

# Original Operating Instructions

## Flame evaluation module

### 3003

Type: 3003

Document: BA 3003 EN Rev5



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# **1 General aspects**

## **1.1 Introduction**

These operating instructions are a helpful guide for ensuring the successful and safe operation of the flame evaluation module. They contain important information on how to operate the system safely, correctly and efficiently. Observing the operating instructions will help to prevent hazards, reduce costs of repair and downtimes and increase the reliability and life of the device.

All illustrations and drawings in these operating instructions are shown for illustration purposes and are not authoritative detailed designs.

The operating instructions always have to be accessible at the device. They have to be read and applied by each person who is required to work with/on the device.

This work may involve, for example:

- operation
- troubleshooting during operation
- servicing
- maintenance (upkeep, inspection, repair) and/or
- transport

This should be confirmed by the operating company in writing.

### 1.2 Warning notes

The following warning notes are used in these operating instructions:

#### **DANGER**

*This warning level indicates an imminent hazardous situation.*

*If the hazardous situation is not prevented, this will result in death or severe injury.*

*Follow the instructions that accompany this warning to prevent the risk of death and severe personal injury.*

#### **WARNING**

*This warning level indicates an potentially hazardous situation.*

*If the hazardous situation is not prevented, this may result in death or severe injury.*

*Follow the instructions that accompany this warning to prevent the potential risk of death and severe personal injury.*

#### **CAUTION**

*This warning level indicates an potentially hazardous situation.*

*If the hazardous situation is not prevented, this may result in slight or moderate injuries.*

*Follow the instructions that accompany this warning to prevent the injury of persons.*

#### **CAUTION**

*This warning level indicates potential damage to property.*

*If this situation is not prevented, it may result in damage to property.*

*Follow the instructions that accompany this warning to prevent damage to property.*

#### **NOTICE**

*A notice indicates additional information that will make the handling of the device easier.*

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### **1.3 Copyright protection**

These operating instructions have to be treated as confidential. They may only be used by authorised staff. Access by third parties may only be granted upon written agreement of BFI Automation.

All documents are protected in keeping with the German copyright law.

The disclosure and reproduction of documentation, in whole or in part, as well as the exploitation and communication of its content shall not be permitted unless expressly stated otherwise. Offenders are liable for prosecution and the payment of damages.

We reserve all rights to exercise industrial property rights.

### **1.4 Disposal information**

The flame signal converter is equipped with electrical and electronic components and must be disposed separate from household waste. Follow the local and actual regulations for waste disposal.



### 1.5 Warranty

**Read these operating instructions carefully before operating the flame signal converter !**

The manufacturer is not liable for damage or operating malfunctions that result from the operating instructions not being observed.

The operating company has to supplement the operating instructions with operating instructions on the basis of national regulations on accident prevention and environmental protection, including information on supervision and notification requirements with respect to special operating circumstances, e.g. regarding organisation of work, working processes and staff deployed.

The recognised technical rules for safe and professional working also have to be observed in addition to the operating instructions and the regulations on accident prevention applicable to the country and place of use.

The warranty shall become void, for example, in the event of:

- inappropriate use
- use of impermissible equipment
- incorrect connection
- prior works that are not part of the supplied product or service
- non-use of original spares and accessories
- conversion, if this has not been harmonised with BFI Automation
- non-performance of specified maintenance work

#### **NOTICE**

*It is recommended that the operator of the device concludes a service contract with BFI Automation. This guarantees that the device is regularly checked by our service staff and ensures that any required wearing and spare parts are available without long delivery periods.*



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## **1.6      Obligation of the operating company**

The flame evaluation module may cause hazards if it is operated inappropriately or in an improper condition.

The operating company is under the obligation to operate the machine in proper state only. The operating company has to secure hazardous areas that exist between BFI devices and the customer's own equipment.

The operating company has to appoint and instruct responsible staff:

- only deploy trained or instructed staff.
- clearly set out the responsibilities of the staff with regard to operation, set-up, maintenance and repair.
- regularly check that staff are safety conscious and aware of hazards and are observing the operating instructions.
- before starting work, staff who are assigned to work with/on the device have to have read and understood the operating instructions, in particular the chapter on "Safety", as well as the relevant regulations.
- the operating instructions and relevant regulations have to be stored in such a way that they are accessible to operating and maintenance staff.
- set out who will have responsibility for device operation and ensure that this person has the authority to overrule any unsafe instructions of third parties.

### **NOTICE**

*Generally valid legal and other binding regulations on accident prevention and environmental protection have to be observed and instructed, in addition to the operating instructions.*

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### 1.7 Liability disclaimer

All technical information, data and guidance on device operation that are contained within these operating instructions are, to the best of our knowledge, correct at the time of printing, taking into account our present understanding and experience.

We reserve the right to make technical changes with respect to the further development of the flame evaluation module outlined in these operating instructions. No claims can be made based on the specifications, illustrations and descriptions of these operating instructions.

We shall not be liable for damage or operating malfunctions that result from operating errors, inappropriate repairs or the non-observance of the operating instructions. We expressly state that only original spare parts and accessories approved by us may be used. This also applies to the components of other manufacturers that have been used.

