

A contact free flux gate based current measurement sensor – 200A_{rms}

DS 200 is member of the small housing sensor family. The family includes a 200A (1:500) and a 600A (1:1500) version.

Features

- Closed loop compensated current transducer
- Zero flux technology for extreme accuracy
- Industry standard DSUB 9 pin connection
- Green diode for normal operation indication
- Aluminum body for shielding against EMI
- Each sensor is delivered with a gain/phase response



Applications:

- Power analysis
- Stable power supplies
- MRI gradient amplifiers
- Reference transducer for calibration purposes

Specification highlights

- Linearity error 3ppm
- Offset is maximum 12uA
- Operating temperature range -40°C to 85°C
- Turns ratio 1:500
- Aperture size 27.6mm
- 400A peak at 25°C ambient temperature and 1Ω measurement resistor

DC Specifications at Ta=25°C, Supply voltage ± 15V

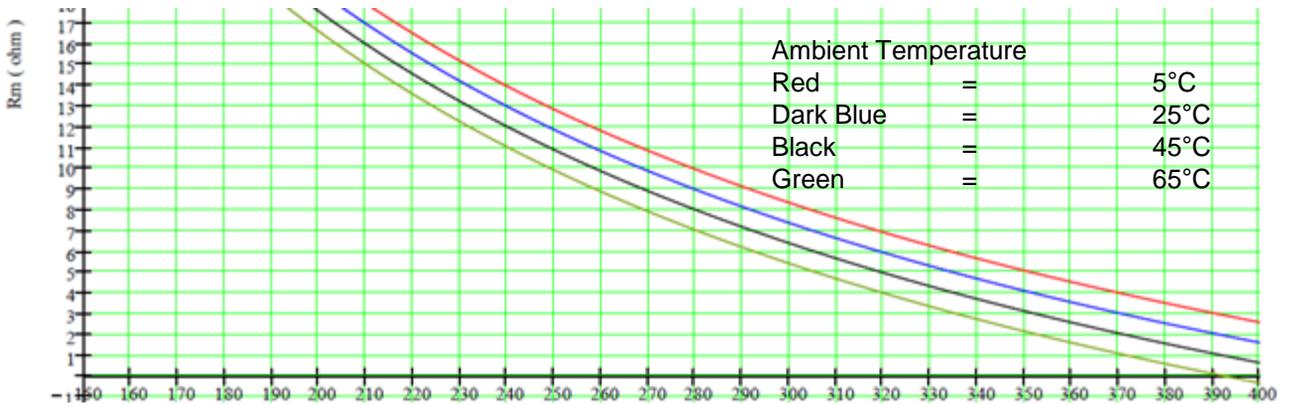
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary Current	I _p	A	-370		370	*
Secondary Current	I _s	mA	-740		740	*
Measuring resistance		Ω	0		3	*
Supply voltage		V	±14.25		±15.75	
Linearity error	ε _{Lin}	uA	-1.2		1.2	Measured on secondary side
Offset current	I _{Offset}	uA	-12		+12	Including earth field. Measured on secondary side
Turns Ratio	Turns		1:500		1:500	
Noise 0-100Hz 0-1kHz 0-10kHz 0-100kHz	Noise	uA rms			0.02 0.04 0.4 1.5	Measured on secondary side
Primary current Overload		kA			1,5	Maximum pulse length 100ms
Positive supply current	I _{ps}	mA		94	102	Add secondary current (if secondary current is positive)
Positive supply current	I _{ns}	mA		86	92	Add secondary current (if secondary current is negative)
Re-injected noise onto primary busbar	U _n	uV rms			5	
Zero Flux Frequency	kHz			31.25		
Stability						
Offset stability over time		uA/Year			0.48	Measured on I _s
Offset change with external magnetic field vertical		uA/mT		0.6	2,4	Magnetic field perpendicular to busbar
Offset change with external magnetic field horizontal		uA/mT		2,4	6	
Offset change with power supply voltage changes voltage		uA/V		0.012	0.12	
Offset change with difference between positive and negative power supply voltage (absolute)		uA/V		0,036	0,12	

