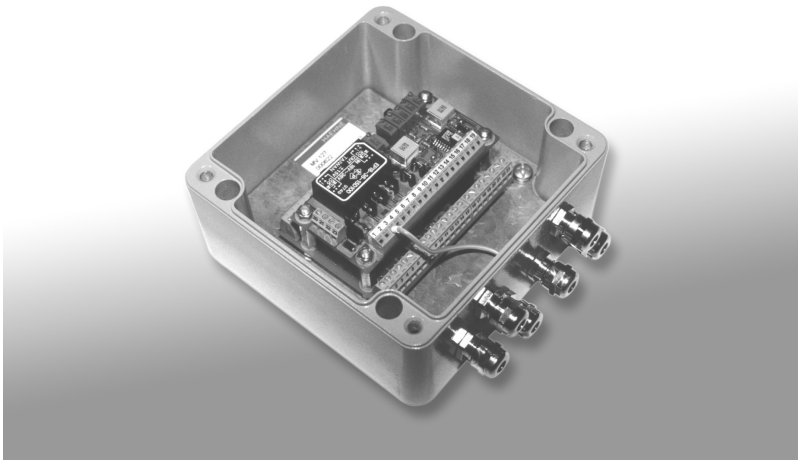
Measuring Amplifier MV127

Scope of Supply
Amplifier in field enclosure
Standard (option U):
2 voltage outputs (direct / filtered)

Variants
C: 1 current output 4…20 mA,
2 voltage outputs
(direct / filtered),
N: 1 current output 0…20 mA,
2 voltage outputs
(direct / filtered)

Additional Options
E: Enlarged excitation supply 160 mA



Special Features

- Amplifier with integrated excitation supply, 2 voltage outputs
- 2 independent limit switches with adjustable hysteresis
- Precision adder with weighted inputs to calculate
- Adjustable filter
- Signals and power supply galvanically isolated

The amplifier MV127 with additional functions is offered in a field enclosure. This makes it possible to amplify and analyze sensor signals in rough environments close to machines and equipment.

The amplifier has two potentiometers to compensate pre-coads e.g. the roll weight. The desired gain is adjusted with two additional potentiometers - coarse and fine.

All additional functions including the limit switches work with standardized voltage signals in the range of -10 V …+10 V.
The ON and OFF switching points of the limit switches can be independently adjusted over the total voltage range. This enables the flexible use as two point controller. The inputs and outputs of the adder and both wide range limit switches are placed separately on terminals and can be used for internal or external signals.

Ordering example

MV127-C
Type
Variants / Options

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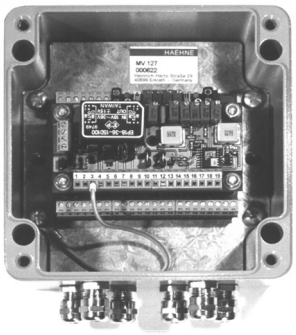
Technical Data		
Strain gauge excitation supply	Voltage V_4	10 V
	Current max.	60 mA
	Option E	160 mA
Zero adjust compensation voltage	(in relation to voltage input)	-25...0...+25 mV
Amplification	Adjustment range	400...3200 V/V
	Factory adjustment	667 V/V
Signal outputs	Voltage (V_2 , V_3)	-10...0...+ 10 V
	Min. load resistance	5 kΩ
	Signal raising delay (10...90 %)	V_2 direct: 5 ms
		V_3 filter 1: 2 s
	Current (I_1)	
	Option C	4...20 mA
	Option N	0...20 mA
	Max. load resistance	600 Ω
Adder	Input voltage range	-10...+ 10 V
	Input resistance of input rating 0,5	36 kΩ
	Input resistance of input rating 1,0	16 kΩ
	Min. load resistance output:	10 kΩ
Filter	Filter	low pass
	Input voltage range	-10...+ 10 V
	Min. load resistance output	10 kΩ
	Signal raising delay (10...90 %)	0,13 ... 4,8 s
Limit switch	Input voltage range	- 10...+ 10 V
	Input resistance	47 kΩ
	Adjustment range of switching point ON	-10...+ 10 V
	Adjustment range of switching point OFF	-10...+ 10 V
	Hysteresis=ON and OFF switching point	0... 20 V
	Switching response time	10 ms
	Relay contacts	230 V / 1 A
Supply voltage	Voltage (V_5)	24 VDC, ± 10 %
	Current consumption	approx. 250 mA
Temperature range		0 ... 60° C
Terminal cross-section		AWG 26-16
Enclosure protection		IP 65

