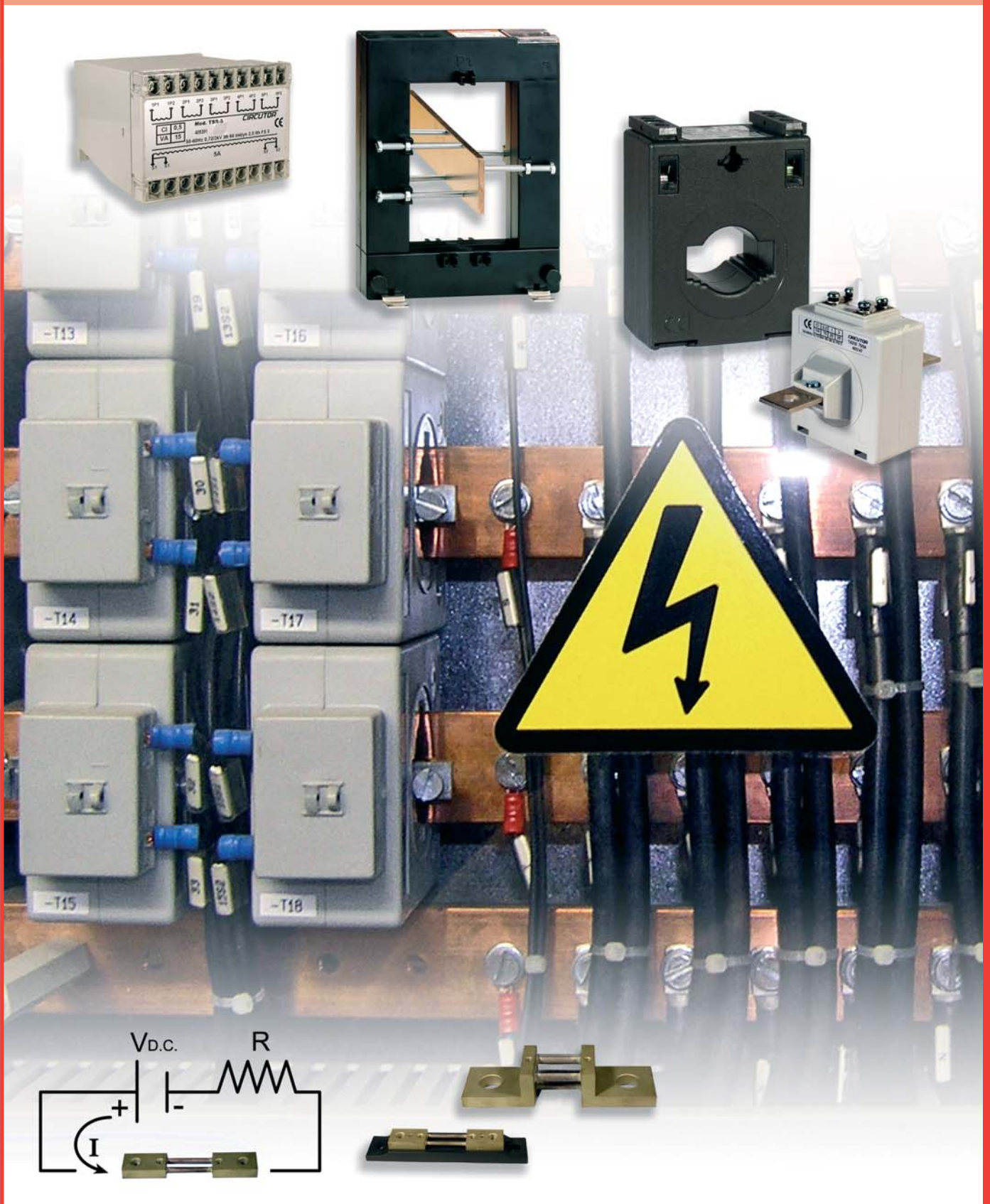


CURRENT TRANSFORMERS AND SHUNTS



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INTRODUCTION



When electricity was first generated it created a need for current transformers (CT) used to measure electricity. In this catalogue we will identify all our CT. Current transformers are used:

- To identify and separate individual circuit(s) for measuring / protecting equipment connected to high voltage lines.
- To help identify / prevent high current transmissions.
- To reduce short circuit currents down to permissible levels, in sensitive measuring and protection equipment.
- To produce proportional secondary signals (0-5 A / 4-20 mA) to cover a given primary range (0 - 10 000 A) which is then connected to the appropriate measuring / protection device.

NOTE: Experience has shown that through improper selection / installation of measurement / protection transformers it may create situations where the device may not operate properly as well as a compromise personnel safety during critical periods.

SELECTION



To correctly select the measurement transformer (measurement or protection) the following information must be verified:

The application for which it is intended (measurement or protection)
Features of the operating environment, or conditions of use (indoors or outdoors, maximum operating temperature, etc.)

The specification of the wire(s) that the CT will be installed around:

- Size of cables or buss bar
- Primary current range to include maximum and minimum current to be measured
- Percentage of overload, range and time (if applicable)
- System voltage (low, medium or high)
- Short circuit current
- System frequency

Specification of the measurement / protection device associated with the CT to include accuracy, nominal current, consumption, etc.

Distance between the transformer and the device, plus the cable diameter used to connect the CT to the device

THE POWER OF A TRANSFORMER



Important Note: In the transformer, the primary current has to generate (induce) the power required for the secondary side to transmit the secondary current to the measurement device. Induced power has to be equal to or greater than the losses in the line plus consumption of the measurement device itself.

Losses in the line, P_L :

This is the power lost, through heat, generated by the passage of current through the resistance R_L in the cables, in the transformer's secondary circuit.

Factors to be taken into account:

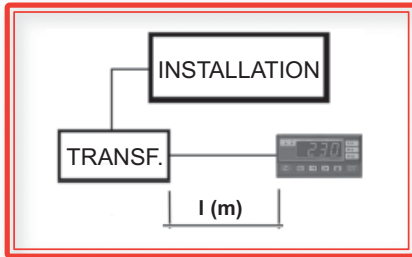
- Secondary current. $P_L = R_L \cdot I^2$
- Cable diameter. R_L is inversely proportional to the square of the diameter
- Cable length. R_L is proportional to the length of cabling (there and back)

Power:

The nominal apparent power (V·A) with a specified power factor, which the current transformer supplies, to the secondary current with the assigned current when it is connected to its nominal load, $S_c(\text{V}\cdot\text{A}) = Z_c \cdot (I_{sn})^2$

According to Standards, for apparent power greater than or equal to 5 V·A, the power factor is 0.8 inductive. For apparent power less than 5 V·A the power factor is considered to be one (unity).

LOSSES IN A TRANSFORMER



Example:

Suppose a current transformer was connected to an ammeter 10 m away. What would be the loss at .../5A? What would be the loss at .../1A?

