

SYSTEM 3000 / 4000

FLAME AMPLIFIER MODULE 3001

TECHNICAL DESCRIPTION

EDITION TB_3001_EN_REV03

Flame amplifier module 3001

- Precise display of intensity
- Fault diagnosis
- Setting of threshold value
- Variable closing delay time
- Variable OFF delay time
- Relay signal output
- Pre-alarm

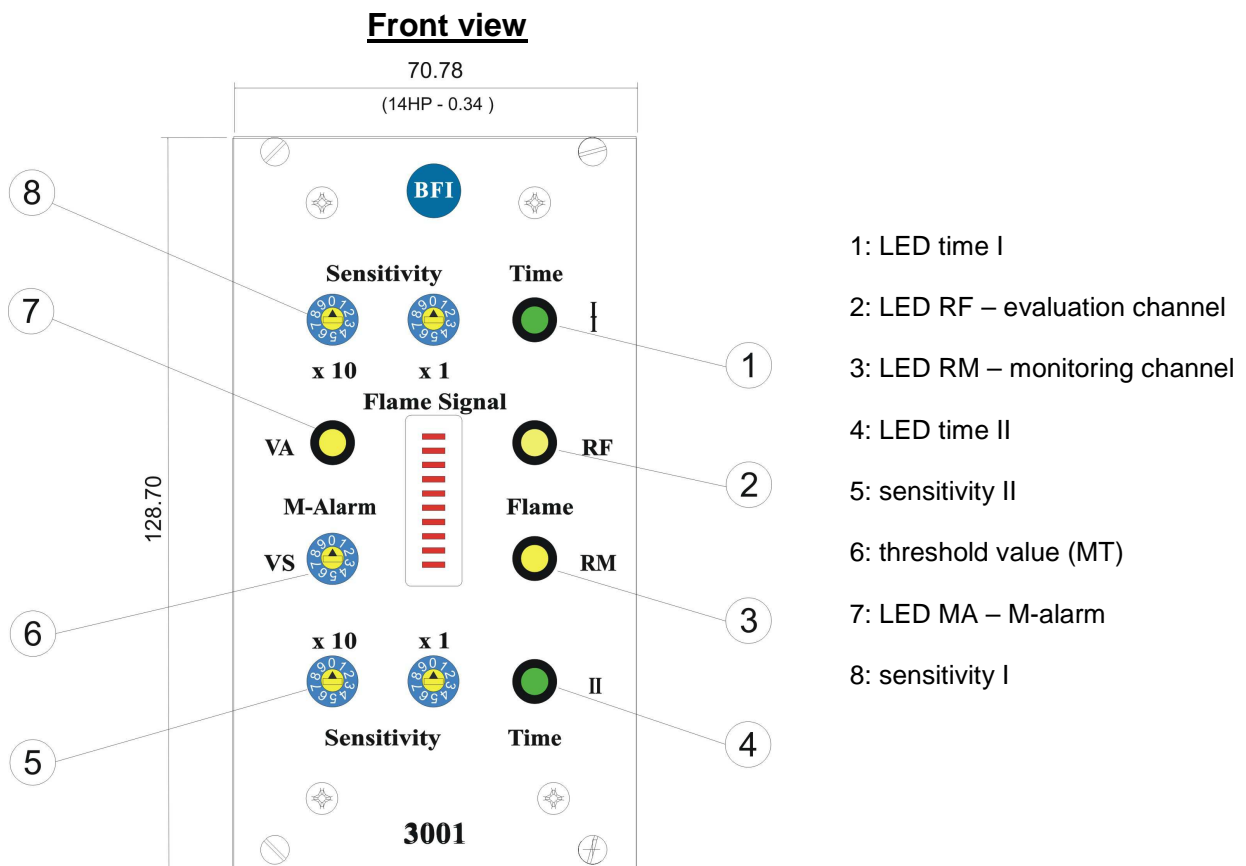
Application

The flame scanner **3001** is a system plug-in unit of the **3000** line, which, in connection with the flame detectors of the system, is providing full-scale flame monitoring for any burner output, fuel, and combustion process.

The flame monitoring system **3000/4000** is tested by TÜV in accordance with EN298:2012

and approved according to DIN DVGW. It meets the requirements of TRD 411 to 414.

The plug-in unit is approved for continuous operation because of continuous fully electronic fail-safe checking of its function.



