Medium Voltage Distribution
Catalogue | 2012

Indoor instrument transformers

Current transformers
Voltage transformers

Make the most of your energy

Schneider Electric

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Presentation

The Schneider Electric range of instrument transformers is designed for voltages from 0.72 kV to 36 kV and rated currents from 5 A to 4000 A.
In order to meet requirements for increasingly high short circuit current values in installations, current transformers notably have a short-time thermal current of 60 kA x 1 second.
All Schneider Electric instrument transformers are in conformity with IEC standards.
■ Current transformers can specifically meet requirements for:
□ accuracy classes “TPS - TPX - TPY - TPZ” defined by standards IEC 60044-6 relative to recommendations concerning transformer behaviour during transient short circuit conditions
□ standard IEC 60079-7 / EN 50.019 concerning enhanced safety electrical equipment for explosive gaseous atmospheres
■ Through their standardized configuration, their high electrical performance levels, their reduced weight and space requirement, these devices are particularly well suited for use with:
□ LSC2B type cubicles (metal clad)
□ LSC2A type cubicles (compartmented)
□ large motor terminals
□ explosive gaseous atmosphere environments (Eex).

Conformity with standards

All Schneider Electric instrument transformers are in conformity with IEC standards, sections 2099 - 2134, and recommendations 60044-1/IEC 60044-2.
Transformers in conformity with specific country standards can also be supplied (IEEE C57.13, NBR6855, NBR6856…).

Main features

The working parts (windings and magnetic cores) are entirely enclosed in an epoxy resin bloc casting whose twofold function is to:
■ guarantee both internal and external electrical insulation of the device
■ provide enhanced mechanical strength.

Product quality over time is guarantee not only by thirty years experience in manufacturing resin insulated instrument transformers, but also by the use of **silica filled epoxy resin** which gives:
■ high dielectric strength, even at high temperatures (18 kV/mm at 180°C for 20.000 hours)
■ insulation class B according to IEC 60044-1
■ high ageing resistance, both thermal, resulting from increase in temperature of structures according to IEC 216 (more than 20 years at 120°C), and surface through salt mist withstand
■ lack of emissions of any harmful substances in the case of f re, in conformity with IEC standards IEC 60020-37, IEC 60020-22 and ASTM D 3286
■ outstanding behaviour in tropical climates
■ high mechanical strength, even at **high service: epoxy resin glass transition temperature ≥ 105°C.**

Rigorous production procedures enable:
■ no blisters or blowholes in the resin thanks to vacuum casting
■ a partial discharge value with a low time constant, also due to the quality of insulating materials used
■ high resistance and very good electrical conductivity at the primary and secondary terminals, even at temperatures reached during short circuit, due to mechanical connections
■ the consistency of production parameters over time, through a computer controlled system which manages and monitors the whole production line.

Presentation

Quality is the result of scheduling and monitoring at each stage, from initial design through to production and testing, and right through to final delivery and after sales service.
This is expressed in terms of execution in conformity with the quality certification.
This procedure allows us to supply a product that has all of the specified characteristics and also to provide the customer with
a production and execution schedule that guarantees product quality.

Certified quality system

Schneider Electric's quality guarantee is certified in documents that are available on request:

- documents explaining the company's quality policy
- a schedule for each stage of each product's execution
- the continuous assessment of indicators checking all possible quality faults during the production process
- a set of technical/quality documents providing proof of what has happened throughout the production and testing processes so as to guarantee the required quality level.

The production process applies standardized methods for Quality Assurance and Control.
Quality Control plans ensure that the defined procedures are applied to the product, from testing through to delivery of equipment used in production right through to final production.
The initial phases of product design and industrialization are also subject to Quality Certification procedures.

The Schneider Electric quality system is certified by the CSQ
The CSQ (independent certification organization for quality management systems) has certified Schneider Electric's quality to be in conformity with IEC standard - EN 29001 (ISO 9001), which require a company to implement a comprehensive quality assurance system covering all aspects from product definition through to after sales service.

Applications and types

Protection or metering devices have to receive data on electrical values (current or voltage) from the equipment to be protected. For technical, economic and safety reasons, this data cannot be obtained directly on the equipment's MV power supply; we have to use intermediary sensors:

■ Current transformers
■ Voltage transformers.

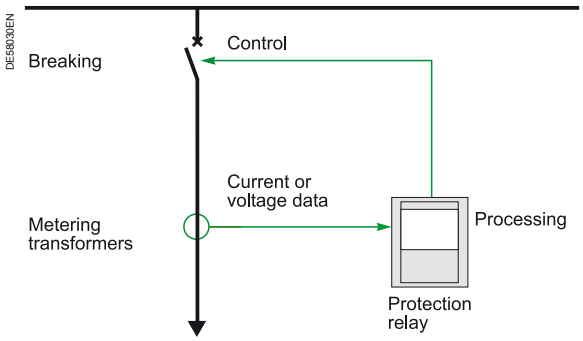
These devices carry out the functions of:

■ Reducing the size of value to be measured
■ Providing galvanic separation
■ Supplying the power needed to process the data, or even for the protection device to work.

Metering transformer applications

In MV electrical distribution, the high current and voltage values mean that they cannot be used directly by metering or protection units.
Instrument transformers are necessary to provide values that can be used by these devices which can be:

■ analogue devices, directly using the supplied signal
■ digital processing units with a microprocessor, after analogue/digital conversion of the input signal (e.g.: Sepam or Power Logic System).



Example of a metering transformer application in a protection system

Types

Instrument transformers are of the following types:

Current transformers

Connected on the MV network primary circuit, they supply a reduced current value to the secondary circuit, proportional to the network current on which they are installed.
There are two types:

■ CT: current transformer
■ LPCT (Low Power Current Transformer): electronic current transformers.

Voltage transformers

Connected to the MV network primary, they supply the secondary circuit with a reduced voltage value, proportional to the network voltage on which they are installed.

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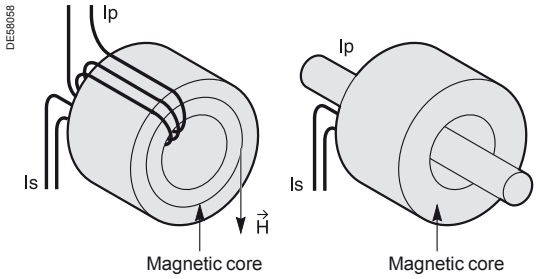
Selection guide
Technical description

Current transformers (CT) meet standard IEC 60044-1.
Their function is to supply the secondary circuit with a current that is proportional to that of the MV circuit on which they are installed.
The primary is series-mounted on the MV network and subject to the same over-currents as the latter and withstands the MV voltage.
The secondary generally has one of its terminals connected to earth.
The secondary must never be in an open circuit (short circuit).



Wound type primary current transformer

Closed core type current transformer

Current transformers
Current transformers have two basic functions:
- adapting the MV current value at the primary to the characteristics of the metering or protection devices by supplying a secondary current with a reduced, but proportional current value
- isolating power circuits from the metering and/or protection circuit.

Composition and types
A current transformer comprises a primary circuit and a secondary circuit connected via a magnetic core and an insulating coating system in epoxy-silica, in the case of Schneider Electric transformers.
The device is of the following type:
- wound: when the primary and the secondary have a coil wound on the magnetic circuit
- slip-over: primary made up of a conductor that is not insulated from the installation
- core: primary made up of an insulated cable.

Characteristics
These are defined in standard IEC 60044-1.

Insulation
Characterized by the rated voltage:
- of the insulation, which is that of the installation (e.g.: 24 kV)
- of the power frequency withstand 1 min (e.g.: 50 kV)
- of the impulse withstand (e.g.: 125 kV).

Rated frequency
50 or 60 Hz.

Rated primary current (Ipn)
Rms value of the maximum continuous primary current. Usual values are 25, 50, 75, 100, 200, 400, 600 A.

Rated secondary current (Isn)
This is equal to 1 A or 5 A.

Rated transformation ratio
Kn = I rated primary / I rated secondary (e.g.: 100 A / 5 A)

Short-time thermal current Ith - 1 second
This characterizes the thermal withstand under short circuit conditions for 1 second. It is expressed in kA or in a multiple of the rated primary current (e.g.: 80 x Ipn) for 1 second.
The value for a **duration that is different to 1 second** is given by:
$I'th = Ith/\sqrt{2}$
For example 16 kA - 1 s is equivalent for 2 s to $I'th = 16 \times \sqrt{2} = 22.6$ kA.

Selection guide
Technical description

Characteristics (cont.)

Short-time thermal current peak value
This value is standardized from Ith - 1 s at:
- IEC: 2.5 Ith at 50 Hz and 2.6 Ith at 60 Hz
- ANSI: 2.7 Ith 60 Hz.

Accuracy load
The value of the load on which is based the metered current accuracy conditions.

Accuracy power Pn
Apparent power (VA) that the CT can supply on the secondary for the rated secondary current for which the accuracy is guaranteed (accuracy load).
Usual values 5 - 7.5 - 10 - 15 VA (IEC).

Accuracy class
Defines the limits of error guaranteed on the transformation ratio and on the phase shift under the specified conditions of power and current. Classes **0.5** and **1** are used for metering class **P** for protection.

Current error ε (%)
Error that the transformer introduces in the measurement of a current when the transformation ratio is different from the rated value.

Phase shift or phase error ψ (minute)
Difference in phase between the primary and secondary currents, in angle minutes.

Table of current transformer characteristics

Characteristics	Rated values				
Rated voltage (kV)	7.2	12	17.5	24	36
Insulation level: ■ power frequency withstand (kV) 1 min ■ lightning impulse withstand (kV - peak)	 20 60	 28 75	 38 95	 50 125	 70 170
Frequency (Hz)	50 - 60				
Primary current Ipn (A)	25 - 50 - 75 - 100 - 200 - 400 - 600...				
Short-time thermal current Ith (1 s)	12.5 - 16 - 20 - 25 - 31.5 - 40 - 50 kA or 40 - 80 - 100 - 200 - 300 x In				
Secondary current Isn (A)	1 - 5				
Accuracy power Pn (VA)	2.5 - 5 - 7.5 - 10 - 15				

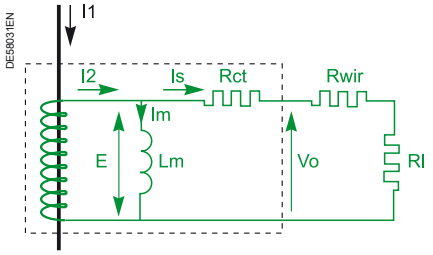
Selection guide
Technical description

The choice of CT is decisive in order for the overall metering or protection system to work properly.

CT operation

Importance of CT selection
The operating accuracy of metering or protection devices depends directly on the CT accuracy.

Operating principle
A CT often has a load that is quite resistive (Rc + its wiring), as shown in the schematic diagram below.

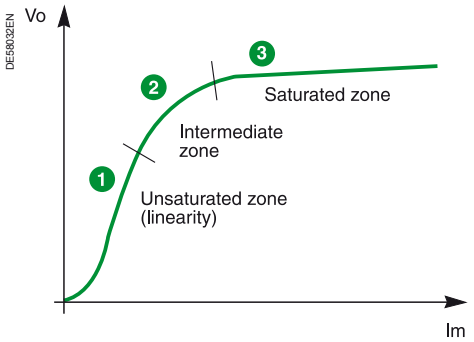


Schematic diagram for a current transformer
I1: primary current.
I2 = Kn I1: secondary current for a perfect CT.
Is: secondary current actually flowing through the circuit.
Im: magnetizing current.
E: induced electromotive force.
Vo: output voltage.
Lm: magnetization inductance (saturable) equivalent to the CT.
Rct: resistance at the CT secondary.
Rwir: resistance of the connection wiring.
Rc: load resistance.

Current I2 is a perfect image of the primary current I1 in the transformation ratio. However, the actual output current (Is) is subject to an error due to the magnetization current (Im).

$\vec{I_2} = \vec{I_s} + \vec{I_m}$ if the CT was perfect, we would have $I_m = 0$ and $I_s = I_2$.

A CT has a unique magnetization curve (for a given temperature and frequency). With the transformation ratio, this characterizes its operation.
This magnetization curve (voltage Vo, magnetizing current function Im) can be divided into 3 zones:
1 - non-saturated zone: Im is low and the voltage Vo (and therefore Is) increases virtually proportionately to the primary current.
2 - intermediary zone: there is no real break in the curve and it is difficult to situate a precise point corresponding to the saturation voltage.
3 - saturated zone: the curve becomes virtually horizontal; the error in transformation ratio is high, the secondary current is distorted by saturation.



Magnetization curve (excitation) for a CT.
Output voltage as a function of the magnetizing current.
Vo = f (Im)

Metering CT or protection CT

We have to choose a CT with characteristics that are suited to its application.

Metering CT
This requires good accuracy (linearity zone) in an area close to the **normal service current**; it must also protect metering devices from high currents by saturating earlier.

Protection CT
This requires good accuracy at **high currents** and will have a higher precision limit (linearity zone) for protection relays to detect the protection thresholds that they are meant to be monitoring.

Selection guide
Technical description

Feasability of a CT

We can define the over-current coefficient of the CT:

$$Ksi = \frac{I\ th\ 1s}{I\ pn}$$

The lower Ksi, the easier the CT is to produce with a given volume, compatible with being integrated in a MV cubicle. A high Ksi leads to over-dimensioning of the CT and makes it difficult to produce.

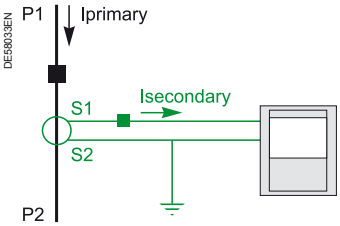
Ksi order of magnitude	CT production
Ksi < 100	Standard
100 < Ksi < 300	Sometimes difficult for certain secondary characteristics
300 < Ksi < 400	Difficult
400 < Ksi < 500	Limited to certain secondary characteristics
Ksi > 500	Sometimes impossible

Safety

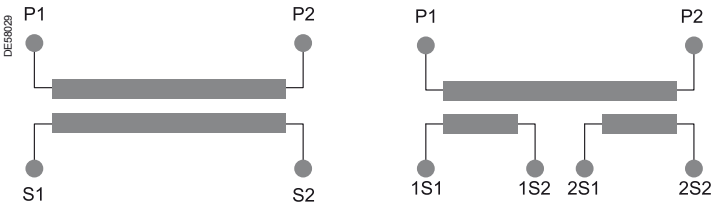
The CT secondary is used at low impedance (virtually in short circuit).
The secondary circuit should never be left open, since this would mean connecting across an infinite impedance. Under these conditions, hazardous voltages for personnel and equipment may exist across the terminals.

Terminal marking

CT connection is made to the terminals identified according to the IEC:
- P1 and P2 on the MV side
- S1 and S2 on the corresponding secondary. In the case of a double output, the first output is identified by 1S1 and 1S2, the second by 2S1 and 2S2.



Current transformer showing the terminals



Single secondary *Double secondary*

Selection guide
Technical description

CT's for metering must have the right accuracy for the rated current.
They are characterized by their accuracy class (generally 0.5 or 1) as well as a safety factor Fs.

Example: 400/5 A, 15 VA, cl 0.5, FS 10

Primary current
Secondary current
Accuracy power
(see explanation in the example)
Accuracy class
Safety factor

Accuracy class according to application

Application	Class
Laboratory measurement	0.1 - 0.2
Accurate metering (calibration devices)	
Industrial metering	0.5 - 1
Billing metering	0.2 - 0.5 - 0.2S - 0.5S
Switchboard indicators statistical metering	0.5 - 1

Error limits according to the accuracy class

Accuracy class	% rated primary current	Current error ± %		Phase shift error ± min	
			for S		for S
0.2 / 0.2S	1 (0.2S alone)		0.75		30
	5	0.75	0.35	30	15
	20	0.35	0.2	15	10
	100	0.2	0.2	10	10
	120	0.2	0.2	10	10
0.5 / 0.5S	1 (0.5S alone)		1.5		90
	5	1.5	0.75	90	45
	20	0.75	0.5	45	30
	100	0.5	0.5	30	30
	120	0.5	0.5	30	30
1	5	3		180	
	20	1.5		90	
	100	1		60	
	120	1		60	

CT for metering

Accuracy class
A metering CT is designed to send as accurate an image as possible of currents below **120%** of the rated primary.
IEC standard 60044-1 determines the maximum error in the accuracy class for the phase and for the module according to the indicated operating range (see "error limits" table opposite).
These accuracy values must be guaranteed by the manufacturer for a secondary load of between 25 and 100% of the accuracy power.
The choice of accuracy class is related to the application (table opposite).
The usual accuracy class is 0.5. there are metering classes of 0.2S and 0.5S specifically for metering applications.

