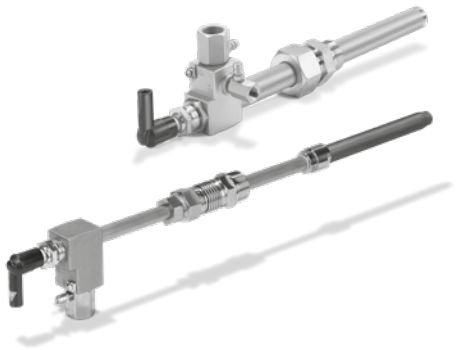
krom//
schroder

Pilot burners ZMI, ZMIC

OPERATING INSTRUCTIONS

· Edition 02.24 · EN · 03251354



CONTENTS

1 SAFETY

1.1 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.

1.2 Explanation of symbols

1, **2**, **3**, **a**, **b**, **c** = Action

➔ = Instruction

1.3 Liability

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

1.4 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.

1.5 Conversion, spare parts

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

2 CHECKING THE USAGE

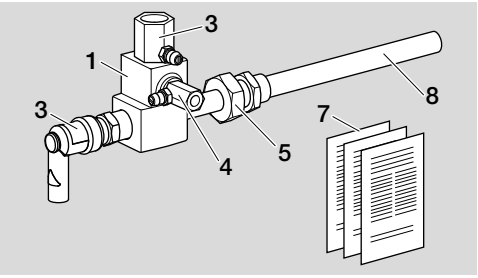
Ionization-controlled pilot burner for safely igniting gas burners. The capacity of the pilot burner should be 2 to 5% of that of the main burner. Can also be used as independently operated burner. For natural gas, coke oven gas, town gas and LPG.
Can also be used as independently operated burner. For natural gas, coke oven gas, town gas and LPG. Other types of gas on request.
This function is only guaranteed when used within the specified limits – see also page 7 (10 Technical data). Any other use is considered as non-compliant.

2.1 Type code

ZMI	Gas pilot
ZMIC	Gas pilot with ceramic flame tube
16	16 mm burner size (ZMI only)
25	25 mm burner size (ZMI only)
28	28 mm burner size (ZMIC only)
T	T-product
B	Natural gas
G	LPG
D	Coke oven gas, town gas
150, 200, 300…	Flame tube length in mm
R	Rp internal thread
N	NPT internal thread
K	With bellows unit

2.2 ZMI

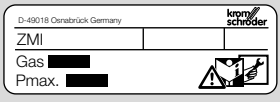
2.2.1 Part designations



1 Burner body
2 Interference-suppressed terminal boot with protective cap
3 Air nozzle
4 Gas nozzle
5 Burner bracket
6 Flame tube
7 Enclosed documentation: operating instructions and flow rate curves

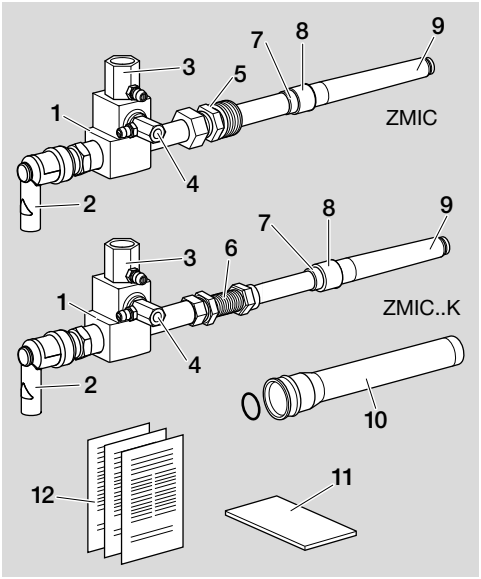
2.2.2 Type label

Burner size, gas type, rated capacity $P_{max.}$, flame tube length, connection – see type label.



2.3 ZMIC

2.3.1 Part designations



1 Burner body
2 Interference-suppressed terminal boot with protective cap
3 Air nozzle
4 Gas nozzle
5 Burner bracket with reducing nipple
6 Bellows unit with nut
7 Ceramic tube retaining piece
8 Ceramic tube clamping ring
9 Ceramic tube
10 Transport safety device (plastic tube and O-ring)
11 Insulation strip
12 Enclosed documentation: operating instructions and flow rate curves

2.3.2 Type label

Burner size, gas type, rated capacity $P_{max.}$, flame tube length, connection – see type label.

