

## GENERAL INFORMATION

At present, the improvement of the energy efficiency cannot be considered a slogan anymore, but a need of our time.

TR-eco series high efficiency transformers are created for this purpose guaranteeing:

- In conformity with all features of EU-Norm 4548/14
- savings in operating costs of the plant, due to low values of losses.
- consumption reduction of energy resources.
- reduction of CO<sub>2</sub> emissions.



## ERP | ECODESIGN | HIGH EFFICIENCY | LOW LOSSES

### ANNUAL SAVINGS (MAXIMUM) COMPARED TO TRANSFORMERS WITH LOSSES, ACCORDING TO CO BK 50541

RATED OUTPUT kVA	100	160	250	400	630	800	1.000	1.250	1.600	2.000	2.500	3.150
LOW CONSUMPTION (MWh)	3,8	5,3	6,7	12,7	9,2	18,4	24,1	26,3	34,2	29,8	51,7	71,8

## PARTICULARITY

Reference norms :

- Reg. UE N548/2014
- CEI EN 60067-1,2,3,4,5 -11
- CEI EN 50541-1

The phases of design and building, in addition to their compliance with IEC EN norms, take into account the following regulations:

- ISO 9001 : 2008 regarding the quality standards and procedures .
- ISO 14001 : 2004 regarding the environmental issues .

Easy and fast to install are suitable for use in:

- MV/LV prefabricated substation and substation with reduced dimensions.
  - fire and pollution hazard areas.
  - buildings with public access.
- Moreover, their disposal is simple and with low environmental impact.

## DESCRIPTION

The three-phase cast resin transformers have the following features:

- MV windings encapsulated in cast resin.
  - LV windings impregnated with resin.
- Magnetic core made using magnetic grain-oriented steel sheets with low loss, and the joints are Step-Lap inserted sheet.
- Level of partial discharges < 10 pC.
  - Thermal class F – Temperature rise 100 K.
  - Ambient temperature ≤ 40°C, altitude ≤ 1000 m.
  - Self-extinguishing with low emission of gas, classification F1.
  - Resistant to thermal shock, classification C2.
  - Resistant to condensation and humidity, classification E2.

## COMPLETION ACCESSORIES ALWAYS PROVIDED

- LV terminal connector plates
- MV voltage variation by off circuit tappings links
- Rating plate
- Lifting lugs
- 2 earthing points
- 4 bi-directional flat rollers



RATED OUTPUT kVA		100	160	250	400	630	800	1.000	1.250	1.600	2.000	2.500	3.150
NO-LOAD LOSSES	W	280	400	520	750	1100	1300	1550	1800	2200	2600	3100	3800
LOAD LOSSES AT 75 °C	W	1795	2535	3325	4800	6650	7000	7875	9625	11375	14000	16625	19250
LOAD LOSSES AT 120 °C	W	2050	2900	3800	5500	7600	8000	9000	11000	13000	16000	19000	22000
NO-LOAD CURRENT	%	1	0,9	0,8	0,8	0,8	0,6	0,6	0,6	0,6	0,6	0,4	0,4
IMPEDANCE VOLTAGE	%	6	6	6	6	6	6	6	6	6	6	6	6
INRUSH CURRENT I <sub>e</sub> /I <sub>N</sub>		11,5	10,5	10,00	9,5	9,5	9	9	8,5	8,5	8	8	7,5

**EFFICIENCY AT 120°C**

COSφ 1 100% LOAD	%	97,72	97,98	98,3	98,46	98,64	98,85	98,96	98,99	99,06	99,08	99,12	99,19
COSφ 1 75% LOAD	%	98,12	98,34	98,6	98,73	98,88	99,04	99,13	99,16	99,21	99,23	99,27	99,32
COSφ 0,9 100% LOAD	%	97,48	97,76	98,12	98,29	98,49	98,72	98,84	98,88	98,96	98,98	99,03	99,1
COSφ 0,9 75% LOAD	%	97,92	98,15	98,45	98,6	98,75	98,94	99,03	99,06	99,13	99,15	99,19	99,25

**VOLTAGE DROP AT 120°C**

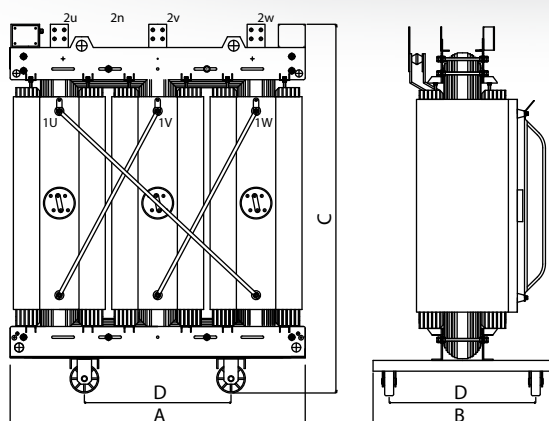
COSφ 1 100% LOAD	%	2,21	1,98	1,69	1,55	1,38	1,18	1,08	1,06	0,99	0,98	0,94	0,88
COSφ 0,9 100% LOAD	%	4,39	4,22	4	3,89	3,76	3,6	3,52	3,5	3,4	3,44	3,4	3,35

