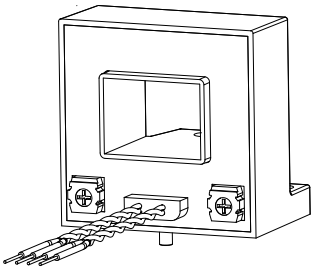
Current Transducer HAL 400-S/SP10

I_{PN} = 400 A

For the electronic measurement of currents: DC, AC, pulsed..., with galvanic separation between the primary circuit and the secondary circuit.



Electrical data

I_{PN}	Primary nominal RMS current	400	A
I_{PM}	Primary current, measuring range	0 ... ±1000	A
$\hat{I}_P$	Overload capability (Ampere Turns)	25000	At
U_{out}	Output voltage (Analog) @ I_{PN}	±4	V
R_L	Load resistance	> 4	kΩ
U_C	Supply voltage (±5 %)	±15	V
I_C	Current consumption	< 25	mA
R_{INS}	Insulation resistance @ 500 V DC	> 500	MΩ

Accuracy - Dynamic performance data

ε	Error [1] @ I_{PN}, T_A = 25 °C	< ±1	% of I_{PN}
U_{OE}	Electrical offset voltage @ I_P = 0, T_A = 25 °C	< ±10	mV
TCU_{OE}	Temperature coefficient of U_{OE}	< ±1	mV/K
TCU_{out}	Temperature coefficient of U_{out}	< ±0.05	%/K
$t_{D\,90}$	Delay time to 90 % of I_{PN} [2]	< 3	µs
BW	Frequency bandwidth (small signal) [3]	DC ... 25	kHz

General data

T_A	Ambient operating temperature	−40 ... +105	°C
T_S	Ambient storage temperature	−40 ... +105	°C
m	Mass	75	g
	Standards	EN 50178: 1997	
		UL 508: 2010	
	Deviation in output when tested to EN 61000-4-6	< 20	% of I_{PN}
	Deviation in output when tested to EN 61000-4-3	< 20	% of I_{PN}

Notes: [1] Excludes the electrical offset

[2] For a di/dt > 50 A/µs

[3] Please refer to derating curves in the technical file to avoid excessive core heating at high frequency.

Features

- Hall effect measuring principle
- Insulating plastic case recognized according to UL 94-V0.

Special features

- Connection of secondary on flying twisted leads 180 mm long
- T_A = −40 °C ... +105 °C.

Advantages

- Very good linerity
- Very good accuracy
- Low temperature drift
- Wide frequency bandwidth
- Very low insertion losses
- High immunity to external interference
- Low power consumption.

Applications

- AC variable speed drives and servo motor drives
- Static converters for DC motor drivers
- Battery supplied applications
- Uninterruptible Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Power suppliers for welding applications.

Application domain

- Industrial.

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UL 508:Ratings and assumptions of certification HAL 400-S/SP10

File # E189713 Volume: 2 Section: 1

Standards

- CSA C22.2 NO. 14 - 10 INDUSTRIAL CONTROL EQUIPMENT - Edition 11 - Revision Date 2011/08/01
- UL 508 STANDARD FOR INDUSTRIAL CONTROL EQUIPMENT - Edition 17 - Revision Date 2010/04/15.

Parameter	Symbol	Unit	Value
Primary involved potential		V AC/DC	300
Max surrounding air temperature	$T_{A\,max}$	°C	80
Primary current	I_P	A	0 to 400
Secondary supply voltage	U_C	V DC	±15
Output voltage	U_{out}	V	0 to 4

Conditions of acceptability

When installed in the end-use equipment, consideration shall be given to the following:

1 - These devices must be mounted in a suitable end-use enclosure.

2 - The terminals have not been evaluated for field wiring.

3 - Low voltage circuits are intended to be powered by a circuit derived from an isolating source (such as a transformer,optical isolator,limiting impedance or electro-mechanical relay) and having no direct connection back to the primary circuit (other than through the grounding means).

4 - Base on results of temperature tests, in the end use application, a maximum of 100 °C cannot be exceeded at soldering point between primary coil pin and soldering point of on the primary bus bar (corrected to the appropriate evaluated max. surrounding air).

Marking

Only those products bearing the UL or UR Mark should be considered to be Listed or Recognized and covered under UL's Follow-Up Service.Always look for the Mark on the product.

