TIME

# COMBINATION GAS VALVES

*Electric Modulating Control*

# ET56S.A1109

## APPLICATION

"ET56SA series combination gas valves have been developed for electric modulating application in gas fired domestic central heating boilers, water heater appliances with an automatic ignition system. The controls are also suitable for application on a wide variety of gas burning appliances such as catering equipment, warm air furnaces and back boilers.

The ET56SA1109 and this data sheet are intended for use by OEMs which integrate the combination gas valves in their products.

## * FEATURES

- Compact design suitable for installation in small modern gas boilers and gas water heaters.
- Specially designed for gas appliances with DBI system to light the main burner.
- Servo pressure regulator ensures stable outlet pressure.
- Pressure feedback ensures constant burner pressure.
- Provides Inlet/Outlet pressure test points.
- All adjustments are accessible from the top of valve.
- An internal fine mesh screen is integrated at the inlet side.

## * SPECIFICATIONS

**Models**
ET56SA1109 .

**Pipe connection**
Inlet and Outlet : G3/4 (ISO 228) Male thread

**Pressure feedback connection**
Servo pressure regulator has 6.5mm OD tube connection for pressure feedback compensation.

**Mounting position**
Vertical / Horizontal ± 5 °

**Dimensions**
See dimensional drawings

**Maximum operating inlet gas pressure**
60 mar

**Outlet pressure range for Modulating control**
1 ～ 37 mbar

**Minimum regulating capacity**
0.31 m3/h air

**Type of gas**
2nd and 3rd family gas

**Inlet filter**
#100 fine mesh

**Closing time of safety valves**
within 1second.

**Class of valve** / EN126
1st safety valve : Class B
2nd safety valve : Class J

**Class of governor**
Class B with reference to EN126

**Protection Degree**
IP44 with optional connector.

## ELECTRICAL DATA

### Power consumption and current

* Safety shut off valves :

| Supply voltage | Power consumption | Current |
|---|---|---|
| 230 V ac | 12 VA | 52 mA |

* Electrical Modulating governor :

| Operating voltage | Maximum current | Resistance |
|---|---|---|
| 13.2 V max | 165 mA | 80 Ω |

**NOTE :** The coils for safety shut off function of ET gas valve are DC type solenoid, however the terminals for electrical connection have been incorporated with full wave rectifier, it can be connected the power supply of 230 V ac.

### Supply voltage tolerance

Gas valve will function satisfactory between 85% and 110% of the rated voltage.

### Electrical connection

Safety shut-off valves : Male contact 3003 MOLEX interchangeable.
Suitable for female / MOLEX series 3001.

Electrical modulating governor : Male fast-on connector #110 ( 2.8 mm )

### Pin connection

Power supply to terminal / Number 4 - 5 Ground connection / Number 3
( Full wave rectifier is integrated in the terminals )

## ENVIRONMENTAL CONDITIONS DATA

### Storage DIN EN60721-3-1

| | |
|---|---|
| Climatic conditions | Class 1K3 |
| Mechanical conditions | Class 1M2 |
| Temperature range | -20 ～+60 ℃ |
| Humidity | < 95%RH |

### Transport DIN EN 60721-3-2

| | |
|---|---|
| Climatic conditions | Class 2K2 |
| Mechanical conditions | Class 2M2 |
| Temperature range | -20 ～+60 ℃ |
| Humidity | < 95% RH |

