

## Current Transducers CT 0.1 .. 0.4-P

For the electronic measurement of small currents: AC,DC, mixed, with a galvanic isolation between the primary circuit and the secondary circuit.



$$I_{PN} = \pm 100..400 \text{ mA}$$

$$V_{OUT} = \pm 5 \text{ V}$$



### Electrical data

Primary nominal current rms $I_{PN}$ (mA)	Primary current, measuring range $I_{PM}$ (mA)	Type	RoHS since date code
100	± 200	CT 0.1-P	46129
200	± 400	CT 0.2-P	46054
400	± 800	CT 0.4-P	46234

$V_C$	Supply voltage (± 5 %)	± 15	V
$I_C$	Current consumption	± 45	mA
$R_{IS}$	Isolation resistance @ 500 VDC	> 500	MΩ
$V_{OUT}$	Output voltage (Analog) @ ± $I_{PN}$ , $R_L = 10\text{k}\Omega$ , $T_A = 25^\circ\text{C}$	± 5	V
$R_{OUT}$	Output internal resistance	< 51	Ω
$R_L$	Load resistance	≥ 10	kΩ
$C_L$	Capacitive loading	≤ 5	nF

### Accuracy-Dynamic performance data

$X$	Accuracy (excluding offset) @ $I_{PN}$ , $T_A = 25^\circ\text{C}$ , $R_L = 10\text{k}\Omega$	< ± 1	% of $I_{PN}$
$\epsilon_L$	Linearity error (0 .. ± $I_{PN}$ )	< ± 0.5	% of $I_{PN}$
$TCV_{OUT}$	Temperature coefficient of $V_{OUT}$ (of reading)	< ± 0.05	%/K
$V_{OE}$	Electrical offset voltage @ $I_p = 0$ , $T_A = 25^\circ\text{C}$	< ± 100	mV
$V_{OH}$	Hysteresis offset voltage		
	@ $I_p = 0$ ; after an excursion of $1 \times I_{PN}$	< ± 2	mV
	@ $I_p = 0$ ; after an excursion of $100 \times I_{PN}$	< ± 20	mV
$TCV_{OE}$	Temperature coefficient of $V_{OE}$ @ $-20..+85^\circ\text{C}$		
	CT 0.1-P	< ± 8	mV/K
	CT 0.2-P	< ± 4	mV/K
	CT 0.4-P	< ± 2	mV/K
$t_r$	Response time to 80% of $I_{PN}$ step	≤ 20	ms
	90% of $I_{PN}$ step	≤ 60	ms
$BW$	Frequency bandwidth (- 3 dB)		
	CT 0.1-P	DC 40..7000Hz	
	CT 0.2-P	DC 40..11000Hz	
	CT 0.4-P	DC 40..18000Hz	

### General data

$T_A$	Ambient operating temperature	- 20 .. + 85	°C
$T_S$	Ambient storage temperature	- 25 .. + 85	°C
dCp	Creepage distance	> 5.5	mm
dCl	Clearance distance	> 5.5	mm
CTI	Comparative tracking index (Group IIIa)	> 220	
$m$	Mass	25	g
	Standards	EN 50178: 1997	

**Notes :** Performance data are given for steady phase of the transducer. Transitory period after power on lasts typically less than 2 min. Please refer to characterization report for details.

Please don't put the high voltage between the secondary pins and fixing pins. If it must be so, don't exceed the 2.5 kV between these pins with the maximum isolation distance.

### Features

- DC & AC earth leakage current transducer using a flux-gate principle
- PCB mounting
- ±15V power supply
- ±5V output @  $I_{PN}$
- Isolated plastic case recognized according to UL94-V0.

### Advantages

- Small size
- Bandwidth :  
DC and 40 up to 7..18 kHz
- Response time better than 60 ms
- Cost effective, compact alternative to classical RCDs (Residual Current Device)

### Applications

- Earth leakage detection in transformerless solar inverters
- 1st human contact protection of PV arrays
- Failure detection in power sources
- Symmetrical fault detection (e.g. after motor inverter)
- Current leakage detection in stacked DC sources
- Single phase or three phase differential current measurement up to ±30A per wire (DC or AC)

### Application domain

- Industrial

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### Isolation characteristics

$V_b$	Rated isolation voltage rms with IEC 61010-1 standard and following conditions - Single insulation - Over voltage category III - Pollution degree 2 - Heterogeneous field	150	V rms
$V_b$	Rated isolation voltage rms with EN 50178 standard and following conditions - Reinforced insulation - Over voltage category III - Pollution degree 2 - Heterogeneous field	250	V rms
$V_d$	Rms voltage for AC isolation test, 50 Hz, 1 min	2.5	kV
$V_{e}^{\wedge}$	Partial discharge extinction voltage rms @ 10pC	> 1.2	kV
$V_w$	Impulse withstand voltage 1.2/50 $\mu$ s	6	kV

If insulated cable is used for the primary circuit, the voltage category could be improved with the following table :

Cable insulation (primary)	Category
HAR 03	300V CAT III
HAR 05	400V CAT III
HAR 07	500V CAT III

### Safety



This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating instructions.



