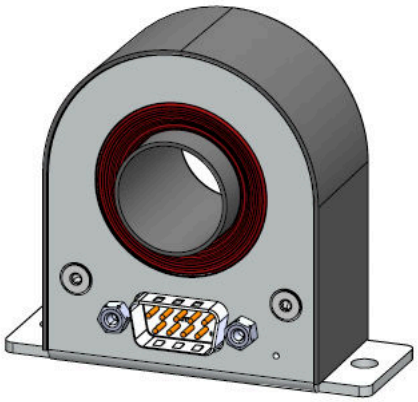
Reduced size, ultra-stable, high precision (ppm class) fluxgate technology DT Series current transducer for isolated DC and AC current measurement up to 100Arms



CE RoHS 2011/65/EU

Features

- ◊ Fluxgate, closed loop compensated technology with fixed excitation frequency and second harmonic zero flux detection for best in class accuracy and stability
- ◊ 2 MHz high frequency bandwidth
- ◊ Excellent linearity, better than 1 ppm
- ◊ Industry standard DSUB 9 pin connection
- ◊ Green diode for normal operation indication
- ◊ Large aperture Ø20.7mm for cables and bus bars

Applications

- ◊ Optimized for space constraint applications
- ◊ MPS for particles accelerators
- ◊ Gradient amplifiers for MRI devices
- ◊ Stable power supplies
- ◊ Precision drives
- ◊ Batteries testing and evaluation systems
- ◊ Power measurement and power analysis
- ◊ Variable speed drives

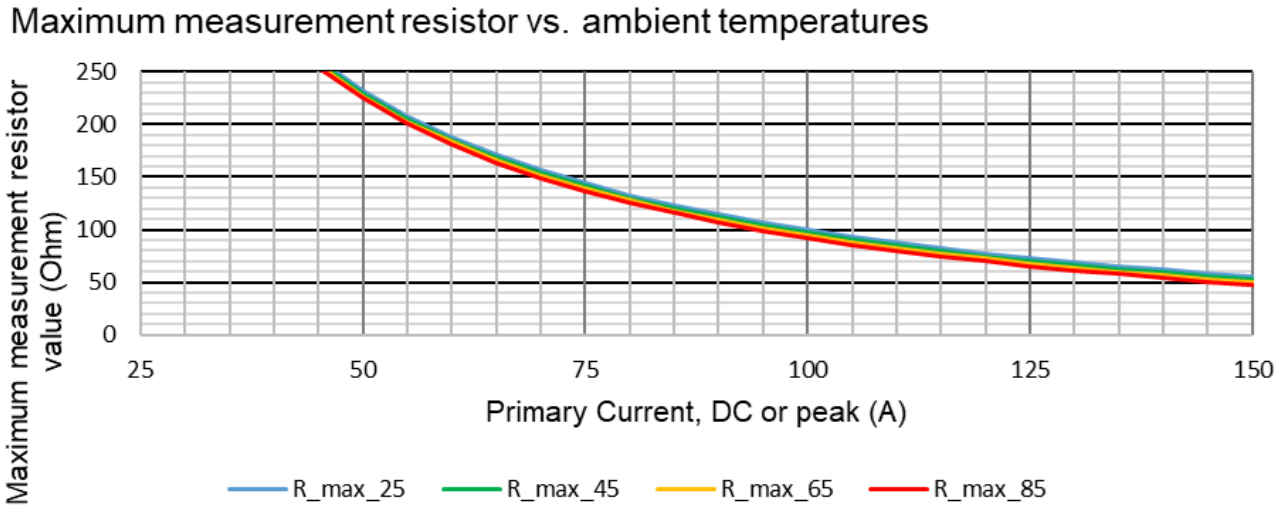
Specification highlights	Symbol	Unit	Min	Typ	Max
Nominal primary AC current	I_{PN} AC	Arms			100
Nominal primary DC current	I_{PN} DC	A	-100		100
Measuring range	$\hat{I}_{PM}$	A	-150		150
Primary / secondary ratio	n1 : n2		1:1000		1:1000
Linearity error	ε_L	ppm	-1	0.4	1
Offset current (including earth field)	I_{OE}	ppm	-50		50
DC-10Hz Overall accuracy @25°C (= $\varepsilon_L + I_{OE}$)	accε	ppm	-51		51
Bandwidth	f(±3dB)	kHz		2000	
AC typical gain error 10Hz to 5kHz	εG	%		±0.01	
Operating temperature range	Ta	°C	-40		85
Power supply voltages	Uc	V	±14.25		±15.75