The installation or use of non-approved spare and accessory parts and any unauthorized retrofits and modifications are not permitted for safety reasons and exclude any liability by BFI Automation for consequential damages.

BFI Automation is liable for possible errors or omissions with the exclusion of additional claims entered into in the framework of the warranty obligations conceded to in the contract. Claims for damages, on whatever legal basis they may be, shall be excluded.

Translations into foreign languages are carried out in good faith. We cannot accept any liability for translation errors; this also applies where the translation has been carried out or has been commissioned by us. The original text alone shall be binding.

Descriptions and illustrations do not necessarily depict the delivered product or a possible spare parts order. Drawings and graphics are not to scale.

## 1.8 Declaration of conformity



BFI Automation Mindermann GmbH  
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### EU Konformitätserklärung EC Declaration of Conformity

**Produkt** **Flammenüberwachungssystem 3000/4000 (Einschübe)**  
*Product* *Flame monitoring system 3000/4000 (Insert modules)*  
**Typ** **3001, 3001D, 3001S, 3011, 3016, 3017, 3002, 3002A, 3003**  
*Type* *3001, 3001D, 3001S, 3011, 3016, 3017, 3002, 3002A, 3003*

Hiermit erklären wir, dass die bezeichnete Flammenwächter und Einschübe, in ihrer Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung, den grundlegenden Sicherheitsanforderungen folgender EU-Richtlinien entsprechen:

*This is to confirm that the described flame amplifier and insert modules in there design and type of construction complies with the provisions of the Directive of the Council of the European Communities on the approximation of the laws of the member states relating to:*

Anwendungsbereich <i>Field of application</i>	EU/2016/426	EU-Gasgeräteverordnung <i>EU Gas Appliances Regulation</i>
Richtlinien <i>Directives</i>	2014/35/EU	Niederspannungsrichtlinie <i>Low voltage directive</i>
	2014/30/EU	EMV Richtlinie <i>EMC directive</i>
Benannte Stelle <i>Notified body</i>	DVGW GmbH	0085
CE-Zerifikat vom <i>CE certificate from</i>	19.02.2018	CE0085BS0478
Gültig bis <i>Valid until</i>	19.02.2028	Baumusterprüfbescheinigung <i>Type examination certificate</i>
Normen <i>Standards</i>	EN 298:2012	

Ausgestellt durch  
*Issued by*  
 Rechtsverbindliche  
 Unterschrift  
*Legally binding signature*

BFI Automation Mindermann GmbH

*Michael Thomas*  
 Name

Funktion  
*Function*

Michael Thomas

Prokurist  
*Authorized Officer*



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Ort, Datum  
*Place, Date*

Heiligenhaus, 13.06.2022

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### 1.9 Address of the manufacturer

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## **2 Safety**

### **2.1 Intended use**

The digital flame evaluator 3003 is a system plug-in unit of the 3000 line which works in connection with the flame amplifier modules 3001, 3001D and 3001S as well as with the flame detectors of the system. It is the function of the 3003 to process and display the output signal (pulse message) produced by the flame detector in parallel with the 3001. Due to its additional features the system plug-in unit 3003 permits evaluation of the flame detector signal resulting from the current flame situation. Integration into the instrumentation and control system via its relay signalling output is possible.

In connection with a 19" portable case the digital flame evaluator designated type 3103 is an indispensable aid for system checking on site. By connecting to the test socket of a BFI-measuring adapter or by simple looping in into the signal / supply line output signals can be evaluated quickly and accurately and also the present alignment of flame detectors can be judged reliably. The operating personnel is supported for better quality and thereby plant availability improved.

#### **⚠ WARNING**

*Danger when improperly used !*

*The device may cause hazards if it is not used as intended and/or for any other purposes.*

*The device has to be used only for the purposes for which it is intended.*

*The procedures described in the operating instructions have to be observed.*

The manufacturer/supplier shall not be liable for damage resulting from use for non-intended purposes. The user/operating company alone shall bear the risk.

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## 2.2 Requirements on persons

### NOTICE

*Work on/with the device may only be performed by persons authorized to do so based on their training and qualification. Furthermore, such persons have to have been commissioned by the operating company.*

Do not allow any persons who are being apprenticed, educated, instructed or on a general training programme to work on the device without the constant supervision of an experienced person.

Persons who are under the influence of drugs, alcohol or medication that affects reactivity shall not be permitted to carry out work on the device.

Connection, set-up, maintenance and repair work may only be carried out by qualified specialist staff.

This device may cause hazards if it is operated inappropriately by untrained staff or if it is not used for its intended purpose.

Generally valid legal and other binding regulations on accident prevention and environmental protection in addition to basic health and safety requirements have to be observed. The operating company has to instruct its staff accordingly.

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## 2.3 Safety instructions

The following instructions on accident prevention have to be observed when operating the flame signal converter.

