

**sigma**  
elektrik®



**LOW VOLTAGE  
CURRENT  
TRANSFORMERS**

## Application

Sigma current transformers are maintenance-free Low voltage current transformers for indoor application. They comply with IEC60044-1 and 61869-2 , VDE 0414, DIN 42600,BS 3938 and GOST 7746-2001.



Sigma L.V window type CT

The LV current transformers are used for 2 main purposes.

1-Instrument

2-Protection

Instrument current transformer is intended to supply to indicative devices, integrated meter and similar apparatus.

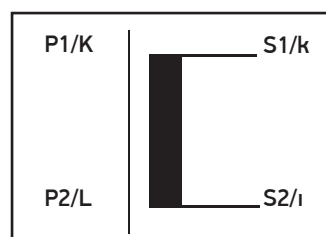
They are characterized by their accuracy and for saturating at moderate overcurrent. This effect protects the measuring instruments from possible overcurrent.

Protective current transformer is intended to supply to protective relays whereby accuracy of CT need to be kept especially during overload conditions.

## Principle Of Operation

A current transformer is defined as “as an instrument transformer in which the secondary current is substantially proportional to the primary current (under normal conditions of operation) and differs in phase from it by an angle which is approximately zero for an appropriate direction of the connections.” This highlights the accuracy requirement of the current transformer but also important is the isolating function, which means no matter what the system voltage the secondary circuit need be insulated only for a low voltage.

The current transformer works on the principle of variable flux. In the “ideal” current transformer, secondary current would be exactly equal (when multiplied by the turns ratio) and opposite to the primary current. This naturally introduces an error in the transformation. The error is classified the current or ratio error and the phase error.

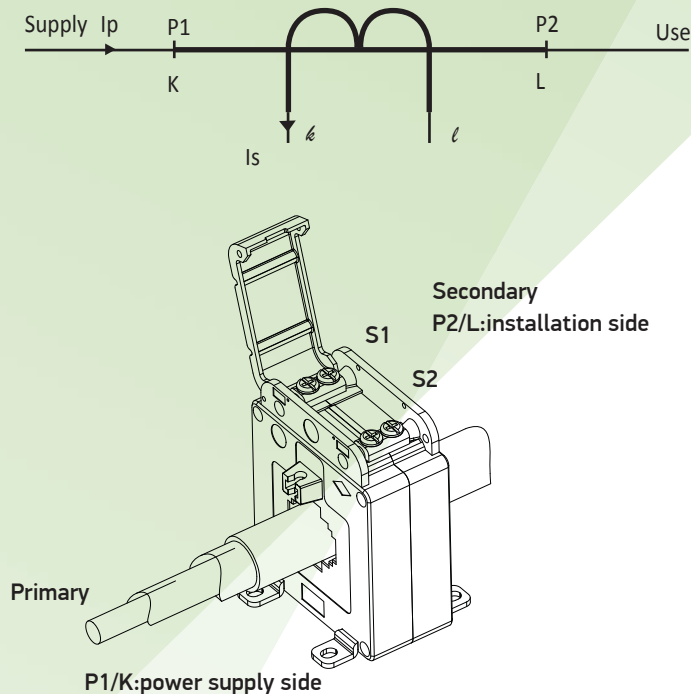


Window type C.T

Sigma CTs are designed to minimise the errors using the best quality high grade electrical steels for the core of the transformer.

## Connection

It is important to always install the transformer in the right direction, especially on 3 phase networks, so as not to invert the phase shift between the current and the voltage on one or more of the phases.



## Open Secondary Voltage Of C.T.'s

C.T.'s generally are secondary short-circuited when no burden is connected. In doing so a continuous operation is possible. Open secondary terminals have the same effect as an secondary circuit which is burdened with an infinitely high resistance. The waveform of the secondary current is heavily distorted then. Moreover, high peak voltages occur which are hazardous for the personnel and dangerous for the C.T. (internal puncture or external flashover).

## Definitions And Terms

**Rated primary current:** The value of current which is to be transformed to a lower value. Sigma CTs have primary current from 5 A to 5000A.

**Rated secondary current:** The current in the secondary circuit and on which the performance of the CT is based. Typical values of secondary current are 1 A or 5 A.

**Rated burden:** The apparent power of the secondary circuit in Volt-amperes expressed at the rated secondary current and at a specific power factor (0.8 for almost all standards)

**Burden in addition to the frequency:** With C.T.'s the burden is proportional to the frequency. As a rule the rating plate indicates the rated burden at a frequency of 50 Hz. The burden capacity will increase for 20 % at 60 Hz and 160% at 400 Hz.

**Accuracy class:** In the case of metering CT s, accuracy class is typically, 0.2, 0.5, 1 or 3. This means that the errors have to be within the limits specified in the standards for that particular accuracy class. The metering CT has to be accurate from 5% to 120% of the rated primary current, at 25% and 100% of the rated burden at the specified power factor. In the case of protection CT s, the CT s should pass both the ratio and phase errors at the specified accuracy class, usually 5P or 10P, as well as composite error at the accuracy limit factor of the CT.

**Accuracy class for metering CTs ;**

0.1 or 0.2 for precision measurements

0.5 for high grade kilowatt hour meters

1.0 for commercial grade kilowatt hour meters

1.0 or 3 for general industrial measurements 3 or 5 for approximate measurements

**Accuracy class for protection CTs ;**

Ins. O/C relays & trip coils - 2.5VA Class 10P5 Thermal inverse time relays - 7.5VA Class 10P10 Low consumption Relay - 2.5VA Class 10P10 Inverse definite min time rly-15VA Class 10P10/15 IDMT Earth fault relays - 15VA Class 10P10

**Composite error:** The rms value of the difference between the instantaneous primary current and the instantaneous secondary current multiplied by the turns ratio, under steady state conditions.

**Accuracy limit factor:** The value of primary current upto which the CT complies with composite error requirements. This is typically 5, 10 or 15, which means that the composite error of the CT has to be within specified limits at 5, 10 or 15 times the rated primary current.

**Short time rating:** The value of primary current (in kA) that the CT should be able to withstand both thermally and dynamically without damage to the windings, with the secondary circuit being short-circuited. The time specified is usually 1 or 3 seconds.

**Instrument security factor (factor of security):** This typically takes a value of less than 5 or less than 10 though it could be much higher if the ratio is very low. If the factor of security of the CT is 5, it means that the composite error of the metering CT at 5 times the rated primary current is equal to or greater than 10%. This means that heavy currents on the primary are not passed on to the secondary circuit and instruments are therefore protected. In the case of double ratio CT's, FS is applicable for the lowest ratio only.

**Class-X CT:** In balance systems of protection, CT s with a high degree of similarity in their characteristics are required. These requirements are met by Clas(X) CT s. Their performance is defined in terms of a knee-point voltage (KPV), the magnetizing current (Imag) at the knee point voltage or 1/2 or 1/4 the knee-point voltage, and the resistance of the CT secondary winding corrected to 75 °C. Accuracy is defined in terms of the turns ratio.

**Further to the general CT specifications, we now need to know :**

Vkp - Voltage knee point

Io - Maximum magnetising current at Vkp

Rs - Maximum resistance of the secondary winding

Knee point voltage: That point on the magnetizing curve where an increase of 10% in the flux density (voltage) causes an increase of 50% in the magnetizing force (current).

Highest voltage for operating equipment (Um) Um is the rms value of the highest voltage occurring between the conductors in a network.



