

Gas Burner Control Box

For 2-stage atmospheric gas burners

Possible flame detectors:

- Ionisation probe
- Infra-red flicker detector

INTRODUCTION

The TFI 812.2 gas burner control boxes are capable of controlling and monitoring atmospheric gas burners. They have been tested and approved as per DIN 4788 part 3 edition 04.89 and with the European standard EN 298. They are also suitable for use with stationary warm air generators (as per DIN 4794).

The control boxes are designed for maximum safety in case of fluctuations in the voltage supply. If the mains voltage drops below the permitted level, operation is interrupted and the control box automatically prevents the start sequence from being repeated. In this way, the safety of the system is not put at risk by a drop in the mains voltage.

The control box and the monitoring function which it performs is not negatively affected by occasional stray ignition sparks jumping to the ionisation electrode.

The FR 870 remote reset (item no. 70700) can be connected, and allows remote reset of the control box (see doc. no. 750).

The TFI 812 mod.5 can be installed in place of the TFI 712 F, and the TFI 812 mod.10 can be employed to replace the TFI 712.

It is not necessary to rewire or replace the baseplate. The difference in the heights of the units can be compensated by attaching the reset button extension (item no. 70601).

The difference between the TFI 812.1 and the TFI 812.2 is that the TFI 812.2 control boxes are equipped with the voltage drop fail-safe function. Otherwise, they are identical in terms of operation and possible applications.

CONSTRUCTIONAL FEATURES

The control box is well protected by a flame-resistant, transparent, plug-in type plastic housing which encloses the thermo-mechanical temperature-compensated timing unit, the flame monitoring unit and the reset device.

The reset button, which incorporates an indicator lamp, and the central screw fastening, are situated on the upper part of the control box.

The baseplate, which can be equipped with additional terminals, together with the various optional cable entry points, makes universal wiring possible.



TYPES AVAILABLE

| | |
|---------------------|--|
| TFI 812.2 mod. 5 | Safety interval nominal 5 sec. Pre-ignition time approx. 15 sec. appropriate nominal capacity according to the appliance standort or the gas appliance directive. |
| TFI 812.2 mod. 10 | Safety interval nominal 10 sec. Pre-ignition time approx. 10 sec. appropriate nominal capacity according to the appliance standort or the gas appliance directive. |
| TFI 812.2 B mod. 5 | dito – without Pre-ignition time |
| TFI 812.2 B mod. 10 | dito – without Pre-ignition time |

TECHNICAL DATA

| | |
|----------------------------------|---|
| Supply voltage | 220/240V (-15... +10%) 50 Hz (40 - 60 Hz) |
| Fuse rating | 10 A rapid or 6 A slow |
| Power consumption | 5 VA |
| Max. current per output terminal | 4 A |
| Max. current total | 6 A |
| Pre-ignition time | 15 or 10 sec. |
| Delay, post-ignition time | none |
| Safety interval nominal | 5 or 10 sec. |
| Safety interval max. | 10 or 20 sec. |
| 2nd stage delay | approx. 20 sec. |
| Reset delay after lockout | approx. 60 sec. |
| Permissible ambient temperature | -20° C to +60° C |
| Sensitivity | 1.5 µA |
| Min. ionisation current required | 2 - 3 µA |
| Ionisation probe insulation | probe - earth greater than 50 MΩ |
| Stray capacitance | probe - earth less than 1000 pF (max. 20 m cable) |
| Insulation standard | IP 44 |
| Weight incl. baseplate | 250 g |
| Mounting attitude | any |

TECHNICAL FEATURES

1. Flame detection

The following types of flame detectors are suitable:

- Ionisation probe, temperature resistant material, well insulated (material and insulation same as for ignition electrode).
- IRD 1020 infra-red flicker detector (see doc. 750)

Flame detection using an ionisation probe is only possible in conjunction with mains supplies which provide a neutral earth connection.



The ionisation rod has to be installed in a way that the distance to the ignition electrode is big enough to prevent the spark to jump to the ionisation rod.

