

Two-stage safety solenoid valves ZRD/5, ZRLE/5, ZRDLE/5

6.03

DUNGS®



Technical description

The DUNGS safety solenoid valve ZR... is a two-stage automatic shut-off valve as per EN 161 for gas burners and gas appliances.

- Max. operating pressure up to 360 mbar
- Class A, Group 2 as per EN 161
- normally closed
- Fast closing
- Fast opening: ZRD
- Slow opening with adjustable fast stroke for start gas volume: ZRLE and ZRDLE
- Main and partial volumes adjustable: ZRD and ZRDLE
- DC solenoid, rectifier wiring with radio interference suppression in terminal box
- Mountable closed position signal contact to monitor closed position of valve
- Pipe thread as per ISO 7/1
- Flange connection as per DIN 2633, ISO 7005
- Reliable function, rugged and maintenance-free

Application

The solenoid valve is used for securing, limiting, shutting off and releasing gas supply to gas burners and gas appliances.

The DUNGS safety solenoid valve ZR... is suitable for gases of families 1, 2, 3 and other neutral gaseous media.

Approval

EU type test approval as per EU Gas Appliance Directive.

ZR...(DLE) 407/4020	CE-0085 AQ 0329
ZR...(DLE) 410/4025	CE-0085 AQ 0330
ZR...(DLE) 415/4040	CE-0085 AQ 0331
ZR...(DLE) 420/4050	CE-0085 AQ 0332

Approvals in other important gas-consuming countries.

ZRD/5 Two-stage solenoid valve, normally when closed, fast opening, fast closing. Main volume adjustable. Partial volume adjustable. Closed position signal contact mountable.

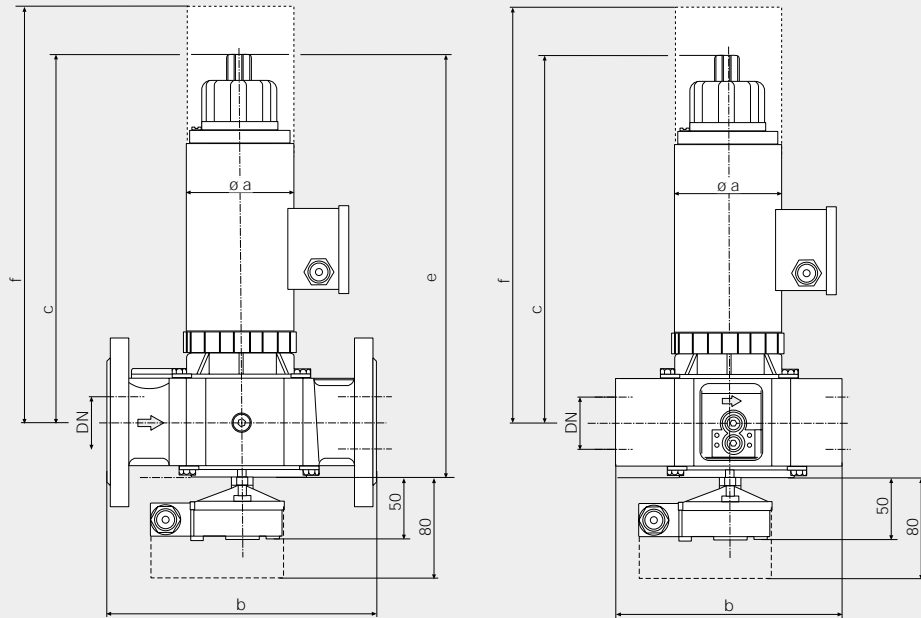
ZRLE/5 Two-stage solenoid valve, normally when closed, slow opening with adjustable fast stroke, fast closing. Main volume adjustable. Partial volume adjustable. Closed position signal contact mountable.

ZRDLE/5 Two-stage solenoid valve, normally when closed, slow opening with adjustable fast stroke, fast closing. Main volume adjustable. Partial volume adjustable. Closed position signal contact mountable.

