

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.

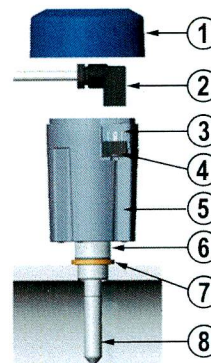
Switches	Pressure (absolute) (bar)
1 2 3 4	
0 ... 2	
2 ... 4	
4 ... 6	
6 ... 8	
8 ... 10	
10 ... 12	
12 ... 14	
14 ... 16	
16 ... 18	
18 ... 20	

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 G½" 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).

Figure 1 Pressure Setting Table



- 1 = Cover
- 2 = Connector
- 3 = Flat gasket
- 4 = Counter connector
- 5 = Transmitter body
- 6 = Nut
- 7 = Sealing washer
- 8 = Probe

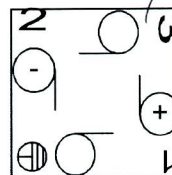
WIRING

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 2 DMT242

	DMT242	DMT152
V+	RED	BROWN
V-	BLACK	BLUE
sig+	WHITE	WHITE
⊖	Green	

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



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.

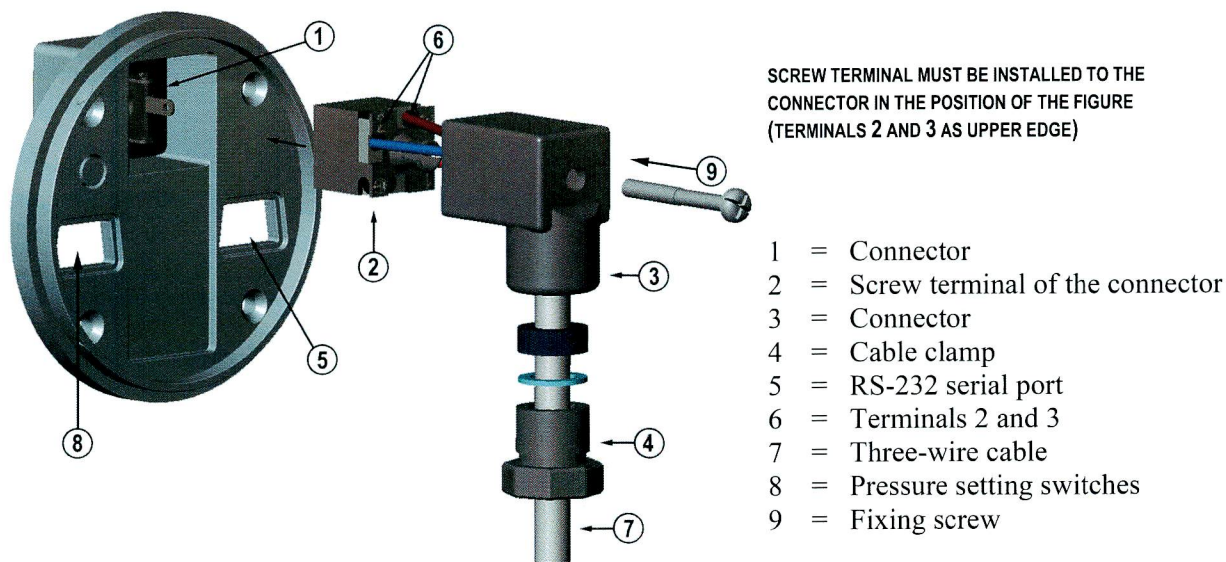


Figure 3 Wiring and Installation of Connector

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.

