

TR23 CUSTOMER DESIGN

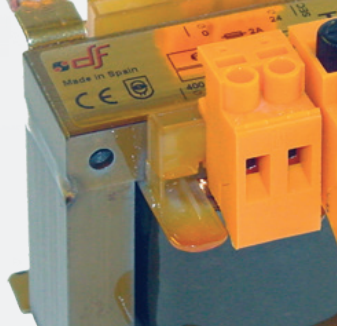
single-phase transformers

TR23



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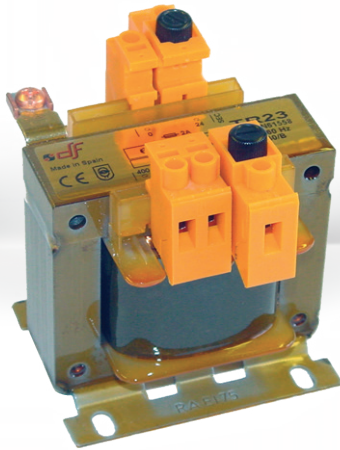
TR23

POWER
10VA...1000VA

PRI VOLTAGE
ON REQUEST

SEC VOLTAGE
ON REQUEST

STANDARDS
IEC/EN 61558-1
IEC/EN 61558-2-1
IEC/EN 61558-2-2
IEC/EN 61558-2-4
IEC/EN 61558-2-6



TR23 CUSTOMER DESIGN

Single-phase transformers

TR23 range comprise special single-phase transformers manufactured on request.

According the use and their characteristics they can be classified as:

- Control
- Safety
- Isolating
- General use

The range comprises rated power between 10VA to 1000VA.

They are sized for continuous service at 100% of power in an ambient temperature up to 40°C.

Rated voltages on request (maximum 750V). These transformers can withstand an input overvoltage of up to 10%.

We can manufacture transformers with terminal block with fuse for 5x20 fuses (max. 10A), thermal protectors, with electrostatic screen, etc.

Range

POWER (VA)

10-12-16-20

25-30

40

50

63

100

160

200

250

320

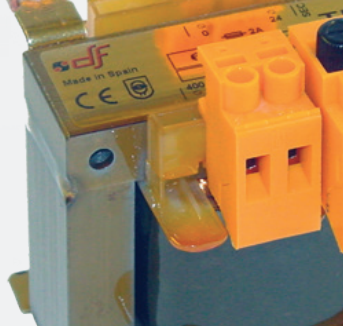
400

500

630

800

1000



Technical data

Rated primary voltage	ON REQUEST 10VA...30VA > max 440V 40VA...1000VA > max 750V
Rated secondary voltage	ON REQUEST 10VA...30VA > max 440V 40VA...1000VA > max 750V
Rated power range	10VA ... 1000VA
Protection against electric shock	Class I
Thermal class	B (130°C)
Rated ambient temperature	40°C
Protection index	IP00
Frequency	50/60Hz
Dielectric strength between primary and secondary	≥4,5kV
Dielectric strength between windings and metallic parts	≥2,5kV
Ambient temperature of service *	-20°C ... 70°C
Storage temperature	-40°C ... 85°C

* For ambient temperatures higher than 40°C it is necessary to apply a derating.

Standards

IEC/EN 61558-1 Transformers, general specifications
IEC/EN 61558-2-1 General use transformers
IEC/EN 61558-2-2 Control transformers
IEC/EN 61558-2-4 Isolating transformers
IEC/EN 61558-2-6 Safety transformers
RoHS Compliant



Constructive characteristics

Windings in F(155°C) or H(180°C) thermal class

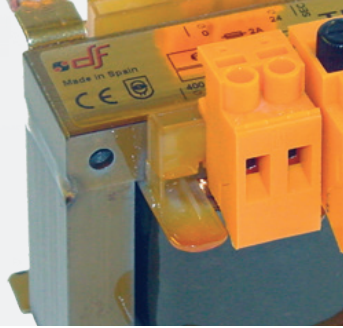
Flexible insulation Class F (130°C)

Impregnation Class F (155°C)

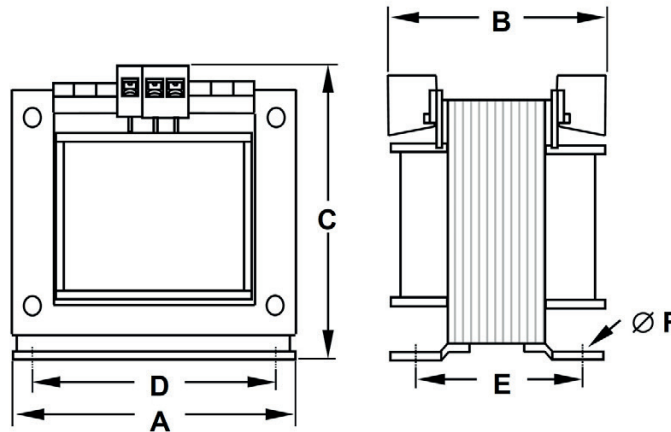
Connections with accidental contact protected terminal blocks

