

# Current Transducer LF 2005-S

For the electronic measurement of currents: DC, AC, pulsed..., with galvanic isolation between the primary circuit (high power) and the secondary circuit (electronic circuit).

$$I_{PN} = 2000 \text{ A}$$



16103



## Electrical data

|          |   |                                    |                          |                         |                               |      |                                       |
|----------|---|------------------------------------|--------------------------|-------------------------|-------------------------------|------|---------------------------------------|
| $I_{PN}$ | Primary nominal current rms                           | 2000                               | A                        |                         |                               |      |                                       |
| $I_{PM}$ | Primary current, measuring range @ $\pm 24 \text{ V}$ | 0 .. $\pm 3000$                    | A                        |                         |                               |      |                                       |
| $R_M$    | Measuring resistance @ $T_A = 70^\circ\text{C}$       | $R_{M \min}$ $R_{M \max}$          | $T_A = 85^\circ\text{C}$ |                         |                               |      |                                       |
|          |   |                                    |                          | with $\pm 15 \text{ V}$ | @ $\pm 2000 \text{ A}_{\max}$ | 0 8  | 0 7 $\Omega$                          |
|          |   |                                    |                          |                         | @ $\pm 2200 \text{ A}_{\max}$ | 0 5  | 0 4 $\Omega$                          |
|          |   |                                    |                          | with $\pm 24 \text{ V}$ | @ $\pm 2000 \text{ A}_{\max}$ | 5 29 | 13 28 $\Omega$                        |
|          |   |                                    |                          |                         | @ $\pm 3000 \text{ A}_{\max}$ | 5 11 | @ $\pm 2800 \text{ A}$ 13 13 $\Omega$ |
| $I_{SN}$ | Secondary nominal current rms                         | 400                                | mA                       |                         |                               |      |                                       |
| $K_N$    | Conversion ratio                                      | 1 : 5000                           |                          |                         |                               |      |                                       |
| $V_C$    | Supply voltage ( $\pm 5\%$ )                          | $\pm 15 \dots 24$                  | V                        |                         |                               |      |                                       |
| $I_C$    | Current consumption ( $\pm 1$ )                       | 33 (@ $\pm 24 \text{ V}$ ) + $I_S$ | mA                       |                         |                               |      |                                       |

## Accuracy - Dynamic performance data

|              |  |   |                        |
|--------------|--|---|------------------------|
| $X$          | Accuracy @ $I_{PN}$ , $T_A = 25^\circ\text{C}$   | $\pm 0.3$                                     | %                      |
| $\epsilon_L$ | Linearity error  | $< 0.1$                                       | %                      |
| $I_O$        | Offset current @ $I_p = 0$ , $T_A = 25^\circ\text{C}$  | Typ   | $\pm 0.5$ mA           |
|              |  | Max   | $\pm 0.5$ mA           |
| $I_{OM}$     | Magnetic offset current @ $I_p = 0$ and specified $R_M$ after an overload of $3 \times I_{PN}$ | $\pm 0.2$                                     | mA                     |
| $I_{OT}$     | Temperature variation of $I_O$   | - $25^\circ\text{C} \dots + 85^\circ\text{C}$ | $\pm 0.2$ $\pm 0.5$ mA |
|              |  | - $40^\circ\text{C} \dots - 25^\circ\text{C}$ | $\pm 1.5$ mA           |
| $t_r$        | Response time <sup>1)</sup> to 90 % of $I_{PN}$ step   | $< 1$   | $\mu\text{s}$          |
| $di/dt$      | $di/dt$ accurately followed  | $> 50$  | A/ $\mu\text{s}$       |
| $BW$         | Frequency bandwidth (-1 dB)  | DC .. 100                                     | kHz                    |

## General data

|       |                               |                            |                  |
|-------|-------------------------------|----------------------------|------------------|
| $T_A$ | Ambient operating temperature | - 40 .. + 85               | $^\circ\text{C}$ |
| $T_S$ | Ambient storage temperature   | - 50 .. + 90               | $^\circ\text{C}$ |
| $R_S$ | Secondary coil resistance     | @ $T_A = 70^\circ\text{C}$ | 25 $\Omega$      |
|       |                               | @ $T_A = 85^\circ\text{C}$ | 26 $\Omega$      |
| $m$   | Mass                          | 1.5                        | kg               |
|       | Standards                     | EN 50178: 1997             |                  |

Note: <sup>1)</sup> With a  $di/dt$  of 100 A/ $\mu\text{s}$ .

## Features

- Closed loop (compensated) current transducer using the Hall effect
- Isolated plastic case recognized according to UL 94-V0.

## Advantages

- Excellent accuracy
- Very good linearity
- Low temperature drift
- Optimized response time
- Wide frequency bandwidth
- No insertion losses
- High immunity to external interference
- Current overload capability.

## 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)
- Power supplies for welding applications.

## Application Domain

- Industrial.

