TMC
TRANSFORMERS

Certified System
Quality
ISO 9001
SAI GLOBAL

CAST RESIN TRANSFORMERS

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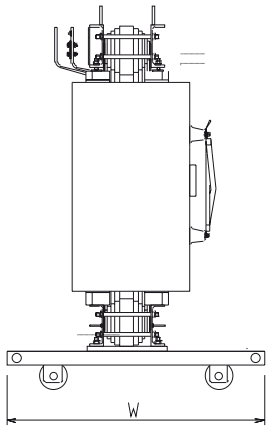
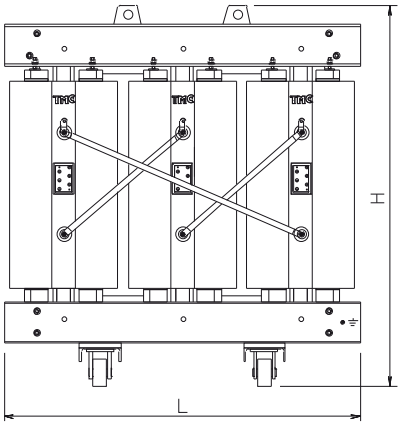
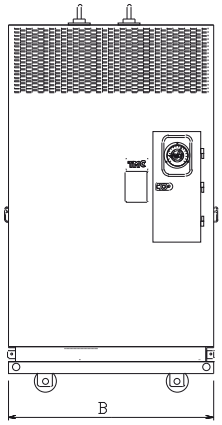
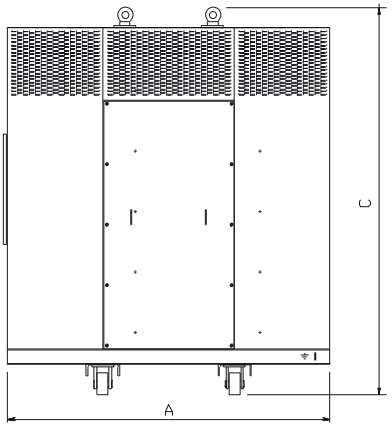
TYPICAL DATA









12kV
LI=95kV BIL AC=28kV

POWER	Impedance	No Load Loss Normal	No Load Loss Reduced	Load Loss @75°C	Load Loss @120°C	Transformer Dimensions (IP00)				Enclosure Dimensions (IP20,21,23,30,31)			
						L	W	H	Mass	A	B	C	Mass
kVA	%	W	W	W	W	mm	mm	mm	kg	mm	mm	mm	kg
50	4	260	200	930	1100	1100	600	1100	710	1850	1100	1560	245
100	4	440	330	1750	2000	1100	600	1100	760	1850	1100	1560	245
150	4	580	430	2250	2600	1100	600	1150	810	1850	1100	1560	245
160	4	610	450	2350	2700	1100	600	1150	860	1850	1100	1560	245
200	4	700	520	2650	3100	1150	600	1300	960	1850	1100	1560	245
250	4	820	610	3050	3500	1150	600	1300	1050	1850	1100	1560	245
315	4	1050	750	3700	4250	1200	750	1400	1270	1850	1100	1560	245
400	4	1150	880	4300	4900	1250	750	1450	1430	1900	1100	1760	255
500	4	1400	1050	5250	6000	1300	750	1510	1650	1900	1100	1760	255
630	6	1500	1150	6350	7300	1350	850	1600	1930	2050	1150	1960	275
750	6	1720	1260	7400	8500	1400	850	1750	2010	2050	1150	1960	275
800	6	1800	1300	7850	9000	1400	850	1750	2090	2050	1150	1960	275
1000	6	2100	1500	8700	10000	1450	1000	1800	2480	2300	1250	2460	325
1250	6	2500	1800	10450	12000	1550	1000	1950	3110	2300	1250	2500	325
1500	6	2700	2100	12050	13900	1700	1000	2050	3550	2300	1250	2500	325
1600	6	2800	2200	12650	14500	1700	1000	2050	3980	2300	1250	2500	325
2000	6	3600	2600	15650	18000	1800	1310	2150	4690	2500	1310	2650	350
2500	6	4300	3200	18250	21000	2000	1310	2400	6160	2500	1310	2650	350
3000	6	5300	3800	22650	26000	2100	1310	2400	6710	2500	1400	3250	400
3150	6	5100	3700	22700	26105	2100	1310	2400	7250	2500	1400	3250	400
3500	6	5600	4100	24700	28405	2100	1500	2440	7790	2500	1750	3250	420
4000	6	5900	4300	25700	29550	DIMENSIONS PER DESIGN							
5000	6	7100	5200	28400	32650								
6300	6	8800	6450	33300	38300								
8000	6	9900	7250	37000	42600								
10000	6	11700	8550	41400	47600								
16000	6	15200	11100	56200	72250								

