

- **GENERAL**
Current Transformer (CT) is used to transform the high AC current to small easily manageable values. They're connected with the Panel Meter or Relay and they can help to measure the current or protect the equipments. Low voltage current transformers are manufactured as of two types for measuring CT and protection CT.
- **MEASURING CT**
Measuring current transformers are constructed to feed on other low voltage apparatus such as measuring instruments, relays, watch-hour meters (KW meter) and these type of current transformers are mainly used 0.5 and 1 class to transfer the current from highest rated current to rated secondary current.
- **PROTECTION CT**
Protection current transformers are constructed to feed the protection relay. These type of current transformers are mainly used 5P (Customer supplied when required)
- **REFERENCE STANDARDS**
IEC60044-1, VDE0414-4+1, DIN57414, BS3938, BS7626, EN60044-1, GB1208-2009
- **SECURITY FACTOR**
 $FS < 5$
- **MAXIMUM SYSTEM VOLTAGE**
720V AC
- **TEST VOLTAGE**
3kV AC(1 min.)
- **FREQUENCY**
50/60Hz
- **RATED SHORT-TIME THERMAL CURRENT**
 $I_{th} = 60 \times I_n$
(It's limited by cable size or primary bus-bar for other case)
- **RATED DYNAMIC CURRENT**
 $I_{dyn} = 2.5 \times I_n$
- **CONTINUOUS OVERLOAD**
1.2 X I_n
- **OPERATING TEMPERATURE**
-25°C ~ +50°C
- **ACCURACY**
Measuring 0.5, 1.0, 3.0 (Special accuracy upon request)
Protection 5P, 10P

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A-01

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- **BURDEN**
Ranging from 1, 1.5-300VA
- **RATED SECONDARY CURRENT**
x/5A (x/1A upon request)
- **RATED PRIMARY CURRENT**
Ranging up to 6000A
- **INSULATION**
Class B for Casing type CT
Class A for Hapung type CT
- **CASING**
Non-flammable, polycarbonate self-extinguishing ABS/PC
- **TERMINAL MARKS**
V0 to U/IG4
Primary P1 & P2(K & L)
Secondary S1 & S2(K & L)
- **SELECTION OF THE CURRENT TRANSFORMER**
To select the Current Transformer correctly, the following points should be clarified:
 - The application (for measuring or protection)
 - The features of the working environment (indoor or outdoor, operating temperature, air humidity etc.,)
 - Operation voltage and frequency
 - Range of the primary current (maximum and minimum of the current to be measured)
 - Dimension of the cable or bus bar
 - Data of the overload
 - Short circuit current
 - Specification of the measuring device associated with the Current Transformer (accuracy, rated current, consumption etc.,)
 - The diameter and length of the cable, the cable which is used to connect the Current Transformer and associated measuring device
- **POWER LOSSES OF THE CT**
In the practical application, the power generated by the primary current should be equal or bigger than the power requirement of the associated measuring device plus the consumption of the connecting line.
Losses in the line, P_L .
This is the power lost, through heat, generated by current through the resistance R_L in the cables, in the transformer's secondary circuit.
Factors to be taken into account:
Secondary current: $P_L = R_L \cdot I^2$
Cable diameter: R_L is inversely proportional to the square of the diameter

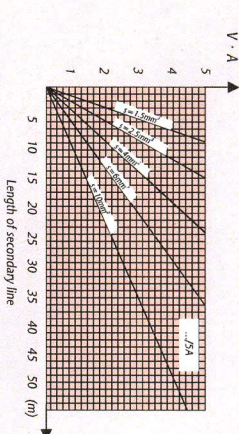


TABLE OF LOSSES IN THE SECONDARY LINE

Note: With.../1A transformers losses are reduced 25 times

● **ACCURACY OF A CURRENT TRANSFORMER**

The percentage of error, produced in a transformer, is established by IEC60044-1. In measurement transformers: 25% and 100% of nominal power. In protection transformers: 100% of nominal power.

