® ProMinent

Operating Instructions

Two-wire measurement transmitter
DULCOMETER® DMT
Measured variable Conductivity

Q TÜV SÜD ISO 9001
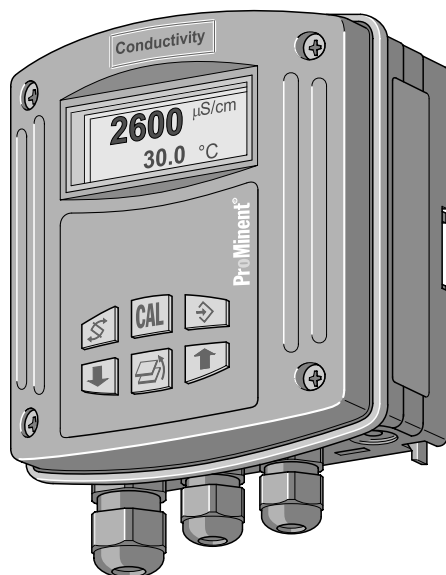
DMTa ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Please enter the identity code for your device here!

**Please carefully read through these operating instructions in full before
commissioning this equipment! · Do not discard!
The operator shall be liable for any damage caused by installation or operating errors!**

Legal Notice

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Device Identification/Identity Code

DMTa	DMT series DULCOMETER® measurement transmitter												
	Assembly type												
W	Wall mounted												
S	Control panel mounted (not PROFIBUS®-DMT)												
		Version											
	0	with ProMinent logo											
	1	None											
			Electrical connection										
		9	4-20 mA 2-wire										
		5	PROFIBUS®-DP, 24 V DC (16...30 V DC)										
				Communication interface									
			0	None									
			4	PROFIBUS®-DP									
					Measured variable								
				L	Conductivity								
						Correction variable							
					1	Temperature (Pt 100/Pt 1000)							
							Enclosure rating						
						0	Standard						
								Language (adjustable via General Settings)					
							D	German					
							E	English					
							F	French					
							S	Spanish					
							I	Italian					
							P	Polish					
									Sensor, type (adjustable via General Settings)				
								0	Cell constant k = 1				
								1	Cell constant k = 0.1				
								2	Cell constant k = 0.01				
								3	Cell constant k = 10				
										Temperature correction (adjustable via General Settings)			
									0	Autom. temperature correction (Pt 100 or Pt 1000)			
									1	Manual temperature correction			
									2	Autom./manual temperature correction			
									9	Without temperature correction			
											Output (adjustable via General Settings)		
										0	Conductivity (Error 23 mA, Calibration 23 mA)		
										1	manually adjustable current value		
										2	Conductivity or manual (Error 23 mA, Calibration 23 mA)		
										4	4 mA constant current		
												Other Settings	
											0	Standard	

DMTa	__	__	__	__	__	__	__	__	__	__	__	__	__

Please enter the identity code for your device here!

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1   General Guidelines for Use

Please read through the following guidelines. Familiarity with the following points ensures optimum use of the operating instructions.

Key points are indicated as follows

• Enumerations

➤ Instructions

Settings Menus

> ***NOTE***
>
> ***Notes are intended to make your work easier.***

and safety instructions:

> ⚠ ***CAUTION***
>
> ***Describes a potentially dangerous situation.***
> ***Could result in personal injuries or damage to***
> ***property if not observed.***

> ⚠ ***IMPORTANT***
>
> ***Describes a potentially damaging situation.***
> ***Could result in damage to property if not observed.***

2 Safety

Correct use   The on-site measurement DMT transmitter is designed exclusively for:

- the measurement of conductive conductivity
- the measurement of temperature
- the display of conductivity and temperature values
- the production of an output signal of the conductivity value

All other uses or modifications is forbidden!

⚠️   **SAFETY INSTRUCTIONS**

- **The DMT has no on/off switch. It starts to operate as soon as it is connected to an electrical supply.**
- **Overdosage of dangerous chemicals in the event of sensor failure or disconnection must be avoided! Ensure system is configured for this!**
- **The DMT must only be operated by appropriately trained and authorised personnel!**
- **The device may not be used in hazardous locations!**
- **The device may not be used outdoors without added protection (extra covering, weather-proof lid)! The housing may be affected by direct sunlight!**

2.1 Enclosure Ratings

Enclosure ratings   When assembly is carried out correctly the following enclosure ratings apply:

- Wall/pipe mounted version: IP 65

- Control panel mounted version: IP 54

3   Storage/Transport

Transport and store the DMT in the original packaging!

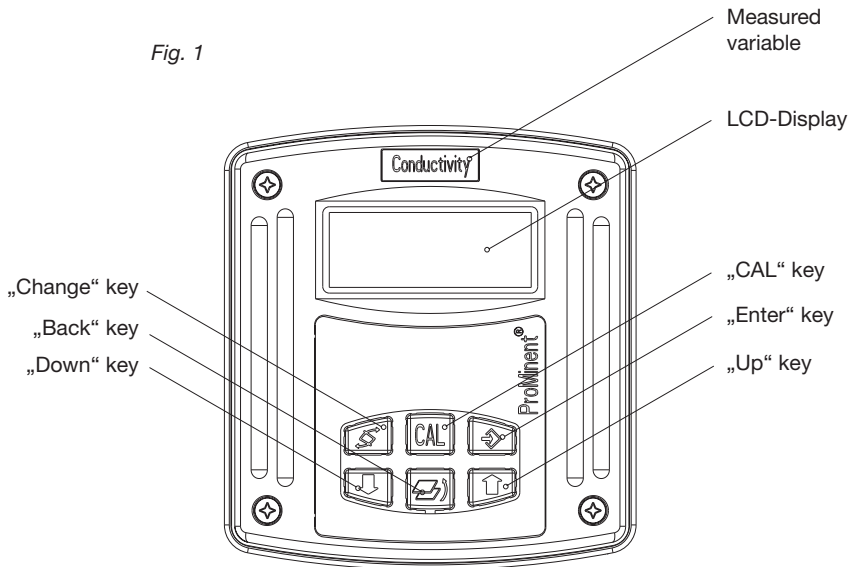Protect also the packed DMT from the effects of chemicals and moisture!

Ambient conditions for storage and transport:

Temperature:	-20 ºC to 70 ºC
Humidity:	< 95 % relative humidity, non-condensing

4   Device Overview/Operating Elements

Fig. 1

Measured variable

LCD-Display

Conductivity

„Change" key

„Back" key

„Down" key

„CAL" key

„Enter" key

„Up" key

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5 Function Description

5.1 General

The DULCOMETER® MEASURING TRANSMITTER (DMT) is a microprocessor controlled on-site measurement transmitter. It measures and displays conductivity and produces a proportional output signal. It can also operate using temperature as a correction variable. The operator can configure these processes via the operating menu.

The inputs are jointly electrically isolated from the output.

In the event of a fault occurring the DMT displays an error message. It also generates an increased current (23 mA) in the ring circuit.