### **NOTICE**

*Only operate the device if it is in a proper state !*

- do not remove or disable safety devices.
- check for externally noticeable damage and defects prior to using the device ! Immediately notify the appropriate authority/person of any changes that occur (including changes in operating performance). If necessary, stop and secure the device immediately.
- allow only authorised specialist staff to carry out set-up and/or maintenance work.
- operating staff have to be informed before maintenance or other special work is carried out.
- replace worn or defective parts.
- use suitable maintenance tools only.
- after repair work, refit all safety devices and carry out electrical and mechanical checks.
- check the operating instructions for details of displays as well as switch-on and switch-off procedures.
- prior to switching on the device, make sure that no-one can be endangered by the device !
- the operating instructions always have to be kept close to the device and be readily at hand.
- any non-compliance with the safety instructions outlined in these operating instructions may lead to damage to property, personal injury or even death.

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## 2.4 Safety devices

### 2.4.1 Fundamental aspects

Check the safety equipment and locking devices on the device for safe operational condition.

Only operate the device if all safety devices are present and enabled. The operating company or operator of the flame signal converter is responsible for the proper operation of the device.

#### **NOTICE**

*The device has been fitted with warning and danger signs for the protection of operating staff. These signs have to be observed. Damaged or illegible signs have to be replaced immediately.*

### 2.4.2 Safety devices on the power supply

The flame signal converter 3003 has been fitted with the following safety devices:

- housing (optional)
- flame-proof housing (optional)
- explosion protection barriers (optional)



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## **2.5 Safety instructions in case of maintenance and troubleshooting**

### **2.5.1 Fundamental aspects**

- Deadlines set or indicated in the operating instructions for repetitive checks / inspections shall have to be observed !
- Appropriate workshop equipment is essential for performing maintenance work.
- In conformity with the electrical regulations, work on the electrical equipment of the system may only be carried out by an electrical specialist or by trained staff under the direction and supervision of an electrical specialist.
- The adjustment, maintenance and inspection activities and deadlines stipulated by BFI Automation, including information on the replacement of parts / assemblies, have to be observed! These tasks may only be carried out by authorised specialist staff.
- Operating staff have to be informed before maintenance or other special work is carried out. A supervisor has to be appointed.
- Screw connections which have been loosened during maintenance and servicing work, have to be tightened.
- If maintenance and repairs require safety devices to be dismantled, these devices have to be remounted and checked as soon as the maintenance and repair work has been completed.
- Operating and auxiliary materials as well as exchanged parts have to be disposed of in a safe and eco-friendly way.
- Spare parts supplied by BFI Automation or approved of by BFI Automation only may be used.

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### 2.5.2 Electrical / electronic devices

#### **DANGER**

*Danger to life caused by electrical current!*

*Contact with live wires or components presents a danger to life !*

*Prior to any work on the electrical equipment, disconnect the flame monitoring system from the power supply network !*

#### **NOTICE**

*In keeping with the electrical regulations, work on electrical / electronic parts / components may only be carried out by electrical specialists.*

#### **Important rules of conduct**

- Check the device in regular intervals. Any defects or faults ascertained have to be corrected immediately. Switch off the device until the defects have been corrected.
- Equipment parts undergoing inspection, maintenance or repair work have to be made de-energised, if required. First check that the disconnected parts are no longer live, then short to earth. Also isolate neighbouring live parts
- If work is required on live parts, a second person has to be assigned who can disconnect the power supply in case of an emergency. Only use insulated tools !
- Fuses must not be repaired or bridged. Only use original fuses with the specified current !

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### 2.5.3 Testing in keeping with the German Workplace Safety Ordinance (BetrSichV)

In case of the coupling or installation of devices from various manufacturers or suppliers, the operating company has to carry out a precise test, prior to start-up, in keeping with the German Workplace Safety Ordinance (BetrSichV) in force and the applicable electrical regulations.

In case of queries, please get in touch with BFI Automation.

### 2.5.4 Safety test

#### **⚠ WARNING**

*In order to ensure a correct operation, the flame evaluation module has to be tested several times in case of all applications by switching on and off the system. The flame relay has to be switch off reliable in all cases. According to the resulting flame signal the flame signal converter gives a corresponding current to its outputs. The test should be performed during several neighbour burner are getting started and stopped and with different boiler outputs. This is an indispensable pre-requisite for a safe and correct operation of the device !*



### 3 Technical data

#### 3.1 General characteristic features

- Precise intensity indication
- Failure diagnostic
- Threshold value adjustment
- Variable switch-on delay time
- Variable switch-off delay time
- Relay signal output

Feature	Value
Input voltage	24V DC
Power consumption	approx. 170mA
Recommended fuse	max. 0.5A, anti-surge fuse
Operating temperature	-20...+70 °C
Intensity indicator	3 digit seven segment LED-display
Indicating range	000...999 x 10 Digits
Status indicators	Yellow LED for digital relay Red LED for error diagnosis
Threshold	adjustable from 001 to 999
Relay switch-on time	adjustable from 1s to 9s
Relay switch-off time	adjustable from 1s to 9s
Fault diagnosis deactivation	with jumper X2, optional