Dimensions
l x w x h:
140 x 140 x 91 mm



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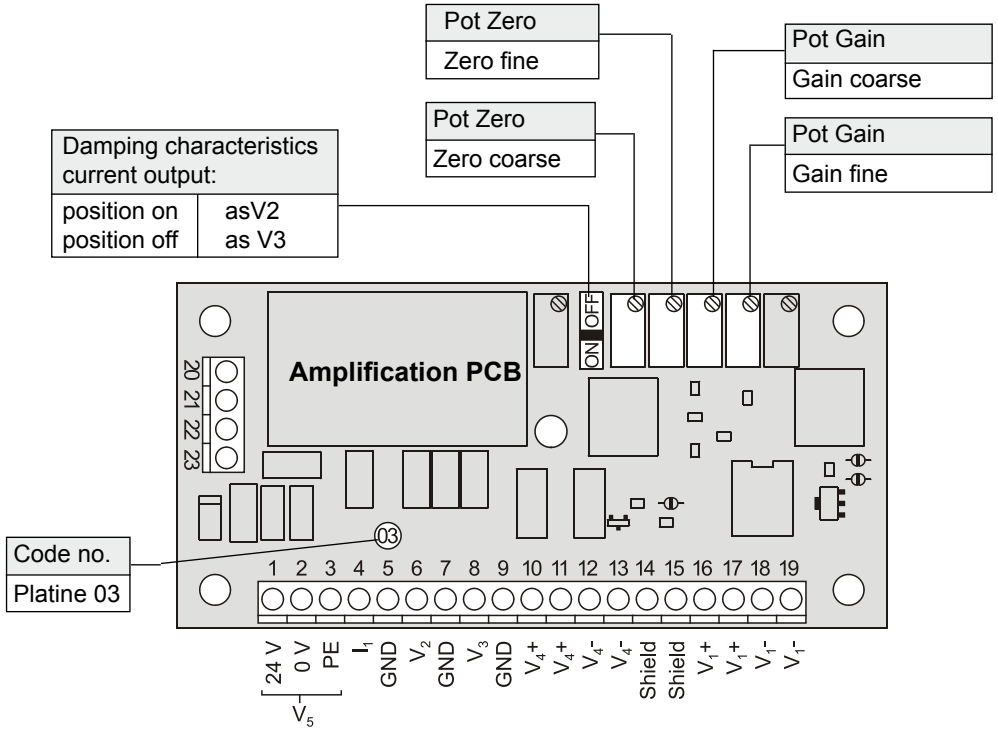
Technical Information