The DMT is available for the following measured variables:

- Conductivity
- pH
- Redox
- Temperature
- Chlorine

**Block circuit diagram**

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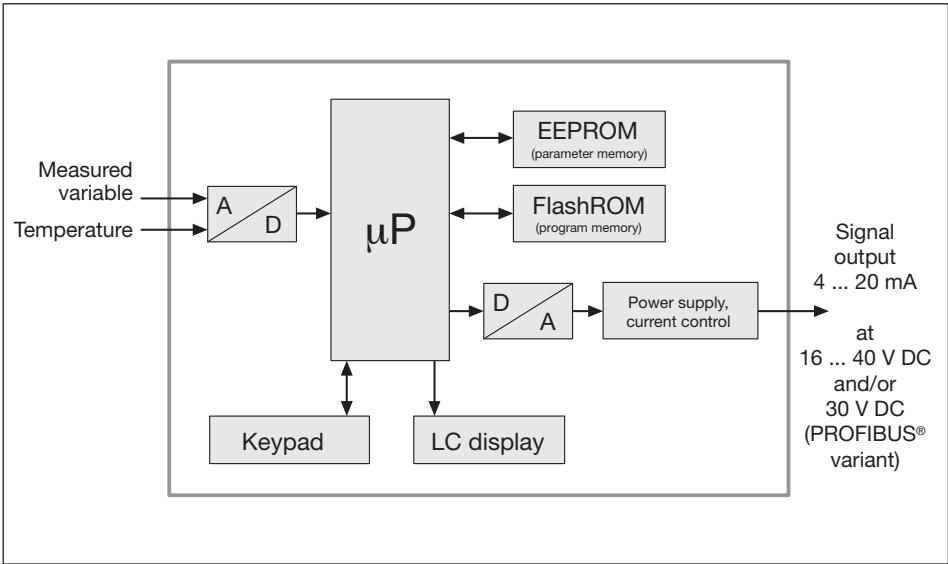
5.2   Key functions

The DMT settings are altered using the keys. The key functions are
as follows:

	In input menus and permanent displays	In menu options
"Change" key	used to toggle between the permanent displays and input menus	select a value in a menu option
"Back" key	return from input menu and permanent display 2 to permanent display 1	change to input menu from menu option without saving changes to value
"Enter" key	change to menu options (enter access code if one is set)	save changes to value and exit menu option change to input menu or another menu option
"CAL" key	open a calibration menu from a permanent display	open a calibration menu, if available
"Up/down" keys	alter contrast from the permanent display	change a value

5.3   Operating menu, schematic

The operating menu comprises:

- **the permanent display**
- **the calibration menu**
- **the info display** (info level)
  for viewing the set parameters or basic settings
- **the menu options** (setting level)
  for changing the parameters or basic settings
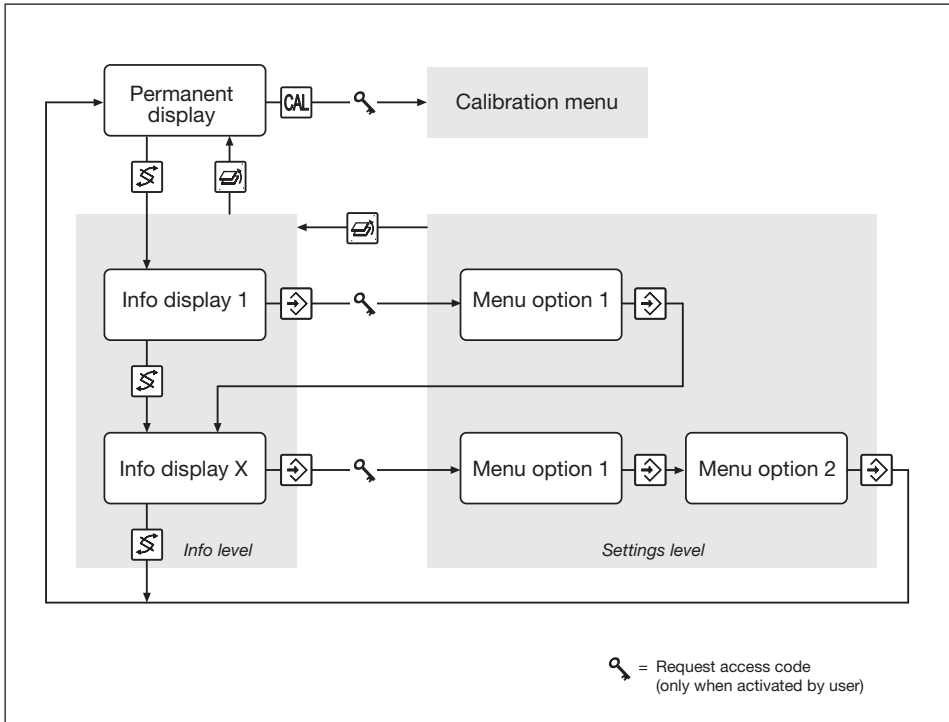
5.4   Negotiating operating menu

NOTE
- *The back key ⏎ can be used to exit the operating menu at any time. Depending upon where you are in the operating menu, you will return either to the permanent display or to the corresponding info level.*
- *The display will automatically return to permanent display if you do not press a key within 5 min. (does not save changes to values).*

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- *If an access code has been activated by the user, access code protection is applied to both the calibration menu and the settings level menu options.*
  To access these menu options the access code must be entered when it is requested and con-firmed with the enter key ⇨ *. Access restriction is reinstated each time you return to the permanent display.*
- *The access code is factory set to 5000 (inactive).*

5.4.1 Calibration menu

Access the calibration menu from the permanent menu using the CAL key CAL (further details given in 8 Operation)
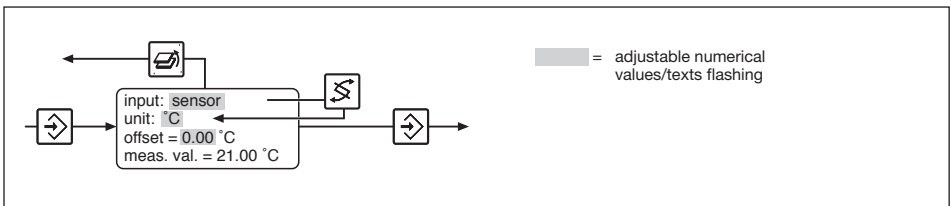
5.4.2 Info Display

Access the first info display of the info level from the permanent display using the change key ⑤ .
Use the change key ⑤ to access the other info displays in turn. Returns to the permanent display after the last info display.

5.4.3 Menu options

Use the enter key ⇨ to access the menu options associated with that info level.

5.4.4 Negotiating the menu options

Press the change key ⑤ to activate all adjustable values in a menu option.
Flashing values can be altered. Use the arrow keys ⬇ / ⬆ to alter numerical values or texts.
Keystrokes perform the following actions:

- 1 x short keystroke reduces/increases a numerical value by one increment or alters a text
- Holding the key down for longer alters numerical values increasingly rapidly.

Use the enter key ⇨ to save changed values in the menu option.
You will then automatically enter the next info display or (if available) the next menu option.

NOTE

Your entries become active immediately and are stored permanently when you press the enter key ⟆ .

If you do not wish to save changes, exit the menu option using the back key ⟆ . You will then return to the info display for that menu.

