

## HSI-LV

## Isolated low voltage module

- Voltage input: 12 ranges (10 mV to 50 V)
- Current input:  $\pm 20$  mA using SE-CUR-SHUNT-1  
 $\pm 5$  A using SE-CUR-SHUNT-4 or -SHUNT-5
- Bandwidth: 2 MHz

### Additional signal input using MSI

- IEPE® Constant current powered sensors (accelerometers, microphones); 12 ranges (10 mV to 5 V); requires MSI-V-ACC
- RTD Resistance Temperature Detector (Pt100 to Pt2000) 9 resistance ranges (8 to 4000  $\Omega$ ); requires MSI-V-RTD



## Module specifications

HSI-LV		
Input ranges	10 mV, 20 mV, 50 mV, 100 mV, 200 mV, 500 mV, 1 V, 2.5 V, 5 V, 10 V, 25 V, 50 V	
Button selectable ranges	10 mV, 50 mV, 200 mV, 1 V, 5 V, 10 V, 50 V	
Rated input voltage	33 V <sub>RMS</sub> , 46.7 V <sub>PEAK</sub> , 70 V <sub>DC</sub> according to EN-61010-1 and EN-61010-2-30	
1 year accuracy <sup>1)</sup>	Range      Signal frequency      Accuracy	
Bipolar	10 mV to 100 mV      DC $\pm 0.02$ % of reading $\pm 60$ $\mu$ V	
	2.5 V      DC $\pm 0.02$ % of reading $\pm 0.1$ % of range	
	200 mV to 50 V      DC $\pm 0.02$ % of reading $\pm 0.05$ % of range	
	10 mV to 100 mV	0.1 Hz to 5 kHz $\pm 0.1$ % of reading $\pm 30$ $\mu$ V
		>5 kHz to 50 kHz $\pm 0.4$ % of reading $\pm 30$ $\mu$ V
		>50 kHz to 100 kHz $\pm(0.016*f)$ % of reading $\pm 0.1$ % of range
		>100 kHz to 1 MHz $\pm(0.010*f)$ % of reading $\pm 1$ % of range
	200 mV to 50 V	>1 MHz to 2 MHz $\pm(0.014*f)$ % of reading $\pm 3$ % of range
0.1 Hz to 500 Hz $\pm 0.05$ % of reading $\pm 0.01$ % of range		
>500 Hz to 5 kHz $\pm 0.1$ % of reading $\pm 0.05$ % of range		
>5 kHz to 50 kHz $\pm 0.4$ % of reading $\pm 0.05$ % of range		
Unipolar	>50 kHz to 100 kHz $\pm(0.016*f)$ % of reading $\pm 0.1$ % of range	
	>100 kHz to 1 MHz $\pm(0.010*f)$ % of reading $\pm 1$ % of range	
	>1 MHz to 2 MHz $\pm(0.014*f)$ % of reading $\pm 3$ % of range	
	200 mV to 50 V      DC $\pm 0.02$ % of reading $\pm 60$ $\mu$ V	
10 mV to 100 mV      DC $\pm 0.02$ % of reading $\pm 0.08$ % of range		
Input coupling	DC or AC software selectable (1.5 Hz standard, custom on request down to 0.01 Hz)	
Gain linearity	Typically 0.01 %; max. 0.04 % of full scale	
Gain drift range	Typically 10 ppm/ $^{\circ}$ C (max. 30 ppm/ $^{\circ}$ C)	
Offset drift	10 mV to 200 mV:      Typically 3 $\mu$ V/ $^{\circ}$ C 500 mV to 50 V:      Typically 10 ppm of range/ $^{\circ}$ C	
Long term stability	100 ppm/sqrt (1000 hrs)	
Input resistance	1 MOhm	
Bandwidth (-3 dB)	2 MHz	
Signal delay @ full bandwidth	approx. 405 ns	
Filter selection	Push button or software	
Filter	100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz, 2 MHz <sup>2)</sup>	
Filter type	Bessel or Butterworth 40 dB/dec	
Filter characteristics	Butterworth or Bessel 40 dB/dec (2 <sup>nd</sup> order; $\pm 1.5$ dB @ $f_0$ ) Butterworth 60 dB/dec (3 <sup>rd</sup> order; 0 to -3 dB @ 2 MHz)	
Typical SFDR and SNR:	10 kHz bandwidth      100 kHz bandwidth      1 MHz bandwidth      2 MHz bandwidth	
	SFDR      SNR      SFDR      SNR      SFDR      SNR      SFDR      SNR	
20 mV	88 dB      78 dB      88 dB      71 dB      77 dB      60 dB      76 dB      56 dB	
1 V	110 dB      98 dB      110 dB      95 dB      93 dB      82 dB      84 dB      75 dB	
50 V	110 dB      98 dB      110 dB      95 dB      94 dB      82 dB      85 dB      75 dB	
Typical CMRR	10 mV to 1 V range:      2.5 V to 50 V range:	
50 Hz	130 dB      100 dB	
1 kHz	120 dB      60 dB	
10 kHz	95 dB      40 dB	
100 kHz	75 dB      20 dB	

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Input overvoltage protection	350 V <sub>DC</sub>
Isolation voltage	1 kV <sub>RMS</sub> <sup>3)</sup>
Sensor supply	±9 V (±1 %), 12 V (±5 %), 200 mA resettable fuse protected <sup>4)</sup>
Output voltage	±5 V
Output resistance	10 Ohm
Maximum output current	5 mA
Output protection	Short to ground for 10 sec.
Power On default settings	Software programmable
Power supply	±9 V <sub>DC</sub> ±1 %
Power consumption	1.1 W without sensor supply
Special functions	Integrated temperature sensor
RS-485 interface	Yes
TEDS	Hardware support for TEDS (Transducer Electronic Data Sheet)
Supported TEDS chips	DS2406, DS2430A, DS2432, DS2433, DS2431
Supported MSI	MSI-V-ACC, MSI-V-RTD

<sup>1)</sup> Conditions for accuracy: Module temperature is calibration temperature ±5 °C; humidity is 30 to 90 RH.

AC accuracy: the highest filter (2 MHz) has to be activated. f = signal frequency in kHz.

For the 2 year accuracy multiply all % of range and % of reading values by 1.5.

<sup>2)</sup> 2 MHz filter: exclusively for Butterworth 60 dB/decade - refer to filter specifications. Please consider possible bandwidth limitation of further components in the measuring chain, e.g. A/D card or signal conditioning mainframe.

<sup>3)</sup> Although the rated input voltage is 33 V<sub>RMS</sub>, 46.7 V<sub>PEAK</sub> or 70 V<sub>DC</sub> according to EN-61010-1 and EN-61010-2-30, the galvanic isolation has been tested with 1 kV<sub>RMS</sub> for 1 min.

<sup>4)</sup> Overall current should not exceed DEWE-30-xx maximum power.

NEW

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