

Instrument Transformer

600 V – Indoor Type

Current and Voltage

Class 4210



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Merlin Gerin

Modicon

Square D

Telemecanique

Schneider Electric Brands

Application and Features

APPLICATION, FEATURES AND SELECTION CRITERIA

Square D 600 Volt rated current and voltage transformers are field-proven in well over a million installations where accuracy and longer, more dependable operation are essential.

In most cases, the information contained in this catalog should be sufficient for the proper selection of the instrument transformer best suited for your application. However, should you need additional assistance, please feel free to contact your nearest Square D Field Sales Office or contact our Nashville instrument transformers product marketing group.

Application

Instrument transformers are ideally suited in the following applications:

- Indoor
- Switchgear assemblies
- Motor controllers
- Over power transformer bushings
- Over circuit breaker bushings
- Metering
- Relaying
- Current sensing

NOTE: Transformers listed in this catalog should not be applied to circuits having a phase-to-phase voltage greater than 600 volts, unless adequate additional insulation is applied between the primary and secondary windings. Square D assumes no responsibility for damage of equipment or personal injury caused by the transformers operated on circuits above their published ratings.

Features

- High thermal ratings for short-time use.
- Most instrument transformers listed in this catalog are UL and CUL Recognized per Classification XODW2, File No. E100570.
- Manufactured according to rigid Square D quality control standards.
- Extremely wide range of ratios available.
- Wide range of window sizes from 1.13 in (28 mm) to 8.13 in (206 mm).
- Applicable standards are ANSI C57.13 and CSA C13.
- Models feature strong, molded thermo-plastic cases.
- Molded plastic core jacket ensures rugged core-to-winding insulation.
- Low energy loss, grain-oriented silicon steel annealed for optimum magnetic qualities.
- Most models feature permanent polarity marks molded into the case and large, easy to read ratios are clearly marked on the case.
- Rugged, corrosion-resistant mounting brackets are available as options.
- Most ratings are available from stock.

Selection Criteria

How to Select a Current Transformer

1. Determine that the *primary range* of the current transformer encompasses the application requirement. Lower or specialized ratios may be obtained by adding primary and secondary turns as shown on page 52.
2. Select the proper window size or slightly larger to fit your primary conductor. Refer to the table below.
3. Determine the usual application of current transformer that best suits the application for which it is intended. Refer to the table below. If the application requirements are not fully defined, refer to "Burden and Accuracy Information" on page 53.
4. After selecting a transformer, check its accuracy and burden capabilities by referring to the information page for that transformer.



Selection Criteria and Selection Charts

How to Select a Voltage Transformer

Square D offers three models of voltage transformers, each suited for a particular application. Model 450R is designed for applications requiring accurate voltage measurement within the 0.3% accuracy class. Model 450R is ideal for switchboard use with 1% instrumentation.

Model 460R is designed for voltage indication where accuracy is less critical or where burden requirements are low. Model 460R is ideally suited for use with transducers and panelboards, and other monitoring applications.

Model 470R is designed for extremely accurate voltage measurement where a very low burden is to be used. Examples of such applications include the input to PLC modules and other electronic devices with a high input impedance.

Current Transformers Selection Chart

Window Diameter		Usual Application				Primary Range in Amperes (5 A Secondary)	Multi Ratio (MR)	UL Recognized Product
IN	mm	Model Number	Metering	Metering or Control Relaying	High Output Relaying			
1.3	28	2NR	•			50-300		YES
1.56	40	5NR	•			100-600		YES
		54R	•			100-600		YES
1.94	49	64R	•			100-750		YES
		66R		•		100-750		YES
2.25	57	7RL				50-1500		YES
						50-1500		
		7RT				150-1500 (w/ 1 A secondary)		YES
2.34	59	74R	•			200-1500		YES
		76R		•		200-1500		YES
2.50	63	74RFT						YES
		180R		•		100-1500		YES
		200R		•		100-600		YES
3.50	89	201R		•		100-800		YES
4.00	102	100R		•		200-2000		YES
		110R		•		200-2000		YES
4.25	108	170R		•		200-2000		YES
4.50	114	312R			•	600-4000	MR	YES
		202R		•	•	100-1000		YES
5.25	133	203R		•	•	100-3000		YES
5.75	146	120R		•		200-3000		YES
6.25	159	210R		•	•	200-3000		YES
6.88	175	151R			•	600-4000	MR	YES
		152R		•	•	50-4000		YES
8.13	206	140R		•	•	50-6000		YES
2.12x4.25	54x108	260R	•			100-4000		YES
3.50x6.25	89x159	273	•			200-4000		YES
3.56x8.81	90x224	270R	•			400-5000		YES
7.45x3.75	189x95	560R	•			400-5000		YES

Voltage Transformers Selection Chart

Application	Model Number	Accuracy/Burden and Thermal Rating	Primary Voltages (120 Volt Secondary)	UL Recognized Product	Product Data on Page No.
Large Burden	450R	0.3 W, X, M, Y; 500 VA Thermal	120 to 600 Volts	YES	48
Small Burden	460R	0.6 W, 1.2X; 150 VA Thermal	120 to 600 Volts	YES	48
Small Burden	470R	0.3W, 1.2X; 150 VA Thermal	120 to 600 Volts	YES	48

Mounting Brackets

Model	Bracket	Model	Bracket	Model	Bracket	Model	Bracket	Model	Bracket
2NR	MB-1	66R	MB-12	110R	MB-32	170R	MB-30	203R	Included
5NR	MB-1	74R	MB-16	120R	MB-31	180R	MB-9	210R	MB-32
7RL	MB-7	76R	MB-18	140R	MB-32	200R	Included	260R	Not Available
54R	Included	81X	MB-81	151R	MB-30	201R	Included	270R	Not Available
64R	MB-10	100R	MB-31	152R	MB-30	202R	Included	273	Not Available



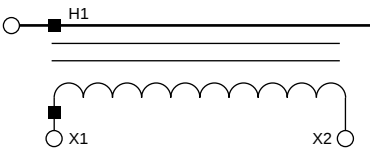
General Purpose Current Transformers

Models 2NR, 5NR, 54R, 7RL, and 7RT

DESCRIPTION

- These low cost, compact units offer good electrical performance in a general purpose transformer.
- UL and CUL Listed per Classification XODW2.
- Feature permanent polarity marks molded into the case.
- All models include two #16 AWG, 24" long secondary leads (white polarity X1 lead).
- Frequency: 50-400 Hz.
- Insulation: 10 kV BIL Full Wave (600 Volt class).
- Applicable Standard: ANSI C57.13.
- Mounts easily on the conductor. No mounting bracketsnecessary. Optional mounting brackets are available and shipped unassembled.
- Model 54R features mounting ears molded into the case for easy installation.
- Model 7RL is are designed for applications used with ammeters, wattmeters, small relays, and cross current compensation. Optional terminals are available. Order as 7RT.

Single Ratio Connection Diagram

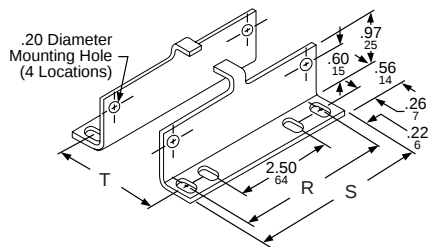
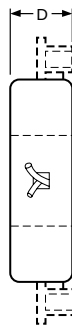
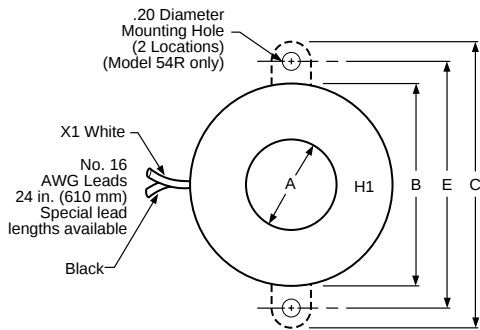


Excitation curves for Model 2NR are not available. See the Square D Digest for pricing.

Optional Mounting Bracket MB-1

Mounting bracket MB-1 is for use with Model 5NR current transformer. The MB-1 bracket may also be applied to the Model 2NR, if bracket is required. Removable mounting ears are supplied on Model 54R only.

Dimensions



Mounting Bracket	Dimensions					
	R		S		T	
	IN	mm	IN	mm	IN	mm
MB-1	3.19	81	3.62	92	1.81	46
MB-7	3.19	81	3.62	92	2.15	55

Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

Model	Dimensions										Mounting Bracket
	A		B		C		D		E		
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	
2NR	1.13	28	2.38	60	—	—	0.94	24	—	—	MB-1
5NR	1.56	40	3.50	89	—	—	1.06	27	—	—	MB-1
54R	1.56	40	3.50	89	4.56	116	1.06	27	4.00	102	—
7RL	2.25	57	4.38	111	—	—	1.38	35	—	—	MB-7
7RT	2.25	57	4.38	111	—	—	1.38	35	—	—	MB-7



Model 2NR

Designed for ammeter use, therefore, needs only one panel meter.



Model 5NR

Designed for ammeter and solid-state transducer applications.



Model 54R

Designed for ammeter and solid-state transducer applications.



Model 7RL

Designed for ammeter and solid-state transducer applications.



General Purpose Current Transformers

Models 2NR, 5NR, 54R, 7RL, and 7RT

Model 2NR

Catalog Number	Current Rating (Amperes)	VA 60 Hz	VA 400 Hz	Accuracy (at Rated Current)	DC Resistance (Ohms) at 25 °C	Weight	
						lb	kg
2NR-500	50:5	1.0	2.0	±2%	0.0298	0.5	0.2
2NR-600	60:5	1.0	2.0	±2%	0.0404	0.5	0.2
2NR-750	75:5	1.5	3.0	±2%	0.0480	0.5	0.2
2NR-800	80:5	1.5	3.0	±2%	0.0556	0.5	0.2
2NR-101	100:5	2.0	4.0	±1%	—	0.5	0.2
2NR-121	120:5	2.5	5.0	±1%	—	0.5	0.2
2NR-1250	125:5	2.5	5.0	±1%	—	0.5	0.2
2NR-151	150:5	2.5	5.0	±1%	—	0.5	0.2
2NR-201	200:5	2.5	5.0	±1%	—	0.5	0.2
2NR-251	250:5	2.5	5.0	±1%	—	0.5	0.2
2NR-301	300:5	2.5	5.0	±1%	—	0.5	0.2

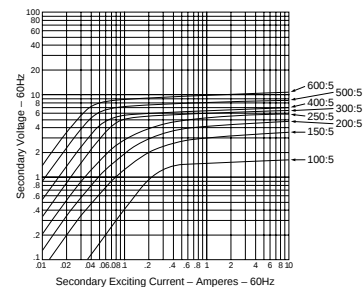
Rating Factor 30 °C Ambient Temp. = 1.0

Model 5NR

Catalog Number	Current Rating (Amperes)	VA 60 Hz	VA 400 Hz	Accuracy (at Rated Current)	DC Resistance (Ohms) at 25 °C	Weight	
						lb	kg
5NR-101	100:5	2.0	4.0	±1%	0.0298	1.0	0.5
5NR-151	150:5	2.5	5.0	±1%	0.0404	1.0	0.5
5NR-201	200:5	5.0	12.5	±1%	0.0480	1.0	0.5
5NR-251	250:5	5.0	12.5	±1%	0.0556	1.0	0.5
5NR-301	300:5	5.0	12.5	±1%	0.0646	1.0	0.5
5NR-401	400:5	12.5	25.0	±1%	0.0883	1.0	0.5
5NR-501	500:5	12.5	25.0	±1%	0.1144	1.0	0.5
5NR-601	600:5	25.0	50.0	±1%	0.1337	1.0	0.5

Rating Factor 30 °C Ambient Temp. = 1.0

Excitation Curves–5NR



Model 7RL

Catalog Number	Current Rating (Amperes)	VA 60 Hz	VA 400 Hz	Accuracy (at Rated Current)	DC Resistance (Ohms) at 25 °C	Weight	
						lb	kg
7RL-500	50:5	2.5	5.0	±1%	0.0530	3.0	1.4
7RL-101	100:5	2.5	5.0	±1%	0.0114	3.0	1.4
7RL-151	150:5	2.5	5.0	±1%	0.0172	3.1	1.4
7RL-201	200:5	5.0	10.0	±1%	0.0306	3.2	1.5
7RL-251	250:5	5.0	10.0	±1%	0.0382	3.3	1.5
7RL-301	300:5	5.0	10.0	±1%	0.0458	3.3	1.5
7RL-401	400:5	12.5	25.0	±1%	0.0611	3.4	1.5
7RL-501	500:5	12.5	25.0	±1%	0.0764	3.6	1.6
7RL-601	600:5	12.5	25.0	±1%	0.0917	3.6	1.6
7RL-751	750:5	12.5	25.0	±1%	0.0859	3.6	1.6
7RL-801	800:5	12.5	25.0	±1%	0.0917	3.3	1.5
7RL-102	1000:5	25.0	50.0	±1%	0.1146	3.4	1.5
7RL-122	1200:5	25.0	50.0	±1%	0.1375	3.5	1.6
7RL-152	1500:5	25.0	50.0	±1%	0.1530	3.5	1.6

Rating Factor 30 °C Ambient Temp. = 1.5



General Purpose Current Transformers

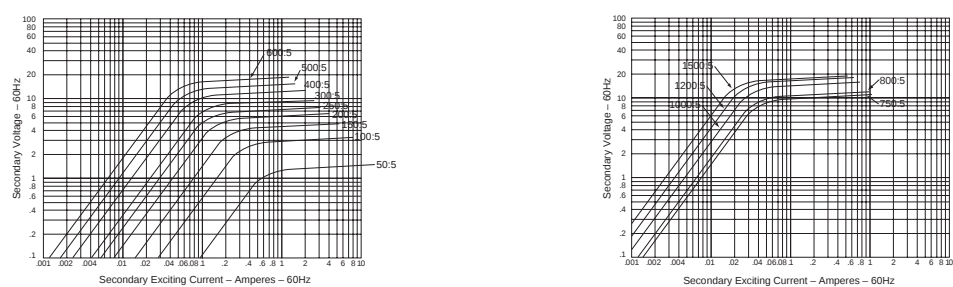
Models 2NR, 5NR, 54R, 7RL, and 7RT

Model 7RT (5 Ampere Current Ratio)

Catalog Number	Current Rating (Amperes)	VA 60 Hz	VA 400 Hz	Accuracy (at Rated Current)	DC Resistance (Ohms) at 25 °C	Weight	
						lb	kg
7RT-500	50:5	2.5	5.0	1.5%	0.0053	3.0	1.4
7RT-101	100:5	2.5	5.0	1.0%	0.0114	3.0	1.4
7RT-151	150:5	2.5	5.0	1.0%	0.0172	3.1	1.4
7RT-201	200:5	2.5	5.0	0.6%	0.0306	3.2	1.5
		5.0	10.0	1.0%		3.2	1.5
		12.5	25.0	2.0%		3.2	1.5
7RT-251	250:5	2.5	5.0	0.6%	0.0382	3.3	1.5
		5.0	10.0	0.6%		3.3	1.5
		12.5	25.0	1.2%		3.3	1.5
7RT-301	300:5	2.5	5.0	0.3%	0.0458	3.3	1.5
		5.0	10.0	0.6%		3.3	1.5
		12.5	25.0	1.0%		3.3	1.5
7RT-401	400:5	2.5	5.0	0.3%	0.0611	3.4	1.5
		5.0	10.0	0.3%		3.4	1.5
		12.5	25.0	0.6%		3.4	1.5
		25.0	50.0	1.0%		3.4	1.5
7RT-501	500:5	2.5	5.0	0.3%	0.0764	3.6	1.6
		5.0	10.0	0.3%		3.6	1.6
		12.5	25.0	0.6%		3.6	1.6
		25.0	50.0	1.0%		3.6	1.6
7RT-601	600:5	2.5	5.0	0.3%	0.0917	3.6	1.6
		5.0	10.0	0.3%		3.6	1.6
		12.5	25.0	0.6%		3.6	1.6
		25.0	50.0	0.6%		3.6	1.6
7RT-751	750:5	2.5	5.0	0.3%	0.0859	3.6	1.6
		5.0	10.0	0.3%		3.6	1.6
		12.5	25.0	0.6%		3.6	1.6
		25.0	50.0	1.0%		3.6	1.6
7RT-801	800:5	2.5	5.0	0.3%	0.0917	3.3	1.5
		5.0	10.0	0.3%		3.3	1.5
		12.5	25.0	0.6%		3.3	1.5
		25.0	50.0	0.6%		3.3	1.5
7RT-102	1000:5	2.5	5.0	0.3%	0.1146	3.4	1.5
		5.0	10.0	0.3%		3.4	1.5
		12.5	25.0	0.3%		3.4	1.5
		25.0	50.0	0.6%		3.4	1.5
7RT-122	1200:5	2.5	5.0	0.3%	0.1375	3.5	1.6
		5.0	10.0	0.3%		3.5	1.6
		12.5	25.0	0.3%		3.5	1.6
		25.0	50.0	0.6%		3.5	1.6
7RT-152	1500:5	2.5	5.0	0.3%	0.1530	3.5	1.6
		5.0	10.0	0.3%		3.5	1.6
		12.5	25.0	0.3%		3.5	1.6
		25.0	50.0	0.3%		3.5	1.6

Rating Factor 30 °C Ambient Temp. = 1.5

Excitation Curves–Model 7RL and 7RT



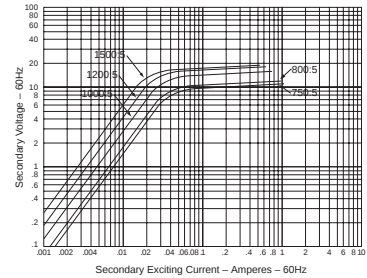
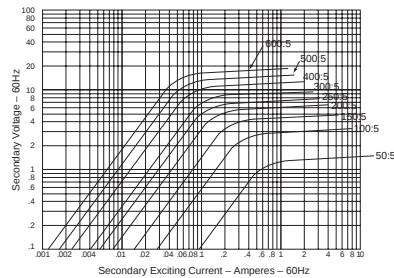
General Purpose Current Transformers Models 2NR, 5NR, 54R, 7RL, and 7RT

Model 7RT (1 Ampere Current Ratio)

Catalog Number	Current Rating (Amperes)	VA 60 Hz	VA 400 Hz	Accuracy (at Rated Current)	DC Resistance (Ohms) at 25 °C	Weight	
						lb	kg
7RT-151-001	150:1	1.0	2.0	0.3%	0.4598	2.8	1.3
		5.0	10.0	1.5%		2.8	1.3
7RT-251-001	250:1	1.0	2.0	0.3%	0.7664	3.0	1.4
		5.0	10.0	0.6%		3.0	1.4
7RT-301-001	300:1	1.0	2.0	0.3%	0.9197	3.0	1.4
		5.0	10.0	0.6%		3.0	1.4
7RT-401-001	400:1	1.0	2.0	0.3%	1.2262	3.0	1.4
		5.0	10.0	0.3%		3.0	1.4
7RT-501-001	500:1	1.0	2.0	0.3%	1.1496	2.5	1.1
		5.0	10.0	0.3%		2.5	1.1
7RT-601-001	600:1	1.0	2.0	0.3%	1.3795	2.5	1.1
		5.0	10.0	0.3%		2.5	1.1
7RT-102-001	1000:1	1.0	2.0	0.3%	2.4700	2.0	0.9
		5.0	10.0	0.3%		2.0	0.9
		10.0	20.0	0.3%		2.0	0.9
7RT-122-001	1200:1	1.0	2.0	0.3%	2.4564	2.5	1.1
		5.0	10.0	0.3%		2.5	1.1
		10.0	20.0	0.3%		2.5	1.1
		15.0	30.0	0.3%		2.5	1.1
7RT-152-001	1500:1	1.0	2.0	0.3%	3.0706	2.7	1.2
		5.0	10.0	0.3%		2.7	1.2
		10.0	20.0	0.3%		2.7	1.2
		15.0	30.0	0.3%		2.7	1.2

Rating Factor 30 °C Ambient Temp. = 1.5

Excitation Curves–Model 7RL and 7RT

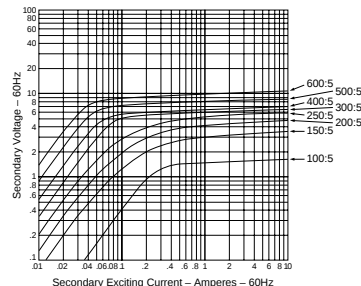


Model 54R

Catalog Number	Current Rating (Amperes)	VA 60 Hz	VA 400 Hz	Accuracy (at Rated Current)	DC Resistance (Ohms) at 25 °C	Weight	
						lb	kg
54R-101	100:5	2.0	4.0	±1%	0.0298	1.0	0.5
54R-151	150:5	2.5	5.0	±1%	0.0404	1.0	0.5
54R-201	200:5	5.0	12.5	±1%	0.0480	1.0	0.5
54R-251	250:5	5.0	12.5	±1%	0.0556	1.0	0.5
54R-301	300:5	5.0	12.5	±1%	0.0646	1.0	0.5
54R-401	400:5	12.5	25.0	±1%	0.0883	1.0	0.5
54R-501	500:5	12.5	25.0	±1%	0.1144	1.0	0.5
54R-601	600:5	25.0	50.0	±1%	0.1337	1.0	0.5

Rating Factor 30 °C Ambient Temp. = 1.0

Excitation Curves–Model 54R



Toroidal Current Transformers (Single Ratio)

Models 64R, 74R, and 74RFT



Model 64R
Designed for metering applications.



