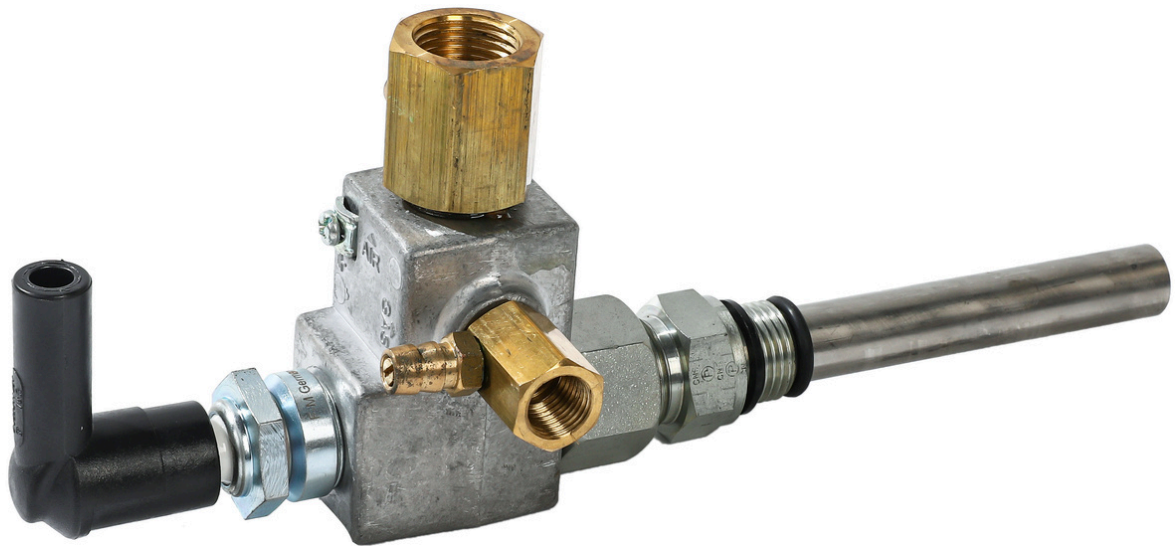


## ***Pilot burner ZMI***

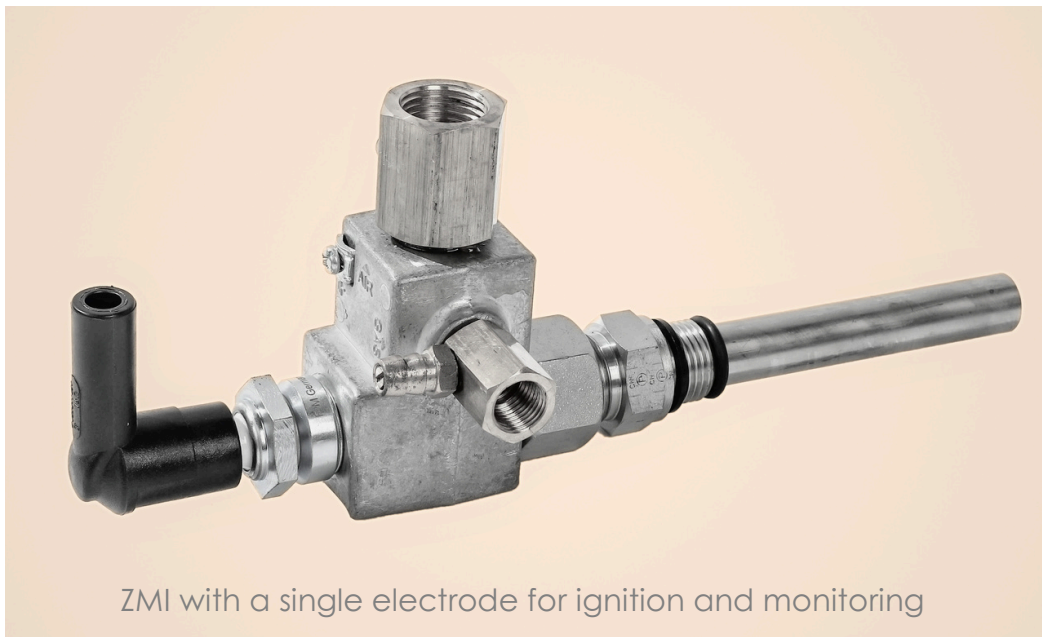
Technical Information · GB



- 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

# 1 Application

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. The ZMIC 28 with ceramic tip has a longer, sharper flame. The ceramic tube has a longer service life and is suitable for higher temperatures.

