# Installation and Operating Instructions
# Process-controlled Digital Display DPM

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## 1. General Information

Please read these operating instructions carefully before using the process-controlled digital display.
The process-controlled digital display model DPM is manufactured in accordance with the valid standards (see information on CE).

The process-controlled digital display model DPM is for displaying and transforming of process factors like: currents, voltages, temperature signals, potentiometer signals. It is for the use in apparatus- and switch cabinet construction.

Further information on instruments can be found on data sheet 9910 as well as on the nameplate of the instrument.

**Applications that are not listet explicitly as intended, are contrary to normal use!**

ARMATURENBAU GmbH and MANOTHERM Beierfeld GmbH do not assume liability for damages that arise from misuse of the device resp. from not regarding the information contained in these operating instructions.

## 2. Safety Information

**Please regard the valid country-specific instructions when installing, putting into operation and operating.**

- All operations may only be executed in dead voltage condition
- Mounting, electrical installation, putting into operation and maintenance may only be executed by qualified personnel.
- These instructions have to be understood, regarded and followed.

- Please do not use the instrument in areas where it is exposed to flammable and explosive gases.
- Use the instrument only in professionally installed condition (see information on installation)
- This instrument is not a security device (SIL). Malfunctions of the instrument can lead to breakdowns of the outlet ports. Please take precautions, like for example the installation of a separate monitoring system, to avoid accidents because of these breakdowns and to grant security.
- The instrument is maintenance-free. Opening the case is not allowed. Within the case are contact-dangerous circuits. Retrofitting or further technical changes of the instrument executed by the customer, are not allowed. With this you will lose your warranty.
- Mounting and dismounting may only be executed in dead-voltage condition.
- You have purchased an electronical precision meter. Please treat the instrument carefully so that it cannot be damaged at the plastic surface and the case parts.
- When disregarding the corresponding instructions, injuries and/or damage to property may occur.

## 3. Description of the Application

This process-controlled digital display model DPM has been developed to realize process control requirements. It can be applied as local display with a process factor or as temperature transducer with integrated display.

Further features:
- protection type IP 65 front-sided
- completely programmable via frontal keyboard
- integrated sensor supply (GS-version)
- any unit symbol applicable (lighted)
- case in 96 mm x 96 mm (3.78" x 3.78") size

Options/accessory:
- extension module with 2 or 4 limit value contacts
- analogue output (0/4...20 mA, 0...10 V DC)


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## 4. Technichal Data

| | |
|---|---|
| Case | : 96x48x130 mm (3.78"x1.89"x5.12"), switch panel mounting |
| Cut-out | : 92.5x45 mm (3.64" x 1.77") w x h |
| Protection type | : front-sided IP65, back-sided IP20 |
| Operating temperature | : 0...50 °C (0...122 °F) |
| Storing temperature | : -20...+70 °C (-4...+158 °F) |
| Atmospheric humidity | : 0...95% without bedewing |
| Inlet port | : analogue 0/4...20 mA (Ri=50Ω) or 0...10 V (Ri=50kΩ) or |
| | : Pt100 -100,0...+600,0 °C (-148...112 °F) or |
| | : Poti 0,1...10kΩ |
| Measuring accuracy | : 0,1% ±1 Digit, Auflösung 15 Bit |
| Display | : 7-Segment, -1999...+9999 |
| Sensor supply | : 20 VDC/30 mA, short-circuit proof |
| Auxiliary supply | : 230 VAC, 50 Hz, approx. 7 VA or 20...30 VDC, max. 0,3 A |
| Limit values (option) | : 2GW or 4GW (option) 250 V / 3 A AC changer, gold contacts hysteresis and switching function adjustbale |
| Analogue outlet port (option) | : supply 0/4...20 mA, resolution 12 Bit, load impedence max. 500 Ω freely adjustable voltage 0...10 V as special version |

## 5. Information on CE

The instrument complies with the following requirements:

- 73/23/EWG low voltage directive
  EN 61010 safety regulations for electrical measuring-, control-, regulation- and laboratory instruments 1995
- 89/336/EWG electromagnetic compatibility
  EN 50081-2 generic standard interference emission 03/94
  EN 50082-2 generic standard stability 02/96
- Please grant these regulations for the whole machine.