Model 74R
Designed for metering applications.

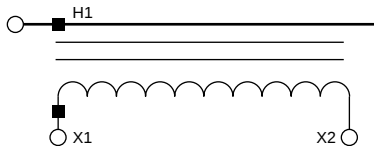


Model 74RFT
Designed for metering applications.

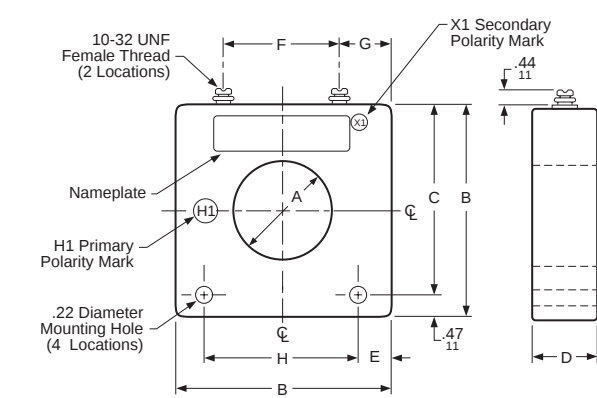
DESCRIPTION

- Permanent polarity marks molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Optional mounting brackets are shipped unassembled.
- Model 74RFT features molded mounting feet.
- Frequency: 25-400 Hz.
- Insulation: 10 kV BIL Full Wave (600 Volt class).
- Applicable Standard—ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

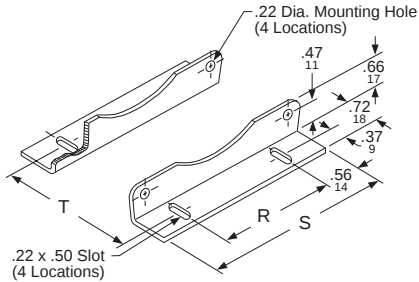
Single Ratio Connection Diagram



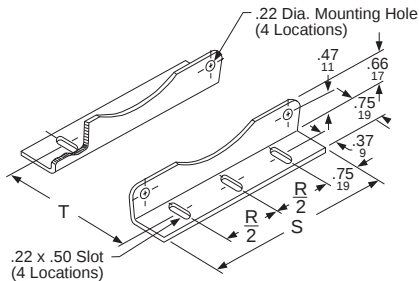
Dimensions



Mounting Bracket	Dimensions					
	R		S		T	
	IN	mm	IN	mm	IN	mm
MB-10	2.50	64	3.62	92	2.38	60
MB-16	2.76	70	4.00	102	2.50	64



Mounting Bracket MB-10



Mounting Bracket MB-16

Dual Dimensions inches
mm

Model	Dimensions																Mounting Bracket
	A		B		C		D		E		F		G		H		
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	
64R	1.94	49	4.19	106	3.72	94	1.50	38	0.54	14	2.38	60	0.91	23	3.12	79	MB-10
74R	2.34	59	4.69	119	4.22	107	1.62	41	0.60	15	2.50	64	1.10	28	3.50	89	MB-16
74RFT	2.5	63	4.69	119	—	—	2.62	67	—	—	2.88	73	—	—	—	—	—



Torroidal Current Transformers (Single Ratio) Models 64R, 74R, and 74RFT

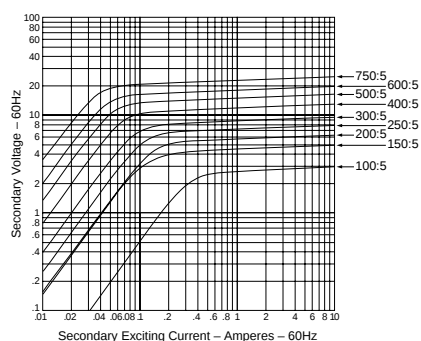
Model 64RL

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
64R-101	100:5	—	1.2	2.4	—	—	—	0.0113	1.9	0.89
64R-151	150:5	—	1.2	1.2	—	—	—	0.0268	1.9	0.89
64R-201	200:5	—	1.2	1.2	2.4	—	—	0.0371	1.9	0.89
64R-251	250:5	—	0.6	0.6	1.2	—	—	0.0463	2.0	0.90
64R-301	300:5	—	0.6	0.6	1.2	2.4	—	0.0556	2.0	0.90
64R-401	400:5	—	0.3	0.6	0.6	1.2	—	0.0741	2.0	0.90
64R-501	500:5	—	0.3	0.3	0.6	0.6	—	0.0926	2.1	0.95
64R-601	600:5	—	0.3	0.3	1.2	0.6	1.2	0.1173	2.1	0.95
64R-751	750:5	—	0.3	0.3	0.6	0.6	0.6	0.1466	2.1	0.95

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves—Model 64R



Torroidal Current Transformers (Single Ratio)

Models 64R, 74R, and 74RFT

Model 74R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
74R-201	200:5	—	1.2	1.2	0.6	—	—	0.0400	2.6	1.2
74R-251	250:5	—	1.2	1.2	0.6	1.2	—	0.0501	2.6	1.2
74R-301	300:5	—	0.6	0.6	1.2	2.4	—	0.0617	2.6	1.2
74R-401	400:5	—	0.3	0.3	0.6	1.2	—	0.0823	2.7	1.2
74R-501	500:5	—	0.3	0.3	0.6	0.6	1.2	0.1029	2.8	1.3
74R-601	600:5	—	0.3	0.3	0.3	0.6	1.2	0.1234	2.8	1.3
74R-751	750:5	—	0.3	0.3	0.6	0.6	1.2	0.1422	2.9	1.3
74R-801	800:5	—	0.3	0.3	0.3	0.6	1.2	0.1517	2.9	1.3
74R-102	1000:5	—	0.3	0.3	0.3	0.3	0.6	0.1896	2.6	1.2
74R-122	1200:5	—	0.3	0.3	0.3	0.3	0.6	0.2275	2.7	1.2
*74R-152	1500:5	—	0.3	0.3	0.3	0.3	0.6	0.2641	2.9	1.3

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

* 74R-152 Rating Factor 30 °C Ambient Temp. = 1.0, Rating Factor 55 °C Ambient Temp. = 0.75

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

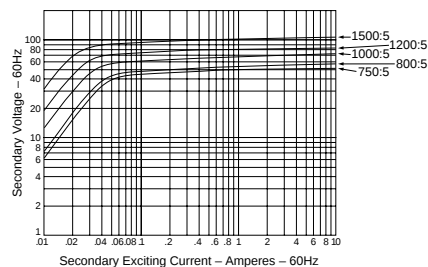
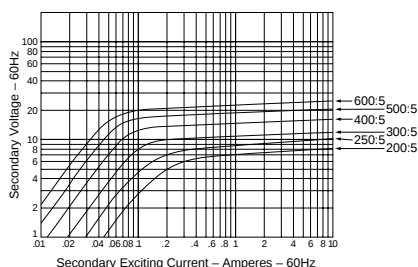
Model 74RF

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
74RFT-201	200:5	—	1.2	1.2	0.6	—	—	0.0400	2.6	1.2
74RFT-251	250:5	—	1.2	1.2	0.6	1.2	—	0.0501	2.6	1.2
74RFT-301	300:5	—	0.6	0.6	1.2	2.4	—	0.0617	2.6	1.2
74RFT-401	400:5	—	0.3	0.3	0.6	1.2	—	0.0823	2.7	1.2
74RFT-501	500:5	—	0.3	0.3	0.6	0.6	1.2	0.1029	2.8	1.3
74RFT-601	600:5	—	0.3	0.3	0.3	0.6	1.2	0.1234	2.8	1.3
74RFT-651	650:5	—	0.3	0.3	0.3	0.6	—	0.1297	2.9	1.3
74RFT-751	750:5	—	0.3	0.3	0.6	0.6	1.2	0.1422	2.9	1.3
74RFT-801	800:5	—	0.3	0.3	0.3	0.6	1.2	0.1517	2.9	1.3
74RFT-102	1000:5	—	0.3	0.3	0.3	0.3	0.6	0.1896	2.6	1.2
74RFT-122	1200:5	—	0.3	0.3	0.3	0.3	0.6	0.2275	2.7	1.2

Rating Factor 30°C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves—Models 74R and 74RFT



Torroidal Current Transformers (Single Ratio)
Models 64R, 74R, and 74RFT



Toroidal Current Transformers (Single Ratio)

Models 66R and 76R



Model 66R
Designed for metering and control relaying applications

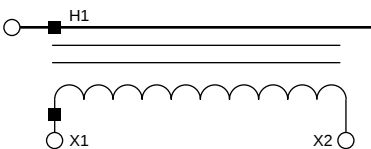


Model 76R
Designed for metering and control relaying applications.

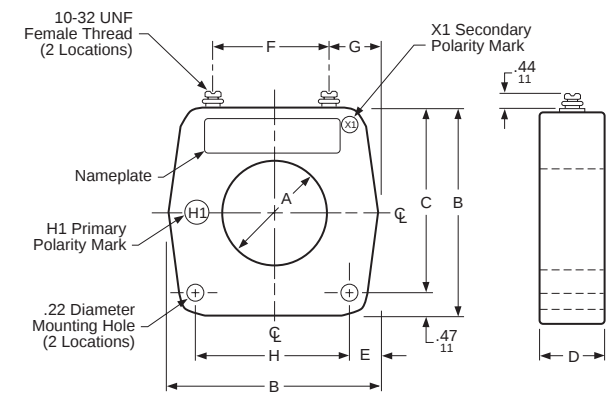
DESCRIPTION

- Permanent polarity marks molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Optional mounting brackets are shipped unassembled.
- Frequency: 25-400 Hz
- Insulation: 10 kV BIL Full Wave (600 Volt class)
- Applicable Standard—ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

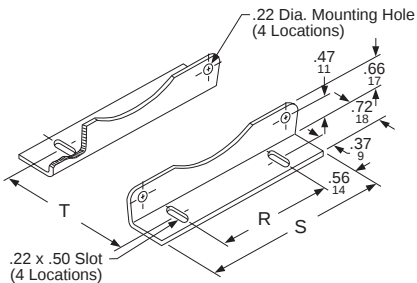
Single Ratio Connection Diagram



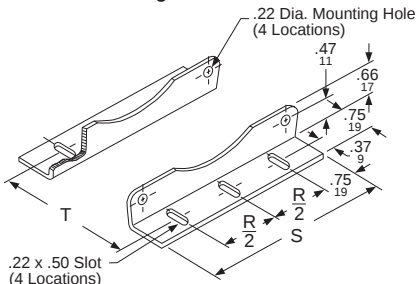
Dimensions



Mounting Bracket	Dimensions					
	R		S		T	
	IN	mm	IN	mm	IN	mm
MB-12	2.50	64	3.62	92	3.94	100
MB-18	2.76	70	4.00	102	4.12	105



Mounting Bracket MB-12



Mounting Bracket MB-18

Dual Dimensions inches
mm

Model	Dimensions																Mounting Bracket
	A		B		C		D		E		F		G		H		
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	
66R	1.94	49	4.19	106	3.72	94	3.06	154	0.54	14	2.38	60	0.91	23	3.12	79	MB-12
76R	2.34	59	4.69	119	4.22	107	3.25	83	0.60	15	2.50	64	1.10	28	3.50	89	MB-18



Torroidal Current Transformers (Single Ratio) Models 66R and 76R

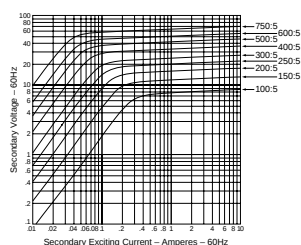
Model 66R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI metering Accuracy Class-60 Hz					Rating Factor (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
66R-101	100:5	—	1.2	2.4	—	—	—	0.0232	4.8	2.2
66R-151	150:5	—	0.6	1.2	2.4	2.4	—	0.0349	4.8	2.2
66R-201	200:5	C10	0.6	0.6	1.2	2.4	—	0.0739	4.8	2.2
66R-251	250:5	C10	0.3	0.6	0.6	1.2	2.4	0.0923	4.9	2.2
66R-301	300:5	C10	0.3	0.3	0.6	1.2	2.4	0.1108	5.0	2.3
66R-401	400:5	C10	0.3	0.3	0.3	0.6	1.2	0.1477	5.1	2.3
66R-501	500:5	C20	0.3	0.3	0.3	0.6	0.6	0.1846	5.2	2.4
66R-601	600:5	C20	0.3	0.3	0.3	0.3	0.6	0.1136	5.3	2.4
66R-751	750:5	C20	0.3	0.3	0.3	0.3	0.3	0.2851	5.3	2.4

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves



Model 76R

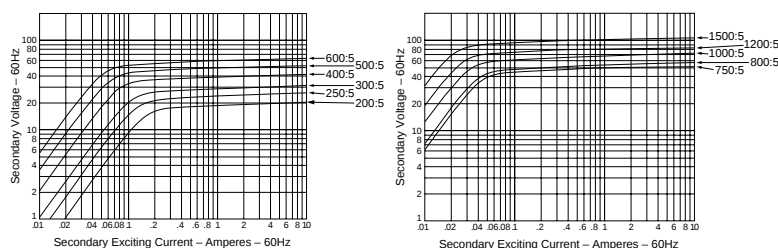
Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
76R-201	200:5	C10	0.6	0.6	1.2	2.4	2.4	0.0782	5.8	2.6
76R-251	250:5	C10	0.3	0.6	1.2	1.2	2.4	0.0977	5.9	2.7
76R-301	300:5	C10	0.3	0.3	0.6	1.2	1.2	0.1173	5.9	2.7
76R-401	400:5	C10	0.3	0.3	0.3	0.6	1.2	0.1563	6.0	2.7
76R-501	500:5	C10	0.3	0.3	0.3	0.3	0.6	0.1954	6.1	2.8
76R-601	600:5	C20	0.3	0.3	0.3	0.3	0.6	0.2345	6.3	2.9
76R-751	750:5	C20	0.3	0.3	0.3	0.3	0.6	0.2805	6.5	3.0
76R-801	800:5	C20	0.3	0.3	0.3	0.3	0.3	0.2992	6.5	3.0
76R-102	1000:5	C20	0.3	0.3	0.3	0.3	0.3	0.3740	6.0	2.7
76R-122	1200:5	C20	0.3	0.3	0.3	0.3	0.3	0.4488	6.2	2.8
*76R-152	1500:5	C20	0.3	0.3	0.3	0.3	0.3	0.5507	6.5	3.0

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

* 76R-152 Rating Factor 30 °C Ambient Temp. = 1.0, Rating Factor 55 °C Ambient Temp. = 0.75

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves-Model 76R



Toroidal Current Transformers (Single Ratio)

Models 100R and 110R



Model 100R
Designed for metering and control relaying applications.

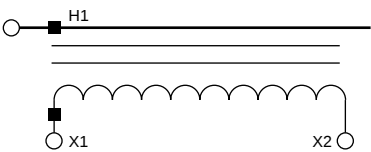


Model 110R
Designed for metering and relaying applications.

