DM1200ID-CD3000

Ultra-stable, high precision (ppm class) fluxgate technology DM Series current transducer for non-intrusive, isolated DC and AC current measurement up to 1500A

Features

- Ø45mm aperture enabling large isolated cables and the possibility to measure leakage current at high precision.
- 3 ppm linearity, 12 ppm offset
- Current output
- Fluxgate, closed loop compensated technology with crystal driven excitation frequency for increased stability
- Access to 3000 turns calibration winding in DSUB
- Possibility to perform 1500A calibration with 500mA source through calibration winding of 3000 turns
- Not suitable for frequencies above 15kHz due to calibration winding

Applications:

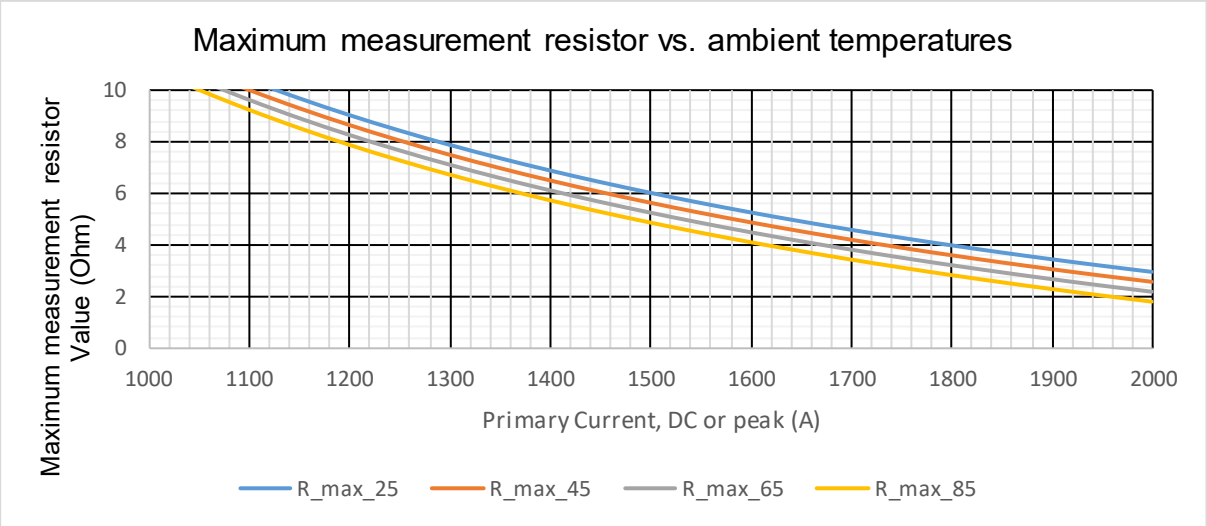
- Stable power supplies
- MPS for particles accelerators
- Batteries testing and evaluation systems
- Current calibration—Metrology

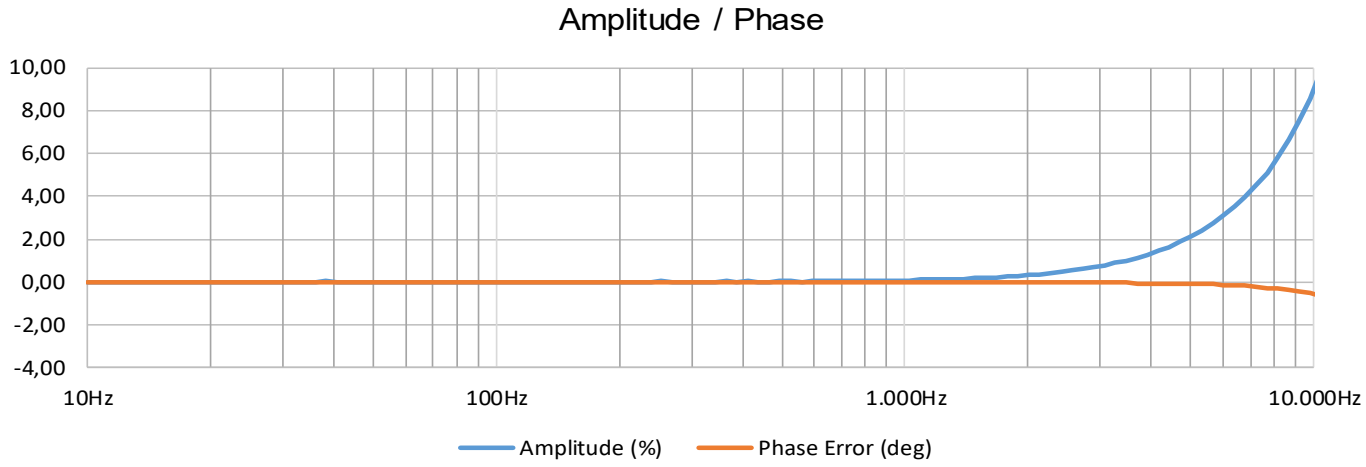
Specification highlights	Symbol	Unit	Min	Typ	Max
Nominal primary AC current	I_{PN} AC	Arms			1200
Nominal primary DC current	I_{PN} DC	A	-1500		1500
Measuring range	$\hat{I}_{PM}$	A	-1800		1800
Primary / secondary ratio	n1:n2		1:1500		1:1500
Linearity error	ε_L	ppm	-3		3
Offset current (including earth field)	I_{OE}	ppm	-12		12
DC-10Hz Overall accuracy @25°C (= $\varepsilon_L + I_{OE}$)	accε	ppm	-15		15
AC Maximum gain error 10Hz to 500Hz	εG	%			±0.01
Operating temperature range	Ta	℃	-40		65
Power supply voltages	Uc	V	±14.25		±15.75