### Operation DIN EN 60721-3-3

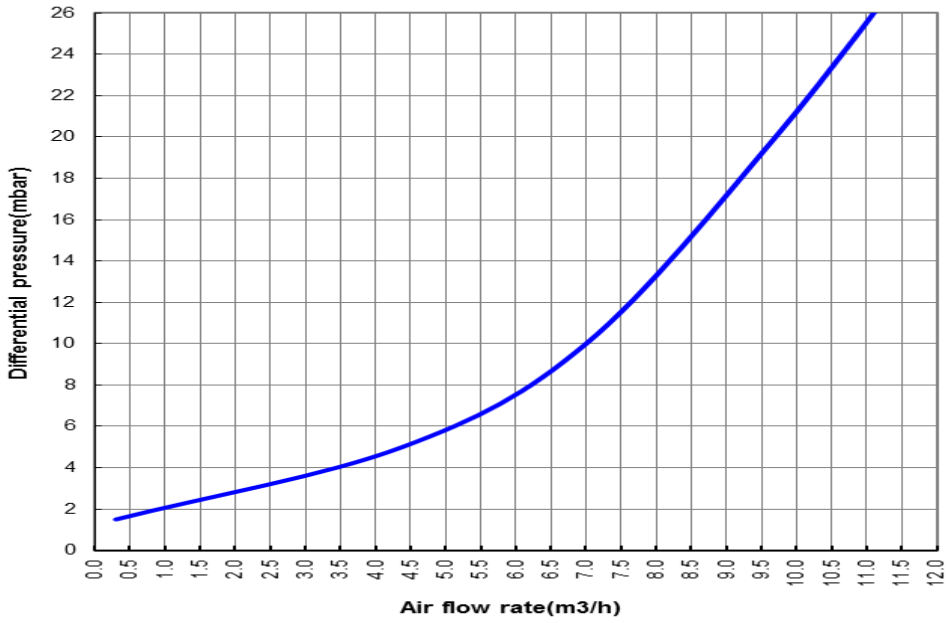
| | |
|---|---|
| Climatic conditions | Class 3K3 |
| Mechanical conditions | Class 3M2 |
| Temperature range | -20 ～+60 ℃ |
| Humidity | < 95%RH |

## PERFORMANCE CHARACTERISTICS

Capacity in m3/h air at pressure differential

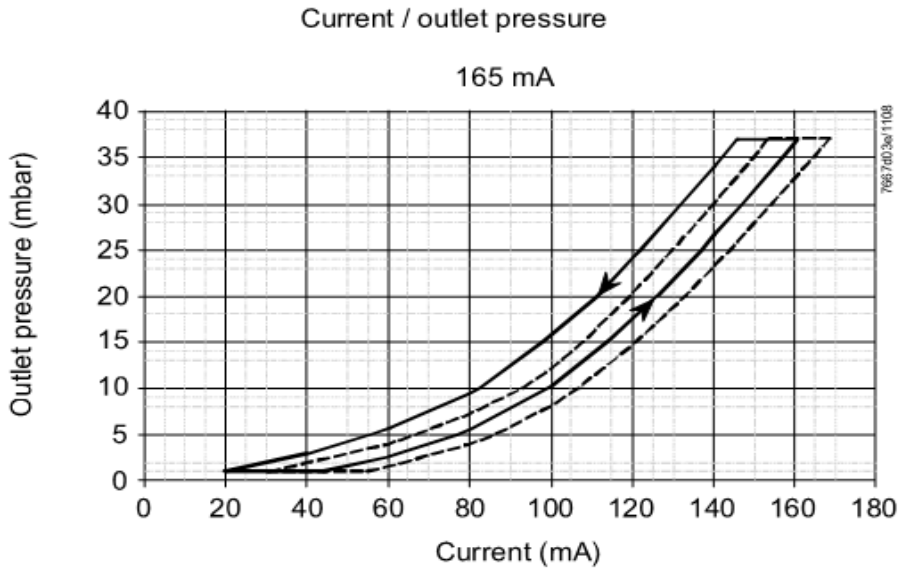
Solenoid valve class B + J

Flow rate at pressure drop of 5 mbar : 4.3 m3/h air




Modulating control characteristics

Modulating coil: 13.2 V / 165 mA




——— Increasing and decreasing arrow line indicates the max. hysteresis of I-P2 curve

------ Max. tolerance of increasing I-P2 curve

## INSTALLATION DATA

**Main gas connection**

- Use a pipe fitting with thread according to BS21 or piece of new.
- To prevent male thread distortion and or damages, care must be taken not to tighten the pipe fitting too far.
- Ensure the gasket is properly placed in the right position of pipe fitting.
- Ensure that gas flow is in the same direction as the arrow on the valve body.

**Pressure test points**

- The valve is provided with an inlet and outlet pressure tap.
  When checking the pressure, undo the screw a half turn and slip the tube over the nipple.

**# Warning : Make sure the screw is retighten after making the test.**

**Electrical connection**

**# Warning : Switch off power supply before making electrical connection.**
**Wiring must be accordance with local regulations.**
**Follow the instruction supplied by the manufacturer.**

- Install power in accordance with required the electrical connection.
- When making connections to the terminals of the valve, use lead wire and connector which can be withstand 105 ℃ ambient temperature.

