

● GENERAL

Current Transformer (C.T.) 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 tyees 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, watt-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, VDE0414-44-1, DIN57414, BS3938, Bs7626, EN60044-1, GB1208-2009

● SECURITY FACTOR

FS<5

● MAXIMUM SYSTEM VOLTGE

720V AC

● TEST VOLTAGE

3kV AC(1 min.)

● FREQUENCY

50/60Hz

● RATED SHORT-TIME THERMAL CURRENT

Ith=60 X In
Ith limited by cable sizes or primary bus-bar for other case

● RATED DYNAMIC CURRENT

Idyn=2.5 X Ith

● CONTINUOUS OVERLOAD

1.2 X In

● OPERATING TEMPERATURE

-25℃ ~ +50℃

● ACCURACY

Measuring 0.5; 1.0; 3.0(special accuracy upon request)
Protection 5P; 10P

● BURDEN

Ranging from 1.5-30VA

● 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 Taping type CT

● CASING

Non-flammable, polycarbonate self extinguishing ABS/PC

● TERMINAL MARKS

VO to UL94
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 wording 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 ect...)
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 practial 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.

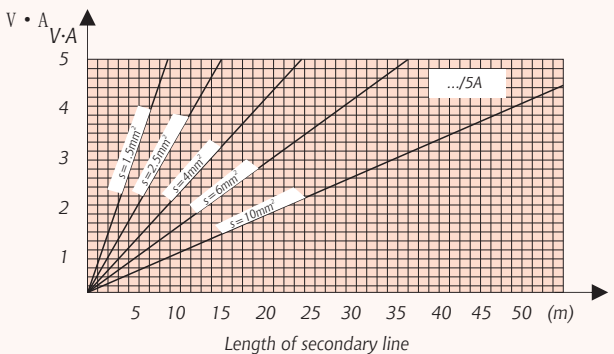
Losses in the line, PL:
This is the power lost, through heat, generated by current through the resistance RL in the cables, in the transformer's secondary circuit.

Factors to be taken into account:
Secondary current: PL=RL/2

Cable diameter: RL is inversely proportional to the square of the diameter

Cable length: RL is proportional to the length of cabling (there and back)

Power:
The nominal apparent power(V A) with a specified power factor, which was supplied by the Current Transformer, to the secondary current with



the assigned current when it is connected to its nominal load, Sc (V·A) = Zc·(I/sn)² According to Standards, for apparent power greater than or equal to 5VA, the power factor is 0.8 inductive. For apparent power less then 5V·A the power factor is considered to be one(unity).

● 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.

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

● ERROR LIMITS. ACCURACY CLASSES OF MEASURING CT

Accuracy Classes	± % Error for % I _n				Phase Difference ±for % I _n							
					Minutes				Centiradians			
	5	20	100	120	5	20	100	120	5	20	100	120
0,1	0.40	0.20	0.10	0.10	15	8	5	5	0.45	0.24	0.15	0.15
0,2	0.75	0.35	0.20	0.20	30	15	10	10	0.9	0.45	0.30	0.30
0,5	1.50	0.75	0.50	0.50	90	45	30	30	2.7	1.35	0.90	0.90
1,0	3.00	1.50	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									
						Minutes					Centiradians				
	1	5	20	100	120	1	5	20	100	120	1	5	20	100	120
0.25	0.75	0.35	0.20	0.20	0.20	30	15	10	10	10	0.90	0.45	0.30	0.30	0.30
0.55	1.50	0.75	0.50	0.50	0.50	90	45	30	30	30	2.70	1.35	0.90	0.90	0.90

Accuracy Classes	± % Error for % I _n											
% In	50						120					
3	3						3					
5	5						5					

LOW VOLTAGE CURRENT TRANSFORMER

• ERROR LIMITS. ACCURACY CLASSES OF PROTECTION CT

Accuracy Classes	$\pm \% \text{ Error for } \% I_n$	Phase Difference $\pm \text{for } \% I_n$		Composite Error
		Minutes	Centiradians	
5P	± 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.

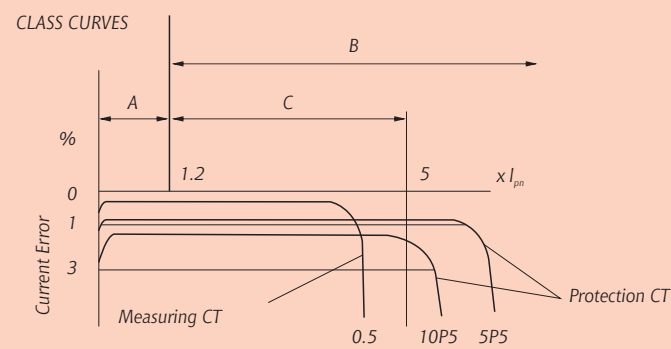
The linearity of CT, between the primary and secondary sides decreases, so error increases. The saturation of the CT is inversely proportional to the load (Fig. 1).

