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Current and Current Pulse Sensor

Type M705A...

Indirect Measurement of Amperage

The current and current pulse sensor Type M705A... is used for the measurement of DC and AC current as well as current pulses.

- Small dimensions
- Installation without tool
- Measuring range from ±15 A (overload safe)
- Sensitivity 37 mV/A/10 V
- Shock resistant up to 2 000 g
- Overload safe up to 200 A
- Low weight (10 grams)

Description

The current pulse sensor is based upon the hall measuring principle and enables thus the indirect measuring of amperage in a wire. The benefits are: The measuring signal is galvanically isolated from the live wire, its current should be measured. Furthermore it is not necessary to split the live wire. Variations in the live wire produces a variation in the magnetic field around the wire. A hall sensor with toroidal core detects the variations of the magnetic field and delivers an output voltage, which is proportional to the current. The quality of the supply voltage linearily flows into the sensitivity and therefore into the measuring range.

The sensor is available with ID module. Customized cable lengths and connectors with customized pin assignments are optional available.

Application

Its domain is the chronological detection of trigger occurrences in component or crash tests of the automobile industry (airbag ignition current, restraint systems and door lock systems, fuel pump and so on) as well as controlling the amperage in the cables in case of a crash. Its small dimensions and the very low weight are advantageous for installation in spatial tight limited systems.

One of the conducting wires (diameter from 4,5 mm to 5 mm) is passed through the sensor vertically. Because of its slide closure the wire input in the sensor is very easy and fast. Mounting of the sensor is toolfree and therefore easily done.

Technical Data

Measuring range[1] (typ.)		
Overload 30 A (Type M705AHSI2...)	A	±15
Overload 50 A (Type M705AHSI3...)	A	±30
Overload 80 A (Type M705AHSI5...)	A	±50
Overload 200 A (Type M705AHSI1...)	A	±100
Sensitivity[2] (typ. / min. / max.)	mV/A/10 V	37 / 20 / 50
Amplitude non-linearity (typ. / max.) Measurement range ±15 A	%	0,3 / 1
Hysteresis (typ. / max.) Measurement range ±15 A	%	0,2 / 1
Zero measurand output (typ. / max.)	mV/10 V	±40 / ±100
Polarity (during current flow in direction of arrow)		positive
Response time (typ.)	µs	3
Supply voltage[2]	VDC	5 ... 10,5
Supply current (typ.)	mA	18
Shock resistance (pulse width >2 ms)	g	2 000
Stray current sensitivity[3] (max.)	mV/A/10 V	1
Insulation resistance[4] (min.)	MΩ	>90
Operating temperature range	°C	–30 ... 80
Storage temperature range	°C	–40 ... 90
Housing material black anodized		AL alloy
Weight, without cable	grams	10
Dimensions, without closure	mm	24,5x18x8,5
Appropriate for wire diameters of	mm	4,5 ... 5

All values are typical at 25 °C and rated at 10 V sensor excitation, unless otherwise specified.

1) The sensor is available with different measuring ranges. The calibration range is adjusted accordingly
2) Sensitivity changes non-linear with supply voltage. For accurate current measurings a calibration in destination supply voltage can be optionally done
3) Impact of currents outside the sensor
4) All wires to screen (GND), with 10 V (DC)

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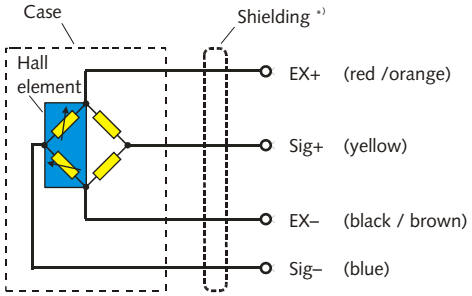

*) Shielding on connector housing (GND).

Fig. 1: Schematic diagram

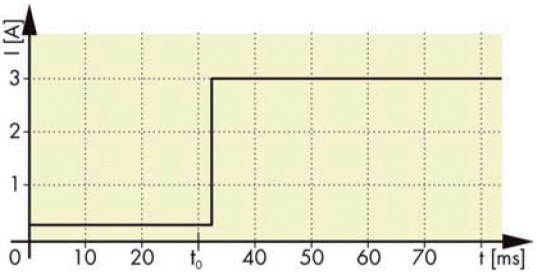

Fig. 2: Current/time curve

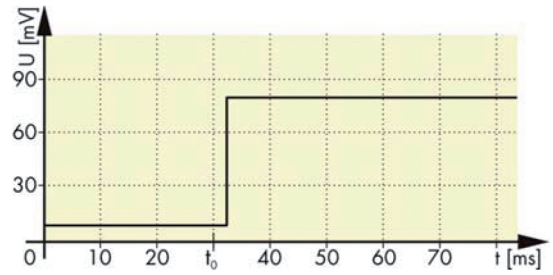

Fig. 3: Stress/time curve

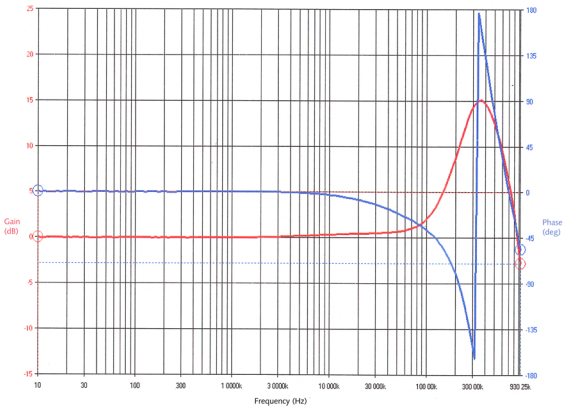

Fig. 4: Frequency response

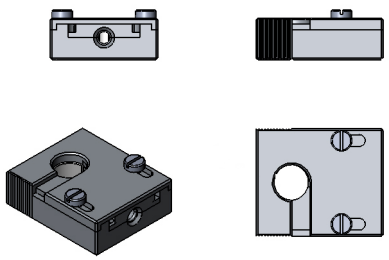

Fig. 5: Sketch

Ordering Key

Type M705A ☐☐☐☐☐☐

Measuring Range

±15 A	**HSI2**
±30 A	**HSI3**
±50 A	**HSI5**
±100 A	**HSI1**

Cable Length before Electronics

0 cm	**00**
<10 cm (digit x 1 cm)	**C#**
10 cm ... 9,9 m (digit x 10 cm)	**##**
10 m ... 90 m (digit x 10 m)	**D#**

Additional Electronics

Sensor detail, as per type declaration current and current pulse TP-650-6	**#**

Cable Length after Electronics

0 cm	**00**
<10 cm (digit x 1 cm)	**C#**
10 cm ... 9,9 m (digit x 10 cm)	**##**
10 m ... 90 m (digit x 10 m)	**D#**

Connector

Conn. type, as per TP-600	**#-**
Conn. assignment, as per TP-600	**-#**