VAISALA

DM70 Handheld Dew Point Meter

For Spot-checking Applications

Vaisala DRYCAP® Handheld Dewpoint Meter DM70 offers accurate and fast measurement for industrial dew point applications, such as compressed air, metal treatment and plastics drying.

Benefits

- Compact, small and light
- Intuitive user interface
- Low maintenance need due to superior long-term stability
- Sensor withstands condensation and fully recovers from getting wet

DM70 measures dew point temperature accurately over a wide measurement range. The probe may be inserted directly into pressurized processes, and it responds rapidly from ambient to process conditions. The DM70 meter is suitable for direct process dew point measurement in a wide temperature and pressure range. For more demanding applications, DM70 can be used with Vaisala sampling cell adapters or with Vaisala DRYCAP® Sampling System DSS70A.

Vaisala DRYCAP® Technology

DM70 is fitted with the Vaisala DRYCAP® Sensor. The sensor provides reliable, stable and high-performance dew point measurement. Autocalibration detects on-line possible measurement inaccuracies and automatically corrects dry-end drift in the calibration curve.

Three Probes to Choose From

Three probe models, all with autocalibration, are available. The A and B models are both general purpose probes. The C model is specifically developed for SF6 gas. The B and C probe models have an additional Sensor Purge feature that heats and dries the sensor, making the response from ambient to dry conditions exceptionally fast.

Intuitive User Interface

DM70 has a versatile and easy-to-use, menu-based user interface, a clear graphical LCD display, and datalogging capability. It can also be used as a tool for reading the output of fixed Vaisala dew point transmitters, such as DMT242, DMT132, DMT143, DMT152 and DMT340. DM70 displays one to three parameters at a time, either numerically or graphically. Several humidity units can be selected. In addition, DM70 includes conversion from gas pressure dew point to ambient pressure dew point. An analog output is also available.

MI70 Link

The optional MI70 Link Windows software and the USB connection cable form a practical tool for transferring logged data and real time measurement data from the DM70 to a PC.
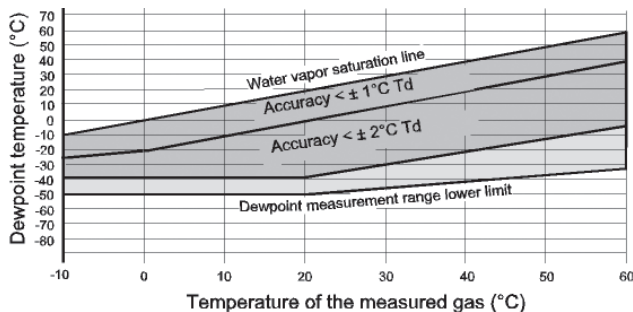
DM70 Technical Data

Measurement Performance, DMP74A Probe

Dew Point

Measurement range (typical)	-50 ... +60 °C (-58 ... +140 °F)

Dew Point Accuracy vs. Measurement Conditions

Accuracy (A probe) -40 ... +60 °C	±2 °C (±3.6 °F) (see graph)

Response Time

Flow rate 0.2 m/s, 1 bar pressure, +20 °C (+68 °F)	63% [90%]
$0 \rightarrow -40$ °C T_d ($32 \rightarrow -40$ °F T_d)	20 s [120 s]
$-40 \rightarrow 0$ °C T_d ($-40 \rightarrow 32$ °F T_d)	10 s [20 s]
Dew point sensor	Vaisala DRYCAP® 180S

Temperature

Measurement range	-10 ... +60 °C (+14 ... +140 °F)
Accuracy at +20 °C (+68 °F)	±0.2 °C (±0.36 °F)
Typical temperature dependence of electronics	±0.005 °C/°C (±0.005 °F/°F)
Temperature sensor	Pt100 RTD Class F0.1 IEC 60751

Other Variables Available

Dew point converted to atmospheric pressure, ppm volume and ppm weight concentration, absolute humidity, mixing ratio, relative humidity

