Magnetec

MB-67x series
6mA-DC-sensors

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Contents

MB-67x series

Safe, reliable, flexible

MAGNETEC offers AC/DC sensitive differential current transformers for charging cable (mode 2), AC wallbox (mode 3), DC charging station (mode 4) and optional in on-board charger applications.

The MB-67x series features a high permeability Nanoperm® core, which makes the detection of very low (6mA) DC currents possible.

It enables the use of individual and customized evaluation circuits, allowing an ideal system integration in to your application in a cost-efficient way.

MAGNETEC sensors are already in use at numerous automotive OEMs.

Why to choose MAGNETEC's MB-67x series?

MAGNETEC offers customers design support to ensure they get the best and most cost-effective solutions for their specific application.

Various designs with the same electrical performance allow customers to use MAGNETEC's MB-67x series in different products without additonal development costs.

The relevant standard for EV charging modes is IEC 61851-1 and it defines 4 charging modes.

MAGNETEC residual current device (RCD) sensors are the most important components for In-Cable control boxes (IC-CPDs) or wallboxes for charging electric vehicles. These sensors are available for various applications in different and compact designs. The MB-67x series, specifically developed for EV-charging solutions, provides all-current sensitivity and can trigger an automatic shut-off in case of hazardous electrical faults (DC and AC) according to IEC 62752 or UL2231.

Benefits

- Protects against hazardous situations with fault currents, preserving residual current circuit-breakers (RCCBs) type A from saturation
- Small footprint allows integration into compact IC-CPD
- Suitable for harsh environmental conditions due to a robust mechanical and electrical design
- Electrical safety at lower cost (compared to RCCB type B)
- Test winding included for self-monitoring and test functions

Differential current sensor

Generally, AC/DC-sensitive differential current sensors can be used where direct current and alternating current circuits are directly connected and therefore AC/DC leakage currents can occur.

Typically, type A RCCBs are the sole type installed in private households, unable to detect and act on DC fault currents. Therefore, everybody that wants to charge an electric vehicle (EV) from a home power supply would require a costly type B RCCB to guarantee safety in the presence of DC fault currents.

A differential current sensor integrated into an IC-CPD or wall box provides all-current sensitivity and electrical safety at low cost and makes the installation of an expensive type B RCCB obsolete.

As the differential currents to be monitored only occur in the event of electrical faults and are extremely low (mA), maximum measurement precision is critical. In addition, a fast response time is required to maintain safety features and prevent humans from getting injured. Differential current sensors fulfill both of these essential requirements.

MAGNETEC provides personal protection since 20 years

- 6mA DC sensitive residual current monitoring for AC charging stations
- RCMB121- compliant and safe charging at a lower cost

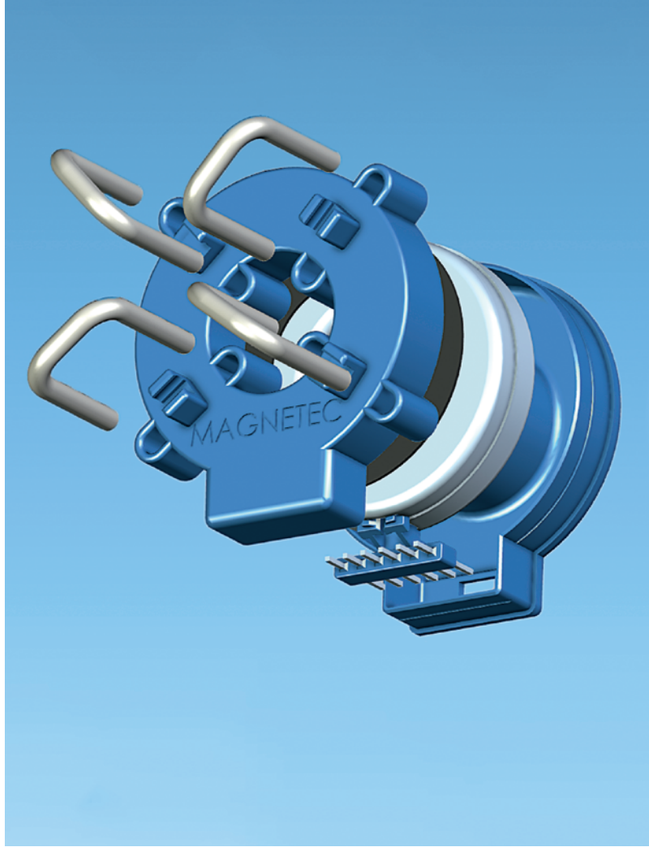
Since January 1st, 2019 the IET Wiring Regulations 18th Edition Section 722.531.2.101 states that it is required to design into all electric charging station protective measures against DC fault currents.

