

### INTRODUCTION

DMT242 is a dewpoint transmitter for wide range of OEM applications. DMT242 measures dewpoint with excellent long term stability which is maintained automatically with the patented auto-calibration procedure. The Vaisala DRYCAP® polymer sensor technology used in DMT242 is also durable against dew in case condensed water exists in the process during system malfunction. The product mechanics have been designed for harsh environments requiring protection against dust, dirt and splashed water.

The disconnection and reconnection of the transmitter is easy with the connector where the output signal and supply voltage wires are connected. The unit also has a serial line for rescaling the analog output.

### PRESSURE SETTING PROCEDURE FOR PRESSURIZED PROCESSES

For achieving the most accurate measurements in pressurized processes, set the process pressure to DMT242 according to Figure 1 by using the pressure switches (see Figure 3, item 8). As shipped from factory, the pressure switch setting is 1 bar, as in switch number 4 in the ON position.

Switches	Pressure (absolute)
1 2 3 4	(bar)
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	0 ... 2
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	2 ... 4
<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	4 ... 6
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	6 ... 8
<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	8 ... 10
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	10 ... 12
<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	12 ... 14
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	14 ... 16
<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	16 ... 18
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	18 ... 20

THE SWITCH MARKED WITH A BLACK SQUARE IS IN THE ON POSITION

### MOUNTING

1. Insert the sealing washer (see Figure 1) on the probe and set the probe through the fitting of the process pipe. The probe has 1/2" ISO 228/1 parallel thread.
2. Fasten the transmitter to the fitting of the process pipe by tightening from the nut of the probe (24 mm).

### WIRING

1. Remove the cover.
2. Take out the connector.
3. Take out the screw terminal from the connector by pushing it out, for example, with the fixing screw.
4. Use a three-wire cable. Suitable 2 m or 10 m optional cable is available from Vaisala (items: 221475 for 2 m cable and 221476 for 10 m cable). Connect the wires to the connector terminals as follows:

Figure 1 Pressure Setting Table

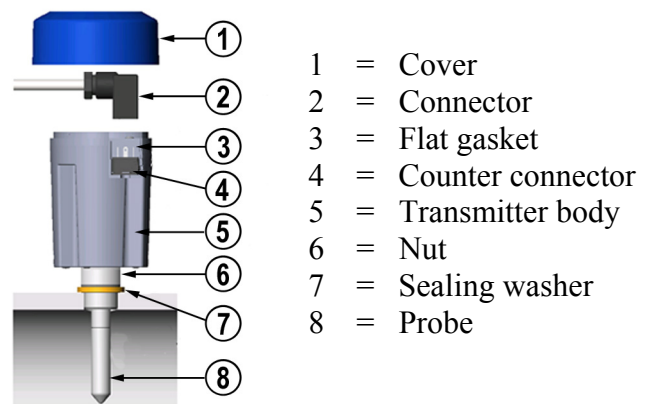
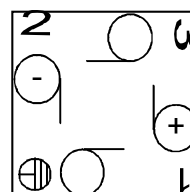


Figure 2 DMT242

**Terminal nr 1 = V supply + (VAC line)**  
**Terminal nr 2 = V supply - (VAC neutral)/signal -**  
**Terminal nr 3 = Signal +**  
**Leave the ground terminal free**