Data:

$$L_{\text{CABLE}} = 2 \cdot L = 2 \cdot 10 = 20 \text{ m}$$

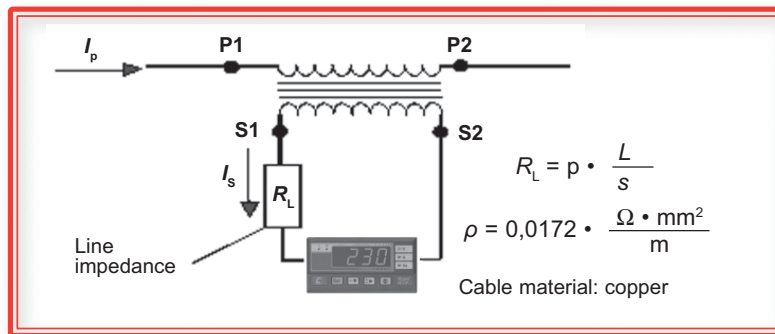
$$S_{\text{CABLE}} = 1 \text{ mm}^2$$

$$R_{\text{LINE}} = 0,0172 \cdot 20 / 1 = 0,35 \Omega$$

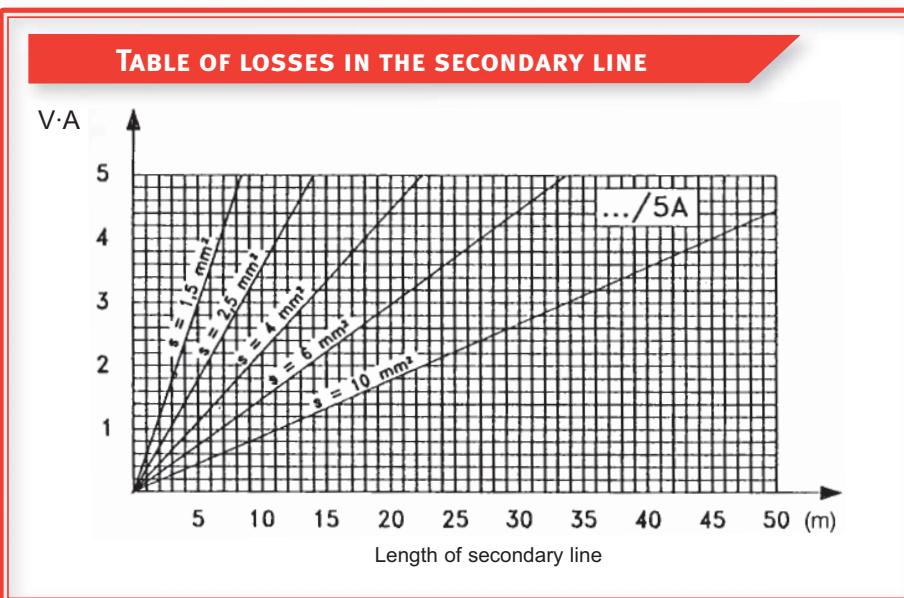
$$P_{\text{LINE}} = 0,35 \cdot 5^2 = \mathbf{8,62 \text{ V}\cdot\text{A}}$$

- If it was .../ 1 A

$$P_{\text{LINE}} = 0,35 \cdot 1^2 = \mathbf{0,35 \text{ V}\cdot\text{A}} \text{ (25 times less)}$$



EQUIPMENT	TYPICAL CONSUMPTION
Moving iron instruments	0,3 ... 15 V·A
Moving coil instruments	0,5 V·A
Analogue wattmeters	0,2 ... 2,5 V·A
Maximum Demand Indicators	2,5 ... 5,0 V·A
Digital instruments	0,5 ... 1,0 V·A
Energy meters	1,0 ... 1,5 V·A
Recording instruments	2,0 ... 5,0 V·A



Note: With .../1 A transformers losses are reduced 25 times

ACCURACY OF A TRANSFORMER



The percentage of error, produced in a transformer, is established by IEC 44-1.

In measurement transformers: 25 % and 100 % of nominal power.

In protection transformers: 100 % of nominal power.

ERROR LIMITS. TABLE 1. ACCURACY CLASSES

TYPE	± % Error for % I_n				Phase difference ± for % I_n							
					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	0,9	0,45	0,30	0,30
0,5	1,50	0,75	0,50	0,50	90	45	30	30	2,7	1,35	0,90	0,90
1,0	3,00	1,50	1,00	1,00	180	90	60	60	5,4	2,70	1,80	1,80

ERROR LIMITS. TABLE 2. ACCURACY CLASSES

TYPE	± % Error for % I_n					Phase difference ± for % I_n									
						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	2,70	1,35	0,90	0,90	0,90

ERROR LIMITS. TABLE 3. ACCURACY CLASSES

Accuracy class	± % Error for % I_n	
% I_n	50	120
3	3	3
5	5	5
No. phase error		

FOR PROTECTION TRANSFORMERS

TYPE	± % Error for % I_n	Phase difference ± for % I_n		Composite error
		Minutes	Centiradians	
5P	± 1	± 60	± 1,8	5
10P	± 3	---	---	10

THE TRANSFORMER WHEN SATURATED

A current transformer is saturated when the primary current, passing through the CT, is greater than the nominal rating of the CT.

The linearity of current transformation, between the primary and secondary sides decreases, so error increases. The saturation of the transformer is inversely proportional to the load (fig. 6).

The difference between measurement and protection current transformers is their behavior when an overload occurs on the primary side.

