

## Burner Control Box

**For 2-stage forced draught and combi oil/gas burners**

**Suitable flame detectors:**

- Ionisation probe
- UV sensor
- Infra-red flicker detector

### INTRODUCTION

The MMG burner control box is capable of controlling and monitoring forced draught and combi oil/gas burners of any nominal rating (tested and approved as per EN 298). The MMG 810.1 model 33 control boxes are also suitable for use in stationary warm air generators (Direct air heaters according to DIN 4794).

Different type and model designations identify the control boxes according to varying national standards, and to some extent, according to programme times.

### TYPES AVAILABLE

|           |         |                  |
|-----------|---------|------------------|
| MMG 810.1 | Mod. 33 | Art. Nr. 0640220 |
|           | Mod. 43 | Art. Nr. 0642520 |
|           | Mod. 45 | Art. Nr. 0642620 |
| MMG 811.1 | Mod. 33 | Art. Nr. 0640520 |
|           | Mod. 63 | Art. Nr. 0640420 |

### ONSTRUCTIONAL FEATURES

The control box is enclosed in a protective, flame resistant, transparent, plug-in type plastic housing, and includes:

- Synchronous motor with reduction gearing driving cam switch
- Cam switch with informative, coloured programme indicator
- 12-way cam switch assembly controlling the programme sequence
- Electronic components on plug-in printed circuit

The following important indicators and operating controls are situated on the front of the control box:

- Reset button incorporating signal lamp for malfunction (lockout)
- Coloured programme indicator
- Central screw fastening



### TECHNICAL DATA

|                                               |                                                                |
|-----------------------------------------------|----------------------------------------------------------------|
| Supply voltage                                | 220 / 240 V (-15... +10%)                                      |
| AC frequency variations                       | 50 Hz (50 - 60 Hz)<br>result in proportional timing deviations |
| Fuse rating                                   | max. 10 A rapid, 6 A slow                                      |
| Power consumption                             | 10 VA                                                          |
| Max. current per output                       |                                                                |
| term. 3                                       | 2A, cos $\phi$ 0.2                                             |
| term. 4, B                                    | 2A, cos $\phi$ 0.4                                             |
| term. 5, 6, C                                 | 1A, cos $\phi$ 0.4                                             |
| Total load                                    | 5A, cos $\phi$ 0.4                                             |
| Amplifier sensitivity                         | 1 $\mu$ A                                                      |
| Min. current from UV tube or ionisation probe | 5 $\mu$ A                                                      |
| Flame detector cable                          | max. 20 m cable length                                         |
| Air proving switch                            | 1 terminal 4 A, 230 V                                          |
| Reset delay                                   | none                                                           |
| Flame detector                                |                                                                |
| - Ionisation probe                            |                                                                |
| - Infra-red flicker detector                  | IRD 1020                                                       |
| - UV tube type                                | UVZ 780 red markings<br>installed radially or axially          |
| Infra red flare detector                      | IRD 1020                                                       |
| Weight incl. base                             | 350 g                                                          |
| Mounting attitude                             | any                                                            |
| Insulation standard                           | IP 44                                                          |
| Permissible ambient temp.                     | -20° C... +60° C                                               |
| Classified acc. to EN 298                     | BTLLXN                                                         |

| program timings (sec.)                    | MMG 810.1 |    |    | 811.1 |     |
|-------------------------------------------|-----------|----|----|-------|-----|
|                                           | 33        | 43 | 45 | 33    | 63  |
| Model                                     |           |    |    |       |     |
| Waiting time at start-up                  |           |    |    |       |     |
| tw                                        | 9         | 9  | 9  | 9     | 6   |
| Max. reaction time for air proving switch |           |    |    |       |     |
| tlw                                       | 6         | 6  | 6  | 6     | 5   |
| Pre-purge time                            |           |    |    |       |     |
| tv1                                       | 24        | 40 | 40 | 24    | 55  |
| Pre-ignition time                         |           |    |    |       |     |
| tvz                                       | 3         | 3  | 3  | 3     | 3   |
| T. ignition time                          |           |    |    |       |     |
| tz                                        | 6         | 6  | 8  | 6     | 5.5 |
| Safety time                               |           |    |    |       |     |
| ts                                        | 3         | 3  | 5  | 3     | 3   |
| Time delay                                |           |    |    |       |     |
| term.6 / term.C                           | tv2       | 10 | 10 | 10    | 6   |

For external resetting, the remote reset device FR 870 (art. No. 70700) can be utilized. (Refer to doc. 750).

