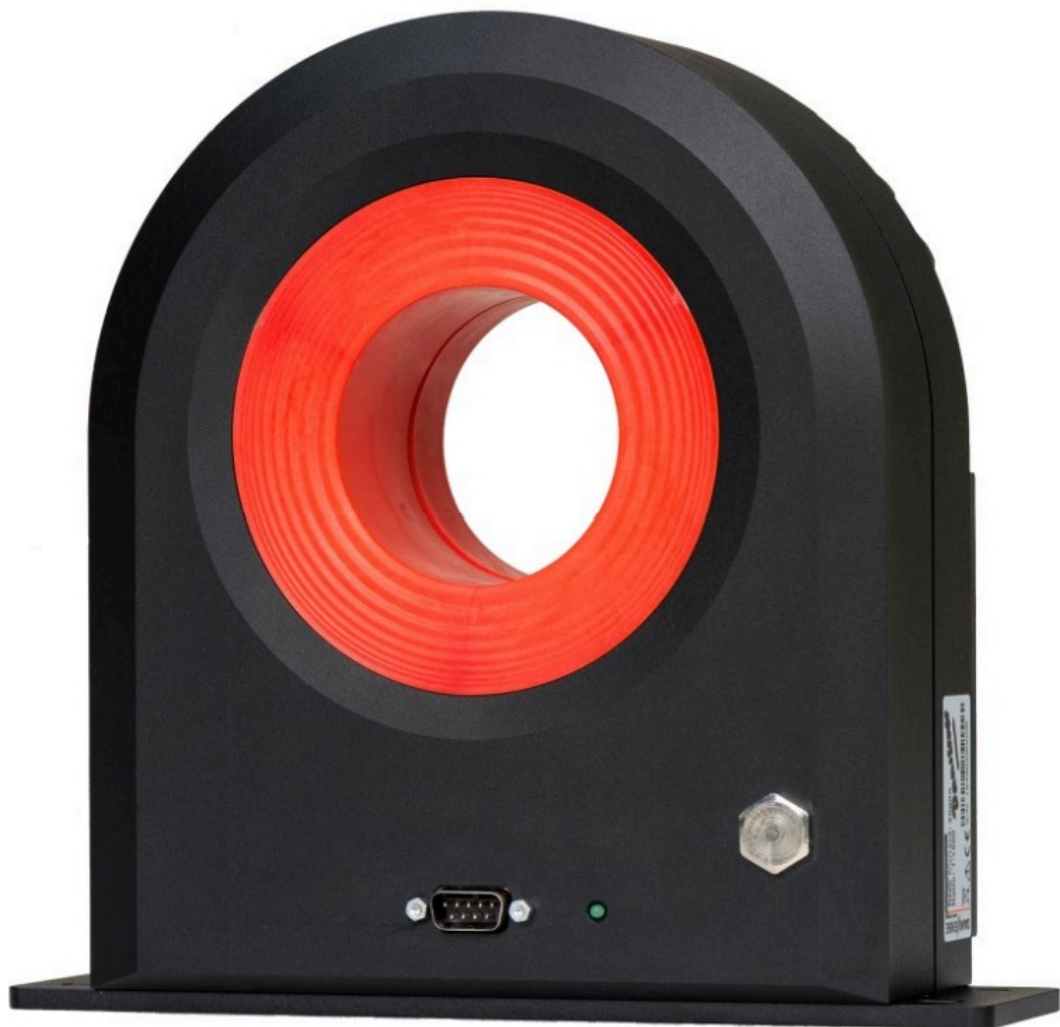




DANISENSE DL2000ID Sensors Transducers DigiKey User Manual

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Sensors Transducers DigiKey
User Manual



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Features

1 ppm linearity
6 ppm offset

Current output

Fluxgate, closed loop compensated technology with fixed excitation frequency and second harmonic zero flux detection for best in class accuracy and stability

Industry standard DSUB 9 pin connection

Green diode for normal operation indication

Full aluminum body for superior EMI shielding and extended operating temperature range

