

SINCE 1980

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CURRENT TRANSFORMERS ROGOWSKI COILS

Energy Metering and Monitoring Solutions

Product Catalog Vol. **101**



Where Stability Meets Supreme Accuracy in Current Sensing

HEADQUARTER & FACTORY

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Smart Grid powered by Accurate Sensing



2011
Earned "the Best Quality Award" by
Japan's largest electric company

2009
Selected as a Frontier company by
provincial government

2007
Established Taehwatrans America Inc,
in greater Chicago area

2000
Designated as supreme performance
company by Industrial Bank of KOREA

1999
Selected as Korean Best product by
Samsung Global Mall

1998
Selected as an export promising company by
government institution & small business corporation

1993
Acquired an award & export achievement merit
from Korea Trade Association

1986
Initiated overseas sales and promotion

1985
Incorporated Taehwatrans Co. LTD

1980
Founded by the name of Taehwa Industry



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Application

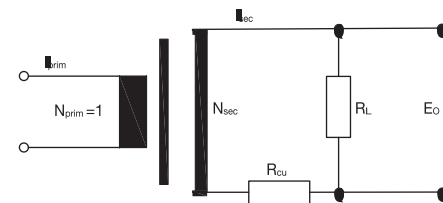
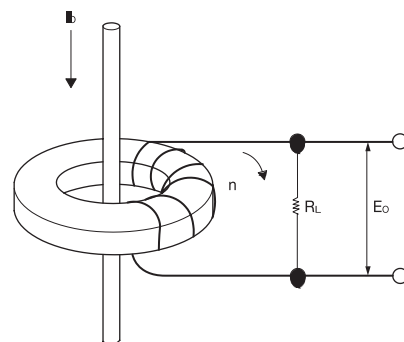
- 0.1 / 0.2 Class 1A, 5A rating accuracy meters in HVCT & MVCT for power & sub-stations and industrial & commercial meters
- Data logger in digital fault recorders
- Energy measurement of HEMS, BEMS, FEMS
- Accuracy multi-harmonics measurements
- Arc plasma current monitoring up to 100Khz
- EV charging cable & station

General Features

- Compliant to IEC61869-2, IEC62053-22 & ANSI C12.20
- Paramount linearity within 0.1% through whole range
- Nearly zero tolerance on temperature change
- Hi-potential : 4kV per min.
- Optional to measure the multi-harmonics
- RoHS & REACH compliant

Circuit Diagram

$I_{max,rms} \approx 2\pi f B_s A_e N^2 \sec / (R_{cu} + R_B)$
 $I_{dcmax} \approx n B_s I_e / \mu$
 Phase Error $\Phi (l) = \arctan(R_{cu} + R_B) / 2\pi f L$
 Amplitude Error $F(l) \approx -\sin \alpha \cdot (R_{cu} + R_B) / 2\pi f \mu$
 $E_o = K \cdot I_o \cdot R_L / n$



I. Supreme Low Current Sensitivity

f : 50Hz / 60Hz

Model No	Current Ratio	Amplitude Error(%)		Phase Shift (min.)		DCR (Ω)	I _{max}
		0.25A	5A	0.25A	5A	± 6%	Amp.
TC158V	5A / 2mA	-0.03±0.05	-0.03±0.03	1'±2'	1'±1'	37.5Ω	450A
TS76V/L	5A / 2mA	-0.03±0.07	-0.03±0.05	3'±2'	3'±2'	51Ω	180A
TS77V/L	5A / 2mA	-0.03±0.07	-0.03±0.07	7'±2'	5'±3'	130Ω	80A
TLS65V/L	5A / 5mA	-0.05±0.15	-0.05±0.15	16'±6'	10'±6'	43Ω	22A
TLS68V/L	5A / 3.125mA	-0.05±0.15	-0.05±0.15	16'±6'	14'±6'	97Ω	23A
TLS77V/L	5A / 2mA	-0.03±0.07	-0.03±0.07	6'±3'	5'±3'	130Ω	80A
TLS71V/L	5A / 2mA	-0.03±0.07	-0.03±0.07	5'±5'	4'±3'	187Ω	100A
TLS84V/L	5A / 5mA	-0.03±0.07	-0.03±0.07	9'±2'	6'±2'	20Ω	120A
TLS85V/L	5A / 2.5mA	-0.03±0.07	-0.03±0.07	5'±4'	5'±3'	39Ω	150A
TLS76V/L	5A / 2mA	-0.03±0.07	-0.03±0.07	4'±4'	3.5'±3'	51Ω	180A
TLS31L	10A / 2mA	-0.03±0.07	-0.03±0.07	8'±4'	6'±4'	395Ω	110A
TLS104L	100A/100mA	-0.03±0.07	-0.03±0.07	7'±4'	6'±4'	12Ω	140A
TLS105L	200A/100mA	-0.03±0.07	-0.03±0.07	4'±2.5'	3'±2.5'	26Ω	240A
TLS106L	200A/80mA	-0.03±0.07	-0.03±0.07	4'±2'	3'±2'	33Ω	280A
TLS79L	200A/80mA	-0.03±0.07	-0.03±0.07	4'±2'	3'±2'	33Ω	360A
TLS96L	200A/40mA	-0.03±0.07	-0.03±0.07	7'±4'	5'±4'	246Ω	180A
TLS110L	100A/25mA	-0.03±0.07	-0.03±0.07	7'±4'	5'±3'	280Ω	140A

II. Excellent Linearity & Stability

f : 50Hz / 60Hz

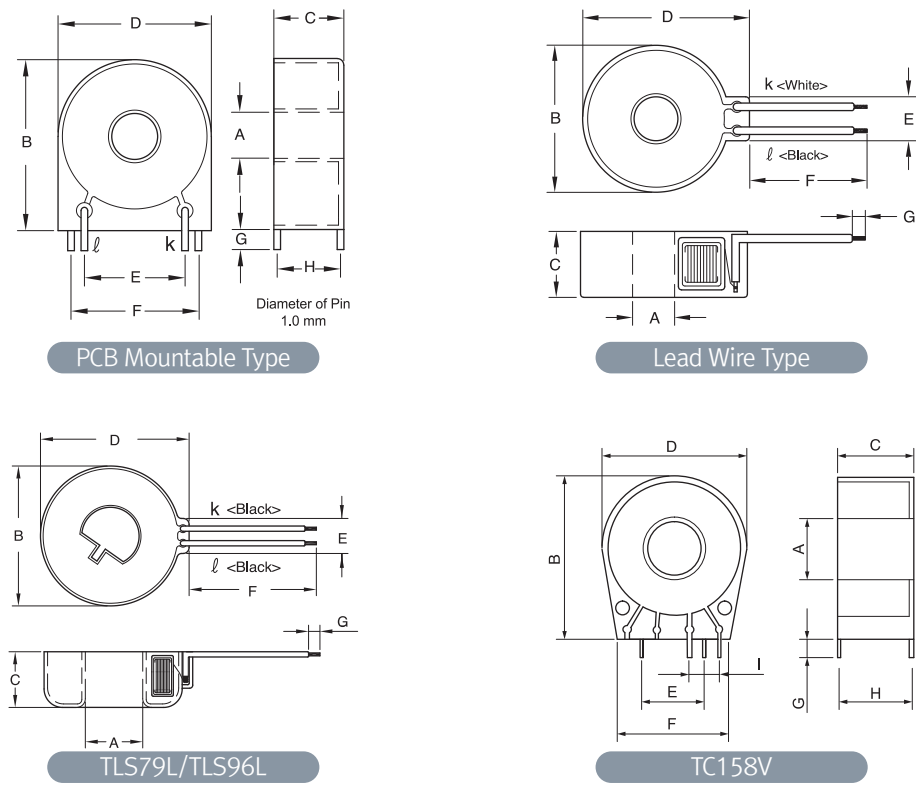
Model No	Current Ratio	Amplitude Error(%)		Phase Shift (min.)		DCR (Ω)	I _{max}
		0.25A	5A	0.25A	5A	± 6%	Amp.
TZ76V/L	5A / 2mA	-0.03±0.07	-0.03±0.07	4'±5'	0±5'	51Ω	180A
TZ71V/L	5A / 2mA	-0.03±0.07	-0.03±0.07	5'±5'	4'±3'	187Ω	100A
TZ77V/L	5A / 2mA	-0.03±0.07	-0.03±0.07	7'±5'	5'±5'	130Ω	80A
TZ73V/L	5A / 2mA	-0.25±0.25	-0.25±0.25	15'±8'	11'±6'	103Ω	45A
TZ31L	10A / 2mA	-0.03±0.07	-0.03±0.07	8'±4'	6'±4'	395Ω	110A
TZ87V/L	5A / 1.25mA	-0.03±0.07	-0.03±0.07	7'±4'	5'±4'	160Ω	100A

III. Multi-Harmonics Accuracy Metering

f : 50Hz / 60Hz

Model No	Current Ratio	Amplitude Error(%)		Phase Shift (min.)		DCR (Ω)	I _{max}
		0.25A	5A	0.25A	5A	± 6%	Amp.
TD35V/L	5A / 2mA	-0.3±0.5	-0.3±0.5	420'±30'	417'±30'	107Ω	72A
TD61L	5A / 2mA	-0.3±0.5	-0.3±0.5	250'±20'	250'±20'	61Ω	130A
TD120V/L	5A / 2mA	-0.25±0.25	-0.25±0.25	200'±25'	200'±25'	51Ω	180A

Drawing



Dimension

PCB Mountable Type

(unit : mm)								
Model No	A(min)	B(max)	C(max)	D(max)	E(±0.3)	F(±0.3)	G(±0.5)	H(±0.3)
TLS65V/TLS68V	5.7	19.5	8.6	19.2	12.7	16	3	7.5
TS77V/TZ77V/TZ73V TLS77V/TD35V	6.8	25	11	23.5	15.1	19.1	3	9.1
TZ71V/TLS71V	8.9	27.5	17	25.3	15.1	19.1	3	15.1
TS76V/TZ76V/TLS76V TLS84V/TLS85V/TD120V	12.9	39.3	14	38	25.2	32.8	3	12.1
TC158V	17.5	64.5	24	55.7	20	38	5	21.5

Lead Wire Type

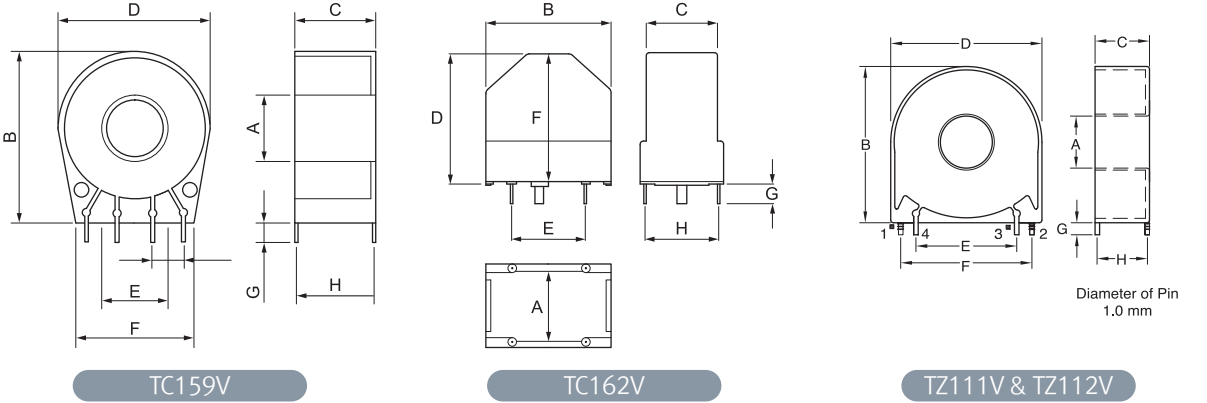
(unit : mm)							
Model No	A(min)	B(max)	C(max)	D(max)	E(max)	F(±0.3)	G(±1.0)
TLS65L/TLS68L	5.7	19.5	8.6	19.2	7.6	65	3
TS77L/TZ77L/TZ73L	6.9	23.6	11	26.8	7.1	71	3
TLS77L/TD35L							
TZ71L/TLS71L	8.9	24.8	17	28.4	7.6	65	3
TD61L	8	30.5	15	31.5	6	71	3
TS76L/TZ76L/TLS84L	12.9	37.5	14	41.3	10.3	68	3
TLS85L/TZ87L/TD120L							
TZ31L/TLS31L	13	31.5	16.5	35.7	6.4	74	5
TLS104L/TLS105L/TLS106L	19.6	48.2	19.2	52	13.2	270	5
TLS79L	19.5	48.2	19.3	51.2	13.2	270	5
TLS110L	32.3	59.6	18	63.2	13.3	763±7	6±2

VI. Isolation Voltage Measurement

Model No	Current Ratio	Ratio & Phase shift Error at 1mA 110V		DCR (Ω) ±6%	Application
		Ratio Error (%)	Phase Shift (min.)		
TC159V	11,000 : 150	-0.03 ± 0.07	63 ± 5'	840 / 0.8	Voltage Monitoring
TC162V	500 : 170	-0.03 ± 0.07	4 ± 4'	13 / 2.2	

Model No	Current Ratio	Ratio & Phase shift Error at 1mA 110V		DCR (Ω) ±6%	Application
		Ratio Error (%)	Phase Shift (min.)		
TZ111V	1250 : 1250	Within 0.2	Within 0.40 Degree	100	Voltage Monitoring
TZ112V	2500 : 2500	Within 0.1	Within 0.20 Degree	245	

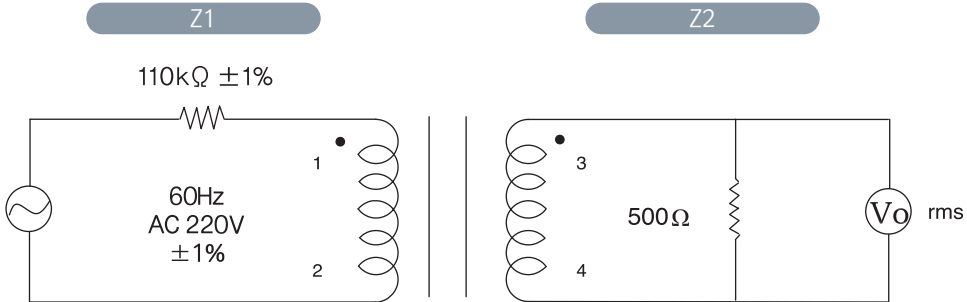
Drawing



Dimension

(unit : mm)									
Model No	A(min)	B(max)	C(max)	D(max)	E(±0.3)	F(±0.3)	G(±0.5)	H(±0.3)	I(±0.3)
TC159V	17.5	64.5	24	55.7	20	38	5	21.5	10.7
TC162V	22.1	42.2	24.2	45	25	41.9	6	25	
TZ / TL111V	6.9	25	11	24.5	15.1	19.1	3	9.2	
TZ / TL112V	12.9	39.3	14	38	25.2	32.8	3	12.1	

Measuring Circuit (Based on TZ111V)



V. Inverter Switching & Arc Plasma Monitoring

Application

- Arc Plasma Power Supply
- Inverter Switching & Control
- Supersonic Welding Machines
- IGBT Output Sensor

Features

- 10kHz ~ 300kHz Precision Measurement
- Compliant to IEC 61869-2
- RoHS Compliant
- RoHS & REACH compliant

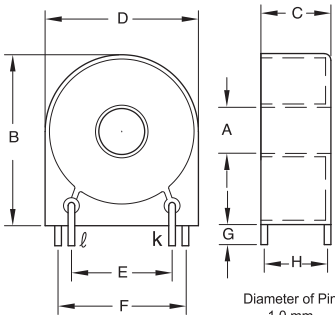
Operating Frequency : 10kHz – 100kHz

Model No	Current Ratio	DCR(Ω) ±6%	Rated Current(A)	Max Current(A)	Phase Shift at 1V		Ratio Error at 1V		Self Resonant Frequency
					10kHz	100kHz	10kHz	100kHz	
TF68V/L	100 : 1	1.1Ω	5A	5A	1.5±1.5'	0.5±0.5'	-0.3±0.7%	-0.3±0.7%	190kHz
TF77V/L	300 : 1	2.95Ω	50A	55A	5±3'	0.5±0.5'	-0.3±0.7%	-0.3±0.7%	110kHz
TF120V/L	300 : 1	2.98Ω	50A	70A	5±3'	0.5±0.5'	-0.3±0.7%	-0.3±0.7%	120kHz