6 Assembly/Installation

⚠️ *IMPORTANT*

- ***The DMT is resistant to normal atmospheres in technical areas.***
- ***The DMT must not be placed in direct sunlight! For outdoor use always provide extra covering or weatherproof lid!***
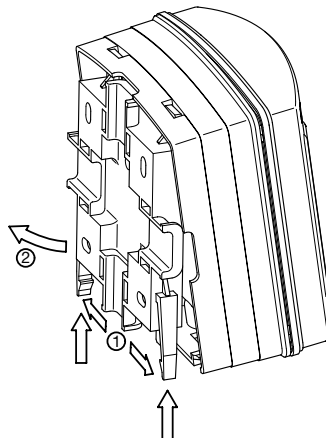
6.1 Assembly (mechanical)

The DMT is designed for mounting onto a wall or pipe or into a control panel.

6.1.1 Wall Mounting

Mounting fittings:

> 1x wall/pipe bracket
>
> 2x round head screw 5x45 mm
>
> 2x washer 5.3
>
> 2x plug Ø 8 mm, synthetic
>
> 1x rubber cap

Fig. 2

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Please follow these steps when mounting to the wall:

➤ Pull wall/pipe bracket away from DMT

➤ Pull both snap hooks outwards and push up, see fig. 2, ①

➤ Fold wall/pipe bracket away from DMT and pull down, see fig. 2, ②

➤ Mark two drill holes at diagonals to one another, using the wall/pipe bracket as a drilling template

➤ Drill holes: Ø 8 mm, depth = 50 mm

➤ Screw on wall/pipe bracket with washers

➤ If the DMT needs addional securing with a screw, pierce the screw hole in the back section and attach a rubber cap ② to the wall/pipe bracket, see fig. 3.

➤ Lower the DMT so it is hanging from the top of the wall/pipe bracket and exert light downwards pressure against the wall/pipe bracket until it engages, then push upwards until you hear it engage for a second time

➤ Now tighten the locking screw for added security.

Fig. 3
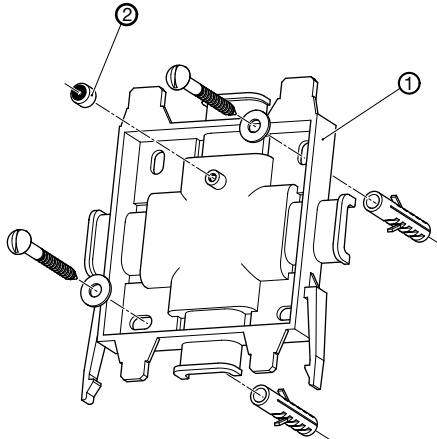
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6.1.2 Pipe Assembly

Mounting fittings:

> 1x wall/pipe bracket
>
> 2x cable connectors
>
> 1x rubber cap

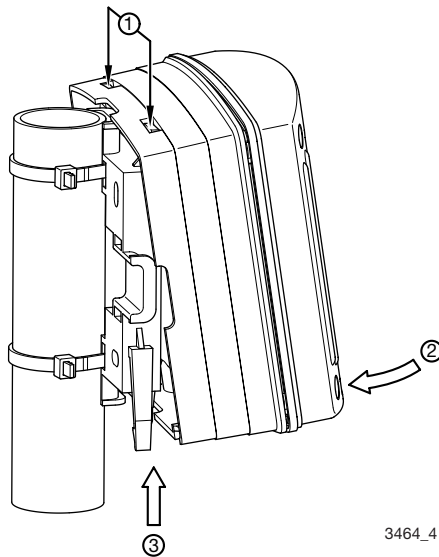May be assembled onto pipes with diameters from 25 mm to 60 mm.

Please observe the following steps when mounting onto a pipe:

➤ Fix the wall/pipe bracket in place using the cable connectors or hose clamps, see fig. 4

➤ Proceed as described under 6.1.1 Wall Mounting

Fig. 4

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6.1.3 Control Panel Assembly

⚠️ **IMPORTANT**

- **The control panel must be thick enough to withstand assembly without buckling! (Minimum 2 mm thickness steel; correspondingly thicker if plastic!) Otherwise the device will not conform to enclosure rating IP 54!**

- **Check the measurements of the drilling/stamping template!**

NOTE

Once assembled, the DMT projects approximately 30 mm from the control panel.

Please observe the following steps when mounting on a control panel:

➤ Locate the DMT precisely on the control panel using the drilling/stamping template and fix this in place

➤ Centre-punch the holes for the screws and the cut-out through the drilling/stamping template

➤ Drill the 4 screw holes with a 3.5 mm Ø drill

➤ Pierce out the cut-out with a keyhole saw, or if this is not to be pierced out, drill the 4 holes in the cut-out area with a 8 mm Ø drill.

Fig. 5
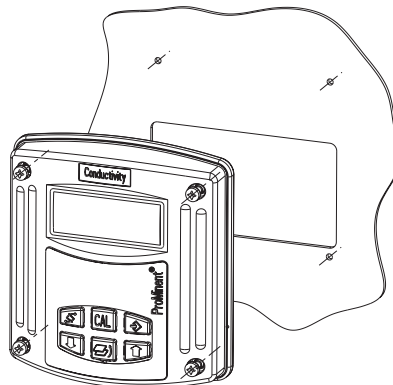
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CAUTION

Sharp edges can cause injury!

➤ File off sharp edges.

➤ Insert the profile seal into the groove of the DMT.

➤ Place the DMT onto the cut-out and screw in place.

IMPORTANT

Check location of seal once more! Enclosure rating IP 54 is only achieved when assembly is carried out correctly!

6.2 Installation (electrical)

IMPORTANT

- *Installation may only be carried out by specialist trained and appropriately certified personnel!*

- *Installation may only be carried out once assembly is complete!*

- *The device may only be connected to a separated extra low voltage in accordance with EN 60335-1!*

- *The device must be disconnected from the power during installation and reconnection must be reliably prevented!*

- *The DMT signal cables may not be laid next to leads that are subject to interference! In particular, the controller and power supply leads for inductive equipment (e.g. solenoid valves, contactors or servo motors) must be enclosed in separate cable ducting. These must not run alongside the signal cables over long distances. If it is not possible to provide a low interference electrical environment, special interference suppression measures must be taken! Very strong interference can lead to incorrect functioning of the DMT or irreparable damage!*

- *The hinge between the front and back sections of the housing cannot withstand mechanical loads! When working on the front section it must be held safely!*

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NOTE

If the LCD display window in the DMT appears very faint when the device is operating, then it may be adjusted from a permanent display using the arrow keys.

6.2.1 Wall Mounted Version

➤ Undo the four housing screws and push the front section to the left.

➤ Break open as many thread holes on the underside of the rear section as required (see fig. 6): use 4.5 mm diameter screwdriver.

