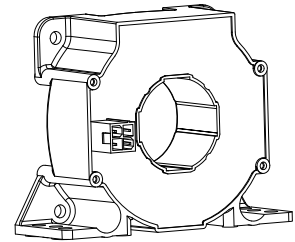


## Current Transducer LF 505-S/SP39

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



$$I_{PN} = 500 \text{ A}$$



### Electrical data

|           |                                                          |                                    |                     |
|-----------|----------------------------------------------------------|------------------------------------|---------------------|
| $I_{PN}$  | Primary nominal RMS current                              | 500                                | A                   |
| $I_{PM}$  | Primary current, measuring range                         | 0 ... $\pm 800$                    | A                   |
| $R_M$     | Measuring resistance @ $T_A = 70 \text{ }^\circ\text{C}$ |                                    |                     |
|           |                                                          | $R_{M \text{ min}}$                | $R_{M \text{ max}}$ |
|           | with $\pm 15 \text{ V}$                                  | @ $\pm 500 \text{ A}_{\text{max}}$ | 0 60 $\Omega$       |
|           |                                                          | @ $\pm 800 \text{ A}_{\text{max}}$ | 0 11 $\Omega$       |
|           | with $\pm 18 \text{ V}$                                  | @ $\pm 500 \text{ A}_{\text{max}}$ | 0 92 $\Omega$       |
|           |                                                          | @ $\pm 800 \text{ A}_{\text{max}}$ | 0 30 $\Omega$       |
|           | with $\pm 24 \text{ V}$                                  | @ $\pm 500 \text{ A}_{\text{max}}$ | 5 149 $\Omega$      |
|           |                                                          | @ $\pm 800 \text{ A}_{\text{max}}$ | 5 65 $\Omega$       |
| $I_{SN}$  | Secondary nominal RMS current                            | 100                                | mA                  |
| $N_P/N_S$ | Turns ratio                                              | 1 : 5000                           |                     |
| $U_C$     | Supply voltage ( $\pm 5 \%$ )                            | $\pm 15 \dots 24$                  | V                   |
| $I_C$     | Current consumption                                      | $24 (@ \pm 18 \text{ V}) + I_S$    | mA                  |

### Accuracy - Dynamic performance data

|                 |                                                                                            |            |               |
|-----------------|--------------------------------------------------------------------------------------------|------------|---------------|
| $\varepsilon$   | Error @ $I_{PN}, T_A = 25 \text{ }^\circ\text{C}$                                          | $\pm 0.6$  | %             |
| $\varepsilon_L$ | Linearity error                                                                            | $< 0.1$    | %             |
|                 |                                                                                            | Typ        | Max           |
| $I_O$           | Offset current @ $I_P = 0, T_A = 25 \text{ }^\circ\text{C}$                                | $\pm 0.3$  | $\pm 0.4$ mA  |
| $I_{OT}$        | Temperature variation of $I_O -10 \text{ }^\circ\text{C} \dots +70 \text{ }^\circ\text{C}$ | $\pm 0.3$  | $\pm 0.5$ mA  |
| $t_{D90}$       | Delay time <sup>1)</sup> to 90 % of $I_{PN}$                                               | $< 1$      | $\mu\text{s}$ |
| $BW$            | Frequency bandwidth ( $-1 \text{ dB}$ )                                                    | DC ... 100 | kHz           |

### General data

|       |                                                                     |                                |                  |
|-------|---------------------------------------------------------------------|--------------------------------|------------------|
| $T_A$ | Ambient operating temperature                                       | $-10 \dots +70$                | $^\circ\text{C}$ |
| $T_S$ | Ambient storage temperature                                         | $-25 \dots +85$                | $^\circ\text{C}$ |
| $R_S$ | Resistance of secondary winding @ $T_A = 70 \text{ }^\circ\text{C}$ | 70                             | $\Omega$         |
| $m$   | Mass                                                                | 230                            | g                |
|       | Standards                                                           | EN 50178: 1997<br>UL 508: 2010 |                  |

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

### Features

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

### Special feature

- Connection to secondary circuit on Molex Minifit Jr. 5566 with gold pin.

### 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.

## Current Transducer LF 505-S/SP39

### Insulation coordination

|          |                                                  |      |    |
|----------|--------------------------------------------------|------|----|
| $U_d$    | RMS voltage for AC insulation test, 50 Hz, 1 min | 3    | kV |
| $U_{Ni}$ | Impulse withstand voltage 1.2/50 $\mu$ s         | 10.6 | kV |
|          |                                                  | Min  |    |
| $d_{Cp}$ | Creepage distance                                | 18   | mm |
| $d_{Ci}$ | Clearance                                        | 12.2 | mm |
| $CTI$    | Comparative tracking index (group IIIa)          | 175  |    |

### 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     |
|--------------------------|--------------------------|-----------------|
| $d_{Cp}, d_{Ci}, U_{Ni}$ | Rated insulation voltage | Nominal voltage |
| Basic insulation         | 1600 V                   | 1600 V          |
| Reinforced insulation    | 600 V                    | 600 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).

