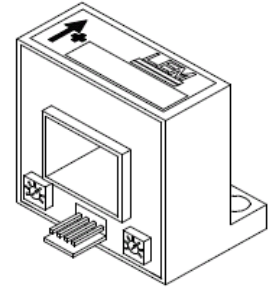# LEM®

# Current Transducer HAL 50..600-S

For the electronic measurement of currents: DC, AC, pulsed..., with galvanic isolation between the primary circuit (high power) and the secondary circuit (electronic circuit).

$I_{PN}$ = 50 .. 600 A

## Electrical data

| Primary nominal current rms $I_{PN}$ (A) | Primary current measuring range [4] $I_{PM}$ (A) | Type | RoHS since date code |
|---|---|---|---|
| 50 | ± 150 | **HAL 50-S** | 46180 |
| 100 | ± 300 | **HAL 100-S** | 46065 |
| 200 | ± 600 | **HAL 200-S** | 46090 |
| 300 | ± 900 | **HAL 300-S** | 46142 |
| 400 | ± 1000 | **HAL 400-S** | 46114 |
| 500 | ± 1000 | **HAL 500-S** | 46306 |
| 600 | ± 1000 | **HAL 600-S** | 46059 |

| | | | | |
|---|---|---|---|---|
| $I_P$ | Overload Capability (Ampere Turns) | | 30,000 | A |
| $V_{OUT}$ | Output voltage (Analog) @ ± $I_{PN}$ | | ± 4 | V |
| $R_L$ | Load resistance @ $T_A$ = 0 .. + 70°C | | > 1 | kΩ |
| | @ $T_A$ = - 25 .. + 85°C | | > 3 | kΩ |
| $V_C$ | Supply voltage (± 5 %) | | ± 15 | V |
| $I_C$ | Current consumption | | < ± 25 | mA |
| $V_b$ | Rated isolation voltage rms[1] | | 500 | V |
| $V_d$ | Rms voltage for AC isolation test, 50 Hz, 1 min | | 3 | kV |
| $R_{is}$ | Isolation resistance @ 500 $V_{DC}$ | | > 500 | MΩ |

## Accuracy - Dynamic performance data

| | | | | |
|---|---|---|---|---|
| X | Accuracy @ $I_{PN}$ , $T_A$ = 25°C, ± 15 V | | < ± 1 | % |
| $\varepsilon_L$ | Linearity error[2] | | < ± 0.5 | % of $I_{PN}$ |
| $V_{OE}$ | Eletrical offset voltage @ $T_A$ = 25°C | HAL 50-S | < ± 20 | mV |
| | | HAL 100..600-S | < ± 10 | mV |
| $V_{OM}$ | Magnetic offset voltage @ $I_P$ = 0, after an overload of 3 x $I_{PN}$ | HAL 50-S | < ± 30 | mV |
| | | HAL 100..200-S | < ± 20 | mV |
| | | HAL 300..600-S | < ± 10 | mV |
| $TCV_{OE}$ | Temperature coefficient of $V_{OE}$ | HAL 50-S | < ± 2.0 | mV/K |
| | | HAL 100..600-S | < ± 1.0 | mV/K |
| $TCV_{OUT}$ | Temperature coefficient of $V_{OUT}$ ( % of reading ) | | ≤ ± 0.05 | %/K |
| $t_r$ | Response time to 90% of $I_{PN}$ step | | ≤ 3 | µs |
| BW | Frequency bandwidth (- 3 dB)[3] | | DC .. 50 | kHz |

## General data

| | | | | |
|---|---|---|---|---|
| $T_A$ | Ambient operating temperature | | - 25 .. + 85 | °C |
| $T_S$ | Ambient storage temperature | | - 25 .. + 85 | °C |
| *m* | Mass | app. | 75 | g |
| | Standard[4] | Safety | EN 50178 : | 1994 |
| | | EMC | EN50082-2: | 1992 |
| | | | EN50081-1: | 1992 |
| | 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] Overvoltage Category III, Pollution Degree 2
[2] Excludes the electrical offset
[3] Derating is needed to avoid excessive core heating at high frequency.
[4] Please consult characterisation report for more technical details and application advice.

