



#### Features

- Measures dew point from -70 ... +80 °C (-94 ... +176 °F) with an accuracy of  $\pm 2$  °C ( $\pm 3.6$  °F)
- Condensation-resistant
- Unique auto-calibration feature maintains accuracy over long term
- Compatible with Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70
- Traceable calibration to measurements and analog outputs (certificates included)
- Graphical display and keypad for convenient operation
- Optional alarm relays and mains power supply module
- Up to three analog outputs, RS-232/485, LAN
- Modbus protocol support (RTU/ TCP)

Vaisala DRYCAP® Dewpoint and Temperature Transmitter Series DMT340 is designed for industrial low-humidity applications such as industrial drying, compressed air systems, semiconductor industry, dry rooms, baking ovens, and metal heat treatment.

#### Vaisala DRYCAP® Sensor Benefits

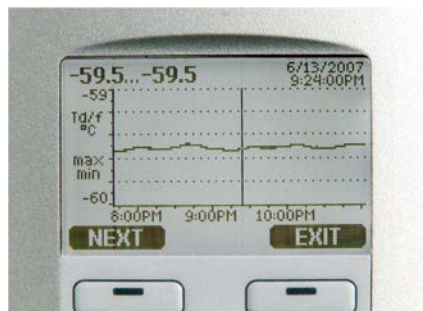
- Accurate and reliable measurement
- Excellent long-term stability
- Fast response time
- Resistant to environmental factors and condensation

#### Stability at Low Dew Points

The Vaisala DRYCAP® sensor is immune to particulate contamination, water condensation, oil vapor, and most chemicals. The sensor is condensation resistant and recovers perfectly if exposed to liquid water. Fast reaction time and stability make its performance unmatched also in dynamic and low dew point applications.

#### Graphical Display of Measurement Data and Trends for Convenient Operation

The DMT340 features a large numerical and graphical display with a multilingual menu and keypad. It allows users to easily monitor operational data, measurement trends, and access measurement history for the past 12 months.



The display shows measurement trends, real-time data, and measurement history.

#### Versatile Outputs and Data Collection

The DMT340 can support up to three isolated analog outputs. Optional AC mains power and relay outputs are also available.

In addition to the analog outputs, the DMT340 supports Modbus RTU and TCP/IP communication protocol.

The data logger, with real-time clock and battery backup, guarantees reliable logging of measurement data for over four years. The display alarm allows tracking of any measured parameter, with freely configurable low and high limits. The recorded data can be viewed on the local display or transferred to a PC with Microsoft Windows® software. The transmitter can also be connected to a network with an optional LAN interface, which enables an Ethernet connection. A

USB service cable makes it easy to connect the DMT340 to a PC via the service port for modifying settings or reading logged data.

### Easy Installation

With multiple options to choose from, the instrument can be tailored to meet the specific needs of each individual application and is delivered installation-ready and pre-configured for each delivery. Quick delivery time and global service network make DMT340 a perfect choice for any project.



The Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 is ideal for fieldchecking DMT340 transmitters.

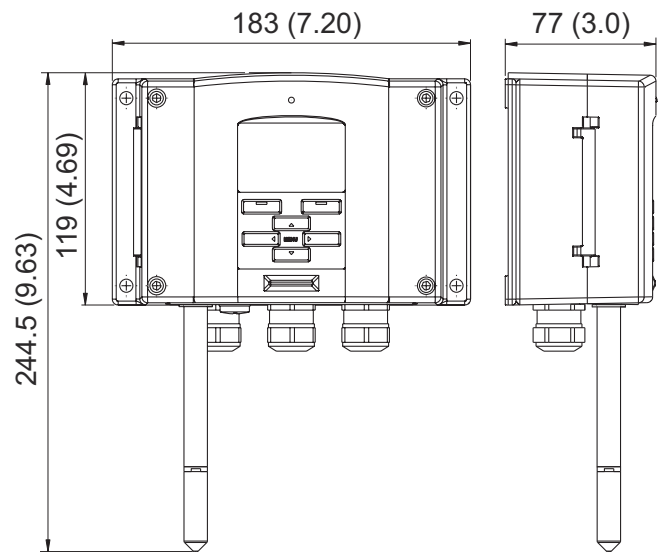
	<b>DMT342</b>	<b>DMT344</b>	<b>DMT347</b>	<b>DMT348</b>
Pressure range	0 ... 50 bar/0 ... 725 psia	0 ... 50 bar/0 ... 725 psia	0 ... 10 bar/0 ... 145 psia	0 ... 40 bar/0 ... 580 psia
Mechanical durability	up to 250 bar/ 3625 psia	up to 100 bar/1450 psia	up to 10 bar/145 psia	up to 70 bar/1015 psia
Probe diameter	12 mm/0.5 in	12 mm/0.5 in	12 mm/0.5 in	12 mm/0.5 in
Installation	Flange 36 mm/1.4 in	Fitting body M22 x 1.5 Fitting body NPT 1/2 in	Fitting body R 3/8 in ISO Fitting body G 1/2 in ISO Fitting body NPT 1/2 in	Fitting body R1/2 in ISO Fitting body NPT 1/2 in
Ball-valve set				BALLVALVE-1
Sampling cell	HMP302SC			DMT242SC or DMT242SC2

# DMT340 Series Dewpoint and Temperature Transmitters for Very Dry Conditions

## DMT341 for Installations in Dry Spaces



DMT341 display shows measurement trends, real-time data, and measurement history. DMT341 is made for installations in dry rooms where the entire dew point transmitter needs to be inside the dry space. The concept is easy to clean and suitable also for cleanrooms.

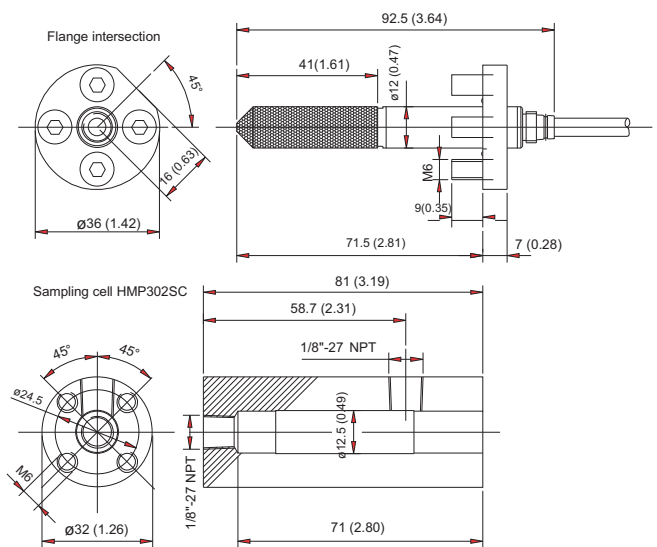


DMT341 dimensions in mm (inches)

## DMT342 with Small Size Flanged Probe

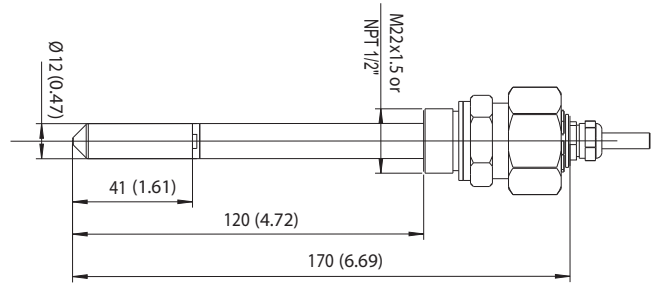


The DMT342 probe is installed using a flange or sampling cell. The small probe is ideal for integration into larger equipment or applications with high pressures.



