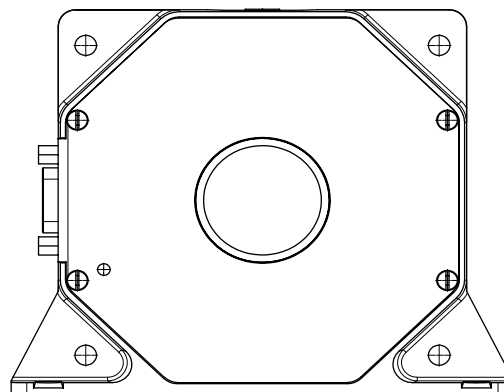




DEWETRON

PA-IT-1000 CURRENT TRANSDUCER

FOR THE ELECTRONIC MEASUREMENT
OF CURRENT: DC, AC, PULSED..., WITH
GALVANIC SEPARATION BETWEEN
PRIMARY AND SECONDARY



$I_{PM} = 0 \dots 1000 \text{ A}$

FEATURES

- > Closed loop (compensated) current transducer using an extremely accurate zero flux detector
- > Electrostatic shield between primary and secondary circuit
- > 9-pin D-Sub male secondary connector
- > Output indicates the transducer state
- > LED indicator confirms normal operation.

ADVANTAGES

- > Very high accuracy
- > Excellent linearity
- > Extremely low temperature drift
- > Wide frequency bandwidth
- > High immunity to external electrostatic and magetical fields interference
- > No insertion losses
- > High resolution
- > Low noise on output signal
- > Low noise feedback to main conductor.

APPLICATIONS

- > Feedback element in high performance gradient amplifiers for MRI
- > Feedback element in precision current regulated devices (power supplies...)
- > Calibration unit
- > Precise and high stability inverters
- > Energy measurement
- > Medical equipment.

APPLICATION DOMAINS

- > Industrial
- > Medical



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ELECTRICAL DATA

ELECTRICAL DATA				
I_{PN}	Primary nominal current DC	1000	A	
I_{PN}	Primary nominal current rms	707	A	
I_{PM}	Primary current, measuring range	0 .. ± 1000	A	
$\hat{I}_P$	Max. overload capability 100 ms ¹⁾	± 4000	A	
R_M	Measuring resistance Over operating current, temperature and supply voltage range	R_{Mmin} 0	R_{Mmax} 3	Ω
I_S	Secondary current	0 .. ± 1000	mA	
I_{SN}	Secondary nominal current rms	700	mA	
K_N	Conversion ratio	1 : 1000		
V_C	Supply voltage ($\pm 5\%$)	± 15	V	
I_C	Current consumption $\pm 15\%$	$\leq 80 + I_S$	mA	

ACCURACY - DYNAMIC PERFORMANCE DATA

ACCURACY - DYNAMIC PERFORMANCE DATA				
ε_L	Linearity error ²⁾	≤ 3	ppm	
I_{OE}	Electrical offset current + self magnetization + effect of earth magnetic field @ $T_A = 25^\circ\text{C}$ ²⁾	< 50	ppm	
ΔI_{OE}	Offset stability (no load) ²⁾	< 1	ppm/month	
TCI_{OE}	Temperature coefficient of I_{OE} ($10^\circ\text{C} \dots 50^\circ\text{C}$) ²⁾	< 0.5	ppm/K	
	Offset vs. power supply stability @ $T_A = 25^\circ\text{C}$ ²⁾ @ $V_C = \pm 15\text{ V} \pm 5\%$	< 3	ppm/% of $V_C = \pm 15\text{ V}$	

GENERAL DATA

GENERAL DATA				
T_A	Ambient operating temperature	+10 .. +50	$^\circ\text{C}$	
	Humidity (non condensing)	20 - 80 %	RH	
T_S	Ambient storage temperature	-20 .. +85	$^\circ\text{C}$	
	Humidity (non condensing)	20 - 80 %	RH	
RS	Secondary coil resistance @ $T_A = 25^\circ\text{C}$	6	Ω	
m	Mass	1	kg	

Notes: ¹⁾ Single pulse only, not AC. The transducer may require a few seconds to return to normal operation when autoreset system is running.

²⁾ All ppm figures refer to secondary measuring range 1000 mA.



