

## 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 test approval as per EC Gas Appliance Directive:

ZR 4../5

CE-0085 AQ7125

Approvals in other important gas consuming countries.

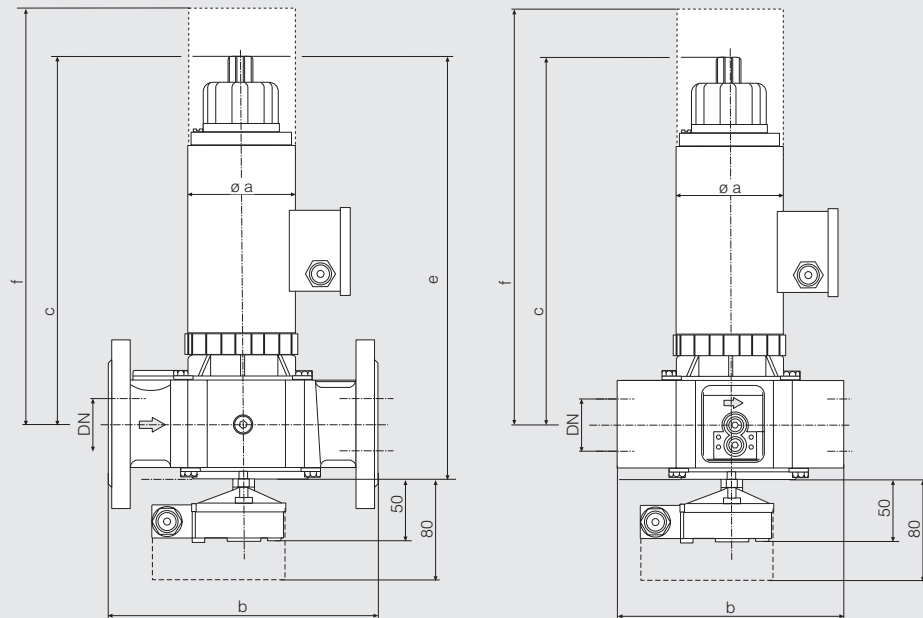
|               |                                                                                                                                                                              |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------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

|                |                                                                                                                                                                                                      |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ZRDLE/5</b> | 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 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<br>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 |

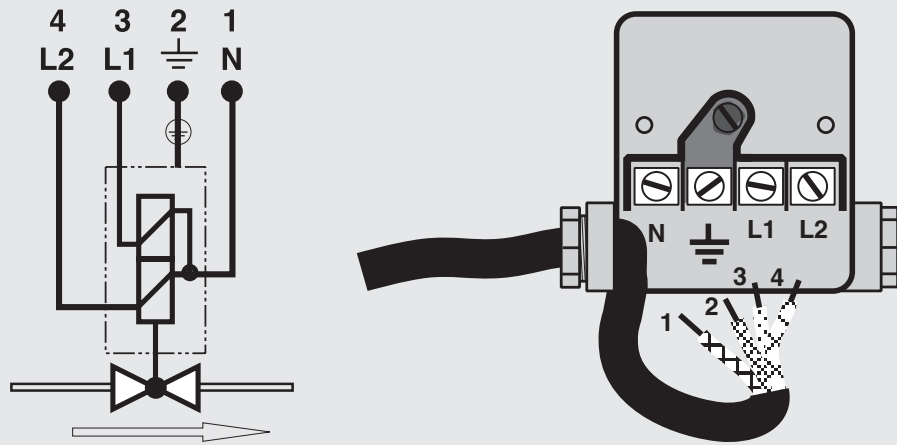
## Dimensions [mm]