## TECHNICAL FEATURES

### 1. Flame detection

The following types of flame detector can be employed:

- Ionisation electrode, where the mains supply provides a neutral earth connection. Suitable for gas burners (signal current from flame cannot be influenced by interference from ignition spark).
- UV sensor type UVZ 780 red, suitable for gas and combi burners.
- Infra-red flicker detector type IRD 1020 for all types of burner.

### 2. Burner Control

- The burner controls features a low-voltage protection. If the supply voltage drops below 160 V during operation, the burner switches-off. When the supply voltage raises above 180 V, the burner performs a restart independently.
- The MMG control boxes only operate when a load is connected to terminal 5. If the fuel valve is isolated during the pre-purge by way of an external switch contact, a resistor with a value of max. 22 k $\Omega$ /4 watts, must be connected between terminals 5 and 8.
- Functional check of the air proving switch before the start, and monitoring of the air pressure during pre-purge as well as during normal operation. In normal use, switch contacts with a rating of 4 A / 220 V are sufficient.
- On the MMG 810.1, switch contacts (e.g. valve end contact) can be wired between terminals 1 and 9. These contacts are checked for proper closure during the burner start phase. The connection between terminals 1 and 9 must be complete during the start phase.
- The MMG 810.1 control box monitors the ignition spark if the UVZ 780 (red) is used for flame detection, and terminals C and 9 are wired together.

### 3. Safety

The design/construction and programme sequence of the control boxes in the MMG series conform to the present applicable European standards and regulations.

### 4. Installation

At the base:

- 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 separate slide-in plates and 2 fixed, threaded knock-outs (PG 11 thread) as well as 2 knock-outs underneath, facilitate wiring of the base.

General:

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

## COMMISSIONING AND MAINTENANCE

### 1. Important

- 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.
- Control boxes are safety devices and should not be interfered with.

### 2. Functional Check

During commissioning and after an overhaul of the burner, the following checks have to be carried out:

- a) Starting test with closed manual valve and bridged gas monitor contact:
  - The device must go into a fault condition after the safety period has elapsed.
- b) Close the manual valve in operating position with the gas monitor contact bridged.
  - The device must go into a fault condition after a flame failure.
- c) Air pressure monitor contact interrupted:
  - Device goes into a fault condition.
- d) Bridge air pressure monitor contact before starting:
  - Device must not start.

### 3. Trouble Shooting

Burner does not go into operation, programme indication remains:

- Electrical connection defective.
- Thermostat or gas monitor "OFF".

Burner does not go into operation, programme indication rotates continuously:

- Air pressure monitor defective, respectively, not in starting position. (Working contact must be open).
- Connection term. 1 - term. 9 interrupted
- mains voltage < 180V

The automatic control switches to fault condition shortly after the start of the pre-purge time (line within the blue zone):

- Air pressure monitor contact does not close.
- No load on terminal 5.
- Flame signal.

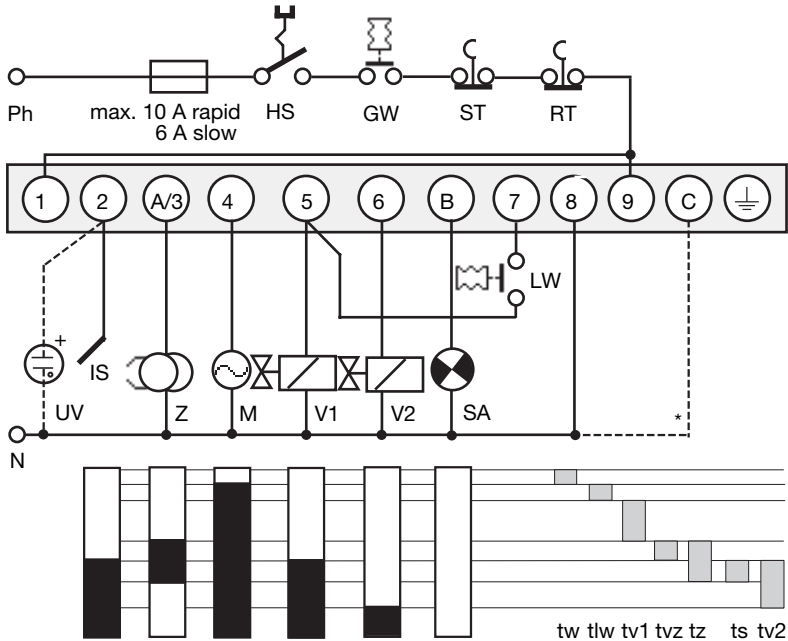
Automatic control switches to fault condition during the pre-purging (blue zone):