Safety factor: FS
In order to protect the metering device connected to the CT from high currents on the MV side, instrument transformers must have early saturation characteristics. The limit primary current (Ipl) is defined for which the current error in the secondary is equal to 10%. The standard then defines the Safety Factor FS.

$$FLP = \frac{Ip\,l}{Ip\,n}$$ (preferred value: **10**)

This is the multiple of the rated primary current from which the error becomes greater than 10% for a load equal to the accuracy power.

Example of a metering CT
Metering CT **200/5 A, 15 VA, cl. 0.5, FS 10**
- rated primary current 200 A
- rated secondary current 5 A
- rated transformation ratio 200/5 A
- accuracy power 15 VA
- accuracy class 0.5.

The table or error limits given for class 0.5 for a primary current:
- between 100% and 120% of the rated current (here 200 A to 240 A), a current error ≤ ± 0.5% and the phase shift error of ≤ ± 30 min.
- at 20% (here 40 A) the error imposed by the standard is less than or equal to 0.75%
- between 20% and 100% of the rated current the standard does not give the metering point and the maximum error is between 0.5 and 0.75%, with a normally permitted linear variation between these two points.
- safety factor FS = 10

For a primary current greater than 10 times the rated current, in other words here 2000 A, we will have a metering error > 10% if the load is equal to the accuracy load; for a load less than this we can still be in the linear part of the magnetization curve.

Selection guide
Technical description

CT's for protection must have suitable accuracy for fault currents. They are characterized by their accuracy class (generally 5P) and the accuracy limit factor FLP.

Example: 400/5 A, 15 VA, 5P10

Primary current
Secondary current
Accuracy power
(see explanation in the example)
Safety factor
Accuracy class

CT for protection

Accuracy class
A protection CT is designed to send as reliable an image as possible of the **fault current** (overload or short circuit). The accuracy and the power are suited to these currents and different from those for metering applications.
IEC standard 60044-1 determines the maximum error for each accuracy class in the phase and in the module according to the indicated operating range.

Error limits according to the accuracy class

Accuracy class	Combined error for the accuracy limit current	Current error between Ipn and 2Ipn	Phase shift error for the rated current
5P	5%	± 1%	± 60 min
10P	10%	± 3%	No limit

For example for class 5P the maximum error is ⩽ ± 5% at the accuracy limit current and ⩽ ± 1% at the rated current.
Standardized classes are 5P and 10P. The choice depends on the application.
The accuracy class is always followed by the accuracy limit factor.

Accuracy class according to application

Application	Class
Zero sequence protection Differential protection	5P
Impedance relay Amperemetric protection	5P - 10P

Accuracy limit factor: FLP
A protection CT must saturate at sufficiently high currents to enable sufficient accuracy in the measurements of fault currents by the protection device whose operating threshold can be very high.
We define the limit primary current (Ipl) for which current errors and phase shift errors in the secondary do not exceed values in the table opposite.
The standard then defines the accuracy limit factor FLP.

$$FLP = \frac{Ip\,l}{Ip\,n}$$ (standardized values: **5 - 10 - 15 - 20 - 30**)

In practice this corresponds to the linearity limit (saturation curve) of the CT.

Example
Protection CT: **100/5 A, 7.5 VA, 5P20**.
- rated primary current 100 A
- rated secondary current 5 A
- rated transformation ratio 100/5 A
- accuracy power 7.5 VA
- accuracy class 5P.

Under a load corresponding to the accuracy power of 7.5 VA, the error limit table gives an error ⩽ ± 1% and ± 60 min at Ipn (100 A).
- accuracy limit factor 20.

At a load corresponding to the accuracy power, the error ⩽ ± 5%.

Selection guide
Using the order forms

The tables on the following pages allow you to define the current transformer reference that corresponds to the necessary and required characteristics, and to place your order.
The selection factors enabling you to find the reference you require are explained in the example given below for a DIN type metering CT, in reference to the previous definitions.

Network insulation 12 kV

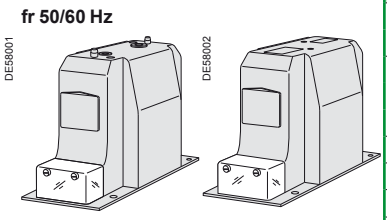
Rated primary current 75 A and secondary output 5 A

Short-time thermal current MV side 31.5 A - 1 s

Power supplied to the secondary 15 VA. Accuracy class 0.5 defines the metering error limits. The safety factor is < 10

Mark the quantity to be ordered

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power, accuracy class, safety factor FS	Type	Reference	Quantity
Ur 12 kV **Ud 28 kV - 1 min** **Up 75 kV peak**	50 / 5	12.5	15 VA cl. 0.5 Fs < 10	AD12	**03811366N0**	
		16		AD12	**03811368N0**	
	75 / 5	25		AD12	**03811371N0**	
		31.5		AD12	**03811373N0**	
fr 50/60 Hz	100 / 5	25		AD12	**03811376N0**	
		31.5		AD12	**03811378N0**	
	200 / 5	25		AD12	**03811380N0**	
		31.5		AD12	**03811382N0**	
		40		AD12	**03811384N0**	
	400 / 5	40		AD12	**03811386N0**	
	600 / 5	50	20 VA cl. 0.5 Fs < 10	AD12	**03811388N0**	
	750 / 5	50		AD12	**03811390N0**	
AD12N1 **AD13N1**	1000 / 5	50	30 VA cl. 0.5 Fs < 10	AD13	**03811392N0**	
Dimensions page 26	1250 / 5	50		AD13	**03811394N0**	



Calculating the power (VA)

Indicative metering consumptions

Device		Max. consumption in VA (per circuit)
Ammeter	Electromagnetic	3
	Electronic	1
Transducer	Self-powered	3
	External powered	1
Meter	Induction	2
	Electronic	1
	Wattmeter, varmeter	1

Indicative protection consumption

Device	Max. consumption in VA (per circuit)
Static over-current relay	0.2 to 1
Electromagnetic over-current relay	1 to 8

Indicative secondary cabling consumption

Cables (mm^2)	Consumption (VA/m)	
	1 A	5 A
2.5	0.008	0.2
4	0.005	0.13
6	0.003	0.09
10	0.002	0.05

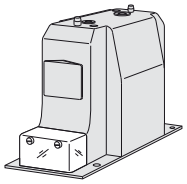
Order form

DIN standard 12 kV CT - single and double secondary

Single secondary metering CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power, accuracy class, safety factor FS	Type	Reference	Qty
Ur 12 kV	50 / 5	12.5	15 VA cl. 0.5 Fs < 10	AD12/N1	**03811366N0**	
Ud 28 kV - 1 min		16		AD12/N1	**03811368N0**	
Up 75 kV peak	75 / 5	25		AD12/N1	**03811371N0**	
		31.5		AD12/N1	**03811373N0**	
fr 50/60 Hz	100 / 5	25		AD12/N1	**03811376N0**	
		31.5		AD12/N1	**03811378N0**	
	200 / 5	25		AD12/N1	**03811380N0**	
		31.5		AD12/N1	**03811382N0**	
		40		AD12/N1	**03811384N0**	
	400 / 5	40		AD12/N1	**03811386N0**	
	600 / 5	50	20 VA cl. 0.5 Fs < 10	AD12/N1	**03811388N0**	
	750 / 5	50		AD12/N1	**03811390N0**	
	1000 / 5	50	30 VA cl. 0.5 Fs < 10	AD13/N1	**03811392N0**	
	1250 / 5	50		AD13/N1	**03811394N0**	

DE58001



AD12

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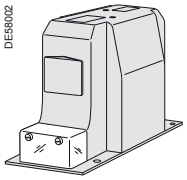


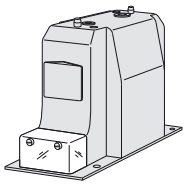
AD13

Dimensions page 26

Single secondary protection CT

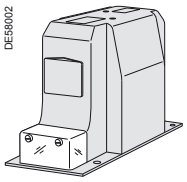
Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power and accuracy class (possible double use)	Type	Reference	Qty
Ur 12 kV	50 / 5	12.5	15 VA 5P10 - 7.5 VA 5P20	AD12/N1	**03811367N0**	
Ud 28 kV - 1 min		16		AD12/N1	**03811369N0**	
Up 75 kV peak		25	7.5 VA 5P10	AD12/N1	**03811370N0**	
fr 50/60 Hz	75 / 5	25	15 VA 5P10 - 7.5 VA 5P20	AD12/N1	**03811372N0**	
		31.5	7.5 VA 5P10	AD12/N1	**03811374N0**	
		40		AD12/N1	**03811375N0**	
	100 / 5	25	15 VA 5P10 - 7.5 VA 5P20	AD12/N1	**03811377N0**	
		31.5		AD12/N1	**03811379N0**	
		40	7.5 VA 5P10	AD12/N1	**03811839N0**	
	200 / 5	25	15 VA 5P10 - 7.5 VA 5P20	AD12/N1	**03811381N0**	
		31.5		AD12/N1	**03811383N0**	
		40		AD12/N1	**03811385N0**	
	400 / 5	40		AD12/N1	**03811387N0**	
	600 / 5	50		AD12/N1	**03811389N0**	
	750 / 5	50		AD12/N1	**03811391N0**	
	1000 / 5	50	10 VA 5P20	AD13/N1	**03811393N0**	
	1250 / 5	50		AD13/N1	**03811395N0**	

DE58001



AD12

DE58002



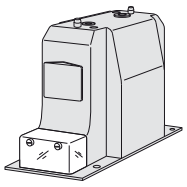
AD13

Dimensions page 26

Double secondary metering and protection CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Metering secondary: power, accuracy class, safety factor FS	Metering secondary: power and accuracy class (possible double use)	Type	Reference	Qty
Ur 12 kV	50 / 5-5	12.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	AD12/N2	**03811396N0**	
Ud 28 kV - 1 min		16			AD12/N2	**03811397N0**	
Up 75 kV peak	75 / 5-5	16			AD12/N2	**03811398N0**	
		25			AD12/N2	**03811399N0**	
fr 50/60 Hz	100 / 5-5	25			AD12/N2	**03811400N0**	
		31.5			AD12/N2	**03811401N0**	
	200 / 5-5	25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	AD12/N2	**03811402N0**	
		31.5			AD12/N2	**03811403N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	AD12/N2	**03811404N0**	
	400 / 5-5	40	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	AD12/N2	**03811405N0**	
	600 / 5-5	50	20 VA cl. 0.5 Fs < 10		AD12/N2	**03811406N0**	
	750 / 5-5	50			AD12/N2	**03811407N0**	
	1000 / 5-5	50	30 VA cl. 0.5 Fs < 10	10 VA 5P20	AD13/N2	**03811408N0**	
	1250 / 5-5	50			AD13/N2	**03811409N0**	

DE58001



AD12

Dimensions page 26

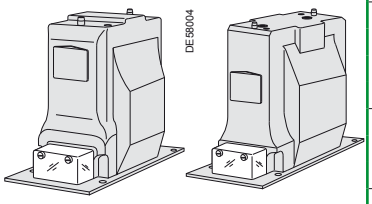
Order form

DIN standard 24 kV CT - single secondary

Single secondary metering CT

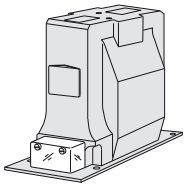
Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power, accuracy class, safety factor FS	Type	Reference	Qty
Ur 24 kV	25 / 5	16	15 VA cl. 0.5 Fs < 10	AD22/N1	**03811410N0**	
Ud 50 kV - 1 min		20		AD22/N1	**03811413N0**	
Up 125 kV peak	50 / 5	20		AD21/N1	**03811416N0**	
fr 50/60 Hz		20		AD22/N1	**03811419N0**	
		20		AD22/N1	**03811421N0**	
	75 / 5	16		AD21/N1	**03811424N0**	
		25		AD21/N1	**03811427N0**	
		31.5		AD21/N1	**03811430N0**	
		40		AD22/N1	**03811433N0**	
	100 / 5	25		AD21/N1	**03811436N0**	
		31.5		AD21/N1	**03811439N0**	
		40		AD22/N1	**03811442N0**	
	200 / 5	25		AD21/N1	**03811443N0**	
		31.5		AD21/N1	**03811445N0**	
		40		AD21/N1	**03811447N0**	
	400 / 5	40		AD21/N1	**03811450N0**	
	600 / 5	50	20 VA cl. 0.5 Fs < 10	AD21/N1	**03811452N0**	
	750 / 5	50		AD21/N1	**03811454N0**	
	1000 / 5	50	30 VA cl. 0.5 Fs < 10	AD23/N1	**03811456N0**	
	1250 / 5	50		AD23/N1	**03811458N0**	
	1500 / 5	50		AD23/N1	**03811460N0**	
	2000 / 5	50		AD23/N1	**03811462N0**	
	2500 / 5	50		AD23/N1	**03811464N0**	

DE58003 DE58004



AD21 **AD22**

DE58005



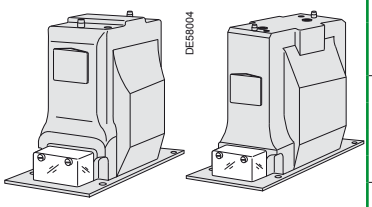
AD23

Dimensions page 26

Single secondary protection CT

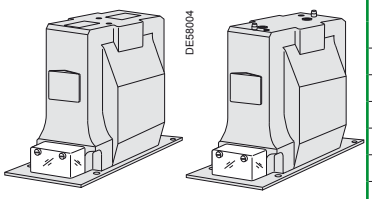
Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power and accuracy class (possible double use)	Type	Reference	Qty
Ur 24 kV	25 / 5	16	7.5 VA 5P10	AD22/N1	**03811411N0**	
Ud 50 kV - 1 min		16	15 VA 5P10 - 7.5 VA 5P20	ARJD/N1	**03811412N0**	
Up 125 kV peak		20	7.5 VA 5P10	AD22/N1	**03811414N0**	
fr 50/60 Hz		20	15 VA 5P10 - 7.5 VA 5P20	ARJD/N1	**03811415N0**	
	50 / 5	20	7.5 VA 5P10	AD21/N1	**03811417N0**	
		16	15 VA 5P10 - 7.5 VA 5P20	AD22/N1	**03811418N0**	
		20		AD22/N1	**03811420N0**	
		20		ARJD/N1	**03811422N0**	
		20	7.5 VA 5P10	ARJD/N1	**03811423N0**	
	75 / 5	16		AD21/N1	**03811425N0**	
		16	15 VA 5P10 - 7.5 VA 5P20	AD22/N1	**03811426N0**	
		25	7.5 VA 5P10	AD21/N1	**03811428N0**	
		25	15 VA 5P10 - 7.5 VA 5P20	AD22/N1	**03811429N0**	
		31.5	7.5 VA 5P10	AD21/N1	**03811431N0**	
		31.5	15 VA 5P10 - 7.5 VA 5P20	AD22/N1	**03811432N0**	
		40	7.5 VA 5P10	AD22/N1	**03811434N0**	
		40	15 VA 5P10 - 7.5 VA 5P20	ARJD/N1	**03811435N0**	
	100 / 5	25	7.5 VA 5P10	AD21/N1	**03811437N0**	
		25	15 VA 5P10 - 7.5 VA 5P20	AD22/N1	**03811438N0**	
		31.5	7.5 VA 5P10	AD21/N1	**03811440N0**	
		31.5	15 VA 5P10 - 7.5 VA 5P20	AD22/N1	**03811441N0**	
	200 / 5	25		AD21/N1	**03811444N0**	
		31.5		AD21/N1	**03811446N0**	
		40	7.5 VA 5P10	AD21/N1	**03811448N0**	
		40	15 VA 5P10 - 7.5 VA 5P20	AD22/N1	**03811449N0**	
	400 / 5	40		AD21/N1	**03811451N0**	
	600 / 5	50		AD21/N1	**03811453N0**	
	750 / 5	50		AD21/N1	**03811455N0**	
	1000 / 5	50	10 VA 5P20	AD23/N1	**03811457N0**	
	1250 / 5	50		AD23/N1	**03811459N0**	
	1500 / 5	50	15 VA 5P20	AD23/N1	**03811461N0**	
	2000 / 5	50		AD23/N1	**03811463N0**	
	2500 / 5	50		AD23/N1	**03811465N0**	