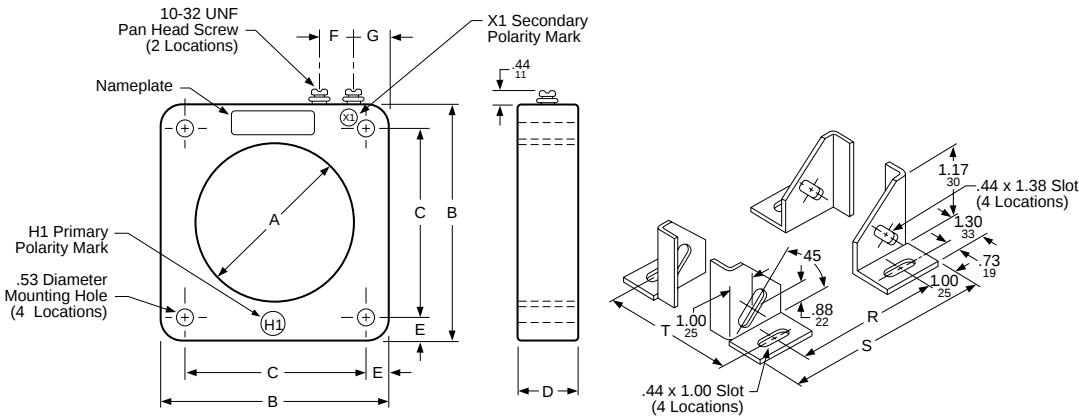
DESCRIPTION

- Permanent polarity marks molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Optional mounting brackets are shipped unassembled.
- Frequency: 25-400 Hz
- Insulation: 10 kV BIL full wave (600 volt class).
- Applicable Standard – ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

Single Ratio Connection Diagram



Dimensions



Mounting Bracket MB-31 & 32

Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

Model	Dimensions														Mounting Bracket
	A		B		C		D		E		F		G		
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	
100R	4.00	102	7.00	178	5.75	146	2.12	54	0.62	16	1.00	25	1.25	32	MB-31
110R	4.00	102	7.00	178	5.75	146	2.88	73	0.62	16	1.00	25	1.25	32	MB-32

Model	Mounting Bracket	Dimensions					
		R		S		T	
		IN	mm	IN	mm	IN	mm
100R	MB-31	5.00	127	7.16	182	3.75	95
110R	MB-32	5.00	127	7.16	182	4.50	114



Torroidal Current Transformers (Single Ratio) Models 100R and 110R

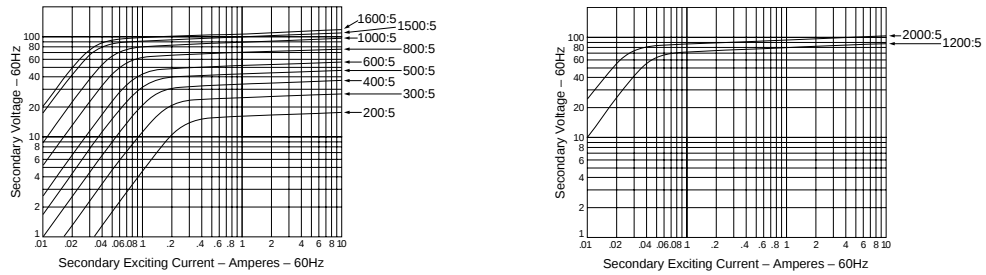
Model 100R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
100R-201	200:5	C10	0.6	1.2	2.4	—	—	0.0619	9.2	4.2
100R-301	300:5	C10	0.3	0.6	1.2	1.2	2.4	0.0929	9.2	4.2
100R-401	400:5	C20	0.3	0.3	0.6	1.2	1.2	0.1239	9.3	4.2
100R-501	500:5	C20	0.3	0.3	0.6	0.6	1.2	0.1548	9.4	4.3
100R-601	600:5	C20	0.3	0.3	0.3	0.6	0.6	0.2331	9.5	4.3
100R-801	800:5	C20	0.3	0.3	0.3	0.3	0.6	0.3109	9.7	4.4
100R-102	1000:5	C50	0.3	0.3	0.3	0.3	0.3	0.3886	9.9	4.5
100R-122	1200:5	C50	0.3	0.3	0.3	0.3	0.3	0.3589	8.6	3.9
100R-152	1500:5	C50	0.3	0.3	0.3	0.3	0.3	0.4886	8.7	3.9
100R-162	1600:5	C50	0.3	0.3	0.3	0.3	0.3	0.4453	8.9	4.0
100R-202	2000:5	C50	0.3	0.3	0.3	0.3	0.3	0.5623	9.1	4.1

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves–Model 100R



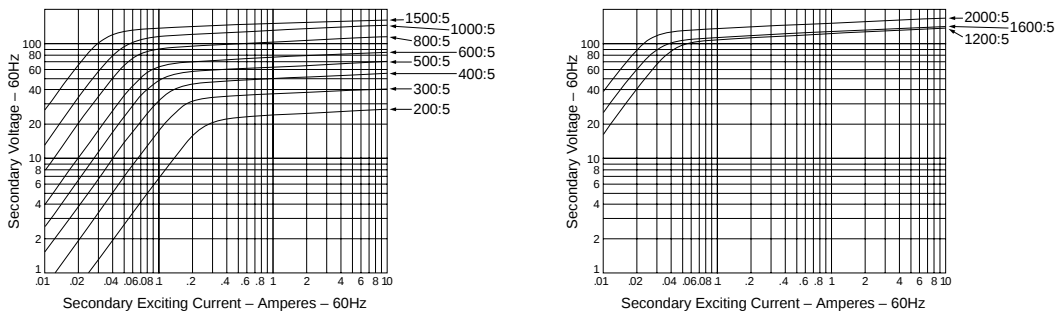
Model 110R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
110R-201	200:5	C20	0.6	0.6	1.2	2.4	—	0.0619	13.6	6.2
110R-301	300:5	C20	0.3	0.3	0.6	1.2	2.4	0.0929	13.6	6.2
110R-401	400:5	C20	0.3	0.3	0.3	0.6	1.2	0.1239	13.8	6.2
110R-501	500:5	C50	0.3	0.3	0.3	0.6	0.6	0.1548	13.8	6.2
110R-601	600:5	C50	0.3	0.3	0.3	0.3	0.6	0.2331	13.9	6.3
110R-801	800:5	C50	0.3	0.3	0.3	0.3	0.6	0.3109	14.2	6.4
110R-102	1000:5	C100	0.3	0.3	0.3	0.3	0.3	0.3886	14.4	6.5
110R-122	1200:5	C100	0.3	0.3	0.3	0.3	0.3	0.3589	12.2	5.5
110R-152	1500:5	C100	0.3	0.3	0.3	0.3	0.3	0.4886	12.6	5.7
110R-162	1600:5	C100	0.3	0.3	0.3	0.3	0.3	0.4453	12.7	5.8
110R-202	2000:5	C100	0.3	0.3	0.3	0.3	0.3	0.5623	13.3	6.0

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves–Model 110R



Toroidal Current Transformers (Single Ratio)

Models 120R and 140R

DESCRIPTION

- Permanent polarity marks molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Optional mounting brackets are shipped unassembled.
- Frequency: 25-400 Hz.
- Insulation: 10 kV BIL full wave (600 volt class).
- Applicable Standard – ANSI C57.13.
- UL and CUL recognized per Classification XODW2.



Model 120R

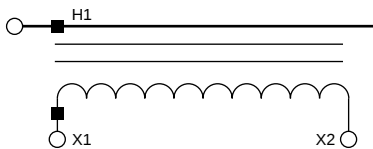
Designed for metering and control relaying applications.



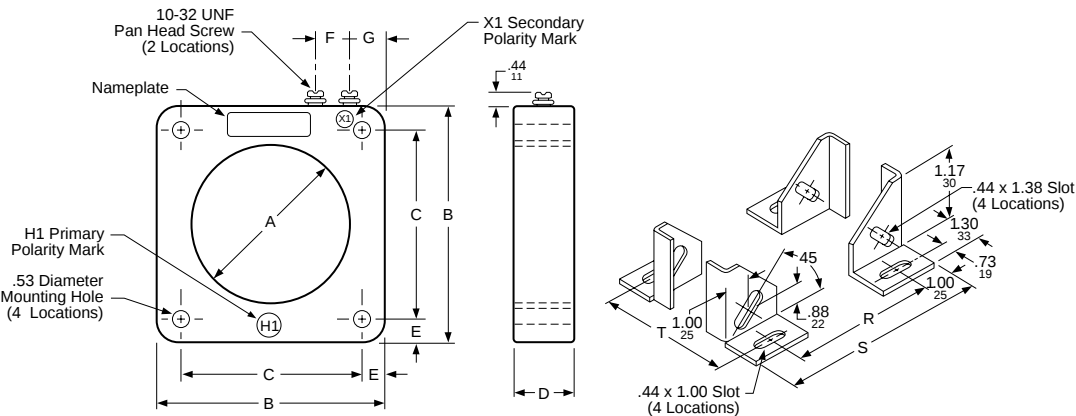
Model 140R

Designed for metering and relaying applications.

Single Ratio Connection Diagram



Dimensions



Mounting Bracket MB-31 & 32

Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

Model	Dimensions														Mounting Bracket
	A		B		C		D		E		F		G		
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	
120R	5.75	146	8.50	216	6.75	171	2.12	54	0.88	22	1.25	32	1.50	38	MB-31
140R	8.13	206	11.00	279	8.50	216	3.00	76	1.25	32	1.00	25	2.25	57	MB-32

Model	Dimensions						Mounting Bracket
	R		S		T		
	IN	mm	IN	mm	IN	mm	
120R	6.50	165	8.66	220	3.75	95	MB-31
140R	9.00	229	11.16	283	4.62	117	MB-32



Torroidal Current Transformers (Single Ratio) Models 120R and 140R

Model 120R

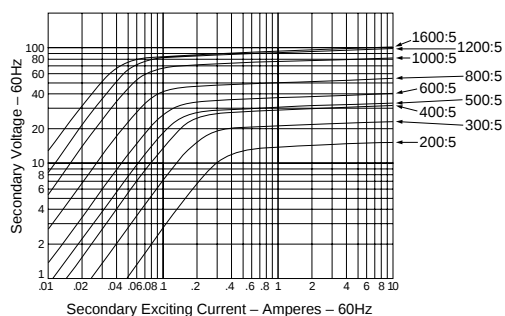
Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
120R-201	200:5	C10	1.2	2.4	2.4	—	—	0.0463	10.0	4.5
120R-301	300:5	C10	0.6	1.2	2.4	2.4	—	0.0695	10.0	4.5
120R-401	400:5	C20	0.3	0.6	1.2	1.2	1.2	0.0927	10.1	4.6
120R-501	500:5	C20	0.3	0.3	0.6	1.2	0.6	0.1046	10.2	4.6
120R-601	600:5	C20	0.3	0.3	0.6	0.6	0.6	0.1255	10.3	4.7
120R-801	800:5	C20	0.3	0.3	0.3	0.6	0.3	0.1673	10.5	4.8
120R-102	1000:5	C50	0.3	0.3	0.3	0.3	0.3	0.2317	10.7	4.9
120R-122	1200:5	C50	0.3	0.3	0.3	0.3	0.3	0.2780	10.9	4.9
120R-152	1500:5	C50	0.3	0.3	0.3	0.3	0.3	0.3571	11.2	5.1
120R-162	1600:5	C50	0.3	0.3	0.3	0.3	0.3	0.4001	11.2	5.1
120R-202	2000:5	C50	0.3	0.3	0.3	0.3	0.3	0.4276	9.8	4.4
120R-252	2500:5	C50	0.3	0.3	0.3	0.3	0.3	0.5064	10.4	4.7
120R-302	3000:5	C50	0.3	0.3	0.3	0.3	0.3	0.6134	10.9	4.9
*120R-402	4000:5	—	0.3	0.3	0.3	0.3	0.3	0.8179	10.9	4.9

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

* 120R-402 Rating Factor 30 °C Ambient Temp. = 1.0, Rating Factor 55 °C Ambient Temp. = 0.75

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves—Model 120R



Torroidal Current Transformers (Single Ratio)

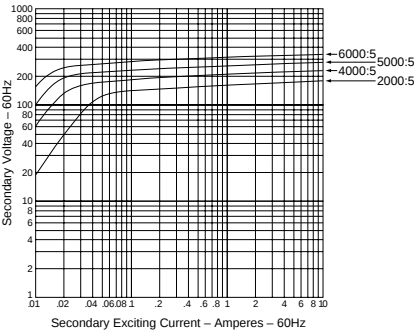
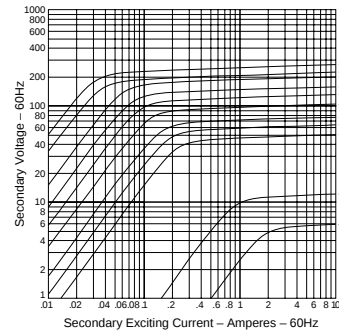
Models 120R and 140R

Model 140R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
140R-500	50:5	—	Ground Fault Sensing				—	0.0078	21.5	9.8
140R-101	100:5	—					—	0.0157	21.5	9.8
140R-401	400:5	C20	0.6	0.6	1.2	1.2	2.4	0.1572	22.0	10.0
140R-501	500:5	C20	0.3	0.3	0.6	1.2	1.2	0.1966	22.1	10.0
140R-601	600:5	C20	0.3	0.3	0.6	0.6	1.2	0.2359	22.2	10.0
140R-801	800:5	C50	0.3	0.3	0.3	0.6	0.6	0.3149	22.5	10.2
140R-102	1000:5	C50	0.3	0.3	0.3	0.3	0.6	0.3931	22.7	10.3
140R-122	1200:5	C100	0.3	0.3	0.3	0.3	0.3	0.4717	22.9	10.4
140R-152	1500:5	C100	0.3	0.3	0.3	0.3	0.3	0.4734	23.5	10.2
140R-202	2000:5	C100	0.3	0.3	0.3	0.3	0.3	0.5510	23.9	10.9
140R-252	2500:5	C100	0.3	0.3	0.3	0.3	0.3	0.7206	18.9	8.6
140R-302	3000:5	C100	0.3	0.3	0.3	0.3	0.3	0.8647	19.4	8.8
140R-402	4000:5	C100	0.3	0.3	0.3	0.3	0.3	1.0142	20.5	9.3
*140R-502	5000:5	C100	0.3	0.3	0.3	0.3	0.3	1.3450	16.6	7.5
*140R-602	6000:5	C100	0.3	0.3	0.3	0.3	0.3	1.6139	17.5	7.9

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0
 * 140R-502 and 140R-602 Rating Factor 55 °C Ambient Temp. = 0.75
 ▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves–Model 140R



Torroidal Current Transformers (Single Ratio)

Models 120R and 140R



Designed for relaying and other current sensing applications.

- Permanent polarity marks molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Optional mounting brackets are shipped unassembled.
- Frequency: 25-400 Hz.
- Insulation: 10 kV BIL full wave (600 volt class).
- Applicable Standard – ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

Model 151R-601		Model 151R-122		Model 151R-202		Model 151R-302		Model 151R-402	
Current Rating (A)	Secondary Terminal Connections	Current Rating (A)	Secondary Terminal Connections	Current Rating (A)	Secondary Terminal Connections	Current Rating (A)	Secondary Terminal Connections	Current Rating (A)	Secondary Terminal Connections
50:5	X2-X3	100:5	X2-X3	300:5	X3-X4	300:5	X3-X4	500:5	X1-X2
100:5	X1-X2	200:5	X1-X2	400:5	X1-X2	500:5	X4-X5	1000:5	X3-X4
150:5	X1-X3	300:5	X1-X3	500:5	X4-X5	800:5	X3-X5	1500:5	X2-X3
200:5	X4-X5	400:5	X4-X5	800:5	X2-X3	1000:5	X1-X2	2000:5	X1-X3
250:5	X3-X4	500:5	X3-X4	1100:5	X2-X4	1200:5	X2-X3	2500:5	X2-X4
300:5	X2-X4	600:5	X2-X4	1200:5	X1-X3	1500:5	X2-X4	3000:5	X1-X4
400:5	X1-X4	800:5	X1-X4	1500:5	X1-X4	2000:5	X2-X5	3500:5	X2-X5
450:5	X3-X5	1000:5	X2-X5	1600:5	X2-X5	2200:5	X1-X3	4000:5	X1-X5
500:5	X4-X5	1200:5	X1-X5	2000:5	X1-X5	2500:5	X1-X4	—	—
600:5	X1-X5	—	—	—	—	3000:5	X1-X5	—	—

10-32 UNF Pan Head Screw (5 Locations)

Omitted on Model 152R

Nameplate

H1 Primary Polarity Mark

.50 Diameter Mounting Hole (4 Locations)

X1 Secondary Polarity Mark

1.12/28

.44/11

.44 x 1.38 Slot (4 Locations)

Mounting Bracket MB-30

Mounting Bracket	Dimensions					
	R		S		T	
	IN	mm	IN	mm	IN	mm
MB-30	4.75	121	6.91	176	2.94	75

Model	Dimensions													
	A		B		C		D		E		F		G	
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
151R	6.88	175	12.25	311	9.50	241	4.12	105	1.38	35	1.00	25	4.62	117

Torroidal Current Transformers (Single Ratio) Model 151R

Model 151R-601

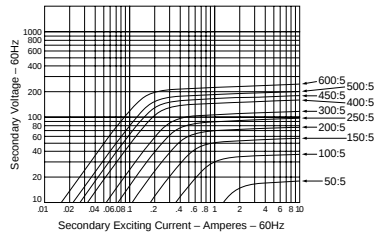
Catalog Number	Current Rating ▲	Relay Accuracy Class*	DC Resistance (Ohms)	Weight (lb/kg)	
				lbs	kg
151R-601	50:5	—	0.0245	63	29
	100:5	—	0.0490		
	150:5	—	0.0735		
	200:5	—	0.0979		
	250:5	—	0.1224		
	300:5	—	0.1469		
	400:5	—	0.1959		
	450:5	—	0.2204		
	500:5	—	0.2449		
	600:5	C200	0.2940		

* Accuracy Class only applies to the nominal ratio

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Taps in accordance with ANSI Standard C57.13 and NEMA Rating SG-4.

Excitation Curves–Model 151R-601



Model 151R-122

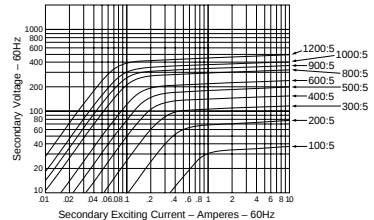
Catalog Number	Current Rating ▲	Relay Accuracy Class*	DC Resistance (Ohms) at 25 °C	Weight (lb/kg)	
				lbs	kg
151R-122	50:5	—	0.0490	63	29
	100:5	—	0.0979		
	200:5	—	0.1469		
	300:5	—	0.1959		
	400:5	—	0.2449		
	500:5	—	0.2938		
	600:5	—	0.3918		
	800:5	—	0.4408		
	900:5	—	0.4897		
	1000:5	C400	0.5879		

* Accuracy Class only applies to the nominal ratio

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Taps in accordance with ANSI Standard C57.13 and NEMA Rating SG-4.

Excitation Curves–Model 151R-122



Torroidal Current Transformers (Single Ratio)

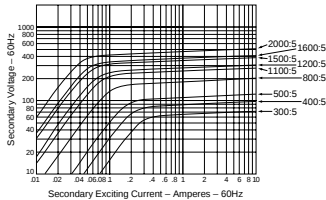
Model 151R

Model 151R-202

Catalog Number	Current Rating ▲	Relay Accuracy Class*	DC Resistance (Ohms) at 25 °C	Weight (lb/kg)	
				lbs	kg
151R-202	300:5	—	0.1306	63	29
	400:5	—	0.1741		
	500:5	—	0.2177		
	800:5	—	0.3483		
	1100:5	—	0.4789		
	1200:5	—	0.5224		
	1500:5	—	0.6530		
	1600:5	—	0.6966		
	2000:5	C400	0.8711		

* Accuracy Class only applies to the nominal ratio
 Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0
 ▲ Taps in accordance with ANSI Standard C57.13 and NEMA Rating SG-4.

Excitation Curves–Model 151R-202

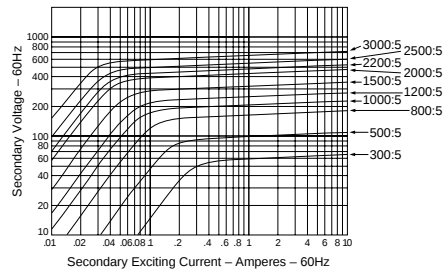


Model 151R-302

Catalog Number	Current Rating ▲	Relay Accuracy Class*	DC Resistance (Ohms) at 25 °C	Weight (lb/kg)	
				lbs	kg
151R-302	300:5	—	0.1239	63	29
	500:5	—	0.2064		
	800:5	—	0.3303		
	1000:5	—	0.4128		
	1200:5	—	0.4954		
	1500:5	—	0.6193		
	2000:5	—	0.8257		
	2200:5	—	0.9083		
	2500:5	—	1.0321		
	3000:5	C400	1.2391		

* Accuracy Class only applies to the nominal ratio
 Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0
 ▲ Taps in accordance with ANSI Standard C57.13 and NEMA Rating SG-4.

