

## Current Transducer HX 03 ... 50-P/SP2 series

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



RoHS c  us

All data are given with  $R_L = 2 \text{ k}\Omega$

### Electrical data

| Primary nominal current RMS<br>$I_{PN} \text{ (A)}$ | Primary current measuring range <sup>1)</sup><br>$I_{PM} \text{ (A)}$ | Primary conductor diameter × turns<br>(mm) | Type        |
|-----------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------|-------------|
| 3                                                   | ±9                                                                    | 0.6d × 20T                                 | HX 03-P/SP2 |
| 5                                                   | ±15                                                                   | 0.8d × 12T                                 | HX 05-P/SP2 |
| 10                                                  | ±30                                                                   | 1.1d × 6T                                  | HX 10-P/SP2 |
| 15                                                  | ±45                                                                   | 1.4d × 4T                                  | HX 15-P/SP2 |
| 50                                                  | ±150                                                                  | 1.2d × 6.3 × 1T                            | HX 50-P/SP2 |

|           |                                                                                               |            |            |
|-----------|-----------------------------------------------------------------------------------------------|------------|------------|
| $U_{out}$ | Output voltage (Analog) @ $\pm I_{PN}$ , $R_L = 2 \text{ k}\Omega$ , $T_A = 25^\circ\text{C}$ | ±0.625     | V          |
| $R_{out}$ | Output internal resistance                                                                    | < 50       | $\Omega$   |
| $R_L$     | Load resistance                                                                               | ≥ 2        | k $\Omega$ |
| $U_C$     | Supply voltage (±5 %)                                                                         | +12 ... 15 | V          |
| $I_C$     | Current consumption                                                                           | < 15       | mA         |

### Accuracy - Dynamic performance data

|                 |                                                                                |            |               |
|-----------------|--------------------------------------------------------------------------------|------------|---------------|
| $\varepsilon$   | Error @ $I_{PN}$ , $T_A = 25^\circ\text{C}$ (excluding offset)                 | ≤ ±1       | % of $I_{PN}$ |
| $\varepsilon_L$ | Linearity error 0 ... $\pm I_{PN}$                                             | ≤ ±1       | % of $I_{PN}$ |
| $U_{OE}$        | Electrical offset voltage, @ $I_P = 0$ , $T_A = 25^\circ\text{C}$              | +2.5 V ±50 | mV            |
| $U_{OM}$        | Magnetic offset voltage @ $I_P = 0$<br>after an excursion of $1 \times I_{PN}$ | < ±10      | mV            |
| $TCU_{OE}$      | Temperature coefficient of $U_{OE}$                                            | < ±1.5     | mV/K          |
| $TCU_{out}$     | Temperature coefficient of $U_{out}$ (% of reading)                            | ±0.1       | %/K           |
| $t_{D90}$       | Delay time to 90 % of the output value for $I_{PN}$ step <sup>2)</sup>         | ≤ 3        | μs            |
| BW              | Frequency bandwidth (−3 dB) <sup>3)</sup>                                      | 50         | kHz           |

### General data

|           |                               |                |    |
|-----------|-------------------------------|----------------|----|
| $T_A$     | Ambient operating temperature | −25 ... +85    | °C |
| $T_{Ast}$ | Ambient storage temperature   | −25 ... +85    | °C |
| $m$       | Mass                          | 8              | g  |
|           | Standard                      | EN 50178: 1997 |    |

Notes: <sup>1)</sup> With  $R_L = 2 \text{ k}\Omega$

<sup>2)</sup> For a  $di/dt = 50 \text{ A}/\mu\text{s}$

<sup>3)</sup> Small signal only to avoid excessive heating of the magnetic cores.

$$I_{PN} = 3 \dots 50 \text{ A}$$



### Features

- Hall effect measuring principle
- Galvanic separation between primary and secondary circuit
- Insulation voltage 3000 V
- Low power consumption
- Extended measuring range ( $3 \times I_{PN}$ )
- Power supply from +12 V to +15 V
- Insulating plastic case recognized according to UL 94-V0.

### Special feature

- Single supply from +12 ... 15 V.

### Advantages

- Low insertion losses
- Easy mount with automatic handling system
- Small size and space savings
- High immunity to external interference.

### Applications

- AC variable speed drives and servo motor drives
- Static converters for DC motor drives
- Battery supplied applications
- Uninterruptible Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Electrical appliances.

### Application domain

- Industrial.