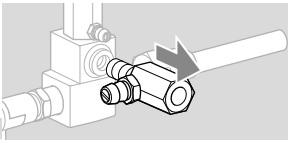
3 CHECKING THE GAS TYPE

1 Check if the gas nozzle diameter is suitable for the required gas type.

Gas type	Nozzle dia. [mm (inch)]		
	ZMI 16	ZMI 25	ZMIC 28
B	0.94 (0.037)	1.40 (0.055)	1.40 (0.055)
G	0.76 (0.029)	1.05 (0.041)	1.05 (0.041)
D	1.30 (0.051)	1.78 (0.070)	1.78 (0.070)

➔ When changing the nozzle, remove the residue of sealant from the burner body.

➔ Suitable nozzles – see accessories.



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4 INSTALLATION

⚠ DANGER

Risk of explosion!

– Ensure the connection is air-tight.

⚠ CAUTION

Burner fault!

– If used as pilot burner, the gas and air pressures must be higher than the connection pressures of the main burner.

➔ Install the pilot burner so that reliable ignition of the main burner is guaranteed.

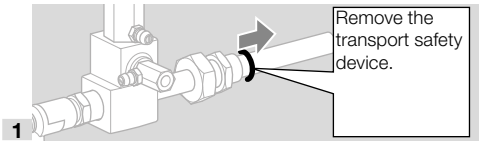
➔ Attach the pilot burner securely.

➔ We recommend that a filter be installed in both the gas and air supply line.

➔ Install pressure regulators and adjusting cocks in the air and gas supply lines upstream of the burner so that the air and gas pressures can be adjusted.

4.1 ZMI

➔ Recommended inlet pressures:
gas: up to 80 mbar (up to 32 "WC),
air: up to 120 mbar (up to 47 "WC).



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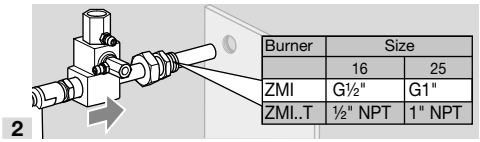

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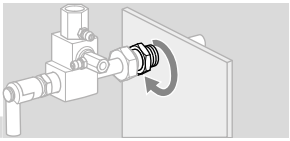

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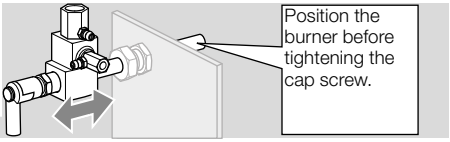

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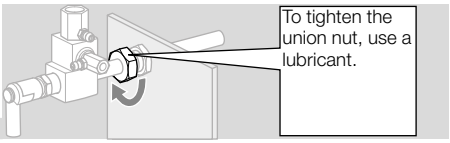

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6 For air-tight installation, hand-tighten the union nut then tighten it with a further turn (olive fitting is secured).

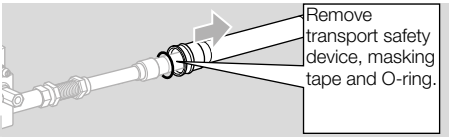
7 Connect Rp ¼ pilot gas supply line and Rp ½ air supply line.

4.2 ZMIC

⚠ WARNING

– Only install the ZMIC when the burner block is cold. When installing in a hot burner block, the fibre insulation can be damaged in such a way that the burner can be thermally destroyed.

➔ Recommended inlet pressures:
gas: up to 100 mbar (up to 40 "WC),
air: up to 120 mbar (up to 47 "WC).



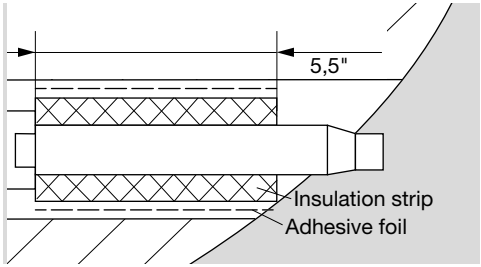
1

Insulating the ceramic tube

➔ Protect the ceramic tube from thermal stress.

