

### Programming

The LCC can be programmed through the keypad or remotely via the serial port. The following details can be programmed:

- Instrument identity code
- Primary voltage / VT ratio
- Primary current / CT ratio
- Relay operation (pulse output or alarm contact)
- Balanced or unbalanced system

Multiple programming can be achieved when units are linked in a communication network. The LCC can be factory programmed if required.

### Serial Port Communication

The LCC has a serial port which when used with a MC-LCC communication module, enables the LCC to communicate using the RS485 standard with a baud rate of 9600 bps. It allows the transmission of the measured values to a computer or PLC. The connection is done on 2 wires half duplex. The RS485 uses the MODBUS RTU communication protocol. The standard configuration permits connection of up to 16 units in one network. Optional software is available to allow meter reading or full data analysis.

### Pulse / Alarm Outputs

The output optocoupler contacts can be programmed to operate as follows:

- Active energy (kWh) or reactive energy (kVarh) indicated by voltage free pulse contacts.
- Any specified parameter can have one or two alarm contacts.

Both contact outputs can be programmed and activated through the serial port.

### Maximum Demand

Maximum demand values for I1, I2, I3, P, Q and S can all be displayed. The integration period can be selected as 5, 10, 30, 60, 300, 480, 600 or 900 seconds.

### Display / Keypad

A custom backlit LCD display has been developed to show more than 30 electrical parameters by sequential pages, selected by the up and down keys. The meter has 3 keys to select the parameters displayed and for programming.

### Minimum / Maximum Values

The LCC is capable of displaying the maximum values of the following parameters: V1, V2, V3, V12, V23, V31, I1, I2, I3, IN, P, Q and S and the minimum values of V1, V2, V3, V12, V23 and V31.

### Parameters Measured

Electrical Parameter	Symbol	System	Line 1	Line 2	Line 3	Reset
Voltage (Line-Neutral)	V		X	X	X	
Voltage (Line-Line)	V		X	X	X	
Current	A		X	X	X	
Neutral Current	A	X				
Active Power (P)	kW	X	X	X	X	
Reactive Power (Q)	kVAr	X	X	X	X	
Apparent Power (S)	KVA	X	X	X	X	
Power Factor (cosØ)	PF	X	X	X	X	
Maximum Demand Current	A		X	X	X	
Maximum Demand P	kW	X				
Maximum Demand Q	kVAr	X				
Maximum Demand S	KVA	X				
Frequency	Hz	X				
Consumed Active Energy (EP+)	kW-h	X				X
Generated Active Energy (EP-)	-kW-h	X				X
Consumed Inductive Reactive Energy (EP+)	kvarL-h	X				X
Consumed Capacitive Reactive Energy (EP-)	kvarC-h	X				X

### Specification Continued

#### Communication Standard:

- RS485 (2 wire half duplex)
- baud rate 9600 bps

#### Maximum Length Of Net Per Line:

- 1250m without repeater

#### Maximum Number Of Units Per Line:

- 16

#### Enclosure:

- DIN96 ABS (UL94 V0)
- Panel mounting with backlit LCD screen
- 14mm high digits

#### Enclosure Code:

- Case front IP40, terminals IP20

#### Input/Output Connectors:

- Plug-in type with
- 2.5mm<sup>2</sup> maximum cable entry

#### Weight:

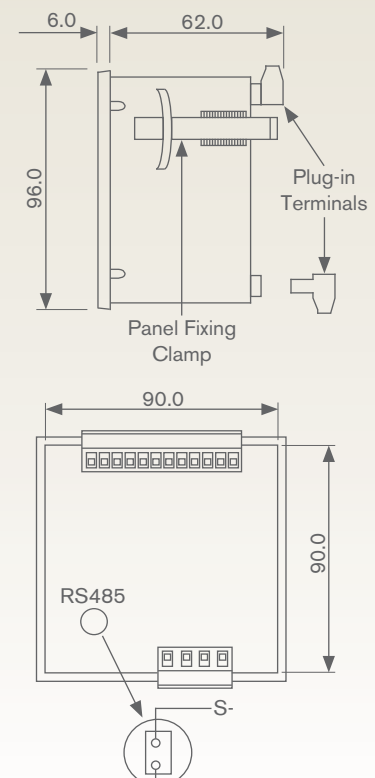
- 325 grams

#### Markings:

- CE marked

Specification subject to change without notice.

