

# Current Transducer RA 1005-S

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



## Electrical data

$M$	Mutual inductance	$3.98 \cdot 10^{-6}$	H
$U_{out}$	Output voltage (instantaneous) <sup>1)</sup>	$U_{out} = M \cdot \frac{di_p}{dt}$	V
$U_{out}$	Output voltage (sinusoidal wave) <sup>1)</sup>	$U_{out} = 2 \cdot \pi \cdot M \cdot f \cdot I_{PAC}$	V
		with $2 \cdot \pi \cdot M = 25 \cdot 10^{-6}$	H
	Example: @ 50 Hz, 20 A	$U_{out} = 2 \cdot \pi \cdot 3.98 \cdot 10^{-6} \cdot 50 \cdot 20 = 25$	mV
$L_S$	Inductance of secondary windings ( $\pm 3$ %)	5.9	mH
$N_S$	Number of secondary turns	1480	

## Accuracy - Dynamic performance data

$BW$	Frequency bandwidth	20 ... 3000	Hz
$\varepsilon$	Error @ $I_{PAC} = 0.1 \dots 20$ A, $T_A = 25$ °C $BW = 20 \dots 3000$ Hz	$< \pm 3$	%
$\varphi_{or}$	Rated phase offset	$-90^\circ$	
$\varphi_{U_{out}}$	Phase error of output voltage $U_{out}$ <sup>1)</sup> , $I_p$ sinusoidal	$BW = 20 \dots 100$ Hz $-90^\circ \pm 5^\circ$ $BW = 100 \dots 3000$ Hz $-90^\circ \pm 2.5^\circ$	
$\frac{\Delta M_T}{M} \cdot 100$	Thermal drift of $M_T$	$T_A = -40 \dots + 85$ °C $< \pm 0.3$	%
$\frac{\Delta L_T}{L} \cdot 100$	Thermal drift of $L_S$ and $L_T$	$T_A = -40 \dots + 85$ °C $< \pm 0.3$	%

## Test circuit

$L_T$	Inductance of secondary winding ( $\pm 4$ %)	6	mH
$N_T$	Number of turns (test winding)	1440	
$R_T$	Resistance of test winding @ $T_A = 85$ °C ( $\pm 5$ %)	307	$\Omega$
$I_T$	Test current	$< 40$	mA

## General data

$T_A$	Ambient operating temperature	$-40 \dots 85$	°C
$T_{Ast}$	Ambient storage temperature	$-45 \dots 90$	°C
$T_B$	Primary conductor temperature	$\leq 100$	°C
$R_S$	Resistance of secondary winding @ $T_A = 85$ °C ( $\pm 4$ %)	312	$\Omega$
$m$	Mass	760	g
	Standards	EN 50155: 2007 EN 50121-3-2: 2015	

**Note:** <sup>1)</sup> Without load resistance.

## Feature

- Insulated plastic case recognized according to UL 94-V0.

## Advantages

- No insertion losses
- Current overload capability.

## Applications

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

## Application Domain

- Railway (fixed installations and onboard).

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### Insulation coordination

$U_d$	RMS voltage for AC insulation test, 50 Hz, 1 min	12 <sup>1)</sup>	kV
		1.5 <sup>2)</sup>	kV
		0.5 <sup>3)</sup>	kV
$U_t$	Partial discharge RMS test voltage ( $q_m < 10$ pC)	> 2.8 <sup>4)</sup>	kV
$d_{Cp}$	Creepage distance <sup>5)</sup>	82.70	mm
$d_{Cl}$	Clearance <sup>5)</sup>	69.60	mm
$CTI$	Comparative Tracking Index (group I)	600	

- Notes:**
- <sup>1)</sup> Between primary and secondary + test turns + shield
  - <sup>2)</sup> Between secondary + test turns and shield
  - <sup>3)</sup> Between secondary and test turns
  - <sup>4)</sup> Test carried out with a busbar  $\varnothing$  40 mm centered in the aperture
  - <sup>5)</sup> See details figure 1.

## 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 (e.g. 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.