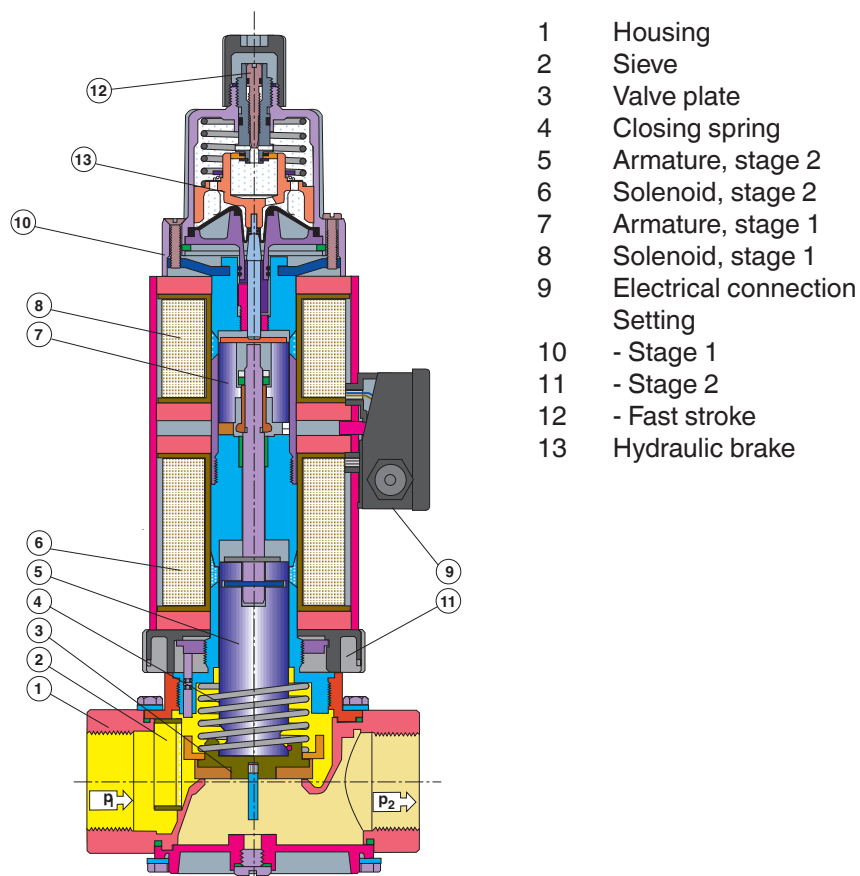
d = largest width

| Type         | DN/Rp    | P <sub>max.</sub><br>[VA] | Order<br>No. |  I <sub>max.</sub><br>~(AC)<br>230 V |  I <sub>max.</sub><br>~(AC)<br>230 V | Opening<br>time | Dimensions [mm] |    |     |     |     |     | Weight<br>[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 11/2                   | 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 11/2                   | 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



## 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.

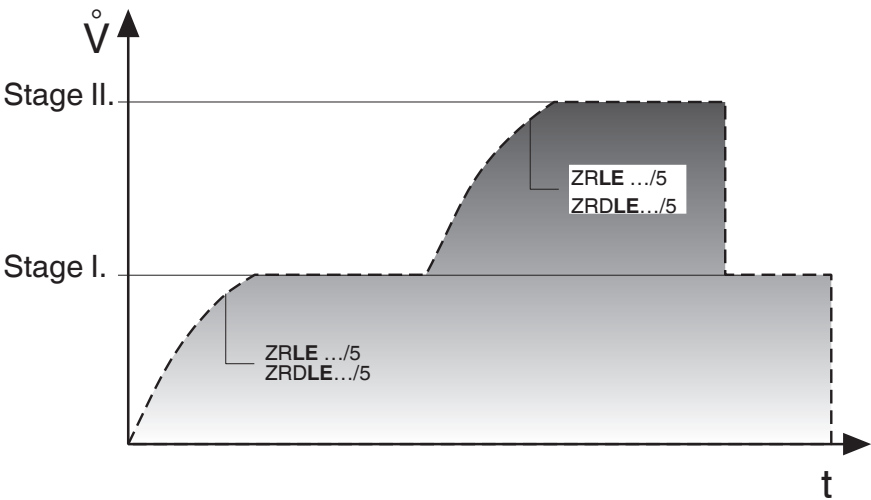
If voltage is applied to the solenoid of stage 1, armature 7 opens up to the adjusted partial volume.

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

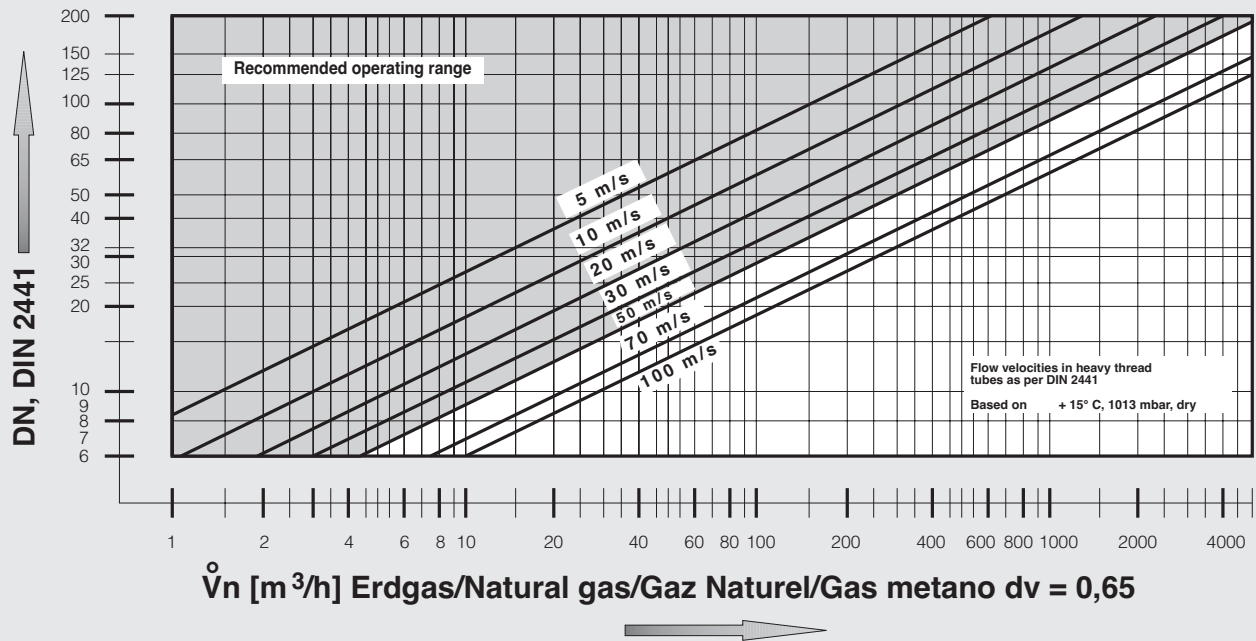
If the auxiliary power is interrupted (operating voltage), closing spring 4 closes the valve within 1 second.

