



Gas Burner Safety Control

For 2-stage forced draught and combi oil/gas burners, facility to connect an air damper unit

Possible flame detectors:

- Ionisation probe
- Infrared flicker detector 1020
- UV flame sensor UVD 971

INTRODUCTION

The burner control box DMG 972 controls and supervises power burner for gas and dual fuel. The control box is approved and certified according the relevant European standards. The use on direct air heaters according DIN 4794 is also possible.

With the facility to connect an air damper unit, a 2 stage operation with two fuel valves or a modulating operation with one fuel valve is possible.

The microprocessor- based programming sequence ensures extremely stable timings independent of voltage variations, ambient temperature and/or switch-on cycles. The built-in information system not only provides a continuous monitoring of the actual state of the box (very helpful especially for monitoring the start-up phase) but also informs about the cause of a possible lock out. The lock out cause is stored in such a way that it can be retrieved even after a power failure.

The control box is 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. This low-voltage protection works not only during start-up but also permanently during operation.

CONSTRUCTIONAL FEATURES

Microprocessor, electronic components, output relays and flame amplifier are placed on two printed circuit boards. These plus the lockout- and reset circuit are well protected inside a flame resistant, plug-in type plastic housing.

The reset switch for reset / remote lockout with its built-in LED for displaying the information system plus the central fixing screw are placed on top of the housing.

The wiring base S98 is equipped with spare- and extraterminals and allows together with a variety of cable entry points utmost flexibility of electrical wiring.

The DMG 972 is functionally compatible to MMI 812, MMI 812.1, MMI 962 and MMI 962.1

 Is the DMG972 to be used to replace the MMI 812, 812.1, MMI 962 or MMI 962.1 care has to be taken to make sure the air proving switch (LW) is wired between terminals 4 and 7 and not like on the MMI between 5 and 7.



TECHNICAL DATA

Operating voltage	220 / 240 V (-15... +10%) 50 Hz (±5%)
Fuse rating	10 A fast, 6 A slow
Power consumption	ca. 15 VA
Max. load per output	
- term. 3 ignition trafo	1.5 A, cos φ 0.2
- term. 4 motor	2.0 A, cos φ 0.4
- term. 5 + 6 solenoid valves	1.0 A, cos φ 0.4
- term. C air damper	1.0 A, cos φ 0.4
- term. B alarm indicator	1.0 A, cos φ 0.4
total load	5.0 A, cos φ 0.4 max. 10 A during 0.5 sec 1 working contact 4 A, 230V
Air proving switch	
Sensitivity (operation)	1 µA
Min. required ion. current	1.5 µA
Sensitivity for stray light	0.4µA
Ionisation probe insulation	Probe - earth greater than 50 MΩ
stray capacity	Probe - earth less than 1000 pF
cable lenght	< 3 m
Flame detectors	
IRD 1020	side-on or end-on viewing
UVD 971	end-on viewing
Weight incl. Wiring base	190 g
Mounting position	any
Protection class	IP 40
Approved ambient parameter	
for control and flame detector	max. 95% at 30° C
- for operation	-20° C... +60° C
- for storage	-20° C... +80° C
Build-up of ice, penetration of water and condensing	water are inadmissible
Approvals according	
to European standards	EN 298 and EN 230, as well as all other relevant Directives and standards
Classified acc. to EN 298	FLLXN

Timings (sec.)

Model	waiting time start	max. reaction time for air proving switch	supervised pre-purge time	pre-ignition time	LK-open command during pre-purge	LK-close movement	ignition time total	Stray light monitoring	safety time	delay terminal 6
		tlw	tv1	tvz	tkl	tr	tz	tf	ts	tv2
01	0	60	44	3	36	8	5.5	5	3	6

APPLICATION FEATURES

1. Information system

The information system is microprocessor based and reports on all aspects of burner control box operation and flame supervision. It informs continuously about the actual programming sequence the unit is just performing. Besides monitoring of the programming sequence it also allows to identify errors during start-up of operation without any additional testing devices. The automatically performed diagnosis is a valuable tool which facilitates service/maintenance work and therefore saves costs. The analyses of the error cause can be done directly on stage or if not possible afterwards as the lock out reason is stored in a non-volatile lock out mode memory.

The information system communicates with the outside world using a LED (the used Flash-Code is similar to the Morse-Code). The messages are optically transmitted by a appropriately flashing LED. Using an additional terminal (optional), the messages can be recorded and displayed in easy readable form.

1.1 Programming sequence display

The built-in microprocessor controls not only the programming sequence but the information system too. The individual phases of the programming sequence are displayed as Flash-Code.

The following messages can be distinguished:

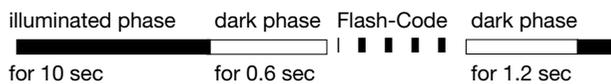
Message	Flash-Code
waiting for air proving switch	.
pre-purge tv1	.
pre-ignition tvz	.
safety time ts	■ .
delay 2nd stage tv2	■ .
running	_
low mains voltage	■ ■ _

- Description
- | = short pulse
 - = long pulse
 - . = short pause
 - _ = long pause

1.2 Lock-out diagnoses

In case of a failure the LED is permanently illuminated. Every 10 seconds the illumination is interrupted by a flash code, which indicates the cause of the error. Therefore the following sequence is performed which is repeated as long as the unit is not reset.

Sequence:



Error diagnosis

Error message	Flash-Code	Possible fault
lock out safety time	■ ■ ■ ■	within lock out safety time no flame establishment
stray light	■ ■ ■	stray light during monitored phase, detector may be faulty
air proving switch in closed position	■ ■	air proving switch contact welded
air proving switch time-out	■ ■	air proving switch does not close within specified time
air proving switch opened	■	air proving switch opens during start or operation
loss of flame	■ ■ ■ ■	loss of flame during operation

Flash-Code for manual lock out

anual/external lock out	■ ■ ■ _ ■ ■ ■ ■ ■
(see also 3. lock out and reset)	

2. 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).
- Infrared-flicker detector type IRD 1020 with mounting flange M 93 or the UV solid state flame sensor UVD 971. Flame detection using an ionisation probe is only possible in conjunction with mains supplies which provides a neutral earth connection. Connecting the IRD 1020 or UVD 971 the correct wiring has to be observed.

2.1 Stray light monitoring

The stray light check is performed at the end of the pre-purge time for thr duration as mentioned in the technical datas.