

**TRANSFORMADORES MONOFÁSICOS DE MANDO,
SEGURIDAD Y SEPARACIÓN IP20**
*IP20 SINGLE-PHASE CONTROL, SAFETY AND
ISOLATING TRANSFORMERS*

TR28 ElectroMechanica



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PRODUCT DESCRIPTION

TR28 5.2 type transformers are intended for use as control or signalling transformer as well as general use transformer with a protection index IP20.

Protected against solid objects greater than 12,5 mm as, for example, a finger due to the protection index IP20.

The range comprises rated power between 40 VA to 1250 VA.

They have been designed with low impedance windings for excellent voltage regulation. They accommodate the high momentary inrush current caused when electromechanical devices are energized.

They are sized for continuous service at 100% of power in an ambient temperature up to 25°C. For ambient temperatures above 25°C it is necessary to apply a derating.

Great versatility due to the primary voltage possibilities with regulation taps and the secondary windings with serial-parallel connection.

Primary voltage 240-400-525±20 V..

Secondary windings comprise two identical windings intended to serial or parallel connection, thus the user can obtain full power in any selected voltage.

The possibilities are: 12-24V or 115-230V

The TR28 transformers are delivered with parallel connection (lower voltage).

Rail fixing in rated power up to 400 VA

STANDARDS

IEC/EN 61558-1 Transformers, general specifications

IEC/EN 61558-2-2 Control transformers

IEC/EN 61558-2-4 Isolating transformers

IEC/EN 61558-2-6 Safety transformers

DF retains the right to change the dimensions, specifications, materials or design of its products at any time with or without notice.

RANGE

POWER (VA) ta 25°C	SEC 12-24 V	SEC 115-230 V
40	680040040	680040042
63	680063040	680063042
100	680100040	680100042
130	680130040	680130042
200	680200040	680200042
250	680250040	680250042
320	680320040	680320042
400	680400040	680400042
500	680500040	680500042
630	680630040	680630042
800	680800040	680800042
1000	681000040	681000042
1250	681250040	681250042

ta = *maximum ambient temperature*

TECHNICAL FEATURES

- SEC 12-24V: control and safety transformer.



- SEC 115-230V: control and isolating transformer



- Class I protection against electric shock.
- Rated primary voltage **0-240-400-525±20 V**
- Rated secondary voltage: 12-24V or 115-230V
- Thermal class B (130°C)
- Maximum ambient temperature (25°C) (for higher ambient temperatures apply derating)
- Frequency: 50/60 Hz
- Protection index: IP20
- Dielectric strength between primary and secondary: $\geq 4,5$ kV
- Dielectric strength between windings and metallic parts: $\geq 2,5$ kV

TECHNICAL FEATURES

Typical values

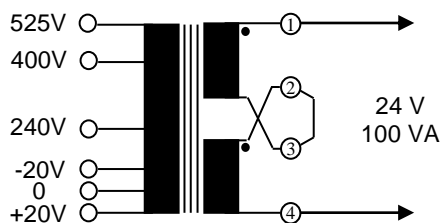
RATED POWER (VA) ta25°C	RATED POWER (VA) ta40°C	INSTANTANEOU SPower ¹⁾	NO-LOAD CURRENT (I ₀)	NO-LOAD LOSSES (P _{FE})	TOTAL LOSSES (P _{Cu} + P _{FE})	U _{cc}	EFFICIENCY	VOLTAGE DROP
(VA) ta25°C	(VA) ta40°C	(VA)	(% I _n)	(W)	(W)	(%)	(%)	(%)
40	25	75	83,46	2,39	4,58	8,0	78,75	8,75
63	40	120	78,29	3,81	6,15	5,5	73,50	6,21
100	63	150	56,16	4,54	8,60	6,1	80,52	5,84
130	100	230	36,40	5,51	13,27	7,2	85,49	7,39
200	160	350	28,72	7,52	18,47	5,8	87,63	6,35
250	200	450	33,50	7,81	18,61	5,3	88,29	5,06
320	250	600	20,63	8,05	22,92	5,8	90,56	4,60
400	320	800	19,10	9,14	26,52	5,2	91,64	6,08
500	400	950	21,07	11,94	33,07	5,2	91,38	3,72
630	500	1275	19,54	14,57	34,48	4,0	92,95	3,35
800	630	1700	17,55	17,05	40,69	3,9	92,43	4,27
1000	800	2100	16,55	23,53	51,10	3,5	92,95	3,89
1250	1000	3300	15,08	28,76	58,76	3,1	93,88	2,21

