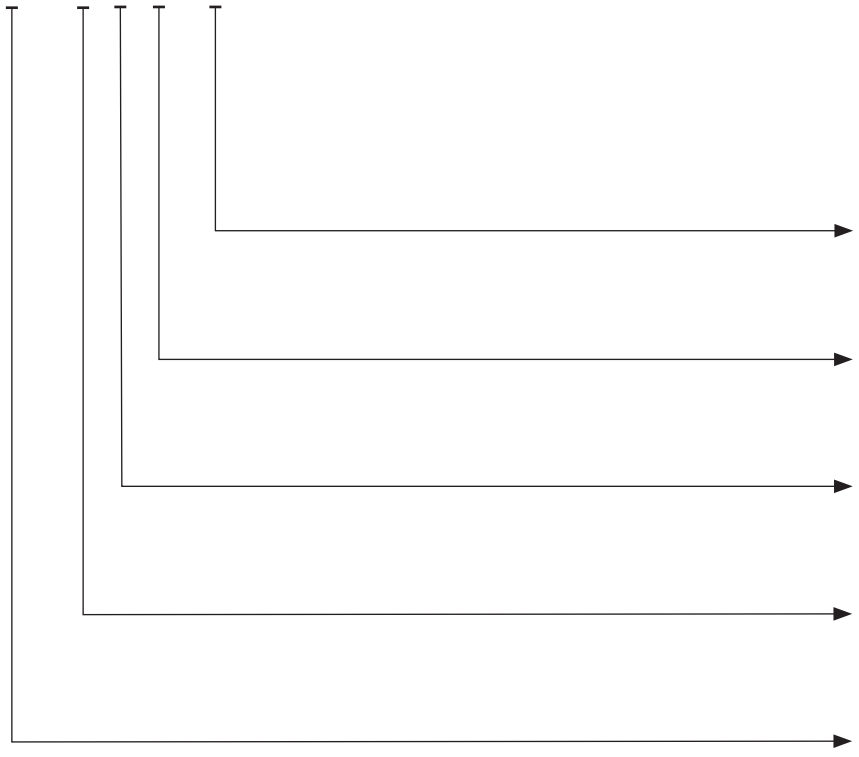
Technical data	
Nominal diameters	Rp ½ - Rp 2
Max. operating pressure	500 mbar (50 kPa)
Max. differential pressure	500 mbar
Medium	Gas families 1, 2 and 3, H_2 and other neutral gaseous media. Suitable for gases up to max. 0.1 vol. % H_2S
Ambient temperature	-20 °C to +60 °C
Medium temperature	-20 °C to +60 °C
Max. permissible actuating speed	1.5 s / 90°
Materials of the gas-carrying parts	Housing: aluminium Spindle: stainless steel Control cylinder: aluminium Threaded flange: aluminium Seals: NBR
Installation position	Vertically upright to lying horizontally
Drive adoption	External square 7 x 7 mm for direct mounting of actuators FCD..00-10 (standard version) External square 9 x 9 mm with adapter spindle (301787) for direct mounting of actuators FCD..00-15 and FCD..01-15 (optional, see accessories) Further adoptions on request

Type code FCV

FCVL-G XYY/ZZ



Control cylinder size
08 / 15 / 20 / 25 / 32 / 40 / 50

Nominal diameter Rp
05 (½"), 07 (¾"), 10 (1"), 12 (1¼"), 15 (1½"), 20 (2")

Max. operating pressure
5 = 500 mbar (50 kPa)

Medium
G = Gas

FCVL
Flow **C**ontrol **V**alve **L**inear

For example: "FCVL-G 515/40"

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Function

The flow control valve linear FCVL is used to adjust the gas supply volume to gas consumption devices and is an automatic control valve that is powered by auxiliary energy. The corresponding electromechanical actuator determines the position of the control cylinder and the operating time. The rotatable cylinders with an opening angle between 0° and 90° help to achieve high control accuracy and the desired flow rate. Different cross-section sizes for the medium are released depending on the opening angle and cylinder position. There is a linear relationship between flow rate and opening angle, which can be measured using an integrated position indicator. There are stops at approx. -5° and approx. 95°.

Depending on the model, the control cylinder is equipped with a different opening size so that it can maintain corresponding levels of flow rate.
A lever is available as an accessory for manually adjusting the opening angle.

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

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

⚠ Check for leaks and function after installation!