**Checkout and installation**

Make sure that all burner components function correctly, therefore the unit must be put into operation after each setting, must be obserbed during several operation cycles and must be served one safety test.

## STANDARDS AND CERTIFICATES

Conformity according to EEC directives

| | |
|---|---|
| - Electromagnetic compatibility EMC ( immunity) | 2004/108/EC |
| - Directive for gas appliances | 90/396/EEC |
| - Directive for pressure devices | 97/23/EEC |

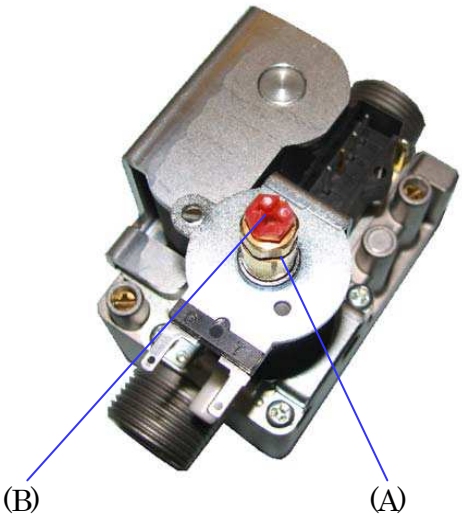
## ADJUSTMENT DATA

**Outlet pressure of modulating governor - Electric modulating control**

Check the inlet and outlet pressure using the pressure test points provided.
Remove the protective cap ( Yellow ) .
If the inlet pressure is the nominal pressure, the voltage must be applied to the modulating coil, so that the maximum modulating current flows.

＊To set maximum outlet pressure :
In order to set the maximum outlet pressure,
- turn the brass screw (A) clockwise to increase the outlet pressure

- turn the brass screw (A) to decrease the outlet pressure.
- Ensure that after achieve of state << outlet pressure < inlet pressure < - ΔP valve >>
  the setting screw for the outlet pressure must not longer turned clockwise.




＊ To set minimum outlet pressure :
When inlet pressure is normal pressure,
then disconnect the terminals of modulating coil,
( modulating current = 0 mA ),
- turn the red color plastic screw (B) clockwise to increase the outlet pressure,
- turn the red color plastic screw (B) counterclockwise to decrease the outlet pressure.

＊ Confirm outlet pressure is correctly adjusted, check minimum and maximum setting several Times, then, tighten the protective cap ( Yellow) for protection.

## CHECKOUT AND INSTALLATION

After any adjustment, set appliance in operation and observe through several complete cycles to ensure that all burner components function correctly.

## SERVICE AND MAINTENANCE DATA

*IMPORTANT : Follow the appliance manufacturer's service and maintenance instruction.*

### Gas leak test

Gas valves are factory checked for gas leakage.
Only the main burner connection needs to be checked for gas leakage.

## WARNING NOTES

To avoid injury to persons, damage to property or the environment, following waring notes must be observed.

Do not open, interfere with or modify the valve !

- All activities (mounting, installation and service work etc., ) must be performed by qualified staff.
- Before making any wiring changes in the connection area, completely isolate the plant from main supply (all-polar disconnection).
  Ensure that the plant cannot be inadvertently switched on again and that it is indeed dead.
  If not observed, there is a risk of electric shock hazard.
- Ensure protection against electric shock hazard by providing adequate protection for connection terminals.

- Each time work has been carried out (mounting , installation, service work, etc., ), check to ensure that wiring is in and orderly state and make safety checks.
- Fall or shock can adversely affect the safety functions. Such valves must not be put into operation even if the unit does not exhibit any damage.
- Use a suitable screwdriver to open or close manually the screws of the pressure test points. If this is not observed, the threaded connections of the pressure test points might get damaged, which can lead to loss of tightness.

**LIFE CYCLE**

Combination gas valves have a designed lifetime of 550,000 burner startup cycles which, under Normal operating conditions in heating mode, correspond to approx.. 10 years of usage ( starting from the production data given on the field ).

This lifetime is based on the ensurance tests specified in standard EN161 and table containing the relevant test documentation as published by the European Association of Component Manufactures ( Afecor) ( www.afecor.org.)