● **ERROR LIMITS, ACCURACY CLASSES OF MEASURING CT**

Accuracy Classes	± % Error for % I _n					Phase Difference ± (for % I _n)							
	5	20	100	120	150	Minutes		Centridadians					
0.1	0.40	0.20	0.10	0.10	0.10	5	8	5	5	0.45	0.24	0.15	0.15
0.2	0.75	0.35	0.20	0.20	0.20	15	15	10	10	0.9	0.45	0.30	0.30
0.5	1.50	0.75	0.50	0.50	0.50	30	45	30	30	2.7	1.35	0.90	0.90
1.0	3.00	1.50	1.00	1.00	1.00	180	90	60	60	5.4	2.70	1.80	1.80

Accuracy Classes	± % Error for % I _n					Phase Difference ± (for % I _n)							
	1	5	20	100	120	Minutes		Centridadians					
0.25	0.75	0.35	0.20	0.20	0.20	1	5	20	10	0.90	0.45	0.30	0.30
0.55	1.50	0.75	0.50	0.50	0.50	30	45	30	30	2.70	1.35	0.90	0.90

Accuracy Classes	± % Error for % I _n					Phase Difference ± (for % I _n)							
	1	5	20	100	120	Minutes		Centridadians					
% In						50							
3						3							
5						5							

No. phase error

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• ERROR LIMITS: ACCURACY CLASSES OF PROTECTION CT

Accuracy Classes	± % Error for 90 In	Phase Difference ± for % I _n		Composite Error
		Minutes	Centradians	
SP	± 1	± 60	± 1,8	5
10P	± 3	---	---	10

• SATURATED CONDITION OF CT

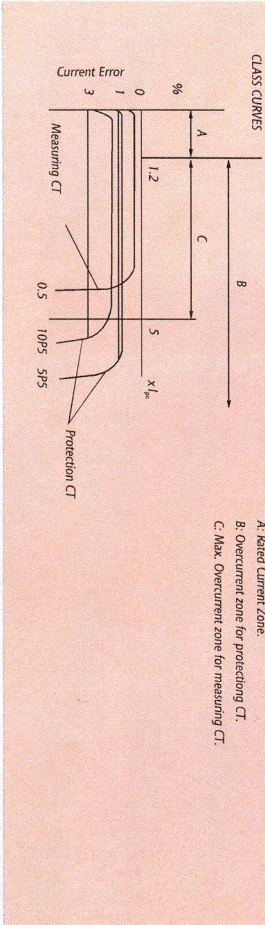
The current transformer is saturated if the primary current, passing through the CT, is greater than the nominal rating of the CT.

The linearity of CT, between the primary and secondary sides decreases, so error increases. The saturation of the CT is inversely proportional to the load (Fig. 1).

The difference between measuring and protection current transformers is their behavior when an overload occurs on the primary side. Measuring CT is saturated when there is a primary current overload. In order to protect the equipment,

on the secondary side, protection CT will not saturate until there is a very high current on the primary side. A Class SP15 protection transformer indicates that it has an accuracy rating of ± 1% that it does not become saturated until the primary current reaches 15 times the nominal current rating of the CT. In measuring transformers, the SAFETY FACTOR "FS" parameter indicates the excessive amperage on the primary side current in relation to the current sent to the measuring device on the secondary side.

FIG. 1



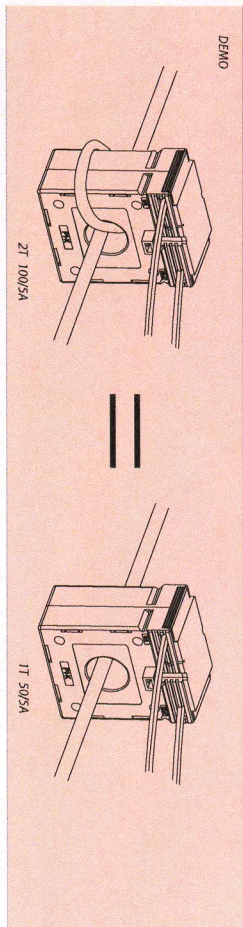
A: Rated Current Zone
B: Overcurrent zone for protecting CT.
C: Max. Overcurrent zone for measuring CT.

