

Serie IEL1/3/6...



## DESCRIPTION

Single stage automatic normally closed solenoid valves that open when the coil is energized and close when there is no tension.

- Pmax = 1 bar**
- Pmax = 3 bar**
- Pmax = 6 bar**

They are equipped with a flow regulator and adjustable slow opening kit.

- EC certified according to EN 161
- In conformity with the 2009/142/EC Directive (Gas Directive)
- In conformity with the 94/9/EC Directive (ATEX Directive)
- In conformity with the 2004/108/EC Directive (Electromagnetic Compatibility)
- In conformity with the 2006/95/EC Directive (Low Voltage)

## IDENTIFICATION

**IEL S 3 02N 1 1 B**

Gas automatic solenoid valve series IEL...

### Types

- S** = standard (fast opening)
- R** = with flow regulation
- L1** = with adjustable slow opening + flow regulation + adjustable rapid stroke
- L2** = with adjustable slow opening + flow regulation
- L3** = with adjustable slow opening + adjustable rapid stroke
- L4** = with adjustable slow opening

### Pmax

- 1** = Pmax 1 bar
- 3** = Pmax 3 bar
- 6** = Pmax 6 bar

**B** = biogas

### CPI switch

- 0** = no CPI switch
- 1** = CPI switch (P.max ≤ 1 bar)
- 2** = CPI switch (P.max > 1 bar)

### Voltage

- 1** = 12 V/50 Hz
- 2** = 12 Vdc
- 3** = 24 V/50 Hz
- 4** = 24 Vdc
- 6** = 110 V/50-60 Hz with rectifier
- 8** = 230 V/50-60 Hz with rectifier

### Connections

| Threaded  |                 |            |                   | Flanged   |        |            |             |
|-----------|-----------------|------------|-------------------|-----------|--------|------------|-------------|
| Code      | GAS             | Code NPT   | NPT               | Code      | PN 16  | Code ANSI  | ANSI PN 16  |
| <b>02</b> | DN 15 (G 1/2")  | <b>02N</b> | DN 15 (NPT 1/2")  |           |        |            |             |
| <b>03</b> | DN 20 (G 3/4")  | <b>03N</b> | DN 20 (NPT 3/4")  |           |        |            |             |
| <b>04</b> | DN 25 (G 1")    | <b>04N</b> | DN 25 (NPT 1")    | <b>25</b> | DN 25  | <b>25A</b> | DN 25 ANSI  |
| <b>05</b> | DN 32 (G 1"1/4) | <b>05N</b> | DN 32 (NPT 1"1/4) | <b>32</b> | DN 32  | <b>32A</b> | DN 32 ANSI  |
| <b>06</b> | DN 40 (G 1"1/2) | <b>06N</b> | DN 40 (NPT 1"1/2) | <b>40</b> | DN 40  | <b>40A</b> | DN 40 ANSI  |
| <b>07</b> | DN 50 (G 2")    | <b>07N</b> | DN 50 (NPT 2")    | <b>50</b> | DN 50  | <b>50A</b> | DN 50 ANSI  |
|           |                 |            |                   | <b>08</b> | DN 65  | <b>08A</b> | DN 65 ANSI  |
|           |                 |            |                   | <b>09</b> | DN 80  | <b>09A</b> | DN 80 ANSI  |
|           |                 |            |                   | <b>10</b> | DN 100 | <b>10A</b> | DN 100 ANSI |

**NOTE: not all combinations are possible  
Please contact the technical department.**

# GENERAL DATA

## TECHNICAL DATA

- Use: not aggressive gases of the 3 families (dry gases)
- Threaded connections Rp: (DN 15 ÷ DN 50) according to EN 10226
- Flanged connections PN 16: (DN 25 ÷ DN 100) according to ISO 7005
- On request ANSI 150 flanged connections
- Power supply voltage: 12 Vdc, 12 V/50 Hz (only for DN 15-25)  
24 Vdc, 24 V/50 Hz, 110 V/50-60 Hz, 230 V/50-60 Hz
- Power supply voltage tolerance: -15% ... +10%
- Power absorption: see coils and connector table
- Max. working pressure: 1 - 3 - 6 bar
- Environment temperature: -15 ÷ +60 °C
- Max superficial temperature: 85 °C
- Protection degree: IP65
- Class: A;
- Group: 2
- Closing time: <1 s
- Opening time: <1 s

Coils: IEL1 DN 15 ÷ DN 50 and IEL3/IEL6 DN 15 ÷ DN 25  
 polyammiac resin encapsulated with glass fibre, connection type DIN 43650; the insulation class is F (155°) and the enamelled copper wire class is H (180°).

