Quick Reference for Endusers

Ignition and Pilot Burner
GFI48/70/89 and Ex Variants



Sensors and Systems for Combustion Engineering

LAMTEC
www.lamtec.de

Table of Contents

1 Important Information about the Manual . . . 3
1.1 Purpose/Applicability of the Document . . . 3
1.2 Target Group . . . 3
1.3 Safekeeping of the Manual . . . 3

2 General Safety Instructions . . . 4
2.1 Classification of the Safety Instructions and Warnings . . . 4
2.2 Product Safety . . . 5
2.3 Product-specific Dangers . . . 6
2.4 Proper Use - Conditions of Use . . . 8

3 Product Description . . . 9
3.1 Item list . . . 9
3.2 Rating Plate . . . 10
3.3 Equipment . . . 11
3.4 Important Information about the Product . . . 12
3.4.1 Life Cycle . . . 12
3.5 Technical Data . . . 13
3.5.1 Technical data for the GFI48 pilot burner . . . 13
3.5.2 Technical data for the GFI70 pilot burner . . . 15
3.5.3 Technical data for the GFI89 pilot burner . . . 17
3.5.4 Common technical data for GFI48/70/89 pilot burner . . . 19
3.5.5 Special version thermal rating with high power versions . . . 24
3.5.6 Technical Data external power unit Ex-Zone I . . . 26
3.5.7 Technical Data external power unit save area . . . 27
3.5.8 Technical data for NW48/70/89 sliding flange . . . 28

4 Design and Functions . . . 29
4.1 Design . . . 29
4.2 Functional Description . . . 30

5 Maintenance . . . 31
5.1 Consumables . . . 32
5.2 Maintenance Preparation . . . 33
5.3 Customer Service Information . . . 33
5.4 Warranty and Delivery Terms . . . 33

6 Correcting Faults . . . 34
6.1 General Data . . . 35
6.2 Repair . . . 35
6.3 Information About the Repair Service . . . 35

7 Decommissioning . . . 36

8 Disposal Notes . . . 37

9 Order Information . . . 38

1 Important Information about the Manual

1.1 Purpose/Applicability of the Document

These instructions facilitate the safe and efficient handling of the pilot burner GFI and its variants.

1.2 Target Group

These instructions must be read carefully and completely before commencing with any work. The basic prerequisite for working safely is compliance with all the specified safety instructions.

NOTICE

- ▶ All assembly, commissioning, troubleshooting and maintenance work may only be carried out by authorised and trained personnel.
- ▶ The device may be operated and maintained only by those who are capable of doing so in terms of their level of knowledge and training.
- ▶ For safety reasons, access to parameter settings must be restricted to authorised and trained personnel.

1.3 Safekeeping of the Manual

Look after the manual and all the associated documents carefully.

The manual is part of the product and must be kept safe and be accessible to personnel at all times.

Moreover, it is important that the manual:

- Is available when required.
- Is kept for the entire service life of the device.
- Is available to its next operator.

2 General Safety Instructions

2.1 Classification of the Safety Instructions and Warnings

The following symbols are used in this document to draw the user's attention to important safety information. They are located at points where the information is required. It is essential that the safety information is observed and followed, and that applies particularly to the warnings.

⚠ DANGER!

This draws the user's attention to imminent danger. If it is not avoided, it will result in death or very serious injury. The plant including its surroundings could be damaged.

⚠ WARNING!

This draws the user's attention to the possibility of imminent danger. If it is not avoided, it may result in death or very serious injury. The plant including its surroundings could be damaged.

⚠ CAUTION!

This draws the user's attention to the possibility of imminent danger. If it is not avoided, it may result in minor injuries. The plant including its surroundings could be damaged.

NOTICE

This draws the user's attention to important additional information about the system or system components and offers further tips.

The safety information described above is incorporated into the instructions.

Thus, the operator is requested to:

1 Comply with the accident prevention regulations whenever work is being carried out.

2 Do everything possible within his control to prevent personal injury and damage to property.

2 General Safety Instructions

2.2 Product Safety

NOTICE

This product is state-of-the-art technology and complies with the generally accepted safety-related rules and regulations.
Every device is tested before delivery to ensure that it is working properly and safely.

- ▶ Only use this product when it is perfect condition and in accordance with the manual, the prevailing regulations and guidelines and the applicable safety and accident prevention regulations.

NOTICE

The risk of danger in the event of external fire, traffic and wind, flood waves and earthquakes depend on the installation situation and the installation site to be assessed separately where appropriate.

2.3 Product-specific Dangers

Installation and commissioning

⚠ WARNING!

All following warnings must be observed to avoid personal injury and damage to property and the environment.

⚠ WARNING!

During the operation of electrical devices, certain parts inevitably have dangerous voltage. If the following notices are not observed, severe bodily injury and property damage could thus occur.

⚠ WARNING!

The integrated flame scanner is not provided with a direct switch-off of the fuel valves. The subsequent signal processing must be carried out in the control system, which is adapted to suit the combustion plant. The device may only be used with burner controllers which comply with local standards.

⚠ WARNING!

The integrated flame scanner is a safety device. Only specialist staff of the manufacturer or people approved by the manufacturer may intervene. No interventions by anyone else are permissible. This applies, in particular, in the event of a defective fuse.

2 General Safety Instructions

NOTICE

The integrated flame scanner of the pilot burner is a safety component for gaseous and liquid fuels. When gas consumers according to EN 298 are used, they are subject to the Gas Appliances Directive 2009/142/EC.

- The applicable national safety regulations and standard notes are to be observed in each case.
- The installation of the device must be carried out precisely according to the directions in these operating instructions.
- Only connect the device when the technical data of the device matches the data of the peripheral equipment.
- The device may only be operated in an environment for which it is specified in accordance with the technical data.
- None of the safety labelling or markings may be removed from the device.
- No unauthorized modifications or attempts to repair the device are permitted.
- Make sure that no spliced strands can come into contact with any of the adjacent connections. Use appropriate end splices.
- Make sure that the power cables are not interchanged between L and N.
- The plug connectors X13, X14, X15 and X16 do not have a secure disconnection from the mains voltage.
- To replace or disconnect the plug connectors, all poles of the plant must be disconnected from the mains.
- Measuring circuits must feature a secure disconnect according to EN 61140 "Protection against electric shock " for active parts; for this reason, use only measurement and evaluation devices which have a double or reinforced insulation.
- In order to provide for operating safety, make sure when installing the output contacts that the circuitry of the radio interference suppression to be provided by the user is carried out in such a way that there is no risk of shorting out the relay contact output (flame signal) by defective component parts of the suppressor circuitry
- Work on electrical systems or equipment may be performed only by a certified electrician or trained personnel managed and supervised by a certified electrician according to the electrical engineering regulations.
- Machine and plant parts on which inspection, maintenance, and repair work is performed must be de-energised and secured against reactivation. First make sure the enabled parts are de-energised, then earth and short-circuit them. Secure adjacent, live parts against accidental contact by covering them.
- The electrical equipment of the system must be checked regularly. Defects must be reported immediately and remedied.
- If work on live parts is necessary, a second person must be involved who can press the emergency stop or main switch if required. Block off the working area with a red-and-white safety chain and a warning sign. Use only voltage-insulated tools.
- In case of fire in electrical systems, do not extinguish with water under any circumstances. Only the provided fire extinguishers may be used.

2 General Safety Instructions

2.4 Proper Use - Conditions of Use

Intended use

The ignition burner is utilised in industrial ovens, thermal processing systems and heating boilers for gas, oil and solid fuels.

It is used for the following purposes:

- Preheating the system
- Igniting the main burner
- Supporting the main burner flame

The ignition burner is intended only for the described use.
Any use going beyond the intended use shall be deemed improper.
The LAMTEC GmbH & Co KG shall not be liable for damage caused by the non-compliance.

3 Product Description

3.1 Item list

Check the item list

The item list comprises:

- Operating Instructions
- Pilot burner GFI, design A, B, C



Fig. 3-1 Item list LAMTEC Pilot burner

Verify correct items are accounted for and undamaged. If items are missing or damaged:

- Do not mount the device
- Do not connect
- Do not place into operation
- Submit a claim to the supplier

3.2 Rating Plate

Information on the rating plate

The rating plate is located on the pilot burner housing.