### Dimensions



# Current Transformers and DC Shunts



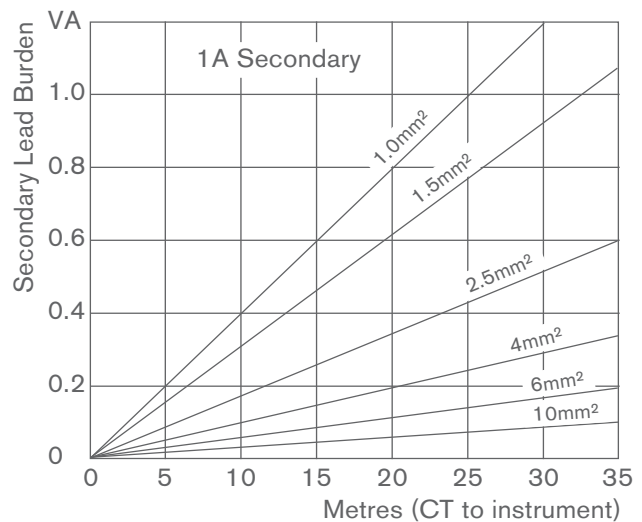
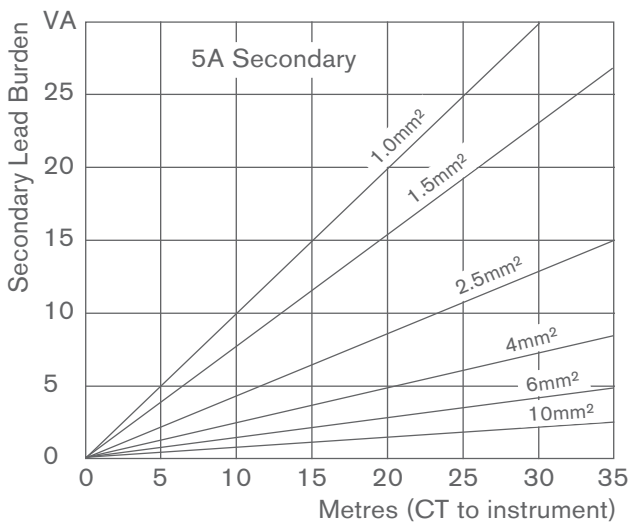
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## Current Transformer General Specification

### Secondary Lead Burdens

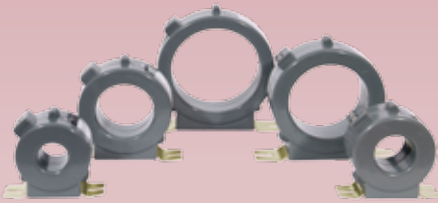
When selecting a current transformer, it is important to consider the power absorbed by the cables connecting the CT secondary terminals and the measuring instrument. The overall burden of the cable and measuring equipment should not exceed the available VA of the CT. Where the current transformer is to be mounted remotely a 1A secondary is recommended. Where there is a very large distance between the instrument and current transformer the use of a current transducer to convert the AC current into a DC signal is recommended.



### Installation & Application Notes

1. It is essential with certain instrumentation that the CT is physically orientated correctly on the conductor. K or P1 must face the supply and L or P2 must face the load. It is also important to ensure that the secondary connections are made in accordance with the instrument connection diagram.
2. The secondary terminals of the CT must NOT make open circuit on load as dangerously high voltages may occur under these conditions. During installation the secondary terminals must be shorted and during operation it is recommended that one side of the secondary winding is earthed.
3. On all current transformers it is possible to reduce the CT ratio by passing multiple turns of the primary conductor cable through the aperture. The resultant CT ratio will be CT primary rating divided by the number of through turns e.g. a 100/5A CT with the primary conductor passed through the aperture twice will produce a CT with a ratio of 50/5A.

