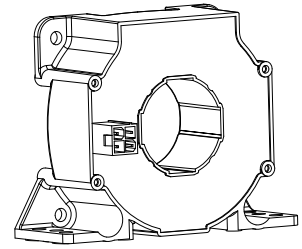


# Current Transducer LF 505-S/SP40

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 (630/10 sec.)	A			
$I_{PM}$	Primary current, measuring range @ $\pm 24 \text{ V}$	0 ... $\pm 1200$	A			
$R_M$	Measuring resistance	$R_{M \min}$	$R_{M \max}$			
		with $\pm 15 \text{ V}$	@ $\pm 500 \text{ A}_{\max}$	0	31	$\Omega$
			@ $\pm 740 \text{ A}_{\max}$	0	3	$\Omega$
		with $\pm 24 \text{ V}$	@ $\pm 500 \text{ A}_{\max}$	3	90	$\Omega$
	@ $\pm 1000 \text{ A}_{\max}$	3	17	$\Omega$		
	@ $\pm 1200 \text{ A}_{\max}$	3	5	$\Omega$		
$I_{SN}$	Secondary nominal RMS current	143	mA			
$N_P/N_S$	Turns ratio	1 : 3500				
$U_C$	Supply voltage ( $\pm 5 \%$ ) <sup>1)</sup>	$\pm 15 \dots 24$	V			
$I_C$	Current consumption	$30 (@ \pm 24 \text{ V}) + I_S$	mA			

## Accuracy - Dynamic performance data

$\epsilon_{\text{tot}}$	Total error @ $I_{PN}, T_A = 25 \text{ }^\circ\text{C}$	$\pm 0.6$	%
$\epsilon_L$	Linearity error	$< 0.1$	%
		Typ	Max
$I_O$	Offset current @ $I_P = 0, T_A = 25 \text{ }^\circ\text{C}$	$\pm 0.45$	mA
$I_{OT}$	Temperature variation of $I_O$	$-25 \text{ }^\circ\text{C} \dots +70 \text{ }^\circ\text{C}$	$\pm 0.50$ mA
		$-40 \text{ }^\circ\text{C} \dots +70 \text{ }^\circ\text{C}$	$\pm 0.80$ mA
$t_{D90}$	Delay time to 90 % of the final output value for $I_{PN}$ step <sup>2)</sup> $< 1$		$\mu\text{s}$
$BW$	Frequency bandwidth ( $-1 \text{ dB}$ )	DC ... 100	kHz

## General data

$T_A$	Ambient operating temperature	$-40 \dots +70$	$^\circ\text{C}$
$T_{Ast}$	Ambient storage temperature	$-40 \dots +85$	$^\circ\text{C}$
$R_S$	Resistance of secondary winding @ $T_A = 70 \text{ }^\circ\text{C}$	56	$\Omega$
$m$	Mass	230	g
	Standard	EN 50155: 2021	

Notes: <sup>1)</sup> For  $U_C = \pm 24 \text{ V} (\pm 3 \%) R_{M \min} = 1.6 \text{ } \Omega$   
<sup>2)</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 Features

- $I_{PM} = 0 \dots \pm 1200 \text{ A}$
- $N_P/N_S = 1 : 3500$
- $U_C = \pm 15 \dots 24 \text{ V}$
- $T_A = -40 \dots +70 \text{ }^\circ\text{C}$
- Connection to secondary circuit on Molex Mini Fit Jr. 5566.

## 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

- Single or three phases inverters
- Propulsion and braking choppers
- Propulsion converters
- Auxiliary converters
- Battery chargers.

## Application domain

- Railway (fixed installations and onboard).

## Current Transducer LF 505-S/SP40

### Insulation coordination

$U_d$	RMS voltage for AC insulation test, 50 Hz, 1 min	4.4	kV
		Min	
$d_{Cp}$	Creepage distance <sup>1)</sup>	22.2	mm
$d_{Cl}$	Clearance <sup>1)</sup>	8.5	mm
$CTI$	Comparative tracking index (group IIIa)	175	

Note: <sup>1)</sup> Distance between "A" and "B" see outline drawing.