In electric vehicle charging if the DC fault current is greater than 6mA, it could change the characteristics of a type A RCD due to its core saturation, resulting in the type A device failing to trip, thereby not detecting the DC fault. In this instance, the risk of electric shock is increased, and safety is compromised.

The new wiring regulations authorize two provisions for DC fault protection:

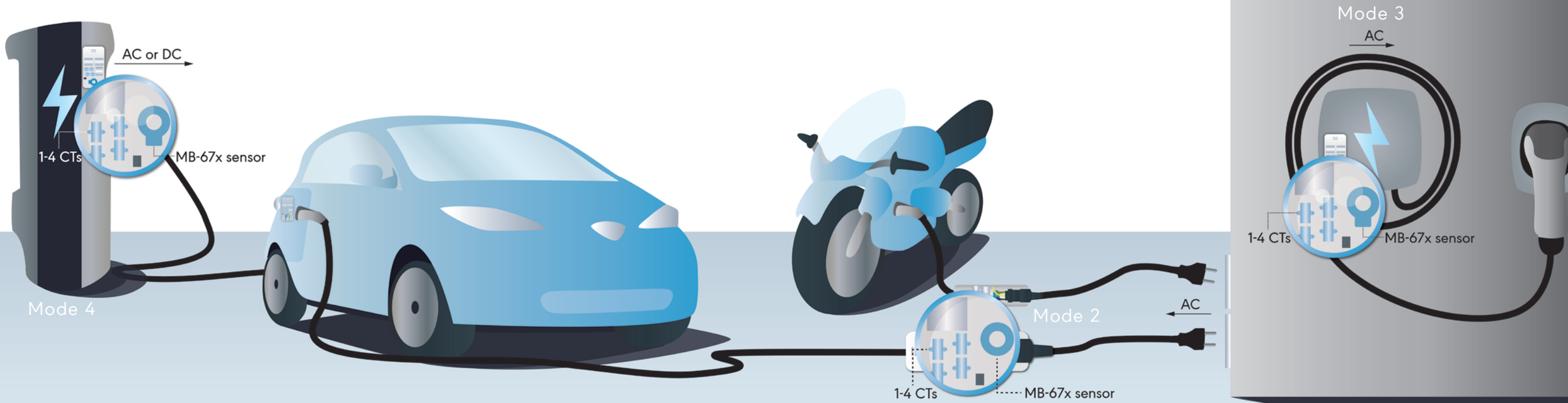
- Use type B RCD, which is suitable for AC and DC fault protection but usually the cost is 10 times higher than that of a type A RCD
- Use type A RCD and a DC 6mA sensor to provide a means to disconnect the supply in case of DC fault, which is commercially a much more attractive solution.

MAGNETEC's new 6 mA DC sensor ensures compliance with the updated BS7671:2018 and reduces the cost of developing electric vehicle charging solutions.



