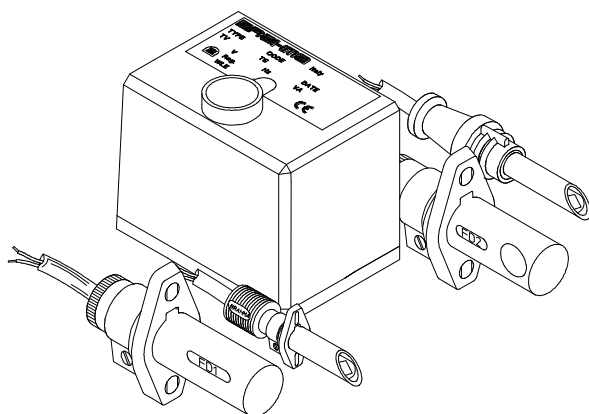


EURO-OIL SERIES

Types GR1 GR1/Z GR2

AUTOMATIC OIL BURNER CONTROL SYSTEMS



APPLICATION

This range of electronic oil burner controls has been specifically designed for oil burners for non permanent operation.

The automatic burner controls of this series are suitable for:

- monobloc oil burners
- warm air generators
- steam boilers
- power washers
- kilns

Due to the technical and structural characteristics and to the variety of models they can be used for the automation of cookers and oil burner operated appliances for domestic and industrial applications.

FEATURES

Table 1 shows the main features of this series.

Other important features are:

- in accordance with the European standard DIN EN 230: 1991-05 concerning monobloc oil burners, safety control and regulation devices. The DIN registration numbers relevant to this series of devices are the following:
types GR1-GR1/Z **DIN Reg. No. 5F165/04**
type GR2 **DIN Reg. No. 5F166/04**
- in compliance with the standard DIN 4794 part 2, edition December 1980 regarding warm air generators WLE (only version with TV = 20 s and TS = 5 s);
- two independent safety contacts for oil valve(s) control;
- electrical service life at max load >250.000 operations;
- simple wiring and installation.

TABLE 1

	single flame	dual flame	pre-heater	normal operation in case of pre-heating thermostat opening	fuel throughput < 30kg/h	fuel throughput > 30kg/h	WLE	external reset	flame detectors : FC11/. FC13/. FC14/. FD1 FD2
GR1	*		(1)		*		*	*	*
GR1/Z	*		*	*	*		*	*	*
GR2		*	(1)			*	*	*	*

(1) : Possible application with suitable connection (see "CONNECTION PARAGRAPH").

TECHNICAL DATA

Supply Voltage:	220-240 V / 50-60 Hz
on request:	110-120 V / 50-60 Hz
Operating temperature range:	-20 ... +60 °C
Ambient humidity:	95 % max at 40 °C
Protection degree:	IP 40
Times	
- Prepurge time (TV):	1.5/10/20/30/40 s
- Safety time (TS):	5/10 s
- Safety time during operation:	< 1s
The times given on the burner control label correspond to the values guaranteed. The actual values slightly differ from the values given, as prepurge time can be longer and safety time shorter than their nominal values.	
Power consumption:	8 VA
Contact rating:	
I max	
- Thermostat:	6.0 A cosφ > 0.4
- Motor:	2.0 A cosφ > 0.4
- Ignition transformer:	2.0 A cosφ > 0.4
- EV1:	0.5 A cosφ > 0.4
- EV2:	0.5 A cosφ > 0.4
- Pre-heater:	0.5 A cosφ = 1.0
- Alarm:	1.0 A cosφ = 1.0
Internal fuse rating:	6.3 A slow blow
External fuse rating:	4.0 A fast
Weight (including socket):	132 g

CONTROLS FOR SPECIAL APPLICATIONS

On request it is possible to meet special requirements concerning times and operating cycles.

CONSTRUCTION

The particular construction and the use of surface mounted components allow to have reduced overall dimensions. The enclosure made of plastic material protects the control from possible damages resulting from crashes, incautious opening, dust and contact with the external environment. A varistor protects the control from voltage transients on the electric network. An inbuilt fuse protects the internal relays of the control box in case of short circuit on the outputs (valves, ignition transformer, motor and lockout signal).

OVERALL DIMENSIONS

The following figure (Fig. 1) shows the overall dimensions of the control.