* Check burden resistor graph for more information page 3

DC Specifications at Ta=-40°C to 85°C, Supply voltage ± 15V

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary Current DC	I _p	A	-300		300	See graph below
Secondary Current	I _s	mA	-600		600	See graph below
Measuring resistance		Ω	0		3	See graph below
Supply voltage		V	±14.25		±15.75	
Linearity error	ε _{Lin}	uA	1.2		1.2	Measured on secondary side
Offset current	I _{Offset}	uA	-12		+12	Including earth field. Measured on I _s
Stability						
Offset change with temperature		uA/°C	-0.04		0.04	

Below is a graph showing the maximum DC and peak current in the DS200 transducer depending on the measurement resistor value and ambient temperature with a power supply of ±15V.



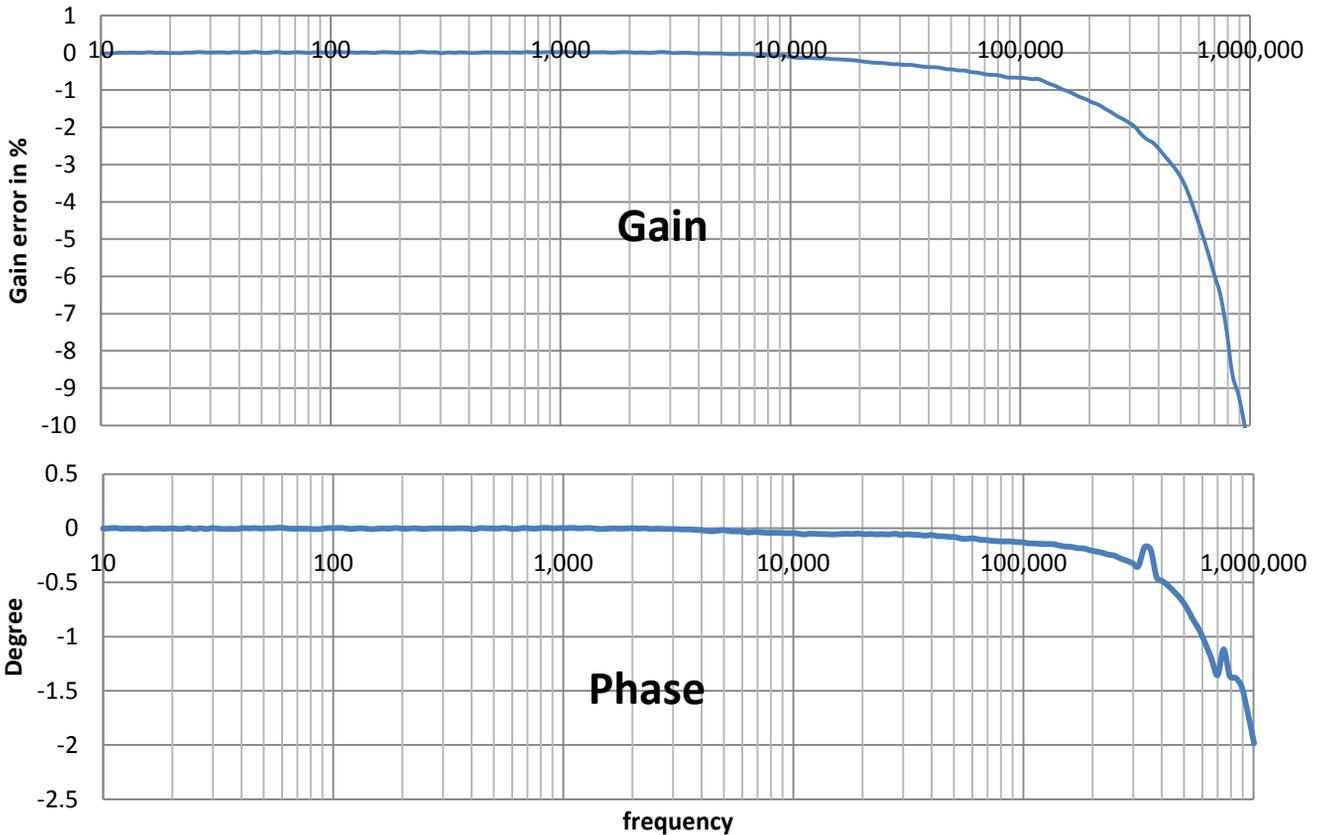
For temperatures above 65 degrees Celsius it is important not to exceed 200 Arms and 300A peak or 200A DC and a maximum measurement resistor value of 3 Ohm.

