



# VAISALA

## DMT345 and DMT346 Dewpoint Transmitters

for High Temperature Applications



### 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

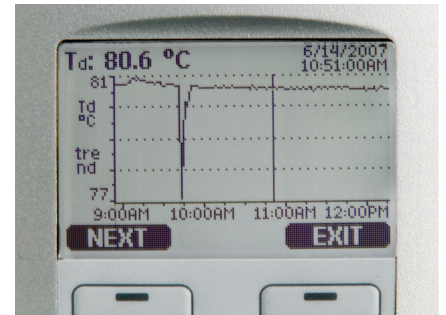
DMT345 and DMT346 transmitters can support up to three analog outputs; an isolated galvanic power supply and relay outputs are also available.

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.



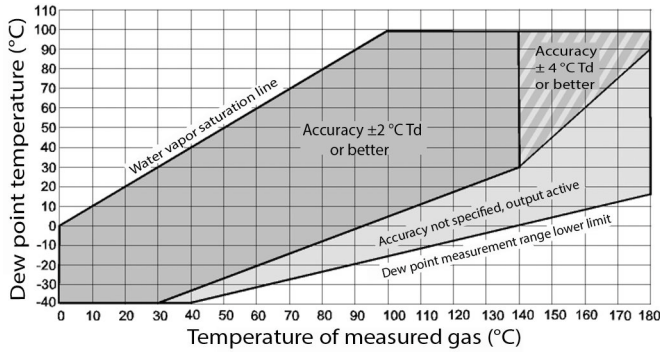
The large graphical display allows the user to check data at a glance.

# 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><br>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]<br>From wet to dry including auto-calibration 45 s [5 min] |
|---|--|

### 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 |

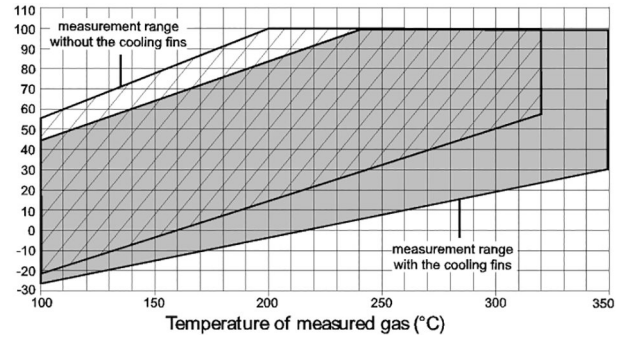
### Mixing Ratio

|                             |                                     |
|-----------------------------|-------------------------------------|
| 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><br>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]<br>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<br>Open / WEP<br>WPA Pre-shared key / TKIP<br>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<br>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)  |

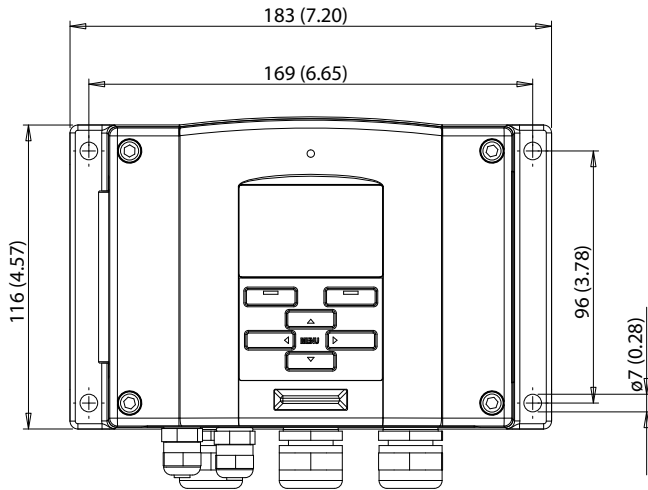
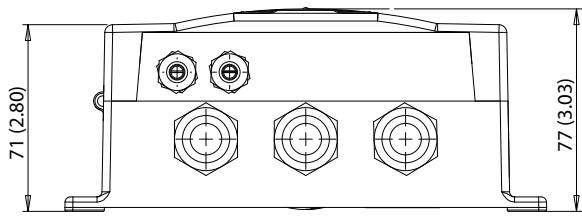
<sup>1)</sup> Note: Transmitter with display test impedance of 40 ohm is used in IEC61000-4-5 (Surge immunity)

## Mechanical Specifications, DMT345 and DMT346

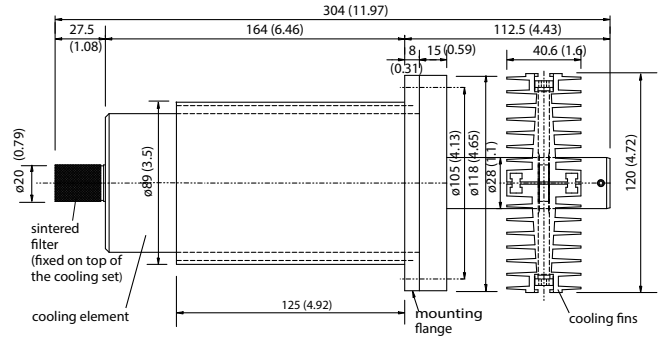
|  |   |
|--|---|
| Cable bushing  | M20 x 1.5 for cable diameter<br>8 ... 11 mm / 0.31 ... 0.43"                              |
| Conduit fitting (optional)                               | 1/2"NPT   |
| Housing material   | G-AISI 10 Mg (DIN 1725)   |
| IP rating  | IP66<br>IP65 (NEMA4X) with local 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  |



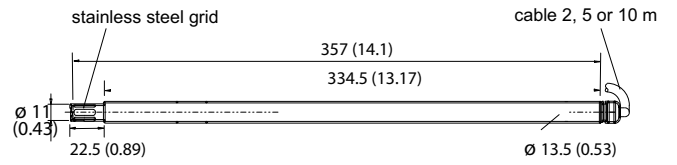
**Dimensions in mm (inches)**



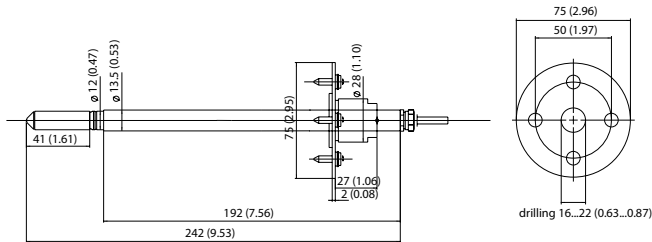
DMT345 and DMT346 Transmitter Housing



DMT346 Cooling Set



DMT346 Probe



DMT345 Probe and Mounting Flange