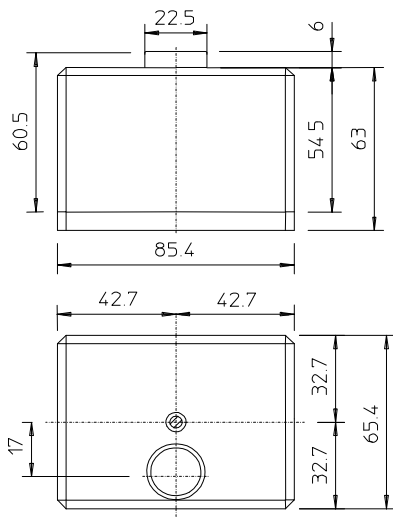
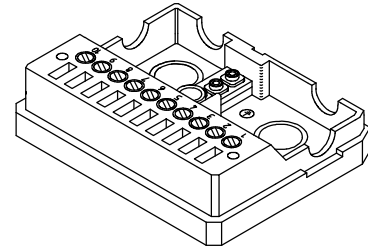


Fig. 1

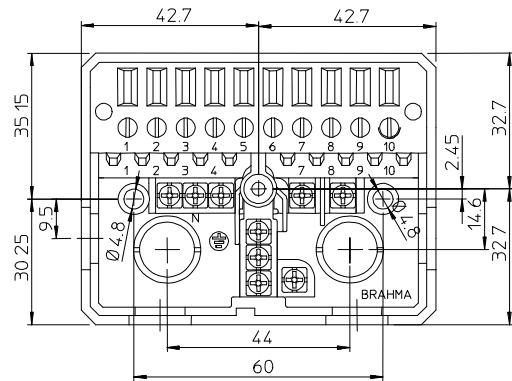
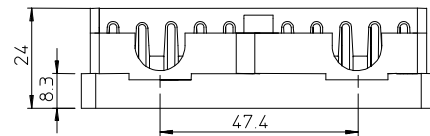
CONNECTION

For the connection of the external components the control is fitted with socket type N (see Fig. 2).

The socket is provided with a screw terminal board which allows a simple and safety connection. To fix the socket it is advisable to use screws type M4, while to fix the control to the socket the pin supplied with the control unit has to be used.



Socket N



Socket N

Fig. 2

For the electrical connection of the external components see "CONNECTION DIAGRAMS" paragraph.

ACCESSORIES

The following data are useful to choose the most suitable flame detector for the application and the control unit used.

flame detectors

frontal and lateral side	FC11/R 1.5 .. 6.5 lux
	FC11/A 1.5 .. 3.0 lux
frontal and lateral side	FC13/R 1.5 .. 6.5 lux
	FC13/A 1.5 .. 3.0 lux

The suffix indicates the colour of the flame detectors enclosure:

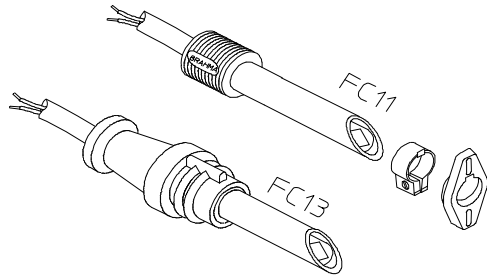
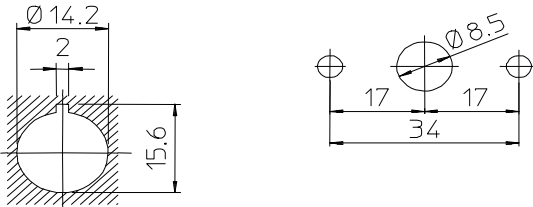
/R	red
/A	blue

To fix the flame detector type FC11 screws diameter 4 mm are suggested.

The following figure (Fig. 3) shows the types and fixing systems of the available flame detectors.

Drilling plane FC13-FC14

Drilling plane FC11



FC14

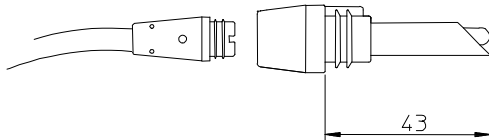


Fig. 3

For blue flame burners, FD1 and FD2 UV sensors are suitable to detect ultraviolet light (spectral bandwidth from 290 nm to 350 nm).

Frontal side	FD1
lateral side	FD2

Figure 4 shows the types and fixing systems of the FD1 and FD2 flame detectors.

To fix FD1 and FD2 flame detectors screws diameter 4 are suggested.