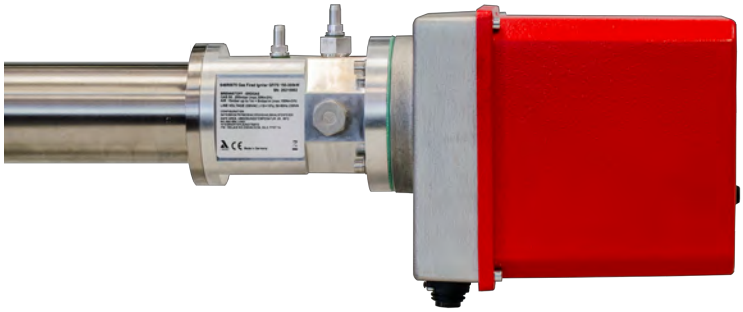


Fig. 3-2 Rating plate on the LAMTEC GFI pilot burner

On the rating plate, you will find information on the configuration of your pilot burner:

Rating plate example:



Fig. 3-3 Rating plate example LAMTEC GFI pilot burner

3.3 Equipment

With respect to the electrical equipment, the ignition burner is available in 3 versions. The versions differ as follows:

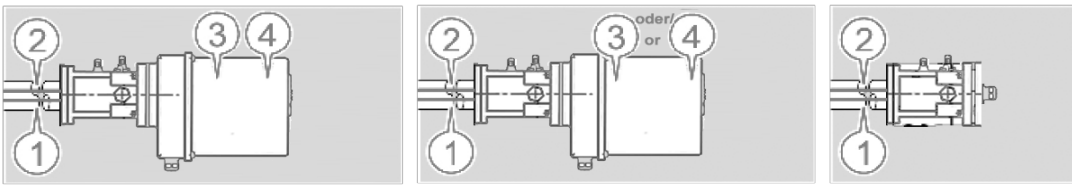


Fig. 3-4 Ignition burner versions A-B-C

Equipment	Version A (standard)	Version B	Version C
1 Ignition electrode	X	X	X
2 Ionisation electrode	X	X	X
3 Spark igniter	X	X[2]	
4 Flame monitor (IFM)[1]	X	X[2]	

[1] IFM= Ionisation Flame Monitoring
[2] Either spark igniter or IFM

GFI 48 / 70 / 89 with optional bar graph



Fig. 3-5 Optional GFI housing with bar graph equipment

NOTICE

The bar graph is optional for versions A and B (if with IFM).

3 Product Description

3.4 Important Information about the Product

3.4.1 Life Cycle

The device has a limited lifespan. It is designed for 250,000 switching cycles at nominal load and thus type-tested. With 50 switching operations per day, this results in a lifespan of approx. 10 years.

Increased load due to extreme operating conditions (e.g. temperature, vibration, contamination, etc.) can significantly reduce the service life.

The system operator is responsible for adapting the frequency of regular safety-related inspections to the operating conditions.

At the end of its service life, the device must be disposed of properly.

3 Product Description

3.5 Technical Data

3.5.1 Technical data for the GFI48 pilot burner

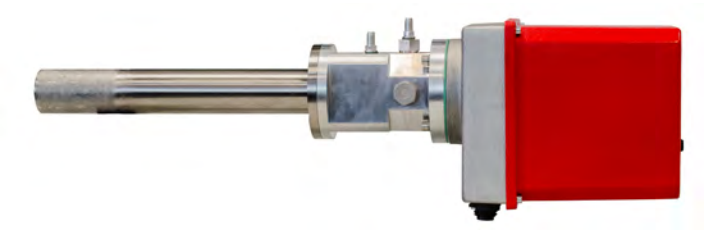


Fig. 3-6 Side view of GFI48 pilot burner design A/B

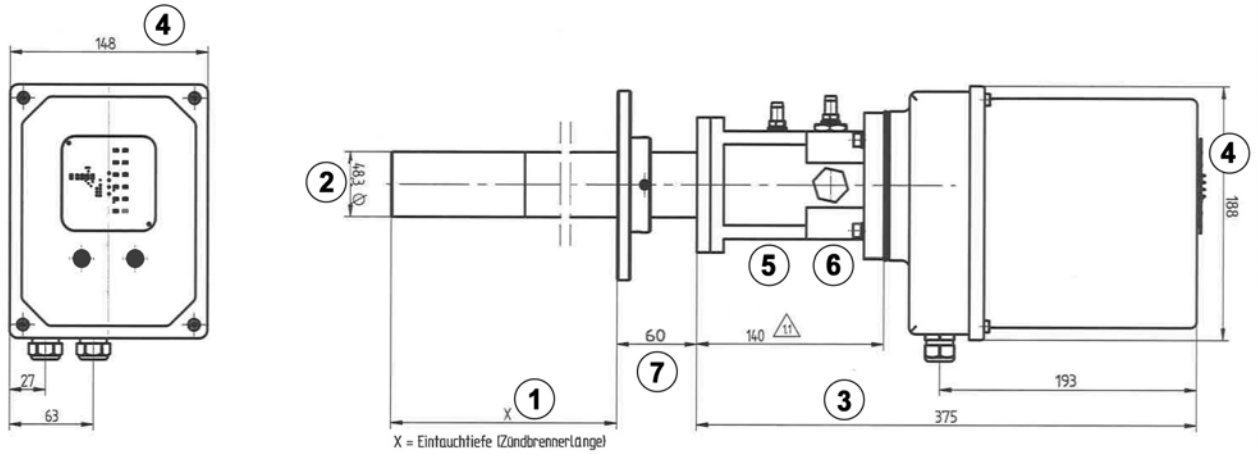


Fig. 3-7 Dimensions of GFI48 pilot burner design A/B



Fig. 3-8 Side view of GFI48 pilot burner Ex-Zone 2

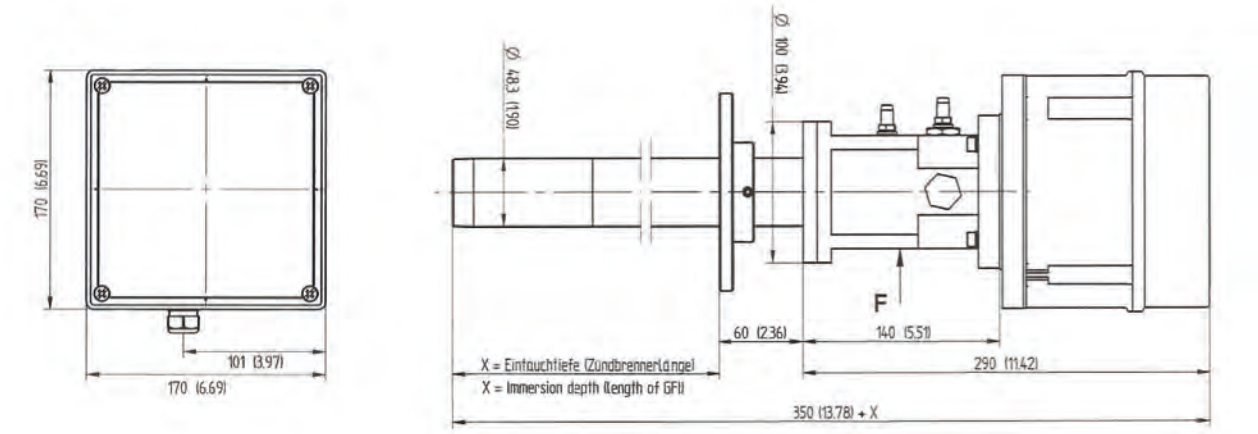


Fig. 3-9 Dimensions of GFI48 pilot burner Ex-Zone 2

3 Product Description



Fig. 3-10 Side view of GFI48 pilot burner design C

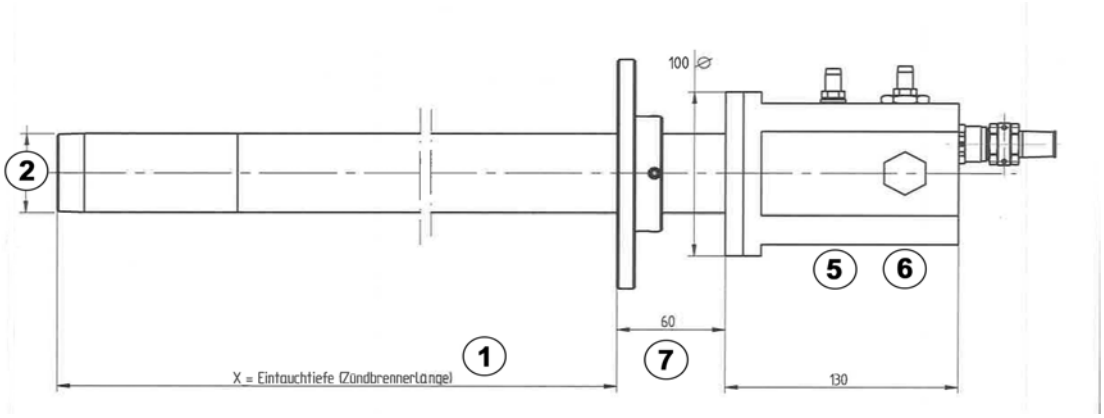


Fig. 3-11 Dimensions of GFI48 pilot burner design C

1	Dimension outer tube length	(customer-specific)
2	Outer tube diameter	48.3 mm x 2 mm (1.90 x 0.078 in)
3	Housing length versions A and B	
4	Housing dimensions	
5	Air supply connection	1 inch (BSPP inner threads)
6	Gas supply connection	1/2 inch (BSPP inner threads)
7	Distance between housing and connection flange	

