Green T.HE
CAST RESIN TRANSFORMERS



THE GLOBAL SPECIALIST
IN ELECTRICAL AND DIGITAL BUILDING INFRASTRUCTURES

legrand®







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Cast resin transformers GREEN T.HE

From 2021, the new European Commission Ecodesign Directive comes into force imposing stricter efficiency standards.

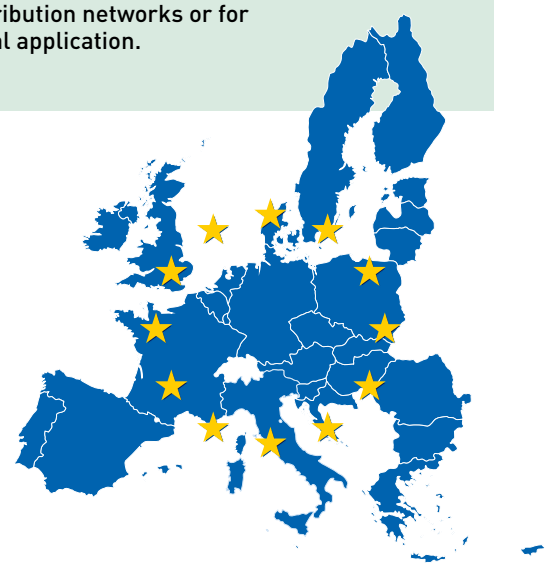
From July 2021 (tier 2), regulation 548/2014 (updated by Regulation 2019/1783) requires manufacturers to produce **transformers with no-load loss reduced by 10%** compared with the previous requirement.

The Legrand Green T.HE transformers fully comply with the new eco-compatible design rules and guarantee a significant reduction in energy consumption, thus promoting significant economic savings and the reduction of CO_2 emissions into the atmosphere.



Standard EN 50708-2-1 applies to medium power transformers with rated powers up to 3150 kVA supplied with frequency 50 HZ and with highest voltage for equipment (U_m) greater than 1.1 kV but not greater than 36 kV.

Commission Regulation (EU) 2019/1783 of 1 October 2019 amends Regulation (EU) 548/2014 of 21 May 2014 and updates the mandatory requirements in European Union countries for the ecodesign of power transformers with a minimum power rating of 1 kVA used in 50 Hz electricity transmission and distribution networks or for industrial application.



CLASSIFICATION

The classification of a cast resin transformer depends on the value of the no-load loss (P_0), as well as the load loss (P_k).
More precisely, P_0 losses are independent from the loads and remain constant for the whole time the transformer is connected to the electrical grid. On the other hand, P_k losses only occur when the transformer is feeding a load and they are proportional to the square of the load.

NO-LOAD LOSS (P_0)	LOAD LOSS (P_k)
A_0 -10%	A_k

ECODESIGN REQUIREMENTS

	TIER 2 (from 1st July 2021)	
Rated power [kVA]	***Maximum no-load loss P_0 [W]***	***Maximum load loss P_k [W]***
≤ 50	A_0 – 10% (180)	A_K (1500)
100	A_0 – 10% (252)	A_K (1800)
160	A_0 – 10% (360)	A_K (2600)
250	A_0 – 10% (468)	A_K (3400)
400	A_0 – 10% (675)	A_K (4500)
630	A_0 – 10% (990)	A_K (7100)
800	A_0 – 10% (1170)	A_k (8000)
1000	A_0 – 10% (1395)	A_k (9000)
1250	A_0 – 10% (1620)	A_k (11000)
1600	A_0 – 10% (1980)	A_k (13000)
2000	A_0 – 10% (2340)	A_k (16000)
2500	A_0 – 10% (2790)	A_k (19000)
3150	A_0 – 10% (3420)	A_k (22000)

Requirements applicable (losses values) to medium power three-phase transformers with rated power ≤ 3150 kVA dry type, and one winding U_m ≤ 24 kV.

Once the transformer has ended its service life, all of the materials can be easily recycled or disposed of, as indicated in the PEP (Product Environmental Profile) document. This document describes the environmental impact of a product during its entire life cycle (from extraction of the needed raw materials to product disposal).



PEP ecoPASSPORT®

Product Environmental Profile

Green Transformers High Efficiency

ADVANTAGES OF THE Green T.HE TRANSFORMERS



Low partial discharges, HIGH quality



Partial discharges are microscopic phenomena occurring inside insulating resin cavities are a factor in the speeding up of the ageing process of a transformer. Therefore, it is important that the values of such currents are limited.
According to the product standard regarding the design of resin transformers (IEC 60076-11), all windings with a voltage of ≥ 3.6 kV are subject to the measure of partial discharges and the value measured **should not exceed 10 pC (picocoulomb).**
When the Green T.HE transformers were subjected to the measurement of partial discharges, the values detected were **always** below **5 pC**, significantly better than required by the standard.

