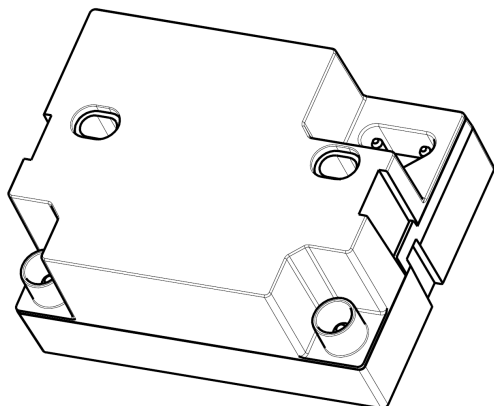
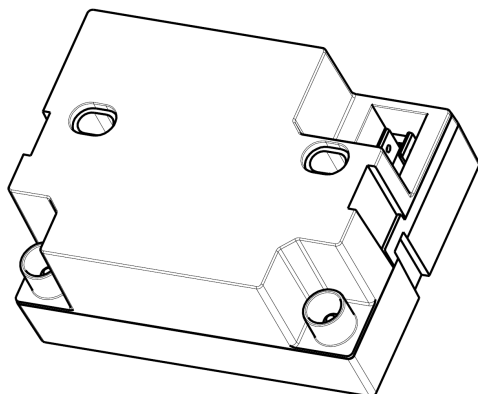


# TTXX SERIES ELECTRONIC IGNITION TRANSFORMERS WITH BUILT-IN TIMER

## TTxBx Series



## TTxFx Series



### DESCRIPTION

This series of electronic ignition transformers is unprecedented in that each ignition unit is equipped with a built-in electronic timer designed to reduce the discharge energy after a pre-determined interval of time. This new and exclusive feature renders the transformer a universal product, suitable for use with all types of gas and oil burners, in both civil and industrial applications.

The operating principle is based on a high-frequency oscillator; the voltage it generates is increased via a transformer with a ferrite core, resulting in output voltages of up to 17 kV. The inclusion of the timer function renders the transformer an ignition unit capable of functioning in continuous mode, but with a notably superior initial energy. For this reason, the presence of the timer is greatly advantageous for all applications that require a continuous discharge, while still ensuring the possibility of intermittent mode operation.

All TT types are fitted with an E.M.C. filter to minimize the emission of electromagnetic interference; in this way they don't need external filter systems and they are in compliance with the EMC directive 2014/30/EU.


### FEATURES

Followings are the main features of these ranges of transformers:

- built-in EMC filter;
- built-in timer that reduces energy discharge after 60 s;
- 33% duty cycle on 3 min. or 100% duty cycle;
- overall dimensions and fixing systems compatible with other ignition devices available in the market;
- fixing systems compatible with TC, TD and TCD series devices produced by Brahma S.p.A.;
- high efficiency and ignition power;
- low consumption;
- single pole or double-pole high voltage output option;
- different connecting system;
- inbuilt protection against short circuit;
- in oil and gas burners, the safety of ignition transformers depends on the control unit.

### APPROVALS

- The transformers comply with the essential requirements of the "Low Voltage Directive (LVD) 2014/35/EU", as they are approved by **IMQ** according to the product standards EN 61558-1:2005+A1:2009 and EN 61558-2-3:2010.

Type	Certificate no. 
TTxxx	<b>CA04.08307</b>

- The transformers type TTxxx 110-120 V, 50/60 Hz are also available in UL approved version with "Certificate Number 20151123-E331308" according to the standards "UL 506 Standard for Specialty Transformers, 13th Edition" and "C22.2 No. 13 Standard for Luminous Tube Signs, Oil or Gas Burner Ignition Equipment 1st Edition".

## TECHNICAL DATA

	TT1x up to 60 s		TT1x after 60 s		TT2x up to 60 s		TT2x after 60 s	
	230 V	110-120 V	230 V	110-120 V	230 V	110-120 V	230 V	110-120 V
Supply voltage	230 V	110-120 V	230 V	110-120 V	230 V	110-120 V	230 V	110-120 V
Number of poles	1				2			
Output peak voltage kV (1)	17				2 x 13			
Rated output voltage kV (4)	6		4		2 x 4.5		2 x 4.1	
Output peak current mA (2)	83				62			
Rated output current mA (2)	37	34	26	25	30	27	21	19
Output voltage frequency kHz (1)	7				10			
Output voltage frequency kHz (2)	13				12			
Consumption VA (3)	31	28	23	20	29	25	19	18

### NOTES

- (1) 30 pF load output.
- (2) Short circuit output.
- (3) 5 mm spark gap.
- (4) No-load output.