3.5.2 Technical data for the GFI70 pilot burner

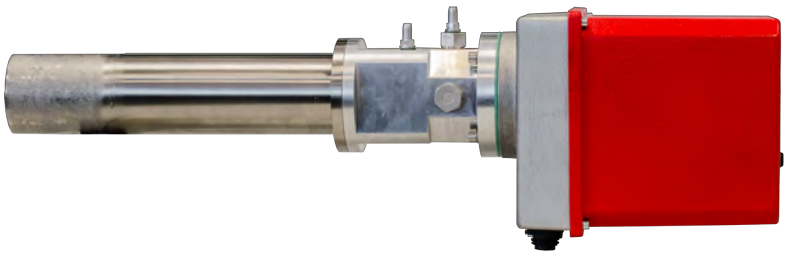


Fig. 3-12 Side view of GFI70 pilot burner design A/B

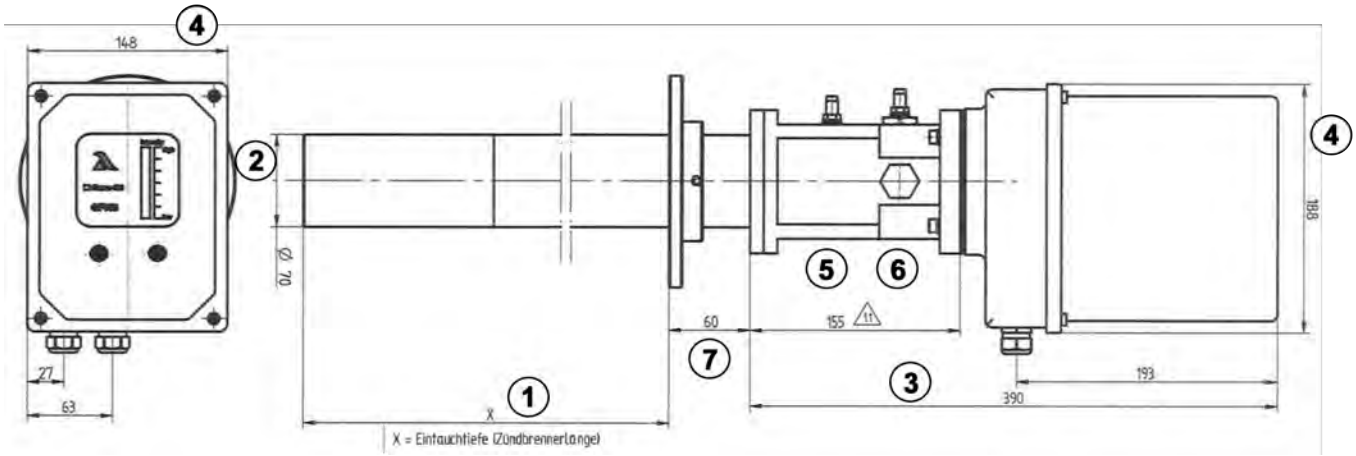


Fig. 3-13 Dimensions of GFI70 pilot burner design A/B



Fig. 3-14 Side view of GFI70 pilot burner Ex-Zone 2

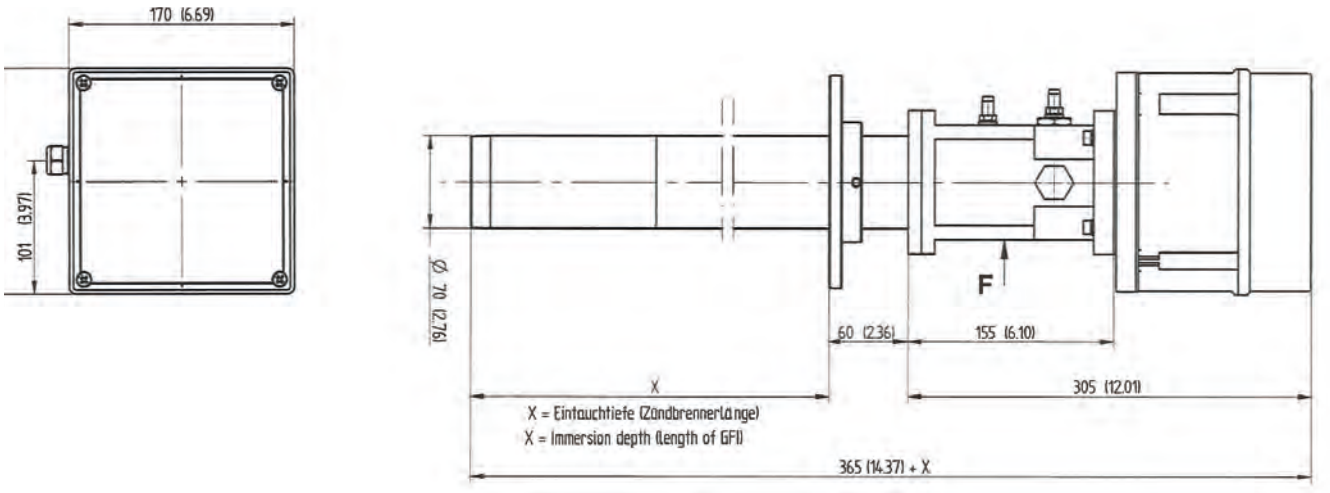


Fig. 3-15 Dimensions of GFI70 pilot burner Ex-Zone 2

3 Product Description



Fig. 3-16 Side view of GFI70 pilot burner design C

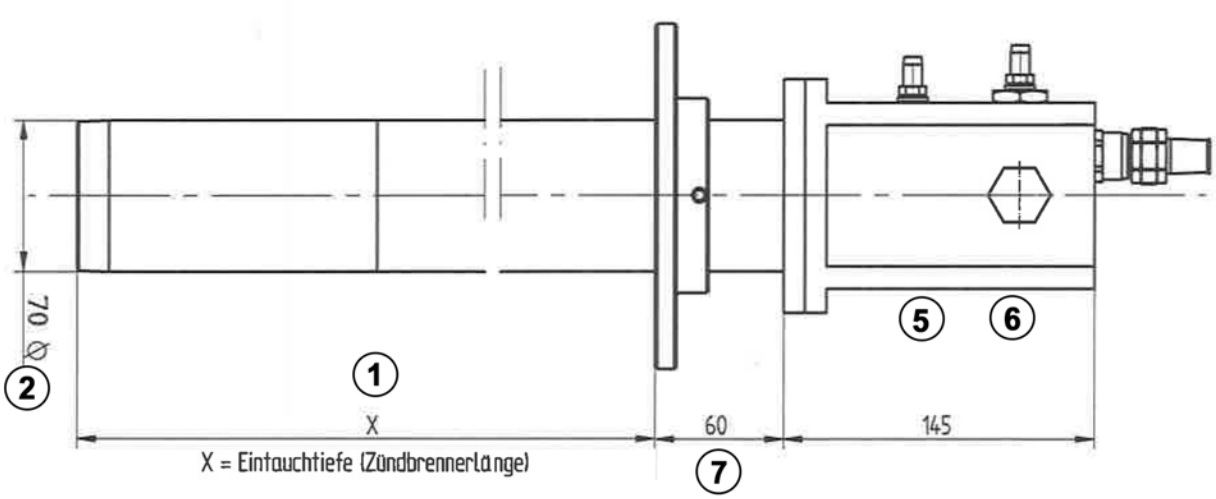


Fig. 3-17 Dimensions of GFI70 pilot burner design C

1	Dimension outer tube length	(customer-specific)
2	Outer tube diameter	70 mm x 2 mm (2.75 x 0.078 in)
3	Housing length versions A and B	
4	Housing dimensions	
5	Air supply connection	1 1/2 inch (BSPP inner threads)
6	Gas supply connection	3/4 inch (BSPP inner threads)
7	Distance between housing and connection flange	