## Technical Specifications

Standard	IEC 60044-1/ 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec. - 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Casing	non-flammable, self extinguishing, glass reinforced PA6
Degree of protection	IP20
Instrument security factor(FS)	5,10 <5,<10
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	Metering; 0.2,0.2s,0.5,0.5s,1,3 ; Protection 5P, 10P
Burden	from 1 to 30VA
Rated primary current	up to 5000A
Rated secondary current	1 or 5 A



## Advantages

- \* Compact and modern design
- \* Nickel plated brass secondary terminals
- \* Supply real routine test report together with each CT
- \* Self-extinguishing glass-reinforced PA6 Housing
- \* Double connection for secondary terminals
- \* DIN rail mounting for mini types
- \* Ratio value as engraved in the body
- \* 5 kV dielectric strength for wound primary types

## Selection Criteria

- 1) Application-protection or measurement
- 2) Information on associated relay or instrument
  - nominal current
  - accuracy
  - burden
- 3) Loss contribute from power loss in power line
  - distance between transformer & instruments
  - diameter of cable use for connection
- 4) Environmental features
  - indoor / outdoor
  - operating temperature
  - etc...

## How To Specify Burden of CT?

Burden is the impedance of the secondary circuit in ohms and power factor. For the measurement instrument or protection relay operating via a transformer, in order to operate them, the primary current has to induce the power required in the secondary current of the instrument or relay. This induced power must be equal or higher than the losses in the power line + consumption of the measurement instrument or protection relay. The burden imposed on a current transformer consist mainly of:

- The impedance of pilot wire between current transformer and instruments/relay
- The impedance of the instrument / relay
- The sum of the above constitute the external burden required

The power consumption of metering-device and cable connection should be between the rated power output (rated burden) and  $\frac{1}{4}$  the rated power output of the current transformer.

Then the secondary current will be inside the given precision class of the CT.

$S_{CT} > 2,5 \text{ VA}$	$S_{CT} > S_{Cable} + S_{Meter} > \frac{1}{4} S_{CT}$
$S_{CT} \leq 2,5 \text{ VA}$	$S_{CT} > S_{Cable} + S_{Meter} > \frac{1}{2} S_{CT}$

$S_{CT}$  = Rated power output of the CT (rated burden)  
 $S_{Cable}$  = Power consumption of the cable connection  
 $S_{Meter}$  = Power consumption of the metering device

## Advantages

- Compact and modern design
- Nickel plated brass secondary terminals
- Supply real routin test report together with each CT
- Self-extinguishing glass-reinforced PA6 Housing
- Double connection for secondary terminals
- DIN rail mounting for mini types
- Ratio value as engraved in the body
- 5 kV dielectric strength for wound primary types

## Burden Presented By Copper Leads

Return leads	Burden In VA					
	Cross section 1.....10 mm2					
	At 1A		At 5A			
m	2.5 <sup>2</sup>	4 <sup>2</sup>	6 <sup>2</sup>	2.5 <sup>2</sup>	4 <sup>2</sup>	6 <sup>2</sup>
1	0.01			0.36	0.22	0.15
2	0.03			0.71	0.45	0.30
3	0.04			1.07	0.67	0.45
4	0.06			1.43	0.89	0.60
5	0.07			1.78	1.12	0.74
6	0.09			2.14	1.34	0.89
7	0.10			2.50	1.56	1.04
8	0.11			2.86	1.79	1.19
9	0.13			3.21	2.01	1.34
10	0.14	0.09	0.09	3.57	2.24	1.49
20	0.29	0.18	0.12	7.10	4.50	3.00
30	0.43	0.27	0.18	10.7	6.70	4.50
40	0.57	0.36	0.24	14.3	8.90	6.00
50	0.72	0.45	0.30	17.8	11.2	7.40
60	0.86	0.54	0.36		13.4	8.90
70	1.00	0.63	0.42		15.6	10.4
80	1.14	0.71	0.48		17.9	11.9
90	1.29	0.80	0.54		20.1	13.4
100	1.43	0.89	0.60		22.4	14.9

## Burden Presented By Instruments And Relay

Device	Current Path VA
<b>Ammeters</b>	
Moving iron	0.7.....1.2
Moving coil with rectifier	0.001.....0.25
Moving coil with bimetal	3.5
Recorder	0.4.....9
<b>Wattmetersz</b>	
Indicating	0.2.....5
Recording	0.01.....12
Power factor meters	2.....5
kWh meters	0.4....1
Reactive power Regulators	2.....3.5
<b>Relays</b>	
Overcurrent, electronic	0.25
Overcurrent, others	2.....25
Time-lag overcurrent, thermal	6.....11
Distance, static	<1
Distance, other	2.....30
Directional, others	<1
Directional, static	1.....5
Earth fault, static	<0.06
Earth fault, others	0.001....3.5

$$P_w = (I^2 * L) / (A_{cu} * 56)$$

$P_w$  = Burden presented by copper leads in VA

$I$  = Amperage

$L$  = Distance in m

$A_{cu}$  = Cross section in mm<sup>2</sup>

**Table – Limits Of Current Error And Phase Displacement For Measuring Current Transformer (Classes 0.1 To 1)**

Accuracy Class	+/- percentage current (ratio) error at percentage of rated current shown below				+/- Phase displacement at percentage of rated current shown below							
					Minutes				Centiradians			
	5	20	100	120	5	20	100	120	5	20	100	120
0.1	0.40	0.20	0.10	0.10	15	8	5	5	0.45	0.24	0.15	0.15
0.2	0.75	0.35	0.20	0.20	30	15	10	10	0.90	0.45	0.30	0.30
0.5	1.50	0.75	0.50	0.50	90	45	30	30	2.70	1.35	0.90	0.90
1.0	3.00	1.50	1.00	1.00	180	90	60	60	5.40	2.70	1.80	1.80

**Table – Limits Of Current Error And Phase Displacement For Measuring Current Transformer For Special Application**

Accuracy Class	+/- percentage current (ratio) error at percentage of rated current shown below					+/- Phase displacement at percentage of rated current shown below									
						Minutes					Centiradians				
	1	5	20	100	120	1	5	20	100	120	1	5	20	100	120
0.2S	0.75	0.35	0.20	0.20	0.20	30	15	10	10	10	0.90	0.45	0.30	0.30	0.30
0.5S	1.50	0.75	0.50	0.50	0.50	90	45	30	30	30	2.7	1.35	0.90	0.90	0.90

**Table – Limits Of Current Error For Measuring Current Transformers (Classes 3 And 5)**

Accuracy Class	+/- Percentage current (ratio) error at percentage of rated current shown below	
	50	120
3	3	3
5	5	5

**Table – Limits Of Error For Protection Current Transformer**

Accuracy Class	Current error at rated primary current %	+/- Percentage current (ratio) error at percentage of rated current shown below		Composite error at rated accuracy limit primary current %
		50	120	
5P	+/-1	+/-60	+/-1.8	5
10P	+/-3	-	-	10

## Important Of Accuracy & Phase Angle

Current error is an error that arises when the current value of the actual transformation ratio is not equal to rated transformation ratio.

$$\text{Current error (\%)} = \{(K_n \times I_s - I_p) \times 100\} / I_p$$

$K_n$  = rated transformation ratio  $I_p$  = actual primary current  $I_s$  = actual secondary current

Example:

In case of a 2000/5A class 1 5VA current transformer

$$K_n = 2000/5 = 400 \text{ turn } I_p = 2000A \text{ } I_s = 4.9A$$

$$\text{Current error} = \{(400 \times 4.9 - 2000) \times 100\} / 2000 = -2\%$$

For protection class current transformer, the accuracy class is designed by the highest permissible percentage composite error at the accuracy limit primary current prescribed for the accuracy class concerned. Accuracy class includes: 5P, 10P Standard accuracy limit factor are: 5, 10, 15, 20, 30

## By Phase Angle

Phase error is the difference in phase between primary & secondary current vectors, the direction of the vectors to be zero for a perfect transformer.

