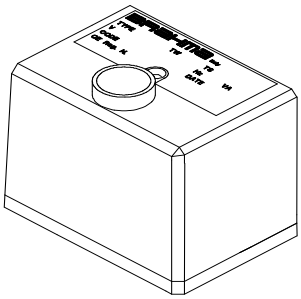
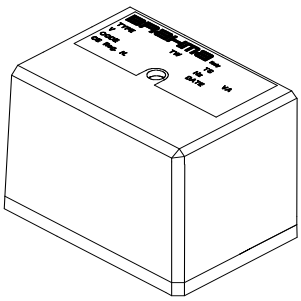
EUROBOX SERIES
TYPES MT191… MT391

AUTOMATIC CONTROL SYSTEMS FOR GAS BURNERS AND GAS FIRED INSTALLATIONS WITH OR WITHOUT FAN AND WITH EXTERNAL IGNITION DEVICE (MANUAL RESET)





DESCRIPTION

This series of electronic control systems is suitable for atmospheric gas burners, with or without fan in the combustion circuit, for non-permanent operation.
In comparison with basic versions, these systems mainly differ in their operating cycle and the characteristics of the ignition and detection device.
Thanks to their technical and manufacturing features, these devices can generally be used in gas fired systems with atmospheric burner (type MT391) or with fume extractor (type MT391).

FEATURES

The main features of this series are shown in Table 1. Other important features are:

- in compliance with EN298 (European standard for automatic gas burner control systems);
- flame monitoring based on the rectification property of the flame (ionization);
- two independent safety contacts in series on the gas valve output;
- electrical service life on max. declared loading > 250.000 operations;
- manual reset from lockout and inbuilt lockout signalling; some models can be provided with remote reset and lockout signalling;
- different connection and fixing systems;
- the ignition device must be insulated from the ground: we recommend using our electronic ignition transformers belonging to the TC….TD… series.

TABLE 1	BURNER			RESET		
	single flame	atmospheric without fan	atmospheric with fan	remote	inbuilt	Classification code according to EN298
MT 191	*	*		(B)	(A)	AMCLXN
MT 391	*		*	(B)	(A)	FMCLXN

REMARK: (A) Casing type xxxxx.2
(B) Casing type xxxxx.4

TECHNICAL DATA

Power supply: 230V~ 50-60Hz
Operating temperature range: -20°C +60°C
Humidity: 95% max. at 40°C
Protection degree:
socket OG IP 40 (after installation)

Timing:
– waiting or prepurge time **(TW)**: 1,5/3/5/10/20/30/40 s
– safety time at start up **(TS)**: 3/5/8/10/20/30/40/50/60 s
– drop-out time on running flame failure: < 1 s
The times appearing on the product label correspond to guaranteed values. Actual times may differ from declared values, as waiting and prepurge time could be longer, while safety and ignition time could be shorter than their nominal values.

Power consumption, running:
atmospheric burner 13VA
atmospheric burner with fan 15VA

Max. contact rating:	Imax	
- Thermostat:	4A	cosφ = 0.4
- EVG:	0.5A	cosφ = 0.4
- Fan:	1A	cosφ = 0.4
- Lockout signalling:	0.5A	cosφ = 1
- Auxiliary contact:	0.5A	cosφ = 0.4
- External ignition device:	1A	cosφ = 0.4

Max. cable length of external components: 1 m
Internal fuse: 4A quick-acting
External fuse: 3.15A quick-acting

Flame monitoring:
The flame detection device exploits the rectification property of the flame (ionization). This device is not provided with any protection impedance, therefore the detection electrode is not safe against electrical shock.
- Min. ionization current: 0.5µA
  on request: 1.2µA
- Recommended ionization current: 3÷5 times the min. ionization current
- Max. cable length: 1,5 m
- Min. insulation resistance of detection cable and electrode to the ground: ≥ 50MΩ
- Max. electrode stray capacitance: ≤ 1nF
- Max. short circuit current: < 200µA AC

Weight: 220g approx.

CONSTRUCTION

The plastic casing protects the control unit from mechanical damages, incautious handling, dust and dirt from the outside environment.
A particular manufacturing technique, consisting in assembling four printed circuit boards in order to form a "box" structure, has enabled a great reduction of the overall dimensions of the unit.
A varistor protects the device from voltage transients which may be generated in the mains supply.
An inbuilt fuse protects the internal relays of the control box in case of short circuit on the control outputs (valves, fan and lockout signal). As this fuse cannot be reached, the device must be protected by means of an external quick-acting fuse, suitable to the loads connected but not exceeding 3,15A.