A low value of partial discharges represents the index of some positive factors, such as:

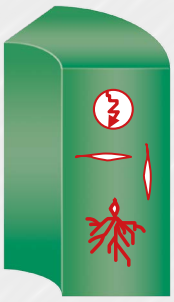
- proper and solid design criteria
- quality raw materials
- precision during conductor foil winding phases
- competence during the epoxy resin pouring around the high-voltage winding
- accuracy in final assembling of the complete assembly

It is really easy to understand that a **lower** level of partial discharge leads to a **higher** resistance to work stresses and consequently to a higher life expectancy of the transformer under examination.

TYPE OF PARTIAL DISCHARGE

Depending on the type, discharges can be divided into:

- **Corona effect** (discharge mechanism occurring in correspondance of sharp ends in dielectric gas)
- **Superficial discharges**
- **Internal discharges** (representing the main cause of life-cycle decrease of the insulating material)
- **Treeing** (branched discharge channel): it is the pre-discharge channel due to the insulation deterioration leading to destructive discharge.



Extreme environmental conditions

The IEC 60076-11 standard identifies the environmental, climatic and fire behaviour classes of dry-type transformers with an alphanumeric code.
Thanks to the use of high-quality epoxy resins, all Legrand transformers minimize environmental impact and comply with the following classes:

- **Environmental class E3**
- **Climate class C2**
- **Fire behaviour class F1**

This means that they can be stored, transported and above all used under extreme environmental conditions:

- Minimum room temperature: -25 °C
- Maximum relative humidity: 95%

Furthermore, in standard configuration, Green T.HE transformers guarantee a seismic resistance up to 0.2g* (light earthquakes) and can be fixed to the ground, thus avoiding any possibility of overturning.
On request, Legrand manufactures transformers that can be installed in areas with higher seismic hazard, up to 0.5g (AG5).



E0
No condensation on the transformer, negligible pollution, installation in a clean and dry environment

E1
Occasional condensation and limited pollution

E2
The transformer is subjected to frequent condensation, light pollution, or both

E3
The transformer is subjected to medium pollution and frequent condensation with humidity above 95%

E4
On request, Legrand is also able to supply transformers with E4 environmental classification for heavy pollution



C1
The transformer is suitable for operation at temperatures not below -5°C but may be exposed during transport and storage to temperatures down to -25°C.

C2
The transformer can operate, be transported and stored at temperatures as low as -25°C.



F0
The risk of fire is not expected and no measures are taken to limit inflammability.

F1
The transformer is subjected to the risk of fire and reduced inflammability is required. Fire on the transformer must be extinguished within laid-down limits.

The normal environmental service conditions are as follows:

Maximum operating temperature: 40°C
Monthly average temperature of the hottest month: 30°C
Yearly average temperature: 20°C

*g=9,81m/s^2 (gravitational acceleration)

PRODUCT News

With the new Green T.HE series (tier 2), Legrand offers its customers a very high-quality product, with excellent performance and reduced losses, in full compliance with regulation 548/2014 and subsequent updates (EU regulation 2019/1783).
Thanks to the use of innovative materials and the measures taken during their design, the new transformers are characterised by the following distinctive features:

- **HV** (high voltage) and **LV** (low voltage) **terminals** have been modified and built to facilitate the connection of the product on both windings.



Updated LV terminals



Updated HV terminals

- The HV windings are all made in **BIL LIST 2**, thanks to the **reinforced insulation** in the critical points of the unit.

- They guarantee very high performance and reduced losses compared to previous models, while maintaining equivalent weights and dimensions. All this is possible thanks to the completely new **magnetic core** with newly developed and high-performance materials.