You will experience a positive phase displacement when secondary current vector lead primary current vector.

Unit of scale expressed in minutes / centiradians.

Circular measure = (unit in radian) is the ratio of the distance measured along the arc to the radius.

Angular measure = (unit in degree) is obtained by dividing the angle subtended at the center of a circle into 360 deg equal division known as “degrees”.



## Class X Current Transformer

Phase error is the difference in phase between primary & secondary current vectors, the direction of the vectors to be zero for a perfect transformer.

You will experience a positive phase displacement when secondary current vector lead primary current vector. Unit of scale expressed in minutes / centiradians.

Circular measure = (unit in radian) is the ratio of the distance measured along the arc to the radius.

Angular measure = (unit in degree) is obtained by dividing the angle subtended at the center of a circle into 360 deg equal division known as “degrees”.

### Step 1: Calculating Knee Point Voltage V<sub>kp</sub>

$$V_{kp} = \{2 \times I_{ft} (R_{ct} + R_w)\} / k$$

V<sub>kp</sub> = required CT knee point voltage I<sub>ft</sub> = max transformer through fault in ampere R<sub>ct</sub> = CT secondary winding resistance in ohms R<sub>w</sub> = loop impedance of pilot wire between CT and the K = CT transformation ratio

### Step 2: Calculate Transformer Through Fault I<sub>ft</sub>

$$I_{ft} = (KVA \times 1000) / (1.732 \times V \times Impedance)$$

KVA = transformer rating in kVA V = transformer secondary voltage Impedance = transformer impedance

### Step 3: How To Obtain R<sub>ct</sub>

To measure when CT is produce

### Step 4: How To Obtain R<sub>w</sub>

This is the resistance of the pilot wire used to connect the 5th class X CT at the transformer star point to the relay in the LV switchboard. Please obtain this data from the Electrical contractor or consultant. We provide a table to serve as a general guide on cable resistance.

## Current Carrying Capacity Of Busbars

Dimensions In mm	Numbers and placement of bars			
	1	2	3	4
	I	II	III	IIII
	(A)			
20x5	400	700		
20x10	620	990	1360	
30x5	560	970		
30x10	820	1360	1860	
40x5	740	1240		
40x10	1050	1860	2550	
50x5	890	1510	2170	
50x10	1280	2230	3040	
60x5	1050	1770	2420	
60x10	1490	2600	3470	
80x10	1930	3100	4090	~ 4800
100x10	2330	3840	4960	~ 5800
120x10	2750	4340	5580	~ 6600
160x10	3470	5450	7190	~ 8000

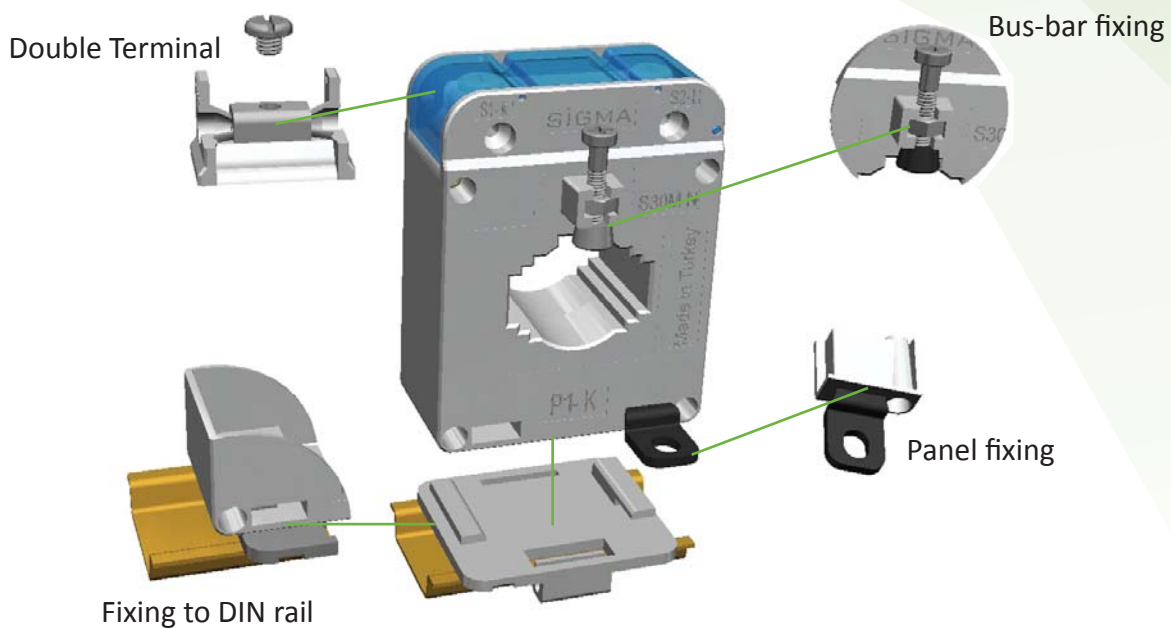
## Current Carrying Capacity Of LV Cables

Wire Cross Section (mm <sup>2</sup> )	Outer Diame- ter (mm)	Current Carrying Capacity	
		In Ground (A)	In Air (A)
1x1.5	8	37	26
1x2.5	8.4	50	35
1x4	8.9	65	46
1x6	9.4	83	58
1x10	10.7	110	80
1x16	11.7	145	105
1x25	12.9	190	140
1x35	14.1	235	175
1x50	15.6	280	215
1x70	17.2	350	270
1x95	19.4	420	335
1x120	21.4	480	390
1x150	23	540	445
1x185	25.7	620	510
1x240	29	770	620
1x300	32	820	710

## Main Dimensions

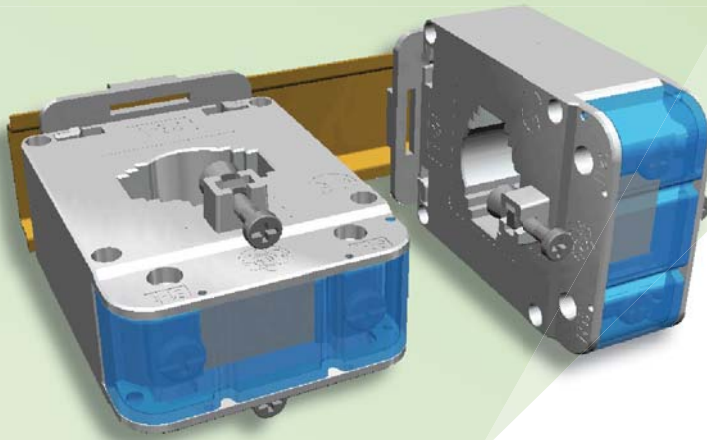
Type	Cable Diameter (mm)	Window (mm)	Busbar (mm)	Cable Section (mm <sup>2</sup> )	Outer dimensions (mm) wxhxd
S25BN	—	—	—	2,5.....50	80x100x40
S20	20	21x11	20x10	16.....95	80x100x(40-60)
S20M	20	21x11	20x10	25.....95	62x80x(30-45)
S30	24	31x11	30x10	35.....300	80x100x(40-60)
S30M	24	31x11	30x10	50.....300	62x80x(30-45)
S40	31	41x11	40x10	185.....400	80x100x(40-60)
S50	38	51x11	50x10	—	80x100x(40-60)
S60	46	62x31	60x10	—	107x132x45
S60D	30	61x31	60x10	—	82x134x60
S60A	30	61x31	60x10	—	102x145x40
S80	67	81x31	2x(80x10)	—	145x165x55
S100	62	102x11	100x10	—	145x165x55
S100D	70	101x72	4x(100x10)	—	128x193x61
S125	126	131x11	130x10	—	190x220x55
			3x(125x10)		