Specification subject to change without notice.



## FCT Series Current Transformers

### Models Available

- FCT29** Ring Type Current Transformer
- FCT39** Ring Type Current Transformer
- FCT61** Ring Type Current Transformer
- FCT85** Ring Type Current Transformer
- FCT105** Ring Type Current Transformer

### Product Features

- Circular aperture ideal for cables
- Moulded ABS plastic housing
- 1 Amp or 5 Amp secondary
- Accuracy class 1
- Mounting feet
- Screw type terminals
- Optional terminal cover available
- Optional busbar clamp kit available

FCT series current transformers are available for primary currents between 5 Amps and 2500 Amps, offering reliability and class 1 accuracy making them suitable for a large range of industrial applications.

The FCT series current transformers are available in five different physical sizes all with a circular aperture, ideally suited for circular cables. They are enclosed in a protective ABS housing ensuring excellent mechanical strength and electrical insulation.

The FCT series current transformers have fixing feet as standard and can be used with the optional busbar mount clamp kit if required. An optional terminal cover is also available.

## For transforming high AC current to a proportional 1 Amp or 5 Amp output

### Specification

#### Reference Standard:

- BS7626-1993, BS3938

#### Accuracy:

- Class 1 ( $\pm 1\%$  max. error)

#### Primary Input Current:

- 0-5A to 0-2500A (see range data table)

#### Secondary Current:

- 0-1A or 0-5A

#### Overload:

- To BS3938 - IEC 185

#### Operating Voltage:

- 600Vac maximum

#### Test Voltage:

- 2kV rms 50Hz for 1 minute

#### Frequency:

- 50/60/400Hz

#### Burden:

- See range data table

#### Enclosure:

- Flame retardant ABS
- Surface mounting or busbar mounting
- M4 screw terminals
- IP40 enclosure code
- Insulation class E

#### Operating Temperature:

- $-20^{\circ}\text{C}$  to  $70^{\circ}\text{C}$

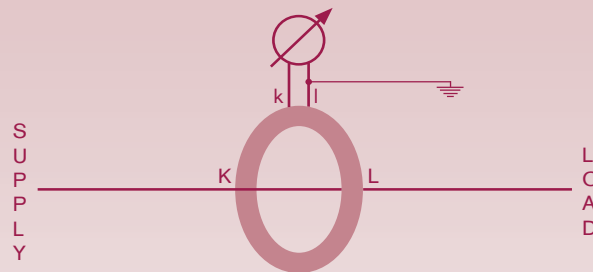
#### Weight:

- See range data table

#### Markings:

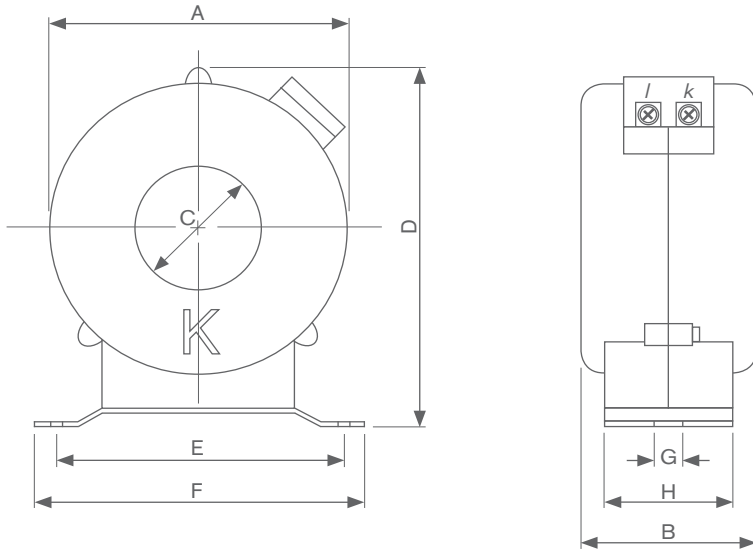
- CE marked

### Connections



### Ordering information

Code	Model & Size	Ratio
FCT29	Ring Type CT - 29mm Hole	5/1, 10/1, 15/1, 20/1, 25/1, 30/1, 40/1, 50/1, 60/1, 80/1, 100/1, 150/1
FCT61	Ring Type CT - 61mm Hole	200/1, 250/1, 300/1, 400/1
FCT29	Ring Type CT - 29mm Hole	5/5, 10/5, 15/5, 20/5, 25/5, 30/5, 40/5, 50/5, 60/5, 75/5, 80/5, 100/5, 120/5, 150/5, 200/5, 250/5, 300/5
FCT39	Ring Type CT - 39mm Hole	400/5, 500/5
FCT61	Ring Type CT - 61mm Hole	600/5, 800/5
FCT85	Ring Type CT - 85mm Hole	1000/5
FCT105	Ring Type CT - 105mm Hole	1200/5, 1500/5, 2000/5, 2500/5
<b>Example</b>	<b>FCT29</b>	<b>100/5</b>



	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
FCT29	74	55	29	93	84	98	6	42
FCT39	81	55	39	105	84	98	6	42
FCT61	103	55	61	129	105	120	6	42
FCT85	122	55	85	144	125	141	6	42
FCT105	141	55	105	160	133	156	10	50

### Options

A busbar mount clip (Order Code: **BBCK**) is available which enables the standard ring type FCT current transformers to be safely clamped to a busbar.

Also available for the FCT series of current transformers is a terminal cover (Order Code: **FCTC**) to insulate the secondary terminals.

### Range Data

Model	Primary Current (Amps)	Secondary Current (Amps)	Burden (VA)	Through Turns	Hole Diameter (mm)	Weight (grams)
FCT29-5/1	5	1	3	10	29	600
FCT29-10/1	10	1	3	5	29	600
FCT29-15/1	15	1	3	4	29	600
FCT29-20/1	20	1	3	5	29	600
FCT29-25/1	25	1	3	2	29	600
FCT29-30/1	30	1	3	2	29	600
FCT29-40/1	40	1	3	2	29	600
FCT29-50/1	50	1	3	1	29	600
FCT29-60/1	60	1	3	1	29	600
FCT29-80/1	80	1	3	1	29	600
FCT29-100/1	100	1	3	1	29	600
FCT29-150/1	150	1	3	1	29	600
FCT61-200/1	200	1	5	1	61	600
FCT61-250/1	250	1	5	1	61	600
FCT61-300/1	300	1	5	1	61	600
FCT61-400/1	400	1	5	1	61	600

FCT29-5/5	5	5	3	10	29	600
FCT29-10/5	10	5	3	10	29	600
FCT29-15/5	15	5	3	4	29	600
FCT29-20/5	20	5	3	5	29	600
FCT29-25/5	25	5	3	2	29	600
FCT29-30/5	30	5	3	2	29	600
FCT29-40/5	40	5	3	2	29	600
FCT29-50/5	50	5	3	1	29	600
FCT29-60/5	60	5	3	1	29	600
FCT29-75/5	75	5	3	1	29	600
FCT29-80/5	80	5	3	1	29	600
FCT29-100/5	100	5	3	1	29	600
FCT29-120/5	120	5	3	1	29	600
FCT29-150/5	150	5	3	1	29	600
FCT29-200/5	200	5	3	1	29	600
FCT29-250/5	250	5	3	1	29	600
FCT29-300/5	300	5	3	1	29	600
FCT39-400/5	400	5	5	1	39	600
FCT39-500/5	500	5	5	1	39	600
FCT61-600/5	600	5	10	1	61	600
FCT61-800/5	800	5	10	1	61	600
FCT85-1000/5	1000	5	10	1	85	750
FCT105-1200/5	1200	5	10	1	105	1000
FCT105-1500/5	1500	5	10	1	105	1000
FCT105-2000/5	2000	5	10	1	105	1000
FCT105-2500/5	2500	5	10	1	105	1000



## MFO Series Current Transformers

### Models Available

- MFO30** Busbar Type Current Transformer
- MFO40** Busbar Type Current Transformer
- MFO60** Busbar Type Current Transformer
- MFO100** Busbar Type Current Transformer

### Product Features

- Staggered aperture ideal for busbars
- Moulded ABS plastic housing
- 5 Amp secondary
- Accuracy class 1
- Mounting feet
- Screw type terminals
- Terminal cover included
- Busbar clamp kit included
- Optional DIN rail mounting clip

MFO series current transformers are available for primary currents between 5 Amps and 2500 Amps, offering reliability and class 1 accuracy making them suitable for a large range of industrial applications.

