

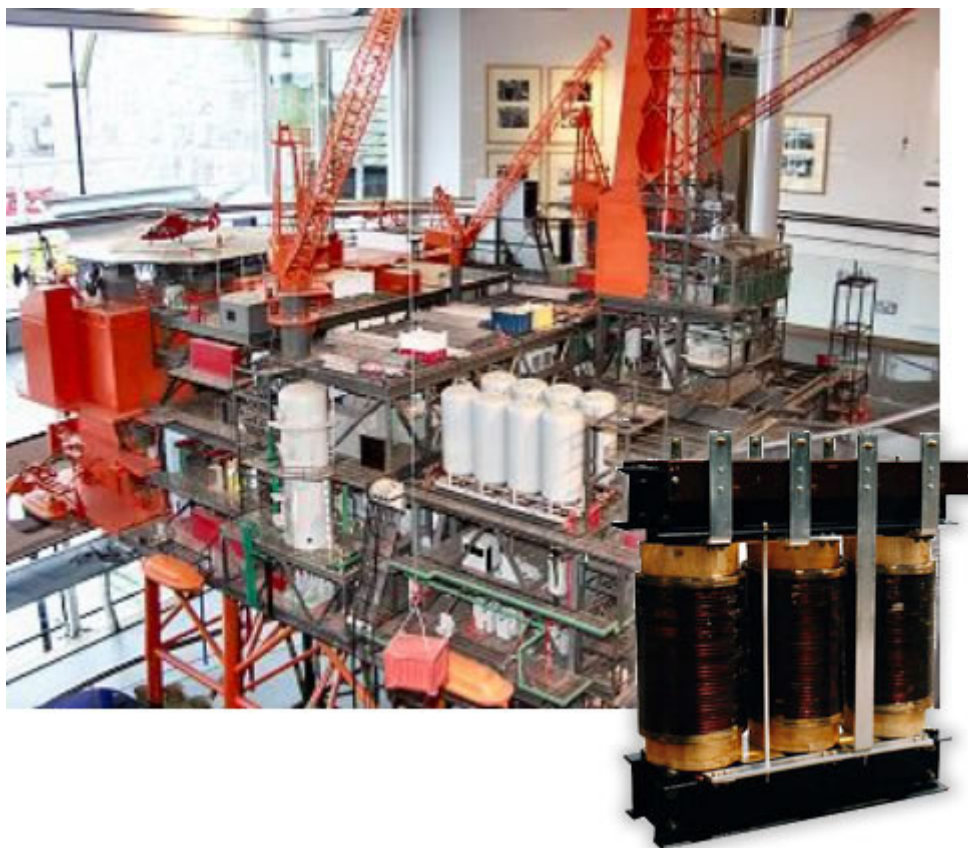


AsiaElectricTransformers

DTDW series

Low Voltage Dry Type

Three Phase Isolating Transformers



## Design Overview

DTDW series Dry Type Transformers are 3 phase, indoor, insusceptibility to moisture and compact designed for general application when ever voltage conversion and/or electrical isolation are required. Its can also be use to provide protection against noise and transient in the common modes.

### Iron Core

Cold rolled, oriented grain steel sheet with low specific losses, insulated on both sides by thin organic coating.

### Windings

Copper Strips with Class F (155°C) or Class H (180°C) enameled coated.

Class H(NOMEX) Insulation material is used between overlapping turns or layers.

Axial channels are used between layers of primary and secondary winding to provide air gap for uniform cooling.

High temperature tolerant fiberglass boards are used as bobbins to separate the core and windings.

Sized, transposed and shaped to minimize Eddy current losses.

Fully impregnated with class H varnish and oven dried.

### Low Inrush Current

Special design measures are implemented to reduce the inrush current, such as

Primary winding at outer layers to increase resistance

High grade iron core with high saturation to prevent core saturation during startup.

