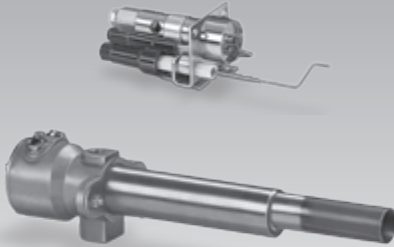


**Operating instructions
Pilot burners ZAI, ZKIH**



Contents

Pilot burners ZAI, ZKIH 1
Contents 1
Safety..... 1
Checking the usage..... 2
Setting the gas type..... 2
Installation 3
Wiring 4
Tightness test..... 4
Commissioning..... 5
Maintenance 6
 Replacing the electrodes 6
Accessories 7
Technical data 7
Declaration of Incorporation..... 8
Contact 8

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.

Transport

On receipt of the product, check that the delivery is complete (see Part designations). Report any transport damage immediately.

Storage

Store the product in a dry place. Ambient temperature: see Technical data.

Changes to edition 12.11

The following chapters have been changed:

- Setting the gas type
- Commissioning

ZMI is not included in these operating instructions, see new operating instructions for ZMI, ZMIC, www.docuthek.com

Checking the usage

Intended use

Ionization-controlled pilot burners 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 burners. For natural gas, town gas, coke oven gas and LPG. Other types of gas on request.

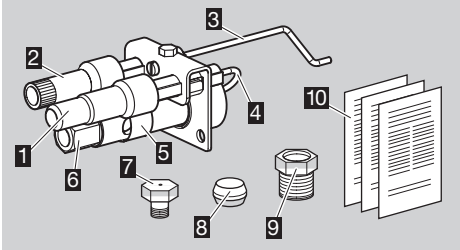
This function is only guaranteed when used within the specified limits – see also page 7 (Technical data). Any other use is considered as non-compliant.

ZAI

Type code

ZAI	Thermo ionization pilot burner with two electrodes
K	Double-cone olive for 8 mm tube
TN	1/4" NPT internal thread

Part designations



- 1 Interference-suppressed plug for ignition electrode
- 2 Plug for ionization electrode
- 3 Ionization electrode
- 4 Ignition electrode
- 5 Air slide valve
- 6 Gas connection
- 7 0.7 mm gas nozzle for LPG
- 8 Cone olive (only for ZAI K)
- 9 Cap screw (only for ZAI K)
- 10 Enclosed documentation: operating instructions

Gas connection – see type label.

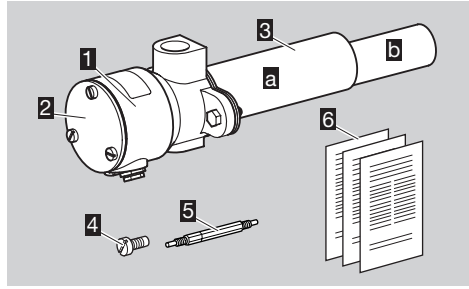


ZKIH

Type code

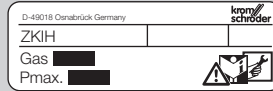
ZKIH	ionization pilot burner with forced air supply
150–1000	Burner tube length
/100	Flame tube length
R	Rp internal thread

Part designations



- 1 Burner housing
- 2 Burner housing cover
- 3 Burner tube set, comprising protective tube **a** and flame tube **b**
- 4 Retaining screw for nozzle insert (in burner housing)
- 5 Nozzle insert (in burner housing)
- 6 Enclosed documentation: operating instructions and flow rate curves

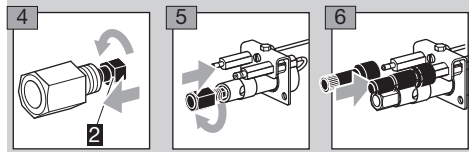
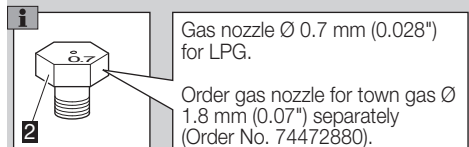
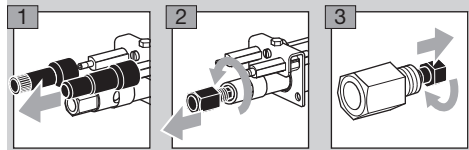
Rated capacity P_{max} , gas type – see type label.