The MFO series current transformers are available in four different physical sizes all with a staggered rectangular aperture, ideally suited for busbars. They are enclosed in a protective ABS housing ensuring excellent mechanical strength and electrical insulation.

The MFO series current transformers have fixing feet, a busbar clamp kit and terminal cover as standard. Optional DIN rail mounting clips are available for mounting the current transformers to 35mm DIN rail.

## For transforming high AC current to a proportional 5 Amp output

### Specification

#### Reference Standard:

- BS7626-1993, BS3938

#### Accuracy:

- Class 1 ( $\pm 1\%$  max. error)

#### Primary Input Current:

- 0-5A to 0-2500A (see range data table)

#### Secondary Current:

- 0-5A

#### Overload:

- To BS3938 - IEC 185

#### Operating Voltage:

- 600Vac maximum

#### Test Voltage:

- 2kV rms 50Hz for 1 minute

#### Frequency:

- 50/60/400Hz

#### Burden:

- See range data table

#### Enclosure:

- Flame retardant ABS
- Surface mounting or busbar mounting
- Optional DIN rail mounting clip available
- M4 screw terminals
- IP40 enclosure code
- Insulation class E

#### Operating Temperature:

- $-20^{\circ}\text{C}$  to  $70^{\circ}\text{C}$

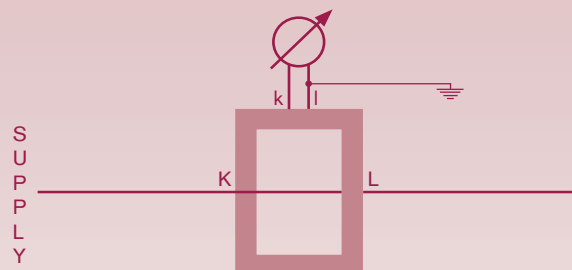
#### Weight:

- See range data table

#### Markings:

- CE marked

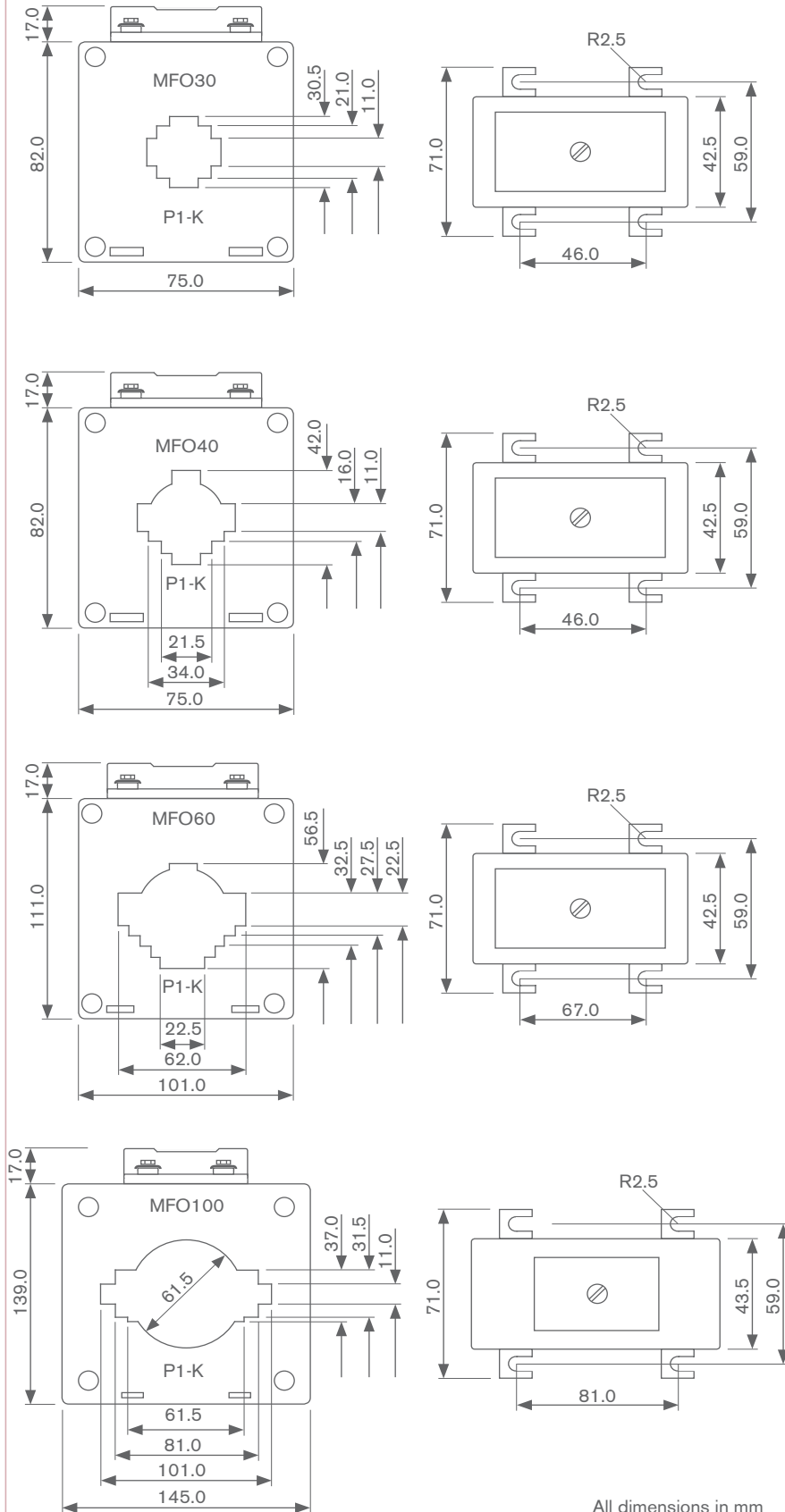
### Connections



### Ordering information

Code	Model & Size	Ratio	Options
MFO30	Busbar Type CT	5/5, 10/5, 15/5, 20/5, 25/5, 30/5, 40/5 50/5, 60/5, 80/5, 100/5, 120/5, 150/5	
MFO40	Busbar Type CT	200/5, 250/5, 300/5, 400/5	
MFO60	Busbar Type CT	500/5, 600/5, 800/5	
MFO100	Busbar Type CT	1000/5, 1200/5, 1500/5, 1600/5, 2000/5, 2400/5, 2500/5	
DRMC1	-		DIN rail mounting clip for MFO30/MFO40
DRMC2	-		DIN rail mounting clip for MFO60
DRMC3	-		DIN rail mounting clip for MFO100
<b>Example</b>	<b>MFO40</b>	<b>300/5</b>	