## 3.2 Electrical system, mechanical system, function

Relay output

2 potential free changeover contacts, 1 x safed internal with 1A VDE 0110, class C, 250V  
max. switching voltage 250V, ohmic load  
max. switching current 1A, ohmic load  
max. switching power 300VA

## 3.3 Weight

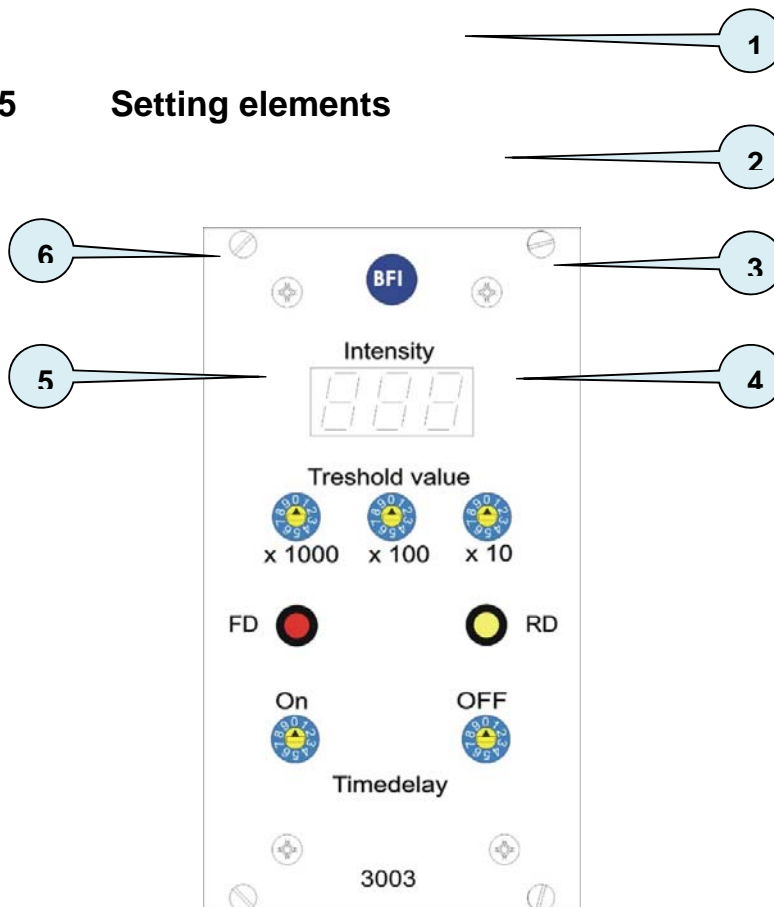
Weight approx. 0.5 kg

## 3.4 Dimensions

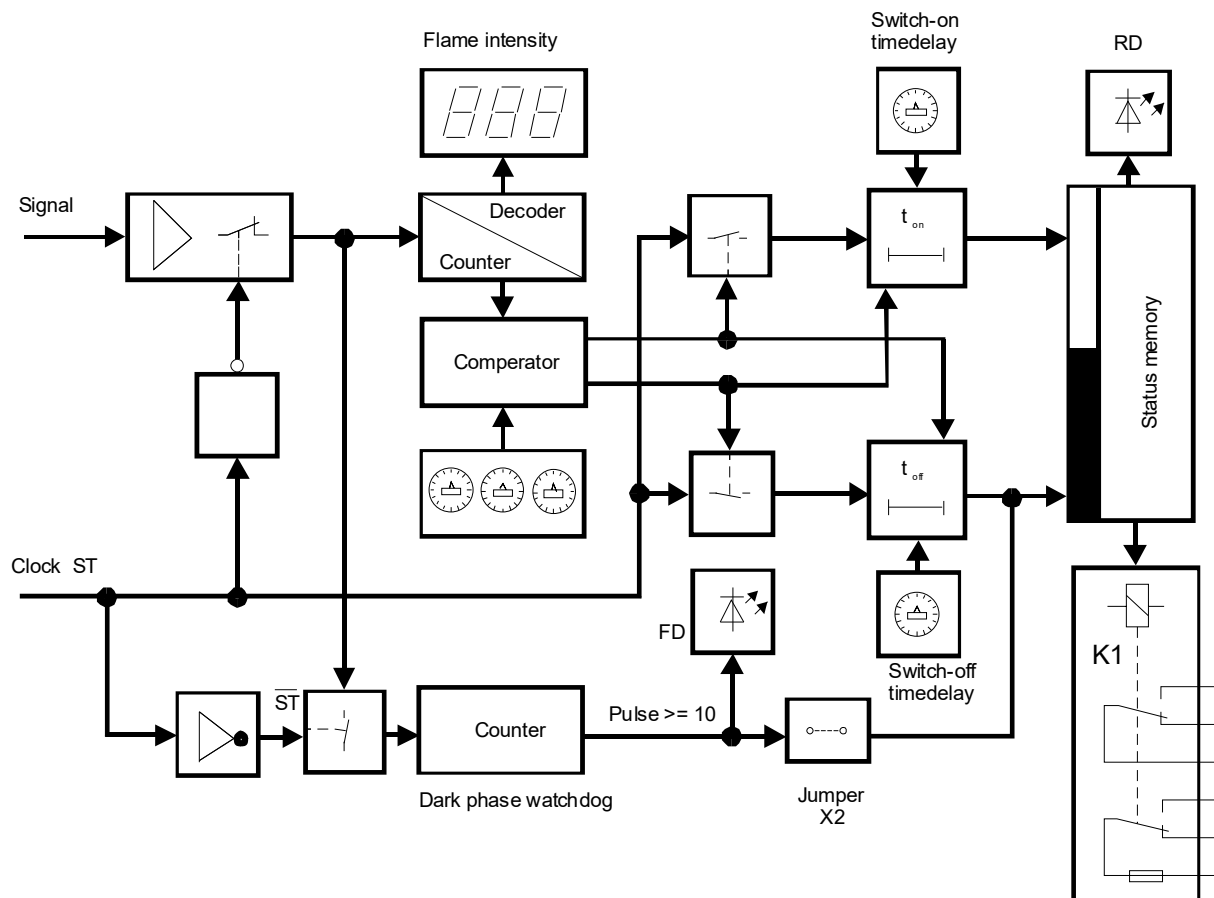
All slide-in modules of series 3000 completely pluggable for use in card magazines in keeping with German standard DIN 41494 (19" standard).