Specifications

Nominal diameters	DN 20 25 40 50
Pipe thread as per ISO 7/1	Rp 3/4 1 1 1/2 2
Flange	Connection flange as per DIN 2501 Part 1, to fit preweld flanges as per DIN 2633 (PN 16) DN 20 to DN 50, ISO 7005 - 1 (PN 16), ISO 7005 - 2 (PN 16)
Max. operating pressure	up to 360 mbar (36 kPa)
Solenoid valve	Valve as per EN 161, Class A, Group 2, two-stage mode, EN 1531
Pressure stage	PN 1
Closing time	< 1 s
Opening time	< 1 s for ZRD; for ZRLE and ZRDLE approx. 20 s at approx. +20°C and without fast stroke
Fast stroke	Manually adjustable for ZRLE and ZRDLE
Main volume adjustment	Manually adjustable for ZRL and ZRDLE
Partial volume adjustment	Manually adjustable for ZRLE and ZRDLE
Materials of gas-conveying parts	Housing: aluminium, steel, brass Seals: NBR basis
Voltage/frequency	50-60 Hz, 230 V AC (+10% -15%); further voltages on request
Rating / power consumption	Refer to type overview
Switch-on duration	100%
Degree of protection	IP 54, IP 65 on request
Electrical connection	At screw terminals via PG* 11 cable gland (* = heavy-gauge conduit thread)
Switching rate	ZRD 4.../5: max. 1000/h ZRLE 4.../5, ZRDLE 4.../5: max. 100/h
Measuring/ignition gas connection	G 1/4 ISO 228, on both sides in inlet section, additionally G 3/4 on inlet side, from size DN 40 (flange) upwards
Dirt trap	Sieve installed, mesh width 1 mm
Ambient temperature	-15 °C to +60 °C
Installation position	Solenoid from vertically upright to horizontally lying
Closed position signal contact	Type K01/1, DIN-tested
Valve proving system	Type VDK 200 A S02, mountable via G 1/4 test connection, Type VPS 504, mountable on housing Rp 3/4 to Rp 2 with adapter
Accessories	K01 closed position signal contact, see Datasheet 12.01 211 202

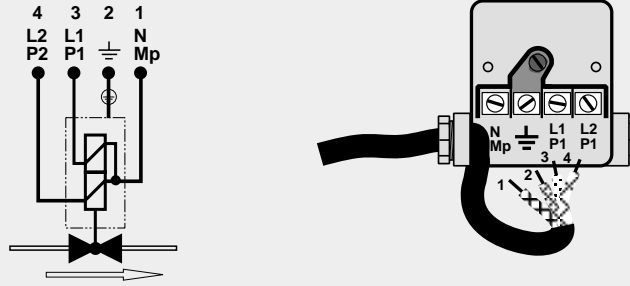
Dimensions [mm]