Setting the gas type

ZAI

- ▷ Pilot burners ZAI are set for natural gas on delivery.
- ▷ If the pilot burner is to be used with a different type of gas, retrofit the burner for its use.

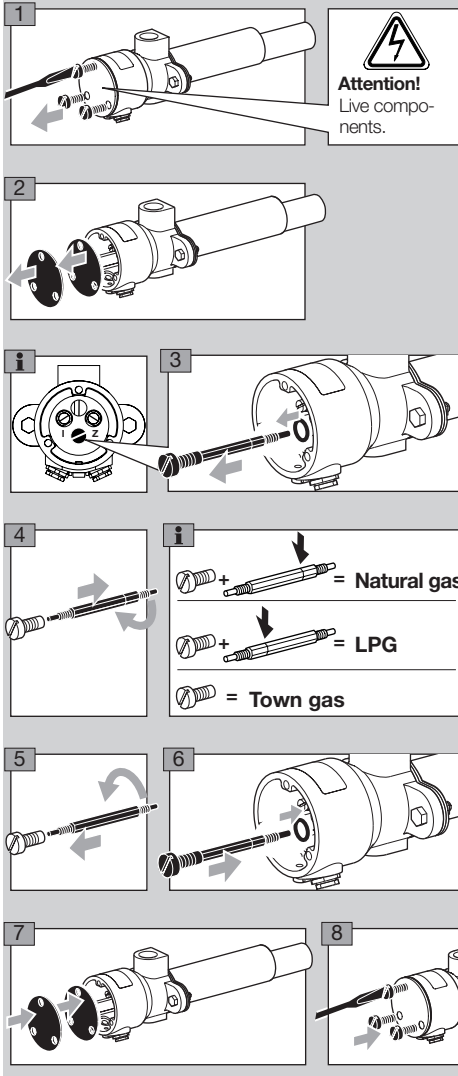


ZKIH

⚠ DANGER

Electric shocks can be fatal! Live components in the housing connection chamber. The burner housing cover must be fitted during ignition.

- ▷ Pilot burners ZKIH are set for natural gas on delivery.
- ▷ If the pilot burner is to be used with a different type of gas, retrofit the burner for its use.



- ▷ For operation with town gas, screw the retaining screw back in without the nozzle insert – do not store the nozzle insert in the connection box: danger of short-circuits.

9 After conversion to another type of gas, adjust the air volume – see page 5 (Commissioning).

Installation

⚠ DANGER

Risk of explosion! Ensure the connection is gas-tight.

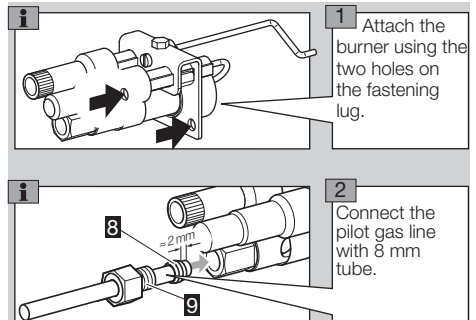
- ▷ Install the pilot burner so that reliable ignition of the main burner is guaranteed.
- ▷ Attach the pilot burner securely.
- ▷ We recommend that a filter be installed in the gas and air supply line respectively.

ZAI

- ▷ Inlet pressure:
natural gas: max. 35 mbar (14 "WC),
town gas: max. 30 mbar (12 "WC),
LPG: max. 60 mbar (23 "WC).
- ▷ In the case of higher inlet pressures, insert a gas restrictor orifice.
- ▷ Ensure air intake is not obstructed.
- ▷ The ZAI has bare electrodes and no protective flame tube. Protective tube, see page 7 (Accessories).

⚠ WARNING

Risk of injury! Observe the projecting ionization electrode.