- No flame formation (ignition missing, valve does not open, etc.)
- No flame signal or too weak flame signal (flame does not adhere, poor insulation of the flame detector, burner not properly connected to the earth conductor).

Automatic control switches to fault condition during the operating position (red, resp. green zone):

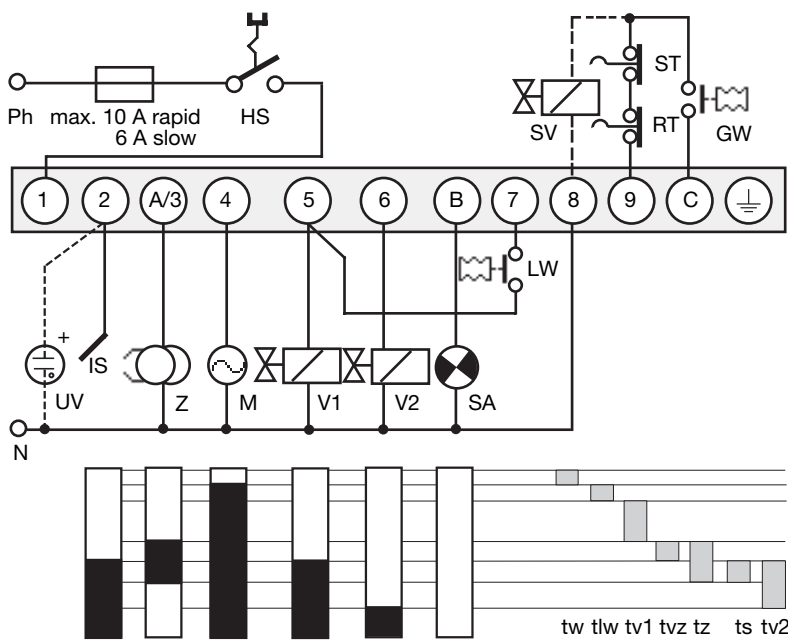
- Flame lift-off
- Air pressure monitor contact opens
- Flame signal too weak.

SCHEMATIC CONNECTION DIAGRAM AND PROCESS DIAGRAM MMG 810.1

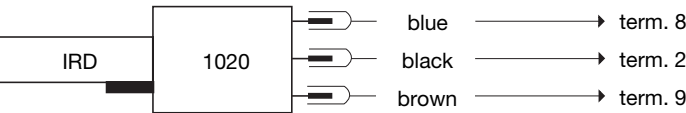


- \* for ign. spark detection only
- HS Mains switch  
GW Gas pressure switch  
ST Limit thermostat  
RT Control thermostat  
IS Ionisation probe  
UV UV sensor  
Z Ignition  
M Burner motor  
V1 Solenoid valve, 1st-stage  
V2 Solenoid valve, 2nd-stage  
LW Air pressure monitor  
SA External lock-out signal for spark detection only  
SV Safety valve
- tw Waiting time at start-up  
tlw Max. reaction time for air proving switch  
tv1 Pre-purge time  
tvz Pre-ignition time  
tz Total ignition time  
ts Safety time  
tv2 Time delay term.6 / term. C

