



บริษัท เอดีดี เฟอร์เนส จำกัด

Add Furnace Co.,Ltd.

44 ซอยบรมราชชนนี70 ถนนบรมราชชนนี แขวงศาลาธรรมสพน์ เขตทวีวัฒนา กทม.10170

โทร: 02-888-3472 โทร(ออฟบน):08-08-170-170 แฟกซ์: 02-888-3258

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kromschroder

GB F NL I E DK S N P GR TR CZ PL RU H → www.docuthek.com

Operating instructions UV flame detector UVC 1



Cert. version 11.16

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Safety

Please read and keep in a safe place



Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.docuthek.com.

Explanation of symbols

• **1, 2, 3** ... = Action

▷ = Instruction

Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

! DANGER

Indicates potentially fatal situations.

! WARNING

Indicates possible danger to life and limb.

! CAUTION

Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

Changes to edition 09.16

The following chapters have been changed:

- Checking the usage
- Reading or setting flame signal, parameters, statistics
- Technical data
- Certification



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Checking the usage

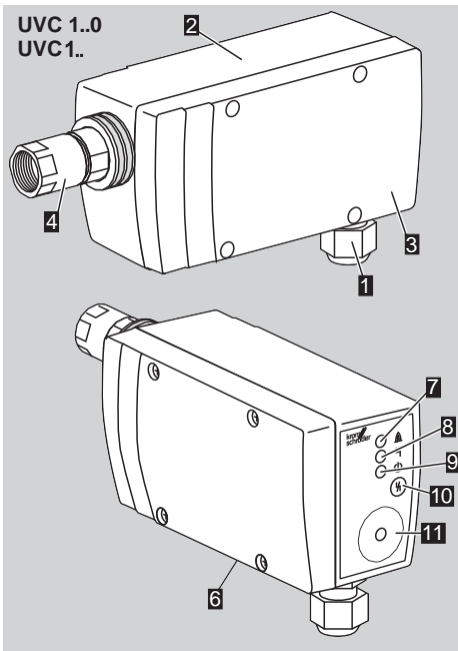
In industrial thermoprocessing systems, the UV flame detector UVC 1 is designed to monitor flames which emit UV radiation. The UV flame detector is suitable for intermittent or continuous operation in conjunction with Kromschroder burner control units BCU 370..U, BCU 4xx..U, PFU 7xx..U or BCU 5xx..U0.

This function is only guaranteed when used within the specified limits – see also page 8 (Technical data). Any other use is considered as non-compliant.

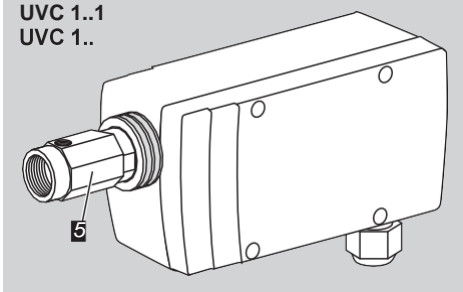
Type code

| Code | Description |
|------------|---------------------------------------------------|
| UVC | UV flamedetector |
| 1 | Series 1 |
| D | Quartz glass heatguard |
| L | Quartz glass heatguard lens |
| 0 | Rp ½ internal thread |
| 1 | Rp ½ internal thread with cooling air connection |
| | NPT ½ internal thread |
| | NPT ½ internal thread with cooling air connection |
| G1 | M20 cable gland |
| A | 100–230 V AC, 50/60 Hz |

Part designations

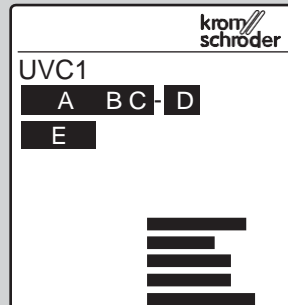


UVC 1..1
UVC 1..



