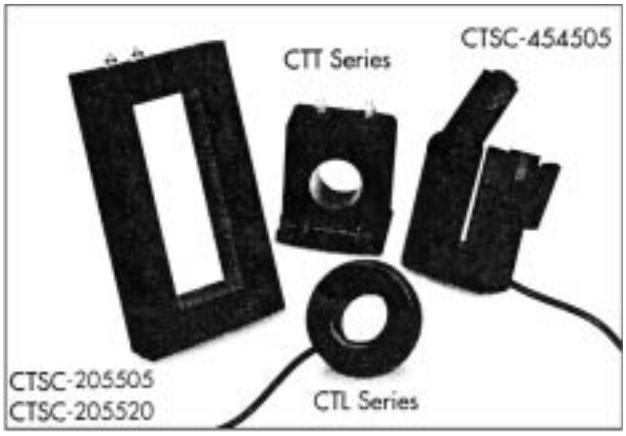
CTL/CTT/CTSC Series

Current Transformers

INSTRUCTION SHEET

M1858/1097



General Description

For AC currents over 5A, a current transformer (CT) is normally used to step down the maximum current to 5A and isolate the meter at the same time, thus avoiding common mode problems.

Current transformers are specified by a turns ratio such as 100:5, where the first number is the rated input current in amps and the second number is the 5A output. When specifying and AC or true-RMS meter for use with a 5A current transformer, specify the reading desired at 5A input to the meter. Current transformers are self-isolating from the circuit being measured.

OMEGA's CTL/CTT/CTSC Series Current Transformers can be used with OMEGA's DP25-CRMS, DP2000-D7, DP2000-G7 or DP18-RTI digital indicators, all of which can be scaled to display current.

CAUTION

Current transformers may develop voltages which are hazardous to personnel or equipment if the secondary circuit is open when primary current is present.

Available Models

One Piece Current Transformers					
CTL Series Model No.	CTT Series Model No.	Current Ratio	Window Diameter	Accuracy	Burden VA @ 60 Hz
CTL-050005	CTT-050005	50:5	0.50"	±1.5%	2.5
CTL-050010	CTT-050010	100:5	0.50"	1.0%	3.0
CTL-094020	CTT-094020	200:5	0.94"	1.0%	12.5
CTL-113005	CTT-113005	50:5	1.13"	3.0%	2.0
CTL-113010	CTT-113010	100:5	1.13"	1.0%	2.0
CTL-113020	CTT-113020	200:5	1.13"	1.0%	4.0
CTL-113030	CTT-113030	300:5	1.13"	1.0%	8.0
CTL-156005	CTT-156005	50:5	1.56"	2.0%	1.0
CTL-156010	CTT-156010	100:5	1.56"	2.0%	2.0
CTL-156020	CTT-156020	200:5	1.56"	1.0%	5.0
CTL-156050	CTT-156050	500:5	1.56"	1.0%	20.0
CTL-156100	CTT-156100	1000:5	1.56"	1.0%	25.0

CTL Series Model No.	CTT Series Model No.	Current Ratio	Window Diameter	Accuracy	Burden VA @ 60 Hz
CTL-206005	CTT-156005	50:5	2.06"	3.0%	0.5
CTL-206010	CTT-206010	100:5	2.06"	1.0%	1.0
CTL-206020	CTT-206020	200:5	2.06"	1.0%	4.0
CTL-206050	CTT-206050	500:5	2.06"	1.0%	12.5
CTL-206100	CTT-206100	1000:5	2.06"	1.0%	10.0

Split Core Current Transformers						
CTSC Series Model No.	Current Ratio	Window Dimensions	ANSI Metering Class Accuracy BO.1	BO.2	BO.5	Burden VA @ 60 Hz
CTSC-205505	500:5	2.00" x 5.50"	2.4	4.8	-	2.0 ±1%
CTSC-205520	2000:5	2.00" x 5.50"	0.6	0.6	0.6	30.0 ±1%
CTSC-454505	500:5	4.50" x 4.50"	4.8	4.8	-	1.5 ±1%
CTSC-454520	2000:5	4.50" x 4.50"	0.6	0.6	1.2	20.0 ±1%
CTSC-081902	200:5	0.80" x 1.95"	-	-	-	2.5 ±4%