- **Supply voltage:** 230 V 50/60 Hz  
on request 110-120 V / 50-60 Hz
- **Protection fuse according to EN 60127:** F1A 250V
- **Duty cycle:**  
100% if used in continuous mode  
33% in 3 min if used in intermittent mode
- **Operating temperature range:**  
230V versions -20 ... +60 °C  
110-120V versions -20 ... +60 °C  
UL 110-120V versions -20 ... +50 °C
- **Time delay timer:**  
230V versions 60 s (tolerance -25% +45%)  
110-120V versions 60 s (tolerance -35% +70%)
- **Protection degree:** depends from wiring
- **Winding class:** F
- **Recommended distance between the electrodes:** 3÷5 mm
- **Max. ignition cable length:** 1.5 m
- **Weight:** 250 g approx.

### EXAMPLES OF USE

If the transformer is used in intermittent mode, the cycle of 33% in 3 minutes must be respected, with functioning identical to the intermittent mode functions of the TC, TD and TCD series.

If the transformer is used in continuous mode, a discharge energy equivalent to that produced by a transformer functioning in intermittent mode, will be supplied in the first 60s. After 60s the discharge energy decreases and the transformer provides performance equal to the continuous operating modes of the TC, TD and TCD series.

### CONSTRUCTION

The working principle based on the use of a high frequency electronic oscillator has enabled to develop a device with limited dimensions and weight, but with high ignition power.

The electronic circuit and the transformer with ferrite nucleus are bathed in a special kind of resin with very good thermal conductivity and a specific coefficient of expansion, which ensures high resistance to temperature variations and to the overload due to protracted working.

An inbuilt varistor protects the device from possible voltage transients in the mains supply.

### DEVICES DENOMINATIONS

The transformers of these series are available in different versions as regards:

- the number of poles
- the type of connection
- fixing of high voltage cables

on this subject, see the following scheme:

### TR.EL. TT X X X

- ↳ **not indicated:** With terminal;
- ↳ **V:** Screw;
- ↳ **F:** supply with fast-on (Fig. 3);
- ↳ **B:** supply with triangular outlet type SP1 (Fig. 4);
- ↳ **1:** single pole;
- ↳ **2:** double poles;

Example: TR.EL. TT2B is a transformer type *TT*:

- double poles (2)
- supply with triangular outlet type SP1 (B)
- fixing with cylindrical terminal ( )

### OVERALL DIMENSIONS

The main overall dimensions of the transformers equipped with fast-on or outlet type SP1 are illustrated in Fig. 1 (u.m. mm). To fix the transformers, screws type M4 or M5 should be used; the oval holes enable a variation of the fixing wheel base between 57.6 mm and 63.2 mm.

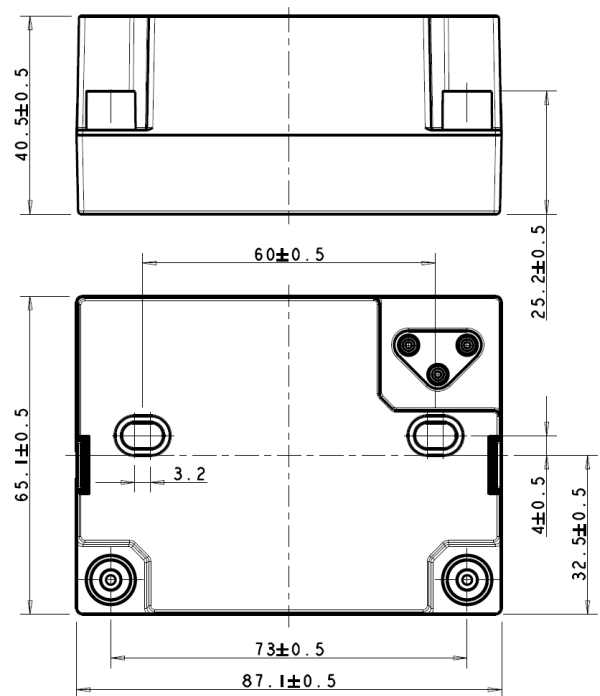


Fig. 1

### CONNECTION

The transformers can be provided with a power supply cable equipped with a triangular die-cast outlet type SP1 (Fig. 2/4), or female terminals of 6.35x0.8 dimensions (for outlet of Fig.3); cable length and termination type depend on customer's request.