Instrument	Burden Consumed
Moving Iron Instruments	0.3-1.5VA
Moving coil Instruments	0.5VA
Analogue power meter	0.2-2.5VA
Maximum Demand Ammeter	2.5-5.0VA
Digital Meter	0.5-1.0VA
Energy Meter	1.0-1.5VA
Recording Instruments	2.0-5.0VA

• APPLICATION NOTE

If the primary current is too small, to keep the same accuracy and output, we can add primary winding, but the rated turns ratio should be the same. For example, if the primary current is 50A, we can use 100/5A Current

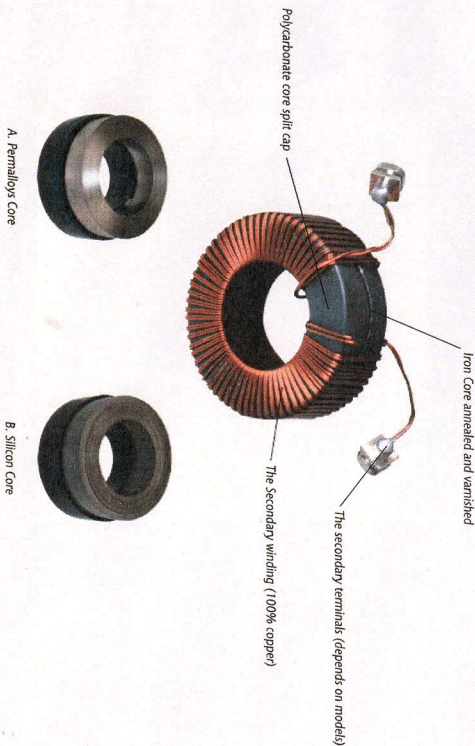
Transformer with the primary current be turned twice which help to keep the saturated turns ratio(1:50 = 2:100).



• CONSTRUCTION

CT consist of primary winding, secondary winding, magnetic core and insulated body. The high-grade silicon steel core is annealed, varnished then finished with polycarbonate core caps. The secondary winding is toroidally wound by high precision semi-automatic machinery. For the

tape wound ring type current transformer, the PEW coated windings are then covered with dielectric paper, varnished and double-lapped with PVC tapes. For the encapsulated type current transformer, the windings are enclosed in a compact and heat resistant split cap.

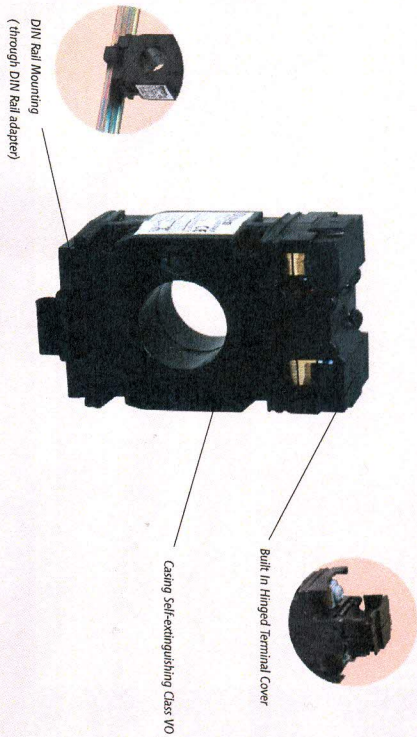


• KIND REMINDER:

- Improper selection, installation or operation can cause danger to personal security!
- Don't open the secondary circuit when the current is available in the primary circuit. Or it will cause high voltage which is dangerous to personal security!
- Resistance of current transformer is very low, so that secondary winding of current transformer can be operated as a short circuit, when required in test operation. Otherwise, this condition causes high voltage and can be dangerous during usage.
- When selecting a current transformer, it is important to consider the power absorbed by the cables connected between the CT secondary terminals and the measuring instrument. The resultant cable burden should be added to the equipment burden, and the total should not exceed the available VA of the CT.
- P1 (X) must face the supply feeder, and P2 (I) must face the load. It is also important to ensure that secondary connections are made in accordance with instrument diagrams. The secondary terminals of the CT must NOT be open-circuited on load as dangerously high voltages may be present under these conditions. It is recommended that one side of the secondary windings is earthed.