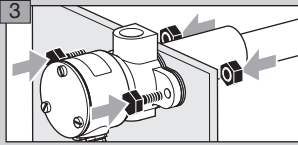
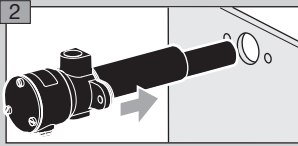
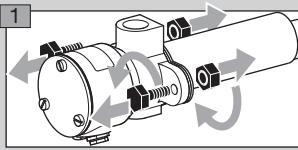
- ▷ When tightening the cap screw **9**, ensure that the cone olive **8** is correctly positioned – lubricate the cone olive.
- ▷ ZAI flow rate curve – see www.docuthek.com

ZKIH

Inlet pressure:

	Gas [mbar ("WC)]
Natural gas	20 (8)
Town gas	17 (6.8)
LPG	30 (12)

- ▷ Flow rate curves – see www.docuthek.com
- ▷ In the case of higher gas pressures, insert a gas restrictor orifice – see page 7 (Accessories).



- 4** Connect the pilot gas line with Rp ¼ and the air line with Rp ½.
- ▷ For connecting pilot gas and air lines with NPT thread, order the adapter set – see page 7 (Accessories).

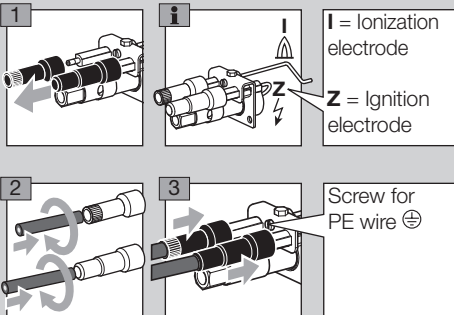
Wiring

⚠ DANGER

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

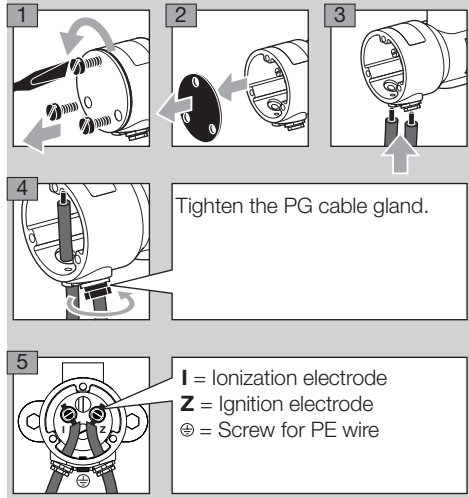
- ▷ For the ionization and ignition cables, use unscreened high-voltage cable:
FZLSi 1/7 -50 to 180°C (-58 to 356°F),
Order No. 04250410,
or
FZLK 1/7 -5 to 80°C (23 to 176°F),
Order No. 04250409.
- ▷ Wire the burner as shown in the connection diagrams of the automatic burner control unit/ignition transformer.

ZAI



- 4** Connect the PE wire for burner ground to the fastening lug on the burner insert.

ZKIH



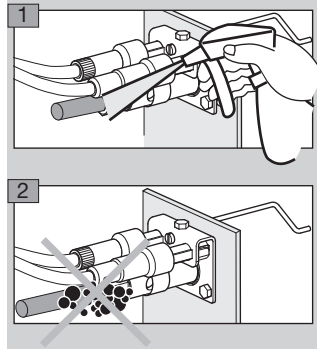
- 6** Tighten ionization and ignition cables securely.
- 7** Replace seal and cover and screw into place.
- 8** Connect the PE wire for burner ground to the burner.

Tightness test

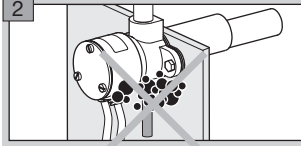
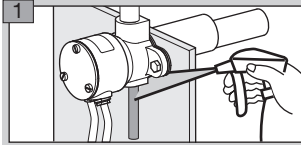
⚠ DANGER

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.

ZAI



ZKIH



Commissioning

⚠ DANGER

Risk of explosion! Please observe the appropriate precautions when igniting the burners.