Automotive EV-Charging – mode 2-4

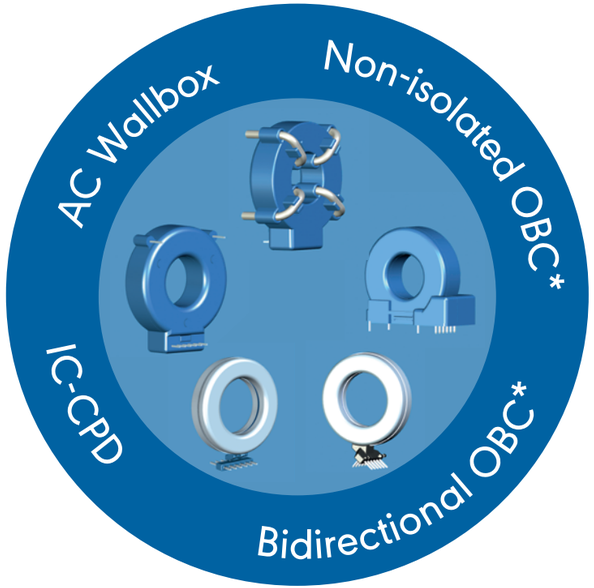
IC-CPD I AC wallbox I Charging station I optional in On-Board charger



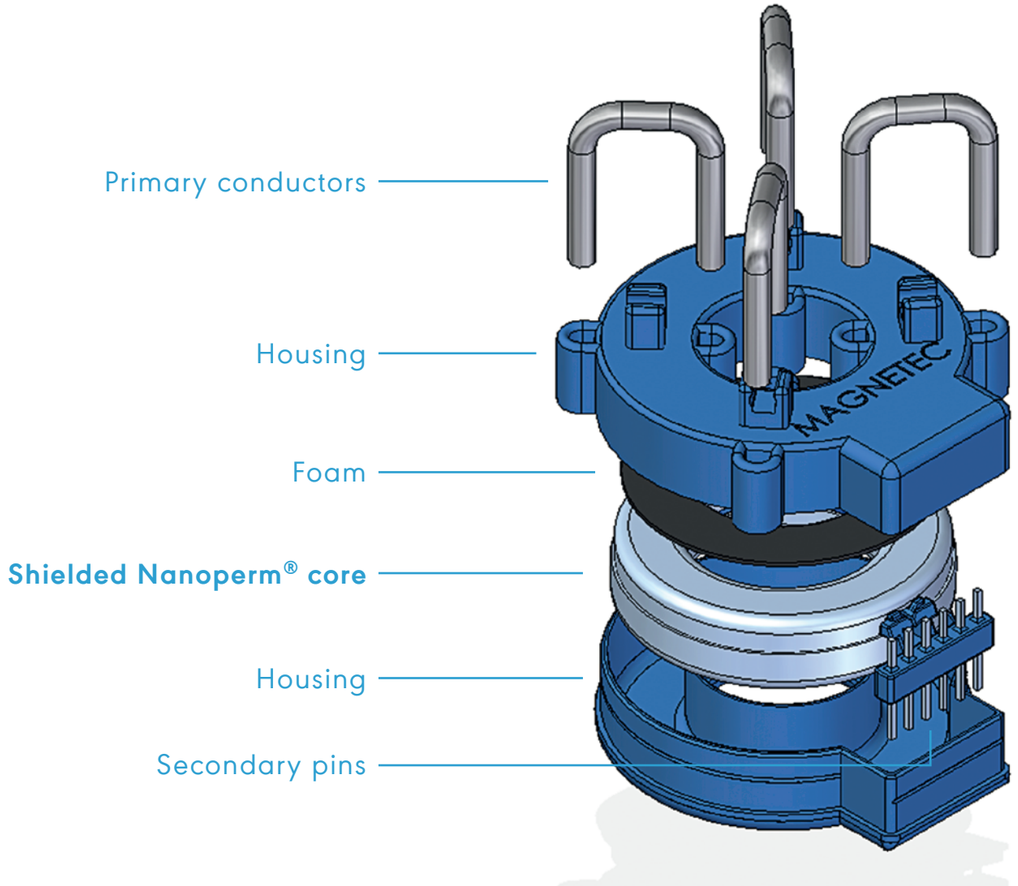
MAGNETEC current sensor

Portfolio of 6mA DC / 30mA AC sensors compliant with standards **UL 2231-1, UL 2231-2 , IEC 61851-1, IEC 62752, GB/T20234.2-2015, NB/T42077-2016.**

Compact design, test windings to verify functionality, complies with standards, available in industrial and automotive grade versions.



