



EN50588-1

**CAST RESIN
DISTRIBUTION
TRANSFORMERS**

2016 EDITION



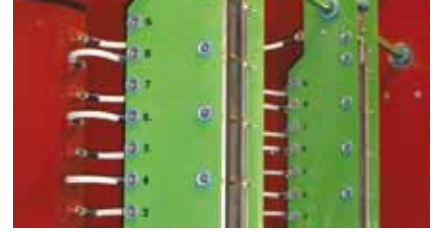
OPTIONAL ACCESSORIES



Temperature Measurement Devices



Switches



On-load Tapchangers



Vibration Dampeners



High Voltage Separable Connectors



Cooling Fans

LOW VOLTAGE COMPONENTS



Temperature Monitoring

Detectors in the LV winding

LV Terminals

With variable arrangements on request

Resilient Supports

To provide insulation for core and windings against mechanical vibrations

LV Windings

Epoxy prepreg-insulated aluminium or copper strip

STANDARD CHARACTERISTICS

European Standard	: EN 50588-1
European Regulation	: EU 548/2014
International Standard	: IEC 60076-11
High Voltage Tappings	: $\pm 2,5 \pm 5 \%$
Low Voltage	: 400-410-415-420-433V
Frequency	: 50Hz
Vector Group	: Dyn or Yyn
Insulation Temperature Class	: F (155°C)
Winding Material	: Aluminium
Installation Altitude	: ≤ 1000 mamsl
Maximum Ambient Temperature	: 40°C
Type of Cooling	: AN

HIGH VOLTAGE COMPONENTS



Three-limbed Core

Cold-rolled grain-oriented ferro-silicon steel sheets with protective varnish coating

HV Terminals

With variable arrangements to permit optimum installation

HV Tappings

For off-circuit adaptation to the supply network

HV Windings

Consisting of vacuum cast, fibreglass reinforced aluminium or copper strip

Epoxy Resin Insulation

Makes the transformer maintenance-free, moisture-free, tropicalized, flame-resistant and self-extinguishing

