

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

6.22

DUNGS[®]
Combustion Controls



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 (36 kPa)
- Class A, Group 2 as per EN 161
- normally closed
- Fast closing
- Slow opening with adjustable fast stroke for start gas volume: ZRLE and ZRDLE
- Main and partial volumes adjustable: 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 EN 1092-1
- 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

EC type testing certificate as per:

- EC-Gas Appliances Regulation

Approvals in other important gas consuming countries.

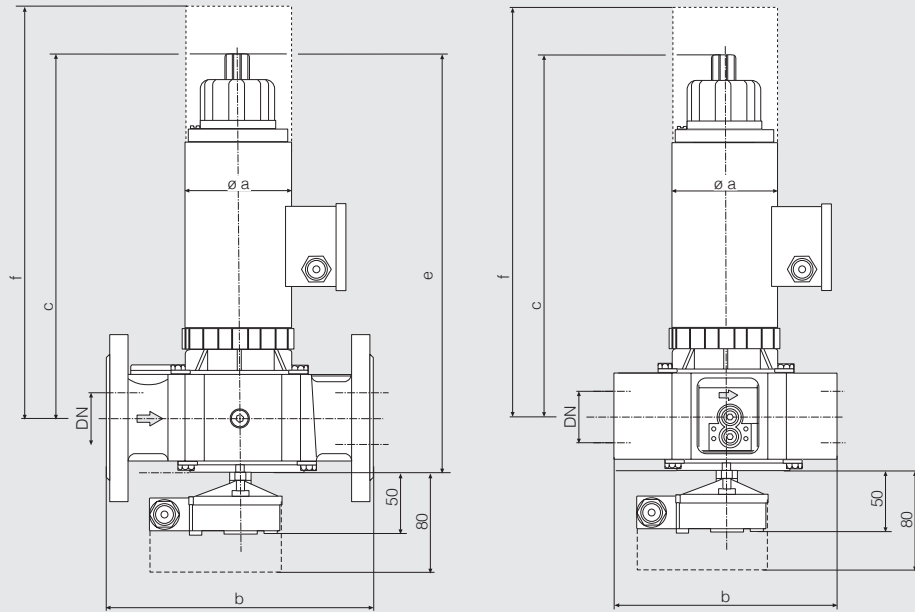
ZRLE/5 Two-stage solenoid valve, normally when closed, slow opening with adjustable fast stroke, fast closing. Partial volume adjustable. Closed position signal contact mountable.

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	40	50
Pipe thread as per ISO 7/1	Rp	3/4 1	1 1/2 2
Flange	Connection flange (PN 16) as per DIN EN 1092-1		
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		
Closing time	< 1 s		
Opening time	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 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	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	

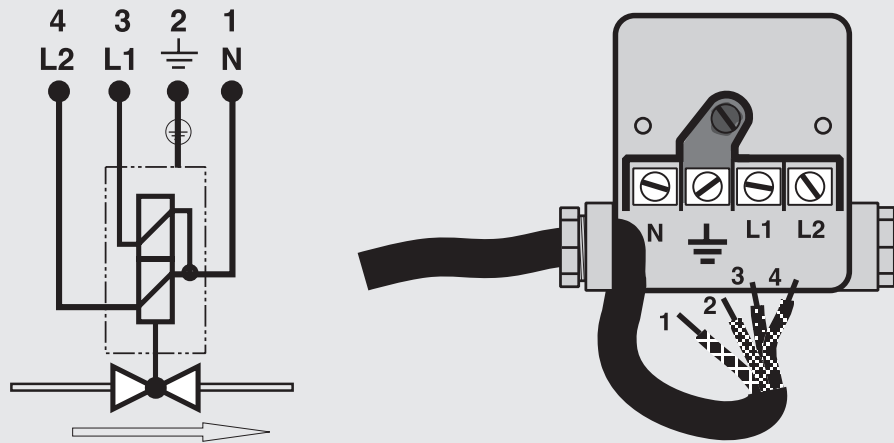
Dimensions [mm]



