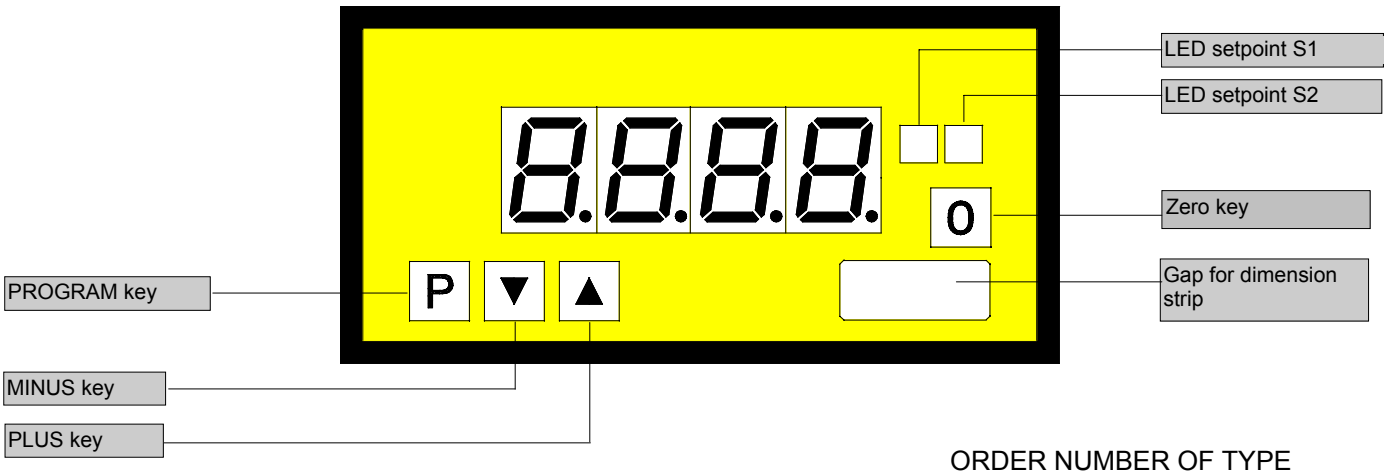
# Strain gauge amplifier for weighing application

**- Standard: 2 setpoints, min/max memory, IP54, plug in terminal**
**- Mounting into panels up to 50 mm – optional: analog output**

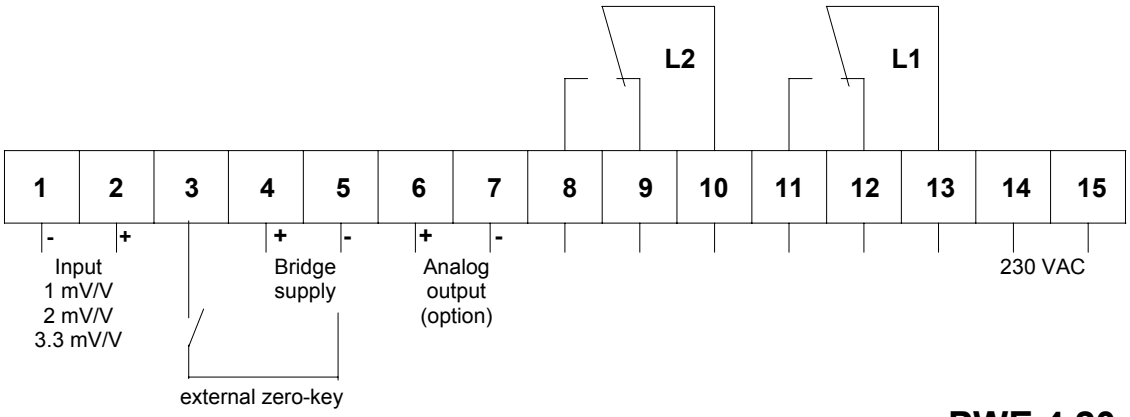
**96x48**

8888




ORDER NUMBER OF TYPE

**PWE 4.20x.1592B**




Power supply 115 VAC **PWE 4.20x.1492B**
(connection via terminal 14 and 15)