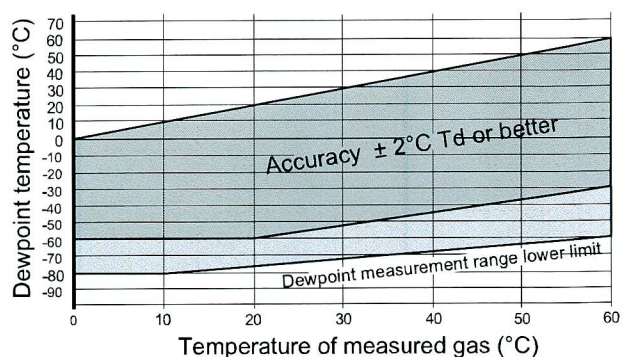
TECHNICAL SPECIFICATIONS

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

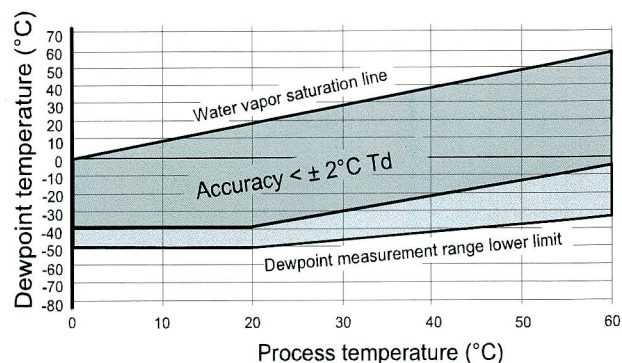
When the dewpoint is below 0 °C, the transmitter outputs frost point.

Dewpoint accuracy with DRYCAP® 180M ± 2 °C (± 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_d (-76 → -4 °F T_d) 5 s [10 s]
 -20 → -60 °C T_d (-4 → -76 °F T_d) 45 s [10 min]

DRYCAP® 180S ± 2 °C (± 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 _a (0 ... 290 psi _a)
Sample flow rate	no effect

Output

Analog output	4 ... 20 mA
Resolution for analog output	± 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 ²
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 + Aml:1998 + Am2:2001; Industrial Environment.

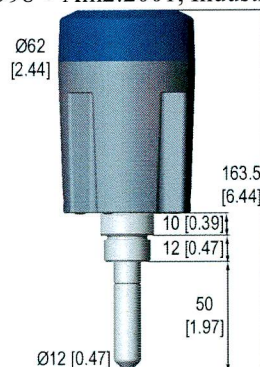


Figure 4 Dimensions in mm [inches]



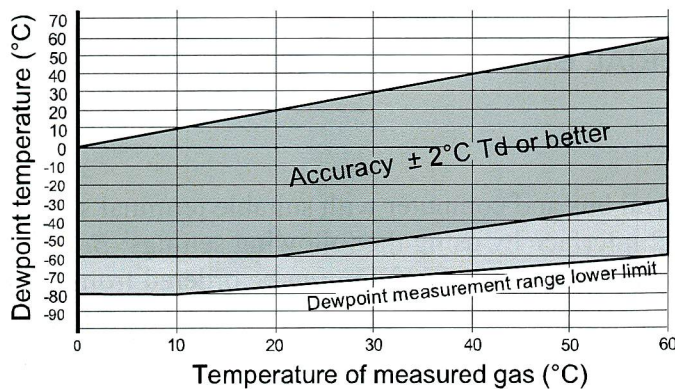
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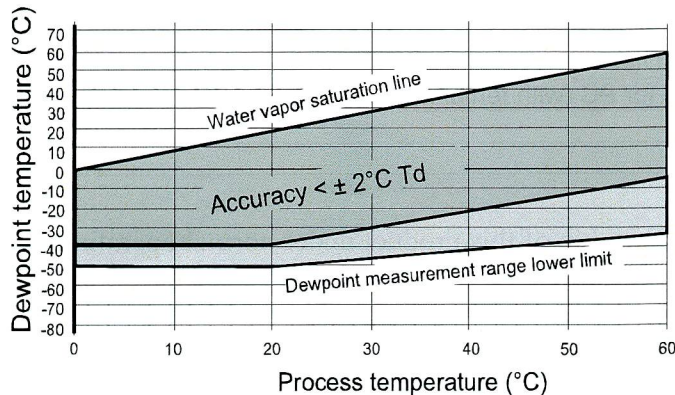
Dewpoint accuracy with DRYCAP[®] 180M ± 2 °C (± 3.6 °F)
(See figure below)



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

-60 → -20 °C T _d (-76 → -4 °F T _d)	5 s [10 s]
-20 → -60 °C T _d (-4 → -76 °F T _d)	45 s [10 min]

DRYCAP[®] 180S ± 2 °C (± 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 _a (0 ... 290 psi _a)
Sample flow rate	no effect

Output

Analog output	4 ... 20 mA
Resolution for analog output	± 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 ²
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)
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Storage temperature range	-40 ... +70 °C (-40 ... +158 °F)