Connection Diagram of the Amplification PCB



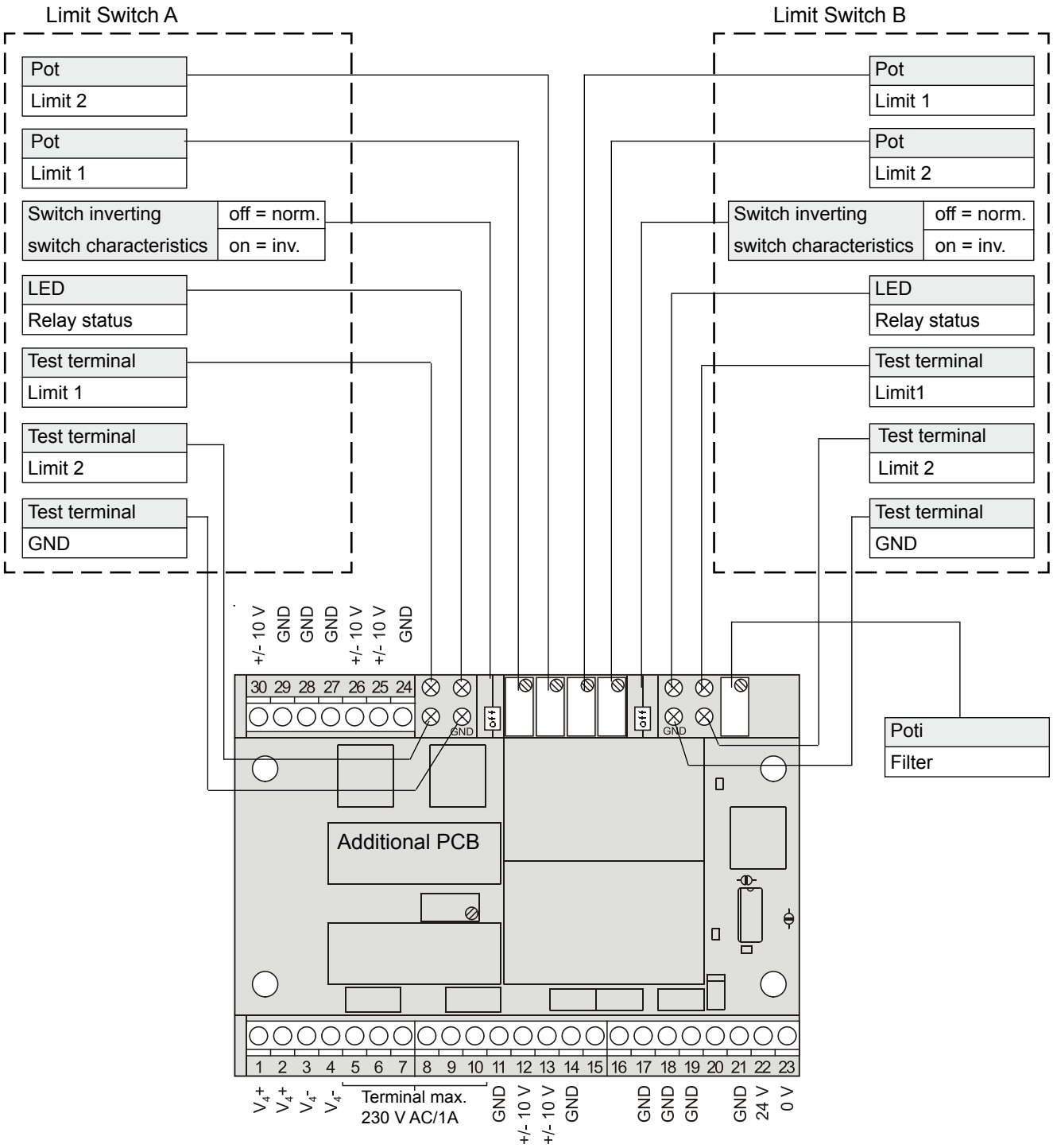
Notice

Before start-up adder or treshold switch (board 2) connect the appropriate inputs with the voltage output of the amplifier (board 1).

Connection:
Cable shields are connected with the EMC plug to the enclosure.
Terminals 14 and 15 are not connected. The shield of the supply cable serves as PE. A wire of sufficient size has to balance the electrical potential between electrically connected parts of the equipment.
The voltage between V_5 0 V and lead (PE) should not exceed 50 V *Vpp*. This is accomplished by connecting 0 V and PE in the equipment as is customary practise.