Excitation Curves–Model 151R-302



Torroidal Current Transformers (Single Ratio) Model 151R

Model 151R-402

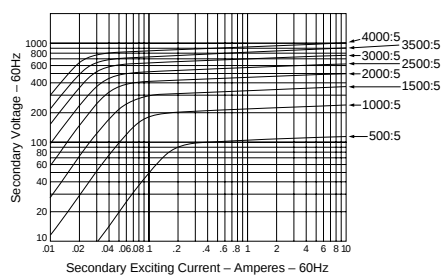
Catalog Number	Current Rating ▲	Relay Accuracy Class*	DC Resistance (Ohms)	Weight (lb/kg)	
				lbs	kg
151R-402	500:5	—	0.2191	63	29
	1000:5	—	0.4382		
	1500:5	—	0.6573		
	2000:5	—	0.8764		
	2500:5	—	1.0955		
	3000:5	—	1.3146		
	3500:5	—	1.5337		
	4000:5	C800	1.7536		

* Accuracy Class only applies to the nominal ratio

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Taps in accordance with ANSI Standard C57.13 and NEMA Rating SG-4.

Excitation Curves—Model 151R-402



Toroidal Current Transformers (Single Ratio) Model 152R

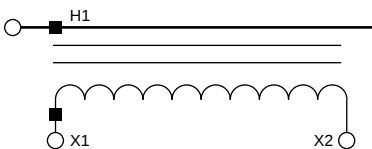


Model 152R
Designed for metering,
relaying and other current
sensing applications.

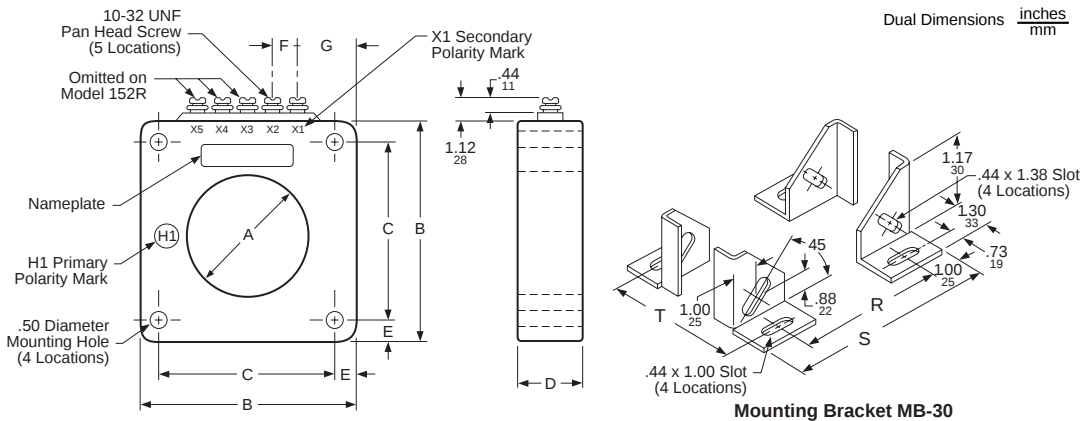
DESCRIPTION

- Permanent polarity marks molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Optional mounting brackets are shipped unassembled.
- Frequency: 25-400 Hz.
- Insulation: 10 kV BIL full wave (600 volt class).
- Applicable Standard – ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

Single Ratio Connection Diagram



Dimensions



Mounting Bracket	Dimensions					
	R		S		T	
	IN	mm	IN	mm	IN	mm
MB-30	4.75	121	6.91	176	2.94	75

Model	Dimensions													
	A		B		C		D		E		F		G	
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
152R	6.88	175	12.25	311	9.50	241	4.12	105	1.38	35	1.00	25	4.62	117



Torroidal Current Transformers (Single Ratio) Model 152R

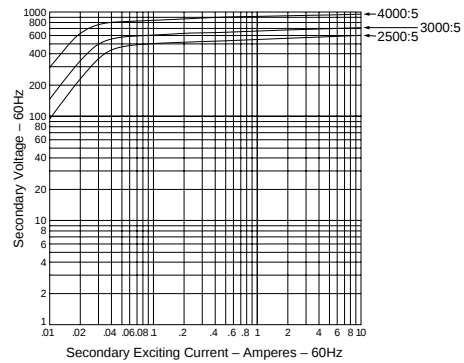
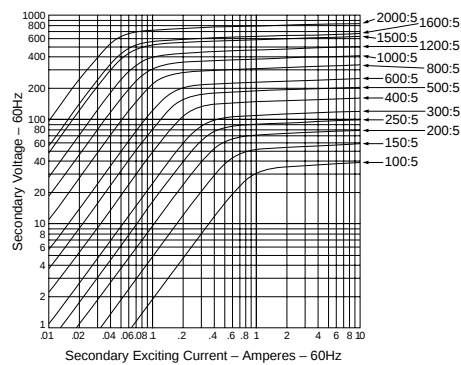
Model 152R

Catalog Number	Current Ratio ▲ (Amperes)	Relay Accuracy Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
152R-500	50:5	C10	1.2	—	—	—	—	0.0501	62	28
152R-101	100:5	C20	1.2	2.4	—	—	—	0.0751	62	28
152R-151	150:5	C50	0.6	1.2	2.4	—	—	0.1002	62	28
152R-201	200:5	C50	0.6	0.6	1.2	2.4	2.4	0.1252	62	28
152R-251	250:5	C50	0.3	0.6	0.6	1.2	2.4	0.1502	63	29
152R-301	300:5	C100	0.3	0.3	0.6	1.2	1.2	0.2003	63	29
152R-401	400:5	C100	0.3	0.3	0.3	0.6	1.2	0.2504	63	29
152R-501	500:5	C100	0.3	0.3	0.3	0.3	0.6	0.3005	63	29
152R-601	600:5	C200	0.3	0.3	0.3	0.3	0.6	0.4006	63	29
152R-801	800:5	C200	0.3	0.3	0.3	0.3	0.3	0.5008	64	29
152R-102	1000:5	C200	0.3	0.3	0.3	0.3	0.3	0.6009	64	29
152R-122	1200:5	C400	0.3	0.3	0.3	0.3	0.3	0.7511	65	30
152R-152	1500:5	C400	0.3	0.3	0.3	0.3	0.3	0.8012	66	30
152R-162	1600:5	C400	0.3	0.3	0.3	0.3	0.3	1.0187	66	30
152R-202	2000:5	C400	0.3	0.3	0.3	0.3	0.3	0.0501	63	29
152R-252	2500:5	C400	0.3	0.3	0.3	0.3	0.3	1.0335	64	29
152R-302	3000:5	C400	0.3	0.3	0.3	0.3	0.3	1.2402	65	30
152R-402	4000:5	C800	0.3	0.3	0.3	0.3	0.3	1.7586	63	29

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ For a multi-ratio unit equivalent to Model 152R, refer to Model 151R.

Excitation Curves-Model 152R



Toroidal Current Transformers (Single Ratio)

Models 170R and 180R

DESCRIPTION

- Permanent polarity marks are molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Optional mounting brackets are shipped unassembled.
- Frequency: 25-400 Hz.
- Insulation: 10 kV BIL Full Wave (600 volt class)
- Applicable Standard —ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

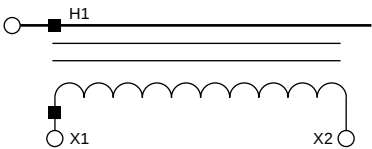


Model 170R
Designed for metering and control relaying applications.

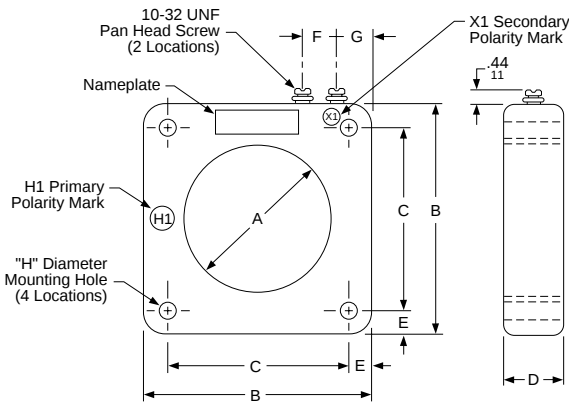


Model 180R
Designed for metering and light-duty control relaying applications.

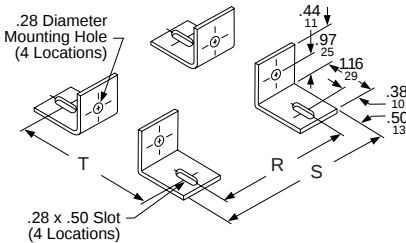
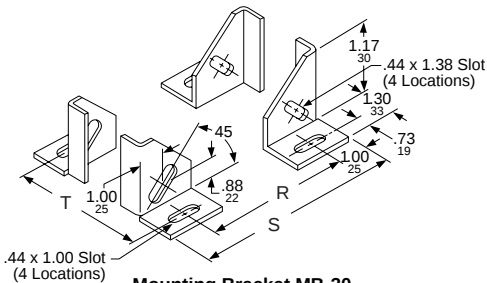
Single Ratio Connection Diagram



Dimensions



Mounting Bracket	Dimensions					
	R		S		T	
	IN	mm	IN	mm	IN	mm
MB-9	3.50	89	4.50	114	3.88	99
MB-30	4.75	121	6.91	176	2.94	75



Dual Dimensions inches
mm

Model	Dimensions																Mounting Bracket
	A		B		C		D		E		F		G		H		
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	
170R	4.25	108	6.75	171	5.41	137	1.31	33	0.67	17	0.78	20	1.12	28	0.44	11	MB-30
180R	2.50	63	4.50	114	3.50	89	2.12	54	0.50	13	0.69	17	0.44	11	0.41	10	MB-9



Torroidal Current Transformers (Single Ratio) Models 170R and 180R

Model 170R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
170R-201	200:5	—	1.2	0.6	2.4	—	—	0.0298	3.8	1.7
170R-251	250:5	—	0.6	0.6	2.4	—	—	0.0430	3.8	1.7
170R-301	300:5	—	0.6	0.6	1.2	2.4	—	0.0517	3.8	1.7
170R-401	400:5	—	0.6	0.6	0.6	1.2	—	0.0488	3.9	1.8
170R-501	500:5	—	0.3	0.6	0.6	1.2	—	0.0963	4.0	1.8
170R-601	600:5	—	0.3	0.3	0.6	1.2	2.4	0.1156	4.0	1.8
170R-751	750:5	C10	0.3	0.3	0.6	0.6	1.2	0.1445	4.0	1.8
170R-801	800:5	C10	0.3	0.3	0.3	0.6	1.2	0.1541	4.1	1.9
170R-102	1000:5	C10	0.3	0.3	0.3	0.3	0.6	0.1927	4.1	1.9
170R-122	1200:5	C10	0.3	0.3	0.3	0.3	0.6	0.2312	4.2	1.9
170R-152	1500:5	—	0.3	0.3	0.3	0.3	0.6	0.2367	4.6	2.1
170R-162	1600:5	—	0.3	0.3	0.3	0.3	0.6	0.2525	4.6	2.1
170R-202	2000:5	—	0.3	0.3	0.3	0.3	0.3	0.3156	2.8	1.3
170R-252	2500:5	—	0.3	0.3	0.3	0.3	0.3	0.3885	4.2	1.9

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or additional secondary turns.

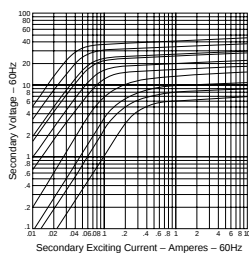
Model 180R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
180R-101	100:5	—	2.4	2.4	—	—	—	0.0273	3.0	1.4
180R-151	150:5	—	1.2	2.4	—	—	—	0.0409	3.0	1.4
180R-201	200:5	—	1.2	1.2	2.4	—	—	0.0505	3.1	1.4
180R-251	250:5	—	0.6	1.2	2.4	2.4	—	0.0631	3.2	1.5
180R-301	300:5	—	0.6	0.6	1.2	2.4	—	0.0757	3.3	1.5
180R-401	400:5	—	0.3	0.3	0.6	1.2	2.4	0.1091	3.3	1.5
180R-501	500:5	—	0.3	0.3	0.6	0.6	1.2	0.1261	3.4	1.5
180R-601	600:5	—	0.3	0.3	0.3	0.6	1.2	0.1514	3.6	1.6
180R-751	750:5	—	0.3	0.3	0.3	0.3	0.6	0.1892	3.6	1.6
180R-801	800:5	—	0.3	0.3	0.3	0.6	1.2	0.1620	3.6	1.6
180R-102	1000:5	—	0.3	0.3	0.3	0.6	0.6	0.1741	3.3	1.5
180R-122	1200:5	—	0.3	0.3	0.3	0.3	0.6	0.2089	3.4	1.5
180R-152	1500:5	—	0.3	0.3	0.3	0.3	0.3	0.2641	3.5	1.6

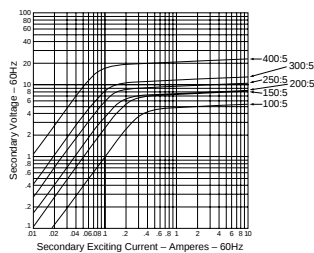
Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or additional secondary turns.

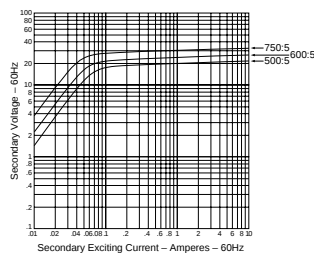
Excitation Curves—Models 170R and 180R



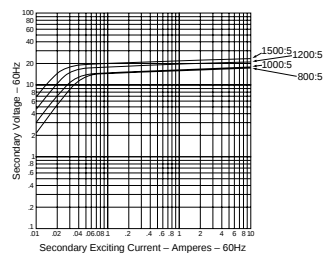
170R



180R



180R



180R



Toroidal Current Transformers (Single Ratio)

Models 200R and 201R



Model 200R
Designed for metering and relaying applications.

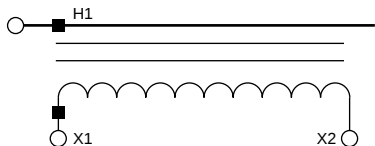


Model 201R
Designed for metering and relaying applications

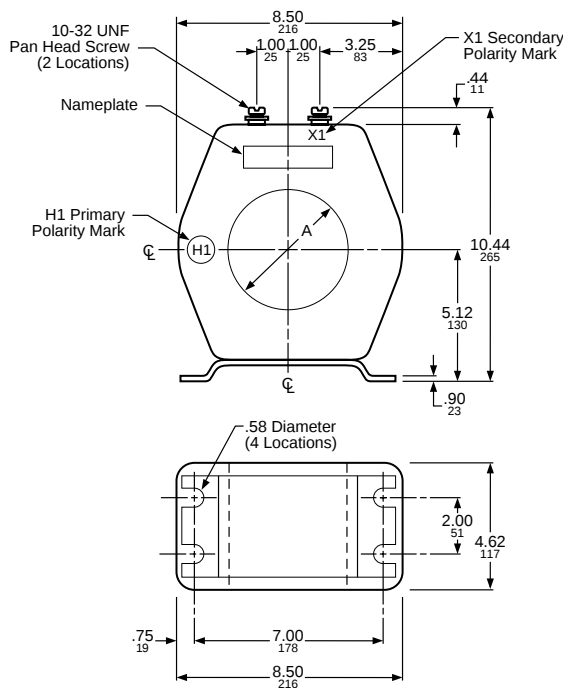
DESCRIPTION

- High-burden capacity design in a choice of small to medium window sizes.
- Permanent polarity marks molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Standard models include a mounting base. If not required, please specify “Less Base.”
- Frequency: 25-400 Hz.
- Insulation: 10 kV BIL full wave (600 volt class).
- Applicable Standard – ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

Single Ratio Connection Diagram



Dimensions



Dual Dimensions inches
mm

Model	Dimension A	
	IN	mm
200R	2.50	63
201R	3.50	89
202R	4.50	114
203R	5.25	133

Torroidal Current Transformers (Single Ratio) Models 200R and 201R

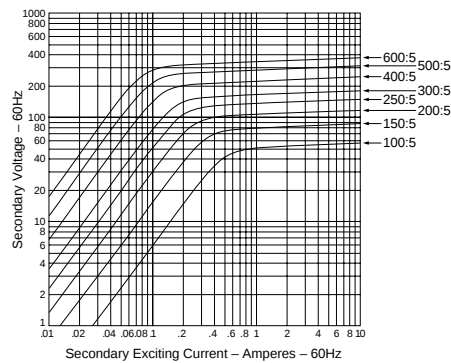
Model 200R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
200R-101	100:5	C50	0.6	1.2	1.2	—	—	0.0596	51.2	23.2
200R-151	150:5	C50	0.3	0.6	0.6	1.2	2.4	0.0894	51.3	23.2
200R-201	200:5	C100	0.3	0.3	0.6	1.2	1.2	0.1191	51.5	23.4
200R-251	250:5	C100	0.3	0.3	0.3	0.6	1.2	0.1489	51.7	23.5
200R-301	300:5	C100	0.3	0.3	0.3	0.3	0.6	0.1787	51.8	23.5
200R-401	400:5	C200	0.3	0.3	0.3	0.3	0.3	0.2383	52.1	23.7
200R-501	500:5	C200	0.3	0.3	0.3	0.3	0.3	0.2979	52.4	23.8
200R-601	600:5	C200	0.3	0.3	0.3	0.3	0.3	0.3574	52.7	23.9

Rating Factor 30 °C Ambient Temp. = 1.5

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves—Model 200R



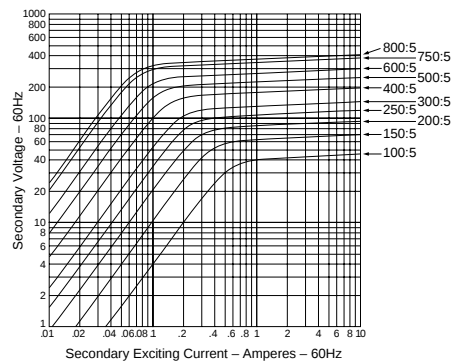
Model 201R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
201R-101	100:5	C20	1.2	1.2	2.4	2.4	—	0.0551	45.0	20.4
201R-151	150:5	C50	0.3	0.6	1.2	2.4	2.4	0.0826	45.2	20.5
201R-201	200:5	C50	0.3	0.3	0.6	1.2	2.4	0.1101	45.3	20.6
201R-251	250:5	C100	0.3	0.3	0.6	1.2	1.2	0.1377	45.5	20.7
201R-301	300:5	C100	0.3	0.3	0.3	0.6	1.2	0.1652	45.6	20.7
201R-401	400:5	C100	0.3	0.3	0.3	0.3	0.6	0.2203	45.9	20.8
201R-501	500:5	C200	0.3	0.3	0.3	0.3	0.3	0.2753	46.2	21.0
201R-601	600:5	C200	0.3	0.3	0.3	0.3	0.3	0.3304	46.5	21.1
201R-751	750:5	C200	0.3	0.3	0.3	0.3	0.3	0.4130	47.0	21.3
201R-801	800:5	C200	0.3	0.3	0.3	0.3	0.3	0.4405	47.2	21.4

Rating Factor 30 °C Ambient Temp. = 1.5

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves—Model 201R



Toroidal Current Transformers (Single Ratio)

Models 202R and 203R



Model 202R
Designed for metering and control relaying

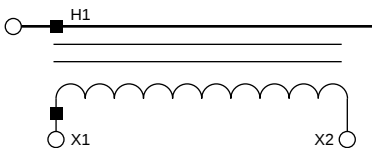


Model 203R
Designed for metering and relaying applications.