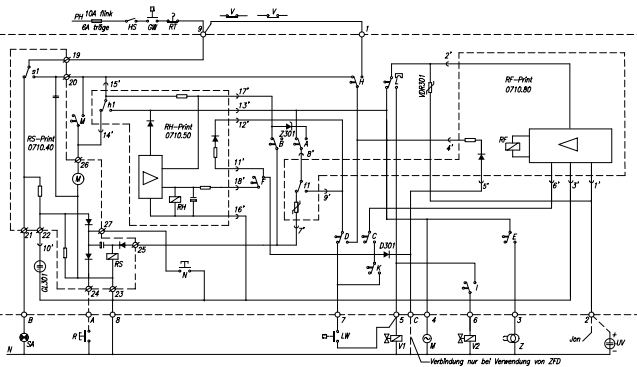
SCHEMATIC CONNECTION DIAGRAM AND PROCESS DIAGRAM MMG 811.1



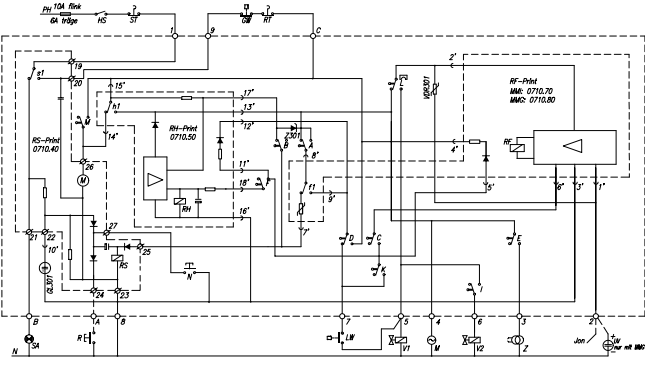
IRD CONNECTION

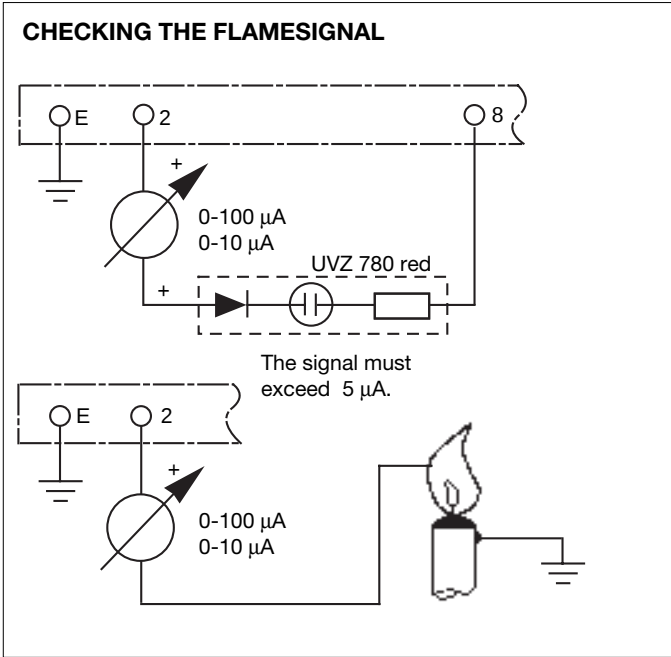
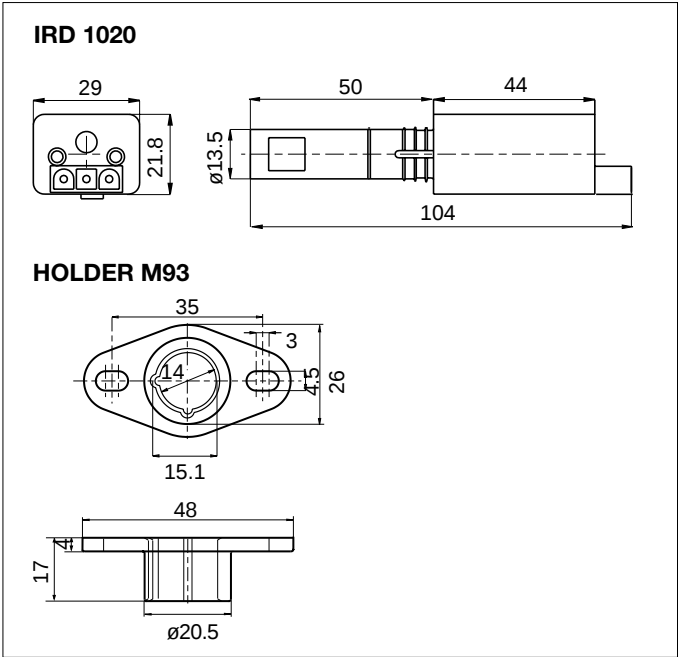
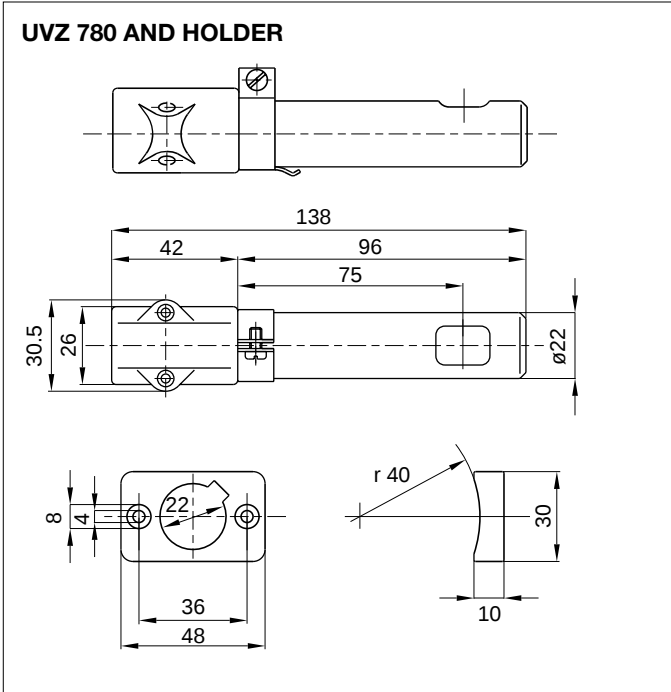
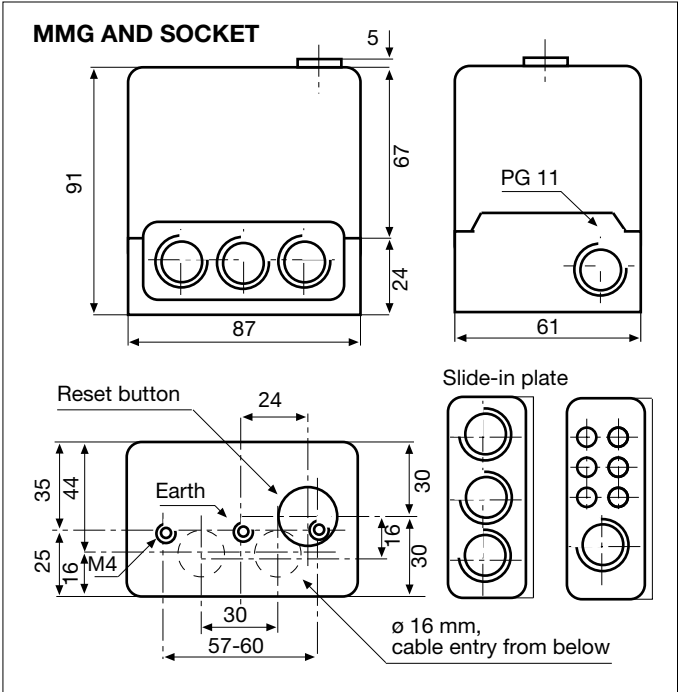


SCHEMATIC DIAGRAMMM MMG 810.1



SCHEMATIC DIAGRAMMM MMG 811.1





| ORDERING INFORMATION | DESIGNATION             | ITEM NO. |
|----------------------|-------------------------|----------|
| ITEM                 |                         |          |
| Control box          | Type MMG 810.1 mod. 33  | 0640220  |
| or                   | Type MMG 811.1 mod. 33  | 0640520  |
| Socket for MMG 810.1 | Socket 701 TTG-EN       | 70101    |
| Socket for MMG 811.1 | Socket 701 TTG-FN       | 70102    |
| Slide-in plate       | Cable terminal plate    | 70502    |
| or                   | PG-plate                | 70501    |
| Flame detector       | IRD 1020 end-on viewing | 16522    |
| Flame detector       | IRD 1020 side-on left   | 16523    |
| Flame detector       | IRD 1020 side-on right  | 16521    |
| Flame detector       | UVZ 780 red             | 18813    |
| IRD mounting flange  | IRD Holder M93          | 59093    |
| UVZ mounting flange  | UVZ Holder              | 18807    |
| 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.