

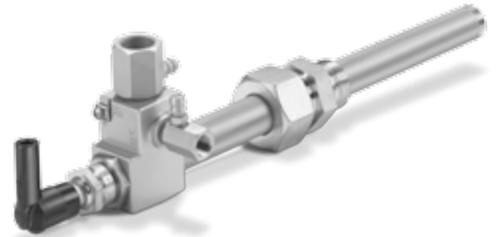
Pilot burner ZMI

Technical Information · GB

7 Edition 03.12



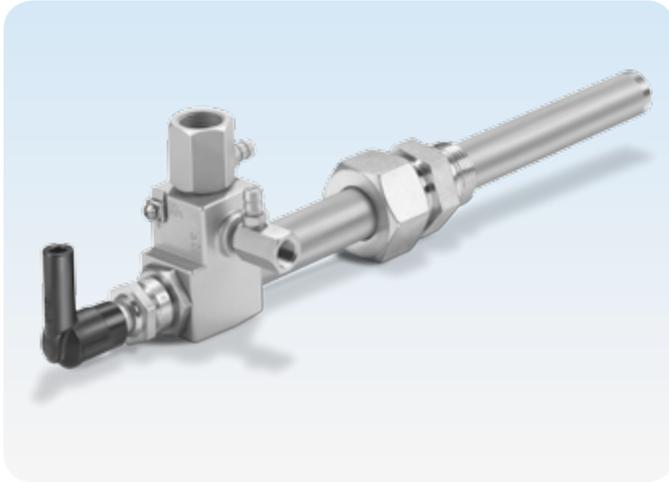
- Pilot burner with forced air supply
- Safe flame control thanks to ionization electrode
- Reliable electrical ignition
- Space-saving slim design due to single-electrode operation
- Optimum positioning thanks to moveable mounting device
- Different lengths make it suitable for many installation situations
- Maintenance-friendly thanks to simple design
- Can be used in many applications



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1 Application



ZMI with a single electrode for igniting and monitoring

For safely igniting gas burners on furnaces in the metal, ceramics and non-ferrous metal industries and on heat treatment installations.

The ZMI can also be used as an independently operated burner.

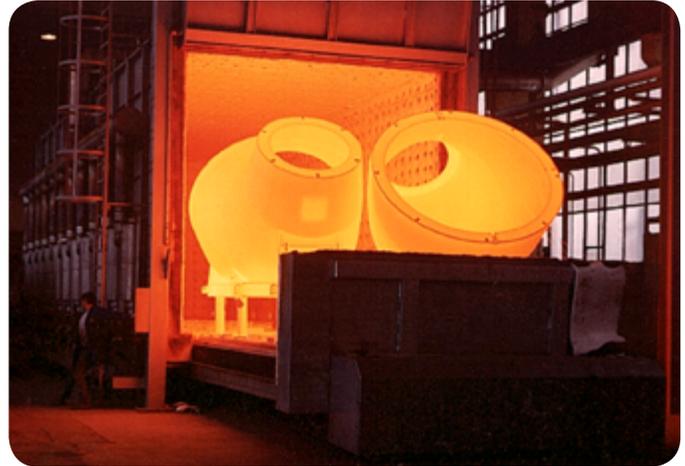
Suitable for operation with natural gas, town gas/coke oven gas or LPG.

The pilot burner is ignited electronically and monitored by a single ignition and ionization electrode.