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 5P15 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 protection CT.
C: Max. Overcurrent zone for measuring CT.

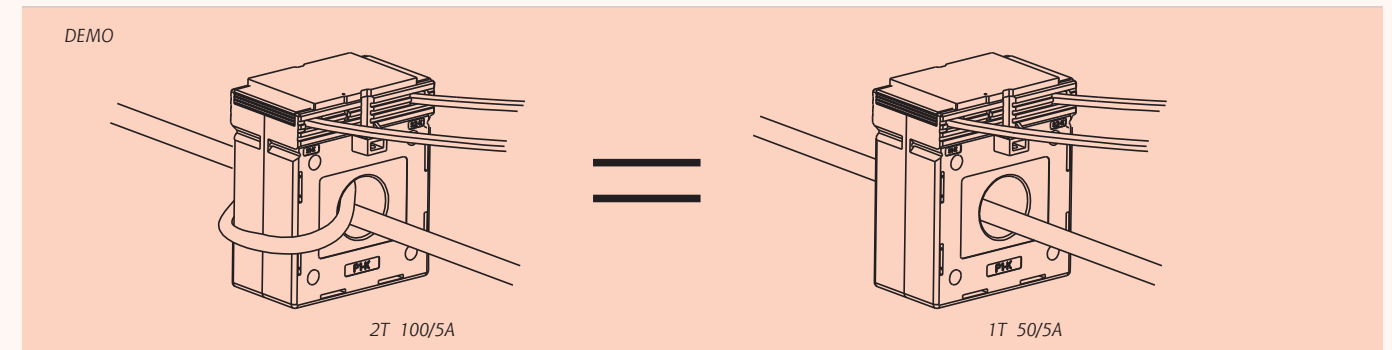
Instrument	Burden Consumed
Moving iron instruments	0.3-1.5VA
Moving coil instruments	0.5VA
Analogue power meter	0.2-2.5VA
Maximum Demand Ammeter	2.5-5.0VA
Digital Meter	0.5-1.0VA
Energy Meter	1.0-1.5VA
Recording Instruments	2.0-5.0VA

• 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 same rated turns ratio (1:50 = 2:100).