NOTE

• *The large cable gland (M20 x 1.5) is intended for the sensor cable.*

• *With the small cable glands (M16 x 1.5), it is good practice to bring the supply cable in on the left, followed by the cables for additional sensors (e.g. Pt 1000).*

Fig. 6
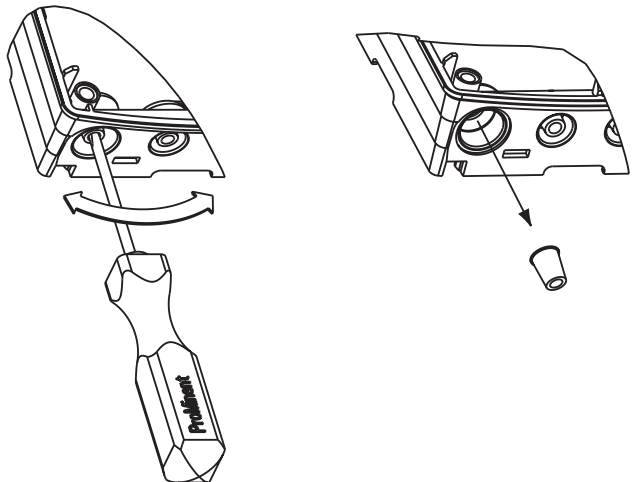
➤ Screw on the corresponding PG threaded connectors (fig. 7, ①) and tighten (not locking screws).

➤ Insert reducers (fig. 7, ②) as required for the diameter of the cable into the PG threaded connectors.

➤ Feed the cables into the threaded connectors

➤ You will find further steps in section 6.2.4 Connecting terminals

> *NOTE*
>
> *Feed sufficient cable into the housing to allow the front section to move freely. Cut off outer insulating sheath so that only 2 cm projects into the housing.*

After this, please procede as follows

➤ Screw locking screws (Fig. 7, ③) on the threaded connectors until tight

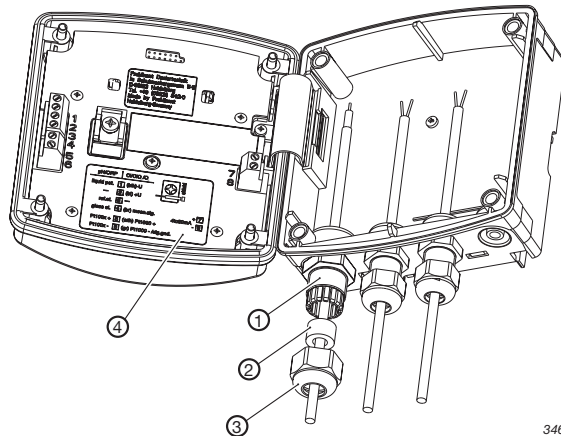➤ Swing the front section onto the rear section

> ⚠ *IMPORTANT*
>
> *Check the location of the seal once more! IP 65 enclosure rating is only achieved when assembly is carried out correctly!*
>
> *(If necessary, pull the front section forward a little in order to relieve stress on the seal.)*

➤ Fasten the housing screws fingertight

Fig. 7

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6.2.2   Pipe Mounted Version

See 6.2.1 Wall Mounting

6.2.3 Control Panel Version

Feed the cable from the back through the cut-out into the control panel:

➤ You will find further steps in section 6.2.4 Connecting terminals

> **NOTE**
>
> **To relieve stress on cables they must be inserted into a cable duct on site.**

6.2.4 Connecting terminals

➤ Remove insulation from cable ends as shown in fig. 8 and attach end crimps to each core.

➤ Connect the cable in accordance with the terminal connection plan.

⚠ **IMPORTANT**

- **Do not operate PROFIBUS® variants at voltages over 30 V.**

- **Connect PROFIBUS® variant power supplies via terminals 3 and 4 on the PROFIBUS® circuit board in the back section, not terminals 7 and 8 in the front section.**

NOTE

- **The terminal connection plan is given in the appendix. There is also a panel giving connection information affixed to the housing near the terminals (fig. 7, ④ and fig. 9).**

- **Push the cable through the housing until the front section can be moved up and down easily.**

- **If the LC display is too weak, reduce the brightness using the up arrow key ⬆ . If the display is too dark, increase the brightness using the down arrow key ⬇ .**

Fig. 8 and Fig. 9
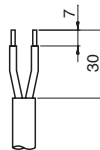
3459_4

1 ☐ current b	
2 ☐ voltage b	
3 ☐ voltage a	4 to 20 mA + ☐ 7
4 ☐ current a	– ☐ 8
5 ☐ Pt 1000 / Pt 100	
6 ☐	

7 Configuring the DMT

NOTE

Reconfiguration is only required if your process requirements deviate from the general factory settings (see section 7.5 General Settings)

Access the input menus using the change key $\boxed{\mathcal{S}}$, and then the menu options with the enter key $\boxed{\diamondsuit}$.

Overview of Menus

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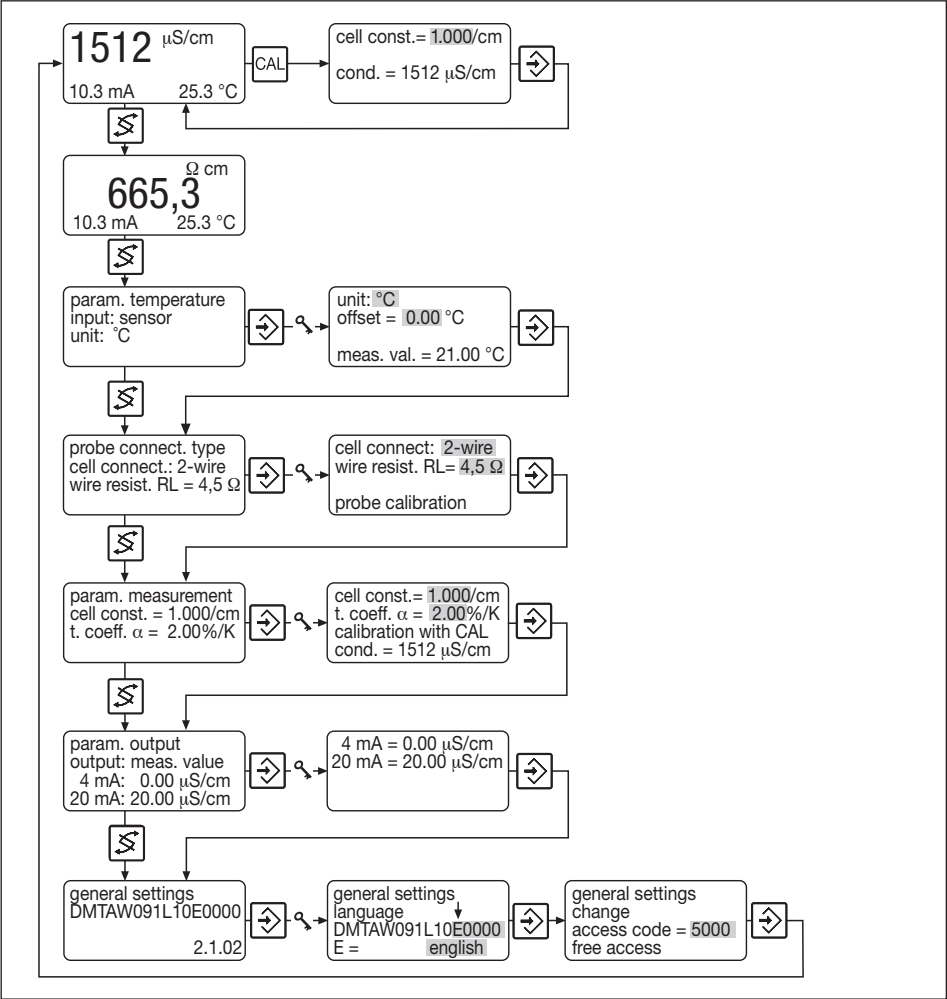
7.1 Parameters Temperature

NOTE

- *The DMT automatically detects whether a Pt 1000 or Pt 100 is connected.*

- *If there is no temperature gauge connected the temperature measurement should be set to "none" or "manual" (see chapter 7.5 General settings).*

Depending upon the "Temperature correction" general setting you have the following options:

7.1.1 General setting: Temperature measurement = automatic
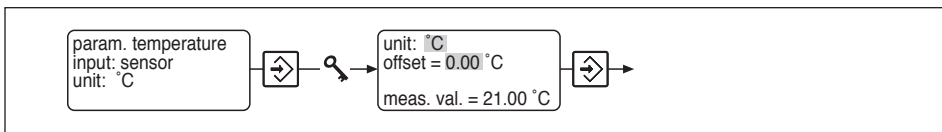
➤ Select the unit of measurement for temperature °**C** or °**F** under "unit".