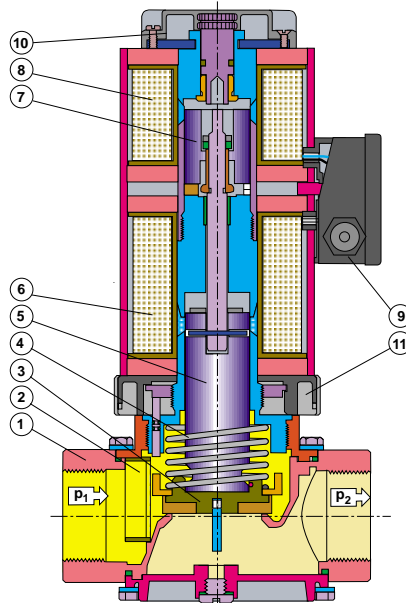
d = largest width

Type	DN/Rp	P _{max.} [VA]	Order No.	I _{max.} ~(AC) 230V	I _{max.} ~(AC) 230V	Opening time	Dimensions [mm]						Weight [kg]
							a	b	c	d	e	f	
ZRD 407/5	Rp 3/4	52	153 810	0.10	0.14	< 1 s	75	100	185	80	210	300	4,0
			153 830	0.10	0.14	< 1 s	75	110	185	90	215	300	4,2
			153 850	0.14	0.27	< 1 s	95	150	250	116	290	410	9,5
			153 870	0.14	0.27	< 1 s	95	170	250	130	295	410	10,4
ZRD 4020/5	DN 20	52	on request	0.10	0.14	< 1 s	75	155	185	105	210	300	4,9
			on request	0.10	0.14	< 1 s	75	165	185	115	215	300	5,3
			155 420	0.14	0.27	< 1 s	95	200	250	150	290	410	11,0
			155 440	0.14	0.27	< 1 s	95	230	250	165	295	410	12,5
ZRLE 407/5	Rp 3/4	52	109 934	0.10	0.14	20 s	75	100	220	80	245	290	3,9
			109 942	0.10	0.14	20 s	75	110	220	90	250	290	4,1
			109 959	0.14	0.27	20 s	95	150	275	116	315	390	9,3
			110 083	0.14	0.27	20 s	95	170	280	130	325	390	10,2
ZRLE 4020/5	DN 20	52	117 879	0.10	0.14	20 s	75	150	220	105	245	290	4,8
			117 887	0.10	0.14	20 s	75	160	220	115	250	290	5,2
			117 895	0.14	0.27	20 s	95	200	275	150	315	390	10,8
			117 903	0.14	0.27	20 s	95	230	280	165	325	390	12,3
ZRDLE 407/5	Rp 3/4	52	153 820	0.10	0.14	20 s	75	100	235	80	260	300	4,0
			153 840	0.10	0.14	20 s	75	110	235	90	265	300	4,2
			153 860	0.14	0.27	20 s	95	150	295	116	340	410	9,5
			153 880	0.14	0.27	20 s	95	170	300	130	345	410	10,4
ZRDLE 4020/5	DN 20	52	155 390	0.10	0.14	20 s	75	150	235	105	260	300	4,9
			155 410	0.10	0.14	20 s	75	160	235	115	265	300	5,3
			155 430	0.14	0.27	20 s	95	200	300	150	340	410	11,0
			155 450	0.14	0.27	20 s	95	230	300	165	345	410	12,5

Electrical connection

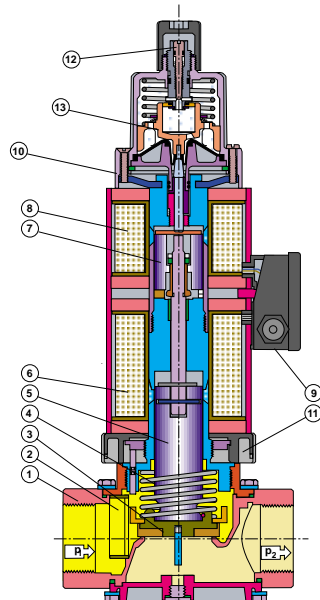


ZRD sectional drawing



- 1 Housing
- 2 Sieve
- 3 Valve plate
- 4 Closing spring
- 5 Armature, stage 2
- 6 Solenoid, stage 2
- 7 Armature, stage 1
- 8 Solenoid, stage 1
- 9 Electrical connection
- Setting
- 10 - Stage 1
- 11 - Stage 2

ZRDLE sectional drawing



- 1 Housing
- 2 Sieve
- 3 Valve plate
- 4 Closing spring
- 5 Armature, stage 2
- 6 Solenoid, stage 2
- 7 Armature, stage 1
- 8 Solenoid, stage 1
- 9 Electrical connection
- Setting
- 10 - Stage 1
- 11 - Stage 2
- 12 - Fast stroke
- 13 Hydraulic brake

Functional description

The DUNGS safety solenoid valve is an automatic shut-off valve operated with auxiliary power.

The electromagnetic drive opens against the force of the closing spring 4. The stroke of armature 7 can be limited by the setting screw. The hydraulic brake 13 permits slow

opening. Fast stroke 12 can be adjusted.

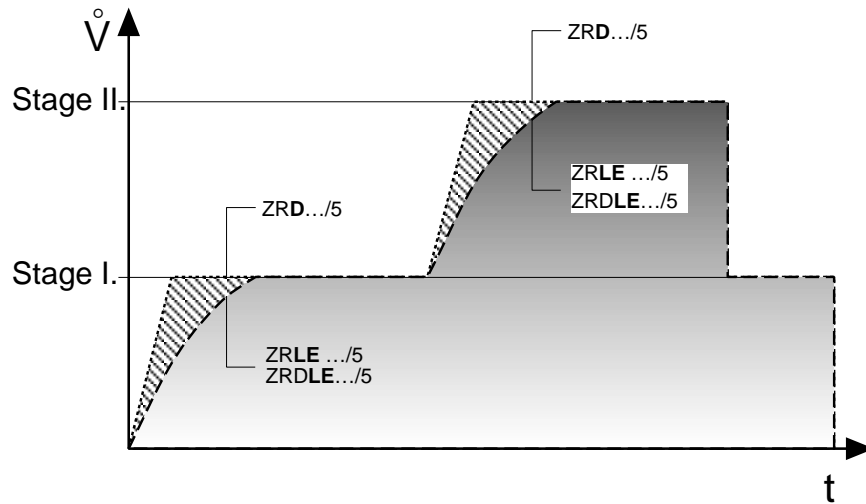
If voltage is applied to the solenoid of stage 1, armature 7 opens up to the adjusted partial volume.