*On-Board Charger



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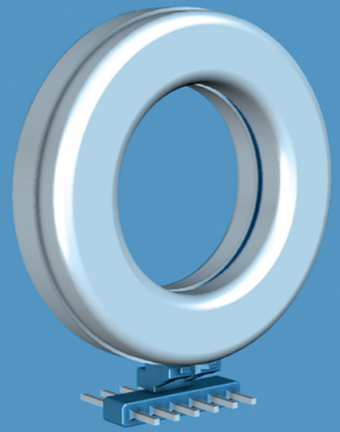
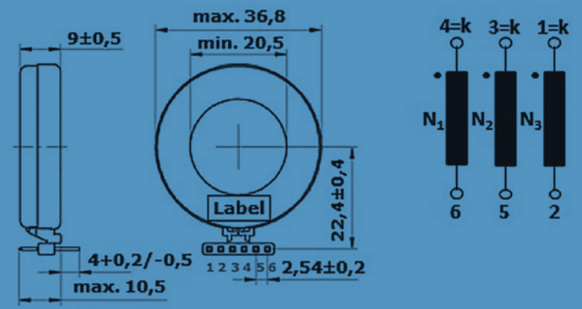




Features

- Nanoperm® core
- Horizontal mounting
- Inner diameter 21mm
- Secondary Pins 0,64mm square, material CuNi18Zn20 alloy
- Low temperature drift / temperature resistant
- Shielded against electrical noise and false triggering caused by high inrush current peaks
- Open loop current transducer
- Compatible with all cable diameters up to 43kW charging power (3x63A)
- Mode 2 (IEC62752) drop test compatible
- One product family covers all mode 2 (IC-CPD) and mode 3 (wallbox) applications
- Bottom side is epoxy coated
- UL listed materials: UL 2231-1, UL 2231-2

Advantages

- Very low error at small currents
- High overload capability and high insulation capability
- Test winding
- Takes over the job of the expensive type B RCCBs

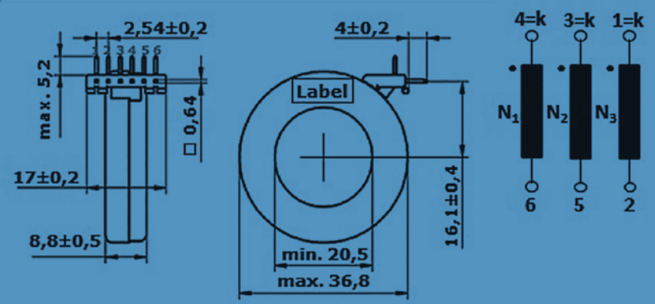
Applications

- Leakage current measurement in an IC-CPD (in-cable contact and protection device) (mode 2), wallboxes (mode 3) and for charging station (mode 4)

Complies with applications using these standards

- Residual current detection according to IEC 61851-1, IEC 62752, IEC 62955
- GB/T20234.2-2015
- NB/T42077-2016

MB-671



Features

- Nanoperm® core
- Vertical mounting
- Inner diameter 21mm
- Secondary Pins 0,64mm square, material C5191 with Sn (3-8 µm) plating over Ni (1,25-3 µm)
- Low temperature drift / temperature resistant
- Shielded against electrical noise and false triggering caused by high inrush current peaks
- Open loop current transducer
- Compatible with all cable diameters up to 43kW charging power (3x63A)
- Mode 2 (IEC62752) drop test compatible
- One product family covers all mode 2 (IC-CPD) and mode 3 (wallbox) applications
- Bottom side is epoxy coated
- UL listed materials: UL 2231-1, UL 2231-2