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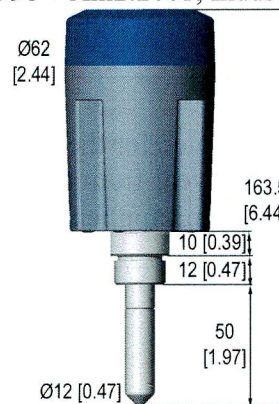


Figure 4 Dimensions in mm [inches]



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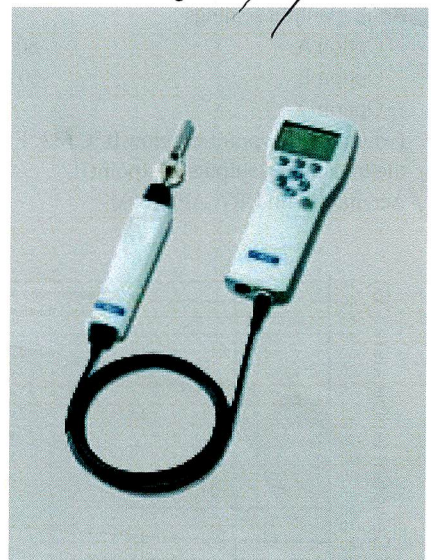
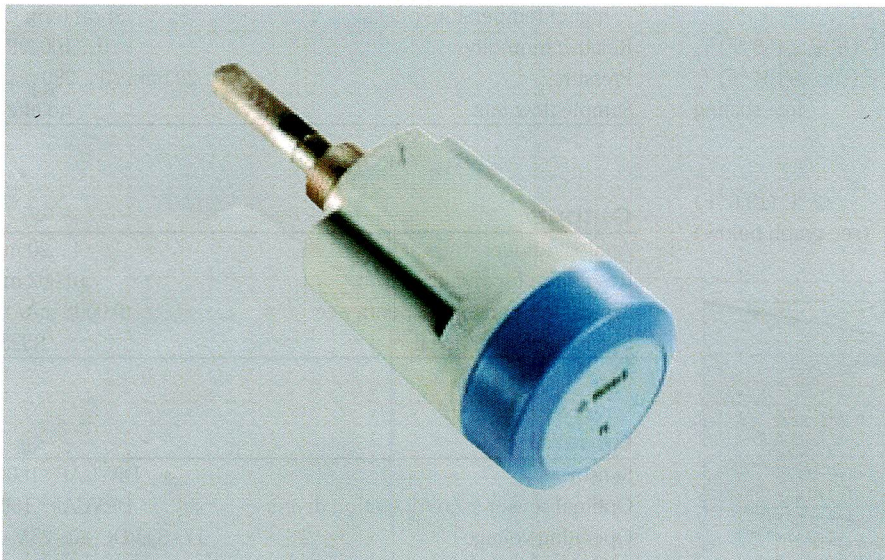
Gema / Pressure
Pyro / Temp.

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DMT242 Dewpoint Transmitter for OEM Applications

SCS #
0062400



Due to its wide measurement range and high long-term stability, the DMT242 is an ideal choice for low dewpoint industrial applications such as compressed air dryers, plastic dryers and other OEM applications.

The Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 is ideal for confirming the performance of the DMT242 in the field.

Features/Benefits

- Ideal choice for industrial dryer applications
- Incorporates advanced Vaisala DRYCAP® Sensor and enhanced auto-calibration software
- Long-term stability in low dewpoints
- Fast response time
- Two sensor options cover dewpoint measurement range from 60 ... +60 °C (-76 ... +140 °F) with an accuracy of ±2 °C (±3.6 °F)
- Withstands condensation
- NIST traceable (certificate included)
- Compatible with Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70

Vaisala DRYCAP®

The Vaisala DRYCAP® Dewpoint Transmitter DMT242 provides reliable and stable measurements for industrial dryer applications. It is designed for extreme conditions. DMT242 incorporates the Vaisala DRYCAP® thin film polymer sensor and auto-calibration software. The standard sensor choice for dry gases and desiccant dryers is DRYCAP® 180M and for more humid applications such as refrigeration dryers, a DRYCAP® 180S sensor. Both the sensors are immune to particulate contamination, water condensation, oil vapor and most chemicals. Because the sensor withstands condensation, its performance is unmatched for low dewpoint applications that experience process water spikes, such as pipeline condensation during a system failure or start-up.