- 1 M20 cable gland
- 2 Housing
- 3 Cover
- 4 Adapter with internal thread
- 5 Adapter with internal thread and cooling air connection
- 6 Type label
- 7 Yellow LED (flame signal)
- 8 Red LED (fault)
- 9 Green LED (ready for operation)
- 10 Reset button
- 11 Connection for opto-adaptor PCO 200/300

Identification number (A), construction stage (B), year/week of manufacture (C), device number (D), firmware (E), input voltage, enclosure – see type label.



Installation

! CAUTION

Please observe the following to ensure that the UVC 1 is not damaged:

- Only use the UV flame detector in conjunction with Kromschroder burner control units BCU 370..U, BCU 4xx..U, PFU 7xx..U or BCU 5xx..U0.
- Use the UV flame detector with cooling air connection (UVC 1..1 or UVC 1..3) in high temperatures. Cool with filtered air via the cooling air connection to provide protection from dirt and condensation.
- The installation surface temperature for the UVC 1 may be max. 20°C above the maximum ambient temperature.



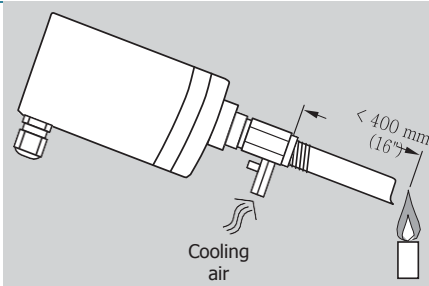
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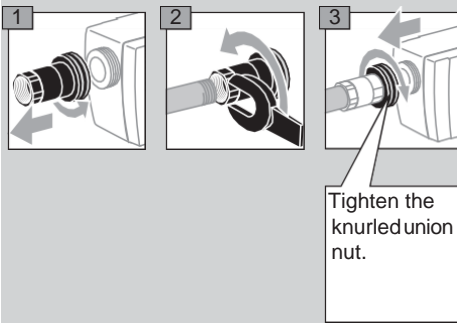
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- ▷ Max. distance between UVC and flame < 400 mm (16").
- ▷ It is installed using a 1/2" steel viewing tube. Direct the viewing tube at the first third of the flame as this is where the highest UV radiation is generally found. The inside of the viewing tube should not be coated and the tube should be directed at the flame from above so that no dirt collects in front of the UV flame detector.
- ▷ The UVC 1 may only be exposed to the UV light of its own flame. It should be protected from other sources of ultraviolet light, e.g. neighbouring flames (this must be observed when monitoring pilot and main burners in particular), ignition sparks, arcs from welding devices or lamps emitting ultraviolet light.
- ▷ Avoid exposing the UVC 1 viewing openings to direct sunlight.
- ▷ Protect the viewing openings against dirt and moisture.

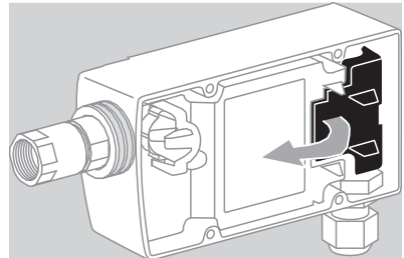


Wiring

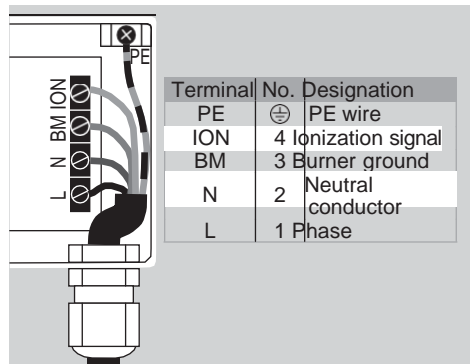
⚠ WARNING

Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.