If voltage is applied to the solenoid of stage 2, armature 5 opens up to the adjusted main volume.

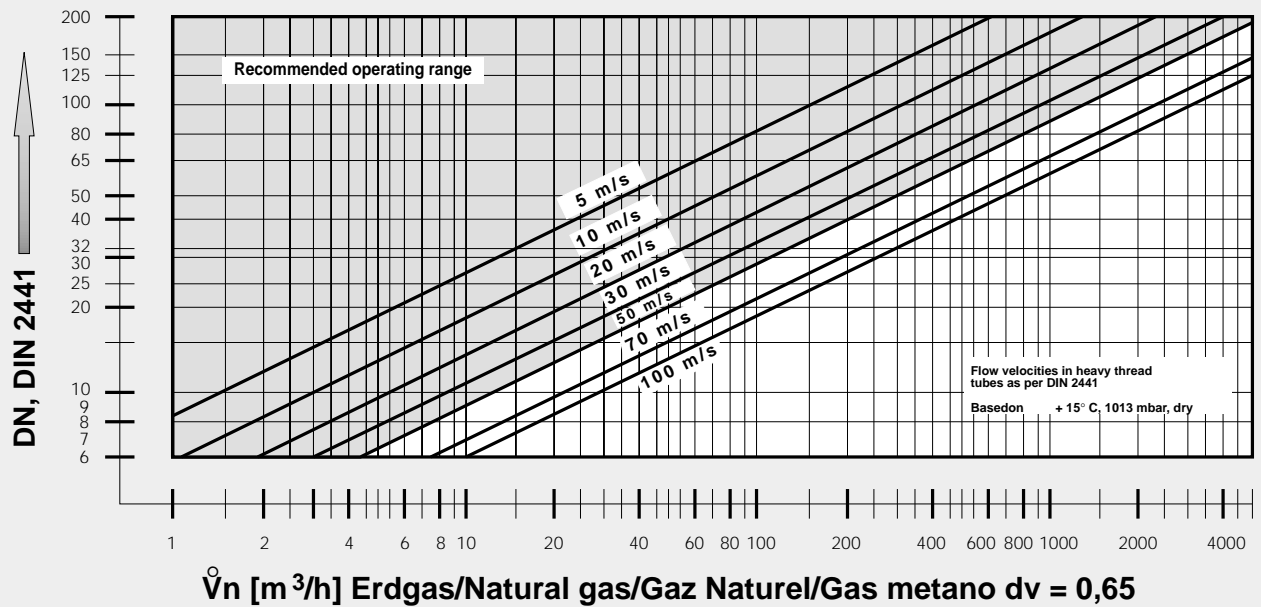
If the auxiliary power is interrupted (operating voltage), closing spring 4 closes the valve within 1 second.

The closed position of the valve can be monitored by a mountable closed position signal contact.

Opening behaviour of ZR.../5



Flow velocity



$$\dot{V}_{\text{verwendetes Gas/gas used/ gaz utilisé/gas utilizzato}} = \dot{V}_{\text{Luft/air/airaria}} \times f$$

