Current Transducer LF 2005-S/SP9

I_{PN} = 1000 A

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

Electrical data

I_{PN}	Primary nominal r.m.s. current			1000			A
I_P	Primary current, measuring range			0 .. ± 2000			A
$\hat{I}_P$	Overload capability @ 250 µs			50			kA
R_M	Measuring resistance @		T_A = 70°C		T_A = 85°C		
			$R_{M\,min}$	$R_{M\,max}$	$R_{M\,min}$	$R_{M\,max}$	
	with ± 24 V	@ ± 1000 A $_{max}$	0	69	3	68	Ω
		@ ± 2000 A $_{max}$	0	18	3	17	Ω
I_{SN}	Secondary nominal r.m.s. current			200			mA
K_N	Conversion ratio			1 : 5000			
V_C	Supply voltage (± 10 %)			± 24			V
I_C	Current consumption			33 + I_S			mA
V_d	R.m.s. voltage for AC isolation test, 50 Hz, 1 mn			12			kV
V_d				500 [1) 2)]			V
V_e	R.m.s. voltage for partial discharge extinction @ 10 pC			> 4.1			kV

Test circuit

N_T	Number of turns		1000	
R_T	Resistance of test circuit @ T_A = 85°C		16	Ω
I_T	Test current @ 10 % of I_{PN}		0.1	A
	@ I_{PN}		1 [2)]	A

General data

T_A	Ambient operating temperature		- 40 .. + 85	°C
T_S	Ambient storage temperature		- 40 .. + 85	°C
R_S	Secondary coil resistance	@ T_A = 70°C	33	Ω
		@ T_A = 85°C	34	Ω
m	Mass		1.65	kg
	Standards [3)]		EN 50155	

Features

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

Special features

- I_{PN} = 1000 A
- I_P = 0 .. ± 2000 A
- V_C = ± 24 V (± 10 %)
- V_d = ± 12 kV
- N_T = 1000 turns
- T_A = - 40°C .. + 85°C
- Secondary connection on shielded cable 5 x 0.5 mm²
- 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.

Notes : [1)] Between secondary and test
[2)] 1 A during 10 seconds 6 times per hour
[3)] A list of corresponding tests is available.

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Accuracy - Dynamic performance data

e_L	Linearity	< 0.1	%
t_r	Response time [1] @ 90 % de $I_{P\ max}$	< 1	µs
di/dt	di/dt accurately followed	> 100	A/µs
f	Frequency bandwidth (- 1 dB)	DC .. 100	kHz

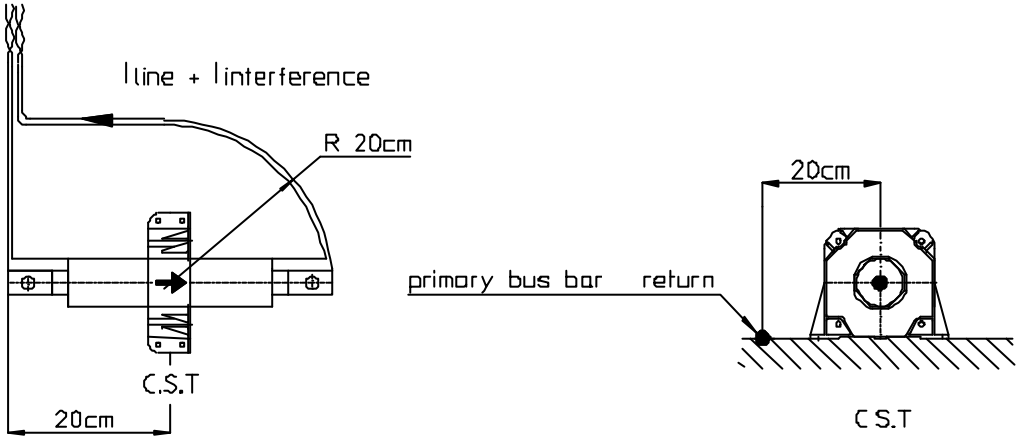
Note : [1] With a di/dt of 100 A/µs

DC Offset [At]

Maximum range of measured current				
Temperature range	-100 ..+100 A	-500 .. + 500 A	- 1000 .. + 1000 A	- 2000 .. + 2000 A
-25°C .. + 85°C	± 3.6	± 3.8	± 4.0	± 4.8
-40°C .. + 85°C	± 5.1	± 5.3	± 5.5	± 6.3

Maximum DC offset for different ranges of temperature and measured current.