- ▷ Connection cable:
 - Use 5-core cable including a PE wire and complying with local regulations.
 - Lay individually and, if possible, not in a metal conduit.
 - Do not lay together with ignition cable but lay them as far apart as possible.
 - M20 cable gland is designed for cable diameters of 7 to 13 mm.
 - Screw terminals for wire cross-sections >0.5mm² to ≤1.5mm² (AWG 26 to AWG 16).
 - Maximum cable length as specified for burner control units BCU or PFU.
- ▷ External electrical interference must be avoided.
 - 1 Disconnect the system from the electrical power supply.
 - 2 Shut off the gas supply.
 - 3 Remove the cover from the housing.
 - 4 Open the cover on the connection terminals.



- 5 Route the cable through the M20 cable gland.
- 6 Wire the UVC 1 as shown in the connection diagram for the burner control unit, including PE wire, see page 4 (Burner control unit connection diagrams):





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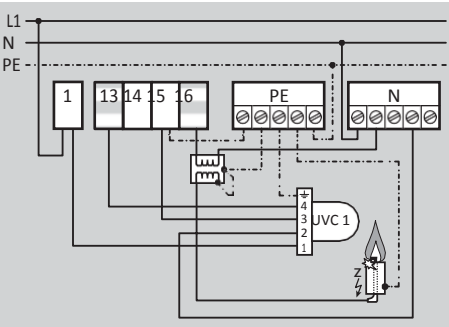
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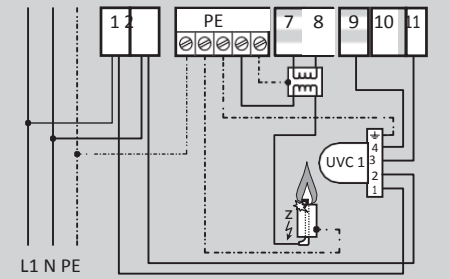
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Burner control unit connection diagrams