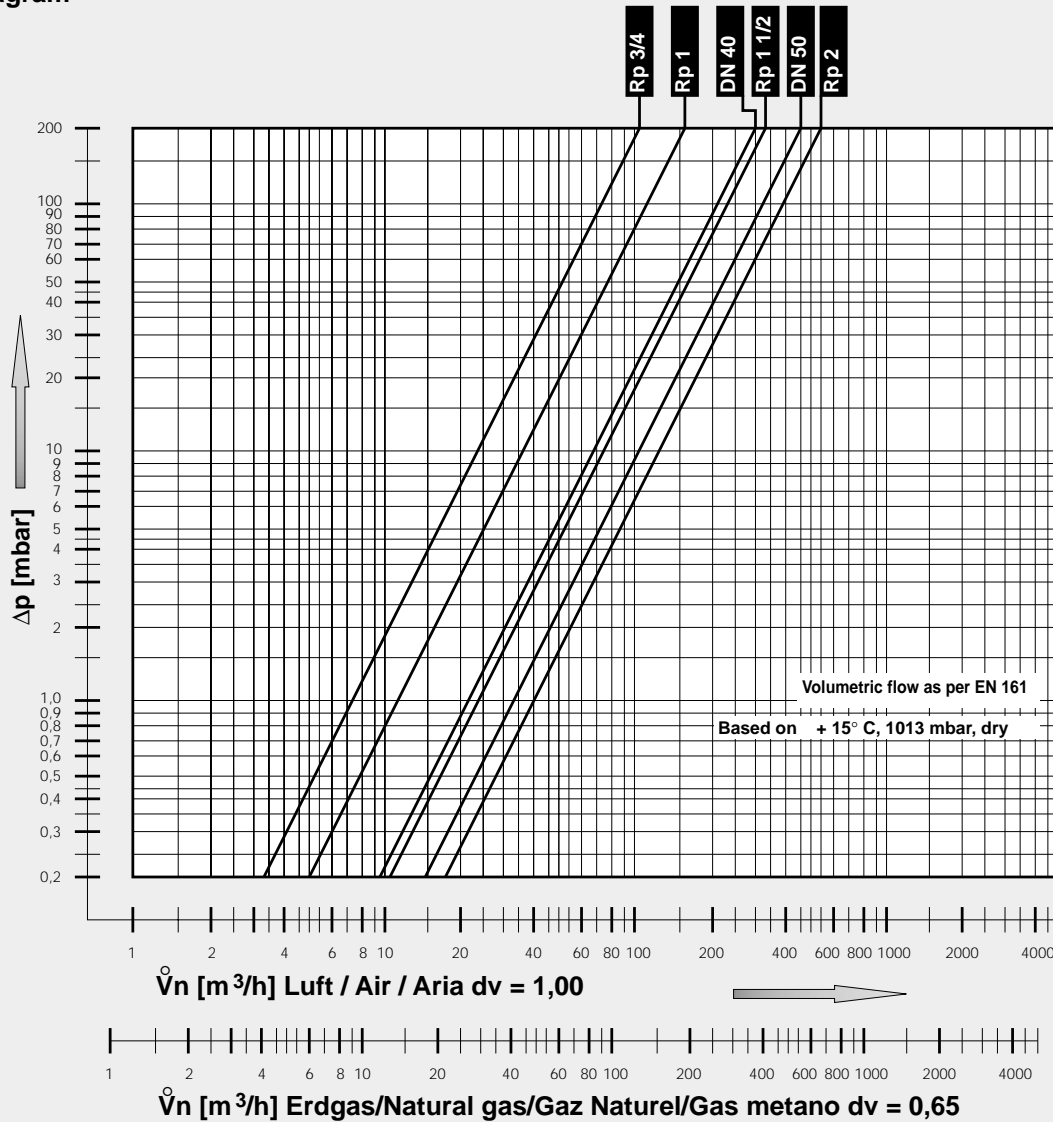
$$f = \frac{\text{Dichte Luft / Spec. weight air / poids spécifique de l'air / peso específico aria}}{\text{Dichte des verwendeten Gases / Spec. weight of gas used / poids spécifique du gaz utilisé / peso específico del gas utilizado}}$$

Gasart Type of gas Type de gaz Tipo di gas	Dichte Spec. Wgt. poids spécifique Peso específico [kg/m³]	dv	f
Erdgas/Nat. Gas/ Gaz naturel/Gas metano	0.81	0.65	1.24
Stadtgas/City gas/ Gaz de ville/Gas città	0.58	0.47	1.46
Flüssiggas/LPG/ Gaz liquide/Gas liquido	2.08	1.67	0.77
Luft/Air/ Air/Aria	1.24	1.00	1.00

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solenoid valves
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Flow diagram



We reserve the right to make any changes in the interest of technical progress.



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