V_1	Output signal of full bridge strain gauge
V_2	Direct voltage output
V_3	Filtered voltage output
V_4	Excitation voltage to the full bridge strain gauge in the sensors
V_5	Supply voltage 24 V DC
I_1	Current output (option C and N)

Connection Diagram of the Additional PCB



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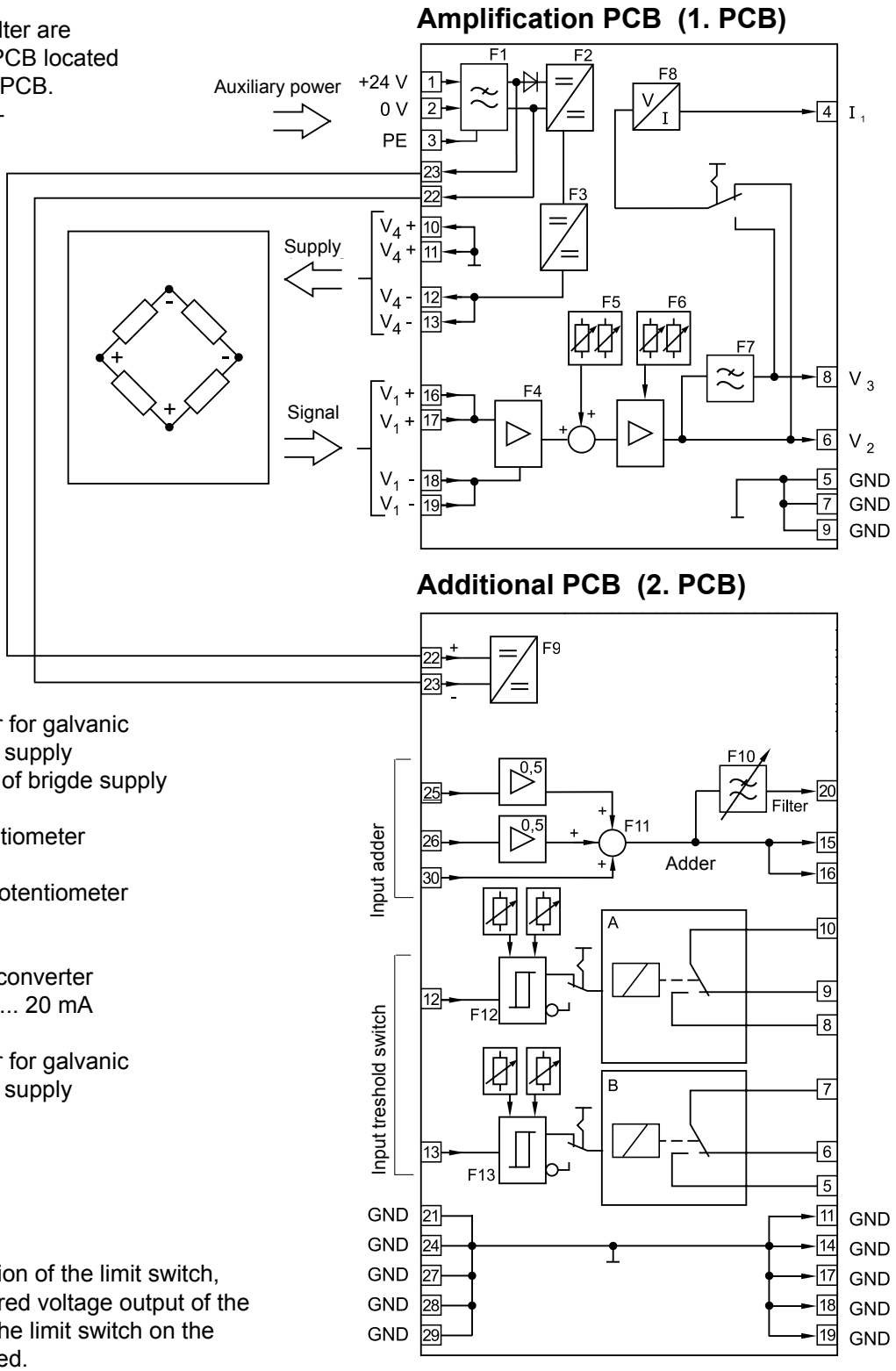
Messverstärker MV127

Adjustement Instruction

Functional Schematic of the 2. PCB

Limit switch, adder and filter are designed on an second PCB located underneath the amplifier PCB. The terminals and adjustment elements of the second PCB are easily accessible even when the amplifier PCB is fully connected.