## 6. Installation

### 6.1 Storing and Transport

- storing temperature: -20...+70 °C (-4...+158 °F)
- relative humidity max. 95% without bedewing
- protect from direct sunlight
- dry and dust-free storing
- no outdoor storing
- no exposure to aggressive media
- the process-controlled digital display DPM has to be protected from mechanical damage when transporting and storing. It has to be stored in the original packing until it is going to be used.
- Disposal of the packing can be made as recovered paper. For a further- or return transport the instrument has to be protected sufficiently from damage.

### 6.2 Information on Installation

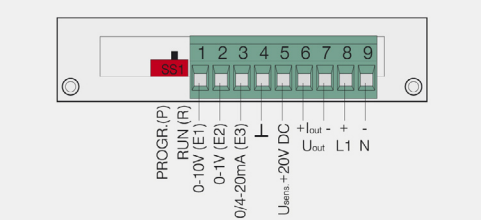
Please make clear that a suitable instrument for the case of application is available.

The digital display is intended for the mounting to front panels or switchboard doors.

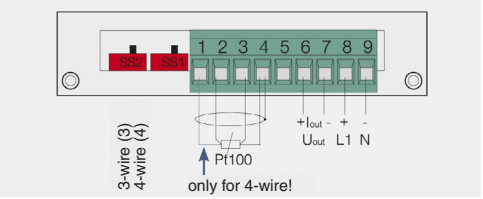
1. Please make the required cut-out (w x h: 92.5 mm x 45 Tol. +0.5 mm / 3.64" x 45 Tol. +0.02") at your front panel.
2. Insert the display in the prepared cut-out from the front.
3. Fix the supplied mounting cramps on both sides.
4. Brace the cramps against the front panel and check if the display is tight.

### 6.3 Electrical Connection

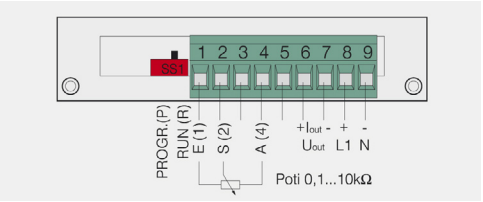
DPM-GS




DPM-PT



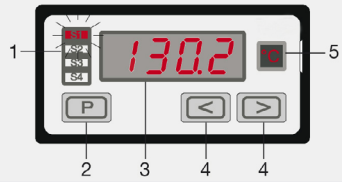

DPM-P




Connection of the optional limit value contacts

## 7. Operation and Parameterisation

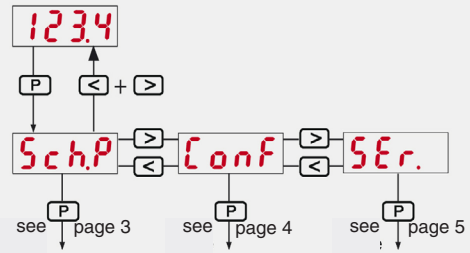
### Operational controls



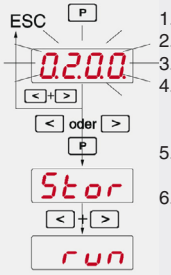

1. Status indication for the switching outputs
2. Programming- and operation button
3. Display
4. Buttons to increase / decrease the value
5. Unit display (changeable → take off the frame of the display)

**Information**
If after pressing the P-button the "Loc" occurs, the sliding switch SS1 at the back of the case has to be shifted to "Progr." at first, to enable the level.

### PAGE-select

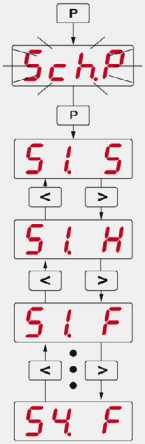



### Changing of a parameter



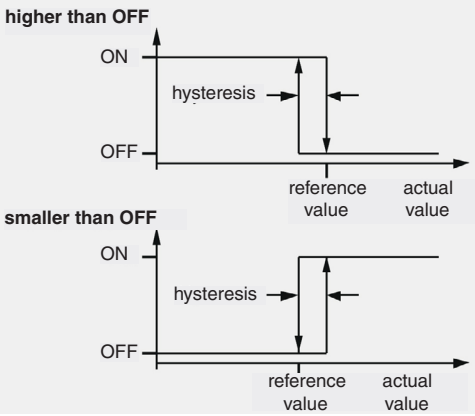

1. Select a parameter (see above)
2. Press P -button
3. Parameter value flashes
4. The value can be decreased via < button and increased via > button
5. Press P -button to save the value
6. Press < + > at the same time to go back to the display mode.