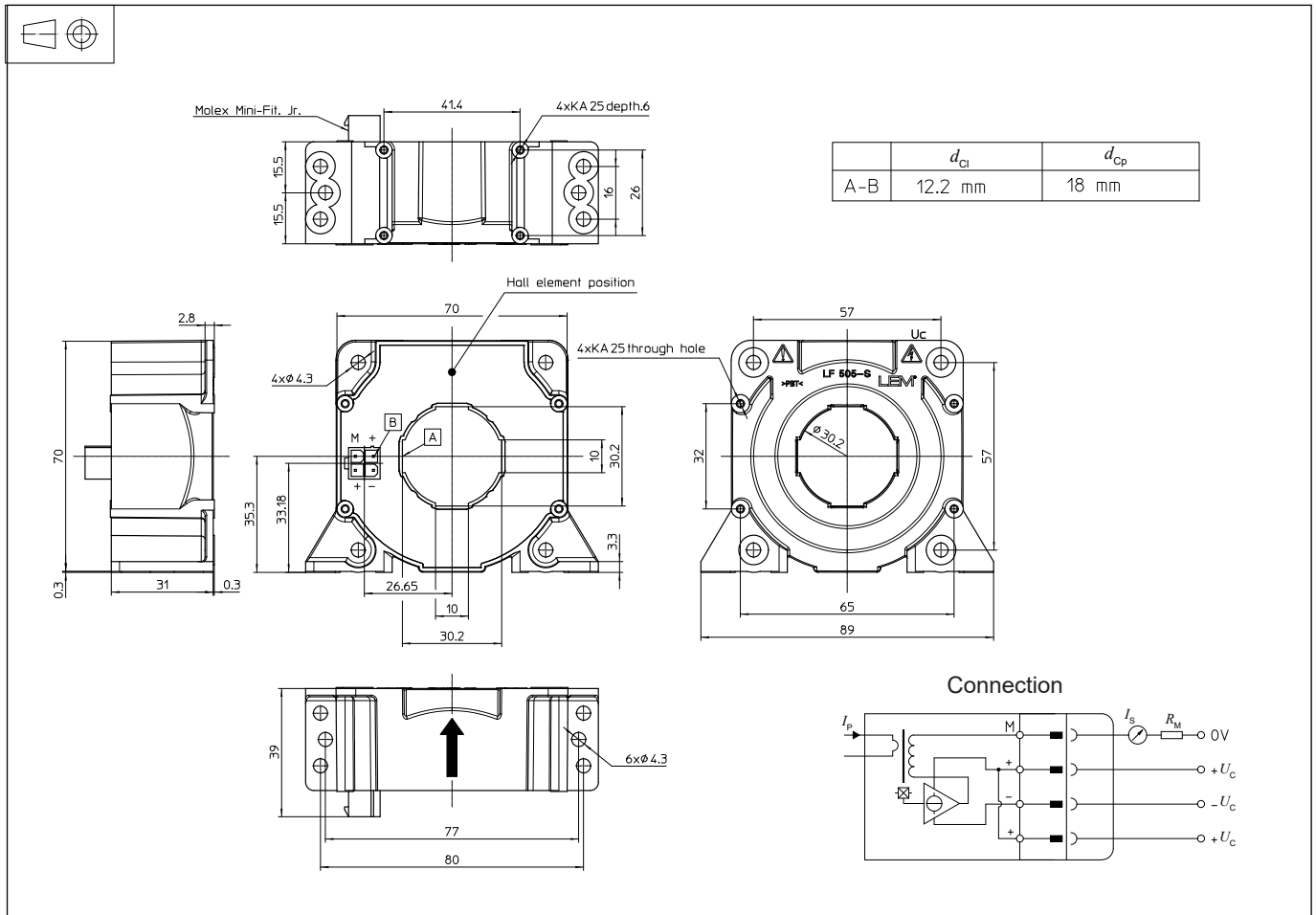
Ignoring this warning can lead to injury and/or cause serious damage.

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 LF 505-S/SP39 (in mm)



### Mechanical characteristics

- General tolerance  $\pm 0.5$  mm
- Transducer fastening
  - Vertical position
    - 6 holes  $\varnothing 4.3$  mm
    - 6 steel screws M4
  - Recommended fastening torque 3.2 N·m
  - or
    - 4 holes  $\varnothing 1.9$  mm, depth: 7.5 mm
    - 4 screws PTKA 25, length: 6 mm
  - Recommended fastening torque 0.7 N·m
  - Horizontal position
    - 4 holes  $\varnothing 4.3$  mm,
    - 4 steel screws M4
  - Recommended fastening torque 0.75 N·m
  - or
    - 4 holes  $\varnothing 1.9$  mm,
    - 4 screws PTKA 25, length: 10 mm
  - Recommended fastening torque 0.75 N·m
- Primary through-hole  $\varnothing 30.2$  mm max
- Connection of secondary Molex Mini-Fit Jr. 5566 gold-plated pins

### 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.
- 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/>
- Dynamic performances ( $di/dt$  and delay time) are best with a single bar completely filling the primary hole.