OVERALL DIMENSIONS

The control units of the EUROBOX series can be supplied with different types of casing according to the characteristics and fixing systems required.
Casings are available with or without reset push-button, and with or without lateral fixing brackets. In the part reference identifying the type of control box, the suffix indicates the type of casing, i.e.:
2 with reset push-button without fixing brackets
4 without reset push-button without fixing brackets
The possibility of using casings without reset push-button is restricted to control units prearranged for remote reset from lockout. Fig.1 shows the overall dimensions of the devices.

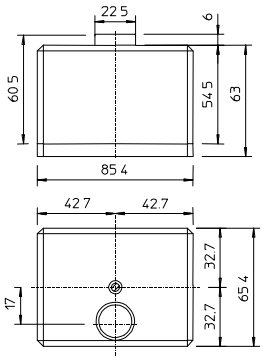


Fig.1

ACCESSORIES

Control boxes are usually supplied complete with inbuilt reset push-button. Versions with remote reset from lockout are available, which are usually provided with light reset push-button (see Fig.2).

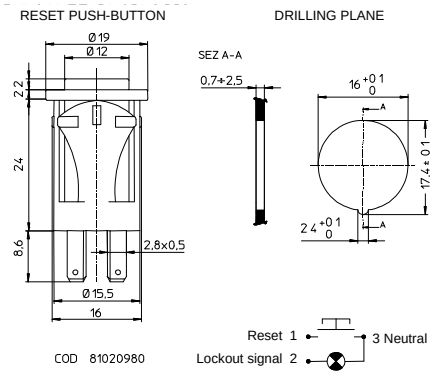


Fig.2

Control unit casings are prearranged for the use of cable holders and/or core hitches on their lateral walls; these accessories can be supplied on request, too (see Fig.3).

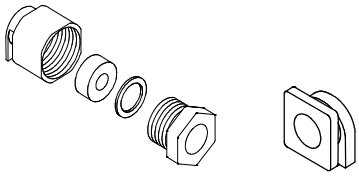


Fig.3

CONNECTION

The devices of this series are designed for use with the connecting socket shown in Fig.4 (socket type OG).

As for the connection of the units, cable holders and a suitable number of ground and neutral terminals should be available in the appliance or through external connection boxes.

These control units are designed for operation with one electrode only for both ignition and flame detection (the ignition electrode also carries out flame detection functions, as shown in Fig.6a); however, the control boxes can operate correctly with separate ignition and detection electrode, too (see Fig.6b).

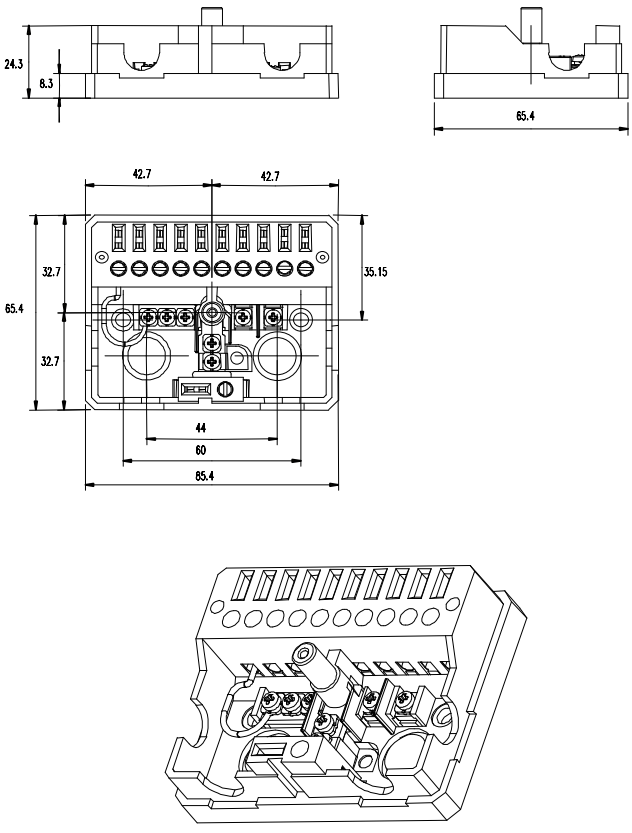


Fig.4: Socket type OG

DIRECTIONS FOR INSTALLATION

- A regulation shutdown must occur every 24 hours to enable the device to check its own efficiency (systems for non-permanent operation).
- Ignition devices are safety systems and shall not be unduly opened; the manufacturer's responsibility and guarantee are invalidated in case of incautious handling.
- Connect and disconnect the control unit only after switching off the mains supply.
- The control can be mounted in any position.
- Avoid exposing the device to dripping water.
- Ventilation and a suitably low temperature ensure the longest life of the control box.
- Make sure that the type (part number and times) you are using is correct before installing or replacing the control.
- The appliance in which the device is installed must provide adequate protection against the risk of electrical shock (at least IP20).

