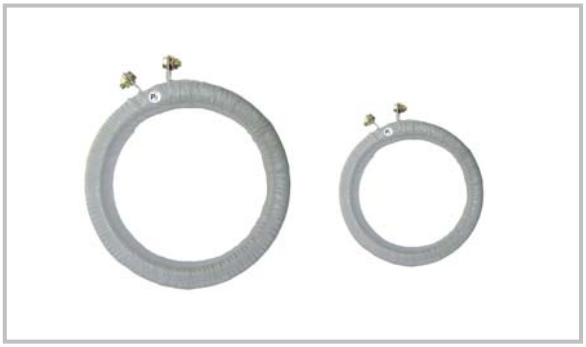


- Ring Type current transformer.
- Temperature range –20°C to 70°C
- Metering class 1.0, 0.5
- Test voltage 4Kv 50Hz. 1min.
- IEC44-1,IEC185,BS3938,DIN42600
- Tropicallised design with Insulation Class A and thermal 105°C
- Totally enclosed in tough and robust.
- Operating voltage 0.6KV
- Available for large busbar or cable

Introduction

Current transformers are used to measure or monitor the current in an AC power circuit. The ratio of the primary current to the secondary current is a function of the turns ratio and the loss associated with the conversion.
For example, copper losses in a voltage transformer affect the voltage regulation. In a current transformer, copper losses cause an increase in core loss, or a reduction in accuracy.

Accuracy

$I_S N_2 = I_P N_1 – I_M N_1$

Where:
$I_S N_2$ = the secondary current X the number of turns
$I_P N_1$ = primary current X the number of turns
$I_M N_1$ = ampere-turns required for core loss
The excitation current, (I_M), determines the maximum accuracy that can be achieved with a current transformer. This current is defined as that portion of the primary current which satisfies the core losses. While the excitation current can never be eliminated, it can, in some cases, be compensated by adjusting the turns ratio. If it were not for the core losses, the primary and secondary cur-rents would be exactly inversely proportional to the number of turns in the two windings. The error due to leakage flux is negligible in most current transformers using toroidal cores, and utilizing proper winding methods.

Burden

The total impedance of the devices connected to the secondary terminals (leads, meters, relay coil, resistance, etc.) of a current transformer is defined as its burden. Burden is expressed in volt-amperes(VA) or in ohms impedance.
Burden resistance should be kept as low as possible, since an increase in burden increases the core flux density (B), thereby increasing the core loss. Utilizing Faraday's Law:

$$B = \frac{10^8 \times I_S (R + W_R)}{4.44 \times f \times N_2 \times A_C}$$

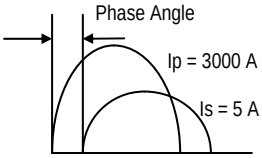
Where:
I_S = secondary current (amps)
R = burden (ohms)
W_R = winding resistance
f = frequency (Hz)
N_2 = burden (ohms)
Ac = cross section area (cm^2)
B = flux density (Gauss)

Note: $I_S = (I_P N_1 - I_M N_1)/ N_2$

Ratio-Correction Factor

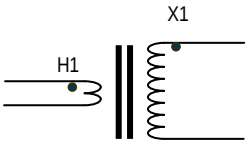
The ratio-correction factor indicates the percentage amount that the secondary current value differs from the correct value.

Phase Angle Error



The phase angle error is not applicable to current actuated devices but will affect the accuracy of devices that respond to the products, the sums or difference of currents.

Polarity



Current transformer polarity can be defined by permanent markings (typically H 1 – X 1) or polarity dots.

Short-Time Current Limits

Current transformers may have to carry very large currents in the event of short circuit, motor starting, etc. The windings heat very rapidly at a rate nearly proportional to the square of the current.The majority of the heat will be stored in the copper. The short-time cur-rent limit is the time to raise the temperature of the winding to 105°C, considering ambient temperature.

Safety Precautions

The secondary winding should always be loaded. If the secondary circuit is opened with primary current flowing, all the primary ampere-turns become magnetizing ampere-turns and usually will produce an excessively high secondary voltage across the open circuit. Magnetization of the core, due to excessive fault currents or acci-dental open circuiting of the secondary, has the effect of increas-ing the ratio errors

Current transformer alternating current system & direct indication of measuring input. They are suitable to use on the distribution panel, control panel, switchboard panel, power plant, machines and all metering system. The current transformer has designed for industrial applications which required precise, reliable and robust for the display and indicating.

- AC Current transformers with primary current upto 4000A and secondary current 1 A or 5 A
- Accuracy class 1.0 or 0.5
- Free contact output as single pole change over with relay rating AC 250V 5A non inductive load or 24V DC 2A resistive load.
- more detail see ordering information.

Accuracy Requirements For Measuring Current Transformers.