**NOISE**

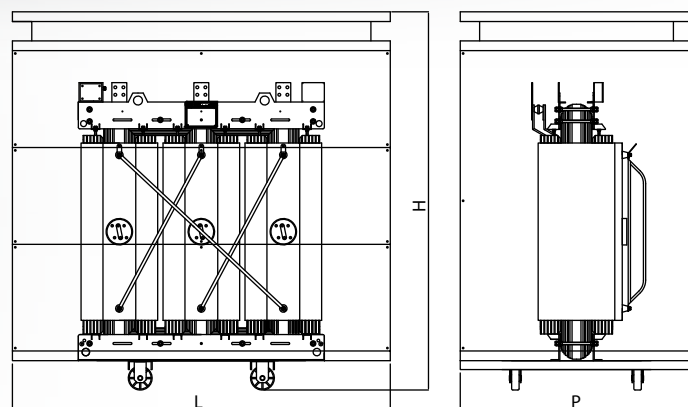
SOUND POWER LEVEL (L <sub>wa</sub> )	dB(A)	51	54	57	60	62	64	65	67	68	70	71	74
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**SIZES AND WEIGHTS (INDICATIVE)**

**Without enclosure IP00**



**With IP21 Protective enclosure**



**INSULATION VOLTAGE 17,5 kV**

		100	160	250	400	630	800	1000	1250	1600	2000	2500	3150
LENGTH (A)	mm	1.100	1.100	1.250	1.250	1.450	1.450	1.650	1.650	1.650	1.650	1.900	1.900
DEPTH (B)	mm	650	650	650	650	800	800	1.000	1.000	1.000	1.000	1.190	1.190
HEIGHT (C)	mm	1.160	1.220	1.350	1.460	1.580	1.710	1.950	1.970	2.100	2.200	2.300	2.470
WHEEL INTERAXIS (D)	mm	520	520	520	520	670	670	820	820	820	820	1.000	1.000
WHEEL DIAMETER	mm	100	100	100	100	160	160	160	160	160	160	150	150
WEIGHT	kg	560	690	930	1.200	1.600	1.930	2.270	2.590	3.170	3.630	4.350	5.170

**PROTECTIVE ENCLOSURE IP21**

		TYPE 00		TYPE 0		TYPE 1		TYPE 2		TYPE 3		
LENGTH (L)	mm	1.550	1.550	1.700	1.700	1.950	1.950	2.200	2.200	2.200	2.500	2.500
DEPTH (P)	mm	900	900	1.000	1.000	1.200	1.200	1.300	1.300	1.300	1.300	1.400
HEIGHT (H)	mm	1.650	1.650	1.800	1.800	2.000	2.000	2.400	2.400	2.400	2.400	2.700
ENCLOSURE WEIGHT	kg	150	150	200	200	260	260	320	320	320	320	360

**INSULATION VOLTAGE 24 kV**

		100	160	250	400	630	800	1000	1250	1600	2000	2500	3150
LENGTH (A)	mm	1.100	1.100	1.250	1.450	1.450	1.650	1.650	1.650	1.900	1.900	1.900	2.200
DEPTH (B)	mm	650	650	650	800	800	1.000	1.000	1.000	1.190	1.190	1.190	1.190
HEIGHT (C)	mm	1.230	1.350	1.390	1.500	1.660	1.810	1.990	2.000	2.150	2.340	2.370	2.500
WHEEL INTERAXIS (D)	mm	520	520	520	670	670	820	820	820	1.000	1.000	1.000	1.000
WHEEL DIAMETER	mm	100	100	100	100	160	160	160	160	150	150	150	150
WEIGHT	kg	610	770	1.130	1.540	1.910	2.370	2.670	3.170	3.850	4.480	5.060	6.130

**PROTECTIVE ENCLOSURE IP21**

		TYPE 00		TYPE 0		TYPE 1		TYPE 2		TYPE 3	
LENGTH (L)	mm	1.550	1.550	1.700	1.950	1.950	2.200	2.200	2.200	2.500	2.500
DEPTH (P)	mm	900	900	1.000	1.200	1.200	1.300	1.300	1.300	1.400	1.400
HEIGHT (H)	mm	1.650	1.650	1.850	2.000	2.000	2.400	2.400	2.400	2.700	2.700
ENCLOSURE WEIGHT	kg	150	150	200	260	260	320	320	320	360	360