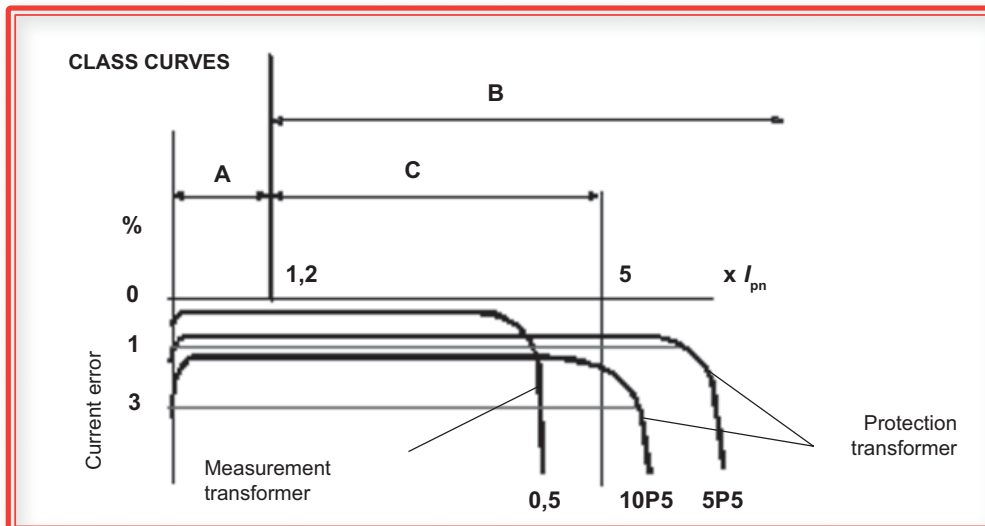
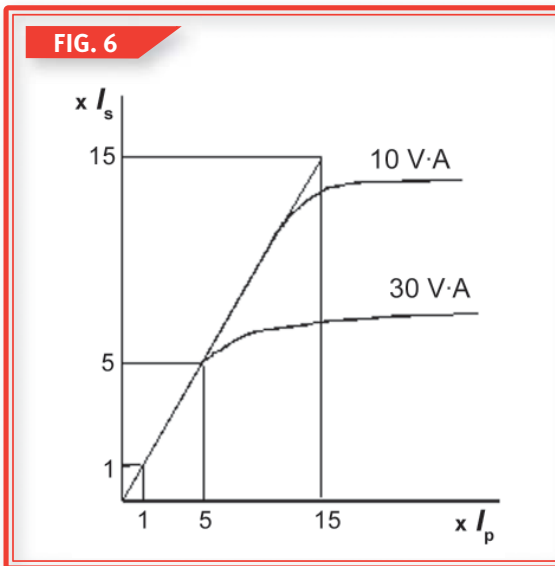
CT used for measurement are saturated when there is a primary current overload. In order to protect the equipment, on the secondary side, Protection transformers do not saturate until there is a very high current on the primary side.

A Class 5P15 protection transformer indicates that it has an accuracy rating of $\pm 1\%$ and that it does not become saturated until the primary current reaches 15 times the nominal current rating of the CT.

In measurement transformers, the SAFETY FACTOR "Fs" parameter indicates the excessive amperage on the primary side current in relation to the current sent to the measuring device on the secondary side.











TP



TC

SLIM LINE current transformers. BERG Series

																		
Type	TC 5	TC 5,2	TC 6,2	TC 6	TC 8	TC 10	TC 12											
Inner Ø	20	22	26	28	44	63	---											
Flat strip	25 x 5	20 x 12 25 x 10 30 x 10	30 x 10	40 x 10	60 x 12	50 x 50 60 x 30 80 x 30	3 x 100 x 10											
a b c	70 58 32	70 58 32	80,5 64 44	80,5 64 44	102 84,5 50	130 108 50	150 129 50											
Mounting																		
A	Class			Class			Class			Class			Class			Class		
	0,5	1	3	0,5	1	3	0,5	1	3	0,5	1	3	0,5	1	3	0,5	1	3
40/5	-	-	1,5															
50/5	-	-	3															
60/5	-	1,25	3,5															
75/5	-	2	3,5															
100/5	1,5	2,5	3,75				1,75	3,75	7,5									
125/5	1,75	3,5	5	-	1,5	2	3,75	7,5	10									
150/5	2,5	3,5	5	1	2	2,5	5	7,5	10	1	3,5	5						
200/5	3,75	5	5	2,5	3	3,5	7,5	10	10	3,5	5	7,5						
250/5	5	7,5	7,5	3,5	3,75	5	7,5	10	15	5	7,5	10						
300/5				3,5	3,75	5	10	10	15	5	7,5	10						
400/5				3,5	5	7,5	10	10	15	5	7,5	10	5	7,5	10			
500/5				5	7,5	10	15	15	20	7,5	10	15	7,5	10	15			
600/5				5	7,5	10	15	20	25	7,5	10	15	10	15	20			
750/5										10	15	20	15	20	25			
800/5										10	15	20	15	20	30			
1 000/5													15	20	30	10	15	20
1 200/5													15	20	30	10	15	20
1 500/5													15	20	30	15	20	25
1 600/5													15	20	30	15	20	25
2 000/5																15	20	25
2 500/5																15	20	30
3 000/5																15	20	30
4 000/5																	35	40

FEATURES

Frequency	50 / 60 Hz
Assigned insulation voltage	10 kV
Short-circuit thermal current, I_{th}	60 I_n
Dynamic current, I_{dyn}	2,5 I_{th}
Higher voltage for the material	0,72 kV a.c.
Thermal class	B (130 °C)
Encapsulated in self-extinguishing plastic	VO
Safety factor	FS 5
Sealed secondary terminals	Yes

CODE TABLE

A	TC 5	TC 5.2	TC 6.2	TC 6		TC 5.2	TC 6.2	TC 6	TC 8	TC 10	TC 12
40/5	M70311					400/5	M70327	M70347	M70335	M70361	
50/5	M70312					500/5	M70328	M70348	M70336	M70362	
60/5	M70313					600/5	M70329	M70349	M70337	M70363	
75/5	M70314					750/5			M70338	M70364	
100/5	M70315		M70341			800/5			M70339	M70365	
125/5	M70316	M70322	M70342			1000/5				M70366	M70373
150/5	M70317	M70323	M70343	M70331		1200/5				M70367	M70374
200/5	M70318	M70324	M70344	M70332		1500/5				M70368	M70375
250/5	M70319	M70325	M70345	M70333		1600/5				M70369	M70376
300/5		M70326	M70346	M70334		2000/5					M70377
						2500/5					M70378
						3000/5					M70379
						4000/5					M70388

ACCESSORIES



DIN rail






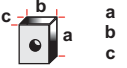


Terminals cover

Certificate

TCH

SLIM LINE current transformers. HIGHLY ACCURATE

															
Type	TCH 6.2	TCH 6	TCH 8	TCH 10	TCH 12										
Inner Ø	26	28	44	63	-										
Flat strip	30 x 10	40 x 10	60 x 12	50 x 50 60 x 30 80 x 30	3 x 100 x 10										
	80,5 64 44	80,5 64 44	102 84,5 50	130 108 50	150 129 50										
V-A	Class			Class			Class			Class					
	0,2S	0,2	0,5S	0,2S	0,2	0,5S	0,2S	0,2	0,5S	0,2S	0,2	0,5S	0,2S	0,2	0,5S
100/5	1	1,5	2,5												
150/5	2,5	3,5	3,5	1	1,25	1,5									
200/5	3,5	5	5	1,25	1,5	2									
250/5	5	5	5	1,5	1,75	2,25									
300/5	5	5	5	1,75	2	2,5									
400/5	7,5	7,5	7,5	1	5	5									
500/5				5	7,5	7,5									
600/5				5	7,5	7,5	5	10	10						
750/5				7,5	10	10	7,5	10	10						
800/5				7,5	10	10	7,5	10	10						
1 000/5							10	15	15	7,5	10	10			
1 200/5							10	15	15	10	10	10			
1 500/5							10	15	15	10	10	15	10	15	15
1 600/5							10	15	15	10	10	15	10	15	15
2 000/5										10	10	15	10	15	15
2 500/5										10	10	15	15	20	20
3 000/5										10	10	15	20	25	25
4 000/5													25	30	30