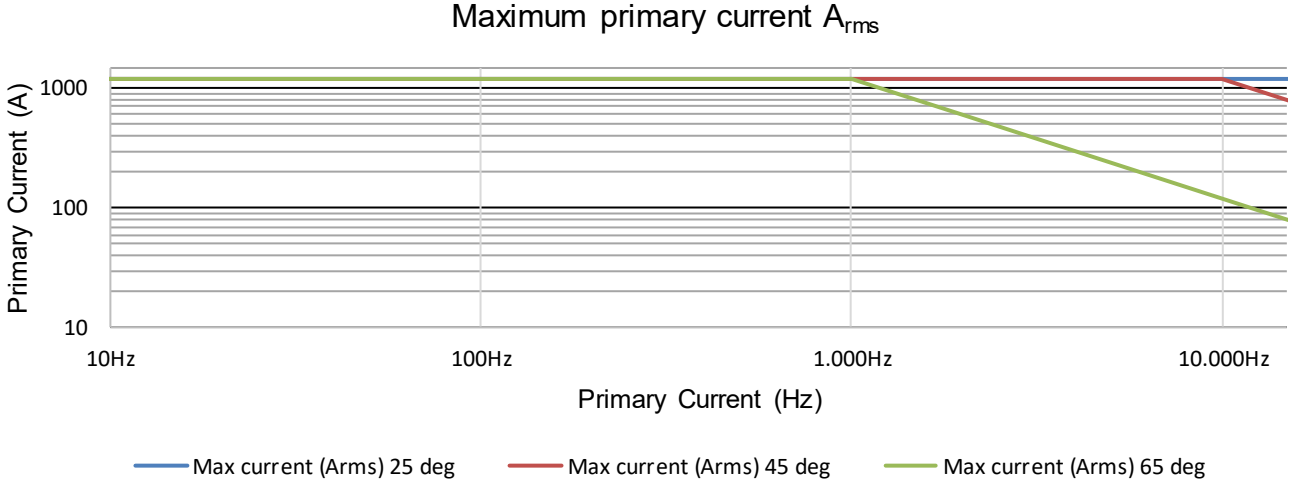
All ppm (or %) values refer to nominal current