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### Insulation coordination

|          |                                                     |            |    |
|----------|-----------------------------------------------------|------------|----|
| $U_d$    | RMS voltage for AC insulation test, 50 Hz, 1 min    | > 3        | kV |
| $U_t$    | Partial discharge RMS test voltage ( $q_m < 10$ pC) | $\geq 1$   | kV |
| $U_{Ni}$ | Impulse withstand voltage 1.2/50 $\mu$ s            | $\geq 6$   | kV |
|          |                                                     | Min        |    |
| $d_{Cp}$ | Creepage distance                                   | $\geq 5.5$ | mm |
| $d_{Cl}$ | Clearance                                           | $\geq 5.5$ | mm |
| CTI      | Comparative Tracking Index (group I)                | $\geq 600$ |    |

### Applications examples

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

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

|                          | EN 50178                 | IEC 61010-1     |
|--------------------------|--------------------------|-----------------|
| $d_{Cp}, d_{Cl}, U_{Ni}$ | Rated insulation voltage | Nominal voltage |
| Basic insulation         | 600 V                    | 600 V           |
| Reinforced insulation    | 300 V                    | 150 V           |

### 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.



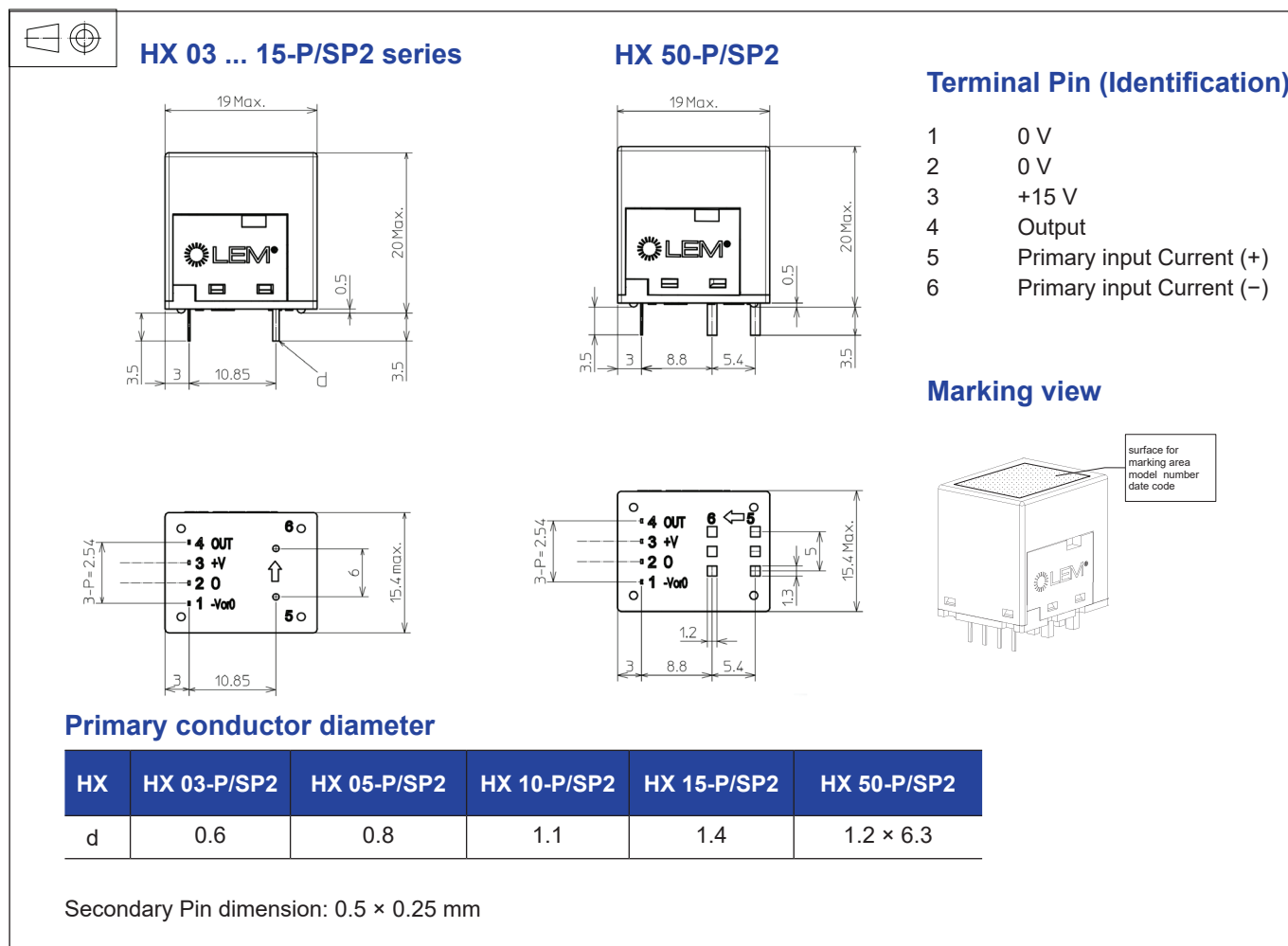
Caution, risk of electrical shock

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 HX 03 ... 50-P/SP2 series (in mm)



## Mechanical characteristic

- General tolerance  $\pm 0.5$  mm

## Remarks

- $U_{out}$  is positive when  $I_p$  flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 100 °C.
- Please do not apply any extra forces to both primary and secondary terminals when mounting onto printed circuit board. Insertion forces apply to primary terminal should be limited to below 10 N.