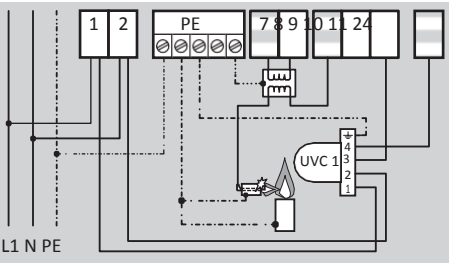
BCU 370..U



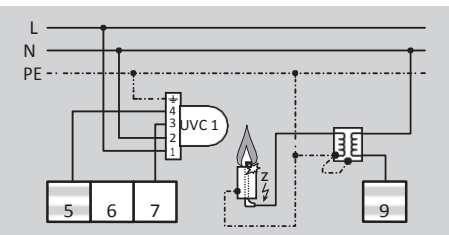
BCU 460..U



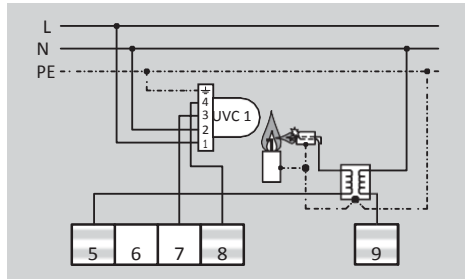
BCU 480..U



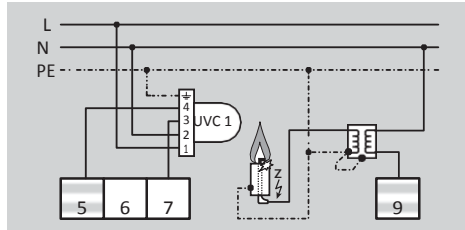
BCU 56x..U0



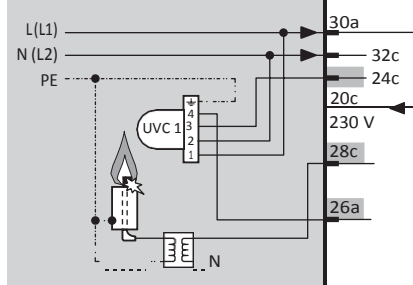
BCU 580..U0



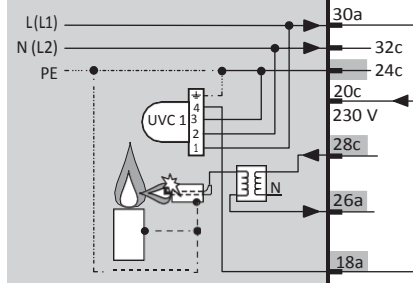
BCU 570..U0



PFU 760..U



PFU 780..U





Adjustment

If faults occur during operation, it may be necessary to change the parameter for the switch-off threshold (parameter 01) on the UVC 1, see page 6 (Assistance in the event of malfunction). The parameter can be set using the separate BCSoft software and the opto-adaptor PCO 200 or PCO 300, see also page 9 (Accessories) and BCSoft operating instructions at www.docuthek.com.

- ▷ The switch-off threshold can be set from 10%
to 80% (in steps of 10%).
- ▷ The switch-off threshold for the flame signal cannot be set on the burner control unit when using a UVC 1.
- ▷ The factory settings are secured with a programmable password (1234).
- ▷ If the password has been changed, the end customer can look up the changed password in the plant documentation or ask the system supplier.

Commissioning

⚠ WARNING

Only use the UV flame detector UVC 1 in conjunction with burner control units BCU 370..U, BCU 4xx..U, PFU 7xx..U or BCU 5xx..U0. For BCU 5xx, set parameter 04 to flame control with a UV sensor for continuous operation. Otherwise, the safety time may be evaluated incorrectly.

- 1 Switch on the system.
 - ▷ The three LEDs (yellow, red and green) will be lit during initialization of the UVC 1.
 - ▷ The green LED will be lit. The UVC 1 is ready for operation.
 - ▷ The yellow LED will also be lit as soon as a flame is detected (with a maximum delay of 1 s).
 - ▷ If the reset button is pressed, the yellow LED will flash to indicate the switch-off threshold, see also page 7 (Reading or setting flame signal, parameters, statistics).
 - ▷ As soon as the red LED or the red and green LEDs are lit, a fault has been detected, see page 6 (Assistance in the event of malfunction).

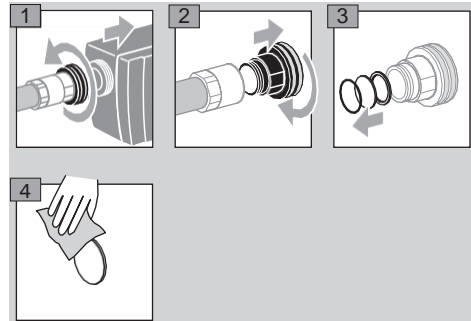
Maintenance

⚠ WARNING

Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.

- ▷ Check the UVC 1 at least once per year to ensure that it is securely attached and that the quartz glass disc is clean.
- ▷ The tube in the UV flame detector must be replaced after approx. 10,000 operating hours (approx year).
- ▷ Spare parts (tube, seal), see www.partdetective.de

Cleaning or replacing the quartz glass disc

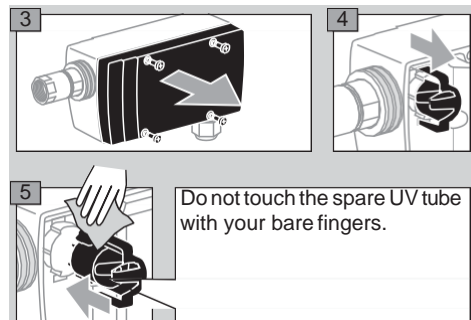


Replacing the UV tube

! CAUTION

Do not touch the UV tube with your bare fingers.

- 1 Disconnect the system from the electrical power supply.
Shut off the gas supply.