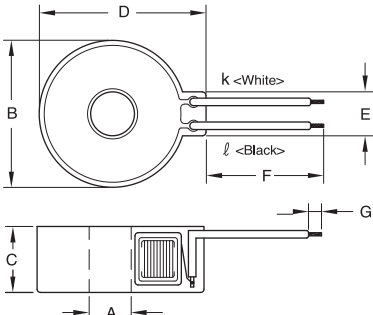
Operating Frequency : 10kHz – 300kHz

Model No	Current Ratio	DCR(Ω) ±6%	Rated Current(A)	Max Current(A)	Phase Shift at 1V		Ratio Error at 1V		Self Resonant Frequency
					100kHz	300kHz	100kHz	300kHz	
TP77V/L	100 : 1	0.75Ω	4A	4A	1.5±1'	1±1'	-0.3±0.7%	-0.3±0.7%	1MHz
TP120V/L	200 : 1	0.85Ω	7A	7A	1.5±1'	1±1'	-0.3±0.7%	-0.3±0.7%	1MHz

Drawing



PCB Mountable Type



Lead Wire Type

Dimension

PCB Mountable Type

unit : mm

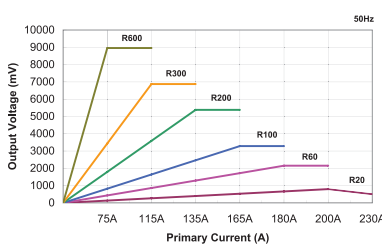
Model No	A(min)	B(max)	C(max)	D(max)	E(±0.3)	F(±0.3)	G(±0.5)	H(±0.3)
TF68V	5.7	19.4	8.2	19.2	12.7	0.95±0.1	4.9±0.1	
TF77V, TP77V	6.8	25.0	11.0	23.5	15.1	19.1	3.0	9.1
TF120V, TP120V	12.9	39.3	14.0	38.0	25.2	32.8	3.0	12.1

Lead Wire Type

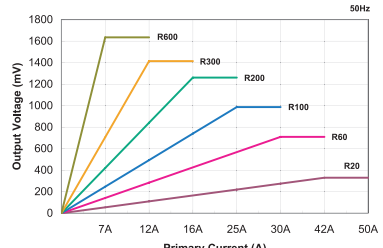
unit : mm

Model No	A(min)	B(max)	C(max)	D(max)	E(±0.3)	F(±0.3)	G(±0.5)
TF68L	5.7	19.4	8.2	19.2	7.6	65.0	3.0
TF77L, TP77L	6.9	23.6	11.0	26.8	7.1	71.0	3.0
TF120L, TP120L	12.9	37.5	14.0	41.3	10.3	68.0	3.0

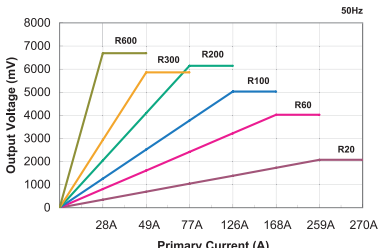
Secondary Burden & Output Voltage Graph



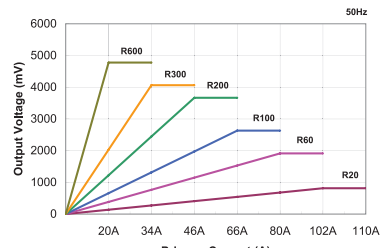
TZ31L



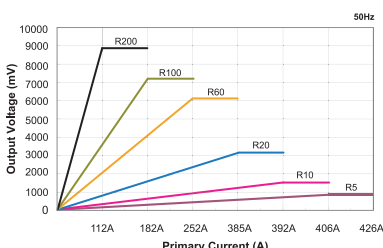
TZ73V/L



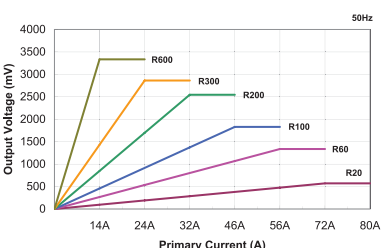
TZ76V/L



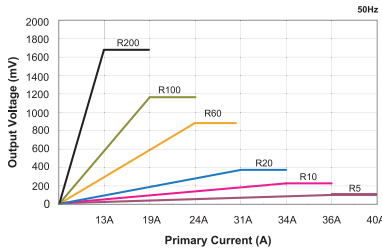
TS77V/L



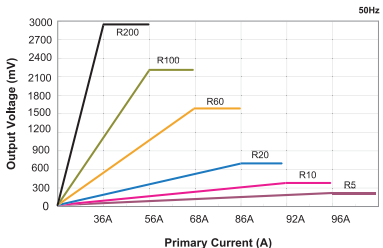
TS76V/L



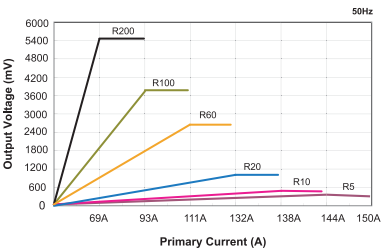
TZ77V/L



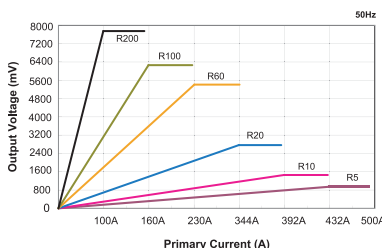
TLS68V/L



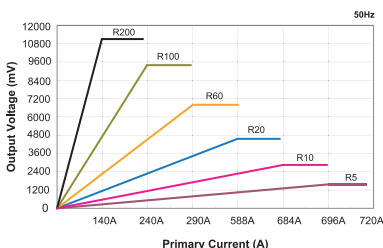
TLS77V/L



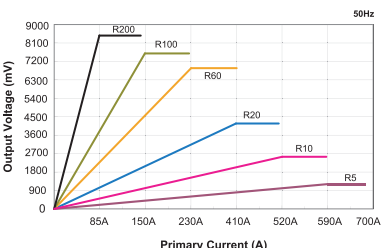
TLS71V/L



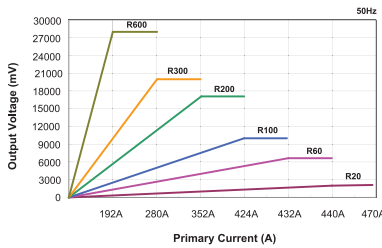
TLS76V/L



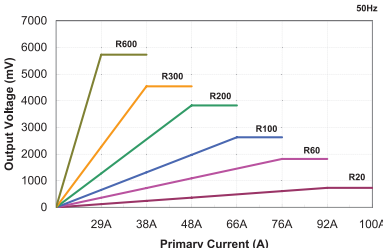
TLS106V/L & TLS79L



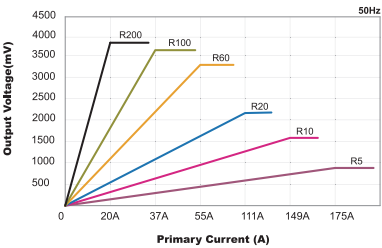
TLS105V/L



TLS110L



TZ71V/L



TLS84L



Application

- Accuracy DC Immune Electronic Energy Meter conforming to IEC 62053-21 (former IEC 61036)
- Smart Grid Application
- Accurate Measurement under DC Components
- Accurate AC Measurement with Anti Tampering
- Immunity to DC Magnets for option

General Features

- Meeting International Standard IEC 61869-2
- Excellent Linearity & Precision
- Steady Phase Shift & No Saturation in DC factor
- Stability from External Magnetic Field
- Possible to adopt the immunity of DC Magnets.
- High Potential Voltage upto 4.0 kV per min.
- RoHS Compliant

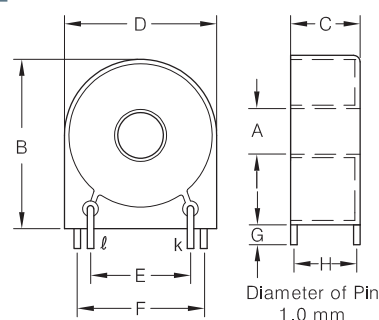
I. Supreme AC & DC Measurement

Model & Specification

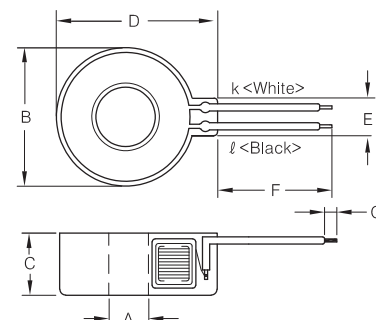
f=50Hz, Rb=1 n, PF=1.0, unit : percent / minute

Model No	Current Ratio	Imax	Idc	DCR(Ω) ±6%	Ip=0.25A		Ip=5A	
					Ratio Error	Phase Error	Ratio Error	Phase Error
TD35VC TD35L	2500 : 1	72A	40A	107	-0.3±0.5	420'±30'	-0.3±0.5	417'±30'
TD40V TD40L	2500 : 1	80A	40A	98	-0.3±0.4	250'±20'	-0.3±0.4	250'±20'
TD61L	2500 : 1	72A	60A	61	-0.3±0.5	240'±25'	-0.3±0.5	240'±25'
TD71V	2500 : 1	90A	60A	86	-0.1±0.1	355'±30'	-0.1±0.1	355'±30'
TD120V TD120L	2500 : 1	180A	120A	51	-0.25±0.25	200'±25'	-0.25±0.25	200'±25'

Drawing



PCB Mountable Type



Wire Lead Type

Dimension

› PCB Mountable Type

unit : mm/inch

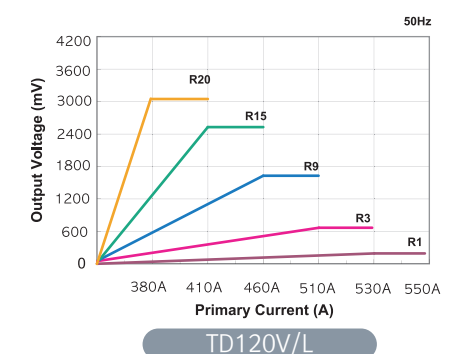
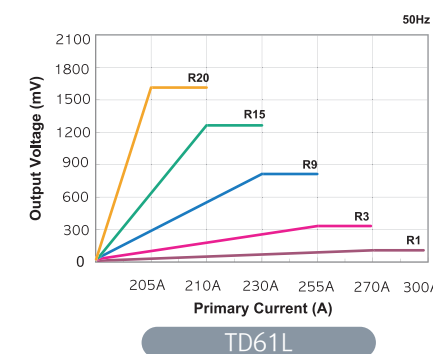
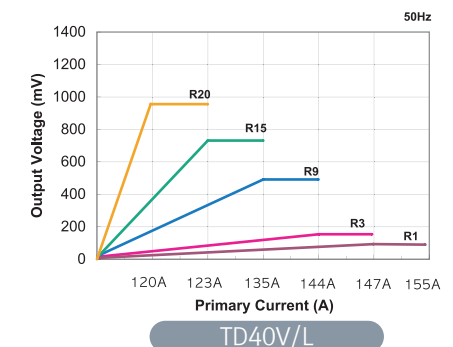
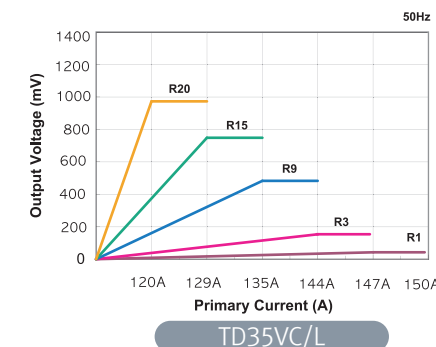
Model No	A(min)	B(max)	C(max)	D(max)	E(±0.3)	F(±0.3)	G(±0.5)	H(±0.3)
TD35VC TD77V	6.8 0.268"	25.0 0.984"	11.0 0.433"	23.5 0.925"	15.1 0.594"	19.1 0.752"	3.0 0.118"	9.1 0.358"
TD40V	8.9 0.350"	27.5 1.083"	17.0 0.669"	25.3 0.996"	15.1 0.594"	19.1 0.752"	3.0 0.118"	15.1 0.594"
TD71V	11.2 0.441"	28.7 1.130"	17.0 0.669"	26.9 1.059"	15.1 0.594"	19.1 0.752"	3.0 0.118"	15.1 0.594"
TD120V	0.508"	1.547"	0.551"	1.496"	0.992"	1.291"	0.118"	0.476"

› Lead Wire Type

unit : mm/inch

Model No	A(min)	B(max)	C(max)	D(max)	E(max)	F(±3.0)	G(±1.0)
TD35L TD77L	69 0.272"	23.6 0.930"	11.0 0.433"	26.8 1.055"	7.1 0.280"	71.0 2.795"	3.0 0.118"
TD40L	11.2	28.7	17	26.9	15.1	71.0	3.0
TD61L	8.0 0.315"	30.5 1.201"	15.0 0.591"	31.5 1.240"	6.0 0.236"	71.0 2.795"	3.0 0.118"
TD120L	0.508"	1.476"	0.551"	1.626"	0.406"	2.677"	0.118"

Secondary Burden & Output Voltage Graph





Application

- Accuracy power monitoring
- High-end digital protection relay
- Power transducer
- High-end UPS periphery relay
- High-end industrial power sensor
- Inverter controlling
- Precision motor protection relay
- EV Charging Plug & Cable

General Features

- Meeting International Standard IEC 61869-2
- High precision & stability
- High saturation induction
- Excellent linearity
- Excellent thermal properties
- High potential voltage of 2.5kV-4.0kV/min
- RoHS compliant

I. Standard Model : Accuracy Class 3.0

Model & Specification

f=50Hz, Rb=1 n, PF=1.0, unit : percent / minute

Model No	Current Ratio	DCR ±6%	Im Rb=1Q	Im Rb=20Q	Im Rb=500Q	Rnv Rb=0, 1-20A	Pnv Rb=0, -20A	Phase Shift at 1V
TC1V TC1L	1000:1	74Ω	76A	60A	9A	1.5%	190'	106'
TC148V TC148L	2000:1	98Ω	225A	190A	38A	0.7%	75'	29'
TC149V TC149L	1500:1	46Ω	370A	260A	31A	1.0%	50'	24'
TC150V TC150L	2000:1	40Ω	870A	590A	69A	2.0%	85'	39'

Definition of Terms

Im: Max rated current **Rnv**: Nominal variation of ratio error at the mentioned primary current range **Pnv**: Nominal variation of phase error at the mentioned primary current range **Rb**: Burden resistance **PF**: Power factor **DCR**: DC Resistance of secondary winding
Remark: The data of maximum current, ratio and phase error on 60Hz testing would be around 20% better than those of above 50Hz

Model & Specification

f=50Hz, Rb=1 n, PF=1.0, unit : percent / minute

Model No	Current Ratio	DCR ±6%	Im Rb=1Q	Im Rb=20Q	Im Rb=500Q	Rnv 1-20A, Rb=0	Pnv 1-20A, Rb=0	Phase Shift at 1V
TC140V/L	1000:1	34Ω	125A	82A	8A	1.2%	10'	88'
TC141V/L	1000:1	29Ω	250A	156A	14A	0.7%	60'	65'
TC142V/L	1000:1	19Ω	460A	230A	17A	2.2%	90'	34'
TC143V/L	4000:1	154Ω	940A	840A	210A	1.5%	86'	13'

f=50Hz, Rb=1 n, PF=1.0, unit : percent / minute

Model No	Current Ratio	DCR ±6%	Im Rb=1Q	Im Rb=20Q	Im Rb=500Q	Rnv 1-20A, Rb=0	Pnv 1-20A, Rb=0	Phase Shift at 1V
TC172V/L	2500:1	129Ω	210A	170A	45A	1.0%	55'	62'
TC173V/L	2500:1	187Ω	260A	240A	70A	1.2%	62'	28'
TC174V/L	2500:1	51Ω	>1000A	790A	100A	1.3%	100'	13'
TC175V/L	2500:1	26Ω	>1000A	790A	67A	1.4%	95'	11'