### Protection Devices(Optional)

Thermal protection devices

Thermister (Normally Closed, activated at 160°C)

Digital Temperature Controller

Relays (for Auxiliary contacts)

### Testing

Insulation Test at 1000Vdc and

Hi-potential test at 2.5KV

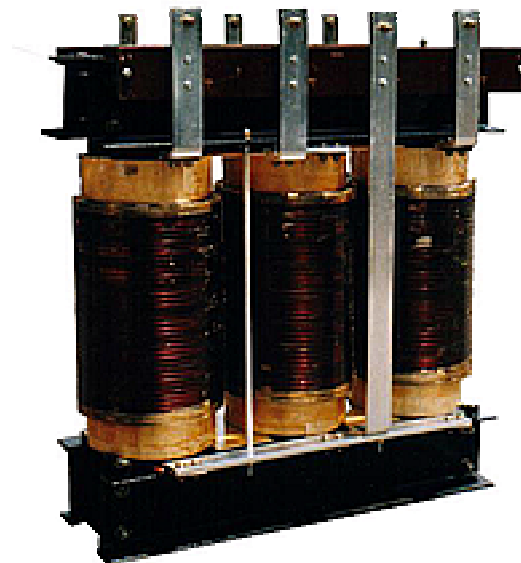
Resistance Test

Open circuit Test (No-load Test)

Short circuit Test

Temperature Rise Test

Noise Level Test



### Standards

In accordance with standards:

- ❑ IEC 60726 Dry Type Transformers
- ❑ Quality Assurance ISO 9001:2000  
DNV Certification no. 0459-2003-AQ-SIN-RVA
- ❑ Conforming to European Union standards, EN 61558

### Electrical Characteristics - 5kVA – 100kVA

Rated power (kVA)	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	
Rated primary voltage	Up to 690 Vac															
Secondary voltage (at no load)	Up to 690 Vac															
Frequency	50/60Hz															
Vector Group	Dyn11 (If not specified)															
Insulation Type	Class F or H for 50kVA and above															
Test Voltage	2.5kVac, 1 min															
Enclosure Protection Degree	IP21															
Max ambient temperature(°C)	40															
Max allowable temperature rise(°C)	150															
Approx impedance voltage (%)	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Noise Level at 1m (dB)	45	45	48	50	50	51	51	52	52	53	53	54	54	54	55	
Losses (W)	No-load Iron losses	33	67	100	133	167	200	267	267	300	333	400	467	533	600	667
	On-Load Copper loss	67	133	200	267	333	400	467	533	600	667	800	933	1.1K	1.2K	1.3K

### Electrical Characteristics - 120kVA – 1MVA

Rated power (kVA)	120	150	250	300	350	400	450	500	600	650	700	750	800	900	1M	
Rated primary voltage	Up to 690 Vac															
Secondary voltage (at no load)	Up to 690 Vac															
Frequency	50/60Hz															
Vector Group	Dyn11 (If not specified)															
Insulation Type	Class H															
Test Voltage	2.5kVac, 1 min															
Enclosure Protection Degree	IP21															
Max ambient temperature(°C)	40															
Max allowable temperature rise(°C)	150															
Approx impedance voltage (%)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	5.0	5.0
Noise Level at 1m (dB)	55	55	56	56	56	56	57	57	57	57	58	58	60	61	62	
Losses (kW)	No-load Iron losses	0.8	1.0	1.7	2.0	2.3	2.7	3.0	3.3	4.0	4.3	4.7	5.0	5.3	6.0	6.7
	On-Load Copper loss	1.6	2.0	3.3	4.0	4.7	5.3	6.0	6.6	8.0	8.7	9.3	10	11	12	13

*Non-standard ratings available upon request*

### Vector groups

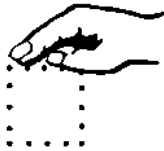







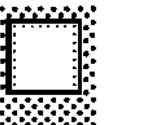





The vector group marks the circuitry of windings and their phase position to each other. It consists of a capital and small letter plus a code number. The capital letter refers to the input winding, the small to the output winding. The upper voltage is marked by 1 in front, the undervoltage by a 2 in front, regardless of input or output voltage. The numbers correlate to letters U V W and distinguish the 3 phases. The neutral point (star point) is always marked N.

