

Current Transducer LF 505-S/SP22

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



Electrical data

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

Accuracy - Dynamic performance data

ε_{tot}	Total error @ I_{PN} , $T_A = 25$ °C	± 0.6	%
ε_L	Linearity error	< 0.1	%
I_O	Offset current @ $I_P = 0$, $T_A = 25$ °C	Typ Max	
I_{OT}	Temperature variation of I_O	± 0.3 ± 0.5	mA
	-25 °C ... +70 °C		
	-40 °C ... +70 °C	± 0.5 ± 0.8	mA
t_{D90}	Delay time to 90 % of the final output value for I_{PN} step ²⁾	< 1	μs
BW	Frequency bandwidth (-1 dB)	DC ... 100	kHz

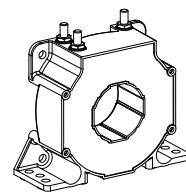
General data

T_A	Ambient operating temperature	-40 ... +70	°C
$T_{A\text{st}}$	Ambient storage temperature	-40 ... +85	°C
R_S	Resistance of secondary winding @ $T_A = 70$ °C	56	Ω
m	Mass	230	g
	Standards	EN 50155: 2021	

Notes: ¹⁾ With $U_C = \pm 24$ V (± 3 %), $R_{M\text{ min}} = 1.6 \Omega$

²⁾ For a $di/dt = 100$ A/μs

$I_{PN} = 500$ A



Features

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

Special features

- $I_{PM} = 0 ... \pm 1200$ A
- $N_P/N_S = 1 : 3500$
- $U_C = \pm 15 ... \pm 24$ (± 5 %) V¹⁾
- $T_A = -40$ °C ... +70 °C
- Connection to secondary circuit on M4 threaded studs.

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 phase inverters
- Propulsion and braking choppers
- Propulsion converters
- Auxiliary converters
- Battery chargers.

Application domains

- Railway (fixed installations and onboard).

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Insulation coordination

U_d	RMS voltage for AC insulation test, 50 Hz, 1 min	4 Min	kV
d_{Cp}	Creepage distance ¹⁾	29.5	mm
d_{Cl}	Clearance ¹⁾	26.5	mm
CTI	Comparative tracking index (group IIIa)	175	

Note: ¹⁾ 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).

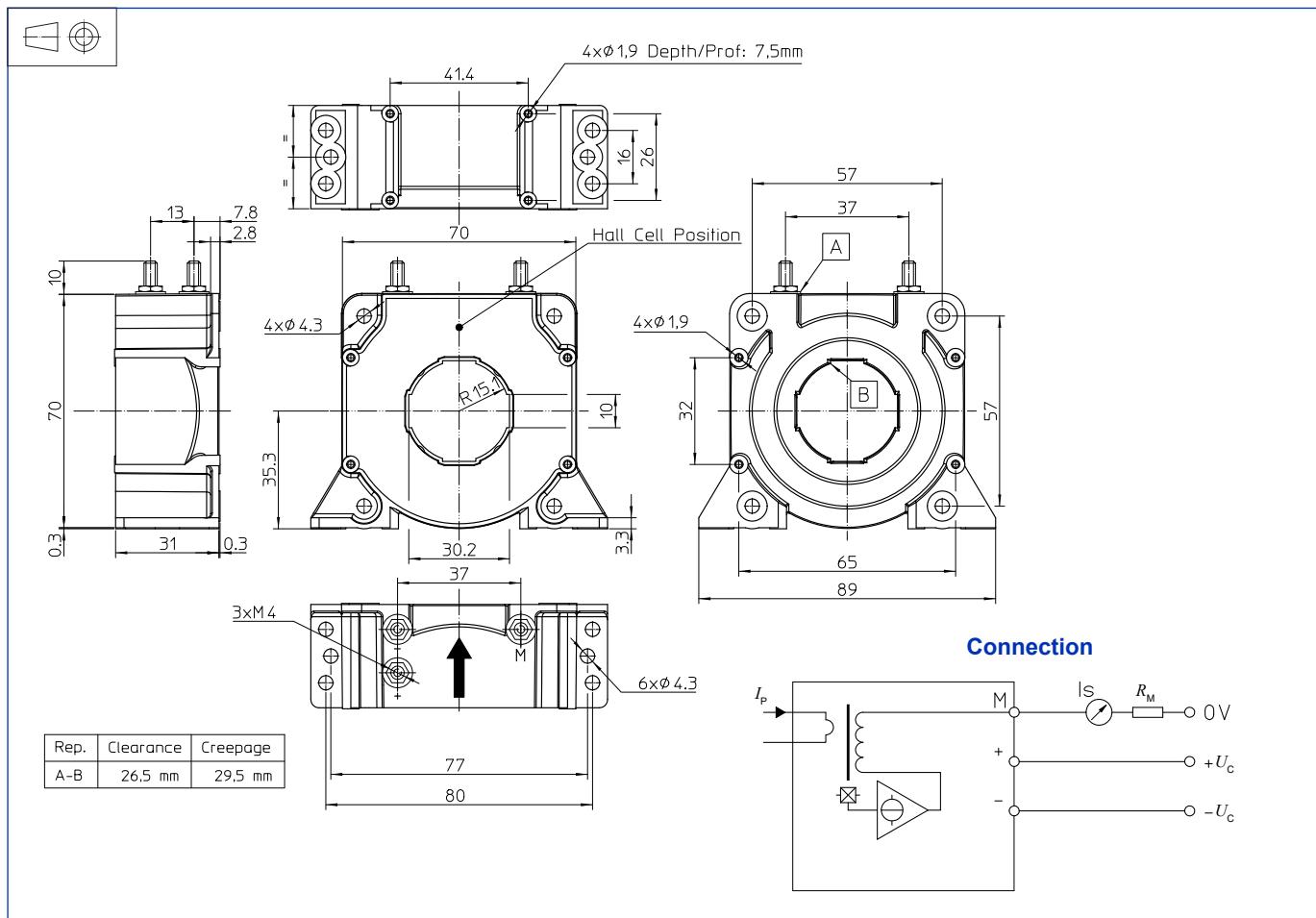
Ignoring this warning can lead to injury and/or cause serious damage.

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/SP22 (in mm)



Mechanical characteristics

- General tolerance ± 0.5 mm
- Transducer fastening
 - Vertical or horizontal position 4 or 6 holes $\varnothing 4.3$ mm
 - Recommended fastening torque or vertical position 3.2 N·m or 2.37 Lb.-Ft
 - Recommended fastening torque or horizontal position 0.7 N·m or 0.52 Lb.-Ft
 - Recommended fastening torque 0.75 N·m or 0.55 Lb.-Ft
- Primary through-hole $\varnothing 30.2$ mm
- Connection of secondary M4 threaded studs
- Recommended fastening torque 1.2 N·m or 0.88 Lb.-Ft

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.