



บริษัท เอดีดี เฟอร์เนส จำกัด

ADD FURNACE CO.,LTD.

44 ซอยบรมราชชนนี 70 ถนนบรมราชชนนี แขวงศาลาธรรมสพน์ เขตทวีวัฒนา กรุงเทพฯ 10170

โทร: 02-888-3472 โทร(ออกแบบ):08-08-170-170 แฟกซ์: 02-888-3258

https://www.add-furnace.com E-mail: [sales@add-furnace.com](mailto:sales@add-furnace.com)



Catalogue

Electronic ignition unit type EBI

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Catalogue

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Catalogue

Electronic ignition unit type EBI

Quality- and Environmental Management System

ISO 9001

ISO 14001

Danfoss A/S Burner Components Division operates a Quality- and Environmental Management System which has been certified to ISO 9001 and ISO 14001.

Application

The EBI series are electronic ignition units for the intermittent ignition of oil and gas burners.

Type EBI is a 2-pole version for ignition between two ignition electrodes.

Type EBI M is like type EBI a 2-pole ignition unit, but with the secondary midpoint connected to earth.

Type EBI 1P is a 1-pole version for ignition between one ignition electrode and frame.

The EBI series both have a plug on the primary side and secondary side, which makes installation and servicing simple.

Low weight and small dimensions make the EBI series very suitable for use on modern compact burners as well as on more conventional burners.

Installation

*Installation*

The EBI series can be installed in any position. There are two sets of mounting holes, one set of which allows installation under the burner control box.

*Electrical connection*

The primary side is connected with a special plug fitted with a lock. The plug can be released by inserting a screwdriver under the lock and pulling the plug upwards.

Phase and neutral can be connected at random without affecting function.

Type EBI is double-insulated and must not be connected to earth.

Type EBI M and EBI 1P must be connected to frame using the tab on the side of the enclosure. The connection must be secured with at least a 3 mm screw with serrated washer.

*High-voltage connection*

High-voltage connection is via a 4 mm round plug. Ignition cables must be fitted with a corresponding female connector, e.g. AMP no. 925688.

**Note:** If the high-voltage connections on EBI are led through the burner housing, there must be an adequate insulation gap.

Pay attention to

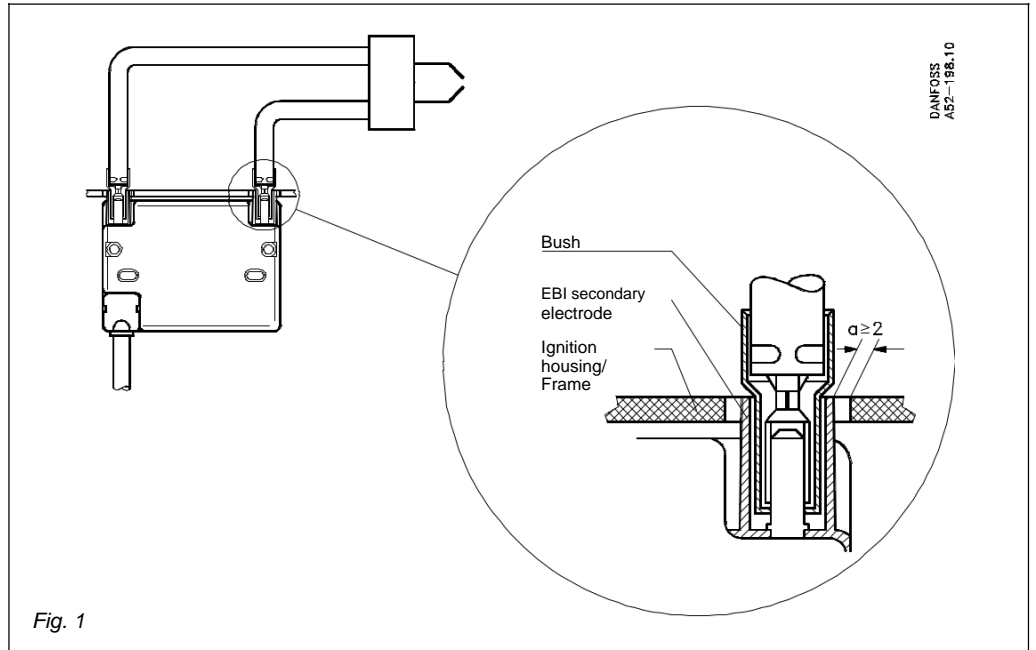
- air space between cable and frame
- leakage path
- the insulation provided by the insulation material