Standard EN 50588-1:2015 Ucc 6% Insulation Class 12kV - 17,5kV - 24kV																
Power kVA	LOSSES	Po W	Pk W	Io %	LpA dB(A)	LwA dB(A)	a1 mm	b1 mm	b2 mm	h1 mm	e mm	Ø mm	t mm	Mass kg	Term Type	Encl Type
100	Ao Bk	280	2050	0.8	38	51	1350	600	750	1300	520	125	40	950	A	1 B
	Ao Ak	280	1800	0.7	38	51	1400	600	750	1300	520	125	40	950	A	1 B
	AAo Ak	252	1800	0.7	37	50	1400	600	750	1300	520	125	40	950	A	1 B
150	Ao Bk	380	2750	0.7	41	54	1400	600	750	1350	520	125	40	1050	A	1 B
	Ao Ak	380	2460	0.7	41	54	1400	600	750	1350	520	125	40	1050	A	1 B
	AAo Ak	340	2460	0.6	40	53	1400	600	750	1350	520	125	40	1050	A	1 B
160	Ao Bk	400	2900	0.7	41	54	1400	600	750	1350	520	125	40	1100	A	1 B
	Ao Ak	400	2600	0.6	41	54	1400	600	750	1350	520	125	40	1100	A	1 B
	AAo Ak	360	2600	0.6	40	53	1400	600	750	1350	520	125	40	1100	A	1 B
200	Ao Bk	450	3300	0.7	42	55	1400	750	800	1400	670	125	40	1150	B	1 B
	Ao Ak	450	2950	0.6	42	55	1400	750	800	1400	670	125	40	1200	B	1 B
	AAo Ak	400	2950	0.5	41	54	1400	750	800	1400	670	125	40	1200	B	1 B
250	Ao Bk	520	3800	0.6	44	57	1400	750	800	1450	670	125	40	1250	B	1 B
	Ao Ak	520	3400	0.6	44	57	1450	750	800	1450	670	125	40	1300	B	1 B
	AAo Ak	468	3400	0.5	43	56	1450	750	800	1450	670	125	40	1300	B	1 B
315	Ao Bk	610	4530	0.6	44	58	1450	750	800	1500	670	125	40	1400	B	1 B
	Ao Ak	610	3870	0.5	44	58	1450	750	800	1500	670	125	40	1450	B	1 B
	AAo Ak	550	3870	0.5	43	57	1450	750	800	1500	670	125	40	1450	B	1 B
400	Ao Bk	750	5500	0.5	46	60	1450	750	850	1550	670	125	40	1600	B	2 B
	Ao Ak	750	4500	0.5	46	60	1500	750	850	1550	670	125	40	1650	B	2 B
	AAo Ak	675	4500	0.4	45	59	1500	750	850	1550	670	125	40	1650	B	2 B
500	Ao Bk	900	6410	0.5	47	61	1500	750	850	1600	670	125	40	1800	C	2 B
	Ao Ak	900	5630	0.5	47	61	1550	750	850	1600	670	125	40	1900	C	2 B
	AAo Ak	810	5630	0.4	46	60	1550	750	850	1600	670	125	40	1900	C	2 B
630	Ao Bk	1100	7600	0.5	48	62	1550	850	900	1650	670	125	40	2100	D	2 B