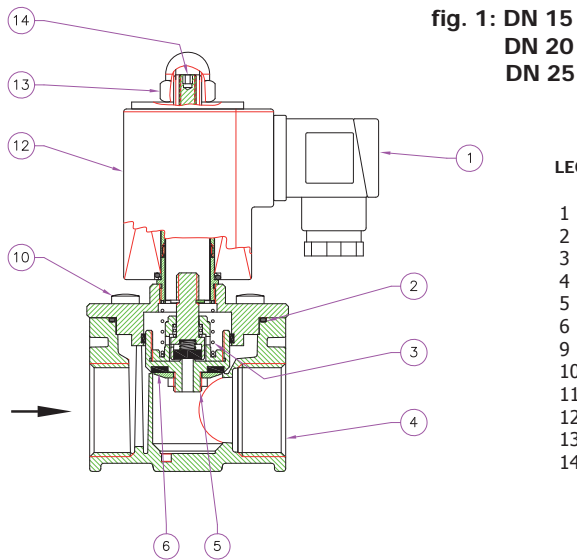
IEL1 DN 65 ÷ DN 100 and IEL3/IEL6 DN 32 ÷ DN 100  
 the insulation class and the enamelled copper wire class is H (180°).

## MATERIALS

- Die-cast aluminium (UNI EN 1706)
- OT-58 brass (UNI EN 12164)
- 11S aluminium (UNI 9002-5)
- Galvanized and 430 F stainless steel (UNI EN 10088)
- NBR rubber (UNI 7702)
- Nylon 30% glass fibre (UNI EN ISO 11667)
- Viledon

# COMPONENTS

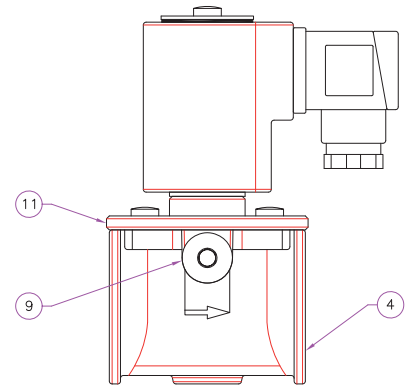
THREADED CONNECTIONS



**fig. 1: DN 15  
DN 20  
DN 25**

### LEGEND

- 1 - Electrical connector
- 2 - Seal O-Ring
- 3 - Closing spring
- 4 - Valve body
- 5 - Closure member
- 6 - Washer seal
- 9 - Pressure tap / test nipple
- 10 - Cover fixing screws
- 11 - Cover
- 12 - Electrical coil
- 13 - Coil fixing nut
- 14 - Flow calibration screw (IELR version)



**fig. 2: DN 32  
DN 40  
DN 50**

### LEGEND

- 1 - Electrical connector
- 2 - Seal O-Ring
- 3 - Closing spring
- 4 - Valve body
- 5 - Closure member
- 6 - Washer seal
- 9 - Pressure tap / test nipple
- 10 - Cover fixing screws
- 11 - Cover
- 12 - Electrical coil
- 13 - Coil fixing nut
- 14 - Flow calibration screw (IELR version)