➤ Enter the difference Δt under "offset" to a reference temperature measurement (see chapter 7.1.5 Calibrating the Pt 100 temperature gauge).

The actual temperature measured is displayed under "meas. val.".

7.1.2 General setting: Temperature measurement = manual (pH only)
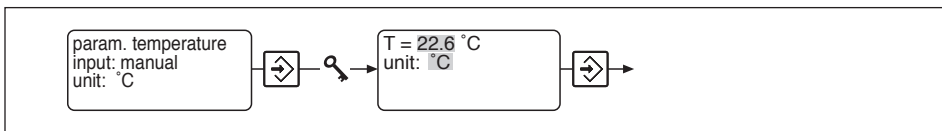
➤ Enter the process temperature under "T".

➤ Select the temperature unit °**C** or °**F** under "unit".

7.1.3 General setting: Temperature measurement = automatic or manual

➤ Under "input" select **sensor** or **manual:**
Select **sensor** if a temperature gauge is connected (temperature measurement = automatic):
Select **manual** if the user is going to enter the process temperature (temperature measurement = manual).

The selection made under "input" affects subsequent settings options.

Sensor If you have selected **sensor** in the "input" option:
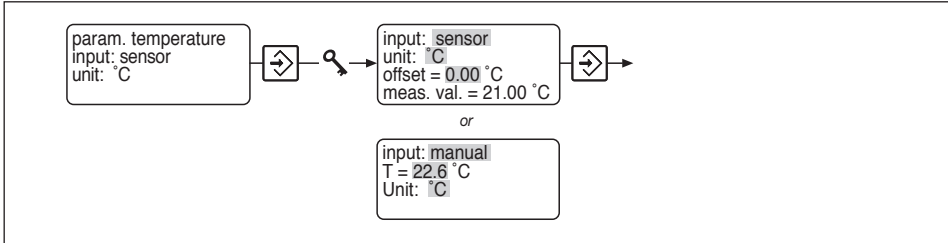
➤ Select the unit of measurement for temperature °**C** or °**F** under "unit".

➤ Enter the difference Δt under "offset" to a reference temperature measurement (see 7.1.5 Calibrating the Pt 100 temperature gauge).

The actual temperature measured is displayed under "meas. val.".

Manual If you have selected **manual** in the "input" option:

➤ Enter the process temperature under "T".

➤ Select the temperature unit °**C** or °**F** under "unit".

7.1.4 General setting: Temperature measurement = none

No info display appears in the operating menu.

No temperature measurement is carried out.

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7.1.5 Calibration of the temperature gauge (Pt 100)

NOTE

You only need to calibrate the temperature gauge if you:

- *have a Pt 100 temperature gauge and the sensor cable is longer than 4 m*
- *have a precision reference device (the DMT measures accurately to ±0.5 °C/±0.9 °F)*

The temperature gauge may not be changed during the following procedure:

➤ Immerse the DMT temperature gauge and the reference device into the same bath

➤ Once the temperature display is stable, read off the value on the reference divice

➤ Set the correction value under "offset" until the "measured value" is identical to that on the reference device.

7.2 Conductivity Sensor Connection
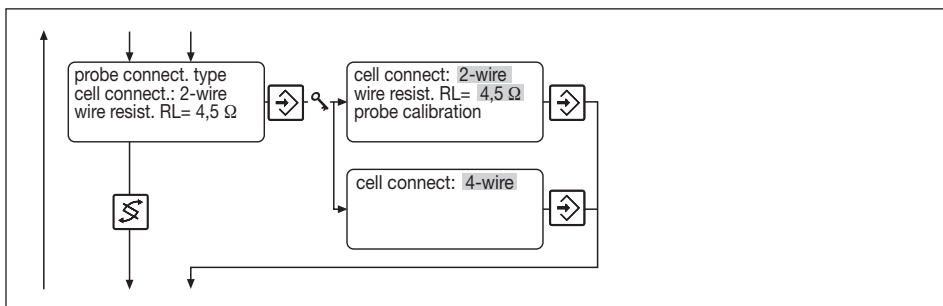
In Setting of "probe connect. type" you can select the connection type of the sensor (2-wire or 4-wire connection)

NOTE

You need to enter the sensor cable resistance only if you:

- *have a sensor with 2-wire connector cable longer than 20 m*
- *are measuring above 10 mS/cm.*

If the **resistance** of the connection cable **is known** then please proceed with setting as follows:

➤ Under "Connection" select "2-wire"

➤ Under "Lead resistance RL" enter the resistance of the sensor cable

If the **resistance** of the connection cable **is not known** and must be determined, proceed as follows:

➤ Under "Connection" select "2-wire"

➤ Use the change key 🖅 to go to the next input value

➤ Access the calibration menu using the CAL key 🄒🄰🄻

➤ Connect a 10 Ω resistance to the end of the sensor cable instead of the sensor

The DMT now automatically determines the resistance of the sensor cable.

➤ Confirm this value by pressing the enter key ⮡

7.3 Parameter Measurement
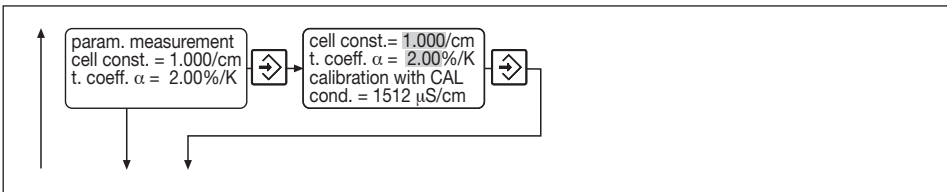
In "param. measurement" you can enter the cell constant or the temperature coefficient α of your sample water.

If the values of the **cell constant** and the **temperature coefficient** α **are known** then please proceed with setting as follows:

➤ Enter the cell constant under "cell const."

➤ Enter the temperature coefficient α under "t.coeff."

If the value of the **temperature coefficient** α **is not known** then please proceed with setting as follows:

➤ Select the value "t.coef." with the change key

➤ Open the calibration menu with the CAL key

➤ Immerse the sensor and the integrated temperature gauge (Pt 100/Pt 1000) into the sample water

➤ Confirm the value of "Temp. 1" with the enter key

➤ Alter the temperature of the sample water by at least 20 ºC ($T_2 \geq T_1 + 20\,°C$ or $T_2 \geq T_1 - 20\,°C$)

➤ Confirm the value of "Temp. 2" with the enter key

The DMT now automatically determines the temperature coefficients α and jumps to the next input menu.