2. Safety

In terms of design/construction and programme sequence, the TFI 812 control boxes conform to the presently applicable European standards and regulations.

3. Installation

At the baseplate:

- 3 earth terminals, with an additional tag for the burner earth.
- 3 neutral terminals, with a fixed, internal through connection to the neutral input, terminal 8.
- 2 independent terminals, which can be used as desired.
- 2 separate slide-in plates and 2 fixed, threaded knock-outs as well as 2 knock-outs underneath, facilitate wiring of the baseplate.

General:

- Can be mounted in any position, insulated as per IP 44 standard (unaffected by water spray).
The control box and detector probe should not, however, be subjected to excessive vibration.
- The applicable installation regulations must be observed during installation.

COMMISSIONING AND MAINTENANCE

1. Important notes

- The wiring must be checked exactly when commissioning the installation. Incorrect wiring could damage the control box, putting the safety of the burner system at risk.
- The chosen fuse rating must not, on any account, be higher than the value given in the technical data. Failure to observe this instruction could, in the case of a short circuit, have serious consequences for the control box or burner system.
- For safety reasons, it must be ensured that the control box performs at least one normal shut-down during every 24 hour period.
- Switch off or disconnect the power before plugging in or unplugging the unit.
- Burner control boxes are responsible for the safety of the system and should not be opened.

2. Routine checks

On commissioning or after servicing the burner system, or if the system has not been in operation for a long period, a check of the safety-relevant control box functions must be made.

- Attempt to start with gas valve closed:
 - At the end of the safety interval
 - > Lockout
- After a normal start, with the burner in operation, close the gas valve:
 - At the end of the safety interval, system attempts to restart
 - > Lockout

3. Possible faults

Burner does not start:

- Fault in electrical supply, thermostat OFF
- Mains voltage too low

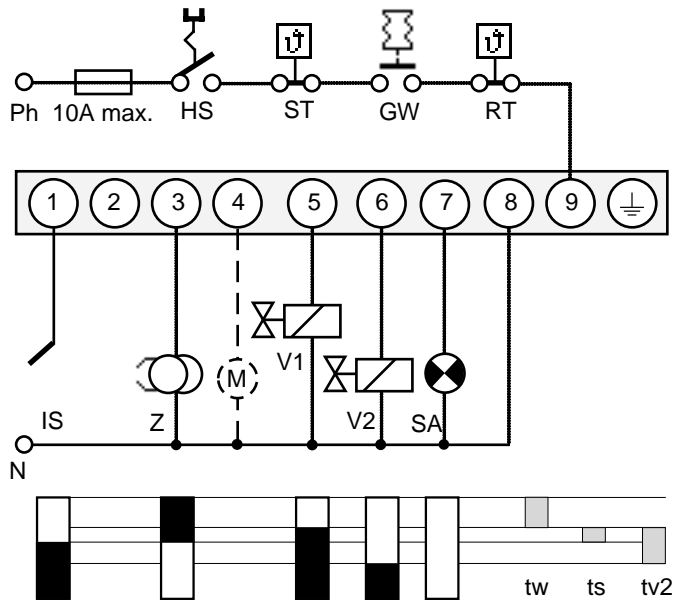
Switches to lockout after attempted start without establishing flame:

- No ignition or no fuel reaching burner
- Flame signal during the pre-purge phase
- Mains voltage more than 15% below nominal value

Burner starts, flame is established but control box switches to lockout after elapse of safety interval:

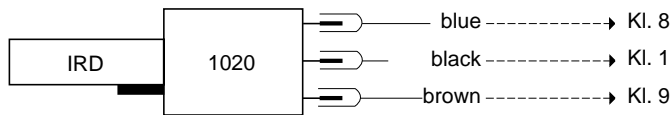
- No flame signal or signal too weak
- Flame detector dirty or defective