# COMPONENTS

## FLANGED CONNECTIONS

fig. 3: DN 32  
DN 40  
DN 50

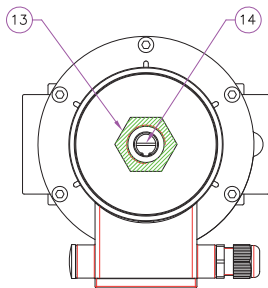
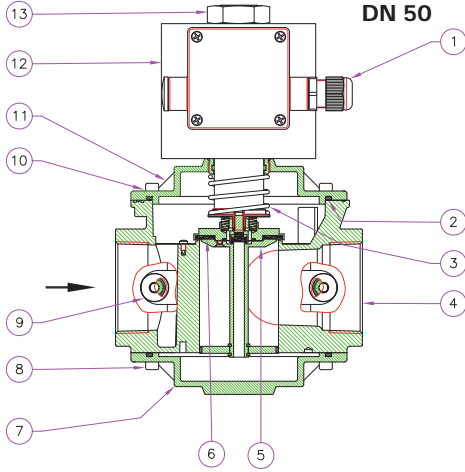
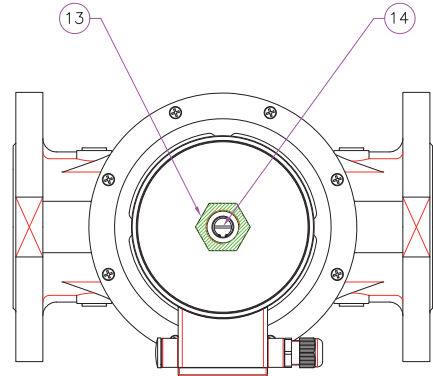
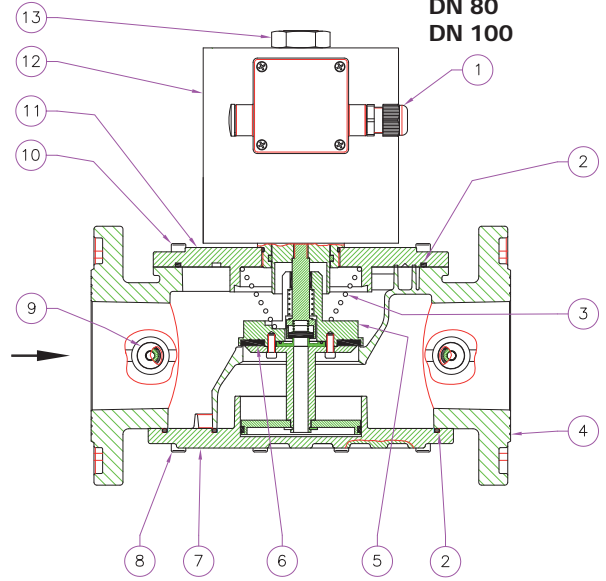