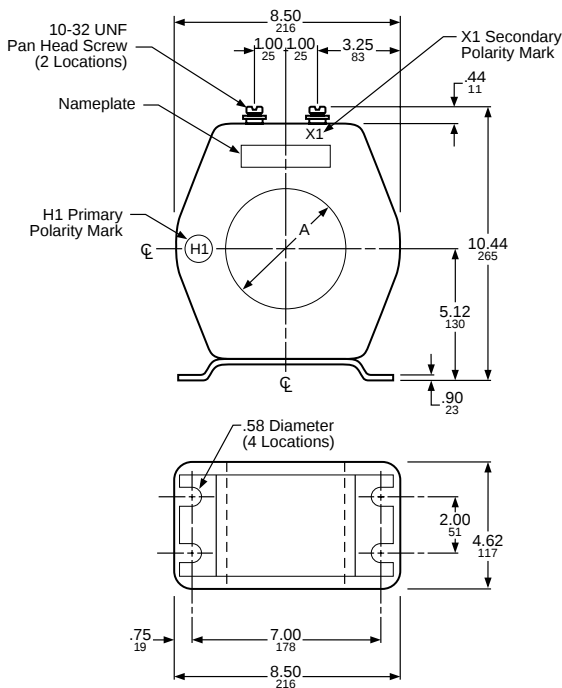
DESCRIPTION

- High-burden capacity design in a choice of small to medium window sizes.
- Permanent polarity marks molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Standard modes include a mounting base. If not required, please specify "Less Base."
- Frequency: 25-400 Hz.
- Insulation: 10 kV BIL full wave (600 volt class).
- Applicable Standard – ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

Single Ratio Connection Diagram



Dimensions



Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

Model	Dimension A	
	IN	mm
202R	4.50	114
203R	5.25	133



Torroidal Current Transformers (Single Ratio) Models 202R and 203R

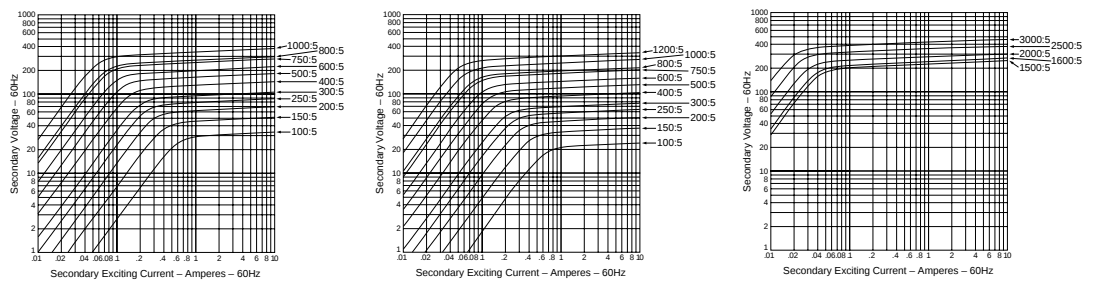
Model 202R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
202R-101	100:5	C20	1.2	2.4	2.4	—	—	0.0506	36.8	16.7
202R-151	150:5	C20	1.2	1.2	2.4	2.4	—	0.0758	37.1	16.8
202R-201	200:5	C50	0.3	0.6	1.2	1.2	2.4	0.1011	37.3	16.9
202R-251	250:5	C50	0.3	0.3	0.6	1.2	1.2	0.1264	37.5	17.0
202R-301	300:5	C50	0.3	0.3	0.6	0.6	1.2	0.1517	37.7	17.1
202R-401	400:5	C100	0.3	0.3	0.3	0.6	0.6	0.2023	38.0	17.3
202R-501	500:5	C100	0.3	0.3	0.3	0.3	0.6	0.2528	38.2	17.3
202R-601	600:5	C100	0.3	0.3	0.3	0.3	0.3	0.3034	38.5	17.5
202R-751	750:5	C200	0.3	0.3	0.3	0.3	0.3	0.3792	38.8	17.6
202R-801	800:5	C200	0.3	0.3	0.3	0.3	0.3	0.4045	39.0	17.7
202R-102	1000:5	C200	0.3	0.3	0.3	0.3	0.3	0.5056	39.5	17.9

Rating Factor 30 °C Ambient Temp. = 1.5

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves—Model 202R



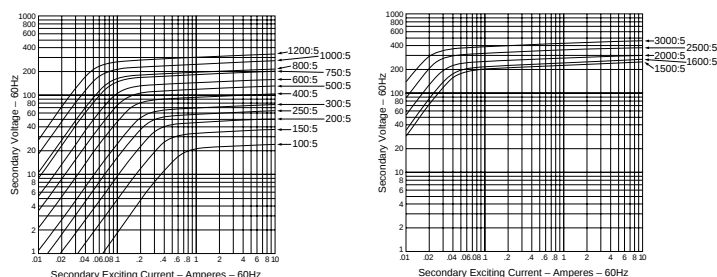
Model 203R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
203R-101	100:5	C20	1.2	2.4	—	—	—	0.0475	30.5	13.8
203R-102	1000:5	C200	0.3	0.3	0.3	0.3	0.3	0.4751	26.0	11.8
203R-122	1200:5	C200	0.3	0.3	0.3	0.3	0.3	0.5701		
203R-151	150:5	C20	0.6	1.2	2.4	2.4	—	0.0713	30.6	13.9
203R-152	1500:5	C200	0.3	0.3	0.3	0.3	0.3	0.6622		
203R-162	1600:5	C200	0.3	0.3	0.3	0.3	0.3	0.7063		
203R-201	200:5	C20	0.3	0.6	1.2	2.4	2.4	0.0950	30.7	13.9
203R-202	2000:5	C200	0.3	0.3	0.3	0.3	0.3	0.8494		
203R-251	250:5	C20	0.3	0.6	1.2	1.2	2.4	0.1188	30.8	14.0
203R-252	2500:5	C200	0.3	0.3	0.3	0.3	0.3	1.0618		
203R-301	300:5	C50	0.3	0.3	0.6	1.2	1.2	0.1425	30.9	14.0
203R-302	3000:5	C200	0.3	0.3	0.3	0.3	0.3	1.3030		
203R-401	400:5	C50	0.3	0.3	0.6	0.6	1.2	0.1900	31.1	14.1
203R-501	500:5	C100	0.3	0.3	0.3	0.3	0.6	0.2375	31.3	14.2
203R-601	600:5	C100	0.3	0.3	0.3	0.3	0.6	0.2851	31.5	14.3
203R-750	750:5	C100	0.3	0.3	0.3	0.3	0.3	0.2563	31.8	14.4
203R-801	800:5	C100	0.3	0.3	0.3	0.3	0.3	0.3801	31.9	14.5

Rating Factor 30 °C Ambient Temp. = 1.5

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves—Model 203R



Toroidal Current Transformers (Single Ratio) Models 210R



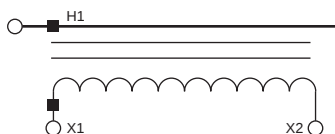
Model 210R

Designed for metering and relaying applications.

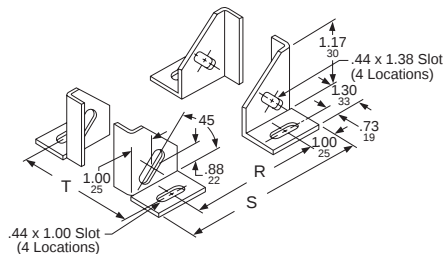
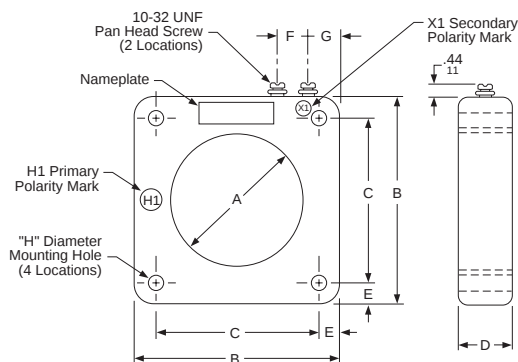
DESCRIPTION

- Secondary terminals are easy-to-install #10-32 brass screws.
- Optional mounting brackets are shipped unassembled.
- Frequency: 25-400 Hz (Modes 210R and 260R).
- Insulation: 10 kV BIL full wave (600 volt class).
- Applicable Standard – ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

Single Ratio Connection Diagram



Dimensions



Mounting Bracket MB-31 and M

Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

Mounting Bracket	Dimensions					
	R		S		T	
	IN	mm	IN	mm	IN	mm
MB-31	7.50	191	9.19	233	4.50	114
MB-32	7.50	191	9.19	233	4.50	114

Model	Dimensions																Mounting Bracket MB-32
	A		B		C		D		E		F		G		H		
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	
210R	6.25	159	9.50	241	7.75	197	2.87	73	0.87	22	1.25	32	1.50	38	0.53	13	

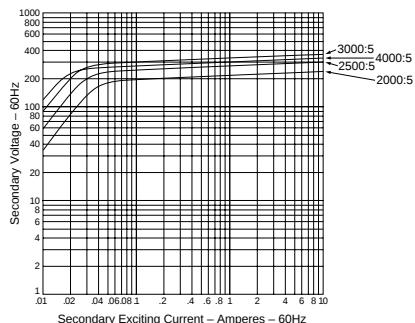
Model 210R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
210R-122	1200:5	100	.03	0.3	0.3	0.3	0.3	—	6.5	3.0
210R-162	1600:5	100	.03	0.3	0.3	0.3	0.3	—	—	—
210R-202	2000:5	100	.03	0.3	0.3	0.3	0.3	0.7641	17.6	8.0
210R-252	2500:5	200	.03	0.3	0.3	0.3	0.3	0.7645	19.0	8.6
210R-302	3000:5	200	.03	0.3	0.3	0.3	0.3	0.9095	19.0	8.6
210R-402	4000:5	200	.03	0.3	0.3	0.3	0.3	1.1517	17.0	7.7

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0 (models 210R-302 and -402 = .075 at 55 °C)

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves–Model 210R



Torroidal Current Transformers (Single Ratio) Models 210R



Toroidal Current Transformers (Single Ratio) Model 312R



Model 312R

Designed for relaying and other current sensing applications.

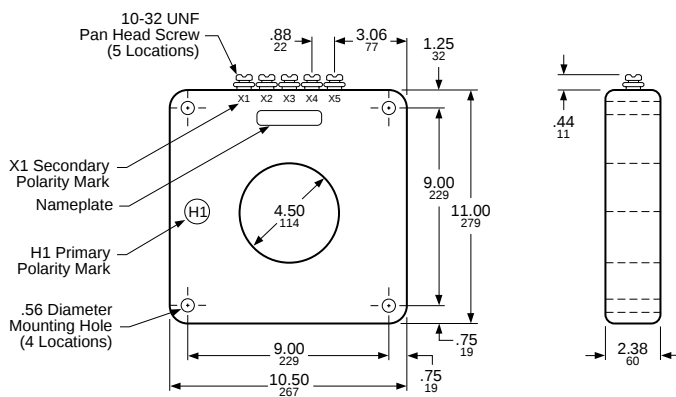
DESCRIPTION

- High-burden capacity design for installation over the ground shield in a current transformer pocket of a high voltage apparatus bushing.
- Permanent polarity marks are molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easier installation.
- Windings are completely distributed around the core on each tap, resulting in a low reactance on all taps.
- Mounting holes are provided for bolting the unit around a power transformer or circuit breaker bushing.
- Frequency: 60 Hz.
- Insulation: 10 kV BIL full wave (600 volt class)
- Applicable Standard — ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

Connections and Connection Diagrams

Model 312R-601		Model 312R-122		Model 312R-202		Model 312R-302		Model 312R-402	
Current Rating (A)	Secondary Terminal Connections	Current Rating (A)	Secondary Terminal Connections	Current Rating (A)	Secondary Terminal Connections	Current Rating (A)	Secondary Terminal Connections	Current Rating (A)	Secondary Terminal Connections
50:5	X2-X3	100:5	X2-X3	300:5	X3-X4	300:5	X3-X4	500:5	X1-X2
100:5	X1-X2	200:5	X1-X2	400:5	X1-X2	500:5	X4-X5	1000:5	X3-X4
150:5	X1-X3	300:5	X1-X3	500:5	X4-X5	800:5	X3-X5	1500:5	X2-X3
200:5	X4-X5	400:5	X4-X5	800:5	X2-X3	1000:5	X1-X2	2000:5	X1-X3
250:5	X3-X4	500:5	X3-X4	1100:5	X2-X4	1200:5	X2-X3	2500:5	X2-X4
300:5	X2-X4	600:5	X2-X4	1200:5	X1-X3	1500:5	X2-X4	3000:5	X1-X4
400:5	X1-X4	800:5	X1-X4	1500:5	X1-X4	2000:5	X2-X5	3500:5	X2-X5
450:5	X3-X5	900:5	X3-X5	1600:5	X2-X5	2200:5	X1-X3	4000:5	X1-X5
500:5	X2-X5	1000:5	X2-X5	2000:5	X1-X5	2500:5	X1-X4	—	—
600:5	X1-X5	1200:5	X1-X5	—	—	3000:5	X1-X5	—	—

Dimensions



Note: Model 311R is supplied with four (4) mounting holes molded into case. Mounting brackets not required.

Dual Dimensions $\frac{\text{inches}}{\text{mm}}$ 

Torroidal Current Transformers (Single Ratio) Model 312R

Model 312R-601

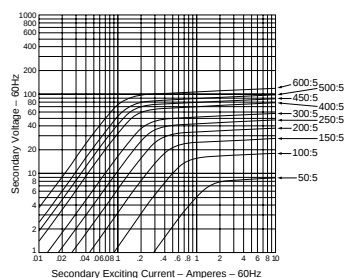
Catalog Number	Current Ratio ▲ (Amperes)	Relay Accuracy Class*	DC Resistance (Ohms) at 25 °C	Weight	
				lb	kg
312R-601	50:5	—	0.0167	27	12.3
	100:5	—	0.0335		
	150:5	—	0.0502		
	200:5	—	0.0669		
	250:5	—	0.0837		
	300:5	—	0.1004		
	400:5	—	0.1339		
	450:5	—	0.1506		
	500:5	—	0.1674		
	600:5	C100	0.2009		

* Accuracy Class only applies to the nominal ratio

Rating Factor 30 °C Ambient Temp. = 1.5, Rating Factor 55 °C Ambient Temp. = 1.33

▲ Taps in accordance with ANSI C57.13 and NEMA SG-4

Excitation Curves–312R-601



Model 312R-122

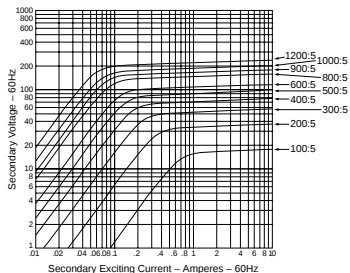
Catalog Number	Current Ratio ▲ (Amperes)	Relay Accuracy Class	DC Resistance (Ohms) at 25 °C	Weight	
				lb	kg
312R-122	300:5	—	0.0335	28	12.7
	400:5	—	0.0669		
	500:5	—	0.1004		
	800:5	—	0.1339		
	1100:5	—	0.1674		
	1200:5	—	0.2008		
	1500:5	—	0.2678		
	1600:5	—	0.3013		
	2000:5	C200	0.3347		

* Accuracy Class only applies to the nominal ratio

Rating Factor 30 °C Ambient Temp. = 1.5, Rating Factor 55 °C Ambient Temp. = 1.33

▲ Taps in accordance with ANSI C57.13 and NEMA SG-4.

Excitation Curves–Model 312R-122



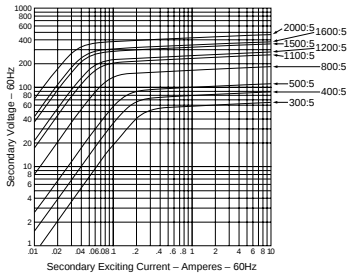
Torroidal Current Transformers (Single Ratio)
Model 312R

Model 312R-202

Catalog Number	Current Ratio ▲ (Amperes)	Relay Accuracy Class	DC Resistance (Ohms) at 25 °C	Weight	
				lb	kg
312R-202	300:5	—	0.1103	34	15.4
	400:5	—	0.1470		
	500:5	—	0.1838		
	800:5	—	0.2941		
	1100:5	—	0.4044		
	1200:5	—	0.4411		
	1500:5	—	0.5514		
	1600:5	—	0.5882		
	2000:5	C400	0.7356		

* Accuracy Class only applies to the nominal ratio
Rating Factor 30 °C Ambient Temp. = 1.5, Rating Factor 55 °C Ambient Temp. = 1.33
▲ Taps in accordance with ANSI C57.13 and NEMA SG-4

.Excitation Curves–Model 312R-202

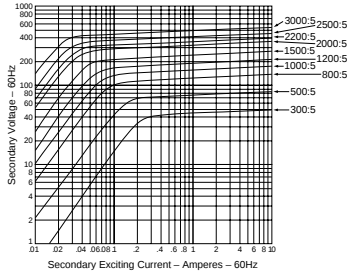


Model 312R-302

Catalog Number	Current Ratio ▲ (Amperes)	Relay Accuracy Class	DC Resistance (Ohms) at 25 °C	Weight	
				lb	kg
312R-302	300:5	—	0.1016	33	15.0
	500:5	—	0.1693		
	800:5	—	0.2709		
	1000:5	—	0.3386		
	1200:5	—	0.4063		
	1500:5	—	0.5079		
	2000:5	—	0.6772		
	2200:5	—	0.7449		
	2500:5	—	0.8465		
	3000:5	C400	1.0162		

* Accuracy Class only applies to the nominal ratio
Rating Factor 30 °C Ambient Temp. = 1.5, Rating Factor 55 °C Ambient Temp. = 1.33
▲ Taps in accordance with ANSI C57.13 and NEMA SG-4.

Excitation Curves–Model 312R-302



Torroidal Current Transformers (Single Ratio) Model 312R

Model 312R-402

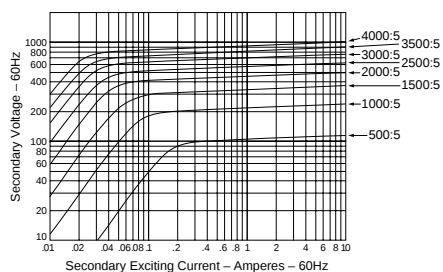
Catalog Number	Current Ratio ▲ (Amperes)	Relay Accuracy Class	DC Resistance (Ohms) at 25 °C	Weight	
				lb	kg
312R-402	500:5	—	0.1016	30	13.6
	1000:5	—	0.1693		
	1500:5	—	0.2709		
	2000:5	—	0.3386		
	2500:5	—	0.4063		
	3000:5	—	0.5079		
	3500:5	—	0.6772		
	4000:5	C400	0.7449		

* Accuracy Class only applies to the nominal ratio

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

▲ Taps in accordance with ANSI C57.13 and NEMA SG-4.