Accuracy Class	Percentage current (ratio) error at percentage of rated current shown below				Phase displacement at percentage of rated current shown below								Application
					Minutes				Centiradians				
	5	20	100	120	5	20	100	120	5	20	100	120	
0.1	0.4	0.2	0.1	0.1	15	8	5	5	0.45	0.24	0.15	0.15	Precision Testing or CT Testing
0.2	0.75	0.35	0.1	0.2	30	15	10	10	0.75	0.45	0.3	0.3	Measuring Precision Grade
0.5	1.5	0.75	0.5	0.5	90	45	30	30	1.5	1.35	0.9	0.9	Tariff KWH Metering
1.0	3.0	1.5	1.0	1.0	180	90	60	60	3.0	2.7	1.8	1.8	Commercial KWH Metering

For accuracy class 0.2S and 0.5S, the current error and phase displacement of current transformer for special applications at rated frequency shall not exceed the value as given above when the secondary burden is any value from 25% to 100% of the rated burdern. These class shall mainly be used for ratio 25/5, 50/5, 100/5 and their decimal multiples and only for the rated secondary current 5A

VA For “Go And Return” Cable Per Meter On The Length For Single Lead Run

Cable CSA	VA / METER								
	20°C	35°C	55°C	75°C		20°C	35°C	55°C	75°C
	Ratio/5A	Ratio/5A	Ratio/5A	Ratio/5A		Ratio/1A	Ratio/1A	Ratio/1A	Ratio/1A
1	1.08	1.14	1.22	1.32		0.040	0.044	0.048	0.132
1.5	0.72	0.64	0.82	0.88		0.028	0.030	0.032	0.034
2.5	0.44	0.46	0.50	0.52		0.018	0.018	0.020	0.020
4	0.26	0.28	0.03	0.32		0.010	0.011	0.012	0.013
6	0.18	0.20	0.16	0.22		0.072	0.008	0.008	0.008
10	0.11	0.11	0.12	0.13		0.004	0.004	0.004	0.005
16	0.03	0.032	0.034	0.37		0.0001	0.00012	0.00014	0.00014

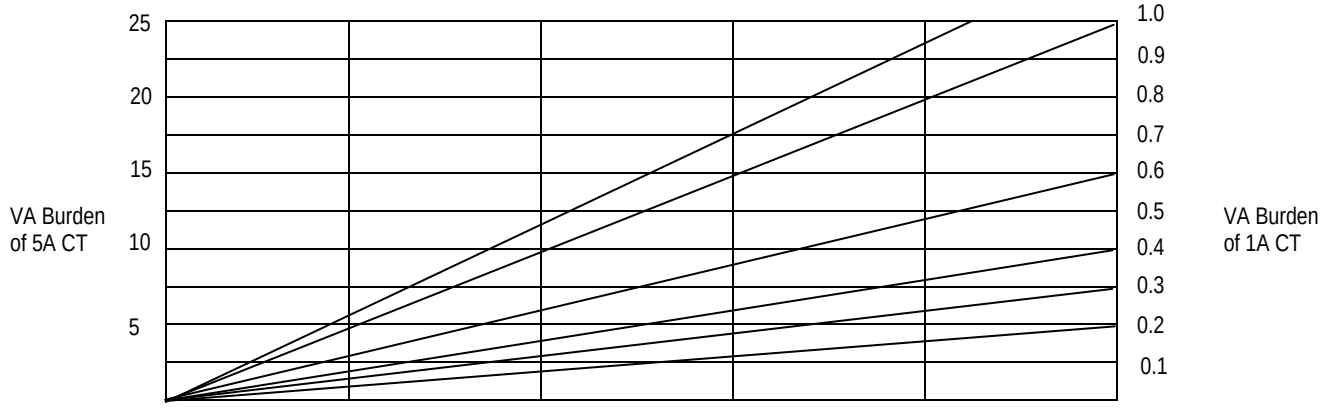
Note:
1) For Leads On Unequal Length Use VA/METER Shown X Total Lead Length (Meter
2) VA shown is calculated at 25% over current to match the error limits of measurement current transformers.
3) The temperature selected should be the maximum temperature expected where the leads run, plus any temperature rise in the cable due to the secondary current. The temperature rise is usually negligible. Check temperature rise at 1.25 x rated current in doubt.
4) No allowance has been made for VA used in the connections of leads between the CT and driven device. It is particularly important to keep these resistance very low for 5 Amps CTs because 0.02 Ohms is 0.5VA.

Data VA in CT Leads At Other Secondary Current And The Volt Drop Cable At Various Temperatures And currents.

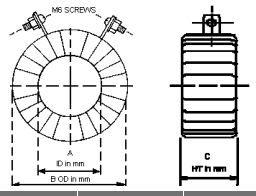
Cable CSA	OHMS / METER – SINGLE CABLE			
	20°C	35°C	55°C	75°C
1	0.0172459	0.018300	0.019100	0.0210000
1.5	0.0114940	0.012200	0.013100	0.0140000
2.5	0.0068960	0.007300	0.007900	0.0840000
4	0.0042660	0.004520	0.004850	0.0052000
6	0.0028735	0.003040	0.003270	0.0035000
10	0.0017242	0.001830	0.001960	0.0021000
16	0.0000487	0.0000515	0.0000554	0.0000592

Table Guide For Pilot Lead Burden

The following chart show the approximate burden imposed CT for vaious size of wires at varying distances.