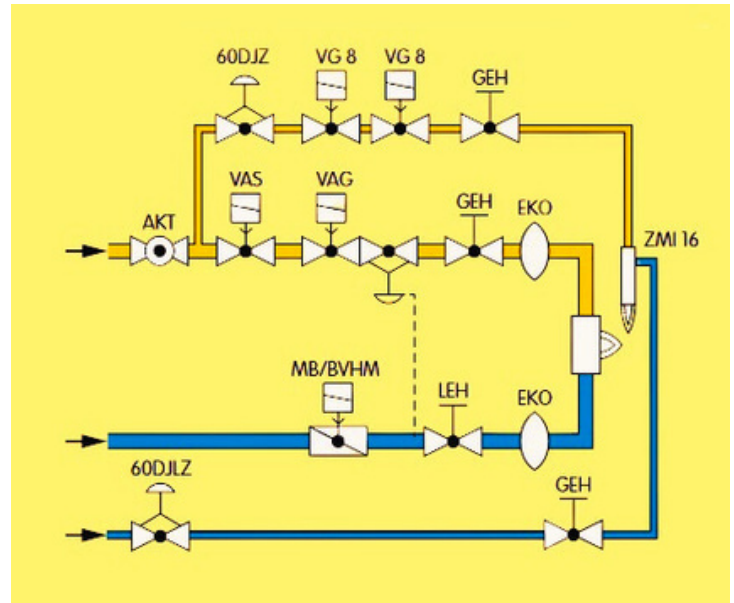


ZMI with a single electrode for ignition and monitoring

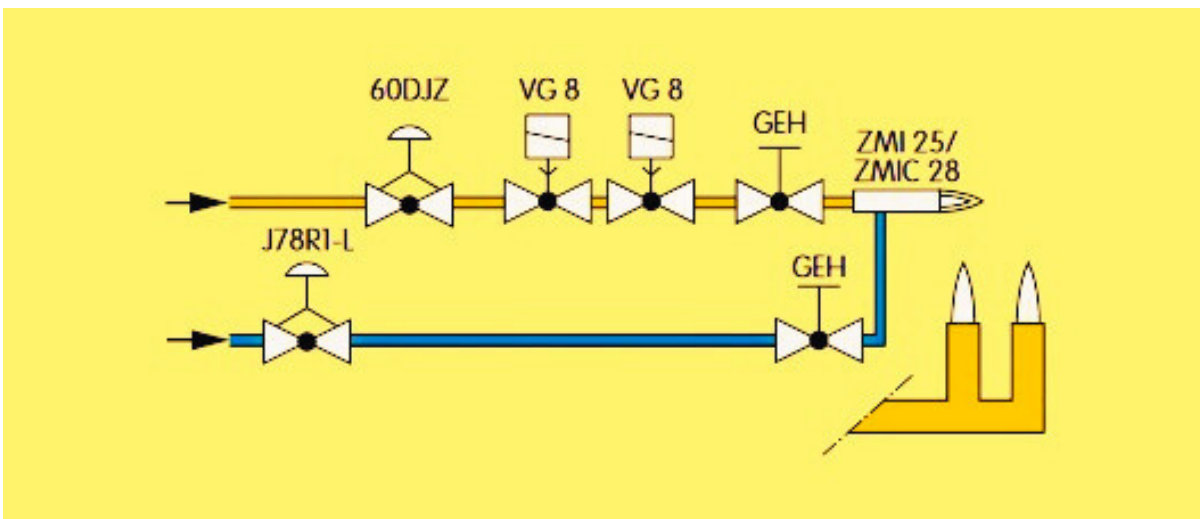
In the case of combined pilot and main burners, EN 746-2:2010 stipulates the monitoring of pilot and main burner via the automatic burner control unit. Exceptions are permitted provided that the safety of the installation is not impaired.