REINFORCED INSULATION

NEW MATERIALS FOR THE MAGNETIC CORE

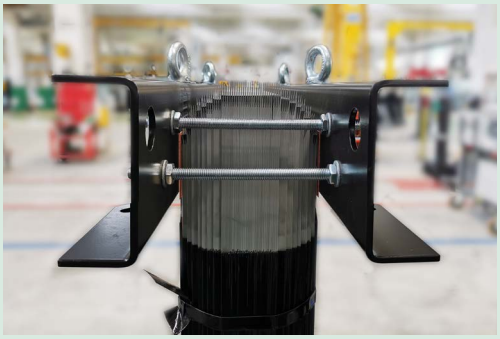
HIGHER PERFORMANCE WITH LOW WEIGHTS AND DIMENSIONS

New magnetic core

The new grain-oriented magnetic sheet has an even sharper crystallographic consistency and makes an important contribution to the realisation of even more efficient power and distribution transformers.
The advantages of using this material are:

- lower core weights
- more compact dimensions
- greater energy efficiency through minimal no-load losses
- reduced noise development through optimised magnetic domain structure
- improved insulation properties

This means that when comparing two transformers of the same size, the one with the core built with the new sheet will have significantly lower no-load loss values and therefore better performance.



BIL: Basic Insulation Level

CERTIFIED quality



A C A E

TESTING AUTHORIZATION

ACAE *(Associazione per la Certificazione delle Apparecchiature Elettriche), Member of* ***LOVAG*** *(Low Voltage Agreement Group)*
authorizes the Laboratory
BTicino S.p.A. *based in*
Via E.Ferrari ,Z.I. Villa Zaccheo – 64020 Castellalto (TE)
Laboratory codification number: ***IB 03***

to carry out the tests *listed in the following, for the purpose to certify the products as stated in the Certificate n° 070B and its enclosure, issued to ACAE by ACCREDIA.*

List of the authorized tests on the power transformers:
Measurement of voltage ratio and check of phase displacement
Measurement of winding resistance
Separate-source AC withstand voltage test
Induced AC voltage withstand test
Measurement of no-load loss and current
Measurement of short-circuit impedance and load loss
Partial discharge measurement
Insulation resistances measurement
Temperature-rise test
Lightning impulse test
Measurement of sound level

The laboratory has demonstrated to the ACAE's inspector to fulfil the basic requirements of IEC EN 17025 Standard for the above purposes.
ACAE will witness the tests according to its Quality Procedure PA 5.2.1 "Test supervision".
The renewal of the authorization is subjected to annual audit.

First issue date: 2015-08-05 ***Current issue date: 2015-08-05***

ACAE General Secretary
Mr. Virginio Scarioni

ACCREDIA
PRD N°070 B
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

A C A E
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LOVAG

Certifications

The Legrand test lab "IB03" has recently received the qualification by ACAE to work in accordance to IEC EN 17025 standard on all routine tests and on some tests for medium-voltage transformers.

Such acknowledgement and qualification is a very important milestone obtained and Legrand, with a limited number of companies around the world, can offer this to their customers.

All Legrand transformers are individually tested before being delivered to the customer.

Thanks to the excellent quality of its transformers, Legrand offers to its customers the possibility of extending, upon request, the purchased product warranty*.

ACCEPTANCE TESTS	
Measurement of the winding resistance	IEC 60076-11 (clause 14.2.1)
Measurement of voltage ratio and check of phase displacement	IEC 60076-11 (clause 14.2.2)
Measurement of short-circuit impedance and load loss	IEC 60076-11 (clause 14.2.3)
Measurement of the no-load loss and the no-load current	IEC 60076-11 (clause 14.2.4)
Separate-source AC withstand voltage test	IEC 60076-11 (clause 14.2.5)
Induced AC withstand voltage test	IEC 60076-11 (clause 14.2.6)
Measurement of the partial discharges	IEC 60076-11 (clause 14.2.7)
TYPE TESTS (on request)	
Atmospheric impulse test	IEC 60076-11 (clause 14.3.1)
Temperature-rise test	IEC 60076-11 (clause 14.3.2)
SPECIAL TESTS (on request)	
Measurement of the noise level	IEC 60076-11 (clause 14.4.2)
Short-circuit test	IEC 60076-11 (clause 14.4.3)

CAST RESIN HV/LV
Green T.HE

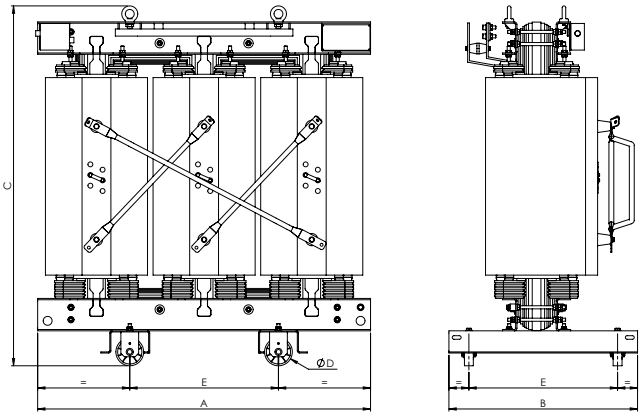
Compliance with the standards: IEC 60076-11 and EN 50708
Power: 100–3150 kVA
Frequency: 50 Hz
Tapping links, HV side: ± 2 x 2.5%
Vector group: Dyn11
Thermal class of the insulation system: 155 °C (F) / 155 °C (F)
Temperature rise: 100 K / 100 K
Environmental Class: E3-C2-F1