Width	70.78	mm = 14 HP – 0.34
Height	128.70	mm = 3 U – 0.34
Depth:	188.00	mm

## 3.5 Setting elements



- ### 3.6 Block diagram 3003







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## **4 Transport, installation and connection**

### **NOTICE**

*All installation and connection work may be carried out by qualified and approved specialist staff only !*

*Observe the legal stipulations and adjustment instructions of the plant operator !*

### **4.1 Scope of delivery**

- flame evaluation module 3003
- operating instructions BA 3003 EN
- backpanel with screw terminal (optional)
- pin connector (optional)
- connection cable (optional)
- 19" rack (optional)
- wall-mounted housing (optional)
- flame-proof housing (optional)

Refer to the order papers for the exact scope of delivery and compare with the delivery note.

#### **Checking for completeness**

Check the entire delivery for completeness against the accompanying delivery note. Please refer to our terms of sale and delivery otherwise.

#### **Report any damage**

After arrival of the device and accessories, notify the shipping agent, the insurance company and BFI Automation immediately in case of any damage caused by transport or inadequate packaging.

#### **Take steps to minimise and prevent further damage.**

Report the insurance case to the insurance company without delay and transmit the full claim documents at once in order to expedite the claims settlement (at the latest in sufficient time before the expiry of any periods of preclusion and/or limitation relating to the compensation claims against third parties).

### 4.2 Packaging

The flame evaluation module is shipped in different packagings.

The most frequently used packaging materials are cardboard and plastics (foils, foamed material). The packaging material also includes materials added to the packed goods as protection against moisture (e.g. bags with silicagel).

#### NOTICE

*Packaging has to be disposed of in an environmentally friendly way and in accordance with the relevant provisions on disposal.*

### 4.3 Forwarding instructions

#### NOTICE

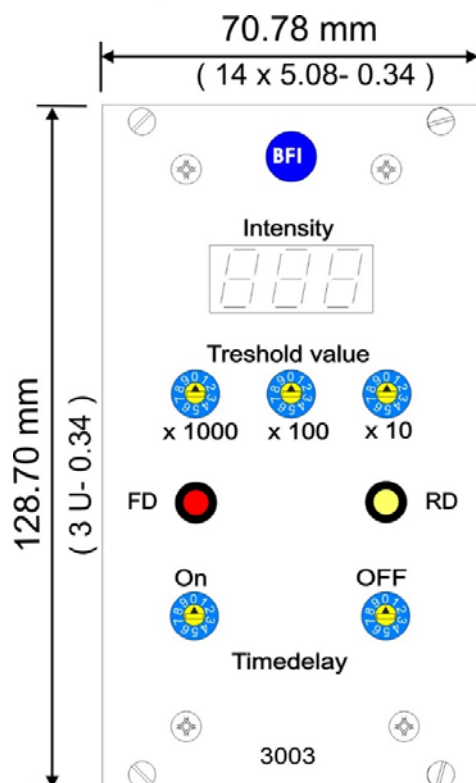
*Do not drop the device during transport and do not subject to heavy impacts.*

### 4.4 Weight

approx. 0.5 kg

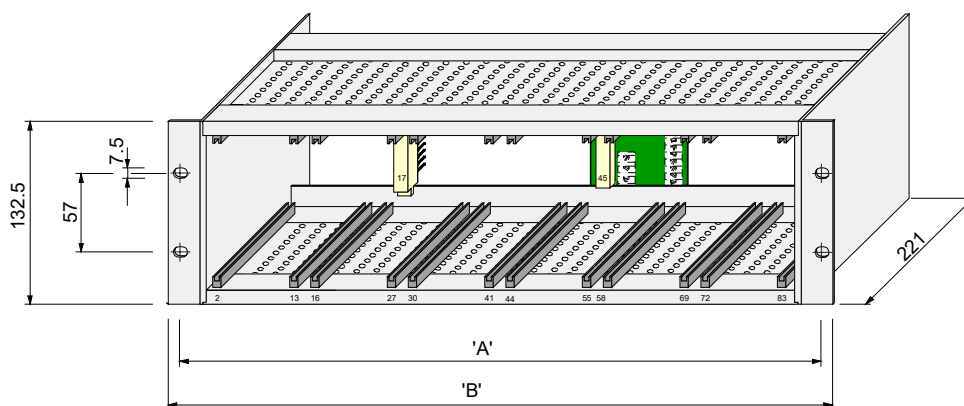
### 4.5 Space requirement

See following illustration, depth 188 mm.