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- Leakage current measurement in an IC-CPD (in-cable contact and protection device) (mode 2), wallboxes (mode 3) and for charging station (mode 4)

Complies with applications using these standards

- Residual current detection according to IEC 61851-1, IEC 62752, IEC 62955
- GB/T20234.2-2015
- NB/T42077-2016

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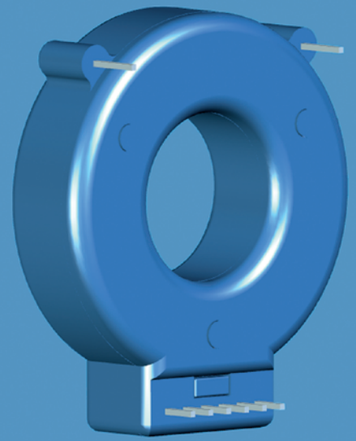

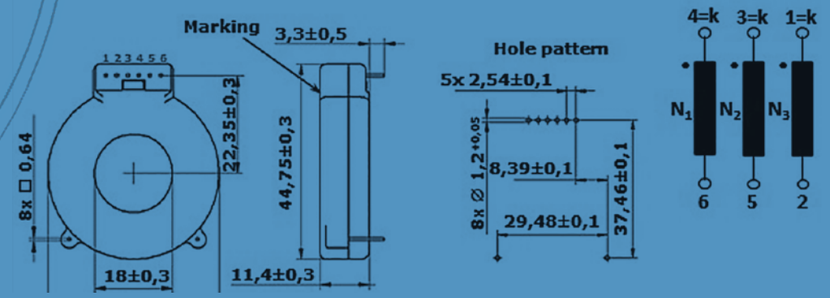

Features

- Nanoperm® core
- Horizontal mounting
- Inner diameter 18mm
- Pins 0,64mm square, material CuNi18Zn20 alloy
- Low temperature drift / temperature resistant
- Shielded against electrical noise and false triggering caused by high inrush current peaks
- Open loop current transducer
- Compatible with all cable diameters up to 43kW charging power (3x63A)
- Fulfills clearance and creepage distances from mode 3 (IEC 62955)
- Mode 2 (IEC62752) drop test compatible
- One product family covers all mode 2 (IC-CPD) and mode 3 (wallbox) applications
- Non-marked tolerance according to ISO 2768 – m
- UL listed materials: UL 2231-1, UL 2231-2

Advantages

- Very low error at small currents
- High overload capability and high insulation capability
- Test winding
- Takes over the job of the expensive type B RCCBs

Applications

- Leakage current measurement in an IC-CPD (in-cable contact and protection device) (mode 2), wallboxes (mode 3) and for charging station (mode 4)

Complies with applications using these standards

- Residual current detection according to IEC 61851-1, IEC 62752, IEC 62955
- GB/T20234.2-2015
- NB/T42077-2016

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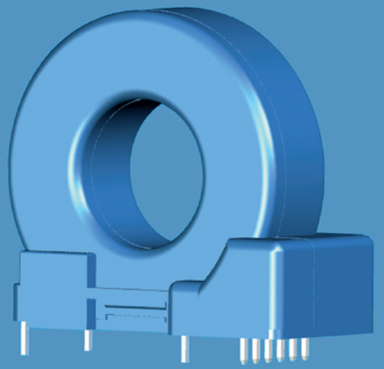