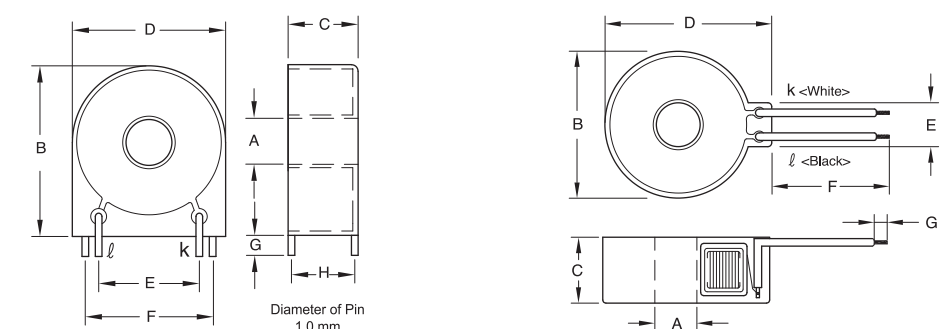
Definition of Terms

Im: Max rated current **Rnv**: Nominal variation of ratio error at the mentioned primary current range **Pnv**: Nominal variation of phase error at the mentioned primary current range **Rb**: Burden resistance **PF**: Power factor **OCR**: DC Resistance of secondary winding
Remark: The data of maximum current, ratio and phase error on 60Hz testing would be around 20% better than those of above 50Hz

f=50Hz, Rb=1 n, PF=1.0, unit : percent / minute

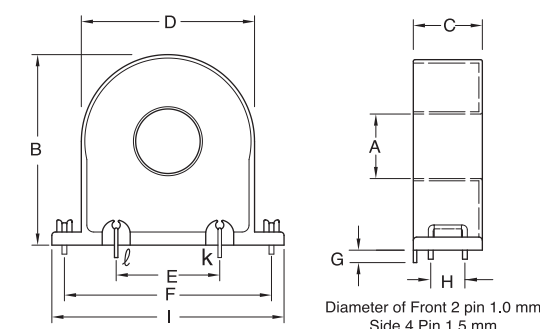
Model No	Current Ratio	DCR(±6%)	Tolerance	Imax		
				Rb=1Q	Rb=20Q	Rb=500Q
TC1PV	1000:1	62Ω	±3%	54A	42A	5A
TC2V/L	1000:1	41Ω		60A	44A	5A
TC3L	1000:1	33Ω		142A	95A	9A
TC4V/L /	1000:1	19Ω		460A	230A	17A
TC5V	1000:1	12Ω		660A	260A	16A

Drawing



PCB Mountable Type

Lead Wire Type



TC175V & TC5V

Dimension

› PCB Mountable type

(unit : mm/inch)

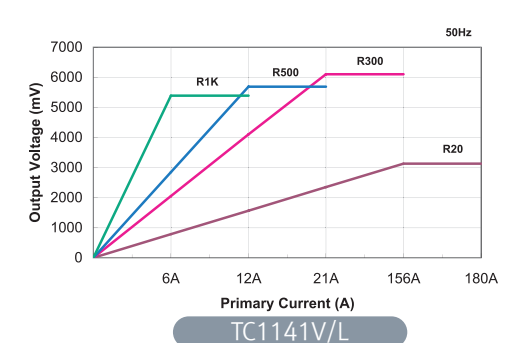
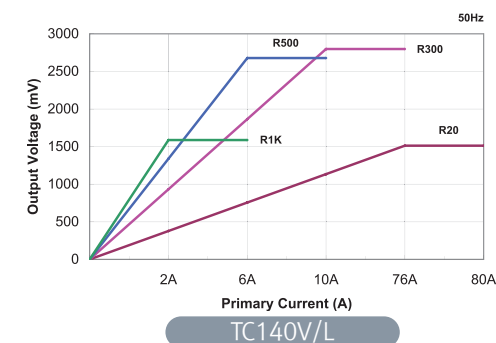
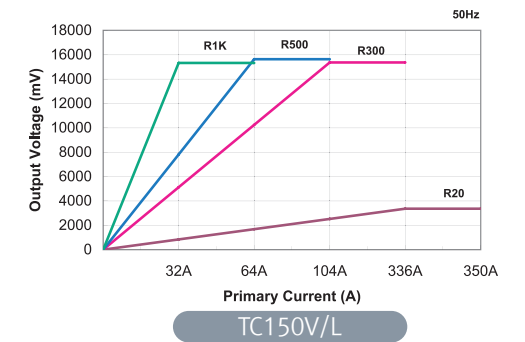
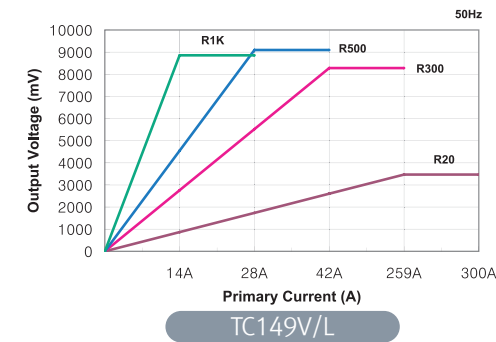
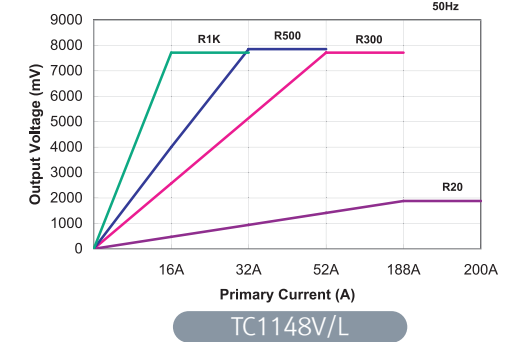
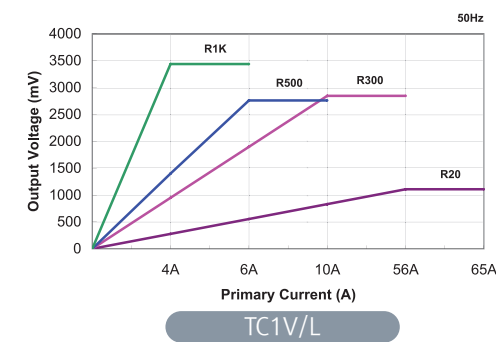
Model No	A(min)	B(max)	C(max)	D(max)	E(±0.3)	F(±0.3)	G(±0.5)	H(±0.3)	I I(max)
TC1PV	5.7 0.224"	19.5 0.768"	8.6 0.339"	19.2 0.756"	12.7 0.500"	16.0 0.630"	3.0 0.118"	7.5 0.295"	
TC1V TC140V TC148V TC172V	6.8 0.268"	25.0 0.984"	11 0.433"	23.5 0.925"	15.1 0.594"	19.1 0.752"	3.0 0.118"	9.1 0.358"	
TC2V TC141V TC149V TC173V	8.9 0.350"	27.5 1.083"	17.0 0.670"	25.3 0.996"	15.1 0.594"	19.1 0.752"	3.0 0.118"	15.1 0.594"	
TC4V TC142V TC143V TC150V TC174V	12.9 0.508"	39.3 1.547"	14.0 0.551"	38.0 1.496"	25.2 0.992"	32.8 1.291"	3.0 0.118"	12.1 0.476"	
TC5V TC175V	18.4 0.744"	55.5 2.185"	20.3 0.799"	50.5 1.988"	30.0 1.181"	60.0 2.362"	4 0.157"	10.0 0.394"	67.6 2.661"

› Lead Wire type

(unit : mm/inch)

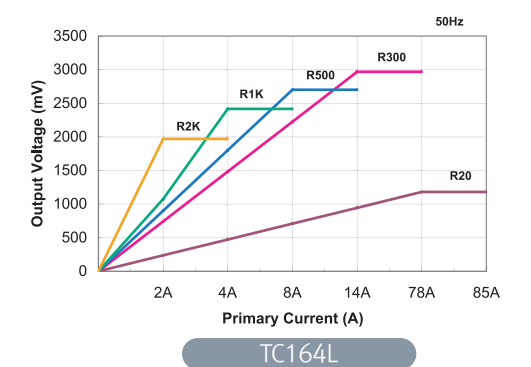
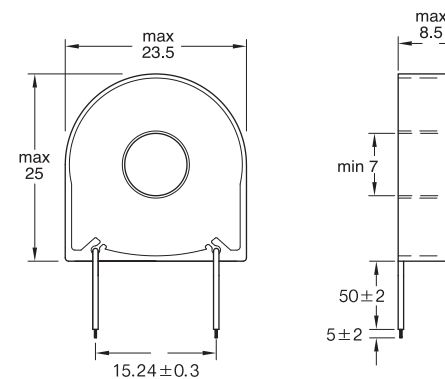
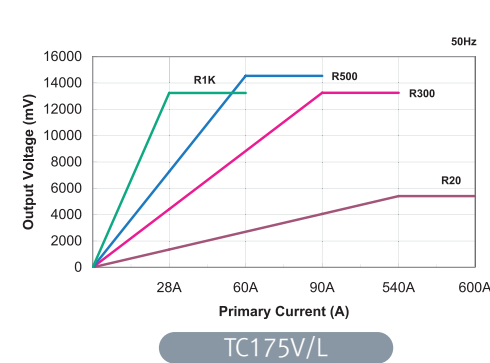
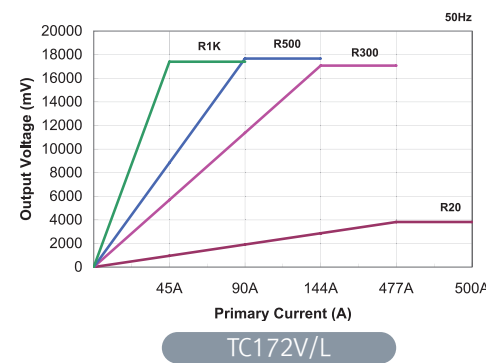
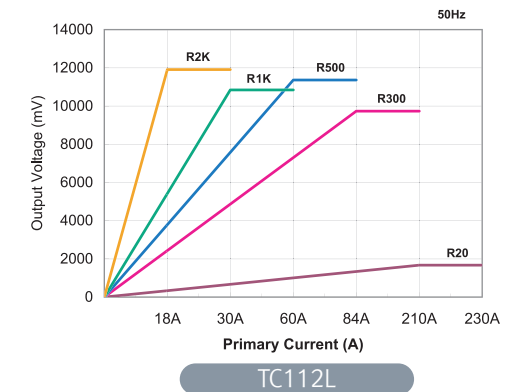
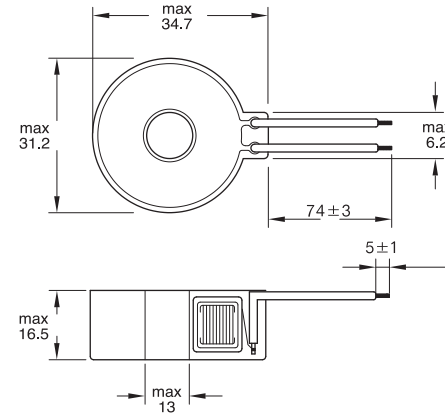
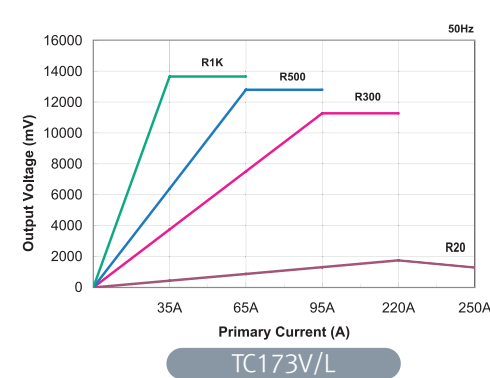
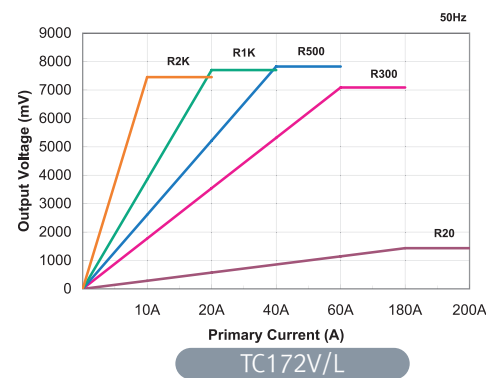
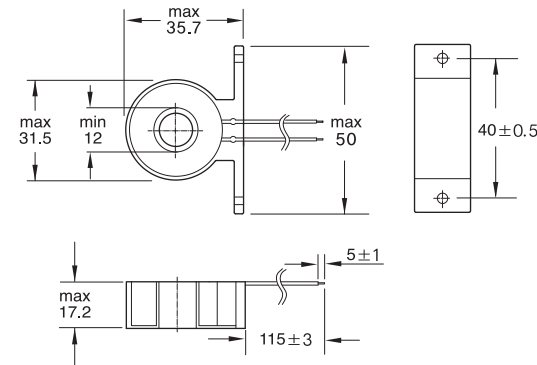
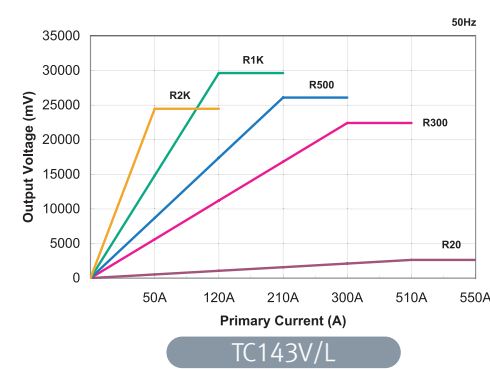
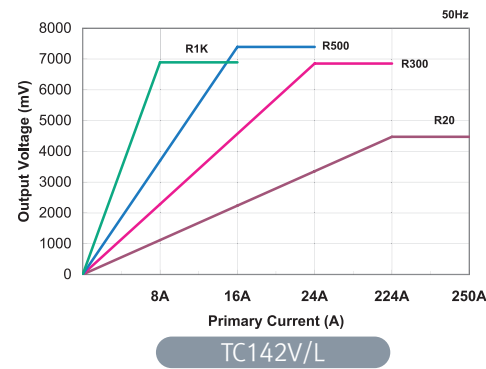
Model No	A(min)	B(max)	C(max)	D(max)	E(max)	F(±3.0)	G(±1.0)
TC1L	8.9 0.350"	22.0 0.866"	9.0 0.354"	25.0 0.984"	7.0 0.276"	73.0 2.874"	3.0 0.118"
TC2L	9.9 0.390"	24.0 0.945"	9.0 0.354"	27.0 1.063"	6.0 0.236"	120.0 4.724"	5.0 0.197"
TC3L	15.5 0.610"	30.35 1.195"	9.2 0.362"	33.4 1.315"	6.3 0.248"	122.0 4.803"	5.0 0.197"
TC172L	6.9 0.272"	23.6 0.930"	11.0 0.433"	26.8 1.055"	7.1 0.280"	71.0 2.795"	3.0 0.118"
TC140L TC148L	6.9 0.272"	23.6 0.930"	11.0 0.433"	26.8 1.055"	7.1 0.280"	81.0 3.189"	3.0 0.118"
TC141L TC149L	8.9 0.350"	24.8 0.976"	17.0 0.669"	28.4 1.118"	7.6 0.299"	73.0 2.874"	3.0 0.118"
TC173L	8.9 0.350"	24.8 0.976"	17.0 0.669"	28.4 1.118"	7.6 0.299"	65.0 2.559"	3.0 0.118"
TC150L	12.9 0.508"	37.5 1.476"	14.0 0.551"	41.3 1.626"	10.3 0.406"	77.0 3.031"	3.0 0.118"
TC4L TC142L TC143L TC174L	12.9 0.508"	37.5 1.476"	14.0 0.551"	41.3 1.626"	10.3 0.406"	77.0 3.031"	3.0 0.118"
TC175L	19.6 0.772"	48.2 1.898"	19.2 0.756"	52.0 2.047"	13.2 0.520"	110.0 4.331"	5.0 0.197"
TC5L	19.6 0.772"	48.2 1.898"	19.2 0.756"	52.0 2.047"	13.2 0.520"	130.0 5.118"	5.0 0.197"

