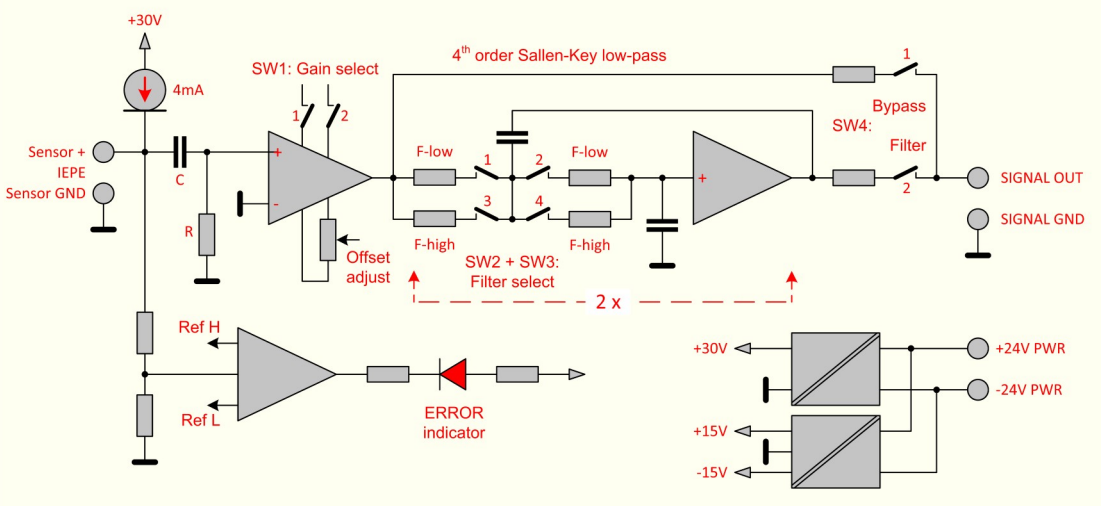
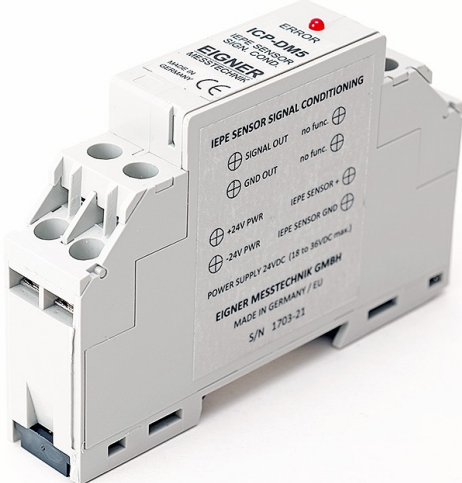
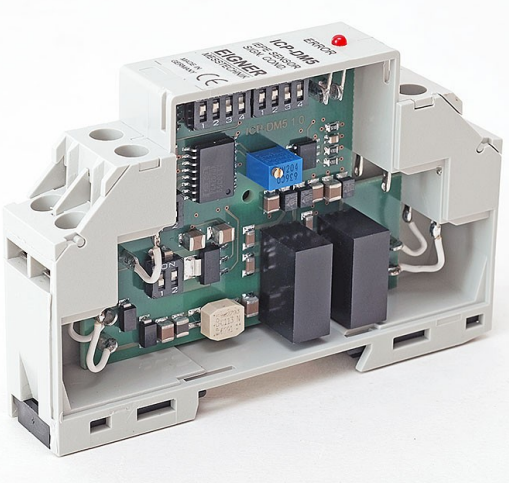