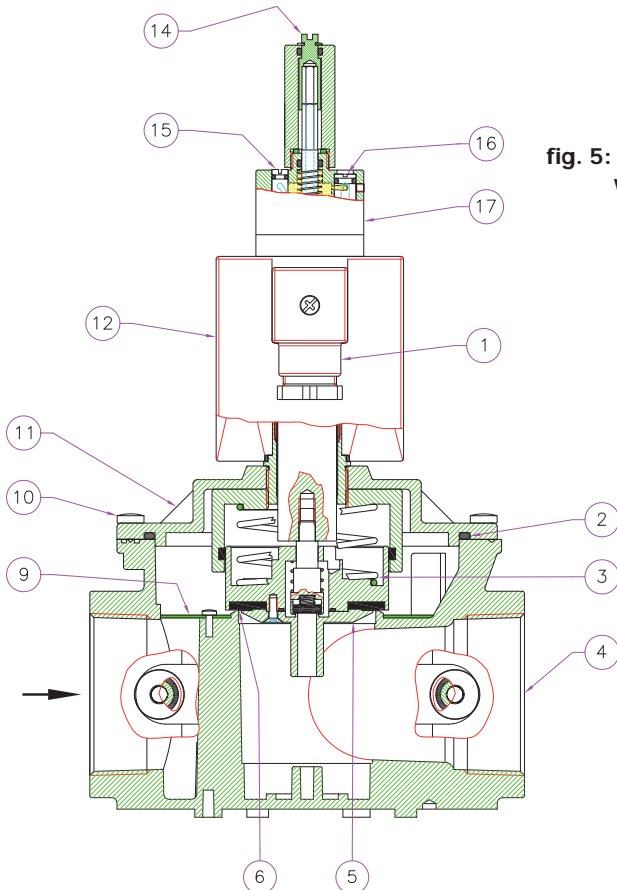
fig. 4: DN 65  
DN 80  
DN 100



### LEGEND

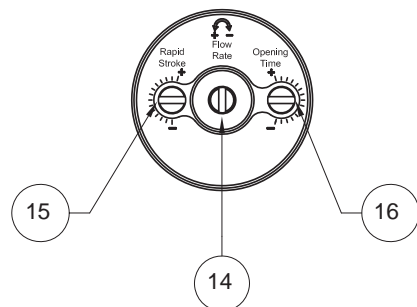
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|--------------------------|--|
| 1 - Electrical connector | 8 - Bottom fixing screws                   |
| 2 - Seal O-Ring          | 9 - Pressure tap / test nipple             |
| 3 - Closing spring       | 10 - Cover fixing screws                   |
| 4 - Valve body           | 11 - Cover                                 |
| 5 - Closure member       | 12 - Electrical coil                       |
| 6 - Washer seal          | 13 - Coil fixing nut                       |
| 7 - Bottom               | 14 - Flow calibration screw (IELR version) |