Drilling plane FD1-FD2

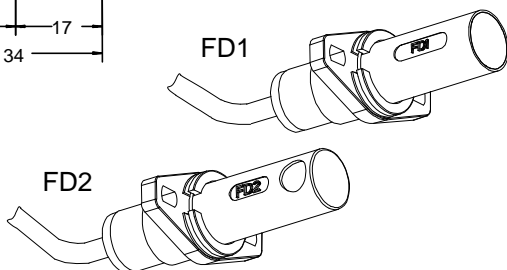
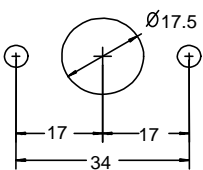


Fig. 4

Cable holders and core hitches can be fitted on the sides of the enclosure and the connecting socket. These accessories can be supplied upon request (see Fig. 5).

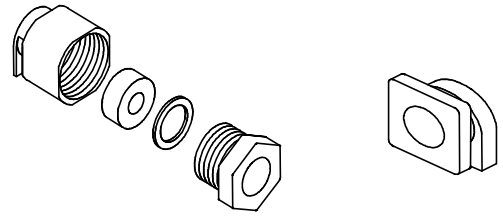


Fig. 5

DIRECTIONS FOR USE

- Automatic controls are safety devices and must not be opened. The manufacturer's responsibility and guarantee are invalidated if the control is incautiously opened.
- For safety reasons a regulation shutdown must occur every 24 hours (systems for non permanent operation).
- The control can be connected and disconnected only without the main power.
- The control can be mounted in any position.
- Avoid exposing the control unit to dripping water.
- Ventilation and the lowest temperature ensure the longest life of the control.
- Make sure that the type (code and times) you are using is correct before installing or replacing the control.

ELECTRICAL INSTALLATION

- The applicable national and European standards (e.g. EN 60335-1 / EN 50165) regarding electrical safety must be respected.
- **Live** and **Neutral** should be connected correctly; a mistake could cause a dangerous situation, as the internal safety devices can be ineffective in case of insulating leakage of the connecting wires of thermostats and valves.
- Before starting the control unit check the cables carefully. Wrong connections can damage the control and compromise the safety of the application.
- The earth terminal of the control, the metal frame of the burner and the earth of the electric system must be well connected.
- Avoid putting detection cables close to power or ignition cables.
- Protect the control with a quick acting fuse suitable to the load connected and never exceeding 4 A.
- The appliance in which the control is installed must provide adequate protection against the risk of electrical shock.

CHECKING AT START

Always check the control before the first start and also after any replacement or a long period of non operation of the system.

Before any ignition attempt make sure that the combustion chamber is free from oil.

Then make sure that:

- if the starting attempt occurs with the flame detector obscured the control performs a lockout after safety time;
- if start up takes place with extraneous light the control performs a lockout within 10 seconds;
- when the flame detector is obscured in running position, supply to the oil valves is interrupted within 1 second and after a recycling the control proceeds to lockout;
- the intervention of limiters or safety devices cause a safety shutdown according to the application;
- operating times and sequence are suitable to the control unit used.

OPERATION

At every start the control unit supplies the burner motor and the ignition transformer and proceeds to a self-checking of its own components. During the pre-purge time the internal circuit makes a test of the flame signal amplifier circuit. Extraneous light or a fault in the amplifier leading to the same condition cause the lockout of the control within 10 seconds.

At the end of pre-purge time the control output of the first oil valve is energized; if a flame signal is detected at the end of safety time, the control unit de-energizes the ignition transformer and goes to running position.

At the end of safety time in the controls with two flame levels the ignition transformer is de-energized and the second oil valve is supplied. If no flame signal is detected during safety time, the control goes to lockout, so the control outputs of the valve(s), the ignition transformer and the burner motor are switched off while the lockout signal is supplied.

The controls prearranged for the use of an oil pre-heater supply the pre-heater when the room thermostat and/or the boiler thermostat switch off. In this way, the starting sequence begins.

In the type GR1/Z the thermostat opening does not cause the burner shutdown; if the pre-heater is used with types GR1 and GR2, the thermostat opening causes the repetition of the starting sequence after the heating stage (RISC) of the pre-heater.

The attached operating cycles are useful to understand how each control operates.

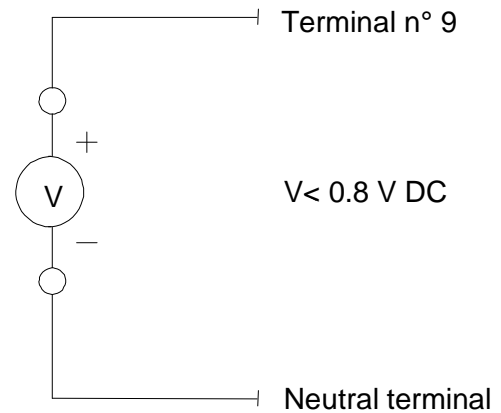


Fig. 6

ABNORMAL OPERATION-EXTRANEIOUS LIGHT

All control units of this series perform a lockout within 10 seconds.