DMT342 dimensions in mm (inches)

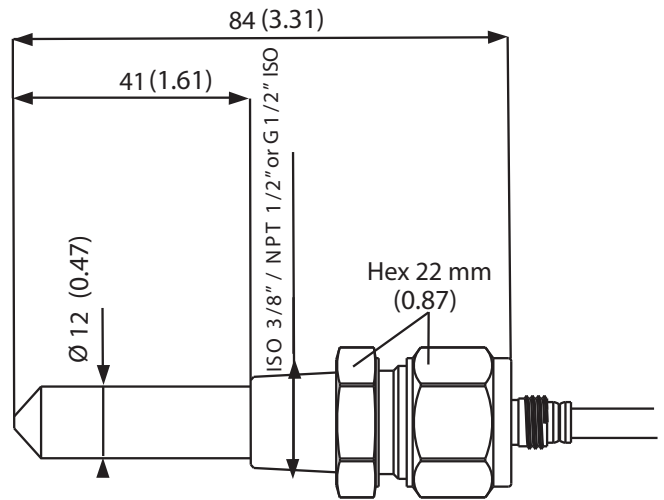
### DMT344 with Probe for High Pressures



DMT344 dimensions in mm (inches)

The DMT344 features a threaded connection for extended pressures with different fitting-body options. It is ideal for permanent installation into pressurized or vacuum processes.

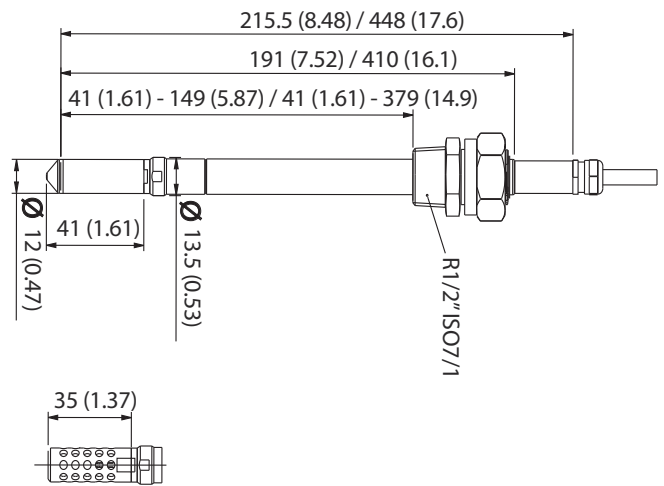
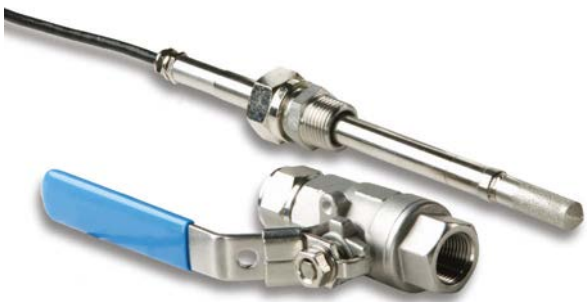
### DMT347 with Small-Sized Probe



DMT347 dimensions in mm (inches)

The DMT347 probe is ideal for pressurized or vacuum applications in tight spaces. The small probe is installed using Swagelok® connectors.

### DMT348 with Probe for Pipeline Installations



The DMT348 is ideal for installation into pressurized or vacuum processes where the probe needs to be able to be removed while the process is running. The probe depth is adjustable.

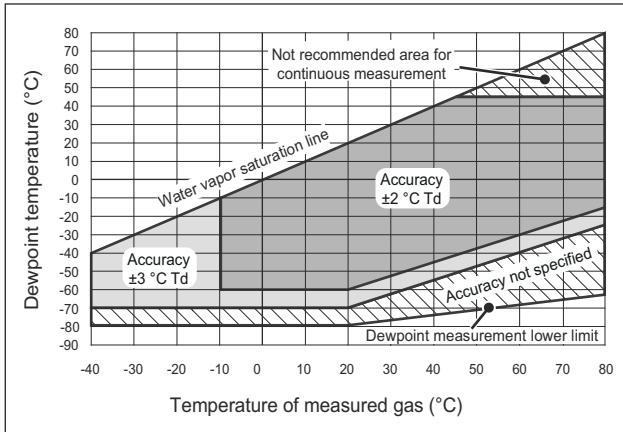
Optional filter for low pressures, suitable for all models, dimensions in mm (inches). Optional filter provides faster gas exchange to the sensor in applications where protection from particulates is not needed.

# DMT340 Series Technical Data

## Measurement Performance

### Dew Point

Sensor	Vaisala DRYCAP® 180M
Measurement range	-70 ... +80 °C (-94 ... +176 °F) T <sub>d</sub>
Measurement range for continuous use	-70 ... +45 °C (-94 ... +113 °F) T <sub>d</sub>
Accuracy up to 20 bar/290 psia	±2 °C/±3.6 °F (see the accuracy graph below)
Accuracy, 20 ... 50 bar/290 ... 725 psia	additional inaccuracy +1 °C T <sub>d</sub>



### Dew Point Accuracy vs. Measurement Conditions

Response time	63% [90%] at +20 °C gas temperature
T63 [T90] response times at 20 °C and 1 l/min flow:	
-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]

### Temperature

Measurement range	0 ... +80 °C (+32 ... +176 °F)
Accuracy	±0.2 °C at room temperature
Temperature sensor	Pt100 RTD Class F0.1 IEC 60751

### Relative Humidity

Measurement range	0 ... 70 %RH
Accuracy (RH <10 %RH, at +20 °C)	±0.004 %RH + 20% of reading

### Concentration by Volume (ppm)

Measurement range (typical)	10 ... 2500 ppm
Accuracy (at +20 °C, 1 bar)	1 ppm + 20% of reading

Other measurement parameters available (model-dependent): mixing ratio, absolute humidity, pressure dew point calculated to 1 bar, temperature difference (T-T<sub>d</sub>), water vapor pressure

## Operating Environment

Operating temperature for probes	-40 ... +80 °C (-40 ... +176 °F)
Mechanical durability	up to +180 °C (+356 °F)
Mechanical durability of transmitter body	40 ... +60 °C (-40 ... +140 °F)
Mechanical durability with display	0 ... +60 °C (+32 ... +140 °F)
Storage temperature range	-55 ... +80 °C (-67 ... +176 °F)
Pressure range for probes	see probe specifications
Sample flow rate	no effect
Measured gases	non-corrosive gases
Electromagnetic compatibility	Complies with EMC standard EN61326-1, Industrial environment

Note: Transmitter with display test impedance of 40 Ω is used in IEC61000-4-5 (Surge immunity)

## Inputs and Outputs

Operating voltage	10 ... 35 VDC, 24 VAC ±20 %
with optional power supply module	100 ... 240 VAC 50/60 Hz

### Power Consumption at 20 °C (U<sub>in</sub> 24VDC)

RS-232	max. 25 mA
U <sub>out</sub> 2 x 0 ... 1V / 0 ... 5 V / 0 ... 10 V	max. 25 mA
I <sub>out</sub> 2 x 0 ... 20 mA	max. 60 mA
display and backlight	+ 20 mA
during sensor purge	max. + 110 mA

### Analog Outputs (2 Standard, 3rd Optional)

current output	0 ... 20 mA, 4 ... 20 mA
voltage output	0 ... 1 V, 0 ... 5 V, 0 ... 10 V
Accuracy of analog outputs at 20 °C	0.05% full scale
Temperature dependence of the analog outputs	± 0.005%/°C full scale

