



AsiaElectricTransformers

HFDT series

High Frequency Dry Type

Power Transformers



Design Overview

HFDT series Dry Type Transformers are 3 phase, indoor, insusceptibility to moisture and compact designed for high frequency 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

High frequency core with low specific losses, insulated on both sides by thin organic coating.

Windings

Multi-strands Copper Strips with Class H (180°C) enameled coated to enhance skin effect.
Class H(NOMEX) Insulation material is used between overlapping turns or layers.
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.

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 | 400Hz | | | | | | | | | | | | | | | |
| 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 (%) | 2.0 | 2.0 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Noise Level at 1m (dB) | 90 | 90 | 99 | 100 | 100 | 102 | 102 | 104 | 104 | 106 | 106 | 108 | 108 | 108 | 110 | |
| Losses (W) | No-load Iron losses | 4 | 8 | 13 | 17 | 21 | 25 | 29 | 33 | 38 | 42 | 50 | 58 | 67 | 75 | 83 |
| | On-Load Copper loss | 8 | 17 | 25 | 33 | 42 | 50 | 58 | 67 | 75 | 83 | 100 | 117 | 133 | 150 | 167 |

Non-standard ratings available upon request

Vector groups

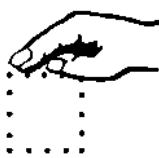








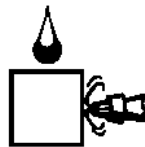
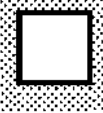



The vector group marks the circuitry of windings and their phase position to each other. It consists of a capital and small letter plus a code number. The capital letter refers to the input winding, the small to the output winding. The upper voltage is marked by 1 in front, the undervoltage by a 2 in 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

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 100KVA:
 - Fiberboard with galvanized steel bolt

Dimensions: 5-100KVA

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

Customised configuration available upon request.

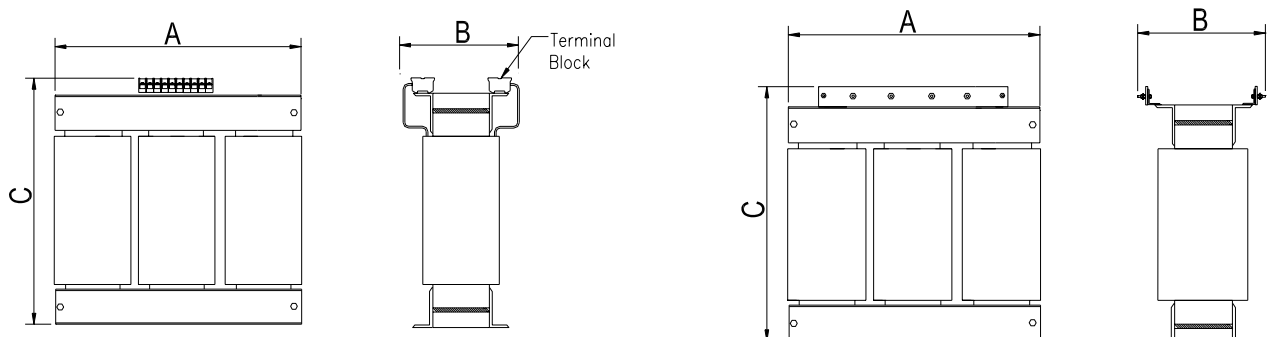
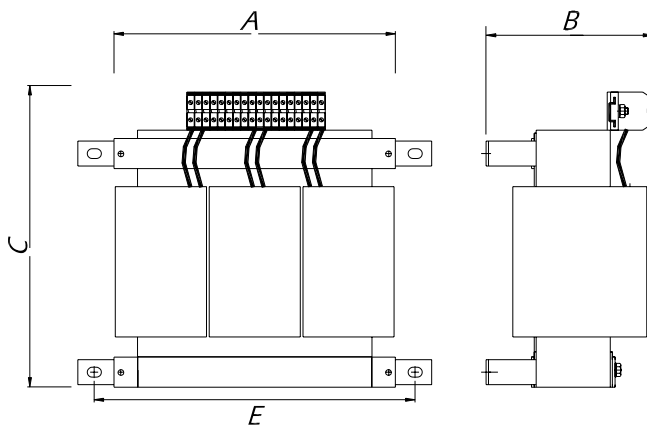


Diagram A

Diagram B



Wall Mounting (Optional)

HFDT series High Frequency Dry Type Power 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:

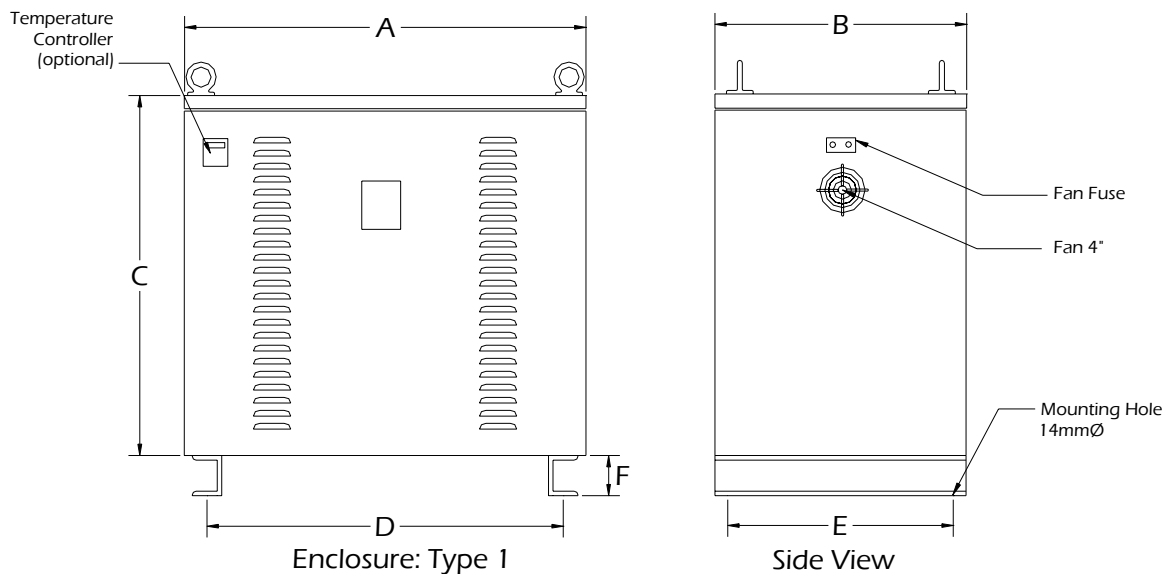
- Thermistors
- Temperature Controller
- Protection Relay (for Auxiliary Contacts)

Dimensions: 5-100KVA

| | | | | | | | | | | | |
|--------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 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 | 400 | 440 | 440 | 440 | 440 | 550 | 550 | 550 | 550 |
| | B | 300 | 300 | 340 | 340 | 340 | 340 | 350 | 350 | 350 | 350 |
| | C | 430 | 430 | 505 | 505 | 505 | 505 | 660 | 570 | 570 | 570 |
| | D | 75 | 75 | 75 | 75 | 75 | 75 | 100 | 100 | 100 | 100 |
| Approx Weight (Kg) | | 70 | 70 | 110 | 110 | 160 | 160 | 180 | 180 | 200 | 200 |
| Enclosure Type | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| | | | | | | |
|--------------------|---|-----|-----|-----|-----|-----|
| Rated power (kVA) | | 60 | 70 | 80 | 90 | 100 |
| No of Fans | | Nil | Nil | Nil | Nil | Nil |
| Dimensions (mm) | A | 600 | 600 | 650 | 650 | 650 |
| | B | 410 | 410 | 470 | 470 | 470 |
| | C | 660 | 660 | 660 | 660 | 660 |
| | D | 100 | 100 | 100 | 100 | 100 |
| Approx Weight (Kg) | | 220 | 250 | 280 | 300 | 340 |
| Enclosure Type | | 1 | 1 | 1 | 1 | 1 |

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



Ordering Specifications

AET Dry Type Transformer HFDT 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:

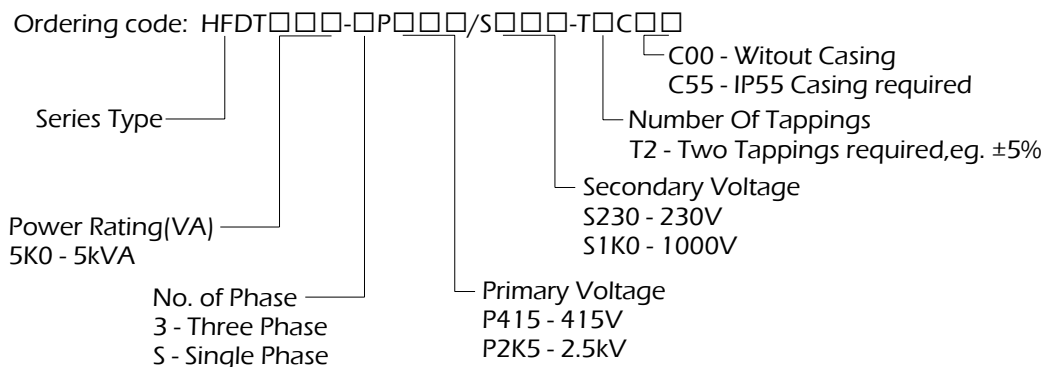
| | | |
|------------------------------|---|-------|
| Rated Power (kVA) | : | |
| No. of Phase | : | |
| Input Voltage | : | |
| Output Voltage | : | |
| Frequency | : | 400Hz |
| Vector Group | : | |
| Enclosure Protection Degree: | : | |
| Quantity | : | |

Standard Material

- Iron Core:
- High frequency core with low specific losses, insulated on both sides by thin organic coating.
- Windings:
- Multi-strands Copper Strips with Class H (180°C) enameled coated to enhance skin effect.
- 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, HFDT080-3P400/S230-T1C00 denote;
80kVA, 3 Phase transformer with input voltage 400V step-down to 230V, casing not required.
Frequency by default will be 400Hz if not specified.