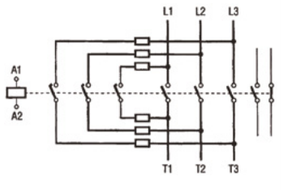
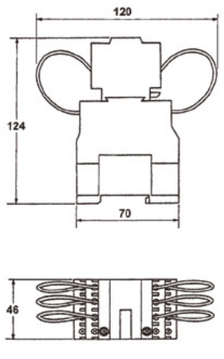
HD CONTACTORS FOR CAPACITORS (IEC-EN 60947-4-1)

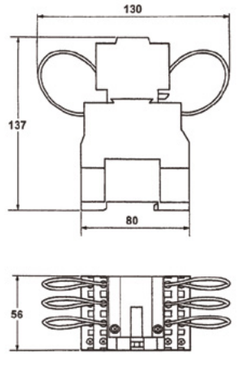
Special contactors for the connection of 3-phase capacitors The inrush overcurrent value is reduced by the early closure contacts and by the limitation resistors.	HD 15	HD 30	HD 60
			

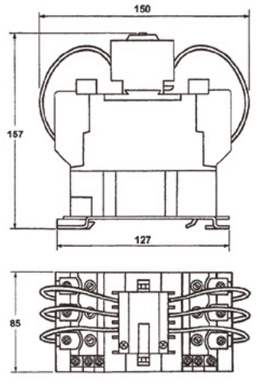
HD CONTACTORS FOR CAPACITORS (IEC-EN 60947-4-1)				
Maximum working voltage	(V)	690	690	690
Nominal isolation voltage IEC 947	(V)	1.000	1.000	1.000
Nominal thermal current	I_{th} (A)	32	60	110
Working power at 55°C and 400 V	kvar	12,5	25	50
Total number of insertions	N.	280.000	250.000	85.000
Maximum frequency of rotations	(RPM)	5,83	4	2,5
Power of the leading circuit	VA	10	10	20
Weight	kg	0,415	0,640	1,570

When the contactor coil is energized, the early closure contacts are closed and they supply the capacitor through the precharge resistors; then the power contacts are closed and after that the early closure contacts are opened.









110 V coil: S/N 220 V coil: S/N 380 V coil: S/N	**RA0150ZZ** **RA0151ZZ** **RA0152ZZ**	**RA0300ZZ** **RA0301ZZ** **RA0302ZZ**	**RA0600ZZ** **RA0601ZZ** **RA0602ZZ**

CURRENT TRANSFORMERS FOR AUTOMATIC PFC SYSTEMS

HOW TO SIZE THE CURRENT TRANSFORMER

The Current Transformer (C.T.) is not supplied with the APFC equipment, but it must be requested separately. The Controller needs a current signal that must be related to the current absorbed by the load that needs to be compensated; the correct device is a C.T. with an adequate ratio and a secondary coil current of 5 A. The primary coil current must be chosen on the maximum current of the electrical system that must be compensated, without considering the inrush current of the loads. This value can be obtained by the maximum power absorbed by the load that is expressed in kW; it can be also found on the electrical bills, on the energy meters or by using the following formula:

$$A = \frac{kW}{1{,}73 \times V \times \cos\varphi} \times 1000$$

Example – data: V = 400 kW = 50 Cosφ = 0,90

$$\text{Current in A} = \frac{50}{1{,}73 \times 400 \times 0{,}90} \times 1000 = 80\ A$$

Once the current value is found, the correct size of the C.T. is the one available on the market that is close to this value; the C.T. size found on the market must be always higher than the first one. In the above example the required C.T. must have a primary coil current of 100/150 A. The C.T. must not be oversized than required so that the PFC controller does not lose its sensitivity.

CLASS, PERFORMANCE, CONNECTIONS OF THE C.T.