### External Loads

current outputs	RL < 500 Ω
0 ... 1 V output	RL > 2 kΩ
0 ... 5 V and 0 ... 10V outputs	RL > 10 kΩ
Wire size	0.5 ... 2.5 mm <sup>2</sup> (AWG 20 ... 14) stranded wires recommended

Digital outputs	RS-232, RS-485 (optional)
Protocols	ASCII commands, Modbus RTU
Service connection	RS-232, USB
Relay outputs	0.5 A, 250 VAC, SPDT (optional)

### Ethernet Interface (Optional)

Supported standards	10BASE-T, 100BASE-TX
Connector	8P8C (RJ45)
IPv4 address assignment	DHCP (automatic), static
Protocols	Telnet, Modbus TCP/IP

### WLAN Interface (Optional)

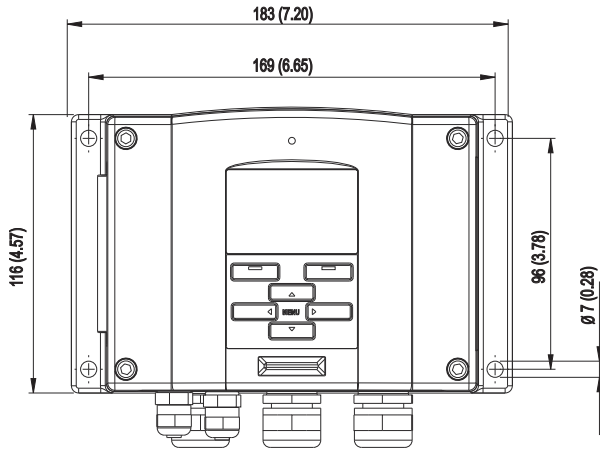
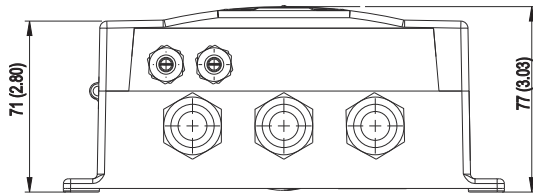
Supported standards	802.11b
Antenna connector type	RP-SMA
IPv4 address assignment	
Protocols	Telnet, Modbus TCP/IP
Security	WEP 64/128, WPA 2/802.11i

### Authentication / Encryption (WLAN)

Open / no encryption	
Open / WEP	
WPA Pre-shared key / TKIP	
WPA Pre-shared key / CCMP (a.k.a. WPA2)	

### Optional Data Logger with Real-Time Clock

Logged parameters	max. three with trend/min./max. values
Logging interval	10 sec. (fixed)
Max. logging period with max. temporal resolution	4 years, 5 months
Logged points	13.7 million points per parameter
Battery lifetime	min. 5 years
Display	LCD with backlight, graphical trend display of any parameter
Menu languages	English, Chinese, Finnish, French, German, Japanese, Russian, Spanish, Swedish



Dimensions in mm (inches)

## Mechanical Specifications

Cable bushing M20x1.5 for cable diameter 8 ... 11mm/  
0.31 ... 0.43"

Conduit fitting 1/2" NPT

User cable connector (optional) M12 series 8-pin (male)

option 1 female plug with 5 m (16.4 ft.) black cable

option 2 female plug with screw terminals

USB-RJ45 Serial Connection Cable 219685

Probe cable diameter 5.5 mm

Standard probe cable lengths 2 m, 5 m, or 10 m

(Additional cable lengths available, see order forms for details)

Housing material G-AlSi 10 Mg (DIN 1725)

Housing classification IP66

IP65 (NEMA4X) with local display

Weight (depending on selected probe, cable and modules) 1.0 - 3.0 kg





#### Features

- DMT345 measures humidity at temperatures up to 180 °C (356 °F)
- DMT346 measures humidity at temperatures up to 350 °C (+662 °F)
- Dew point accuracy  $\pm 2$  °C ( $\pm 3.6$  °F)
- Condensation-resistant
- Unique auto-calibration feature
- Analog outputs, RS-232/485, WLAN/LAN
- Modbus protocol support (RTU/TCP)

Vaisala DRYCAP® Dewpoint Transmitters DMT345 and DMT346 are designed for humidity measurement in industrial drying applications with particularly high temperatures.

#### Benefits

- Vaisala DRYCAP® sensor provides accurate and reliable measurement with excellent long-term stability and fast response time
- Graphical display and keypad for convenient operation
- Optional alarm relays and mains power supply module

Both transmitters incorporate the Vaisala DRYCAP® sensor, which is accurate, reliable, and stable. The sensor is condensation-resistant and is immune to particulate contamination, oil vapor, and most chemicals. The DRYCAP® sensor is notable for its swift response time and rapid recovery after getting wet.

#### Measure Humidity Directly in Hot Processes

DMT345 and DMT346 are built for direct measurement in hot processes. Therefore, there is no need for sampling systems and trace heating. As a result, high measurement accuracy and constancy are maintained.

The accuracy and stability of DMT345 and the DMT346 are due to their unique auto-calibration function, developed by Vaisala. This feature allows the transmitter to perform calibration and adjustment by itself while the measured process is running. If the measurement accuracy is not confirmed, corrections are made automatically. The procedure is so quick and corrections so minor that it causes no disruption, ensuring easy maintenance and high performance.

#### DMT345: Accurate in Hot and Dry Environments

DMT345 is designed for accurate humidity measurement in hot and dry conditions. This model provides unmatched dry-end measurement accuracy at temperatures up to 140 °C; however, it can operate safely at temperatures up to 180 °C.

The long and robust steel probe and an optional installation flange allow easy, adjustable installation depth through insulation for example in ovens.

#### DMT346: Reliable in Very Hot Processes

DMT346 provides the best measurement performance at process temperatures between 140 °C and 350 °C.

DMT346 includes a cooling set as standard. The cooling set provides passive cooling by conducting heat away from the probe and thus reduces temperature to optimal range for the sensor.

The cooling system has no moving parts, and requires no additional power or cooling utilities, so there is no risk of sensor damage due to mechanical cooling failure.

Additionally, sensor warming minimizes the risk of condensation accumulating on the sensor. In low humidity conditions the combination of auto-calibration and DRYCAP® ensures accurate measurement.

## Graphical Display of Measurement Data and Trends for Convenient Operation

DMT345 and DMT346 transmitters feature a large numerical and graphical display with a multilingual menu and keypad. It allows users to easily monitor operational data, measurement trends, and access measurement history for the past 12 months.

The optional data logger, with real-time clock, makes it possible to generate over four years of measurement history and zoom in on any desired time or time frame.

The display alarm allows tracking of any measured parameter, with freely configurable low and high limits.

## Versatile Outputs and Data Collection

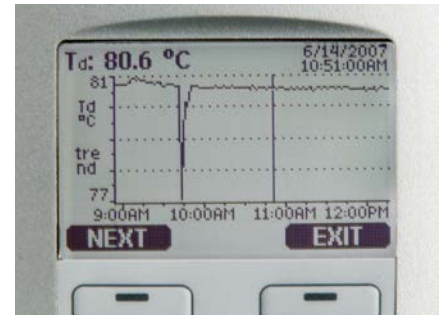
DMT345 and DMT346 transmitters can support up to three analog outputs; an isolated galvanic power supply and relay outputs are also available.

