



AUTOMATIC NORMALLY CLOSED SOLENOID VALVE FOR GAS

355AA

DN 15 - DN 20 - DN 25



CE-51CM4100/ED05

CE-51CT4873/ED05

CE 0051

MADE IN ITALY

EC approval according to EN 161, compliant with Regulation (EU) 2016/426

EN

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1.0 - GENERAL INFORMATION

This manual shows you how to safely install, operate and use the device.

The instructions for use **ALWAYS** need to be available in the facility where the device is installed.

ATTENTION: installation/wiring/maintenance need to be carried out by qualified staff (as explained in section 1.3) using appropriate personal protective equipment (PPE).

For any information pertaining to installation/wiring/maintenance or in any case problems that cannot be resolved with the use of the instructions, it is possible to contact the manufacturer from the address and phone numbers provided on the last page.

1.1 - DESCRIPTION

Normally closed automatic fast opening solenoid valves for gas. They open the flow of gas when the coil is electrically powered and close them when power is disconnected. They can be controlled by pressure switches, thermostats, etc.

They can be equipped with CPI switches to control the valve's obturator position (closed) remotely. The CPI can also be installed at a later time **ONLY IF** the device is set-up properly (cap under the valve body). Further information regarding the CPI switch is available in 6.0.

Reference standards: EN 161 - EN 13611.

1.2 - KEY OF SYMBOLS



DANGER: In the event of inobservance, this may cause damage to tangible goods.



DANGER: In the event of inobservance, this may cause damage to tangible goods, to people and/or pets.



ATTENTION: Attention is drawn to the technical details intended for qualified staff.

1.3 - QUALIFIED STAFF

These are people who:

- Are qualified to carry out product installation, assembly, start-up and maintenance;
- Know the regulations in force in the region or country pertaining to installation and safety;
- Are trained in first aid.



1.4 - USING NON-ORIGINAL SPARE PARTS

- To perform maintenance or replace parts (ex. coil, connector, etc.) **ONLY** manufacturer-recommended parts can be used. Using different parts not only voids the product warranty, it could compromise correct device operation.
- The manufacturer is not liable for malfunctions caused by unauthorised tampering or use of non-original parts.



1.5 - IMPROPER USE

- The product must only be used for the purpose it was built for.
- It is not allowed to use different fluids than those expressly stated.
- The technical data set forth on the rating plate must not be exceeded whatsoever. The end user or installer is in charge of implementing proper systems to protect the device, which prevent exceeding the maximum pressure indicated on the rating plate.
- The manufacturer is not responsible for any damage caused by improper use of the device.

2.0 - TECHNICAL DATA

• Use	: non-aggressive gases of the three families (dry gases)
• Ambient temperature (TS)	: $-20 \div +60$ °C
• Supply voltages (see table 2)	: 24 V/50 Hz - 110 V/50-60 Hz - 230 V/50-60 Hz*
• Power supply tolerance	: -15% ... +10%
• Electric wiring	: cable gland M20x1.5
• Absorbed power	: see table 2
• Maximum operating pressure	: (DN 15 - DN 20) 200 mbar : (DN 25) 500 mbar
• Opening time	: <1 s
• Closing time	: <1 s
• Protection rating	: IP65
• Class	: A
• Mechanical resistance	: Group 2
• Rp Threaded connections	: (DN 15 - DN 20 - DN 25) according to EN 10226
• NPT threaded or ANSI 150 flanged connections	: on request
• Filter element	: 1 mm wire mesh
• In compliance with	: Regulation (EU) 2016/426 (Appliances burning gaseous fuels) Directive EMC 2014/30/EU - Directive LVD 2014/35/EU Directive RoHS II 2011/65/EU

* Only single-phase, the device does not work if powered with three-phase voltage.

2.1 - MODEL IDENTIFICATION

See Table 2 on page 17.

2.2 - SIL LEVEL

The SIL level of the stand-alone solenoid valve is SIL 2; when two solenoids are installed in series and the relative leak test (Valve Proving System), certified according to EN 1643, the achieved level is SIL 3, as set forth in EN 676:2008. The solenoid valve has PL d level. For further data refer to the SIL LEVEL table (table 3).