DE58003 DE58004



AD21 **AD22**

DE58005 DE58004



AD23 **ARJD**

Dimensions page 26

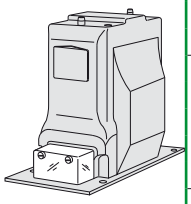
Order form

DIN standard 24 kV CT - double secondary

Double secondary metering and protection CT

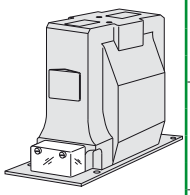
Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Metering secondary: power, accuracy class, safety factor FS	Metering secondary: power and accuracy class (possible double use)	Type	Reference	Qty
Ur 24 kV	25 / 5-5	16	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	AD22/N2	**03811466N0**	
Ud 50 kV - 1 min		20			ARJD/N2	**03811467N0**	
Up 125 kV peak	50 / 5-5	16			AD21/N2	**03811468N0**	
fr 50/60 Hz		16		15 VA 5P10 - 7.5 VA 5P20	ARJD/N2	**03811469N0**	
		25		7.5 VA 5P10	AD22/N2	**03811470N0**	
		25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJD/N2	**03811471N0**	
		31.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJD/N2	**03811472N0**	
	75 / 5-5	16	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	AD21/N2	**03811473N0**	
		25			AD21/N2	**03811474N0**	
		31.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	AD22/N2	**03811475N0**	
		31.5	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJD/N2	**03811476N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJD/N2	**03811477N0**	
	100 / 5-5	25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	AD21/N2	**03811478N0**	
		31.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	AD21/N2	**03811479N0**	
		31.5	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	AD22/N2	**03811480N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	AD22/N2	**03811481N0**	
		40	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJD/N2	**03811482N0**	
	200 / 5-5	31.5			AD21/N2	**03811483N0**	
		40			AD21/N2	**03811484N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	AD21/N2	**03811485N0**	
		40	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	AD22/N2	**03811486N0**	
	400 / 5-5	40			AD21/N2	**03811487N0**	
	600 / 5-5	40	20 VA cl. 0.5 Fs < 10		AD21/N2	**03811488N0**	
	750 / 5-5	40			AD21/N2	**03811489N0**	
	1000 / 5-5	40	30 VA cl. 0.5 Fs < 10		AD23/N2	**03811490N0**	
	1250 / 5-5	40			AD23/N2	**03811491N0**	
	1500 / 5-5	40			AD23/N2	**03811492N0**	
	2000 / 5-5	40			AD23/N2	**03811493N0**	
	2500 / 5-5	40			AD23/N2	**03811494N0**	

DE58003



AD21

DE58005



AD23

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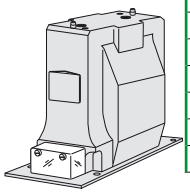


ARJD

Dimensions page 26

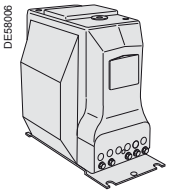
Order form

24 kV primary conductor support CT - single secondary

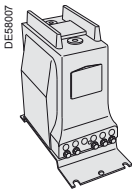
Single secondary metering CT

Ur 24 kV
Ud 50 kV - 1 min
Up 125 kV peak

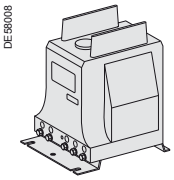
fr 50/60 Hz



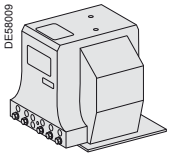
ARJM2



ARJP1



ARJP3



ARJA1

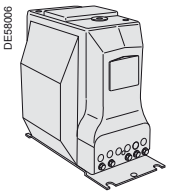
Dimensions page 27

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power, accuracy class, safety factor FS	Type	Reference	Qty
	25 / 5	16	15 VA cl. 0.5 Fs < 10	ARJM2/N1J	**03811495N0**	
		25		ARJM2/N1J	**03811498N0**	
	50 / 5	16		ARJP1/N1J	**03811501N0**	
		25		ARJM2/N1J	**03811504N0**	
		31.5		ARJM2/N1J	**03811507N0**	
	75 / 5	25		ARJP1/N1J	**03811510N0**	
		31.5		ARJP1/N1J	**03811513N0**	
		40		ARJM2/N1J	**03811516N0**	
	100 / 5	25		ARJP1/N1J	**03811519N0**	
		31.5		ARJP1/N1J	**03811522N0**	
		40		ARJM2/N1J	**03811525N0**	
	200 / 5	25		ARJP1/N1J	**03811526N0**	
		31.5		ARJP1/N1J	**03811528N0**	
		40		ARJP1/N1J	**03811530N0**	
	400 / 5	40		ARJP1/N1J	**03811533N0**	
	600 / 5	50	20 VA cl. 0.5 Fs < 10	ARJP1/N1J	**03811535N0**	
	750 / 5	50		ARJP1/N1J	**03811537N0**	
	1000 / 5	50	30 VA cl. 0.5 Fs < 10	ARJP3/N1J	**03811539N0**	
	1250 / 5	50		ARJP3/N1J	**03811541N0**	
	1500 / 5	50		ARJA1/N1J	**03811543N0**	
	2000 / 5	50		ARJA1/N1J	**03811545N0**	
	2500 / 5	50		ARJA1/N1J	**03811547N0**	

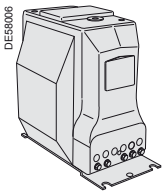
Single secondary protection CT

Ur 24 kV
Ud 50 kV - 1 min
Up 125 kV peak

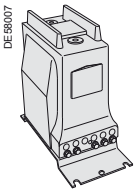
fr 50/60 Hz



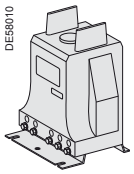
ARJM2



ARJH



ARJP1



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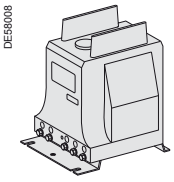
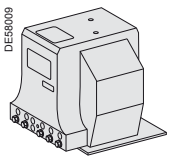


ARJP3



ARJA1

Dimensions page 27

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power and accuracy class (possible double use)	Type	Reference	Qty
	25 / 5	16	7.5 VA 5P10	ARJM2/N1J	**03811496N0**	
		16	15 VA 5P10 - 7.5 VA 5P20	ARJH/N1J	**03811497N0**	
		25	7.5 VA 5P10	ARJM2/N1J	**03811499N0**	
		25	15 VA 5P10 - 7.5 VA 5P20	ARJH/N1J	**03811500N0**	
	50 / 5	16	7.5 VA 5P10	ARJP1/N1J	**03811502N0**	
		16	15 VA 5P10 - 7.5 VA 5P20	ARJP2/N1J	**03811503N0**	
		25	7.5 VA 5P10	ARJP2/N1J	**03811505N0**	
		25	15 VA 5P10 - 7.5 VA 5P20	ARJM2/N1J	**03811506N0**	
		31.5		ARJH/N1J	**03811508N0**	
		40	7.5 VA 5P10	ARJH/N1J	**03811509N0**	
	75 / 5	25		ARJP1/N1J	**03811511N0**	
		25	15 VA 5P10 - 7.5 VA 5P20	ARJP2/N1J	**03811512N0**	
		31.5	7.5 VA 5P10	ARJP2/N1J	**03811514N0**	
		31.5	15 VA 5P10 - 7.5 VA 5P20	ARJM2/N1J	**03811515N0**	
		40	7.5 VA 5P10	ARJP2/N1J	**03811517N0**	
		40	15 VA 5P10 - 7.5 VA 5P20	ARJH/N1J	**03811518N0**	
	100 / 5	25	7.5 VA 5P10	ARJP1/N1J	**03811520N0**	
		25	15 VA 5P10 - 7.5 VA 5P20	ARJP2/N1J	**03811521N0**	
		31.5	7.5 VA 5P10	ARJP1/N1J	**03811523N0**	
		31.5	15 VA 5P10 - 7.5 VA 5P20	ARJP2/N1J	**03811524N0**	
		40	7.5 VA 5P10	ARJP2/N1J	**03811840N0**	
		40	15 VA 5P10 - 7.5 VA 5P20	ARJH/N1J	**03811841N0**	
	200 / 5	31.5		ARJP1/N1J	**03811527N0**	
		40		ARJP1/N1J	**03811529N0**	
		40	7.5 VA 5P10	ARJP1/N1J	**03811531N0**	
		40	15 VA 5P10 - 7.5 VA 5P20	ARJP2/N1J	**03811532N0**	
	400 / 5	40		ARJP1/N1J	**03811534N0**	
	600 / 5	50		ARJP1/N1J	**03811536N0**	
	750 / 5	50		ARJP1/N1J	**03811538N0**	
	1000 / 5	50	10 VA 5P20	ARJP3/N1J	**03811540N0**	
	1250 / 5	50		ARJP3/N1J	**03811542N0**	
	1500 / 5	50	15 VA 5P20	ARJA1/N1J	**03811544N0**	
	2000 / 5	50		ARJA1/N1J	**03811546N0**	
	2500 / 5	50		ARJA1/N1J	**03811548N0**	

Order form

24 kV primary conductor support CT - double secondary

Double secondary metering and protection CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Metering secondary: power, accuracy class, safety factor FS	Metering secondary: power and accuracy class (possible double use)	Type	Reference	Qty
Ur 24 kV	25 / 5-5	12.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJH/N2J	**03811549N0**	
Ud 50 kV - 1 min		20			ARJH/N2J	**03811550N0**	
Up 125 kV peak	50 / 5-5	16			ARJP2/N2J	**03811551N0**	
fr 50/60 Hz		16	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJM2/N2J	**03811552N0**	
		25	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJP2/N2J	**03811553N0**	
		25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJH/N2J	**03811554N0**	
		31.5			ARJH/N2J	**03811555N0**	
	75 / 5-5	16	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJP2/N2J	**03811556N0**	
		16	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJM2/N2J	**03811557N0**	
		25	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJP2/N2J	**03811558N0**	
		25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJM2/N2J	**03811559N0**	
		31.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJP2/N2J	**03811560N0**	
		31.5	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJH/N2J	**03811561N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJH/N2J	**03811562N0**	
	100 / 5-5	25			ARJP2/N2J	**03811563N0**	
		25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJM2/N2J	**03811564N0**	
		31.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJP2/N2J	**03811565N0**	
		31.5	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJH/N2J	**03811566N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJP2/N2J	**03811567N0**	
		40	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJH/N2J	**03811568N0**	
	200 / 5-5	25			ARJP2/N2J	**03811569N0**	
		31.5			ARJP2/N2J	**03811570N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARJP2/N2J	**03811571N0**	
		40	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARJH/N2J	**03811572N0**	
	400 / 5-5	40			ARJP2/N2J	**03811573N0**	
	600 / 5-5	40	20 VA cl. 0.5 Fs < 10		ARJP2/N2J	**03406314F0**	
	750 / 5-5	40			ARJP2/N2J	**03406332F0**	
	1000 / 5-5	50	30 VA cl. 0.5 Fs < 10	10 VA 5P20	ARJP3/N2J	**03406333F0**	
	1250 / 5-5	50			ARJP3/N2J	**03406315F0**	
	1500 / 5-5	50		15 VA 5P20	ARJA1/N2J	**03406335F0**	
	2000 / 5-5	50			ARJA1/N2J	**03406336F0**	
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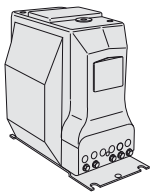

ARJH

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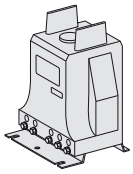

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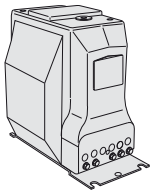

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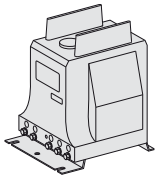

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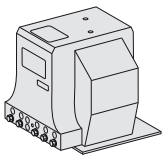


ARJA1

Dimensions page 27

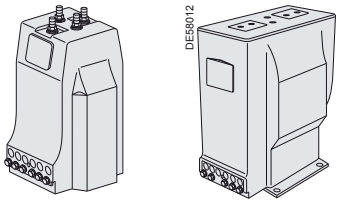
Order form

36 kV primary conductor support CT - single secondary

Single secondary metering CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power, accuracy class, safety factor FS	Type	Reference	Qty
Ur 36 kV	25 / 5	16	15 VA cl. 0.5 Fs < 10	ARM6T/N1	**03811574N0**	
Ud 70 kV - 1 min		20		ARM6T/N1	**03811577N0**	
Up 170 kV peak	50 / 5	16		ARM6T/N1	**03811580N0**	
		25		ARM6T/N1	**03811582N0**	
fr 50/60 Hz		31.5		ARM6T/N1	**03811584N0**	
	75 / 5	25		ARM6T/N1	**03811588N0**	
		31.5		ARM6T/N1	**03811590N0**	
		40		ARM6T/N1	**03811592N0**	
	100 / 5	25		ARM6T/N1	**03811595N0**	
		31.5		ARM6T/N1	**03811597N0**	
		40		ARM6T/N1	**03811599N0**	
	200 / 5	25		ARM6T/N1	**03811602N0**	
		31.5		ARM6T/N1	**03811604N0**	
		40		ARM6T/N1	**03811606N0**	
	400 / 5	40		ARM6T/N1	**03811608N0**	
	600 / 5	40	20 VA cl. 0.5 Fs < 10	ARM6T/N1	**03811610N0**	
	750 / 5	40		ARM6T/N1	**03811612N0**	
	1000 / 5	40	30 VA cl. 0.5 Fs < 10	ARM9T/N1	**03811614N0**	
	1250 / 5	40		ARM9T/N1	**03811616N0**	
	1500 / 5	40		ARM9T/N1	**03811618N0**	
	2000 / 5	40		ARM9T/N1	**03811620N0**	
	2500 / 5	40		ARM9T/N1	**03811622N0**	

DE58011 DE58012



ARM6T **ARM9T**

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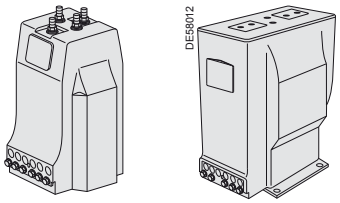
Single secondary protection CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power and accuracy class (possible double use)	Type	Reference	Qty
Ur 36 kV	25 / 5	16	7.5 VA 5P10	ARM6T/N1	**03811575N0**	
Ud 70 kV - 1 min		16	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N1	**03811576N0**	
Up 170 kV peak		20	7.5 VA 5P10	ARM6T/N1	**03811578N0**	
		20	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N1	**03811579N0**	
fr 50/60 Hz	50 / 5	16		ARM6T/N1	**03811581N0**	
		25		ARM6T/N1	**03811583N0**	
		31.5	7.5 VA 5P10	ARM6T/N1	**03811585N0**	
		31.5	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N1	**03811586N0**	
		40	7.5 VA 5P10	ARM9T/N1	**03811587N0**	
	75 / 5	25	15 VA 5P10 - 7.5 VA 5P20	ARM6T/N1	**03811589N0**	
		31.5		ARM6T/N1	**03811591N0**	
		40	7.5 VA 5P10	ARM6T/N1	**03811593N0**	
		40	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N1	**03811594N0**	
	100 / 5	25		ARM6T/N1	**03811596N0**	
		31.5		ARM6T/N1	**03811598N0**	
		40	7.5 VA 5P10	ARM6T/N1	**03811600N0**	
		40	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N1	**03811601N0**	
	200 / 5	25		ARM6T/N1	**03811603N0**	
		31.5		ARM6T/N1	**03811605N0**	
		40		ARM6T/N1	**03811607N0**	
	400 / 5	40		ARM6T/N1	**03811609N0**	
	600 / 5	40		ARM6T/N1	**03811611N0**	
	750 / 5	40		ARM6T/N1	**03811613N0**	
	1000 / 5	40	10 VA 5P20	ARM9T/N1	**03811615N0**	
	1250 / 5	40		ARM9T/N1	**03811617N0**	
	1500 / 5	40	15 VA 5P20	ARM9T/N1	**03811619N0**	
	2000 / 5	40		ARM9T/N1	**03811621N0**	
	2500 / 5	40		ARM9T/N1	**03811623N0**	

