

Adex PROTIVA Transformer

MV/LV Ecodesign cast resin distribution transformers ≤ 3150 kVA



Energy Efficient Ecodesigned Transformers
Complying IEC and EU regulation No.: 548/2014

PROTIVA range Green Transformer ≤ 3150 kVA

MV/LV Ecodesign cast resin distribution transformers ≤ 3150 kVA



PROTIVA Range

Description

Cast resin, 50 Hz, three-phased distribution transformers with the following characteristics:
Indoor use / Outdoor use with properly designed enclosure

- Thermal class F - Temperature rise 100 K
- Ambient ≤ 40 °C, altitude ≤ 1000 m
- MV windings encapsulated in cast resin
- Pre-impregnated LV windings
- Natural air cooling system (AN type)
- Core and frame covered with protective coating

Standard

These transformers comply with standards:

- IEC 60076-11
 - Ecodesign Directive EU 548-2014
- Adex Engineering Ltd guarantees that its transformers are:
- C2 Climatic class
 - E2 Environment class according to IEC 60076-16
 - F1 Fire behaviour class
 - Almost partial discharge free - Acceptance level:
 - ≤ 10 pC Routine Test
 - ≤ 5 pC Special Test according to IEC 60076 standard

Standard fittings

PROTIVA range of Cast resin insulated transformers (IP00):

- HV voltage variation by off circuit tapping links
- 4 bi-directional flat rollers
- 4 lifting holes
- 4 haulage holes on the underbase
- 2 earthing points
- 1 rating plate (on HV side)

PROTIVA with IP31 metal enclosure :

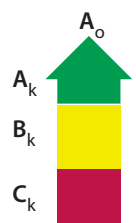
- 2 lifting lugs for transformer and enclosure assembly
- 1 earthing point on enclosure
- access to HV tapping by removing a bolted panel
- enclosure final colour adex beige or as requested

Ecodesign regulation EU 548-2014

- Maximal Loss levels
- Statement on Loss tolerances:
 - No tolerance on transformer design
 - 5% tolerance for end user checks
- Additional data requested on the name plates
 - Loss level and measured values
 - Type and weight of main materials used

Dry Type Transformers maximum loss levels according to Ecodesign:

- Insulation voltage MV ≤ 24 kV & LV ≤ 1.1 kV
 - $A_o B_k \leq 630$ kVA
 - $A_o A_k \geq 630$ kVA
- Insulation voltage: MV ≤ 36 kV & LV ≤ 1.1 kV
 - $A_o +15\% B_k +10\% \leq 630$ kVA
 - $A_o +15\% A_k +10\% \geq 630$ kVA



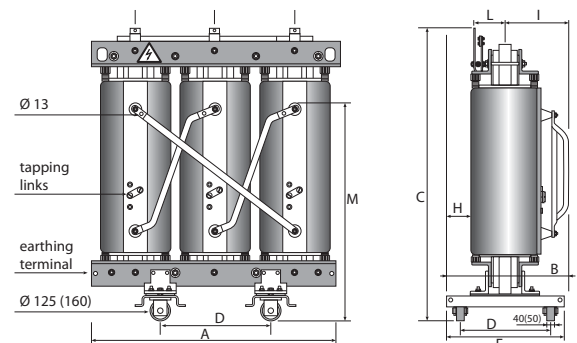
PROTIVA range Ecodesigned Cast Resin Transformers - 7.2 kV and 12 kV AoBk