Excitation Curves—Model 312R-402



Rectangular Window Current Transformers (Single Ratio)
Models 260R and 560R



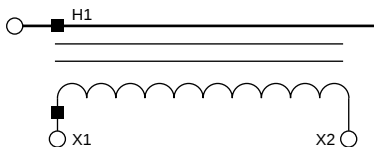
Model 260R

Designed for metering applications with minimum clearances.

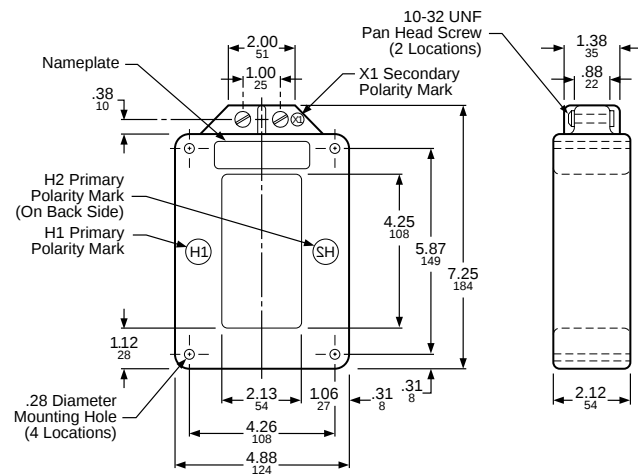
DESCRIPTION

- Features rectangular window for bus conductor applications with minimum clearance requirements.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Frequency: 25-400 Hz (Modes 210R and 260R).
- Insulation: 10 kV BIL full wave (600 volt class).
- Applicable Standard – ANSI C57.13.
- UL and CUL recognized per Classification XODW2.

Single Ratio Connection Diagram



Dimensions–Model 260R



Note: Model 260R is supplied with four (4) mounting holes molded in case. Mounting brackets not required.

Dual Dimensions inches/mm

Model 260R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
260R-101	100:5	—	1.2	2.4	—	—	—	0.0304	7.5	3.4
260R-151	150:5	—	1.2	2.4	—	—	—	0.0193	7.5	3.4
260R-201	200:5	—	1.2	1.2	—	—	—	0.0258	7.5	3.4
260R-301	300:5	—	0.6	0.6	—	—	—	0.0290	7.5	3.4
260R-401	400:5	—	0.6	0.6	—	—	—	0.0355	7.5	3.4
260R-601	600:5	—	0.3	0.3	—	—	—	0.0548	7.0	3.2
260R-801	800:5	—	0.3	0.3	—	—	—	1.663	7.0	3.2
260R-122	1200:5	—	0.3	0.3	—	—	—	2.000	6.5	3.0
260R-162	1600:5	—	0.3	0.3	—	—	—	2.442	5.5	2.5
260R-202	2000:5	—	0.3	0.3	—	—	—	3.222	6.0	3.4
260R-252	2500:5	—	0.3	0.3	—	—	—	5.429	5.5	2.7
260R-302	3000:5	—	0.3	0.3	—	—	—	6.859	5.5	2.7
260R-402	4000:5	—	0.3	0.3	—	—	—	1.193	6.0	3.4

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

Models 260R-252, -302, and -402 Rating Factor 30 °C Ambient Temp. = 1.0, Rating Factor 55 °C Ambient Temp. = 0.75

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.



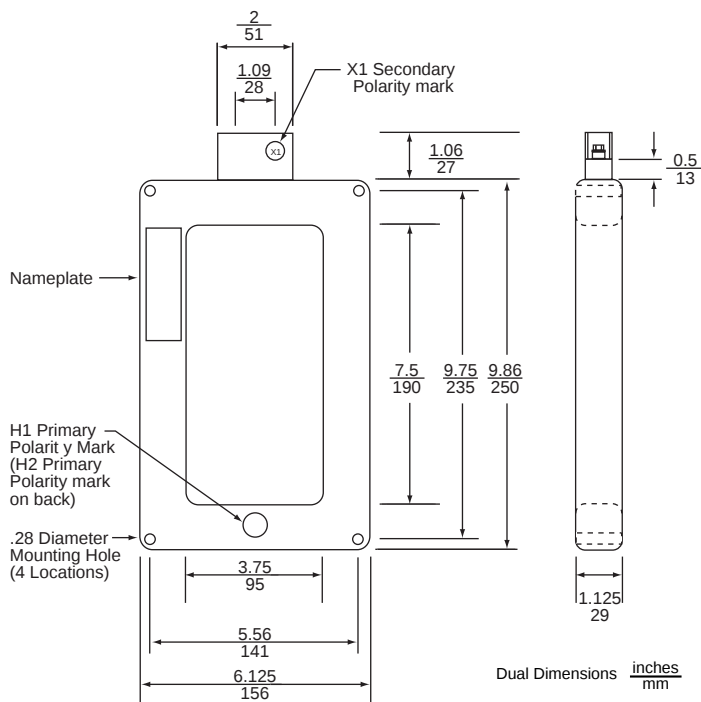
Rectangular Window Current Transformers (Single Ratio) Models 260R and 560R

Dimensions—Model 560R



Model 560R

Designed for metering applications



Model 560R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
560R-401	400:5	—	1.2	1.2	2.4	—	—	0.0783	4.25	1.95
560R-501	500:5	—	1.2	1.2	2.4	—	—	0.0987	4.30	1.95
560R-601	600:5	—	0.6	0.6	1.2	2.4	2.4	0.1174	4.35	1.97
560R-751	750:5	—	0.6	0.6	1.2	1.2	2.4	0.1467	4.42	2.00
560R-801	800:5	—	0.6	0.6	1.2	1.2	2.4	0.1565	4.45	2.02
560R-102	1000:5	—	0.3	0.3	0.6	1.2	1.2	0.2348	4.55	2.06
560R-122	1200:5	—	0.3	0.3	0.6	0.6	1.2	0.2935	4.65	2.11
560R-152	1500:5	—	0.3	0.3	0.3	0.6	0.6	0.3130	4.80	2.18
560R-162	1600:5	—	0.3	0.3	0.3	0.6	0.6	0.2935	4.85	2.20
560R-202	2000:5	—	0.3	0.3	0.3	0.6	0.6	0.3237	3.69	1.67
560R-252	2500:5	—	0.3	0.3	0.3	0.3	0.6	0.4046	3.90	1.77
560R-302	3000:5	—	0.3	0.3	0.3	0.3	0.6	0.4855	4.10	1.86
560R-322	3200:5	—	0.3	0.3	0.3	0.3	0.6	0.5179	4.19	1.90
560R-402	4000:5	—	0.3	0.3	0.3	0.3	0.6	0.3937	2.46	1.11
560R-502	5000:5	—	0.3	0.3	0.3	0.3	0.6	0.4921	2.71	1.23

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

Models 260R-252, -302, and -402 Rating Factor 30 °C Ambient Temp. = 1.0, Rating Factor 55 °C Ambient Temp. = 0.75

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.



Split Core Current Transformers (Single Ratio)

Models 270R and 273



Model 270R

Split core design for load surveying, ground fault relaying and metering applications.

DESCRIPTION

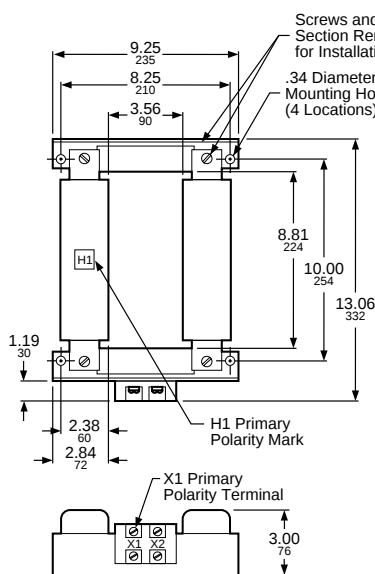
- Model 270R features a split core design for easy installation over an existing bus or cable conductor. Window length or width may be increased or decreased as an option.
- Large, easy-to-read ratios are clearly marked on the case.
- Secondary terminals are #10-32 brass screws and include flat washers and bronze lockwashers for easy installation.
- Mounting brackets provided with transformer.
- Frequency: 60 Hz (Model 270R and 273).
- Insulation: 10 kV BIL full wave (600 volt class).
- Applicable Standard – ANSI C57.13.
- UL and CUL recognized per Classification XODW2.



Model 273

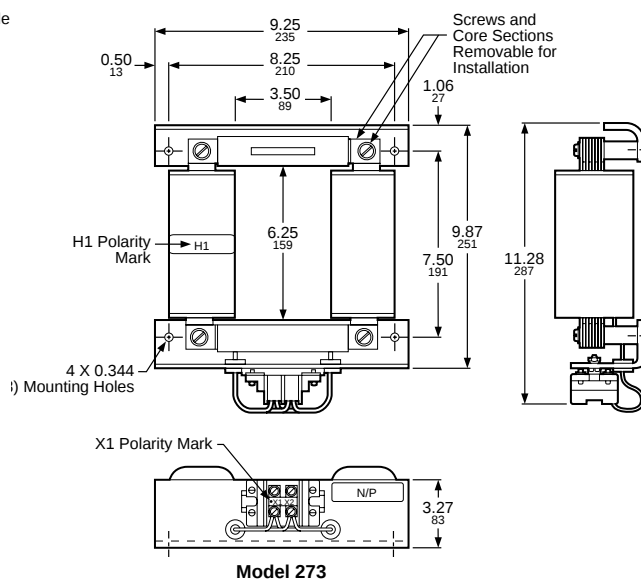
Designed for load surveying and current measurement on non-revenue metering and energy management applications.

Dimensions



Note: Model 270R is supplied with four (4) mounting holes in frame. Mounting brackets not required.

Model 270R



Model 273

Dual Dimensions $\frac{\text{inches}}{\text{mm}}$



Split Core Current Transformers (Single Ratio) Models 270R and 273

Model 270R

Catalog Number	Current Rating ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C	Weight	
			B0.1	B0.2	B0.5	B0.9	B1.8		lb	kg
270R-401	400:5	—	—	—	—	—	—	0.08	12.0	5.4
270R-501	500:5	—	—	—	—	—	—	0.10	12.0	5.4
270R-601	600:5	—	—	—	—	—	—	0.12	12.0	5.4
270R-801	800:5	—	1.2	2.4	—	—	—	0.16	12.0	5.4
270R-102	1000:5	—	1.2	1.2	2.4	—	—	0.20	12.1	5.4
270R-122	1200:5	—	1.2	1.2	2.4	—	—	0.24	12.4	5.6
270R-152	1500:5	—	1.2	1.2	2.4	—	—	0.30	12.8	5.8
270R-162	1600:5	—	1.2	1.2	2.4	—	—	0.32	12.9	5.9
270R-202	2000:5	—	1.2	1.2	1.2	2.4	—	0.40	13.2	6.0
270R-252	2500:5	—	1.2	1.2	1.2	2.4	—	0.53	14.0	6.4
270R-302	3000:5	—	1.2	1.2	1.2	1.2	2.4	0.65	14.4	6.5
270R-402	4000:5	—	1.2	1.2	1.2	1.2	1.2	0.89	15.6	7.1
270R-502	5000:5	—	1.2	1.2	1.2	1.2	1.2	1.19	16.7	7.6

Rating Factor 30 °C Ambient Temp. = 1.33, Rating Factor 55 °C Ambient Temp. = 1.0

Models 270R--302, -402, and -502 Rating Factor 30 °C Ambient Temp. = 1.0, Rating Factor 55 °C Ambient Temp. = 0.75

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Model 273

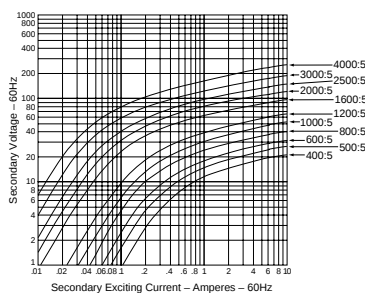
Catalog Number	Current Ratio ▲ (Amperes)	Relay Class	ANSI Metering Accuracy Class-60 Hz					DC Resistance (Ohms) at 25 °C
			B0.1 2.5 VA	B0.2 5 VA	B0.5 12.5 VA	B0.9 22.5 Va	B1.8 45 VA	
273-201	200:5	—	—	—	—	—	—	0.04
273-251	250:5	—	—	—	—	—	—	0.045
273-301	300:5	—	2.4	—	—	—	—	0.055
273-401	400:5	—	2.4	—	—	—	—	0.075
273-501	500:5	—	2.4	—	—	—	—	0.095
273-601	600:5	—	2.4	2.4	—	—	—	0.12
273-801	800:5	—	1.2	2.4	—	—	—	0.16
273-102	1000:5	—	1.2	1.2	2.4	—	—	0.21
273-122	1200:5	—	1.2	1.2	2.4	—	—	0.25
273-162	1600:5	—	1.2	1.2	2.4	—	—	0.34
273-202	2000:5	—	1.2	1.2	1.2	2.4	—	0.45
273-252	2500:5	—	1.2	1.2	1.2	2.4	—	0.55
273-302	3000:5	—	1.2	1.2	1.2	1.2	2.4	0.69
273-402	4000:5	—	1.2	1.2	1.2	1.2	1.2	0.95

Rating Factor 30 °C Ambient Temp. = 1.33

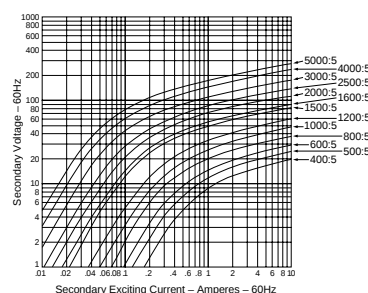
Models 273R--302 and -402 Rating Factor 30 °C Ambient Temp. = 1.0

▲ Ratios are based on one primary turn, with user-applied primary conductor. Refer to page 52 for other ratios using multiple primary turns or secondary turns.

Excitation Curves—Model 270R and 273R



Model 270R



Model 273R



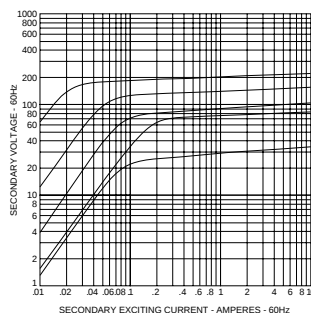
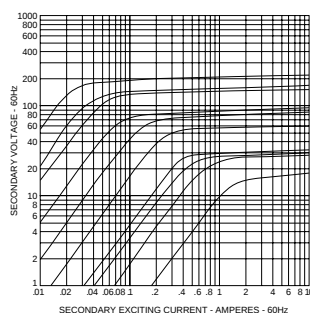
Bushing Current Transformers, 50–400Hz Models 780R and 785R (Single Ratio)

Model 780R

Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification - 60 Hz Metering Class				
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8
6.5 in. (165 mm)	780R500	50:5	—	—	—	—	—	—
	780R750	75:5	C10	1.2	2.4	—	—	—
	780R101	100:5	C10	2.4	2.4	—	—	—
	780R151	150:5	C20	0.6	1.2	—	—	—
	780R201	200:5	C20	0.6	1.2	2.4	—	—
	780R251	250:5	C20	0.6	0.6	1.2	2.4	—
	780R301	300:5	C50	0.3	0.6	1.2	1.2	2.4
	780R401	400:5	C50	0.3	0.3	0.6	1.2	1.2
	780R501	500:5	C50	0.3	0.3	0.6	0.6	0.6
	780R601	600:5	C100	0.3	0.3	0.3	0.6	0.6
	780R751	750:5	C100	0.3	0.3	0.3	0.3	0.6
	780R801	800:5	C100	0.3	0.3	0.3	0.3	0.3
	780R102	1000:5	C100	0.3	0.3	0.3	0.3	0.3
	780R122	1200:5	C200	0.3	0.3	0.3	0.3	0.3
	780R152	1500:5	C200	0.3	0.3	0.3	0.3	0.3
	780R162	1600:5	C200	0.3	0.3	0.3	0.3	0.3
	780R202	2000:5	C200	0.3	0.3	0.3	0.3	0.3
	780R252	2500:5	C200	0.3	0.3	0.3	0.3	0.3
	780R302	3000:5	C200	0.3	0.3	0.3	0.3	0.3
	780R402	4000:5	C200	0.3	0.3	0.3	0.3	0.3

Rating Factor 30 °C Ambient Temp. = 2.0, Model 780R402 Rating Factor 30 °C Ambient Temp. = 1.5

Excitation Curves—Models 780R



Model 785

Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification - 60 Hz Metering Class					Rating Factor 30 °C Ambient
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8	
6.5 in. (165 mm)	785R500	50:5	C10	2.4	2.4	—	—	—	2.0
	785R750	75:5	C20	1.2	1.2	—	—	—	2.0
	785R101	100:5	C20	1.2	1.2	2.4	—	—	2.0
	785R151	150:5	C50	0.6	0.6	1.2	2.4	—	2.0
	785R201	200:5	C50	0.6	0.6	1.2	2.4	2.4	2.0
	785R251	250:5	C50	0.3	0.6	1.2	1.2	2.4	2.0
	785R301	300:5	C100	0.3	0.3	0.6	0.6	1.2	2.0
	785R401	400:5	C100	0.3	0.3	0.3	0.6	1.2	2.0
	785R501	500:5	C100	0.3	0.3	0.3	0.6	0.6	2.0
	785R601	600:5	C200	0.3	0.3	0.3	0.3	0.6	2.0
	785R751	750:5	C200	0.3	0.3	0.3	0.3	0.3	2.0
	785R801	800:5	C200	0.3	0.3	0.3	0.3	0.3	2.0
	785R102	1000:5	C200	0.3	0.3	0.3	0.3	0.3	2.0
	785R122	1200:5	C400	0.3	0.3	0.3	0.3	0.3	2.0
	785R152	1500:5	C400	0.3	0.3	0.3	0.3	0.3	2.0
	785R162	1600:5	C400	0.3	0.3	0.3	0.3	0.3	2.0
	785R202	2000:5	C400	0.3	0.3	0.3	0.3	0.3	2.0
	785R252	2500:5	C400	0.3	0.3	0.3	0.3	0.3	2.0
	785R302	3000:5	C400	0.3	0.3	0.3	0.3	0.3	2.0
	785R402	4000:5	C400	0.3	0.3	0.3	0.3	0.3	1.5

Rating Factor 30 °C Ambient Temp. = 2.0, Model 785R402 Rating Factor 30 °C Ambient Temp. = 1.5



Bushing Current Transformers, 50–400 Hz Models 780R and 785R (Single Ratio)

Model 781R-122

Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C	Rating Factor 30 °C Ambient
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8		
6.5 in. (165 mm)	781R122	100:5	C200	0.3	0.3	0.3	0.3	0.3	0.035	2.0
		200:5							0.071	
		300:5							0.108	
		400:5							0.141	
		500:5							0.178	
		600:5							0.211	
		800:5							0.282	
		900:5							0.317	
		1000:5							0.352	
		1200:5							0.035	