Primary Voltages: from 6 to 11 kV. Insulation class: 12 kV BIL 75 kV
Secondary Voltages no-load: from 400 to 433 V (insulation class ≤ 1,1 kV))

Primary Voltages: from 12 to 15.75 kV. Insulation class: 17.5 kV BIL 95 kV
Secondary Voltages no-load: from 400 to 420 V (insulation class ≤ 1,1 kV))

Primary Voltages: from 20 to 23 kV. Insulation class: 24 kV BIL 125 kV
Secondary Voltages no-load: from 400 to 420 V (insulation class ≤ 1,1 kV))

Primary Voltages: from 25 to 35 kV. Insulation class: 36 kV BIL 170 kV
Secondary Voltages no-load: from 400 to 420 V (insulation class ≤ 1,1 kV))



Summary reference values. Use the construction drawing for the design.
All the data given may be modified without warning for reasons of technical production or product improvement.

Possibility to build, on request, products with other combinations of primary and secondary voltage plus bespoke units to meet differing site requirements.



INSULATION CLASS 12 kV

S_R [kVA]	Primary voltage [kV]	Secondary no-load voltage [V]	Uk [%]	Po [W]	Pk [W] at 120 °C	Io [%]	LwA-Acoustic Power [dB (A)]	Item	Length (A) [mm]	Width (B) [mm]	Height (C) [mm]	Mass [kg]	Wheel centre line (E) [mm]	Wheel diameter (D) [mm]	Enclosure* type
100	10	400	6	252	1800	1	51	**HB2AIACBA**	1150	750	1290	700	520	125	H1
160	10	400	6	360	2600	1	54	**HC2AIACBA**	1200	750	1310	820	520	125	H1
250	10	400	6	468	3400	0.9	57	**HE2AIACBA**	1300	780	1370	1150	520	125	H1
315	10	400	6	557	3875	0.8	58	**HF2AIACBA**	1350	850	1430	1220	670	125	H2
400	10	400	6	675	4500	0.8	60	**HG2AIACBA**	1350	850	1490	1350	670	125	H2
500	10	400	6	811	5630	0.7	60	**HH2AIACBA**	1450	850	1540	1600	670	125	H2
630	10	400	6	990	7100	0.7	62	**HI2AIACBA**	1450	850	1600	1750	670	125	H2
800	10	400	6	1170	8000	0.6	64	**HJ2AIACBA**	1550	1000	1740	2150	820	160	H3
1000	10	400	6	1395	9000	0.6	65	**HK2AIACBA**	1600	1000	1960	2750	820	160	H3
1250	10	400	6	1620	11000	0.6	67	**HL2AIACBA**	1700	1000	1980	3200	820	160	H3
1600	10	400	6	1980	13000	0.5	68	**HM2AIACBA**	1750	1000	2160	3850	820	160	H4
2000	10	400	6	2340	16000	0.4	70	**HN2AIACBA**	1850	1000	2240	4550	820	160	H4
2500	10	400	6	2790	19000	0.4	71	**HO2AIACBA**	2000	1500	2300	5450	1070	200	H5
3150	10	400	6	3420	22000	0.35	71	**HP2AIACBA**	2150	1500	2370	6500	1070	200	H5

This table shows the characteristics and codes of transformers with 10/0.4 kV ratio and Dyn11 vector group.
The losses information is also valid for various transformer ratios and vector groups.