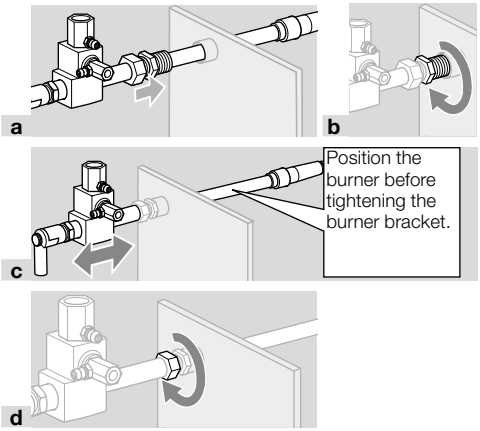
➔ Insulation with enclosed insulation strips.

2 Compress insulation strips by wrapping adhesive foil around them tightly until they press tightly against the ceramic tube.

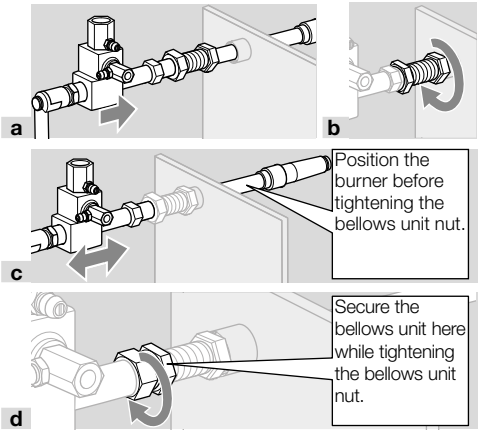


3 Check that the burner block hole is not blocked, e.g. using a wooden stick.

ZMIC



ZMIC..K



ZMI/ZMIC

4 Follow the reverse procedure when dismantling.

5 WIRING

⚠ DANGER

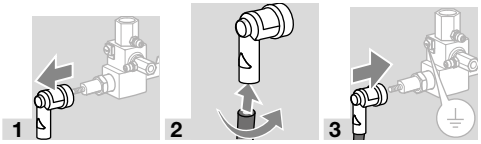
Electric shocks can be fatal!

– Before working on possible live components, ensure the unit is disconnected from the power supply.

➔ For the ionization and ignition cables, use unscreened high-voltage cable:
FZLSi 1/7 -50 to +180°C (-58 to +356°F),
Order No. 04250410,
or
FZLK 1/7 -5 to +80°C (23 to 176°F),
Order No. 04250409.

➔ Wire the burner as shown in the connection diagrams of the automatic burner control unit/ ignition transformer.

➔ Flame control and ignition by a single electrode (single-electrode operation).



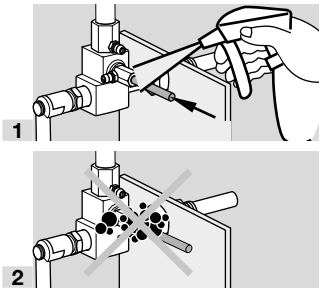
4 Route the PE wire directly to the automatic burner control unit.

6 TIGHTNESS TEST

⚠ DANGER

Risk of explosion and poisoning!

– To ensure that there is no danger resulting from a leak, check the gas connections on the burner for leaks immediately after the burner has been put into operation.



7 COMMISSIONING

⚠ DANGER

Risk of explosion!

– Please observe the appropriate precautions when igniting the burners.

⚠ DANGER

Risk of poisoning!

– Open the gas and air supply so that the burner is always operated with excess air – otherwise CO will form in the furnace chamber. CO is odourless and poisonous! Conduct a flue gas analysis.

➔ Agree on settings and commissioning of the burner with the system operator or manufacturer.

➔ Check the entire system, upstream devices and electrical connections.

➔ Pre-purge the furnace chamber with air before every ignition attempt.

⚠ DANGER

Risk of explosion!

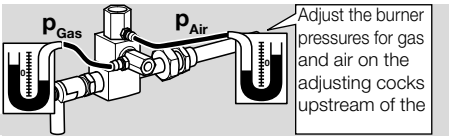
– Fill the gas line to the burner carefully and correctly with gas and vent it safely into the open air – do not discharge the test volume into the furnace chamber.