For serial interface the USB connection, RS-232, and RS-485 can be used. DMT345 and DMT346 are also capable of applying the Modbus communication protocol and, together with an appropriate connection option, provide either Modbus RTU (RS-485) or Modbus TCP/IP (Ethernet) communication.

The data logger, with real-time clock and battery backup, guarantees reliable logging of measurement data for over four years. The recorded data can be viewed on the local display or transferred to a PC with Microsoft Windows software. The transmitter can also be connected to a network with an optional LAN interface, which enables an Ethernet connection. A USB service cable makes it easy to connect DMT345/346 to a PC via the service port.

With multiple options to choose from, the instrument can be tailored to meet the specific needs of each individual application and is delivered

installation-ready and pre-configured for each delivery. Quick delivery time and global service network make DMT340 series a perfect choice for any project.



The large graphical display allows the user to check data at a glance.

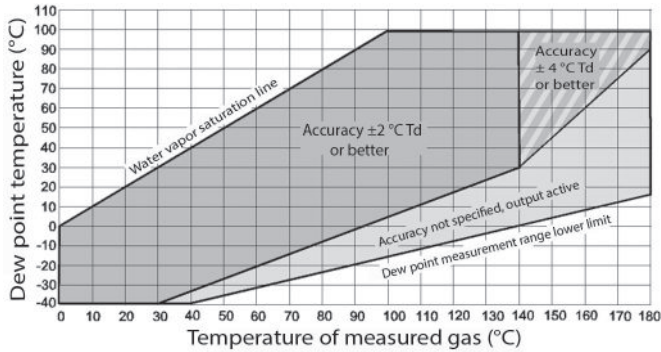


# Technical Data

## Measurement Performance, DMT345

### Dew Point

Sensor	Vaisala DRYCAP 180S
Measurement range	-40 ... +100 °C (-40 ... +212 °F) T <sub>d</sub>
Accuracy	±2 °C (±3.6 °F) T <sub>d</sub> See the accuracy graph below



Dew point accuracy vs. measurement conditions

Response time 63 % [90 %] in flow rate 1 l/min and 1 bar pressure	From dry to wet: 5 s [10 s] From wet to dry including auto-calibration 45 s [5 min]
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### Temperature

Measurement range	0 ... +180 °C (+32 ... +356 °F)
Measurement range with sensor warming	Upper range limited by humidity (at 80 %RH warming is switched on and T reading not actual process temperature)
Accuracy	±0.4 °C at 100 °C
Temperature sensor	Pt100 RTD Class F0.1 IEC 60751

### Relative Humidity

Measurement range	0 ... 100 %RH
Measurement range with sensor warming	0 ... 80 %RH
Accuracy below 10 %RH	±10 % of reading
Accuracy above 10 %RH	±1.5 %RH + 1.5 % of reading

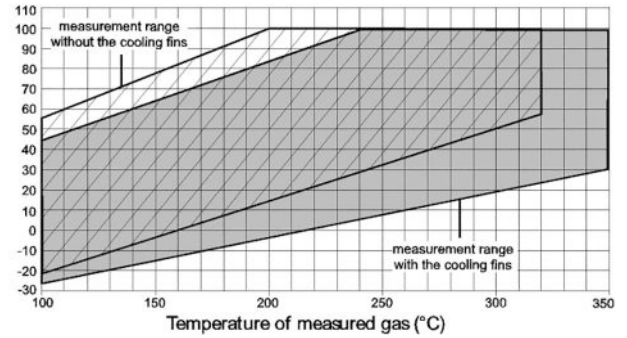
### Mixing Ratio

Measurement range (typical)	0 ... 1000 g/kg (0 ... 7000 gr/lbs)
Accuracy (typical)	±12 % of reading

## Measurement Performance, DMT346

### Dew Point

Sensor	Vaisala DRYCAP 180S
Measurement range	-25 ... +100 °C (-13 ... +212 °F) T <sub>d</sub>
Accuracy	±2 °C (±3.6 °F) T <sub>d</sub> See the accuracy graph below



Dew point accuracy vs. measurement conditions

Response time 63 % [90 %] in flow rate 1 l/min and 1 bar pressure	From dry to wet: 5 s [10 s] From wet to dry including auto-calibration 45 s [5 min]
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### Mixing Ratio

Measurement range (typical)	0 ... 1000 g/kg (0 ... 7000 gr/lbs)
Accuracy (typical)	±12 % of reading

## Inputs and Outputs, DMT345 and DMT346

Accuracy of analog outputs at 20 °C	± 0.05% full scale
Temperature dependence of analog outputs	± 0.005%/°C full scale
Max. wire size	0.5 mm2 (AWG 20) stranded wires recommended
Digital outputs	RS-232, RS-485 (optional)
Protocols	ASCII commands, Modbus RTU
Service connection	RS-232, USB
Relay outputs 2+2 pcs (optional)	0.5 A, 250 VAC, SPDT
Operating voltage	10 ... 35 VDC, 24 VAC ±20%
Operating voltage with optional power supply module	100 ... 240 VAC 50/60 Hz
<b>Default Start-up Time</b>	
Initial reading after power-up	3 s
Full operation after sensor purge and autocalibration	Approx. 6 min
<b>Power Consumption at 20 °C (U<sub>in</sub> 24 VDC)</b>	
U <sub>out</sub> 2x0 ... 1V/0 ... 5V/0 ... 10V	max. 25 mA
I <sub>out</sub> 2x0 ... 20mA	max. 60 mA
RS-232	max. 25 mA
Display and backlight	+ 20 mA
During sensor purge	max. + 110 mA
<b>Analog Outputs (2 Standard, 3rd Optional)</b>	
Current output	0 ... 20 mA, 4 ... 20 mA
Voltage output	0 ... 1 V, 0 ... 5 V, 0 ... 10 V
<b>External Loads</b>	
Current outputs	R <sub>L</sub> < 500 Ω
0 ... 1V output	R <sub>L</sub> > 2 kΩ
0 ... 5V and 0 ... 10V outputs	R <sub>L</sub> > 10 kΩ
<b>Ethernet Interface (Optional)</b>	
Supported standards	10BASE-T, 100BASE-TX
Connector	8P8C (RJ45)
IPv4 address assignment	DHCP (automatic), static
Protocols	Telnet, Modbus TCP/IP
<b>WLAN Interface (Optional)</b>	
Supported standards	802.11b
Antenna connector type	RP-SMA
IPv4 address assignment	DHCP (automatic), static
Protocols	Telnet, Modbus TCP/IP
Security	WEP 64/128, WPA WPA2/802.11i
Authentication / Encryption (WLAN)	Open / no encryption Open / WEP WPA Pre-shared key / TKIP WPA Pre-shared key / CCMP (a.k.a. WPA2)
<b>Optional Data Logger with Real-time Clock</b>	
Logged parameters	Max. four with trend/min/max values
Logging interval	10 sec. (fixed)
Max. logging period	4 years, 5 months
Logged points	13.7 million points per parameter
Battery lifetime	Min. 5 years
Display	LCD with backlight, graphical trend display
Menu languages	English, Chinese, Finnish, French, German, Japanese, Russian, Spanish, Swedish