Designation Code no.	Vector group	Vector diagram	Circuit configuration	Secondary star point
0	Dd0			none
	Yy0			10% load capacity
	Dz0			full load capacity
5	Dy5			full load capacity
	Yd5			none
	Yz5			full load capacity
6	Dd6			none
	Yy6			10% load capacity
	Dz6			full load capacity
11	Dy11			full load capacity
	Yd11			none
	Yz11			full load capacity
0	Ya0			10% load capacity

### IP Rating

The first characteristic numeral indicates the protection of persons against contact with live or moving parts inside the enclosure and protection of equipment against ingress of solid foreign bodies. Protection against contact with moving parts inside the enclosure is limited to contact with moving parts inside the enclosure which might cause danger to persons.

The second characteristic numeral indicates the protection of equipment against ingress of liquid.

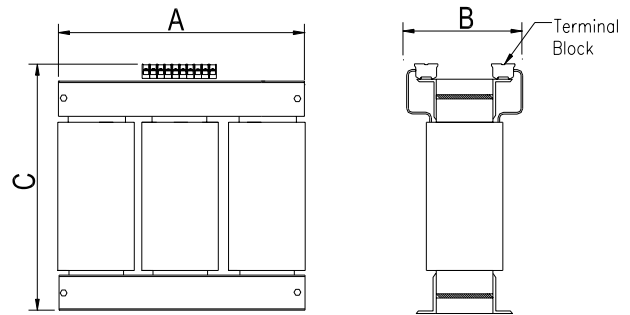
First Numeral			Second Numeral		
IP	Protection of Persons	Protection of Equipment	IP	Protection of Equipment	
0	No Protection	No Protection	0	No Protection	
1	 Protected against contact with large areas of the body (back of hand)	Protected against objects over 50 mm in diameter	1		Protected against vertically falling drops of water, e.g. condensation
2	 Protected against contact with fingers	Protected against solid objects over 12mm in diameter	2		Protected against direct sprays of water up to 15° from vertical
3	 Protected against tools and wires over 2.5 mm in diameter	Protected against solid objects over 2.5mm in diameter	3		Protected against sprays to 60° from vertical
4	 Protected against tools and wires over 1 mm in diameter	Protected against solid objects over 1mm in diameter	4		Protected against water sprayed from all directions (limited ingress permitted)
5	 Protected against tools and wires over 1mm in diameter	Protected against dust (limited ingress, no harmful deposit)	5		Protected against low pressure jets of water from all directions (limited ingress permitted)
6	 Protected against tools and wires over 1mm in diameter	Totally protected against dust	6		Protected against strong jets of water
			7		Protected against the effects of immersion between 15 cm and 1 m
			8		Protected against long periods of immersion under pressure

CE IEC SYMBOLS

**DTDW series Low Voltage Dry Type Three Phase Isolating Transformers**

**Dimensions and weights - without enclosure housing(IP00)**

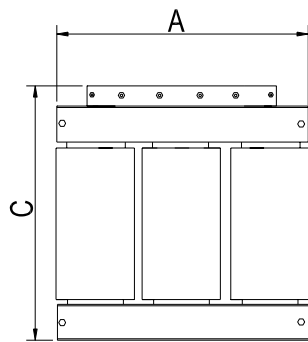
- (1) Dimensions and weights indicated apply to the transformers with electrical characteristics shown in the previous table and subjected to minor variation of  $\pm 5\%$ .
- (2) Termination may be differ from drawing:
  - For 60KVA and below:
    - DIN rail terminal block.
  - For 70KVA to 150KVA:
    - Fiberboard with galvanized steel bolt
  - For 200KVA above:
    - copper busbars