### 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.



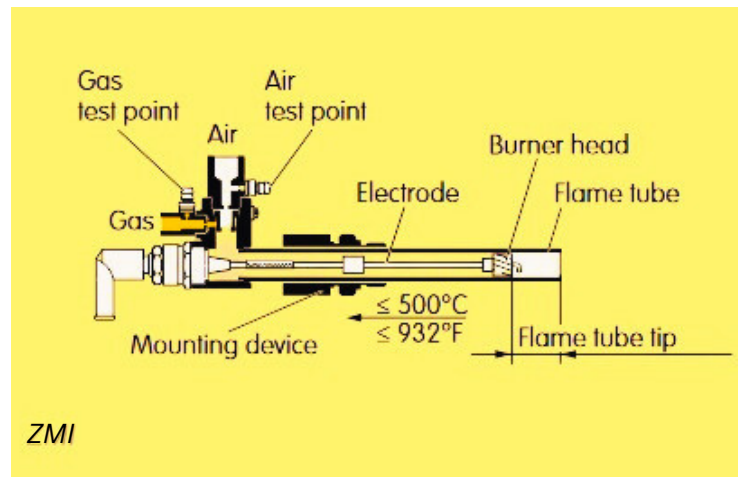
### 1.1.2 Igniting a flame curtain



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 Function

The pilot burners ZMI are 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 using an ignition electrode at the burner head. The flame is produced downstream of the burner head. The electrode monitors it using ionization control (single-electrode operation).



## 3 Selection

### 3.1 Pilot burner capacity

#### ZMI 16

Flame length approx. 4 cm (1.6 inches)

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

Gas type	Capacity [103 BTU/h]	Gas pressure [inch "WC]	Air pressure [inch WC]
Natural gas*	3.8 – 7.6	13.8 – 31.5	11.8 – 31.5
Propane	4.4 – 7.4	7.9 – 17.7	11.8 – 27.9
Town gas	5.0 – 7.8	11.8 – 27.9	11.8 – 31.5

#### ZMI 25

Flame length approx. 6 cm (2.4 inches)

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

Gas type	Capacity [103 BTU/h]	Gas pressure [inch "WC]	Air pressure [inch "WC]
Natural gas*	9.5 – 15.1	7.9 – 19.7	11.8 – 31.5
Propane	10.4 – 14.8	6.7 – 15.7	15 – 31.5
Town gas	5.8 – 12.8	7.9 – 27.6	7.9 – 31.5

### 3.2 Selection table

	16	25	28	T	B	G	D	150	200	300...	R	N	K
ZMI	●	●		●	●	●	●	●	●	●	●	●	

● = standard, ○ = available

### 3.3 Type code

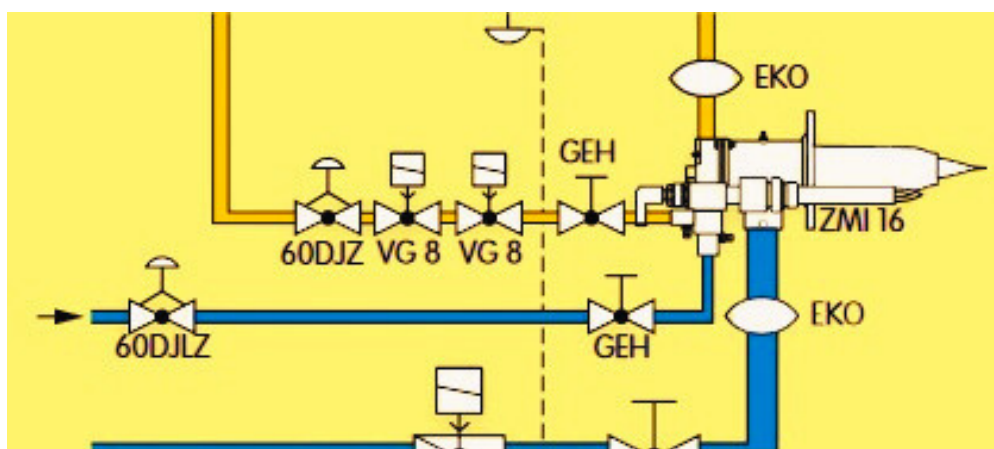
Code							Description
ZMI							Pilot burner
	16						16 mm burner size
	25						25 mm burner size
	28						28 mm burner size
	T						T-product
		B					For natural gas
		G					For LPG
		D					For town gas/coke oven gas
			150				Flame tube length [mm]*
			200				
			300				
			400				
			500				
			600				
			700				
			800				
			900				
			1000				
			...2000				
				R			Rp internal thread
				N			NPT internal thread
					K		Bellows unit