## Operating Environment, DMT345 and DMT346

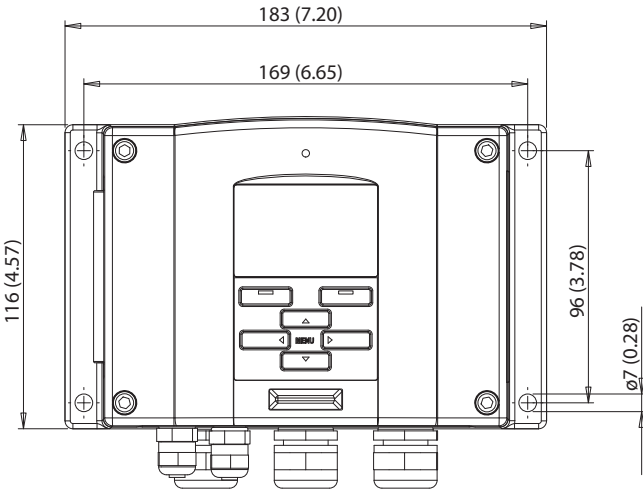
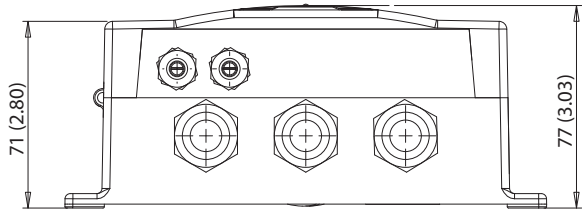
Storage temperature	-55 ... +80 °C (-67 ... +176 °F)
Pressure range for probes	Slight pressure difference (- 200 mbar)
Measured gases	Non-corrosive gases
EMC compliance	EN61326-1, Industrial environment <sup>1)</sup>
<b>Mechanical Durability</b>	
Of probes	Up to +180 °C (+356 °F) for DMT345 Up to +350 °C (+662 °F) for DMT346
Of transmitter body	-40 ... +60 °C (-40 ... +140 °F)
With display	0 ... +60 °C (32 ... +140 °F)

<sup>1)</sup> Note: Transmitter with display test impedance of 40 ohm is used in IEC61000-4-5 (Surge immunity)

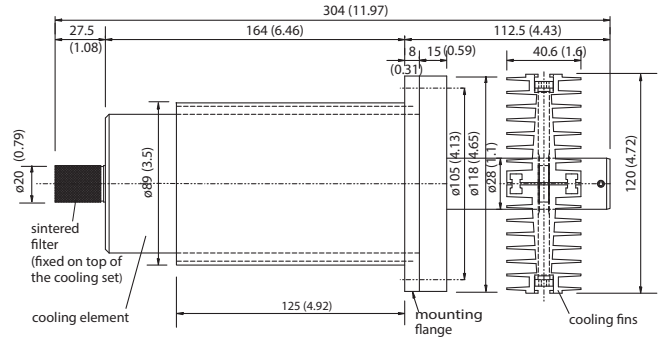
## Mechanical Specifications, DMT345 and DMT346

Cable bushing	M20 x 1.5 for cable diameter 8 ... 11 mm / 0.31 ... 0.43"
Conduit fitting (optional)	1/2"NPT
Housing material	G-AISI 10 Mg (DIN 1725)
IP rating	IP66 IP65 (NEMA4X) with local display
Weight (depending on selected probe, cable, and modules)	1.0 – 3.0 kgs (2.2-6.6 lbs)
USB-RJ45 Serial Connection Cable	219685
Probe cable diameter	5.5 mm (0.2 in)
Standard probe cable lengths	2 m, 5 m or 10 m (Additional cable lengths available, please see order forms for details)
User cable connector (optional)	M12 series 8-pin (male)
option 1	female plug with 5 m (16.4 ft) black cable
option 2	female plug with screw terminals

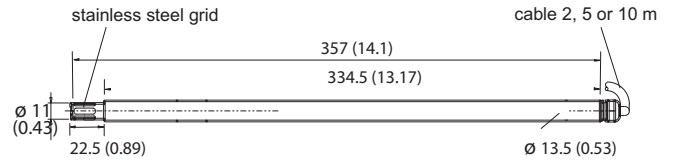
**Dimensions in mm (inches)**



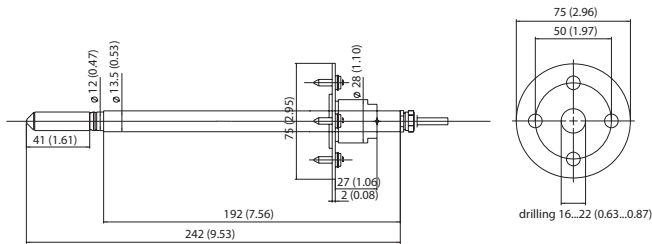
DMT345 and DMT346 Transmitter Housing



DMT346 Cooling Set



DMT346 Probe



DMT345 Probe and Mounting Flange



## DMT152 Dew Point Transmitter

For Low Dew Point Measurement in OEM Applications



### Features

- Vaisala DRYCAP® technology with a polymer sensor
- Measures dew point down to -80 °C (-112 °F)
- Withstands condensation
- Traceable calibration (certificate included)
- Applications: dry chambers, dry gases, semiconductor manufacturing, research and testing, and compressed air

The Vaisala DRYCAP® Dewpoint Transmitter DMT152 is designed for measuring low dew point in OEM applications, even down to -80 °C . The excellent long-term stability and reliability of its performance is based on the latest DRYCAP® polymer sensor technology.

### Low Maintenance

The DMT152 mechanics have been designed for harsh environments requiring protection against dust, dirt, and splashed water. The DRYCAP® technology has a low maintenance need due to its excellent long-term stability and durability against condensation.

### Applications

The DMT152 is an ideal choice for industrial applications where it is necessary to control very low humidity. Most typical areas of use are air and plastics dryers, dry chambers, dry gases, and high-voltage circuit breakers.

The DMT152 measures accurately and reliably also in the challenging combination of low humidity and hot air, which is typical in plastics drying.

### Benefits

- Accurate
- Compact and powerful
- Fast response time
- Reduced maintenance costs due to long calibration interval

# Technical Data

## Measurement Performance

Sensor	Vaisala DRYCAP® 180U Thin-film capacitive polymer sensor
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Recommended calibration interval	2 years
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### Dew Point Temperature

Measurement range	-80 ... -10 °C (-112 ... +14 °F) T <sub>d</sub>
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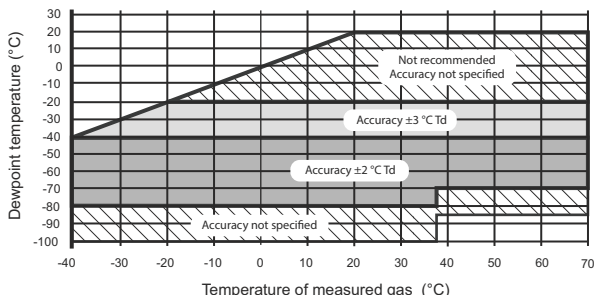
Accuracy	
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-80 ... -40 °C (-112 ... -40 °F)	±2 °C (3.6 °F) T <sub>d</sub>
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-40 ... -20 °C (-40 ... -4 °F)	±3 °C (5.4 °F) T <sub>d</sub>
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Non-calibrated range	-100 ... +20 °C (-148 ... +68 °F) T <sub>d</sub>
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Accuracy over temperature range:



Typical response time 63 % [90 %] at a gas temperature of +20 °C (+68 °F) and pressure of 1 bar:

-10 ... -80 °C T <sub>d</sub>	0.5 min [7.5 min]
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-80 ... -10 °C T <sub>d</sub>	2 s [5 s]
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Typical long-term stability	Better than 2 °C (3.6 °F) /year
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### Concentration by Volume (ppm)