Power supply 24 VDC **PWE 4.20x.1792B**
**- galv. insulated -** (15=plus, 14=minus)

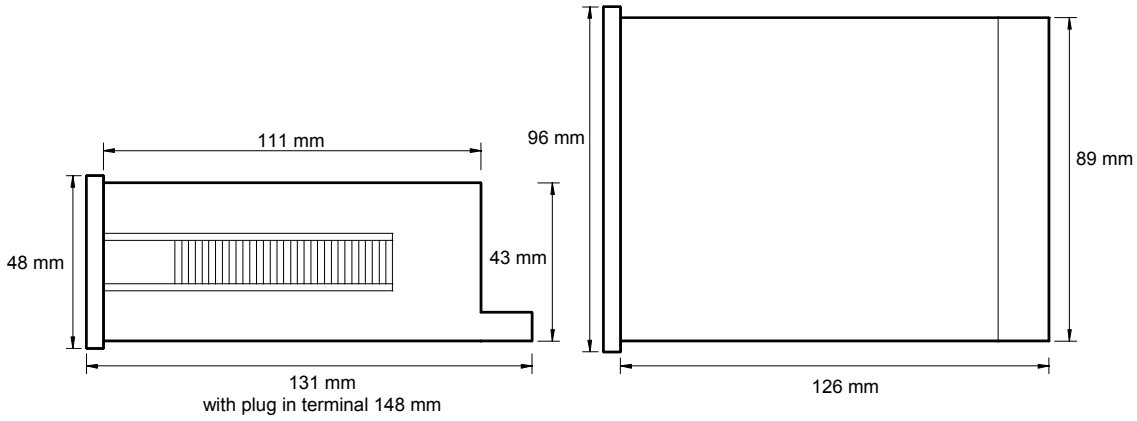
## Options

- Green LED
- Plug in terminal and protection IP65
- Analog output 0-10 VDC (12 bit)
- Analog output 0-20 mA/load 500 Ω (12 bit)
- Analog output 4-20 mA/load 500 Ω (12 bit)
- Analog output 0-10 VDC (12 bit) *(supply voltage 24 VDC galvanically insulated)*
- Analog output 0-20 mA/load 500 Ω (12 bit) *(supply voltage 24 VDC galvanically insulated)*
- Analog output 4-20 mA/load 500 Ω (12 bit) *(supply voltage 24 VDC galvanically insulated)*
- Other power supplies on demand

