

## Current Transducer LF 2005-S/SP8

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



16143

### Electrical data

$I_{PN}$	Primary nominal current rms	2000	A			
$I_{A,PM}$	Primary current, measuring range @ $\pm 24$ V	0 .. $\pm 3700$	A			
$I_p$	Overload capability <sup>1)</sup> @ 10 ms	80	kA			
$R_M$	Measuring resistance @	$T_A = 70^\circ\text{C}$		$T_A = 85^\circ\text{C}$		
		$R_{M \min}$ $R_{M \max}$	$R_{M \min}$ $R_{M \max}$	$R_{M \min}$ $R_{M \max}$	$R_{M \min}$ $R_{M \max}$	
	with $\pm 15$ V	@ $\pm 1800$ A <sub>max</sub>	0 24.4	@ $\pm 1760$ A <sup>2)</sup>	0 10	$\Omega$
		@ $\pm 2100$ A <sub>max</sub>	0 5.5	@ $\pm 2050$ A <sup>2)</sup>	0 5	$\Omega$
		@ $\pm 2200$ A <sub>max</sub>	0 4.2		0 3	$\Omega$
	with $\pm 24$ V	@ $\pm 2000$ A <sub>max</sub>	3 27.2		3 26	$\Omega$
		@ $\pm 3000$ A <sub>max</sub>	3 10.2	@ $\pm 2900$ A <sup>2)</sup>	3 10	$\Omega$
		@ $\pm 3500$ A <sub>max</sub>	3 5.3	@ $\pm 3400$ A <sup>2)</sup>	3 5	$\Omega$
	@ $\pm 3700$ A <sub>max</sub>	3 3.7	@ $\pm 3630$ A <sup>2)</sup>	3 3	$\Omega$	
$I_{SN}$	Secondary nominal current rms	400	mA			
$K_N$	Conversion ratio	1 : 5000				
$V_C$	Supply voltage ( $\pm 10$ %)	$\pm 15$ .. 24	V			
$I_C$	Current consumption	33 (@ $\pm 24$ V) + $I_s$	mA			

### Accuracy - Dynamic performance data

$X_G$	Overall accuracy @ $I_{PN}$ , $T_A = 25^\circ\text{C}$	$\pm 0.4$	%
$\epsilon_L$	Linearity error	< 0.1	%
$I_O$	Offset current @ $I_p = 0$ , $T_A = 25^\circ\text{C}$	Typ	Max
$I_{OM}$	Magnetic offset current @ $I_p = 0$ and specified $R_M$ , after an overload of $3 \times I_{PN}$		$\pm 0.5$ mA
$I_{OT}$	Temperature variation of $I_O$	- $40^\circ\text{C}$ .. $+70^\circ\text{C}$	$\pm 0.2$ $\pm 0.5$ mA
		- $50^\circ\text{C}$ .. $+85^\circ\text{C}$	$\pm 0.8$ mA
$t_r$	Response time <sup>3)</sup> to 90 % of $I_{PN}$ step	< 1	$\mu\text{s}$
$di/dt$	$di/dt$ accurately followed	> 100	A/ $\mu\text{s}$
<b>BW</b>	Frequency bandwidth (- 1 dB)	DC .. 100	kHz

### General data

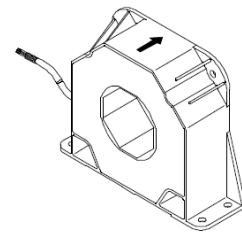
$T_A$	Ambient operating temperature	- 40 (- 50) .. $+85$	$^\circ\text{C}$
$T_S$	Ambient storage temperature	- 50 .. $+85$	$^\circ\text{C}$
$R_S$	Secondary coil resistance	@ $T_A = 70^\circ\text{C}$	24 $\Omega$
		@ $T_A = 85^\circ\text{C}$	25 $\Omega$
$m$	Mass	1.5	kg
	Standard	EN 50155: 2001	

Notes: <sup>1)</sup> Not measurable

<sup>2)</sup>  $I_{PN}$  @  $85^\circ\text{C}$  & customer measuring resistance

<sup>3)</sup> With a  $di/dt$  of 100 A/ $\mu\text{s}$ .

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



### Features

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

### Special features

- $I_{PM} = 0 \dots \pm 3700$  A
- $V_d = 12$  kV
- $T_A = -40^\circ\text{C}$  (-  $50^\circ\text{C}$ ) ..  $+85^\circ\text{C}$
- Secondary connection on shielded cable  $3 \times 0.5$  mm<sup>2</sup>
- Shield between primary and secondary connected to the cable screening
- Customer marking.

### 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 inverter
- Propulsion and braking chopper
- Propulsion converter
- Auxiliary converter
- Battery charger.

### Application Domain

- Traction.