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ISOLATION CHARACTERISTICS

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V_b	Rated isolation voltage rms, reinforced isolation Rated isolation voltage rms, single isolation with IEC 61010-1 standards and following conditions - Over voltage category III - Pollution degree 2	150 300	V V
V_d	Rms voltage for AC isolation test, 50/60 Hz, 1 min	3.1 ¹⁾ 200 ²⁾	kV V_{DC}
$\hat{V}_w$	Impulse withstand voltage 1.2/50 μ s	5.7	kV
V_b	Rated isolation voltage rms, reinforced isolation Rated isolation voltage rms, single isolation with EN 50178 standards and following conditions - Over voltage category III - Pollution degree 2	150 300	V V
dCp	Creepage distance	5	mm
dCl	Clearance distance	5	mm
CTI	Comparative Tracking Index (Group I)	700	mA
I_c	Current consumption ± 15 V	$\leq 80 + I_s$	mA

¹⁾ Between primary and secondary + shield

²⁾ Between secondary and shield.

If insulated cable is used for the primary circuit, the voltage category could be improved with the following table (for single insulation) (IEC 61010-1 standard):

Cable insulated (primary)	Category
HAR03	450 V CAT III
HAR05	550 V CAT III
HAR07	650 V CAT III



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OUTPUT NOISE FIGURES @ 25 °C

Random Noise ppm (rms):

0 - 10 HZ	0 - 10 kHz	0 - 50 kHz
<0.05	<3	<6

Re-injected noise measured on primary cable (DC - 50 kHz): $<5 \mu V_{rms}$

DYNAMIC PERFORMANCE DATA

DYNAMIC PERFORMANCE DATA			
BW	Frequency bandwidth for small signal 0.5 %, of I_{PN} (DC) (± 3 dB)	DC .. >500	kHz
di/dt	di/dt accurately followed	>100	A/ μs
t_r	Response time ¹⁾ to 90 % of I_{PN} step	<1	μs

¹⁾ With a di/dt of 100 A/ μs

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.



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OVERLOAD PROTECTION - ELECTRICAL SPECIFICATION - STATUS

As soon as electrical saturation appears, the transducer switches from normal operation to over current mode. This electrical saturation appears in any case beyond 1.1 time the current range. The primary current corresponding to this trip level is related to the temperature inside the transducer.

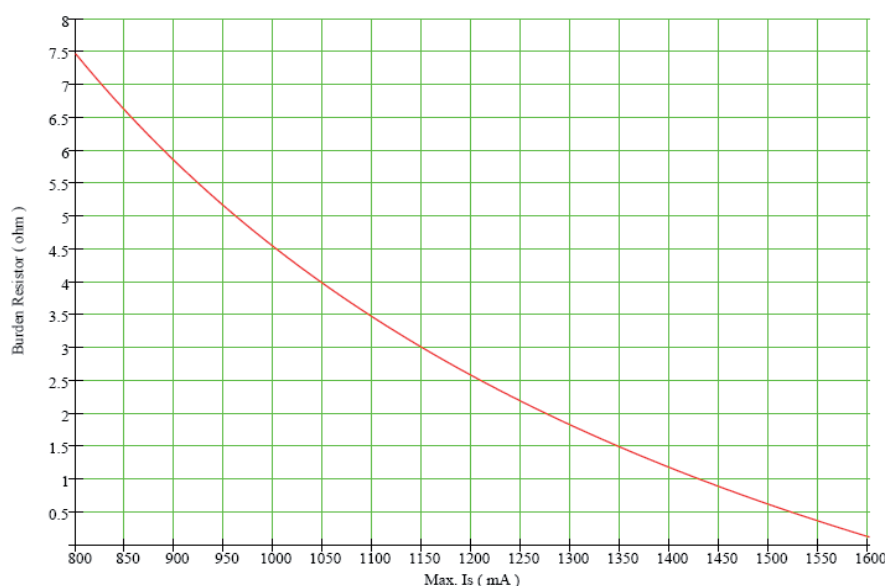
Under these conditions:

- > The contact (normal operation status) between pin 3 and 8 (of the D-sub connector) switches off, this contact becomes open.
- > The green LED indicator (located on the cover plate of the transducer and related to operation status) switches off.

Fault level (off state)	$I_p > 110\% \text{ of } I_{PN} \text{ DC}$
Max voltage pin 3 to pin 8, off-State	45 V
Max current pin 3 to pin 8, on-State	30 mA
On state resistance pin 3 to pin 8	50 mΩ (typ)

To maintain safe start-up R_M must not exceed 3 Ω during fault condition. The over current mode remains until the primary current decreases to a value lower than the recovery current.