## Features

- Hall effect measuring principle
- Galvanic isolation between primary and secondary circuit
- Isolation voltage 3000V
- Low power consumption
- Extended measuring range(3 x $I_{PN}$)
- Isolated plastic case recognized according to UL 94-V0

## Advantages

- Easy installation
- Small size and space saving
- Only one design for wide current ratings range
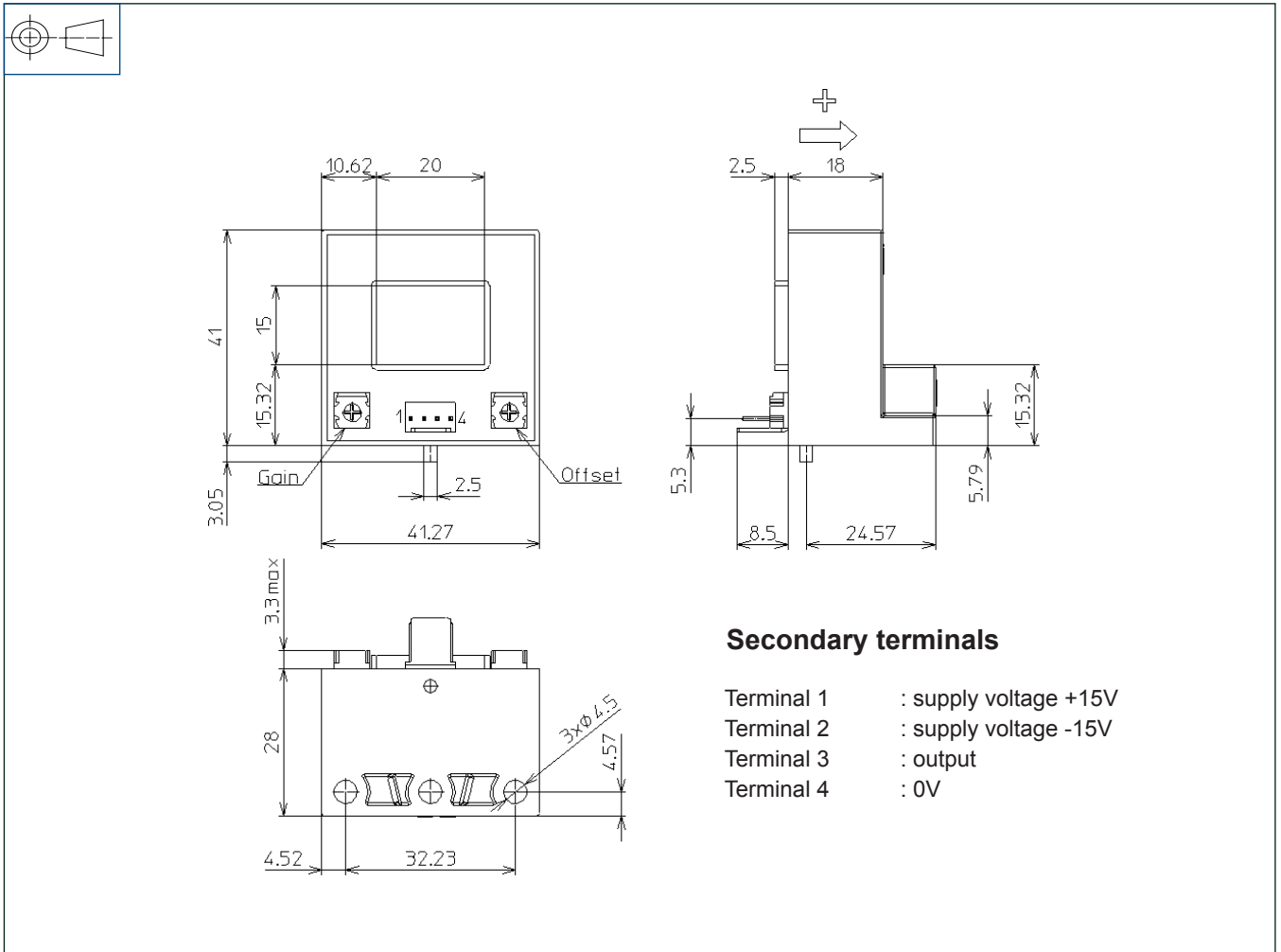- High immunity to external interference

## Applications

- AC variable speed drives
- DC motor drives
- Battery supplied applications
- Uninterruptable Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Power supplies for welding applications.

## Application domain

- Industrial

## Dimensions HAL 50..600-S (in mm. 1 mm = 0.0394 inch)



### Secondary terminals

Terminal 1 : supply voltage +15V
Terminal 2 : supply voltage -15V
Terminal 3 : output
Terminal 4 : 0V

### Mechanical characteristics

- General tolerance      ± 0.5 mm
- Primary through-hole      20 mm x 15 mm
- Connection of secondary      Molex 5045-04-A

### Remarks

- $V_{OUT}$ is positive when $I_P$ flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 90°C.
- This is a standard model. For different versions please contact us.

### Safety

⚠️

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 built-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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110209/5      LEM reserves the right to carry out modifications on its transducers, in order to improve them, without prior notice.      www.lem.com