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Insulation coordination

U_d	RMS voltage for AC insulation test, 50 Hz/1 min	3	kV
U_{Ni}	Impluse withstand voltage 1.2/50 µs	> 8	kV
		Min	
d_{Cp}	Creepage distance	12.1	mm
d_{Cl}	Clearance	9.8	mm
CTI	Comparative tracking index (group I)	600	

Applications examples

According to EN 50178 and IEC 61010-1 standards and following conditions:

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field

	EN 50178	IEC 61010-1
d_{Cp}, d_{Cl}, U_{Ni}	Rated insulation voltage	Nominal voltage
Basic insulation	1000 V	1000 V
Reinforced insulation	600 V	300 V

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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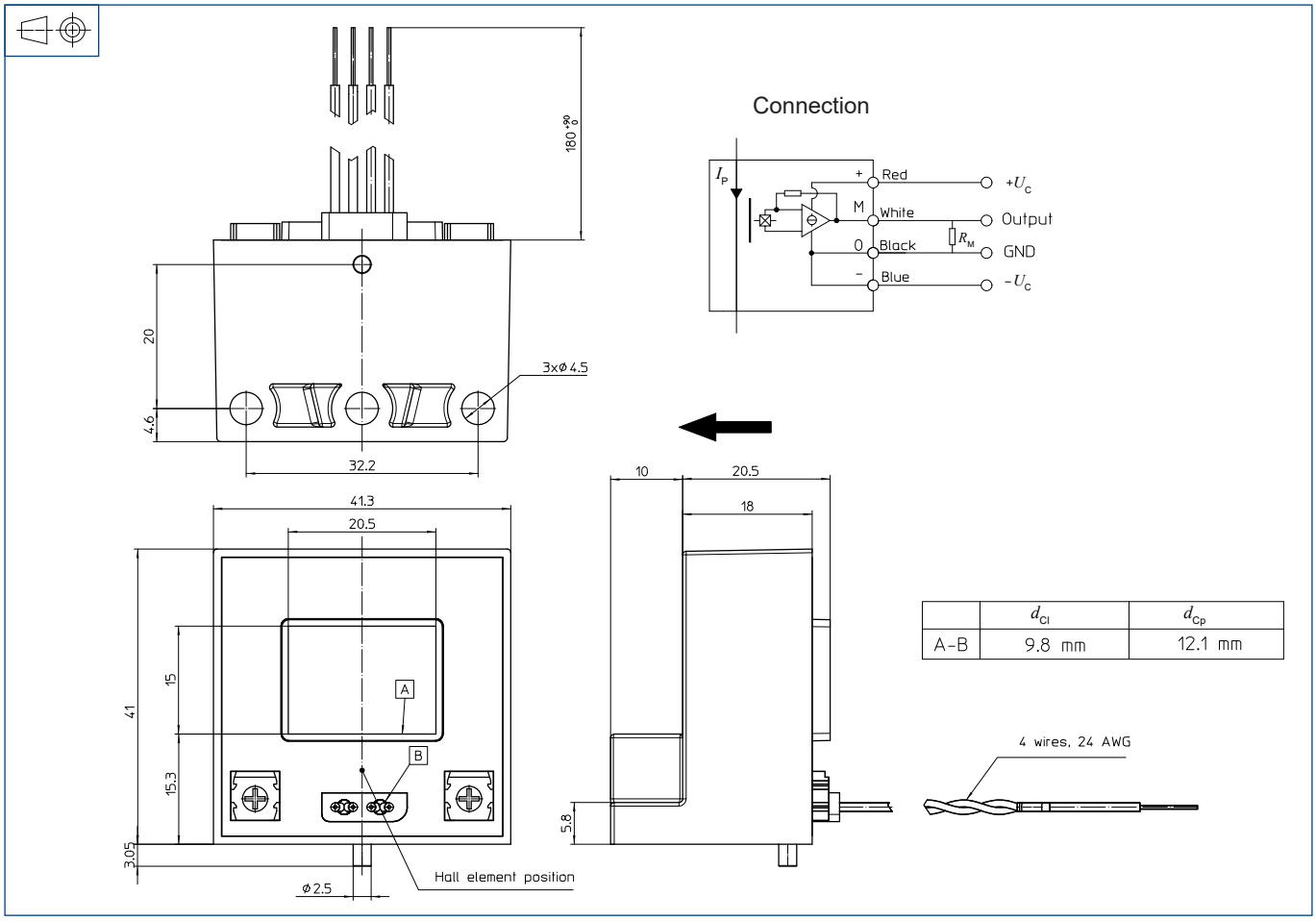
Dimensions HAL 400-S/SP10 (in mm)



	d_{Cl}	d_{Cp}
A-B	9.8 mm	12.1 mm

Mechanical characteristics

- General tolerance ±0.5 mm
- Transducer fastening 3 holes Ø 4.5 mm
  3 M4 steel screws
  Recommended fastening torque 1.2 N·m (±10 %)
- Primary through-hole 20.5 × 15 mm
- Connection of secondary flying twisted leads
  180 mm long

Remarks

- U_{out} is positive when I_P flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 90 °C.
- 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:
  https://www.lem.com/en/file/3137/download/.
- Dynamic performances (di/dt and response time) are best with a single bar completely filling the primary hole.

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