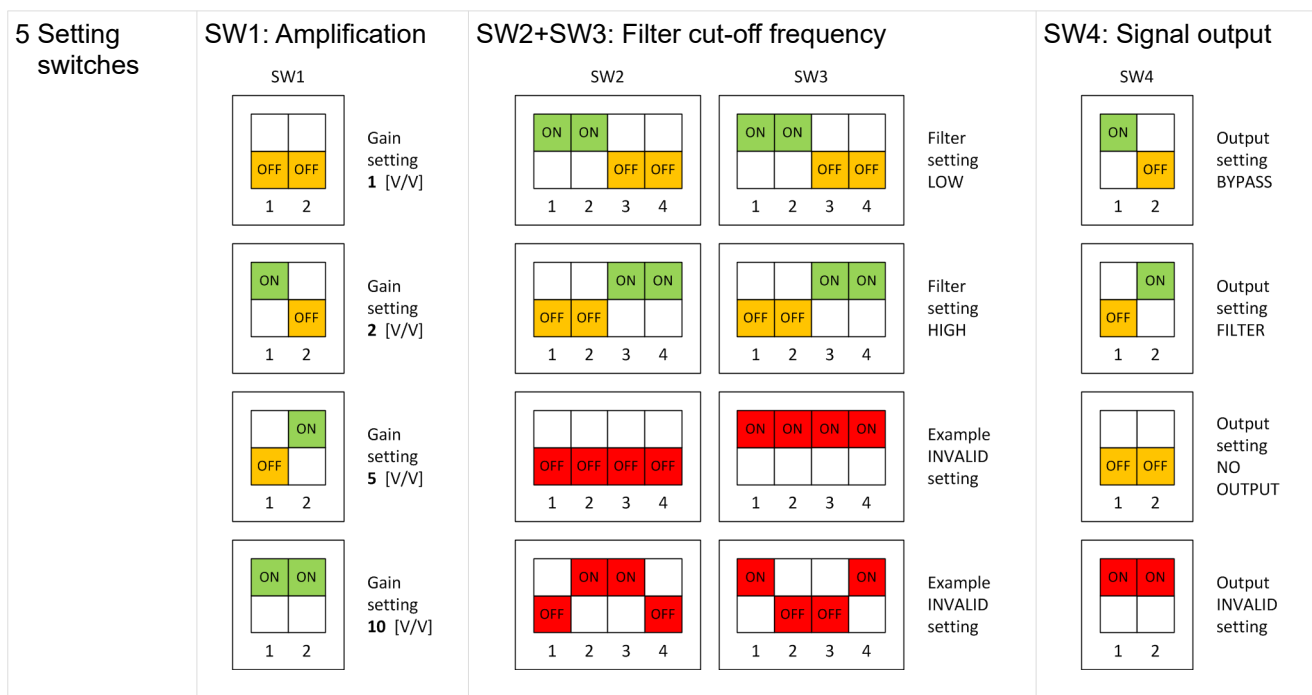
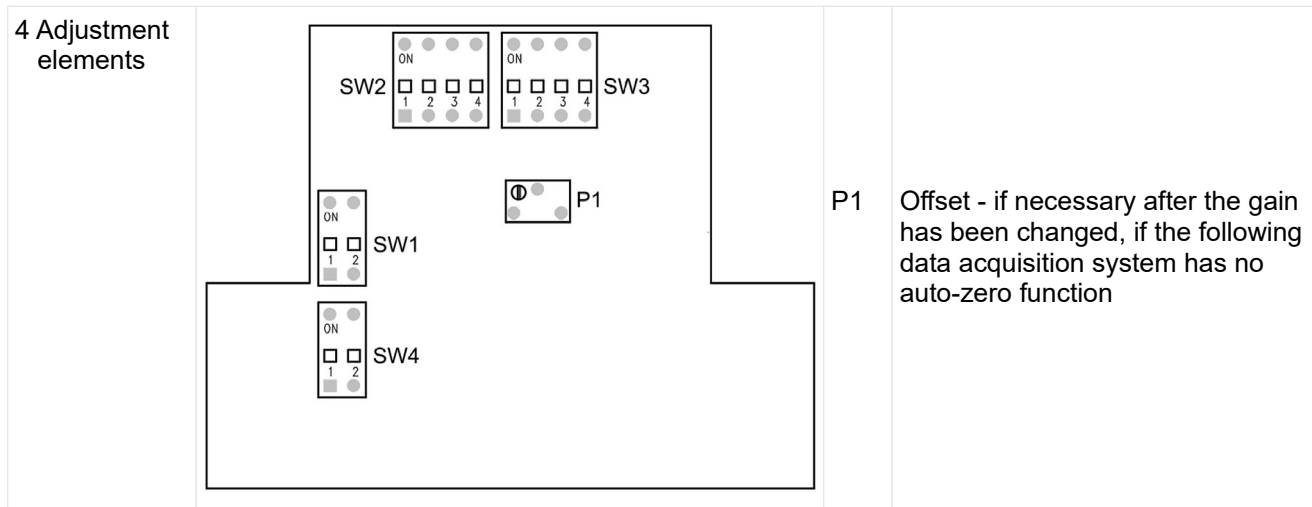