24kV
LI=125kV BIL AC=50kV

POWER	Impedance	No Load Loss Normal	No Load Loss Reduced	Load Loss @75°C	Load Loss @120°C	Transformer Dimensions (IP00)				Enclosure Dimensions (IP20,21,23,30,31)			
						L	W	H	Mass	A	B	C	Mass
kVA	%	W	W	W	W	mm	mm	mm	kg	mm	mm	mm	kg
50	6	250	190	1130	1300	1260	600	1130	710	1850	1100	1560	245
100	6	460	340	1790	2050	1260	600	1130	760	1850	1100	1560	245
150	6	620	460	2450	2850	1260	600	1130	810	1850	1100	1560	245
160	6	650	480	2550	2900	1260	600	1130	860	1850	1100	1560	245
200	6	750	560	2900	3350	1300	600	1130	970	1850	1100	1560	245
250	6	880	650	3300	3800	1300	600	1350	1080	1850	1100	1560	245
315	6	980	750	3900	4500	1300	750	1400	1210	1850	1100	1560	245
400	6	1200	940	4800	5500	1370	750	1450	1400	1900	1100	1760	255
500	6	1350	1050	5950	6800	1370	750	1500	1620	1900	1100	1760	255
630	6	1650	1250	6600	7600	1450	850	1600	1870	2050	1150	1960	275
750	6	1900	1450	7750	8950	1450	850	1700	2040	2050	1150	1960	275
800	6	2000	1500	8200	9400	1450	850	1750	2200	2050	1150	1960	275
1000	6	2300	1800	9600	11000	1550	1000	1800	2760	2300	1250	2460	325
1250	6	2800	2100	11300	13000	1650	1000	1950	3340	2300	1250	2500	325
1500	6	3050	2350	13200	15150	1700	1000	2050	3660	2300	1250	2500	325
1600	6	3100	2400	13950	16000	1700	1000	2050	3980	2300	1250	2500	325
2000	6	4000	3000	15650	18000	1850	1310	2150	4720	2500	1310	2650	350
2500	6	5000	3600	20000	23000	2050	1310	2440	6330	2500	1310	2650	350
3000	6	5800	4150	23350	26850	2100	1310	2440	7190	2500	1310	2650	350
3150	6	6000	4300	24350	28000	2200	1310	2440	8050	2600	1400	3250	400
3500	6	6200	4450	27200	31300	2200	1500	2440	8910	2600	1600	3250	450
4000	6	6500	4700	27600	31750	DIMENSIONS PER DESIGN							
5000	6	7900	5700	31300	36000								
6300	6	9800	7100	36800	42350								
8000	6	10900	7900	40900	47000								
10000	6	12900	9350	45700	52550								
16000	6	17200	12450	62600	75800								