Operating Environment, All Probe Models

Operating temperature	-10 ... +60 °C (+14 ... +140 °F)
Operating pressure for DMP74A, DMP74B	0 ... 20 bara (0 ... 290 psia)
Operating pressure for DMP74C	0 ... 10 bara (0 ... 150 psia)
Sample flow rate	No effect for measurement accuracy
Measured gases	Non-corrosive gases
EMC compliance	EN61326-1, Generic Environment

Mechanical Specifications

|	
Probe material (wetted parts)	Stainless steel (AISI 316L)
Sensor protection	Sintered filter (AISI 316L)
Mechanical connection	G1/2" ISO228-1 thread with bonded seal ring (U-seal)
IP rating	IP65 (NEMA 4)
Weight	350 g

Measurement Performance, DMP74B and DMP74C (for SF6 gas) Probes

Dew Point

Measurement range (typical)	-70 ... +30 °C (-94 ... +86 °F)

Dew Point Accuracy vs. Measurement Conditions
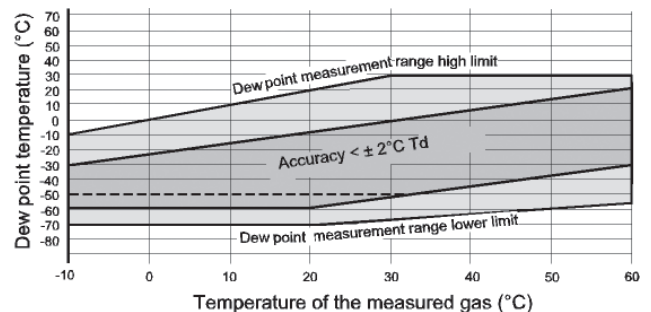
Dotted line:
For DMP74C the ±2 °C accuracy range is limited to -50 °C T_d when used in SF6 gas.

Accuracy (B and C probe) -60 ... +20 °C	±2 °C (±3.6 °F) (see graph)

Response Time

Flow rate 0.2 m/s, 1 bar pressure, +20 °C (+68 °F)	63% [90%]
$0 \rightarrow -60$ °C T_d ($32 \rightarrow -76$ °F T_d)	50 s [340 s]
$-60 \rightarrow 0$ °C T_d ($-76 \rightarrow 32$ °F T_d)	10 s [20 s]
Dew point sensor	Vaisala DRYCAP® 180M

Temperature

Measurement range	-10 ... +60 °C (+14 ... +140 °F)
Accuracy at +20 °C (+68 °F)	±0.2 °C (±0.36 °F)
Typical temperature dependence of electronics	±0.005 °C/°C (±0.005 °F/°F)
Temperature sensor	Pt100 RTD Class F0.1 IEC 60751

Other Variables Available

Dew point converted to atmospheric pressure, ppm volume and ppm weight concentration

MI70 Measurement Indicator

Operating Environment

Operating temperature	-10 ... +40 °C (+14 ... +104 °F)
Operating humidity	0 ... 100 %RH, non-condensing
Storage temperature	-40 ... +70 °C (-40 ... +158 °F)

Inputs and Outputs

Max. no of probes	2
Power supply	Rechargeable NiMH battery pack with AC adapter or 4xAA size alkalines, type IEC LR6
PC interface	MI70 Link software with USB or serial port cable

Analog Output	
Scale	0...1 VDC
Output resolution	0.6 mV
Accuracy	0.2 % full scale
Temperature dependence	0.002 %/˚C (0.01 %/˚F) full scale
Minimum load resistor	10 kΩ to ground

Mechanical Specifications

Housing classification	IP54
Housing materials	ABS/PC blend
Weight	400 g (14 oz)