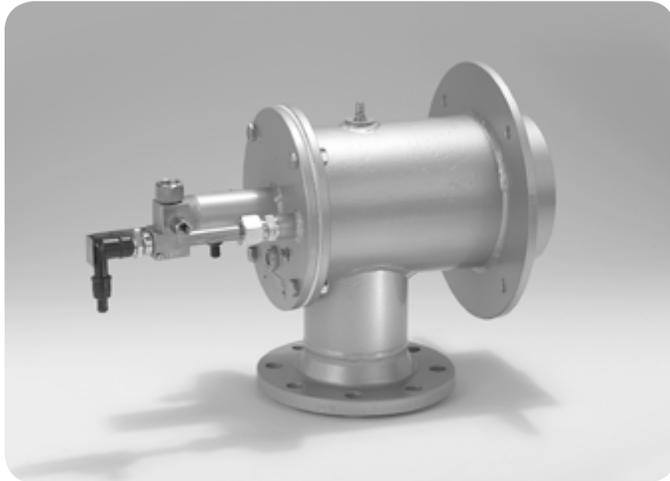
1.1 Examples of application



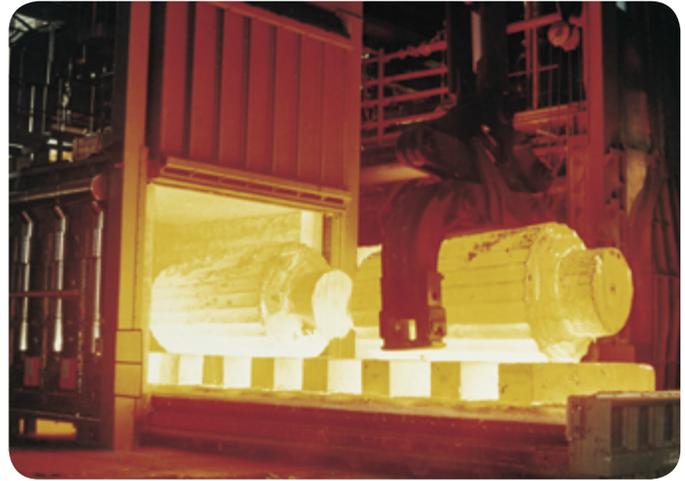
Main burner BBG with integrated pilot burner ZMI



Industrial furnace for housings



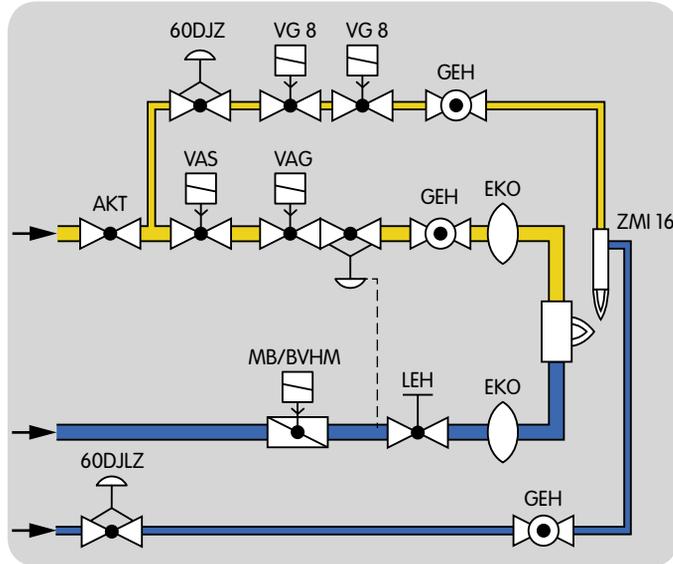
Main burner ZIO with integrated pilot burner ZMI



Bogie hearth forging furnace

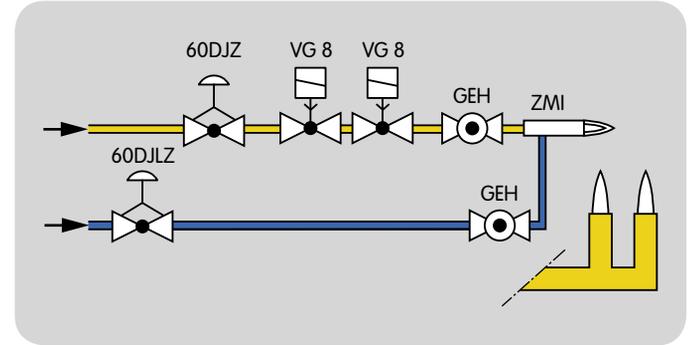
In the case of combined pilot and main burners, EN 746-2:2010 stipulates the monitoring of pilot and main burner via the automatic burner control unit. Exceptions are permitted provided that the safety of the installation is not impaired.