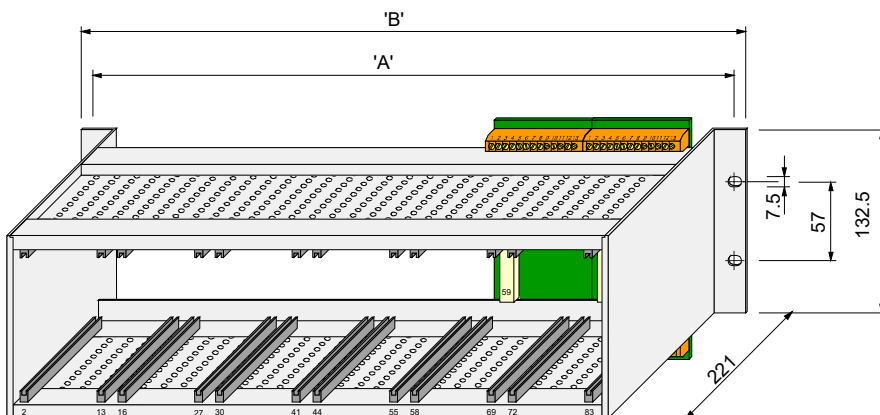


## 4.6 Installation

### 4.6.1 19"-built-in housing (rack mount installation)



### 4.6.2 19"-built-on housing (wall mount installation)



### 4.6.3 Dimensions for 19"-built in/on housing

	14 HP	28 HP	42 HP	56 HP	84 HP
All dimensions ± 0.4 mm	for 1 slide-in module	for 2 slide-in modules	for 3 slide-in modules	for 4 slide-in modules	for 6 slide-in modules
	3000 / 4000	3000 / 4000	3000 / 4000	3000 / 4000	3000 / 4000
Dimension "A"	110.3	181.4	252.6	323.7	465.9
Dimension "B"	127.1	198.2	269.4	340.5	482.7

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### 4.7 Connection

#### 4.7.1 Electrical connection

##### **⚠ DANGER**

*Danger to life caused by electrical current !*

*The safety instructions and local safety regulations have to be observed during connection !*

For connection data, please refer to the chapter titled "Technical data" as well as to the following terminal diagram.

Ensure that the available supply voltage complies with the voltage indicated on the type plate (24V DC).

Prior to connection, check the device and the connecting cables for visible damage.

Push the flame evaluation module into the 19" rack and connect the connecting cable up to the rack.

Various connection possibilities are available:

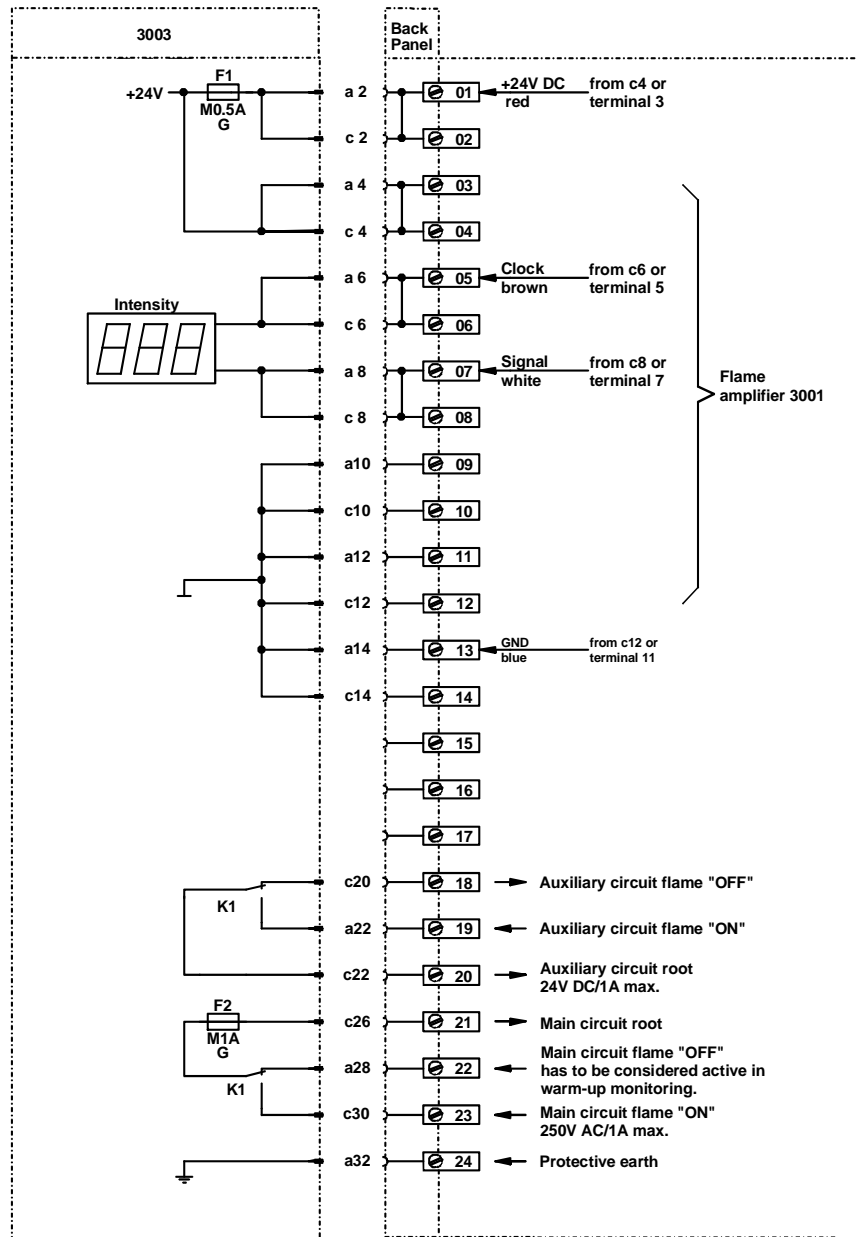
- Backpanel R (screw terminal on the rear)
- Backpanel F (screw terminal on the front)
- Pin connector
  - Flat-Pin 2.8 mm