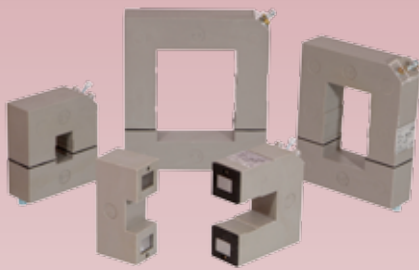
## Dimensions



All dimensions in mm

### Range Data

Model	Primary Current (Amps)	Secondary Current (Amps)	Burden (VA)	Through Turns	Hole Diameter (mm)	Weight (grams)
MFO30-5/5	5	5	3	10	21	600
MFO30-10/5	10	5	3	10	21	600
MFO30-15/5	15	5	3	4	21	600
MFO30-20/5	20	5	3	5	21	600
MFO30-25/5	25	5	3	2	21	600
MFO30-30/5	30	5	3	2	21	600
MFO30-40/5	40	5	3	2	21	600
MFO30-50/5	50	5	3	1	21	600
MFO30-60/5	60	5	3	1	21	600
MFO30-80/5	80	5	3	1	21	600
MFO30-100/5	100	5	3	1	21	600
MFO30-120/5	120	5	3	1	21	600
MFO30-150/5	150	5	3	1	21	600
MFO40-200/5	200	5	3	1	31	600
MFO40-250/5	250	5	3	1	31	600
MFO40-300/5	300	5	3	1	31	600
MFO40-400/5	400	5	3	1	31	600
MFO60-500/5	500	5	5	1	45	600
MFO60-600/5	600	5	5	1	45	600
MFO60-800/5	800	5	5	1	45	600
MFO100-1000/5	1000	5	10	1	60	800
MFO100-1200/5	1200	5	10	1	60	1000
MFO100-1500/5	1500	5	10	1	60	1000
MFO100-1600/5	1600	5	10	1	60	1000
MFO100-2000/5	2000	5	10	1	60	1000
MFO100-2400/5	2400	5	10	1	60	1000
MFO100-2500/5	2500	5	10	1	60	1100



## TA Series Current Transformers

### Models Available

- TA30R** Split Core Current Transformer
- TA60R** Split Core Current Transformer
- TA80R** Split Core Current Transformer
- TA100R** Split Core Current Transformer
- TA125R** Split Core Current Transformer

### Product Features

- Split core ideal for retro-fitting
- Resin encapsulated housing
- 5 Amp secondary
- Accuracy class 1
- Screw type terminals
- Terminal cover included
- Busbar clamp kit included

TA current transformers are available for primary currents between 100 Amps and 2500 Amps, offering reliability and class 1 accuracy making them suitable for a large range of industrial applications.

The TA series current transformers are available in five different physical sizes all with a rectangular aperture and due to their split core design are ideal for retro-fitting. They are protected in a resin encapsulated enclosure ensuring excellent mechanical strength and electrical insulation.

The TA series current transformers have a busbar clamp kit and terminal cover as standard.

## For transforming high AC current to a proportional 5 Amp output

### Specification

#### Reference Standard:

- IEC185, UNE EN 60044-1, VDE0414

#### Accuracy:

- See range data table

#### Primary Input Current:

- 0-100A to 0-2500A (see data table)

#### Secondary Current:

- 0-5A

#### Overload:

- To BS3938 - IEC 185

#### Operating Voltage:

- 720Vac maximum

#### Test Voltage:

- 3kV rms 50Hz for 1 minute

#### Frequency:

- 50/60/400Hz

#### Burden:

- See range data table

#### Enclosure:

- Self extinguishing to UL94V0
- Busbar mounting with clamp
- M5 screw terminals
- IP40 enclosure code
- Insulation class E

#### Operating Temperature:

- -10°C to 50°C

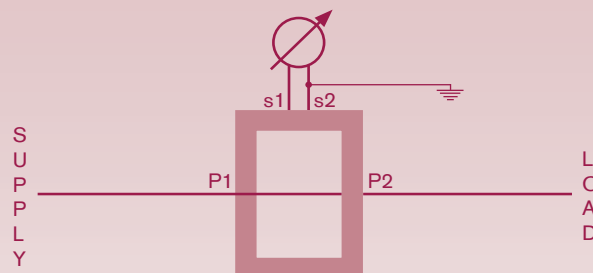
#### Weight:

- See range data table

#### Markings:

- CE marked

### Connections



### Ordering information

Code	Model & Size	Ratio
TA30R	Split Core CT	100/5, 150/5, 200/5, 250/5
TA60R	Split Core CT	300/5, 400/5, 500/5, 600/5
TA80R	Split Core CT	800/5, 1000/5
TA100R	Split Core CT	1200/5, 1500/5, 1600/5, 2000/5
TA125R	Split Core CT	2500/5
<b>Example</b>	<b>TA125R</b>	<b>2500/5</b>