Measurement range (typical)	0 ... 500 ppm
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Accuracy at +20 °C (+68 °F), 1013 mbar	±(0.2 ppm + 20 % of reading)
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## Operating Environment

Temperature	-40 ... +70 °C (-40 ... +158 °F)
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Relative humidity	0 ... 100 %RH (up to +20 °C/+68 °F)
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Pressure	0 ... 50 bar (725 psia)
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Measured gases	Non-corrosive gases
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Sample flow rate	No effect on measurement accuracy
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## Accessories

Connection cable for MI70 hand-held indicator	219980
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USB cable for pc connection	219690
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NW40 flange	225220SP
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Sampling cells (available for ISO G $\frac{1}{2}$ " )	
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basic sampling cell	DMT242SC
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with Swagelok 1/4" male connectors	DMT242SC2
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with a quick connector and leak screw	DSC74
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two-pressure sampling cell	DSC74B
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## Inputs and Outputs

Two analog outputs (scalable)	4 ... 20 mA, 0 ... 20 mA (3 wire) 0 ... 5 V, 0 ... 10 V
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Accuracy of analog outputs	±0.01 V / ±0.01 mA
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Digital output	RS-485 (2-wire)
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Alarm-level indication by analog signal	User selectable
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Purge information	5 V, 10 V, 20 mA or LED
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### Operating Voltage

RS-485 output	11 <sup>1)</sup> ... 28 VDC
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voltage output	15 <sup>1)</sup> ... 28 VDC
----------------	-----------------------------

current output	21 ... 28 VDC
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### Supply Current

normal measurement	20 mA + load current
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during self-diagnostics	Max. 220 mA pulsed
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Supply voltage fluctuation	Max. 0.3 V
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### External Load

voltage output	Min. 10 kΩ
----------------	------------

current output	Max. 500 Ω
----------------	------------

1) For extended temp. down to -40 °C (-40 °F) or pressure up to 50 bar (725 psia), the supply voltage is 21 ... 28 VDC.

## Mechanical Specifications

Housing material (wetted parts)	AISI316L
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Stainless steel mesh filter	Filter body AISI303, mesh AISI316L, grade 18 μm
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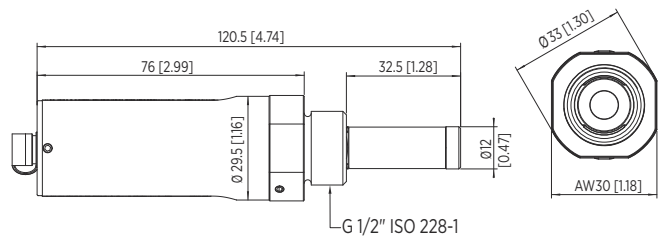
Mechanical connections	ISO G $\frac{1}{2}$ ", NPT $\frac{1}{2}$ ", UNF 3/4"- 16"
------------------------	---

Housing classification	IP66
------------------------	------

Storage temperature range	-40 ... +80 °C (-40 ... +176 °F)
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Weight (ISO G $\frac{1}{2}$ " )	190 g (6.70 oz)
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Complies with EMC standard EN61326-1, Electrical equipment for measurement control and laboratory use - EMC requirements; Industrial environment



Dimensions in mm (inches)



#### Features

- Miniature size dew point transmitter for e.g. small industrial dryer applications
- Vaisala DRYCAP® technology with auto-calibration
- Calibration interval of two years
- Dew point measurement range -70 ... +60 °C (-94 ... +140 °F)
- Accuracy  $\pm 2$  °C ( $\pm 3.6$  °F)
- Withstands condensation
- Compatible with Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70
- Traceable calibration
- Easy servicing and data transfer via RS-485 user interface
- LED alarm for exceeded dew point level
- Fast response time

Vaisala DRYCAP® Dewpoint Transmitter DMT143 is an ideal choice for small compressed air dryers, plastic dryers and other OEM applications.

#### Vaisala DRYCAP®

Vaisala DRYCAP® Dewpoint Transmitter DMT143 is a miniature dew point measurement instrument.

The transmitter can be installed directly into pressurized systems at 50 bar (725 psia) maximum pressure. The long-term high performance is achieved with Vaisala DRYCAP® technology.

The sensor fully withstands getting wet, and therefore, the transmitter performs exceptionally well in applications that occasionally experience process water spikes, such as pipeline condensation during a system failure or start-up.

The sensor is also highly resistant to particulate contamination, oil vapor and most chemicals, and is insensitive to the flow rate.

#### Long Calibration Interval

The calibration interval of DMT143 is two years. Additionally, Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 can be used to confirm the performance of DMT143 without disconnecting the transmitter. For any adjustment needs, the transmitter can be sent to Vaisala Service.

The auto-calibration software works on-line while the process is running. If the measurement accuracy is not confirmed, corrections are made automatically.

#### Easy Installation

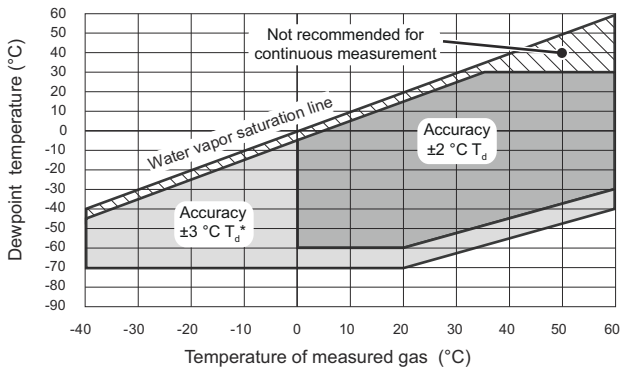
DMT143 has a variety of features to choose from, including different output, installation options and alarm LED.

Due to its small size and light weight, DMT143 is quickly and easily installed in tight spaces or in small-size pipelines. The alarm LED indicates too high dew point in the process. The trigger point is preset at the factory. It can be later adjusted with Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 or a computer.

# Technical Data

## Measurement Performance

Sensor	Vaisala DRYCAP® 180D
Sensor protection	Stainless steel sintered filter
Recommended calibration interval to confirm the specified accuracy	2 years
<b>Dew Point Temperature</b>	
Measurement range (typical)	-70 ... +60 °C (-94 ... +140 °F) T <sub>d</sub>
Accuracy in air or N <sub>2</sub> <sup>1)</sup>	±2 °C (±3.6 °F) T <sub>d</sub> (see graph below)



\* > 12 bar, accuracy ±4 °C T<sub>d</sub>

<b>Analog output scalings:</b>	
Option 1	-80 ... +20 °C (-112 ... +68 °F) T <sub>d</sub>
Option 2	-80 ... +20 °C (-112 ... +68 °F) T <sub>d</sub> dew point at ambient pressure
Option 3	Free scaling
<b>Response time 63% [90%] at +20 °C gas temperature and 1 bar pressure:</b>	
-60 → -20 °C T <sub>d</sub> (-76 → -4 °F T <sub>d</sub> )	5 s [15 s]
-20 → -60 °C T <sub>d</sub> (-4 → -76 °F T <sub>d</sub> )	45 s [10 min]
<b>Water Concentration by Volume (ppm)</b>	
Measurement range (typical)	10 ... 40 000 ppm
Accuracy at +20 °C (+68 °F), 1 bar	1 ppm + 20 % of reading

<sup>1)</sup> When the dew point is below 0 °C (32 °F), the transmitter outputs frost point.

