EL.PI. CAST-RESIN

CAST RESIN
DISTRIBUTION
TRANSFORMERS

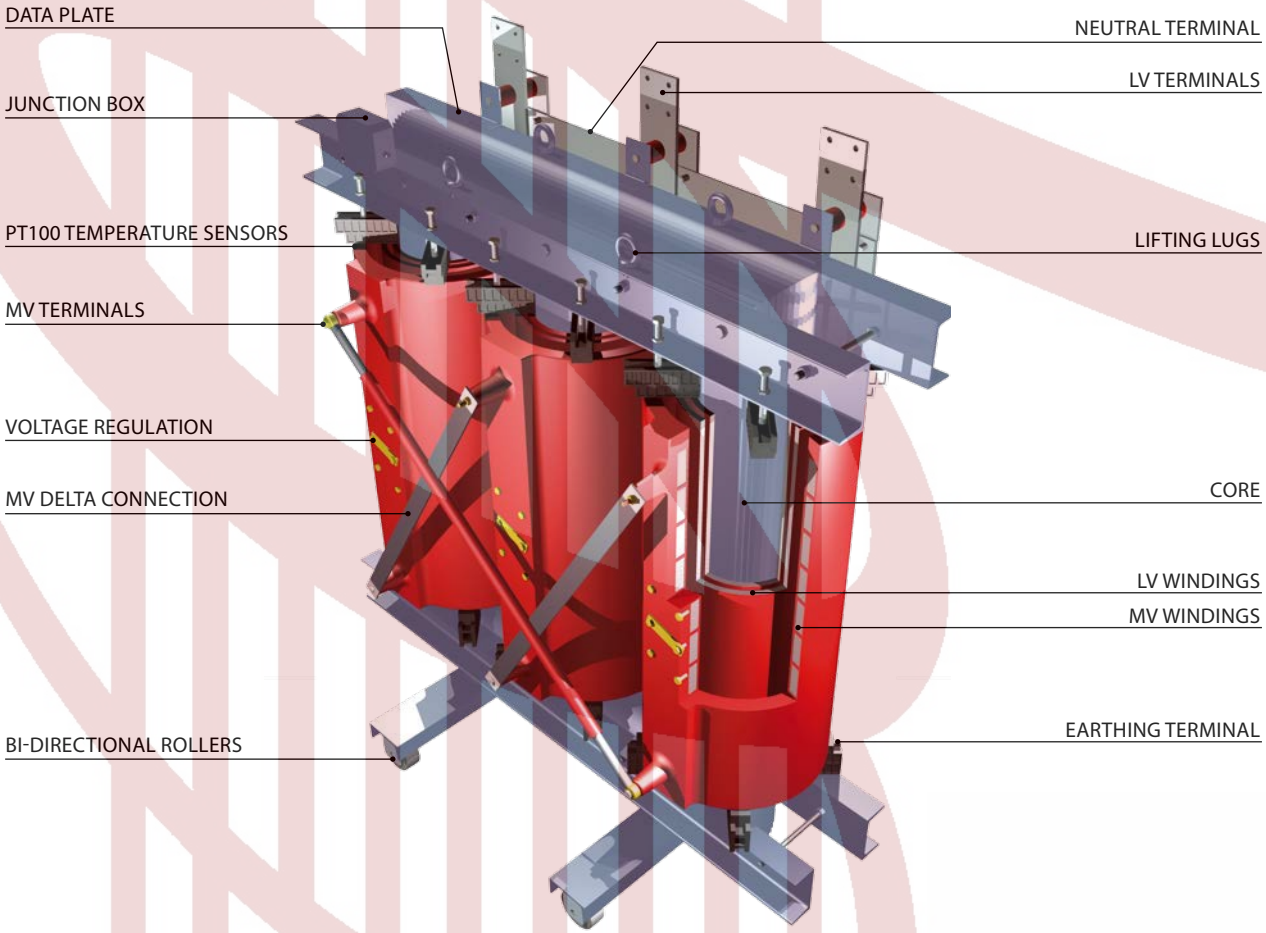
english

Stemming from the experience of Elettromeccanica Piossasco, established in 1962, **EL.PI. CAST-RESIN**, its subsidiary, launched in 2010 the *manufacture of cast resin transformers*.

Thanks to its recent establishment **EL.PI. CAST-RESIN** can count on state-of-the art machinery to ensure the manufacture of transformers with the highest standards of efficiency.