	Ao Ak	1100	7100	0.4	48	62	1600	850	900	1700	670	125	40	2200	D	2 B
	AAo Ak	990	7100	0.4	47	61	1600	850	900	1700	670	125	40	2200	D	2 B
750	Ao Ak	1240	7730	0.4	49	63	1650	850	900	1800	670	125	40	2500	E	3 B
	AAo Ak	1110	7730	0.4	48	62	1650	850	900	1800	670	125	40	2500	E	3 B
800	Ao Ak	1300	8000	0.4	50	64	1650	850	900	1850	670	125	40	2600	E	3 B
	AAo Ak	1170	8000	0.4	49	63	1650	850	900	1850	670	125	40	2600	E	3 B
1000	Ao Ak	1550	9000	0.4	50	65	1700	1000	1000	1950	820	125	40	3050	F	3 B
	AAo Ak	1395	9000	0.4	49	64	1700	1000	1000	1950	820	125	40	3050	F	3 B
1250	Ao Ak	1800	11000	0.4	52	67	1800	1000	1000	2100	820	160	50	3650	G	4 B
	AAo Ak	1620	11000	0.3	51	66	1800	1000	1000	2100	820	160	50	3650	G	4 B
1500	Ao Ak	2080	12420	0.4	53	68	1900	1000	1000	2250	820	160	50	4200	H	4 B
	AAo Ak	1870	12420	0.3	52	67	1900	1000	1000	2250	820	160	50	4200	H	4 B
1600	Ao Ak	2200	13000	0.3	53	68	1900	1000	1000	2300	820	160	50	4400	H	4 B
	AAo Ak	1980	13000	0.3	52	67	1900	1000	1000	2300	820	160	50	4400	H	4 B
2000	Ao Ak	2600	16000	0.3	54	70	2050	1310	1310	2450	1070	200	70	5300	I	5 B
	AAo Ak	2340	16000	0.3	53	69	2050	1310	1310	2450	1070	200	70	5300	I	5 B
2500	Ao Ak	3100	19000	0.3	55	71	2150	1310	1310	2600	1070	200	70	6350	J	5 B
	AAo Ak	2790	19000	0.3	54	70	2150	1310	1310	2600	1070	200	70	6350	J	5 B
3000	Ao Ak	3630	21300	0.3	57	73	2250	1310	1310	2700	1070	200	70	7400	K	6 B
	AAo Ak	3270	21300	0.3	56	72	2250	1310	1310	2700	1070	200	70	7400	K	6 B
3150	Ao Ak	3800	22000	0.3	58	74	2300	1310	1310	2750	1070	200	70	7700	K	6 B
	AAo Ak	3420	22000	0.3	57	73	2300	1310	1310	2750	1070	200	70	7700	K	6 B
3500	Ao Ak	4500	25300	0.3	59	75	2350	1440	1440	2750	1200	200	70	8350	K	7 B
	AAo Ak	4050	25300	0.3	58	74	2350	1440	1440	2750	1200	200	70	8350	K	7 B
4000	Ao Ak	5500	30000	0.3	60	76	2400	1440	1440	2750	1200	200	70	9350	K	7 B
	AAo Ak	4950	30000	0.2	59	75	2400	1440	1440	2750	1200	200	70	9350	K	7 B