## IPE-DM5 – IEPE Excitation and Signal Conditioning

<p>1 Function</p>	<p>The IEPE excitation and signal conditioning device IPE-DM5 is designed for installation in control cabinets with 35 mm DIN rail mounting.</p> <p>It consists of the function groups:</p> <ul style="list-style-type: none"> <li>• Constant current excitation for IEPE Sensors 4 mA @ 30 VDC (others on request)</li> <li>• Input high-pass filter for decoupling the DC offset of the IEPE circuit</li> <li>• Amplifier with switchable amplification 1 - 2 - 5 - 10 [V/V]</li> <li>• Low pass filter with two switchable cut-off frequencies (e.g. 100 Hz and 1000 Hz), alternative bypass switch</li> <li>• Galvanic isolation of the measuring circuit from the 12 V / 24 V control cabinet supply by means of electrically isolated DC / DC converters for IEPE and device supply</li> </ul>
<p>2 System overview</p>	
<p>3 Device image</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="387 1373 850 1854">  <p>DIN rail housing with screw terminals</p> </div> <div data-bbox="930 1373 1441 1854">  <p>PCB mounting with position of the selector switches</p> </div> </div>

## IPE-DM5 – IEPE Excitation and Signal Conditioning



6 Operation

The time constant of the input high-pass filter is very high as a result of the desired low lower cut-off frequency (0.2 Hz):

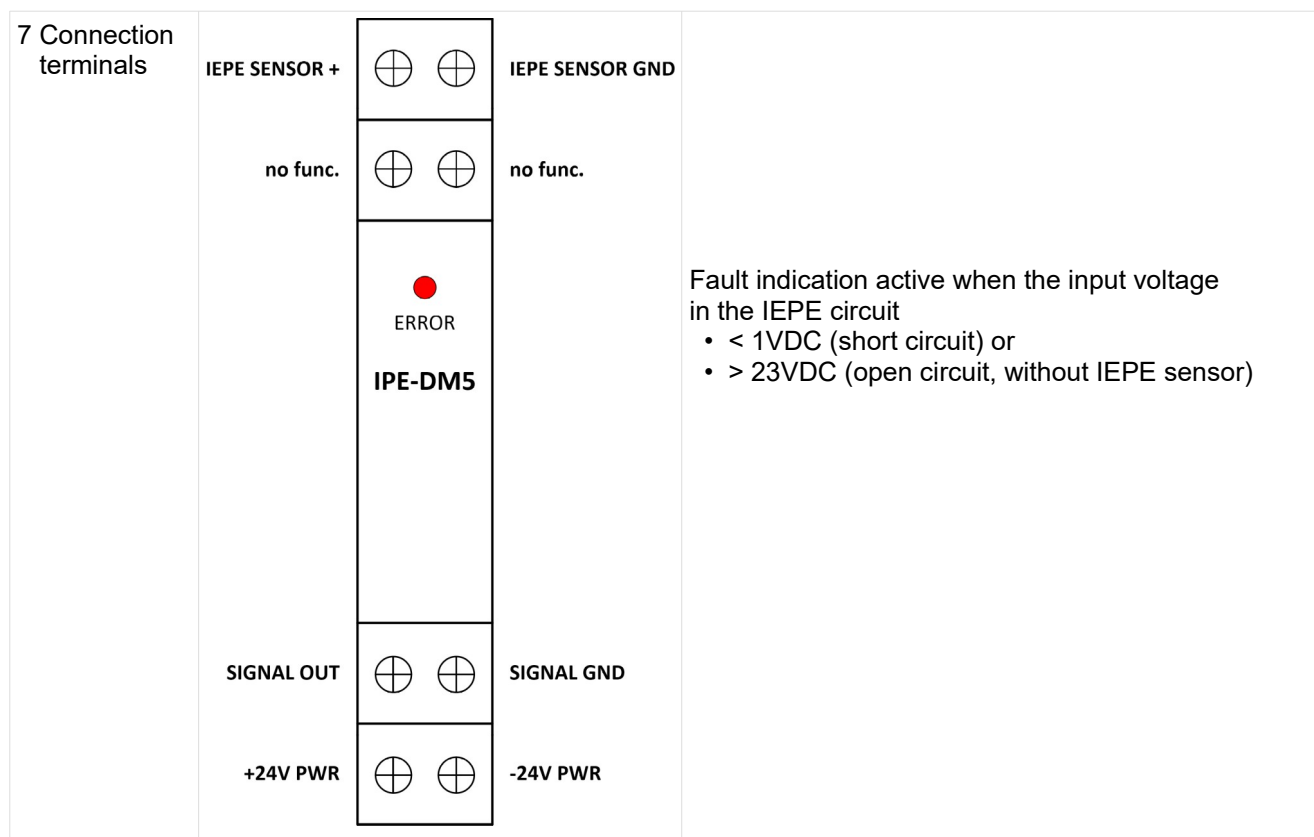
- $t = R \cdot C = 200 \text{ k}\Omega \cdot 10 \text{ }\mu\text{F} = \text{ca. } 2 \text{ s}$

A correspondingly long settling time of the system must be observed for the start of the measurement or for the offset adjustment after the supply voltage has been applied (or the IEPE sensor has been connected).