fig. 5: DN 15 - DN 100  
with flow regulation

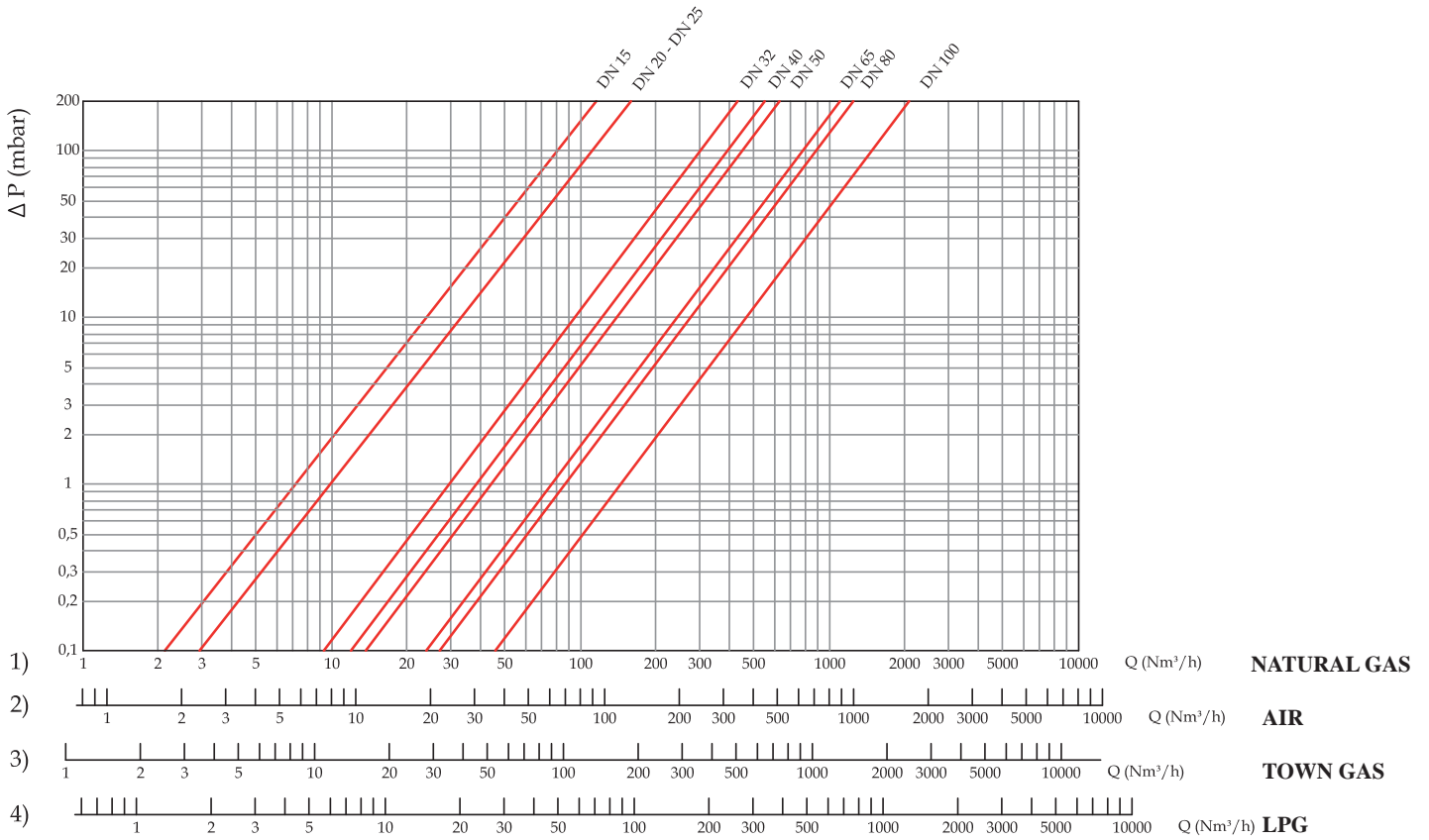


### LEGEND

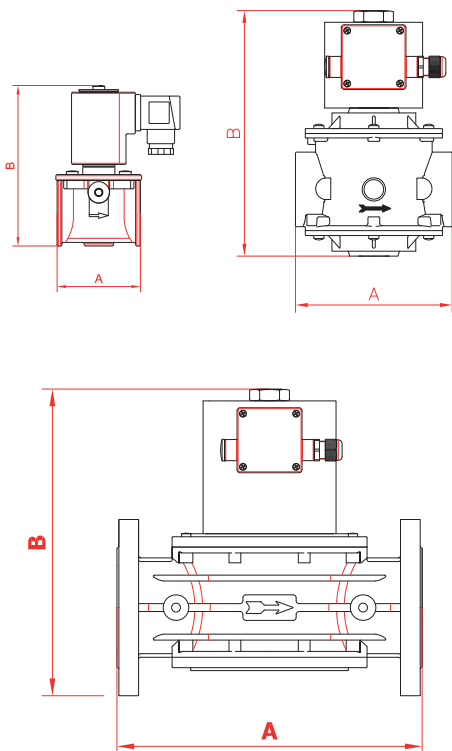
- |                          |                               |
|--------------------------|-------------------------------|
| 1 - Electrical connector | 10 - Cover fixing screws      |
| 2 - Seal O-Ring          | 11 - Cover                    |
| 3 - Closing spring       | 12 - Electrical coil          |
| 4 - Valve body           | 14 - Flow calibration screw   |
| 5 - Closure member       | 15 - Rapid stroke calibration |
| 6 - Washer seal          | 16 - Opening speed regulation |
| 9 - Filter               | 17 - Slow opening kit         |



# PRESSURE DROP DIAGRAM



# DIMENSIONS



| Threaded connections  | Flanged connections   | P. max (bar) | A   | B   |      |
|-----------------------|-----------------------|--------------|-----|-----|------|
|                       |                       |              |     | IEL | IELR |
| DN 15 - DN 20 - DN 25 | -                     | 1 - 3 - 6    | 70  | 137 | 150  |
| -                     | DN 25                 | 1 - 3 - 6    | 142 | 170 | 195  |
| DN 32 - DN 40 - DN 50 | -                     | 1            | 160 | 210 | 226  |
| DN 32 - DN 40 - DN 50 | -                     | 3 - 6        | 160 | 258 | 258  |
|                       | DN 32 - DN 40 - DN 50 | 1            | 230 | 237 | 252  |
|                       | DN 32 - DN 40 - DN 50 | 3 - 6        | 230 | 261 | 261  |
|                       | DN 65                 | 1 - 3 - 6    | 290 | 318 | 318  |
|                       | DN 80                 | 1 - 3 - 6    | 310 | 325 | 325  |
|                       | DN 100                | 1 - 3 - 6    | 350 | 392 | 392  |