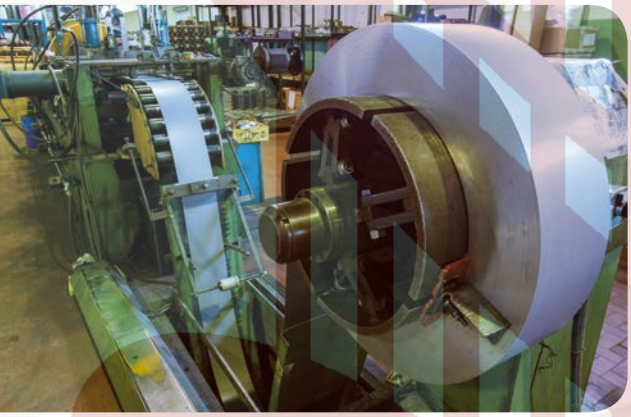
Standard features

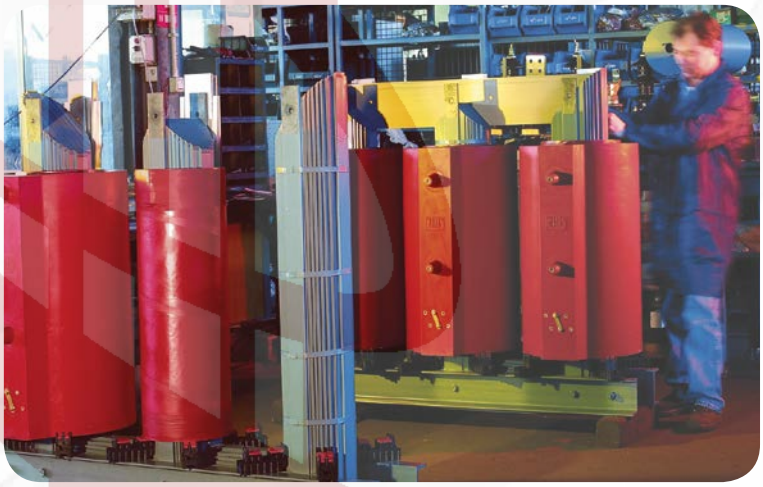
- primary voltage: up to 24kV;
- secondary voltage: up to kV 0,690;
- insulation class: up to kV 24;
- windings configuration (from kVA100 to kVA 3150): delta/star with neutral (other upon request);
- vector group: Yyn0, Dyn11, Dyn5 (other upon request);
- frequency: 50Hz;
- core assembled with layers of grain-oriented steel foil;
- encapsulated aluminum primary winding;
- pre-impregnated aluminum secondary winding;
- primary voltage tap changers;
- LV terminal plates;
- bi-directional rollers;
- lifting lugs;
- earthing terminal;
- n. 3 PT100 temperature sensors connected in a junction box;
- electronic temperature monitoring unit;
- data plate;
- protection grade IP 00.



Core

The core is manufactured with first class Carlite insulated grain-oriented magnetic steel foil.
Cutting is performed at 45° with CNC machines ensuring precision and quality.
Cores are mounted on special benches with STEP-LAP system, through clamps and runners to ensure flawless overlapping of aluminum sheets.
Core clamping is ensured by sturdy steel sections.





Medium voltage windings

Windings feature a circular section and are coaxial to core columns.
MV windings are made with an aluminum strip encapsulated in epoxy resin.
This process, in addition to its dielectric qualities, ensures excellent fire resistance and immediate self-extinguishing properties as well as high resistance to industrial pollution.

Low voltage windings

Windings feature a circular section and are coaxial to core columns.
LV windings are made with an aluminum conductor strip featuring the same height as the winding and a class F insulation strip, then they are vacuum impregnated in epoxy resin and finally painted with red insulating paint.
Terminals are built with extruded aluminum flat bars welded to the conductor along its entire width thus ensuring minimum contact resistance.

Epoxy resin encapsulation plant

Winding supports and spacers

MV and LV windings are secured to transformers' core frames by special insulating supports and spacers made in PBT and fibreglass.
Such supports also ensure windings' coaxiality in all working conditions.

Environmental and climatic classes

Dry-transformer environmental working conditions are classified by humidity, condensation, pollution and ambient temperature.
These factors are crucial not only once the transformers are operational but also during storage prior to installation.