3.5.3 Technical data for the GFI89 pilot burner



Fig. 3-18 Side view of GFI89 pilot burner design A/B

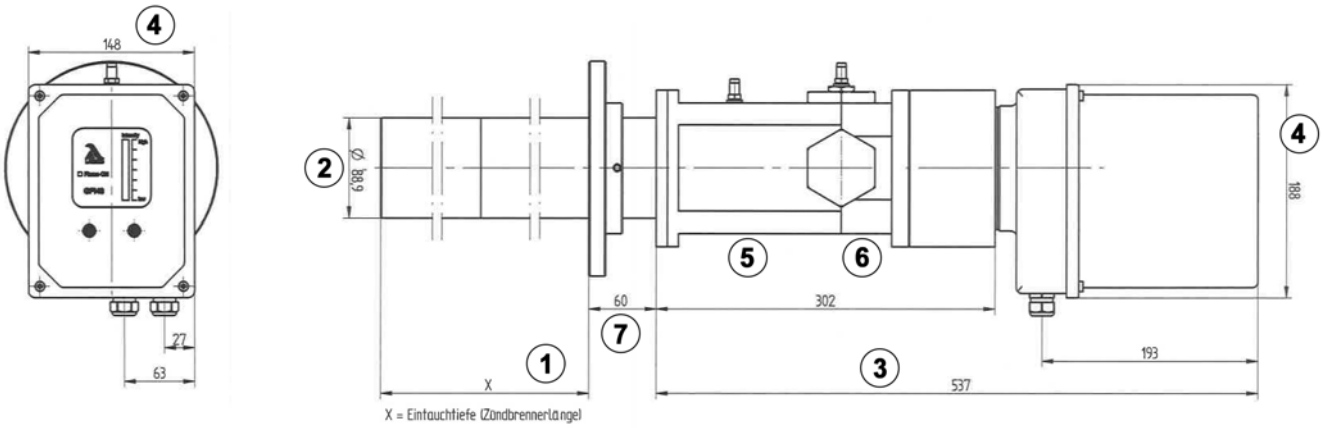


Fig. 3-19 Dimensions of GFI70 pilot burner design A/B



Fig. 3-20 Side view of GFI89 pilot burner Ex-Zone 2

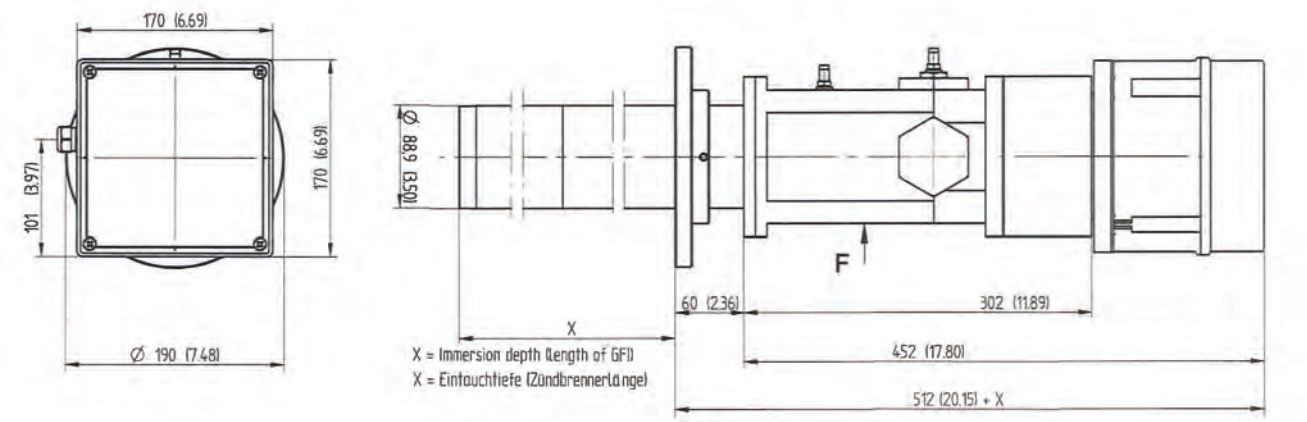


Fig. 3-21 Dimensions of GFI70 pilot burner Ex-Zone 2

3 Product Description



Fig. 3-22 Side view of GFI89 pilot burner design C

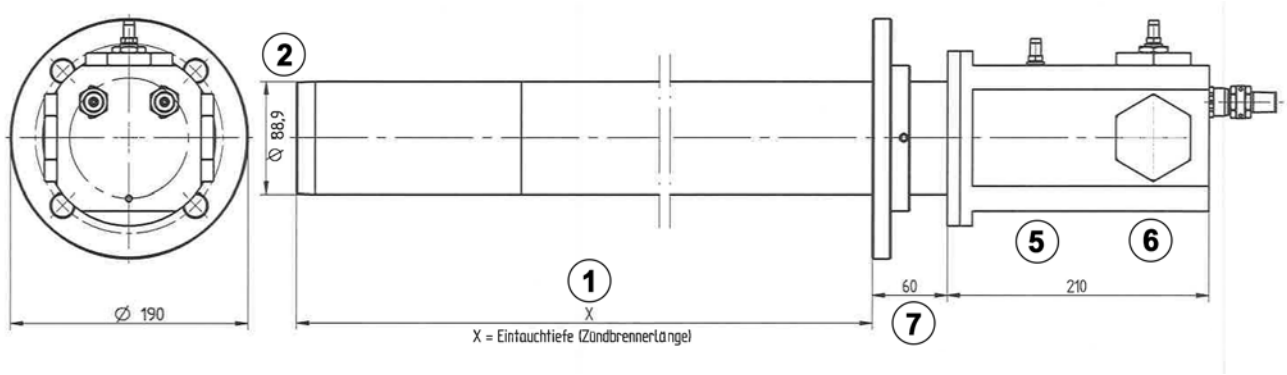


Fig. 3-23 Dimensions of GFI89 pilot burner design C

1	Dimension outer tube length	(customer-specific)
2	Outer tube diameter	GFI89: 88.9 mm x 2 mm (3.5 x 0.078 in)
3	Housing length versions A and B	
4	Housing dimensions	
5	Air supply connection	2 inch (BSPP inner threads)
6	Gas supply connection	1 1/2 inch (BSPP inner threads)
7	Distance between housing and connection flange	

3.5.4 Common technical data for GFI48/70/89 pilot burner

NOTICE

The electrical data are identical for all devices, only the air and gas volume flows differ.

Design A and B: Power supply voltage connection	
Electrical data	120/230 VAC (within the scope of the EU Gas Appliances Directive), cf. rating plate Mains tolerance according to DIN EN 60730-1
Mains frequency	50/60 Hz
Power consumption	at rated voltage = 230 V 230 VA ignition transformer, 10 VA flame scanner at rated voltage = 120 V, 192 VA ignition transformer, 10 VA flame scanner
Ignition transformer duty cycle	switch-on duration = 16 % on 1 min. (10”on; 50” off) - 20 °C<Ta<60 °C
External device fuse (mandatory)	4 A
Integrated flame scanner	
SIL-classification level	SIL 3
Ionisation input	
Ionisation current	from 1 µADC flame ON
Operating mode	continuous operation capable
Flame signal output contact	
Contact type	safety-oriented, floating contact
Contact type	NO, for "flame on", the contact is closed
Level of protection	SKII, base isolation for the status signal
Permissible switching voltage[1]	≤ 230 VAC ≤ 48 VDC
Permissible switching current[1, 2]	max. 0.5 A cos φ 0.4 Min. 10 mA
Contact fusing	0.5 AT (internal, soldered)
Safety time (FFDT)	
Response time in the event of the flame failure	t_V off configurable via DIP switches to 1 s or 3 s (standard 1 s)
Switch-on time	t_V on ≤ 1 s
Measuring shunt	runs mains potential
Transmission ratio of measurement voltage to ionisation current	10 mV (DC) = 1 µA (DC)
Basic error	≤ 2 %
Electrical safety	contact protection by means of protective impedances
Min. impedance of the connected measuring device	1 MΩ

[1] The product is not permitted to be transported, stored or operated outside the specified range. Doing so will invalidate any guarantees with regard to safety relevant functions.

[2] Provide external spark quenching for inductive loads, do not connect any capacitive loads.

NOTICE

Use device manufacturer recommended silicone shielded cable. The device manufacturer will only guarantee proper functioning if this cable is used. This cable is available in any length up to the maximum cable length.

Design B and C: Connection of external flame scanner to the ionisation electrode	
Recommended cable specifications	
Cable type	RG62 coaxial cable
Cable lengths	< 10 m / 32,8 ft
Inner conductor	solid copper-plated steel wire, uninsulated Ø: 0.64 ± 0.025 mm / 0.025 ± 0,00098 in
Wire insulation	PE hollow space insulation (helix made from PE strands with PE hose on top) Ø: 3.7 mm / 0.14 in
Shield	braided from bare Cu wires, 96 % coverage (nominal value)
Outer shell	PVC, black outside diameter: 6.15 ± 0.18 mm / 0.24 ± 0.0070 in)
Conductor resistance	max. 144 Ohm/km
Operating capacity	max. 43 pF/m (1 kHz)
Rated voltage	0.8 kV (50 Hz)
Test voltage	2 kV
Temperature range	-40 ... 80 °C / -40 ... 176 °F (fixed installation)

Design B and C: Power supply voltage connection to the external ignition transformer	
Recommended cable specifications	
Cable lengths	max. 200 m / 656.168 ft
Cable cross-section	3 x 1.0 mm^2 / 3 x 17 AWG
Isolation	PVC
Temperature range	-40 ... +90 °C /-40 ... 194 °F

Design B and C: Connection of external ignition transformer to the ignition electrode	
Electrical data	
Ignition voltage to earth	max. 8 kV (at rated voltage = 230 V) max. 7 kV (at rated voltage = 120 V) For Ex Zone 2 applies: max. 5 kV for both voltage ranges
Recommended cable specifications	
Cable lengths	max. 20 m / 65.62 ft
Cable cross-section	1 x 1.0 mm^2 /1 x 17 AWG
Isolation	Silicone, red-brown
Temperature range	-60 ... +180 °C / -76 ... +356 °F

Design B and C: Ground cable	
Recommended cable specifications	
Cable lengths	max. 200 m / 656.168 ft
Cable cross-section	1 x 1.5 mm^2 / 1 x 15 AWG and/or according to regional regulation

3 Product Description

Mode of operation	
Permitted mode of operation	intermittent operation/continuous operation

Operating condition	
Relative humidity	max. 85 % (non-condensing)

Environmental conditions		
Operation	Permissible temperature range	-20 ... +60 °C / -4 ... +140 °F (without display) 0 .. +60 °C / +32 ... +140 °F (with display)
Transport	Permissible temperature range	-20 ... +60 °C / -4 ... +140 °F
Storage	Permissible temperature range	-20 ... +60 °C / -4 ... +140 °F
Degree of protection	DIN EN 60529	IP65 / NEMA 4 / NEMA 4X

⚠ DANGER!