Secondary Burden & Output Voltage Graph



PROTECTION PURPOSE PRECISION CURRENT TRANSFORMERS

PROTECTION PURPOSE PRECISION CURRENT TRANSFORMERS



MINIATURE SPLIT CORE CURRENT TRANSFORMERS

MINIATURE SPLIT CORE CURRENT TRANSFORMERS



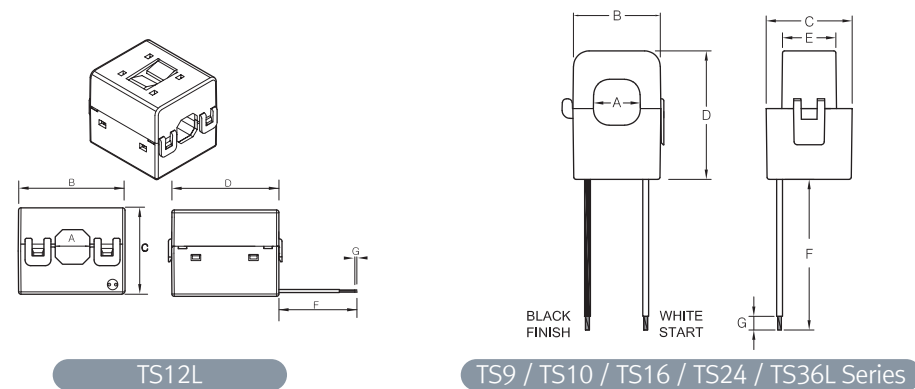
Application

- Home / Building / Factory Energy Management
- Sub metering monitoring & management
- Data logger to building & machinery
- Solar & wind turbine system, inverter system
- Load center

General Features

- Compliant to IEC61869-2
- Standard accuracy : Class 0.5 ~ Class 3
- Nominal linearity : $\pm 0.5\%$
- Operating frequency : 20Hz to 400Hz
- Voltage protection embedded
- RoHS compliant

Drawing



Dimension

Model No	A (min)	B (max)	C (max)	D (max)	E (max)
TS9L	5.9	19.1	19.2	32.7	10.2
TS10L	10	25	26.4	40	14
TS12L	12	36.2	36.6	40.2	
TS16L	16	31	32	48	19.2
TSFH16L	16	36.7	34.8	53.9	
TSH24L/TSFH24L	22.2	46	34.2	66	22.1
TSH36L/TSFH36L	34.4	57.7	38.5	83.3	23

(unit : mm)

Electrical Properties : mA Output

f : 50/60Hz

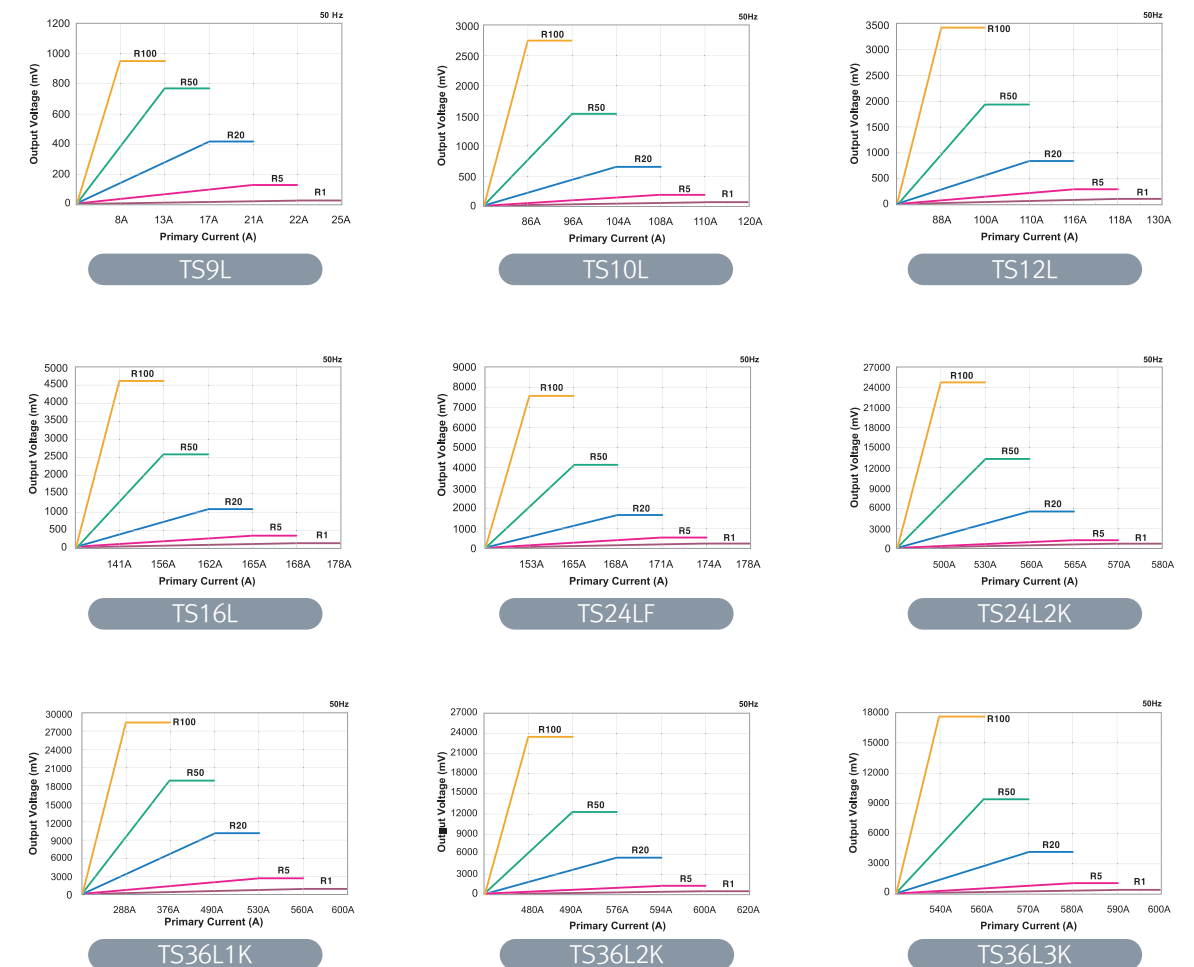
Properties	TS9L	TS10L	TS12L	TS16L	TS16LC	TSFH24L	TSH24L	TSFH36L	TSH36L
Current Rating	10A	50A	100A	100A	200A	200A	360A	300A	400A
Max Current	15A	80A	120A	150A	240A	240A	600A	330A	600A
Current Ratio	800 : 1	3000:1	2500:1	3000:1	1000:1	2000:1	2000:1	2000:1	2000:1
Hi-Potential	2kV per min.					4kV per min.			
Accuracy Class (IEC61869-2)	Class 0.5 ~ 3								

Electrical Properties : 333mV Output

f : 50/60Hz

Properties	TS9L	TS10L	TS12L	TS16L	TS16LC	TSFH24L	TSH24L	TSFH36L	TSH36L
Current Rating	10A	50A	100A	100A	200A	200A	360A	300A	400A
Max Current	15A	80A	120A	150A	240A	240A	600A	330A	600A
Current Ratio	800 : 1	3000:1	2500:1	3000:1	1000:1	2000:1	2000:1	2000:1	2000:1
Hi-Potential	2kV per min.					4kV per min.			
Accuracy Class (IEC61869-2)	Class 0.5 ~ 1								

Secondary Burden & Output Voltage





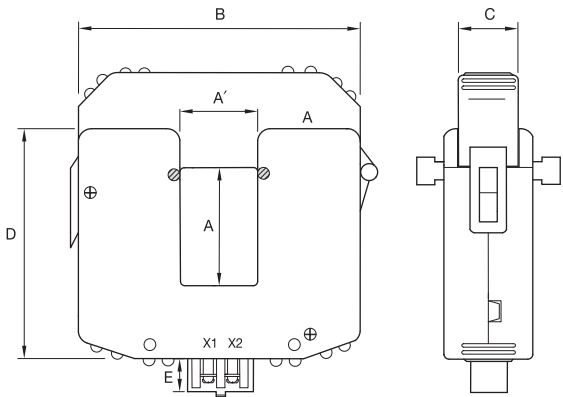
Application

- Three Phase Balance Current Monitoring
- Monitoring & Measurement for Retrofit

General Features

- Standard Accuracy Class 0.5, 1.0, & 3.0
- Excellent Linearity & Stability
- Rated Current from 100A to 4000A
- RoHS & REACH Compliant

Drawing & Dimension



TSP43 / TSP50 / TSP90 / TSP120 / TSP160 Series

Dimension

Model	(unit : mm)					
	A(min)	A'(min)	B(max)	C(max)	D(max)	E(max)
TSP43 Series	42	32	92	29	98	
TSP50 Series	50	20	82	41	94	
TSP90 Series	89	50	112	33	151	
TSP120 Series	118	78	142	30	181	
TSP160 Series	160	80	180	72	259	32

Electrical Properties

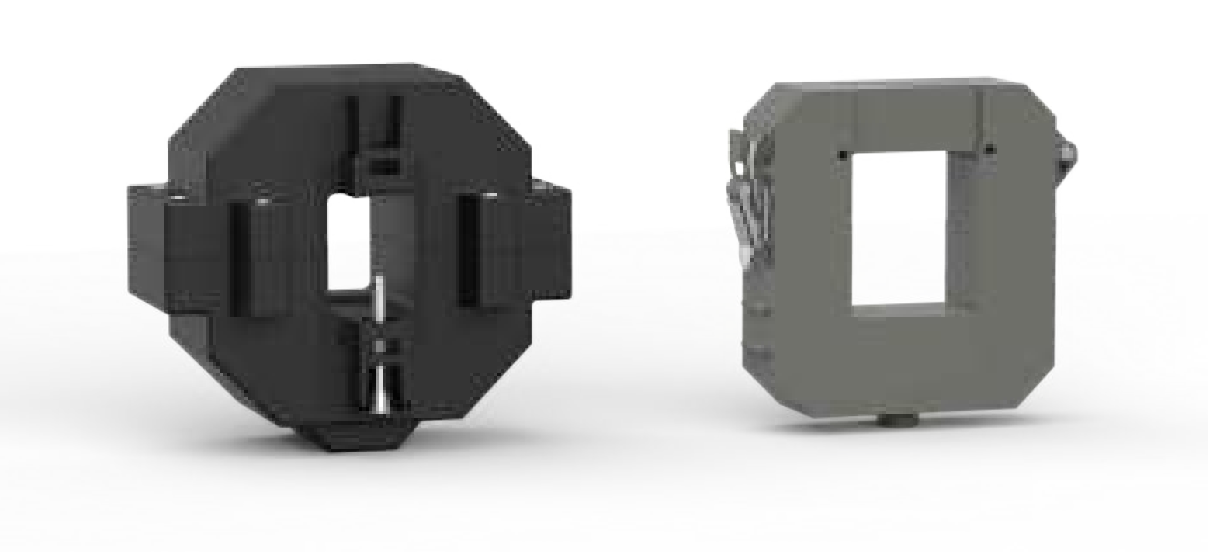
Current Rating	200A ~ 4000A	Rated Frequency	50Hz / 60Hz
Accuracy	Class 0.5~3.0	Secondary Output	5A / 1A
Frequency	50Hz ~ 400Hz	Hi-Potential Voltage	a.c. 4.0kV / 1 min.
Operating Temp.	-40°C ~ +50°C	Storage Temp.	-45°C ~ +80°C

※ The secondary output of mV and mA is customizable per request

Current Rating & Accuracy Class

(VA:2.5)

Series	Secondary Output	Current Rating										
		200A	300A	400A	500A	600A	800A	1000A	1200A	2000A	3000A	4000A
TSP43	1A	cl.1.0	cl.0.5	cl.0.5	cl.0.5							
	5A	cl.3.0	cl.3.0	cl.1.0	cl.0.5							
TSP50	1A	cl.1.0	cl.0.5	cl.0.5	cl.0.5	cl.0.5	cl.0.5					
	5A	cl.3.0	cl.3.0	cl.1.0	cl.0.5	cl.0.5	cl.0.5					
TSP90	1A				cl.0.5	cl.0.5	cl.0.5	cl.0.5	cl.0.5			
	5A				cl.0.5	cl.0.5	cl.0.5	cl.0.5	cl.0.5			
TSP120	1A						cl.0.5	cl.0.5	cl.0.5	cl.0.5		
	5A						cl.0.5	cl.0.5	cl.0.5	cl.0.5		
TSP160	1A							cl.0.5	cl.0.5	cl.0.5	cl.0.5	cl.0.5
	5A							cl.0.5	cl.0.5	cl.0.5	cl.0.5	cl.0.5



The TQP series from Taehwatrans are high-performance outdoor split-core current transformers designed for monitoring conductors in power distribution lines. These CTs are capable of converting AC input currents of up to 800A into standardized output currents of 1A or 5A, as specified by the customer. Built for outdoor durability, the TQP series features a corrosion-resistant core design, UV-resistant housing, and an IP67 ingress protection rating, ensuring long-term performance under harsh environmental conditions. With accuracy classes ranging from 0.5 to 3.0 and burden ratings between 1.25VA and 5VA, the TQP series provides flexibility to meet various metering and monitoring needs. Its compact and lightweight design enables easy, tool-less installation, minimizing labor time and allowing for metering service continuity without interrupting power lines. These transformers are an ideal solution for utilities and service providers seeking efficient, field-ready solutions for current measurement on live outdoor conductors.