Large aperture Ø68mm for cables and bus bars

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

Current calibration purposes

Specification highlights	Symbol	Unit	Min	Max
Nominal primary AC current	IPN AC	Arms		2000
Nominal primary DC current	IPN DC	A	-3000	3000
Measuring range	ÎPM	A	-3000	3000
Primary / secondary ratio	n1 : n2		1: 1500	1: 1500
Linearity error	εL	ppm	-1	1
Offset current (including earth field)	IOE	ppm	-6	6
DC-10Hz Overall accuracy @25°C (= εL + IOE)	accε	ppm	-7	7
AC Maximum gain error 10Hz to 2kHz	εG	%		±0.01
Operating temperature range	Ta	°C	-40	65
Power supply voltages	Uc	V	±14.25	±15.75

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

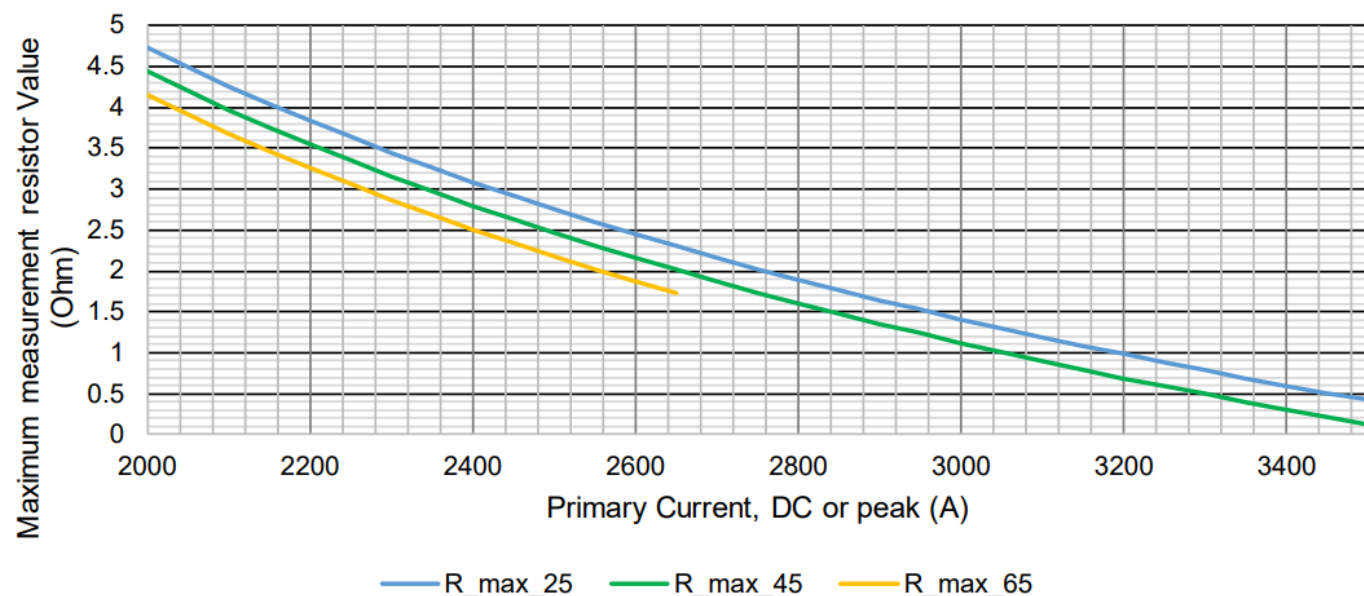
Parameter	Symb ol	Unit	Min	Typ.	Max	Comment
Nominal primary AC current	IPN A C	Arms			2000	Refer to fig. 1 & 2 for derating
Nominal primary DC current	IPN D C	A	-3000		3000	Refer to fig. 1 for derating
Measuring range	IPM	A	-3000		3000	Refer to fig. 1 & 2 for derating
Overload capacity	ÎOL	kA			10	Non-measured, 100ms
Nominal secondary current	ISN	mA	-2000		2000	At nominal primary DC current