ELECTRICAL INSTALLATION

- The applicable national and European standards regarding electrical safety (e.g. EN 60335-1/prEN 50165) must be respected.
- **Live** and **neutral** should be connected correctly. The non-observance of live-neutral polarity may cause dangerous situations, as internal and external protection and safety devices might be ineffective in case the connection cables of thermostats and valves should lose their insulation. Besides, if **live-neutral** polarity is not respected the control proceeds to lockout at the end of the safety time at start up.
- Before starting the system check the cables carefully; incorrect wiring can damage the control unit and compromise the safety of the installation.
- Make sure the **ground** terminal of the control box, the burner metal casing and the **ground** of the electrical system are well connected.
- Avoid placing the detection cable close to power or ignition cables.
- In case the device is used in connection with a separate detection electrode, use a heat resistant detection electrode and cable and make sure they are well insulated to the **ground** and protected from humidity or water in general.
- Make sure the ignition cable you are using is as short and straight as possible and place it far from other conductors in order to reduce the emission of electromagnetic interference (max. length < 2m and insulation voltage > 25kV).
- Take great care while connecting the lockout signal and the reset push-button; reversed connection may damage the control unit.

In case of **live-neutral** network with **unearthed neutral**, or **live-live** network (with **unearthed** star centre), the device can operate as well by means of an inbuilt resistor; in any case, we recommend using our step-up transformer type AR1.

In case of bad insulation between **live** and **earth**, the voltage on the detection electrode may be reduced until it causes the lockout of the control.

CHECKING AT START

Always check the control before the first start, after any replacement or a long period of non-operation of the system. Before any ignition attempt make sure the combustion chamber is free from gas. Then make sure that:

- if a starting attempt occurs without gas supply, the device proceeds to lockout at the end of the safety time;
- when stopping the gas flow while the control is running, power supply to the gas valve(s) is interrupted within 1s, and after recycling the device goes to lockout;
- timing and operating cycle correspond to the behaviour declared for each type of control unit;
- the level of the flame signal is high enough (see Fig.5 for the measuring test);
- the ignition electrode is adjusted steadily for a spark gap between 2 and 4 mm;
- any adjusters, limiters or safety devices switching on cause the lockout of the device according to the type of appliance and the relevant operating mode.

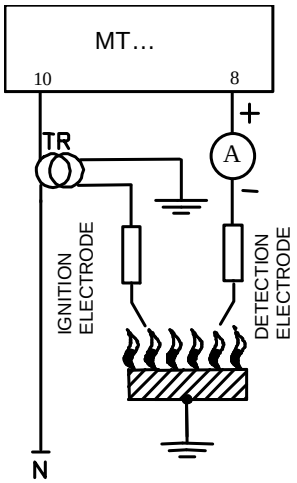


Fig.5

OPERATION

Each time the system starts up, the control box checks its own efficiency: any failure causing flame signal simulation prevents the unit from starting the ignition cycle.

In the types provided with fan control, before the beginning of the prepurge time TW the position of the air pressure switch contact is checked to ensure its "no-air-flow" state. Only if this test is positive can the air pressure switch detect air flow, enabling the prepurge stage to begin. At the end of the waiting or prepurge time, the gas valve is energized and the ignition device is started. In this way, the safety time (TS) and ignition time (TSP) begin.

The ignition device works for 40% of the safety time in any operation conditions (end of the TSP time). If a flame signal is detected during the remaining TS time, the control box still supplies the gas valve and continues running until either the flame turns off accidentally (with consequent recycling) or the adjustment ring opens.

If the control unit does not detect any flame signal, lockout occurs at the end of the safety time, after which the gas valve shuts off and the lockout signal is supplied.