7.4   Parameter Output

You have the following settings options, depending on the "output" type you selected under general settings:

7.4.1   General setting:
output current = measured value
(= 0 in the identity code)
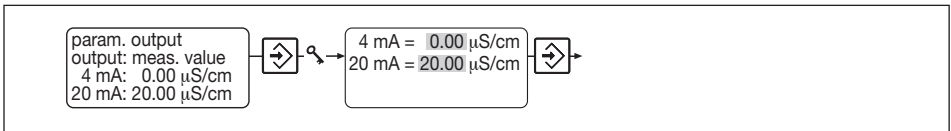
➤ Under "4 mA", enter the value at which the output current should be 4 mA.

➤ Under "20 mA", enter the value at which the output current should be 20 mA.

7.4.2   General setting: output current =
manual adjustable current value
(= 1 in the identity code)
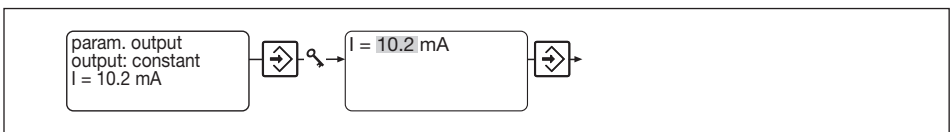
➤ Under "I", enter an output current between 4 and 20 mA.

This setting is used for the function check.

7.4.3 General setting: output current = measured value or adjustable

(= 2 in the identity code)
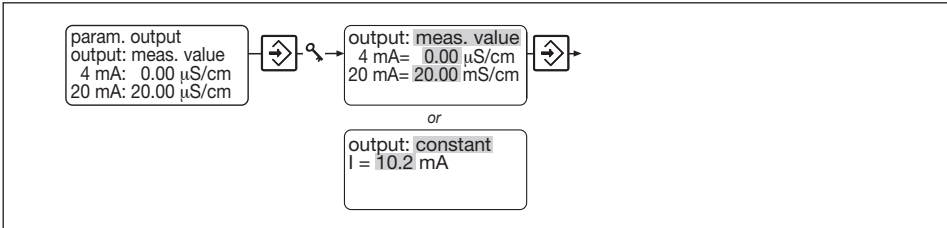
➤ Under "output", select **meas. value** or **constant:**
Select **meas. value** if the output current should be proportional to the measured value (output = measured value):
Select **constant** if the output current is to be entered manually (output = adjustable).

The selection you make under "output" influences the subsequent settings options:

Measured value If you selected "output" **meas. value:**

➤ Under "4 mA", enter the value at which the output current should be 4 mA.
➤ Under "20 mA", enter the value at which the output current should be 20 mA.

Constant If you selected "output" **constant:**

➤ Under "I", enter any output current between 4 and 20 mA.

7.4.4 General setting: output current = 4 mA constant

(= 4 in the identity code)

No information display will appear in the operating menu.

The DMT emits a constant output current of 4 mA.

This setting is used for the function check and/or is selected if the DMT is to be used purely as a display device (the power consumption is minimal in this case).

7.5   General Settings

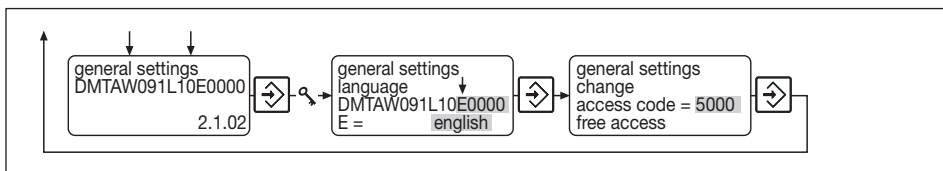In the input menu "General Settings" you can adapt the DMT to your special process requirement and activate an access code.

Special Configurations

Under the menu option "General Settings"you can activate the functions described in the table. To do this select the corresponding identity code position using the change key and activate the corresponding function using the arrow keys.

Confirm your selection with the enter key.

Language	Conductivity sensor type	Temperature correction	Output current	Other settings
D German	**0** cell constant = 1	**0** Sensor PT 1000 (PT 100)	**0** Conductivity	**0** standard
E English	**1** cell constant = 0,1	**1** temp. input manual	**1** selectable	
F French	**2** cell constant = 0,01	**2** selectable: PT or man.	**2** Cond. + selectable	
S Spanish	**3** cell constant = 10	**9** no temp. corr.	**4** output current = 4 mA	

> **NOTE**
>
> ***Your settings in "General Setting Identity Code"***
> ***affect the number of input menus in the DMT.***

Changing access code

The factory pre-set access code is **5000**. This setting allows unlimited access to the calibration menu and the menu options in the settings level.

This code can be changed in the third menu option "change access code". Use the change key ⑤ to move to individual digits. The new code is confirmed and activated with the enter key ⑤ .

NOTE

- *If an access code has been activated, both the calibration menu and the menu options are access-protected.*
  To gain access, enter the access code when requested to do so and confirm using the enter key ⟐ *. Access protection is reactivated when the DMT returns to continuous display mode.*

- *Deactivate the access code by resetting the code to 5000 in the "change access code" menu option.*

8 Operation

During operation the permanent displays allow monitoring of the DMT values (the number of values displayed depends upon the DMT factory settings).
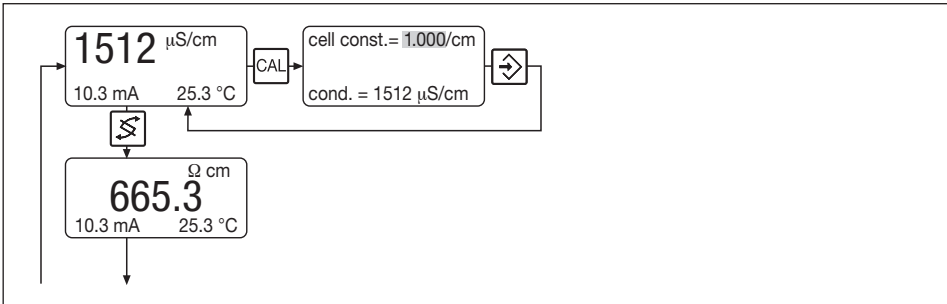
Permanent display brightness setting

➤ If the LCD display window in the DMT appears faint when the device is in operation it may be simply adjusted using the arrow keys.

Calibration of conductivity measurement

- with buffer solution:

➤ Rinse the conductivity sensor with distilled water and dry

➤ Press the CAL key in Permanent Display 1 or Permanent Display 2 (Calibration of Conductivity Measurement input menu is accessed)

➤ Press the enter key (menu options accessed)

➤ Place the DMT conductivity sensor and the temperature gauge in the buffer solution and wait until measured variables are stable

➤ Read off the temperature on the DMT and look in the buffer table for the conductivity value at this temperature

➤ Set the conductivity value under "cond." by changing cell constant.