1.1.1 Alternating pilot burner with modulating-controlled main burner



As soon as voltage is supplied to the ignition transformer, the pilot burner ZMI is ignited using an ignition spark. If the pilot burner detects a stable ionization signal, the enable signal for operation of the main burner is issued via the automatic burner control unit. The main burner is ignited. If the main burner provides a stable flame signal, the pilot burner ZMI can be switched off.

1.1.2 Igniting a flame curtain



As soon as voltage is supplied to the ignition transformer, the pilot burner ZMI is ignited using an ignition spark. If the pilot burner provides a stable ionization signal, the enable signal for the flame curtain is then issued via the automatic burner control unit. The flame curtain is ignited.

2 Certification

2.1 Approval for Russia



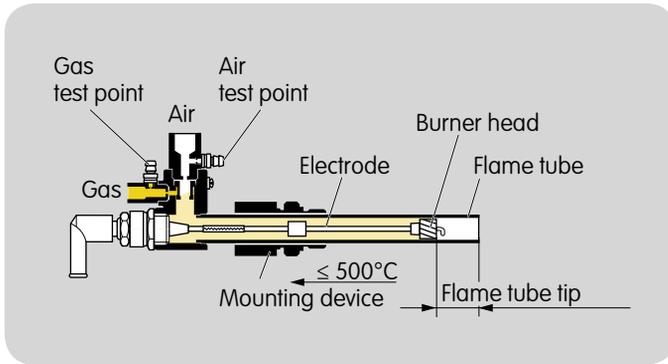
Certified by Gosstandart pursuant to GOST-TR.
Approved by Rostekhnadzor (RTN).

Scan of the approval for Russia (RUS) – see
www.docuthek.com → Elster Kromschroder → Kromschroder,
LBE → Products → 07 Pilot burners and burners → Ionization
pilot burner ZMI → Kind of document: Certificate → ZMI B00050
(nationales Zertifikat Russland) (RUS)

2.2 Declaration of Incorporation pursuant to the Machinery Directive

The ZMI complies with the requirements of EN 746-2 and the
Machinery Directive 2006/42/EC. This is confirmed by the
manufacturer's Declaration of Incorporation.

3 Function



The pilot burner ZMI is equipped with a gas nozzle and an air nozzle for the respective gas type at the factory. Gas and air are supplied separately and mixed in the housing. The gas and air nozzles feature pressure test points.

The gas/air mixture is ignited by the electrode at the burner head. The flame is produced downstream of the burner head. The electrode monitors it using ionization control (single-electrode operation).

4 Selection

4.1 Pilot burner capacity

ZMI 16

Flame length approx. 4 cm

Gas type	Capacity [kW]	Gas pressure [mbar]	Air pressure [mbar]
Natural gas*	1–2	35–80	30–80
Propane	1.2–2	20–45	30–70
Town gas	1.3–2	30–70	30–80

* Measured using natural gas L

ZMI 25

Flame length approx. 6 cm

Gas type	Capacity [kW]	Gas pressure [mbar]	Air pressure [mbar]
Natural gas*	2.5–4.0	20–50	30–80
Propane	2.8–4.0	17–40	38–80
Town gas	1.5–3.3	20–70	20–80

* Measured using natural gas L

Flow rate curves for ZMI, see www.docuthek.com → Elster Kromschroder

Search term: ZMI

Kind of document: Flow rate curves

Registration required!

4.2 Selection table

	16	25	T	B	G	D	150	200	300 ...	R	N
ZMI	●	●	●	●	●	●	●	●	●	●	●

● = standard, ○ = available

Order example

ZMI 16B200R

4.3 Type code

Code	Description
ZMI	Pilot burner
16 25	Burner size
T	T-product
B	For natural gas
G	For LPG
D	For town gas/coke oven gas
150 200 300...	Flame tube length [mm]*
R	Rp internal thread
N	NPT internal thread

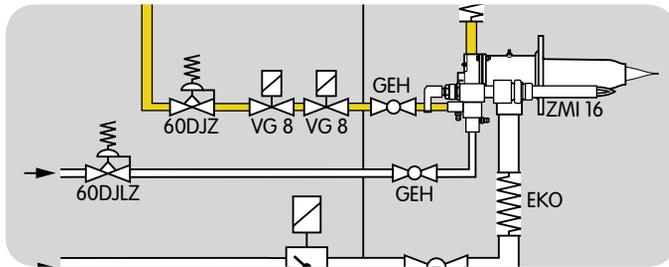
* Burner lengths as of 200 mm in 100 mm increments

5 Project planning information

5.1 Gas and air supply

Install pressure regulators and adjusting cocks in the air and gas supply lines upstream of the burner. 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. Using the adjusting cocks, reduce the air and gas pressures to the required values for the pilot burner.