## COILS AND CONNECTORS

| CONNECTIONS  | VOLTAGE        | COIL CODE | COIL STAMPING           | CONNECTOR CODE | POWWER ABSORPTION            |
|--|----------------|-----------|-------------------------|----------------|------------------------------|
| IEL1... - IEL3... - IEL6...<br>(L1-L2-L3-L4)<br>DN 15 - DN 20 - DN 25<br>(P.max 1 - 3 - 6 bar) | 12 Vdc         | BO-0407   | BO-0407<br>12V RAC ES   | CN-2101        | 56 VA<br>Energy saving 16 VA |
|  | 12 V/50 Hz     | BO-0407   | BO-0407<br>12V RAC ES   | CN-2111        | 56 VA<br>Energy saving 16 VA |
|  | 24 Vdc         | BO-0417   | BO-0417<br>24V RAC ES   | CN-2101        | 56 VA<br>Energy saving 16 VA |
|  | 24 V/50 Hz     | BO-0417   | BO-0417<br>24V RAC ES   | CN-2111        | 56 VA<br>Energy saving 16 VA |
|  | 110 V/50-60 Hz | BO-0427   | BO-0427<br>110V RAC ES  | CN-2131        | 63 VA<br>Energy saving 20 VA |
|  | 230 V/50-60 Hz | BO-0437   | BO-0437<br>230V RAC ES  | CN-2131        | 54 VA<br>Energy saving 18 VA |
| IEL1... (L1-L2-L3-L4)<br>DN 32 - DN 40 - DN 50<br>(P.max 1 bar)                                | 24 Vdc         | BO-0355   | BO-0355<br>24V RAC ES   | CN-2101        | 68 VA<br>Energy saving 18 VA |
|  | 24 V/50 Hz     | BO-0355   | BO-0355<br>24V RAC ES   | CN-2111        | 68 VA<br>Energy saving 18 VA |
|  | 110 V/50-60 Hz | BO-0365   | BO-0365<br>110 V RAC ES | CN-2131        | 77 VA<br>Energy saving 23 VA |
|  | 230 V/50-60 Hz | BO-0375   | BO-0375<br>230 V RAC ES | CN-2131        | 89 VA<br>Energy saving 25 VA |

**Connector type**  
**CN-2101** = Long Time Energy Saving 12 Vdc - 24 Vdc  
**CN-2111** = Long Time Energy Saving 12 Vac - 24 Vac  
**CN-2131** = Long Time Energy Saving 110 Vac - 230 Vac



| CONNECTIONS   | VOLTAGE   | COIL CODE | COIL STAMPING           | CONNECTOR CODE    | POWWER ABSORPTION             |
|---|---|-----------|-------------------------|-------------------|-------------------------------|
| IEL3... - IEL6... (L1-L2-L3-L4)<br>DN 32 - DN 40 - DN 50<br>(P.max 3 - 6 bar) | 24 Vdc  | BO-2010   | 24 Vdc DN 32 - 40 - 50  | CN-2001           | 47 VA<br>Energy saving 13 VA  |
|   | 24 V/50 Hz  | BO-2015   | 24 Vac DN 32 - 40 - 50  | CN-2011           | 47 VA<br>Energy saving 13 VA  |
|   | 110 V/50-60 Hz  | BO-2020   | 110 Vac DN 32 - 40 - 50 | CN-2021           | 46 VA<br>Energy saving 13 VA  |
|   | 230 V/50-60 Hz  | BO-2030   | 230 Vac DN 32 - 40 - 50 | CN-2031           | 55 VA<br>Energy saving 15 VA  |
|   | IEL1... - IEL3... - IEL6... (L1-L2-L3-L4)<br>DN 65 - DN 80<br>(P.max 1 - 3 - 6 bar) | 24 Vdc    | BO-2110                 | 24 Vdc DN 65 - 80 | CN-2001                       |
| 24 V/50 Hz  |   | BO-2115   | 24 Vac DN 65 - 80       | CN-2011           | 88 VA<br>Energy saving 24 VA  |
| 110 V/50-60 Hz  |   | BO-2120   | 110 Vac DN 65 - 80      | CN-2021           | 97 VA<br>Energy saving 26 VA  |
| 230 V/50-60 Hz  |   | BO-2130   | 230 Vac DN 65 - 80      | CN-2031           | 105 VA<br>Energy saving 29 VA |
| IEL1... - IEL3... - IEL6... (L1-L2-L3-L4)<br>DN 100<br>(P.max 1 - 3 - 6 bar)  | 24 Vdc  | BO-2210   | 24 Vdc DN 100           | CN-2001           | 107 VA<br>Energy saving 29 VA |
|   | 24 V/50 Hz  | BO-2215   | 24 Vac DN 100           | CN-2011           | 107 VA<br>Energy saving 29 VA |
|   | 110 V/50-60 Hz  | BO-2220   | 110 Vac DN 100          | CN-2021           | 115 VA<br>Energy saving 31 VA |
|   | 230 V/50-60 Hz  | BO-2230   | 230 Vac DN 100          | CN-2031           | 124 VA<br>Energy saving 36 VA |