## Construction And Fixing Details

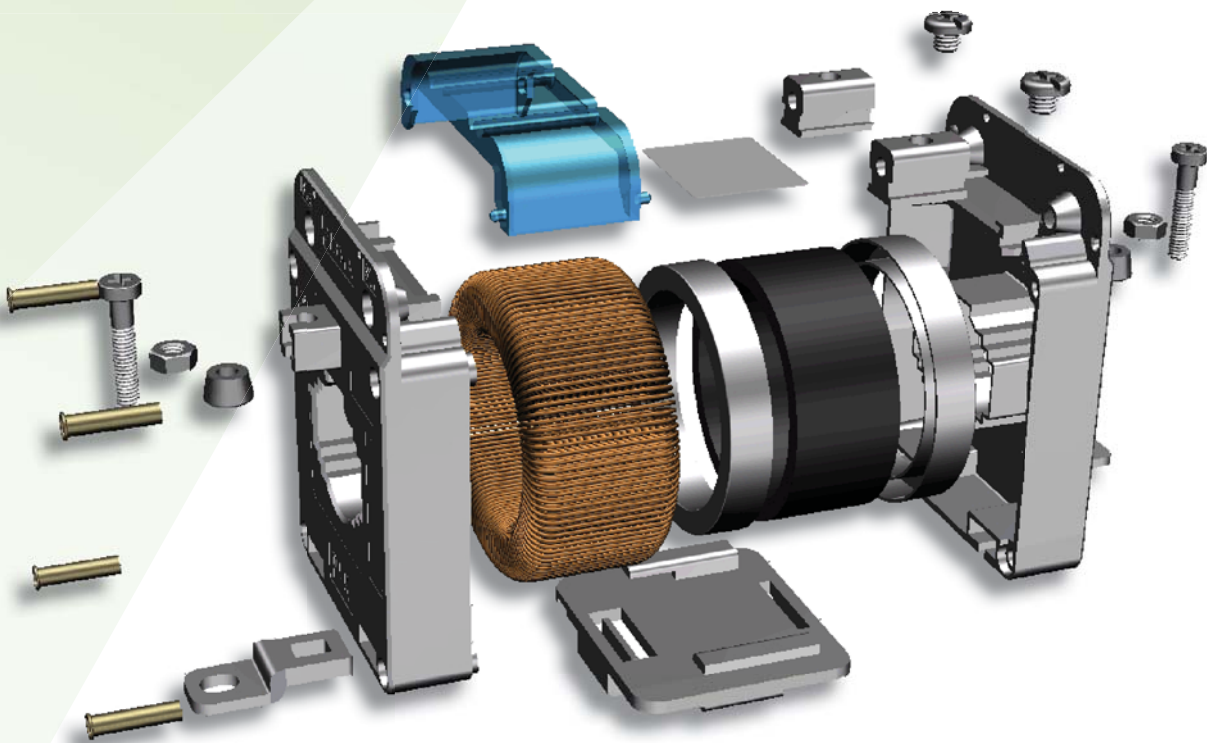


## Assembly Of Din Rail Mounted Ct 'S

It is possible to fix din rail mounted CT's both vertically and horizontally.



## Structure Of Ct



# S25B Series Wound Primary Type Current Transformers



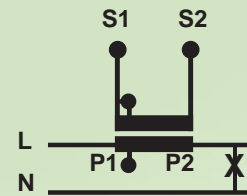
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 20A to 150A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Technical Data

Standard	IEC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75°C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	10 to 15 VA
Rated primary current	from 20 A to 150 A
Rated secondary current	5 A

## Approvals

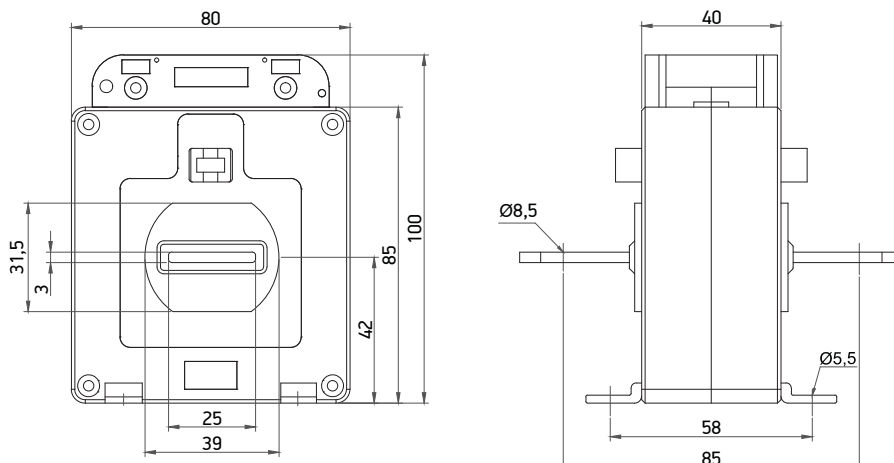


## Range Table

S25B	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	-				
Cable Ø (mm)	-				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)	VA				
20	3,75	3,75	10	15	20
25	3,75	3,75	10	15	20
30	3,75	3,75	10	15	20
40	3,75	3,75	10	15	20
50	3,75	3,75	10	15	20
60	3,75	3,75	10	15	20
75	3,75	3,75	10	15	20
100	3,75	3,75	10	15	20
125	3,75	3,75	10	15	20
150	3,75	3,75	10	15	20

Note: Other specifications on request

## Dimensions



# S20 Series Wound Primary Type Current Transformers



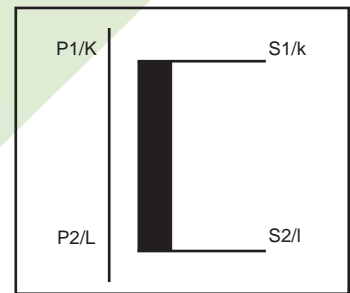
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 40A to 250A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Technical Data

Standard	IEC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec.- 100xIn/1sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	1.25 to 15 VA
Rated primary current	from 40 A to 250 A
Rated secondary current	5 A

## Approvals

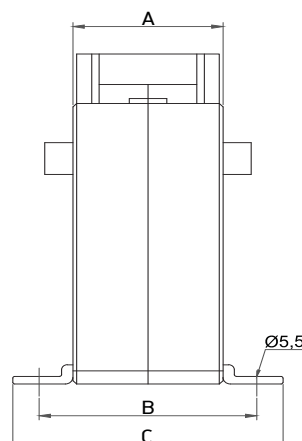
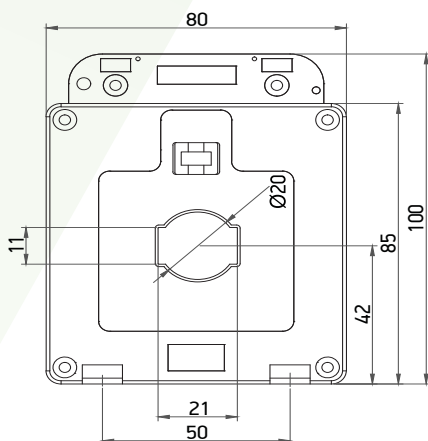