Type	Ordering no.	Nominal diameter	Cylinder [mm]	Weight [kg]	Max. operating pressure
FCVL-G 505/08	300272	Rp ½	08	1.65	
FCVL-G 507/15	300273	Rp ¾	15	1.65	
FCVL-G 510/20	300274	Rp 1	20	1.60	
FCVL-G 512/25	300275	Rp 1¼	25	1.60	500 mbar
FCVL-G 515/32	300276	Rp 1½	32	1.55	
FCVL-G 520/40	300277	Rp 2	40	1.50	
FCVL-G 520/50	300278	Rp 2	50	1.50	
FCVL-G 505/08 NPT	300686	NPT ½	08	1.65	
FCVL-G 507/15 NPT	300687	NPT ¾	15	1.65	
FCVL-G 510/20 NPT	300688	NPT 1	20	1.60	
FCVL-G 512/25 NPT	300689	NPT 1¼	25	1.60	500 mbar
FCVL-G 515/32 NPT	300690	NPT 1½	32	1.55	
FCVL-G 520/40 NPT	300691	NPT 2	40	1.50	
FCVL-G 520/50 NPT	300692	NPT 2	50	1.50	

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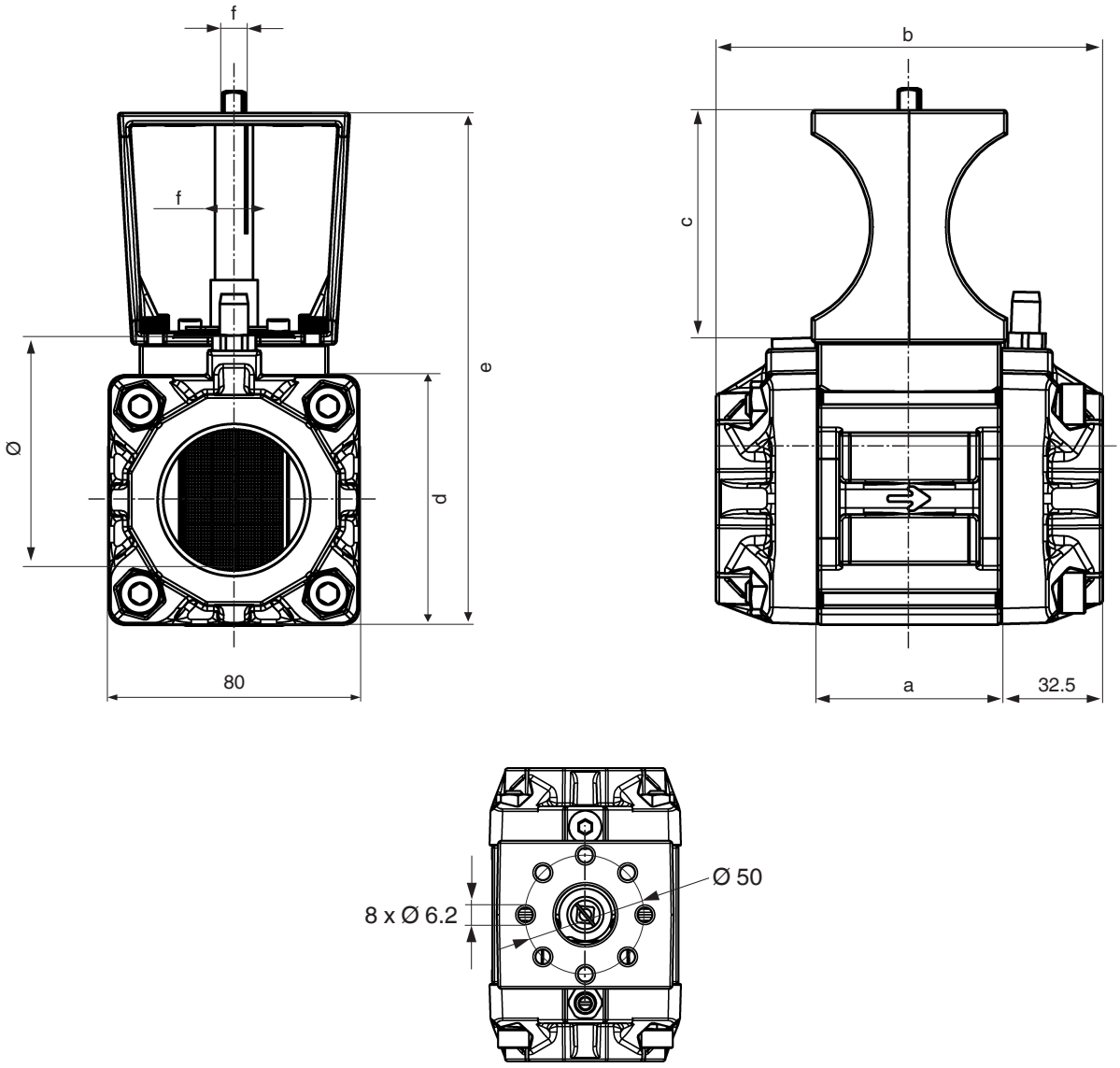
Dimensions [mm]