For maximum flame stability of the pilot burner, the gas and air pressures of the ZMI must be higher than the connection pressure of the main burner.



To protect the nozzles against soiling, we recommend installing filters in the gas and air circuits.

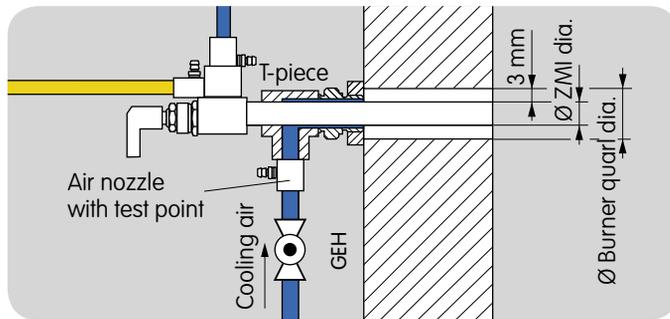
5.2 Installation

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

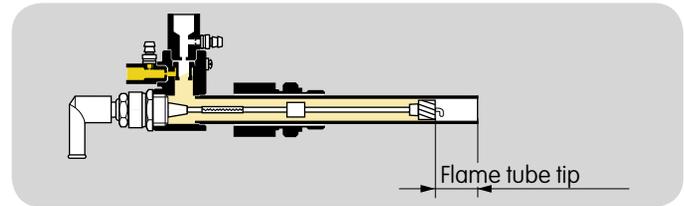
The pilot burner tip can be positioned exactly using the moveable mounting device.

When pilot burners ZMI are installed in a burner quarl, the tip of the pilot burner is subjected to a very high thermal stress. A means of cooling the ZMI must always be provided. Air must constantly be passed through a 3 mm gap on the outside of the flame tube. As a result of this measure, the service life of the pilot burners can be significantly increased.

5.2.1 ZMI in burner quarl



To adjust the cooling air volume, we recommend using the same air nozzles as for ZMI 16 (Ø 3.3 mm) and ZMI 25 (Ø 4.5 mm). The air pressure at the test point is set to approx. 20 to 25 mbar using adjusting cock GEH.



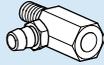
The tip of the pilot burner flame tube must not come into contact with the main burner flame. Safe ignition of the main burner must be ensured.

To avoid spontaneous combustion, the temperature of the gas/air mixture upstream of the tip of the flame tube must be lower than the ignition temperature of the fuel gas $\leq 500^{\circ}\text{C}$.

When the pilot burner is switched off, the pilot burner air should continue to flow to ensure that the pilot burner is cooled.

6 Accessories

6.1 Gas nozzle



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

6.2 High-voltage cable

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.

6.3 Ignition transformer

To ensure safe ignition, we recommend using ignition transformer TGI 5-15/100W or TZI 5-15/100W.