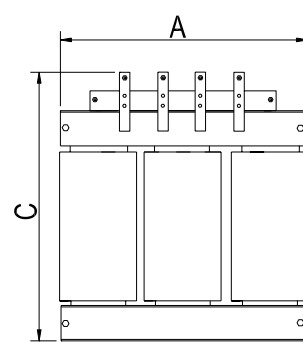
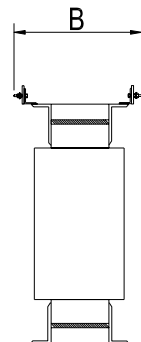
**Diagram A**

**5-100KVA**

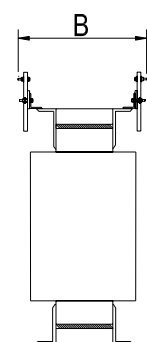
Rated power (kVA)		5	10	15	20	25	30	35	40	45	50	60	70	80	90	100
Dimensions (mm)	A	300	360	390	420	450	460	460	480	480	500	570	580	600	600	600
	B	200	230	230	230	250	250	280	300	330	350	350	380	380	400	420
	C	280	340	380	420	450	450	480	500	500	500	580	560	600	600	620
Transformer Diagram		A	A	A	A	A	A	A	A	A	A	A	B	B	B	B



**Diagram B**



**Diagram C**



**120-1000KVA**

Rated power (kVA)		120	150	200	250	300	350	400	450	500	600	700	800	900	1000
Dimensions (mm)	A	700	750	780	800	900	930	950	950	1000	1050	1100	1200	1300	1500
	B	450	420	450	480	500	520	550	600	600	650	650	700	750	750
	C	680	750	750	850	900	950	950	1000	1050	1100	1150	1250	1400	1400
Transformer Diagram		B	B	C	C	C	C	C	C	C	C	C	C	C	C

Customised configuration available upon request.

## DTDW series Low Voltage Dry Type Three Phase Isolating Transformers

### Dimensions and weights - with metal enclosure IP21

**Accessories:**

- Rating Plate
- Earthing points
- Lifting Lugs
- Mounting skids
- Forced air cooled fans
- Busbar terminals for primary and secondary
- Metal enclosure IP21

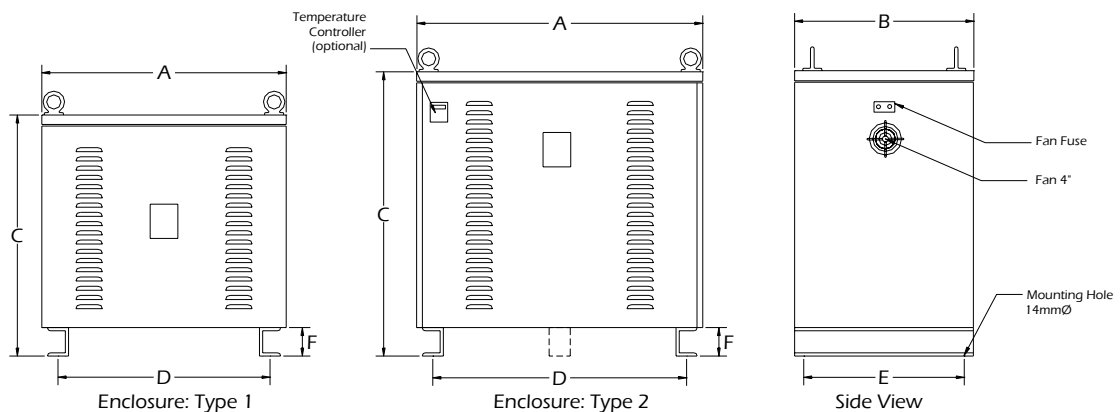
**Optional:**

- Thermistors
- Temperature Controller
- Protection Relay (for Auxiliary Contacts)

Rated power (kVA)		5	10	15	20	25	30	35	40	45	50
No of Fans		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Dimensions (mm)	A	400	440	440	550	550	600	600	650	650	650
	B	300	340	340	350	350	410	410	470	470	470
	C	430	505	505	570	570	660	660	660	660	660
	F	75	75	75	100	100	100	100	100	100	100
Approx Weight (Kg)		70	110	160	180	200	220	250	280	300	340
Enclosure Type		1	1	1	1	1	1	1	1	1	1