Electrical characteristics

Rated power (kVA)	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Rated frequency (Hz)	50	50	50	50	50	50	50	50	50	50	50	50
Primary voltage (V)	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
Isolation level (kV)	12	12	12	12	12	12	12	12	12	12	12	12
Secondary voltage at no-load (V)	415	415	415	415	415	415	415	415	415	415	415	415
Tappings (%)	± 2x2.5	± 2x2.5	± 2x2.5	± 2x2.5	± 2x2.5	± 2x2.5	± 2x2.5	± 2x2.5	± 2x2.5	± 2x2.5	± 2x2.5	± 2x2.5
Vector groups	Dyn11	Dyn11	Dyn11	Dyn11	Dyn11	Dyn11	Dyn11	Dyn11	Dyn11	Dyn11	Dyn11	Dyn11
Losses (W) - no-load losses	520	620	750	900	1100	1300	1550	1800	2200	2600	3100	3800
Losses (W) - load losses at 120°C	3800	4300	5500	6020	7600	8000	9000	11000	13000	16000	19000	22000
Rated impedance voltage (%)	4	4	4	4/5	6	6	6	6	6	6	6	6
Max altitude (m)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Max ambiental temperature (C)	40	40	40	40	40	40	40	40	40	40	40	40
Nature of HV/LV windings	Al/Al	Al/Al	Al/Al	Al/Al	Al/Al	Al/Al	Al/Al	Al/Al	Al/Al	Al/Al	Al/Al	Al/Al

Dimensions and weights without enclosure housing (IP00)

Dimensions and weights are for guidance only, and are provided for a single-voltage transformer with the following HV insulation levels and low voltages. Only the definitive drawings following from the order will commit us contractually. For other voltages, impedance voltages and dual-voltages, weights and dimensions are different (consult us).

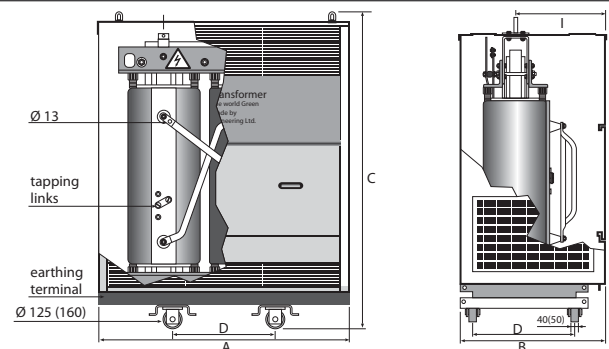


Insulation level: 7.2 kV and 12 kV- low voltage 400 V to 433 V

Rated power (kVA)	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Dimensions (mm)												
- Length A	1220	1250	1300	1400	1440	1460	1550	1630	1770	1820	1970	2260
- Width B	680	680	680	800	800	800	800	850	850	975	1080	1000
- Height C	1170	1260	1340	1380	1440	1520	1670	1740	1940	2000	2040	2100
- Roller pitch D	520	570	670	670	670	670	670	800	800	800	800	800
- Frame width E	650	650	650	780	780	780	780	800	800	950	950	950
- Roller diam. F	125	125	125	125	125	125	125	125	125	125	125	125
- Roller width G	50	50	50	50	50	50	50	50	50	70	70	70
Weight without enclosure (kg)	1150	1400	1580	1750	2000	2400	2900	3200	3980	5020	6000	9800

Dimensions and weights with IP31 metal enclosure

Dimensions and weights are for guidance only, and are provided for a single-voltage transformer with the following HV insulation levels and low voltages. Only the definitive drawings following from the order will commit us contractually. For other voltages, impedance voltages and dual-voltages, weights and dimensions are different (consult us).



Insulation level: 7.2 kV and 12 kV- low voltage 400 V to 433 V

Rated power (kVA)	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Dimensions (mm)												
- Length A	1650	1700	1800	1800	1800	1900	2150	2150	2130	2180	2350	2630
- Width B	950	1020	1020	1020	1020	1100	1170	1170	980	1230	1230	1270
- Height C	1750	1900	2050	2050	2050	2480	2480	2480	2440	2620	2650	3080
- Roller pitch D	520	670	670	670	670	670	820	820	820	1070	1070	1070
- Frame width E	645	795	795	795	795	795	945	945	945	1195	1195	1195
- Roller diam. F	125	125	125	125	125	125	125	125	125	160	160	200
- Roller width G	40	40	40	40	40	40	40	40	40	50	50	70
Weight with enclosure (kg)	1340	1580	1790	1870	2270	2620	3320	3900	4470	5470	6565	10470

Ecodesign requirements

Requirements applicable (losses value) to three phase dry type transformers with rated power ≤ 3150 kVA with one winding with $U_m \leq 24$ kV and the other one with $U_m \leq 1,1$ kV.