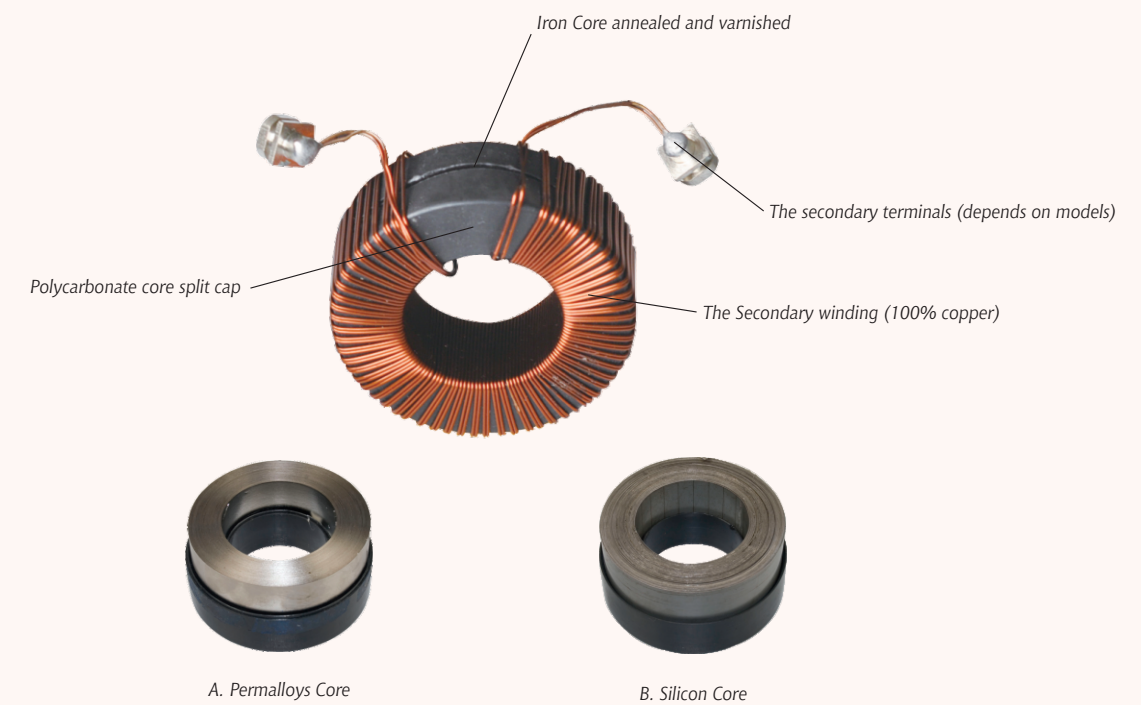
LOW VOLTAGE CURRENT TRANSFORMER



• CONSTRUCTION

CT consist of primary winding, secondary winding, magnetic core and insulated body. The high-grade silicon steel core is annealed, varnished then insulated 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 elephantite paper, varnished and double-tapped with PVS tapes. For the encapsulated type current transformer, the windings are enclosed in a compact and heat resistant split cap.



• KIND REMINDER:

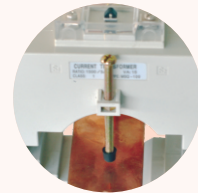


Improper selection, installation or operation can cause danger to personal security! Don't open the secondary circuit when the current is available in the primary circuit. Or it will cause high voltage which is dangerous to personal security! Resistance of current transformer is very low, so that secondary winding of current transformer can be operated as a shortcircuit, 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 (K) must face the supply feeder, and P2(L) 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



Built In Hinged Sealable Terminal Cover
(Metallic sealable screw for option)



Busbar Support Mounting



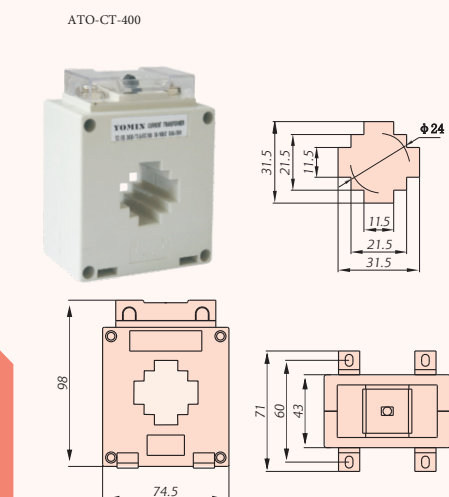
Panel Mounting(through plastic fixing kit)

Casing Self-extinguishing Class VO

MSQ Series

	Ratio (A)	Burden(VA)		Case Qty.(Pcs)	Item Code
		Class:0.5	Class:1.0		
ATO-CT-075	5/5	5	7.5	36	130100055
	10/5	5	7.5	36	130100105
	15/5	5	7.5	36	130100155
	20/5	5	7.5	36	130100205
	25/5	5	7.5	36	130100255
	30/5	5	7.5	36	130100305
	40/5	5	7.5	36	130100505
	50/5	5	7.5	36	130100605
	75/5	5	7.5	36	130101005
	/	5	7.5	36	130101505
	/	5	7.5	36	130102005
	/	5	7.5	36	130102505
	/	5	7.5	36	130103005
	/	5	7.5	36	130103005
	/	5	7.5	36	130103005

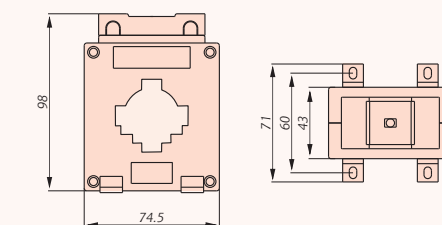
Note: Class/VA rating must be mentioned when ordering.



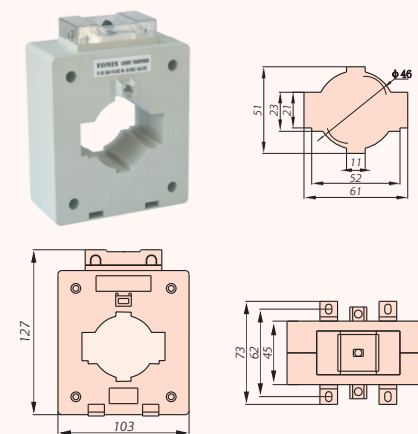
	30/5	-	1.5 (3T)	60	103000305
	50/5	-	1.5 (2T)	60	103000405
	75/5	-	2.5 (2T)	60	103000505
	100/5	-	2.5 (2T)	60	103000605
	150/5	-	1.5	60	103000755
	200/5	-	1.5	60	103000805
	250/5	-	2.5	60	103001005
	300/5	-	3.75	60	103001505
	400/5	5	5	60	103002005
	/	5	7.5	60	103002505
	/	10	10	60	103003005