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

Opening behaviour of ZR.../5



Flow velocity



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

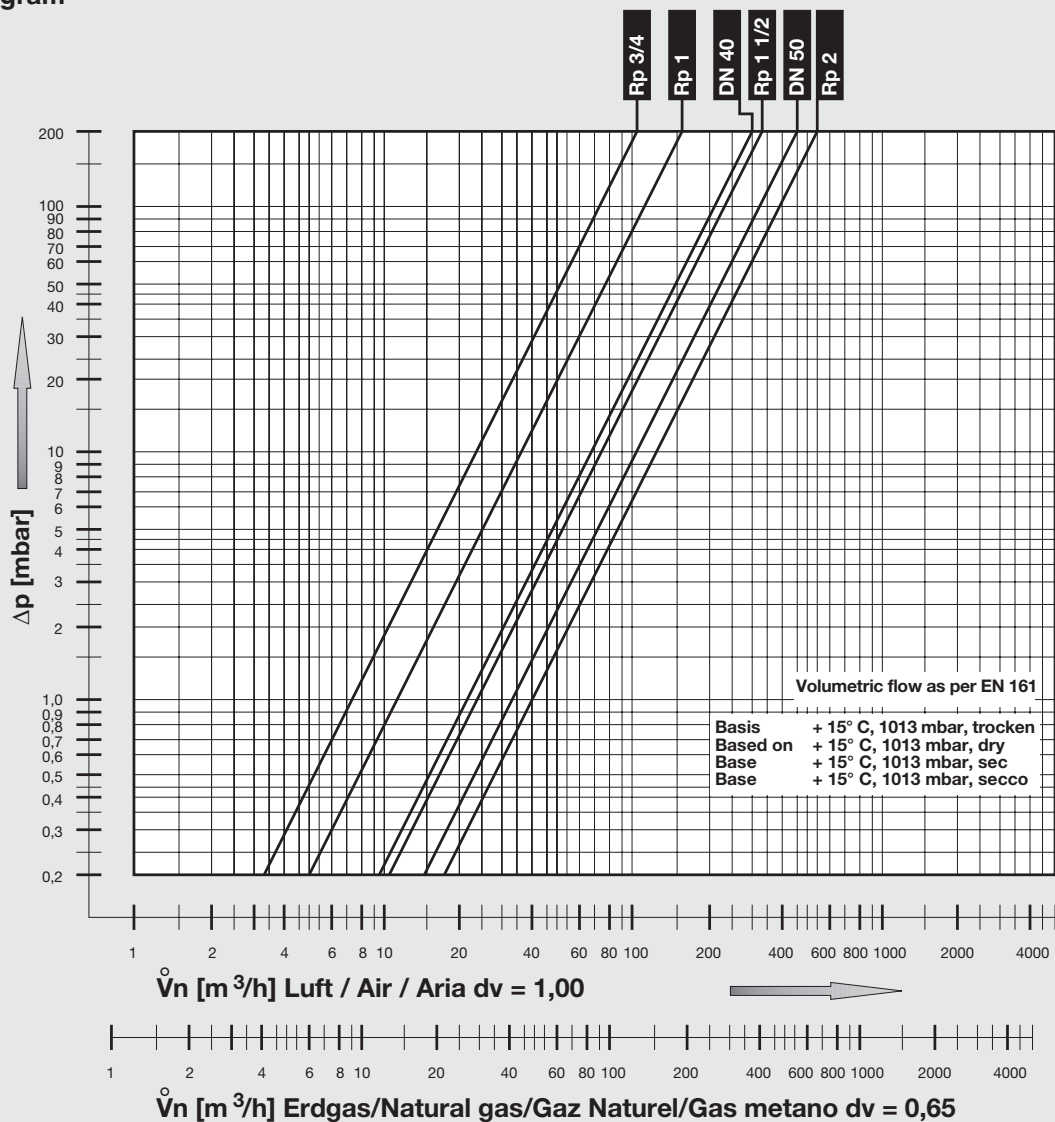
$f = \sqrt{\frac{\text{Dichte Luft}}{\text{Dichte des verwendeten Gases}}}$

Spec. weight air  
poids spécifique de l'air  
peso específico aria

Spec. weight of gas used  
poids spécifique du gaz utilisé  
peso específico del gas utilizado

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

Flow diagram



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

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