INSULATION CLASS 17.5 kV

S_R [kVA]	Primary voltage [kV]	Secondary no-load voltage [V]	Uk [%]	Po [W]	Pk [W] at 120 °C	Io [%]	LwA-Acoustic Power [dB (A)]	Item	Length (A) [mm]	Width (B) [mm]	Height (C) [mm]	Mass [kg]	Wheel centre line (E) [mm]	Wheel diameter (D) [mm]	Enclosure* type
100	15	400	6	252	1800	1	51	**HB3AIAFBA**	1250	750	1310	830	520	125	H1
160	15	400	6	360	2600	1	54	**HC3AIAFBA**	1250	760	1330	880	520	125	H1
250	15	400	6	468	3400	0.9	57	**HE3AIAFBA**	1300	780	1370	1150	520	125	H1
315	15	400	6	557	3875	0.8	58	**HF3AIAFBA**	1400	850	1450	1350	670	125	H2
400	15	400	6	675	4500	0.8	60	**HG3AIAFBA**	1400	850	1510	1450	670	125	H2
500	15	400	6	811	5630	0.7	60	**HH3AIAFBA**	1450	850	1540	1650	670	125	H2
630	15	400	6	990	7100	0.7	62	**HI3AIAFBA**	1450	850	1620	1850	670	125	H2
800	15	400	6	1170	8000	0.6	64	**HJ3AIAFBA**	1550	1000	1750	2200	820	160	H3
1000	15	400	6	1395	9000	0.6	65	**HK3AIAFBA**	1600	1000	1960	2800	820	160	H3
1250	15	400	6	1620	11000	0.6	67	**HL3AIAFBA**	1700	1000	2000	3200	820	160	H3
1600	15	400	6	1980	13000	0.5	68	**HM3AIAFBA**	1750	1000	2150	3750	820	160	H4
2000	15	400	6	2340	16000	0.4	70	**HN3AIAFBA**	1900	1000	2260	4700	820	160	H4
2500	15	400	6	2790	19000	0.4	71	**HO3AIAFBA**	2000	1500	2320	5600	1070	200	H5
3150	15	400	6	3420	22000	0.35	71	**HP3AIAFBA**	2200	1500	2430	7300	1070	200	H5

This table shows the characteristics and codes of transformers with 15/0.4 kV ratio and Dyn11 vector group.
The losses information is also valid for various transformer ratios and vector groups.

A dedicated application is available for the cost estimate and the ordering of transformers. For more details please contact Legrand.

* Enclosure with accessories. For more information, please see page 14

INSULATION CLASS 24 kV

S_R [kVA]	Primary voltage [kV]	Secondary no-load voltage [V]	Uk [%]	Po [W]	Pk [W] at 120 °C	Io [%]	LwA-Acoustic Power [dB (A)]	Item	Length (A) [mm]	Width (B) [mm]	Height (C) [mm]	Mass [kg]	Wheel centre line (E) [mm]	Wheel diameter (D) [mm]	Enclosure* type
100	20	400	6	252	1800	1	51	**HB4AIAGBA**	1350	750	1320	880	520	125	H1
160	20	400	6	360	2600	1	54	**HC4AIAGBA**	1350	760	1340	920	520	125	H1
250	20	400	6	468	3400	0.9	57	**HE4AIAGBA**	1400	780	1400	1210	520	125	H1
315	20	400	6	557	3875	0.8	58	**HF4AIAGBA**	1400	850	1460	1400	670	125	H2
400	20	400	6	675	4500	0.8	60	**HG4AIAGBA**	1400	850	1520	1500	670	125	H2
500	20	400	6	811	5630	0.7	60	**HH4AIAGBA**	1450	850	1550	1650	670	125	H2
630	20	400	6	990	7100	0.7	62	**HI4AIAGBA**	1500	850	1630	1880	670	125	H2
800	20	400	6	1170	8000	0.6	64	**HJ4AIAGBA**	1600	1000	1750	2300	820	160	H3
1000	20	400	6	1395	9000	0.6	65	**HK4AIAGBA**	1700	1000	1940	2900	820	160	H3
1250	20	400	6	1620	11000	0.6	67	**HL4AIAGBA**	1750	1000	2010	3300	820	160	H3
1600	20	400	6	1980	13000	0.5	68	**HM4AIAGBA**	1800	1000	2150	3950	820	160	H4
2000	20	400	6	2340	16000	0.4	70	**HN4AIAGBA**	1950	1000	2260	4850	820	160	H4
2500	20	400	6	2790	19000	0.4	71	**HO4AIAGBA**	2050	1500	2380	5900	1070	200	H5
3150	20	400	6	3420	22000	0.35	71	**HP4AIAGBA**	2250	1500	2440	7250	1070	200	H5

This table shows the characteristics and codes of transformers with 20/0.4 kV ratio and Dyn11 vector group.
The losses information is also valid for various transformer ratios and vector groups.

