

WESCHLER INSTRUMENTS

Current Transformers

Current transformers are specified by size (VA rating), ratio and accuracy. The VA rating determines the maximum secondary impedance (lead+terminal+meter impedance) that can be driven at the stated accuracy. Metering CTs are specified for a 0.9 power factor at 60Hz. Relaying CTs are specified at a 0.5 PF.

The nameplate ratio assumes that the primary conductor passes once through the transformer window. Large changes in ratio can be achieved by running the conductor through the window more than once. A 300:5 CT with two passes (turns) becomes a 150:5 CT. Three passes yields a 100:5 CT, etc. The accuracy and burden characteristics are unchanged. However the window must be large enough to accommodate the additional turns of heavy primary wire.

Smaller ratio changes can be made by using additive or subtractive turns on the secondary. On a 5A CT with 1 primary turn, each secondary turn modifies the ratio by 5A. 1 turn additive on a 100:5 CT becomes a 105:5 CT. One turn subtractive becomes a 95:5 CT. An additive turn is wound by running the X1 lead through the window from the H2 to the H1 direction (from the side opposite the polarity mark). A subtractive turn runs the opposite direction (from the side with the polarity mark). For more than 1 primary turn, the effect of secondary turns is also divided by the number of primary turns.

A higher ratio CT generally has better performance characteristics. By adjusting the primary and secondary turns, it can be modified to have a lower ratio while retaining this better performance.

Current Transformer Wire Length Chart

Size	Max Length	Gauge	Size	Max Length	Gauge
0.5VA (0.02Ω max)	2 feet	18 AWG	5VA (0.20Ω max)	22 feet	18 AWG
	3 feet	16 AWG		37 feet	16 AWG
	5 feet	14 AWG		60 feet	14 AWG
	8 feet	12 AWG		97 feet	12 AWG
	14 feet	10 AWG		156 feet	10 AWG
1.0VA (0.04Ω max)	4 feet	18 AWG	6VA (0.24Ω max)	27 feet	18 AWG
	6 feet	16 AWG		45 feet	16 AWG
	11 feet	14 AWG		73 feet	14 AWG
	18 feet	12 AWG		117 feet	12 AWG
	30 feet	10 AWG		188 feet	10 AWG
1.5VA (0.06Ω max)	7 feet	18 AWG	8VA (0.32Ω max)	37 feet	18 AWG
	11 feet	16 AWG		60 feet	16 AWG
	18 feet	14 AWG		98 feet	14 AWG
	29 feet	12 AWG		157 feet	12 AWG
	47 feet	10 AWG		250 feet	10 AWG
2.0VA (0.08Ω max)	9 feet	18 AWG	10VA (0.40Ω max)	47 feet	18 AWG
	15 feet	16 AWG		76 feet	16 AWG
	24 feet	14 AWG		123 feet	14 AWG
	38 feet	12 AWG		197 feet	12 AWG
	62 feet	10 AWG		315 feet	10 AWG
2.5VA (0.10Ω max)	11 feet	18 AWG	12.5VA (0.50Ω max)	59 feet	18 AWG
	18 feet	16 AWG		96 feet	16 AWG
	30 feet	14 AWG		154 feet	14 AWG
	47 feet	12 AWG		244 feet	12 AWG
	77 feet	10 AWG		390 feet	10 AWG
3.0VA (0.12Ω max)	13 feet	18 AWG	15VA (0.60Ω max)	72 feet	18 AWG
	21 feet	16 AWG		115 feet	16 AWG
	35 feet	14 AWG		185 feet	14 AWG
	57 feet	12 AWG		295 feet	12 AWG
	93 feet	10 AWG		470 feet	10 AWG
3.5VA (0.14Ω max)	15 feet	18 AWG	20VA (0.80Ω max)	95 feet	18 AWG
	25 feet	16 AWG		152 feet	16 AWG
	41 feet	14 AWG		245 feet	14 AWG
	67 feet	12 AWG		395 feet	12 AWG
	109 feet	10 AWG		630 feet	10 AWG
4VA (0.16Ω max)	17 feet	18 AWG	25VA (1.00Ω max)	120 feet	18 AWG
	30 feet	16 AWG		190 feet	16 AWG
	48 feet	14 AWG		310 feet	14 AWG
	77 feet	12 AWG		490 feet	12 AWG
	124 feet	10 AWG		790 feet	10 AWG
4.5VA (0.18Ω max)	20 feet	18 AWG	45VA (1.80Ω max)	215 feet	18 AWG
	33 feet	16 AWG		350 feet	16 AWG
	54 feet	14 AWG		560 feet	14 AWG
	87 feet	12 AWG		890 feet	12 AWG
	140 feet	10 AWG		1420 feet	10 AWG

Maximum total wire length shown. If distance from meter is 10 feet, then wire length is 20 feet.
Table assumes stranded wire, 0.02Ω meter resistance & 50°C temperature.