FEATURES	
Frequency	50...60 Hz
Assigned insulation voltage	10 kV
Short-circuit thermal current, I_{th}	$60 I_n$
Dynamic current, I_{dyn}	$2,5 I_{th}$
Higher voltage for the material	0,72 kV a.c.
Thermal class	B (130 °C)
Encapsulated in self-extinguishing plastic	VO
Safety factor	FS 5 / 10
Sealed secondary terminals	Yes

CODE TABLE					
A	TCH 6.2	TCH 6	TCH 8	TCH 10	TCH 12
100/5	M70441				
150/5	M70443	M70431			
200/5	M70444	M70432			
250/5	M70445	M70433			
300/5	M70446	M70434			
400/5	M70447	M70435			
500/5		M70436			
600/5		M70437	M70463		
750/5		M70438	M70464		
800/5		M70439	M70465		
1 000/5			M70466	M70473	
1 200/5			M70467	M70474	
1 500/5			M70468	M70475	M70483
1 600/5			M70469	M70476	M70484
2 000/5				M70477	M70485
2 500/5				M70478	M70486
3 000/5				M70479	M70487
4 000/5					M70488

ACCESSORIES



DIN rail




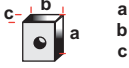


Terminal cover

Certificate

TA400 , TA500 , TA600

Current transformers

									
Type	TA 400	TA 500	TA 600						
Inner Ø	100 x 20	100 x 30	125 x 60						
	165 95 59	185 115 63	196 124 62						
Mounting									
A \ V-A	Class			Class			Class		
	0,5	1	3	0,5	1	3	0,5	1	3
750/5	15	20	30						
800/5	15	20	30						
1 000/5	15	20	30				15	20	30
1 200/5	15	20	30						
1 500/5	15	30	40	15	30	40	15	20	30
2 000/5	20	40	50	20	40	50	15	20	30
2 500/5				20	40	50	20	30	40
3 000/5				20	45	60	30	40	60
4 000/5				35	50	70	35	50	70
5 000/5							40	60	80

FEATURES	
Frequency	50...60 Hz
Assigned insulation voltage	3 kV
Short-circuit thermal current, I_{th}	60 I_n
Dynamic current, I_{dyn}	2,5 I_{th}
Higher voltage for the material	0,72 kV a.c.
Thermal class	105 °C
Encapsulated in self-extinguishing plastic	VO
Safety factor	< 5
Sealed secondary terminals	Yes
Standards	IEC 44-1, UNE 21 088-1, UL 94, VDE 0414

CODE TABLE			
A	TA 400	TA 500	TA 600
750/5	M70594		
800/5	M70595		
1 000/5	M70596		M705B1
1 200/5	M70597		
1 500/5	M70598	M705A4	M705B3
2 000/5	M70599	M705A6	M705B5
2 500/5		M705A7	M705B6
3 000/5		M705A8	M705B7
4 000/5		M705A9	M705B8
5 000/5			M705B9

ACCESSORIES



DIN rail

Certificate

TP

SPLIT CORE current transformers

Type	TP-23	TP-58	TP-88	TP-812	TP816											
Inner Ø	20 x 30	50 x 80	80 x 80	80 x 120	80 x 160											
	a: 110 b: 89 c: 58	a: 145 b: 114 c: 50	a: 145 b: 144 c: 50	a: 185 b: 144 c: 50	a: 245 b: 184 c: 70											
Mounting																
A	V-A	Class			Class			Class			Class			Class		
		0,5	1	3	0,5	1	3	0,5	1	3	0,5	1	3	0,5	1	3
	100/5	-	-	1,5												
	150/5	-	-	2												
	200/5	-	1,5	2,5												
	250/5	-	2	4	1	2	4	1	2	4						
	300/5	1,5	4	6	1,5	3	6	1,5	3	6						
	400/5	2,5	6	10	1,5	3	10	1,5	3	10						
	500/5				2,5	5	15	2,5	5	15	-	4	12			
	600/5				2,5	5	17,5	2,5	5	17,5	-	5	14			
	750/5				3	6	18	3	6	18	2,5	6	17			
	800/5				3	7	18	3	7	18	3	7	18			
	1 000/5				5	10	20	5	10	20	5	9	20	10	15	20
	1 200/5										6	11	24			
	1 250/5										7	15	28			
	1 500/5										8	17	30	15	20	25
	2 000/5													15	20	25
	2 500/5													15	20	25
	3 000/5													20	25	30
	4 000/5													20	25	30
	5 000/5													20	25	30

FEATURES	
Assigned insulation voltage	3 kV
Assigned short-circuit thermal current (I_{th})	$60 I_n$
Assigned dynamic current (I_{dyn})	$2,5 I_n$
Higher voltage for the material (U_m)	0,72 kV a.c.
Thermal class	A (105 °C)
Response in frequencies	Lineal 50...60 Hz
Transformation ratio, accuracy power and accuracy class	According to type (.../5 A or .../1 A)
Use	Inner
Casing	Self extinguishing (UL94V0)
Terminal box for the secondary	Lockable
Dimensions and weight	According to type
Standards	IEC 44-1, UNE 21 088-1, UL 94, VDE 0414

CODE TABLE					
A	TP-23	TP-58	TP-88	TP-812	TP-816
100/5	M70111				
150/5	M70112				
200/5	M70113				
250/5	M70114	M70121	M70131		
300/5	M70115	M70122	M70132		
400/5	M70116	M70123	M70133		
500/5		M70124	M70134	M70141	
600/5		M70125	M70135	M70142	
750/5		M70126	M70136	M70143	
800/5		M70127	M70137	M70144	
1 000/5		M70128	M70138	M70145	M70151
1 200/5				M70146	
1 250/5				M70147	
1 500/5				M70148	M70152
2 000/5					M70153
2 500/5					M70154
3 000/5					M70155
4 000/5					M70156
5 000/5					M70157

ACCESSORIES




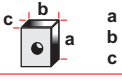
Certificate




TET114 (TP58)
TET144 (TP88,812)

TM 45 , TA 210 , TW 25 , TW 25M

Measurement transformers

										
Type	TM 45	TA 210	TW 25							
Inner Ø	Primary winding -	Primary winding -	Bushing bar 25							
	85 52,5 70	104.5 75 134	85 70 70							
Mounting										
V-A	Class			Class			Class			
	0,5	1	3	0,5	1	3	0,5	1	3	
A	5/5	2,5	5	7	15	20	30			
	10/5	2,5	5	7	15	20	30			
	15/5	2,5	5	7	15	20	30			
	20/5	2,5	5	7	15	20	30			
	25/5	2,5	5	7	15	20	30			
	30/5	2,5	5	7	15	20	30			
	40/5	2,5	5	7	15	20	30			
	100/5							-	1,5	3
	125/5							-	2	4
	150/5							-	3	5
	200/5							3	5	8
	250/5							4	9	11
	300/5							6	11	13

				
Type	TW 25 M*			
Inner Ø	Bushing bar 25			
a b c	85 70 70			
Mounting				
V-A	Class			
	0,5	1	3	
A	100/5	-	1,5	3
	125/5	-	2	4
	150/5	-	3	5
	200/5	3	5	8
	250/5	4	9	11
	300/5	6	11	13

* MULTI-RATIO TRANSFORMER:

Groups 6 current transformers into one single transformer. Ratio is selected according to the terminal connections on the secondary side.