3.0 - COMMISSIONING THE DEVICE



3.1 - OPERATIONS PRIOR TO INSTALLATION

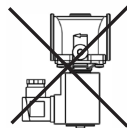
- It is necessary to close the gas upstream of the valve prior to installation;
- Make sure that the line pressure **DOES NOT EXCEED** the maximum pressure declared on the product label;
- Any protective caps (if any) must be removed prior to installation;
- Valve pipes and insides must be clear of any foreign bodies;
- Make sure that the pipe thread is not too long, to prevent damaging the body of the device when screwing it on;
- In accordance with EN 161 a suitable filter must be installed upstream of a gas closing safety device;
- With outdoor installation, it is advisable to provide a protective roof to prevent rain from damaging the electrical parts of the device;
- Prior to carrying out any electrical wiring operations, make sure that the mains voltage matches the supply voltage indicated on the product label;
- Cut out power prior to proceeding with wiring;
- According to the plant geometry, check the risk of explosive mixture arising inside the piping;
- If the solenoid valve is installed near other devices or as part of an assembly, compatibility between the solenoid valve and this other device must be evaluated beforehand;
- Avoid installing the solenoid valve near surfaces that could be damaged by the coil temperature;
- Provide a protection against impacts or accidental contacts if the solenoid valve is accessible to unqualified personnel.



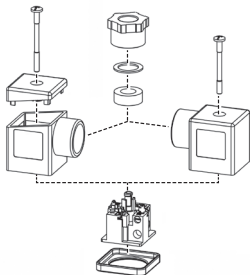


3.2 - INSTALLATION (see example in 3.4)

- Assemble the device by screwing it, with the correct seals, onto the plant with pipes and/or fittings whose threads are consistent with the connection being attached;
- Do not use the coil (**11**) as a lever to help you screw it on, only use the specific tool;
- The arrow, shown on the body (**4**) of the device, needs to be pointing towards the application;
- The device can also be installed vertically without prejudicing correct operation. It cannot be put in upside down (with the coil (**11**) pointing downwards);
- During installation, avoid debris or metal residues from getting into the device;
- To guarantee mechanical tension-free assembly, we recommend using compensating joints, which also adjust to the pipe's thermal expansion;
- If the device is to be installed in a ramp, it is the installer's responsibility to provide suitable supports or correctly sized supports, to properly hold and secure the assembly. Never, for any reason whatsoever, leave the weight of the ramp only on the connections (threaded or flanged) of the individual devices;
- In any case, following installation, check the tightness of the plant;
- Wiring cannot have cables connected directly to the coil. **ALWAYS and ONLY** use the connector identified by the manufacturer;
- Before wiring the connector (**1**), unscrew and remove the central screw (**13**). Use proper cable terminals (see figures on page 21). **NOTE:** Connector (**1**) wiring must be done ensuring a product rating of IP65;
- Wire the connector (**1**) with 3x0.75mm² cable with external Ø 6.2 to 8.1 mm. The cable must have double sheathing, be suitable for use outdoors, with minimum voltage of 500V, and minimum temperature of 105°C;



- Connect terminals 1 and 2 to the power supply and the earth cable to terminal $\perp$.
- Secure the connector (**1**) to the coil (**11**), tightening (recommended tightening torque $0.4 \text{ N.m} \pm 10\%$) the centre screw (**13**);
- The valve needs to be earthed either through the pipe or through other means (ex. cable jumpers).



3.3 - INSTALLATION IN PLACES WHERE THERE IS THE RISK OF EXPLOSION (DIRECTIVE 2014/34/EU)

The solenoid valve is not suitable for use in potentially explosive areas.

