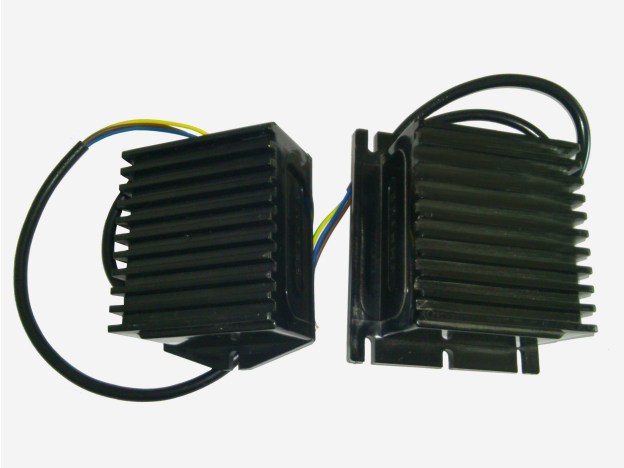
ELECTRONIC IGNITION TRANSFORMERS WITH BUILT-IN TIMER (replacing types T8-T18)

TTA/TTBxxxx 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 electrical characteristics of these transformers make them suitable to replace induction ignition transformers type T8 and T18, with considerably reduced overall dimensions and higher performance.
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 20 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 TTA/TTB types do not need any external filtering system, as they are fitted with a built-in filter to minimize the emission of electromagnetic interference, thus being in compliance with the EMC directive 2004/108/EC.
In oil and gas burners the safety of the ignition transformer depends on the burner control unit.

FEATURES

Followings are the main features of this range of transformers:
– built-in EMC filter;
– built-in timer that reduces energy discharge after 60 s;
– 100% duty cycle or 33% duty cycle in 3 min. option;
– high efficiency and ignition power;
– low consumption;
– single-pole or double-pole high voltage output option;
– different connection options;
– built-in protection against short circuit.

TECHNICAL DATA

- **Power supply**: 220-240V/50-60Hz
  110-120V/50-60Hz
- **Duty cycle:** 100% in continuous mode operation
  33% in 3 min. in intermittent mode operation
- **Operating temperature:** -20℃ +60℃
- **Timer delay:** 60s -25% +45%
- **IP rating:** depending on wiring
- **Winding class:** F
- **Recommended distance between the electrodes:** 3÷5 mm
- **Max. ignition cable length:** 1,5 m
- **Weight:** 500 g approx.

Technical data measured in 220-240VAC	TTA1/TTB1 up to 60s	TTA1/TTB1 after 60s	TTA2/TTB2 up to 60s	TTA2/TTB2 after 60s
Output peak voltage kV (1)	20	20	2x15	2x15
Output peak current mA (2)	85	85	115	115
Output RMS current mA (2)	32	21	40	22
Output voltage frequency kHz (1)	7	7	8	8
Output voltage frequency kHz (2)	10	10	10	10
Consumption VA (3)	35	25	45	35

(1) No-load secondary and 30 pF load.
(2) Shorted secondary.
(3) 5 mm spark gap.

CONSTRUCTION

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

The electronic circuit and the transformer with a ferrite core 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.

The transformers of this series are available in different versions as regards the number of poles, the position of the isolators, the type of fixing and the power supply connection; on this subject see the following scheme:

TTA/TTB X X X X

- C: cable power supply (Fig. 1 and 2); P: plug power supply (Fig. 3);
- V: screw fixing (Fig. 4); T: Ø 4 terminal fixing (Fig. 4);
- L: lateral isolators (Fig. 1 and 2); S: bottom isolators (Fig. 1 and 2);
- 1: single pole; 2: double pole;

For example, the designation TTB2STP refers to a transformer with the following characteristics:

- two lateral fixing slots (B);
- double-pole high voltage output (2);
- bottom isolators (S);
- ∅4 mm terminal connection (T);
- plug power supply (P).

EXAMPLES OF USE

If the transformer is used in intermittent mode, the cycle of 33% in 3 minutes must be respected; in this case the transformer provides performance higher than the T8 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 higher than the T18 series.

OVERALL DIMENSIONS

The main overall dimensions of the transformers are illustrated in Fig. 1 and 2. In particular, Fig. 1 shows types TTA, while Fig. 2 refers to types TTB. The transformers can be fixed by means of M4x10 screws.