Type	Nominal diameter	Cylinder [mm]	Dimensions [mm]						
			a	b	c	d	e	f	Height incl. drive FCD..00-10
FCVL-G 505/08	Rp / NPT ½	08	58	123	74	80	164	7 x 7	256.5
FCVL-G 507/15	Rp / NPT ¾	15							
FCVL-G 510/20	Rp / NPT 1	20							
FCVL-G 512/25	Rp / NPT 1¼	25							
FCVL-G 515/32	Rp / NPT 1½	32							
FCVL-G 520/40	Rp / NPT 2	40							
FCVL-G 520/50	Rp / NPT 2	50							

Flanges & 4 screws are enclosed.

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

1. Max. flow rate $V_{max.}$
2. Pressure loss Δp at max. flow rate
3. Min. flow rate $V_{min.}$
4. Differential pressure when the control valve is in the closed position (= pu)

The control cylinder size can be determined either mathematically via the K_v value or using the flow diagram.
Check whether the required minimum flow rate is reached when the cylinder is positioned at 0°.
If the calculated or measured value is below the required minimum flow rate, the cylinder can be used.

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

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

K_v values for flow control valve linear FCVL
The flow control valve linear FCVL is limited by the following parameters:

Max. operating pressure
500 mbar (50 kPa)

Differential pressure
500 mbar

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

V_n [m³/h]
Flow rate, standard state
Δp [bar]
Pressure loss FCVL
p_2 [bar]
Absolute pressure downstream of FCVL
ρ_n [kg/m³]
Standard gas density
T_1 [K]
Absolute gas temperature upstream of FCVL
K_V [m³/h]
Valve flow coefficient, value taken from the table below

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

Type / control cylinder size	K_v value for control cylinder position		Mounted inlet / outlet flange size
	0°	90°	
FCVL..08	0.09	4.3	½"
FCVL..15	0.09	7.5	¾"
FCVL..20	0.09	14.0	1"
FCVL..25	0.10	19.1	1¼"
FCVL..32	0.10	35.6	1½"
FCVL..40	0.11	72.3	2"
FCVL..50	0.11	119.6	2"

