

CURRENT TRANSFORMERS: STANDARDS AND RATINGS

Standard Features	Voltage Ratings				
<p>Current Ratings Most Polycast current transformers are available as single, dual or multi-ratio units. Five amp secondaries are standard, but other secondaries are available for many styles. Maximum and minimum primary ratings depend upon the style selected.</p> <p>Accuracy Ratings For most applications the simplicity and high mechanical withstand capabilities of window type and bar type current transformers makes them preferable for most applications. Wound primary current transformers are recommended where high accuracy is required at a lower ratio (5-5A through 300-5A typically).</p> <p>Testing Polycast testing capabilities include polarity, ratio and phase angle, saturation, temperature rise, open circuit, induced, power factor, hipot, impulse, partial discharge, low temperature withstand and other physical and mechanical testing.</p> <p>Note: All Polycast current transformers are individually tested. Routine and type test reports are available upon request.</p>	Polycast Standard Designation	Nominal Voltage Class (kV)	Dry Low Frequency (kV)	Impulse kV Crest 1.2x50µs	Chopped Wave kV Crest (µs)
	0.6	0.7	4	10	12 (1.0)
	5	5.0	19	60	69 (1.5)
	8	8.7	26	75	88 (1.6)
	15	15.0L	34	95	110 (2.0)
	18	15.0H	36	110	130 (2.0)
	25	27.5L	50	125	145 (3.0)
	28	27.5H	60	150	175 (3.0)
<p>The above values are based upon and are intended to meet the most stringent requirements of the following standards:</p> <p>ANSI / IEEE C57.13 CSA 61869-2 IEC 61869-2</p>					

Material Standards

- Cores are grain oriented silicon steel (M4 or higher), annealed after forming to provide maximum accuracy.
- Core insulation is electrical grade pressboard and kraft paper, epoxy or non-paper tape.
- Secondary turns are 200°C rated copper magnet wire with silver soldered connections to terminal or leads, and high quality electrical grade kraft or nomex interlayer insulation.
- Primaries (where provided) are electrolytic copper, typically electroplated with silver.
- Cast indoor units are manufactured using Bisphenol-A epoxy.
- Cast outdoor units are manufactured using cycloaliphatic epoxy, and are typically provided with IP55 rated weatherproof terminal boxes.
- All current transformers have nameplates and prominent polarity markings.

Ambient Working Temperatures

Indoor Current Transformers:	Ambient -5°C to +55°C
Outdoor Current Transformers:	Ambient -50°C to +55°C

These ambient temperatures are considered safe for all current transformer applications. Please consult catalog pages for recommended maximum continuous operating temperatures, or contact Polycast for any special requirements.

Standard Terminology

Turns Ratio	The ratio of the secondary turns to one.
Current Ratio	The ratio of the primary current to the secondary current in amps.
Transformer Correction Factor (TCF)	The correction for the overall error due to both ratio and phase angle error for a specified circuit power factor.
Ratio Correction Factor (RCF)	The ratio of the true ratio to the marked ratio (excitation and other losses result in ratio error)
Rated Burden	The maximum load which may be placed on the current transformer secondary without causing an error greater than that allowed by the stated accuracy (in ohms impedance, ie/B0.1, B0.9 or B2.0 or corresponding volt-ampere values of 2.5, 22.5 or 50VA).

Accuracy Class	<p>Metering Accuracy: The transformer correction factor (TCF) shall be within specified limits at 10%, 100% and CCRF x 100% at a given power factor with a specified burden.</p> <p>Relaying Accuracy: The composite error shall not exceed a specified percentage error at a specified secondary terminal voltage based upon a maximum fault level of secondary current.</p>
Continuous Current Rating Factor (CCRF)	The factor by which the rated current of the current transformer can be multiplied to obtain the maximum continuous current that the current transformer can carry without exceed the temperature rise or accuracy requirements.
1 Second Thermal Withstand	The maximum RMS symmetrical primary current that a current transformer can be carry for one second with the secondary short circuited without exceeding the limiting temperature.
Mechanical Withstand	The maximum RMS asymmetrical primary current that a current transformer can carry with the secondary short circuited without and damage which would render it incapable of meeting other standard accuracy and transformation requirements.

Special Considerations

- Current transformers should never have primary current applied with the secondary(s) open circuited. This is especially true at higher current ratios (1200-5A and above) where the open circuit voltage may exceed the open circuit standard test voltage limit of 3500 volts.
- The test standard and any special requirements for each current transformer ordered should be specified at the time of quoting, and be referenced on the purchase order.
- Because the conditions of use of any current transformer are beyond Polycast's control, it is always the responsibility of the user to ensure that the current and voltage ratings along with the accuracy of the current transformer used are adequate for their application.