➤ Confirm the "cond." value using the enter key

• with reference measurement device:

➤ Press the CAL key in Permanent Display 1 or Permanent Display 2 (Calibration of Conductivity Measurement Setting menu is accessed)

➤ Press the enter key (menu options accessed)

➤ Place the conductivity sensor of the reference measuring device into the sample water

➤ Read off the conductivity value

➤ Set the conductivity value under "cond." by changing the cell constant

➤ Confirm the "cond." value using the enter key

⚠️ ***IMPORTANT***

- ***The same temperature coefficient must be set for the reference measuring machine as for the DMT!***

- ***Your settings become effective the moment you press the enter key.***

- ***If there is a significant discrepancy between the measured variable from your reference measuring device and the DMT it is advisable to seek the cause!***

9   Trouble Shooting

Error text: "meas. range overflow"/"meas. range underflow"

Error	Reason	Remedy
Conductivity value is outside the set limit values	Conductivity value of your liquid are outside given range	Check the conductivity of the fluid in your system and enter alternative values if necessary (see 7.4 "Parameter output")

Error text: "conduct. input error" + Measured value 9999 μS/cm

Error	Reason	Remedy
Short circuit at conductivity input	Sensor is connected incorrectly or is defective	Correctly attach functioning sensor
	Short circuit in sensor cable	Replace sensor cable

Error text: "conduct. input error" + Measured value 0.000 μS/cm

Error	Reason	Remedy
No signal at conductivity input	No sensor connected	Connect sensor
	Sensor is connected incorrectly or is defective	Correctly attach functioning sensor
	Break in sensor cable	Replace sensor cable
	Sensor is dry or there are air bubbles on the electrode	Remove cause of error (e.g. increase flow, ensure sensor is horizontal)

Error text: "temp. input error" + Measured value 999.0

Error	Reason	Remedy
No signal at temperature input	No sensor connected	Connect sensor or set temperature manually
	Break in sensor cable	Replace sensor cable

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Error text: "temp. input error" + Measured value -99.0		
Error	**Reason**	**Remedy**
Short circuit at temperature input	Sensor is defective	Connect correctly functioning sensor

No visible display field		
Error	**Reason**	**Remedy**
Display window looks faint	As long as the DMT displays a failure message it emits a current of 23 mA	Alter brightness using arrow keys

The error message automatically disappears once the cause of the error has been removed.

10   Maintenance/Repair

Maintenance   The DMT is maintenance free.

The housing should be cleaned with a cloth dipped in soapy water. Dry afterwards.

⚠ **IMPORTANT**
Never use solvents! May corrode the surface!

Repair   Please return the DMT to us for repairs.

11   Disposal

⚠ **IMPORTANT**
Electronic waste is subject to rules for special waste!

Observe all currently applicable local and national regulations!

12   Technical Data

Electrical data

Measured variables:	conductive conductivity
Measurement range:	20, 200, 2000 μS/cm 20, 200 mS/cm (autoranging)
Reproducibility [1]:	0.1 %
Operating measurement deviation [1]:	0.5 % from measurement range (at 25 °C)
Conductivity sensor:	2 or 4 electrode sensor
Cell constant k:	0.006….12.00
Sensor connection:	2 or 4 wire via terminal
Correction variable:	temperature via Pt 100 or Pt 1000
Temperature measurement range:	-20 °C...150 °C, -4 °F…302 °F
Correction range:	0 °C...100 °C
Accuracy of temp. measurement:	0.3 °C (Pt 1000 at 25 °C)
Internal resolution of temperature measurement:	0.01 °C
Temperature coefficients α:	0...8.00 %/K
Correction variable connection:	2-wire via terminal
Signal output:	4…20 mA in normal operation 23 mA during failure message
Ohmic resistance:	50 Ω
Voltage supply:	- 4-20 mA (two wire) current loop, 24 V DC (16...40 V DC), protective low voltage - PROFIBUS®-DP, 24 V DC (16...30 V DC), protective low voltage The supply voltage level must not fall below 16 V at any time.
Display:	LCD display

[1] according DIN IEC 746 Part 1

Measurement range depending on cell constant:

Cell constant	Measurement range
0.01	0.01… 200 μS/cm
0.1	0.1… 2 mS/cm
1	1…20 mS/cm[1]
10	10…200 mS/cm[2]

[1] depending on sensor type used, the measurement range can be increased to 200 mS/cm

[2] depending on sensor type used, the measurement range can be increased to 2 S/cm

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Maximum cable length of conductivity sensor:

Measurement range	Cable length
0 - 10 µS/cm	10 m
10 - 200 µS/cm	20 m*

* depending on application range and sensor type used, the cable length may be considerably longer.

Environmental conditions

Operating temperature:	0…55 ºC
Storage temperature:	-20…70 ºC
Humidity:	< 95 % relative humidity, non-condensing

Dimensions and weight
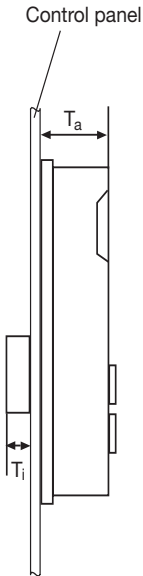
Dimensions (WxHxD):	126x136x78 mm for wall mounted version 35 mm, 30 mm (T_i, T_a) for control panel mounted version
Weight:	450 g for wall mounted version 300 g for control panel mounted version
Permissible cable diameter:	M20 x 1.5, clamping range 2-7 mm diam. (22 mm AF) M16 x 1.5, clamping range 5-10 mm diam. (19 mm AF)
Permissible conductor cross-sectional area:	0.14-0.75 mm^2
Permissible diameter over screen:	2-5 mm diam.

Control panel

T_a

T_i

DMT dimensions

Materials information

Housing:	Luranyl PPE - blue RAL 5003
Bracket:	Luranyl PPE - GF 10 - grey RAL 7035
Keypad:	Slicon
Housing seal:	Silicon

13   Replacement Parts and Accessories

Assembly set for wall/pipe assembly	part number 1003205
Hose clamp for pillar mounting	part number 1002777
Sensor	see product catalogue
Sensor cable	see product catalogue

EC Declaration of Conformity

We,
ProMinent Dosiertechnik GmbH
Im Schuhmachergewann 5 - 11
D - 69123 Heidelberg

hereby declare that, on the basis of its functional concept and design and in the version brought into circulation by us, the product specified in the following complies with the relevant, fundamental safety and health stipulations laid down by EC regulations.
Any modification to the product not approved by us will invalidate this declaration.

