

Current Transducer RA 2000-S/SP1

$$I_{P\ DC} < 3000\ A$$

For the measurement of alternating components in a determined bandwidth, contained in a continuous primary current up to 3000 A.



Electrical data

$I_{P\ DC}$	Continuous primary current		< 3000	A
V_{OUT}	Output voltage (instantaneous)	$V_m =$	$-4.4018 \cdot 10^{-6} \frac{Vs}{A} \cdot \frac{di}{dt}$	
V_{OUT}	Output voltage (measure sinusoidal sign)	$V_m =$	$27.657 \cdot 10^{-6} \frac{Vs}{A} \cdot f \cdot \hat{i}$	
	Examples : $V_m = 27.657 \cdot 10^{-6} 50 \times 50 = 0.069\ V$		@ 50 Hz, 50 A	
	$V_m = 27.657 \cdot 10^{-6} 3000 \times 50 = 4.140\ V$		@ 3000 Hz, 50 A	
V_d	R.m.s. voltage for AC isolation test ¹⁾ , 50 Hz, 1 mn		12 ¹⁾	kV
			500 ²⁾	V
L_S	Secondary circuit inductance ($\pm 10\ %$)		9	mH
N_S	Number of turns		1920	
R_S	Resistance of secondary circuit @ $T_A = 70^\circ C$, ($\pm 5\ %$)		135	Ω

Feature

- Insulated plastic case recognized according to UL 94-V0

Advantages

- No insertion losses
- Current overload capability.

Application

- Railway security system.

Accuracy - Dynamic performance data

f	Frequency bandwidth	20 .. 3000	Hz
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Test circuit

L_T	Test circuit inductance ($\pm 10\ %$)	9	mH
N_T	Number of turns	1920	
R_T	Resistance of test circuit @ $T_A = 70^\circ C$, ($\pm 5\ %$)	135	Ω
I_T	R.m.s. test current	< 50	mA

General data

T_A	Ambient operating temperature	- 25 .. + 70	$^\circ C$
T_S	Ambient storage temperature	- 40 .. + 85	$^\circ C$
m	Mass	5.5	kg
	Standard	EN 50155 (01.11.95)	

Notes : ¹⁾ Between primary and secondary + test winding

²⁾ Between secondary and test winding.

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Accuracy

Accuracy for the measurement of a single frequency signal :

Amplitude error : in % of the measured signal.

Frequency \ Amplitude	20 Hz .. 100 Hz		10 Hz .. 3000 Hz	
	Amplitude error %	Phase error in °	Amplitude error %	Phase error in °
0.1 .. 1 A	± 2.8	- 90 ± 5	± 2.7	- 90 ± 2.5
1 .. 10 A	± 2.5	- 90 ± 5	± 2.6	- 90 ± 2.5
10 .. 20 A	± 2.9	- 90 ± 5	± 3.0	- 90 ± 2.5

Table 1.1 - Maximum amplitude and phase errors for single frequency signals.

Accuracy for the measurement of signal added to a DC current of > 10A

Amplitude error : in % of the measured signal.

Frequency \ Amplitude	20 Hz .. 100 Hz		10 Hz .. 3000 Hz	
	Amplitude error %	Phase error in °	Amplitude error %	Phase error in °
0.1 .. 1 A	± 2.8	- 90 ± 5	± 2.7	- 90 ± 2.5
1 .. 10 A	± 2.5	- 90 ± 5	± 2.6	- 90 ± 2.5
10 .. 20 A	± 2.9	- 90 ± 5	± 3.0	- 90 ± 2.5

Table 1.2 - Maximum amplitude and phase errors for signals added to a minimum DC fundamental.

The values are the same as without DC (see 1.1).

Accuracy for the measurement of signal added to a AC (fundamental) current in the range between 15Hz and 100Hz of >10 A rms

Amplitude error : in % of the measured signal.

Frequency \ Amplitude	20 Hz .. 100 Hz		10 Hz .. 3000 Hz	
	Amplitude error %	Phase error in °	Amplitude error %	Phase error in °
0.1 .. 1 A	± 2.8	- 90 ± 5	± 2.7	- 90 ± 2.5
1 .. 10 A	± 2.5	- 90 ± 5	± 2.6	- 90 ± 2.5
10 .. 20 A	± 2.9	- 90 ± 5	± 3.0	- 90 ± 2.5

Table 1.3 - Maximum amplitude and phase errors for signals added to a minimum AC fundamental.

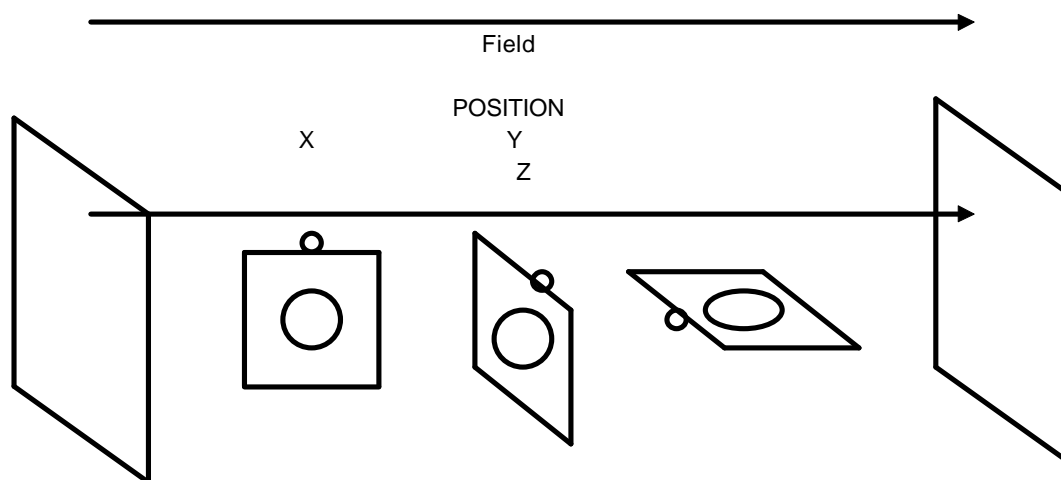
Influence of external magnetic fields

Table 2-1 shows the error in the measurement of the primary current (mA_{rms}) due to external magnetic fields at the frequency of the external field. The errors are measured with respect to the theoretically expected signal. The influence is different for the 3 axes of the transducer. See Fig. 2-1 for the orientation of the axes.