AC Specifications at Ta=-40°C to 85°C, Supply voltage ± 15V

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary Current, rms	I _p	A			200	*
Secondary Current rms	I _s	mA			400	*
Measuring resistance		Ω	0		3	*
Gain error - DC to 5kHz - 5kHz to 100kHz - 100kHz to 1MHz		%			0.01 1.0 20	Measured with 10Apeak primary current
Phase error - DC to 5kHz - 5kHz to 100kHz - 100kHz to 1MHz		Degree			0,1 0,5 5	

* Check burden resistor graph for more information page 3

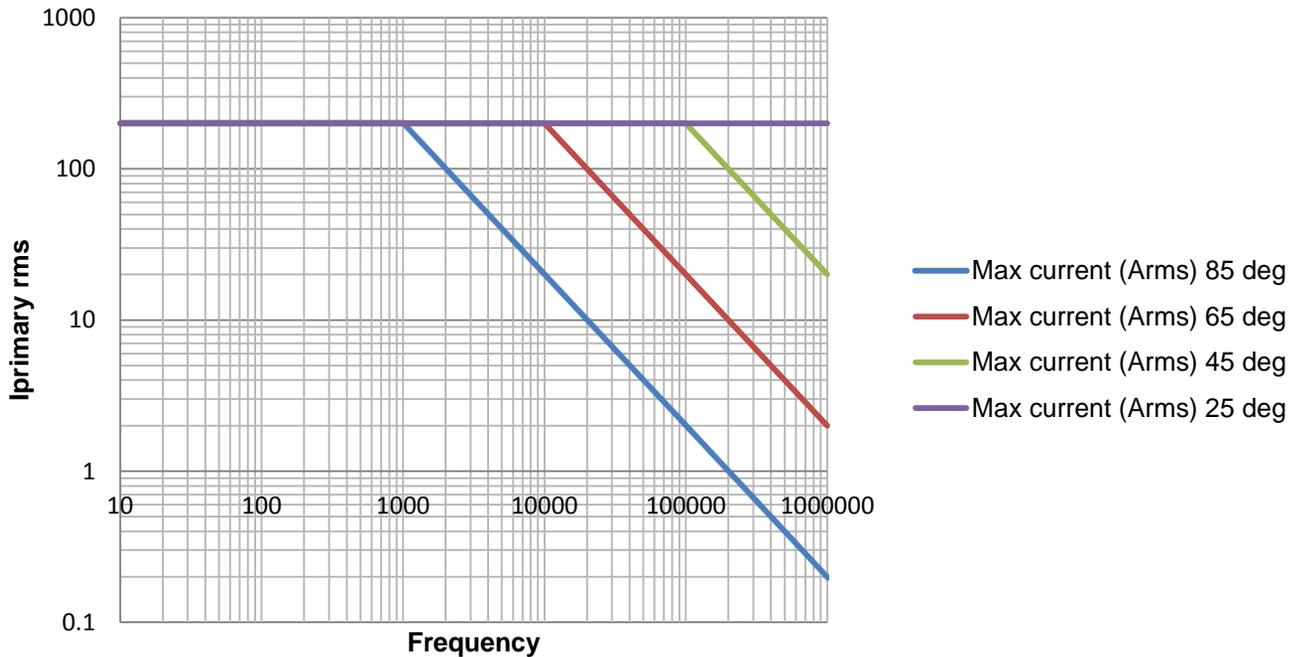
Gain / Phase (typical)



* The phase artifact at 350kHz and 750kHz is coming from the test system

Temperature derating with Iprimary rms, ambient temperature and frequency

Temperature derating of sensor



Absolute maximum ratings

Parameter	Unit	Min	Typ	Max	Comment
Primary	kA			4.5	* Maximum 100ms
Power supply	V			±16.5	
Current in calibration winding	mA			100mA	