High voltage on the bare ignition electrode!

- ▶ Pilot burner is only permitted to be operated with correct earthing.
  With version C in particular there is a danger of death when removing or omitting the earthing, the housing earthing must be connected directly to the ignition transformer earthing!
- ▶ In the event of damage to the earthing insulation, the device should be shut down; further operation without repair is not permitted.

Integrated standard power unit safe area

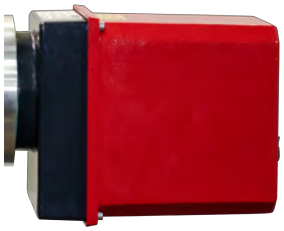


Fig. 3-24 Side view Integrated standard power unit safe area

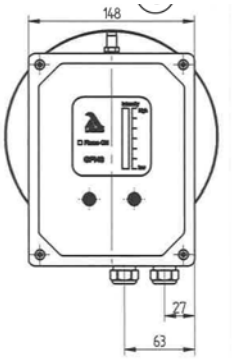


Fig. 3-25 Dimensions Integrated standard power unit safe area

Degree of protection	IP 65 / NEMA 4 / NEMA 4X
Design	with or without display

Integrated power unit Ex-Zone 2

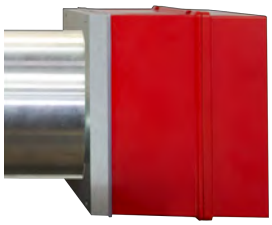


Fig. 3-26 Side view integrated power unit Ex-Zone 2

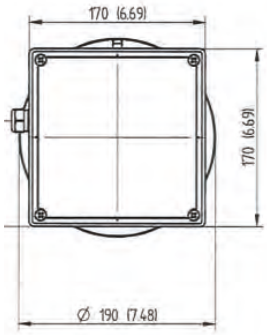


Fig. 3-27 Dimensions integrated power unit Ex-Zone 2

Degree of protection	IP 65 / NEMA 4 / NEMA 4X
Type	no display possible
Device marking	Ex ec nC IIB+H2 T4 Gc (with flame scanner) Ex ec IIB+H2 T4 Gc (without flame scanner)
IEC Standards	IEC 60079-0:2017; IEC 60079-7:2015; IEC 60079-15:2010
certificate no.:	IECEx KIWA 20.0005X

NOTICE

The free ends of the unterminated cable shall be connected in a suitable certified enclosure (e.g. Ex e) or outside the hazardous area.

-The equipment shall only be used in an area of at least pollution degree 2, as defined in IEC 60664-1.

-Transient protection shall be provided that is set to a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the equipment.

- The cable glands are tested with a reduced tensile force (25 %) in accordance with clause A.3.1 of IEC 60079-0 and may only be used for fixed installation apparatus. The user shall ensure adequate clamping of the cable.
- The cable gland size M16 is tested for low risk of mechanical danger (drop height 0.4 m with 1 kg mass) and shall be protected against higher impact energy levels.

Thermal Power*	
Thermal power	GFI48: 70 ... 130 kW (propane gas) 70 ... 140kW (natural gas) GFI70: 150 ... 300 kW GFI89: 400 ... 700 kW

Connection: GFI48 gas	
Gas type	Natural gas or propane
Flow rate (gas quantity)	Natural gas: 8.0 ... 15.0 m^3/h (10.46 ... 19.61 yd^3/h) Propane: 3.2 ... 6.0 m^3/h (4.18 ... 7.84 yd^3/h)
Operating pressure	Min. 50 mbar (0.725 psi) Max. 200 mbar (2.90 psi)

Connection: GFI70 gas	
Gas type	Natural gas or propane
Flow rate (gas quantity)	Natural gas: 15.0 ... 30.0 m^3/h (19.61 ... 39.23 yd^3/h) Propane: 6 ... 12.0 m^3/h (7.84 yd^3/h ... 15.69 yd^3/h)
Operating pressure	Min. 50 mbar (0.725 psi) Max. 200 mbar (2.90 psi)

Connection: GFI89 gas	
Gas type	Natural gas or propane
Flow rate (gas quantity)	Natural gas: 35.0 ... 70.0 m^3/h (45.77 ... 91.55 yd^3/h) Propane: 14 ... 28.0 m^3/h (18.31 ... 36.62 yd^3/h)
Operating pressure	Min. 50 mbar (0.725 psi) Max. 200 mbar (2.90 psi)

NOTICE

Higher pressure ratings can be realised by connecting a restrictor upstream.

Connection: Air	
Air type	Combustion air
Operating pressure	GFI48/70: min. 15 mbar (0.217 psi) + 6 mbar (0.087 psi) per metre of tube length GFI89: min. 15 mbar 0.217 psi) + 5 mbar (0.087 psi) per metre of tube length
Air temperature	max. 80 °C (176 °F)
Relative air humidity	max. 70 %
Air quality	Free of dust, oil, grease and aerosols The quality for the compressed air supply should conform to ISO 8573-1:2010 class (7 : 4 : 4). Non-observance can result in short-circuits due to material deposits in the housing.
Air ratio	0.3 ... 0.5 (the remaining air quantity must be provided by the combustion chamber)
Flow rate (air quantity)	GFI48: max. 50 m^3/h (65.39 yd^3/h) GFI70: max. 150 m^3/h (196.19 yd^3/h) GFI89: max. 250 m^3/h (326.98 yd^3/h)

NOTICE

At temperatures in the combustion chamber of over 500 °C (932 °F), if the pilot burner is off, a cooling air supply of 50 % of the max. combustion air should be provided.

* At International Standard Atmosphere, ISA: 15 °C, 1013,25 hPa

3.5.5 Special version thermal rating with high power versions

Thermal rating with high power versions*	
GFI48	natural gas: 250 ... 400 kW propane: 250 ... 400 kW
GFI70	natural gas: 500 ... 800 kW propane: 500 ... 800 kW
GFI89	natural gas I: 2300 ... 3000 kW natural gas II: 4600 ... 6000 kW propane: 2300 ... 3000 kW
Connection: GFI48 gas	
Flow rate (gas quantity)	natural gas: 25 ... 40 m^3/h (32.69 ... 52.31 yd^3/h) propane: 9.5 ... 15 m^3/h (12.42 ... 19.61 yd^3/h)
Operating pressure	natural gas: 500 ... 1000 mbar (7.25 ... 14.50 psi) propane: 400 ... 800 mbar (5.80 ... 11.60 psi)
Connection: GFI70 gas	
Flow rate (gas quantity)	natural gas: 50 ... 80 m^3/h (65.39 ... 104.63 yd^3/h) propane: 19 ... 31 m^3/h (24.85 ... 40.54 yd^3/h)
Operating pressure	natural gas: 500 ... 1000 mbar (7.25 ... 14.50 psi) propane: 500 ... 1000 mbar (7.25 ... 14.50 psi)
Connection: GFI89 gas	
Flow rate (gas quantity)	natural gas I: 230 ... 300 m^3/h (300.82 ... 392.38 yd^3/h) natural gas II: 460 ... 600 m^3/h (601.65 ... 784.76 yd^3/h) propane: 90 ... 115 m^3/h (117.71 ... 150.41 yd^3/h)
Operating pressure	natural gas I: 700 ... 1000 mbar (10.15 ... 14.50 psi) natural gas II: 700 ... 1000 mbar (10.15 ... 14.50 psi) propane: 700 ... 1000 mbar (10.15 ... 14.50 psi)

NOTICE

This is not a control range as for a burner as the appropriate air volume must be set accordingly when changing the gas pre-pressure.

Connection: Air	
Air type	combustion air
Operating pressure	GFI48/70: min. 15 mbar + 6 mbar (0.217 psi + 0.087 psi) per metre of tube length GFI89: min. 15 mbar + 5 mbar (0.217 psi + 0.072 psi) per metre of tube length
Air temperature	max. 80 °C (176 °F)
Relative air humidity	max. 70 %
Air quality	free of dust, oil, grease and aerosols The quality for the compressed air supply should conform to ISO 8573-1:2010 class (7 : 4 : 4). Non-observance can result in short-circuits due to material deposits in the housing.
Air ratio	0.3 ... 0.5 (the remaining air quantity must be provided by the combustion chamber)

Connection: Air	
Flow rate (air quantity)	GFI48: max. 50 m^3/h (65.39 yd^3/h) GFI70: max. 150 m^3/h (196.19 yd^3/h) GFI89: max. 250 m^3/h (326.98 yd^3/h)

NOTICE

At temperatures in the combustion chamber of over 500°C (932 °F), if the pilot burner is off, a cooling air supply of 50% of the max. combustion air should be provided.