A waiting time of  $5t$  for 99% steady state should be maintained:  $5 \cdot 2 \text{ s} = \text{ca. } 10 \text{ s}$ .

The cutoff frequency of the high-pass filter is given by the values  $C / R$  at 0.2 Hz:

- $(X_c + R) / R = 1 / ((2\pi \cdot 0.2 \text{ Hz} \cdot 10 \text{ }\mu\text{F}) + 200 \text{ k}\Omega) / 200 \text{ k}\Omega = 1,398$
- Attenuation =  $20 \cdot \lg 1.398 = 2.97 \text{ dB} \sim -3 \text{ dB}$

**IPE-DM5 – IEPE Excitation and Signal Conditioning**

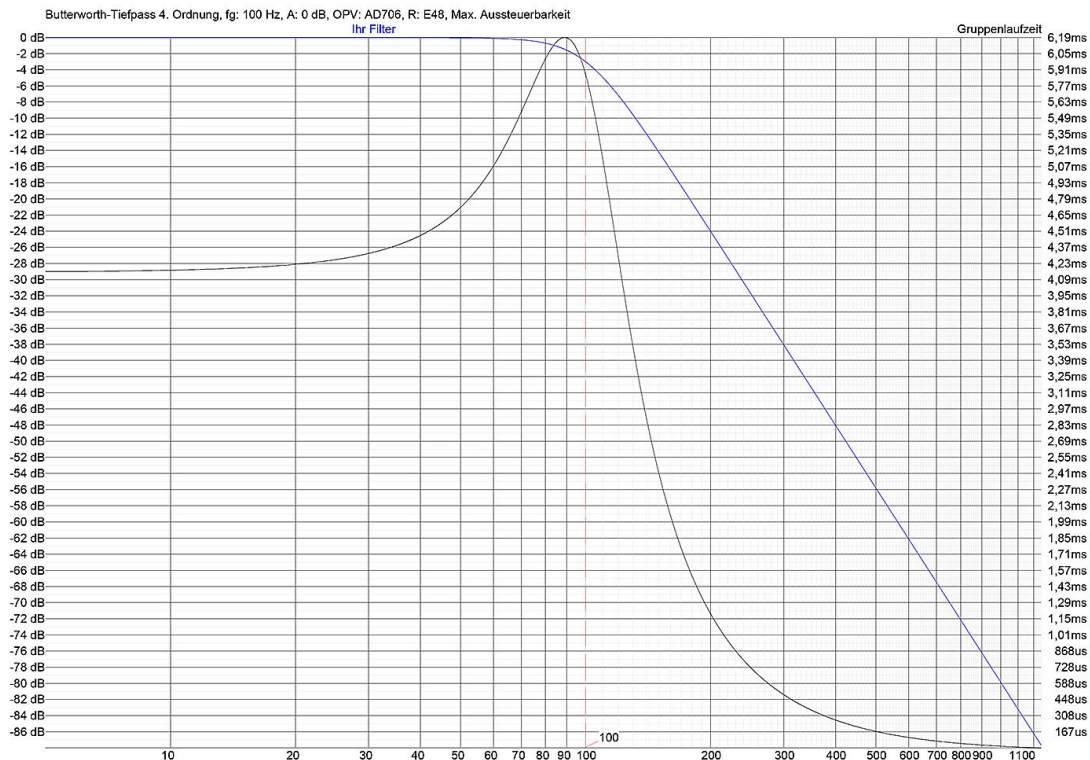
## IPE-DM5 – IEPE Excitation and Signal Conditioning