Rated power (kVA)	Tier 1 (from 1 July 2015)		Tier 2 (from 1 July 2021)	
	Maximum load losses P_k (W)	Maximum no load losses P_o (W)	Maximum load losses P_k (W)	Maximum no load losses P_o (W)
≤ 50	B_k (1700)	A_o (200)	A_k (1500)	$A_o - 10\%$ (180)
100	B_k (2050)	A_o (280)	A_k (1800)	$A_o - 10\%$ (252)
160	B_k (2900)	A_o (400)	A_k (2600)	$A_o - 10\%$ (360)
250	B_k (3800)	A_o (520)	A_k (3400)	$A_o - 10\%$ (468)
400	B_k (5500)	A_o (750)	A_k (4500)	$A_o - 10\%$ (675)
630	B_k (7600)	A_o (1100)	A_k (7100)	$A_o - 10\%$ (990)
800	A_k (8000)	A_o (1300)	A_k (8000)	$A_o - 10\%$ (1170)
1000	A_k (9000)	A_o (1550)	A_k (9000)	$A_o - 10\%$ (1395)
1250	A_k (11000)	A_o (1800)	A_k (11000)	$A_o - 10\%$ (1620)
1600	A_k (13000)	A_o (2200)	A_k (13000)	$A_o - 10\%$ (1980)
2000	A_k (16000)	A_o (2600)	A_k (16000)	$A_o - 10\%$ (2340)
2500	A_k (19000)	A_o (3100)	A_k (19000)	$A_o - 10\%$ (2790)
3150	A_k (22000)	A_o (3800)	A_k (22000)	$A_o - 10\%$ (3420)

Requirements applicable (losses value) to three phase liquid immersed medium power transformers with rated power ≤ 3150 kVA with one winding with $U_m \leq 24$ kV and the other one with $U_m \leq 1,1$ kV (table 1.1).

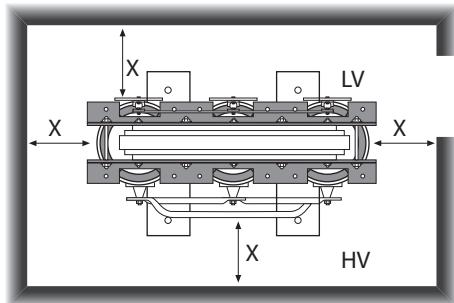
Rated power (kVA)	Tier 1 (from 1 July 2015)		Tier 2 (from 1 July 2021)	
	Maximum load losses P_k (W)	Maximum no load losses P_o (W)	Maximum load losses P_k (W)	Maximum no load losses P_o (W)
≤ 25	C_k (900)	A_o (70)	A_k (600)	$A_o - 10\%$ (63)
50	C_k (1100)	A_o (90)	A_k (750)	$A_o - 10\%$ (81)
100	C_k (1750)	A_o (145)	A_k (1250)	$A_o - 10\%$ (130)
160	C_k (2350)	A_o (210)	A_k (1750)	$A_o - 10\%$ (189)
250	C_k (3250)	A_o (300)	A_k (2350)	$A_o - 10\%$ (270)
315	C_k (3900)	A_o (360)	A_k (2800)	$A_o - 10\%$ (324)
400	C_k (4600)	A_o (430)	A_k (3250)	$A_o - 10\%$ (387)
500	C_k (5500)	A_o (510)	A_k (3900)	$A_o - 10\%$ (459)
630	C_k (6500)	A_o (600)	A_k (4600)	$A_o - 10\%$ (540)
800	C_k (8400)	A_o (650)	A_k (6000)	$A_o - 10\%$ (585)
1000	C_k (10500)	A_o (770)	A_k (7600)	$A_o - 10\%$ (693)
1250	B_k (11000)	A_o (950)	A_k (9500)	$A_o - 10\%$ (855)
1600	B_k (14000)	A_o (1200)	A_k (12000)	$A_o - 10\%$ (1080)
2000	B_k (18000)	A_o (1450)	A_k (15000)	$A_o - 10\%$ (1305)
2500	B_k (22000)	A_o (1750)	A_k (18500)	$A_o - 10\%$ (1575)
3150	B_k (27500)	A_o (2200)	A_k (23000)	$A_o - 10\%$ (1980)