Application

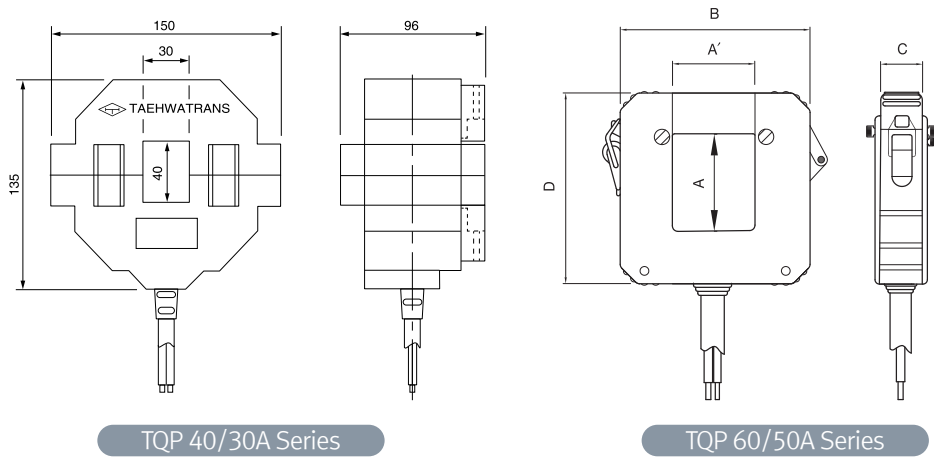
- Distribution Grid Monitoring
- Utility Pole top & Pad mount current transformer monitoring
- Outdoor Distribution Board & Panel

Features

- 100A ~ 800A Outdoor Monitoring Current Sensors
- IP67 rating with UV Resistive
- Hi-Potential Voltage 10K Per Min.
- Accuracy Class 0.5~3.0(1.25VA to 5VA) compliant to IEC61869-2
- Over-voltage protection circuits

Outdoor Weather Proof CT TQP Series

Drawing



1. Model : TQP40/30A Series

Dimension & Accuracy

Part no.	Current Ratio	Accuracy(Compliant to IEC61869-2)			Dimensions(mm)				Weight(kg)	IP Rating
		1.25VA	2.5VA	5VA	Window	Width	Height	Thickness		
TQP40/30A10	100:5A	3	3	3	30 X 40	150	135	96	2.3	67
TQP40/30A15	150:5A	3	3	3						
TQP40/30A20	200:5A	1	1	1						
TQP40/30A30	300:5A	0.5	0.5	1						
TQP40/30A40	400:5A	0.5	0.5	0.5						

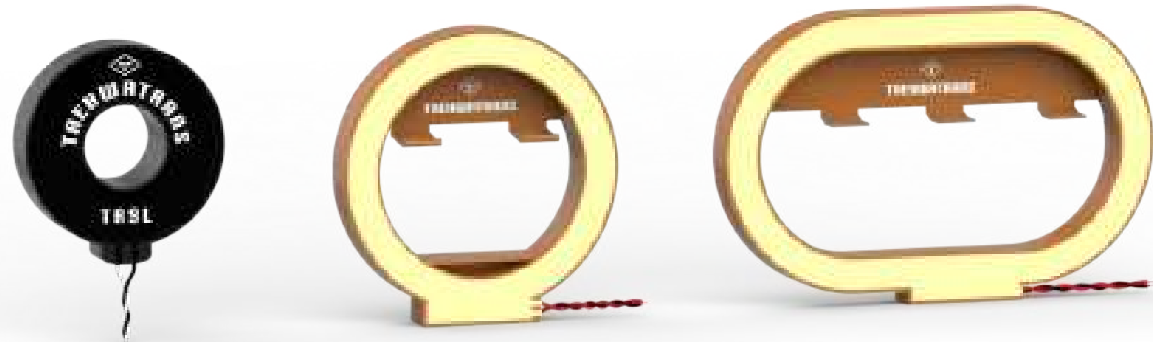
2. Model : TQP60/50A Series

Dimension & Accuracy

Part no.	Current Ratio	Accuracy(Compliant to IEC61869-2)			Dimensions(mm)				Weight(kg)	IP Rating
		1.25VA	2.5VA	5VA	Window	Width	Height	Thickness		
TQP60/50A40	400:5A	1	1	3	50 X 60	90	121	34	0.8	67
TQP60/50A60	600:5A	0.5	0.5	1						
TQP60/50A80	800:5A	0.5	0.5	0.5						

Electrical Properties

Current Rating	100A ~ 800A	Accuracy	Class 0.5~3.0
Secondary Output	5A & 1A	Rated Frequency	50Hz / 60Hz
IP Rating	IP67	Hi-Potential Voltage	a.c. 4.0kV / 1 min.
Certified	IP67 / TYPE TEST	Cable	13AWG AWM600V 4Meter
Operating Temp.	-40°C ~ +70°C	Storage Temp.	-45°C ~ +80°C



Application

- Smart Recloser on distribution line
- Electronic sectionizer
- High current & frequency metering & monitoring
- Harmonics measurement sensor
- Air circuit breaker (ACB)
- Gas insulation switch gear (GIS)
- AC component fault detector in DC power
- Welding machine

General Features

- Compliant to IEC61869-10
- Perfect immunity to DC external magnetic field
- High current & frequency coverage without saturation
- Intrinsic frequency linearity
- High potential voltage : 4kV per min.
- RoHS compliant

Test Conditions

1. Mutual Inductance Value based on the primary 100A
2. Max Stray Noise Output Voltage (Vo) on the ac external magnetic field 0.5mT
3. Burden Impedance : 1M Ω

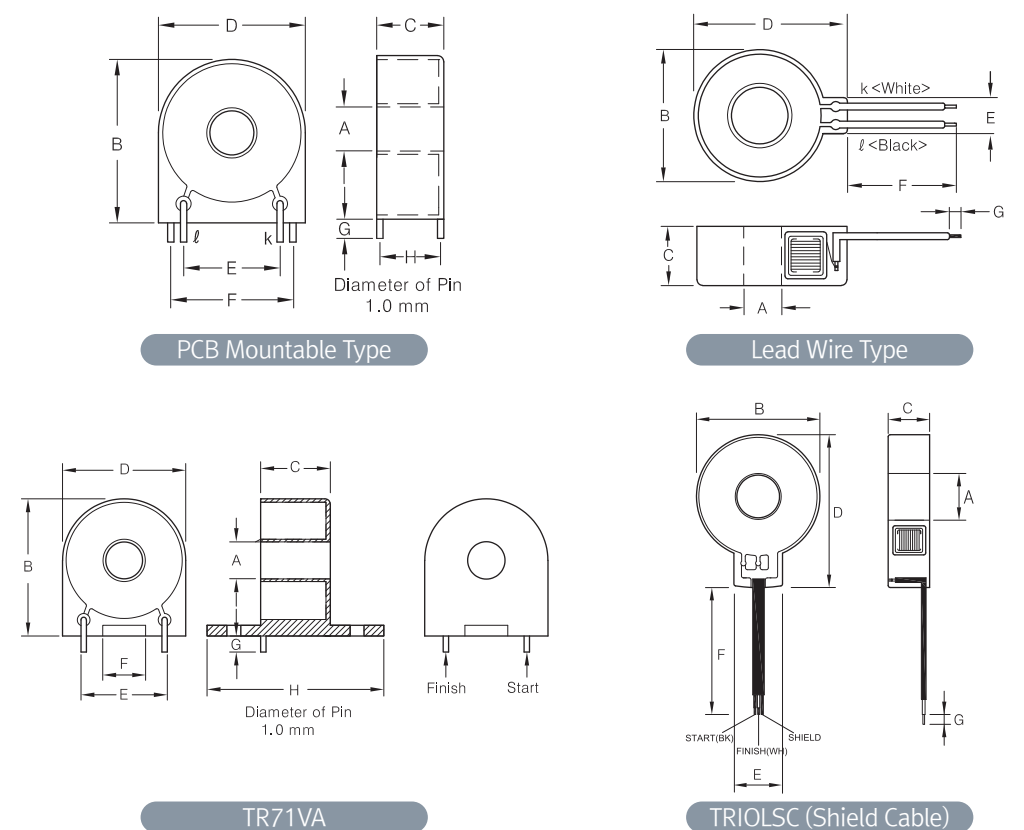
I. Miniature Rogowski Coils

ELECTRICAL PROPERTIES

f : 50Hz

Model No	DCR(Q) ±6%	Rated Current(A)	Max Current(kA)	Self Inductance(mH)	Mutual Inductance	Max Stray Noise Vo	Max Mutual Inductance Error(%)	Output Voltage at 100A	Instant Peak Amp(kA)
TR77V/L	100Ω	1000A	10kA	0.7mH	0.69μH	1.3mV	0.60%	21.6mV	64kA
TR71V/L	181Ω		9kA	7.6mH	3.25μH	0.3mV	0.03%	102.2mV	54kA
TR71VA	13.5Ω		13kA	0.4mH	0.80μH	0.3mV	0.12%	25.0mV	81kA
TR10VSH TR10LSH TR10LSC	173Ω		6kA	5.8mH	2.13μH	0.6mV	0.09%	66.9mV	39kA
TR9L	200Ω		6kA	20.9mH	4.48μH	4.0mV	0.28%	140.8mV	40kA

Drawing

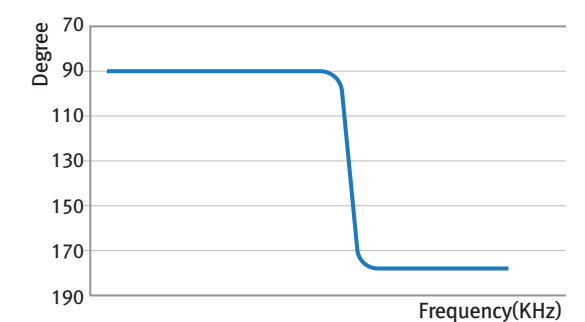
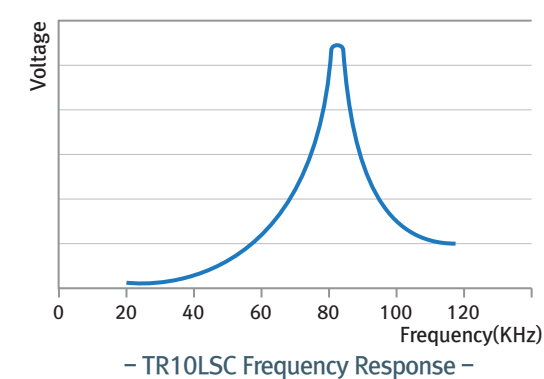


Dimension

(unit : mm)

Model No	A(min)	B(max)	C(max)	D(max)	E(± 0.3)	F(± 0.3)	G(± 1.0)	H(± 0.3)
TR77V	6.8	25.0	11.0	23.5	15.1	19.1	3.0	9.1
TR77L	6.9	23.6	11.0	26.8	7.1	71.0	3.0	
TR71V	8.9	27.5	17.0	25.3	15.1	19.1	3.0	15.1
TR71L	8.9	24.8	17.0	28.4	7.6	65.0	3.0	
TR71VA	8.9	27.7	20.3	25.3	15.1	9.0	3.0	4.0
TR10VSH	12.9	39.3	14.0	38.0	25.2	32.8	3.0	12.1
TR10LSH	12.9	37.5	14.0	41.3	10.3	240.0	5.0	
TR10LSC	12.9	37.5	14.0	46.8	14.9	381.0	5.0	
TR9L	19.6	48.2	19.2	52.0	13.2	270.0	5.0	

Frequency Vs Typical Output Gain Diagram



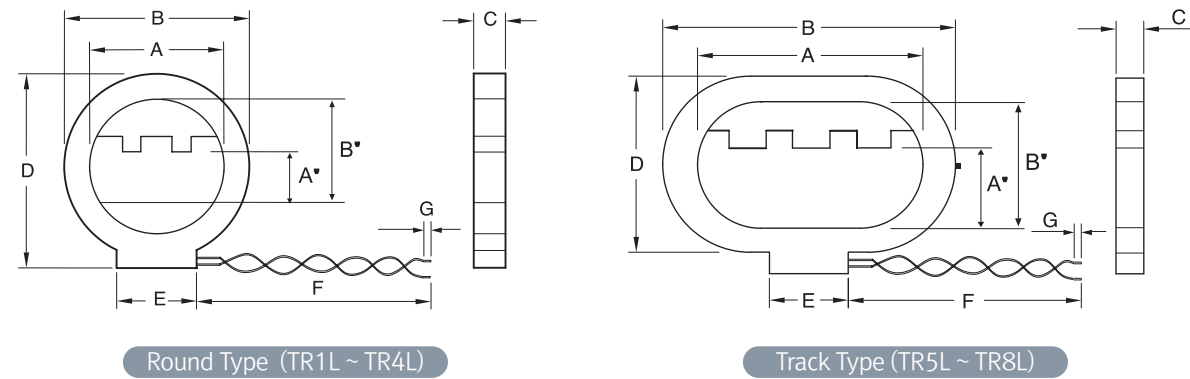
II. ACB & GIS Application Rogowski Coils

ELECTRICAL PROPERTIES

f : 50Hz

Model No	Current Rating(A)	Output Voltage	Max Current(kA)	Self Inductance	Mutual Inductance	Max Stray Noise Voltage	Max Mutual Inductance Error(%)
TR1L	630A	169.7mV	55kA	1.72mH	0.86 μ H	0.3mV	0.18%
TR2L	1000A		44kA	0.69mH	0.54 μ H		0.18%
TR3L	1250A		51kA	0.43mH	0.43 μ H		0.18%
TR4L	1600A		60kA	0.26mH	0.34 μ H		0.18%
TR5L	2000A		90kA	0.32mH	0.27 μ H		0.18%
TR6L	2500A		120kA	0.22mH	0.22 μ H		0.18%
TR7L	3200A		120kA	0.13mH	0.17 μ H		0.18%
TR8L	4000A		90kA	0.33mH	0.14 μ H		0.18%

Drawing

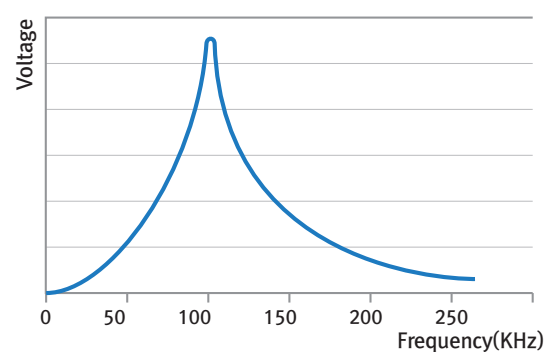


Dimension

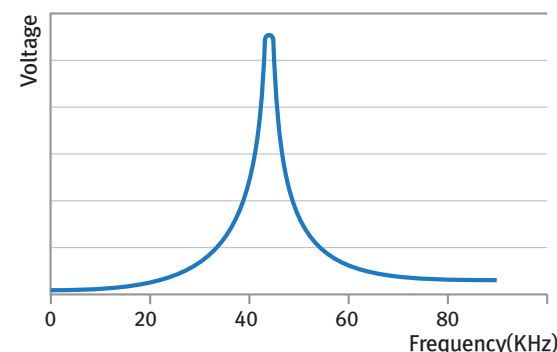
(unit : mm)

Model No	A(min)	B(max)	B'(max)	C(max)	D(max)	E(max)	F(± 7)	G(± 1)
TR1L/TR2L/TR3L/TR4L	53.0	75.0	48.9	12.5	76.5	31.5	300.0	5.0
TR5L/TR6L/TR7L/TR8L	98.0	119.0	54.4	11.0	76.0	31.5	300.0	5.0

Frequency Vs Typical Output Gain Diagram



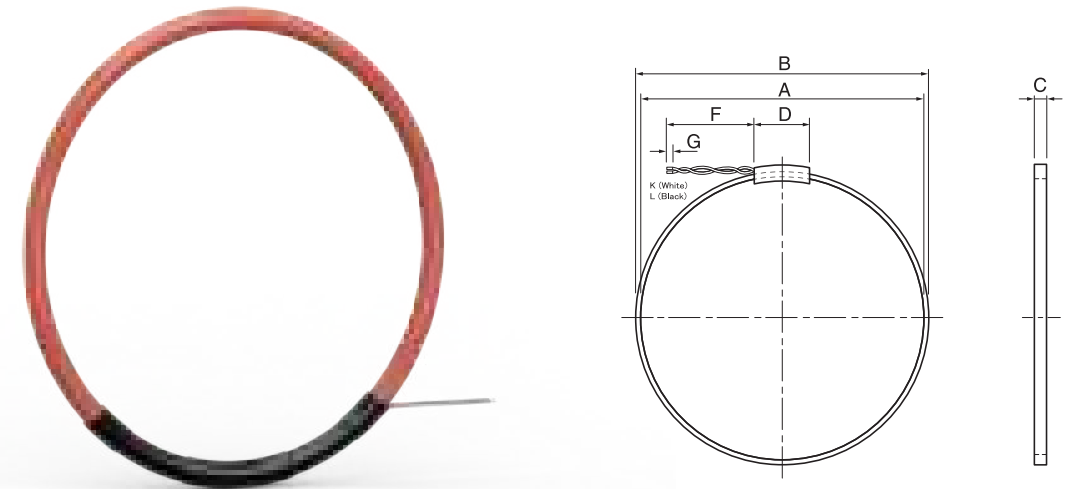
- TR1L Frequency Response -



- TR9L Frequency Response -

III. Switch Gear Application Rogowski Coils (Model : TFR610)

Drawing & Dimension

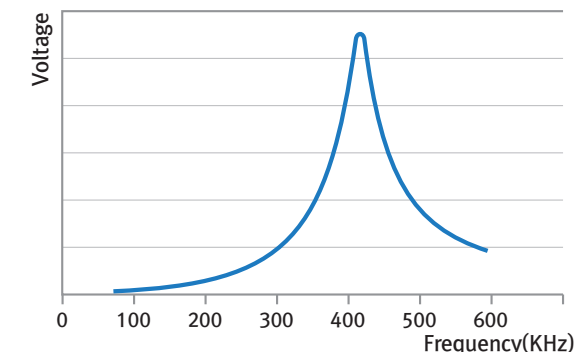


(unit: mm/inch)