DE58011 DE58012



ARM6T **ARM9T**

Dimensions page 28

Order form

36 kV primary conductor support CT - double secondary

Double secondary metering and protection CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Metering secondary: power, accuracy class, safety factor FS	Metering secondary: power and accuracy class (possible double use)	Type	Reference	Qty
Ur 36 kV	25 / 5-5	16	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811624N0**	
Ud 70 kV - 1 min		20			ARM9T/N2	**03811625N0**	
Up 170 kV peak	50 / 5-5	16			ARM6T/N2	**03811626N0**	
fr 50/60 Hz		16	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811627N0**	
		25	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811628N0**	
		25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811629N0**	
		31.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM9T/N2	**03811630N0**	
	75 / 5-5	25			ARM6T/N2	**03811631N0**	
		25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811632N0**	
		31.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811633N0**	
		31.5	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811634N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM9T/N2	**03811635N0**	
	100 / 5-5	25			ARM6T/N2	**03811636N0**	
		25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811637N0**	
		31.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811638N0**	
		31.5	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811639N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811640N0**	
	200 / 5-5	25			ARM6T/N2	**03811641N0**	
		25	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811642N0**	
		31.5	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811643N0**	
		31.5	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811644N0**	
		40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811645N0**	
		40	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811646N0**	
	400 / 5-5	40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811647N0**	
		40	15 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811648N0**	
	600 / 5-5	40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811649N0**	
		40	20 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811650N0**	
	750 / 5-5	40	7.5 VA cl. 0.5 Fs < 10	7.5 VA 5P10	ARM6T/N2	**03811651N0**	
		40	20 VA cl. 0.5 Fs < 10	15 VA 5P10 - 7.5 VA 5P20	ARM9T/N2	**03811652N0**	
	1000 / 5-5	40	30 VA cl. 0.5 Fs < 10	10 VA 5P20	ARM9T/N2	**03811653N0**	
	1250 / 5-5	40			ARM9T/N2	**03811654N0**	
	1500 / 5-5	40		15 VA 5P20	ARM9T/N2	**03811655N0**	
	2000 / 5-5	40			ARM9T/N2	**03811656N0**	
	2500 / 5-5	40			ARM9T/N2	**03811657N0**	

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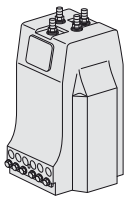

ARM6T

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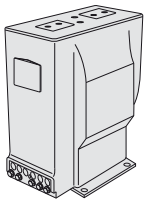


ARM9T

Dimensions page 28

Order form

17.5 - 24 - 36 kV split-over CT - single and double secondary

Single secondary metering CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power, accuracy class, safety factor FS	Type	Reference	Qty
Ur 17.5 kV Ud 38 kV - 1 min Up 95 kV peak fr 50/60 Hz	2500 / 5	50	30 VA cl. 0.5 Fs < 10	ARO1b/N1	**03811842N0**	
	3000 / 5	50		ARO1b/N1	**03811659N0**	
Ur 24 kV Ud 50 kV - 1 min Up 125 kV peak fr 50/60 Hz	2500 / 5	50	30 VA cl. 0.5 Fs < 10	ARO2/N1	**03811661N0**	
	3000 / 5	50		ARO2/N1	**03811663N0**	
Ur 36 kV Ud 70 kV - 1 min Up 170 kV peak fr 50/60 Hz	2500 / 5	50	30 VA cl. 0.5 Fs < 10	ARO2/N1	**03811665N0**	
	3000 / 5	50		ARO2/N1	**03811667N0**	

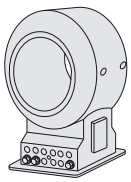
Single secondary protection CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power and accuracy class (possible double use)	Type	Reference	Qty
Ur 17.5 kV Ud 38 kV - 1 min Up 95 kV peak fr 50/60 Hz	2500 / 5	50	15 VA 5P20	ARO1b/N1	**03811658N0**	
	3000 / 5	50		ARO1b/N1	**03811660N0**	
Ur 24 kV Ud 50 kV - 1 min Up 125 kV peak fr 50/60 Hz	2500 / 5	50	15 VA 5P20	ARO2/N1	**03811662N0**	
	3000 / 5	50		ARO2/N1	**03811664N0**	
Ur 36 kV Ud 70 kV - 1 min Up 170 kV peak fr 50/60 Hz	2500 / 5	50	15 VA 5P20	ARO2/N1	**03811666N0**	
	3000 / 5	50		ARO2/N1	**03811668N0**	

Double secondary metering and protection CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Metering secondary: power, accuracy class, safety factor FS	Metering secondary: power and accuracy class (possible double use)	Type	Reference	Qty
Ur 17.5 kV Ud 38 kV - 1 min Up 95 kV peak fr 50/60 Hz	2500 / 5 - 5	50	30 VA cl. 0.5 Fs < 10	15 VA 5P20	ARO1b/N2	**03811669N0**	
	3000 / 5 - 5	50			ARO1b/N2	**03811670N0**	
Ur 24 kV Ud 50 kV - 1 min Up 125 kV peak fr 50/60 Hz	2500 / 5 - 5	50	30 VA cl. 0.5 Fs < 10	15 VA 5P20	ARO2/N2	**03811671N0**	
	3000 / 5 - 5	50			ARO2/N2	**03811672N0**	
Ur 36 kV Ud 70 kV - 1 min Up 170 kV peak fr 50/60 Hz	2500 / 5 - 5	50	30 VA cl. 0.5 Fs < 10	15 VA 5P20	ARO2/N2	**03811673N0**	
	3000 / 5 - 5	50			ARO2/N2	**03811674N0**	

DE58013



ARO1b

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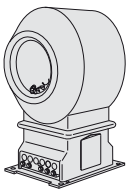
DE58014



ARO2

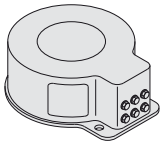
Order form

0.72 kV closed core CT - single and double secondary

Single secondary metering CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power, accuracy class, safety factor FS	Type	Reference	Qty
Ur 0.72 kV	150 / 5	50	7.5 VA cl. 0.5 Fs < 10	ARC2/N1	**03811675N0**	
Ud 3 kV - 1 min	200 / 5	50		ARC2/N1	**03811676N0**	
fr 50/60 Hz	250 / 5	50	15 VA cl. 0.5 Fs < 10	ARC2/N1	**03811677N0**	
	300 / 5	50		ARC2/N1	**03811678N0**	
	400 / 5	50		ARC2/N1	**03811679N0**	
	600 / 5	50	20 VA cl. 0.5 Fs < 10	ARC2/N1	**03811680N0**	
	750 / 5	50		ARC3/N1	**03811681N0**	
	1000 / 5	50	30 VA cl. 0.5 Fs < 10	ARC3/N1	**03811682N0**	
	1250 / 5	50		ARC3/N1	**03811683N0**	

DE58015



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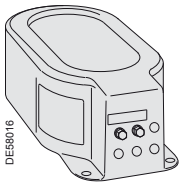

ARC2 **ARC3**

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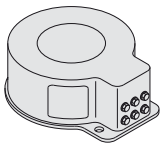
Single secondary protection CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Power and accuracy class (possible double use)	Type	Reference	Qty
Ur 0.72 kV	75 / 5	50	2.5 VA 5P20	ARC2/N1	**03881124N0**	
Ud 3 kV - 1 min	100 / 5	50		ARC2/N1	**03881125N0**	
fr 50/60 Hz	150 / 5	50	5 VA 5P20	ARC2/N1	**03881126N0**	
	200 / 5	50		ARC2/N1	**03881127N0**	
	250 / 5	50		ARC2/N1	**03881128N0**	
	300 / 5	50		ARC2/N1	**03881129N0**	
	400 / 5	50		ARC2/N1	**03881130N0**	
	600 / 5	50	7.5 VA 5P20	ARC2/N1	**03881131N0**	
	750 / 5	50		ARC3/N1	**03881302N0**	
	1000 / 5	50	10 VA 5P20	ARC3/N1	**03881303N0**	
	1250 / 5	50		ARC3/N1	**03881304N0**	

DE58015



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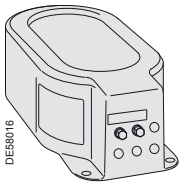

ARC2 **ARC3**

Dimensions page 28

Double secondary metering and protection CT

Insulation level and frequency	Transformation ratio A / A	Short-time thermal current kA x 1 s	Metering secondary: power, accuracy class, safety factor FS	Metering secondary: power and accuracy class (possible double use)	Type	Reference	Qty
Ur 0.72 kV	250 / 5-5	50	10 VA cl. 0.5 Fs < 10	5 VA 5P20	ARC2/N2	**03881141N0**	
Ud 3 kV - 1 min	300 / 5-5	50			ARC2/N2	**03881142N0**	
fr 50/60 Hz	400 / 5-5	50	15 VA cl. 0.5 Fs < 10		ARC2/N2	**03881143N0**	
	600 / 5-5	50	20 VA cl. 0.5 Fs < 10	7.5 VA 5P20	ARC2/N2	**03881144N0**	
	750 / 5-5	50			ARC3/N2	**03881305N0**	
	1000 / 5-5	50	30 VA cl. 0.5 Fs < 10	15 VA 5P20	ARC3/N2	**03881306N0**	
	1250 / 5-5	50			ARC3/N2	**03881307N0**	

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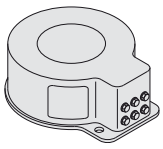

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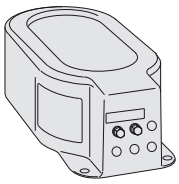


ARC3

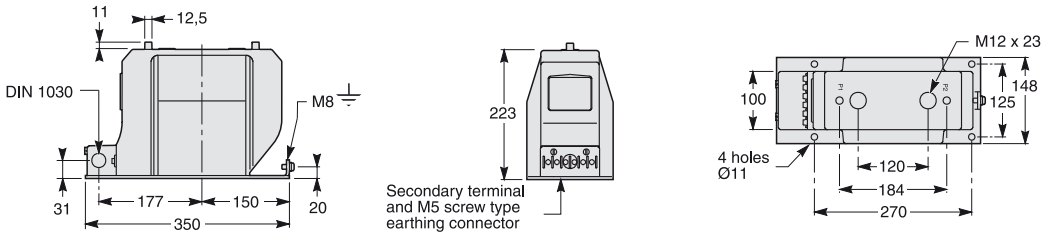
Dimensions page 28

Dimensions

AD12

PE58378

DE52296EN



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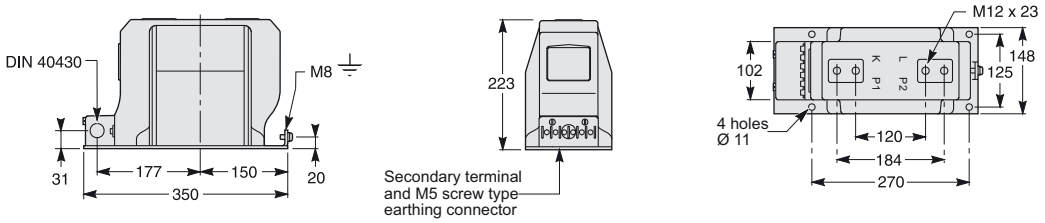

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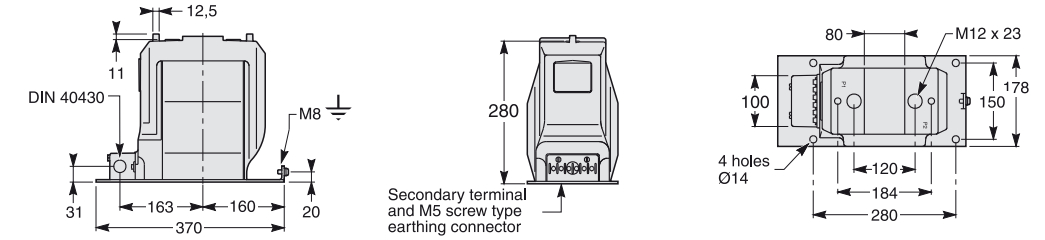

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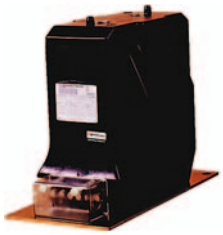

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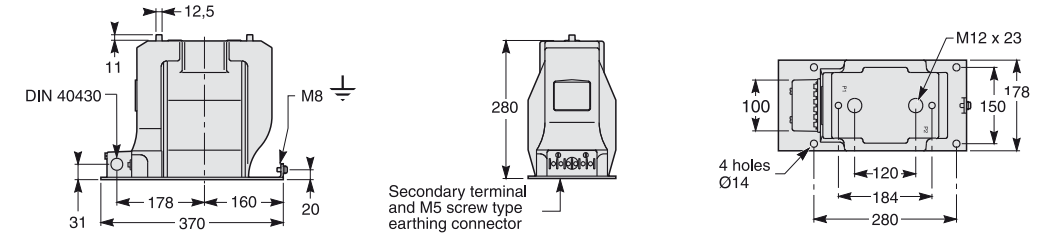
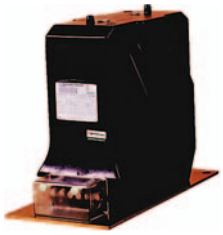


ARJD

PE58421



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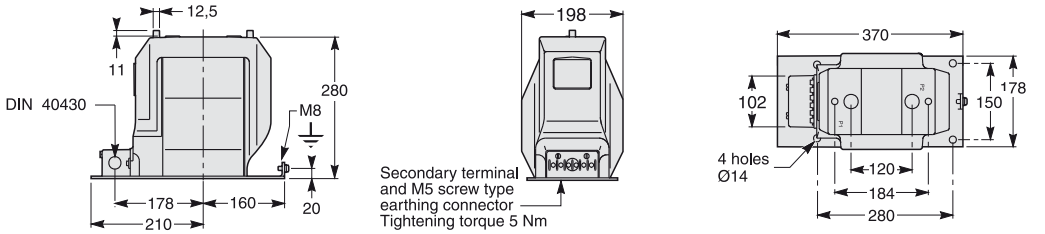

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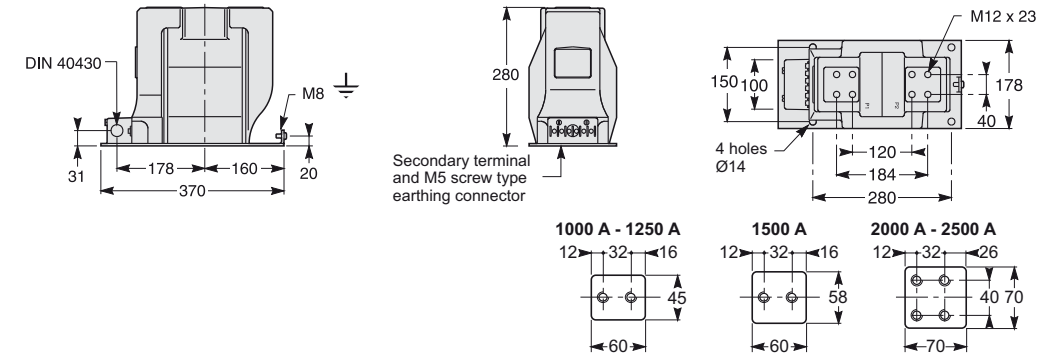

Dimensions

ARJP1

PE58387

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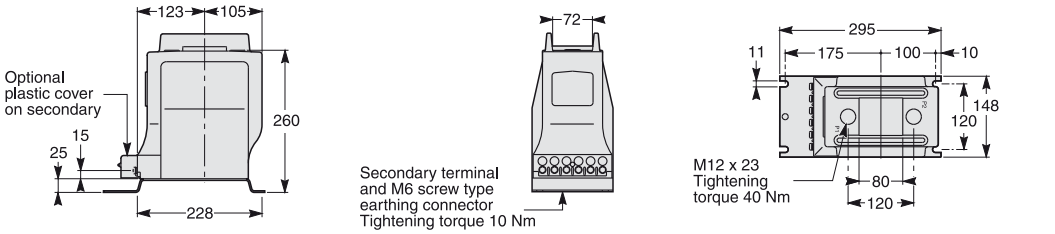

