

# Current Transducer HTFS 400 ... 800-P/SP5

For the electronic measurement of currents: DC, AC, pulsed..., with galvanic separation between the primary circuit and the secondary circuit.



All data are given with  $R_L = 10\text{ k}\Omega$

## Electrical data

Primary nominal RMS current	Primary current measuring range	Type
$I_{P,N}$ (A)	$I_{P,M}$ (A)	
400	$\pm 600$	<b>HTFS 400-P/SP5</b>
800	$\pm 1200$	<b>HTFS 800-P/SP5</b>
$U_{out}$	Output voltage (Analog) @ $I_p$	$U_{ref} \pm (1.25 \cdot I_p / I_{P,N})$ V
	$I_p = 0$	$U_{ref} \pm 0.025$ V
$U_{ref}$	Reference voltage	$^{1)} U_{ref}$ Output voltage 2.5 $\pm 0.025$ V
	$U_{ref}$ Output impedance	typ. 200 $\Omega$
	$U_{ref}$ Load impedance	$\geq 200$ k $\Omega$
$R_L$	Load resistance	$\geq 2$ k $\Omega$
$R_{out}$	Output internal resistance	$< 10$ $\Omega$
$C_L$	Load capacitance	$< 1$ nF
$U_C$	Supply voltage ( $\pm 5\%$ )	5 V
$I_C$	Current consumption @ $U_C = 5\text{ V}$	22 mA

## Accuracy - Dynamic performance data

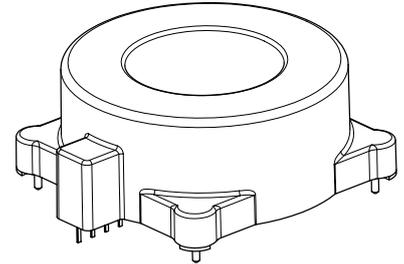
$\epsilon_{tot}$	Total error $^{2)}$ @ $I_{P,N}, T_A = 25^\circ\text{C}$	$\leq \pm 1$	%
$\epsilon_L$	Linearity error 0 ... $1.5 \times I_{P,N}$	$\leq \pm 0.5$	%
$TCU_{OE}$	Temperature coefficient of $U_{OE}$ @ $I_p = 0$	$\leq \pm 0.3$	mV/K
$TCU_{ref}$	Temperature coefficient of $U_{ref}$	$\leq \pm 0.01$	%/K
$TCU_{out}$	Temperature coefficient of $U_{out}$	$\leq \pm 0.05$	% of reading/K
$TCU_{out} / U_{ref}$	Temperature coefficient of $U_{out} / U_{ref}$	$\leq \pm 0.2$	mV/K
$U_{OM}$	Magnetic offset voltage @ $I_p = 0$ and specified $R_M$ , after an overload of $3 \times I_{P,N,DC}$	$< \pm 0.5$	%
$U_{no}$	RMS noise voltage referred to primary (DC ... 10 kHz)	$< 15$	mVpp
	(DC ... 1 MHz)	$< 40$	mVpp
$t_{D,10}$	Delay time to 10 % of the final output value for $I_{P,N}$ step	$< 3$	$\mu\text{s}$
$t_{D,90}$	Delay time to 90 % of the final output value for $I_{P,N}$ step	$< 7$	$\mu\text{s}$
$di/dt$	$di/dt$ accurately followed	$> 100$	A/ $\mu\text{s}$
$BW$	Frequency bandwidth ( $-3\text{ dB}$ ) $^{3)}$	DC ... 50	kHz

**Notes:**  $^{1)}$  It is possible to overdrive  $U_{ref}$  with an external reference voltage between 2 - 2.8 V providing its ability to sink or source approx. 2.5 mA

$^{2)}$  Excluding offset and hysteresis

$^{3)}$  Small signal only to avoid excessive heatings of the magnetic core.

$$I_{P,N} = 400 \dots 800\text{ A}$$



## Features

- Hall effect measuring principle
- Galvanic separation between primary and secondary circuit
- Low power consumption
- Single power supply +5 V
- Insulating plastic case recognized according to UL 94-V0
- $T_A = -40^\circ\text{C} \dots +105^\circ\text{C}$ .

## Special features

- Fixed offset
- PCB fixation with 4 pins  $\varnothing 1\text{ mm}$ .

## Advantages

- Small size and space saving
- Only one design for two currents ratings
- High immunity to external interference
- $U_{ref}$  IN/OUT.

## Applications

- Forklift drives
- AC variable speed drives
- Static converters for DC motor drives
- Battery supplied applications
- Uninterruptible Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Power supplies for welding applications.

## Application domain

- Industrial.

## Current Transducer HTFS 400 ... 800-P/SP5

### General data

$T_A$	Ambient operating temperature	-40 ... +105	°C
$T_{A\text{st}}$	Ambient storage temperature	-40 ... +105	°C
$m$	Mass	60	g
	Standard	EN 50178: 1997	

### Insulation coordination

$U_d$	RMS voltage for AC insulation test, 50 Hz, 1 min	2.5	kV
$U_t$	Partial discharge RMS test voltage ( $q_m < 10$ pC)	> 1	kV
$U_{Ni}$	Impulse withstand voltage 1.2/50 $\mu$ s	4	kV
		Min	
$d_{Cp}$	Creepage distance	> 4	mm
$d_{Cl}$	Clearance distance	> 4	mm
$CTI$	Comparative Tracking Index (group IIIa)	220	

### Applications examples

	EN 50178	IEC 61010-1
$d_{Cp}$ , $d_{Cl}$ , $U_{Ni}$	Rated insulation voltage	Nominal voltage
Basic insulation	300 V	300 V
Reinforced insulation	150 V	150 V

According to EN 50178 and IEC 61010-1 standards and following conditions:

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field

### Safety

This transducer must be used in limited-energy secondary circuits according to IEC 61010-1.



