Single phase safety and insulating transformers IP00

Technical data:	
Frequency	50 Hz
Thermal class	B & F
Losses in the core sheets	1,3 - 1,5 W/kg
Insulation voltage	4000V between coils 2000V between coils and ground
Primary voltage	230 V/50 Hz 230 V +/- 15V 50 Hz - type EURO
Standard	EN 61558-2-4
Service type	Continuous
Protection index	IP00

Technical features chart of single phase safety and insulating transformers. Thermal class B

Fall secondary windigs power (VA)	No-load losse s Δ P (W)	Losses (short circuit) Δ P (W)	Ucc (cos φ=1) (%)	Efficiency (cos φ=1) (%)
30	2,9	3,1	11	0,83
50	6,4	3,9	10	0,82
75	7,9	6,6	9	0,84
100	3,6	7,6	7,8	0,89
150	6,2	8,8	7	0,91
200	6,3	11,6	6,5	0,92
250	8,2	14,8	6	0,92
300	9,3	17	5,3	0,92
400	14,5	22,5	4,5	0,92
500	18,4	27,6	4,5	0,92
630	18,5	29,5	5	0,93
800	22	33	5	0,94
1000	24	42	4,5	0,94
1600	28	62	4	0,94
2000	36	69	3,5	0,95
2500	47	85	3,5	0,95
3000	59	95	3	0,95
4000	72	113	3	0,95
5000	76	131	2,8	0,96
6000	76	139	2,8	0,96
8000	75	196	2,5	0,97
10000	88	248	2,5	0,97

Technical features chart of single phase safety and insulating transformers. Thermal class F

Fall secondary windigs power (VA)	No-load losse s Δ P (W)	Losses (short circuit) Δ P (W)	Ucc (cos φ=1) (%)	Efficiency (cos φ=1) (%)
40	3,7	3,3	11,4	0,81
63	6,2	5,5	11	0,81
100	9,6	7	7,8	0,86
160	6,9	13	10	0,88
200	8,6	16	9,5	0,89
250	10	16	7,7	0,90
300	12	20	7	0,90
400	15	24	6,8	0,91
500	18	28	6,3	0,91
630	20	33	5,8	0,92
1000	27	46	5	0,93
1600	32	74	5	0,94
2000	41	80	5	0,94
2500	50	91	4,5	0,94

Single phase safety and insulating transformers IP20 DIN rail mounted

Technical data	
Primary voltage	0 - 230V - 400V +/- 15V (50-60 Hz)
Thermal class	F
Cable section	10 mm²
Protection	IP20
Fixing	on DIN rail
Standard	EN 61558-1
Service type	Continuous
Protection index	IP 20

Technical parameters for insulating transformers. Thermal class F. Fixed on DIN rail.

Fall secondary windigs power (VA)	No-load losse s Δ P (W)	Losses (short circuit) Δ P (W)	Ucc (cos φ=1) (%)	Efficiency (cos φ=1) (%)
30	7,6	4,2	11,0	0,89
40	7,8	5,0	9,0	0,88
50	8,0	6,0	8,0	0,88
63	8,0	7,0	7,8	0,86
75	8,2	7,2	7,5	0,85
100	8,3	9,1	7,2	0,83
160	8,2	14,8	6	0,92
200	8,3	15,2	5,7	0,92
250	9,3	17	5,3	0,92
300	9,4	18,3	5,0	0,91

Generally about transformers

The transformers must be protected against possible overloads and short circuits. Our transformers belong to the non-short-circuit-proof type and so they must be protected using external fuses. Rated current of the suggested fuse is always indicated on our labels. However the protection can be also obtained using Miniature Circuit Breakers - ETIMAT. Selected protection of the input winding of the transformer must be chosen taking into account that at the starting phase of the transfomer, a high value of inrush current is generated, a value that can reach 25 times the value of the input rated current, for about 10 milliseconds. Hence, time delay fuses (T or aM type) or MCB - ETIMAT having D or K characteristic must be used for a correct protection. The protection of the secondary side can be realized using fuses of F or gG type, or MCB - ETIMAT having B or C characteristic. Here below there is a table with all the suggested protection fuses for the input and output windings (all the values are in Ampere):

General rules for choosing a transformers protection

Fall secondary windigs power (VA)	Rated value of aM or T fuse for secondary side protection (A)				Rated value of aM or T fuse for primary side protection (A)	
	Voltage U_2 24V	Voltage U_2 48V	Voltage U_2 110V	Voltage U_2 220V	Voltage U_1 230V	Voltage U_1 400V
30	1,25	0,63	0,315	0,16	0,5	0,5
50	2,0	1,0	0,4	0,2	1,0	0,5
75	3,15	1,6	0,63	0,315	1,0	1,0
100	4,0	2,0	1,0	0,5	1,0	1,0
150	6,0	3,15	1,25	0,63	1,0	1,0
200	8,0	4,0	2,0	1,0	1,0	1,0
250	10,0	6,0	2,0	1,0	2,0	1,0
300	12,0	6,0	2,5	1,25	2,0	1,0
400	16,0	8,0	4,0	2,0	4,0	2,0
500	20,0	10,0	4,0	2,0	4,0	2,0
630	25,0	12,0	6,0	3,15	4,0	2,0
800	32,0	16,0	6,3	4,0	4,0	4,0
1000	40,0	20,0	10,0	5,0	10,0	6,0
1600	63,0	32,0	12,0	6,0	10,0	10,0
2500	100,0	50,0	20,0	10,0	16,0	10,0

Transformer thermal class

Thermal class	Over temperature °C
A	75
E	90
B	95
F	115
H	140

The above over temperature values are referred to an ambient temperature of 25°C

Thermal class: The transformers have some level of power loss that causes a rising in the temperature of the metallic parts and of the windings. High temperatures cause deterioration of the materials and shorten the "average life" of the transformer itself. For this reason the international standards define some thermal classes, with a maximum over temperature value for each one. The thermal classes established by EN 61558 standard are.

Rated power:

It is the value resulting from the rated secondary winding voltage multiplied by the rated secondary current. In case of a n-phases transformers, it is the value corresponding to n times the result of rated secondary voltage multiplied by rated secondary current. If a transformer is used in a non-continuous work cycle, its power can be lower.