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PE58388

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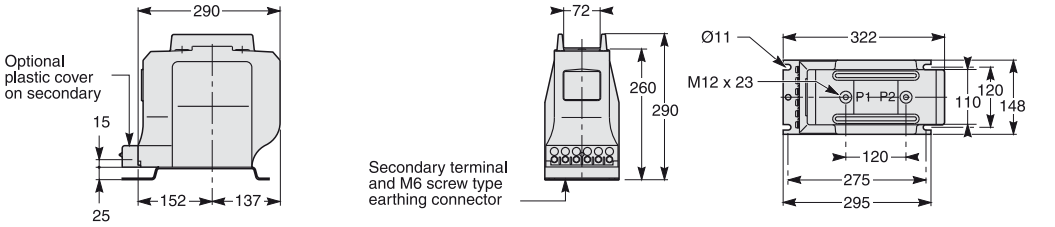

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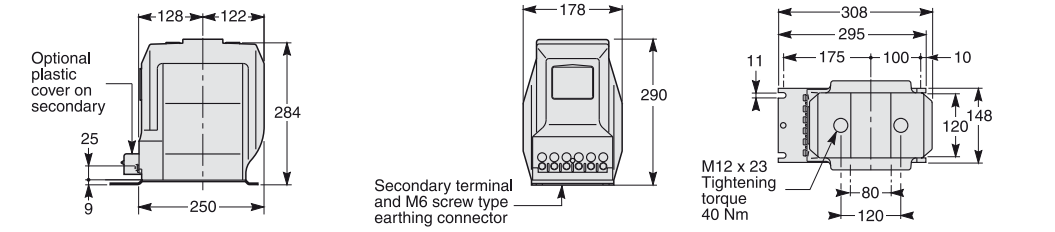

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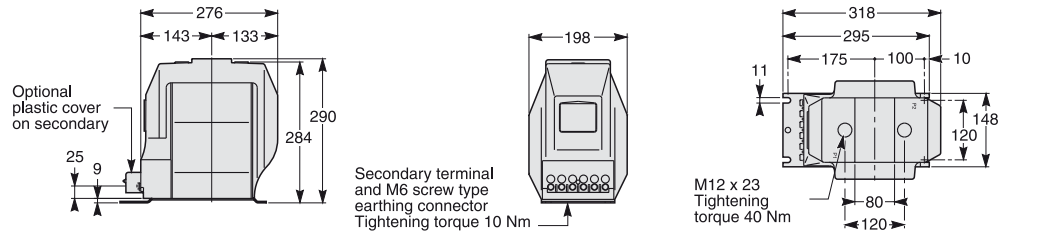

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PE58389

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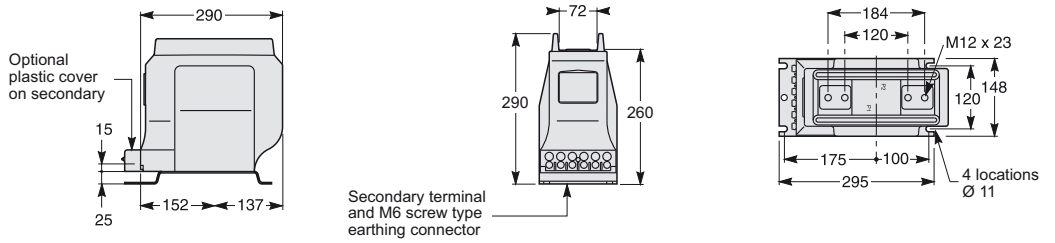

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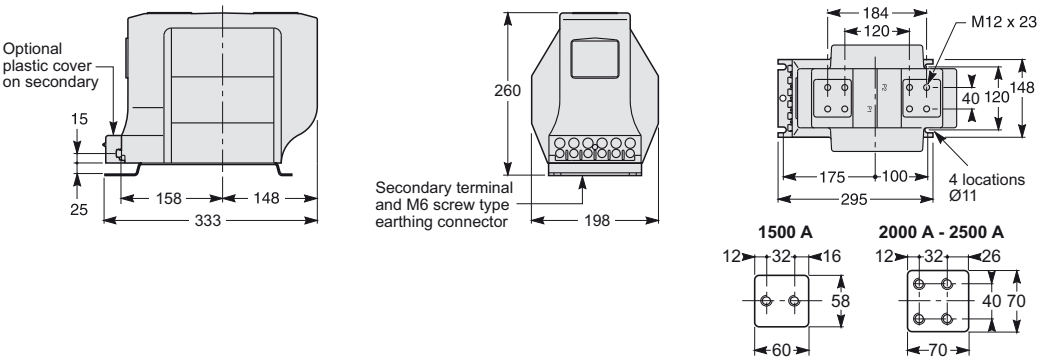

Dimensions

ARM6T

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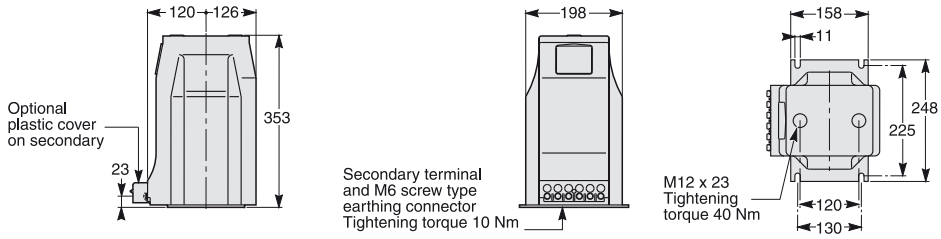

ARM9T

PE58391

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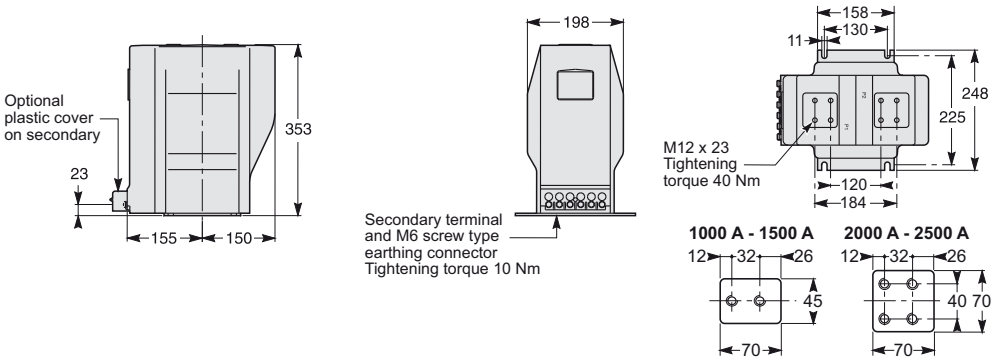

ARO1b

PE58392

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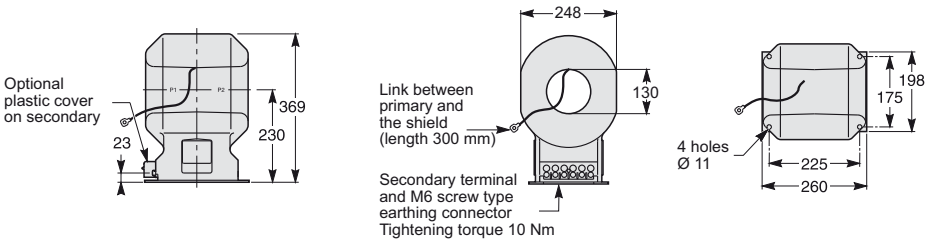

ARO2

PE58393

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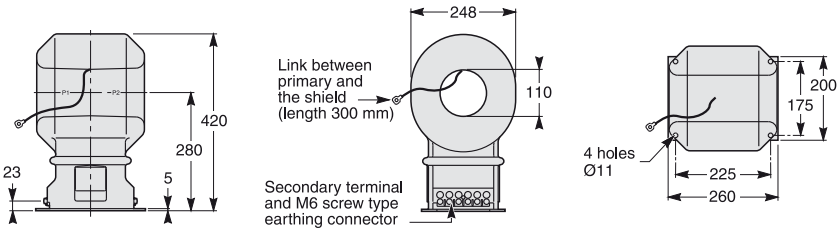

ARC2

PE58444

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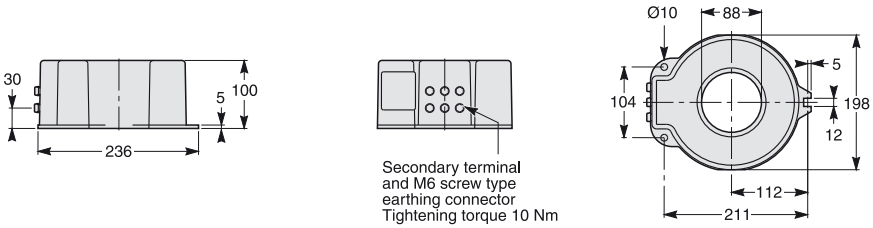

ARC3

PE58445

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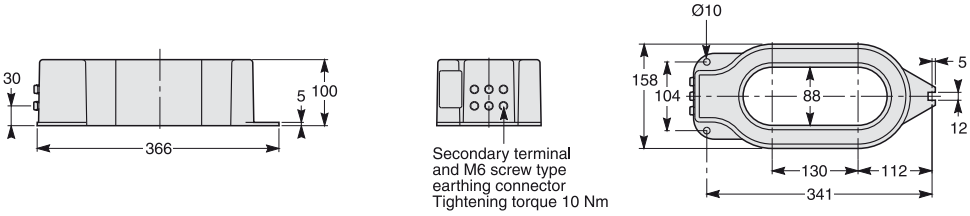

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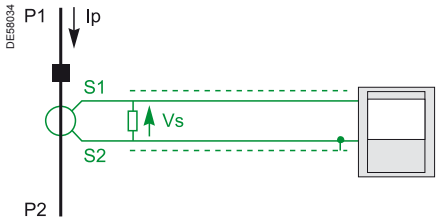
LPCT's (Low Power Current Transformers) meet IEC standard IEC 60044-8.
These are CT's with a direct voltage output which has the advantage of having a very wide range of applications, simplifying selection.



LPCT low power current transformers

LPCT's are specific current sensors with a direct voltage output of the "Low Power Current Transformers" type, in conformity with standard IEC 60044-8.
LPCT's provide metering and protection functions.
They are defined by:
- the rated primary current
- the extended primary current
- the accuracy limit primary current or the accuracy limit factor.

These have a linear response over a large current range and do not start to saturate until beyond the currents to be broken.

Examples of LPCT characteristics according to IEC standard 60044-8

These characteristics are summarized in the curves below. They show the maximum error limits (as an absolute value) on the current and the phase corresponding to the accuracy class for the given examples.
They give the same error limits shown for these classes in page 9, but with much wider current ranges, which gives an advantage to this type of sensor.

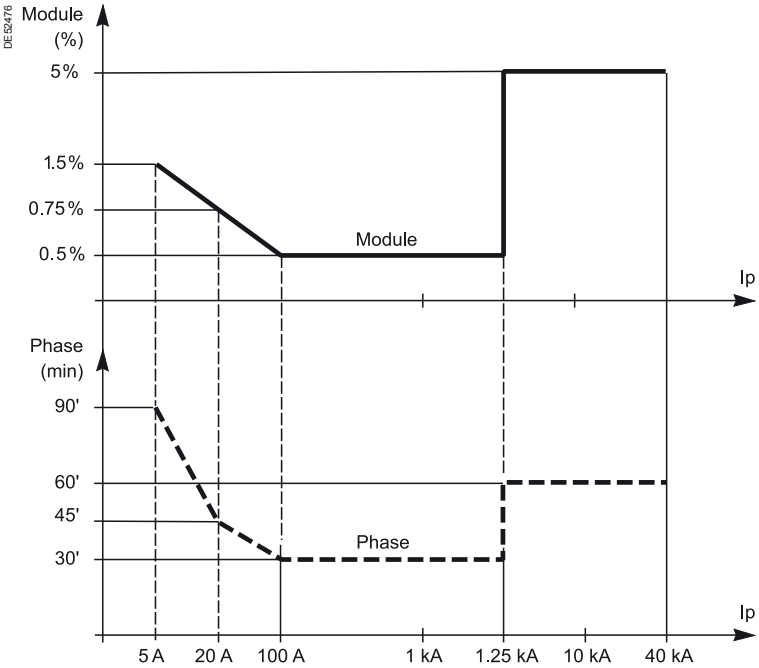
Example for metering class 0.5
- rated primary current Ipn = 100 A
- extended primary current Ipe = 1250 A
- secondary voltage Vsn = 22.5 mV (for 100 A on the secondary)
- class 0.5:
  - accuracy (see definitions page 13) on:
  - the primary current module 0.5% (error ⩽ ± 0.5%)
  - the primary current phase 60 min (error ⩽ 30 minutes)

over a range of 100 A to 1250 A
- accuracy 0.75% and 45 min at 20 A
- accuracy 1.5% and 90 min at 5 A.

which are two metering points specified by the standard.

Example for class 5P protection
- primary current Ipn = 100 A
- secondary voltage Vsn = 22.5 mV
- class 5P:
  - accuracy (see definitions page 9) on:
  - the primary current module 5% (error ⩽ ± 5%)
  - the primary current phase 60 min (error ⩽ 60 minutes) on a range of 1.25 kA to 40 kA.

The LPCT and Sepam guarantees a very high coverage range and flexibility of usage. Example: protection system with CLP1 or CLP2 and Sepam guaranteeing a usage range of 5 A to 1250 A.



Accuracy characteristics of a LPCT (example of Schneider Electric's CLP1): the accuracy classes are given for extended current ranges (here class 0.5 for metering from 100 to 1250 A and protection class 5P from 1.25 to 40 kA).

Order form

Primary current rated (A)	extended (A)	Secondary voltage (mV)	Accuracy class	Accuracy limit factor FLP	Short-time thermal current	Rated insulation (kV)	Secondary connector	Internal diameter (mm)	Type	Reference	Qty
100	1250	22.5	0.5 – 5P	500	50 kA - 1 s 40 kA - 3 s	17.5	RJ45 - 8 pts		CLP1	62623	
100	1250	22.5	0.5 – 5P	400	40 kA - 3 s	24	RJ45 - 8 pts		CLP2	51238696F0	
100	2500	22.5	0.5 – 5P	400	40 kA - 3 s	24	RJ45 - 8 pts		CLP3	AAA10474	
100	2500	22.5	0.5 – 5P	400	40 kA - 3 s	0.72	RJ45 - 8 pts	160	TLP160	AAA10094	
100	2500	22.5	0.5 – 5P	400	40 kA - 3 s	0.72	RJ45 - 8 pts	190	TLP190	AAA10095	

Frequency and insulation

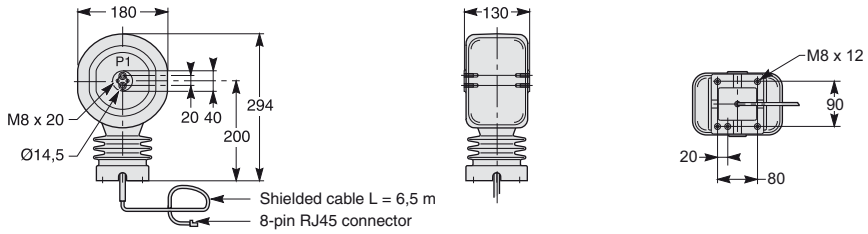
Frequency (Hz)	Ur (kV)	Ud (kV - 1 min)	Up (kV peak)
50 / 60	24	50	125
	17.5	38	95
	0.72	3	

Dimensions

CLP1

PE58394

DE58051EN



CLP2

PE58395

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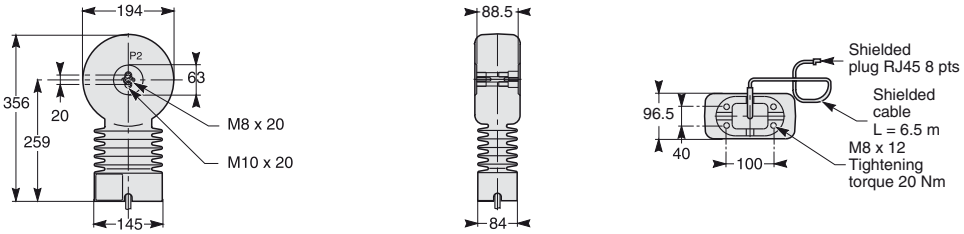