FEATURES

	TM 45	TA 210	TW 25	TW 25 M
Frequency	50...60 Hz			
Assigned insulation voltage	3 kV			
Short-circuit thermal current, I_{th}	$60 I_n$			
Dynamic current, I_{dyn}	$2,5 I_{th}$			
Higher voltage for the material	0,72 kV			
Thermal class	A (105 °C)			
Encapsulated in self-extinguishing plastic	VO			
Safety factor	< 5			
Sealed secondary terminals	Yes			
Standards	IEC 44-1, UNE 21 088-1, UL 94, VDE 0414			

CODE TABLE

A	TM 45	TA 210	TW 25	TW 25 M
5/5	M70601	M70541		
10/5	M70602	M70542		
15/5	M70603	M70543		
20/5	M70604	M70544		
25/5	M70605	M70545		
30/5	M70606	M70546		
40/5	M70607	M70547		
50/5	M70608	M70548		
60/5		M70549		
75/5		M7054A		
100/5		M7054B	M70611	M70621
125/5		M7054C	M70612	
150/5		M7054D	M70613	
200/5		M7054E	M70614	
250/5		M7054F	M70615	
300/5		M7054G	M70616	
400/5		M7054H		

ACCESSORIES

Certificate

TI-420 , TP-420 , TCM-420 , TCB-420

Current transformers WITH 4 ... 20 mA OUTPUT

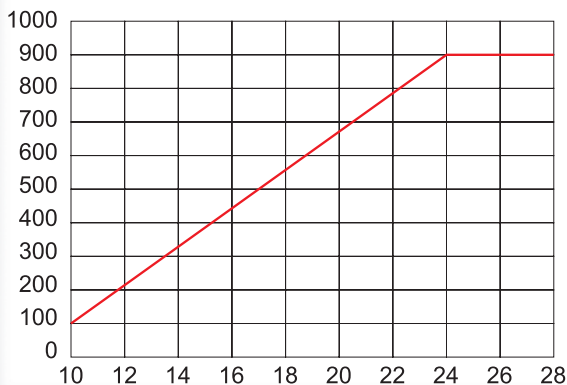
Type	TI-420			TP-420					TCM-420		TCB-420		
	35	70	105	23	58	88	812	816	25	35	35	70	105
Inner Ø	35	70	105	20 x 30	50 x 80	80 x 80	80 x 120	80 x 160	25	35	35	70	105
	79	110	146	110	145	145	185	245	87	87	79	110	146
	100	130	170	89	114	144	144	184	70	105	166	196	236
	33	33	33	58	50	50	50	70	70	70	33	33	33
Mounting													
A	TI-420			TP-420					TCM-420		TCB-420		
	35	70	105	23	58	88	812	816	25	35	35	70	105
2,5	M70811								M71041			M71011	
5	M70812			M70211					M71042			M71012	
10	M70813			M70212					M71043	M71051		M71013	
20	M70814			M70213					M71044	M71052		M71014	
50	M70815			M70214					M71045	M71053		M71015	
100	M70816	M70821		M70215	M70221	M70231			M71046	M71054	M71016	M71021	
200				M70216					M71047	M71055			
250	M70817	M70822	M70831	M70217	M70222	M70232	M70241				M71017	M71022	M71031
300										M71056			
500		M70823	M70832	M70218	M70223	M70233	M70242	M70251				M71023	M71032
750		M70824	M70833		M70224	M70234	M70243	M70252				M71024	M71033
1 000			M70834			M70235	M70244	M70253					M71034
1 500			M70835			M70236	M70245	M70254					M71035
2 000								M70255					
3 000								M70256					
4 000								M70257					

FEATURES

	TI-420	TP-420	TCM-420	TCB-420
Operating Conditions				
Class interval	0 °C / +50 °C			
Operating temperature	-10 °C / +50 °C			
Higher voltage for the material (U_m)	0,72 kV c.a.			

	TI-420	TP-420	TCM-420	TCB-420
Measurement circuit				
Primary current	According to type			
Response in lineal frequency	50...60 Hz			
Secondary current	4...20 mA d.c.			
Accuracy (between 5...110 % I_n)	± 1,5 I_n reading			
Overloads (at ambient temperature)	1,5 I_n permanently			
Standards	IEC 44-1, UNE 21 088-1, IEC 664, VDE0110, VDE0414, UL 94, IEC 1010-1, EN 61010-1			

MAXIMUM LOAD RESISTANCE






ACCESSORIES

**FA-420
M79911**



TC 420 / TC 020

Current transformers WITH BUILT IN CONVERTER

							
Type	TC 420			TC 020			
	TC 5 420	TC 6 420	TC 8 420	TC 5 020A	TC 6 020A	TC 8 020A	
Inner Ø	20	28	44	20	28	44	
BAR mm	25 x 5	40 x 10	60 x 12	25 x 5	40 x 10	60 x 12	
	a	70	80,5	102	70	80,5	
	b	58	64	84,5	58	64	84,5
	c	32	44	50	32	44	50
Mounting	TC 420			TC 020			
A	TC 5 420	TC 6 420	TC 8 420	TC 5 020A	TC 6 020A	TC 8 020A	
5	M72112			M72012			
10	M72113			M72013			
20	M72114			M72014			
50		M72131			M72031		
100		M72132			M72032		
200		M72134			M72034		
300		M72136			M72036		
500			M72151			M72051	
1 000			M72152			M72052	
1 500			M72153			M72053	

FEATURES

	TC 420	TC 020
Frequency	50...60 Hz	
Assigned insulation voltage	3 kV	
Short-circuit thermal current, I_{th}	60 I_n	
Dynamic current, I_{dyn}	2,5 I_{th}	
Higher voltage for the material	0,72 kV	
Thermal class	B (130 °C)	
Encapsulated in self-extinguishing plastic	VO	
Safety factor	< 5	
Sealed secondary terminals	yes	
Response time	< 300ms	
Accuracy class	± 1,5%	
Standards	IEC 44-1, B5 2627	

ACCESSORIES

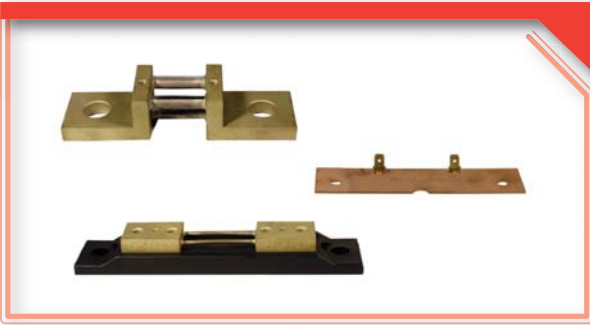


DIN rail



Terminal cover

SHUNTS



CIRCUTOR offers a wide range of Shunts up to 15,000 A for continuous current measurement. The standard secondary side output is 60 mV. 50, 100, 150, 200, 300, 600 mV outputs are available upon request.