* At International Standard Atmosphere, ISA: 15 °C, 1013,25 hPa

3.5.6 Technical Data external power unit Ex-Zone I



Fig. 3-28 External power unit Ex-Zone I

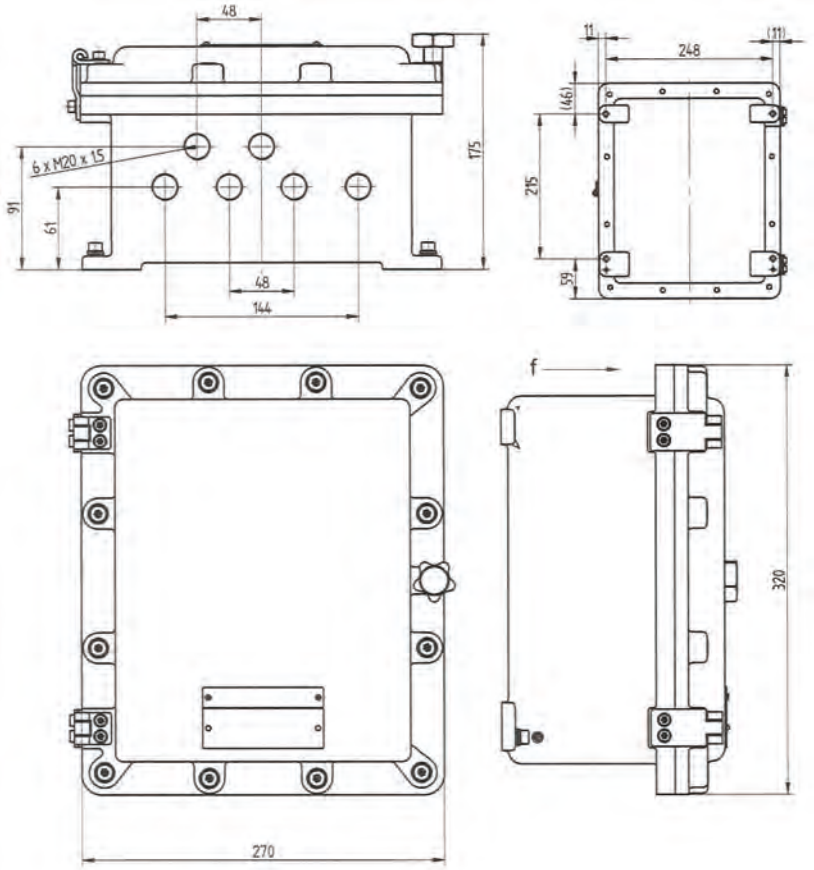


Fig. 3-29 Dimensions external power unit for Ex-Zone I

Technical Data	
Explosion protection	II 2 G Ex db IIB + H2 T6/T5 GbII 2 D Ex tb IIIC T80 °C...T95 °C Db
Material	copper-free aluminium, stainless steel 1.4404/316
Certificates/Test certificates *Certificate holder Rose Systemtechnik*	ITS 15 ATEX 18302X, IECEx ITS 15.0041X
Electrical safety	IP 66 according to EN 60529
Impact resistance	7 Joule according to EN 60079-0
Temperature range	-20 ... +60 °C / -4 ... +140 °F

3.5.7 Technical Data external power unit save area



Fig. 3-30 External power unit safe area

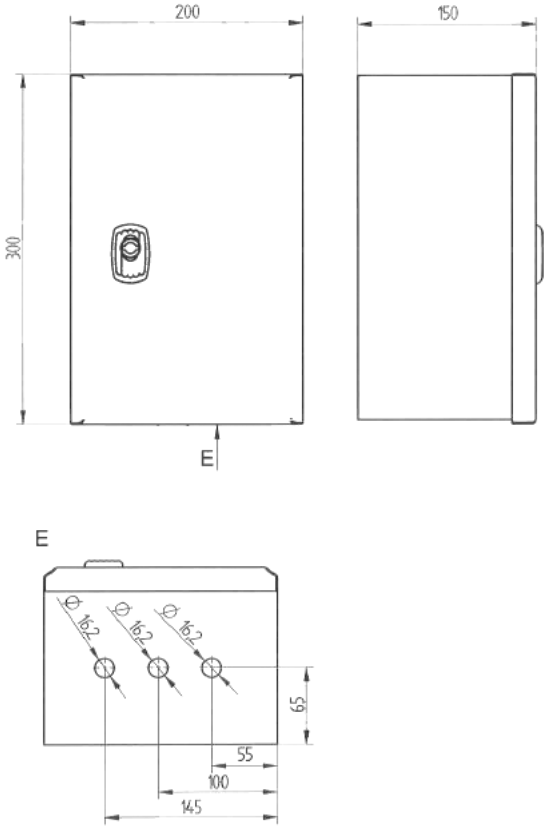


Fig. 3-31 Dimensions external power unit safe area

Technical Data	
Material	varnished steel RAL7035
Degree of protection	IP 66
Temperature operating range	-20 ... +60 °C / -4 ... +140 °F

3.5.8 Technical data for NW48/70/89 sliding flange

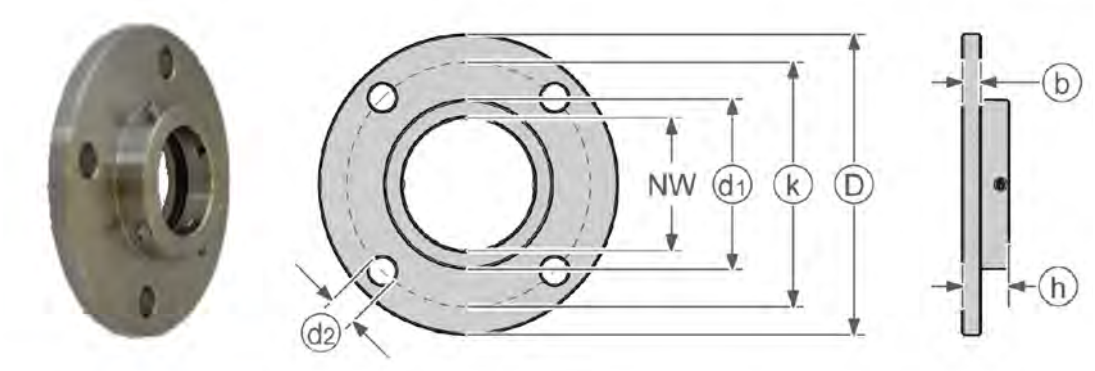


Fig. 3-32 Dimensions of the sliding flange of the GFI pilot burner

The flange is equipped with 4 grub screws to fix the outer tube in a defined position. The pipe leadthrough contains an EPDM O-ring seal.

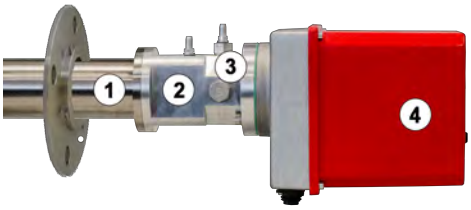
Technical data for NW48/70/89 sliding flange

Material	
Flange	1.4571 stainless steel, galvanized steel
O-ring seal	EPDM
Temperature range	-40 ... +120 °C / -40 ... +248 °F
Pressure	1.0 bar / 14.50 psi
Weight	NW48: 1.24 kg / 2.73 lb NW70: 1.5 kg / 3.30 lb NW89: 2.4 kg / 5.29 lb
Dimensions	
b Flange plate thickness	NW48: 10 mm / 0.39 in NW70: 10 mm / 0.39 in NW89: 15 mm / 0.47 in
D Flange diameter	NW48: 140 mm / 5.51 in NW70: 160 mm / 6.29 in NW89: 190 mm / 7.48 in
d1 Outside collar diameter	NW48: 70 mm / 2.75 in NW70: 90 mm / 3.54 in NW89: 115 mm / 4.33 in
d_2 Hole diameter	NW48: 14 mm / 0.55 in NW70: 14 mm / 0.55 in NW89: 18 mm / 0.70 in
h Total height	NW48: 25 mm / 0.98 in NW70: 25 mm / 0.98 in NW89: 30 mm / 1.18 in
k Hole circle diameter	NW48: 110 mm / 4.33 in NW70: 130 mm / 5.11 in NW89: 150 mm / 5.90 in
DN Nominal diameter	48/70/89

4 Design and Functions

4.1 Design

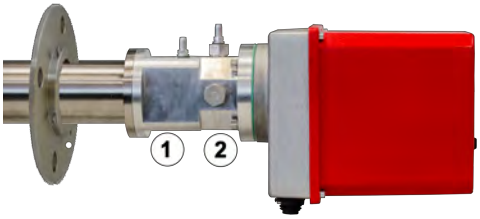
Construction of pilot burner versions A and B