## Operating Environment

Measured gases	Non-corrosive gases
Temperature <sup>1)</sup>	-40 ... +60 °C (-40 ... +140 °F)
Relative humidity	0 ... 100 % RH
Pressure <sup>1)</sup>	0 ... 50 bara (725 psia)
Sample flow rate	No effect for measurement accuracy
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)

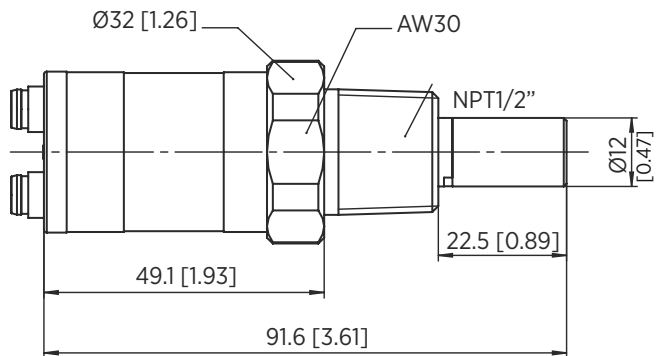
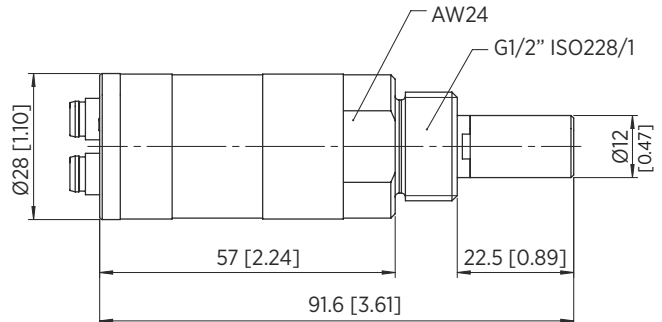
<sup>1)</sup> For extended temperature below 0 °C (+32 °F) or pressure above 20 bara (290 psia) the supply voltage must be 24 ... 28 VDC.

## Inputs and Outputs

Analog output (scalable)	4 ... 20 mA (3-wire), 0 ... 1 V / 5 V, 1 ... 5 V
Resolution for current output	0.002 mA
Resolution for voltage output	0.3 mV
Accuracy for current output at +20 °C	+/- 0.05 mA
Accuracy for voltage output at +20 °C	+/- 0.01 V
Operating voltage with voltage output	12 ... 28 VDC
Operating voltage with current output	18 ... 28 VDC
Load for current output	Max. 500 Ω
Load for voltage output	Min. 10 kΩ
Typical temperature dependence	0.005 % of span/°C
Digital output	RS-485, non-isolated Vaisala Industrial Protocol
Connector	4-pin M8 (IEC 60947-5-2)
<b>Supply Current</b>	
Normal measurement	Max. 10 mA + load current
During self-diagnostics	Max. 220 mA pulsed

## Mechanical Specifications

Mechanical connection	ISO G1/2 in or NPT 1/2
Housing material	Stainless steel (AISI316L)
Weight	G-thread version 90 g (3.2 oz) NPT-thread version 100 g (3.5 oz)



Dimensions in mm (inches)



## Spare Parts and Accessories

Connection cable for DM70	219980SP
USB connection cable	219690
Loop powered external display	226476
Loop powered external display with relays	234759

### Sampling Cells

Basic sampling cell	DMT242SC
With Swagelok 1/4 in male connectors	DMT242SC2
With quick connector and leak screw	DSC74SP
Two-pressure sampling cell	DSC74BSP
Cooling/venting coil	DMCOILSP

See DM70/Portable Sampling Systems and Sampling Cells for further information about sampling cells available.

## Compliance

IP rating	IP66
NEMA rating	NEMA 4
EMC compliance	EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements - Industrial environment

## DMT143L Dew Point Transmitter

For OEM Applications (DMT242 Replacement)



### Features

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

Due to its wide measurement range and high long-term stability, DMT143L is an ideal choice for low dew point industrial applications such as compressed air dryers, plastic dryers, and other OEM applications.

### Vaisala DRYCAP®

Vaisala DRYCAP® Dewpoint Transmitter DMT143L provides reliable and stable measurements for industrial dryer applications. It is designed for extreme conditions.

DMT143L incorporates 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 sensors are immune to particulate contamination, water condensation, oil vapor, and most chemicals.

Because the sensor withstands condensation, its performance is suitable for low dew point applications that experience process water spikes, such as pipeline condensation during a system failure or start-up.

The auto-calibration software works online while the process is running. If the measurement accuracy is not confirmed, corrections are made automatically. DMT143L 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, DMT143L is quickly and easily installed in tight spaces.

Users can perform a field-check by using Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70. The transmitter can be sent to Vaisala Service for traceable calibration. The recommended calibration interval is every two years.

# Technical Data

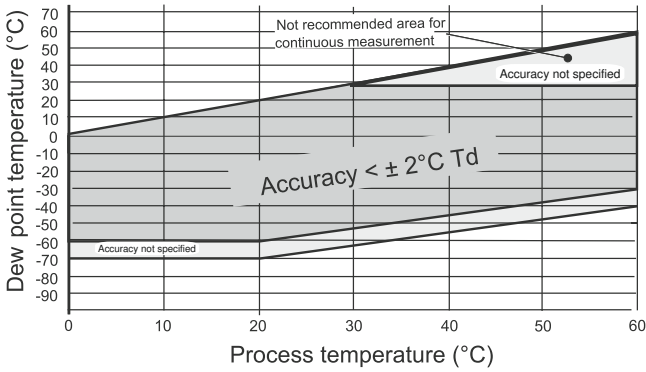
## Dew Point Temperature

Measurement range (typical) -60 ... +60 °C (-76 ... +140 °F)

Different analog output scalings available.<sup>1)</sup>

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

1) When the dew point is below 0 °C (32 °F), the transmitter outputs frost point.



### Dew Point Accuracy vs. Measurement Conditions

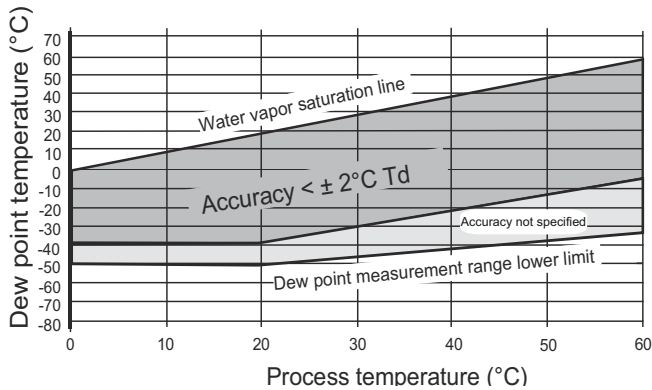
Response time 63 % [90 %] at +20 °C (+68 °F) gas temperature

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]

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

Storage temperature -40 ... +60 °C (-40 ... +140 °F)

## Inputs and Outputs

Analog output 4 ... 20 mA

Resolution for analog output ±0.002 mA

Accuracy for analog output at +20 °C +/- 0.05 mA

External load for analog output Max. 500 Ω

Typical temperature dependence 0.0008 mA/°C

Serial line for service use RS-485

Operating voltage 18 ... 28 VDC

Power consumption at 24 VDC Max. 220 mA

## Mechanical Specifications

Probe material (wetted parts) Stainless steel (AISI 316L)