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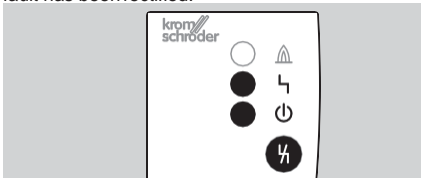
Assistance in the event of malfunction

⚠ WARNING

- Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.
- Fault-clearance must only be undertaken by authorized trained personnel!
- Do not carry out repairs on the UV flame detector on your own as this will cancel our guarantee. Unauthorized repairs or incorrect electrical connections can cause the UV flame detector to become defective.
- Resets may only be conducted by authorized trained personnel with continuous monitoring of the burner to be reset.
- Safe operation only in conjunction with Kromschroder burner control units.

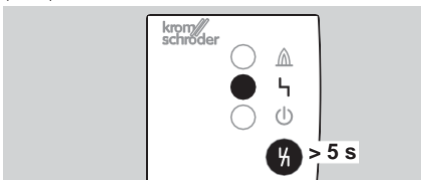
Safety shut-down

- ▷ The red and green LEDs will be lit.
 - Reset the UVC by pressing the reset button after the fault has been rectified.



Fault lock-out/Device error

- ▷ Only the red LED will be lit.
 - Reset the UVC by pressing and holding the reset button (> 5 s).



? Fault

! Cause

• Remedy

- ▷ If the UVC does not respond even though all faults have been remedied: remove the unit and return it to the manufacturer for inspection.

? The yellow LED “Flame signal” is lit although there is no flame.

- ! The UV flame detector is influenced by the flames of other burners, e.g. by reflection on the furnace walls.
 - Position the UV flame detector so that it can only “see” its own dedicated flame (e.g. use viewing tube).
- ! Sensitivity of the UV flame detector is too high.
 - Increase the switch-off threshold using BCSoft.

? The yellow LED “Flame signal” is not lit although there is a flame.

- ! The UV flame detector is dirty, e.g. sooted.
 - Clean the quartz glass disc/lens.
- ! There is moisture in the burner adapter.
 - Vent the burner adapter.
- ! The UV flame detector is too far away from the flame.
 - Reduce the distance.
- ! No UV tube has been inserted.
 - Insert a UV tube.
- ! After many hours of operation, the flame signal becomes weaker, the UV tube ages.
 - Replace the UV tube, see page 5 (Maintenance).

? The yellow LED “Flame signal” is lit, but the burner control unit does not detect a flame signal.

- Measure the flame signal.
- ▷ If the current is less than 5 μA , this may be attributable to the following causes:
 - ! Short-circuit or discontinuity on the flame signal cable. UV flame detector or burner control unit is not correctly wired.
 - ! The flame signal cable is too long.
 - ! Sources of interference, e.g. ignition transformers, are influencing the flame signal.
- Remedy fault.

? The red LED “Fault” is lit.

- ! The UV tube is defective.
 - Replace the UV tube, see page 5 (Maintenance).
- ! The unit is defective.
 - Remove the unit and return it to the manufacturer for inspection.



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? **The red LED “Fault” flashes.**

- ! The printed circuit board temperature is above 95°C, see page 8 (Technical data).
- ▷ The function of the UV flame detector is not restricted.
- ▷ The service life of the UV tube may be reduced as a result.
 - Provide a cooler ambient temperature.
- ▷ As soon as the UVC is in the normal operating temperature range, the red LED stops flashing.

? **The green LED “Ready for operation” is not lit.**

- ! Incorrect wiring.
 - Check wiring, see page 4 (Burner control unit connection diagrams).
- ! Fuse defective.
 - Send back the unit.
- ! UVC 1 has suffered a device error.
 - Read the error with BCSoft and react accordingly.
- ! UVC 1 has carried out a fault lock-out.
 - Read the error with BCSoft and react accordingly.

? **The burner ignites in pulses.**

- ! The UV flame detector “sees” the ignition spark.
 - Reposition the UV flame detector so that it cannot “see” the ignition spark.
- Use a burner control unit that is able to distinguish between an ignition spark and a flame signal.