Type		SH
Ratio	A	
30 A / 60 mV	30	M71231
40 A / 60 mV	40	M71232
50 A / 60 mV	50	M71233
60 A / 60 mV	60	M71234
80 A / 60 mV	80	M71235
100 A / 60 mV	100	M71236
150 A / 60 mV	150	M71237
200 A / 60 mV	200	M71238
250 A / 60 mV	250	M71239
300 A / 60 mV	300	M7123A
400 A / 60 mV	400	M7123B
500 A / 60 mV	500	M7123C
600 A / 60 mV	600	M7123D
750 A / 60 mV	750	M7123E
800 A / 60 mV	800	M7123F

Type		SH
Ratio	A	
1 000 A / 60 mV	1 000	M7123G
1 200 A / 60 mV	1 200	M7123H
1 500 A / 60 mV	1 500	M7123J
2 000 A / 60 mV	2 000	M7123K
2 500 A / 60 mV	2 500	M7123L
3 000 A / 60 mV	3 000	M7123M
4 000 A / 60 mV	4 000	M7123N
5 000 A / 60 mV	5 000	M7123P
6 000 A / 60 mV	6 000	M7123Q
7 500 A / 60 mV	7 500	M7123R
8 000 A / 60 mV	8 000	M7123S
10 000 A / 60 mV	10 000	M7123T
12 500 A / 60 mV	12 500	M7123U
15 000 A / 60 mV	15 000	M7123V

Type		SHP	SHB
Ratio	A		
1 A / 60 mV	1		M71221
1,5 A / 60 mV	1,5		M71222
2,5 A / 60 mV	2,5		M71223
4 A / 60 mV	4		M71224
5 A / 60 mV	5		M71225
6 A / 60 mV	6		M71226
10 A / 60 mV	10		M71227
15 A / 60 mV	15		M71228
25 A / 60 mV	25		M71229
30 A / 60 mV	30	M71211	M7122A
40 A / 60 mV	40	M71212	M7122B
50 A / 60 mV	50	M71213	M7122C
60 A / 60 mV	60	M71214	M7122D
75 A / 60 mV	75	M71215	
80 A / 60 mV	80		M7122E
100 A / 60 mV	100	M71216	M7122F
150 A / 60 mV	150	M71217	

TSR



Having to add multiple sets of current transformers onto one measuring device is very common in meter installations. The TSR adding transformer offers an easy solution to this application. The output current generated by the TSR is obtained by using the following calculation:

$$I_{\text{OUTPUT}} = \frac{I_1 + I_2 + \dots + I_n}{n}$$

“n” is the number of inputs on the TSR and “I₁, I₂, ..., I_n” is the current of each input.

The TSR can add all the connected currents, from several sets current transformers, to generate a proportional output. To do this the ratio of connected CT has to be the same. Upon request a TSR can be manufactured to handle different ratio current transformers. Please specify ratios at time of inquiry.

Number of inputs	Power and accuracy	Type	Code
2 x 5 A	15 V·A / Class 0,5	TSR-2	M70701
3 x 5 A	15 V·A / Class 0,5	TSR-3	M70702
4 x 5 A	15 V·A / Class 0,5	TSR-4	M70703
5 x 5 A	15 V·A / Class 0,5	TSR-5	M70704

ACCESSORIES

TERMINAL COVER



Accessory to seal the secondary side terminals on the TC type transformer

Code: M79951

PA-TC / WG



Accessory to mount the TC5, TC5.2, T6, TC6.2 transformer on a DIN rail

Code: P19921

FA-420



The FA-420 module supplies a 15 V d.c. power supply. This module is fed with 230 V a.c.

Code: M79911

TET 114 / TET 144



TP bad weather protector

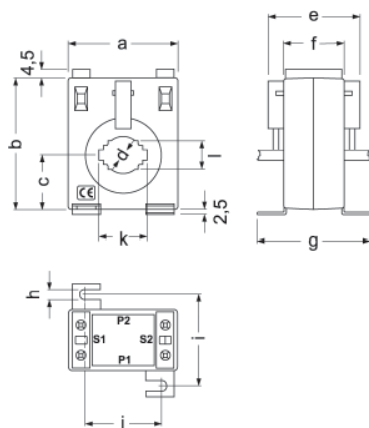
For TP 58 -

TET 114 Code: M79972

For TP 88 and TP 812 - TET 144 Code: M79973

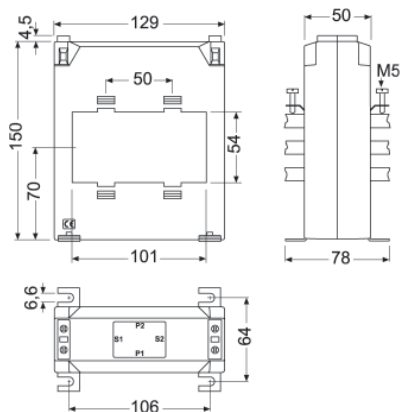
DIMENSIONS

TC 5 / TC 5.2 / TC 6.2 / TC 6 / TC 8 / TC 10 / TCH 5 / TCH 5.2 / TCH 6.2 / TCH 6 / TCH 8 / TCH 10

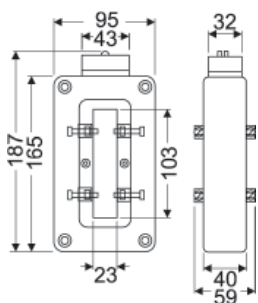


sizes in mm	TC 5 TCH 5	TC 5.2 TCH 5.2	TC 6.2 TCH6.2	TC 6 TCH 6	TC 8 TCH 8	TC 10 TCH 10
a	58	58	64	64	84,5	108
b	70	70	80,5	80,5	102	130
c	29	29	34	34	46	61
d	20,3	22	26	28,5	44	63
e	45	45	60,5	66,5	69	---
f	32	32	44	44	50	50
g	59	59	71	71,2	78	78
h	5,6	5,6	5,6	5,6	6,6	6,6
i	48	48	60	60	64	64
j	39	39	46	46	62	86
k	25,6	30,6	20,6	40,6	60,6	80,6
l	15,6	15,6	30,6	25,2	30,6	50,8