MAX SECONDARY CURRENT VERSUS MEASURING RESISTOR

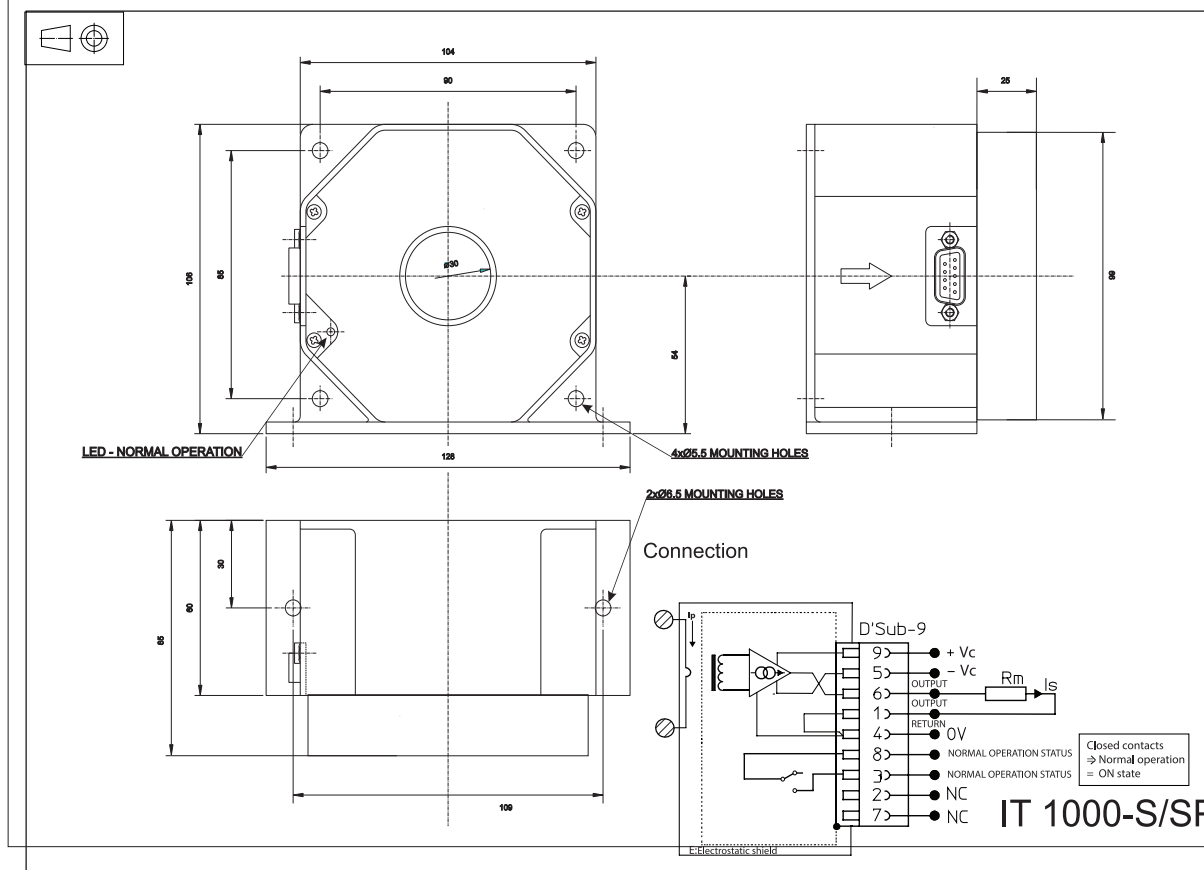


To maintain safe start-up R_M must not exceed 3 Ω during fault condition.

MISCELLANEOUS

Bus bar free zone (length: 110 mm) (from center): $r \geq 110 \text{ mm}$

DIMENSIONS



CONNECTION

- > Normal operation status (Pins 3 and 8)
- Normal operation means:
 - ± 15 V ($\pm U_c$) present
 - zero detector is working
 - compensation current ≤ 110 % of $I_{PN DC}$

The contacts of the related relay are closed under normal operation.

REMARKS

- > I_s is positive when I_p flows in the direction of the arrow.
- > We recommend that a shielded output cable and plug are used to ensure the maximum immunity against electrostatic fields.
- > Pin 4 should be connected to cable and connector shield to maintain lowest output noise.
- > Temperature of the primary conductor should not exceed 50 °C.

MECHANICAL CHARACTERISTICS

- > General tolerance ± 0.3 mm
- > Transducer fastening
 - Straight mounting 2 holes $\varnothing 6.5$ mm
2 x M6 steel screws
 - Recommended fastening torque 4.4 Nm
 - Flat mounting 4 holes $\varnothing 5.5$ mm
4 x M5 steel screws
 - Recommended fastening torque 3.7 Nm
- > Connection of secondary connector on D-SUB-9, UNC 4-40
- > All mounting recommendations are given for a standard mounting. Screws with flat and spring washers.
- > Primary through hole $\varnothing \leq 30$ mm
- > 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.