WIRING AND SEQUENCE DIAGRAMS TFI 812.2

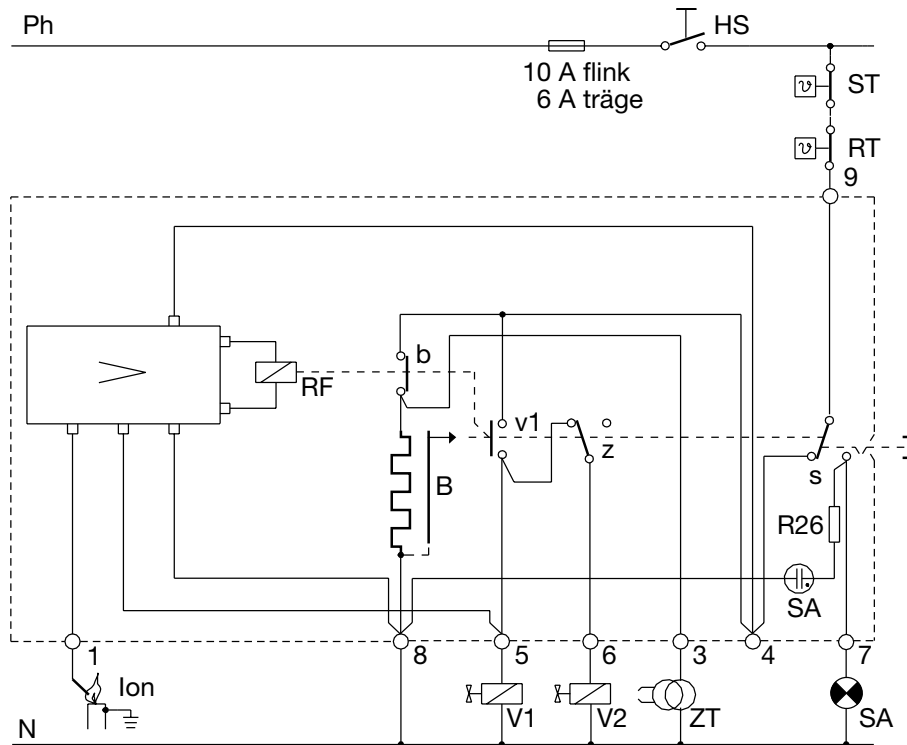


- | | |
|-----|--|
| HS | Main switch |
| GW | Gas proving switch |
| ST | Safety thermostat |
| RT | Controlling thermostat |
| IS | Ionisation probe |
| Z | Ignition |
| V1 | Solenoid valve, 1st stage |
| V2 | Solenoid valve, 2nd stage |
| SA | remote lockout indicator |
| M | Auxiliary blower |
| tw | Pre-ignition time approx. 15 sec. (mod. 5) approx. 10 sec. (mod. 10) |
| ts | Safety time nominal 5 sec. (mod. 5) 10 sec. (mod. 10) |
| tv2 | 2nd stage delay approx. 20 sec. |