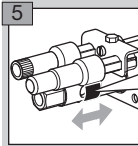
Risk of poisoning! Open the gas and air supply so that the burner is always operated with excess air – otherwise CO will form in the furnace chamber. CO is odourless and poisonous! Conduct a flue gas analysis.

- ▷ Arrange the adjustment 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 (5 x furnace chamber volume) before every ignition attempt.
 - ▷ 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. Risk of explosion!
 - ▷ 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.

⚠ DANGER

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!

ZAI



The air slide is open on delivery. Only close the air slide if the burner flame is not stable.

ZKIH

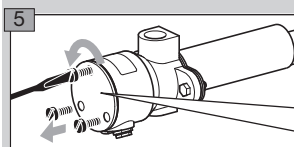
⚠ DANGER

Electric shocks can be fatal! Live components in the housing connection chamber. Re-ignition must be prevented if the burner housing cover is open. Fit the burner housing cover before igniting the burner.

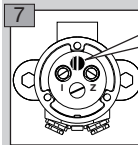
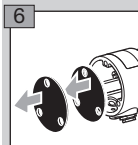
- ▷ Inlet pressure for air adjustment screw set at the factory:

	Gas [mbar ("WC)]	Air [mbar ("WC)]
Natural gas	20 (8)	20 (8)
Town gas	17 (6.8)	35 (13.8)
LPG	30 (12)	30 (12)

- ▷ If the air inlet pressure cannot be set to the recommended value owing to the factory setting of the air adjustment screw, readjust the air adjustment screw.



⚠
Attention!
Live components.



Turn the air adjustment screw to the left to increase the air flow. Turn the air adjustment screw to the right to reduce the air flow.

- 8** Replace seal and cover and screw into place.

Maintenance

- ▷ We recommend an annual function check.

⚠ DANGER

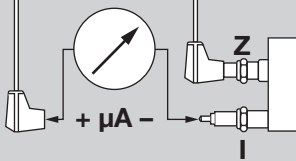
Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.

Risk of burning! Dismantled burner components can be hot due to outflowing flue gases.

Risk of explosion and poisoning during burner adjustment with an air deficiency! 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.

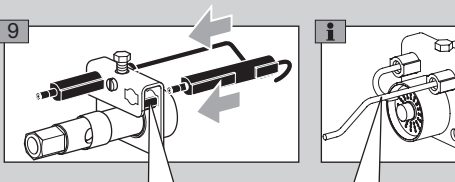
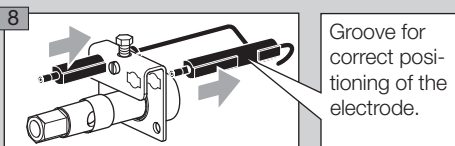
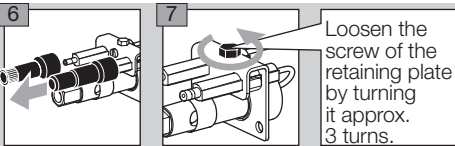
- ▷ The ionization current must be at least 5 μA and must not vary.



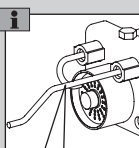
- 3 Disconnect the system from the electrical power supply.
- 4 Shut off the gas and air supply – do not change the restrictor settings.
- 5 Check the nozzles for dirt.

Replacing the electrodes

ZAI



For correct positioning, slide in the electrodes until the projection of the retaining plate engages into the groove.



When sliding in the electrodes, ensure they are aligned.

- 10 Once the electrodes have been positioned, hand tighten the retaining plate screw using a spanner (approx. 3 turns).

- ▷ After tightening, the electrodes cannot be moved any more.