# Technical data

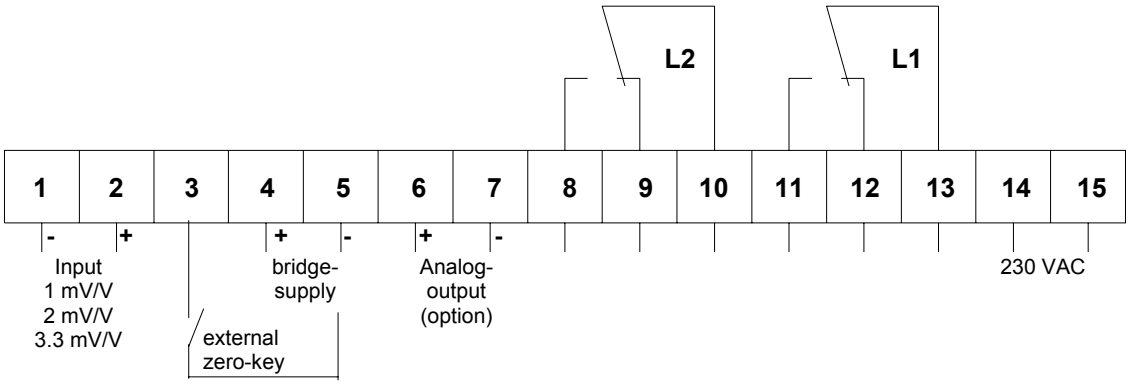
| | | |
|---|---|---|
| **Dimensions** | Housing | 96 x 48 x 134 including screw terminal |
| | Assembly cut out | $92.0^{+0.8}$ x $45.0^{+0.6}$ mm |
| | Fastening | special quick plastic clamp proper to fix in wall thickness up to 50 mm |
| | Housing material | PC/ABS-plastic blend, colour black, UL94V-0 |
| | Protective system | at the front IP54<br>connection IP00 |
| | Weight | approx. 0.450 kg |
| | Connection | At the rear side via screw terminal up to 2.5 $mm^2$ |
| **Input** | Measuring range | 1 mV/V – 2 mV/V – 3.3 mV/V |
| **Output** | Sensor supply | 10 VDC/350 Ω (power supply for other strain gauges) |
| | Relay output | charge 230 VAC/5 A – 30 VDC/2 A, with ohm resistive burden |
| | Switching cycles | $0.5 * 10^5$ at max. contact rating<br>$5 * 10^6$ mechanically |
| | | Separation appropriate to DIN EN 50178/ Specification appropriate to DIN EN60255 |
| | Analogue output | 0-10 VDC (12 bit)<br>0-20 mA (12 bit) - load 500 Ohm<br>4-20 mA (12 bit) - load 500 Ohm<br>} **The analogue output is galvanic insulated from the measuring input!** |
| **Accuracy** | Resolution | -999 up to +9999 |
| | Measuring fault | +/-0.2 % of measuring range, +/- 1 digit |
| | Temp. drift | 100 ppm/K |
| | Measuring principle | voltage/frequency converter |
| **Power unit** | Supply voltage | 230/115 VAC +/- 10 % (50-60 Hz), 24 VDC +/-10 % galvanic insulated |
| | Power consumption | approx. 5 VA2 |
| **Indication** | Display | LED with 7 segments, 14 mm high, red<br>4-digit = indication 9999 |
| | Overflow | 4 bars up |
| | Underflow | 4 bars down |
| | Measuring time | adjustable from 0.2 up to 10.0 seconds |
| **Ambient conditions** | Working temperature | 0 up to + 60 °C |
| | Storing temperature | -20 up to + 80 °C |

**Housing:**




**CE-sign**
For unlimited use of the instrument within the directives for electromagnetic compatibility 89/336/EC analog input wires have to be used with shielded cable and cable's shield connected to earth ground at one end only.

# Wiring diagram, programming, instructions




**Adjustment (also see programming example on the next page)**

1. Connect the instrument according to the wiring diagram. Connect screening of sensor line with protective conductor.
2. Switch on supply voltage. There is a segment test with switching-over to operating mode.
3. Charge DMS probe or sensor, respectively, with minimum load (in the case of a scale, by putting on a reference weight).
4. Press program key [P]. Program number **1** lit.
5. Change the program number by simultaneously pressing program key [P] and key [▲].
6. Pressing the key [▲] or [▼]results in a change of indication to the value stored under this program number.
7. Change the indicated value by pressing key [▼] or [▲].
8. Effect storing by pressing keys [P] & [▼].
9. Charge DMS probe or sensor, respectively, with maximum load (in the case of a scale, by putting-on a reference weight).
10. Press program keys [P] & [▲] until program number **2** lights up and continue in correspondance with item 6.
11. Without pressing of any key, the device changes to the operating mode after 7 seconds. With this, final storing of all adjusted values is effected.

**Calling of MIN/MAX values from memory**

Press key [▲] to indicate **MAX** memory. Press key [▼] to indicate **MIN** memory.
Simultaneous pressing of keys [▼] and [▲] deletes and updates the **MIN/MAX** memory.