Product description :   *Dulcometer transducer*
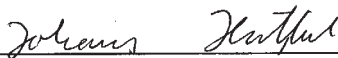
Product type :   *DMTa*

Serial number :   *see type identification plate on device*

Relevant EC directives :   *EC - EMC - directive (2004/108/EC)*

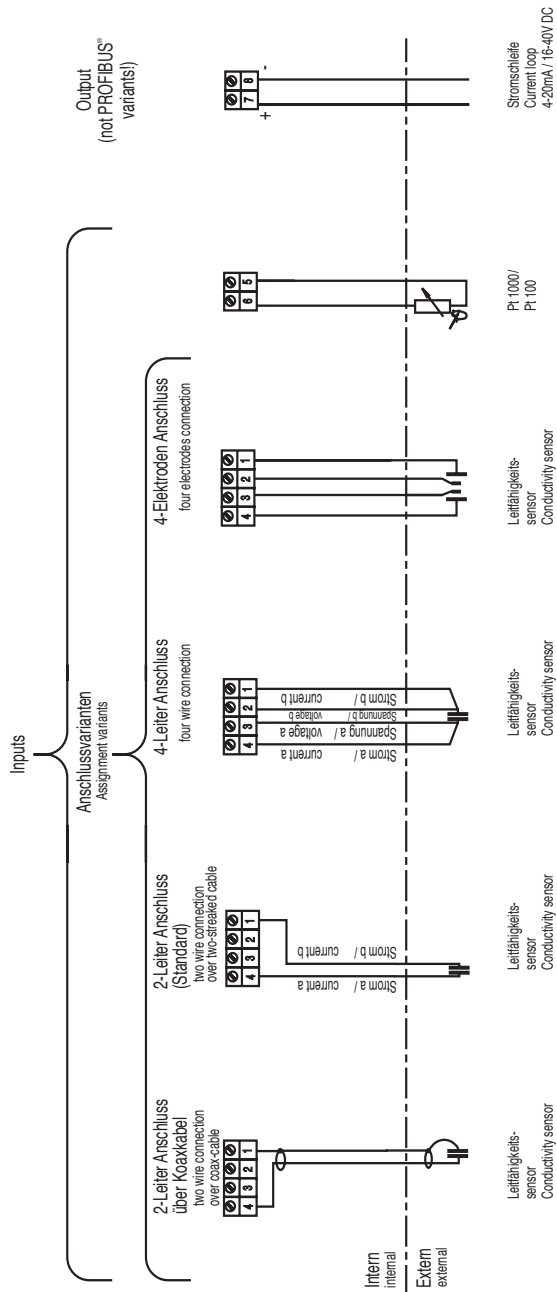Harmonised standards used,   *EN 55011, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3,*
in particular :   *EN 61000-6-4*
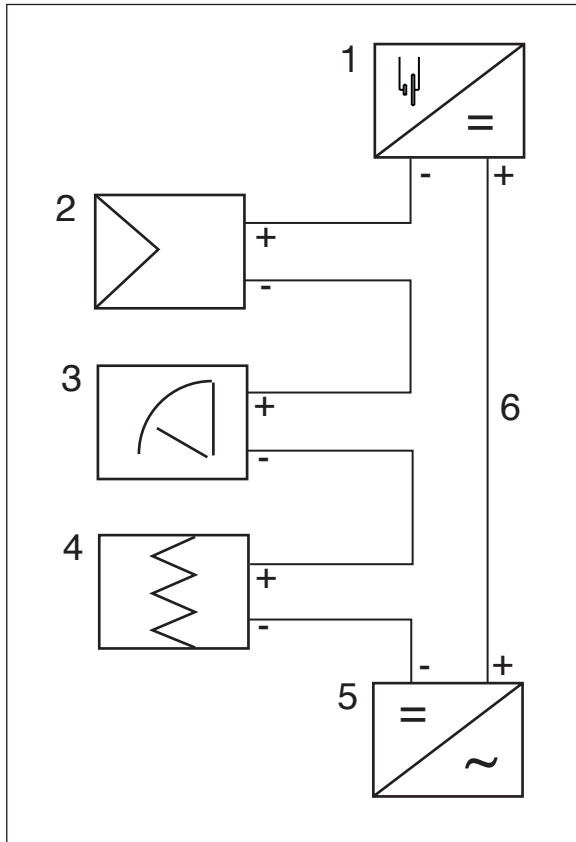
Date/manufacturer´s signature :   *10.04.2007*

The undersigned :   *Dr. Johannes Hartfiel, assistent development manager*

Output
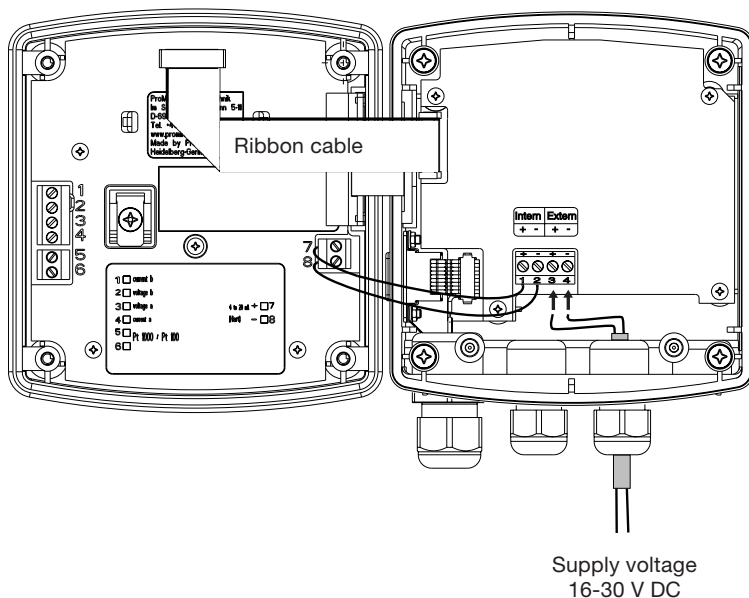(not PROFIBUS®
variantsl)

Stromschleife
Current loop
4-20mA / 16-40V DC

- 8
7 +

Pt 1000/
Pt 100

6 5

Inputs

Anschlussvarianten
Assignment variants

4-Elektroden Anschluss
four electrodes connection

Leitfähigkeits-
sensor
Conductivity sensor

1
2
3
4

4-Leiter Anschluss
four wire connection

Leitfähigkeits-
sensor
Conductivity sensor

Strom b / current b
Spannung b / voltage b
Spannung a / voltage a
Strom a / current a

1
2
3
4

2-Leiter Anschluss
(Standard)
two wire connection
over two-streaked cable

Leitfähigkeits-
sensor
Conductivity sensor

Strom b / current b
Strom a / current a

1
2
3
4

2-Leiter Anschluss
über Koaxkabel
two wire connection
over coax-cable

Leitfähigkeits-
sensor
Conductivity sensor

1
2
3
4

Intern
internal

Extern
external

Wiring example - two wire system

1 DMT transmitter
2 Controller
3 Meter
4 Recorder
5 24 V DC (16...30 V DC/40 V DC) power supply unit
6 4-20 mA current loop

> ⚠ **IMPORTANT**
> - **The signal inputs of all devices in the current loop must be electrically isolated from the current output.**
> - **Take into account the sum of the ohmic resistances of all devices in the current loop (excluding power supply).**
>
>   **The input voltage of the transmitter must never drop below 16 V during operation.**
>
>   **The measured value will otherwise be wrong.**

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PROFIBUS®-DMT power supply

Supply voltage
16-30 V DC

NOTE

To operate the PROFIBUS®-DMT temporarily without the PROFIBUS®, unplug the ribbon cable (see fig.) and briefly disconnect from the power supply.

To operate the PROFIBUS®-DMT with the PROFIBUS® again, plug the ribbon cable back in (plug in the connector on the side of the PROFIBUS® circuit board with the red edge of the ribbon cable facing upwards, see fig.). Briefly disconnect from the power supply.

Index

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Drilling template

3460-4.1

100

60

5

4 drill holes Ø 3.5

100

108

R4

DULCOMETER® DMT
Drilling template for control
panel assembly

NOTE:
Check the measurements of the
drilling/stamping template!

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