Compatibility

EMC compliance	EN61326-1, Portable Equipment

Other

Menu languages	English, Chinese, Spanish, Russian, French, Japanese, German, Swedish, Finnish
Display	• LCD with backlight • Graphic trend display of any parameter • Character height up to 16 mm (0.63 in)
Alarm	Audible alarm function
Data logging capacity	2700 real time data points
Logging interval	1 s to 12 h
Logging duration	1 min ... memory full
Resolution	0.01 %RH, 0.01 °C/°F, 0.01 hPa, 0.01 a_w, 10 ppm / 0.01 %CO_2

Spare Parts and Accessories

|	
Weatherproof Carrying Case	MI70CASE3
Soft Carrying Case	MI70SOFTCASE
MI70 Link software with USB cable	219687
MI70 Link software with serial port cable	MI70LINK
Analog output cable	27168ZZ
10 m (32.81 ft) extension cable for probe	213107SP
Portable Sampling System (see separate data sheet)	DSS70A
Connection Cables for Fixed Vaisala Dew Point Transmitters	
For DMT242 transmitter	27160ZZ
For DMT340 series	211339
For DMT152, DMT143, and DMT132 transmitters	219980SP

Battery Operation Time

Typical charging time	4 hours
Operation Times	
Continuous use	48 h typical at +20 ˚C (68 °F)
Data logging use	Up to a month

MI70 dimensions in millimeters (inches)
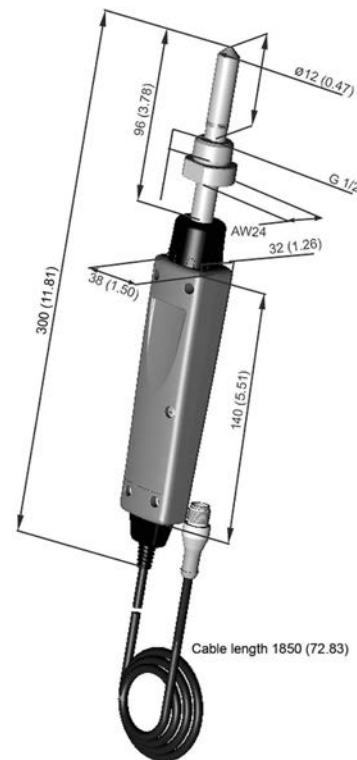
Probe dimensions in millimeters (inches)

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DSS70A Portable Sampling System and Sampling Cells

For DM70

DSS70A provides a compact solution for field checking dew point where direct measurement is difficult. Typical applications for the sampling system are metal treatment and plastics drying processes.

DSS70A Portable Sampling System

DSS70A is designed to provide dew point sampling flexibility for the DM70 hand-held dew point meter. For processes at atmospheric pressure, a battery powered pump is used to extract a gas sample. For pressurized processes up to 20 bar, the sample is measured at process pressure and then reduced to atmospheric pressure for venting or re-direction, bypassing the pump. In all cases, the sample gas passes through a filter to remove particulate contamination before measurement. Flow through the system is controlled and monitored with a needle valve and flow meter.

DSS70A is easily connected to an appropriate sample point with tubing (typically 1/4" or 6 mm). The measured dew point must be below ambient temperature to avoid condensation in the system. Gas temperatures higher than +40 °C (+104 °F) should be cooled with a short PTFE (included in the DSS70A system) or stainless steel tube prior to entering DSS70A. DSS70A is an accessory for DM70 Dewpoint Handheld Meter.

Sampling Cells for Pressurized Processes

DM70 can easily be connected to pressurized processes. In addition to direct pipeline installation, a variety of sampling cell options are available for gas sampling.

DSC74 sampling cell is the recommended choice. It has a variety of connection adapters that allow several different ways of installation. The quick connector with a leak screw allows a very fast connection for compressed air lines. Additionally, two thread adapters are available for the inlet port.

DSC74B is a two-pressure sampling cell, which enables measurements in both process and ambient pressure. This sampling cell is especially suitable for dew point measurements in SF6 gas with the DMP74C probe.

DMT242SC is a basic sampling cell. DMT242SC2 is a sampling cell supplied with welded Swagelok connectors for sampling in a 1/4" pipeline.