**Counterbalancing**

| Operator | Device |
|---|---|
| Press key **[0]** (TARA) | Indication of counterbalancing with continuous zeros. The “offset” value stored under PN2 is indicated. |

**Note**

**Overflow/underflow**
In the case of a display overflow, the display shows 4 horizontal bars in the upper indication section. In the case of a display underflow, the display shows 4 horizontal bars in the lower indication section. If PN8 = 1…3 has been selected, then the starting value, defined under PN1 as -12.5% of the measuring range, is evaluated as the underflow value and the end value, defined under PN2 as +12.5% of the measuring range, is evaluated as the overflow value. With the configuration PN8 = 4…6, only the sensor sensitivity is tested and used for the evaluation of an overflow or underflow. The calibration points defined under PN1 and PN2 are used for the linearization.

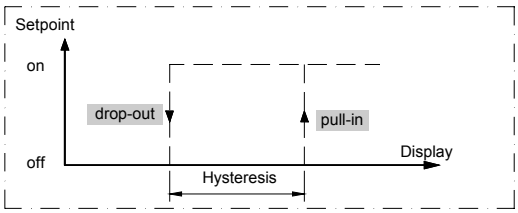
**Error messages**
After switching-on of the supply voltage, the device starts a self-test including a segment test (all LEDs lit). Should any disturbance occur during this procedure, this is indicated by „**HELP**“ on the display. That is also valid with running operation. The function serves to grant security to all surrounding components and installations. After a „HELP“ indication, a basic reset has to be performed by pressing key **P** and, simultaneously, connecting the supply voltage. As long as key **P** is pressed, the display performs a segment test and then the parameter entered ex works are taken over. After this, the device has to be programmed to have the parameters required by the user.

**Analog output**
The parameters of the analog output refer to the values set under PN1 and PN2. After counterbalancing, the analog output does not shift its zero point. With this output, the measuring value actually present on the input is represented.

**Switching points**
The following diagram illustrates the switching behaviour of the relay outputs for devices having switching points. The parameters for each switching point are freely programmable. In the operating current mode, the respecting relay actuates with reaching the switching threshold, in the quiescent current mode, the respecting relay falls off when the switching threshold has been reached. This way. a failure of the supply voltage can be indicated by an alarm.

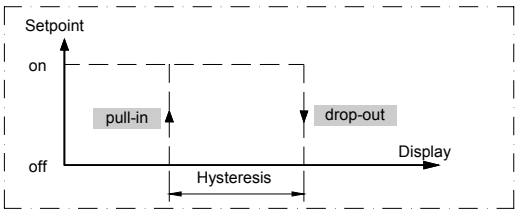
**Definition: Hysteresis is the width of the “window” between two threshold values.**

**Example: operation current**




Operation current means that the relay will be pulled in if reaching the adjusted setpoint.

**Example: quiescent current**




Quiescent current means that the relay will be dropped out by reaching the adjusted setpoint.

# Operation, setting instructions

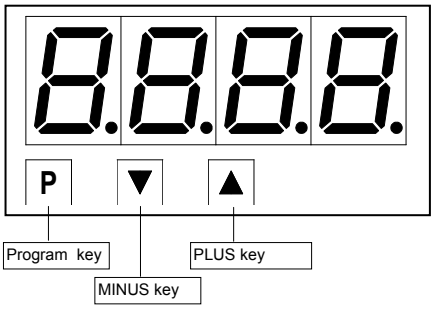
Subject to technical alteration - status 04/2006 - PWE431GB