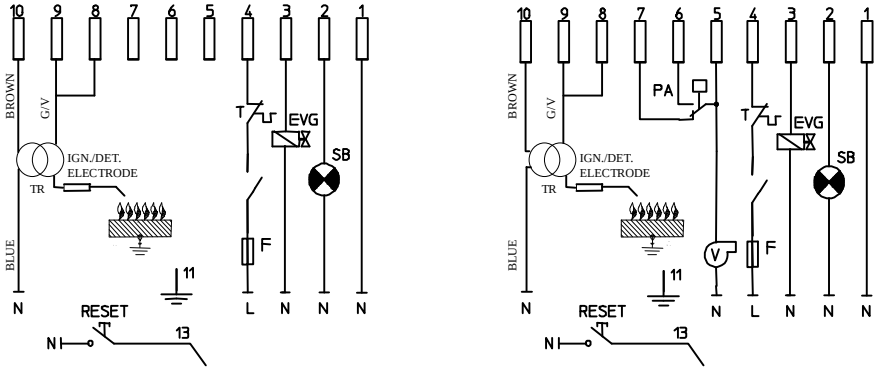
The attached operating cycle diagrams are useful to better understand the operation of each control box.

RESET OF THE DEVICE

In case of lockout, wait at least 10 seconds before trying to reset the unit; if this time is not observed, the system may not reset correctly.

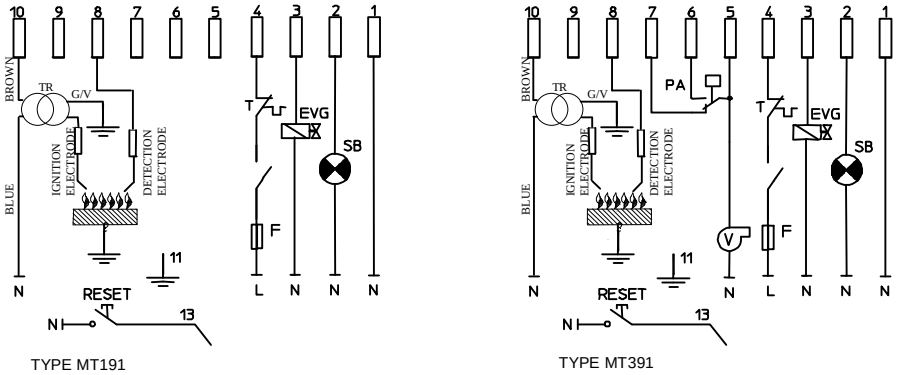
If the device is provided with remote reset push-button, this must usually be visible and placed near the appliance.

WIRING DIAGRAMS



TYPE MT191 TYPE MT391

Fig. 6a: Wiring diagrams with single ignition/detection electrode

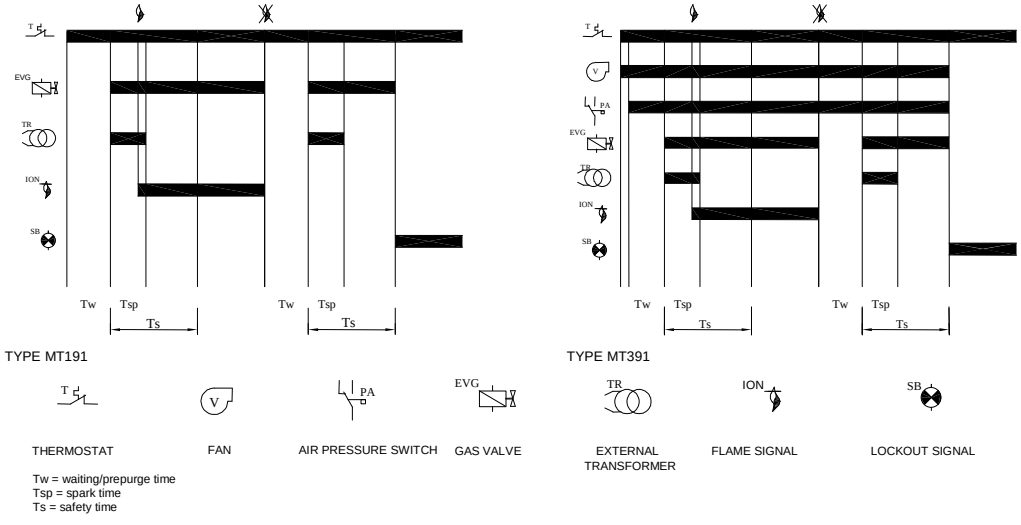


TYPE MT191 TYPE MT391

Fig. 6b: Wiring diagrams with separate detection electrode

REMARK: The limit thermostat must be wired in series to the live.

OPERATING CYCLES



TYPE MT191 TYPE MT391

THERMOSTAT FAN AIR PRESSURE SWITCH GAS VALVE EXTERNAL TRANSFORMER FLAME SIGNAL LOCKOUT SIGNAL

Tw = waiting/prepurge time
Tsp = spark time
Ts = safety time

ATTENTION -> Company Brahma S.p.A. declines any responsibility for any damage resulting from the Customer's interfering with the device.

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2011/06/07 subject to amendments without notice