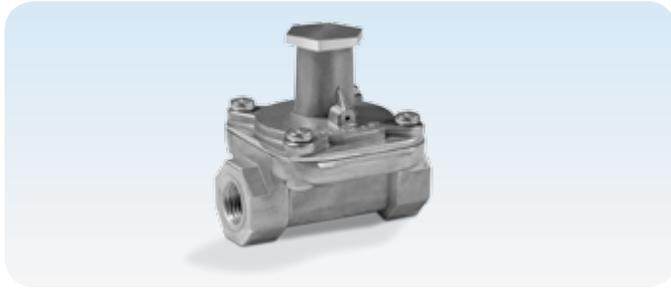


TGI 5-15/100W



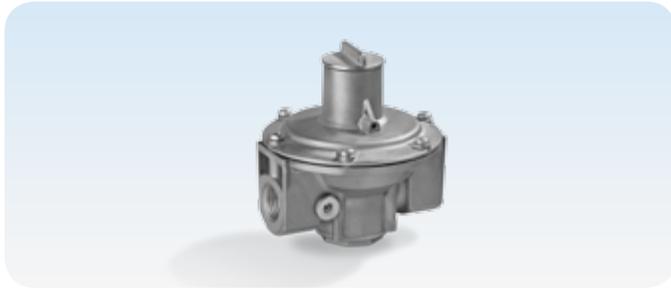
TZI 5-15/100W

6.4 Regulator 60DJ



60DJ, DN 8, outlet pressure p_d 35 – 90 mbar

6.5 Regulator J78R



J78R, DN 15, outlet pressure p_d 42 – 55 mbar

	Gas	Order No.	Air	Order No.
ZMI 16	60DJZ	03155300	60DJLZ*	03155301
ZMI 25	60DJZ	03155300	J78R1-L*	03155026

* With special diaphragms for air operation

7 Technical data

Capacity:

ZMI 16: 1 to 2 kW,

ZMI 25: 2.5 to 4 kW (1.5 to 3.3 kW when used with town gas, coke oven gas).

Gas inlet pressure: up to 80 mbar (up to 32 "WC),

air inlet pressure: up to 120 mbar (up to 46.8 "WC),

each depending on the gas type.

Burner pressures: flow rate curves for ZMI, see

www.docuthek.com → Elster Kromschroder

Search term: ZMI

Kind of document: Flow rate curves

Registration required!

Burner length increments: 100 mm.

Gas types: natural gas, LPG (gaseous) and coke oven gas;
other gases on request.

For cold air only.

Flame control: with ionization electrode.

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

Angle plug: interference-suppressed.

Housing: aluminium.

Flame tube: heat-resistant steel.

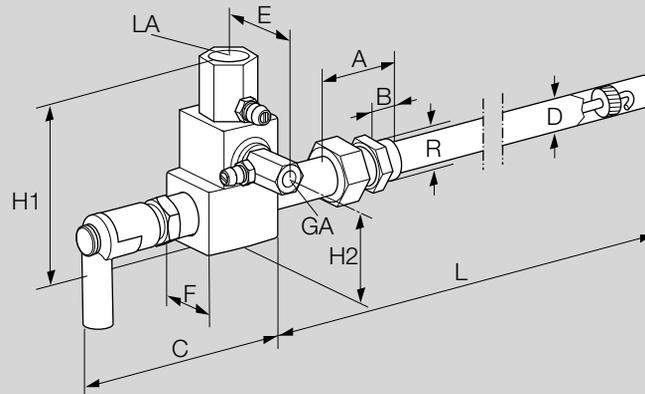
Max. temperature at the tip of the flame tube:

1000°C (1832°F),

for $\lambda < 1$:

900°C (1652°F).

7.1 Dimensions



ZMI 16

[mm]	Dimensions [mm]							DIN 2999		DIN EN ISO 228-1
D	A	B	C	E	F	H1	H2	GA	LA	R
16	~44	13.5	~106	49	36	96	45	Rp 1/4	Rp 1/2	G 1/2

* L = burner length increments: 150, 200, 300 ... mm

ZMI 25

[mm]	Dimensions [mm]							DIN 2999		DIN EN ISO 228-1
D	A	B	C	E	F	H1	H2	GA	LA	R
25	~78	19	~112	49	36	96	45	Rp 1/4	Rp 1/2	G 1

* L = burner length increments: 150, 200, 300 ... mm

7.2 Converting units

SI unit x	multiplier =	US unit
m ³ /h	35.31	CFH
mbar	0.0145	psi
mbar	0.39	"WC
mm	0.039	inch
kg	2.2	lbs
litres	0.26	gal
m/s	3.28	ft/s

US unit x	multiplier =	SI unit
CFH	0.0283	m ³ /h
psi	68.89	mbar
"WC	2.54	mbar
inch	25.4	mm
lbs	0.45	kg
gal	3.79	litres
ft/s	0.3048	m/s

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$$

$$^{\circ}\text{F} = (^{\circ}\text{C} \times \frac{9}{5}) + 32$$

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8 Maintenance cycles

We recommend a function check at least once a year.