### Parameter list on PAGE switch point (SCH.P)

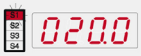



1. Press P -button
   Page "Sch.P" appears
2. Press P -button
3. S1 switch point of the relay
4. S1 hysteresis: Difference between upward movement and drop-out of the relay
5. S1 switching function of the relay
   0 = for higher values AUS (max.inv.)
6. Analogue to that the parameters of the limit values S2...S4 can be adjusted

### Switching functions in diagram

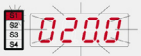



### Displaying the limit value (S1...S4)



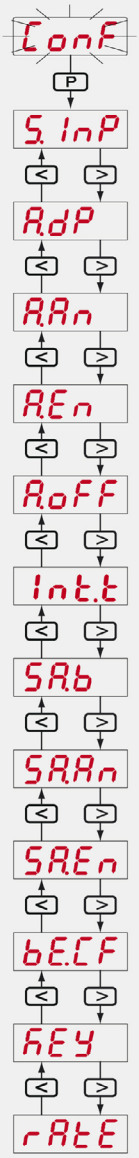

The values S1...S4 can be displayed via < or > button. After approx. 5 seconds the instruments switches back to the display mode.

### Fast change of the limit value (S1...S4)




1. Address limit value (see 4.4.3)
2. Hold P -button pressed and change via < or > button.

## Parameter on PAGE (ConF) for DPM-GS / -PT




Press P -button, change to page "ConF" via > button (see PAGE selection)
Press P -button

**Signal inlet port (*1)**
0...20 mA / 4...20 mA / 0...1 V / 0...10 V ,

**Display decimal point (*1)**
without (1111) / 1. figure (111.1)
2. figure (11.11) / 3. figure (1.111)

**Display initial value (*1)**
displayed value for inlet 20 mA resp. 1/10 V

**Display final value (*1)**
displayed final value for inlet 20mA resp. 1/10 V

**Display Offset**
zero point shift e.g. for the cable compensation of Pt100 in 2-wire connection

**Integration time (*2)**
0...60 seconds (affects display, limit values and analogue output)

**Signal ouput range (for option -SA /-SPA)**
0 = 0...20 mA / 0...10V
1 = 4...20 mA

**Signal output initial value (for option -SA /-SPA)**
displayed value for output 0/4 mA / 0 V

**Signal output final value (for option -SA /-SPA)**
displayed value for output 20 mA / 10 V

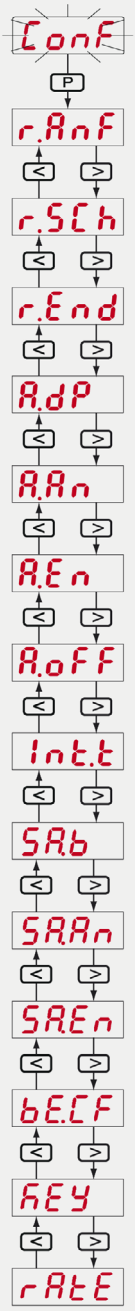
**Operation configuration**
fast change of limit values
0 = disabled, 1 = enabled

**Code request**
access to parameter values only possible via code entering **"6090"**
0 = access without code,
1 = code protection

**Measuring rate**
measured value is updated
0 = every 0.25 seconds
1 = every 0.08 seconds

*1 = not for inlet port Pt 100 (DPM-PT...)
*2 = parameter is only visible if "rAte" goes for "1"

## Parameter on PAGE (ConF) for DPM-P




Press P -button, change to page "ConF" via > button (see PAGE selection)
Press P -button