Screw earth connection (standard IEC/EN61558 prescribes in the clause 24 that it should not be possible to loosen the protection wire without the aid of a tool)

TIG welded magnetic core prevent vibration and allows small air gap to reduce the magnetization current



Dimensions



APPLY TABLE 1

FOR TRANSFORMERS WITH THE FOLLOWING CHARACTERISTICS:

- Only one primary voltage up to 400V
- Only one secondary voltage between 12 and 230V
- WITHOUT electrostatic screen

For transformers with other characteristics APPLY TABLE 2

TABLE 1

POWER (VA)	DIMENSIONS (mm)						WEIGHT (kg)
	A	B ¹	C ²	D	E	F	
10-12-16-20-25	60	71	77	44	39	3,6	0,51
30-40	60	76	77	44	49	3,6	0,74
50	75	77	88	56	54	4,8	1,00
63	75	82	88	56	54	4,8	1,10
100	84	80	95	64	52	4,8	1,35
160	84	94	95	64	67	4,8	1,96
200	96	96	106	84	77	5,7	2,68
250	96	110	106	84	91	5,7	3,35
320							
400							
500							
630							
800							
1000							

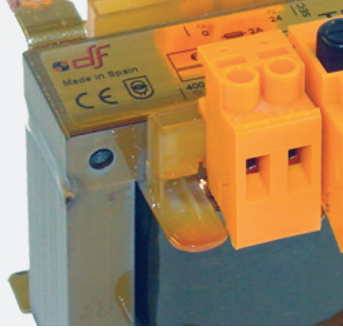
SEE TABLE 2

TABLE 2

POWER (VA)	DIMENSIONS (mm)						WEIGHT (kg)
	A	B ¹	C ²	D	E	F	
10-12-16-20	60	71	77	44	39	3,6	0,51
25-30	60	80	77	44	49	3,6	0,74
40	75	77	88	56	47	4,8	1,00
50	75	82	88	56	54	4,8	1,10
63	84	80	95	64	52	4,8	1,35
100	84	94	95	64	67	4,8	1,96
160	96	96	106	84	77	5,7	2,68
200	96	110	106	84	91	5,7	3,35
250	108	99	115	80,5	73	5,7	3,64
320	108	111	115	80,5	87	5,7	4,40
400	120	106	124	90	87	5,7	4,90
500	120	126	124	90	107	5,7	6,70
630	150	114	146	122	92	6,8	7,50
800	150	133	146	122	108	6,8	9,80
1000	150	156	146	122	135	6,8	13,2

¹ Terminal block with fuse: +8,5mm
Terminal block with current > 32A: +16mm

² Terminal block with fuse: +5mm
Terminal block with current > 32A: +8,5mm



Transformer protection

The transformers (and their lines) must be protected against overloads and/or short-circuits that they can be submitted during its use, and that could cause dangerous situations for persons, animals or installations.

This protection is also a requirement of the standards of these products and the regulations about the electrical installations.

Due to the high inrush current (about $25 \cdot I_n$) it is very difficult to get an optimal protection in the primary side. If we select the rated current of fuses according to the rated current of transformer, the inrush current will melt the fuses.

On the other hand, if the fuses are overrating for withstand the inrush, the transformer won't have a good protection against overloads.

For this reason we recommend to protect the transformers on the secondary side (output).

We recommend to protect the utilization side (output) of the transformer and his line against the overloads and short circuits.

We must also to protect the line of the primary side (input) against short circuits.

As a general rule, we can apply the following criteria in order to achieve an optimal protection:

Protection on the **output side** (load)

In this part can appear overloads (if the user try to obtain a power higher than the rated power) as well as short circuits.

In order to achieve a good protection, the device (fuse link, circuit breaker or similar) must be capable to interrupt all range of currents (overloads and short circuits) and must have a rated current equal or lower than the output rated current of the transformer.

We can use:

- Miniature fuses 5x20 or 6x32 according to IEC/EN60127.
- Fuse links class gG according to IEC/EN60269
- Circuit breakers type C or D

Protection on the **input side** (supply line)

In this part there is no risk of overload because if the output protection has been correctly selected, it will operate if appear an overload at the output side and the load will be disconnected of the transformer.

For this reason we only must protect the input line of transformer against short circuits in the line, in the transformer connections or inside the windings in a hypothetical failure of the insulations.

When the autotransformer is energized, it can demand a high momentary current (can be about 25 times the rated current) with a duration of a few milliseconds, that decrease very quickly until reach the rated value.