ZKIH

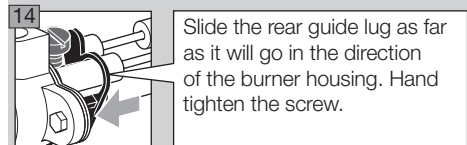
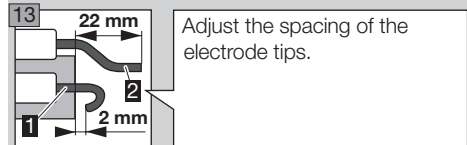
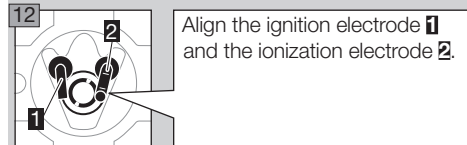
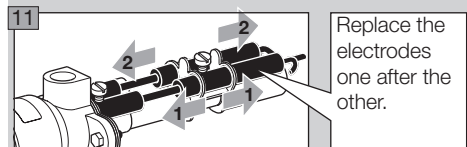
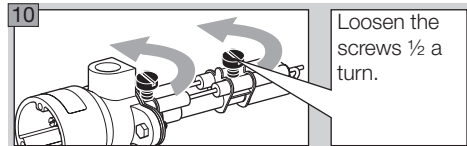
- 6 Undo the housing cover screws, remove seal and housing cover.

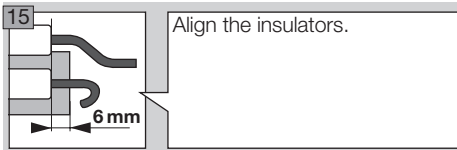
- 7 Unscrew the ionization and ignition cables.

- 8 Unscrew the PE wire for burner ground from the burner.

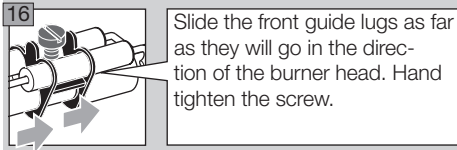
- 9 Remove the burner – see page 3 (Installation).

- ▷ Removal and reassembly of the electrodes is facilitated, when the housing is placed in a vertical position on a smooth working surface.

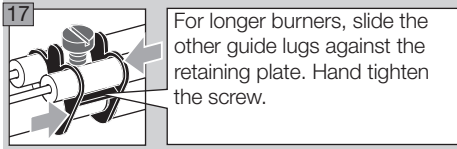




Align the insulators.



Slide the front guide lugs as far as they will go in the direction of the burner head. Hand tighten the screw.



For longer burners, slide the other guide lugs against the retaining plate. Hand tighten the screw.

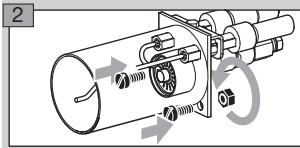
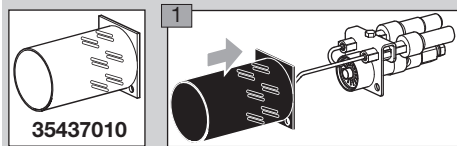
ZAI, ZKIH

- Reconnect the electrode plug(s).
- Produce a maintenance report.

Accessories

Protective tube set

- ▷ For ZAI, heat-resistant.



35437010

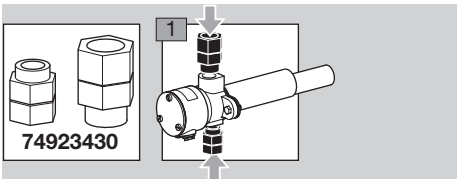
Gas nozzle

For ZAI:

- ▷ 1.8 mm.
 - ▷ For operation with town gas.
- Order No. 74472880

Adapter set

- ▷ For connecting the pilot burner ZKIH to pilot gas and air lines. Comprising one adapter with 1/4-18 NPT internal thread and one adapter with 1/2-14 NPT internal thread.



74923430

Gas restrictor orifice

- ▷ Rp 1/4".
- ▷ For operation of the ZKIH at the following inlet pressures:

Inlet pressure in mbar		Town gas	Hole mm	Order No.
Natural gas	Propane			
-	-	20-50	2.3	74452740
23-50	-	50-200	1.5	74452742
50-120	-	200-1500	1.2	74452744
120-450	50-200	-	0.9	74452745
450-1500	200-1500	-	0.6	74452747

Technical data

ZAI

Capacity: approx. 1.8 – 3 kW.