CLP3

PE58396

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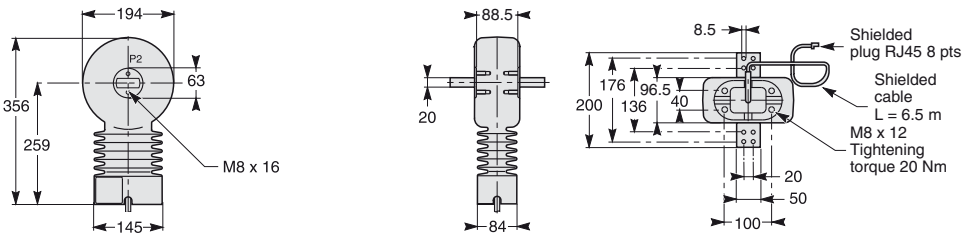

TLP160

PE56703

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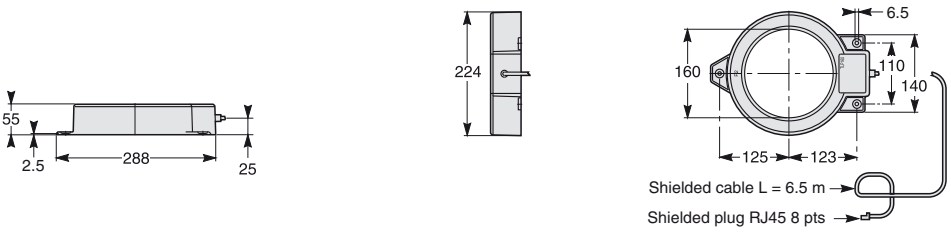

TLP190

PE58397

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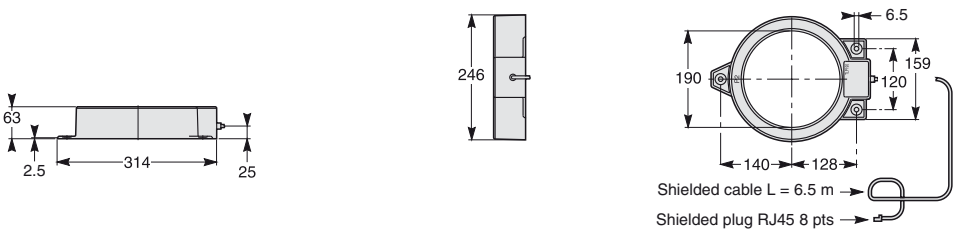

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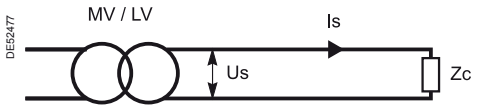
Phase-phase VT 48

Selection guide
Technical description

Voltage transformers (VT) meet standards IEC 60044-2.
Their function is to supply a voltage proportional to the MV circuit that they are installed on to the secondary.
The primary, which is parallel mounted on the MV network between phases of from phase to earth, is subject to the same over-voltages as the latter. The secondary supplies a voltage that is virtually constant, whatever the load.
The secondary must never be placed in short circuit.



Simplified schematic diagram of a voltage transformer
IS: secondary current
Us: secondary voltage
Zc: load impedance.

Voltage transformers (VT)
Voltage transformers have two key functions:
- adapting the value of MV voltage on the primary to the characteristics of metering or protection devices by supplying a secondary voltage that is proportional and lower
- isolating power circuits from the metering and/or protection circuit.

Composition and type
These comprise a primary winding, a magnetic core, one or several secondary windings, with everything encapsulated in an insulating resin.
There are two types, according to how they are connected:
- phase/phase: primary connected between two phases
- phase/earth: primary connected between a phase and the earth.

Characteristics
These are defined by standard IEC 60044-2.

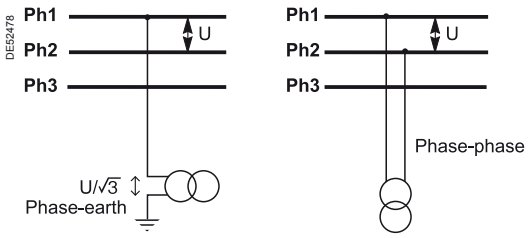
Insulation
Characterized by the rated voltages:
- insulation voltage, which will be that of the installation (e.g.: 24 kV)
- power frequency withstand 1 min (e.g.: 50 kV)
- impulse withstand (e.g.: 125 kV).

Rated frequency
50 or 60 Hz.

Rated primary voltage (Upn)
According to their design, voltage transformers are connected:
- either between phase and earth and in this case Upn = U/$\sqrt{3}$ (e.g.: 20/$\sqrt{3}$)
- or between phases and in this case Upn = U.

Rated secondary voltage (Usn)
This is equal to 100 or 110 V for phase/phase voltage transformers. For single phase, phase/earth transformers, the secondary voltage must be divided by $\sqrt{3}$ (e.g.: 100/$\sqrt{3}$).

Accuracy power Pn
Apparent power (VA) that the VT can supply the secondary for the rated secondary voltage for which the accuracy is guaranteed (accuracy load).
Standardized values 30, 50, 100 VA (IEC).



Connection of a VT

Accuracy class
Defines the error limits guaranteed relative to the transformation ratio and the phase shift under specified conditions of power and voltage.

Voltage error ε (%)
Error that the transformer introduces into the voltage measurement when the transformation ratio is different from the rated value.

Phase shift or phase error (ψ in minutes)
Phase difference between primary and secondary voltages, in angle minutes.

Rated voltage factor KT
This is the factor, a multiple of the rated primary voltage, which determines the maximum voltage which the transformer must meet the specified temperature rise and accuracy recommendations. The maximum operating voltage depends on the network neutral system and the earthing conditions of the primary winding.

Table of voltage factors KT

Voltage factor	Rated duration	Connection mode of the primary winding	Network neutral system
1.2	Continuous	Between phases	Any
	Continuous	Between the star-connected transformer neutral point and earth	Any
1.2	Continuous	Between phase and earth	Directly earthed
1.5	30 s		
1.2	Continuous	Between phase and earth	Earthed via a limiting resistor with automatic earthing fault elimination
1.9	30 s		
1.2	Continuous	Between phase and earth	Insulated neutral without automatic earthing fault elimination
1.9	8 h		
1.2	Continuous	Between phase and earth	Earthed via a limiting resistance with automatic earthing fault elimination

Table of voltage transformer characteristics

Characteristics	Rated values				
Insulating voltage (kV)	7.2	12	17.5	24	36
■ power frequency withstand (kV) (1) 1 min	20	28	38	50	70
■ lightning impulse withstand (kV - peak)	60	75	95	125	170
Frequency (Hz)	50 - 60				
Primary voltage U1n (kV) (divided by √3 if single phase)	3 - 3.3 - 5 - 5.5 - 6 - 6.6 - 10 - 11 - 13.8 - 15 - 20 - 22 - 30 - 33				
Secondary voltage U2n (V)	100 - 110 or 100/√3 - 110/√3				
Accuracy power (VA)	30 - 50 - 100				

(1) When there is a major difference between the highest voltage for the equipment (Um) and the rated primary voltage, the power frequency must be limited to five times the rated voltage.

VT operating characteristics

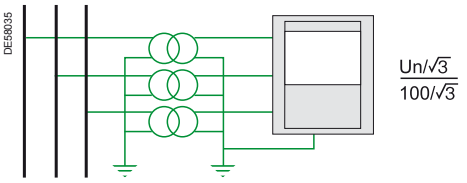
Operation of a VT is more simple than that of a CT because the secondary voltage is virtually independent of the load, due to it being connected through a high impedance (virtually used in an open circuit).
Therefore, **the secondary must not be short circuited**. Under these conditions an excessively high current will damage the transformer.

VT connections

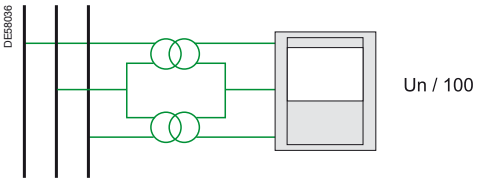
Several metering connection arrangements are possible (fig. opposite)

■ star-connection of 3 transformers: requires 1 isolated MV terminal for each transformer

■ connecting to 2 transformers, so-called V-connection: requires 2 isolated MV terminals per transformer.



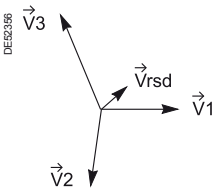
Star-connected VT and example of transformation ratio



V-connected VT and example of the transformation ratio

Residual voltage metering

The residual voltage which characterizes the voltage of the neutral point relative to earth, is equal to the vectorial sum of the three phase-earth voltages.
The residual voltage is equal to 3 times the zero-sequence voltage V0.



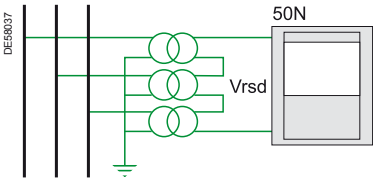
$$\overrightarrow{Vrsd} = 3 \cdot \vec{V0} = \vec{V1} + \vec{V2} + \vec{V3}$$

Please note, it is impossible to measure a residual voltage with ***phase/phase VT's***.

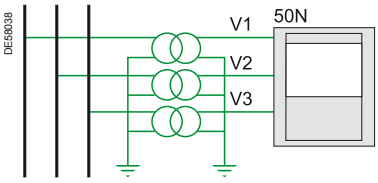
The appearance of this voltage signifies the existence of an earthing fault.
It is obtained by measurement or by calculation:

■ measuring by three voltage transformers whose primary circuits are star-connected and whose secondary circuits are open-delta connected, supplying the residual voltage ①

■ calculation by the relay based on three voltage transformers whose primary and secondary circuits are star-connected ②.



① *Direct measurement of the residual voltage*



② *Calculation of the residual voltage*

Voltage transformer for metering

Accuracy class

These devices are intended to send an image as accurately as possible of the rated primary voltage between **80 and 120%** of the latter.
The accuracy class determines the permissible error in the phase and in the module in this range for the accuracy load.
It is valid for all loads of between 25 and 100% of the rated accuracy power with an inductive power factor of 0.8.
The table below gives the usual classes according to application.

Application	Class
Accurate laboratory metering applications (calibration devices)	0.2
Billing metering industrial measurements	0.2
Statistical switchboard metering indicators	0.5 - 1

■ **Class 0.5** corresponds to an error ⩽ ± 0.5% for the rated primary voltage, with the accuracy load over the secondary.
■ **Class 1** corresponds to an error ⩽ ± 1% in the same conditions.
For a given accuracy class, voltage and phase-shift errors must not exceed the values indicated in the table opposite.

Error limits according to the accuracy class

Accuracy class	Voltage error (ratio) ± %	Phase-shift error ± min
0.2	0.2	10
0.5	0.5	20
1	1.0	40

Example:
Metering voltage transformer $\frac{20\,000}{\sqrt{3}} / \frac{110}{\sqrt{3}}$, 50 VA, cl. 0.5

■ rated primary voltage 20000 V/$\sqrt{3}$, rated secondary 110 V/$\sqrt{3}$
■ accuracy power 50 VA
■ accuracy class 0.5. The table of limit error values gives, under the specified conditions for the accuracy class:
□ a primary voltage 80% to 120% of the rated voltage (16 kV to 24 kV)
□ a load of between 25% and 100% of the accuracy power, i.e. between 12.5 VA and 50 VA with an inductive power factor of 0.8, the metering errors will be ⩽ ± 0.5% for voltage and ⩽ ± 20 min for phase shift.

Voltage transformer for protection

Accuracy class

These devices are intended to send an image that is as accurate as possible of the voltage in the case of a fault (voltage drop or overvoltage).
They must have the right accuracy and power for the fault voltages and therefore different from those used for instrument transformers.
In practice, the accuracy class **3P** is used for all applications and the error limits for voltage and phase given in the table below.
These are guaranteed for all loads of between 25 and 100% of the accuracy power with an inductive power factor of 0.8.

Error limits for each accuracy class

Accuracy class	Voltage error (± %) between		Phase-shift error (minutes) between	
	5% Upn and KT	2% Upn and KT	5% Upn and KT	2% Upn and KT
3P	3	6	120	240
6P	6	12	240	480

KT: over-voltage coefficient.
Upn: rated primary voltage.

Example:
Protection voltage transformer $\frac{20\,000}{\sqrt{3}} / \frac{110}{3}$, 100 VA, 3P, KT = 1.9 8h

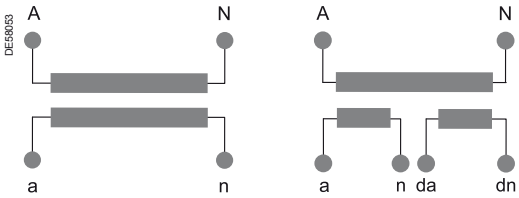
■ rated primary voltage 20000 V/$\sqrt{3}$, rated secondary 110 V/3
■ accuracy power 100 VA
■ accuracy class 3P. The table of limit values shows that for:
□ a primary voltage of 5% of the rated voltage at KT times the rated voltage, i.e. 20000 x 5% = 1000 V at 20000 x 1.9 = 38000 V
□ a load of between 25% and 100% of the accuracy power, in other words of between 25 VA and 100 VA with a power factor of 0.8, the metering error will be ⩽ ± 3% in voltage and ⩽ ± 120 min in phase shift.

Connecting a VT

VT with a double (or triple) secondary
A VT can have one or two secondaries (figure opposite), and more rarely three secondaries for the appropriate applications (protection and/or metering).

Identifying terminals
A VT is connected across the terminals identified according to the IEC:
- A for phase and N for earth on the MV side
- a and n on the corresponding secondary side. In the case of a double output, the first output is shown by 1a and 1n, the second by 2a and 2n.