Wiring plan for DC component measuring



Accuracy for the measurement of a single frequency signal

Frequency / Amplitude	20 .. 200 Hz		200 .. 3000 Hz	
	Amplitude Error [%]	Phase Error [°]	Amplitude Error [%]	Phase Error [°]
0.1 .. 0.5 A	± 55	-15.0	± 55	22
0.5 .. 1 A	± 17	-14.0	± 48	22
1 .. 2 A	± 7.0	-7.4	± 32	14
2 .. 10 A	± 6.6	-1.6	± 17	6.2
10 .. 20 A	± 3.7	< -1.0	± 6.8	-1.4
20 .. 50 A	± 2.8	< -1.0	± 3.6	< -1.0

Amplitude error : in % of the measured signal .
Phase error : in degrees with respect to the measured signal.
Maximum amplitude and phase errors for single frequency signals.
High values are due to the crossing distortion.

Accuracy for the measurement of signals added to a DC current ³ 10 A

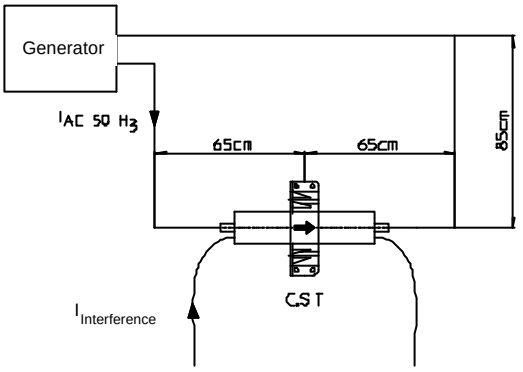
Frequency / Amplitude	20 .. 200 Hz		200 .. 3000 Hz	
	Amplitude Error [%]	Phase Error [°]	Amplitude Error [%]	Phase Error [°]
0.1 .. 0.5 A	± 2.2	-1.6	± 4.4	-1.4
0.5 .. 1 A	± 2.5	-1.6	± 4.1	< -1.0
1 .. 2 A	± 2.5	-1.6	± 4.1	< -1.0
2 .. 10 A	± 6.1	-1.1	± 7.0	< -1.0
10 .. 20 A	± 6.1	< -1.0	± 8.8	< -1.0
20 .. 50 A	± 6.0	< -1.0	± 7.5	< -1.0

Amplitude error : in % of the measured signal.
Phase error : in Degrees with respect to the measured signal.
Maximum amplitude and phase errors for signals added to a DC fundamental.

Accuracy for the measurement of signals added to an AC (fundamental) current (15 Hz < f< 100 Hz), ³ 10 A rms

Frequency / Amplitude	20 .. 200 Hz		200 .. 3000 Hz	
	Amplitude Error [%]	Phase Error [°]	Amplitude Error [%]	Phase Error [°]
0.1 .. 0.5 A	± 1.6	< -1.0	± 2.3	< -1.0
0.5 .. 1 A	± 1.2	< -1.0	± 1.9	< -1.0
1 .. 2 A	± 0.9	< -1.0	± 1.3	< -1.0
2 .. 10 A	± 0.6	< -1.0	± 0.8	< -1.0
10 .. 20 A	± 0.6	< -1.0	± 0.7	< -1.0
20 .. 50 A	± 1.0	< -1.0	± 1.0	< -1.0

Amplitude error : in % of the measured signal.
Phase error : in degrees with respect to the measured signal.
Maximum amplitude and phase errors for signals added to a AC fundamental.