Environment and mechanical characteristics

Parameter	Unit	Min	Typ	Max	Comment
Ambient operating temperature	°C	-40		85	
Storage temperature	°C	-40		85	
Mass	kg		0.6		
Standards	EN 61326 EMC EN 61010 Safety				

Isolation and safety characteristics

Parameter	Unit	Min
Rated isolation voltage rms, reinforced isolation IEC 61010-1 standard and with following conditions - Overvoltage category II - Pollution degree 2	V	300
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	kV	10.4
Creepage distance / Clearance	mm	10 / 9
Comparative Tracking Index	CTI	600

Advanced Sensor Protection Circuits “ASPC”

Developed to protect your sensor from fault conditions typically harmful to flux-gate Sensors. Protection against damage to the electronics in the following situations.

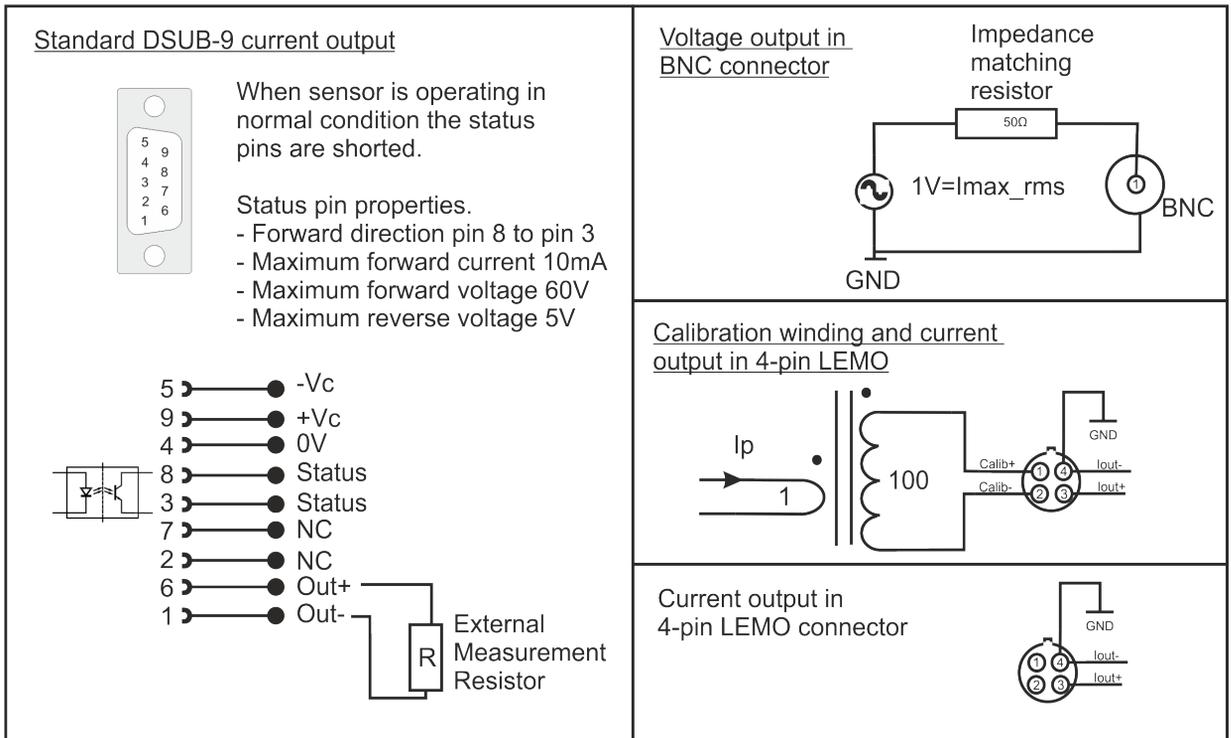
1. Unit is un-powered and secondary circuit is open*
Both DC and AC primary current can be applied up to 100% of nominal current.
2. Unit is un-powered and secondary circuit is closed*
Both DC and AC primary current can be applied up to 100% of nominal current.
3. Unit is powered and secondary circuit is open*
Both DC and AC primary current can be applied up to 100% of nominal current.
4. Unit is powered and secondary circuit is interrupted*
Both DC and AC primary current can be applied up to 100% of nominal current.