**Poti initial value in ohm**
resitance between porter and slider, for Poti in starting position

**Poti slider value in ohm**
resitance that is exceeded by the slider of the Poti

**Poti final value in ohm**
resistance between end and slider, for Poti in final position

**Display decimal point**
without (1111) / 1. figure (111.1)
2. figure (11.11) / 3. figure (1.111)

**Display initial value**
displayed value for Poti in starting position

**Display final value**
displayed final value for Poti in final position

**Display Offset**
zero point shift (1999...+5000)

**Integration time (*2)**
0...60 seconds (affects display, limit values and analogue output)

**Signal ouput range (for option -SA /-SPA)**
0 = 0...20 mA / 0...20V
1 = 4...20 mA

**Signal output initial value (for option -SA /-SPA)**
displayed value for output 0/4 mA / 0 V

**Signal output final value (for option -SA /-SPA)**
displayed value for output 20 mA / 10 V

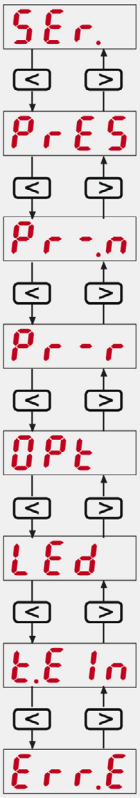
**Operation configuration**
fast change of limit values
0 = disabled, 1 = enabled

**Code request**
access to parameter values only possible via code entering **"6090"**
0 = access without code,
1 = code protection

**Measuring rate**
measured value is updated
0 = every 0.25 seconds
1 = every 0.08 seconds

**Information**
All parameters on PAGE "SEr." are protected against accidental changing by the code "**4095**". The code has to be entered for the first changing on page "SEr." and is valid till leaving of the page.

Parameter list on the PAGE service (SEr.)




**Selection of the PAGE (SEr.)**
(see PAGE selection)

**Instrument preset**
0 = no action
1 = reset the instrument to factory setting (malfunction message E.80 is being deleted by this)

**Programme name**
display of the programme name, no settings possible

**Programme release**
display of the version number, no settings possible

**Options**
display of the option code 00..FF (hex), no settings possible

**LED unit-lighting**
0 = unit-lighting off
1 = unit-lighting on

**Temperature unit (only DPM-PT)**
0 = degree Celsius (-200,0...+600.0 °C)
1 = Fahrenheit (-328.0...+999.9 °F)
Attention!
Fahrenheit equates -200...+537.7 °C

**Remedy inlet port (only DPM-GS)**
0 = monitoring inactive
1 = 3.5 mA monitoring inactive
2 = 22 mA monitoring active
3 = 3.5 mA monitoring active

For values beyond the monitoring limits the error "F.EIn" is displayed (see remedy)

Error code

If more errors occur at the same time, these are going to be added.
**Example:**
E A1 means: Error 80/20/01 did occur at the same time.

Malfunctions

**Mains error**
Power supply voltage has fallen by at least 20 %.
**Reaction:** relais fall / analogue output: 0 V / 0 mA
**Remedy:** check power supply voltage

**Error overflow display > 9999**
incorrect scale, input signal too high or reverse-poled
**Remedy:** adjust scale, check input signal

**Error underflow display < 1999**
incorrect scale, input signal too low or reverse-poled
**Remedy:** adjust scale, check input signal

**Error sensor (only DPM-PT)**
sensor break or short-circuit
**Reaction:** relais fall / analogue output: 0 V / 0 mA
**Remedy:** check cable to sensor

**Error input**
pressure range blasted by at least 100 %
**Reaction:** relais fall / analogue output: 0 V / 0 mA
**Remedy:** check measuring signal, eventually switch to higher pressure range

**Error inlet**
malfunction monitoring inlet port active (activated as in parameter "Err.E" on page "Ser." 3.5 or / and 22 mA monitoring)
**Reaction:** relais fall / analogue output: 0 V / 0 mA

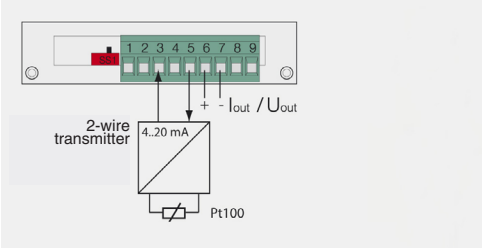
**Error**
an internal instrumental error exists. The error number is being displayed
**Remedy:** see error code below!