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Flow rate curves

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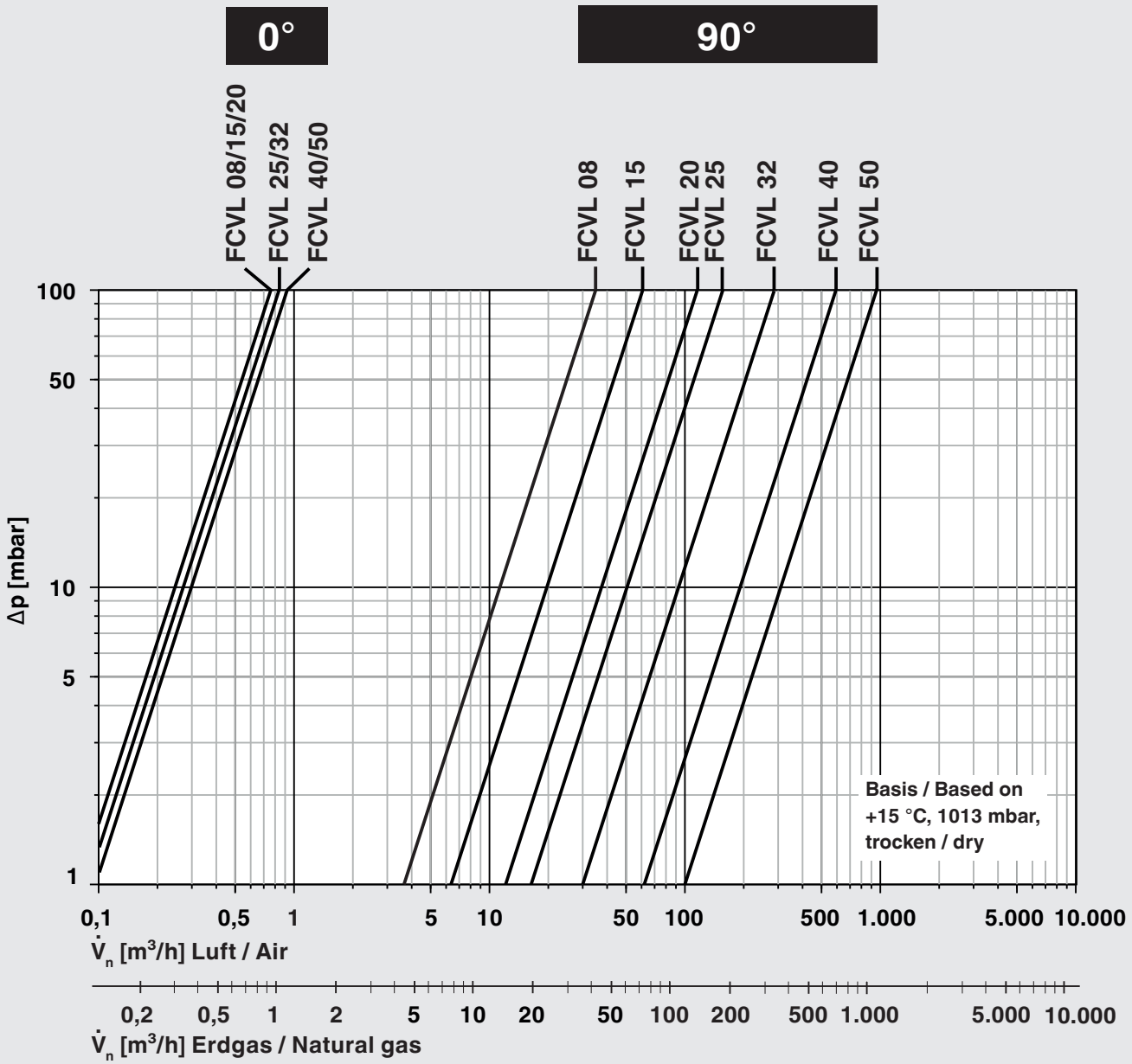

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Replacement parts / accessories

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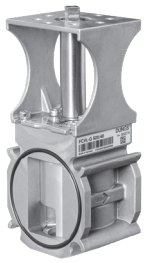
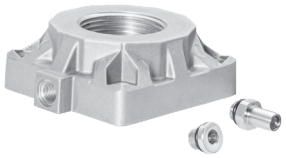
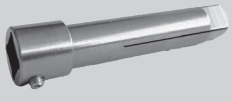
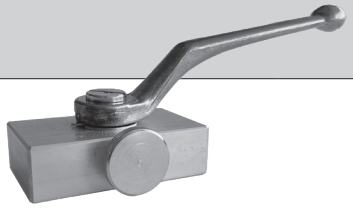
Flow bodies*	Ordering no.	Control cylinder size	
FCVL-G Body/08	300931	08	
FCVL-G Body/15	300932	15	
FCVL-G Body/20	300933	20	
FCVL-G Body/25	300934	25	
FCVL-G Body/32	300935	32	
FCVL-G Body/40	300936	40	
FCVL-G Body/50	300937	50	
Mounting Flange Rp / NPT		**Nominal diameter**	
FCVL-G Flange Rp ½	300940	½	
FCVL-G Flange Rp ¾	300941	¾	
FCVL-G Flange Rp 1	300942	1	
FCVL-G Flange Rp 1¼	300943	1¼	
FCVL-G Flange Rp 1½	300944	1½	
FCVL-G Flange Rp 2	300945	2	
FCVL-G Flange NPT ½	302119	½	
FCVL-G Flange NPT ¾	302120	¾	
FCVL-G Flange NPT 1	302121	1	
FCVL-G Flange NPT 1¼	302124	1¼	
FCVL-G Flange NPT 1½	302125	1½	
FCVL-G Flange NPT 2	302126	2	
Replacement parts			
FCVL-G O-Ring Set	300946		
FCVL-G Mounting Set	300947		
Accessories			
FCVL-G Filter	301212		
FCVL-G Adapter Spindle 9 x 9 (for direct mounting of actuators FCD..00-15 and FCD..01-15)	301787		
FCVL-G Handle 7 x 7	301213		

*incl. fastening screws and nuts for the flanges; O-rings and fastening screws for the actuator FCD

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