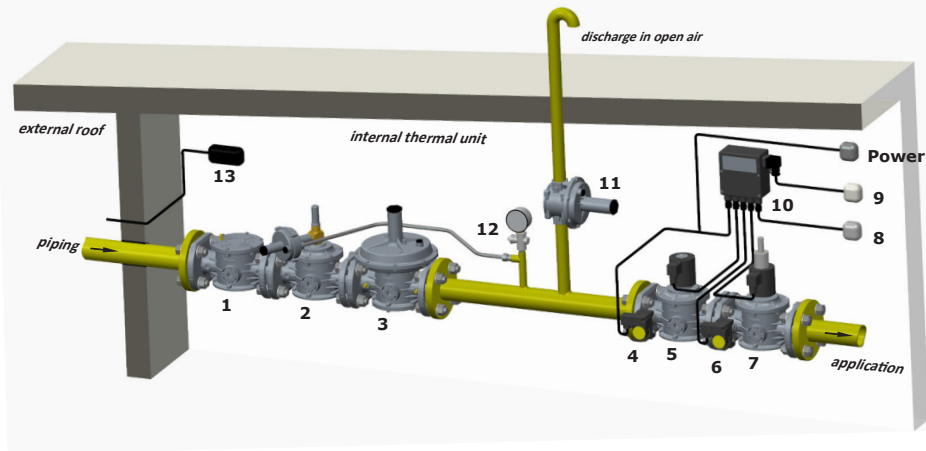
3.4 - GENERIC EXAMPLE OF AN INSTALLATION (Burner Gas Train)

1. Gas filter
2. OPSO shut off valve
3. Pressure regulator
4. Minimum pressure switch

5. 355AA fast opening automatic solenoid valve

6. Maximum pressure switch

7. Slow opening automatic solenoid valve
8. External reset
9. Burner control
10. Valve proving system
11. Relief valve
12. Pressure gauge and relative button
13. Gas detector





4.0 - FIRST START-UP



- Before start-up make sure that all of the instructions on the rating plate, including the direction of flow, are observed;
- After having gradually pressurised the system, check tightness and operation of the solenoid valve, electrically powering / disconnecting the connector **ONLY IF** connected to the coil.

IMPORTANT NOTE: Do not use the connector as a switch to open/close the solenoid valve.



4.1 - RECOMMENDED PERIODIC CHECKS

- Use a suitable calibration tool to ensure the bolts are tightened as indicated in 3.2;
- Check tightness of the flanged/threaded connections on the system;
- Check tightness and operation of the solenoid valve;

It is the responsibility of the final user or installer to define the frequency of these checks based on the severity of the service conditions.



5.0 - MAINTENANCE

No maintenance operations need to be carried out inside the device.

If the coil and/or connector need to be replaced:



- Before performing any operation, make sure that the device is not electrically powered;
- Since the coil is also suitable to be permanently powered, high coil temperature in case of continuous operation is entirely normal. It is advisable to avoid touching the coil with bare hands after a continuous power supply lasting longer than 20 minutes. In case of maintenance, wait for the coil to cool down or, if necessary, use suitable protections;

NOTE: if the coil (**11**) needs to be changed following an electrical failure, we recommend changing the connector (**1**) as well. The coil and/or connector replacement operations need to be carried out taking care to ensure the product's IP65 rating.



5.1 - REPLACING THE CONNECTOR

- Unscrew and remove the central screw (**13**), then remove the connector (**1**) from the coil (**11**);
- When you have taken out the existing internal electrical wiring, wire the new connector and secure it to the coil, as shown in 3.2;



5.2 - REPLACING THE COIL

- Unscrew and remove the central screw (**13**), then remove the connector (**1**) from the coil (**11**);
- Loosen the screw (or nut) (**12**) that locks the coil (**11**) and take it out from the armature assembly along with the seals/discs;
- Place the new coil + seals + discs inside the armature assembly and secure with the relative screw (or nut);

6.0 - CPI SWITCH

The microswitch that signals the closed position (CPI SWITCH) is a magnetic proximity sensor with normally open contact. It provides a signal when the valve obturator closes.

If the solenoid valve comes with the microswitch, the position of the sensor is already calibrated and set, therefore, for operation you simply need to connect it to the power supply.