A (Min)	B (Max)	C (Max)	D (Max)	F (± 5)	G (± 1)
190	200	10	50	200	10
7.48"	7.87"	0.39"	1.97"	7.87"	0.38"

Electrical Properties

Output (1000A, 60Hz)	400mV	Operating Frequency	20Hz~20KHz
Standard Accuracy	Class 0.5	Dynamic Current Range	72KA
Phase displacement	$\langle 0.5^\circ$	High Potential Volatge	a.c.7400V
Reading Error (20% Rating)	$\leq 0.75\%$	Temp Range	$-40^\circ\text{C} \sim +80^\circ\text{C}$
Max Positioning Error	Avr. $\pm 0.5\%$ (max 1%)	Insulation Resistance	DC500V/100M Ω Min
Max External Stray Mutual Inductance Error (1000A, AC0.5mT)	$\langle 0.1\%$		



- TFR610 Frequency Response -

FLEXIBLE & CLAMP-ON ROGOWSKI COILS

Features & Application

- X0BA7 UL 2808 & CSA 61010-02 (Insulation CATIII 1000V, CAT IV 600V) Pollution Degree III
- IP67 & UV Protective
- Power quality monitoring
- Current balance monitoring
- Power distribution line monitoring
- Quick & easy installation

Part Number & Dimension

(unit : mm/inch)

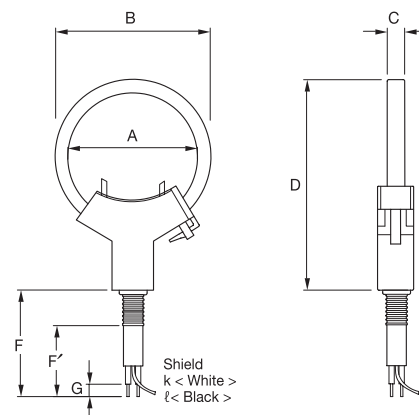
Item	TFR180LU	TFR240LU	TFR300LU	TFR400LU	TFR620LU
Window Size	47	60	75	110	160
	1.85"	2.36"	2.95"	4.33"	6.29"
Outer Diameter	66	79	94	129	179
	2.59"	3.11"	3.70"	5.07"	7.04"

Electrical Properties

Accuracy Class (IEC61869-10)	Class 0.5	Operating Frequency	20Hz ~ 20KHz
Output Voltage @1000A,60Hz	120mV / 240mV / 480mV / 600mV	Nominal Measurement Current	5A to 6,000A
Max Primary Voltage	1000V CAT III	IP Rating & UV Resistance	IP67 & UV Resistance
Phase Displacement	<0.5°	Hi-Potential Voltage Per min.	AC 7,400V / min.
Reading Error (20% Rating)	≤0.75%	Full Scale Error (Whole Range)	±0.5%
Position Error (0° ~ 360°)	Avr. ±0.5% (max 1%)	Temperature Drift	±0.15% per 10°C
Max External Stray Mutual Inductance Error (1000A, AC0.5mT)	<0.1%		
Ambient Operating Temp.	-40°C ~ +80°C	Cable Length	2 Meters / 5Meters
		Storage Temperature	-40°C ~ +80°C

I. Flexible Rogowski Coils

› UL2808 & CSA61010-02 600V CATIV Pol.Degree III

Drawing

TFR000L / YFR000H Series

FLEXIBLE & CLAMP-ON ROGOWSKI COILS

Features & Application

- X0BA7 UL 2808 & CSA 61010-02 (Insulation CATIII 1000V, CAT IV 600V) Pollution Degree III
- IP67 & UV Protective
- Power quality monitoring
- Current balance monitoring
- Power distribution line monitoring
- Quick & easy installation

Part Number & Dimension

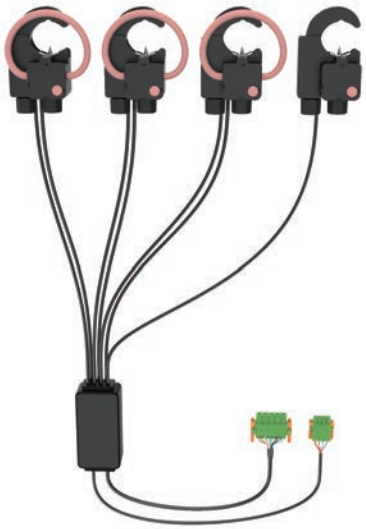
(unit : mm/inch)

Item	TGR410L	TGR570L	TGR730L	TGR1040L
Window Size	100	150	200	300
	3.94"	5.91"	7.87"	11.81"
Outer Diameter	150	200	250	350
	5.91"	7.87"	9.84"	13.78"

Electrical Properties

Accuracy Class (IEC61869-10)	Class 0.5	Operating Frequency	20Hz ~ 20KHz
Output Voltage @1000A,60Hz	30mV ~ 120mV	Nominal Measurement Current	5A to 6,000A
Max Primary Voltage	1000V CAT III	IP Rating & UV Resistance	IP67 & UV Resistance
Phase Displacement	<0.5°	Hi-Potential Voltage Per min.	AC 7,400V/3s 6,000V / Min
Reading Error (20% Rating)	≤0.75%	Full Scale Error (Whole Range)	±0.5%
Position Error (0° ~ 360°)	Avr. ±1.0%	Temperature Drift	±0.15% per 10°C
Max External Stray Mutual Inductance Error (1000A, AC0.5mT)	<0.1%		
Ambient Operating Temp.	-40°C ~ +80°C	Cable Length	2 Meters / 5Meters
		Storage Temperature	-40°C ~ +80°C

FLEXIBLE & CLAMP-ON ROGOWSKI COILS



Features & Application

- Excellent linearity in dynamic range, 0.1A to 1kA
- Voltage Piercing Mode with IP63
- Product Dimension : 81.5mm(H) x 46.5mm (W) x 25mm (H)
- Enhanced shield to reduce exposure to external magnetic fields
- No need for a separate signal integrator
- Indicators for power loss, tools for fault location on transmission lines
- Used in Synchronous Phasor Measurement Units (PMUs) for real-time system analysis

The **TMR40** represents an advanced line of **flexible Rogowski® current sensors**, purpose-built for seamless integration with various metering devices. Designed with enhanced shielding, these coils provide excellent immunity against ambient magnetic interference. Thanks to this improved design, the **TMR40** can be **directly interfaced with DIN rail or panel-mounted meters** that natively support Rogowski coil input, eliminating the need for a separate signal integrator.

FLEXIBLE & CLAMP-ON ROGOWSKI COILS



Features & Application

- MV Rogowski coil (Operating voltage 12KV, Hi-potential voltage 24KV)
- IP67 & UV protective
- Current measurement in MV switchgear
- Energy monitoring and load analysis in industrial plants
- Predictive maintenance and fault detection systems
- Smart grid and AMI (Advanced Metering Infrastructure)
- Busduct current monitoring and protection systems
- Power quality (PQ) monitoring and system diagnostics

Part Number & Dimension

(unit : mm/inch)

Item	TFR240LM	TFR300LM	TFR400LM	TFR620LM
Window Size	60	75	110	160
	2.36"	2.95"	4.33"	6.29"
Outer Diameter	84	99	134	184
	3.30"	3.89"	5.27"	7.24"

Electrical Properties

Accuracy Class (IEC61869-10)	Class 0.5	Operating Frequency	1Hz ~ 20KHz
Output Voltage @1000A,60Hz	30mV / 500A 50Hz	Nominal Current	0.1A to 1KA
Rated Primary Current	100A	Tolerance	<0.5%
Max Primary Current I _{max}	500A	Linearity	±0.1% (1% ~ 100%)
Rated Accuracy	Class 0.5%	Hi-Potential Voltage	7400Vac / min
Position Error (0° ~ 360°)	<1%	Temperature Drift	<3800ppm/ C
Output 0A (zero drift)	<0.05mV	Temp. Drift Coefficiency	<100ppm/C
Phase Error	<0.5° (45Hz ~ 65Hz)	Coil Thickness	6mm
Ambient Operating Temp.	-40°C ~ +70°C	Humidity	≤80%RH

Electrical Properties

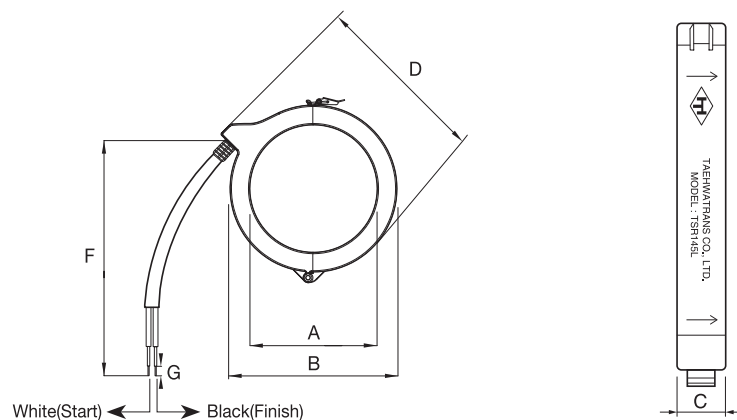
Accuracy Class (IEC61869-10)	Class 0.5	Operating Frequency	20Hz ~ 20KHz
Output Voltage @1000A,60Hz	120mV / 270mV 380mV/ 480mV	Nominal Measurement Current	5A to 6,000A
Max Primary Voltage	AC 12KV	IP Rating & UV Resistance	IP67 & UV Resistance
Phase Displacement	<0.5°	Hi-Potential Voltage Per min.	AC 28KV / Min.
Reading Error (20% Rating)	≤0.75%	Full Scale Error (Whole Range)	±0.5%
Position Error (0° ~ 360°)	Avr. ±0.5% (max 1%)	Temperature Drift	±0.15% per 10°C
Max External Stray Mutual Inductance Error (1000A, AC0.5mT)	<0.1%		
		Cable Length	3 Meters / 5 Meters
Ambient Operating Temp.	-40°C ~ +80°C	Storage Temperature	-40°C ~ +80°C

FLEXIBLE & CLAMP-ON ROGOWSKI COILS

Features & Application

- Clamp-on Rogowski coil
- UL XODW8 Recognized
- Current measurement in confined or irregular spaces
- Energy monitoring in industrial facilities
- Predictive maintenance and fault detection
- High-frequency transient and harmonic analysis
- Smart grid and substation monitoring systems

Drawing



Dimension

(unit : mm/inch)

Model No.	A (min)	B (max)	C (max)	D (max)
TSR35L/C	35.0 (1.378")	83.0 (3.268")	20.9 (0.823")	99.5 (3.917")
TSR115L/C	114.5 (4.508")	151.2 (5.953")	22.4 (0.882")	173.0 (6.811")
TSR145L/C	145.0 (5.709")	190.0 (7.480")	22.5 (0.886")	210.0 (8.268")

※ L : 600V Cable Type ※ C : BNC Connector Type

Electrical Properties

Accuracy Class (IEC61869-10)	Class 0.5	Operating Frequency	20Hz~20KHz
Output Voltage @1000A,60Hz	120mV	Nominal Measurement Current	5A to 6000A
Output Voltage @1000A,50Hz	100mV	Hi-Potential Voltage per min.	a.c 7400V
Reading Error (20% Rating)	≤0.75%	Full Scale Error (Whole Range)	≤ 0.5%
Phase Displacement	∠0.5°	Connected Cable	AWG24 600V
Max Position Error (0° ~ 360°)	Avr. ± 0.5%(max 1%)	IP Rating & UV Resistance	IP67 & UV Resistive
Max External Stray Mutual Inductance Error (1000A, AC0.5mT)	∠0.1%		
Ambient Operating Temp.	-40°C ~ +80°C	Storage Temperature	-40°C ~ +80°C

FLEXIBLE & CLAMP-ON ROGOWSKI COILS

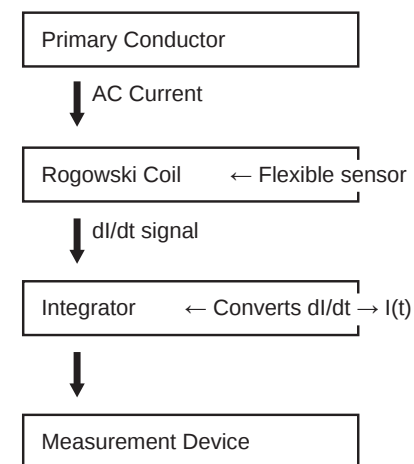
What is a Rogowski Coil??

A modern, flexible solution for high-precision AC current sensing.

A Rogowski coil is a toroidal, air-core sensor designed to measure alternating current (AC) by detecting the changing magnetic field surrounding a conductor. Unlike traditional current transformers (CTs), it has no ferromagnetic core, which means it is immune to saturation and provides excellent linearity across a wide current range.

When AC current flows through the primary conductor, the Rogowski coil generates a voltage proportional to the rate of change of current (di/dt). This signal is then sent to an integrator, which reconstructs the actual current waveform.

How It Works – Concept Diagram



Why Choose Rogowski Coils?

- No saturation: Ideal for high-current applications
- High accuracy & linearity: Even under harmonic distortion
- Safe & non-invasive: No direct electrical contact required
- Flexible and lightweight: Easy to install in tight spaces
- Customizable output: mV/kA options for various meters

FAQ: In-depth Technical Questions

Q1. How does the absence of a magnetic core influence frequency response?

Rogowski coils offer superior high-frequency response due to the absence of a magnetic core, which eliminates core-related losses and saturation. This makes them ideal for detecting transients and harmonics in power systems.

Q2. What factors determine the accuracy class of a Rogowski coil system?

Accuracy depends on several parameters including coil geometry, turns uniformity, shielding quality, and the precision of the integrator. Environmental factors such as temperature stability and electromagnetic interference also influence final performance.

Q3. How is phase error minimized in Rogowski coil-based measurement systems?

Phase error is minimized through careful design of the integrator circuit and by calibrating both the coil and integrator together as a system. Low-pass filtering and digital compensation techniques can also help reduce phase deviation.

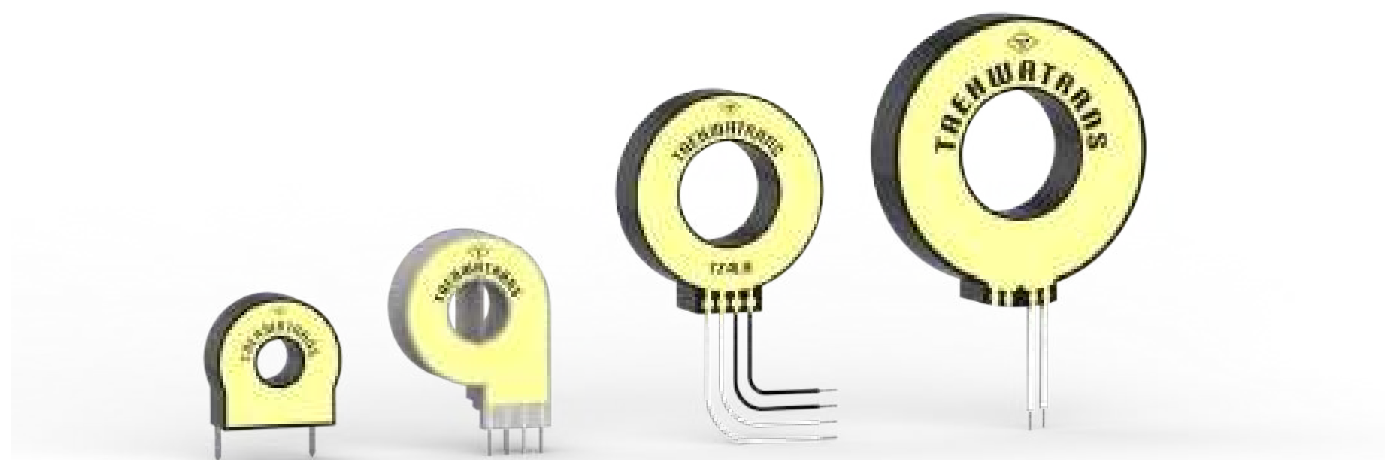
Q4. Can Rogowski coils be used in permanent installations for energy metering?