➔ If the burner does not ignite although the automatic burner control unit has been switched on and off several times: check the entire system.
➔ After ignition, monitor the gas and air pressures measured on the burner and the flame. Measure the ionization current. Switch-off threshold – see automatic burner control unit operating instructions.
1 Switch on the system.
2 Open the manual valve.
3 Ignite the burner via the automatic burner control unit.
4 Adjust the burner.
➔ Set the ionization current by adjusting the air volume.
➔ The ionization current must be at least 5 µA and must not vary.

⚠ CAUTION

Risk of explosion in case of CO being formed in the furnace chamber!
An incorrect change of the burner settings may change the gas/air ratio and lead to unsafe operating conditions. CO is odourless and poisonous!

5 Set the pressure regulators for the gas and air supply pressures to the maximum admissible values, whereby the gas and air supply pressures should be identical.



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➔ Gas and air pressures: flow rate curves – see www.docuthek.com.

ZMI

➔ Inlet pressure:
gas: up to 80 mbar (up to 32 "WC),
air: up to 120 mbar (up to 47 "WC).

ZMIC

➔ Inlet pressure:
gas: up to 80 mbar (up to 32 "WC),
air: up to 120 mbar (up to 47 "WC).

8 MAINTENANCE

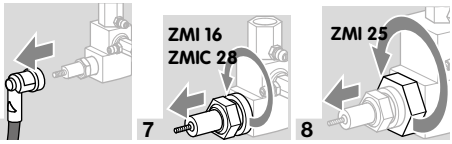
➔ We recommend an annual function check.

⚠ DANGER

Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.
Risk of burning! Dismantled burner components can be hot due to outflowing flue gases.
Risk of explosion and poisoning in case of burner adjustment with insufficient air! Adjust the gas and air supply so that the burner is always operated with excess air – otherwise CO will form in the furnace chamber. CO is odourless and poisonous! Conduct a flue gas analysis.

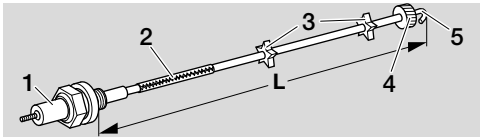
1 Check the ionization and ignition cables.
2 Measure the ionization current.
➔ The ionization current must be at least 5 µA and must not vary.
3 Disconnect the system from the electrical power supply.
4 Shut off the gas and air supply – do not change the restrictor settings.
5 Check the nozzles for dirt.

Replacing the electrode



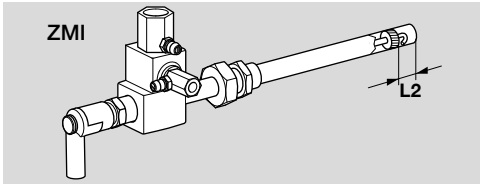
6 7 8

➔ Ensure that the electrode length does not change.

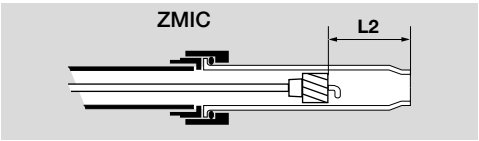


1 Spark plug
2 Dowel pin
3 Insulators
4 Burner head
5 Electrode tip

9 Remove dirt from electrode and insulators.
10 If the electrode tip or insulators are damaged, replace the electrode.
➔ Before changing the electrode, measure the total length **L**.
11 Connect the new electrode with the spark plug using the dowel pin.
12 Adjust spark plug and electrode to the measured total length **L**.
13 Screw the electrode into the burner body.
14 Check distance **L2**:



Burner	L2		Burner	L2
ZMI 16 B	25 mm		ZMI 25 B	35 mm
ZMI 16D	21 mm		ZMI 25D	20 mm
ZMI 16G	25 mm		ZMI 25G	35 mm