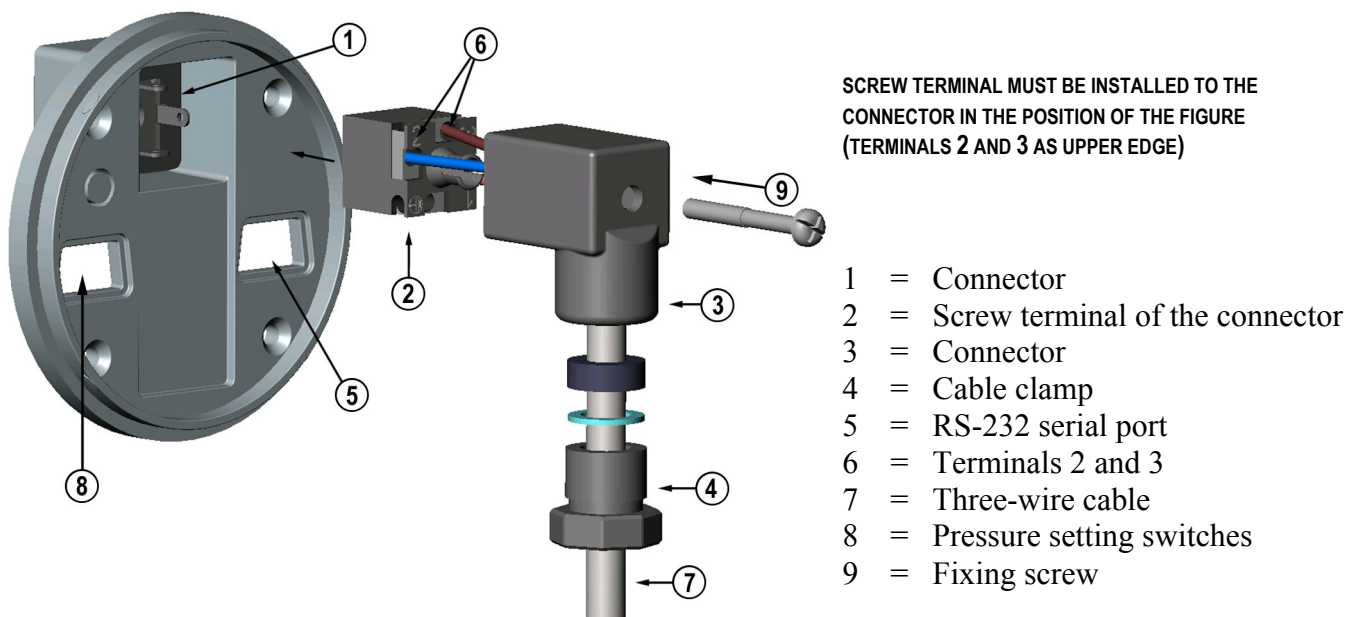
**Wire colours in cables 221475 and 221476:**  
 1 = brown  
 2 = blue  
 3 = black

5. Insert the wired screw terminal back into the connector exactly in the position indicated in Figure 3. Push the fixing screw through the connector. Fasten the cable clamp. Insert the wired connector into the counter connector.

**NOTE** The connection is incompatible if the positioning of the screw terminal is NOT as indicated in Figure 3. Fasten the fixing screw.

6. Install the back cover allowing the cable to run through the hole in the cover. The transmitter is ready for use.

**NOTE** When the power is switched on, wait about 7 minutes before taking measurements. Start-up self-diagnostics freeze the output during the first operation minutes.



**Figure 3 Wiring and Installation of Connector**

## CALIBRATION AND MAINTENANCE

### Replacing the sintered filter

If the sintered filter is dirty it can prolong the response time of the measurement. If the filter needs to be changed unscrew the filter and replace the old filter with a new one.

### Calibration

It is recommended to perform a calibration check every other year. A field check can be carried out by using a calibrated reference probe and comparing the readings measured with the transmitter and the reference probe. The Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 is ideal for confirming the performance of the transmitter in the field. By using a connection cable the readings of DMT242 and DM70 can be viewed simultaneously on the display of DM70. If there is need for adjustment contact Vaisala Instruments Service Centers or local Vaisala representative.

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**SCALING THE ANALOG OUTPUT VIA THE SERIAL BUS**

Serial communication settings

The analog output scaling can be done using the serial bus and computer with suitable terminal software. Connect the DMT242 to a serial bus via the RS-232 interface by using the following settings: *Baud rate: 2400, Parity: none, Data bits: 8, Stop bits: 1*. The serial cable (DMT242RS) can be ordered from Vaisala.

Scaling of the dewpoint output

Scale the dewpoint parameter by giving the command **ascl xx yy<ENTER>** where xx = the low limit (°C or °F) and yy = the high limit (°C or °F). The factory setting for serial measurement unit is Centigrade (°C). To change the unit for Fahrenheit (°F) use command **unit xx <ENTER>** where xx = **n** for non-metric (°F) and xx = **m** for metric (°C) units.

**ACCESSORIES**

Order Code	Description
HM47280	Stainless steel sintered filter
DMT242RS	RS-232 serial line cable for PC (with female D connector)
210662	1/2" NPT adapter

**GUARANTEE**

Vaisala issues a guarantee for the material and workmanship of this product under normal operating conditions for one (1) year from the date of delivery. Exceptional operating conditions, damage due to careless handling and misapplication will void the guarantee.