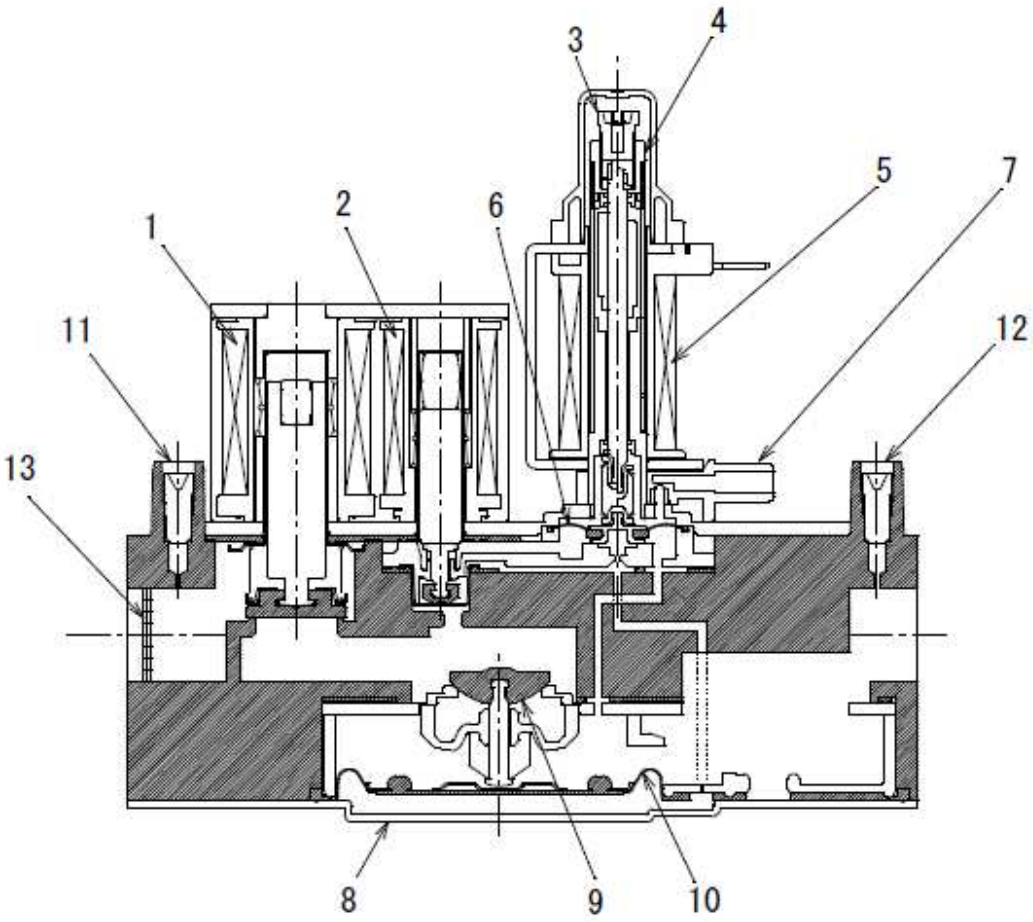
The designed lifetime is based on use of the Combination Gas Valves according to the Data Sheet.

After reaching the designed lifetime in terms of the number of burner startup cycles, or the respective time of usage, the Combination Gas Valve is to be replaced by authorized personnel.

**DISPOAL**

The unit contains electrical and electronic components and must not be disposed of together with house hold waste. Local and currently valid legislation must be observed.