INSULATION CLASS 36 kV

S_R [kVA]	Primary voltage [kV]	Secondary no-load voltage [V]	Uk [%]	Po [W]	Pk [W] at 120 °C	Io [%]	LwA-Acoustic Power [dB (A)]	Item	Length (A) [mm]	Width (B) [mm]	Height (C) [mm]	Mass [kg]	Wheel centre line (E) [mm]	Wheel diameter (D) [mm]	Enclosure* type
100	33	400	6	289	1980	1.2	51	**HB5AIAQBA**	1650	850	1800	1800	670	125	AL
160	33	400	6	414	2860	1.2	54	**HC5AIAQBA**	1600	850	1750	1700	670	125	AL
250	33	400	6	538	3740	1.1	57	**HE5AIAQBA**	1600	850	1850	2000	670	125	AL
315	33	400	6	641	4264	1	58	**HF5AIAQBA**	1700	1000	1850	2300	670	125	AL
400	33	400	6	776	4950	1	60	**HG5AIAQBA**	1700	1000	1850	2300	670	125	AL
500	33	400	6	933	6193	0.8	60	**HH5AIAQBA**	1750	1000	1900	2500	670	125	AL
630	33	400	6	1138	7810	0.8	62	**HI5AIAQBA**	1700	1200	2000	2600	820	160	BL
800	33	400	6	1345	8800	0.7	64	**HJ5AIAQBA**	1750	1200	2150	3100	820	160	BL
1000	33	400	6	1604	9900	0.7	65	**HK5AIAQBA**	1850	1200	2250	3700	820	160	BL
1250	33	400	6	1863	12100	0.7	67	**HL5AIAQBA**	1950	1200	2300	4300	820	160	BL
1600	33	400	8	2277	14300	0.6	68	**HM5AIDQBA**	2050	1700	2400	4700	1070	200	CL
2000	33	400	8	2691	17600	0.5	70	**HN5AIDQBA**	2150	1700	2450	5400	1070	200	CL
2500	33	400	8	3208	20900	0.5	71	**HO5AIDQBA**	2350	1700	2550	6800	1300	200	DT
3150	33	400	8	3933	24200	0.4	71	**HP5AIDQBA**	2400	1700	2600	7700	1300	200	DT

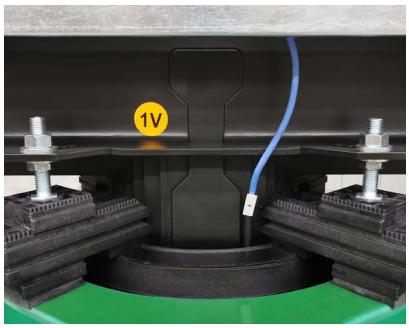
This table shows the characteristics and codes of transformers with 33/0.4 kV ratio and Dyn11 vector group.
The losses information is also valid for various transformer ratios and vector groups.

A dedicated application is available for the cost estimate and the ordering of transformers. For more details please contact Legrand.

* Enclosure with accessories. For more information, please see page 14

GREEN T.HE - Cast resin transformers
Installation accessories







Item	TEMPERATURE MEASUREMENT PROBES				
	The probes are supplied mounted on the transformer and wired to a robust IP66 die-cast aluminium junction box.				
	Type	Range [kVA]	No.	Δt [°C]	Mounting
200073	Pt100	≤2000	3	-	on the LV windings (3)
200074	Pt100	≥2500	3	-	on the LV windings (3)
200137	Pt100	≤2000	3+1	-	on the LV windings (3) + on the core (1)
200138	Pt100	≥2500	3+1	-	on the LV windings (3) + on the core (1)
CB00120	PTC	-	3+3	130-140	on the LV windings (3 pairs) for alarm and trip.
CB02400	PTC	-	3+3	110-120	on the LV windings (3 pairs) for alarm and trip.
CB0272	PTC	-	3+3+3	130-140 - 90	on the LV windings (3 pairs) for fan control, for alarm and trip.

	CONTROL UNITS	
	The control units are supplied loose	
	Type	Description
220002	T154	temperature control for 3 or 4 Pt100 probes
220023	MT200 L	temperature control for 3 or 4 Pt100 probes
220197	NT935 AD	temperature control for 3 or 4 Pt100 probes with analogue and digital output
220211	MT200 LITE S	temperature control for 3 or 4 Pt100 probes with digital output
220219	NT935 ETH	temperature control for 3 or 4 Pt100 probes with Ethernet output
220218	MT200 LITE E	temperature control for 3 or 4 Pt100 probes with Ethernet output
220212	NT538 AD	temperature control up to 8 Pt100 probes with analogue and digital output
220004	T 119	temperature control for PTC probes
220010	T119 DIN	temperature control for PTC probes preset for DIN rail mounting
220024	MT300	temperature control for PTC probes preset for DIN rail mounting
220035	VRT200	ventilation bar control
220174	AT100	ventilation bar control