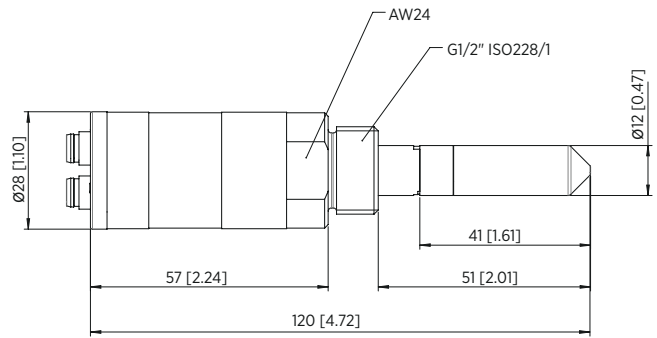
Sensor DRYCAP® 180M

Optimal sensor for refrigeration dryers DRYCAP® 180S

Sensor protection Stainless steel sintered filter (HM47280)

Electronics housing material Stainless steel

Mechanical connection G½ in ISO228-1 thread with bonded seal ring (U-seal)



Dimensions in mm (inches)

## Compliance

IP rating IP66

EMC compliance EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Industrial environment



#### Features

- High accuracy  $\pm 1\text{ }^{\circ}\text{C}$  ( $\pm 1.8\text{ }^{\circ}\text{F}$ ) in the measurement range of refrigerant dryers
- Excellent long-term stability - resistant to compressor oil and most other chemicals thanks to HUMICAP® technology
- Low power requirements, 10 ... 28 VDC
- Easy to verify functionality with compatible Vaisala DM70 or HM70 hand-held meters
- Optional LED warning light

Vaisala HUMICAP® Dew Point Transmitter DMT132 is an affordable dew point measurement instrument designed to verify the functionality of refrigerant dryers. It is especially well suited for OEM dryer manufacturers.

#### Direct Measurement Cuts Costs

Direct outlet air dew point measurement provides accurate information about dryer functionality and is more reliable than the traditional method of measuring refrigerator temperature only. Knowledge of the real dew point ensures high quality compressed air at all times and enables customers to optimize dryer capacity. This helps to prevent investment in redundant dryer capacity and avoid unnecessary maintenance and costly malfunctions.

#### High Accuracy and Long-Term Stability

DMT132 provides optimal performance in the operating range of refrigerant dryers. In the measurement range of  $-3\text{ }^{\circ}\text{C}$  ...  $20\text{ }^{\circ}\text{C}$  ( $+26.6\text{ }^{\circ}\text{F}$  ...  $+68\text{ }^{\circ}\text{F}$ ), where the refrigerator

dryers typically operate, the  $T_d$  accuracy is  $\pm 1\text{ }^{\circ}\text{C}$  ( $\pm 1.8\text{ }^{\circ}\text{F}$ ). The instrument incorporates the proven Vaisala HUMICAP® sensor, which is resistant to compressor oil and most other chemicals, thereby providing excellent long-term stability.

#### Quick Installation and Easy Field Checking

It takes just a few minutes to install DMT132 directly into a dryer or compressed air line through a G1/2" ISO thread. Vaisala sampling cells can also be used. The loop-powered electronics mean that wiring is easy and power requirements are low. DMT132 operating voltages can be as low as 10 VDC.

Verifying the performance of DMT132 is easy with the compatible Vaisala DM70 or HM70 hand-held meters. The user can perform possible adjustments with Vaisala HMK15 Humidity Calibrator.



Demand for dew point sensors to verify refrigerant dryers is increasing. Direct dew point measurement enables energy savings and improved efficiency.

# Technical Data

## Measurement Performance

Measurement range	-30 ... +50 °C (-22 ... +122 °F) $T_d$
Accuracy at +20 °C (+68 °F)	±1 °C for -3 ... 20 °C (+26.6 ... +68 °F) $T_d$ <sup>1)</sup> ±2 °C for -15 ... -3 °C (+5 ... +26.6 °F) $T_d$ <sup>1)</sup> See accuracy graph below

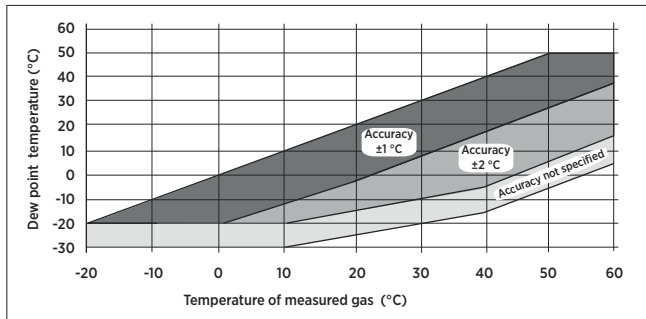
### Typical Response Time at 20 °C (+68 °F) Gas Temperature and 1 Bar Pressure

-14 → +3 °C (+7 → +37 °F) $T_d$	17 s (63 %) 40 s (90 %)
+3 → -14 °C (+37 → +7 °F) $T_d$	33 s (63 %) 85 s (90 %)

### Calculated Variables

Dew point converted to atmospheric pressure  $T_{d/ft}$  atm

<sup>1)</sup> When dew point is below 0 °C (+32 °F), the transmitter outputs frost point.



## Operating Environment

Operating temperature	-30 ... +50 °C (-22 ... +122 °F)
Operating pressure	0 ... 20 bar
Relative humidity	0 ... 100 %RH
Sample flow rate	No effect on measurement accuracy
Measured gases	Non-corrosive gases
EMC compliance	EN61326-1, Industrial Environment

## Outputs

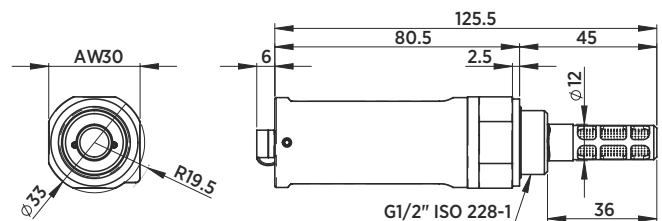
Analog output (scalable)	4 ... 20 mA, 2-wire
Resolution for current output	0.002 mA
Accuracy of analog outputs at +20 °C	±0.05 % full scale
Typical temperature dependence	±0.005 % of full scale/ °C
Connector	4-pin M8 (IEC 60947-5-2)
LED indication available for defined dew point limit/error state indication RS-485 serial line for service use	

## Mechanical Specifications

Sensor	Vaisala HUMICAP® 180R
Recommended calibration interval (in refrigerant dryer application)	2 years
Mechanical connection	G1/2" ISO
Operating voltage	10 ... 28 VDC
External load	Max. 100 Ω for supply voltages < 20 VDC Max. 500 Ω for supply voltages 20 ... 28 VDC
Weight	65 g (2.3 oz)
Housing material	PPS + 40 % GF
IP rating	IP65 (NEMA 4)
Storage temperature range	-40 ... +80 °C (-40 ... +176 °F)
Start-up time	3 s

## Spare Parts and Accessories

Tube filter	230602
Special cover set for HMK15 (calibrator fitting DMT132 and HMP60)	230914
NPT Adapter	210662SP
Sample cells	DMT242SC, DMT242SC2, DSC74, DSC74B, DSC74C, DMCOIL
Duct installation flange	DM240FA
Cables (several lengths available)	HMP50Z032, HMP50Z300SP, HMP50Z500SP, HMP50Z1000SP
Loop powered external display	226476
USB service cable	219690
Connection cable to DM70/HM70	219980
LED plug	230388
ISO 1/2" plug	218773
NPT 1/2" plug	222507
Sealing ring set (3 pcs U-seal)	221525SP



Dimensions in mm

**VAISALA**

www.vaisala.com