## Range Table

S20	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	20x10				
Cable Ø (mm)	20				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)	VA				
40	--	--	--	--	1,5
50	--	--	--	1,5	2,5
60	--	--	--	2,5	3,75
75	--	--	2,5	3,75	7,5
100	--	--	5	7,5	10
125	--	--	5	7,5	10
150	--	--	10	10	15
200	2,5	2,5	10	10	15
250	3,75	3,75	10	10	15

Note: Other specifications on request

## Dimensions



	A	B	C
S20	40	60	72
S20L	60	80	92



# S30 Series Wound Primary Type Current Transformers



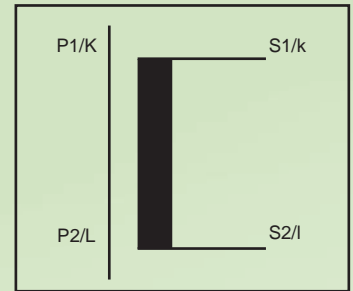
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 40A to 600A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Approvals



## Technical Data

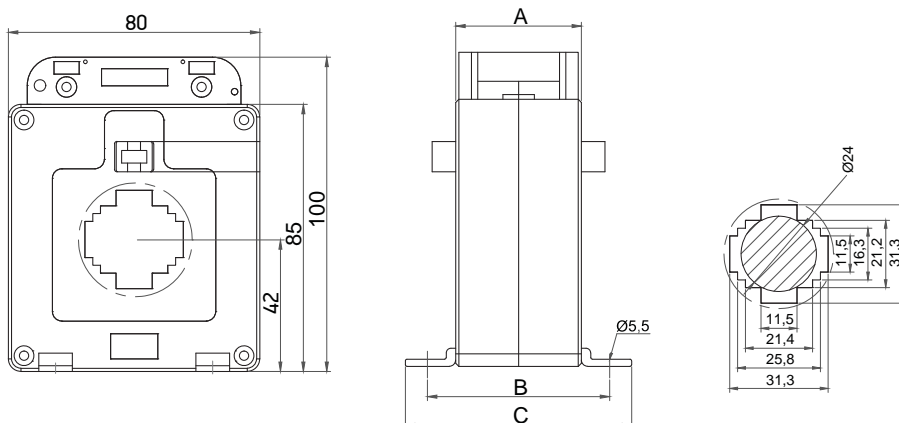
Standard	IEC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec. - 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	1.5 to 20 VA
Rated primary current	from 40 A to 600 A
Rated secondary current	5 A

Note: Other specifications on request

## Range Table

S30	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	20x10/30x10				
Cable Ø (mm)	24				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)	VA				
40	---	---	---	---	1,5
50	---	---	---	---	2,5
60	---	---	---	2,5	3,75
75	---	---	1,5	3,75	7,5
100	---	---	5	7,5	10
125	---	---	5	7,5	10
150	---	---	10	10	15
200	2,5	2,5	10	10	15
250	3,75	3,75	10	10	15
300	5	5	10	10	15
400	5	5	10	10	15
500	7,5	7,5	10	15	20
600	10	10	10	15	20

## Dimensions



	A	B	C
S30	40	60	72
S30L	60	80	92

# S40 Series Wound Primary Type Current Transformers



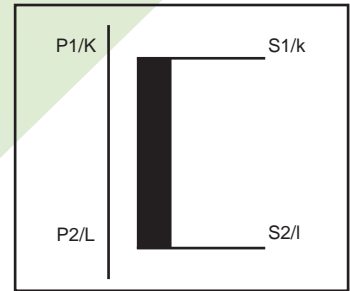
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 150A to 600A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Technical Data

Standard	IEC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec. - 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	2.5 to 15 VA
Rated primary current	from 150 A to 600 A
Rated secondary current	5 A

Note: Other specifications on request

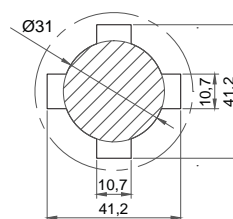
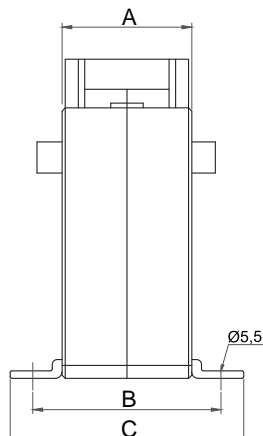
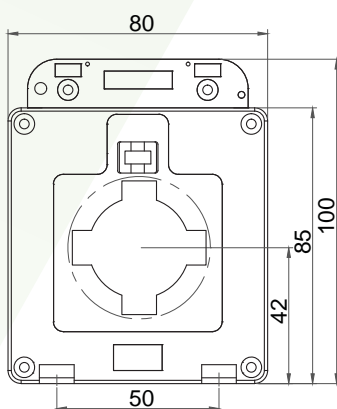
## Approvals



## Range Table

S40	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	40x10				
Cable Ø (mm)	31				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)	VA				
150	--	--	2,5	3,75	5
200	--	--	3,75	5	7,5
250	--	--	7,5	10	15
300	2,5	2,5	10	10	15
400	3,75	3,75	10	15	20
500	5	5	10	15	30
600	7,5	7,5	10	15	30

## Dimensions



	A	B	C
S40	40	60	72
S40L	60	80	92

# S50 Series Wound Primary Type Current Transformers



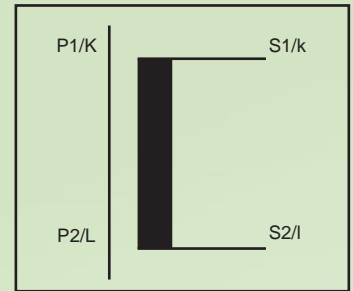
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 250A to 1000A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Approvals



## Technical Data

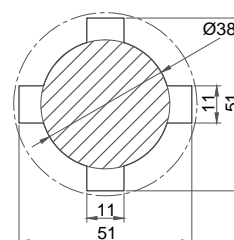
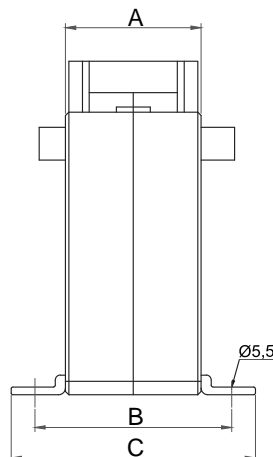
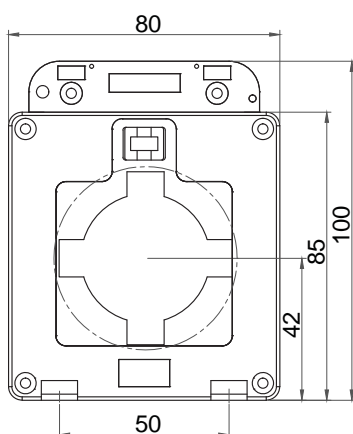
Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec. - 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	3.75 to 15 VA
Rated primary current	from 250 A to 1000 A
Rated secondary current	5 A

## Range Table

S50	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	50x10				
Cable Ø (mm)	38				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)					
250	---	---		3,75	5
300	---	---	2,5	5	7,5
400	---	---	5	7,5	15
500	---	---	10	10	15
600	3,75	5	10	15	20
800	5	7,5	10	15	20
1000	10	10	10	15	30