If it comes separately and is installed at a later time on a solenoid valve with CPI set-up, follow the instructions provided in paragraph 6.2

6.1 - CPI SWITCH TECHNICAL DATA

- Ambient temperature : $-20 \div +60$ °C
- Switchable voltage : max 1000 V (dc or ac peak)
- Switchable current : max 1 A (dc or ac peak)
- Switchable power : max 40W ohmic
- Resistance : 200 mΩ
- Protection rating : IP65
- Cable length : max 5m

CPI wiring diagram



open valve / open contact
closed valve / closed contact



6.2 - CPI SWITCH INSTALLATION and CALIBRATION

It is necessary to close the gas prior to installation.

NOTE: CPI connector (**19**) wiring must be done ensuring a product rating of IP65;

- Unscrew the cap (**14**) under the valve body (**4**);
- In place of the cap (**14**) screw in the CPI kit (**21**). Make sure that between the body (**4**) and CPI kit (**21**) there is the aluminium washer (**16**);
- Tighten the CPI kit (**21**) onto the valve body (**4**) with a special commercial spanner;
- Before wiring the CPI connector (**19**), unscrew and remove the central screw (**18**);
- Connect the CPI connector (**19**) terminals 1 and 2 in series to the signalling device. Use proper cable terminals (see figures in 3.2);
- Wire the CPI connector (**19**) with 2x1 mm² cable with external Ø of 6.7 mm. The cable to be used must be in double sheath, suitable for outdoor use, with a minimum voltage of 500V and a temperature of at least 90°C;
- Secure the CPI connector (**19**), tightening (recommended tightening torque 0.4 N.m ± 10%) the centre screw (**18**);
- To calibrate the microswitch loosen the fastening nut (**20**) and position (by screwing on or off) the adjustment ring nut (**17**) so that, with the solenoid valve in a closed position, the microswitch provides the signal;
- Secure the adjustment ring nut (**17**) in that position by tightening the nut (**20**);
- The kit is now installed. Open and close the solenoid valve (by supplying and cutting off power) 2-3 times to make sure the microswitch is signalling correctly.

7.0 - TRANSPORT, STORAGE AND DISPOSAL

- During transport the material needs to be handled with care, avoiding any impact or vibrations to the device;
- If the product has any surface treatments (ex. painting, cataphoresis, etc) it must not be damaged during transport;
- The transport and storage temperatures must observe the values provided on the rating plate;
- If the device is not installed immediately after delivery it must be correctly placed in storage in a dry and clean place;
- In humid facilities, it is necessary to use driers or heating to avoid condensation;
- At the end of its service life, the product is to be disposed of in compliance with the legislation in force in the country where this operation is performed.

8.0 - WARRANTY

The warranty conditions agreed with the manufacturer at the time of the supply apply.

For damage caused by:

- Improper use of the device;
- Failure to observe the requirements described herein;
- Failure to observe the regulations pertaining to installation;
- Tampering, modification and use of non-original spare parts;

are not covered by the rights of the warranty or compensation for damage.

The warranty also excludes maintenance work, other manufacturers's assembling units, making changes to the device and natural wear.

9.0 - RATING PLATE DATA

The rating plate data (see example provided here) includes the following:

- Manufacturer's name/logo and address
- Mod.: = device name/model followed by the connection diameter
- CE-51.../ED05 = certification pin number
- Cl. A = Seal strength in counterflow at 150 mbar in accordance with EN 161
- Gr. 2 = Mechanical resistance group 2 in accordance with EN 161
- EN 161 = Product reference regulation
- P.max = Maximum pressure at which product operation is guaranteed
- IP... = Protection rating
- 230V.... = Power supply voltage, frequency (if Vac), followed by electrical absorption
- TS = Temperature range within which product operation is guaranteed
-  0051 = Conformity with Regulation (EU) 2016/426 followed by Notified Body No.
- year = Year of manufacture
- Lot = Product serial number (see explanation below)
 - U2002 = Lot issued in year 2020 in the 2nd week
 - 1728 = progressive job order number for the indicated year
 - 00002 = progressive number referring to the quantity of the lot

BOSSTM

Lodge Way House, Lodge Way,
Harlestone Road,
Northampton NN5 7UG.