Model 781R-202

Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C	Rating Factor 30 °C Ambient
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8		
6.5 in. (165 mm)	781R202	300:5	C200	0.3	0.3	0.3	0.3	0.3	0.091	2.0
		400:5							0.121	
		500:5							0.151	
		800:5							0.242	
		1100:5							0.335	
		1200:5							0.369	
		1500:5							0.470	
		1600:5							0.504	
		2000:5							0.837	

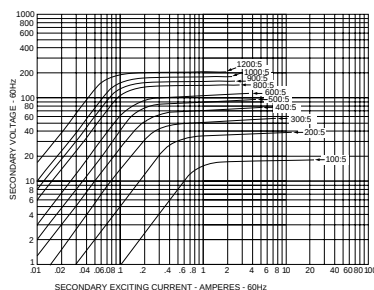
Model 781R-302

Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C	Rating Factor 30 °C Ambient
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8		
6.5 in. (165 mm)	781R302	300:5	C200	0.3	0.3	0.3	0.3	0.3	0.079	2.0
		500:5							0.131	
		800:5							0.210	
		1000:5							0.262	
		1200:5							0.321	
		1500:5							0.410	
		2000:5							0.557	
		2200:5							0.623	
		2500:5							0.722	

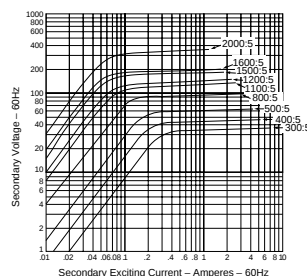
Model 781R-122, -202, -302, -601 Rating Factor 30 °C Ambient Temp. = 2.0

Model 781R-402 Rating Factor 30 °C Ambient Temp. = 1.5

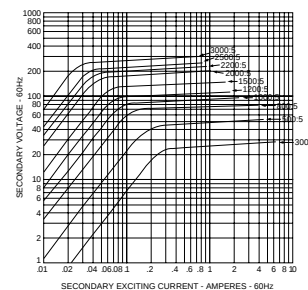
Excitation Curves—Models 781R-122, 781R-202, and 781R-302 (left to right)



Model 781R-122



Model 781R-202



Model 781R-302



Bushing Transformers

Models 781R and 786R (Multi Ratio)

Model 781R-402

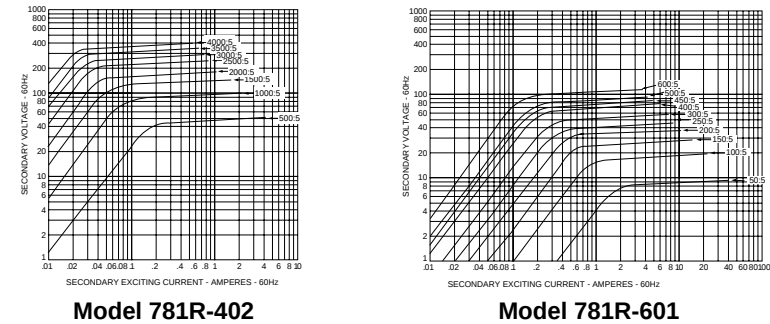
Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C	Rating Factor 30 °C Ambient
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8		
6.5 in. (165 mm)	781R402	500:5	C200	0.3	0.3	0.3	0.3	0.3	0.184	1.5
		1000:5							0.328	
		1500:5							0.510	
		2000:5							0.693	
		2500:5							0.895	
		3000:5							1.097	
		3500:5							1.336	
		4000:5							1.570	

Model 781R-601

Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C	Rating Factor 30 °C Ambient
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8		
6.5 in. (165 mm)	781R601	50:5	C100	0.3	0.3	0.3	0.6	0.6	0.018	2.0
		100:5							0.035	
		150:5							0.053	
		200:5							0.071	
		250:5							0.088	
		300:5							0.106	
		400:5							0.141	
		450:5							0.159	
		500:5							0.178	
		600:5							0.211	

Model 781R-122, -202, -302, -601 Rating Factor 30 °C Ambient Temp. = 2.0
 Model 781R-402 Rating Factor 30 °C Ambient Temp. = 1.5

Excitation Curves–Models 781R-402 and 781R-601



Bushing Transformers Models 781R and 786R (Multi Ratio)

Model 786R-122

Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8	
6.5 in. (165 mm)	786R122	100:5	C400	0.3	0.3	0.3	0.3	0.3	0.061
		200:5							0.121
		300:5							0.182
		400:5							0.242
		500:5							0.303
		600:5							0.384
		800:5							0.485
		900:5							0.545
		1000:5							0.606
		1200:5							0.727

Rating Factor 30 °C Ambient Temp. = 2.0

Model 786R-202

Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8	
6.5 in. (165 mm)	786R202	300:5	C400	0.3	0.3	0.3	0.3	0.3	0.145
		400:5							0.194
		500:5							0.242
		800:5							0.388
		1100:5							0.536
		1200:5							0.588
		1500:5							0.744
		1600:5							0.796
		2000:5							1.003

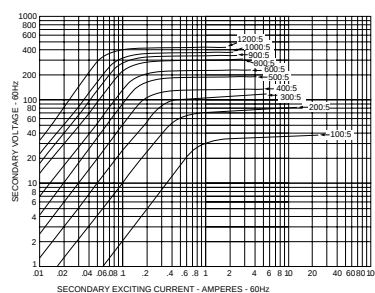
Rating Factor 30 °C Ambient Temp. = 2.0

Model 786R-302

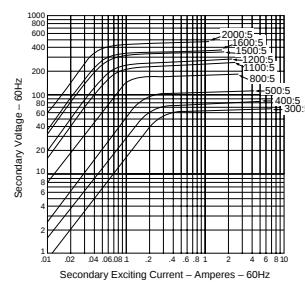
Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8	
6.5 in. (165 mm)	786R302	300:5	C400	0.3	0.3	0.3	0.3	0.3	0.145
		500:5							0.242
		800:5							0.388
		1000:5							0.485
		1200:5							0.588
		1500:5							0.743
		2000:5							1.003
		2200:5							1.113
		2500:5							1.278
		3000:5							1.550

Rating Factor 30 °C Ambient Temp. = 2.0

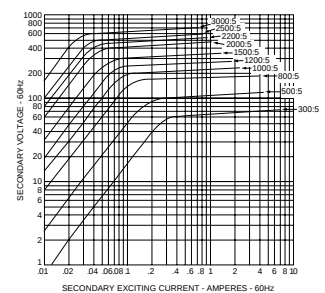
Excitation Curves—Models 786R-122, 786R-202, and 786R-302



Model 786R-122



Model 786R-202



Model 786R-302



Bushing Transformers

Models 781R and 786R (Multi Ratio)

Model 786R-402

Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8	
6.5 in. (165 mm)	786R402	500:5	C400	0.3	0.3	0.3	0.3	0.3	0.305
		1000:5							0.609
		1500:5							0.932
		2000:5							1.258
		2500:5							1.598
		3000:5							1.941
		3500:5							2.321
		4000:5							2.702

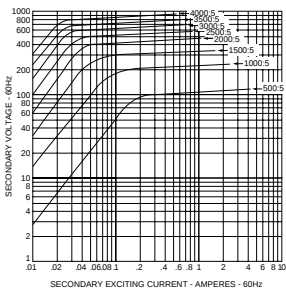
Rating Factor 30 °C Ambient Temp. = 1.5

Model 786R-601

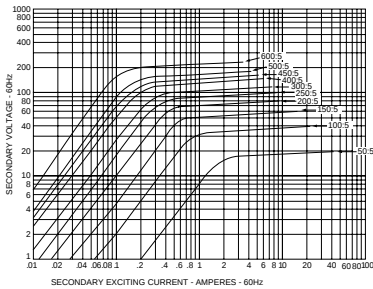
Window Size	Catalog Number	Current Rating (A)	Relay Class	ANSI Accuracy Classification 60 Hz Metering Class					DC Resistance (Ohms) at 25 °C
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8	
6.5 in. (165 mm)	786R601	100:5	C200	0.3	0.3	0.3	0.3	0.3	100:5
		200:5							200:5
		300:5							300:5
		400:5							400:5
		500:5							500:5
		600:5							600:5
		800:5							800:5
		900:5							900:5
		1000:5							1000:5
		1200:5							1200:5

Rating Factor 30 °C Ambient Temp. = 2.0

Excitation Curves–Models786R-402 and 786R-601

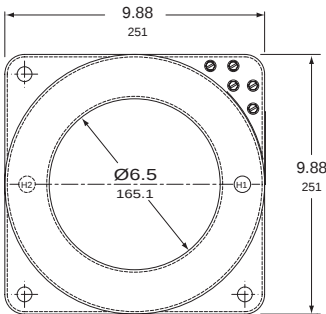


Model 786R-402



Model 786R-601

Dimensions



Model	T in (mm)
780R	3.38 (36)
781R	3.38 (36)
785R	6.75 (171)
786R	6.75 (171)



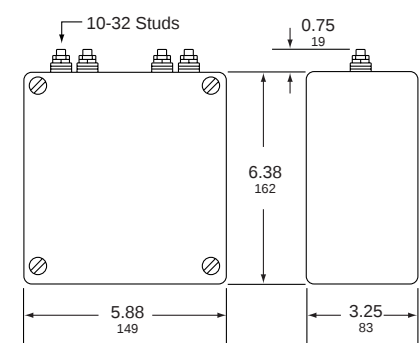
Auxiliary Current Transformer
Model 81X

Model 81X Auxiliary Current Transformer
Auxiliary Current Transformer

Catalog Number (without brackets)	Ratio	ANSI Accuracy Classification - 60 Hz Metering Class		
		B-0.1	B-0.2	B-0.5
81X05000100	5:1	0.3	0.3	0.3
81X05000200	5:2	0.3	0.3	0.3
81X05000250	5:2.5	0.3	0.3	0.3
81X05000500	5:5	0.3	0.3	0.3
81X07500500	7.5:5	0.3	0.3	0.3
81X10000500	10:5	0.3	0.3	0.3
81X12500500	12.5:5	0.3	0.3	0.3
81X15000500	15:5	0.3	0.3	0.3

Rating Factor 30 °C Ambient Temp. = 1.5

Dimensions



Voltage Transformers

Models 450R, 460R, and 470R

DESCRIPTION

- These voltage transformers are designed for line-to-line or line-to-ground connection on the primary voltage indicated. See the table below to determine the applicable configuration for proper system voltage indication.
- Model 450R is designed for switchboard use. This model features high accuracy and burden capacity for excellent performance in metering and indication.
- Model 460R is a compact, lightweight design, providing exceptional performance in electrical indicating and recording instrumentation.
- Model 470R is designed for extremely accurate voltage measurement where low burden is to be used.
- Permanent polarity marks are molded into the case.
- Large, easy-to-read ratios are clearly marked on the case.
- Primary and secondary terminals are fully insulated #10-32 threaded studs, complete with nuts and washers. Terminal covers and mounting base are also supplied.
- Frequency: 60 Hz.
- Insulation: 10 kV BIL full wave (600 volt class)
- Applicable Standard — ANSI C57.13.
- UL recognized per Classification XODW2.



Model 450R

Designed for a wide range of electrical indicating, recording instruments and protective relays in power systems.

Model 450R

Catalog Number	Primary Voltage Rating (Volts)	Secondary Voltage Rating (Volts)	Voltage Ratio	System	Transformer Connections	Accuracy and Burden Rating	Thermal Burden Rating (VA)		Weight	
							30 °C Ambient	55 °C Ambient	lb	kg
450R-120	120	120	1:1	208Y	Ø - Ground	0.3Y, 1.2Z	500	300	23	10.5
				120Δ	Ø - Ø					
450R-240	240	120	2:1	416Y	Ø - Ground					
				240Δ	Ø - Ø					
450R-288	288	120	2.4:1	480Y	Ø - Ground					
450R-300	300	120	2.5:1	520Y	Ø - Ground					
450R-480	480	120	4:1	480Y	Ø - Ø					
				480Δ	Ø - Ø					
450R-600	600	120	5:1	600Y	Ø - Ø					
				600Δ	Ø - Ø					

- Use on 277/480 wye systems.
- ★ Use 480 V delta systems.



Model 460R

Designed for use with voltmeters, transducers and other types of electrical indicating and recording instrumentation.

Model 460R

Catalog Number	Primary Voltage Rating (Volts)	Secondary Voltage Rating (Volts)	Voltage Ratio	System	Transformer Connections	Accuracy and Burden Rating	Thermal Burden Rating (VA)		Weight	
							30 °C Ambient	55 °C Ambient	lb	kg
460R-120	120	120	1:1	208Y	Ø - Ground	0.6Y, 1.2X	150	100	8	3.6
				120Δ	Ø - Ø					
460R-240	240	120	2:1	416Y	Ø - Ground					
				240Δ	Ø - Ø					
460R-288	288	120	2.4:1	480Y	Ø - Ground					
460R-300	300	120	2.5:1	520Y	Ø - Ground					
460R-480	480	120	4:1	480Y	Ø - Ø					
				480Δ	Ø - Ø					
460R-600	600	120	5:1	600Y	Ø - Ø					
				600Δ	Ø - Ø					

- Use on 277/480 wye systems.
- ★ Use 480 V delta systems.



Voltage Transformers Models 450R, 460R, and 470R



Model 470R

Ideal for applications such as input to PLC modules and other electronic devices with high input impedance.

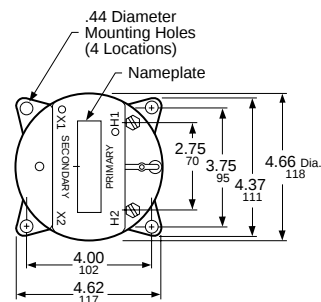
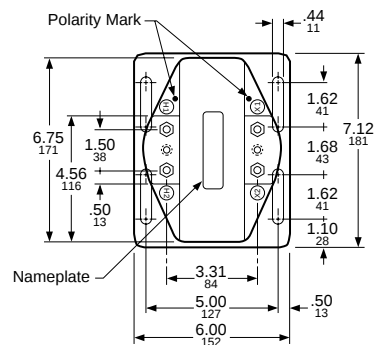
Model 470R

Catalog Number	Primary Voltage Rating (Volts)	Secondary Voltage Rating (Volts)	Voltage Ratio	System	Transformer Connections	Accuracy and Burden Rating	Thermal Burden Rating (VA)		Weight	
							30 °C Ambient	55 °C Ambient	lb	kg
470R-069	69	120	0.58:1	120Y	Ø - Ground	0.3W	150	100	8	3.6
470R-120	120	120	1:1	208Y 120D Δ	Ø - Ground Ø - Ø					
470R-208	120	120	1.73:1	360Y 208 Δ	Ø - Ground Ø - Ø					
470R-240	240	120	2:1	416Y 240 Δ	Ø - Ground Ø - Ø					
470R-288	288	120	2.4:1	480Y ●	Ø - Ground					
470R-300	300	120	2.5:1	520Y	Ø - Ground					
470R-380	220	120	3.17:1	380Y 380 Δ	Ø - Ø Ø - Ø					
470R-480	480	120	4:1	480Y ★ 480 Δ	Ø - Ø Ø - Ø					
470R-600	600	120	5:1	600Y 600 Δ	Ø - Ø Ø - Ø					

● Use on 277/480 wye systems.

★ Use 480 V delta systems.

Dimensions



Dual Dimensions $\frac{\text{inches}}{\text{mm}}$



Voltage Transformers
Models 450R, 460R, and 470R

VOLTAGE TRANSFORMER CIRCLE DIAGRAMS

Circle Diagram Accuracy Determination

Voltage Transformers (VT) Circle Diagrams are provided as an easy method for determining accuracy at any burden and power factor. The radial lines represent different power factors for the burdens and the concentric circles represent burden amount in Volt-Amperes.

VT accuracy at a specific burden may be determined by choosing the appropriate power factor line that represents the power factor of the actual burden, then extending outward in the radial direction to the appropriate volt-ampere level. Note that the concentric circles represent proportional Volt-Amperes that increase in value as you extend outward.

The Ratio Correction Factor and Phase Angle error for this Burden may be taken from the ordinate and abscissa of the circle diagram.

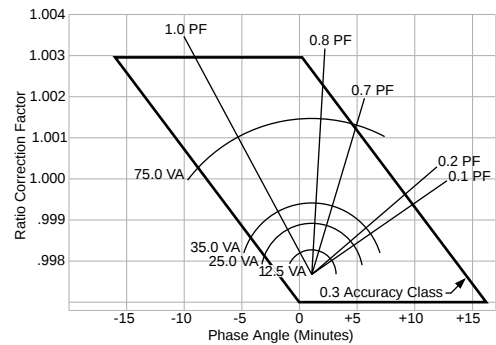
Example: Burden Volt-Amperes = 20 VA
Burden Power Factor = .95

The Model 460R circle diagram provides an accuracy of operation:
Ratio Correction Factor = 1.0017
Phase Angle = +4.3 minutes

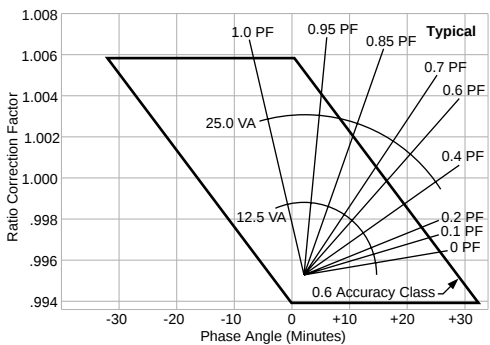
Standard Burdens for Voltage Transformers

Burden	VA	Power Factor
W	12.5	0.1
X	25	0.7
M	35	0.2
Y	75	0.85
Z	200	0.85

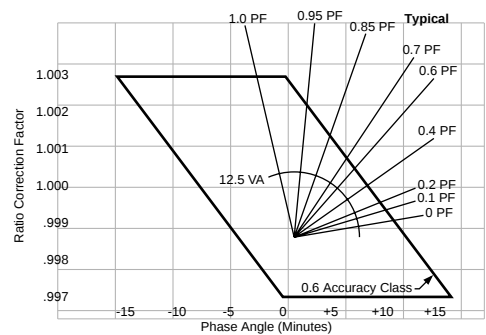
Model 450



Model 460



Model 470



Glossary of Terms and Abbreviations

Term or Abbreviation	Definition
Accuracy	Metering accuracy of current transformers. The accuracy class followed by a standard burden for which the accuracy class applies. The accuracy rating applies only over the specified current or voltage range and at the stated frequency. The burden of current transformers may be expressed in two ways: in volt-amperes (VA) or in ohms impedance, for example B-1.8 means a burden of 1.8 ohms at a specific power factor (See page 53). To convert, use formula: $VA = I^2Z$.
Relaying accuracy of current transformers	A relaying accuracy class is designated by two symbols which effectively describe the capability of the transformer as follows: "C" means the transformer ratio can be calculated, i.e. a window type current transformer with uniformly distributed windings. The C rating refers to a low-reactance design. The secondary terminal voltage rating is the voltage which the transformer will deliver to a standard burden at 20 times normal secondary current without exceeding 10% ratio error. Furthermore, the ratio error must be limited to 10% at any current from 1 to 20 times rated current at any lesser burden. For example, relay accuracy class C100 means that the ratio can be calculated and that the ratio error will not exceed 10% at any current if the burden does not exceed 1.0 ohms (1 ohm x 5 amperes X 20 times normal current = 100 volts). Note: Previous standards used the term "10L" in place of "C", such as 10L100, 10L400, etc. CSA Standard C13 used the term "10L" in place of "C".
Accuracy ratings of voltage transformers	Accuracy classes are based on the requirement that the transformer correction factor (TCF) is within specified limits when the power factor of the metered load has any value from 0.6 lag to 1.0, from zero burden to the specified standard burden (See page 54), and at any voltage from 90% to 110% of the rated transformer voltage.
AMB	Ambient
ANSI	American National Standard Institute (Successor to USASI, United States of America Standards Institute)
B.I.L.	Basic insulation level, which is the withstand of a 1.2 x 50 full wave impulse of specified kV crest value.
Burden	Burden of an instrument transformer is equivalent to the term "load" as applied to a power transformer.
Compensated VA	Transformer is compensated to provide maximum accuracy at that burden.
Rating Factor of window type transformers	The factor by which the nominal rated secondary current (usually 5 amperes) can be multiplied to obtain the maximum secondary current that can be carried continuously without exceeding the allowable temperature rise above a specified ambient temperature. The factor will also apply to the primary current if the primary conductor is of sufficient size to carry the current without exceeding the allowable temperature rise
Current Rating	The ratio of the rated primary value to the rated secondary value as stated on the nameplate.
Hz —	Hertz = cycles per second.
Insulation Class of Instrument Transformer	Denotes the maximum (Line-to-Line) voltage of the circuit on which it should be used. (NOTE: Voltage transformers may be limited by their primary voltage ratings to use at a lower voltage than that of their insulation class.) Conformity to the class means that the transformer is capable of withstanding low frequency insulation tests, and basic insulation level (BIL) tests as prescribed in ANSI C57.13.
kV	Kilovolt or 1000 volts.
Polarity	The relative instantaneous polarity of the leads or terminals is indicated by permanent marking, i.e. H1 and X1 are of the same polarity. They are identified by white dots, white wires, or the actual terminal designations.
PRI.	Primary.
SEC.	Secondary.
Ratio	Ratio of transformer, primary: secondary.
VA	Volt-amperes.
X1, X2	Secondary Terminals (See "Polarity").