All ppm (or %) values refer to nominal current

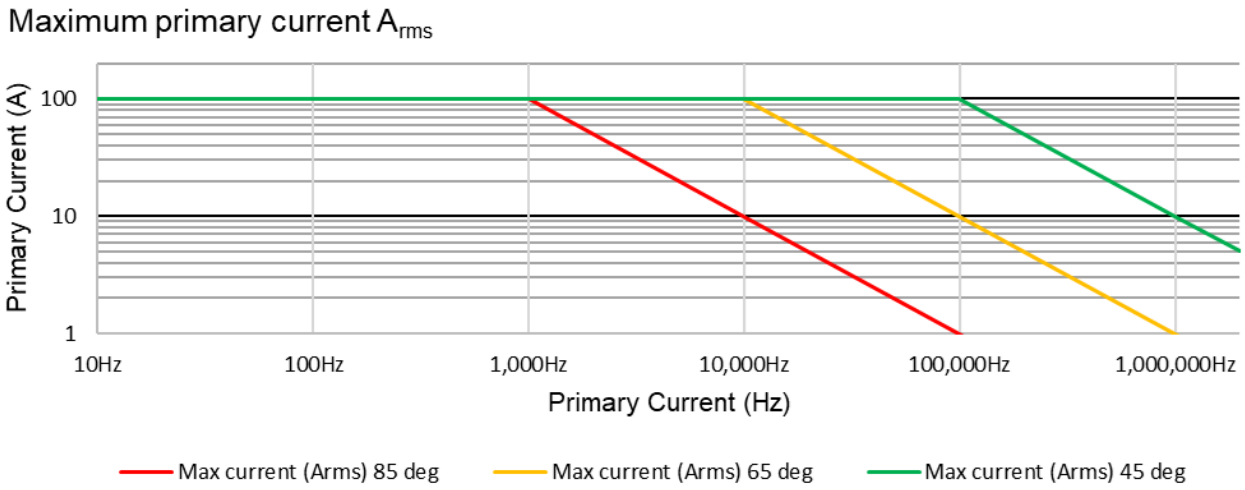
Electrical specifications at Ta=23°C, supply voltage = ± 15V unless otherwise stated

Parameter		Symbol	Unit	Min	Typ.	Max	Comment
Nominal primary AC current		I_{PN} AC	Arms			100	Refer to fig. 1 & 2 for derating
Nominal primary DC current		I_{PN} DC	A	-100		100	Refer to fig. 1 for derating
Measuring range		I_{PM}	A	-150		150	Refer to fig. 1 & 2 for derating
Overload capacity		$\hat{I}_{OL}$	A	-500		500	Non-measured, 100ms
Nominal secondary current		I_{SN}	mA	-100		100	At nominal primary DC current
Primary / secondary ratio				1:1000		1:1000	
Measuring resistance		R_M	Ω	0		50	Refer to fig. 1 for details
Linearity error		ε_L	ppm µA	-1 -0.1	0.4 0.04	1 0.1	ppm refers to nominal current µA refers to secondary current
Offset current		I_{OE}	ppm µA	-50 -5		50 5	ppm refers to nominal current µA refers to secondary current
DC-10Hz Overall accuracy @25°C (= εL + IOE)		accε	ppm	-51		51	ppm refers to nominal DC current
Offset temperature coefficient		TC_{IOE}	ppm/K µA/K	-0.3 -0.03	0.15 0.015	0.3 0.03	ppm refers to nominal current µA refers to secondary current
Bandwidth		f(±3dB)	kHz		2000		Small signal, graphs figure 3
Amplitude error	10Hz –5kHz 5kHz -100kHz 100kHz - 1000kHz 1000kHz - 2000kHz	εG	%		0.01% 1% 10% 30%		% refers to nominal current
Phase shift	10Hz –5kHz 5kHz -100kHz 100kHz - 1000kHz 1000kHz - 2000kHz	θ	°		0.01° 0.5° 5° 30°		
Response time to a step current IPN		tr @ 90%	µs		1		di/dt = 100A/µs
RMS noise	0.1Hz - 10Hz 0.1Hz - 100Hz 0.1Hz - 1kHz 0.1Hz - 10kHz 0.1Hz - 100kHz	noise	ppm RMS		0.03 0.5 0.6 0.9 6.5	0.07 1.1 1.5 1.8 12	ppm RMS refers to nominal current
Peak-to-peak noise	0.1Hz - 10Hz 0.1Hz - 100Hz 0.1Hz - 1kHz 0.1Hz - 10kHz 0.1Hz - 100kHz	noise	ppm p-p		0.4 1.6 3.2 5.1 50	0.5 2 4 8 80	ppm peak-to-peak refers to nominal current
Fluxgate excitation frequency		f_{Exc}	kHz		31.25		
Induced rms voltage on primary conductor			µV rms			5	
Power supply voltages		Uc	V	±14.25		±15.75	
Positive current consumption		Ips	mA		40		Add Is (if Is is positive)
Negative current consumption		Ins	mA		35		Add Is (if Is is negative)
Operating temperature range		Ta	°C	-40		85	
Stability							
Offset stability over time			ppm/month µA/month	-0.1 -0.01		0.1 0.01	ppm refers to nominal current µA refers to secondary current
Impact of external magnetic field			ppm/mT µA/mT	-8 -0.8	2 0.2	8 0.8	ppm refers to nominal current µA refers to secondary current
Offset change with power supply voltages changes			µA /V		0.02		µA refers to secondary current