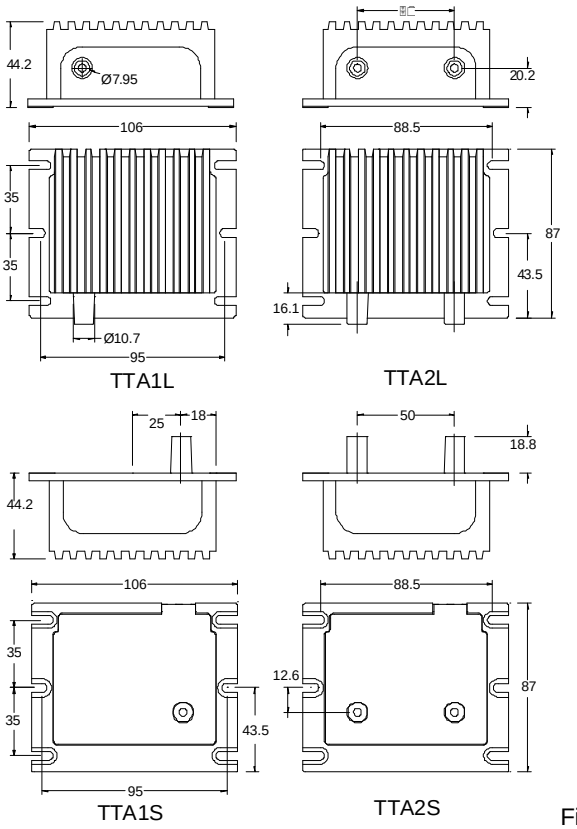


Fig. 1

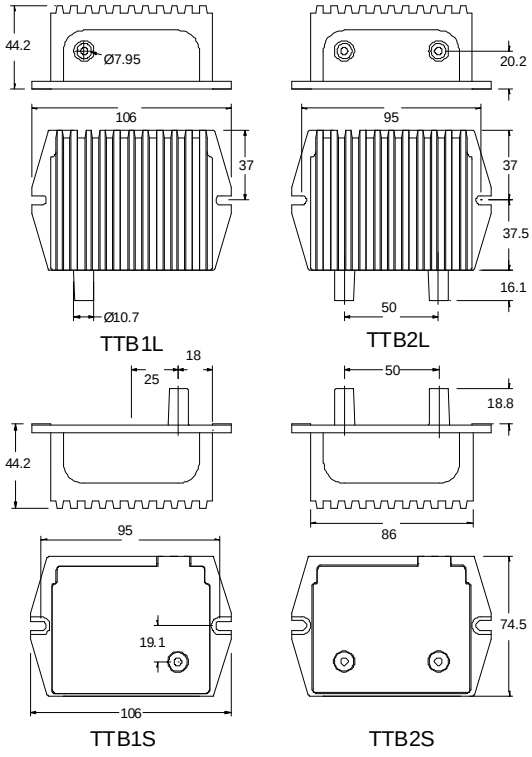


Fig. 2

CONNECTION

All transformers can be supplied with cable or with power supply plug; see for example Fig. 3, showing in detail the power supply plug of a transformer with bottom isolators.

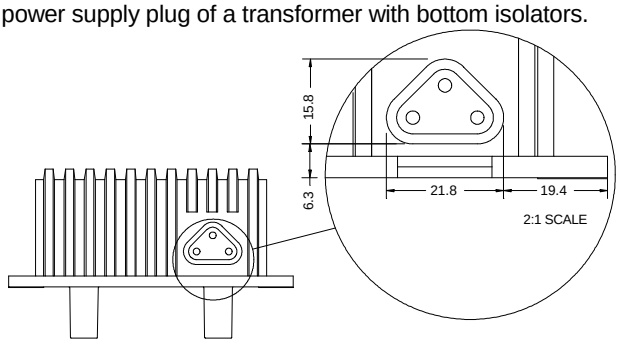
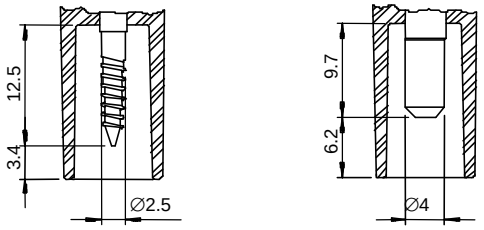


Fig. 3

The high voltage cable connection can be of two types, depending on the terminals used inside the isolators: the connection can be carried out by means of a screw or by means of a diam. 4mm terminal, as illustrated in Fig. 4. Cables with different length and termination options can be supplied upon request.



"V" version "T" version

Fig. 4

INSTALLATION

- Caution! Possible high voltage danger.
- Connect and disconnect the transformer only after switching off the power supply.
- Respect the applicable national and European standards (e.g.. EN 60355-1 / EN 50165) 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 placing 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 CISPR-16) is adequately equipped for the measuring of electromagnetic interference according to EN 55014-1 in boilers, burners, hot air generators and heating systems in general.

According to the EMC directive 2004/108/EC, the above-mentioned products must be subjected to the measuring of conducted electromagnetic interference on the connection terminals and of irradiated interference from the power supply cable; the measuring is carried out on the basis of a frequency range from 150kHz to 30MHz in case of conducted interference and from 30 to 300MHz in case of irradiated interference.

Electromagnetic interference is mainly generated by power variations in the electric circuits (i.e. current peaks); the greater and faster these variations, the higher the interference. In the above-mentioned applications, 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 standard in force, a special capacitive-inductive filter is generally installed in series to the mains supply, in order to reduce electromagnetic interference with a frequency of 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 electrodes; the purpose of this component is to reduce the 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 closer to the source of electric discharge, the higher the effectiveness of the resistor.

Besides the obvious advantage of reduced assembly costs, mounting an EMC filter inside the ignition transformer ensures the elimination of electromagnetic interference in close proximity to its source, without involving the remaining electric circuit.

Finally, please find below some suggestions that may be helpful to reduce the emission of electromagnetic interference in any case:

- 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, preferably, mount a resistor next to the ignition 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 earth conductors from creating circular paths.

ATTENTION → Company Brahma S.p.A. takes no responsibility for any damage resulting from Customer tampering with the device.

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