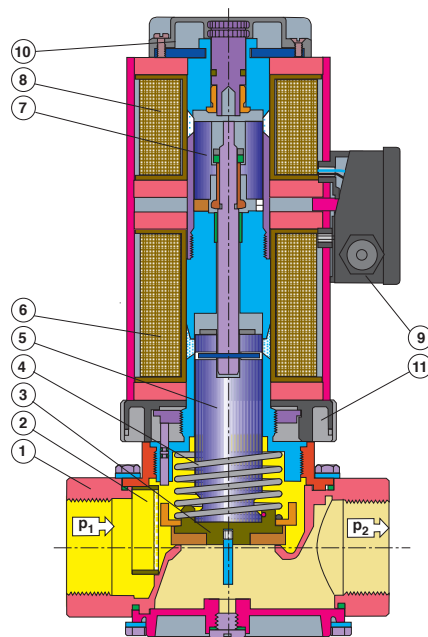
d = largest width

Type	DN/Rp	P _{max.} [VA]	Order No.	 I _{max.} ~(AC) 230 V	 I _{max.} ~(AC) 230 V	Opening time	Dimensions [mm]						Weight [kg]	
							a	b	c	d	e	f		
ZRLE 407/5	360 mbar	Rp 3/4	52	109 934	0.10	0.14	20 s	75	100	220	80	245	290	3.9
ZRLE 410/5		Rp 1	52	109 942	0.10	0.14	20 s	75	110	220	90	250	290	4.1
ZRLE 415/5		Rp 1 1/2	90	109 959	0.14	0.27	20 s	95	150	275	116	315	390	9.3
ZRLE 420/5		Rp 2	90	110 083	0.14	0.27	20 s	95	170	280	130	325	390	10.2
ZRDLE 407/5	360 mbar	Rp 3/4	52	153 820	0.10	0.14	20 s	75	100	235	80	260	300	4.0
ZRDLE 410/5		Rp 1	52	153 840	0.10	0.14	20 s	75	110	235	90	265	300	4.2
ZRDLE 415/5		Rp 1 1/2	90	153 860	0.14	0.27	20 s	95	150	295	116	340	410	9.5
ZRDLE 420/5		Rp 2	90	153 880	0.14	0.27	20 s	95	170	300	130	345	410	10.4
ZRDLE 4040/5	360 mbar	DN 40	90	155 430	0.14	0.27	20 s	95	200	300	150	340	410	11.0
ZRDLE 4050/5		DN 50	90	155 450	0.14	0.27	20 s	95	230	300	165	345	410	12.5

Electrical connection



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.

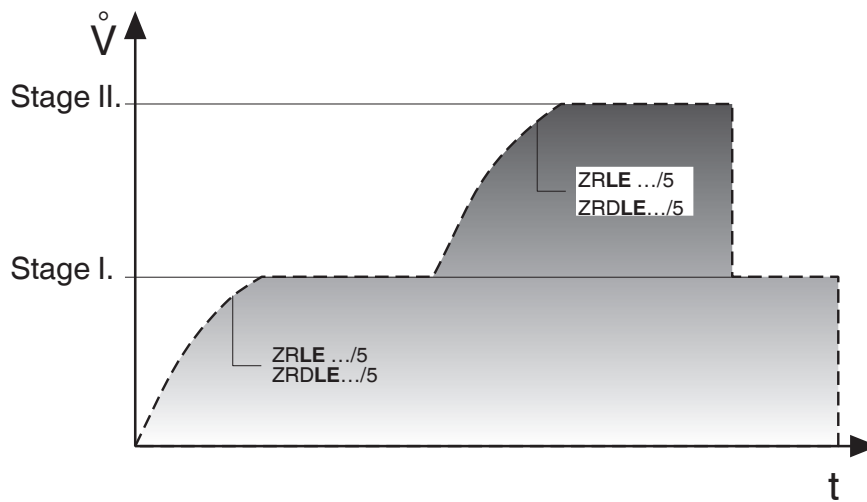
If voltage is applied to the solenoid of stage 1, armature 7 opens up to the adjusted partial volume.

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

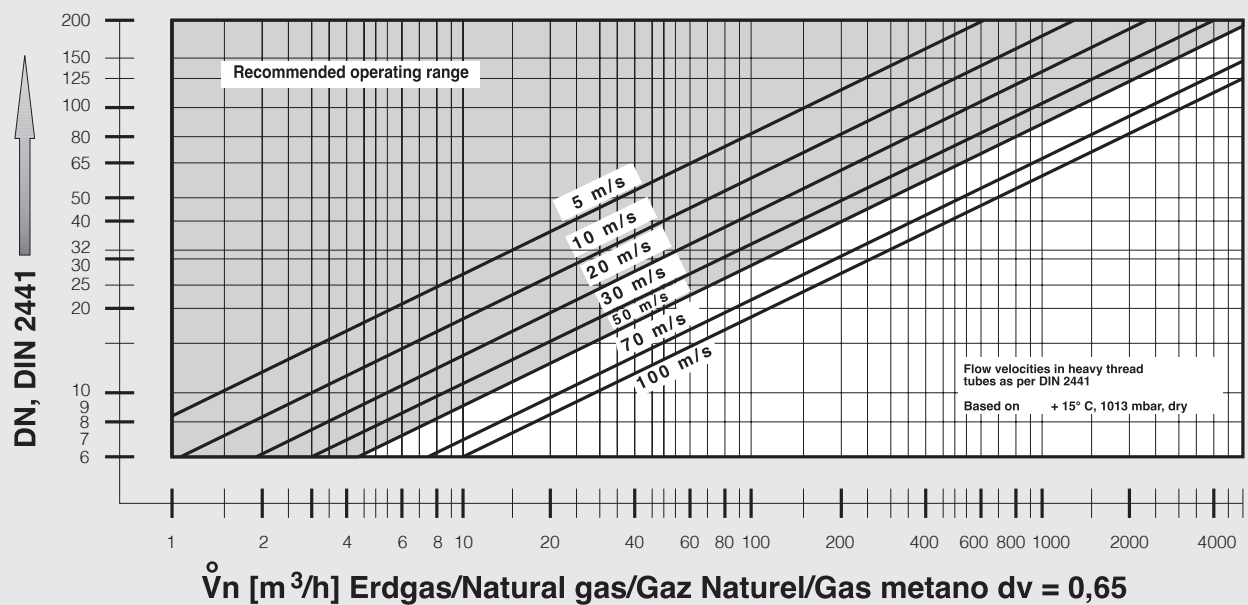
If the auxiliary power is interrupted (operating voltage), closing spring 4 closes the valve within 1 second.

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

Opening behaviour of ZR.../5

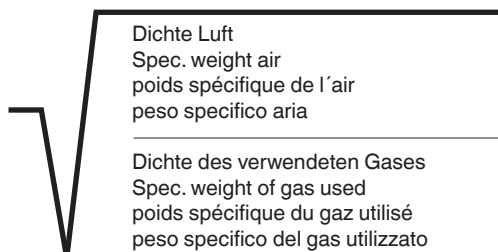


Flow velocity



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

f =



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

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

Flow diagram