Mod.: 355AA DN 25

CODE: 35500033

CE-51.../ED05 Cl. A Gr.2 EN 161

P.max: 500 mbar

IP65 - 230 V/50-60 Hz 18 VA

TS: -20+60 °C

 0051

year: 2020

Lot: U2002

1728/00002

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fig. 1
DN 15-20
P.max 200 mbar

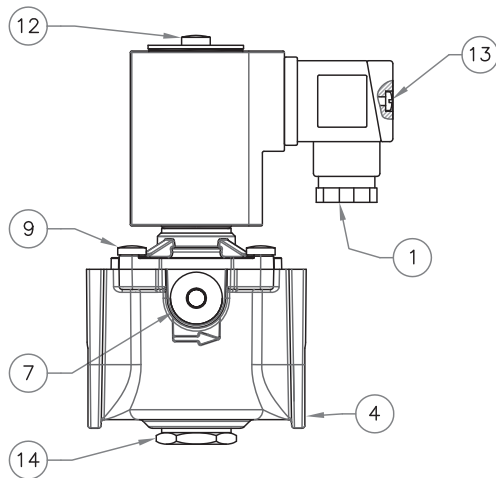
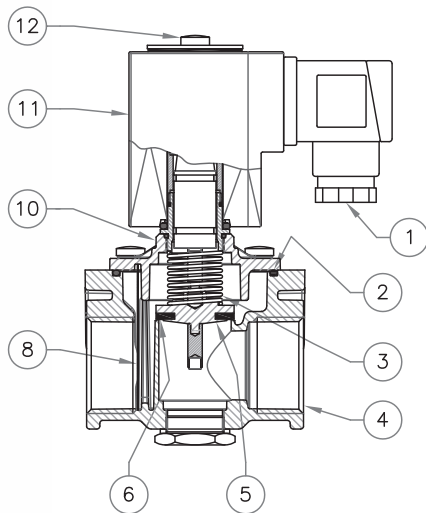


fig. 2
DN 25
P.max 500 mbar

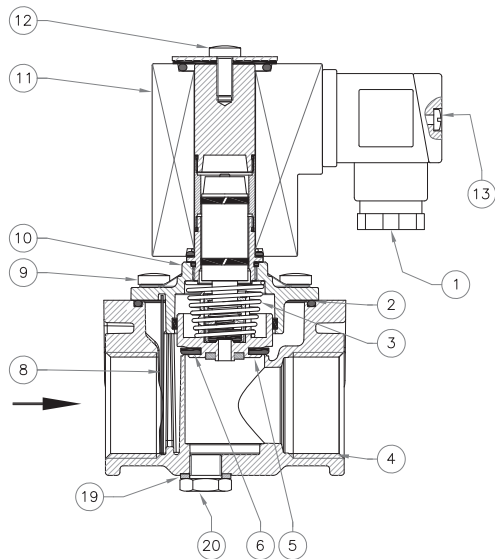
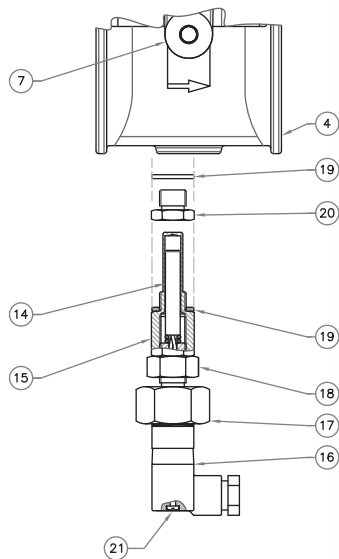


fig. 3
CPI installation



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fig. 1, 2 and 3

1. Electric connector
2. Cover sealing O-Ring
3. Closing spring
4. Valve body
5. Obturator
6. Sealing washer
7. Cap G 1/4
8. Filter
9. Cover fastening screws
10. Cover
11. Electric coil
12. Coil fastening screw
13. Connector centre screw
14. Lower cap (on versions set-up for CPI installation)
15. Microswitch
16. Aluminium washer
17. CPI adjustment ring nut
18. CPI connector centre screw
19. CPI connector
20. CPI fastening nut
21. CPI kit