Installation (continued)

Avoid the secondary electrodes lying adjacent to the frame. Keep an airspace of min. 2 mm as shown in Fig. 1, and/or use suitable insulation. Leakage current at high voltages can creep over long distances (up to 50 mm),

particularly when the insulation surface is covered by grease and dirt. This is a familiar occurrence in car ignition systems.



The insulation property of ignition cables depends on the material used and the thickness of the insulation. If cables with insufficient insulation are used, especially together with divergent electrodes, there is a risk of electrical insulation breakdown should the cables

touch each other or the frame. Divergent electrodes put a higher electrical load on the insulation than conventional ignition electrodes. This is because the ignition spark is constantly blown out and must be regenerated, and the ignition voltage is typically higher.

Guidelines:

Cable types in practice	Remarks
2,5 mm Teflon	Not recommended
3 mm Teflon	In practice used a good deal Risk of electrical insulation breakdown with divergent electrodes
5 mm and 7 mm PVC	Recommended at normal temperatures Becomes stiff with age
$\epsilon$ 2,5 mm Silicone	Recommended – particularly at higher temperatures

Protection against accidental contact

Protection against accidental contact must be ensured in connection with installation. When the burner is connected it must not be possible for the final user without using tools to touch insufficiently insulated parts of the ignition circuit. The ignition circuit must be adequately insulated from metal parts which might not be earthed and which are not protected against accidental contact.

**Notes: It can be extremely dangerous to touch high-voltage terminals when the ignition unit is on!**

EMC

To guard against electromagnetic interference, the primary cable and other cables should be placed at the greatest possible distance from the ignition cables, and the distance between the ignition cables should not be too great. Particularly for radiated noise – frequencies above 30 MHz – 1 kW resistance in series with the ignition cables can reduce the radiated noise.

The resistor must be located at the end of the cable at the ignition electrodes.



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Design

EBI is compact because it incorporates an electronic circuit operating on a frequency of approx. 20 kHz. Increasing the frequency makes it possible to reduce the magnetic circuit of the high-voltage coil and also enables the transfer of the same amount of energy as with traditional transformers.

EBI units are robust, built up in a plastic enclosure with moulded-in electronic circuit. This ensures thermal stability and outstanding resistance to mechanical influences, moisture and dirt.



The design and materials used in the EBI ensure high operational stability with reliable ignition characteristics.

Intermittent operation

An ignition unit for intermittent operation must normally be cut in only for a certain length of time. The cut-in time is given as a percentage of an operating cycle of 3 minutes.

**20% ED for 3 min. at 60° C ~ 33% for 3 min. at 35° C.**

The stated ED usually applies at an ambient temperature of 35° C, but as it has become the usual practice to state the ambient temperature of electronics for burners as 60° C, we have also chosen this temperature for the EBI.

A precondition for intermittent operation is that the burner control ensures cut-in and cut-out of the ignition unit so that at no time can the ignition unit become overheated, which would damage the ignition unit.

Ignition

It is essential that the fuel is ignited rapidly and reliably so that harmful substances such as unburnt oil/gas and carbon monoxide are reduced as much as possible during the start phase.

- Avoid divergent electrodes
- Use thinner electrodes < 1.6 mm
- Choose a greater electrode distance

This is ensured with type EBI by correct electrode location, electrode form and spark gap.