These factors should be taken into account to choose the protection in order to avoid the fusing of the fuses or the not desired operation of the circuit breakers.

For the protection of the line side (output side) of the TR23 transformers we can use the following devices:

- Miniature fuses 5x20 or 6x32 with time delay characteristic (T) according to IEC/EN60127

In fuse link $\geq 3 \cdot I_n$ transformer

- Fuse links class aM according to IEC/EN60269

In fuse link $\geq 1,8 \cdot I_n$ transformer

- Fuse links class gG according to IEC/EN60269

In fuse link $\geq 3 \cdot I_n$ transformer

- Circuit breaker D type

In MCB $\geq 1,8 \cdot I_n$ transformer



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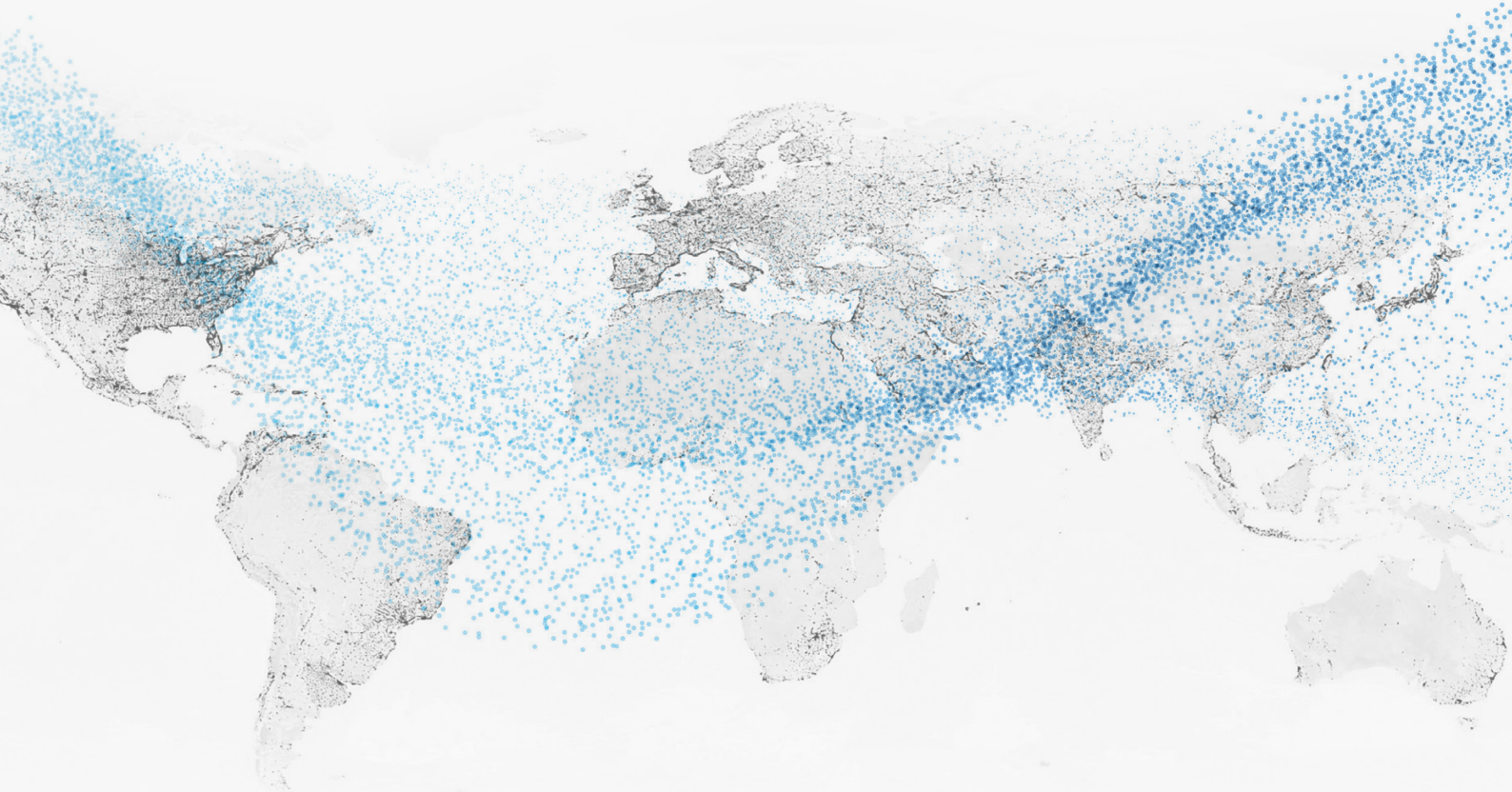
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The products described in this document have been designed, developed and tested in accordance with specific standard. They are considered components that are integrated as part of installation, machine or equipment. The correct general operation of the referred product is responsibility of the manufacturer of the installation, machine or equipment.

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