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.



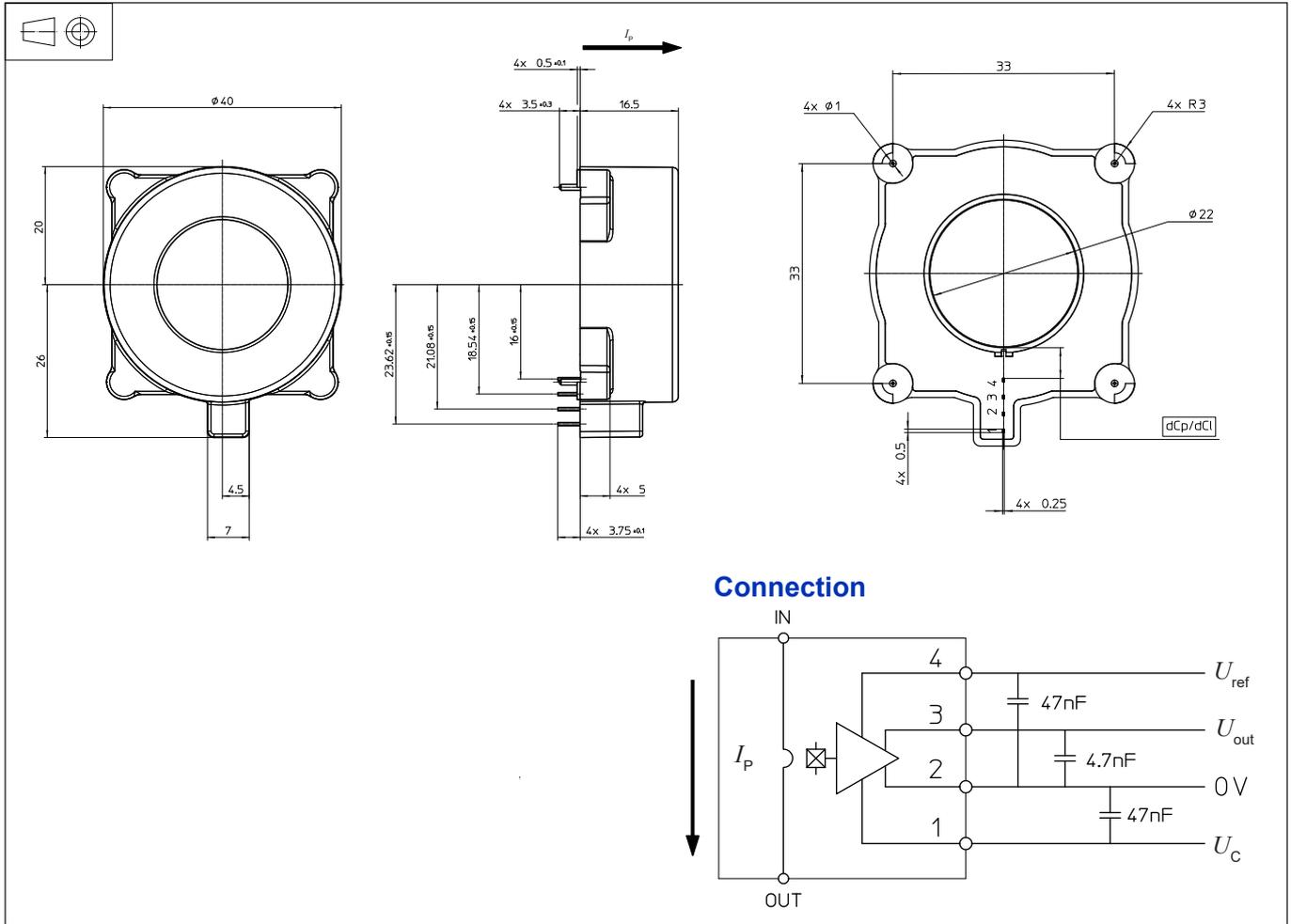
Caution, risk of electrical shock

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 build-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 HTFS 400 ... 800-P/SP5 (in mm)



### Mechanical characteristics

- General tolerance  $\pm 0.2$  mm
- Fixation to PCB  
4 pins  $\times \phi 1$  mm  
Recommended PCB hole  $\phi 1.2$  mm
- Connection to secondary  
4 pins  $0.5 \times 0.25$  mm  
Recommended PCB hole  $\phi 0.7$  mm

### Remarks

- $U_{out}$  is positive when  $I_p$  flows in the direction of arrow.
- Temperature of the primary conductor should not exceed  $120$  °C.
- Installation of the transducer must be done, unless otherwise specified on the datasheet, according to LEM Transducer Generic Mounting Rules. Please refer to LEM document N°ANE120504 available on our Web site: <https://www.lem.com/en/file/3137/download>

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