Error code

- **01 device code has been changed**
  Remedy: instrument defective -> send
- **02 error during EEPROM reading**
  Remedy: instrument defective -> send
- **20 error detected in adjustment data**
  Remedy: instrument has to be calibrated once again -> send
- **80 error detected in parameter set**
  Remedy: enter parameters once again

Application example

Pressure measurement with 2-wire transmitter,
e. g. PTM




| | |
|---|---|
| Connection: | see 6.3.1 |
| Adjustment: | 4...20 mA = 0...100 bar |
| Current output: | 0...20 mA = 0...100 bar |
| Limit values: | 10 bar, 90 bar, hysteresis 5bar |

The supply of the transmitter results from the internal sensor supply of the DPM at terminal 5.

**Page: ConF**

| | | |
|---|---|---|
| S.InP | 4-20 | signal input 4...20 mA |
| A.dP | 111.1 | decimal point of a figure |
| A.An | 0 | value for 4 mA |
| A.En | 100 | value for 20 mA |
| A.off | 0 | display offset |

"Ende", if no output should be configured.

| | | |
|---|---|---|
| SA.b | 0 | output 0...20 mA |
| SA.An | 0 | value for 0 mA |
| SA.En | 100 | value for 20 mA |

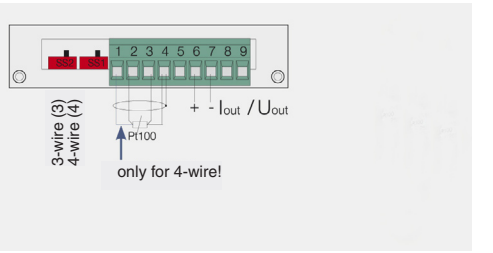
"Ende", if no limit values should be configured.

**Page: Sch.P**

| | | |
|---|---|---|
| SI.S | 10 | switch point 10 bar |
| SI.H | 5 | hysteresis 5 bar |
| SI.F | 0 | relais off for higher values |

The points on page Sch.P have to be repeated for each further limit value.

Temperature measurement with Pt100




| | |
|---|---|
| Connection: | see 6.3.2 |
| Adjustment: | Pt100 temperature measurement |
| Current output: | 4...20 mA = 0...150 °C |

Put switch 3L/4L (SS2) on 3- or 4- wire, depending on sensor.

**Page: ConF**

| | | |
|---|---|---|
| A.off | 0 | display offset, e. g. for performance-compensation |

"Ende", if no output should be configured.

| | | |
|---|---|---|
| SA.b | 1 | output 4...20 mA |
| SA.An | 0 | value for 4 mA |
| SA.En | 150 | value for 20 mA |

## 8. Maintenance, Repair

The instruments are maintenance-free.

Use a wet cloth for cleaning. Please make sure that all parts are dried before restarting.

To assure the accuracy of the measurement and the switching function we reccommend a regular examination of the instruments. For this the transmitter has to be disconnected of the process and has to be controlled by a test device.
Should malfunctions occur that can not be rectified without intervention at the pressure transmitter, please return the instrument with a precise description of the malfunction.

Repairs may only be executed by the manufacturer.

Please agree all returns with our sales team to grant a repair which is easier to maintain.

## 9. Decommissioning

For decomissioning please disconnect the instrument completely from the field of application.

The dismounting of the process-controlled digital display model DPM may only be executed in dead voltage condition.

## 10. Disposal

Please help protecting the environment and dispose the used materials according to the valid regulations resp. recycle them.

This pressure transmitter is not subject to the WEEE-standards 2002/96/EG and the corresponding national laws.

Please take the instrument directly to a specialized recycling company and do not use the local waste disposals for that.

Technical changes accepted.

## Data Sheets and Operating Instructions *online*

Our data sheets as latest version can always be found in the PDF download area of our websites

**http://armaturenbau.com and http://manotherm.com**.

Data sheets of pressure transmitters are available in category 9.

The latest issue status of our operating instructions is also available in the PDF download area in category II. operating instructions.

Do not hesitate to contact our sales teams for queries:

| | |
|---|---|
| Monday - Thursday | from 7:00 a.m. to 4:30 p.m. |
| Freitag | from 7:00 a.m. to 3:15 p.m. |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