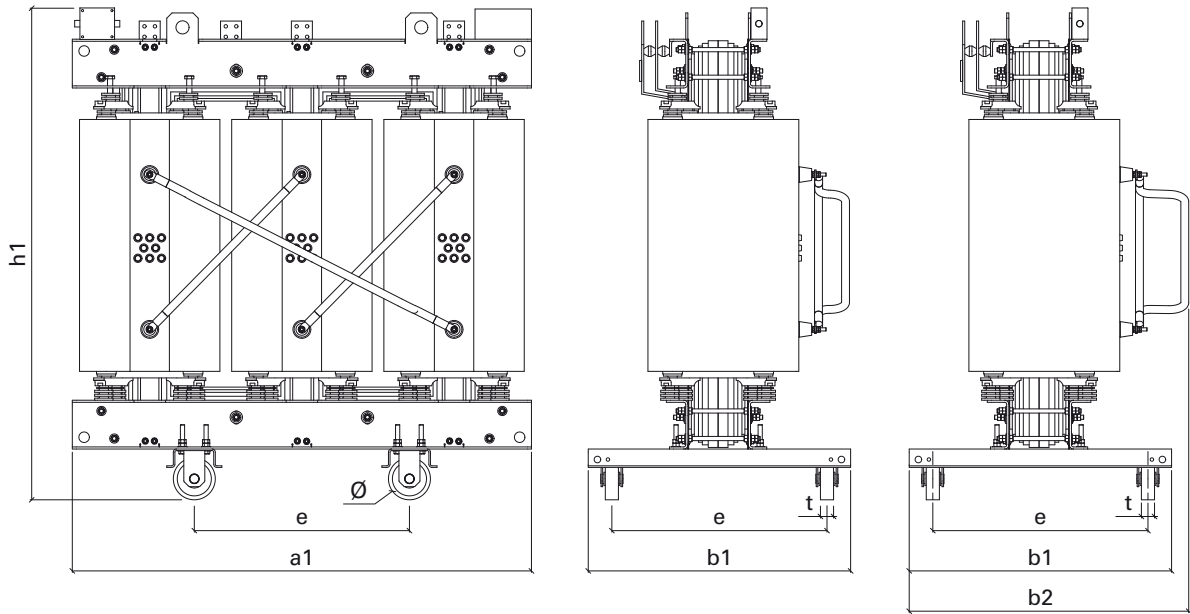


Standard EN 50588-1:2015 U _{cc} 6,5%											Insulation Class 36kV					
Power kVA	LOSSES	P _o W	P _k W	I _o %	L _p A dB(A)	L _w A dB(A)	a1 mm	b1 mm	b2 mm	h1 mm	e mm	Ø mm	t mm	Mass kg	Term Type	Encl Type
100	Ao Bk	320	2250	1.1	37	51	1700	600	850	1650	520	125	40	1550	A	11 B
	Ao Ak	320	1980	1.0	37	51	1700	600	850	1700	520	125	40	1550	A	11 B
	AAo Ak	280	1980	0.9	36	50	1700	600	850	1700	520	125	40	1550	A	11 B
150	Ao Bk	430	3030	0.9	40	54	1700	600	850	1700	520	125	40	1700	A	11 B
	Ao Ak	430	2710	0.9	40	54	1700	600	850	1750	520	125	40	1700	A	11 B
	AAo Ak	390	2710	0.8	39	53	1700	600	850	1750	520	125	40	1700	A	11 B
160	Ao Bk	460	3190	0.9	40	54	1700	600	850	1700	520	125	40	1700	A	11 B
	Ao Ak	460	2860	0.8	40	54	1700	600	850	1750	520	125	40	1700	A	11 B
	AAo Ak	410	2860	0.7	39	53	1700	600	850	1750	520	125	40	1700	A	11 B
200	Ao Bk	510	3630	0.9	41	55	1700	750	850	1750	670	125	40	1800	B	11 B
	Ao Ak	510	3250	0.8	41	55	1700	750	850	1750	670	125	40	1800	B	11 B
	AAo Ak	460	3250	0.7	40	54	1700	750	850	1750	670	125	40	1800	B	11 B
250	Ao Bk	590	4180	0.8	43	57	1700	750	850	1800	670	125	40	1900	B	11 B
	Ao Ak	590	3740	0.7	43	57	1750	750	850	1800	670	125	40	1950	B	11 B
	AAo Ak	530	3740	0.7	42	56	1750	750	850	1800	670	125	40	1950	B	11 B
315	Ao Bk	700	4990	0.8	44	58	1700	750	900	1850	670	125	40	2050	B	11 B
	Ao Ak	700	4260	0.7	44	58	1750	750	900	1850	670	125	40	2150	B	11 B
	AAo Ak	630	4260	0.6	43	57	1750	750	900	1850	670	125	40	2150	B	11 B
400	Ao Bk	860	6050	0.7	46	60	1700	750	900	1900	670	125	40	2300	B	12 B
	Ao Ak	860	4950	0.6	46	60	1800	750	900	1900	670	125	40	2400	B	12 B
	AAo Ak	770	4950	0.6	45	59	1800	750	900	1900	670	125	40	2400	B	12 B
500	Ao Bk	1030	7050	0.7	47	61	1750	850	1000	1950	670	125	40	2550	C	12 B
	Ao Ak	1030	6190	0.6	46	61	1800	850	1000	1950	670	125	40	2700	C	12 B
	AAo Ak	930	6190	0.5	45	60	1800	850	1000	1950	670	125	40	2700	C	12 B
630	Ao Bk	1260	8360	0.6	47	62	1800	850	1000	2050	670	125	40	2900	D	12 B
