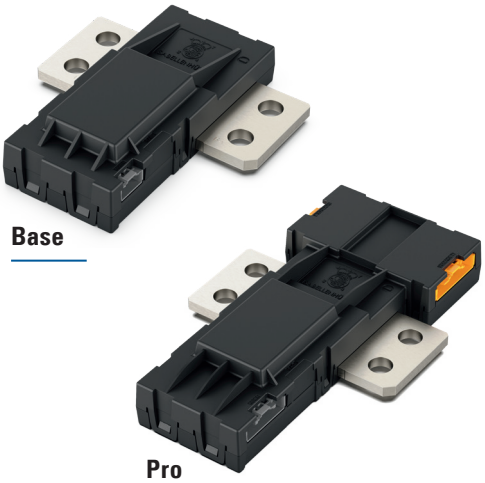
ISABELLENHÜTTE

IVT 3

COMPACT SMART SENSING

ISAscale® compact high precision smart sensing device



INTRODUCTION

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 3 or 6 voltage measurement channels and an optional insulation resistance monitoring. The IVT 3 series is developed according to ISO 26262:2018 (Road vehicles – Functional safety).

APPLICATIONS

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

FEATURES

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

*rdg. = reading; measured value

	IVT 3 Base	IVT 3 Pro
Current Measurement (ASIL C)	✓	✓
Voltage Measurement Channels (ASIL B)	—	*3 or 6*
Insulation Monitoring (QM)	—	*optional*
Temp. Measurement	✓	✓
Diagnosis via UDS	✓	✓
AUTOSAR 4.0.3	✓	✓
CAN 2.0 B	✓	✓
CAN Termination	*optional*	*optional*
Sleep Mode	*optional*	*optional*
Supply Voltage	*12 V*	*12 V or 24 V*
Coulomb Counter	—	*optional*
Energy Counter	—	*optional*

IVT 3

Part Description / Ordering

IVT – 3 – 1K – U6 – IRE – CAN1 – 24 - XXX

Product group
IVT

Product name 2nd level
3

Current range
1K – nominal range 1000 A

Voltage channels
U0 – 0 voltage channels - Base
U3 – 3 voltage channels - Pro
U6 – 6 voltage channels - Pro

Key features
I – galvanic isolation
R – insulation monitoring
E – energy/coulomb counter

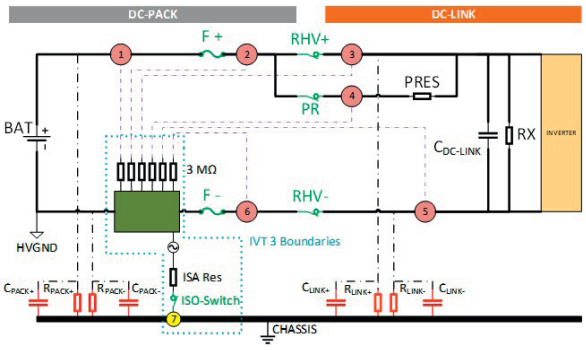
CAN type & termination
CAN1 – with internal termination
CAN2 – without internal termination

Supply voltage
12 – 12 V
24 – 24 V

Optional customer internal code
3 characters (customer specific variants will be filled with individual customer code)

INSTALLATION WITH INSULATION MONITORING FEATURE EQUIPPED

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. ISO 26262:2018 (Road vehicles – Functional safety).



IVT 3

CURRENT SENSING – TECHNICAL DATA

Description	*Value*			*Unit*
Measurement range	nominal: ±1,000	overcurrent: ±1,500	extended: ±4,000	A
Resolution		2		mA
Initial accuracy		± (0.1 % of rdg.** + 0.05)		A
Total accuracy	± (0.4 % of rdg.** + 0.1)	± (0.4 % of rdg.** + 0.1)	± (1.0% of rdg.** + 0.1)	A
Linearity		±0.01		% of rng.***
Noise		≤70		mA (RMS)

VOLTAGE SENSING – TECHNICAL DATA

Description	*Value*			*Unit*
Measurement range	nominal: ±1,000		extended: ±1,250	V
Resolution		<40		mV
Initial accuracy		± (0.1% of rdg.** + 0.1)		V
Total accuracy	± (0.4 % of rdg.** + 0.1)		± (5 % of rdg.** + 0.1)	V
Linearity		±0.01		% of rng.***
Noise		≤60		mV (RMS)

Note: number of channels 3 or 6

INSULATION MONITORING – TECHNICAL DATA*

Accuracy	*Conditions*	*Value*
In the range of 0.1 MΩ - 6.125 MΩ	0.1 F … 2 µF; 30 sec	±(15 % of rdg.** + 30 kΩ)
	2 µF … 6 µF; 100 sec	±(15 % of rdg.** + 30 kΩ)
In the range of > 0 kΩ to ≤ 100 kΩ	0.1 µF … 2 µF; 30 sec	±30 kΩ
	2 µF … 6 µF; 100 sec	±30 kΩ
Safe to start indication	<4 µF; ± (15% of rdg.** + 30 kΩ)	5 sec

* Additional measurement modes are described in more detail in the product data sheet.

** rdg. = reading

*** rng. = range