Yes, Rogowski coils are increasingly used in permanent metering, especially in retrofit scenarios. Their lightweight and non-saturating nature make them suitable for high-current, long-term applications when paired with stable integrators.

Q5. What are the considerations for designing Rogowski coils in high-EMI environments?

In high electromagnetic interference (EMI) environments, proper shielding (e.g., braided copper mesh), twisted-pair output cabling, and integrators with common-mode noise rejection are essential to preserve signal integrity.

ZERO PHASE CURRENT TRANSFORMERS



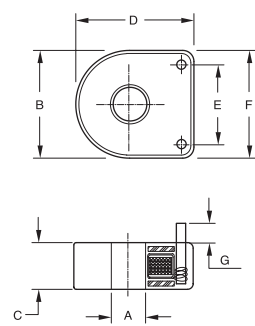
Application

- Residual current circuit breaker
- Earth leakage circuit breaker
- ZCT for Energy Storage System (ESS)
- Home Energy Management System
- Application leakage circuit interrupter
- Ground fault interrupter
- EV Charging Plug & Cable

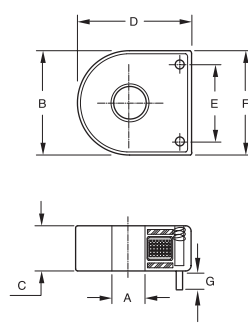
General Features

- Minimum output voltage tolerance
- Close to zero load shift & excellent thermal properties
- A variety of configuration
- RoHS compliant

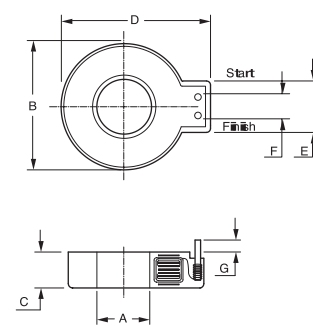
Drawing



TZ1H

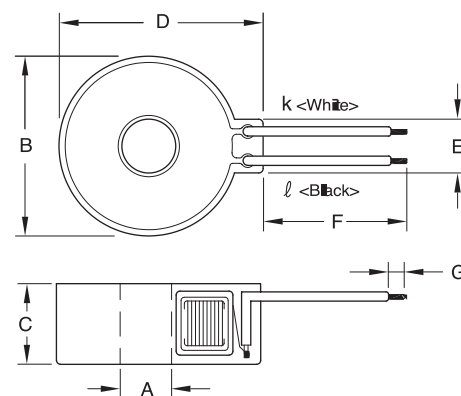


TZ1H3



TZ53H

Drawing



Lead Wire Type

ZERO PHASE CURRENT TRANSFORMERS

Dimension & Current Rating

› Leadwire Type

(unit : mm/inch)

Model No	Dimension(mm/inch)							Rated Current Rated Sensitivity	Secondary Noise Voltage
	A(min)	B(max)	C(max)	D(max)	E(±0.3)	F(±0.3)	F(±0.3)		
TZ1L	5.9 0.232"	17.4 0.685"	8.0 0.315"	20.5 0.807"	5.5 0.217"	73.0 2.874"	3.0 0.118"	15A – 30A 15mA – 30mA	Hair Pin Test ≤RMS 1.5mV / 60A 1KΩ
TZ53L10	6.9 0.272"	17.1 0.673"	6.7 0.264"	19.1 0.752"	5.2 0.205"	50.0 1.969"	3.0 0.118"		
TZ1PL	7.3 0.287"	19.1 0.752"	8.1 0.319"	22.0 0.866"	7.0 0.276"	73.0 2.874"	3.0 0.118"		
TZ2L9	8.9 0.350"	22.0 0.866"	8.2 0.323"	25.0 0.984"	7.0 0.276"	120±5.0 4.724"	4.0±0.5 0.157"	30A 15mA – 30mA	Hair Pin Test ≤RMS 1mV / 180A 1KΩ
TZ3L	9.9 0.390"	24 0.945"	9.0 0.354"	27.0 1.063"	6.0 0.236"	73.0 2.874"	3.0 0.118"	50A 15mA – 30mA	Hair Pin Test ≤RMS 10mV / 300A 1KΩ
TZ3PLG	9.9 0.390"	24 0.945"	9 0.354"	27 1.063"	6 0.236"	73 2.874"	3 0.118"	60A 15mA – 30mA	Hair Pin Test ≤RMS 0.3mV / 60A 470Ω
TZ3PLG1	9.9 0.390"	24 0.945"	9 0.354"	27 1.063"	6 0.236"	73 2.874"	3 0.118"	40A 15mA – 30mA	Hair Pin Test ≤RMS 0.4mV / 60A 470Ω
TZ3PL	12.5 0.492"	26.2 1.031"	9.0 0.354"	29.0 1.142"	6.45 0.254"	120±5.0 4.724"	4±0.5 0.157"	20A & 50A 15mA – 30mA	Hair Pin Test ≤RMS 10mV / 300A 1KΩ
TL3L	9.9 0.390"	24 0.945"	9 0.354"	27 1.063"	6 0.236"	73 2.874"	3 0.118"	15A – 30A 15mA – 30mA	Hair Pin Test ≤RMS 3mV / 180A 1KΩ
TZ4L	15.5 0.610"	30.35 1.195"	9.2 0.362"	33.4 1.315"	6.3 0.248"	73 2.874"	3 0.118"	100A 15mA – 30mA	Hair Pin Test ≤RMS 10mV / 300A 1KΩ
TZ2LG	8.9 0.350"	22 0.866"	8.2 0.323"	25 0.984"	7 0.276"	120±5.0 4.724"	4.0±0.5 0.157"	30A 15mA – 30mA	Hair Pin Test ≤RMS 1mV / 180A 1KΩ
TZ5L	19.4 0.764"	40.5 1.594"	10 0.394"	43.5 1.713"	12.1 0.476"	87 3.425"	6 0.236"	50A 15mA – 30mA	Hair Pin Test ≤RMS 5mV / 60A 1KΩ
TL5L	19.4 0.764"	40.5 1.594"	10 0.394"	43.5 1.713"	12.1 0.476"	87 3.425"	6 0.236"	120A 15mA – 30mA	Hair Pin Test ≤RMS 8mV / 900A 1KΩ

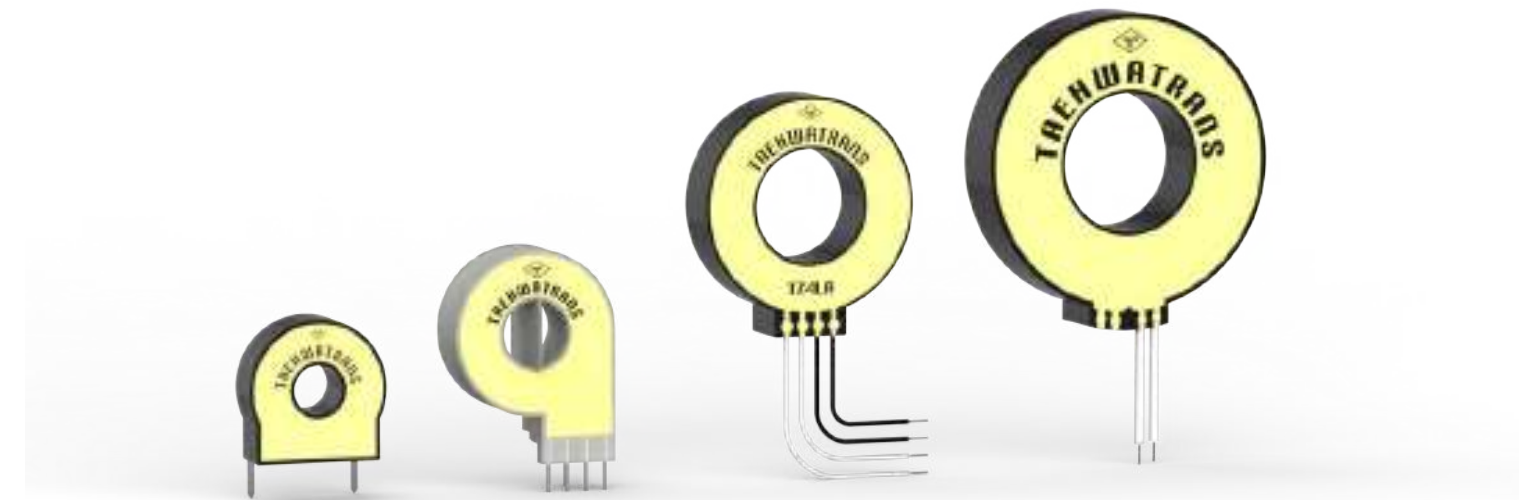
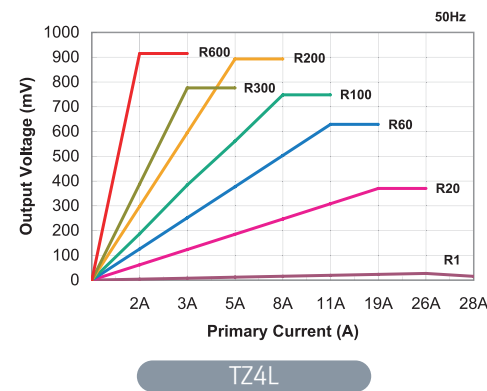
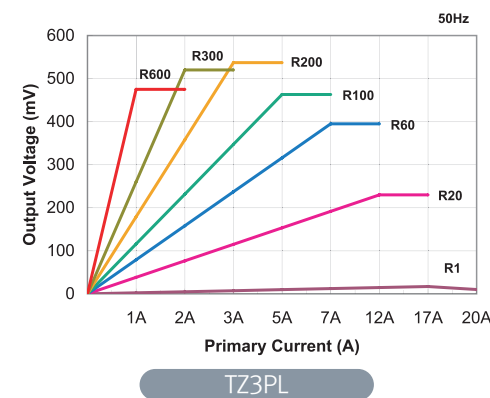
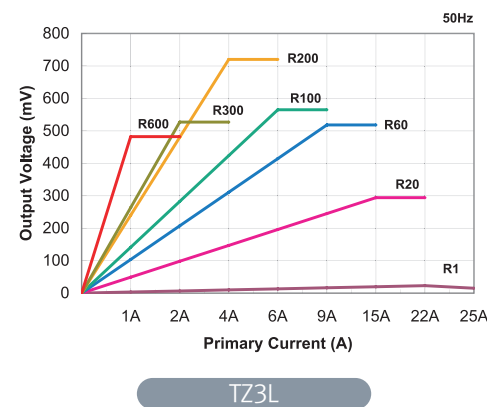
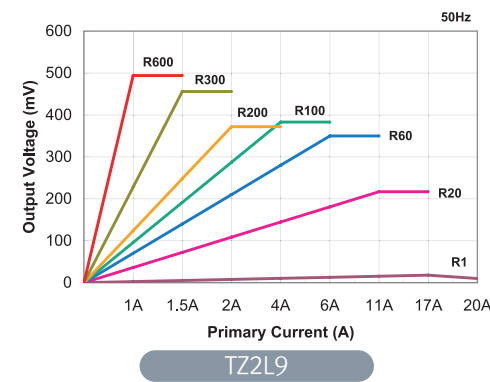
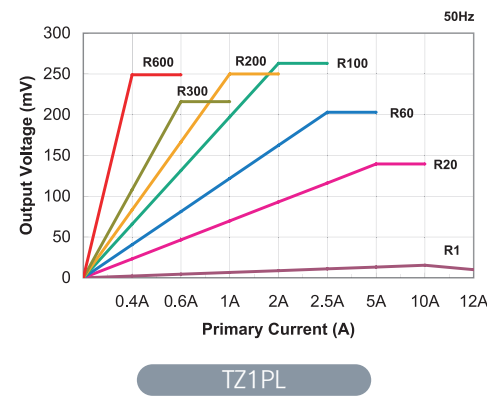
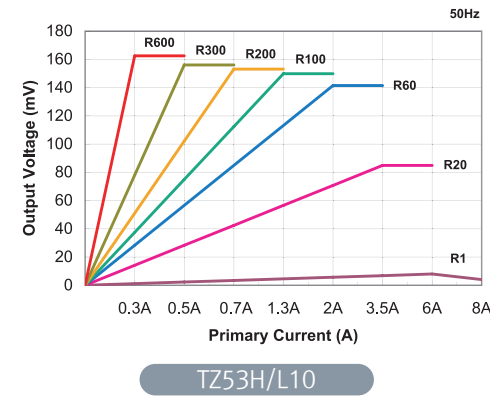
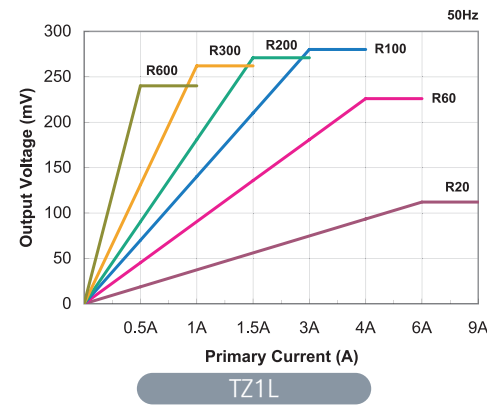
Dimension & Current Rating

› PCB mountable Type

(unit : mm/inch)

Model No	Dimension(mm/inch)								Rated Current Rated Sensitivity	Secondary Noise Voltage
	A(min)	B(max)	C(max)	D(max)	E	F(max)	G(±0.5)	H(±0.3)		
TZ1H	5.7 0.224"	17.4 0.685"	8.0 0.315"	17.3 0.681"	11.2 0.441"	17.4 0.685"	6±1.0 0.236"		15A – 30A 15mA – 30mA	Hair Pin Test ≤RMS 1.5mV / 60A 1KΩ
TZ1H3	6.1 0.240"	17.1 0.673"	7.0 0.276"	18.2 0.717"	10.3 0.406"	17.1 0.673"	2.75 0.108"			
TZ1H6	6 0.236"	17.1 0.673"	7 0.276"	18.2 0.717"	10.3 0.406"	17.1 0.673"	6 0.236"			
TZ53H	6.9 0.272"	17.1 0.673"	6 0.236"	19.1 0.752"	5.2 0.205"	3±0.3 0.118"	6±3.0 0.236"		20A 5mA – 10mA	Hair Pin Test ≤RMS 1.0mV / 180A 1KΩ
TG4H2	6 0.236"	17.6 0.693"	6.6 0.260"	17.8 0.701"	12.4 0.488"	17.7 0.697"	2.9 0.114"			
TZ67VA	5.7 0.224"	19.5 0.768"	8.6 0.339"	19.2 0.756"	12.7 0.500"	16 0.630"	3 0.118"	7.5 0.297"		
TZ67V1	5.7 0.224"	19.5 0.768"	8.6 0.339"	19.2 0.756"	12.7 0.500"		3 0.118"	7.5 0.297"	20A 5mA – 10mA	Hair Pin Test ≤RMS 1.5mV / 20A 3.83KΩ
TL65V	5.7 0.224"	19.5 0.768"	8.6 0.339"	19.2 0.756"	12.7 0.500"		3 0.118"		15A – 30A 5mA – 10mA	Hair Pin Test ≤RMS 3.0mV / 60A 1KΩ
TL2PV	9.9 0.390"	25.6 1.008"	10 0.394"	23.8 0.941"	15.1 0.594"	19.1 0.752"	3 0.118"	9 0.354"	15A – 35A 5mA – 10mA	Hair Pin Test ≤RMS 2.0mV / 60A 1KΩ
TZ2H	8.9 0.350"	22 0.866"	8.2 0.323"	25 0.984"	3.8 0.150"	8 0.315"	0.64 0.025"		15A – 30A 15mA – 30mA	Hair Pin Test ≤RMS 1.5mV / 60A 1KΩ
TZ3H	12.5 0.492"	26.3 1.035"	9 0.354"	29 1.142"	2.5 0.098"	8 0.315"	0.64 0.025"			
TZ4H	15.5 0.610"	30.35 1.195"	9.2 0.362"	33.4 1.315"	2.5 0.098"	8 0.315"	0.64 0.025"			
									100A 15mA – 30mA	Hair Pin Test ≤RMS 1mV / 180A 1KΩ