Primary / secondary ratio			1:1500		1:1500	
Measuring resistance	RM	Ω	0		3	Refer to fig. 1 for details
Linearity error	ϵ_L	ppm μA	-1 -2		1 2	ppm refers to nominal c urrent μA refers to secondary c urrent
Offset current	IOE	ppm μA	-6 -12		6 12	ppm refers to nominal c urrent μA refers to secondary c urrent
DC-10Hz Overall accuracy @25°C (= EL + bE)	accE	ppm	-7		7	ppm refers to nominal D C current
Offset temperature coefficient	TCIOE	ppm/K $\mu A/K$	-0.1 -02		0.1 0.2	ppm refers to nominal c urrent μA refers to secondary c urrent
Bandwidth	f(-3dB)	kHz	300			Small signal, graphs figu re 3
Amplitude error 10Hz —2kHz 2kHz -10kHz 10kHz- 100kHz	ϵ_G	%			0.01% 1.50% 3.00%	% refers to nominal curr ent
Phase shift 10Hz —2kHz 2kHz -10kHz 10kHz- 100kHz	θ	°			0.04° 0.5° 3°	
Response time to a step current Intg	tr @ 9 0%	μs		1		di/dt = 100A/ μs
Noise 0 – 100Hz 0 – 1kHz 0 – 10kHz 0 – 100kHz	noise	ppm r ms			0.02 0.10 1.20 3.50	Measured on secondary current
Fluxgate excitation frequency	fExc	kHz		15.63		
Induced rms voltage on primary condu ctor		μV rms			5	
Power supply voltages	Uc	v	± 14.25		± 15.75	
Positive current consumption	Ips	mA	160	170	185	Add Is (if Is is positive)
Negative current consumption	I _{ns}	mA	150	160	170	Add Is (if Is is negative)
Operating temperature range	Ta	°C	-40		65	
Stability						
Offset stability over time		ppm/m onth $\mu A/mo$ nth	-0.1 -02		0.1 0.2	ppm refers to nominal c urrent μA refers to secondary c urrent

Offset change with vertical external magnetic field		$\mu\text{A} / \text{mT}$	0.2	0.8	(perpendicular to bus bar) μA refers to secondary current
Offset change with horizontal external magnetic field		$\mu\text{A} / \text{mT}$	0.8	2	(parallel to bus bar) μA refers to secondary current
Offset change with power supply voltage changes		$\mu\text{A} / \text{V}$	0.004	0.04	μA refers to secondary current
Offset change with absolute power supply voltages tracking		$\mu\text{A} / \text{V}$	0.012	0.04	μA refers to secondary current

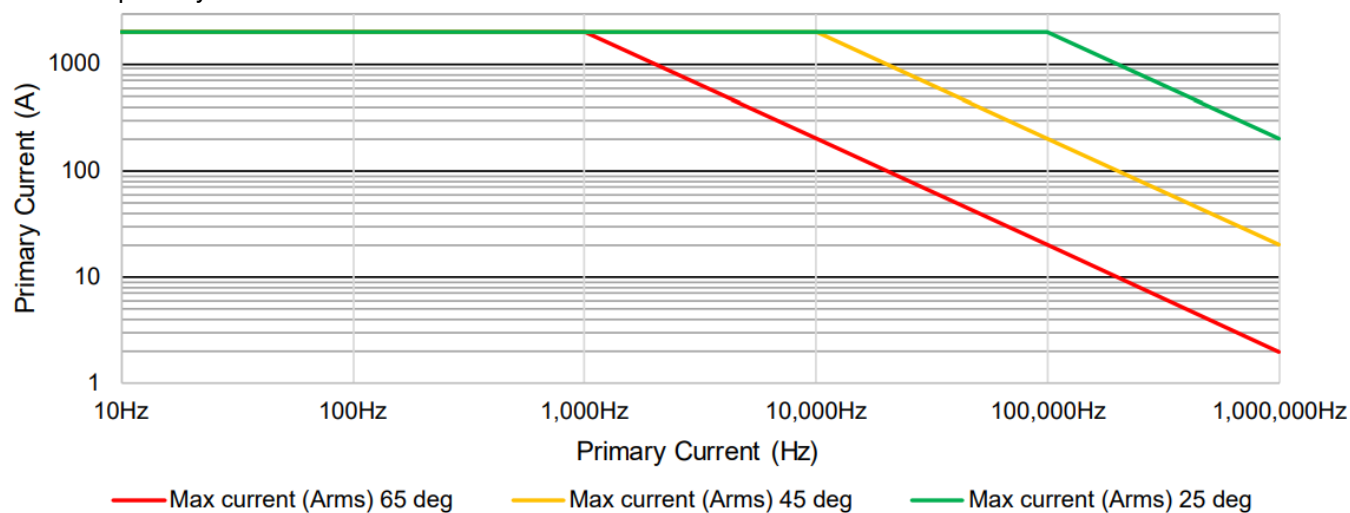
Measurement resistor R_M and ambient temperature derating (Fig. 1)

