ISABELLENHÜTTE
Innovation by Tradition

IVT 3 SERIES

The IVT 3 is a compact high precision current measurement device, which is built on a platform concept where functional components can be added to adapt to many different use cases. The Pro version supports insulation resistance monitoring and 3 or 6 voltage measurement channels.
The IVT 3 series is developed according to ISO 26262:2018 (Road vehicles – Functional safety).

APPLICATIONS

The IVT 3 series can be used for a wide range of DC applications, like:

- Hybrid and battery electric vehicles
- Stationary energy storage systems
- Uninterruptable power supply (UPS) systems
- Battery based applications
- Fuel cells
- Industrial applications

Current/Voltage/Insulation Monitoring Sensor

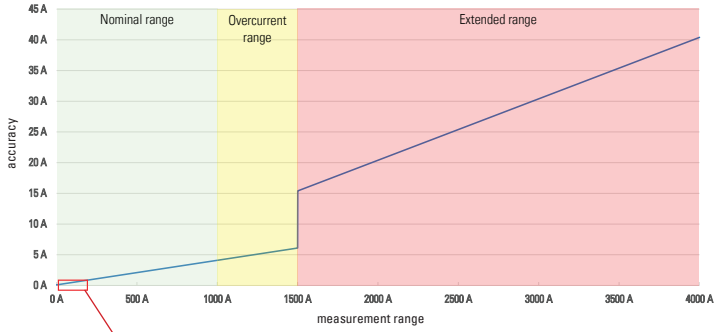
- Shunt based current measurement (ASIL C)
- 3 or 6 voltage measurement inputs (ASIL B)
- Active isolation monitoring (ASIL B)
- Temperature measurement
- Nominal current measurement range: ±1,000 A
- Extended measurement range: ±4,000 A
- Total accuracy ± (0.4 % of rdg. + 0.1 A) *
  (over whole temperature range -40 °C up to 125 °C)
- Isolation according to ISO 60664 basic isolation
- CAN 2.0B
- Diagnosis via UDS
- Supply voltage 12/24 V

*rdg. = reading; measured value

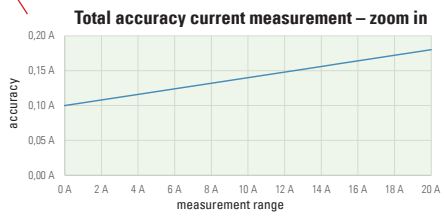
	IVT 3 Base	IVT 3 Pro
Current Measurement (ASIL C)	✓	✓
Voltage Measurement 6 channels (ASIL B)		✓
Insulation monitoring (ASIL B)		✓
Temp. Measurement	✓	✓
Diagnosis via UDS	✓	✓
AUTOSAR 4.0.3	✓	✓
CAN 2.0 B	✓	✓
CAN Termination	optional	optional
Independent Analog Channel	optional	optional
Sleep mode	optional	optional
Supply Voltage 24 V	development	✓

This graphic shows the maximum accuracy of the current measurement over the whole temperature range of -40…105 °C.

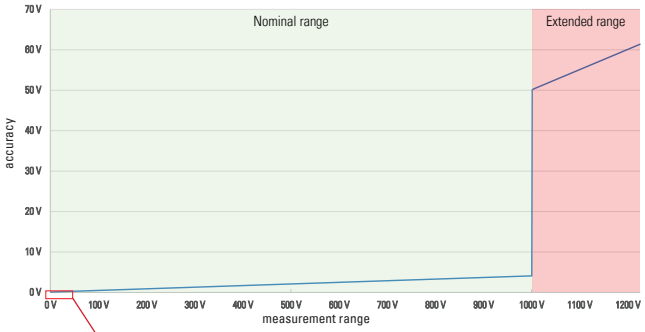
Total accuracy current measurement



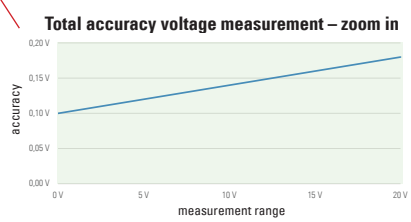
Total accuracy current measurement – zoom in



Total accuracy voltage measurement

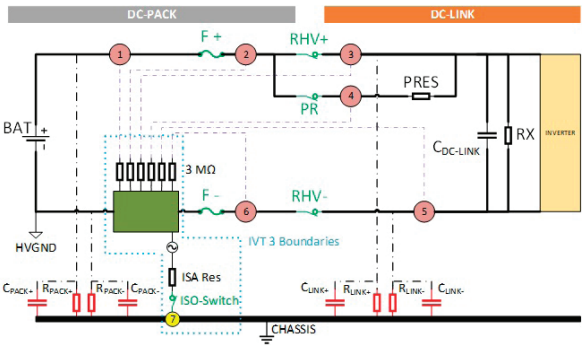


Total accuracy voltage measurement – zoom in



INSTALLATION

The following graphic shows the connection scheme of the IVT 3 Pro. For the voltage channels in IVT 3 Pro, the measurement points **1, 3, 5** must be connected as shown in the picture, to ensure that there is no disturbance of the insulation monitoring. Moving **2**, **4, 6** to other positions is possible, but not recommended. Due to the fact that changing positions could result in deviation of insulation monitoring. The IVT 3 Pro can also be placed in the plus path of the battery. In this case, the rules for the voltage measurement points remain the same, however the position of the sensor and **1** are inverted. Insulation monitoring can be switched on and off via CAN.



Technical data of the active insulation detection

Parameter	Min.	Typical	Max.	Unit
Nominal measurement range	0		50	MΩ
Total accuracy measurement, range 0 kΩ - 100 kΩ	-30		+0	kΩ
Total accuracy measurement, range 100 kΩ - 5 MΩ	-25		+0	%
Total accuracy measurement, range 5 MΩ - 50 MΩ	-30		+0	%
Distinguishable measuring zones		4		

Independent analog current measurement channel

The analog channel is implemented by a passive hall sensor that requires a stable 5 V supply voltage, as the output voltage is ratiometrically dependent on the input voltage. This analog output is **NOT** necessary to reach any ASIL C classification.

Parameter	Min.	Typical	Max.	Unit
Nominal measurement range		±4000		A
Linearity		0.04		% (of 2.5V)
Sensitivity		~0.3		mV/A
Supply voltage	4.5	5	5.5	V (DC)
Analog temperature measurement range	-40		150	°C