1 Outer tube
2 Air housing
3 Gas block
4 Connection enclosure

Fig. 4-1 Main components pilot burner

Connections: Gas and air supply



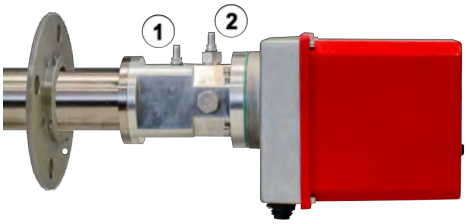
1 Air supply connection
2 Gas supply connection

Fig. 4-2 Gas and air supply connections

Connections: Measurement sockets

NOTICE

Gas supply connection is possible on all four sides (standard bottom)



1 Measurement socket - air
2 Measurement socket - gas

Fig. 4-3 Connections of the measurement sockets for gas and air

Connections: test sockets



1 and 2 test sockets for the temporary connection of a measurement device for flame setting

Fig. 4-4 Test socket connections

4.2 Functional Description

Operating mode of the pilot burner

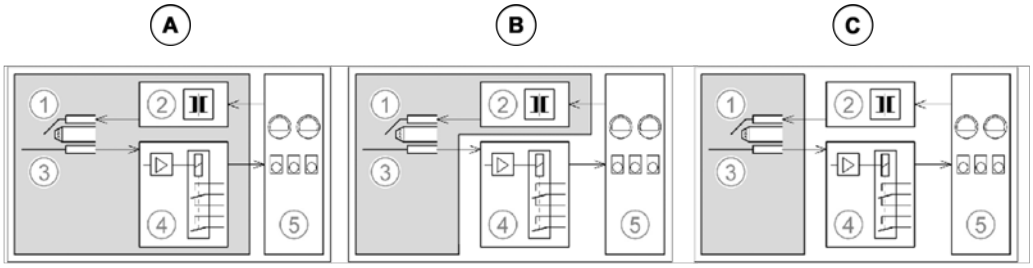


Fig. 4-5 Pilot burner versions A-B-C

1 Ignition electrode	3 Ionisation electrode	5 System control
2 Ignition transformer	4 Flame scanner	

⚠ DANGER!

High voltage on the bare ignition electrode!

- ▶ Pilot burner is only permitted to be operated with correct earthing.
  With version C in particular there is a danger of death when removing or omitting the earthing; the housing earthing must be connected directly to the ignition transformer earthing!
- ▶ In the event of damage to the earthing insulation, the device should be shut down; further operation without repair is not permitted.

The ignition electrode is connected to the ignition transformer. The ignition transformer is supplied from the system control.

The ionisation diode in the flame area of the pilot burner is connected to the flame scanner. The flame scanner measures the ionisation current and evaluates it.

The amount of the ionisation current can also be determined via a shunt measuring principle using a multimeter. The measured voltage is to be converted as follows into the ionisation current: 10 mVDC = 1 µADC

When the flame is detected, the flame scanner activates the relay and the pilot light indicates "flame on".

The system control detects the relay activity and implements this into system-specific actions.

⚠ WARNING!

Both analogue outputs have supply voltage reference!
Contact protection must be observed.

- ▶ Measuring circuits must be safely separated from dangerous active components to EN 61140 "Protection against electric shock".
- ▶ Only use measurement and data interpreting devices that have double or reinforced insulation.

5 Maintenance

Observe the safety regulations!

NOTICE

Wear personal safety equipment.

- Face protection
- Insulating safety gloves
- Safety shoes

⚠ WARNING!

All activities described in this chapter must be performed by qualified, authorised personnel only under observance of requirements from the following regulating bodies:

- Official Journal of the European Union L 96/309, Directive 2014/34/EU of 26 February 2014 relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast)
- EN 60079-0:2014-06 (VDE 0170-1:2014-06) Explosive atmospheres – Part 0: Equipment – General requirements

⚠ DANGER!

For ignition attempts for maintenance purposes, there is a risk of flashing caused by residual gas in the gas tube or gases in the environment.

- For pilot attempts, secure the hazard area in front of the pilot burner mouth.
- Clear the pilot burner with purge air from residual gas as necessary.
- The ignition should ideally only be tested in installed status.

⚠ WARNING!

Opening the housing of the integrated power unit Ex-Zone 2 is not permitted!
This does not affect the opening of the tube to replace the wearing parts.

5 Maintenance

5.1 Consumables

Replace wear parts

The replacement of parts that are subject to normal wear is not deemed to be repair work and may be performed by authorised personnel of the system operator.

The decision as to when wear parts are to be replaced is the responsibility of the system operator.

The following events can make the replacement of wear parts necessary:

- Malfunctions become more frequent.
- Device fails due to a defect.
- Device working under adverse conditions.
- Abnormalities during the course of proper maintenance.

NOTICE

It is not necessary to repair ignition breakdown paths.

NOTICE

Use only original replacement parts when replacing wear parts.

Original replacement parts are available from the manufacturer; for contact data, see chapter *6.3 Information About the Repair Service*

5 Maintenance

5.2 Maintenance Preparation

Under regular operating conditions, the maintenance is limited to a semi-annual inspection of the device. With increased load due to extreme operating conditions (e.g. temperature, vibration, contamination, etc.), the inspection must be performed monthly.

Shut down the system control and secure it against inadvertent or accidental restarting.

⚠ CAUTION!

Residual heat on all parts of the system and the ignition burner.
Risk of contact burns.
Allow the system and ignition burner to cool down before removal.

5.3 Customer Service Information

Please contact LAMTEC Service/Support if you have any questions.

LAMTEC GmbH & Co.KG
Sensors and Systems for Combustion Technology
Wiesenstraße 6
D-69190 Walldorf
Hotline: +49 (0) 6227 / 6052-33
email: support@lamtec.de

5.4 Warranty and Delivery Terms

The manufacturer's warranty conditions apply. Warranty claims are refused if changes have been made to the device or it has been interfered with in any way during the warranty period.

The device is shipped as specified in the purchase order information. LAMTEC's terms and conditions of delivery and service and the general terms and conditions of delivery and service of the electrical and electronic engineering industry apply.

6 Correcting Faults

⚠ WARNING!

The flame safeguard is a safety device. Consequently, interventions must only be carried out by the specialists of the manufacturer or by such other staff to be agreed with the manufacturer beforehand. Any intervention in the equipment going beyond the setting options described as well as any repair work must only be carried out by the manufacturer's staff.

Observe the safety regulations!

NOTICE

Wear personal safety equipment.

- Face protection
- Insulating safety gloves
- Safety shoes

⚠ WARNING!

All activities described in this chapter must be performed by qualified, authorised personnel only under observance of requirements from the following regulating bodies:

- Official Journal of the European Union L 96/309, Directive 2014/34/EU of 26 February 2014 relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast)
- EN 60079-0:2014-06 (VDE 0170-1:2014-06) Explosive atmospheres – Part 0: Equipment – General requirements

⚠ DANGER!

For ignition attempts for maintenance purposes, there is a risk of flashing caused by residual gas in the gas tube or gases in the environment.

- For pilot attempts, secure the hazard area in front of the pilot burner mouth.
- Clear the pilot burner with purge air from residual gas as necessary.
- The ignition should ideally only be tested in installed status.

⚠ WARNING!

Opening the housing of the integrated power unit Ex-Zone 2 is not permitted!
This does not affect the opening of the tube to replace the wearing parts.

6 Correcting Faults

6.1 General Data

Act correctly when an error occurs

⚠ DANGER!

Critical operating state when an error occurs.
Risk of death from deflagration or explosion.
Shut off the gas supply immediately.
Stop operation.
Shut down the system.
Secure the system against being restarted.

6.2 Repair

⚠ WARNING!

Safety-relevant components!
Risk of malfunction if repaired improperly.
Only have repairs done by the manufacturer.
Do not attempt to make repairs yourself.

6.3 Information About the Repair Service

Please contact LAMTEC Service/Support if you have any questions.

LAMTEC GmbH & Co.KG
Sensors and Systems for Combustion Technology
Wiesenstraße 6
D-69190 Walldorf
Hotline: +49 (0) 6227 / 6052-33
email: support@lamtec.de

7 Decommissioning

Take the pilot burner out of operation.

⚠ CAUTION!

Residual heat on all parts of the system and the pilot burner.
Risk of contact burns.
Allow the system and pilot burner to cool down before removal.

Procedure:

1 Shut down the system and secure it from being switched on again.

2 Allow the pilot burner to cool down completely.

3 Shut off the gas and air supply.

8 Disposal Notes

NOTICE

Improper or inadequate recycling harms the environment.

- ▶ Please observe the regional disposal regulations.
- ▶ The device itself is to be recycled as electronic waste to returned to the burner or boiler manufacturer.