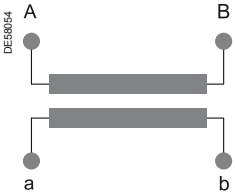
Single (grounded) pole



Single secondary
Instrument or protection

Double secondary
(one instrument and one residual voltage)
SEPARATED OPERATION

Two (insulated) poles



Single secondary
Instrument or protection

Calculating the power (VA)

Indicative metering consumption

Device		Max. consumption in VA (per circuit)
Voltmeter	Electromagnetic	5
	Electronic	1
Transducer	Self-powered	5
	External power	2
Meter	Induction	5
	Electronic	4
	Wattmeter, varmeter	5

Indicative protection consumption

Device	Consumption in VA (per circuit)
Static overvoltage relay	0.2 to 1
Electromagnetic overvoltage relay	1 to 8

Order form
DIN standard phase-earth VT

Single secondary metering VT

Frequency: 50 - 60 Hz

Rated voltage kV	Power frequency withstand kV-1 min	Lightning impulse withstand kV-peak	Transformation ratio V / V	Power and accuracy class (double use)	Type	Reference	Qty
7.2	9	60	3000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VDF12n/S1	**03811684N0**	
	10		3300:√3 / 110:√3		VDF12n/S1	**03811685N0**	
	15		5000:√3 / 100:√3		VDF12n/S1	**03811686N0**	
	16		5500:√3 / 110:√3		VDF12n/S1	**03811687N0**	
	20		6000:√3 / 100:√3		VDF12n/S1	**03811688N0**	
			6600:√3 / 110:√3		VDF12n/S1	**03811689N0**	
12	20	75	6000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VDF12n/S1	**03811690N0**	
			6600:√3 / 110:√3		VDF12n/S1	**03811691N0**	
	28		10000:√3 / 100:√3		VDF12n/S1	**03811692N0**	
			11000:√3 / 110:√3		VDF12n/S1	**03811693N0**	
17.5	38	95	13800:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VDF21n/S1	**03811694N0**	
			15000:√3 / 100:√3		VDF21n/S1	**03811695N0**	
24	44	125	15000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VDF21n/S1	**03811696N0**	
	50		20000:√3 / 100:√3		VDF21n/S1	**03811697N0**	
			22000:√3 / 110:√3		VDF21n/S1	**03811698N0**	

Double secondary metering and protection VT

Frequency: 50 - 60 Hz

Rated voltage kV	Power frequency withstand kV-1 min	Lightning impulse withstand kV-peak	Transformation ratio V / V	Power, accuracy class for metering secondary (double use)	Power, accuracy class for protection secondary	Type	Reference	Qty
7.2	9	60	3000:√3 / 100:√3-100:3	30 VA - 50 VA cl. 0.5	50 VA 3P	VDF12n/S2	**03811699N0**	
	10		3300:√3 / 110:√3-110:3			VDF12n/S2	**03811700N0**	
	15		5000:√3 / 100:√3-100:3			VDF12n/S2	**03811701N0**	
	16		5500:√3 / 110:√3-110:3			VDF12n/S2	**03811702N0**	
	20		6000:√3 / 100:√3-100:3			VDF12n/S2	**03811703N0**	
			6600:√3 / 110:√3-110:3			VDF12n/S2	**03811704N0**	
12	20	75	6000:√3 / 100:√3-100:3	30 VA - 50 VA cl. 0.5	50 VA 3P	VDF12n/S2	**03811705N0**	
			6600:√3 / 110:√3-110:3			VDF12n/S2	**03811706N0**	
	28		10000:√3 / 100:√3-100:3			VDF12n/S2	**03811707N0**	
			11000:√3 / 110:√3-110:3			VDF12n/S2	**03811708N0**	
17.5	38	95	13800:√3 / 110:√3-110:3	30 VA - 50 VA cl. 0.5	50 VA 3P	VDF21n/S2	**03811709N0**	
			15000:√3 / 100:√3-100:3			VDF21n/S2	**03811710N0**	
24	44	125	15000:√3 / 100:√3-100:3	30 VA - 50 VA cl. 0.5	50 VA 3P	VDF21n/S2	**03811711N0**	
	50		20000:√3 / 100:√3-100:3			VDF21n/S2	**03811712N0**	
			22000:√3 / 110:√3-110:3			VDF21n/S2	**03811713N0**	

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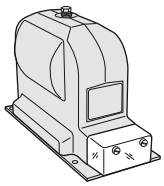

VDF12

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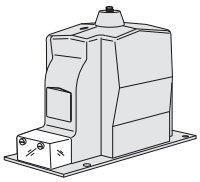
DE58018



VDF21

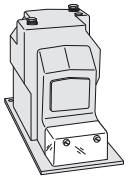
Order form
DIN standard phase-phase VT

Single secondary metering VT

Frequency: 50 - 60 Hz

Rated voltage kV	Power frequency withstand kV-1 min	Lightning impulse withstand kV-peak	Transformation ratio V / V	Power and accuracy class (double use)	Type	Reference	Qty
7.2	15	60	3000 / 100	50 VA cl. 0.5	VDC11/S1	**03811777N0**	
	20	60	3300 / 110		VDC11/S1	**03811778N0**	
			5000 / 100		VDC11/S1	**03811779N0**	
			5500 / 110		VDC11/S1	**03811780N0**	
			6000 / 100		VDC11/S1	**03811781N0**	
			6600 / 110		VDC11/S1	**03811782N0**	
12	28	75	6000 / 100	50 VA cl. 0.5	VDC11/S1	**03811783N0**	
			6600 / 110		VDC11/S1	**03811784N0**	
			10000 / 100		VDC11/S1	**03811785N0**	
			11000 / 110		VDC11/S1	**03811786N0**	
17.5	38	95	10000 / 100	50 VA cl. 0.5	VDC21/S1	**03811787N0**	
				100 VA cl. 0.5	VDC21/S1	**03811788N0**	
			11000 / 110	50 VA cl. 0.5	VDC21/S1	**03811789N0**	
				100 VA cl. 0.5	VDC21/S1	**03811790N0**	
			13800 / 100	50 VA cl. 0.5	VDC21/S1	**03811791N0**	
				100 VA cl. 0.5	VDC21/S1	**03811792N0**	
			15000 / 100	50 VA cl. 0.5	VDC21/S1	**03811793N0**	
				100 VA cl. 0.5	VDC21/S1	**03811794N0**	
24	50	125	15000 / 100	50 VA cl. 0.5	VDC21/S1	**03811795N0**	
				100 VA cl. 0.5	VDC21/S1	**03811796N0**	
			20000 / 100	50 VA cl. 0.5	VDC21/S1	**03811797N0**	
				100 VA cl. 0.5	VDC21/S1	**03811798N0**	
			22000 / 110	50 VA cl. 0.5	VDC21/S1	**03811799N0**	
				100 VA cl. 0.5	VDC21/S1	**03811800N0**	

DE58019



VDC11

Dimensions page 46

Order form
Phase-earth VT

Single secondary metering VT

Frequency: 50 - 60 Hz

Rated voltage kV	Power frequency withstand kV-1 min	Lightning impulse withstand kV-peak	Transformation ratio V / V	Power and accuracy class (double use)	Type	Reference	Qty
7.2	9	60	3000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811714N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811715N0**	
	10	60	3300:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811716N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811717N0**	
	15	60	5000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811718N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811719N0**	
	16	60	5500:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811720N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811721N0**	
	20	60	6000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811722N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811723N0**	
			6600:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811724N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811725N0**	
12	20	75	6000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811726N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811727N0**	
			6600:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811728N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811729N0**	
	28	75	10000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811730N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811731N0**	
			11000:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811732N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811733N0**	
17.5	28	95	10000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRFRn/S1	**03811734N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811735N0**	
			11000:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VRQ3n/S1	**03811736N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811737N0**	
	38	95	13800:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VRQ3n/S1	**03811738N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811739N0**	
			15000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRQ3n/S1	**03811740N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811741N0**	
24	44	125	15000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRQ2n/S1	**03811742N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811743N0**	
	50	125	20000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRQ2n/S1	**03811744N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811745N0**	
			22000:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VRQ2n/S1	**03811746N0**	
				100 VA cl. 0.5	VRQ1n/S1	**03811747N0**	
36	70	170	30000:√3 / 100:√3	100 VA cl. 0.5	VRF3n/S1	**03811748N0**	
			33000:√3 / 110:√3	100 VA cl. 0.5	VRF3n/S1	**03811749N0**	

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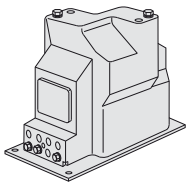

VRFR

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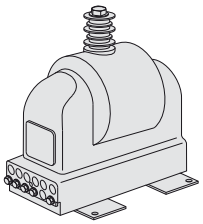
DE58021



VRF3

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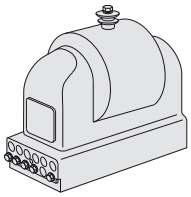
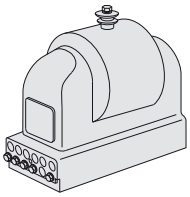


VRQ1

DE58022



VRQ2

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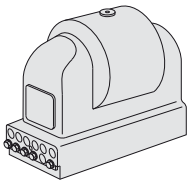


VRQ3

Order form
Phase-earth VT

Double secondary metering and protection VT

Frequency: 50 - 60 Hz

Rated voltage kV	Power frequency withstand kV-1 min	Lightning impulse withstand kV-peak	Transformation ratio V / V	Power, accuracy class for metering secondary (double use)	Power, accuracy class for protection secondary	Type	Reference	Qty
7.2	9	60	3000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62558**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62559**	
				100 VA cl. 0.5		VRQ1n/S2	**03811750N0**	
	10	60	3300:√3 / 110:√3 -110:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62567**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62568**	
				100 VA cl. 0.5		VRQ1n/S2	**03811751N0**	
	15	60	5000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62561**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62562**	
				100 VA cl. 0.5		VRQ1n/S2	**03811752N0**	
	16	60	5500:√3 / 110:√3-110:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62570**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62571**	
				100 VA cl. 0.5		VRQ1n/S2	**03811753N0**	
	20	60	6000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62564**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62565**	
				100 VA cl. 0.5		VRQ1n/S2	**03811754N0**	
			6600:√3 / 110:√3 -110:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62574**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62575**	
				100 VA cl. 0.5		VRQ1n/S2	**03811755N0**	
12	20	75	6000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62576**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62577**	
				100 VA cl. 0.5		VRQ1n/S2	**03811756N0**	
			6600:√3 / 110:√3 -110:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62582**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62583**	
				100 VA cl. 0.5		VRQ1n/S2	**03811757N0**	
	28	75	10000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62579**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62580**	
				100 VA cl. 0.5		VRQ1n/S2	**03811758N0**	
			11000:√3 / 110:√3 -110:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62585**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62586**	
				100 VA cl. 0.5		VRQ1n/S2	**03811759N0**	
17.5	28	95	10000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62588**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62589**	
				100 VA cl. 0.5		VRQ1n/S2	**03811760N0**	
			11000:√3 / 110:√3 -110:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62594**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62595**	
				100 VA cl. 0.5		VRQ1n/S2	**03811761N0**	
	38	95	13800:√3 / 110:√3 -110:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**03811762N0**	
				50 VA cl. 0.5		VRQ3n/S2	**03811763N0**	
				100 VA cl. 0.5		VRQ1n/S2	**03811764N0**	
			15000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRQ3n/S2	**AAD62591**	
				50 VA cl. 0.5		VRQ3n/S2	**AAD62592**	
				100 VA cl. 0.5		VRQ1n/S2	**03811765N0**	
24	44	125	15000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRQ2n/S2	**03811766N0**	
				50 VA cl. 0.5		VRQ2n/S2	**03811767N0**	
				100 VA cl. 0.5		VRQ1n/S2	**03811768N0**	
	50	125	20000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRQ2n/S2	**03811769N0**	
				50 VA cl. 0.5		VRQ2n/S2	**03811770N0**	
				100 VA cl. 0.5		VRQ1n/S2	**03811771N0**	
			22000:√3 / 110:√3 -110:3	30 VA cl. 0.5	50 VA 3P	VRQ2n/S2	**03811772N0**	
				50 VA cl. 0.5		VRQ2n/S2	**03811773N0**	
				100 VA cl. 0.5		VRQ1n/S2	**03811774N0**	
36	70	170	30000:√3 / 100:√3 -100:3	30 VA cl. 0.5	50 VA 3P	VRF3n/S2	**03811775N0**	
			33000:√3 / 110:√3 -110:3	50 VA cl. 0.5	50 VA 3P	VRF3n/S2	**03811776N0**	

Order form

Phase-earth VT with fuse-holder

Single secondary metering VT

Frequency: 50 - 60 Hz

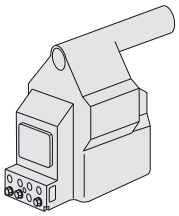
Rated voltage kV	Power frequency withstand kV-1 min	Lightning impulse withstand kV-peak	Transformation ratio V / V	Power and accuracy class (double use)	Type	Reference	Qty
7.2	9	60	3000:√3 / 100:√3	30 VA cl. 0.5	VRS3n/S1	**AAD62597**	
	10		3300:√3 / 110:√3		VRS3n/S1	**AAD62603**	
	15		5000:√3 / 100:√3		VRS3n/S1	**AAD62599**	
	16		5500:√3 / 110:√3		VRS3n/S1	**AAD62605**	
	20		6000:√3 / 100:√3		VRS3n/S1	**AAD62601**	
			6600:√3 / 110:√3		VRS3n/S1	**AAD62607**	
12	20	75	6000:√3 / 100:√3	30 VA cl. 0.5	VRS3n/S1	**AAD62609**	
			6600:√3 / 110:√3		VRS3n/S1	**AAD62613**	
	28		10000:√3 / 100:√3		VRS3n/S1	**AAD62611**	
			11000:√3 / 110:√3		VRS3n/S1	**AAD62615**	
17.5	30	95	10000:√3 / 100:√3	30 VA cl. 0.5	VRS3n/S1	**AAD62617**	
	32		11000:√3 / 110:√3		VRS3n/S1	**AAD62621**	
	38		15000:√3 / 100:√3		VRS3n/S1	**AAD62619**	
24	44	125	15000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRS2Bn/S1	**03811885N0**	
				100 VA cl. 0.5	VRS2Bn/S1	**03811886N0**	
	50		20000:√3 / 100:√3	30 VA - 50 VA cl. 0.5	VRS2Bn/S1	**03811887N0**	
				100 VA cl. 0.5	VRS2Bn/S1	**03811888N0**	
			22000:√3 / 110:√3	30 VA - 50 VA cl. 0.5	VRS2Bn/S1	**03811889N0**	
				100 VA cl. 0.5	VRS2Bn/S1	**03811890N0**	

Double secondary metering and protection VT

Frequency: 50 - 60 Hz

Rated voltage kV	Power frequency withstand kV-1 min	Lightning impulse withstand kV-peak	Transformation ratio V / V	Power, accuracy class for metering secondary (double use)	Power, accuracy class for protection secondary	Type	Reference	Qty
7.2	9	60	3000:√3 / 100:√3-100:3	30 VA cl. 0.5	30 VA 3P	VRS3n/S2	**03811891N0**	
	10		3300:√3 / 110:√3-110:3			VRS3n/S2	**03811892N0**	
	15		5000:√3 / 100:√3-100:3			VRS3n/S2	**03811893N0**	
	16		5500:√3 / 110:√3-110:3			VRS3n/S2	**03811894N0**	
	20		6000:√3 / 100:√3-100:3			VRS3n/S2	**03811895N0**	
			6600:√3 / 110:√3-110:3			VRS3n/S2	**03811896N0**	
12	20	75	6000:√3 / 100:√3-100:3	30 VA cl. 0.5	30 VA 3P	VRS3n/S2	**03811897N0**	
			6600:√3 / 110:√3-110:3			VRS3n/S2	**03811898N0**	
	28		10000:√3 / 100:√3-100:3			VRS3n/S2	**03811899N0**	
			11000:√3 / 110:√3-110:3			VRS3n/S2	**03811900N0**	
17.5	30	95	10000:√3 / 100:√3-100:3	30 VA cl. 0.5	30 VA 3P	VRS3n/S2	**03811901N0**	
	32		11000:√3 / 110:√3-110:3			VRS3n/S2	**03811902N0**	
	38		13800:√3 / 110:√3-110:3			VRS3n/S2	**03811903N0**	
			15000:√3 / 100:√3-100:3			VRS3n/S2	**03811904N0**	
24	44	125	15000:√3 / 100:√3-100:3	30 VA cl. 0.5	50 VA 3P	VRS2Bn/S2	**03811905N0**	
			15000:√3 / 100:√3-100:3	50 VA cl. 0.5		VRS2Bn/S2	**03811906N0**	
			15000:√3 / 100:√3-100:3	100 VA cl. 0.5		VRS2Bn/S2	**03811907N0**	
	50		20000:√3 / 100:√3-100:3	30 VA cl. 0.5		VRS2Bn/S2	**03811908N0**	
				50 VA cl. 0.5		VRS2Bn/S2	**03811909N0**	
				100 VA cl. 0.5		VRS2Bn/S2	**03811910N0**	
			22000:√3 / 110:√3 -110:3	30 VA cl. 0.5		VRS2Bn/S2	**03811911N0**	
				50 VA cl. 0.5		VRS2Bn/S2	**03811912N0**	
				100 VA cl. 0.5		VRS2Bn/S2	**03811913N0**	

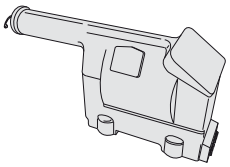
DE58024



VRS3

Dimensions page 48

DE58025



VRS2B

Order form

Installation structure for phase-earth VT with fuse-holder

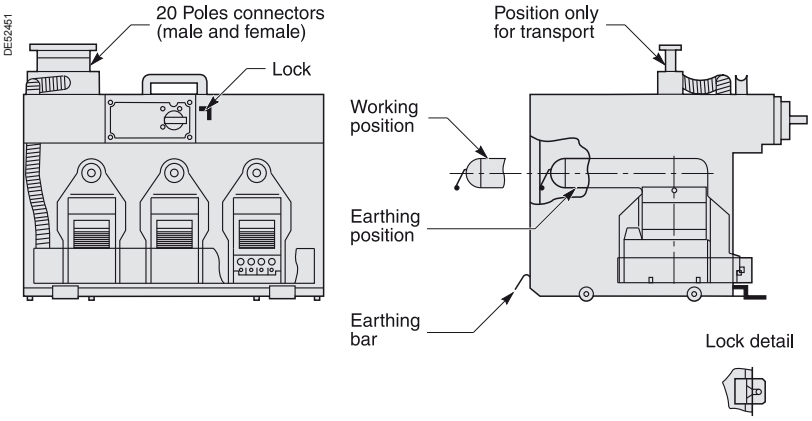
Technical description

The mobile installation structure, ready to be assembled for phase-earth voltage transformers with fuse-holders comprises the following components:

- movement selector for the internal part
- movement control arm
- movement selector for the external plastic cover
- torsion spring selector
- self-adhesive VT mimic diagram
- control panel
- 12 contact entrelec unit
- contact rod
- self-adhesive VT indicator mimic diagram.