Maximum measurement resistor vs. ambient temperatures



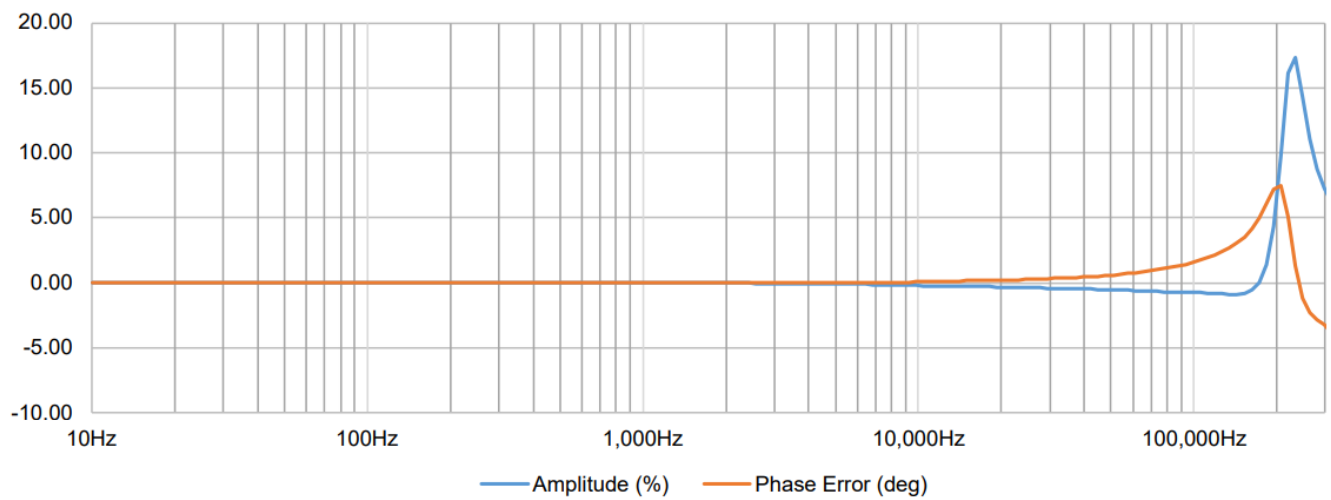
Frequency and ambient temperature derating (Fig. 2)

Maximum primary current Arms



Frequency characteristics (Fig. 3)

Amplitude / Phase



Isolation specifications

Parameter	Unit	Value
Clearance	mm	22
Creepage distance	mm	22
Comparative tracking index (CTI)	V	> 600
Rms voltage for AC isolation test, 50/60 Hz, 1 min <ul style="list-style-type: none"> – Between primary and (secondary and shield) – Between secondary and shield 	kV	14.4 0.2
Impulse withstand voltage (1.2/50µs)	kV	26.3
Rated rms isolation voltage reinforced isolation, overvoltage category III , Pollution degree 2 according to <ul style="list-style-type: none"> – IEC 61010-1 – EN50780 	V	1500 1500