Note: Other specifications on request

## Dimensions



	A	B	C
S50	40	60	72
S50L	60	80	92

# S60 Series Wound Primary Type Current Transformers



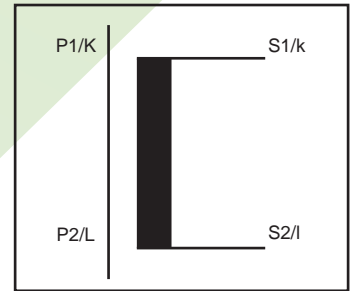
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 300A to 1600A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Technical Data

Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec. - 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) / 1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	5 to 30 VA
Rated primary current	from 300A to 1600A
Rated secondary current	5 A

## Approvals

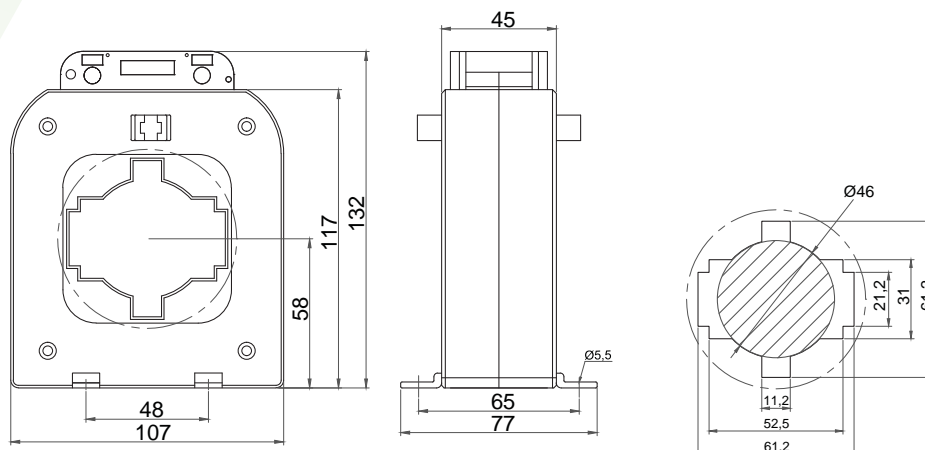


## Range Table

S60	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	60x10				
Cable Ø (mm)	46				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)	VA				
300	--	--	3,75	5	12,5
400	--	--	5	7,5	15
500	--	--	7,5	10	15
600	3,75	3,75	10	15	20
800	5	5	15	15	20
1000	7,5	7,5	15	15	30
1200	7,5	7,5	15	15	30
1250	7,5	7,5	15	15	30
1500	10	10	15	15	30
1600	15	15	15	15	30

Note: Other specifications on request

## Dimensions



# S60A Series Wound Primary Type Current Transformers



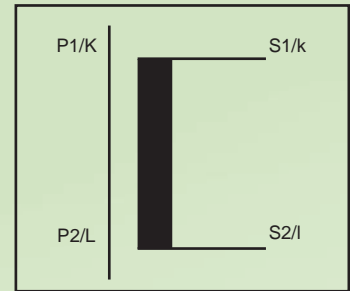
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 400A to 1000A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Approvals



## Technical Data

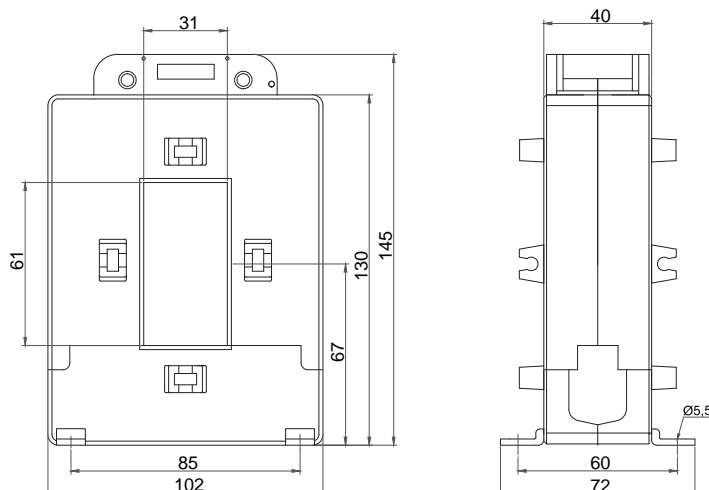
Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	3.75 to 15 VA
Rated primary current	from 400 A to 1000 A
Rated secondary current	5 A

## Range Table

S60A	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	60x10				
Cable Ø (mm)	31				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)	VA				
400	---	---	---	3,75	5
500	---	---	---	5	7,5
600	---	---	5	7,5	10
800	---	---	7,5	10	12,5
1000	---	---	10	15	15

Note: Other specifications on request

## Dimensions





# S60D Series Wound Primary Type Current Transformers



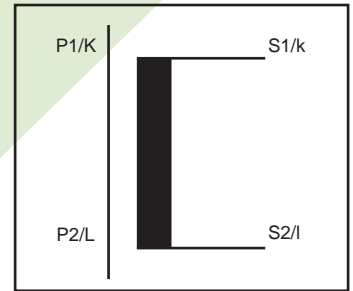
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 600A to 1600A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Technical Data

Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec. - 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) / 1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	5 to 30 VA
Rated primary current	from 600A to 1600A
Rated secondary current	5 A

Note: Other specifications on request

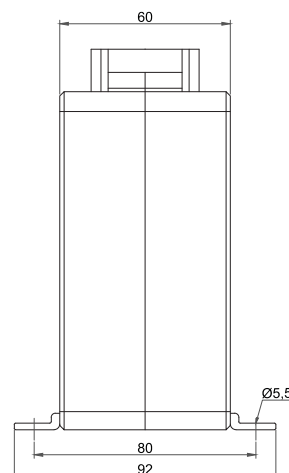
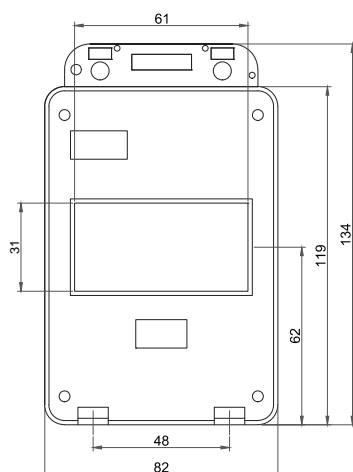
## Approvals



## Range Table

S60D	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	60x10				
Cable Ø (mm)	31				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)					
600	---	---	5	7,5	10
750	---	---	7,5	10	15
1000	---	---	10	15	15
1200	---	---	15	15	15
1250	---	---	15	15	15
1500	---	---	15	15	30
1600	---	---	15	15	30

## Dimensions



# S80 Series Wound Primary Type Current Transformers



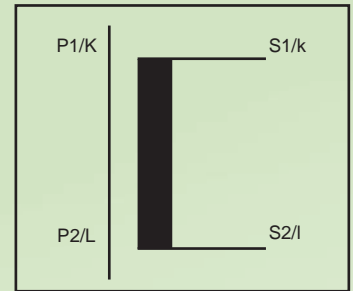
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 750A to 2000A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Approvals



## Technical Data

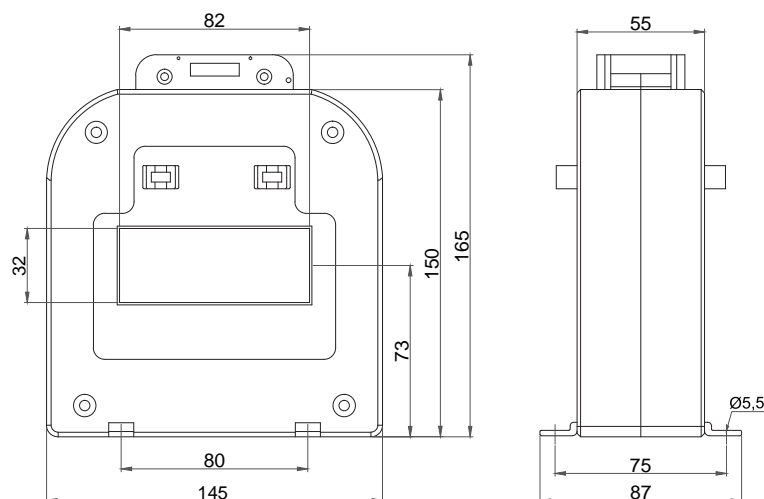
Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec.- 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	7.5 to 30 VA
Rated primary current	from 750 A to 2000 A
Rated secondary current	5 A