1) Maximum output delivered at a power factor $\cos \varphi = 0,5$ for a short time and for a output voltage of at least $0,95 \cdot U_n$.

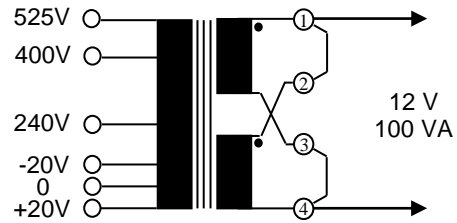
CONEXION POSSIBILITIES

CONNECTION POSSIBILITIES IN A TRANSFORMER 0-240-400-525V//12-24 V 100 VA

CONEXIÓN SERIE
SERIAL CONNECTION



CONEXIÓN PARALELO
PARALLEL CONNECTION



CONSTRUCTIVE CHARACTERISTICS

- Two identical secondary winding intended for serial or parallel connection (jumpers supplied with the transformer).
- Windings in F (155°C) or H (180°C) thermal class.
- Flexible insulation class B (130°C).
- Impregnation class B (130°C).
- Great capacity clamp type terminal blocks: 10mm² up to 400VA and 25mm² up to 1250VA.
- 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.

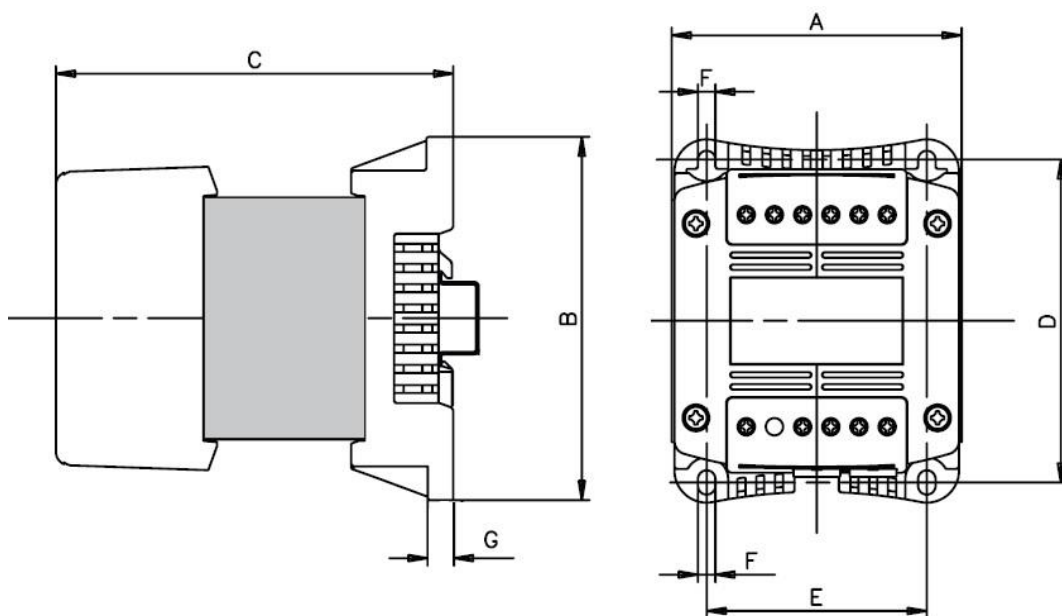
DERATING FOR HIGH AMBIENT TEMPERATURES

If the transformer works in ambient temperature above 25°C, it is necessary to apply a derating to adapt transformer power to the ambient where it works in order to avoiding an excess heating that decrease life of transformer.