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### Isolation characteristics

|            |   |      |    |
|------------|---|------|----|
| $V_d$      | Rms voltage for AC isolation test, 50 Hz, 1 min | 6    | kV |
|            |   | Min  |    |
| <b>dCp</b> | Creepage distance                               | 29.1 | mm |
| <b>dCI</b> | Clearance distance                              | 27.1 | mm |
| <b>CTI</b> | Comparative Tracking Index (group I)            | 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     |
|---|--------------------------|-----------------|
| <b>dCp, dCI, <math>\hat{V}_w</math></b> | Rated insulation voltage | Nominal voltage |
| Basic insulation                        | 4000 V                   | 4000 V          |
| Reinforced insulation                   | 2000 V                   | 2000 V          |

### 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).

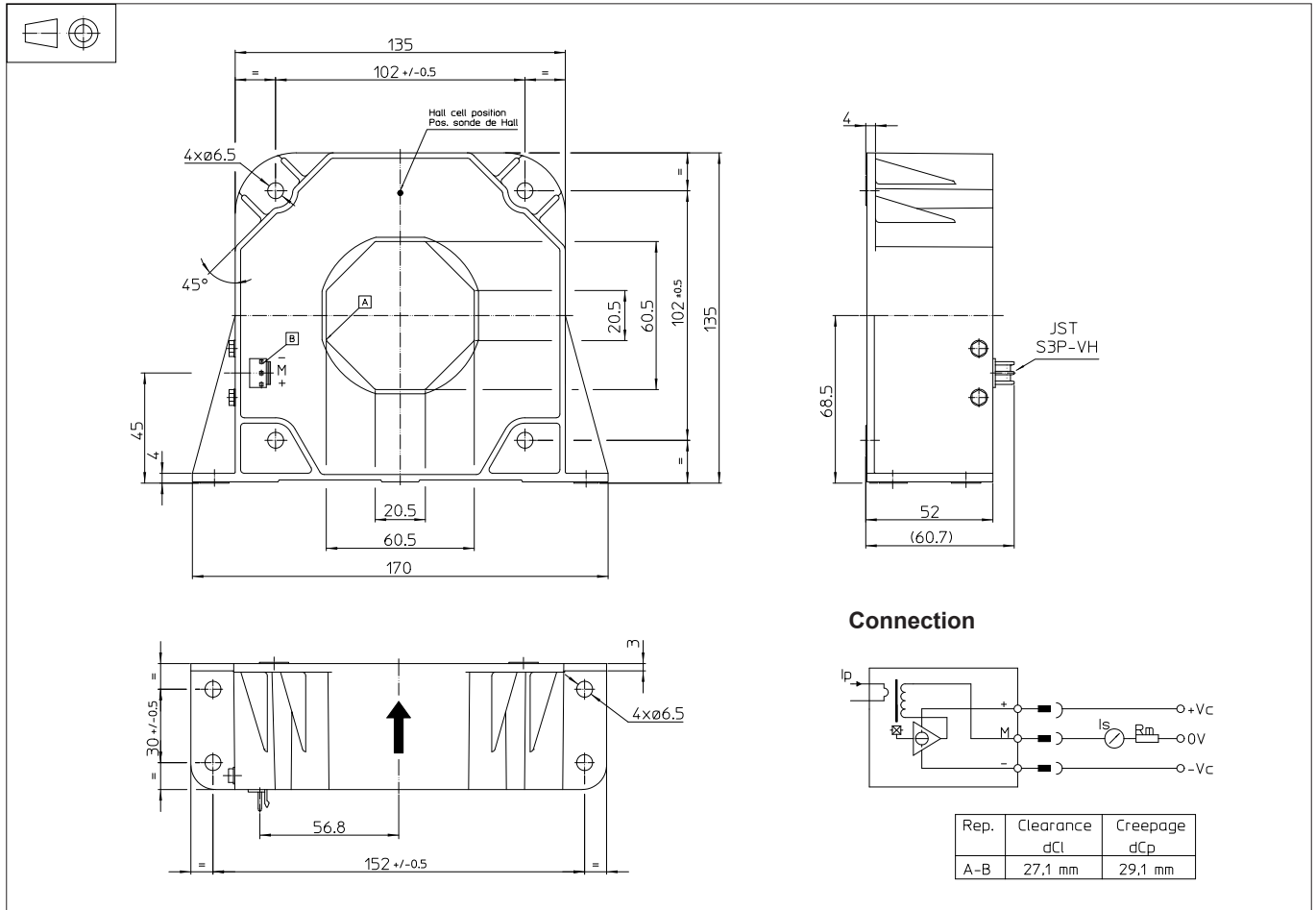
Ignoring this warning can lead to injury and/or cause serious damage.

This transducer is a 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 LF 2005-S (in mm)



## Mechanical characteristics

- General tolerance  $\pm 1$  mm
- Transducer fastening  
Vertical or flat position 4 holes  $\varnothing 6.5$   
4 steel screws M6
- Recommended fastening torque 5.5 Nm
- Primary through-hole 60.5 x 20.5  
or  $\varnothing$  max 57 mm
- Connection of secondary S3P-VH

## Remarks

- $I_s$  is positive when  $I_p$  flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 100°C.
- Dynamic performances (di/dt and response time) are best with a single bar completely filling the primary hole.
- This is a standard model. For different versions (supply voltages, turns ratios, unidirectional measurements...), please contact us.