Drawing



Application

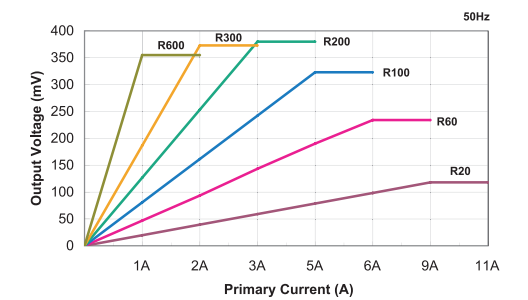
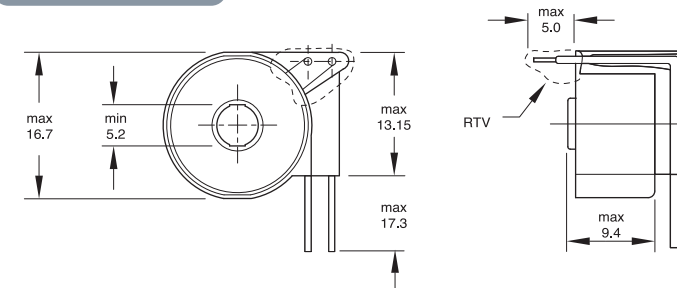
- GFCI outlet receptacle (Wall socket)
- AFCI outlet receptacle (Wall socket)
- ALCI power cord
- Differential (mA) current sensor
- Ground neutral sensor
- EV Charging Plug & Cable

General Features

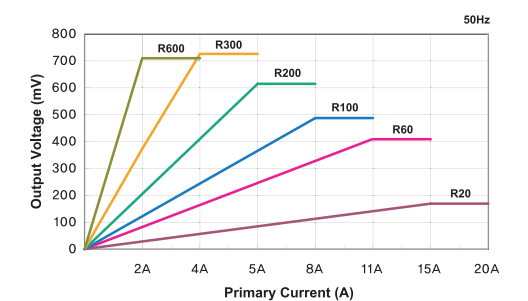
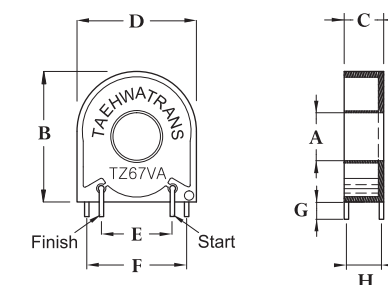
- Close to zero load shift
- Excellent balance properties
- Precision output voltage
- Superior hair-pin performance
- Minimal thermal variance
- RoHS compliant

Differential & Current Transformer Series

TZ47V

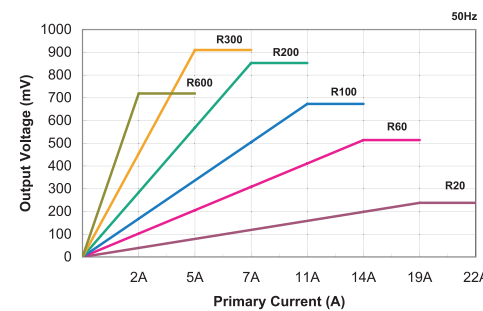
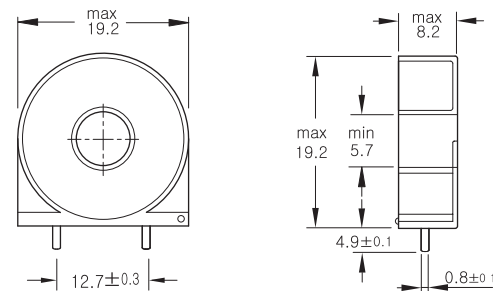


TZ67VA

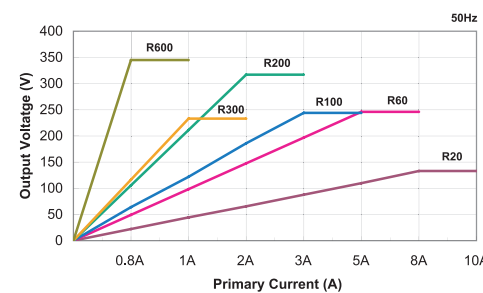
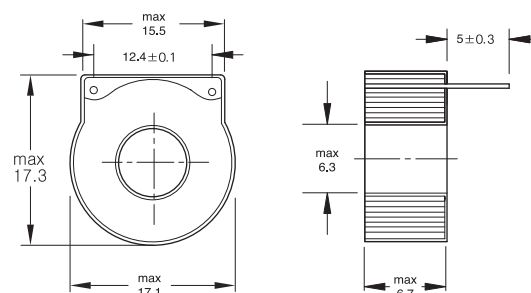


Differential & Current Transformer Series

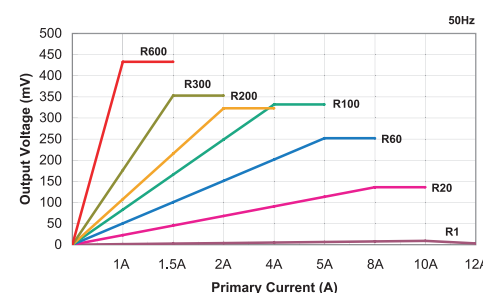
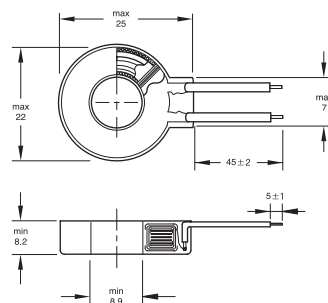
TZ68V1



TG4V



TG115L



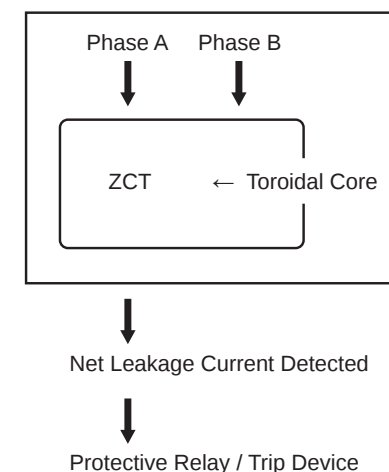
What is a Zero-Phase Current Transformer (ZCT)?

Essential for Ground Fault Detection and Electrical Safety

A Zero-Phase Current Transformer (ZCT) is a type of current sensor designed to detect ground fault current in three-phase or single-phase power systems. It operates by monitoring the vector sum of all phase conductors—including the neutral—passing through its toroidal core. Under normal operating conditions, the sum of the currents equals zero, resulting in no net magnetic flux and thus no output signal.

However, if a ground fault occurs, the balance is broken. The resulting difference creates a net magnetic flux, which induces a voltage in the secondary winding proportional to the leakage current. This signal is used to trigger protective devices such as Residual Current Devices (RCDs) or Ground Fault Relays.

How It Works – Concept Diagram



Why Choose Zero-Phase Current Transformers?

- High sensitivity to ground faults
- No need to monitor each phase separately
- Compact and easy to install around bundled cables
- Fast response to leakage conditions
- Works for single-phase or three-phase systems

FAQ: In-depth Technical Questions

Q1. How does a ZCT differ from a traditional current transformer?

Unlike a traditional CT that measures the current in a single conductor, a ZCT monitors the sum of all phase and neutral currents. It detects imbalance caused by leakage rather than the magnitude of the load current.

Q2. What makes ZCTs suitable for ground fault protection?

They are highly sensitive to small leakage currents (typically in the mA range), making them ideal for early detection of faults that might not trigger traditional overcurrent protection.

Q3. How should the conductors be arranged through a ZCT?

All phase and neutral conductors of the monitored circuit must pass through the center of the toroid. Any grounding conductors must be routed outside the ZCT to avoid false readings.

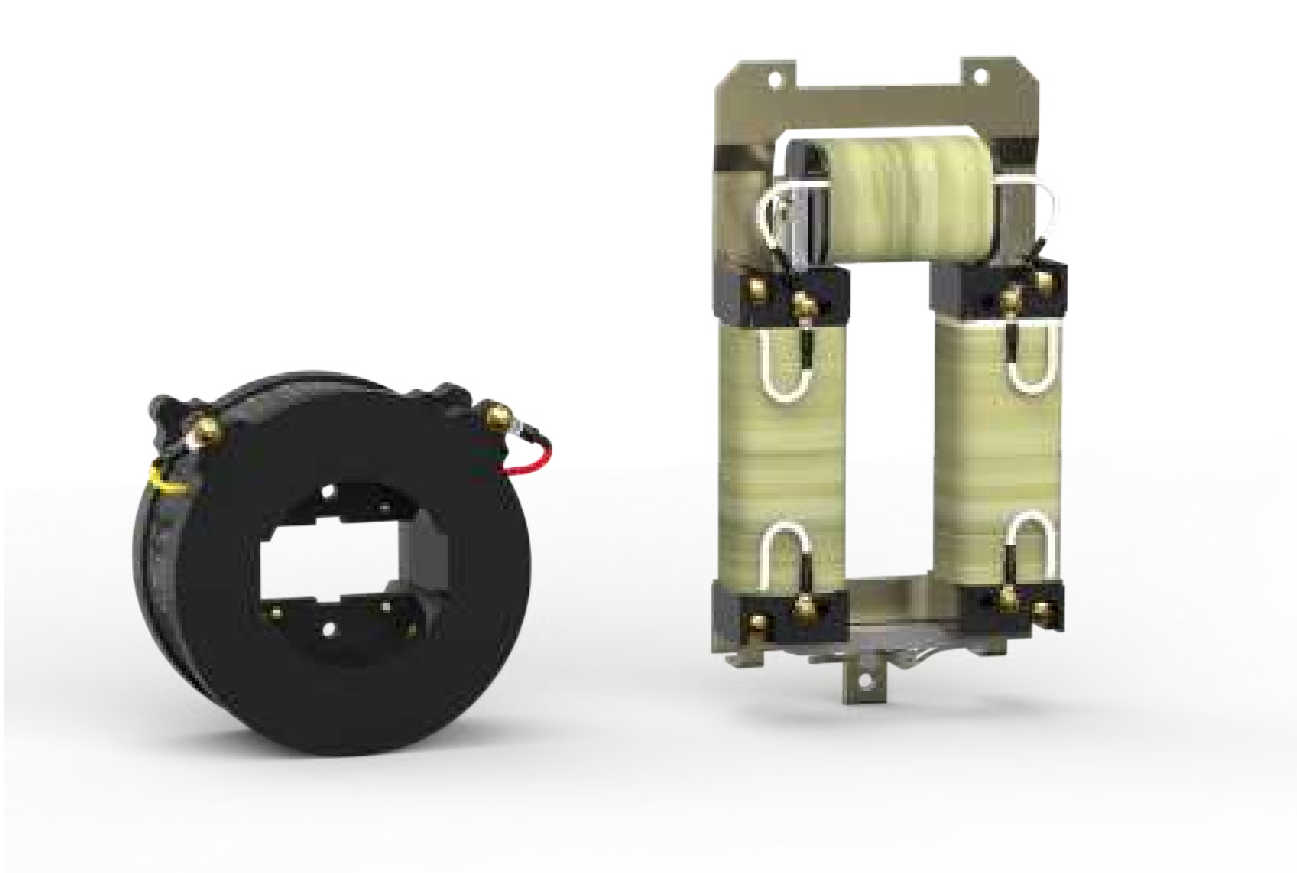
Q4. What are the design considerations for minimizing nuisance tripping?

Ensure proper cable routing, use shielded connections to the relay, and select ZCTs with appropriate sensitivity thresholds and noise immunity features.

TIP FOR INSTALLATION

- ✓ Pass all live and neutral conductors through the ZCT core
- ✓ Avoid routing grounding conductors inside the coil
- ✓ Mount ZCTs away from high-EMI sources for stable detection

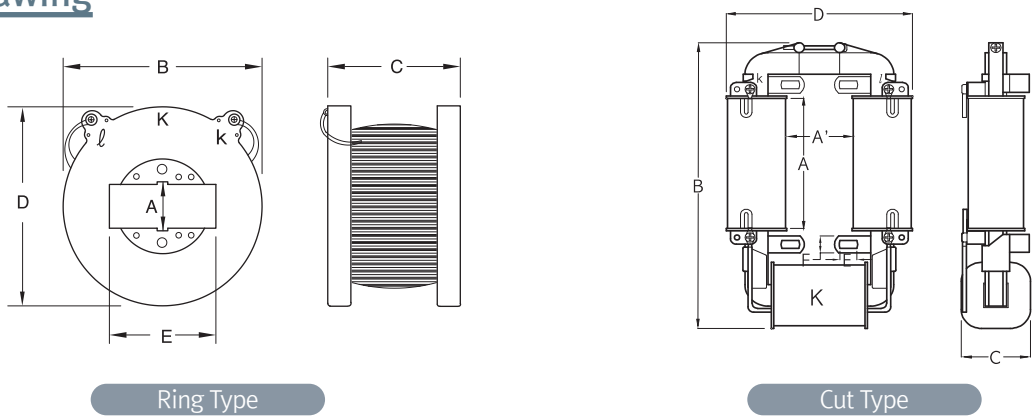
I . ACB & GIS Current Transformer



Application & Features

- Meeting International Standard IEC 61869-2
 - Secondary Current 5A Meters (0.5 Class)
 - Accurate Current Balancing Transformers
 - Building & Factory Energy Management System
- Air Circuit Breakers (ACB)
 - Minimum Ratio Error
 - Excellent Linearity Properties

Drawing



1. Ring Type Current Transformers

Model & Dimension

(unit : mm/inch)

Model No	Current Ratio	A(±0.2)	B(±0.5)	C(±0.5)	D(±0.5)	E(±0.5)	Rdc(mΩ)
TC56L	80A/5A	21.6 0.850"	105.5 4.154"	52(2.047")	105.5 4.154"	56 2.205"	40-55
TC57L	160A/5A			52(2.047")			56-60
TC58L	320A/5A			53.5(2.106")			90-110
TC59L	630A/5A			52.5(2.067")			150-170
TC171L	800A/5A			53.5(2.106")			198-218
TC97L	1000A/5A			52.5(2.067")			140-160
TC60L	1250A/5A			51.5(2.028")			170-200
TC61L	1600A/5A			52.5(2.067")			220-250
TC62L	2000A/5A			52.5(2.067")			280-320
Hi-Potential Voltage		AC 5kV Per Min.					

2. Cut Type Current Transformers

Model & Dimension

(unit : mm/inch)

Model No	Current Rating	A	B	C	D
TC67L	2500A / 5A	210.0 5.334"	139.0 3.531"	67.0 1.702"	108.5 2.756"
TC69L	3200A / 5A	210.0 5.334"	144.0 3.658"	50.0 1.270"	127.0 3.226"
TC70L	4000A / 5A	200.0 5.080"	143.0 3.632"	42.5 1.080"	122.5 3.112"