8 Filter  
 diagram:  
 Example  
 100 Hz

Blue Curve:  
 Amplitude  
 over  
 frequency

Red line:  
 Cut-off  
 frequency

Black Curve:  
 Group delay  
 over  
 frequency

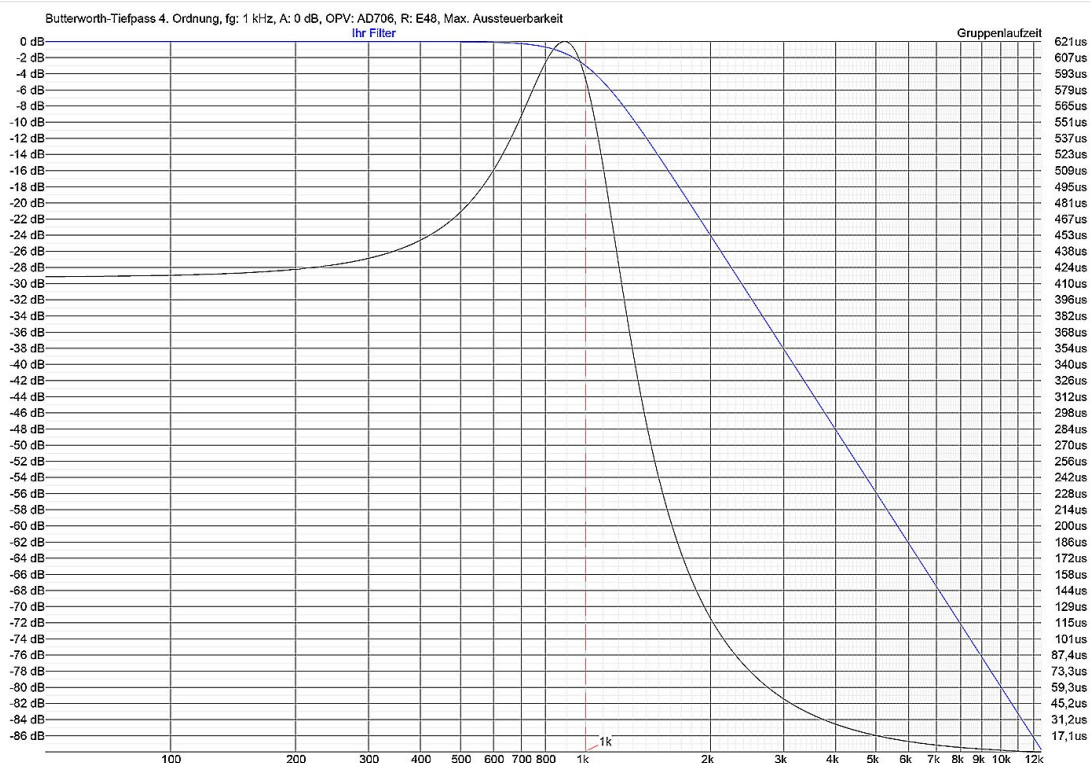


9 Filter  
 diagram:  
 Example  
 1000 Hz

Blue Curve:  
 Amplitude  
 over  
 frequency

Red line:  
 Cut-off  
 frequency

Black Curve:  
 Group delay  
 over  
 frequency



## IPE-DM5 – IEPE Excitation and Signal Conditioning

10 Technical data	Power supply:	12 VDC (9 – 18 VDC) or 24 VDC (18 – 36 VDC)
	Consumption:	ca. 50 mA @ 24 V = ca. 1.2 W
	IEPE current:	4 mA constant @ 30 VDC (current source permanently short circuit proof) (other values from 0.5 – 8 [mA] on request)
	Signal input:	0 – ±10 VAC (with ca. 12V DC offset caused by IEPE circuit)
	Input filter:	High-pass 1 <sup>th</sup> order with C = 10 uF / R = 200 kOhm
	Bandwidth:	0.2 Hz – 20 kHz (-3dB)
	Amplification:	G = 1 - 2 - 5 - 10V/V (Amplification error < ± 0.1 %)
	Output filter:	Active low-pass filter 4 <sup>th</sup> order with Butterworth characteristic - Two frequencies can be selected when ordering (eg 100 Hz / 1 kHz) Filter or bypass via DIP switch selectable
	Signal output:	0 – ±10 VAC (referred to GND)
	Output impedance:	51 Ohm
	Error indication:	LED (red) - Input short-circuited: $U_{in} < 1$ VDC or Input open (without IEPE sensor): $U_{in} > 23$ VDC
	Dimensions:	90 x 60 x 17.5 (standard width) [mm <sup>3</sup> ]
	Gewicht:	ca. 65 g
	Temperature:	-10 °C – +70 °C
	Humidity:	max. 70 % RH
	Protection class:	IP20
	Installation instructions:	Installation only in dry, ventilated control cabinets. Connection and commissioning only by qualified staff.