## Program table

| Program-number (PN) | Function | Remark | | Display | Factory settings |
|---|---|---|---|---|---|
| 1 | Indication of desired initial value | stored with [P] & [▼] | | -999 up to +9999 | 0.0 |
| 2 | Indication of desired final value | stored with [P] & [▼] | | -999 up to +9999 | 200.0 |
| 3 | Setting of decimal point | with ▲ to the desired decimal point | | | 000.0 |
| 4 | Display refresh | refresh of the display value | | 0.2 up to 10.0 seconds | 1.0 |
| 5 | Final value for analog output | option | | -999 up to +9999 | 200.0 |
| 6 | Offset for analog output | option | | -999 up to +9999 | 0 |
| 7 | Tara key and counterbalancing | no key<br>front key<br>external key<br>both keys<br>no key<br>front key<br>external key<br>both keys | no counterbalancing<br>no counterbalancing<br>no counterbalancing<br>no counterbalancing<br>auto-counterbalancing<br>auto-counterbalancing<br>auto-counterbalancing<br>auto-counterbalancing | 0<br>1<br>2<br>3<br>4<br>5<br>6<br>7 | 5 |
| 8 | Input of the measuring range<br>Range monitoring on PN1/PN2<br>Sensor sensitivity monitoring | 1 = 1 mV/V – 2 = 2 mV/V – 3 = 3.3 mV/V - 4 = 1 mV/V – 5 = 2mV/V – 6 = 3.3 mV/V<br>stored with [P] & [▼] | | 1 / 2 / 3 | 2 |
| 61 | Setpoint 1 | | | -999 up to +9999 | 100.0 |
| 62 | Setpoint 1 hysteresis | | | 0 up to +9999 | 1 |
| 63 | Setpoint 1 operating/quiescent current | 0 = R / 1 = A | | 0 / 1 | 0 |
| 64 | Setpoint 1 delay time | | | 0.0 –10 seconds | 0.0 |
| 66 | Setpoint 2 | | | -999 up to +9999 | 1500 |
| 67 | Setpoint 2 hysteresis | | | 0 up to +9999 | 1 |
| 68 | Setpoint 2 operating/quiescent current | 0 = R / 1 = A | | 0 / 1 | 0 |
| 69 | Setpoint 2 delay time | | | 0.0 –10 seconds | 0.0 |

**Befor the first operation or after a change of the above mentioned parameters, a calibration is necessary!**

## Example for programming




**Measuring range:** 2 mV/V
**Measuring signal:** 0 – 20 mV
**Display:** 0 – 300.0
**Display refresh:** 2.0 seconds
**Setpoints:** S1 ==> 60.0 and quiescent current
relay pull in= 58.0 ➔ hysteresis 2.0
S2 ==> 150.0 and operation current
relay drop out = 80.0 ➔ hysteresis70.0
**Analogue output:** 0 V Output ==> Display 0.0 ==> Measuring signal 0 mV
10 V Output ==> Display 300.0 ==> Measuring signal 20 mV

The basic adjustments concerning to the following program example are the factory settings.

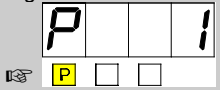
**Program advices**
Pressing the **P**-key enters **always** the program mode with program number 1. The "**P1**" begins to blink in change with the current value after 3 seconds. After further 4 seconds the system leaves the program mode and goes to the normal mode. In program mode pressing ▼ or ▲- key selects the current values which is free scalable with both of the keys. Under program number 1 and 2 the memorization will be executed by pressing the **P**- and ▼-key simultaneously - 4 horizontal bars indicates the storage. All other parameters will be stored automatically after leaving program mode.

**Programming.**
Switch power on!

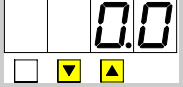
Segment test

normal mode

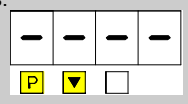
Enter program mode



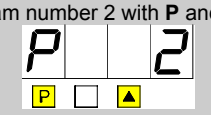

To the stored value with ▼ or ▲



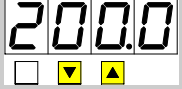

Store at scale without load by pressing P and ▼. Take over by display of trans-versal bars.



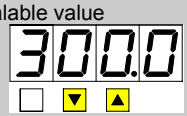

To program number 2 with **P** and ▲



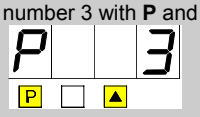

To the stored value with ▼ or ▲




Set free scalable value

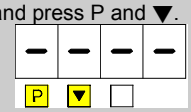



To program number 3 with **P** and ▲

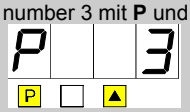


# Example for programming

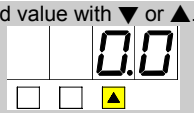
Burden scale with the desired reference emphasis and press P and ▼.