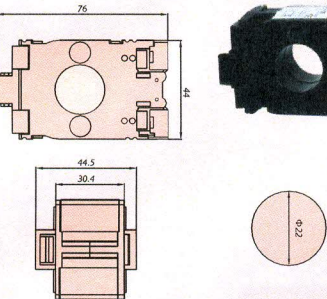
• FEATURE

DM Series

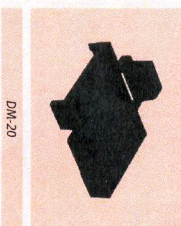


Ref.	Model	Ratio (A)	Burden(VA) Class:1.0	Case Qty. (Pcs)	Item Code
DM-20	DM-20	15/5	1.5 (S1)	120	202000155
DM-20	DM-20	20/5	2.5 (S1)	120	202000205
DM-20	DM-20	25/5	2.5 (H1)	120	202000255
DM-20	DM-20	30/5	2.5 (H1)	120	202000305
DM-20	DM-20	40/5	1	120	202000405
DM-20	DM-20	50/5	1.5	120	202000505
DM-20	DM-20	60/5	1.5	120	202000605
DM-20	DM-20	75/5	1.5	120	202000755
DM-20	DM-20	80/5	1.5	120	202000805
DM-20	DM-20	100/5	2.5	120	202001005
DM-20	DM-20	125/5	2.5	120	202001255
DM-20	DM-20	150/5	2.5	120	202001505
DM-20	DM-20	200/5	3.75	120	202002005
DM-20	DM-20	250/5	3.75	120	202002505
DM-20	DM-20	300/5	3.75	120	202003005

Note: Class/VA rating must be mentioned when ordering.



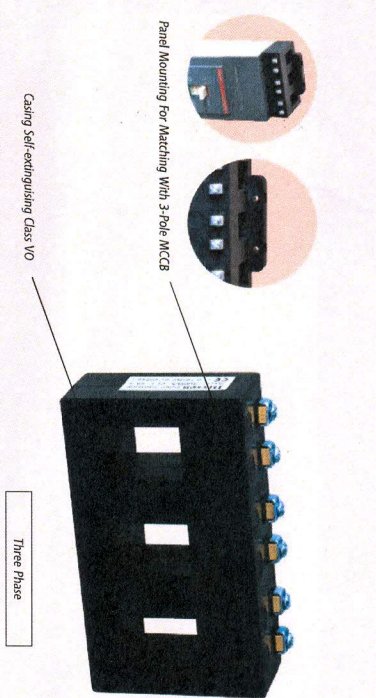
• ACCESSORY



DM-20

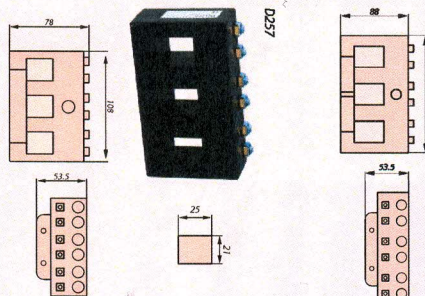
• FEATURE

D Series



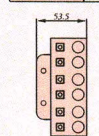
Ref.	Model	Ratio (A)	Burden(VA) Class:1.0	Case Qty. (Pcs)	Item Code
D247	D247	100/5	1.5	30	724701005
D247	D247	150/5	1.5	30	724701505
D247	D247	200/5	2.5	30	724702005
D247	D247	250/5	2.5	30	724702505
D247	D247	300/5	2.5	30	724703005

Note: Class/VA rating must be mentioned when ordering. There is no accessory for D247.



D257	300/5	2.5	20	725703005
D257	400/5	2.5	20	725704005
D257	500/5	2.5	20	725705005
D257	600/5	2.5	20	725706005

Note: Class/VA rating must be mentioned when ordering. There is no accessory for D257.



D257	300/5	2.5	20	725703005
D257	400/5	2.5	20	725704005
D257	500/5	2.5	20	725705005
D257	600/5	2.5	20	725706005