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			1200	Refer to fig. 1 & 2 for derating
Nominal primary DC current	I_{PN} DC	A	-1500		1500	Refer to fig. 1 for derating
Measuring range	I_{PM}	A	-1800		1800	Refer to fig. 1 & 2 for derating
Overload capacity	$\hat{I}_{OL}$	kA			5	Non-measured, 100ms
Nominal secondary current	I_{SN}	mA	-1000		1000	At nominal primary DC current
Primary / secondary ratio			1:1500		1:1500	
Measuring resistance	R_M	Ω	0		3	Refer to fig. 1 for details
Linearity error	ε_L	ppm µA	-3 -3		3 3	ppm refers to nominal current µA refers to secondary current
Offset current	I_{OE}	ppm µA	-12 -12		12 12	ppm refers to nominal current µA refers to secondary current
DC-10Hz Overall accuracy @25°C (= εL + IOE)	accε	ppm	-15		15	ppm refers to nominal DC current
Offset temperature coefficient	TC_{IOE}	ppm/K µA/K	-0,1 -0,1		0,1 0,1	ppm refers to nominal current µA refers to secondary current
Bandwidth	f(-3dB)	kHz	15			Small signal, graphs figure 3
Amplitude error 10Hz–500Hz 500Hz-10kHz	εG	%			0,01% 15,00%	% refers to nominal current
Phase shift 10Hz–500Hz 500Hz-10kHz	θ	°			0.01° 1.0°	
Response time to a step current I_{PN}	tr @ 90%	µs		1		di/dt = 100A/µs
Noise 0 - 100Hz 0 - 1kHz 0 - 10kHz 0 - 100kHz	noise	ppm rms			0,10 0,5 5 20	Measured on secondary 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	100	110	120	Add Is (if Is is positive)
Negative current consumption	Ins	mA	110	120	130	Add Is (if Is is negative)
Operating temperature range	Ta	℃	-40		65	
Stability						
Offset stability over time		ppm/month µA/month	-0,1 -0,1		0,1 0,1	ppm refers to nominal current µA refers to secondary current
Offset change with vertical external magnetic field		µA /mT		0,2	0,8	(perpendicular to bus bar) µA refers to secondary current
Offset change with horizontal external magnetic field		µA /mT		0,8	2	(parallel to bus bar) µA refers to secondary current
Offset change with power supply voltage changes		µA /V		0,004	0,04	µA refers to secondary current
Offset change with absolute power supply voltages tracking		µA /V		0,012	0,04	µA refers to secondary current


Maximum measurement resistor vs. ambient temperatures
Maximum measurement resistor Value (Ohm)
10
8
6
4
2
0
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
Primary Current, DC or peak (A)
R_max_25
R_max_45
R_max_65
R_max_85


Amplitude / Phase
10,00
8,00
6,00
4,00
2,00
0,00
-2,00
-4,00
10Hz
100Hz
1.000Hz
10.000Hz
Amplitude (%)
Phase Error (deg)


Maximum primary current A_{rms}
Primary Current (A)
1000
100
10
10Hz
100Hz
1.000Hz
10.000Hz
Primary Current (Hz)
Max current (Arms) 25 deg
Max current (Arms) 45 deg
Max current (Arms) 65 deg

Isolation specifications

Parameter	Unit	Value
Clearance	mm	12
Creepage distance	mm	12
Comparative tracking index	CTI	> 600
Rms voltage for AC isolation test, 50/60 Hz, 1 min - 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 DC or rms isolation voltage reinforced isolation, overvoltage category II, Pollution degree 2 according to - IEC 61010-1 - IEC 61010-2-30	V	1000

Absolute maximum ratings

Parameter	Unit	Max	Comment
Primary	kA	5	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		1.5		
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