Type	Reference	Qty
Kit VT	AAD62630	

Example of a voltage transformer compartment



Order form
Phase-phase VT

Single secondary metering VT

Frequency: 50 - 60 Hz

Rated voltage kV	Power frequency withstand kV-1 min	Lightning impulse withstand kV-peak	Transformation ratio V / V	Power and accuracy class (double use)	Type	Reference	Qty
7.2	15	60	3000 / 100	50 VA cl. 0.5	VRCR/S1	**03811801N0**	
				100 VA cl. 0.5	VRC1/S1	**03811802N0**	
	20	60	3300 / 110	50 VA cl. 0.5	VRCR/S1	**03811803N0**	
				100 VA cl. 0.5	VRC1/S1	**03811804N0**	
			5000 / 100	50 VA cl. 0.5	VRCR/S1	**03811805N0**	
				100 VA cl. 0.5	VRC1/S1	**03811806N0**	
			5500 / 110	50 VA cl. 0.5	VRCR/S1	**03811807N0**	
				100 VA cl. 0.5	VRC1/S1	**03811808N0**	
			6000 / 100	50 VA cl. 0.5	VRCR/S1	**03811809N0**	
				100 VA cl. 0.5	VRC1/S1	**03811810N0**	
			6600 / 110	50 VA cl. 0.5	VRCR/S1	**03811811N0**	
				100 VA cl. 0.5	VRC1/S1	**03811812N0**	
12	28	75	6000 / 100	50 VA cl. 0.5	VRCR/S1	**03811813N0**	
				100 VA cl. 0.5	VRC1/S1	**03811814N0**	
			6600 / 110	50 VA cl. 0.5	VRCR/S1	**03811815N0**	
				100 VA cl. 0.5	VRC1/S1	**03811816N0**	
			10000 / 100	50 VA cl. 0.5	VRCR/S1	**03811817N0**	
				100 VA cl. 0.5	VRC1/S1	**03811818N0**	
			11000 / 110	50 VA cl. 0.5	VRCR/S1	**03811819N0**	
				100 VA cl. 0.5	VRC1/S1	**03811820N0**	
17.5	38	95	10000 / 100	50 VA cl. 0.5	VRC1/S1	**03811821N0**	
				100 VA cl. 0.5	VRC1/S1	**03811822N0**	
			11000 / 110	50 VA cl. 0.5	VRC1/S1	**03811823N0**	
				100 VA cl. 0.5	VRC1/S1	**03811824N0**	
			13800 / 100	50 VA cl. 0.5	VRC1/S1	**03811825N0**	
				100 VA cl. 0.5	VRC1/S1	**03811826N0**	
			15000 / 100	50 VA cl. 0.5	VRC1/S1	**03811827N0**	
				100 VA cl. 0.5	VRC1/S1	**03811828N0**	
24	50	125	15000 / 100	50 VA cl. 0.5	VRC2/S1	**03811829N0**	
				100 VA cl. 0.5	VRC2/S1	**03811830N0**	
			20000 / 100	50 VA cl. 0.5	VRC2/S1	**03811831N0**	
				100 VA cl. 0.5	VRC2/S1	**03811832N0**	
			22000 / 110	50 VA cl. 0.5	VRC2/S1	**03811833N0**	
				100 VA cl. 0.5	VRC2/S1	**03811834N0**	
36	70	170	30000 / 100	50 VA cl. 0.5	VRL3/S1	**03813376N0**	
				100 VA cl. 0.5	VRL3/S1	**03813377N0**	
			33000 / 110	50 VA cl. 0.5	VRL3/S1	**03813378N0**	
				100 VA cl. 0.5	VRL3/S1	**03813379N0**	

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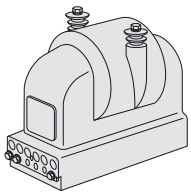
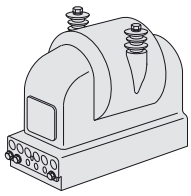


VRC1

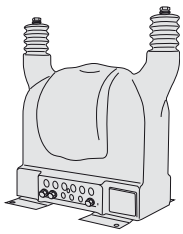
Dimensions page 48

DE58027



VRC2

DE58028



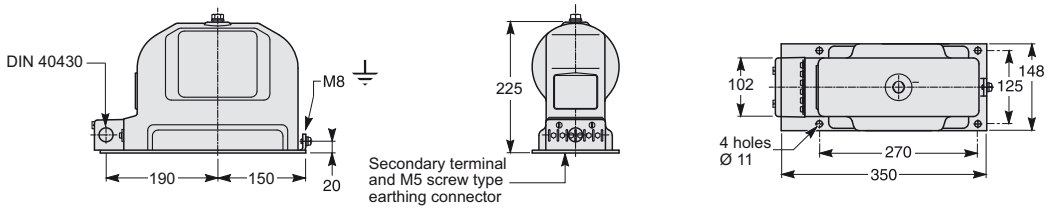
VRL3

Dimensions
DIN standard VT

VDF12

PE58400

DE58000EN



VDF21

PE58401

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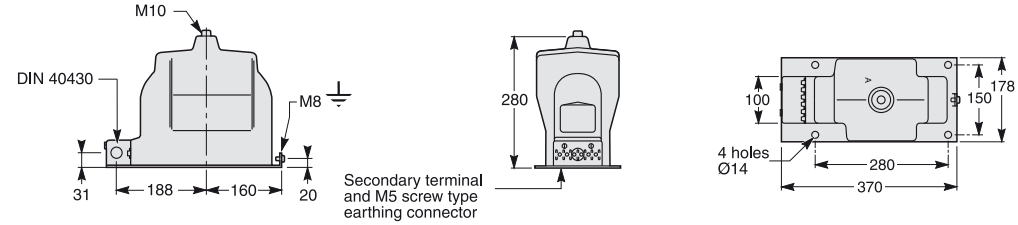

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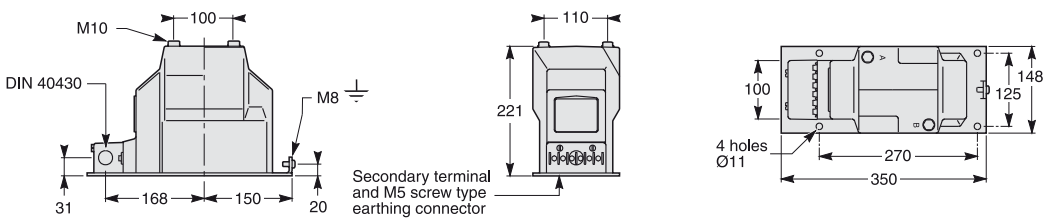

VDC21

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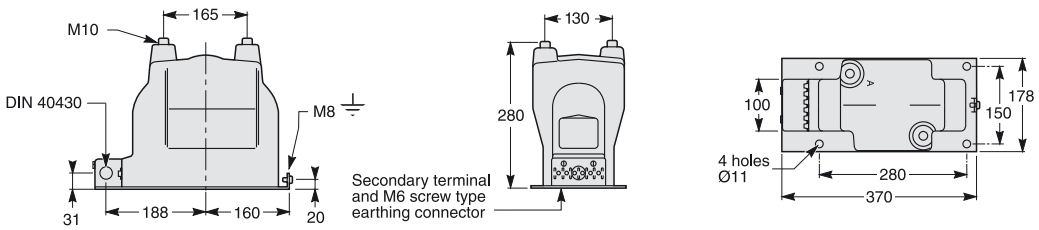

Dimensions
Phase-earth VT

VRFR

PE58406

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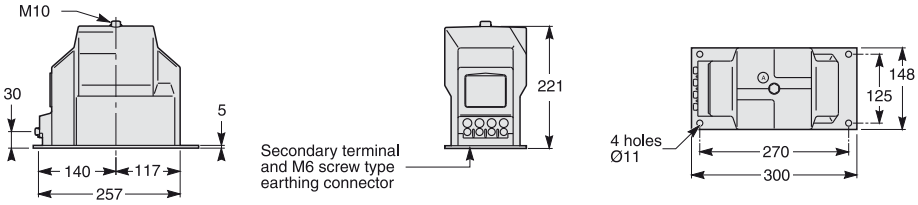

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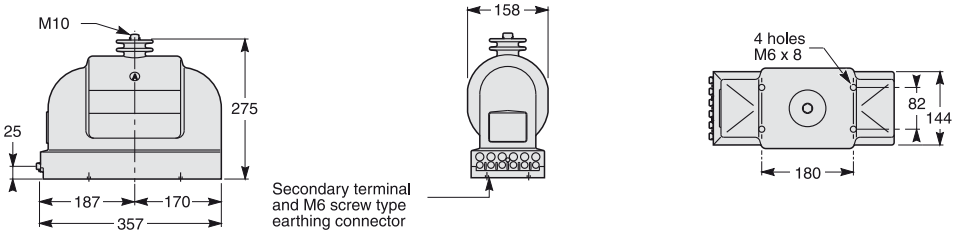

VRQ2

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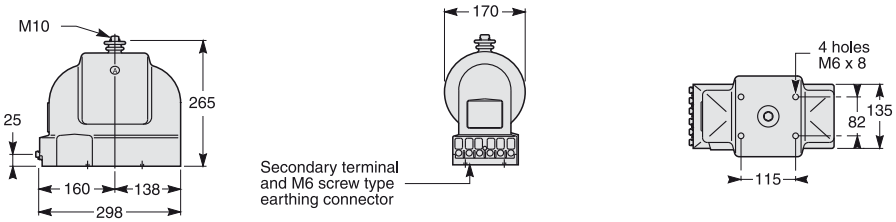

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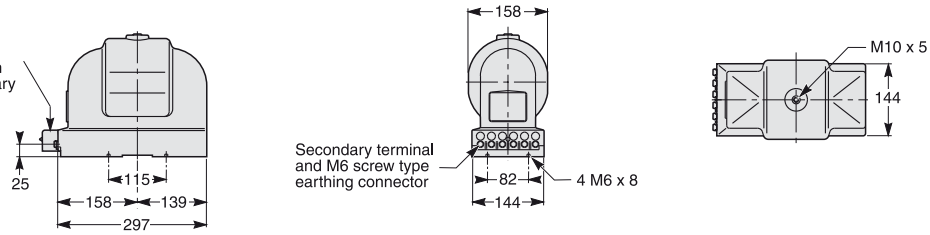

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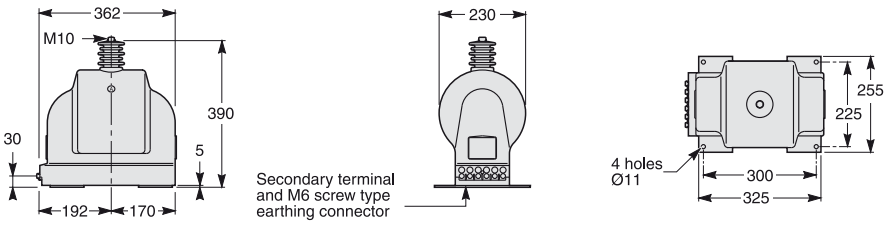

Dimensions

Phase-earth VT with fuse-holder
Phase-phase VT

VRS3

PE58410

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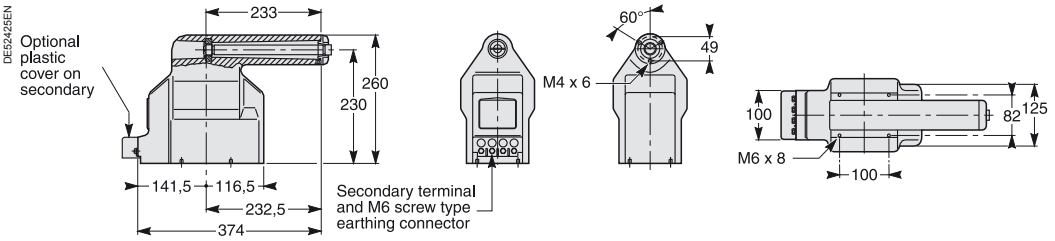

VRS2B

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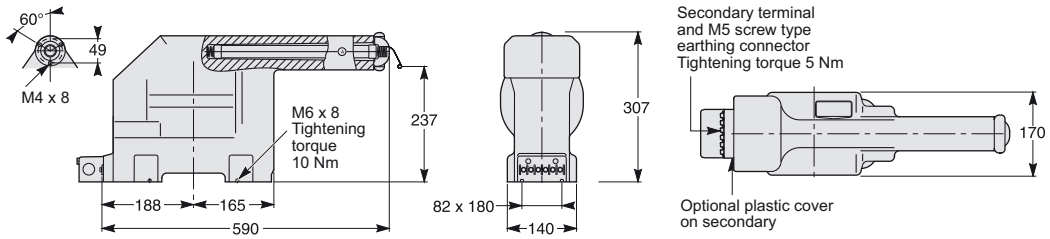

VRCR

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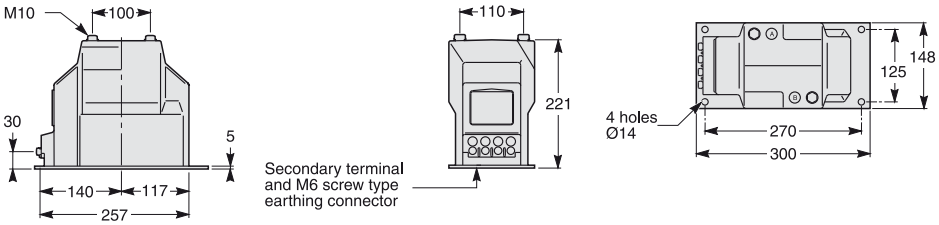

VRC1

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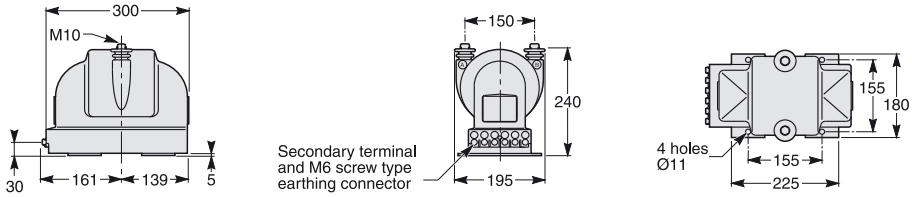

VRC2

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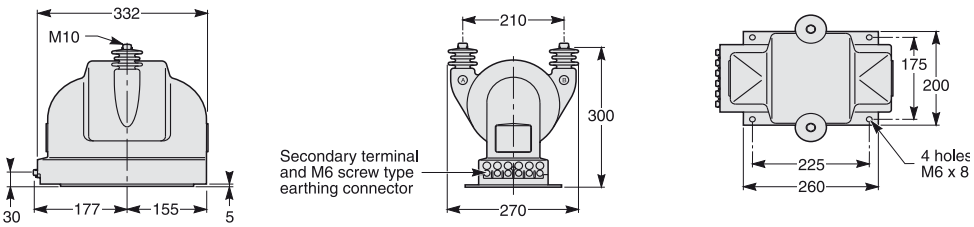

VRL3

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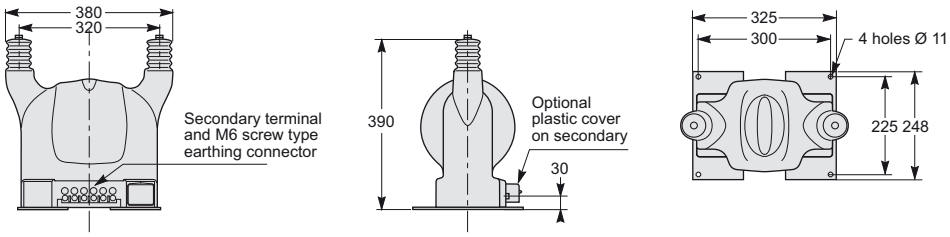

Notes

Notes

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