\*ZMI lengths as of 200 mm in 100 mm increments

## 4 Project planning information

### 4.1 Gas and air supply

Install pressure regulators and adjusting cocks in the air and gas supply lines upstream of the burner. Pressure regulator 60DJZ does not have zero shut-off. For this reason, the pressure regulator must be installed directly upstream of the gas solenoid valve to ensure that the gas volume between the pressure regulator and the gas solenoid valve is as low as possible. Set pressure regulators for the gas and air supply pressures to the maximum admissible values, see page 13 (Regulator 60DJZ), where by the gas and air supply pressures should be identical (approx. 80 mbar for igniting a main burner). 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.

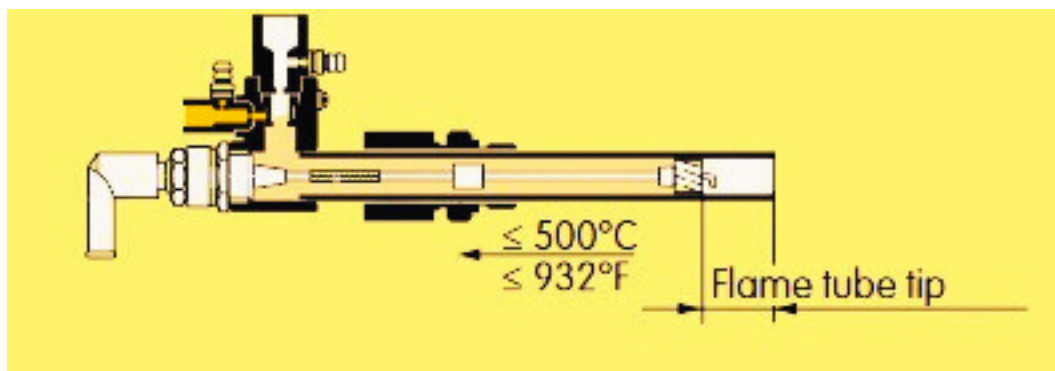


To protect the nozzles against soiling, we recommend installing filters in the gas and air circuits.

### 4.2 Installation

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

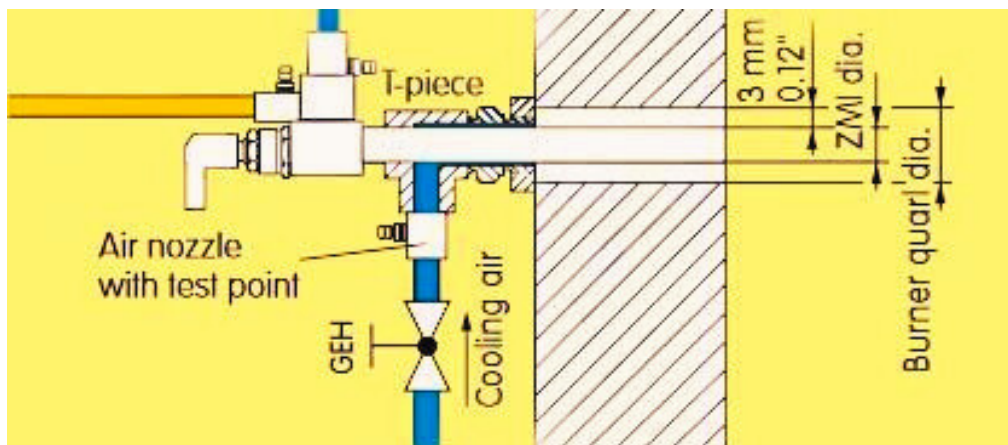
The pilot burner tip can be positioned exactly using the moveable mounting device.