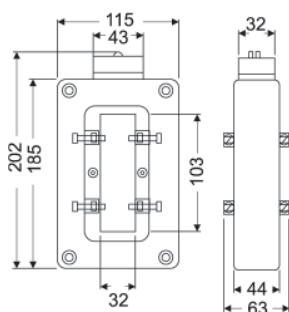
TC 12 / TCH 12



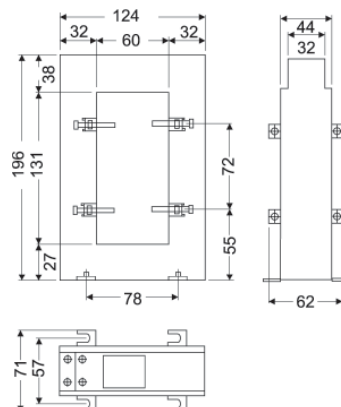
TA 400



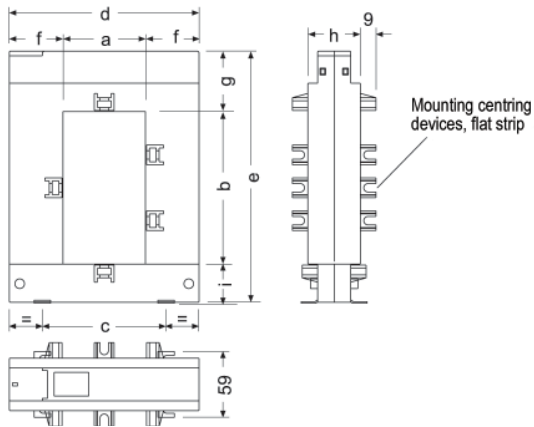
TA 500



TA 600



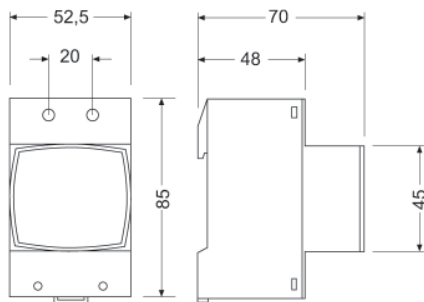
TP 23 / TP 58 / TP 88 / TP 812 / TP 816



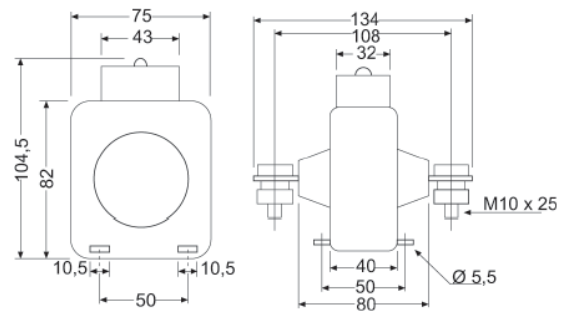
sizes in mm	TP-23	TP-58	TP-88	TP-812	TP-816
a	20	50	80	80	80
b	30	80	80	120	160
c	51	78	108	108	120
d	89	114	144	144	184
e	110	145	145	185	245
f	34	32	32	32	52
g	47	32	32	32	47
h	40	32	32	32	52
i	32	32	32	32	38

Note: All types have mounting centring devices except the TP-23

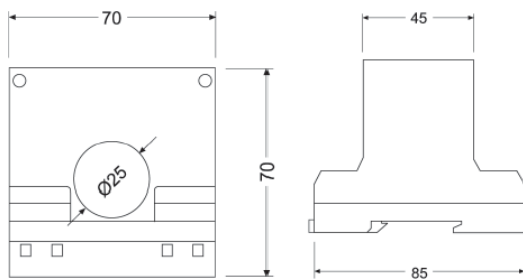
TM 45



TA 210

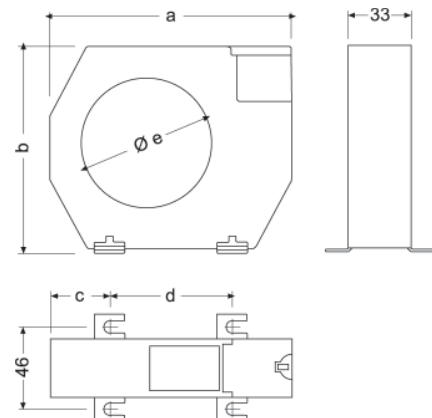


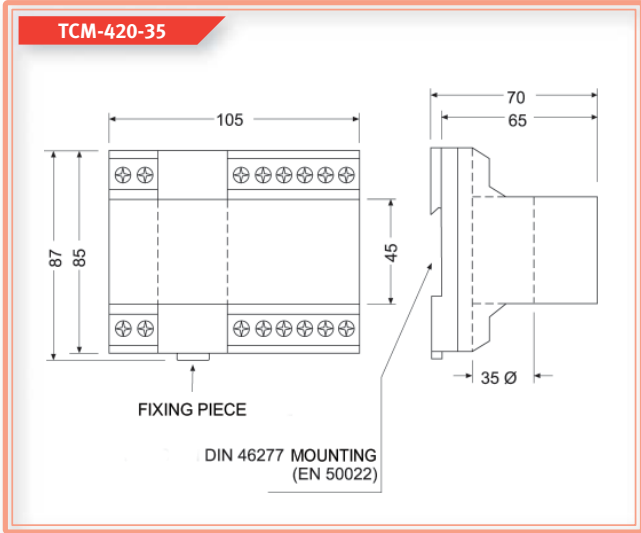
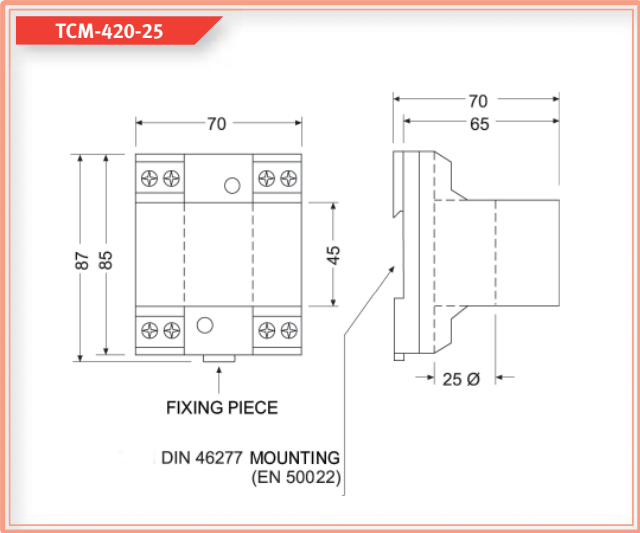
TW 25 / TW 25M