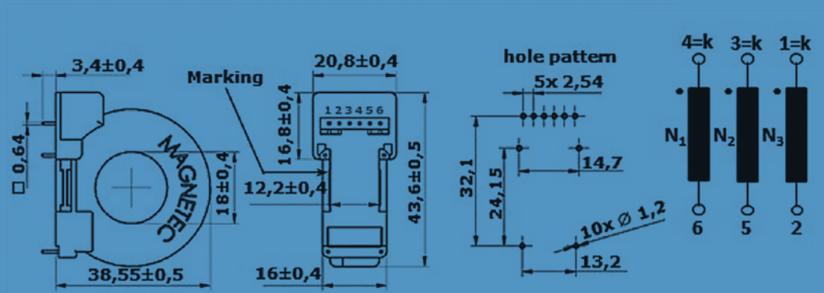

Features

- Nanoperm® core
- Vertical mounting
- Inner diameter 18mm
- Pins 0,64mm square, material CuNi18Zn20 alloy or tinned Cu
- Low temperature drift / temperature resistant
- Shielded against electrical noise and false triggering caused by high inrush current peaks
- Open loop current transducer
- Compatible with all cable diameters up to 43kW charging power (3x63A)
- Fulfills clearance and creepage distances from mode 3 (IEC 62955)
- Mode 2 (IEC62752) drop test compatible
- One product family covers all mode 2 (IC-CPD) and mode 3 (wallbox) applications
- UL listed materials: UL 2231-1, UL 2231-2

Advantages

- Very low error at small currents
- High overload capability and high insulation capability
- Test winding
- Takes over the job of the expensive type B RCCBs

Applications

- Leakage current measurement in an IC-CPD (in-cable contact and protection device) (mode 2), wallboxes (mode 3) and for charging station (mode 4)

Complies with applications using these standards

- Residual current detection according to IEC 61851-1, IEC 62752, IEC 62955
- GB/T20234.2-2015
- NB/T42077-2016

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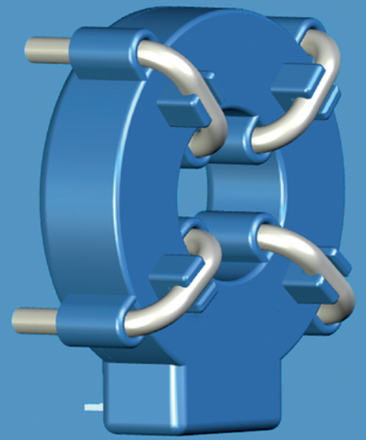

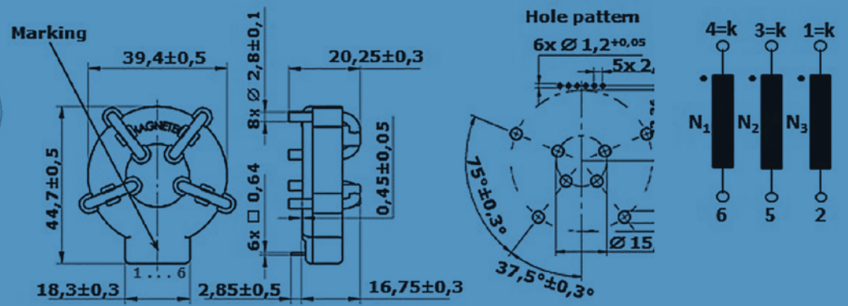

Features

- Nanoperm® core
- Horizontal mounting
- Secondary Pins 0,64mm square, material CuNi18Zn20 alloy
- Low temperature drift / temperature resistant
- Shielded against electrical noise and false triggering caused by high inrush current peaks
- Open loop current transducer
- With integrated primary conductors up to 22kW charging power (3x32A)
- Fulfills clearance and creepage distances from mode 3 (IEC 62955)
- Mode 2 (IEC62752) drop test compatible
- One product family covers all mode 2 (IC-CPD) and mode 3 (wallbox) applications
- UL listed materials: UL 2231-1, UL 2231-2

Advantages

- Very low error at small currents
- High overload capability and high insulation capability
- Test winding
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Applications

- Leakage current measurement in an IC-CPD (in-cable contact and protection device) (mode 2), wallboxes (mode 3) and for charging station (mode 4)

Complies with applications using these standards

- Residual current detection according to IEC 61851-1, IEC 62752, IEC 62955
- GB/T20234.2-2015
- NB/T42077-2016

MB-67x
customer design options

MAGNETEC sensors are compatible with all common evaluation systems and can be adapted to customer specific evaluation units.