The sampling cells (from the left) DMT242SC2, DMT242SC and DSC74 can be used to connect the DM70 to sample gas flow. The DSC74B (right) is a two-pressure sampling cell that can be used for measurements in either pressurized or ambient pressure. The cooling/venting coil is included in the DSC74C sample cell, but is an option for all sampling cells.

Technical Data

DSS70A Sampling System and DSC74B/C Sampling Cells
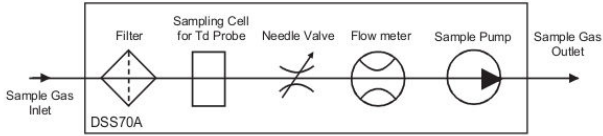
The DSS70A sampling system includes a filter to clean the dirty sample gas and a needle valve to control the sample flow rate with the flow meter. A sample pump is used to generate a sample flow from processes at ambient pressure.
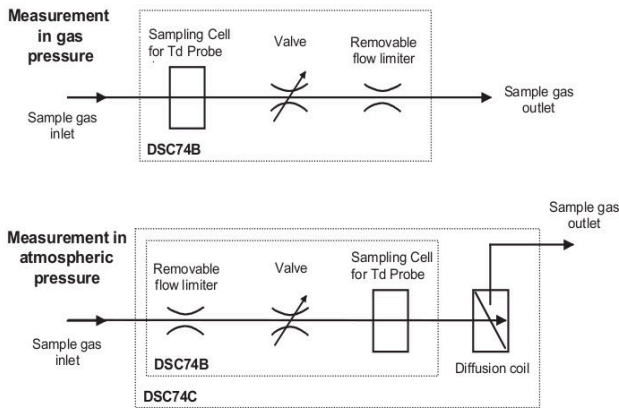
The DSC74B sampling cell enables the measurement of the sampled gas either in gas pressure up to 10 bar or in atmospheric pressure depending on the gas inlet and outlet. DSC74C is like DSC74B but with an additional coil to avoid back diffusion, the effect of surrounding moisture, in dew point measurements in atmospheric pressure.

DSS70A Operating Environment

Operating gases	Air, N_2, and other non-toxic, inert gases
Sampled gas dew point	Below Tamb
Inlet/outlet connection	1/4″ Swagelok
Operating ambient temperature	0 … +40 °C (+32 … +104 °F)
Operating process gas temperature with PTFE tube at +20 °C (+68 °F) (included in the DSS70A)	Max. +200 °C (+392 °F)
Operating temperature with stainless steel tube	Specification according to stainless steel tube specification
Maximum gas temperature at inlet	+40 °C (+104 °F)
Operating pressure with pump	0.6 … 1.2 bara (8.7 … 17.4 psia)
Operating pressure with pump disconnected	0 … 20 bara (0 … 290 psia)

Mechanical Specifications

Battery operation time for pump	8 h continuous use (battery can be recharged using DM70 charger)
Filter	7 mm inline filter cartridge 1/4″ Swagelok SS-4F-7 (spare part order no. 210801)
Case dimensions (W × D × H)	430 × 330 × 100 mm
Weight	5.5 kg (12 lbs)
Materials	
Wetted parts	Stainless steel
Carrying case	ABS plastic

Sampling Cell Options

DSC74	Sampling cell for pressurized gases
DSC74 pressure limit	1 MPa (10 barg, 145 psig)
DSC74B	Two pressure sampling cell
DSC74B pressure limit	1 MPa (10 barg, 145 psig)
DSC74C	DSC74B with DMCOIL cooling/venting coil
DMCOIL	Cooling/venting coil
DMT242SC	Sampling cell
DMT242SC pressure limit	10 MPa (100 barg, 1450 psig)
DMT242SC2	Sampling cell with Swagelok connectors
DMT242SC2 pressure limit	4 MPa (40 barg, 580 psig)
Material for all sampling cells	Stainless steel AISI316

Compliance

EMC	EN61326-1, Generic Environment