The following table shows the maximum power recommended for different ambient temperatures.

MAXIMUM POWER OF USE FOR $t_a > 40^\circ\text{C}$ (VA)										
RATED POWER (VA) at $t_{a25^\circ\text{C}}$	AMBIENT TEMPERATURE ($^\circ\text{C}$)									
	25°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C	75°C	80°C
40 VA	40	25	23	21	19	17	15	13	12	10
63 VA	63	40	37	34	31	28	25	21	18	15
100 VA	100	63	58	53	48	44	39	34	29	24
130 VA	130	100	92	85	77	69	61	54	46	38
200 VA	200	160	148	135	123	111	98	86	74	61
250 VA	250	200	185	169	154	138	123	107	92	77
320 VA	320	250	231	211	192	173	154	134	115	96
400 VA	400	320	295	271	246	221	197	172	147	123
500 VA	500	400	369	338	307	277	246	215	184	153
630 VA	630	500	461	423	384	346	307	269	230	191
800 VA	800	630	581	533	484	436	387	338	290	241
1000 VA	1000	800	738	677	615	553	491	430	368	306
1250 VA	1250	1000	923	846	769	691	614	537	460	383

DIMENSIONS AND WEIGHTS



<i>POWER</i> (VA) (ta25°C)	<i>DIMENSIONS (in mm)</i>							<i>WEIGHT</i>
	A	(kg)	C	D	E	F	G	
40	84	113	96	101	66	5	7,5	1,17
63	84	113	105	101	66	5	7,5	1,48
100	84	113	112	101	66	5	7,5	1,83
130	84	113	116	101	66	5	7,5	2,00
200	84	113	131	101	66	5	7,5	2,65
250	108	135	133	120	82	6,5	9,5	4,20
320	108	135	138	120	82	6,5	9,5	4,45
400	108	135	148	120	82	6,5	9,5	5,00
500	120	152	141	135	94	7	9,5	5,86
630	120	152	156	135	94	7	9,5	7,08
800	150	177	140	160	115	7	2	8,68
1000	150	177	160	160	115	7	2	11,5
1250	150	177	182,6	160	115	7	2	14,4

PROTECTION

The transformers (and their lines) must be protected against overloads and/or short-circuits that they can be submitted in use, and could causes dangerous situations for persons, animals or 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. In 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 this transformers on the secondary side (output).

The rated current for the fuses are indicated below.

For rated currents up to and including 6,3 A we can use 5x20 or 6x32 fuses according to IEC/EN60127. The characteristics (fast, slow, etc.) it depends of the load.

For rated currents above 6,3 A the adequate type of fuse links are those according to IEC/EN60269. (class gG).

RATED CURRENT OF FUSE LINKS PROTECTION ON SECONDARY SIDE				
POWER	OUTPUT VOLTAGE			
(VA)	12 V	24 V	115 V	230 V
40	3,15 A	1,6 A	315 mA	160 mA
63	5 A	2,5 A	500 mA	250 mA
100	8 A	4 A	800 mA	400 mA
160	12 A	6,3 A	1,25 A	630 mA
200	16 A	8 A	1,6 A	800 mA
250	20 A	10 A	2 A	1 A
320	25 A	12 A	2,5 A	1,25 A
400	32 A	16 A	3,15 A	1,6 A
500	40 A	20 A	4 A	2 A
630	50 A	25 A	5 A	2,5 A
800	63 A	32 A	6,3 A	3,15 A
1000	80 A	40 A	8 A	4 A
1250	100 A	50 A	10 A	6 A