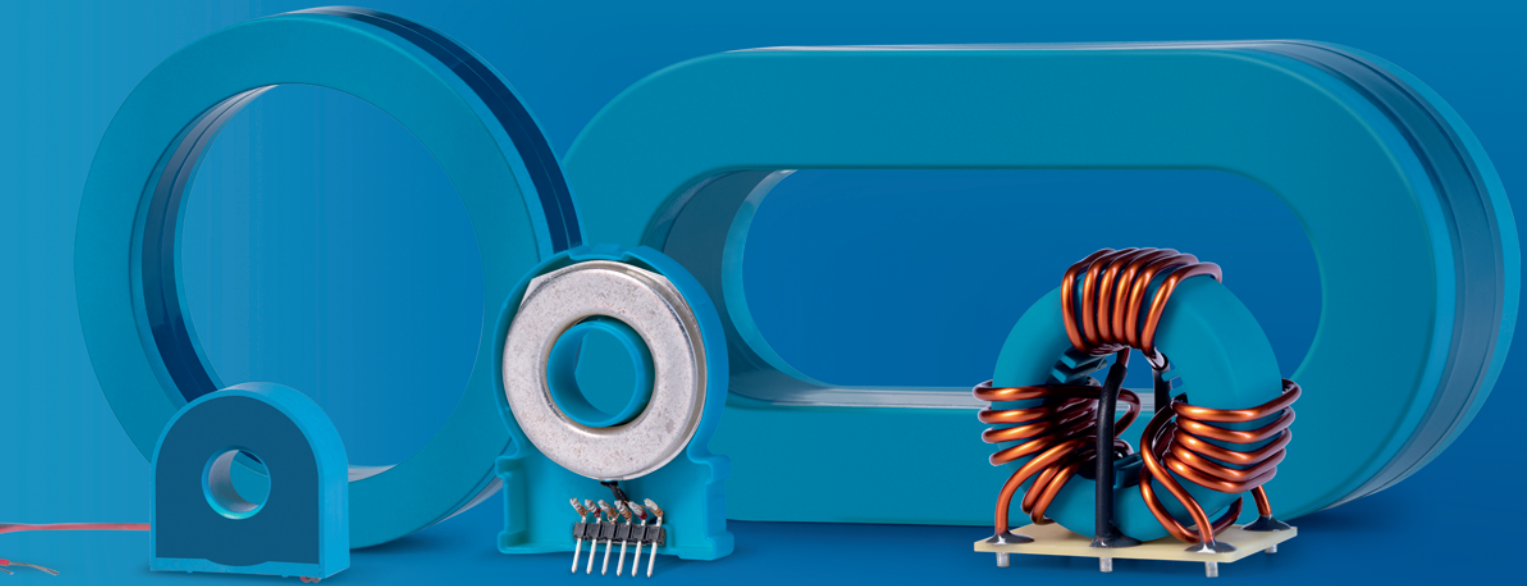
A sensor in combination with a separate evaluation unit is a more cost-effective solution than a system where the logic is integrated in the system and provides more flexibility for customization.

MAGNETEC offers customers the single sensor or a full solution package (sensor and evaluation system – standard or customer specific). In cooperation with well-known partner MAGNETEC offers the complete solution.

The MB-67x series is avaiable as an off-the-shelf solution in various formfactors and performance levels and can be customized to meet individual requirements.

Magnetec

Efficiency is our passion



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