Table 1

Overall dimensions in mm

Threaded connections	P. max (mbar)	A	B=(D+E)	C	D	E	F (CPI)	
Rp DN 15 - Rp DN 20	200	75	137	74	22	115	95	
Rp DN 25	200	75	142	74	27	115	100	
The dimensions are provided as a guideline, they are not binding								

Table 2
Coils and connectors

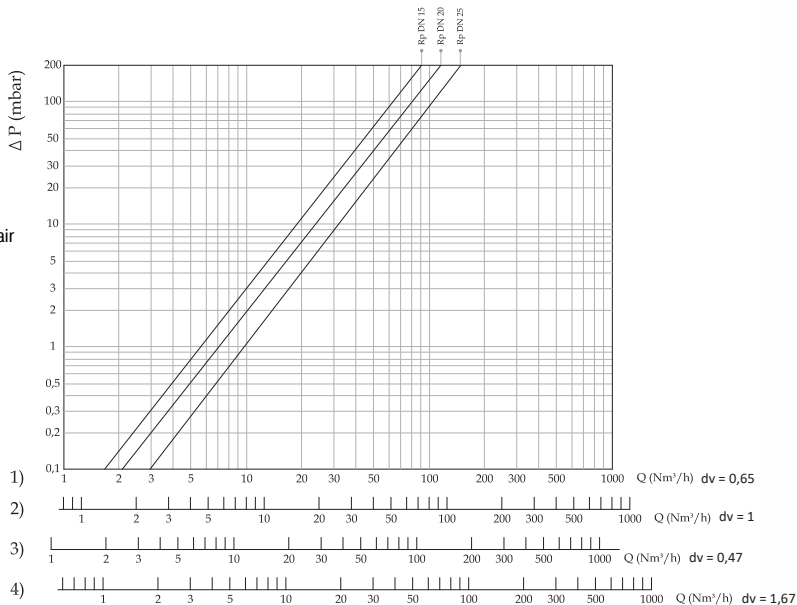
Valve code	Connections	Voltage	Coil + connector code	Coil stamping	Connector type	Absorbed power
35500173	Rp DN 15	24 V/50 Hz	B13052	BO-0410 24 VDC 17W	24 Vac Rectifier	14 VA
35500184	Rp DN 20					
35500195	Rp DN 25					
35500642	Rp DN 15	110 V/50-60 Hz	B13089	BO-0420 110 V RAC 17W	110 Vac, 230 Vac Rectifier	17 VA
35500653	Rp DN 20					
35500664	Rp DN 25					
35500011	Rp DN 15	230 V/50-60 Hz	B13051	BO-0430 230 V RAC 17W	110 Vac, 230 Vac Rectifier	18 VA
35500022	Rp DN 20					
35500033	Rp DN 25					

Table 3	
SIL LEVEL	
Parameter	Value
Hardware Failure Tolerance - HFT	0
Common Cause Failure - CCF in points	75
Safe Failure Fraction - SFF in %	65%
Expected Lifetime Cycles - B_{10d}	251278
Expected Lifetime - T_{10d} [years]	87
Probability of Dangerous Failures - PFH_D [1/h]	1.33E-07
Performance Level - PL	d
Safety Integrity Level - SIL	2
Mean Time to Dangerous Failure - $MTTF_D$ [years]	860
DESIGNED LIFETIME	
Designed operating cycles (According to EN 161)	Time (years)
from 100.000 to 200.000 depends on diameter	10

Pressure drop diagram (calculated with P1 = 50 mbar)

ρ_v = density relative to the air

- 1) methane
- 2) air
- 3) town gas
- 4) lpg



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We reserve the right to any technical and construction changes.



Registered Office: Travis Perkins PLC, Lodge Way House, Lodge Way, Harlestone Road, Northampton NN5 7UG.

Telephone Number: 0116 245 5500

www.bssindustrial.co.uk - inquiries@bssgroup.com