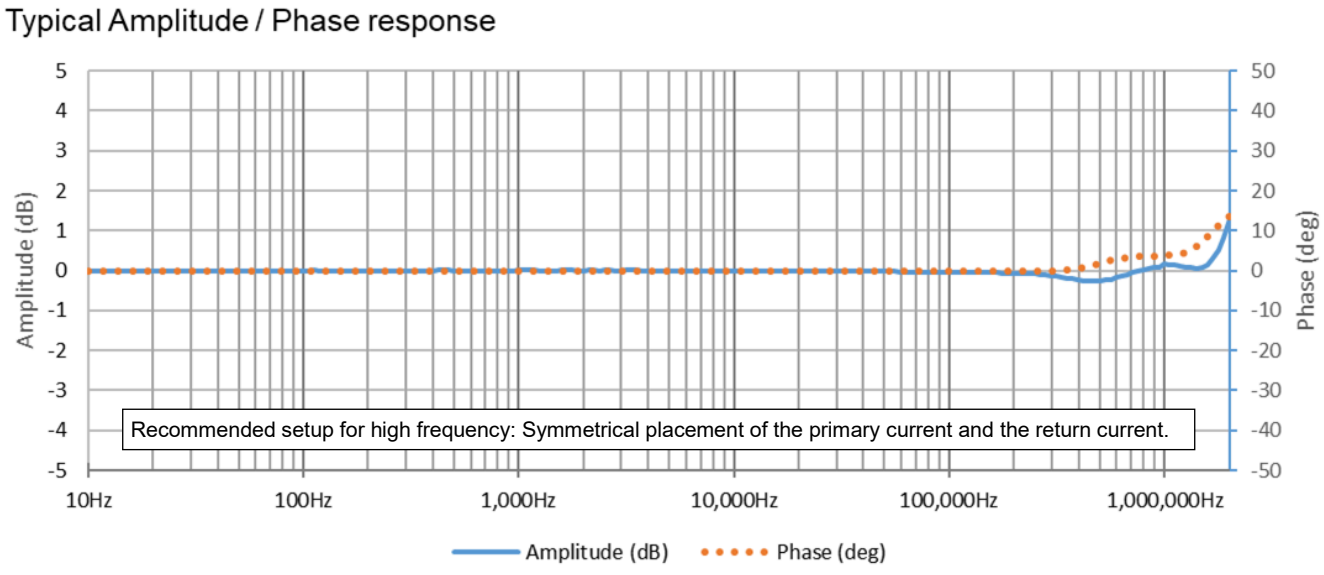
Measurement resistor RM and ambient temperature derating (Fig. 1)



Frequency and ambient temperature derating (Fig. 2)



Frequency characteristics (Fig. 3)