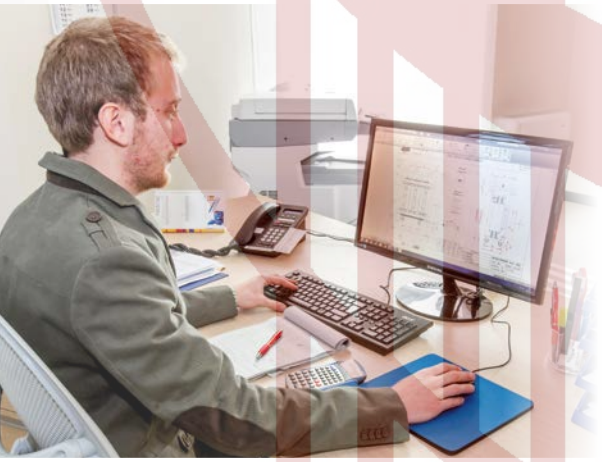
Our transformers are built in compliance with the following environmental standards:

E2 Environmental class
Transformers withstand a consistent condensation or intense pollution or a combination of both phenomena;

C2 Climatic class
Outdoor installation (in a protection enclosure) but not under direct weather conditions. Transformers are suitable for operation, transport and storage at ambient temperature down to -25°C;

F1 Fire class
Transformers subject to fire hazard with reduced flammability with self-extinguishing characteristics.

International standards



Our transformers are tested in compliance with **CEI EN 60076-11**.
Tests are performed both during and at the end of the production process, according to working instructions and technical department instructions.
Before being put on the market all transformers are tested in compliance with CEI/IEC standards and test reports are duly completed.
Final tests, performed in our test room, include all compliance tests (routine tests) as per standard **CEI EN 60076-11**.

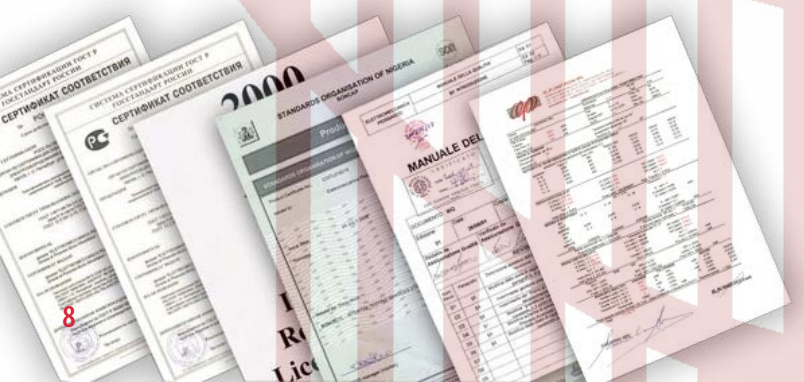
Tests and trials

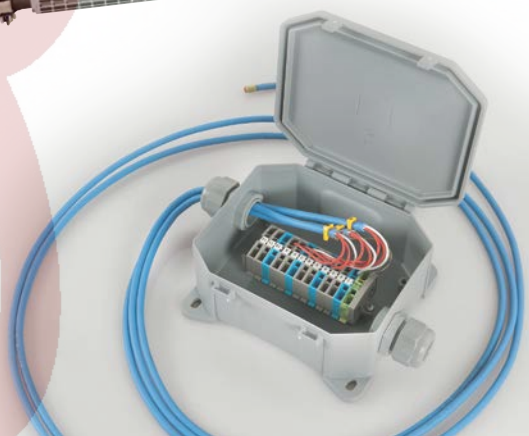
Our transformers, before being put in the market, are all tested in compliance with CEI EN 60076-11 standard with the following routine tests:

- voltage ratio measurement;
- polarity and connection group test;
- insulation test with applied voltage;
- insulation test with induced voltage;
- losses and no load current measurement;
- winding resistance at room temperature measurement;
- measurement of losses and short circuit voltage at required reference temperature;
- partial discharge measurement.

It is also possible, upon customers' request (with an extra charge) to run or repeat both routine tests and type tests, in addition to special tests, at accredited external boards facilities (as, for example CESI – Milan Italy).

After-sale assistance is also ensured.





Customization

- primary voltage up to kV36;
- dual primary voltage;
- dual secondary voltage;
- multiple secondary voltage (e.g. for use in photovoltaic systems);
- copper primary and secondary windings;
- non-standard losses and voltages (upon request);
- non-standard connections and vector groups (upon request);
- 60Hz frequency;
- electrostatic shield between primary and secondary windings;
- MV outer cone elastimold type separable connectors;
- air forced fans;
- forced air cooling electronic monitoring unit;
- digital output RS485 module or analog output 4-20mA module;
- infrared temperature monitoring system (recommended for MV/MV transformers);
- IP 31 protection grade panel enclosure, mounted on the transformer – RAL 9002 paint;
- tropicalization up to +55°C (for installation in countries such as United Arab Emirates, African countries etc.);
- customization for use in arctic weather conditions with temperatures down to -60° C (e.g. Russia);
- surge protection kit (strongly recommended in case of connection to overhead power lines or lines without surge protection);
- other features upon request.