Absolute maximum ratings

Parameter	Unit	Max	Comment
Primary	kA	10	Maximum 100ms
Power supply	V	±16.5	

Environmental and mechanical characteristics

Parameter	Unit	Min	Typ	Max	Comment
Ambient operating temperature range	°C	-40		65	
Storage temperature range	°C	-40		65	
Relative humidity	%	20		80	Non-condensing
Mass	kg		6.5		
Connections	Power supplies: D-SUB 9 pins male				
Standards	EN 61326-1 EMC EN 61010-1:2010 Safety				

Advanced Sensor Protection Circuits “ASPC”

Developed to protect the current transducer from typical fault conditions:

- Unit is un-powered and secondary circuit is open or closed
- Unit is powered and secondary circuit is open or interrupted

Both DC and AC primary current up to 100% of nominal value can be applied to the current transducers in the above situations without damage to the electronics.

Please notice that the sensor core can be magnetized in all above cases, leading to a small change in output offset current (less than 10ppm)

Status pins

When transducer is operating in normal condition, the status pins (3 and 8) are shorted.

Status pins properties: – forward direction pin 8 to pin 3, maximum forward current 10mA

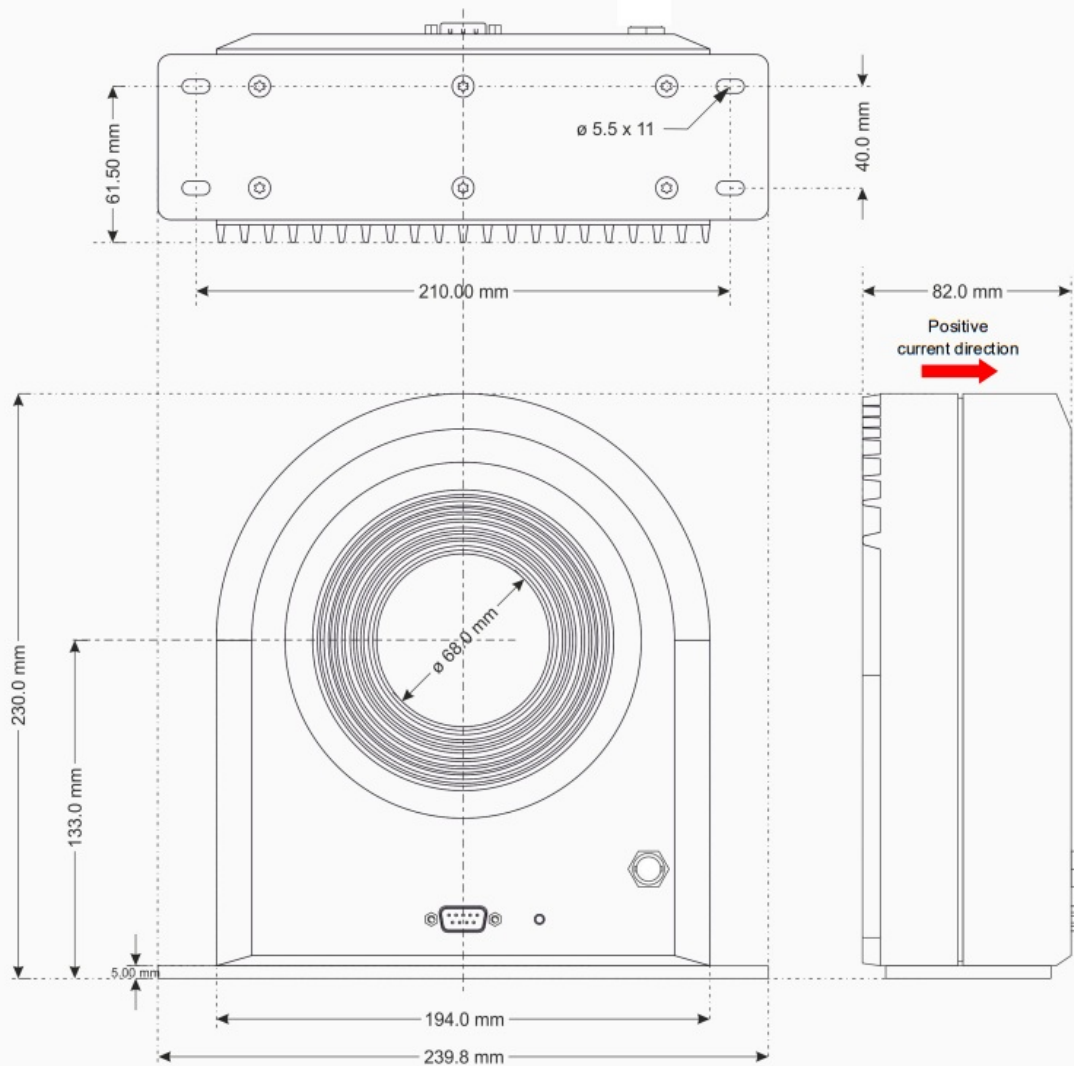
– maximum forward voltage 60V, maximum reverse voltage 5V