Gas types: natural gas, LPG (gaseous) and coke oven gas.

Gas inlet pressure: 20 – 60 mbar (8 – 24 "WC), depending on the gas type.

Condition on delivery: for natural gas, max.

30 mbar (12 "WC),

(gas inlet pressures – see www.docuthek.com,

Kind of document: Flow rate curve).

Flame control: with ionization electrode.

Ignition: direct spark ignition (5 kV ignition transformer).

Ignition electrode plug: interference-suppressed.

Ignition head made of galvanized steel.

Retaining plate made of galvanized steel.

ZKIH

Capacity: approx. 2 to 5 kW.

Gas types: natural gas, LPG (gaseous) and coke oven gas.

Gas inlet pressure: 5 to approx. 50 mbar (2 to

approx. 20 "WC),

air inlet pressure: 5 to approx. 30 mbar (2 to approx. 12 "WC),

each depending on the gas type

(burner pressures – see www.docuthek.com, Kind of document: Flow rate curve).

On delivery: natural gas setting (gas and air pressures: 20 mbar (8 "WC)).

For cold air only.

Flame control: with ionization electrode.

Ignition: direct spark ignition (5 kV ignition transformer).

Housing: AISi.

Protective tube: stainless steel.

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.

Max. temperature of the protective tube: 500°C (932°F).

Declaration of Incorporation



pursuant to 2006/42/EC, Annex II, No. 1B
The products "Burners for gas ZAI and ZKIH" are partly completed machines pursuant to Article 2g which are designed exclusively for installation in or assembly with another machine or other equipment. The following essential health and safety requirements pursuant to Annex I of this Directive have been applied and satisfied:

Annex I, Articles 1.1.3, 1.1.5, 1.3.2, 1.5.2, 1.7.4

The special technical documentation pursuant to Annex VII B has been produced and will be transmitted to the competent national authorities in electronic form on request.

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 – Basic concepts, general principles for design

The partly completed machine may only be put into service once it has been established that the machine where the product mentioned above is to be installed complies with the provisions of the Machinery Directive (2006/42/EC).

Elster GmbH

Einbauerklärung
nach 2006/42/EG, Anhang II, Nr. 1B

/ Declaration of Incorporation
/ according to 2006/42/EC, Annex II No. 1B

Folgendes Produkt / The following product

Bezeichnung:
Description
Typenbezeichnung / Type:

Brenner für Gas
Burner for gas
ZAI, ZMI, ZMGC, ZKIH

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, 1.5.2, 1.7.4

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 Thermoprocessinganlagen, Sicherheitsanforderungen an Feuerungen und Brennstoffführungssysteme
– Industrial thermoprocessing equipment, Safety requirements for combustion and fuel handling systems
EN ISO 12100 (2010) – Sicherheit von Maschinen – Grundbegriffe, allg. Gestaltungsgrundsätze
– Safety of machinery – Basic concepts, general principles for design

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in der das oben beschriebene 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 should be incorporated complies with the provisions of the Machinery Directive 2006/42/EC.

Lotte (Büren)

15.10.2013
Datum / Date

S. Rundo, L. Schröder
Sandra Rundo, Lars Schröder
Kontaktperson / Designate

Elster GmbH

Postfach 28 09
D-49018 Osnabrück
Strothweg 1
D-49504 Lotte (Büren)
Tel. +49 (0)541 12 14-0
Fax +49 (0)541 12 14-370
info@kromschroeder.com
www.kromschroeder.com

Sandra Rundo, Lars Schröder sind bevollmächtigt, die speziellen technischen Unterlagen gemäß Anhang VII B zusammenzustellen.
Sandra Rundo, Lars Schröder are authorized to compile the relevant technical documentation according to Annex VII B.

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.

elster
Kromschroder

Elster GmbH
Postfach 28 09, D-49018 Osnabrück
Strothweg 1, D-49504 Lotte (Büren)
T +49 541 1214-0
F +49 541 1214-370
info@kromschroeder.com, www.kromschroeder.com