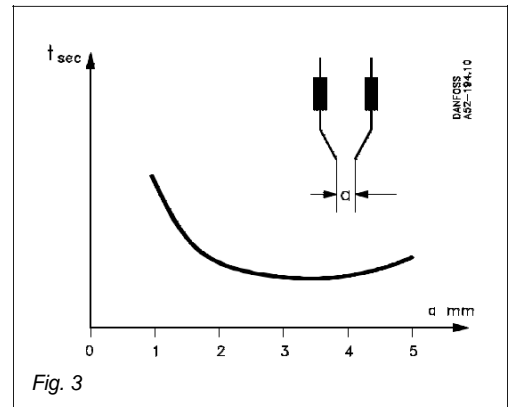
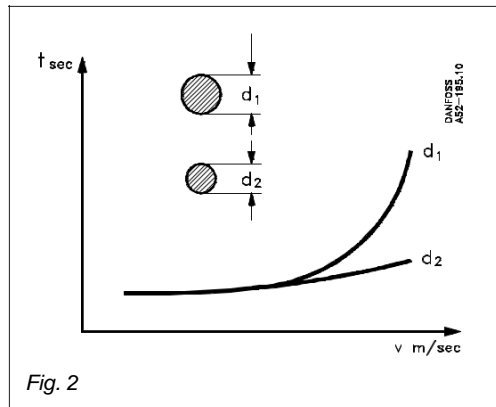
Fig. 2 shows the significance of electrode diameter in relation to ignition time on rising air velocity around the ignition spark.

Compared with traditional ignition transformers, there is no difference in the requirements on the selection of electrode form.

Fig. 3 shows the significance of electrode distance in relation to ignition time. The optimum electrode distance is burner-dependent.

If at relatively high air velocities around the electrodes there is a need to optimize ignition, the following guidelines can be helpful:

Ignition time



Technical data  
and code numbers

Type	EBI (2-pole)	EBI M *) (2-pole)	EBI 1P (1-pole)
Code number	<b>052F0030</b>	<b>052F0033</b>	<b>052F0040</b>
Primary connection	230 V-0.25 A-50/60 Hz-60 VA		
Working range	187 V - 255 V		
Main fuse	max. 10 A		
Secondary connection **)	15 kV amp.	2 x 7.5 kV amp.	11 kV amp.
Short circuit current	40 mA (rms)	40 mA (rms)	50 mA (rms)
Frequency	20 kHz	20 kHz	20 kHz
ED in 3 minutes (cutting in)	33% at 35° C or 20% at 60° C		
Ambient temperature	-10° C to +60° C		
Storage temperature	-25° C to +85° C		
Enclosure	IP 40 (Not for secondary connections)		
EMC (Generic Standard)	Emission EN 50014 Immunity EN 50082-1		
Primary connection	2 x 0.75 mm <sup>2</sup> cable with special plug Cables in 8 standard length from 180 to 2000 mm		
Secondary connections	2 x 4 mm plugs	1 x 4 mm plug	
Earthing (reference earth)	EBI M and EBI 1P with earth connection		
Distance between electrodes	Recommended 2.5 mm - 5.0 mm		
Weight	300 g		

\*) With secondary-midpoint connection.

\*\*) The voltage may vary dependent on primary voltage and length of ignition cable.

## Accessories

	Cable length in mm	Code no.
Primary cable with plug	180	<b>052F0106</b>
	250	<b>052F0100</b>
	315	<b>052F0103</b>
	355	<b>052F0105</b>
	400	<b>052F0101</b>
	500	<b>052F0104</b>
	630	<b>052F0102</b>
	2000	<b>052F0120</b>

Contents	Code no.
100 bushes	<b>052F0060</b>
Accessory set: 2 ignition cables with 4 mm electrode plug 2 x 4 mm electrode plug 2 x 6.35 mm electrode plug 1 x M4 screw 1 x M5 screw 2 x 4.2 mm self-cutting screws 1 x double-adhesive foam plastic	<b>052F0061</b>
EBI / 052F0030 Primary cable / 052F0102 Accessory set / 052F0061	<b>052F0063</b>
2 bushes 2 x 4 mm electrode plug	<b>052F0064</b>

*EBI accessory set 052F0061* is used when changing over from, for example, Danfoss ignition transformer type 52L (or another make) to type EBI. In addition to high-voltage cables and electrode plugs, the accessory set also contains an assortment of screws for mounting EBI.

It is sufficient to use a single screw and the double-sided adhesive foam pad for mounting EBI. Thus, EBI can be mounted in most existing installations without drilling new holes in the burner.

In addition to the accessory set just described, *EBI accessory set 052F0063* contains an EBI with primary cable.

The sketch on page 6 shows how the accessory set can be used.



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Dimensions