The auto-calibration software works on-line while the process is running. If the measurement accuracy is not confirmed, corrections are made automatically. The DMT242 adjusts the measurement, corrects dry-end drifts and continues to function. Calibration occurs quickly, and with corrections so minor, it will go unnoticed.

Compact, rugged and intelligent

Due to its compact size, DMT242 is quickly and easily installed in tight spaces. Users can perform a field-check by using the Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70. The transmitter can be sent to Vaisala Service for NIST traceable calibration. The recommended calibration interval is every two years.

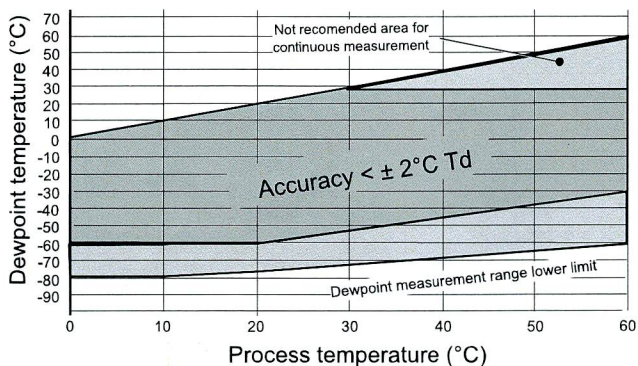
Technical data

Dewpoint temperature

Measurement range (typical)	-60 ... +60 °C (-76 ... +140 °F)
Analog output scalings	
Option A	-80 ... +20 °C (-112 ... +68 °F) T _d
Option B	-60 ... +40 °C (-76 ... +104 °F) T _d
Option X	free scaling

(when the dewpoint is below 0 °C (32 °F), the transmitter outputs frostpoint)

Accuracy with DRYCAP® 180M ± 2 °C (± 3.6 °F)
(see graph below)



DEWPOINT ACCURACY VS. MEASUREMENT CONDITIONS

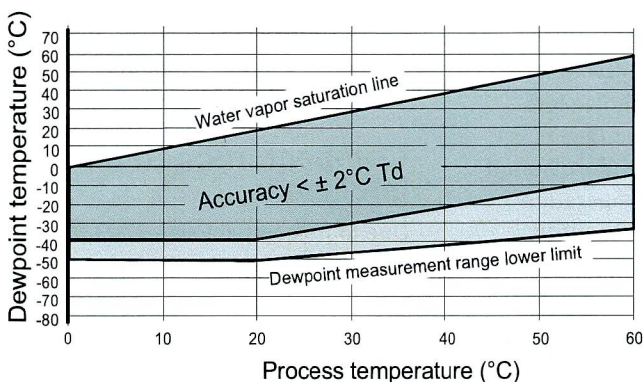
Response time 63 % [90 %] at +20 °C gas temperature

Flow rate >1 l/min and 1 bar pressure

-60 -> -20 °C Td (-76 -> -4 °F Td) 5 s [10 s]

-20 -> -60 °C Td (-4 -> -76 °F Td) 45 s [10 min]

Accuracy with DRYCAP® 180S ± 2 °C (± 3.6 °F)
(see graph below)



Operating environment

Temperature	0 ... +60 °C (32 ... +140 °F)
higher temperature peaks	Short-term OK
Relative humidity	0 ... 100 %RH
Pressure	0 ... 20 bara (0 ... 290 psia)
Sample flow rate	no effect

Output

Analog output	4 ... 20 mA
Resolution for analog output	± 0.002 mA
Typical temperature dependence	0.0008 mA/ °C
Serial line for service use	RS232

General

Sensor	DRYCAP® 180M
Optimal sensor for refrigeration dryers	DRYCAP® 180S
Operating voltage	17 - 35 VDC, 20 - 28 VAC
Power consumption at 24 VDC	max. 220 mA
External load for analog 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 mm2
max. cable diameter	6.5 mm /PG7
Service cable for serial interface RS232	product code DMT242RS
Probe material (wetted parts)	stainless steel (AISI 316L)
Sensor protection	stainless steel sintered filter (HM47280)
Mechanical connection	G $\frac{1}{2}$ " ISO228-1 thread with bonded seal ring (U-seal)
Electronics housing material	plastic (ABS/PC)
Housing classification	IP65 (NEMA4)
Storage temperature range	-40 ... +70 °C, (-40 ... +158 °F)
Complies with the EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Industrial environment.	

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For more information, visit www.vaisala.com or contact us at sales@vaisala.com

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