	Ao Ak	1260	7810	0.6	47	62	1850	850	1000	2050	670	125	40	3050	D	12 B
	AAo Ak	1130	7810	0.5	46	61	1850	850	1000	2050	670	125	40	3050	D	12 B
750	Ao Ak	1420	8500	0.5	48	63	1900	850	1000	2100	670	125	40	3400	E	13 B
	AAo Ak	1270	8500	0.5	47	62	1900	850	1000	2100	670	125	40	3400	E	13 B
800	Ao Ak	1490	8800	0.5	49	64	1900	850	1000	2150	670	125	40	3550	E	13 B
	AAo Ak	1340	8800	0.5	48	63	1900	850	1000	2150	670	125	40	3550	E	13 B
1000	Ao Ak	1780	9900	0.5	50	65	1950	1000	1100	2250	820	125	40	4100	F	13 B
	AAo Ak	1600	9900	0.5	49	64	1950	1000	1100	2250	820	125	40	4100	F	13 B
1250	Ao Ak	2070	12100	0.5	52	67	2000	1000	1100	2350	820	160	50	4750	G	14 B
	AAo Ak	1860	12100	0.4	51	66	2000	1000	1100	2350	820	160	50	4750	G	14 B
1500	Ao Ak	2390	13670	0.5	53	68	2100	1000	1100	2500	820	160	50	5400	H	14 B
	AAo Ak	2150	13670	0.4	52	67	2100	1000	1100	2500	820	160	50	5400	H	14 B
1600	Ao Ak	2530	14300	0.4	53	68	2100	1000	1100	2500	820	160	50	5650	H	14 B
	AAo Ak	2270	14300	0.4	52	67	2100	1000	1100	2500	820	160	50	5650	H	14 B
2000	Ao Ak	2990	17600	0.4	54	70	2200	1310	1310	2700	1070	200	70	6650	I	15 B
	AAo Ak	2690	17600	0.4	53	69	2200	1310	1310	2700	1070	200	70	6650	I	15 B
2500	Ao Ak	3560	20900	0.4	55	71	2350	1310	1310	2850	1070	200	70	7800	J	15 B
	AAo Ak	3200	20900	0.4	54	70	2350	1310	1310	2850	1070	200	70	7800	J	15 B
3000	Ao Ak	4180	23430	0.4	57	73	2450	1310	1310	2950	1070	200	70	8850	K	16 B
	AAo Ak	3760	23430	0.3	56	72	2450	1310	1310	2950	1070	200	70	8850	K	16 B
3150	Ao Ak	4370	24200	0.4	58	74	2450	1310	1310	3000	1070	200	70	9150	K	16 B
	AAo Ak	3930	24200	0.3	57	73	2450	1310	1310	3000	1070	200	70	9150	K	16 B
3500	Ao Ak	5000	25800	0.4	58	75	2500	1440	1440	3050	1200	200	70	9850	K	17 B
	AAo Ak	4500	25800	0.3	57	74	2500	1440	1440	3050	1200	200	70	9850	K	17 B
4000	Ao Ak	6000	28000	0.3	59	76	2600	1440	1440	3100	1200	200	70	10750	K	17 B
	AAo Ak	5400	28000	0.3	58	75	2600	1440	1440	3100	1200	200	70	10750	K	17 B