Appendices

APPENDIX A

ADJUSTING CURRENT TRANSFORMER RATIO

Use the equations provided in this section to obtain special ratios from standard ratings.

Window type current transformers (CT) are rated on the basis of a single primary turn. Other ratios are obtainable by the use of multiple turns. Any window type current transformer listed herein may have its nominal ratio adjusted to a nonstandard ratio by the use of primary and secondary turns as follows:

Applying Turns to Adjust Ratio

Primary Turns—To provide a coarse adjustment to the ratio, the required number of primary turns should be applied as shown in Figure 1. An electrical turn is defined as one pass through the window.

$$\frac{\text{Nameplate Primary Amps}}{\text{Number of Turns}} = \text{New Primary Amps}$$

Example:

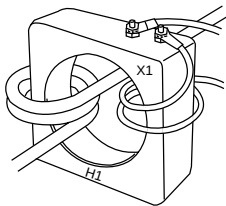
For 100:5 Ampere CT with 4 primary turns

$$\frac{100}{4} = 25 \text{ Primary}$$

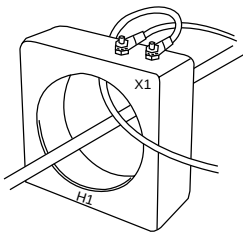
Thus the new ratio is 25:5.

Secondary Turns—For finer adjustment to the ratio, secondary turns may be added or subtracted by routing the X₁ lead in the proper direction. To **subtract** turns, take the X₁ lead and pass it through the window from H₁ to H₂ (see “Subtracting Turns” at top left). To **add** turns, the X₁ lead is passed through the window in the reverse direction (see “Adding Turns” at bottom left).

$$[\text{Nameplate Primary Amperes} \pm (\text{Extra secondary turns} \times 5 \text{ Amperes/turn})] : 5 = \text{New Ratio.}$$



Subtracting Turns:
3 primary turns with
2 secondary turns
subtracted



Adding Turns:
1 primary turn with
1 secondary turn
added

Example:	For 100:5 Amperes CT with 2 secondary turns added.
	$100 + (2 \times 5) = 110:5 \text{ Amperes Ratio}$
	For 150:5 Amperes CT with 3 secondary turns subtracted.
	$150 - (3 \times 5) = 135:5 \text{ Ampere Ratio}$

Primary and Secondary Turns—The relationship of ratio to primary and secondary turns is expressed in the following formula:

$$K_a = \frac{K_n \pm N_{sa}}{N_p}$$

Where: K_a = actual transformation ratio obtained =

$$\frac{\text{Desired Primary Amperes}}{\text{Secondary Amperes}}$$

K_n = nameplate transformation ratio =

$$\frac{\text{Primary Amperes}}{\text{Secondary Amperes}}$$

N_{sa} = Number of secondary turns added or subtracted.

N_p = Number of primary turns.

Example: For 100:5 Amperes CT with 4 primary turns added, how many secondary turns are required to make a 30:5 CT ratio?

$$K_a = 6 = \frac{20 \pm N_{sa}}{4}$$

N_{sa} = +4 turns (added)

APPENDIX B

PARALLELING CURRENT TRANSFORMERS

To parallel CT secondaries to combine currents from two or more feeders from the same phase, follow guidelines 1–7 below.

- All transformers, which have their secondaries paralleled, must be connected in the same phase of the primary circuit.
- All transformers must have the same nominal ratio regardless of the circuits in which they are connected.
- The secondaries must be paralleled at the meter, not at the CT.
- Use only one common ground point for all the secondaries of all transformers. This should be at their common point at the meter.
- Each CT must be capable of supporting “n” times the burden within the desired accuracy class, where n = number of CTs in parallel, (0.3 accuracy class for switchboard use).
- A common potential must be available for the meter.
- The meter must have sufficient current capacity to carry the sum of the currents from all the transformers to which it is connected.

APPENDIX C

BURDEN AND ACCURACY INFORMATION

In applying the burden and accuracy limits of instrument transformers, it is important to keep in mind that accuracy and burden are interdependent, the same as load and regulation are in power transformer terminology.

Power Transformer		Instrument Transformer
Load	=	Burden
Regulation	=	Accuracy

All instrument transformers will have some small error. The metering accuracy classes are defined in the table below:

Accuracy Class	Current Transformer Max. Error At Secondary Amps		Voltage Transformer Max. Error 90-110% Volts
	5.0 Amp	0.5 Amp	
0.3	±0.3%	±0.6%	±0.3%
0.6	±0.6%	±1.2%	±0.6%
1.2	±1.2%	±2.4%	±1.2%

Accuracy Determination

Recommended accuracy classes for metering and control relaying uses are shown below. Switchboard instruments are normally 1% rated meters, and panel meters are 2% or 3% rated.

Accuracy Class of Meter	1%	2%	3%
Accuracy Class of CT or VT	0.3%	0.6%	1.2%
Accuracy Class of CT or VT for Wattmeters, Watt-hourmeters, Varmeters, Transducers, etc.	0.3%		
Accuracy Class of CT or VT for Control Relay use.	1.2%		

The standard burden limits defined by ANSI C57.13 for current and voltage transformers are as follows:

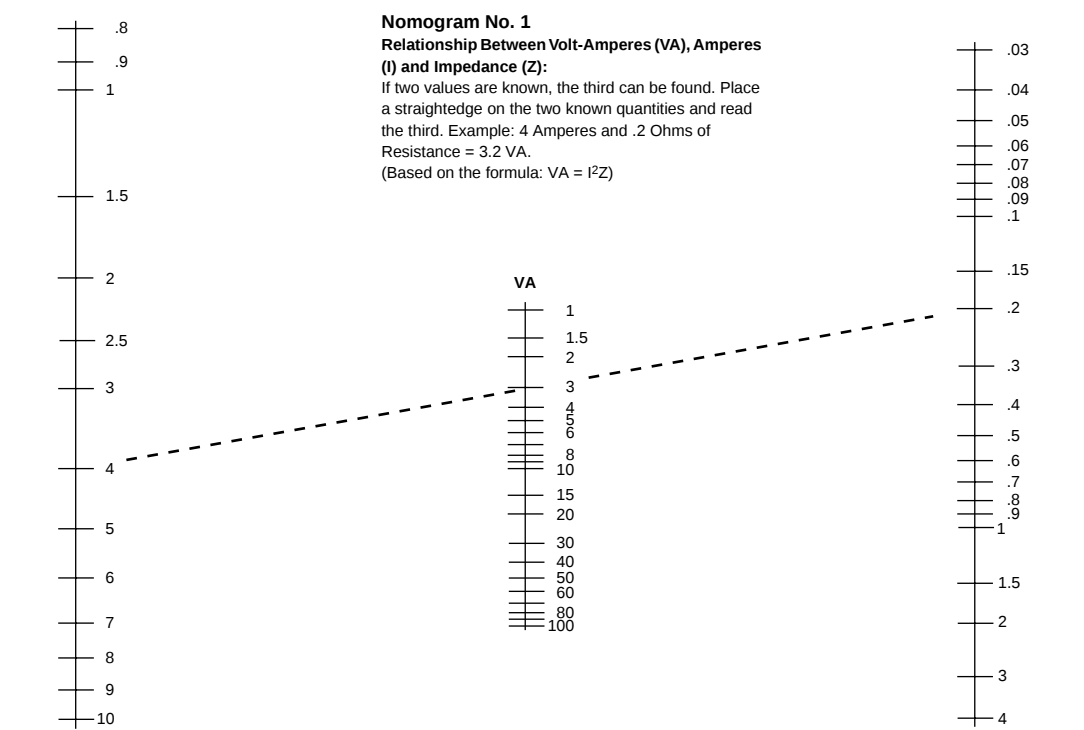
Current Transformers			
Burden	Impedance Ohms	Volt Amperes	Power Factor
B-0.1	0.1	2.5	0.9
B-0.2	0.2	5.0	0.9
B-0.5	0.5	12.5	0.9
B-0.9	0.9	22.5	0.9
B-1.8	1.8	45.0	0.9

Voltage Transformers		
Burden	Volt-Amperes	Power Factor
W	12.5	0.1
X	25	0.7
M	35	0.2
Y	75	0.85
Z	200	0.85
ZZ	400	0.85



Burden Determination

The Burden consists of the sum total of the wiring and all connected devices. Determine the burden of the connected devices by referring to the nameplate or catalog data. If the burden is expressed in volt-amperes, add this directly for the Voltage Transformer, or convert to ohms impedance for the Current Transformer, using Nomogram No. 1.



Determining Burden

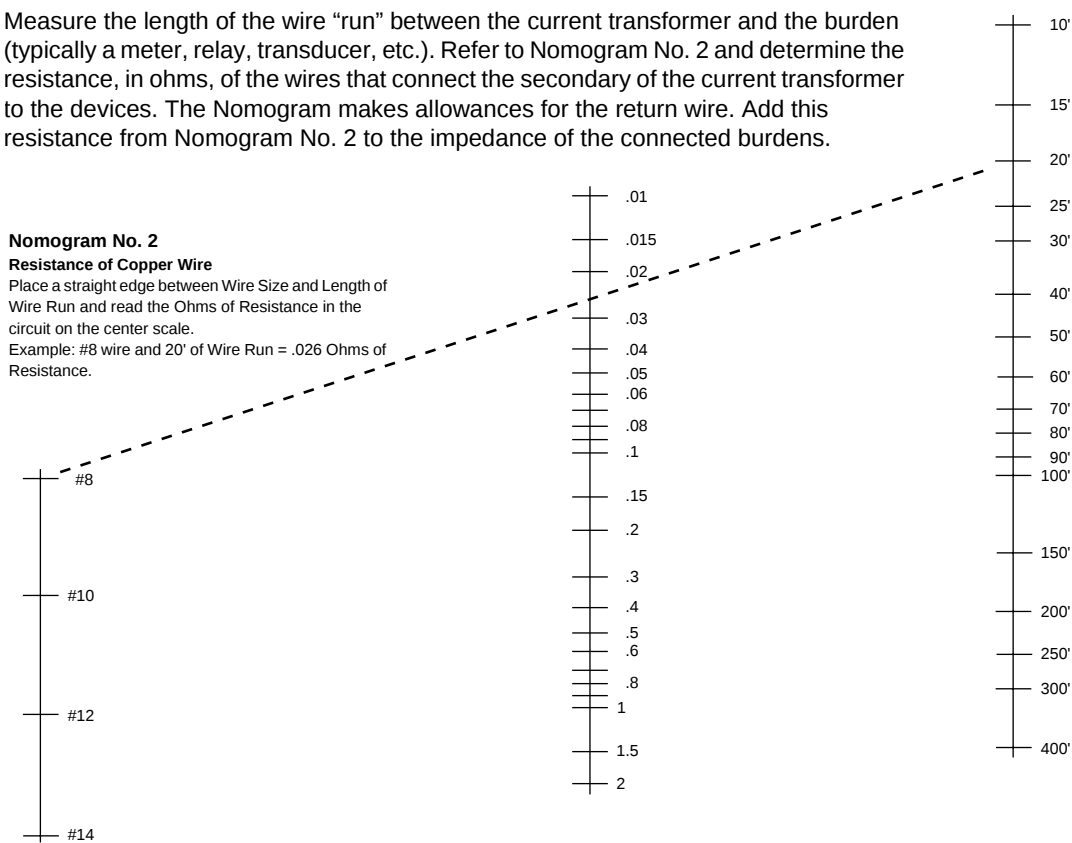
Measure the length of the wire "run" between the current transformer and the burden (typically a meter, relay, transducer, etc.). Refer to Nomogram No. 2 and determine the resistance, in ohms, of the wires that connect the secondary of the current transformer to the devices. The Nomogram makes allowances for the return wire. Add this resistance from Nomogram No. 2 to the impedance of the connected burdens.

Nomogram No. 2

Resistance of Copper Wire

Place a straight edge between Wire Size and Length of Wire Run and read the Ohms of Resistance in the circuit on the center scale.

Example: #8 wire and 20' of Wire Run = .026 Ohms of Resistance.



Excitation Data

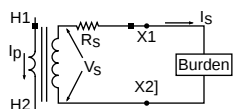
Calculating CT Metering Accuracy from Excitation Curves

The accuracies shown in the Data Sheets for each CT are for standardized burdens and provide a quick approximation of the accuracy for most purposes. However, if a more precise value of accuracy is needed to refer to the Excitation Curves where the exciting current, I_e , is plotted against secondary voltage, V_s . The transformer ratio error expressed as a percentage becomes:

$$\% \text{ (RE)} = \frac{I_e \times 100}{I_s}$$

Where: I_s = Secondary Current

To use the curves to determine I_e , first calculate V_s .



Typical CT Circuit Diagram

By referring to a typical CT circuit as shown at left, it shows that the voltage V_s must force the secondary current I_s through the entire circuit consisting of the secondary winding and the burden, including the interconnecting leads.

The resistance of the secondary winding R_s is listed in this catalog for a given CT under the heading of "DC R – ohms". "Z" is commonly referred to as "Burden" and must be obtained from the catalog information of the connected devices added to the resistance of the interconnection leads and R_s . Ohm's Law gives us $V_s = I_s Z$. We may now refer to the Excitation Curve for the CT in question and determine I_e , the exciting current.

Appendices

Calculating Accuracy

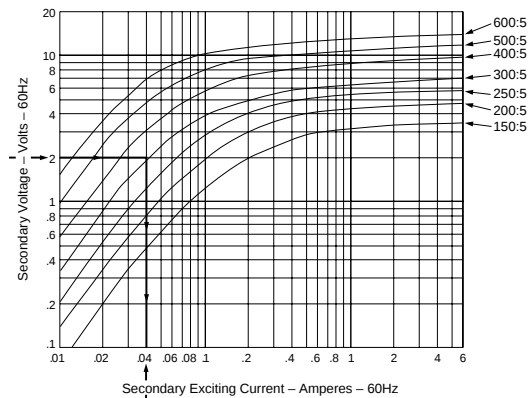
For example, a 300:5 ratio CT with a total burden of $Z = .5$ ohm. With 240 amperes in the primary, the secondary current will be:

$$I_S = 240 \times \frac{5}{300} = 4 \text{ Amps}$$

$$V_S = I_S Z = 4 \text{ Amps} \times .5 \text{ ohms} = 2 \text{ Volts}$$

Referring to Figure 2, we see that at 2 secondary volts, the exciting current, I_e , is equal to .04 amperes. Thus, the percent error of the CT would be:

$$\% (\text{Ratio Error}) = \frac{I_e}{I_S} \times 100 = \frac{.04}{4} \times 100 = 1\%$$



Typical Excitation Curves
Figure 2

Relaying CT Accuracy

ANSI C57.13 defines relay accuracy in terms of the secondary terminal voltage that a current transformer will supply, with a standard burden connected and 20 times secondary current flowing, while not exceeding 10 percent ratio error. The excitation curves have as their ordinate, secondary voltage, which includes the CT internal voltage drop. In order to determine if the CT is adequate for a particular relay accuracy level, from the excitation curve, the total secondary voltage V_S must be calculated, which will include the internal voltage drop.

Since the CT will operate at an elevated temperature over Ambient of 30 °C, we must take into consideration the maximum temperature rise of 55 °C.

R_C = Secondary winding resistance corrected to 85 °C (30 °C + 55 °C) = 1.2555 x R_S (secondary resistance).

Z_t = Total Impedance of burden circuit =

$$\sqrt{(R_C + .5Z_b)^2 + (.866Z_b)^2}$$

Where: $X_b = .866 Z_b$

$R_b = .5 Z_b$

$$Z_t = \sqrt{(1.2555R_S + R_b)^2 + (.866Z_b)^2}$$

Obtain R_S from specific CT and ratio used, and determine Z_t , using the standard relay burden data indicated below.



ANSI Standard Relay Burdens

Relay Accuracy	R _b (Ohms)	Z _b (Ohms)	Relay Accuracy	R _b (Ohms)	Z _b (Ohms)
C10	0.09	0.1	C200	1.0	2.0
C20	0.18	0.2	C400	2.0	4.0
C50	0.45	0.5	C800	4.0	8.0
C100	0.50	1.0			

The formula to determine the secondary voltage, required from the current transformer, to maintain a certain relay accuracy is:

$$V_S = I_S \times Z_t$$

$I_S = 20 \times 5$ amperes = 100 amperes for Fault considerations.

$$V_S = 100 \text{ amperes} \times Z_t$$

V_S = Minimum voltage required to meet the relay accuracy.

V_{SC} = Secondary voltage at 10 ampere exciting current on CT curve.

The relay accuracy rating defines that the CT must not exceed 10% error at the V_S level. The 10% error level is represented by the 10 ampere excitation current line (based on 100 ampere total secondary current) on the CT excitation curve. Extending up the 10 ampere line to the ratio used, find V_{SC} . If V_{SC} is greater than, or equal to V_S calculated, then the CT is adequate for the relay accuracy.

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