24 kV Series (Insulation classes: Primary winding 24/50/95 kV - Secondary winding 1,1 - 3 kV)

Rated Power (kVA)	No load losses (W)	No load current %	Losses at 75° (W)	Losses at 120° (W)	Shortcircuit impedance %	LpA (dB)	LwA (dB)	Weight (Kg)	Length (mm)	Width (mm)	Height (mm)	Wheelbase (mm)
100	530	2,0	2150	2400	6	48	55	600	1100	600	1200	520
125	580	1,8	2550	2800	6	49	57	700	1160	600	1260	520
160	650	1,6	2900	3250	6	52	62	800	1250	600	1320	520
200	780	1,5	3400	3800	6	53	63	900	1250	600	1340	520
250	880	1,4	3580	4000	6	54	64	1050	1350	600	1360	520
315	1000	1,2	4250	4750	6	55	66	1150	1400	750	1450	670
400	1200	1,1	5090	5700	6	56	67	1350	1400	750	1560	670
500	1320	1,0	5900	6600	6	57	68	1500	1460	750	1600	670
630	1650	0,9	6950	7800	6	59	70	1700	1460	850	1680	670
800	2000	0,8	8600	9600	6	60	71	2000	1500	850	1800	670
1000	2400	0,7	10800	12100	6	61	73	2400	1550	1000	1910	820
1250	2750	0,6	12000	13500	6	62	74	2850	1650	1000	2040	820
1600	3000	0,6	14250	16000	6	63	75	3350	1700	1000	2200	820
2000	3900	0,5	18000	20000	6	65	77	4000	1800	1300	2300	1070
2500	4400	0,4	22500	25200	6	66	79	5000	2000	1300	2350	1070
2500	4200	0,4	23200	25980	8	65	78	4800	2000	1300	2310	1070
3150	5000	0,3	24500	27300	8	67	81	5800	2100	1300	2370	1070

17,5 kV Series (Insulation classes: Primary winding 17,5/38/75 kV - Secondary winding 1,1 - 3 kV)

Rated Power (kVA)	No load losses (W)	No load current %	Losses at 75° (W)	Losses at 120° (W)	Shortcircuit impedance %	LpA (dB)	LwA (dB)	Weight (Kg)	Length (mm)	Width (mm)	Height (mm)	Wheelbase (mm)
100	500	1,9	2050	2300	5	48	55	550	1000	600	1180	520
125	540	1,7	2450	2700	6	49	56	620	1090	600	1240	520
160	620	1,6	2900	3250	6	50	61	720	1160	600	1280	520
200	750	1,5	3200	3600	6	51	62	820	1220	600	1300	520
250	850	1,4	3550	4000	6	53	64	980	1310	600	1320	520
315	920	1,2	4250	4750	6	54	65	1100	1340	750	1410	670
400	1150	1,1	5000	5600	6	55	66	1200	1280	750	1520	670
500	1200	1,0	6120	6850	6	56	67	1400	1370	750	1540	670
630	1550	0,9	7050	7900	6	58	69	1600	1400	850	1640	670
800	1850	0,8	8480	9500	6	59	70	1900	1460	850	1790	670
1000	2200	0,7	9820	11000	6	60	71	2300	1520	1000	1910	820
1250	2550	0,6	11500	12800	6	61	73	2650	1550	1000	2000	820
1600	2850	0,6	14000	15680	6	62	75	3200	1640	1000	2180	820
2000	3700	0,5	17700	19800	6	64	77	3850	1700	1300	2270	1070
2500	3800	0,4	21800	24400	6	65	78	4700	1920	1300	2290	1070
2500	3700	0,4	22500	25200	8	65	78	4600	1950	1300	2270	1070
3150	4900	0,3	24000	26880	8	67	81	5800	2120	1300	2350	1070

12 kV Series (Insulation classes: Primary winding 12/28/60 kV - Secondary winding 1,1 - 3 kV)