Accuracy is specified as a percentage of the range, and is given for the maximum burden as expressed in volt amperes. The total burden includes the input resistance of the meter and the loop resistance of the wire and connections between the current transformer and meter. Example: Burden = 2.0 Volt Amps. Maximum Voltage drop = 2.0 Volt Amps / 5 Amps = 0.400 Volts. Maximum Resistance = Voltage / Current = 04.00 Volts / 5 Amps = 0.080 Ohms.

If the input resistance of the meter is 0.010 Ohms, then 0.070 Ohms is allowed for loop resistance of the wire, and connections between the current transformer and the meter. The length and gauge of the wire must be considered in order to avoid exceeding the maximum burden. If resistance in the 5 amp loop causes the burden to be exceeded, the current will drop. This will result in the meter reading low at higher current levels.

Primary / Secondary Turns Ratio Modification

The nameplate current ratio of the current transformer is based on the condition that the primary conductor will be passed once through the transformer opening. If necessary, this rating can be reduced in even multiples by looping this conductor two or more times through the opening. A transformer having a rating of 300 amperes will be changed to 75 amperes if four loops or turns are made with the primary cable as illustrated.

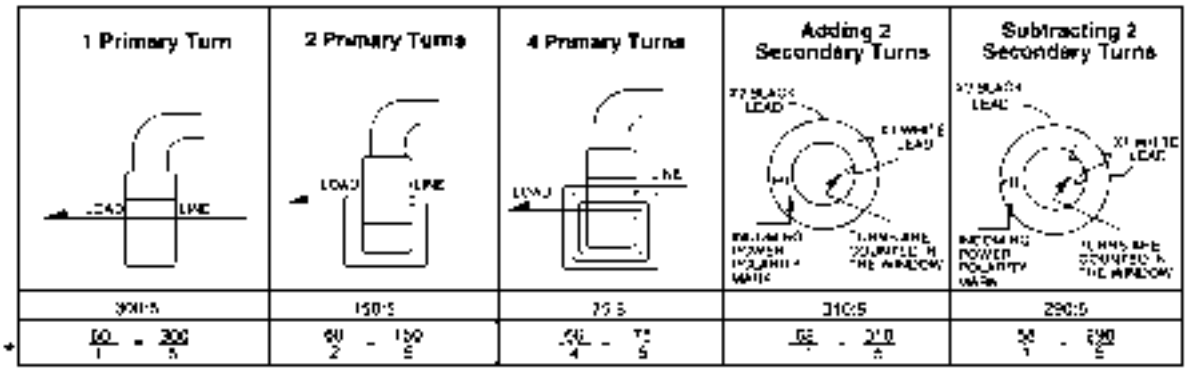
The ratio of the current transformer can be also modified by altering the number of secondary turns by forward or back-winding the secondary lead through the window of the current transformer.

By adding secondary turns, the same primary amperage will result in a decrease in secondary output. By subtracting secondary turns, the same primary amperage will result in greater secondary output.

Again using the 300:5 example, adding two secondary turns will require 310 amps on the primary to maintain the 5 amp secondary output or 62 / 1p = 310p / 5s. Subtracting two secondary turns will only require 290 amps on the primary to maintain the 5 amp secondary output or 58s / 5p = 290p / 5s. The ratio modifications are achieved in the following manner:
To add secondary turns, the white lead should be wound through the CT from the side opposite the polarity mark.
To subtract turns, the white lead should be wound through the CT from the same side as the polarity mark.

*Formula: $\frac{Ns}{Np} = \frac{Ip}{Is}$ where: Ns = Number of Secondary Turns
Np = Number of Primary Turns
Ip = Primary Amperage
Is = Secondary Amperage

Example of Primary / Secondary Turn Ratio Modification with a 300:5 Current Transformer



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