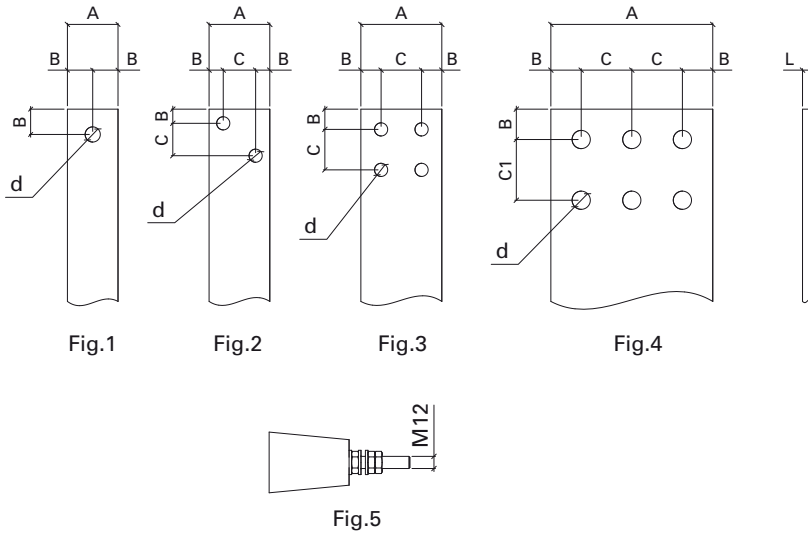


TECHNICAL DETAILS

IP00



TERMINALS

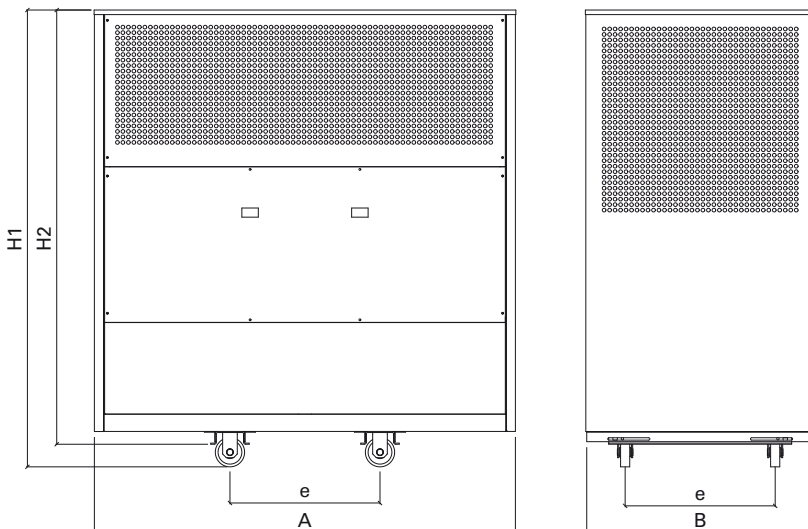


LV Terminals		A	L	B	C	C1	d
		mm	mm	mm	mm	mm	mm
Term Type	Fig.	LV TERMINALS					
A	1	30	3	15	-	-	13
B	1	50	5	25	-	-	15
C	2	60	6	14	32	-	13
D	2	60	8	14	32	-	13
E	3	80	8	20	40	-	13
F	3	100	8	25	50	-	15
G	3	120	10	30	60	-	18
H	3	120	12	30	60	-	18
I	4	160	10	30	50	60	18
J	4	160	14	30	50	60	18
K	4	160	20	30	50	60	18

HV TERMINALS

All HV terminals per Fig.5 with thread dimension M12

ENCLOSURES IP21 IP22 IP23 IP31 IP32 IP33



Type	A	B	H1 (with wheels) mm	H2 (without wheels) mm	e	Mass
	mm	mm			mm	kg
Insulation Class 12kV 17,5kV 24kV						
1 B	1850	1250	1710	1610	See transformer tables	170
2 B	1950	1300	2010	1910		205
3 B	2050	1350	2260	2160		235
4 B	2250	1400	2500	2360		270
5 B	2500	1450	2850	2670		325
6 B	2750	1550	3050	2870		385
7 B	2900	1600	3150	3110		415
Insulation Class 36kV						
11 B	2400	1550	1960	1860	See transformer tables	255
12 B	2500	1600	2260	2120		300
13 B	2600	1650	2460	2320		330
14 B	2750	1700	2700	2520		365
15 B	2950	1750	3050	2870		430
16 B	3050	1800	3200	3160		465
17 B	3250	1850	3550	3510		535

ENCLOSURES

INDOOR

IP21 IP22 IP23 IP31 IP32 IP33



IP21



IP23



IP43

The European Commission issued Regulation No 548/2014 on 21 May 2014, implementing Directive 2009/125/EC of the European Parliament and of the Council, with regard to small, medium and large power transformers. The Regulation was mandated by law on 1 July 2015. The main impetus of the Regulation is a requirement for high efficiency, and therefore low loss, in transformers destined for the European market.

Subsequently, Standard EN50588-1:2015 was issued by the European Committee for Electro-technical Standardization, Cenelec, under a mandate given by the European Commission and the European Free Trade Association to provide a means of conforming to requirements of the Regulation. EN50588-1:2015 fully defines the ecodesign requirements for small, medium and large power transformers.

In response, TMC has developed the wide range of vacuum cast resin dry type distribution transformers as described in this brochure. These units are offered to the market in full compliance with both EU Regulation 548/2014 as well as Cenelec Standard EN50588-1:2015.

The no-load and load losses described as AoBk (rated power up to 630kVA) and AoAk (rated power up to 3150kVA) must not be exceeded for transformers supplied or installed in Europe after 1 July 2015 up to 1 July 2021.

On 1 July 2021, reduced losses shown as AAoAk will be invoked. By law these will supersede both AoBk and AoAk.

This range of cast resin distribution transformers covered in this brochure is generally specified as below.

Rated Power: 100kVA to 3150kVA

High Voltage: up to 36kV class

Low Voltage: up to 1,1kV class

Frequency: 50 hertz

OUTDOOR

IP43 to IP66



IP43



IP54



IP66
with Switchgear



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