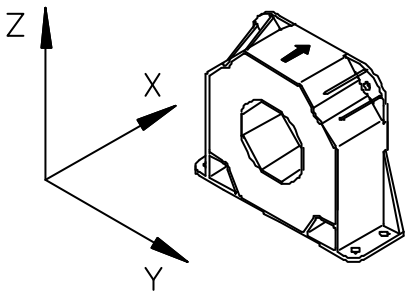


Wiring plan for measurements with an AC component.

Influence regarding external magnetic fields

Frequency / Direction	0..5 Hz Max error [mAt rms per A/m]	5 Hz..200 Hz Max error [mAt rms per A/m]
X-axis	0.16	0.18
Y-axis	3.3	5.3
Z-axis	0.04	0.08

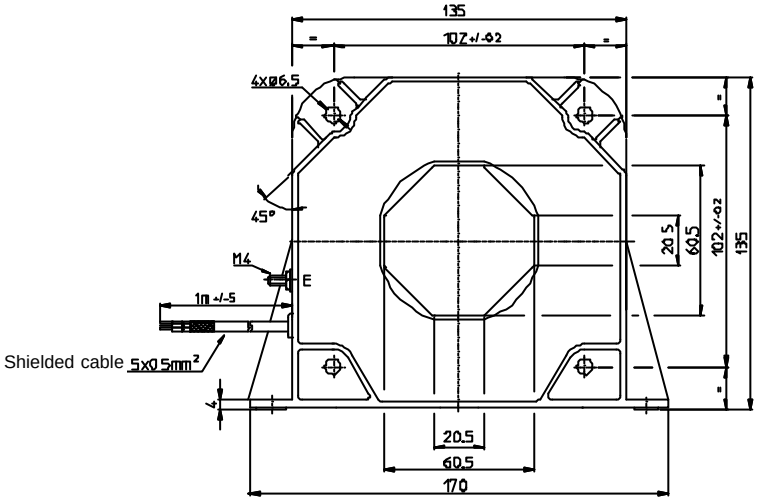
Error in the measurement of the primary current [mA_{rms}] due to external magnetic fields at the frequency of the external field, for the 3 axes of the transducer.



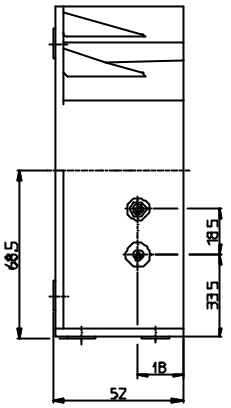
Orientation of transducer during magnetic field sensitivity testing.

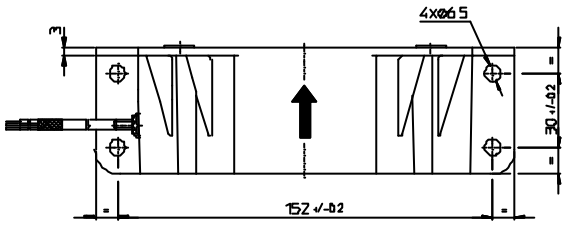
Dimensions LF 2005-S/SP9 (in mm. 1 mm = 0.0394 inch)

Front view



Left view



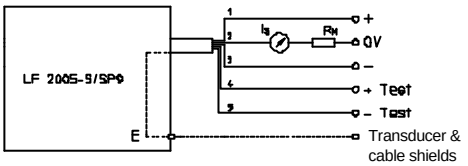


Top view

Secondary connections

wire	1	: supply voltage + 24 V
wire	2	: measure
wire	3	: supply voltage - 24 V
wire	4	: + test
wire	5	: - test

Connection



Mechanical characteristics

• General tolerance	± 0.5 mm
• Fastening	4 holes ∅ 6.5 mm
• Primary through-hole	60.5 x 60.5 mm
• Connection of secondary	shielded cable
• Connection of transducer & cable shields	M4 threaded stud
Fastening torque	1.2 Nm or .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.
- Dynamic performances (di/dt and response time) are best with a single bar completely filling the primary hole.