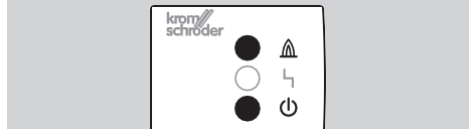
? **The burner control unit performs a fault lock-out during start-up with the fault message “No flame” or during operation indicating “Flame failure”.**

- ! The highly fluctuating flame signal temporarily falls below the switch-off threshold.
 - Reduce the distance between UV flame detector and flame.
 - Position the UV flame detector so that it can “see” the flame without hindrance (e.g. smoke curtain).
- ! The switch-off threshold is set too high.
 - Reduce the switch-off threshold using BCSoft.

Reading or setting flame signal, parameters, statistics

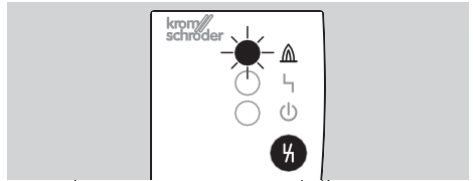
Reading from the UVC

Flame signal:



- ▷ The yellow and green LEDs are lit during operation: the flame signal is above the switch-off threshold.

Parameterization:



the switch-off threshold is 30%.

Reading/Setting using BCSoft

Using an optionally available opto-adapter, it is possible to set parameter 01 and read analysis and diagnostic information from the UVC using the BC- Soft program, see BCSoft operating instructions at www.docuthek.com. PCO opto-adapter and BCSoft, see page 9 (Accessories).

- ▷ The switch-off threshold can be set from 10 to 80% (in steps of 10%).



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Technical data

Electrical data

Supply voltage:

100 to 230 V AC, 50/60 Hz (terminals L and N). Length of cable between UV flame detector and burner control unit:

min. 2 m,

max. 100 m (note the specifications for the connected burner control unit).

Distance between UV flame detector and flame: 300 to 400 mm.

UV tube: P578,

spectral range: 190 to 270 nm,

max. sensitivity: 210 nm \pm 10 nm. Min.

DC signal: 1 μ A.

Mechanical data

Housing: aluminium.

Cable gland for cable diameters of 7 to 13 mm.

Clamping range of the connection terminals:

0.5 to 1.5 mm². Weight: 1

kg.

Environment

Ambient temperature: -20 to +80°C (-4 to +176°F). Storage

temperature: -20 to +80°C (-4 to +176°F). Enclosure: IP 65.

Safety class: 1.

Pollution degree: internal environment: 2, external environment: 4.

Designed lifetime

This information on the designed lifetime is based on using the product in accordance with these operating instructions.

Once the designed lifetime has been reached, safety-relevant products must be replaced. Designed lifetime of the UVC 1 (based on date of manufacture): 10 years.

Designed lifetime of the UV tube:

approx. 10,000 operating hours (approx. 1 year). You

can find further explanations in the applicable rules and regulations and on the afecor website (www.afecor.org).

This procedure applies to heating systems. For thermoprocessing equipment, observe local regulations.

Safety instructions

Scope of application:

As set out in "Industrial thermoprocessing equipment – Part 2: Safety requirements for combustion and fuel handling systems" (DIN EN 746-2:2010) when used with fuels and oxidants which emit UV radiation during oxidation.

Action:

Type 2 pursuant to DIN EN 60730-1. Behaviour under fault conditions:

Pursuant to Type 2.AD2.Y. During a fault, the UVC 1 switches off and uses a trip-free mechanism which cannot be reclosed.

Fault detection time:

\leq 10 min. during operation depending on the number of testing cycles for the UV tube by the integrated shutter.

Safety time during operation (in the event of a flame failure):

$<$ 0.5 s.

Intermittent operation:

Possible pursuant to EN 298:2012 Section 7.101.2.9. As a result of the fault detection time, depending on the process time it may happen that a defective tube is not detected during the self-check using the shutter. A flame simulation check must be conducted before starting the burner control unit.

Software class: corresponds to software class C which operates in a similar double-channel architecture with comparison.

Short-circuit fault exclusion:

No. Internal voltages are neither SELV nor PELV.