The C.T. must be properly chosen and sized, otherwise some distorsions on the current signal and some remarkable errors on the measurements might occur.
As regards the precision of the C.T., it must be of 1 Class as already mentioned; if this kind of C.T. is difficult to be found, a 3 Class C.T. may be used with a performance reduction of 50%.
For example: a 3 Class C.T. with a performance of 10 VA must be used as a 1 Class C.T. with a performance of 5 VA.
The C.T. performance, that is its apparent power which is expressed in VA, and the secondary cables section are linked as it is easily shown in the below table:

Cable section in mm2	C.T. performance in VA			
	3	5	10	15
	Maximum length of the connection			
1,5	2,8	5	10	16
2,5	4,6	9	18	27
4	7,2	13	28	43
6	11	20	42	64
10	18	33	71	108

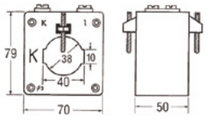
Example: a 5 VA performance C.T. may be connected up to 5 m far from the APFC equipment if the connection is realized with cables of 1,5 mm^2 and up to 9 m using 2,5 mm^2 cables.

TAC1 - Secondary current 5 A – Performance 3 VA – 1 Class – Working voltage 750 V – Test voltage 3 Kv – The hole is suitable for busbars up to 30x10 mm and for cables up to a diameter of 28 mm.

Available transformation ratios:

TAC1 50 /5A **(SA050ZZ5)** **TAC1** 100/5A **(SA100ZZ5)**
TAC1 150/5A **(SA150ZZ5)** **TAC1** 200/5A **(SA200ZZ5)**
TAC1 300/5A **(SA300ZZ5)** **TAC1** 400/5A **(SA400ZZ5)**

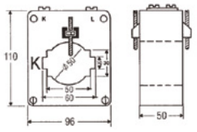
TAC2 - Secondary current 5 A – Performance 5 VA – 1 Class – Working voltage 750 V – Test voltage 3 Kv – The hole is suitable for busbars up to 40x10 mm and for cables up to a diameter of 38 mm.



Available transformation ratios:

TAC2 150/5A **(SB150ZZ5)** **TAC2** 200/5A **(SB200ZZ5)**
TAC2 300/5A **(SB300ZZ5)** **TAC2** 400/5A **(SB400ZZ5)**
TAC2 600/5A **(SB600ZZ5)** **TAC2** 800/5A **(SB800ZZ5)**

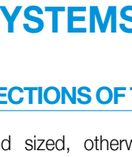
TAC3 - Secondary current 5 A – Performance 10 VA – 1 Class – Working voltage 750 V – Test voltage 3 Kv – The hole is suitable for busbars up to 60x10 mm and for cables up to a diameter of 50 mm.



Available transformation ratios:

TAC3 400/5A **(SC400ZZ5)** **TAC3** 600 /5A **(SC600ZZ5)**
TAC3 800/5A **(SC800ZZ5)** **TAC3** 1000/5A **(SCA00ZZ5)**

TAC4 - Secondary current 5 A – Performance 15 VA – 1 Class – Working voltage 750 V – Test voltage 3 Kv – The hole has 103x60 mm dimensions and it is suitable for busbars and cables.



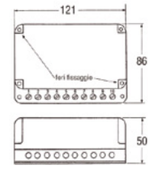
Available transformation ratios:

TAC4 1500/5A **(SDA50ZZ5)** **TAC4** 2000/5A **(SDB00ZZ5)**
TAC4 3000/5A **(SDC00ZZ5)** **TAC4** 4000/5A **(SDD00ZZ5)**

TSW - **SUMMATION CURRENT TRANSFORMERS**

This kind of C.T.s is used for catching the signal coming from different main C.T.s connected in parallel on different busbars of the same electrical system. The main C.T.s must have the same transformation ratio of the other ones (for different applications please contact our Technical Department). The summation C.T. is provided with as many primary windings as main C.T.s and with one secondary winding that is connected to the APFC equipment. The self-consumption of the TSW is 5 VA that must be divided into the number of main C.T.s.

Secondary current 5 A – Performance 10 VA – 1 Class



TSW 2X5/5A Two inputs of 5 A **(SEA25ZZZ)**
TSW 3X5/5A Three inputs of 5 A **(SFB35ZZZ)**
TSW 4X5/5A Four inputs of 5 A **(SHC45ZZZ)**
TSW 5X5/5A Five inputs of 5 A **(SJD55ZZZ)**