RESET OF THE CONTROL

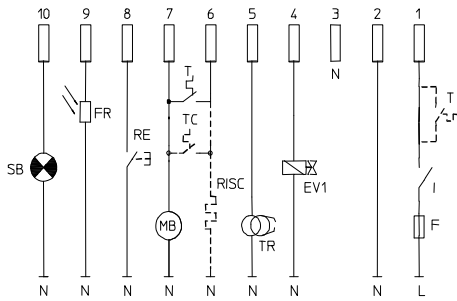
When a control has gone to lockout, a delay of 10 seconds should be considered before attempting to reset the control unit; if this time is not observed the control may not reset.

TESTING THE FLAME SIGNAL

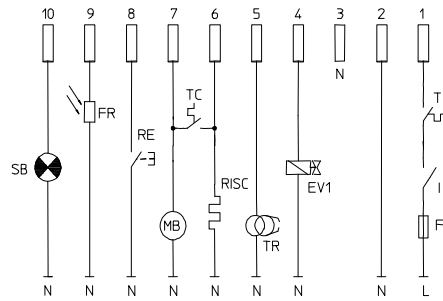
It is extremely important to test the flame signal level before having the burner operate.

Arrange one cable connected to terminal n° 9 and one cable connected to the neutral terminal. These cables should be accessible when the control is mounted on the socket; then, with the burner in running position, the voltage between terminals must be ≤ 0.8 V. This value guarantees a safe operation; it corresponds to a light intensity 50 % beyond the limit value (about 1.4 V). In case the tested voltage is higher, try to better orientate the photocell or to clean it (see Fig. 6).

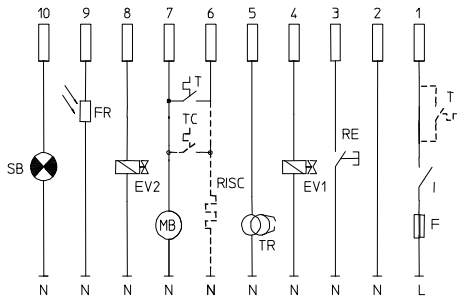
CONNECTION DIAGRAMS



TYPE GR1



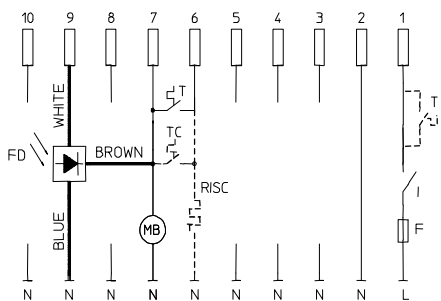
TYPE GR1/Z



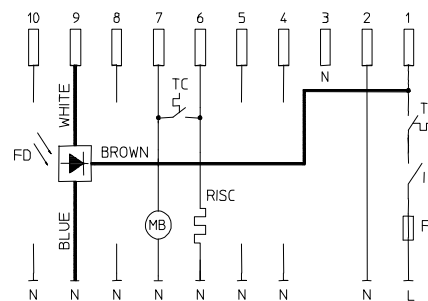
TYPE GR2

Note : The sketched wiring shows the pre-heater and pre-heater thermostat connection in the application which are pre-arranged for.