36kV
LI=170kV BIL AC=70kV

POWER	Impedance	No Load Loss Normal	No Load Loss Reduced	Load Loss @75°C	Load Loss @120°C	Transformer Dimensions (IP00)				Enclosure Dimensions (IP20,21,23,30,31)			
						L	W	H	Mass	A	B	C	Mass
kVA	%	W	W	W	W	mm	mm	mm	kg	mm	mm	mm	kg
50	6	530	490	1090	1250	1450	750	1450	1180	1850	1100	1560	245
100	6	660	620	2490	2900	1450	750	1450	1230	1850	1100	1560	245
150	6	820	770	2730	3150	1450	750	1450	1280	1850	1100	1560	245
160	6	960	900	2550	2900	1450	750	1450	1330	1850	1100	1560	245
200	6	1100	990	2950	3400	1450	750	1450	1380	1850	1100	1560	245
250	6	1280	1100	3450	4000	1450	750	1450	1430	1850	1100	1560	245
315	6	1450	1200	4100	4750	1550	750	1550	1630	1900	1100	1760	255
400	6	1650	1300	4950	5700	1550	750	1550	1820	1900	1100	1760	255
500	6	1900	1450	5850	6700	1650	850	1700	2100	2050	1150	1960	275
630	6	2200	1600	6950	8000	1650	850	1700	2370	2050	1150	1960	275
750	6	2550	1850	7950	9150	1700	850	1850	2590	2300	1250	2460	325
800	6	2700	1900	8350	9600	1700	850	1850	2810	2300	1250	2460	325
1000	7	3100	2250	10000	11500	1800	850	1950	3190	2300	1250	2500	325
1250	8	3600	2600	12150	14000	1900	1000	2050	3800	2300	1250	2500	325
1500	8	4050	2900	14050	16150	1900	1000	2050	4160	2300	1250	2500	325
1600	8	4200	3000	14800	17000	1950	1000	2400	4520	2500	1310	2600	350
2000	8	5000	3500	18250	21000	2000	1310	2500	4830	2500	1310	2650	350
2500	8	5800	4200	21750	25000	2250	1310	2500	7130	2500	1310	2650	350
3000	8	6500	4850	25100	28900	2400	1310	2500	8455	2800	1400	3250	400
3150	8	6700	5000	26100	30000	2400	1310	2500	9150	2800	1400	3250	400
3500	8	7320	5500	28200	32400	2400	1500	2500	9640	2800	1600	3250	450
4000	8	7790	5850	31000	36700	DIMENSIONS PER DESIGN							
5000	8	9230	6950	35800	41200								
6300	8	11060	8350	40600	47000								
8000	8	12500	9450	45400	52200								
10000	8	14420	11000	48500	55800								
16000	8	19199	14650	69000	79350								

DESIGN AND CONSTRUCTION FEATURES

Foil Windings
TMC Cast Resin Transformers are wound with either aluminium or copper foil.

One advantage of foil construction is that short circuit axial forces are eliminated, due to the matched electrical lengths of the low (LV) and medium (MV) voltage coils.

"State of the Art" winding machines enable insulation and conductor materials to be simultaneously wound, resulting in a very compact winding, capable of resisting radial short circuit forces.

A major electrical advantage over conventional wire or strip windings is that the interlayer voltage never exceeds the individual voltage of each turn.

The LV foil conductor edges are conditioned prior to winding, and each turn is insulated with three-ply, resin impregnated high temperature film laminate.

After winding, a vacuum impregnation and final oven hardening fully protects the coil from infiltration of moisture.

The MV conductor foil is also edge conditioned and wound in continuous discs onto a precision former. This system of winding guarantees the accuracy required for close tolerance mould casting.

The winding is reinforced with fibreglass mesh and vacuum cast in high temperature epoxy resin.

Different epoxy formulations are used for aluminium and copper winding material to allow for the varying coefficients of thermal expansion of these materials.

Enclosures
TMC enclosures are manufactured from zinc coated mild steel plate. For very onerous environmental conditions this may be replaced with stainless steel. The standard finish is a polyester-based powder coat. Protection categories up to IP66 can be supplied. Enclosures can also be manufactured to meet special requirements.

Lightning Impulse Withstand Voltage (BIL)
TMC Cast Resin Transformers are designed to withstand lightning impulse voltages without the aid of surge protection devices.

Terminations
Terminations are fabricated from generously sized solid copper or copper clad aluminium busbar.

Coils wound with aluminium foil are terminated with copper clad aluminium bars to avoid bi-metal connections to the Customer's cables.

Core
The core used in **TMC** Cast Resin Transformers is manufactured from prime quality, low loss, grain oriented ferro-silicon steel laminations, individually coated with high temperature, inorganic insulation.

The structure consists of vertical columns interconnected with fully mitred joints at the yokes.

Resin impregnated glass bandages strap the core and ensure low noise levels.

The completed core is treated with a high temperature, electrically stable coating, to prevent corrosion in service.

Free of Partial Discharge
Internal Partial Discharge, which are a major cause of erosion and failure in transformer insulation systems at voltages greater than 12kV, are effectively eliminated in **TMC** Cast Resin Transformers.

Forced Air Cooling
TMC Cast Resin Transformers can be supplied with fans and controls to increase the rated kVA capacity. Forced and directed air circulation permits a substantial power increase of the rated kVA.

On-Load Tapchangers
Larger capacity **TMC** Cast Resin Transformers can be fitted with on-load tapchangers to suit special applications.

Environmentally Safe
TMC Cast Resin Transformers contain no liquid to pollute ground or water supplies, and no special measures are required to guard against spillage.