##### **NOTICE**

*Prior to the connection of the flame sensor to the flame evaluation module, observe the separate operating instructions of the flame scanner !*

## 4.7.2 Terminal diagram

### Terminal diagram



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### 4.8 Storage

Do not unpack the packed flame evaluation module and accessories.

The following conditions apply to storage:

- Store in a dry place. Maximum relative humidity 60 %. Make sure that packages are not stored in the open. In addition, It has to be assured that the floor in the storage area will remain dry throughout the storage period.
- Protect from direct sunlight. Storage temperature: 15 degrees to 25 degrees C (59 degrees to 77 degrees F).
- Store in a dustfree location.
- Avoid mechanical vibrations and damage.

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## **5 Description**

### **5.1 Functional description**

As an input signal the 3003 is receiving the system clock produced in flame amplifier modules 3001, 3001D or 3001S and, in addition, the pulse message from the flame detector. The system internal cycle time for evaluation is one second.

The signal arriving from the flame detector is read-in digitally and processed. The number of pulses per time unit for evaluation (800ms) is counted and visualised on a 3-digit seven-segment display. During self-diagnosis time (200ms) a check is made whether there are disturbing pulses at the input or a malfunction of the system. By means of the separate addressable functions the non-steady flame intensity signal can be assigned to a defined operate and release point. The level of the digital value displayed corresponds to the detected flame detector signal and depends on different conditions:

- Type of fuel
- Fuel / air ratio
- Recirculation
- Combustion velocity
- Flame temperature
- Flame detector type
- Flame detector alignment
- Flame detector setting

The flame evaluator 3003 provides two floating contacts for the control and instrumentation system, a safety circuit for the serial interconnection to the output circuit of the 3001 and an auxiliary circuit as additional signal output. Optionally the relay message can be effected with or without fault disconnection. The three-digit seven-segment display INTENSITY is showing in second intervals the actual pulse rate of the flame detector.

The LED RD (yellow) is showing the function "digital relay activated" on reaching the set threshold value within the switch-on time. The LED FD (red) "Fault diagnosis" is showing an existing system fault or a wiring fault in flash mode.

During the self-diagnosis time no pulses must be detected on the signal line. Optionally, switching off of the relay RD in case of fault message FD can be activated through plug-in jumper x2. This will, however, also be evaluated by flame amplifier module 3001 and will cause switching off of the monitor channel and, thereby, switching off of the flame relay. The ro-

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tary switches threshold value permit setting of a desired operate and release point, within the range between 001 and 999 \*10 digits, at which the relay is to pick up. 000 is a non-defined value. The rotary switch closing delay time permits in conjunction with the set threshold value evaluation of the flame ON signal in comparison with possible interference light signals from other burners. This means that the signal for the set delay time must be larger than the threshold value. When remaining below the value the counting procedure starts anew.

### 5.1.1 Settings

The system drawer unit 3003 is working actively parallel at the flame detector output and is ready for operation immediately. The works-internal default setting of plug-in jumper x2 does not consider flame relay release in case of a fault message.

As default settings the time switches have the value 1s and the threshold value switch the value 001.

These can be varied also during operation. The values to be selected depend on the specific conditions of the particular plant.