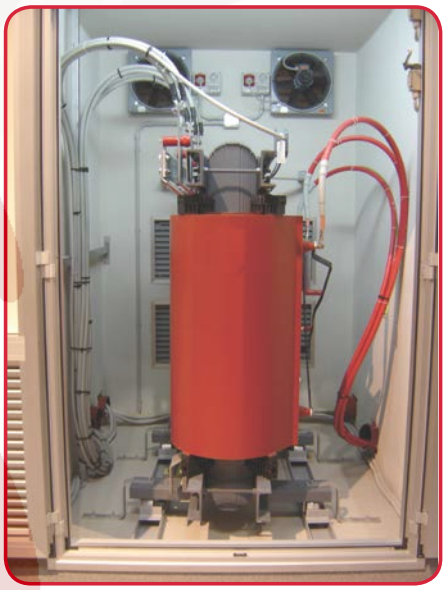
Rated Power (kVA)	No load losses (W)	No load current %	Losses at 75° (W)	Losses at 120° (W)	Shortcircuit impedance %	LpA (dB)	LwA (dB)	Weight (Kg)	Length (mm)	Width (mm)	Height (mm)	Wheelbase (mm)
100	480	1,9	1960	2200	4	46	53	500	980	600	1100	520
125	530	1,8	2460	2750	4	48	55	600	1020	600	1220	520
160	600	1,6	2960	3300	6	49	60	700	1150	600	1200	520
200	730	1,5	3210	3600	6	51	62	760	1200	600	1200	520
250	800	1,4	3480	3900	6	52	63	860	1200	600	1250	520
315	850	1,2	4100	4600	6	54	65	1000	1250	750	1300	670
400	1100	1,1	4900	5500	6	55	67	1200	1250	750	1400	670
500	1150	1,0	5980	6700	6	56	67	1350	1300	750	1450	670
630	1400	0,9	6950	7800	6	57	68	1550	1400	850	1500	670
800	1800	0,8	8480	9500	6	58	70	1850	1450	850	1650	670
1000	2150	0,7	9820	11000	6	59	71	2300	1500	1000	1800	820
1250	2500	0,6	11150	12500	6	61	73	2700	1550	1000	1910	820
1600	2750	0,6	13900	15600	6	62	74	3160	1640	1000	2100	820
2000	3550	0,5	16100	18000	6	64	76	4000	1700	1300	2150	1070
2500	3800	0,4	19650	22000	6	65	78	4800	1900	1300	2200	1070
3150	4800	0,3	23200	26000	8	66	80	5800	2100	1300	2210	1070

DATA VALID FOR ALL SIZES

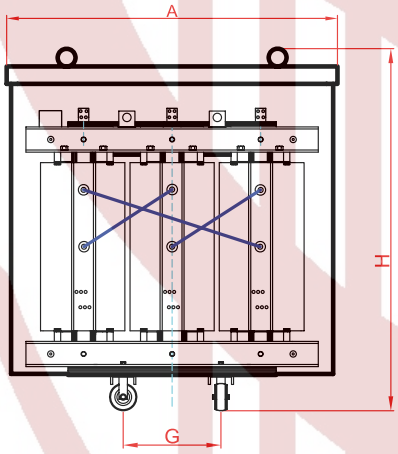
Partial discharges level:	< 10 pC
Insulation system class – over temperatures:	F / F - 100 / 100 K
Vector group:	Dyn11
Utility frequency:	50 Hz

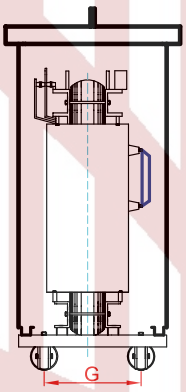
Any technical information detailed in this catalogue is not legally binding. EL.PI reserves the right to amend any specification without prior notice.

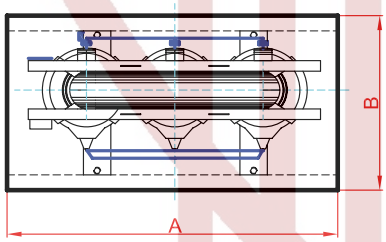
Enclosures



Cast resin transformers enclosures overall dimensions







TYPE	DIMENSIONS			
	A	B	H	G
EP01	1550	1030	1500	520
EP02	1750	1090	1710	670
EP03	1850	1190	1875	670
EP04	2000	1290	2060	820
EP05	2200	1390	2300	820
EP06	2500	1550	2635	1070

TYPE	VALID ISSUE	RATED POWER (KVA)	PROTECTION GRADE	STANDARD PAINT
EP01	April 2003	50 - 100 - 125 - 160 - 200	IP31	RAL 9002
EP02	April 2003	250 - 315 - 400		
EP03	April 2003	500 - 630		
EP04	April 2003	800 - 1000		
EP05	April 2003	1250 - 1600		
EP06	June 2005	2000 - 2500		

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