**Connector type**  
**CN-2001** = Long Time Energy Saving 24 Vdc  
**CN-2011** = Long Time Energy Saving 24 Vac  
**CN-2021** = Long Time Energy Saving 110 Vac  
**CN-2031** = Long Time Energy Saving 230 Vac



## INSTALLATION

The solenoid valve is in conformity with the Directive 94/9/CE (Directive ATEX 100 a) as device of group II, category 3G and as device of group II, category 3D; for this reason it is suitable to be installed in the zones 2 and 22 as classified in the attachment I to the Directive 99/92/EC.

The solenoid valve is not suitable to be used in zones 1 and 21 and, all the more so, in zones 0 and 20 as classified in the already said Directive 99/92/EC.

To determine the qualification and the extension of the dangerous zones, see the norm EN 60079-10.

The device, if installed and serviced respecting all the conditions and the technical instructions of this document, is not source of specific dangers: in particular, there is no emission in the atmosphere of inflammable substance in way to cause an explosive atmosphere.



**Installation must be in compliance with local legislation in force!**

**WARNING: Read carefully the instruction sheet of each product before installing.**

**All installation and maintenance operations must be carried out by qualified personnel.**

- The gas supply must be shut off before installation.
- Check that the line pressure **DOES NOT EXCEED** the maximum pressure stated on the product label.
- The device must be installed with the arrow (on the body of the device) facing towards the user appliance.
- The solenoid valves DN 15 - 20 - 25 (P. max 1-3-6 bar) and DN 32 - 40 - 50 (P. max -1 bar) will function equally effectively if installed vertical. The devices must not be installed upside down (with the coil underneath).
- The solenoid valves DN 32 - 40 - 50 (P. max 3-6 bar) and DN 65 - 80 - 100 (P. max 1-3-6 bar) must be installed with the pipe in horizontal position and with upright coil.
- During installation take care not to allow impurities or scraps of metal to enter the device.
- If the device is threaded check that the pipeline thread is not too long; overlong threads may damage the body of the device when screwed into place. Do not use the coil for leverage when screwing into position; use the appropriate tool.
- If the device is flanged check that the inlet and outlet counterflanges are perfectly parallel to avoid unnecessary mechanical stresses on the body of the device. Also calculate the space needed to fit the seal. If the gap left after the seal is fitted is too wide, do not try to close it by over-tightening the device's bolts.
- Always check that the system is gas-tight after installation.

## CALIBRATIONS

- To regulate the opening speed of the obturator operate on the screw (16). The opening speed increases gradually screwing clockwise the screw (16).  
**WARNING:** Inlet pressure and environment temperature changes can influence the valve opening time.
- To regulate the rapidity of the stroke operate on the screw (15). Screwing counterclockwise till the limit, the opening of the valve will be slow at first, screwing it clockwise you get a first phase of speed opening and a second slow one.
- To regulate the flow operate on the screw (14). Screwing it clockwise in order to decrease the flow, counterclockwise in order to increase it.  
For connections  $\geq$  DN 65 in order to make this regulation you need at first to take off the electrical power to the coil. In this way you avoid the regulation screw to be submitted to useless mechanical efforts.