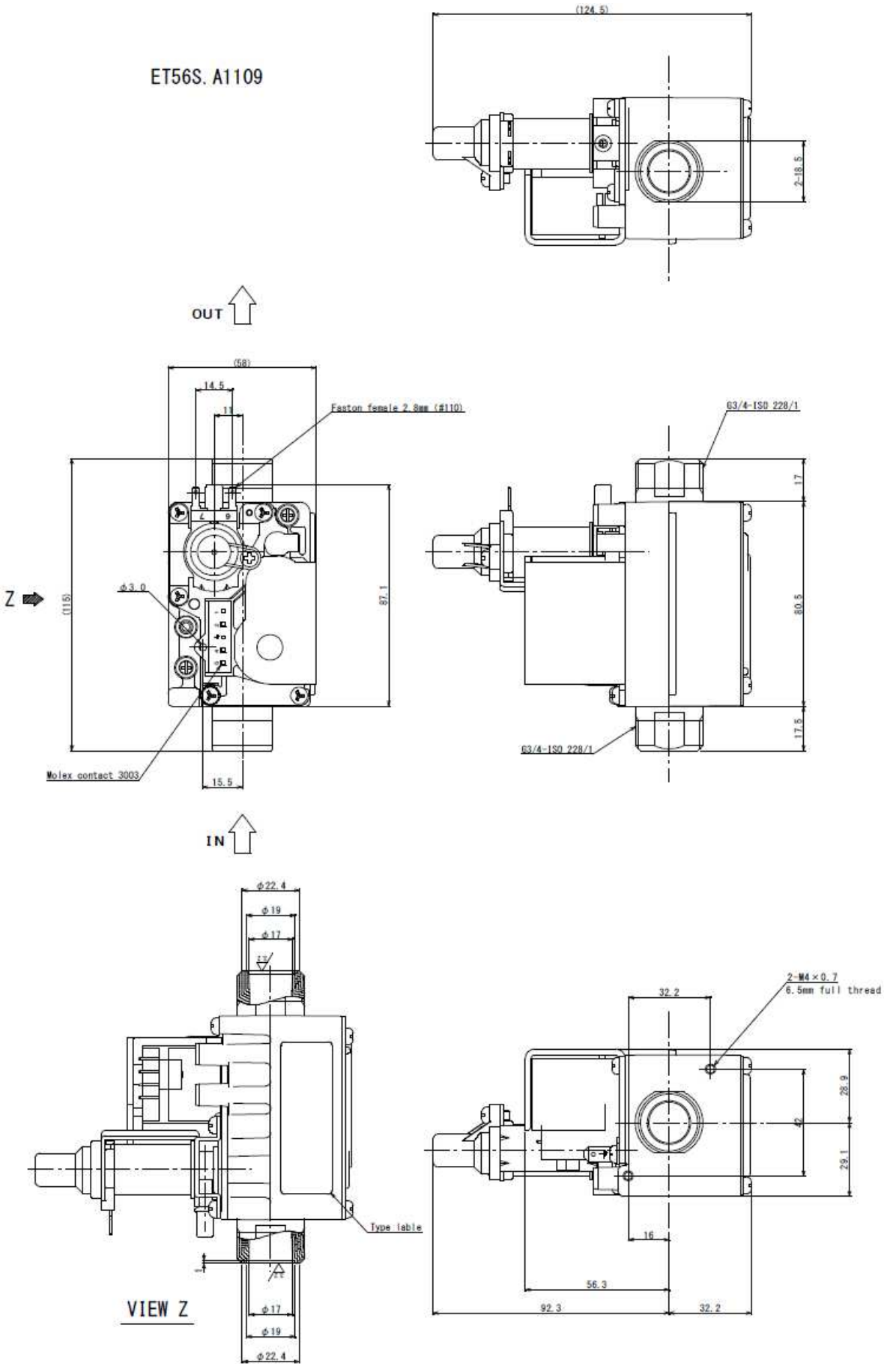
Sectional view of
ET5xS...




Legend

| | | | |
|---|---|---|---|
| 1 | 1st shutoff valve(class B) | 8 | Gas inlet governor |
| 2 | Operating valve | 9 | 2nd shutoff valve(regulator plug) |
| 3 | Setting screw minimum outle pressure | 10 | Main diaphragm |
| 4 | Setting screw maximum outlet pressure | 11 | Inlet pressure |
| 5 | Modulating coil | 12 | Outlet pressure |
| 6 | Servo diaphragm | 13 | Filter |
| 7 | Combustion chamber feedback pressure | | |

ET56S.A1109


(124.5)
2-18.5
OUT
(58)
14.5
11
Faston female 2.8mm (#110)
G3/4-ISO 228/1
17
80.5
17.5
G3/4-ISO 228/1
Z
φ3.0
(115)
87.1
Molex contact 3003
15.5
IN
φ22.4
φ19
φ17
Type lable
VIEW Z
φ17
φ19
φ22.4
2-M4×0.7
6.5mm full thread
32.2
28.9
42
29.1
16
56.3
92.3
32.2