IRD CONNECTION

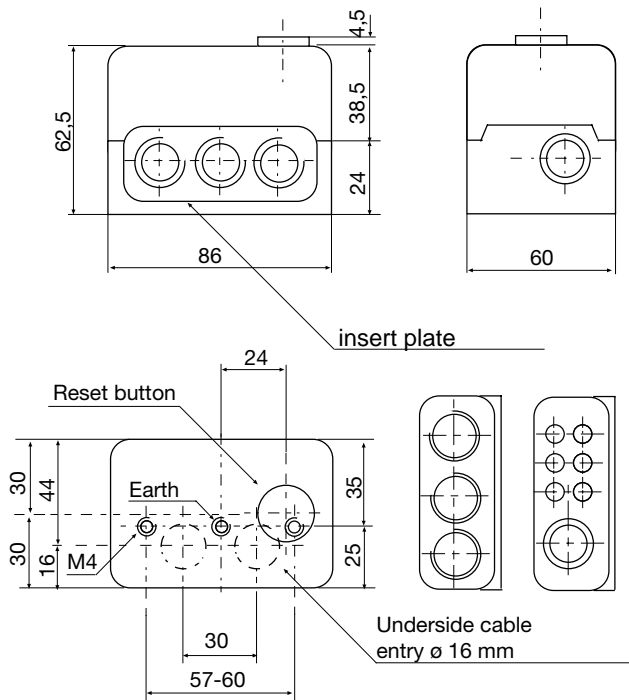


GENERAL CIRCUIT DIAGRAM TFI 812.2

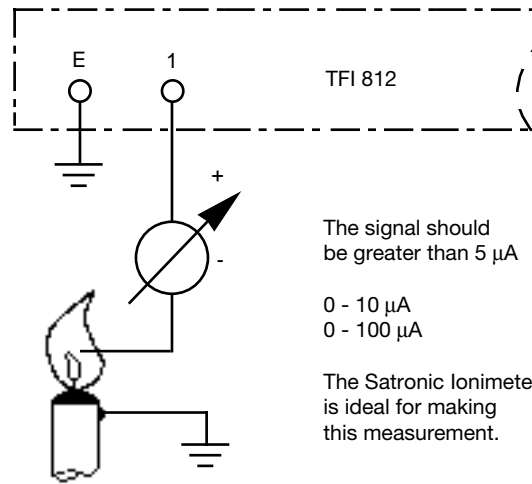


- | | | | |
|-----|------------------------|----|-------------------|
| HS | Main switch | ST | Safety thermostat |
| RT | Controlling thermostat | RF | Flame relay |
| B | Thermal timing unit | V1 | Valve1 |
| R26 | Resistor | V2 | Valve 2 |
| Ion | Ionisation probe | SA | Lockout indicator |
| ZT | Ignition | > | Amplifier IV7 |

DIMENSIONS WITH BASEPLATE TFI 812



MEASUREMENT OF THE FLAME SIGNAL

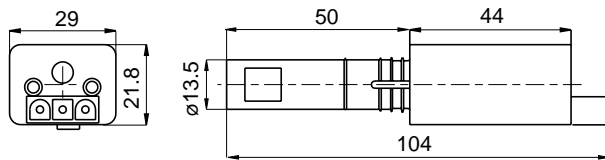


The signal should be greater than 5 μA

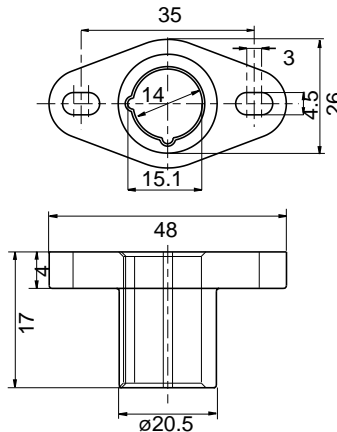
0 - 10 μA
0 - 100 μA

The Satronic Ionimeter is ideal for making this measurement.

IRD 1020



HOLDER M93



ORDERING INFORMATION

| ITEM | DESIGNATION | ITEM NO. |
|----------------------|-------------------------|----------|
| Control box | TFI 812.2 mod. 5 | 02601 |
| Control box | TFI 812.2 mod. 10 | 02602 |
| Control box | TFI 812.2 B mod. 5 | 02607 |
| Control box | TFI 812.2 B mod. 10 | 02608 |
| Socket | Wiring base S98 9-pin | 75300 |
| Socket | Wiring base S98 12-pin | 75310 |
| Insert plate | PG plate | 70502 |
| optionally | Cable entry plate | 70503 |
| Flame detector | IRD 1020 end-on viewing | 16522 |
| Flame detector | IRD 1020 side-on left | 16523 |
| Flame detector | IRD 1020 side-on right | 16521 |
| IRD mounting flange | IRD Holder M93 | 59093 |
| Flame detector cable | 3-wire, 0.6 m | 7236001 |

The above ordering information refers to the standard version.
Special versions are also included in our product range.

Specifications subject to change without notice.

TFI 812

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