## Range Table

S80	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	2(80x10)				
Cable Ø (mm)	31				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)	VA				
750	2,5	2,5	10	15	20
800	3,75	3,75	10	15	20
1000	5	5	15	20	30
1200	5	5	15	20	30
1250	5	5	15	20	30
1500	7,5	7,5	15	20	30
1600	10	10	15	20	30
2000	15	15	15	20	30

Note: Other specifications on request

## Dimensions



# S100 Series Wound Primary Type Current Transformers



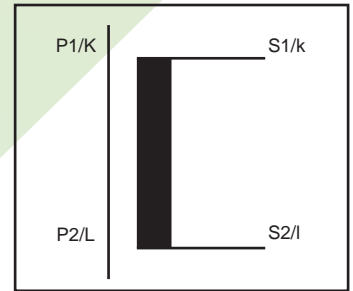
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 750A to 3000A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Technical Data

Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec. - 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	15 to 30 VA
Rated primary current	from 750 A to 3000 A
Rated secondary current	5 A

## Approvals

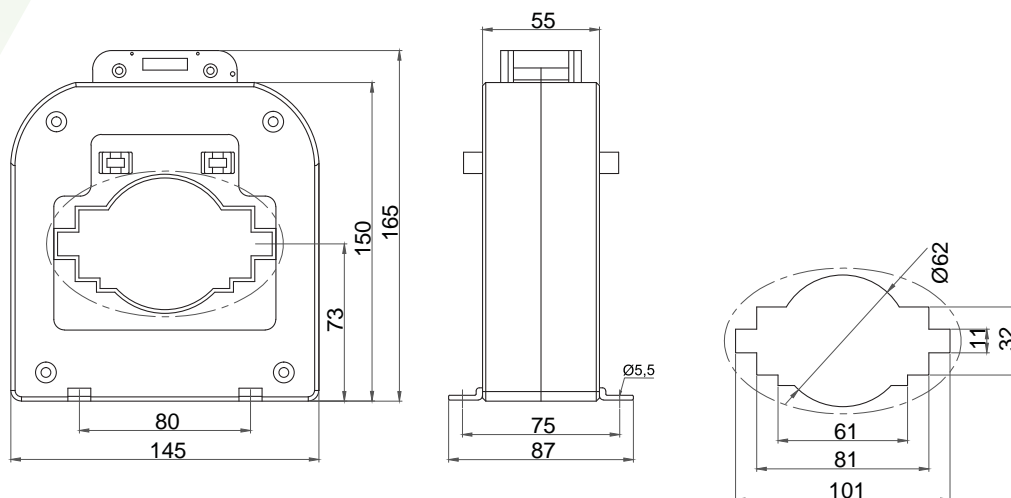


## Range Table

S100	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	100x10				
Cable Ø (mm)	62				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)					
750	2,5	2,5	10	15	15
800	3,75	3,75	15	20	20
1000	5	5	15	20	30
1200	5	5	15	20	30
1250	5	5	15	20	30
1500	7,5	7,5	15	20	30
1600	10	10	15	20	30
2000	15	15	15	20	30
2500	15	15	15	20	30
3000	15	15	30	30	45

Note: Other specifications on request

## Dimensions



# S100D Series Wound Primary Type Current Transformers



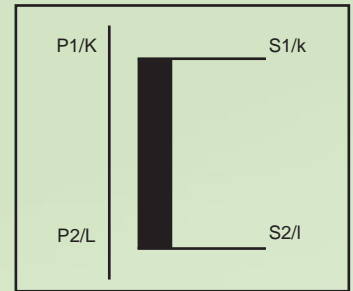
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 600A to 4000A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Approvals



## Technical Data

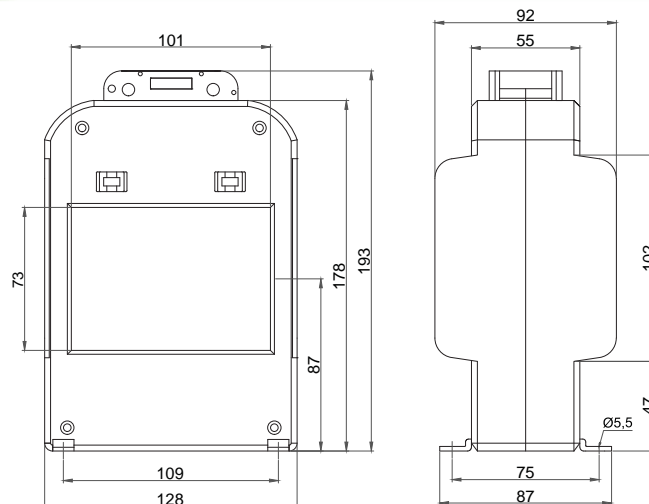
Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continious current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec.- 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	10 to 30 VA
Rated primary current	from 600 A to 4000 A
Rated secondary current	5 A

## Range Table

S80	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	4(100x10)				
Cable Ø (mm)	70				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)	VA				
600	---	---	5	7,5	10
800	---	---	7,5	10	20
1000	---	---	10	15	20
1200	---	---	15	15	30
1250	---	---	15	15	30
1500	---	---	15	20	30
1600	---	---	15	20	30
2000	---	---	15	20	30
2500	---	---	15	20	30
3000	---	---	15	20	30
4000	---	---	15	20	30

Note: Other specifications on request

## Dimensions



# S125 Series Wound Primary Type Current Transformers



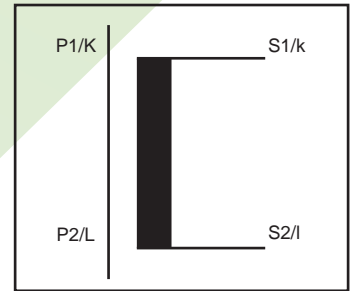
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 1250A to 5000A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram



## Technical Data

Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75 °C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec. - 100xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) / 1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	10 to 45 VA
Rated primary current	from 1250 A to 5000 A
Rated secondary current	5 A