Rated power (kVA)		60	70	80	90	100	120	150	200	250	300
No of Fans		Nil	2 X 4"	2 X 4"	2 X 4"	2 X 4"	2 X 4"	2 X 4"	2 X 6"	2 X 6"	2 X 6"
Dimensions (mm)	A	700	700	800	800	900	900	1000	1000	1100	1100
	B	550	550	600	600	700	700	800	800	800	800
	C	650	650	900	900	1000	1000	1100	1100	1350	1350
	F	100	100	100	100	100	100	100	100	100	100
Approx Weight (Kg)		380	450	500	550	600	680	700	850	950	1100
Enclosure Type		1	1	2	2	2	2	2	2	2	2

Rated power (kVA)		350	400	450	500	600	800	850	900	1000
No of Fans		2 X 6"	3 X 6"	3 X 6"	3 X 6"	4 X 6"	4 X 6"	4 X 6"	6 X 6"	6 X 6"
Dimensions (mm)	A	1250	1300	1300	1400	1500	1600	1600	1700	1700
	B	900	950	950	950	1000	1100	1100	1200	1200
	C	1350	1500	1700	1600	1700	1800	1800	1900	1900
	F	100	100	100	100	100	100	100	100	100
Approx Weight (Kg)		1200	1400	1500	1600	2000	2100	2200	2500	3000
Enclosure Type		2	2	2	2	2	2	2	2	2



Note: Number of fans and louvers are added depending on the capacity of transformer.

## Ordering Specifications

AET Dry Type Transformer DTDW series, in accordance with IEC 60726, EN 61558, for general application, suitable for indoor use, in ventilated rooms with a room temperature of -15°C / +40°C.

Mandatory Information for quotation/order:

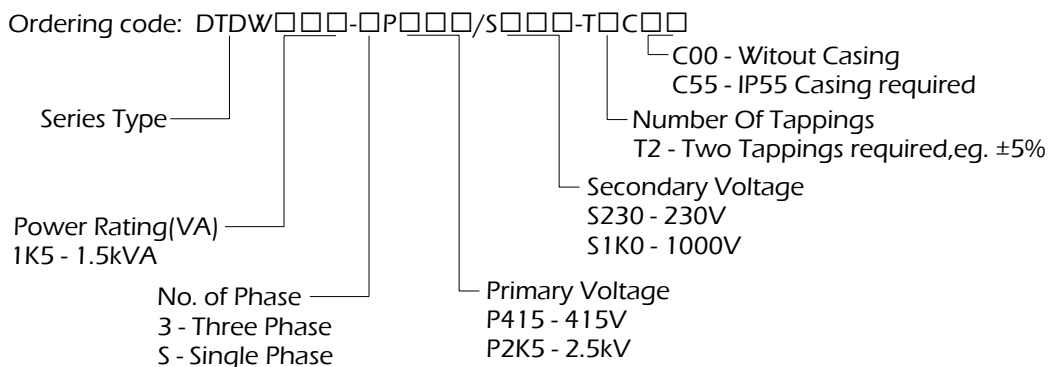
Rated Power (kVA)	:	
No. of Phase	:	
Input Voltage	:	
Output Voltage	:	
Frequency	:	
Vector Group	:	
Enclosure Protection Degree:	:	
Quantity	:	

### Standard Material

- Iron Core:
- Cold rolled, oriented grain steel sheet insulated on both sides by thin organic coating.
- Windings:
- Copper Strips with Class F (155°C) or Class H (180°C) enameled coated.
- Class H(NOMEX) Insulation material.
- Fully impregnated with class H varnish and oven dried .

### Optional components:

- Thermal protection devices
- Thermister (Normally Closed, activated at 160°C)
- Digital Temperature Controller
- Relays (for Auxiliary contacts)



Example, DTDW250-3P400/S230-T1C00 denote;  
250kVA, 3 Phase transformer with input voltage 400V step-down to 230V, casing not required.  
Frequency by default will be 50/60Hz if not specified.