Interfaces

Type of wiring:

Attachment type X to EN 60730-1.

Connection terminals:

Supply voltage: 100 to 230 V AC, 50/60 Hz, between terminals L and N.

Ionization signal: 230 V AC between terminal ION (ionization output) and BM (burner ground). The voltage is provided by the burner control unit/automatic burner control unit.

DC signal:

No flame: $<$ 1 μ A,

active flame: 5 to 25 μ A, depending on flame quality.

Grounding:

Using PE wire connection, galvanically connected to the housing.



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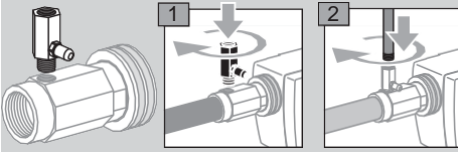
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Accessories

Nozzle for cooling air adapter



Order No.: 7 496 061 6

Quartz glass disc/lens



With seals

Quartz glass disc, Order No. 7 496 061 2

Quartz glass lens, Order No. 7 496 061 1

BCSoft

The current software can be downloaded from our Internet site at <http://www.docuthek.com>. To do so, you need to register in the DOCUTHEK.

Opto-adapter PCO 00

Including BCSOFT CD-ROM,

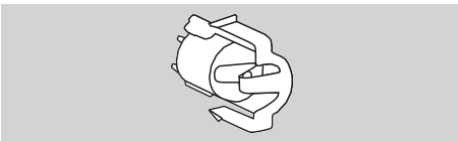
Order No.: 7 496 0625.

Bluetooth adapter PCO 00

Including BCSOFT CD-ROM,

Order No.: 7 496 0617.

Spare UV tube



With bracket,

Order No.: 7 496 068 4.

Logistics

Transport

Protect the unit from external forces (blows, shocks, vibration). On receipt of the product, check that the delivery is complete, see page 2 (Part designations). Report any transport damage immediately.

Storage

Store the product in a dry and clean place. Storage temperature: see page 8 (Technical data). Storage time: 6 months in the original packaging before using for the first time. If stored for longer than this, the overall service life will be reduced by the corresponding amount of extra storage time.

Packaging

The packaging material is to be disposed of in accordance with local regulations.

Disposal

Components are to be disposed of separately in accordance with local regulations.



บริษัท เอดีดี เฟอร์เนส จำกัด

Add Furnace Co.,Ltd.

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Certification

Declaration of conformity



We, the manufacturer, hereby declare that the product UVC 1 complies with the essential requirements of the following Directives and Standards:

Directives:

- 2014/35/EU
- 2014/30/EU

Standards:

- EN 298:2012
- EN 60730:2015
- SIL 3 according to EN61508

The production is subject to the conformity assessment procedure pursuant to Directive 2014/35/EU Annex II Module A and Directive 2014/30/EU Annex II Module A, and to the quality management system pursuant to DIN EN ISO9001.

Scan of the Declaration of conformity (D, GB) – see www.docuthek.com

SIL, PL



For systems up to SIL 3 pursuant to EN 61508. Pursuant to EN ISO 13849-1:2006, Table 4, the UVC 1 can be used up to PL e.

| | | |
|--------------------------------------------------------|----------------------------------|----------------------------------------------|
| Safety-specific characteristic values | Diagnostic coverage DC | 94.7% |
| Type of subsystem | Type B to EN 61508-2:2010 | High demand mode pursuant to EN 61508-4:2010 |
| Operating mode | Continuous operation (to EN 298) | |
| Mean probability of dangerous failure PFH _D | | 10.2 x 10 ⁻⁹ 1/h |
| Mean time to dangerous failure MTTF _d | | 1/PFH _D |
| Safe failure fraction SFF | | 98.9% |

Contact

If you have any technical questions, please contact your local branch office/agent. The addresses are available on the Internet or from Elster GmbH.

We reserve the right to make technical modifications in the interests of progress.

Honeywell

**krom
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