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## **6 Operation of the flame evaluation module**

### **NOTICE**

*All installation and connection work may be carried out by qualified and approved specialist staff only !*

*Prior to initial operation, all regulations and adjustment parameters set up by the operating company of the burner have to be observed !*

*For the operation of the flame evaluation module, please observe the separate operating instructions of the flame scanner and flame amplifier!*

### **6.1 Connection of the flame evaluation module**

#### **NOTICE**

*Prior to the connection of the flame scanner, flame amplifier and power supply to the flame evaluation module, observe the separate operating instructions of the flame scanner, of the flame amplifier and of the power supply!*

### **6.2 Testing the flame evaluation module**

In order to ensure a correct operation, the flame evaluation module has to be tested several times in case of all applications by switching on and off the system. After every switching on the the main- and auxiliary relay have to switch off dependable in case of nonexisting flame and all connected devices should operate perfect. The tests should be made during different neighbour burner switched on and off and with different boiler outputs. This is an indispensable pre-requisite for a safe and correct operation of the device !

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### 6.3 Commissioning of the flame evaluation module

The flame evaluation module needs the flame signal of the flame scanner and the system clock of the flame amplifier. All security-related functions are internal self monitored by the flame amplifier. The system is promptly ready for use after regulately mounting and connection. The LED RD is off, the LED FD is on and the display shows the value 000.

#### **NOTICE**

*The displayed flame intensity should move in the range of 50% to 100%!*

### 6.4 Factory settings of the flame evaluation module

The jumper X2 is put to the position “open” because this function is part of the flame amplifier too.

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## **7 Maintenance and servicing**

The flame evaluation module requires no maintenance.

For cleaning, use a moist cloth to wipe the front panel from the outside only.



## 8 Failures

Problem:	Display:	Cause:	Correction:
No intensity value shown on the display after burner start	No analogue signal LED RD is off LED FD is off	Flame evaluation module doesn't work	Check power supply Check fuse F1 (0.5 A) Change flame evaluation module
Main relay doesn't switch	Analogue signal 25-75% LED RD <i>OFF</i> LED FD <i>blinking</i>	Flame signal below switching threshold	Increase sensitivity Reduce switching threshold System error
Main relay doesn't switch the signal	Analogue signal 25-100% LED RD <i>ON</i>	Relay contact or wiring problems	Check fuse F2 (T1A) Check electrical connections
Burner fails	Analogue signal is falling down. Beneath 25% RD switches <i>OFF</i> and FD is <i>blinking</i>	No flame or weak flame	Check flame Check flame scanner Check scanner direction and lens Increase sensitivity Change flame scanner Change flame amplifier Check electrical connections



**9****Order data**

The flame signal converter 3003 is available from BFI Automation Mindermann GmbH under the following order data:

Typ	Order-No.:
Flame evaluation unit 3003	6020-3003-00





## 10 Accessories

BFI Automation offers the following accessories:

Type	Order-No.:
19"-built-on housing, one-part, 14 HP, IP 20 with back panel 3000F	6830-0701-00
19"-built-in housing one-part, 14 HP, IP 20 with back panel 3000R	6830-0701-01
19"-built-in housing, one-part, 14 HP, 32-pole female connector style „D“	6830-0701-02
19"-built-on housing, two-parts, 28 HP, IP 20 with back panel 3000F	6830-0702-00
19"-built-in housing, two-parts, 28 HP, IP 20 with back panel 3000R	6830-0702-01
19"-built-in housing, two-parts, 28 HP, 32-pole female connector style „D“	6830-0702-02
19"-built-on housing, three-parts, 42 HP, IP 20 with back panel 3000F	6830-0703-00
19"-built-in housing, three-parts, 42 HP, IP 20 with back panel 3000R	6830-0703-01
19"-built-in housing, three-parts, 42 HP, 32-pole female connector style „D“	6830-0703-02
19"-built-on housing, four-parts, 56 HP, IP 20 with back panel 3000F	6830-0704-00
19"-built-in housing, four-parts, 56 HP, IP 20 with back panel 3000R	6830-0704-01
19"-built-in housing, four-parts, 56 HP, 32-pole female connector style „D“	6830-0704-02

19"-built-on housing, six-parts, 84 HP, IP 20 with back panel 3000F	6830-0706-00
19"-built-in housing, six-parts, 84 HP, IP 20 with back panel 3000R	6830-0706-01
19"-built-in housing, six-parts, 84 HP, 32-pole female connector style „D“	6830-0706-02
19"-built-on housing, six-parts, 84 HP, IP 20 with back panel 3000F	6830-0706-07
Housing with terminal compartment, 20 HP, IP66, shock-resistant ABS	6830-0601-00
Housing with terminal compartment, 30 HP, IP66, shock-resistant ABS	6830-0602-00
Housing with terminal compartment, 49 HP, IP66 shock-resistant ABS	6830-0603-00
Ex-proofed built-on housing, 42 HP with terminal compartment and viewing window	1830-5313-01
Rack 84 HP, 3U, with 6 x 32-pole female connector	6830-0706-12
Rack 84 HP, 3U, with 6 x back panel 3000R	6830-0706-11
Rack 84 HP, 3U, with 6 x back panel 3000F	6830-0706-10
back panel 3003F	5020-3003-91
back panel 3003R	5020-3003-92