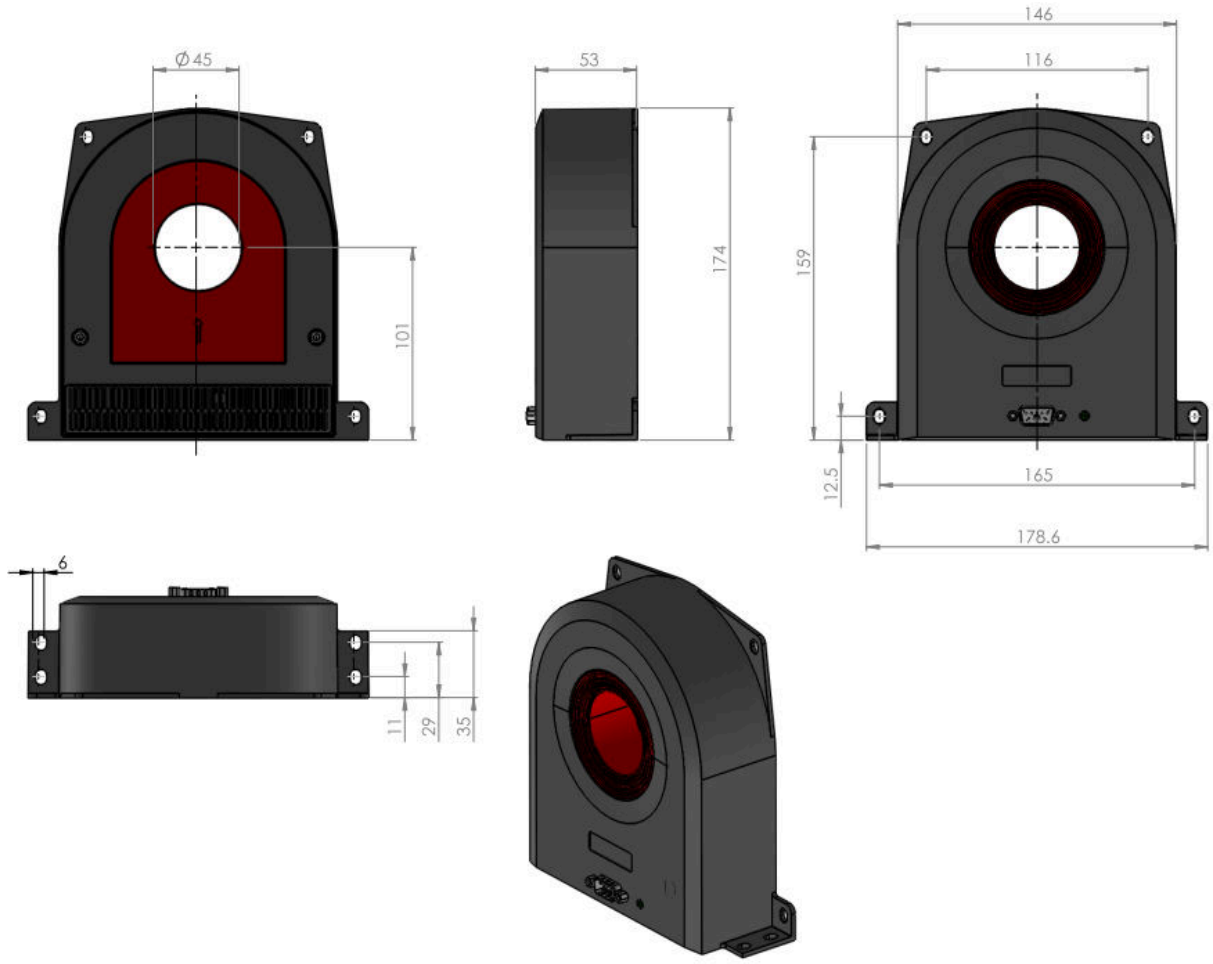
When transducer is operating in normal condition, the status pins (3 and 8) are shorted.

Status pins properties: - forward direction pin 8 to pin 3, maximum forward current 10mA
- maximum forward voltage 60V, maximum reverse voltage 5V

Accessories

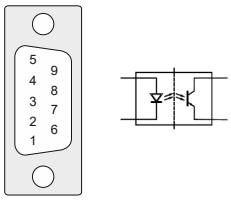
- 4-channel power supplies unit for connection up to 4xDM1200 : DSSIU-4
- 6-channel power supplies unit for connection up to 6xDM1200 : DSSIU-6
- Transducer cables in 5 lengths (2m - 5m - 10m - 15m - 20m): DSUB2 - DSUB5 - DSUB10 - DSUB15 - DSUB20
- Transducer cable 3m for connection to end-user's power supply: Transducer cable for lab PS
  (with access to current output via ϕ4 banana jacks)

Please visit Danisense homepage for relevant datasheets



Dimension in mm (general tolerance 0.3mm unless otherwise stated)

DSUB-9 current output with calibration winding



5	-Vc
9	+Vc
4	0V
8	Status (Optical Isolated)
3	Status (optical isolated)
7	Calibration current +
2	Calibration current -
6	I (Out+)
1	I (Out-)

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Status pin properties.
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- Maximum forward voltage 60V
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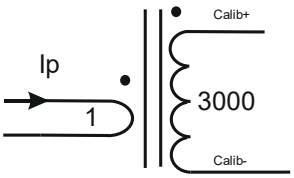

Positive current direction

Is identified by an arrow on the transducer body

Mounting

Base plate mounting:	4 slotted holes Ø6 mm
Back plate mounting:	4 slotted holes Ø6 mm
Fastening torque:	6 Nm

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		Date
Taastrup, Denmark	Henrik Elbæk	2022-03-15