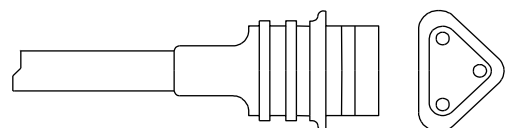


Fig. 2

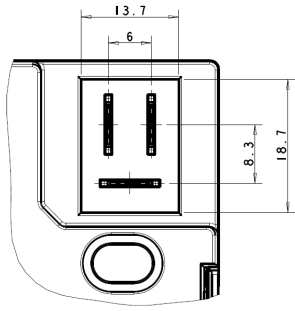


Fig. 3

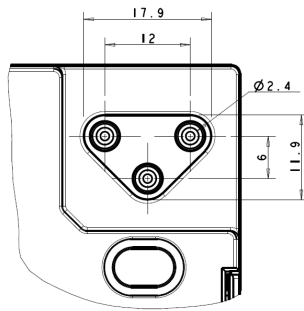


Fig. 4

The connection of high voltage cables can be carried out by means of a cylindrical terminal with 4 mm diameter as shown in Fig. 5 or of a screw (Fig. 6). All connectors, including the ones complete with cable, can be supplied on request. More detailed information on high tension cables provided with cylindrical terminal is available in the PC.../PD... series technical data (see [www.brahma.it](http://www.brahma.it)).

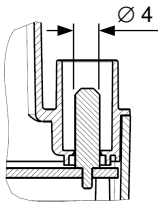


Fig. 5

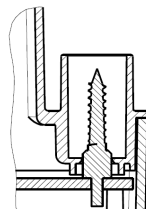


Fig. 6

## INSTALLATION



- Caution! There might be dangerous voltages.
- Connect and disconnect the ignition transformer only after interrupting the mains supply.
- Respect the applicable national and European standards (e.g. EN 60335-1 / EN 60335-2-102) regarding electrical safety.
- Make sure that the earth of the ignition transformer and the earth of the electrical system are well connected.
- The device can be mounted in any position.
- Avoid putting high voltage cables next to other cables.
- Ensure a protection degree suitable to the application.

## EMC FILTER

With particular reference to the use of ignition transformers in oil or gas burners, you will find here below some remarks about the application of these devices, resulting from the research carried out by the Brahma Test Laboratory. This Laboratory, in compliance with EN 55014-1, is adequately equipped for the measuring of electromagnetic interference in boilers, burners, hot air generators and heating systems in general.

According to the EMC directive 2014/30/EU, the above mentioned products must be subjected to the measuring of conducted electromagnetic interference in the mains supply, irradiated by the supply cable; the measuring is carried out on the basis of a frequency range from 150 kHz to 30 MHz in case of conducted interference, and from 30 to 300 MHz in case of irradiated interference.

Electromagnetic interference is mainly due to power variations in the electric circuits (i.e. current peaks); the greater and faster these variations, the higher the interference. In the case we are considering, the main source of interference is the discharge of the ignition transformer: the irregular discharge current causes the emission of interference on a wide frequency range.

To keep the products within the limits allowed by the present standards, a special capacitive-inductive filter is generally installed in series to the mains supply, in order to reduce electromagnetic interference with frequency up to 20 MHz approx. For the frequency range beyond this limit, it is useful to mount a resistor of a few kΩs in series to the ignition electrode, as in this case the interference is due to the high current peak generated whenever an electric arc is produced. The stronger the stray capacitance between ignition electrodes and cables and burner metal casing, the higher the current peak. The above mentioned resistor has the function of keeping the current peak as low as possible; the closer to the source of electric discharge, the greater the effectiveness of the resistor. Besides the obvious advantage of reduced assembly costs, the fitting of an EMC filter inside the ignition transformer ensures the elimination of electromagnetic interference in close proximity to their source, without involving the remaining electric circuit.

Finally, the following solutions are always effective to reduce the emission of electromagnetic interference:

- ignition cables should be as short as possible (this will reduce their stray capacitance and their possibility of acting as antennas, transferring electromagnetic interference to the nearby cables);
- use distributed resistance cables or mount a resistor near the electrodes (few kΩs can reduce the current peak);
- let ignition cables follow a separate path, close to ground planes (this will reduce the influence of electromagnetic interference on the remaining electric cables);
- make a single earth centre, preventing the earth conductors from creating circular paths.



## NOTES FOR THE DISPOSAL OPERATION

The device contains electronic components and it must not be disposed of as a domestic waste. For the disposal operation refer to the local rules concerning special waste.

**ATTENTION ->Company Brahma S.p.A. declines any responsibility for any damage resulting from the Customer's interfering with the device.**

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