PROTIVA range - up to 3150 kVA

Connections - PROTIVA transformers without enclosure housing (IP00)

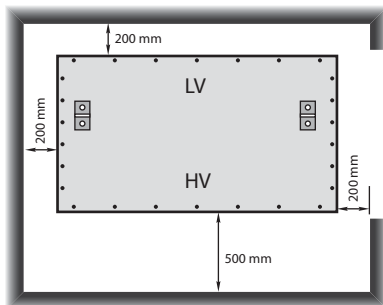
The winding resin coating and the plug-in connectors don't ensure any protection against touch when the transformer is energized. The contractor must ensure that cables and busbars are adequately supported to prevent mechanical stresses from being imposed on the transformer terminals, busbars or bushings.

Minimum clearances required

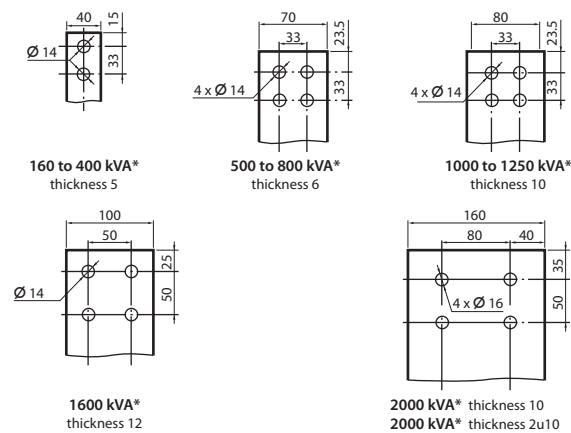


Connections -PROTIVA transformers with IP31 metal enclosure

Minimum clearances required



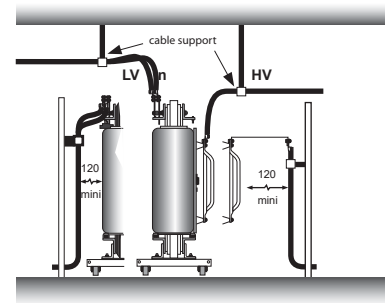
LV terminations



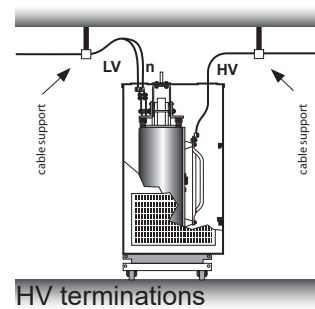
*Valid for aluminium terminations.

The contractor must ensure that cables and busbars are adequately supported to prevent mechanical stresses from being imposed on the transformer terminals, busbars or bushings.

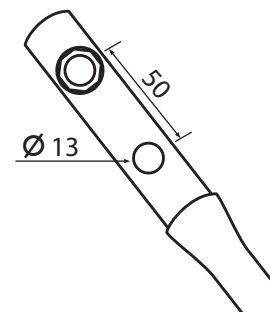
HV and LV standard connection



HV and LV standard connection



HV terminations



After years of continuous Research, Development and Testing, **ADEX R & D team** has developed and validated quality performance of these range of products.



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