Item	VENTILATION BARS		
	The ventilation busbars temporarily increase the rated power (under normal service conditions). According to standard IEC 60076-1, a transformer is called AN even if it is equipped with discontinuous ventilation. If a transformer with AF continuous duty power is required, please contact Legrand.		
	Range [kVA]	ΔPower [%]	Notes
CB02444	100 - 250	+ 40	Temporary increase in nominal conditions (50Hz)
CB02454	315 - 630	+ 40	
CB02464	800 - 1000	+ 40	
CB01414	1250 - 2000	+ 40	
CB01412	2500 - 3150	+ 40	

	SURGE ARRESTER KIT	
	HV* [kV]	Ur [kV]
130075D	6	9
130054D	10-11	12
130055D	15	18
130056D	20	24

*other HV values available on request
Ur: rated voltage of the surge arrester

	RUBBER SUPPORTS	
	Range [kVA]	Description
170019	≤2000	4 vibration pads supplied for mounting under the transformer wheels
170020	≥2500	4 vibration pads supplied for mounting under the transformer wheels

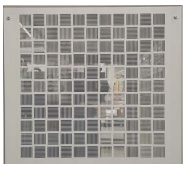
	CUPAL PLATES	
	CUPAL is a bimetal sheet made up of one copper sheet and one aluminium sheet welded together through a special mechanical procedure.	
	Range [kVA]	Description
030014 **	≤ 160	40 x 40 CUPAL plate
030008 **	250	50 x 50 CUPAL plate
030009 **	≥ 315 and ≤ 500	60 x 60 CUPAL plate
030010 **	630	80 x 80 CUPAL plate
030011 **	800	100 x 100 CUPAL plate
030012 **	≥ 1000	120 x 120 CUPAL plate

** the codes refer to a single CUPAL plate

EXAMPLE:
For a transformer with a power of 1250 kVA, the correct CUPAL plate is product code 030012.
- 1 Cupal has 2 plates (1 Aluminium and 1 Copper) therefore for quantity calculation:
  2 plates x 4 LV terminals = 8 CUPAL plates

GREEN T.HE - Cast resin transformers
Installation accessories





Enclosure ventilation grid IP31



Enclosure ventilation grid IP23

ENCLOSURES

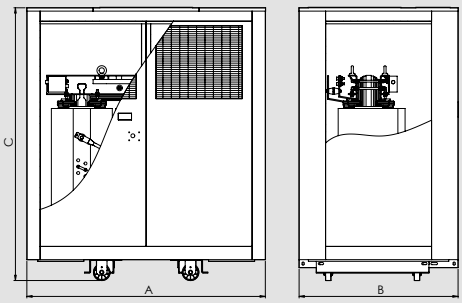
There are 9 enclosure sizes available, with the possibility to choose 2 types of ventilation grill for each one, IP31 and IP23.
It is also possible to choose the transformer with the enclosure either assembled or disassembled, to be assembled on site.
All the indicated protection enclosures are compatible with the installation of Zucchini busbar ducts
It is also possible to provide customized solutions based on specific requirements: please contact Legrand.

Enclosure colour: RAL 7035
AREL door lock with enclosure key: product code 230076