## ELECTRICAL CONNECTIONS

- Before making electrical connections, check that the mains voltage is the same as the power supply voltage stated on the product label.
- Disconnect the power supply before wiring.
- Wire the connector with cable type: IEL1 / 3 / 6 ... DN 15 ÷ DN 25 and IEL1... DN 32 ÷ DN 50  
H05RN-F 3X0,75mm<sup>2</sup>, Ø outside from 6,2 to 8,1 mm

IEL 3 / 6 ... DN 32 ÷ DN 100  
H05RN-F 3X1 mm<sup>2</sup>, Ø outside from 8,3 to 9,5 mm

Ensure that the device has IP65 protection.

- Connect the power supply to terminals 1 and 2 and the ground wire to terminal  $\perp$  .  
**IMPORTANT:** with tension 12 Vdc and 24 Vdc with energy saving connector C21-23 observe the polarity.

The coil is also suitable for permanent power supply. In case of continuous duty, it is absolutely normal for the coil to heat up.

The coil should not be touched with bare hands after it has been continuously powered for more than 20 minutes. Before maintenance work, wait for the coil to cool or use suitable protective equipment.

## MAINTENANCE

Before performing any internal checks make sure that:

1. the power supply to the device is disconnected
2. there is no pressurised gas inside the device

Unscrew the nut (13) and remove the coil (12). Unscrew the fixing screws (10) and, with care, take the cover (11) off the body (4) of the valve, then control the closure member (5) and if it is necessary change the rubber made seal component (6). For threaded connection clean or blow the filter (metallic net).

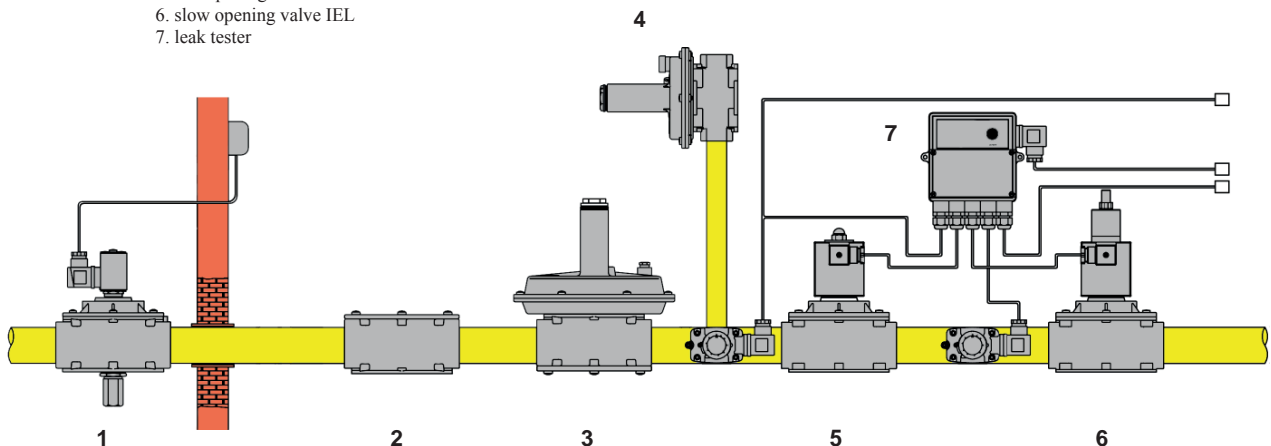
Then assemble doing backward the same operation.



**All operations must be carried out only by qualified personnel.**

## EXAMPLE OF INSTALLATION

1. manual reset solenoid valve IENA
2. gas filter IF
3. filter regulator IFR
4. overflow valve IVR
5. fast opening valve IEL
6. slow opening valve IEL
7. leak tester



FOR FURTHER INFORMATION PLEASE CONTACT OUR TECHNICAL OFFICE.