TI 420

sizes in mm	TI-420-35	TI-420-70	TI-420-105
a	100	130	170
b	79	110	146
c	26	32	38
d	48,5	66	94
e	35	70	105

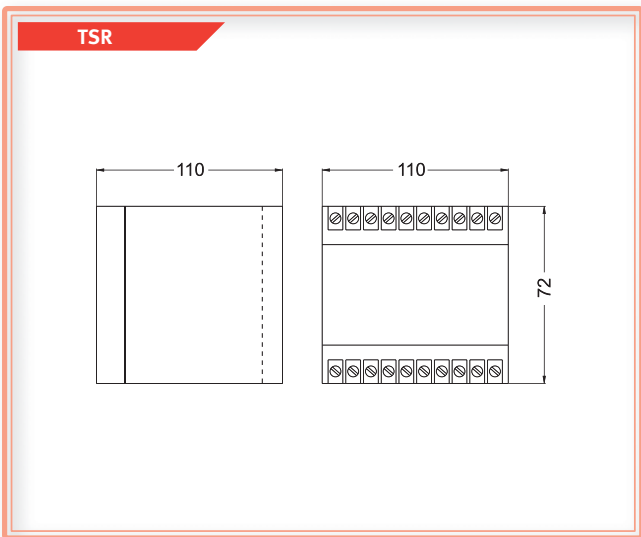
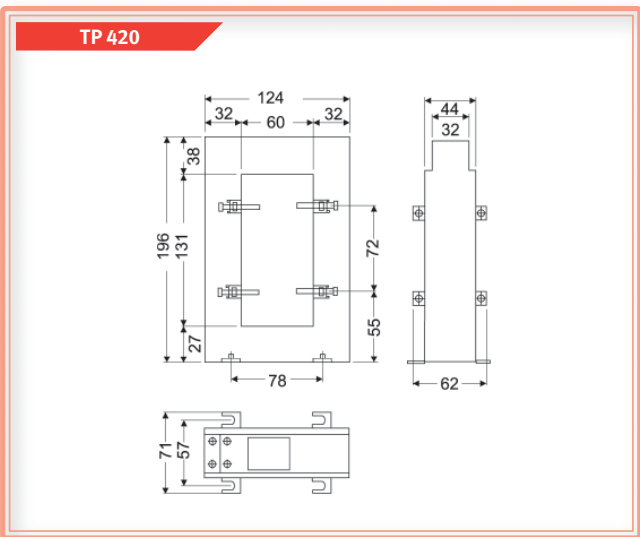




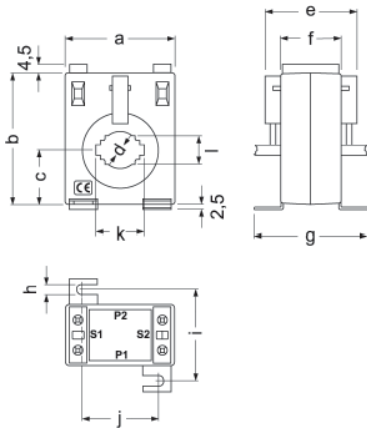
TCB-420

a
b
33
c
d
46

sizes in mm	TCB-420-35	TCB-420-70	TCB-420-105
a	166	196	236
b	79	110	146
c	26	32	38
d	48,5	66	94
e	35	70	105



TC-020 / TC-420



sizes in mm	TC 5 TCH 5	TC 6 TCH 6	TC 8 TCH 8
a	58	64	84,5
b	70	80,5	102
c	29	34	46
d	20,3	28,5	44
e	45	66,5	69
f	32	44	50
g	59	71,2	78
h	5,6	5,6	6,6
i	48	60	64
j	39	46	62
k	25,6	40,6	60,6
l	15,6	25,2	30,6

SHP / SHB / SH

Voltage drop mV ₍₁₎	Scope A ₍₁₎	Fig.	a1	a2	b1	b2	b3	c1	c2	e	h	Weight kg	No. of current splices	Current splices			Voltage splices
														Hexagonal screw DIN 933	Washer DIN 125	Nut DIN 934	
60	1-1, 5-2, 5-4-6-10-15-25	1	90	28	20	-	-	8	-	78	-	0,15	2 x 1	M5 x 12	5,3	-	2 M5 x 8 DIN 84 screws and 2 x 5,3 DIN 433 washers
	30-40-60-100-150		100	33	20	-	-	8	-	80	-	0,13	2 x 1	M8 x 16	8,4	-	
	250	2	145	55	30	15	-	10	10	105	30	0,54	2 x 1	M12 x 40	13	M12	
	400-600				40	20	-	10	10	115	30	0,78	2 x 1	M16 x 45	17	M16	
	1 000				60	30	-	10	10	115	30	1,49	2 x 1	M20 x 50	21	M20	
	1 500				90	21	48	10	10	115	30	1,95	2 x 2	M16 x 45	17	M16	
2 500				120	30	60	10	10	115	30	3	2 x 2	M20 x 50	21	M20		
150	1-1, 5-2, 5-4-6-10-15-25	1	90	25	20	-	-	8	-	78	-	0,18	2 x 1	M5 x 12	5,3	-	
	40-60-100-150		225	33	25	-	-	8	-	205	-	1,14	2 x 1	M8 x 16	8,4	-	
	250	2	270	55	30	15	-	10	10	230	50	0,80	2 x 1	M12 x 40	13	M12	
	400-600				40	20	-	10	10	230	50	1,38	2 x 1	M16 x 45	17	M16	
	1 000				70	35	-	10	10	240	60	2,55	2 x 1	M20 x 50	21	M20	

All shunts are supplied with connection cables, 1.5 m long and 1.5 mm Ø diameter.

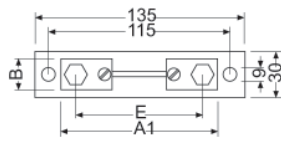
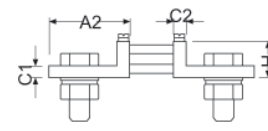
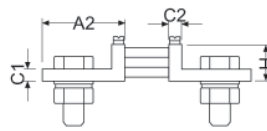
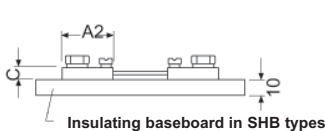


fig 1: from 1 to 150 A

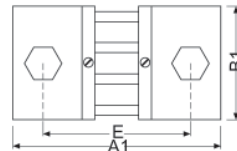


fig 2: from 200 to 1 000 A

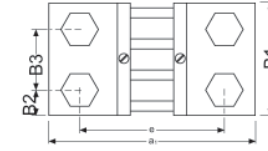


fig 3: from 1 500 to 2 500 A



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