9 Order Information

Spare parts for GFI48

Description / Type	Order no.
Ionization and ignition electrode with distance and centring holder for the electrode rods	646R1115
Distance and centring holder with insulating piece for the electrode rods	646R1116
Flame stabilizer, material 1.4301/1.4305	646R1100
Nozzle for natural gas	646R1105
Nozzle for propane gas	646R1106

Spare parts for GFI70

Description / Type	Order no.
Ionization and ignition electrode with distance and centring holder for the electrode rods	646R2115
Distance and centring holder with insulating piece for the electrode rods	646R2116
Flame stabilizer, material 1.4301/1.4305	646R2100
Nozzle for natural gas	646R2105
Nozzle for propane gas	646R2106

Spare parts for GFI89

Description / Type	Order no.
Ionization and ignition electrode with distance and centring holder for the electrode rods	646R3115
Distance and centring holder with insulating piece for the electrode rods	646R3116
Flame stabilizer, material 1.4301/1.4305	646R3100
Nozzle for natural gas	646R3105
Nozzle for propane gas	646R3106

Spare parts for GFI48 / GFI70 / GFI89

Description / Type	Order no.
Ignition transformer for GFI ignition systems, 230 VAC / 8 kV	646P1040
Ignition transformer for GFI ignition systems, 120 VAC / 8 kV	646P1041
Ionizing flame monitoring (IFM) F130i, SIL3, supply voltage 230 VAC, for DIN rail mounting, continuous operation, FFDT 1 s	659G1001
Ionizing flame monitoring (IFM) F130i, SIL3, supply voltage 120 VAC, for DIN rail mounting, continuous operation, FFDT 1 s	659G1002

Ignitor and Pilot Burner - Accessories

Sliding Flange

Description / Type	Order no.
GFI48 Sliding flange with O-ring seal and grub screws, DN50 PN6, 1.4571 (4 fixing holes)	646R1151
GFI48 Special sliding flange with O-ring seal and grub screws, 1.4571 (2 fixing holes)	646R1152
GFI70 Sliding flange with O-ring seal and grub screws, DN65 PN6, 1.4571 (4 fixing holes)	646R2151

9 Order Information

Description / Type	Order no.
GFI89 Sliding flange with O-ring seal and grub screws, DN80 PN6, 1.4571 (4 fixing holes)	646R3151

Connecting cable

Description / Type	Order no.
Connection cable with counter plug, length 2 m	646R0150

General

Description / Type	Order no.
Double nipple 3", material: 1.4408	646R9001
Double nipple 1" external thread, stainless steel	646R9015
Double nipple R1 1/2" external thread, stainless steel	646R9016
Double nipple R1 3/4" external thread, stainless steel	646R9014
Double nipple R1 2" external thread, stainless steel	646R9017
Hexagonal Reducing Nipple NPT 3/4" to R 1/2", material: 1.4571	646R9030
Hexagonal Reducing Nipple NPT 11/4" to R 1", material: 1.4571	646R9031
Conical reducer R 1/2 A X G 3/4 I MS.vernickelt	646R9032
Stainless steel pressure gauge 0 ... 160 mbar, housing Ø 63 mm, connection G1/8" vertical	646R9040
Sliding nipple with O-ring seal and 3" male thread, 1.4301, for GFI48	646R9055
Needle valve 1 1/4" NPT inside thread, material 1.4571	646R9058
Needle valve 3/4" NPT inside thread, material 1.4571	646R9059
Ball valve for gas 1/2" internal/external thread, with DVGW certification, brass	646R9060
Ball valve for gas 3/4" internal/external thread, with DVGW certification, brass	646R9061
Ball valve for gas 1 1/2" internal/external thread, with DVGW certification, brass	646R9062
Ball valve for gas 2" internal/external thread, with DVGW certification, brass	646R9063
Ball valve (Mini) Ballofix for gas 3/4" internal/external thread, brass	646R9065
Ball valve (stainless steel) 3" IG/IG with lever handle, DN80	646R9069
Air regulating sleeve 1" internal thread, malleable cast iron black	646R9102
Air regulating sleeve 1 1/2" internal thread malleable cast iron black	646R9103
Air regulating sleeve 3/4" internal thread, malleable cast iron black	646R9104
Air regulating sleeve 2" internal thread malleable cast iron black	646R9105

9 Order Information

Commissioning / maintenance / service

Description / Type	Order no.
Inspection diode for GFI	646R0100

Proposals of spare parts for a two-year operation

GFI48

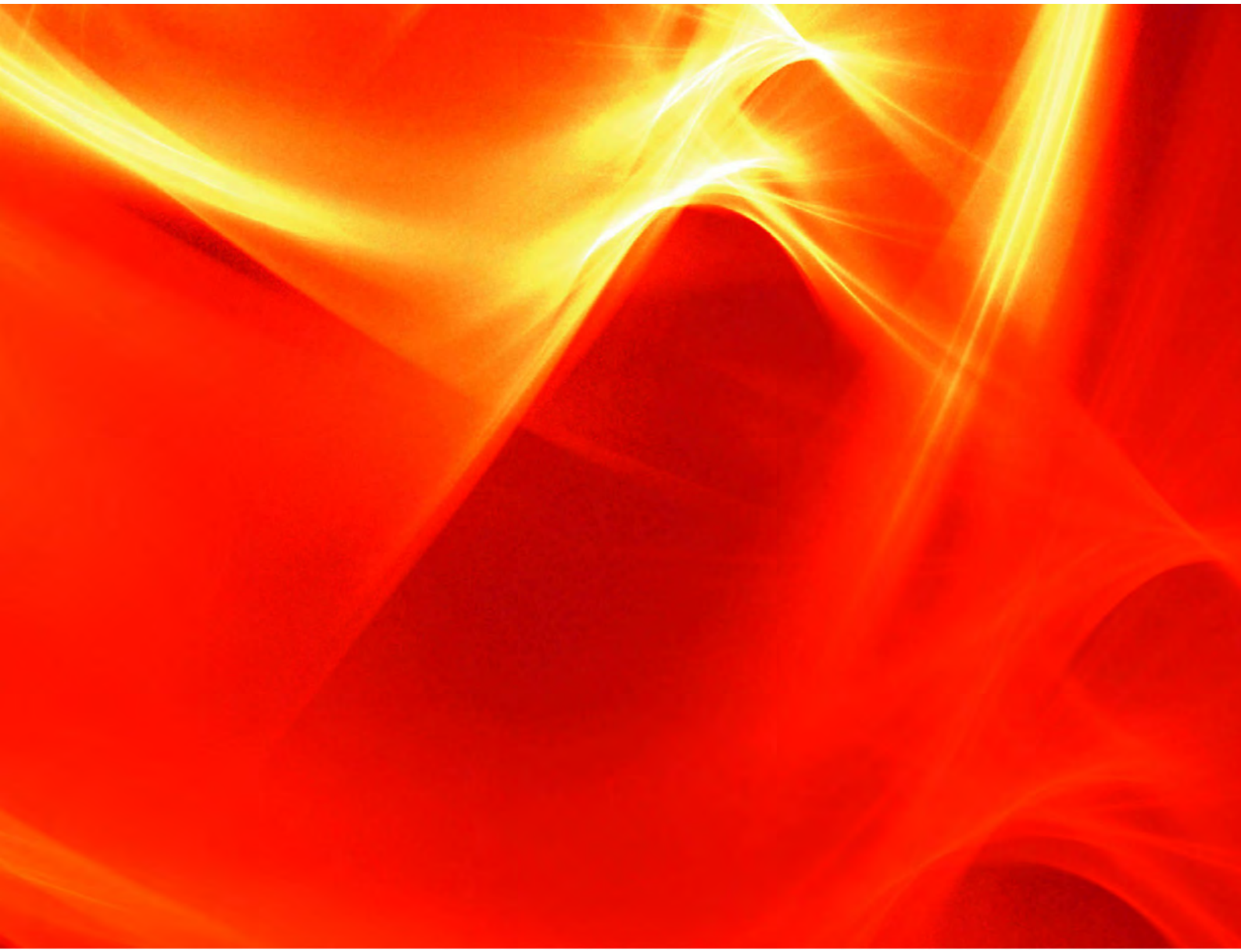
Description / Type	Order.no.
1x Ionization and ignition electrode with distance and centring holder for the electrode rods	646R1115
3x Distance and centring holder with insulating piece for the electrode rods	646R1116

GFI70

Description / Type	Order.no.
1x Ionization and ignition electrode with distance and centring holder for the electrode rods	646R2115
3x Distance and centring holder with insulating piece for the electrode rods	646R2116

GFI89

Description / Type	Order.no.
1x Ionization and ignition electrode with distance and centring holder for the electrode rods	646R3115
3x Distance and centring holder with insulating piece for the electrode rods	646R3116



The information in this publication is subject to technical changes.

LAMTEC Meß- und Regeltechnik
für Feuerungen GmbH & Co. KG
Wiesenstraße 6
D-69190 Walldorf
Telefon: +49 (0) 6227 6052-0
Telefax: +49 (0) 6227 6052-57

info@lamtec.de
www.lamtec.de

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