### 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).

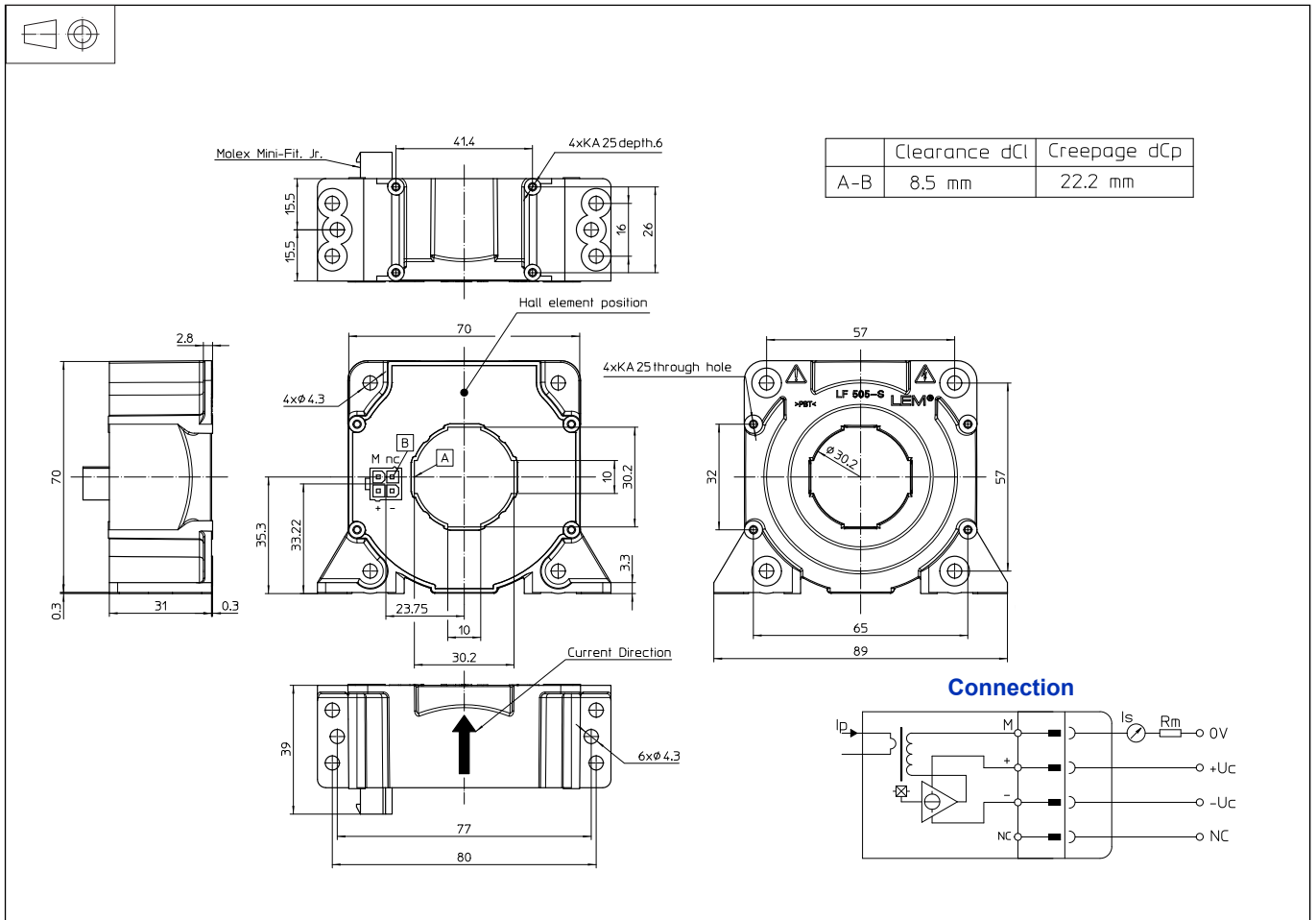
Ignoring this warning can lead to injury and/or cause serious damage.

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/SP40 (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  $3.2 \text{ N}\cdot\text{m}$
  - or
    - 4 holes  $\varnothing 1.9$  mm, depth: 7.5 mm
    - 4 screws PTKA 25, length: 6 mm
  - Recommended fastening torque  $0.7 \text{ N}\cdot\text{m}$
  - Horizontal position
    - 4 holes  $\varnothing 4.3$  mm,
    - 4 steel screws M4
  - Recommended fastening torque  $0.75 \text{ N}\cdot\text{m}$
  - or
    - 4 holes  $\varnothing 1.9$  mm,
    - 4 screws PTKA 25, length: 10 mm
  - Recommended fastening torque  $0.75 \text{ N}\cdot\text{m}$
- 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  $100^\circ\text{C}$ .
- 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.