Function

The self-checking and fail-safe flame scanner **3001** contains two separate signal processing channels of differing layout, which are being synchronised by a processor. Internal and external faults of any kind trigger automatically immediate actuation of the safety devices.

Two independent monitoring levels (time level I, time level II) can freely be selected by means of an external control signal. Each level is described by its sensitivity setting and sign-off time. In this way a fuel- and load-related optimisation of flame monitoring is easy to implement. The connection of a second flame detector in parallel or alternating operation is possible.

The output signal of the flame detector is transmitted as a pulse message via a filter and pulse shaper stage to the sensitive controllers. Two rotary switches are available per time level for setting the desired signal amplification. This flame signal is distributed on three further function channels:

1. Measuring channel (M)
2. Monitoring channel (RM)
3. Evaluation channel (RF)

MEASURING CHANNEL (M)

The analogue measuring channel is designed as a attenuation filter with signal contractor followed by a voltage-current transformer. The output of the transformer supplies the internal analogue intensity indicator and through output terminals the remote display instruments with 0 - 20 mA resp. 4 - 20 mA.

MONITORING CHANNEL (RM)

The monitoring channel contains all the periodical self-monitoring checks of the system required for continuous operation. In case of malfunction of the flame monitoring system **3000** the processor-based control logic reacts immediately and the relay assigned to LED RM drops and interrupts burner operation within the safety switch off time set for the monitoring channel (S4/S5). Should the LED RM not be lit during burner start operation or extinguish during operation the following malfunctions may exist:

- a) Module defect in flame scanner **3001** for inst. failure of clock signal.
- b) Disturbing pulse effects on not correctly connected or installed flame detector lines (induced voltage).

- c) Defects in the electronic system of the flame detector.

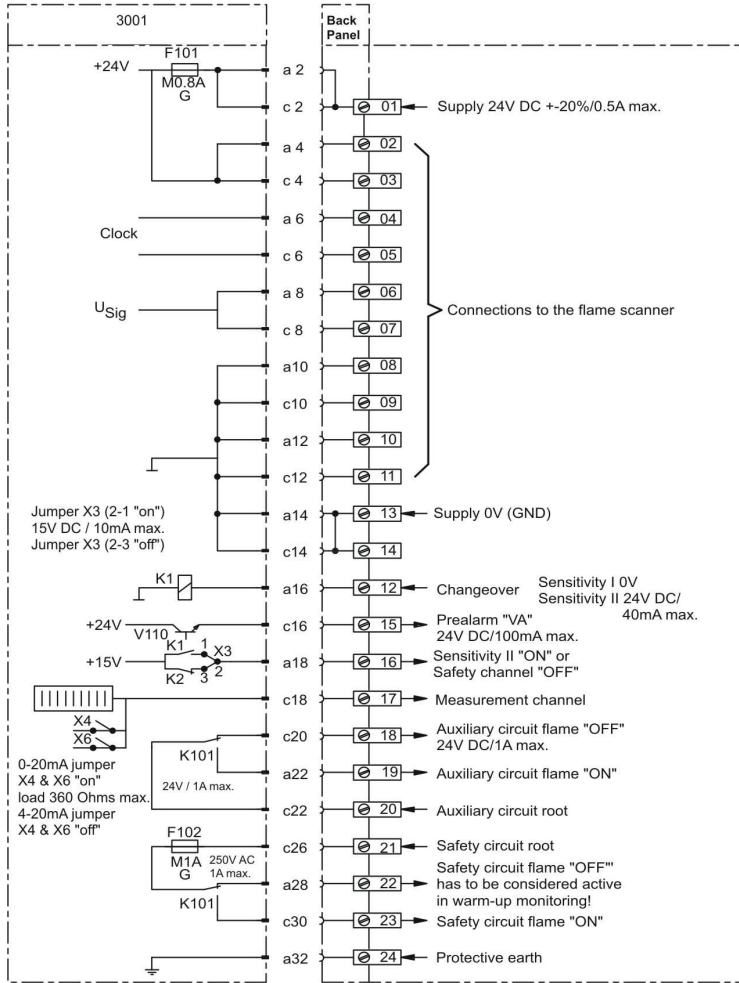
EVALUATION CHANNEL (RF)

The evaluation channel contains all the necessary precision components which are providing the sign-off times differing per level. The sign-off times are selected per DIP switches (S2/S3). Further, the evaluation channel supports the setting of the hysteresis for pre-selecting the switching threshold "Flame on" (DIP switch S1). In connection with the monitoring channel the evaluation channel addresses the output relay K 101.