Current Transformer Ring Type



1) Ratio : Standard Ratio as listed
2) Class : Class 1, Class 0.5 etc
3) Burden : Standard as listed or specify
4) Type : SR1, SR2 etc.

Example
100/5A, Class 1, 5VA, Type SR1

Type	Ratio	ID (mm.)	OD (mm.)	VA OF CLASS 3			VA OF CLASS 1								VA OF CLASS 0.5						
				3	5	15	3	5	7.5	10	15	20	30	40	5	7.5	10	15	20	30	40
				HT Thickness			HT Thickness (mm.)								HT Thickness (mm.)						
SR1	60/5	30	70	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	100/5	30	70	35	40	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	120/5	30	70	35	40	-	40	40	-	-	-	-	-	-	-	-	-	-	-	-	-
	150/5	30	70	30	35	-	35	40	-	-	-	-	-	-	-	-	-	-	-	-	-
	200/5	28	70	30	30	-	30	35	40	-	-	-	-	-	40	-	-	-	-	-	-
SR2	150/5	40	80	40	40	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	200/5	40	80	30	30	-	30	40	40	-	-	-	-	-	-	-	-	-	-	-	-
	250/5	40	80	30	30	40	30	35	40	-	-	-	-	-	40	-	-	-	-	-	-
	300/5	40	80	30	30	40	30	30	35	40	40	-	-	-	30	40	40	-	-	-	-
	400/5	40	80	30	30	35	30	30	30	35	35	40	-	-	30	35	40	40	-	-	-
SR3	200/5	45	85	35	40	-	40	40	-	-	-	-	-	-	-	-	-	-	-	-	-
	250/5	45	85	30	35	40	30	35	40	-	-	-	-	-	40	-	-	-	-	-	-
	300/5	45	85	30	30	40	30	30	35	40	-	-	-	-	35	40	40	-	-	-	-
	400/5	45	85	30	30	35	30	30	30	35	35	40	-	-	35	35	40	40	-	-	-
SR4	400/5	60	95	30	-	-	30	30	30	35	40	40	-	-	30	35	40	40	-	-	-
	500/5	60	95	30	-	-	30	30	30	30	35	40	-	-	30	35	35	40	-	-	-
	600/5	60	95	30	-	-	30	30	30	30	35	40	40	-	30	30	35	40	40	-	-
	800/5	60	95	30	-	-	30	30	30	30	30	35	40	-	30	30	30	35	40	40	-
SR5	600/5	70	110	30	-	-	-	30	30	35	40	-	-	-	30	35	35	40	-	-	-
	800/5	70	110	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	40	-	-
	1000/5	70	110	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	40	40	-
	1200/5	70	110	30	-	-	-	30	30	30	30	30	35	-	30	30	30	30	35	40	-
SR6	800/5	85	125	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	40	-	-
	1000/5	85	125	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	40	40	-
	1200/5	85	125	30	-	-	-	30	30	30	30	30	35	-	30	30	30	30	35	40	-
	1600/5	85	125	30	-	-	-	30	30	30	30	30	35	-	30	30	30	30	35	40	-
SR7	1200/5	110	150	30	-	-	-	30	30	30	40	40	40	-	30	30	30	40	40	40	-
	1600/5	110	150	30	-	-	-	30	30	30	30	35	40	-	30	30	30	30	35	40	-
	2000/5	110	150	30	-	-	-	30	30	30	30	35	35	-	30	30	30	30	35	35	-
	2500/5	110	150	30	-	-	-	30	30	30	30	35	35	-	30	30	30	30	35	35	-
SR8	1600/5	120	160	30	-	-	-	30	30	30	35	40	40	-	30	30	35	35	40	40	-
	2000/5	120	160	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	2500/5	120	160	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	3000/5	120	160	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
SR9	2000/5	130	170	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	2500/5	130	170	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	3000/5	130	170	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	3500/5	130	170	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
SR10	2000/5	140	175	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	2500/5	140	175	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	3000/5	140	175	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	3500/5	140	175	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	4000/5	140	175	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
SR11	4000/5	170	210	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	5000/5	170	210	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
	6000/5	170	210	30	-	-	-	30	30	30	30	35	40	-	30	30	30	35	35	40	-
SR12	4000/5	190	230	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	5000/5	190	230	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	6000/5	190	230	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
SR13	4000/5	220	260	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	5000/5	220	260	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	6000/5	220	260	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
SR14	4000/5	250	290	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	5000/5	250	290	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	6000/5	250	290	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	8000/5	250	290	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
SR15	4000/5	270	310	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	5000/5	270	310	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	6000/5	270	310	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	8000/5	270	310	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
SR16	4000/5	300	340	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	5000/5	300	340	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	6000/5	300	340	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	8000/5	300	340	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40
	10000/5	300	340	-	-	-	-	-	-	-	30	35	40	40	-	-	-	35	35	40	40