Function Unit (F)

- F1 EMC filter
- F2 DC/DC converter for galvanic insulation of 24 V supply
- F3 Voltage regulator of brigde supply
- F4 Input amplifier
- F5 Zero adjust potentiometer (coarse, fine)
- F6 Amplifier adjust potentiometer (coarse, fine)
- F7 Filter
- F8 Voltage / current converter 0 ... 10 V to 4 (0) ... 20 mA (option C and N)
- F9 DC/DC converter for galvanic insulation of 24 V supply
- F10 Adjustable filter
- F11 Precision adder
- F12 Limit switch A
- F13 Limit switch B

In order to use the function of the limit switch, a connection of the desired voltage output of the 1st PCB to the input of the limit switch on the 2nd PCB must be realized.

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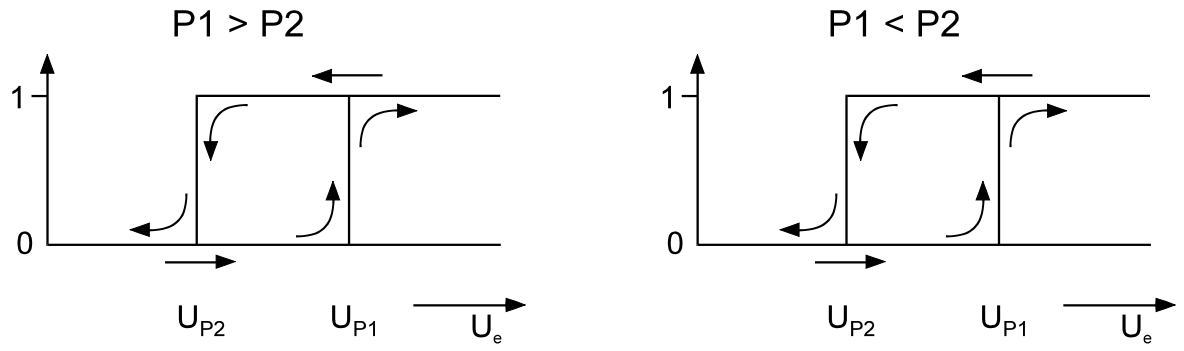
Adder and Filter
The adder has 3 inputs; 2 inputs with an amplification factor of 0.5 each and one input with an amplification factor of 1.0. For simple additions the two inputs with the amplification factor weighted 0.5 are switched in parallel and added at the input weighted with the factor 1.0.
For calculating averages both inputs with the weighting factor 0.5 are added. The input with 1.0 is hereby connected to the GND receptacle.
The output signal of the adder can be used directly or with an additional adjustable filter for display or control purposes.

Limit Switch
The limit switch module contains two independent functioning limit switches A and B. Two potentiometers and one switch are assigned to each limit switch. At each potentiometer a voltage ranging from - 10 to + 10 V can be adjusted. The voltage values of the corresponding potentiometers can be measured at the appropriate receptacles against the ground GND. The potentiometer with the higher switching voltage level determines the ”ON” switch point and the potentiometer with the lower voltage level the ”OFF” switch point (trigger point). The switching hysteresis results from this voltage difference. The slide switch can be used to invert the switching characteristics of the output relay. The combination of the inverting switch and double shrow relays contacts creates limit switches of the N.C. (normally closed) or N.O. (normally open) type.

The following schematics show the switching characteristics of the relays of limit switch A as the result of input signal U_e and the adjustment of potentiometer P1 and P2 when the slide switch is in ”normal”.

Relay Status



In case of loss of the limit switch voltage supply the relays assumes the switch condition of 1, the input signal voltage is between U_{P1} and U_{P2} after reapplying power.

Attention: If the measuring signal carries noise voltage then the adjusted hysteresis value should be larger than the peak to peak value of the additional noise voltage.

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