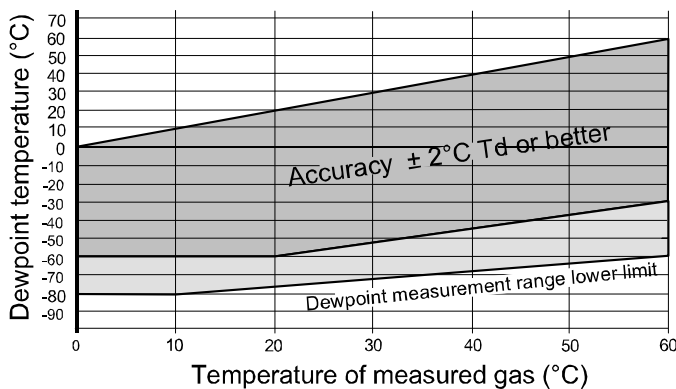
### TECHNICAL SPECIFICATIONS

#### Dewpoint Temperature

Measurement range	-80 ... +60 °C (-112 ... +140 °F)
DMT242A	-80 ... +20 °C (-112 ... +68 °F)
DMT242B	-60 ... +60 °C (-76 ... +140 °F)
DMT242X	free scaling

When the dewpoint is below 0 °C, the transmitter outputs frost point.

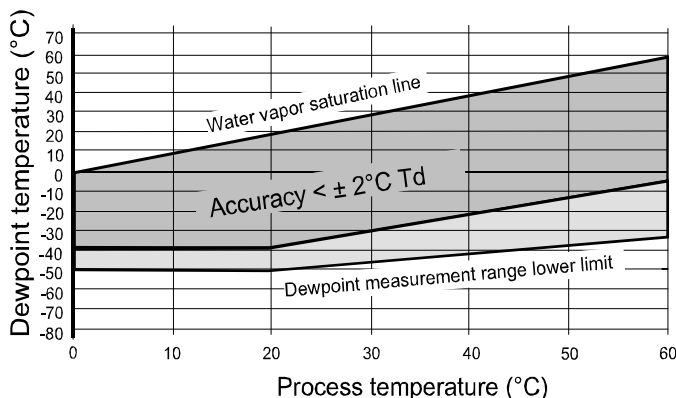
Dewpoint accuracy with DRYCAP® 180M  $\pm 2$  °C ( $\pm 3.6$  °F)  
(See figure below)



Response time 63 % [90 %] at 20 °C gas temperature at flow rate > 1 l/min and 1 bar pressure:

-60 → -20 °C T <sub>d</sub> (-76 → -4 °F T <sub>d</sub> )	5 s [10 s]
-20 → -60 °C T <sub>d</sub> (-4 → -76 °F T <sub>d</sub> )	45 s [10 min]

DRYCAP® 180S  $\pm 2$  °C ( $\pm 3.6$  °F)  
(See figure below)



#### Operating Environment

Temperature	0 ... +60 °C (32 ... +140 °F)
Higher temperature peaks	Short term OK
Relative humidity	0 ... 100 %RH
Pressure	0 ... 20 bar <sub>a</sub> (0 ... 290 psi <sub>a</sub> )
Sample flow rate	no effect

#### Output

Analog output	4 ... 20 mA
Resolution for analog output	$\pm 0.002$ mA
Typical temperature dependence	0.0008 mA/°C
Serial line for service use	RS-232

#### General

Sensor	DRYCAP® 180M
Operation voltage	17 ... 35 VDC 20 ... 28 VAC
Power consumption 24 VDC	max 220 mA
External load for current output	max 500 Ω
Optional connection cable with DMT242 connector	2 m or 10 m
Connector for supply voltage and signal output	
Max wire size	0.75 mm <sup>2</sup>
Max wire diameter	6.5 mm/PG7
Service cable for serial line	DMT242RS
Probe material	stainless steel (AISI 316L)
Sensor protection	stainless steel sintered filter (HM47280)
Mechanical connection	G1/2" ISO228-1 thread with bonded seal ring (U-seal)
Electronics housing	plastic (ABS/PC)
Housing classification	IP 65 (NEMA 4)
Storage temperature range	-40 ... +70 °C (-40 ... +158 °F)

Complies with EMC standard EN61326-1:1997 + Am1:1998 + Am2:2001; Industrial Environment.

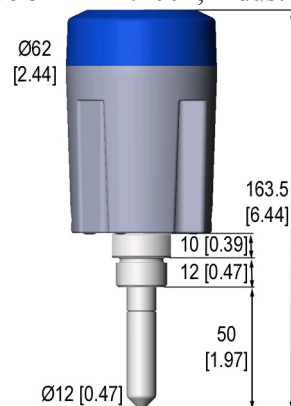


Figure 4 Dimensions in mm [inches]