Quality Assurance
TMC is accredited and audited for compliance to ISO9001 Quality Assurance standards.

The rigorous requirements of this International Standard, together with the Customer's own technical specifications, ensure that TMC supplies products that are safe, reliable and of the highest quality.

The Quality Manager continuously monitors the approved quality assurance programme.

Routine Testing
Specified routine tests are carried out by trained personnel using modern, calibrated digital test equipment.

These tests include:
- Ratio and Vector Group
- Insulation Resistance
- Applied Voltage
- Induced Overvoltage
- No Load Loss
- Load Loss
- Impedance
- Partial Discharge

Type Testing
On request, the following type tests can be carried out at an extra cost:
- Short Circuit Test
- Sound Level Test
- Impulse Test
- Temperature Rise
- Noise Level

Temperature monitoring
detectors in the LV winding.

LV terminals
with variable arrangements
on request.

Three-limb core
of cold-rolled, grain-oriented
ferro-silicon steel sheets with
protective varnish coating.

Resilient supports
to provide insulation for
core and windings against
mechanical vibrations.

MV terminals
with variable arrangement to permit
optimum installation.

MV tapping
for off-circuit adaptation
to the supply network

LV winding (inside)
of epoxy prepreg-insulated
aluminium or copper strip.

MV winding
consisting of vacuum cast,
fibreglass reinforced aluminium or
copper strip.

Epoxy resin insulation
makes the transformer
maintenance-free, moisture-free,
tropicalised, flame-resistant and
self-extinguishing.

Accessories
The following accessories may also
be requested:

- Temperature measurement devices
- Cooling Fans
- Medium Voltage plug-in connectors
- Vibration Dampeners
- On-load Tapchanger

GENERAL INFORMATION

TMC is an international group of companies with over 75 years of transformer manufacturing experience. The group has excelled at providing high quality induction equipment to the electrical power industry, with an emphasis on meeting exacting specifications and standards, whilst minimising cost. **TMC** is fully accredited to the international quality standard ISO9001, and continues to build on a tradition of product excellence and customer focus and satisfaction.

Range
- 100kVA to 20000kVA
- 66kV System Highest Voltage
- Temperature Class F or H
- Indoor or Outdoor Application
- Degree of Protection IP00 to IP66

Application
TMC Cast Resin Transformers are ideal for installation close to the electrical load under adverse environmental conditions.

All airways are smooth and unobstructed, so that even in polluted ambient conditions, very little maintenance is required.

Since both medium and low voltage windings are cast under vacuum, moisture cannot penetrate, and therefore no drying process is required in humid conditions after long periods out of service.

Transformers and Reactors suitable for special purposes can be supplied to particular customer requirements, such as: Rectifier Transformers, Traction Transformers, Furnace Transformers as well as Air or Iron Cored Reactors.

Indoor or outdoor housings can be supplied. These comply with a degree of protection to suit any particular requirement.

TMC Cast Resin Transformers comply with the latest National or International Standard, consistent with the Customer's own specifications.

Due to the possibility of installation close to the load centre, without the attendant fire risk from flammable oil leaks inherent in oil cooling, significant economic benefits will result if the use of **TMC** Cast Resin Transformers is considered at the planning stage.

This will ensure that the overall costs of an installed power supply system are considerably reduced.

TMC Cast Resin Transformers are maintenance free.

Information Required with Enquiry
- Design Standard
- Rated Power
- Overload Requirements
- Ambient Conditions
- No-load Voltage Ratio
- Insulation Levels (BIL)
- Number of Phases
- Frequency
- Connection Symbol
- Tapping Range
- Impedance
- Enclosure Protection
- LV Fittings
- MV Fittings

Transformers Manufacturing Company Pty Ltd

19 Ewing Street
Brunswick Victoria 3056
Australia

Telephone: +61 3 9356 8700
Facsimile: +61 3 9356 8701
e-mail: sales@tmc.com.au

Transformers Manufacturing Company España S.A.

Poligono Bildosola, Parcela B1
48142 Artea (Bizkaia)
Spain

Telephone: +34 94 631 2280
Facsimile: +34 94 631 4524
e-mail: ventas@tmc.com.au

TMC range of products

- Cast Resin Transformers
- Dry Type Transformers
- Oil Cooled Transformers
- Water Cooled Transformers
- Reactors and Inductors

Typical field applications

- Power and Distribution
- Rectifier
- Furnace
- Industrial
- Mining