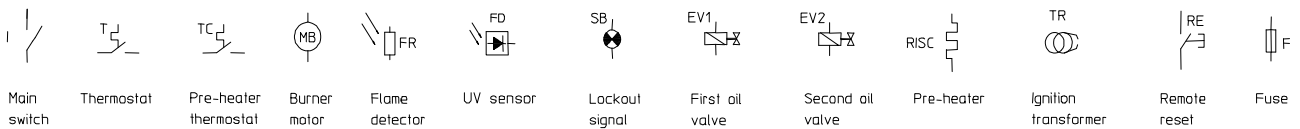
UV Sensor FD1 - FD2 connection



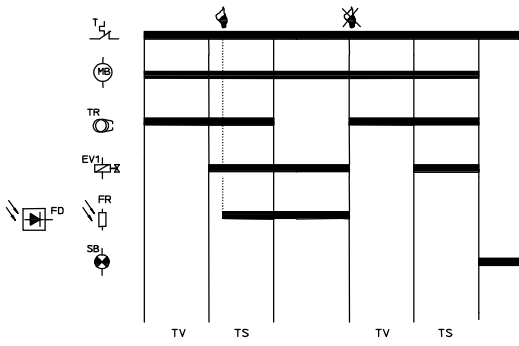
TYPE GR1-GR2



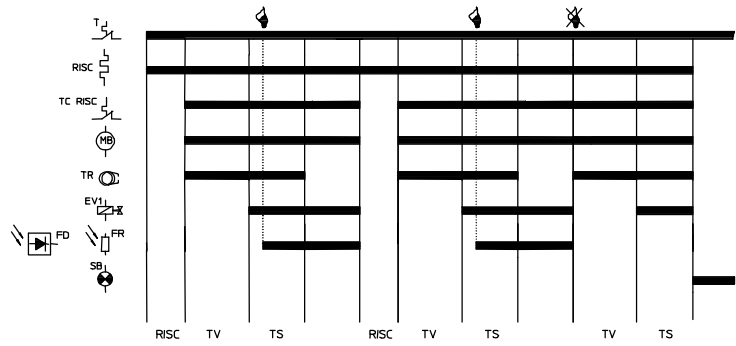
TYPE GR1/Z



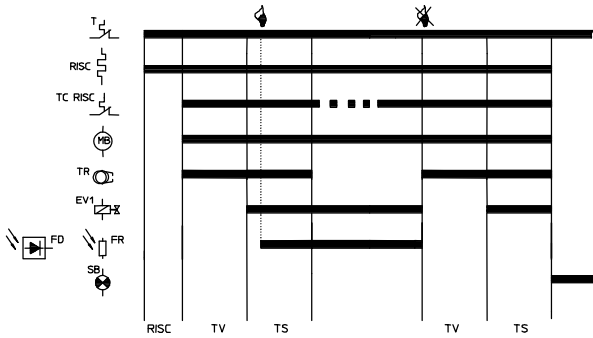
OPERATING CYCLES



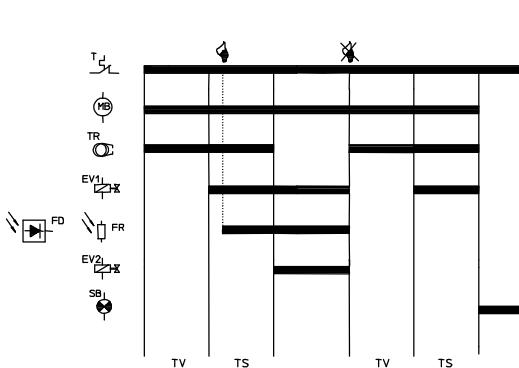
TYPE GR1



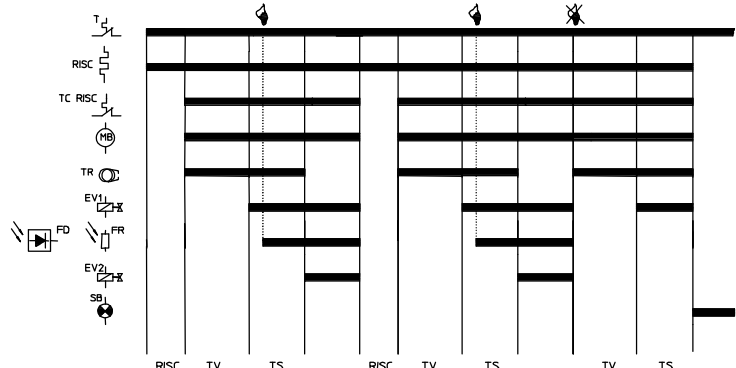
TYPE GR1 Appliance with pre-heater



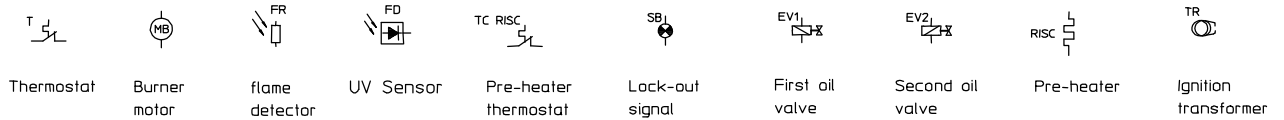
TYPE GR1/Z



TYPE GR2



TYPE GR2 Appliance with pre-heater



EURO-OIL SERIES Types GR1 GR1/Z GR2

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