The tip of the ZMI flame tube or the ceramic flame tube of the ZMIC 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  $\leq 500^{\circ}\text{C}$  ( $932^{\circ}\text{F}$ ). When the pilot burner is switched off, the pilot burner air should continue to flow to ensure that the pilot burner is cooled.

### 4.3 ZMI in burner quarl

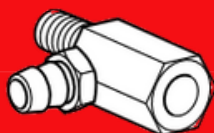
When pilot burners ZMI are installed in a burner quarl, the tip of the pilot burner is subjected to a very high thermal stress. A means of cooling the ZMI must always be provided. Air must constantly be passed through a 3 mm (0.12") gap on the outside of the flame tube. As a result of this measure, the service life of the pilot burners can be significantly increased.



To adjust the cooling air volume, we recommend using the same air nozzles as for ZMI 16 (Ø 3.3 mm (0.13")) and ZMI 25 (Ø 4.5 mm (0.18")). The air pressure at the test point is set to approx. 20 to 25 mbar (7.9 to 9.8 "WC) using adjusting cock GEH.

## 5 Accessories

### 5.1 Gas nozzle



Burner	Gas type	Nozzle dia. [mm (inch)]
ZMI 16	Natural gas	0.94 (0.037)
	LPG	0.76 (0.029)
	Town gas/coke oven gas	1.30 (0.051)
ZMI 25	Natural gas	1.40 (0.055)
	LPG	1.05 (0.041)
	Town gas/coke oven gas	1.78 (0.070)



## 5.2 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) or FZLK 1/7 -5 to 80°C (23 to 176°F).

## 5.3 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*

## 5.4 Regulator 60DJZ



60DJZ, DN 8,  
Inlet pressure  $p_u$ : up to 100 bar,  
outlet pressure  $p_d$ : 35 – 90 mbar



## 5.5 Regulator J78R



J78R, DN 15,  
Inlet pressure  $p_u$ : up to 100 bar,  
outlet pressure  $p_d$ : 42 – 55 mbar

	Gas	Air
ZMI 16	60DJZ	60DJLZ*
ZMI 25	60DJZ	J78R1-L*

\* With special diaphragms for air operation

## 6 Technical data

Capacity:

ZMI 16: 1 to 2 kW (3.8 to 7.6 10<sup>3</sup> BTU/h),

ZMI 25: 2.5 to 4 kW (9.5 to 15.1 10<sup>3</sup> BTU/h)

(1.5 to 3.3 kW when used with town gas, coke oven gas)

Capacities in kW refer to the lower calorific value  $H_u$  and capacities in BTU/h refer to the upper calorific value  $H_o$

Gas inlet pressure:

ZMI: up to 80 mbar (up to 32 "WC) air inlet pressure: up to 120 mbar (up to 47 "WC),  
each depending on the gas type.

### **Registration in the Docuthek required**

Burner length increments: 100 mm (4"), 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:

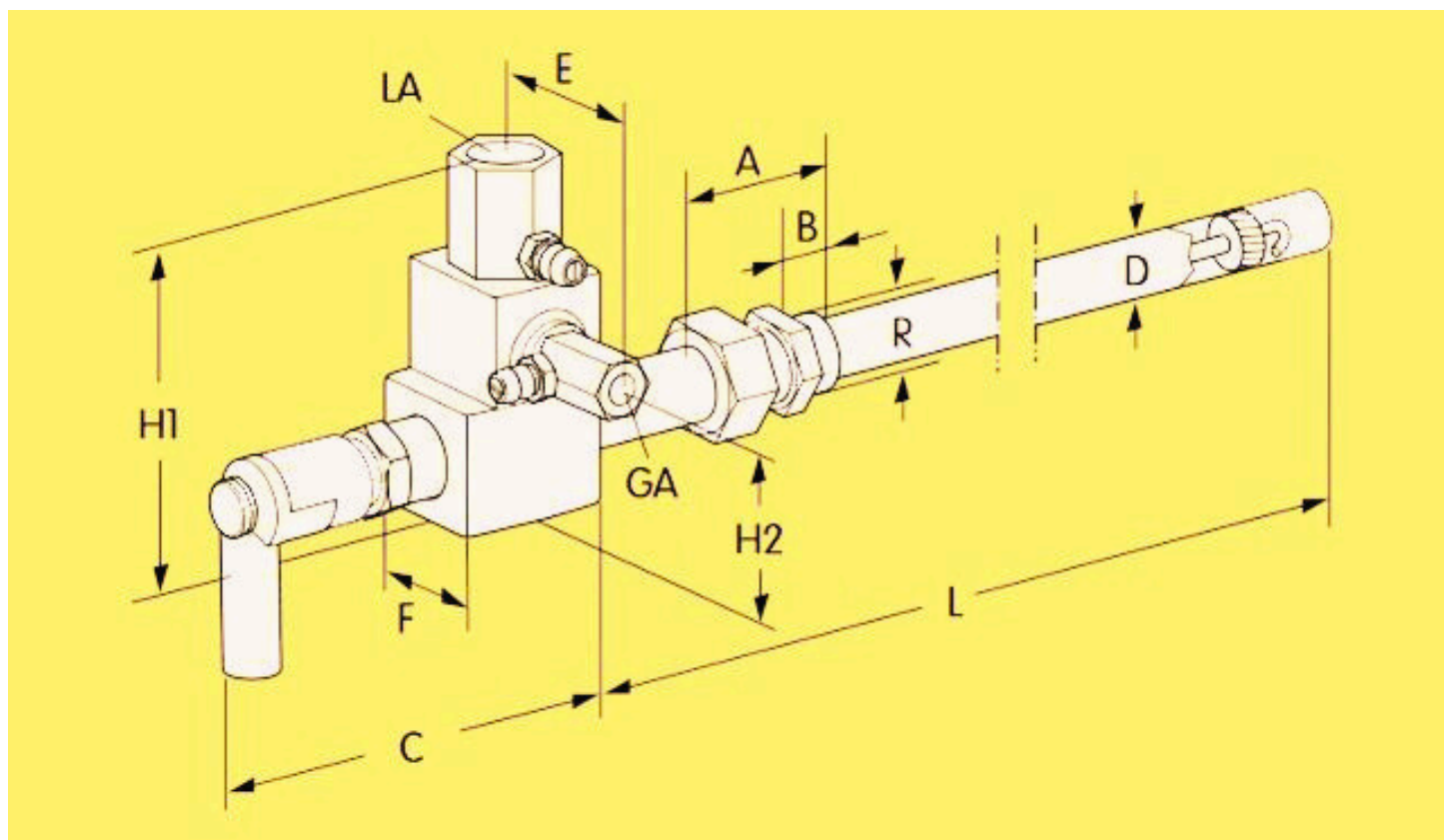
ZMI: heat-resistant steel,

Max. temperature at the tip of the flame tube:

ZMI: 1000°C (1832°F),

for  $\lambda < 1$ : 900°C (1652°F),

## 6.1 Dimensions



### 6.1.1 ZMI 16 and ZMI 25

Type	mm	Dimensions [mm]							ISO 7-1:1994		ISO 228-1
	D	A	B	C	E	F	H1	H2	GA	LA	R
ZMI 16	16	~44	13,5	~106	49	36	96	45	Rp ¼	Rp ½	G ½
ZMI 25	25	~78	19	~112	49	36	96	45	Rp ¼	Rp ½	G 1

\* L = burner length increments: 150, 200, 300 ... mm (6, 8, 12 ... inches)

### 6.1.2 ZMI 16T and ZMI 25T

Type	inch	Dimensions [inch]									
	D	A	B	C	E	F	H1	H2	GA	LA	R
ZMI 16	0.63	1.73	0.56	4.17	2.64	1.42	3.78	1.77	¼ NPT	½ NPT	½ NPT
ZMI 25	1	3.07	0.75	4.41	2.64	1.42	3.78	1.77	¼ NPT	½ NPT	1 NPT

\* L = burner length increments: 150, 200, 300 ... mm (6, 8, 12 ... inches)