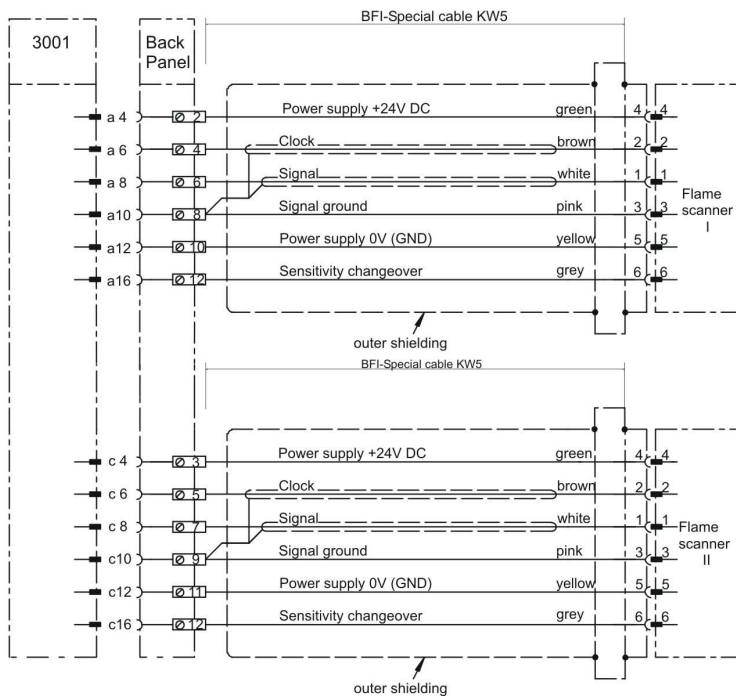
After satisfactory start-up of the monitoring system **3000** the LED RM lights up immediately at flame signal, whereas the LED RF switches time-delayed depending on selected sensitivity and hysteresis stage. The important floating relay contact K 101 "Flame on", assigned to the external safety circuit, is fused inside the device, thus excluding any contact welding. In addition, a further non-fused auxiliary circuit is available.

The adjustable pre-alarm (MT) signals unfavourable combustion processes depending on flame intensity, before a final switching off happens. Indication is by LED MA. For external processing an output 24 V / 100 mA is available.

Connection diagram



Flame scanner connection



Attention:

The outer shielding on scanner side has to be connected via clamping connection between the plastic insert and the thread of the PG-gland extensive to the housing ground.
The inner shielding should be cut off on scanner side and connected to ground on flame amplifier side.

Technical data

The flame amplifier is self-monitoring for the fail-safe function control accordance to EN298:2012. Conform to the requirement of DIN VDE0116 and TRD 411 to 414, approved accordance to DIN DVGW.

Two safety times	set in 1 - 6 steps (1 –6 seconds), longer times on request
Two sensitivity ranges	set by digital switches, ratio 1:99
Hysteresis:	
Switching point flame „ON“	adjustable in 64 steps, 5 - 15 mA
Switching point flame „OFF“	< 5 mA
Flame relay:	2 changeover contacts, floating (1 safety circuit, 1 subsidiary circuit)
Flame intensity display:	0-100 % (Built-in luminous bar indicator)
Current output 0-20 or 4-20 mA:	selection-jumper shunt resistance max. 300 Ω
Pre-alarm:	set by 10 steps / 2 mA
Pre-alarm output:	24 V, 100 mA, short circuit proof
Channel selection:	24 V, 40 mA
Quantization switchover:	plug-in bridges
Locked range switchover or monitoring channel „off“	message 15 V/10 mA
Status indication on LEDs:	channel I or channel II 'on' = green evaluation channel (RF) and monitoring channel (RM) 'on' = yellow Pre-alarm signal (MA) 'on' = yellow
Supply:	24V DC, 500 mA
Current consumption:	approximate 150 mA
Ambient temperature:	-20°C to +70°C
Protection:	IP 00
Weight:	700 g
Part-no.:	G 601

The following applies to the safety circuit:

VDE 0110, class C 250 V	
max. switching voltage:	250 V ohmic load
max. switching current:	1 A, ohmic load
max. switching power:	300 VA

All modules of the series **3000** are plug-in types for using in 19"-magazines accordance to DIN 41494 (19"-norm).

The dimensions of all modules are:

Width	70.78 mm = 14 DIV
Height	128.70 mm = 3 DIV
Depth	188.00 mm