Caution! Risk of electrical shock

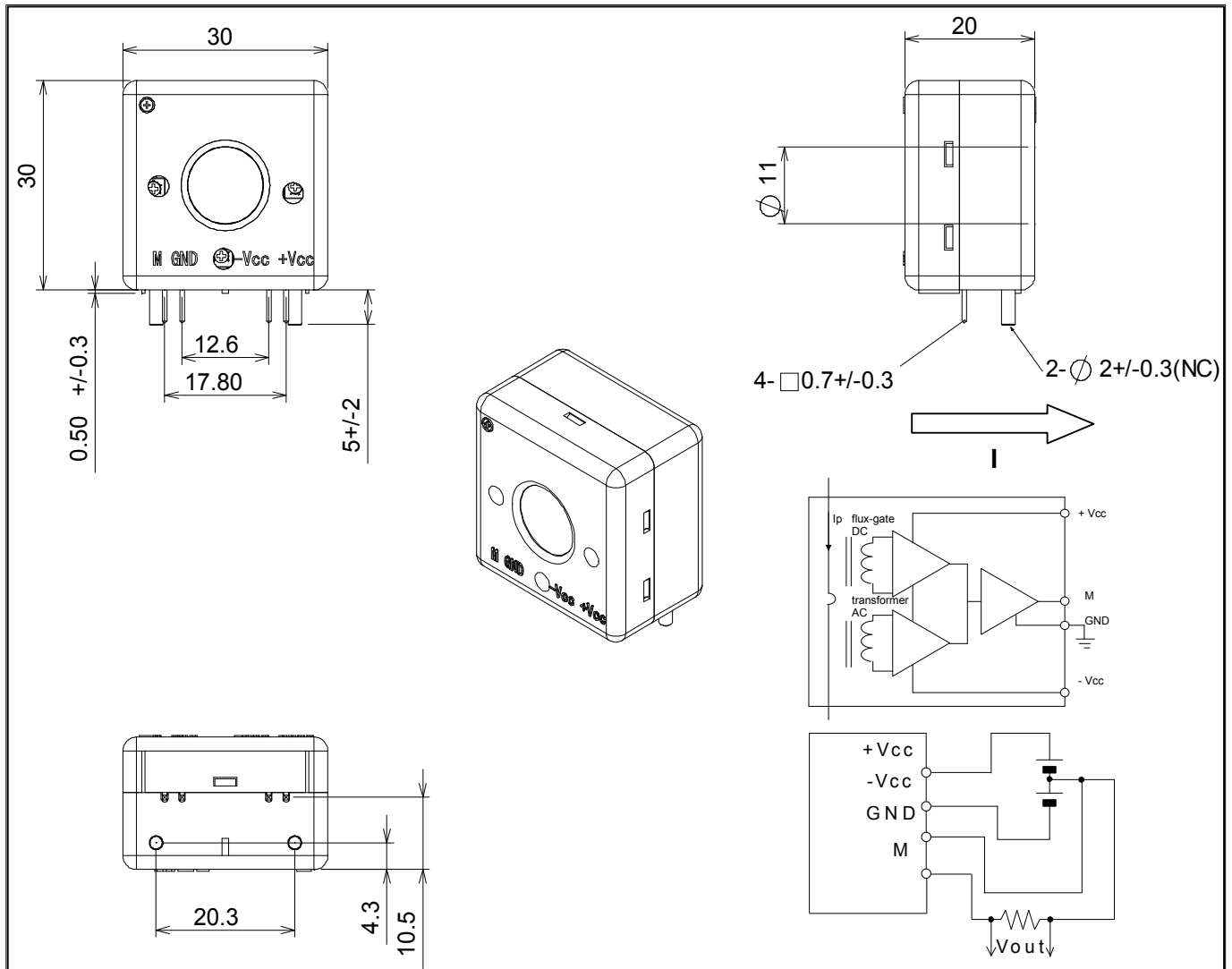
When operating the transducer, certain parts of the module can carry hazardous voltage (eg. primary busbar, power supply).

Ignoring this warning can lead to injury and/or cause serious damage.

This transducer is a built-in device, whose conducting parts must be inaccessible after installation.

A protective housing or additional shield could be used.

Main supply must be able to be disconnected.

**Dimensions CT 0.1 .. 0.4-P** (in mm. 1 mm = 0.0394 inch)

**Mechanical characteristics**

- General tolerance  $\pm 1$  mm  
(Unless otherwise specified in the above drawings.)
- Aperture for primary conductor  $\varnothing 11$  mm
- Connection of secondary  
Recommended PCB hole 1.2 mm
- PCB fixation  
Recommended PCB hole 2.2 mm

**Remarks**

- $V_{OUT}$  is positive when  $I_p$  flows in the direction of the arrow.
- This transducer induces into the primary circuit a square wave of 500Hz. This voltage can induce an AC current in the primary if the primary impedance is low.
- Primary impedance  $\geq 10\Omega$  CT 0.1-P CT 0.2-P CT 0.4-P  
 $V_{OUT}$  by induced current  $\leq \pm 0.8\%$   $\leq \pm 0.5\%$   $\leq \pm 0.3\%$  of  $I_{PN}$
- Temperature of the primary conductor should not exceed 100°C.