	Ratio (A)	Burden(VA)		Case Qty.(Pcs)	Item Code
		Class:0.5	Class:1.0		
ATO-CT-800	30/5	1.5	1.5	60	104001005
	150/5	1.5	2.5	60	104001505
	200/5	2.5	5	60	104002005
	250/5	5	5	60	104002505
	300/5	5	5	60	104003005
	400/5	5	10	60	104004005
	800/5	5	10	60	104005005

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



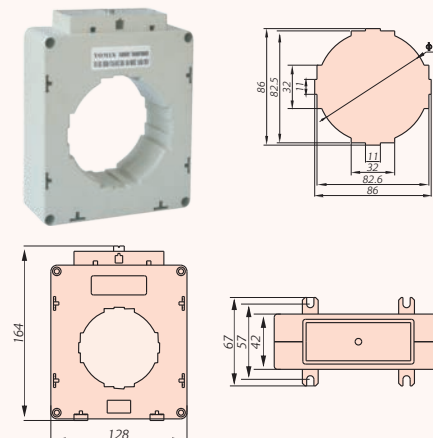
ATO-CT-1000



	200/5	1.5	2.5	32	106002505
	250/5	2.5	5	32	106003005
	300/5	5	10	32	106004005
	500/5	5	10	32	106005005
	600/5	5	10	32	106006005
	750/5	5	10	32	106007505
	800/5	7.5	10	32	106008005
	1000/5	10	15	32	106010005
	/	10	15	32	106012005
	/	15	15	32	106015005
	/	15	15	32	106016005

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

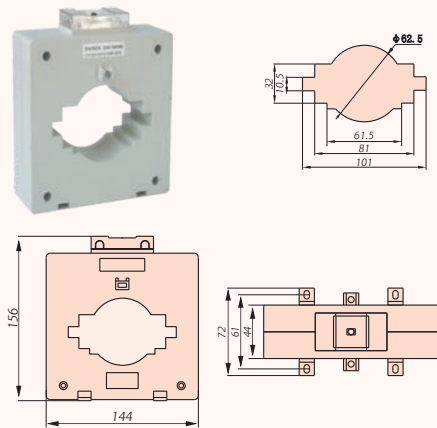
ATO-CT-1500



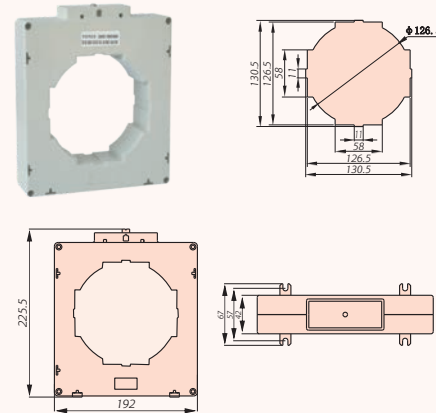
	300/5	5	10	12	108507505
	400/5	5	10	12	108508005
	500/5	7.5	10	12	108510005
	600/5	10	15	12	108512005
	750/5	10	15	12	108515005
	1200/5	10	15	12	108516005
	1500/5	15	15	12	108520005

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

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	Ratio (A)	Burden(VA)		Case Qty. (Pcs)	Item Code
		Class:0.5	Class:1.0		
<div> <div>ATO-CT-2500</div>  </div>	500/5	5	5	16	110008005
	600/5	10	10	16	110010005
	750/5	10	15	16	110012005
	800/5	10	15	16	110012505
	1000/5	10	15	16	110015005
	1200/5	10	15	16	110016005
	1500/5	10	15	16	110020005
	2500/5	10	15	16	110025005
	3000/5	10	15	16	110030005

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

<div> <div>ATO-CT-3000</div>  </div>	600/5	5	10	10	112510005
	750/5	7.5	10	10	112512005
	800/5	10	15	10	112515005
	1000/5	10	15	10	112516005
	1200/5	15	20	10	112520005
	1500/5	15	20	10	112525005
	2000/5	15	20	10	112530005
	2500/5	15	20	10	112540005
	3000/5	20	20	10	112550005
	/	20	20	10	112560005

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

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