*Notice that the sensor core will be magnetized in all four cases, leading to a small change in output offset current (less than 10ppm)

Package content

- Sensor
- Sensor specific test report with Gain / Phase analysis 1Hz-1MHz and CE certificate of conformance

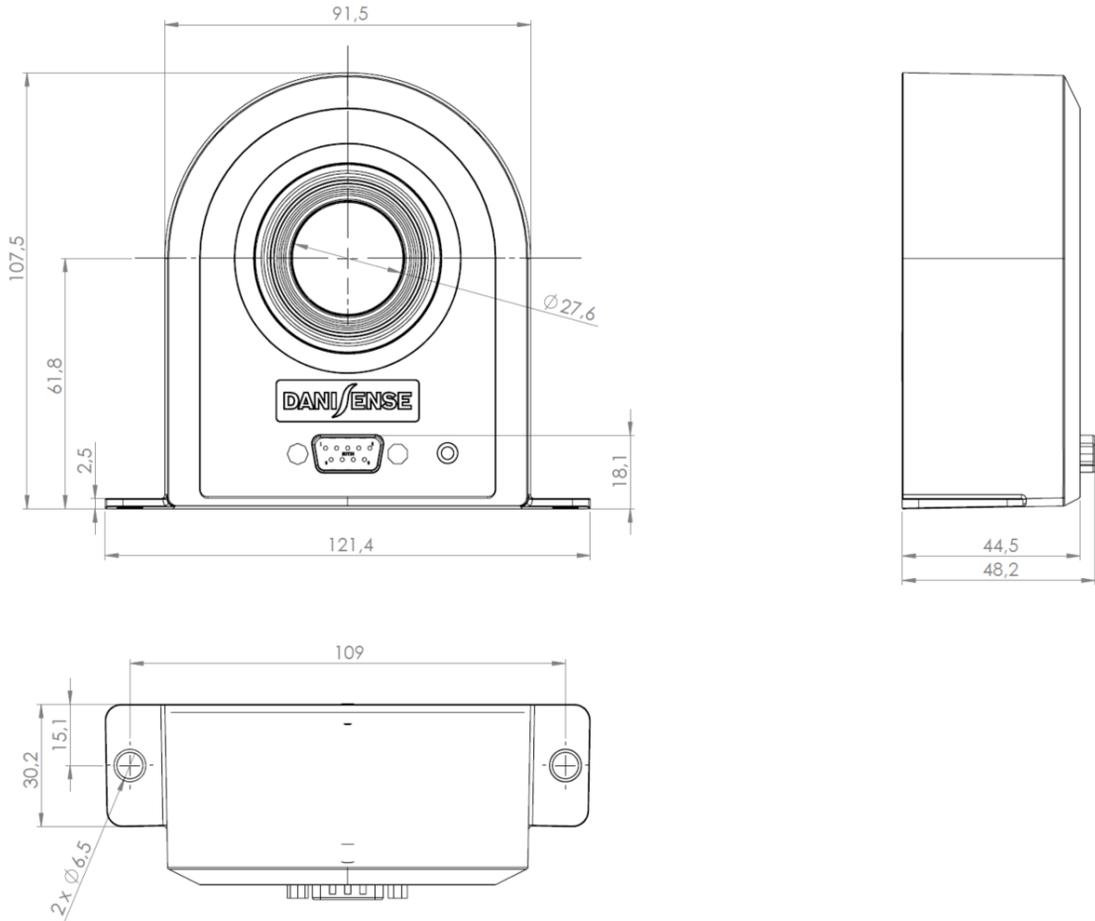
Connection diagram



Options and ordering information

Product Description	Part Name	Part Number
DS 200 with current output in 4-pin LEMO connector	DS200ILSA	1212100003
DS 200 with 1V voltage output in BNC connector	DS200UBSA-1	1212200003
DS 200 with 10V voltage output in BNC connector	DS200UBSA-10	1212200004
DS 200 with calibration winding and current output in 4-pin LEMO	DS200CLSA	1212400005
DS 200 with current output in 9-pin DSUB	DS200IDSA	1212100004

Mechanical dimensions



Mounting bushings on the back