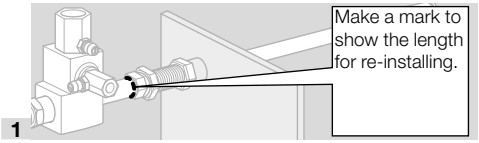


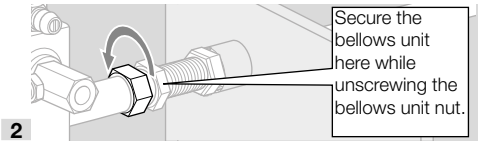
Burner	L2
ZMIC 28 B	50 mm
ZMIC 28G	50 mm

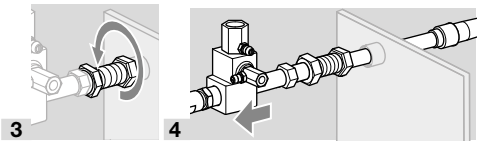
15 Reconnect the terminal boot.

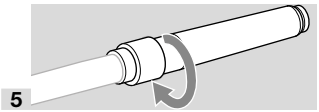
16 Produce a maintenance report.

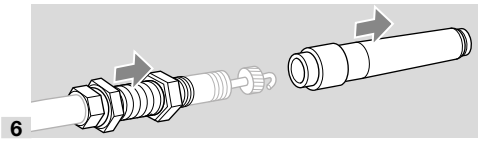
8.1 ZMIC..K: replacing the bellows unit

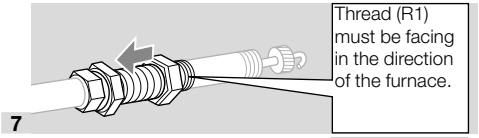


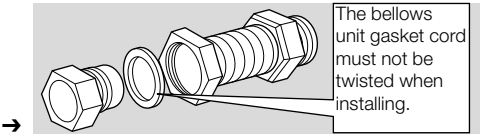


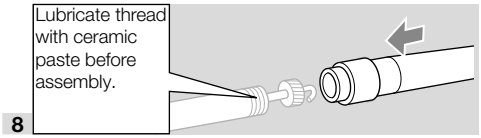


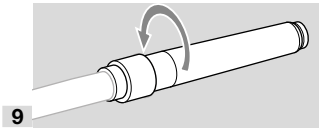








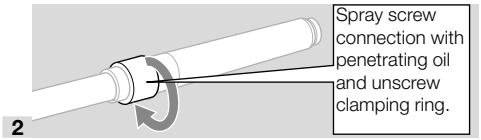


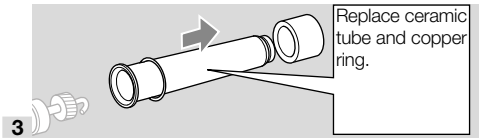


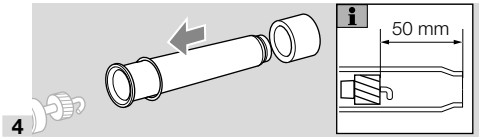
10 Insulate the ceramic tube and reinstall the burner, see page 3 (4 Installation).

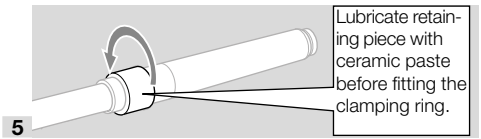
8.2 ZMIC: replacing the ceramic tube

1 Remove the ZMIC – see page 6 (8.1 ZMIC..K: replacing the bellows unit).









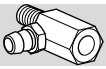
➔ Tighten the clamping ring with a torque of 30 Nm.

6 Insulate the ceramic tube.

7 Reinstall the burner, see page 3 (4 Installation).

9 ACCESSORIES

9.1 Gas nozzle



Burner	Gas type	mm (inch)	Order No.	
			ZMI/ ZMIC	ZMI..T
ZMI 16	Natural gas	0.94 (0.037)	75455010	75442157
ZMI 16	LPG	0.76 (0.029)	75455147	75448032
ZMI 16	Town gas/ coke oven gas	1.30 (0.051)	75455146	–
ZMI 25	Natural gas	1.40 (0.055)	75455012	75443157
ZMI 25	LPG	1.05 (0.041)	75455149	75448031
ZMI 25	Town gas/ coke oven gas	1.78 (0.070)	75455148	–
ZMIC 28	Natural gas	1.40 (0.055)	75455012	–
ZMIC 28	LPG	1.05 (0.041)	75455149	–
ZMIC 28	Town gas/ coke oven gas	1.78 (0.070)	75455148	–

9.2 Ceramic paste

For avoiding cold-setting on screw connections after replacing burner components.
Order No.: 050120009.