Accessories

- 4-channel power supplies unit for connection up to 4xDCCT : DSSIU-4
- 6-channel power supplies unit for connection up to 6xDCCT : DSSIU-6
- Transducer cables in 5 lengths (2m – 5m – 10m – 15m – 20m): DSUB2 – DSUB5 – DSUB10 – DSUB15 DSUB20
- Transducer cable 3m for connection to end-user's power supply:
Transducer cable for lab PS (with access to current output via Ø4 banana jacks)

Please visit Danisense homepage for relevant datasheets

DS2000 Dimensions



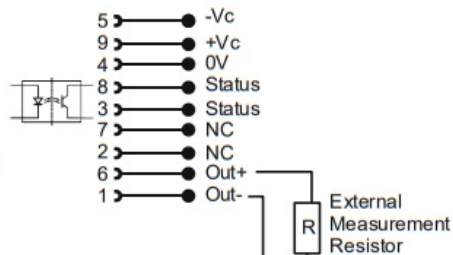
Standard DSUB-9 current output



When sensor is operating in normal condition the status pins are shorted.

Status pin properties.

- Forward direction pin 8 to pin 3
- Maximum forward current 10mA
- Maximum forward voltage 60V
- Maximum reverse voltage 5V



Positive current direction

Is identified by an arrow on the transducer body

Mounting instructions

• Base plate mounting	4 holes $\varnothing 5.5 \times 11$ 4 x M5 steel screws / 6N.m
• Bottom direct mounting (after unscrewing the base plate)	6 holes $\varnothing 4.2 \times 7$ 6 x M4 steel screw / 4N.m

Declaration of Conformity

Danisense A/S

Malervej 10
DK-2630 Taastrup
Denmark

Declares that under our sole responsibility that this product is in conformity with the provisions of the following EC Directives, including all amendments, and with national legislation implementing these directives:

Directive 2014/30/EU

Directive 2014/35/EU

And that the following harmonized standards have been applied

EN 61010-1 (Third Edition):2010, EN 61010-1:2010/A1:2019

EN 61010-2-030:2021/A11:2021

EN 61326-1:2013

All DANISENSE products are manufactured in accordance with RoHS directive 2011/65/EU. Annex II of the RoHS directive was amended by directive 2015/863 in force since 2015, expanding the list of 6 restricted substances (Lead, Hexavalent Chromium, PBB, PBDE and Cadmium)

Danisense follows the provision in EN 63000:2018

Place
Taastrup, Denmark



Henrik Elbæk


Date: 2022-03-15

2022-11-24

Precision – Innovation

www.danisense.com

Documents / Resources

	<p>DANISENSE DL2000ID Sensors Transducers DigiKey [pdf] User Manual</p> <p>DL2000ID Sensors Transducers DigiKey, DL2000ID, Sensors Transducers DigiKey, Transducer s DigiKey</p>
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