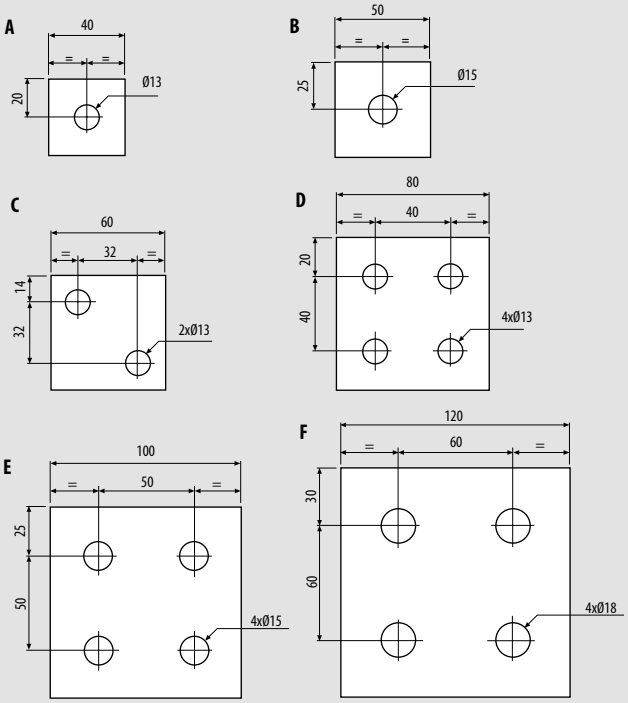
ENCLOSURES

IP index	Item	Mounted (M)/ Dismantled (S)	Power [kVA]	Enclosure type	Dimensions [mm] Length (A)	Width (B)	Height (C)	Mass [kg]
12 kV-17.5 kV-24 kV CLASSES								
IP31	BXM31H1	M	100 - 160 250	H1	1800	1150	1800	160
	BXS31H1	S						
	BXM31H2	M	315 - 400 500 - 630	H2	1800	1200	2100	180
	BXS31H2	S						
	BXM31H3	M	800 -1000 1250	H3	2100	1300	2450	230
	BXS31H3	S						
	BXM31H4	M	1600 - 2000	H4	2300	1350	2750	270
	BXS31H4	S						
	BXM31H5	M	2500 - 3150	H5	2600	1500	2750	370
	BXS31H5	S						
IP23	BXM23H1	M	100 - 160 250	H1	1800	1150	1800	170
	BXS23H1	S						
	BXM23H2	M	315 - 400 500 - 630	H2	1800	1200	2100	190
	BXS23H2	S						
	BXM23H3	M	800 - 1000 1250	H3	2100	1300	2450	240
	BXS23H3	S						
	BXM23H4	M	1600 - 2000	H4	2300	1350	2750	290
	BXS23H4	S						
	BXM23H5	M	2500 - 3150	H5	2600	1500	2750	390
	BXS23H5	S						
CLASSES 36 kV								
IP31	BXM31AL	M	100 - 160 250 - 315 400 - 500	AL	2300	1450	2300	250
	BXS31AL	S						
	BXM31BL	M	630 - 800 1000 - 1250	BL	2600	1500	2700	320
	BXS31BL	S						
	BXM31CL	M	1600 - 2000	CL	2900	1700	2900	370
	BXS31CL	S						
	BXM31DT*	M	2500 - 3150	DT	3200	2000	3100	450
	BXS31DT*	S						
IP23	BXM23AL	M	100 - 160 250 - 315 400 - 500	AL	2300	1450	2300	280
	BXS23AL	S						
	BXM23BL	M	630 - 800 1000 - 1250	BL	2600	1500	2700	350
	BXS23BL	S						
	BXM23CL	M	1600 - 2000	CL	2900	1700	2900	400
	BXS23CL	S						
	BXM23DT*	M	2500 - 3150	DT	3200	2000	3100	510
	BXS23DT*	S						

ENCLOSURE DIMENSIONS



DIMENSIONS AND HOLES OF THE LV CONNECTION TERMINALS



STANDARD HOLE DETAILS

The LV connection terminals are made of aluminium. Appropriate CUPAL bimetal plates are also available for copper connections

Drawing	Range [kVA]	Thickness [mm]
A	100	4
	160	
B	250	5
C	315	6
	400	
	500	8
D	630	8
E	800	8
F	1000	8
	1250	10
	1600	12
	2000	16
	2500	20
	3150	24

All the data given may be modified without warning for reasons of technical production or product improvement.

*DT: floor mounted and non-integrated configuration.

ENVIRONMENTAL ASPECTS

Legrand has always taken care of every detail relating to cast resin transformers to guarantee maximum performance to customers in terms of simplicity, safety and flexibility.

The new design criteria adopted also go in the direction of creating added values in terms of environmental aspects.

In compliance with regulations, the attention paid to new material technologies has led Legrand to play a primary role in reducing the environmental impact of dry-type transformers.

The following table shows the material of the components used in our products, useful to manage recycling operations, getting high-performance end-of-life recycling solutions

Due to the manufacturing complexity of the product, the table below provides the main materials of which it is composed, and the relative quantity by weight.

The precise data for each single transformer are indicated on the plate of the specific transformer itself.



WEIGHTS OF THE MAIN TRANSFORMER MATERIALS

Range	***Conductor material Aluminum [kg]***	***Core material CRGO (cold-rolled grain-oriented steel) [kg]***
up to 630 kVA	100 to 500	200 to 1500
from 800 kVA to 1600 kVA	500 to 1100	1300 to 2700
from 2000 kVA to 3150 kVA	1100 to 1700	2700 to 6000

For its High Efficiency Green Transformers Legrand makes PEP (Product Environmental Profile) certificates available to offer customers environmentally friendly solutions.



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