10 TECHNICAL DATA

10.1 Ambient conditions

Protect the unit from precipitation, dirt and dust, e.g. with a protective housing.
Do not allow any icing, condensation or dew in and on the ZMI.
Avoid direct sunlight or radiation from red-hot surfaces on the unit. Note the maximum medium and ambient temperatures!
Avoid corrosive influences, e.g. salty ambient air or SO_2.
The unit may be stored and installed outdoors in the specified ambient conditions as long as a weather protection cover is used.
Ambient, transport and storage temperature: -15 to +60°C (5 to 140°F).
This unit is not suitable for cleaning with a high-pressure cleaner and/or cleaning products.

10.2 Mechanical data

Gas types: natural gas, LPG (gaseous), coke oven gas, town gas and clean cold air.

ZMI

Capacity:
ZMI 16: 1 to 2 kW (3.8 to 7.6 10^3 BTU/h),
ZMI 25: 2.5 to 4 kW (9.5 to 15.1 10^3 BTU/h)
(1.5 to 3.3 kW when used with coke oven gas, town gas).
Capacities in kW refer to the lower heating value H_i and capacities in BTU/h refer to the higher heating value H_s (gross calorific value).
Gas inlet pressure: 15 to 70 mbar (6 to 27 "WC), air inlet pressure: 15 to 90 mbar (6 to 35 "WC), each depending on the gas type (burner pressures – see www.docuthek.com, Type of document: Flow rate curve).
Burner length increments: 100 mm (4").
Housing: aluminium.
Flame tube: heat-resistant steel.
Max. temperature at the tip of the flame tube:
< 1000°C (< 1832°F),
< 900°C (< 1652°F) for lambda < 1.

ZMIC

Capacity:
2.5 to 4.2 kW (9.5 to 15.9 10^3 BTU/h).
Capacities in kW refer to the lower heating value H_i and capacities in BTU/h refer to the higher heating value H_s (gross calorific value).
Gas inlet pressure: up to 100 mbar (up to 40 "WC), air inlet pressure: up to 120 mbar (up to 47 "WC), each depending on the gas type (burner pressures – see www.docuthek.com, Type of document: Flow rate curve).
Burner length increments: 100 mm (4"), length increments of the ZMIC 28..K: 50 mm (2").
Housing: aluminium.
Flame tube: ceramic flame tube.
Max. temperature at the tip of the flame tube: 1450°C (2642°F).

10.3 Electrical data

Control: with flame rod.
Ignition: direct spark ignition (5 kV ignition transformer).

ZMI

Right-angle terminal boot: interference-suppressed.

ZMIC

Spark electrode terminal boot: interference-suppressed.

11 LOGISTICS

Transport

Protect the unit from external forces (blows, shocks, vibration).
Transport temperature: see page 7 (10 Technical data).
Transport is subject to the ambient conditions described.
Report any transport damage on the unit or packaging without delay.
Check that the delivery is complete.

Storage

Storage temperature: see page 7 (10 Technical data).
Storage is subject to the ambient conditions described.
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.

12 DISPOSAL

Devices with electronic components:
WEEE Directive 2012/19/EU – Waste Electrical and Electronic Equipment Directive

At the end of the product life (number of operating cycles reached), dispose of the packaging and product in a corresponding recycling center. Do not dispose of the unit with the usual domestic refuse. Do not burn the product.
On request, old units may be returned carriage paid to the manufacturer in accordance with the relevant waste legislation requirements.