## Approvals

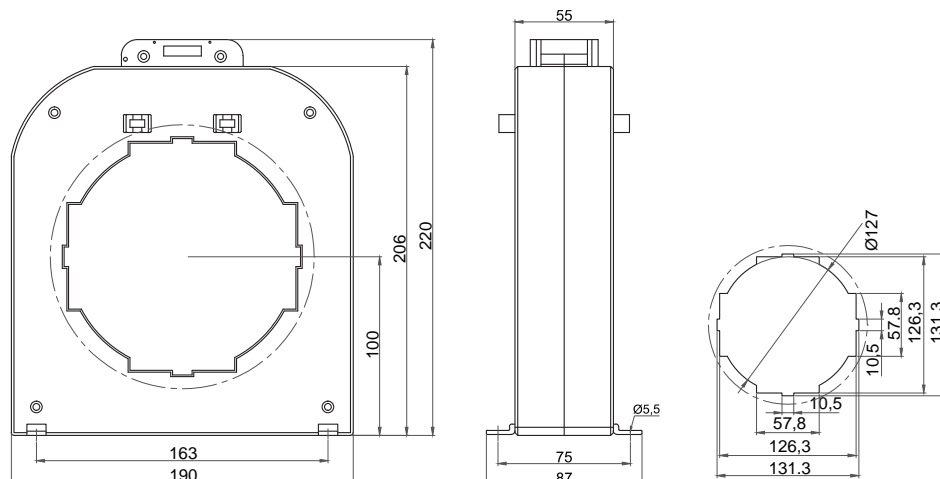


## Range Table

S100	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	3 ( 125x10)				
Cable Ø (mm)	126				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)					
1250	---	---	10	15	20
1500	---	---	15	20	30
1600	3,75	3,75	15	20	30
2000	5	5	15	20	30
2500	5	5	15	20	45
3000	10	10	30	30	45
4000	15	15	30	30	45
5000	15	15	30	30	45

Note: Other specifications on request

## Dimensions





# S20M Series Wound Primary Type Current Transformers



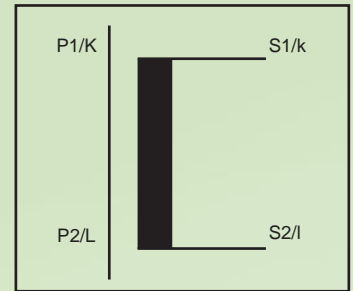
### Description

A range of compact low cost moulded case current transformers suitable for primary currents from 40A to 400A with built in sealable terminal covers.

### Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

### Wiring Diagram



### Approvals



### Technical Data

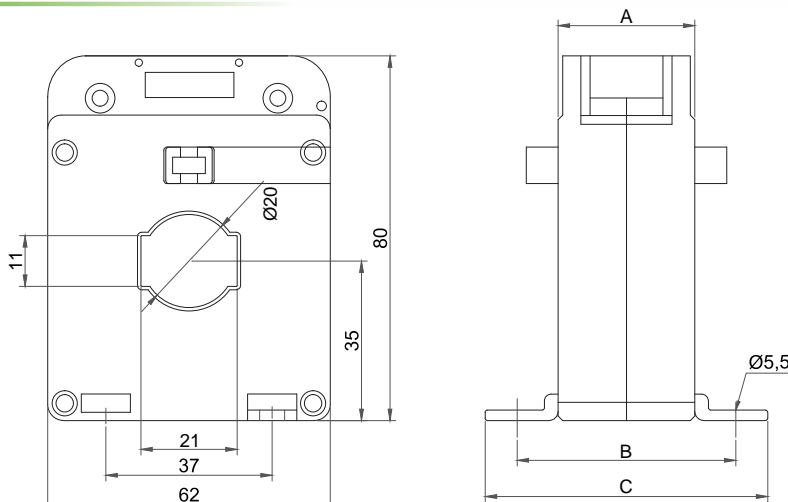
Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75°C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continious current	1.2In
Rated short time thermal current (Ith)	60xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	1 to 15 VA
Rated primary current	from 40 A to 400 A
Rated secondary current	5 A

### Range Table

S20M	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	20x10				
Cable Ø (mm)	20				
Accuracy (cl)	0.2s	0,2	0,5	1	3
I <sub>p</sub> (A)	VA				
40	---	---	---	---	1,25
50	---	---	---	---	1,25
60	---	---	---	---	2,5
75	---	---	---	2,5	2,5
100	---	---	2,5	2,5	5
125	---	---	2,5	5	5
150	---	---	2,5	5	5
200	---	---	5	5	7,5
250	---	---	10	10	10
300	---	---	10	10	15
400	---	---	10	10	15

Note: Other specifications on request

### Dimensions



	A	B	C
S20M	30	50	62
S20ML	45	65	77

# S30M Series Wound Primary Type Current Transformers



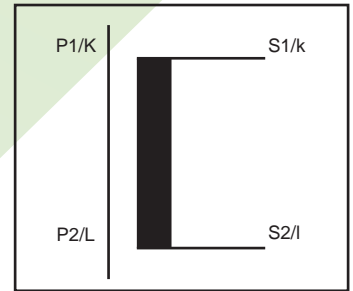
## Description

A range of compact low cost moulded case current transformers suitable for primary currents from 60A to 600A with built in sealable terminal covers.

## Application

- Suitable for measuring applications in AC power systems
- For metering and relaying applications in low voltage switchboards, switchgear

## Wiring Diagram

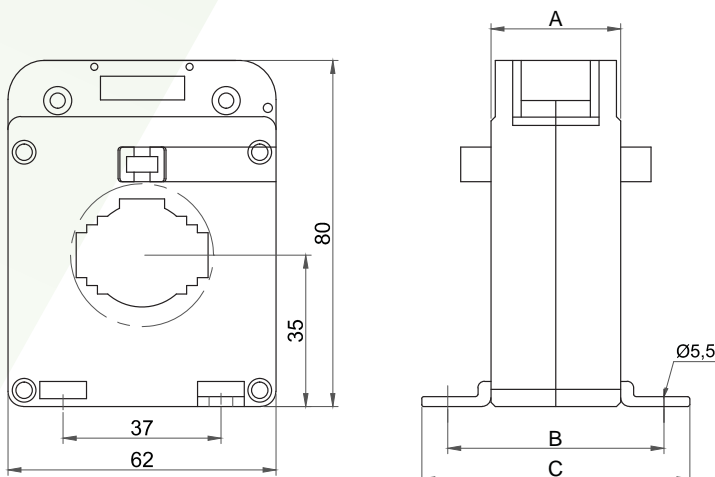


## Technical Data

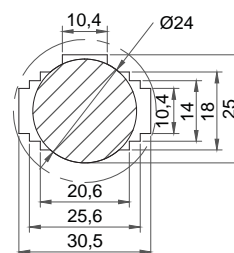
Standard	EC 60044-1/IEC 61869-2
Rated operational voltage (Un)	720V
Rated frequency	50/60Hz ( on demand 400 Hz)
Ambient temperature	-20/75°C
Storage temperature	-50/80 °C
Operating humidity	up to 95% relative humidity
Rated Thermal continuous current	1.2xIn
Rated short time thermal current (Ith)	60xIn / 1 sec.
Rated dynamic current (Idyn)	2.5 x Ith / 1 sec.
Rated Power-frequency withstand voltage	5kV eff. (50 Hz) /1 min.
Thermal class of insulation	E ( 120 deg.C max.)
Degree of protection	IP20
Instrument security factor(FS)	5
Secondary terminals	Brass plated nickel M5 screws
Recommended tightening torque	2 Nm (for secondary terminals)
Accuracy class	0.5-1-3
Burden	1 to 10 VA
Rated primary current	from 60 A to 600 A
Rated secondary current	5 A

Note: Other specifications on request

## Dimensions



	A	B	C
S30M	30	50	62
S30ML	45	65	77



## Approvals



## Range Table

S30M	Max.Burden Against Class Index(at 5 A)				
Busbar (mm)	20x10 / 30x10				
Cable Ø (mm)	24				
Accuracy (cl)	0.2s	0,2	0,5	1	3
Ip(A)					
60	---	---	---	---	1,25
75	---	---		2,5	2,5
100	---	---	2,5	2,5	2,5
125	---	---	2,5	2,5	3,75
150	---	---	2,5	5	7,5
200	---	---	5	5	7,5
250	---	---	10	10	10
300	---	---	10	10	10
400	---	---	10	10	15
500	---	---	10	10	15
600	---	---	10	10	15

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