Isolation specifications

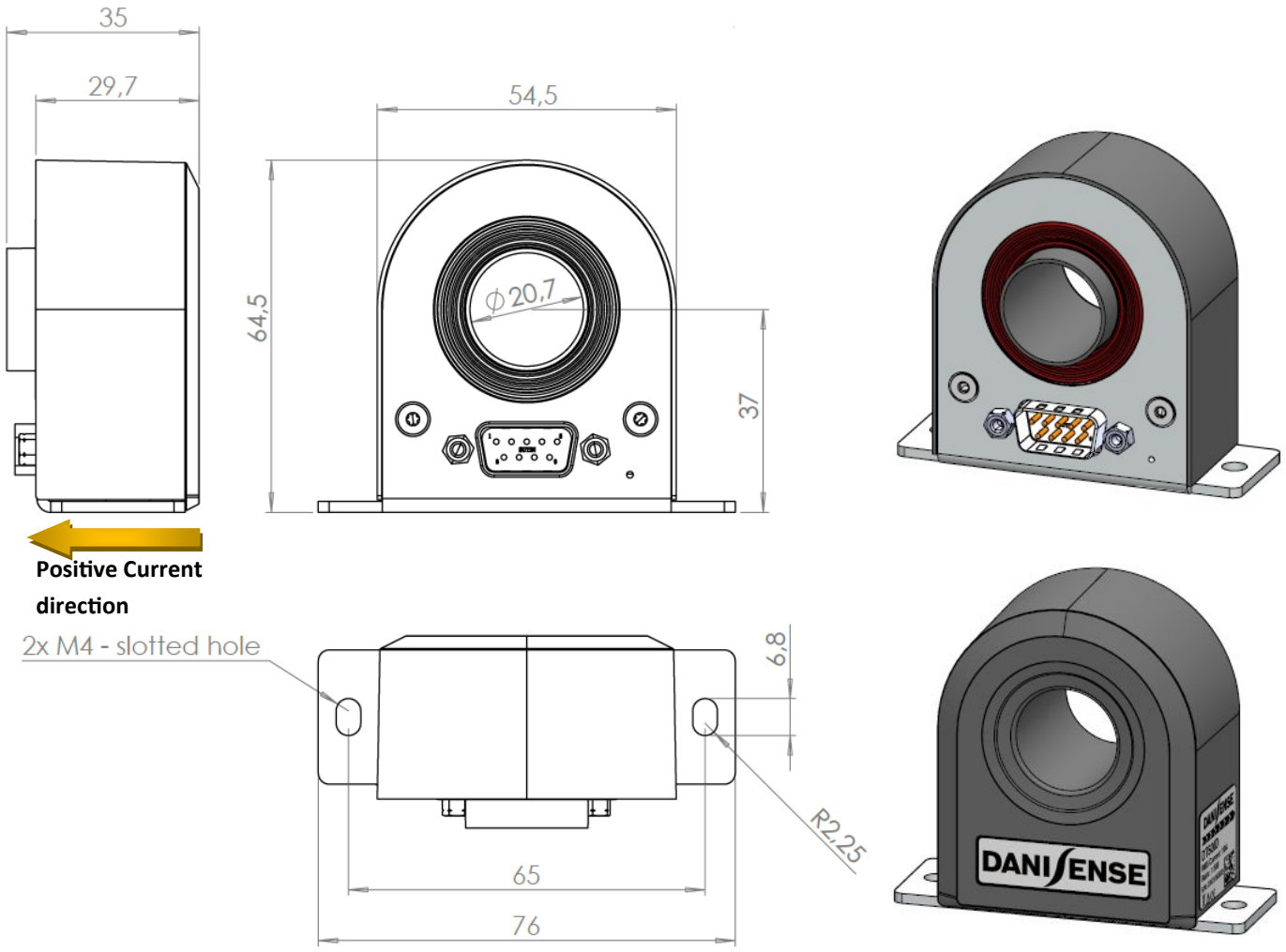
Parameter	Unit	Value
Clearance	mm	11.5
Creepage distance	mm	11.5
Rms voltage for AC isolation test, 50/60 Hz, 1 min - Between primary and (secondary and shield) - Between secondary and shield	kV	5.7 0.2
Impulse withstand voltage (1.2/50µs)	kV	10.4
Rated rms isolation voltage reinforced isolation, overvoltage category III, Pollution degree 2 according to - IEC 61010-1 - EN50780	V	300 600

Absolute maximum ratings

Parameter	Unit	Max	Comment
Primary	A	500	Maximum 100ms
Power supply	V	±16.5	

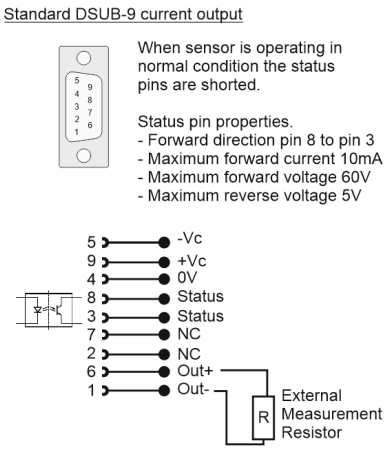
Environmental and mechanical characteristics

Parameter	Unit	Min	Typ	Max	Comment
Altitude	m			2000	
Usage					Designed for indoor use
Transient voltages					Up to overvoltage category III
Polution Degree				2	
Ambient operating temperature range	°C	-40		85	
Storage temperature range	°C	-40		85	
Relative humidity	%	20		80	Non-condensing
Mass	kg		0.15		
Connections	Power supplies: D-SUB 9 pins male				
Standards	IEC61010-2-30 IEC61326-1 EMC IEC61010-1:2010 3rd Edition				



(general tolerance 0.3mm unless otherwise stated)

DSUB pin layout



Positive current direction

Is identified by an arrow on the transducer body

Mounting instructions

Base plate mounting:

◊ 2 x M4 - slotted holes

◊ Suggested fastening torque: 5.5 Nm