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### Isolation characteristics

$V_d$	Rms voltage for AC insulation test, 50 Hz, 1 min	12 <sup>1)</sup>	kV
		1.5 <sup>2)</sup>	kV
$V_e$	Partial discharge extinction voltage rms @ 10 pC	$\geq 4.3$ <sup>3)</sup>	kV
		Min	
<b>dCp</b>	Creepage distance	51.4	mm
<b>dCI</b>	Clearance	50.8	mm
<b>CTI</b>	Comparative Tracking Index (group I)	600	

**Notes:** <sup>1)</sup> Between primary and secondary + shield  
<sup>2)</sup> Between shield and secondary  
<sup>3)</sup> Test carried out with a non-insulation busbar, dimension 290 x 50 x 10 mm, centered in the through-hole.

## 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).

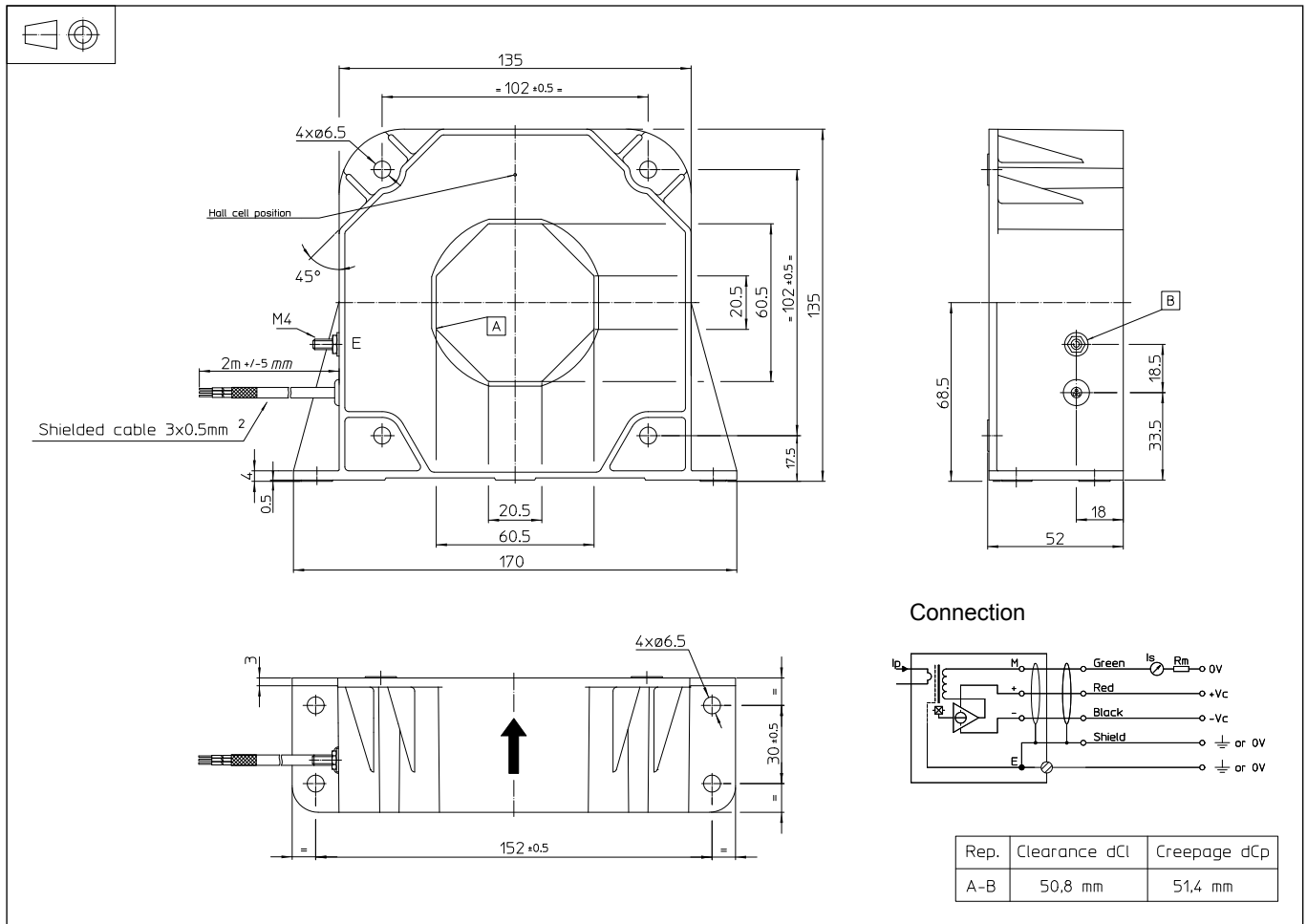
Ignoring this warning can lead to injury and/or cause serious damage.

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/SP8 (in mm)



### Mechanical characteristics

- General tolerance  $\pm 1$  mm
- Transducer fastening  
Vertical or flat position 4 holes  $\varnothing 6.5$  mm  
4 M6 steel screws  
Recommended fastening torque 5.5 Nm
- Primary through-hole 60.5 x 20.5 mm  
Or  $\varnothing 56$  mm
- Connection of secondary shielded cable 3 x 0.5 mm<sup>2</sup>
- Connection to shield M4 threaded stud  
Recommended fastening torque 1.2 Nm

### Remarks

- I<sub>s</sub> is positive when I<sub>p</sub> 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.