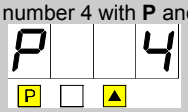

To program number 3 mit **P** und ▲.



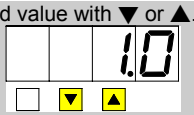

To the stored value with ▼ or ▲.



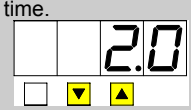

To program number 4 with **P** and ▲.




To the stored value with ▼ or ▲.




Set display time.

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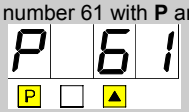
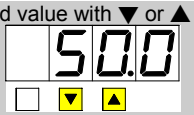
**The following programming steps are neccessary for the setpoint programming of S1 and S2 only.**

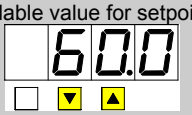
To program number 61 with **P** and ▲



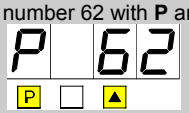

To the stored value with ▼ or ▲



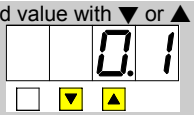

Set free scalable value for setpoint S1



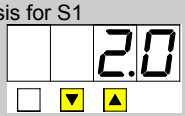

To program number 62 with **P** and ▲



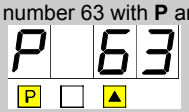

To the stored value with ▼ or ▲



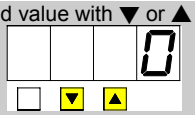

Set hysteresis for S1



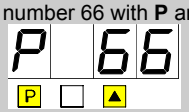

To program number 63 with **P** and ▲



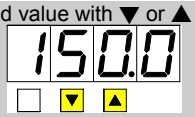

To the stored value with ▼ or ▲



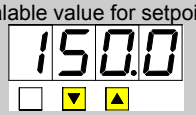

To program number 66 with **P** and ▲



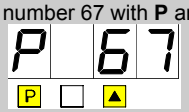

To the stored value with ▼ or ▲



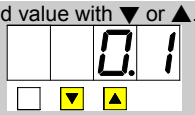

Set free scalable value for setpoint S2



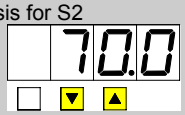

To program number 67 with **P** and ▲



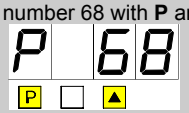

To the stored value with ▼ or ▲.



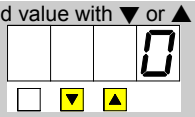

Set hysteresis for S2



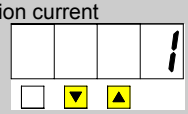

To program number 68 with **P** and ▲




To the stored value with ▼ or ▲




Set operation current

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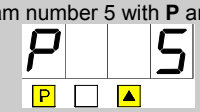
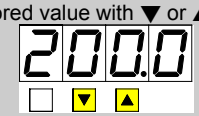
**The program numbers 5 and 6 are available with option analogue output only.**

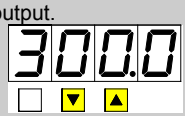
To program number 5 with **P** and ▲



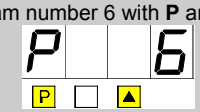

To the stored value with ▼ or ▲



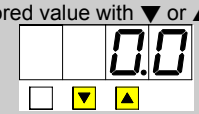

Set free scalable final indication value for analogue output.




To program number 6 with **P** and ▲

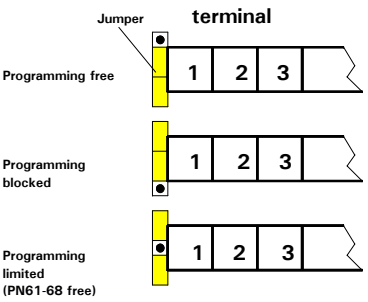



To the stored value with ▼ or ▲




**Programming finished.**
All programmed values are memorized after 7 seconds. Jumps back into standard mode automatically. Calibration necessary!

**Setting possibilities of the jumper field on the rear side.**




Subject to technical alteration
status 04/2006 - PWE431GB