13 DECLARATION OF INCORPORATION

according to 2006/42/EC, Annex II, No. 1B
The product ZMI/ZMIC is a partly completed machine pursuant to Article 2g and is designed exclusively for installation in or assembly with another machine or other equipment.
The following essential health and safety requirements in accordance with Annex I of this Directive are applicable and have been fulfilled:
Annex I, Articles 1.1.3, 1.1.5, 1.3.2, 1.3.4., 1.5.2, 1.7.4, 1.5.10.
The relevant technical documentation has been compiled in accordance with part B of Annex VII and will be sent to the relevant national authorities on request as a digital file.
The following (harmonized) standards have been applied:

- EN 746-2:2010 – Industrial thermoprocessing equipment; Safety requirements for combustion and fuel handling systems
- EN ISO 12100:2010 – Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010)

The following EU Directives are fulfilled:
RoHS II (2011/65/EU)

The partly completed machine may only be commissioned once it has been established that the machine into which the product mentioned above is to be incorporated complies with the provisions of the Machinery Directive 2006/42/EC.
Elster GmbH

Honeywell

Einbauerklärung / ***Declaration of Incorporation***
nach 2006/42/EG, Anhang II, Nr. 1B / *according to 2006/42/EC, Annex II No. 1B*

Folgendes Produkt / *The following product:*

Bezeichnung: **Brenner für Gas**
Description ***Burner for gas***
Typenbezeichnung / *Type:* **BIO, BIOA, ZIO, BIC, BICA, ZIC BIOW, ZIOW, BICW, ZICW**

Markenname / Branding: kromschroder

ist eine unvollständige Maschine nach Artikel 2g und ausschließlich zum Einbau in oder zum Zusammenbau mit einer anderen Maschine oder Ausrüstung vorgesehen.
is a partly completed machine pursuant to Article 2g and is designed exclusively for installation in or assembly with another machine or other equipment.

Folgende grundlegende Sicherheits- und Gesundheitsschutzanforderungen gemäß Anhang I dieser Richtlinie kommen zur Anwendung und wurden eingehalten:
The following essential health and safety requirements in accordance with Annex I of this Directive are applicable and have been fulfilled:

Anhang I, Artikel / *Annex I, Article*
1.1.3, 1.1.5, 1.3.2, 1.3.4, 1.5.2, 1.7.4,1.5.10

Die speziellen technischen Unterlagen gemäß Anhang VII B wurden erstellt und werden der zuständigen nationalen Behörde auf Verlangen in elektronischer Form übermittelt.
The relevant technical documentation has been compiled in accordance with part B of Annex VII and will be sent to the relevant national authorities on request as a digital file.

Folgende (harmonisierte) Normen wurden angewandt: / *The following (harmonized) standards have been applied:*
EN 746-2:2010 – Industrielle Thermoprozessanlagen; Sicherheitsanforderungen an Feuerungen und Brennstoffführungssystem – *Industrial thermoprocessing equipment; Safety requirements for combustion and fuel handling systems*
EN ISO 12100:2010 – Sicherheit von Maschinen – Allgemeine Gestaltungsleitsätze – Risikobeurteilung und Risikominderung (ISO 12100:2010)
– *Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010)*

Folgende EU-Richtlinien werden erfüllt: / *The following EU directives are fulfilled:*
RoHS II (2011/65/EU)
RoHS III (2015/863/EU)

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in der das oben bezeichnete Produkt eingebaut werden soll, den Bestimmungen der Richtlinie für Maschinen (2006/42/EG) entspricht.
The partly completed machine may only be commissioned once it has been established that the machine into which the product mentioned above is to be incorporated complies with the provisions of the Machinery Directive 2006/42/EC.

Lotte (Bünen)

10.07.2019
Datum / *Date*

M. Rieken, S. Escher
Konstrukteur / Designer

M. Rieken, S. Escher sind bevollmächtigt, die speziellen technischen Unterlagen gemäß Anhang VII B zusammenzustellen.
M. Rieken, S. Escher are authorized to compile the relevant technical documentation according to Annex VII B.

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14 CERTIFICATION

14.1 Eurasian Customs Union

The products ZMI, ZMIC meet the technical specifications of the Eurasian Customs Union.

14.2 RoHS compliant

14.3 China RoHS

Directive on the restriction of the use of hazardous substances (RoHS) in China. Scan of the Disclosure Table China RoHS2, see certificates at www.docuthek.com.

FOR MORE INFORMATION

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschröder and Maxon. To learn more about our products, visit ThermalSolutions.honeywell.com or contact your Honeywell Sales Engineer.
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