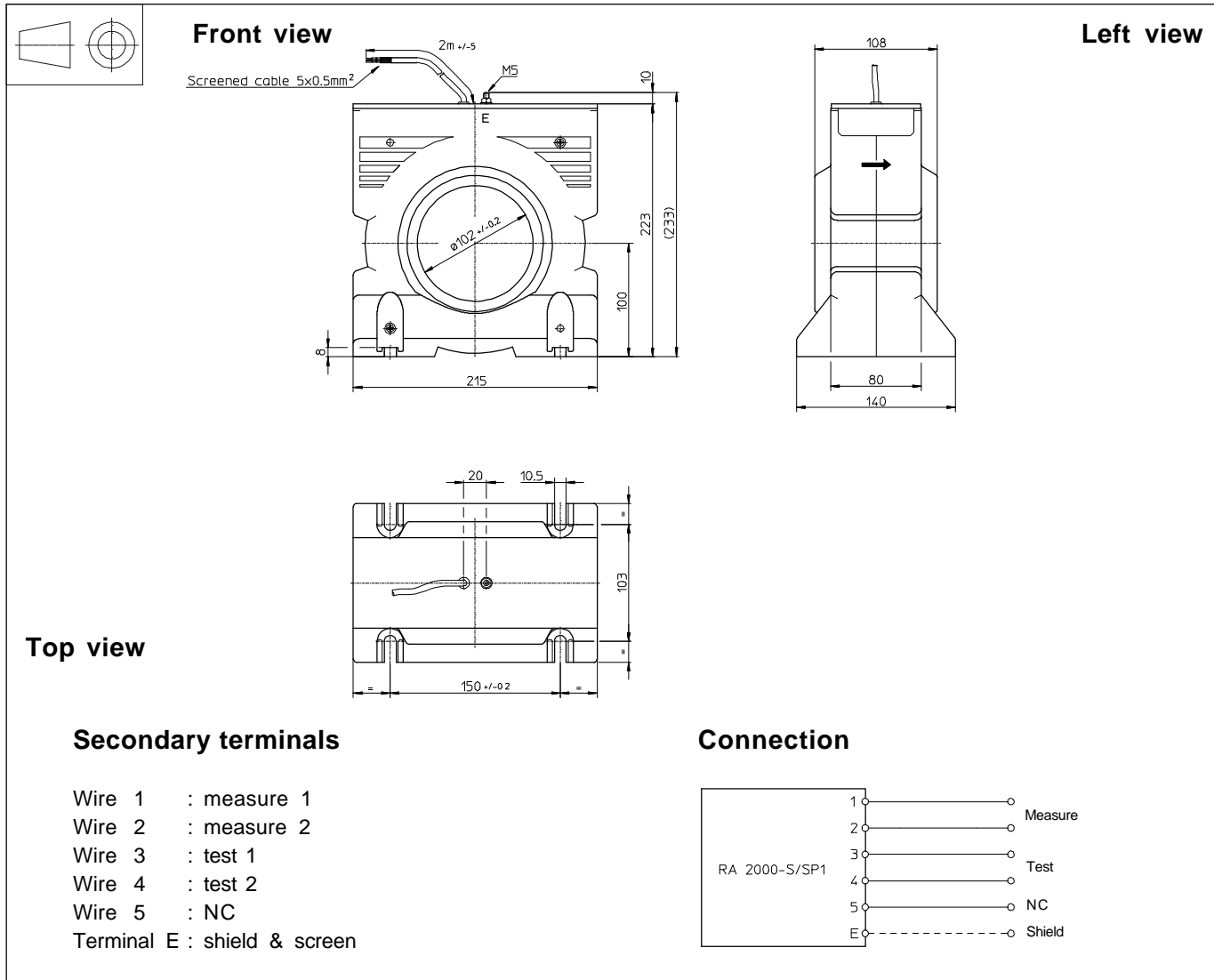
At 50Hz :

Frequency \ Position	X	Y	Z
	mAT/A/m	mAT/A/m	mAT/A/m
H_{AC} 50Hz	5	18.2	1.54
H_{AC} 300Hz	17.6	49.2	1.96

Table 2.1 - Influence of external magnetic fields in each axes of the transducer.



Dimensions RA 2000-S/SP1 (in mm. 1 mm = 0.0394 inch)



Mechanical characteristics

- General tolerance ± 1 mm
- Transducer fastening 4 slots ∅ 10.5 mm
4 M10 steelscrews
Recommended fastening torque 11.5 Nm or 8.48 Lb.-Ft.
- Primary through-hole ∅ 102 mm
- Connection of secondary screened cable 5 x 0.5 mm²
- Connection of screen M5 threaded stud
Recommended fastening torque 2.2 Nm or 1.62 Lb. - Ft.

Remarks

- V_s is positive when di_p/dt flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 100°C.