VAISALA

HMT370EX Series HMP378F and HMP378H probes for measurements in oil and JET A-1 fuel

Features

- HMP378F and HMP378H: HMT370EX Series probe variants designed for moisture and temperature measurement in oil and JET A-1 fuel
- Intrinsically safe (Ex i) for operation in up to Zone 0 / 20
- Designed for harsh conditions
- Temperature range between −70 ... +180 °C (−94 ... +356 °F)
- Vaisala HUMICAP® 180L2 sensor designed specifically for oil and fuel measurements
- Display options: graphical LCD display and non-display model
- Traceable calibration (certificate included)
- Compatible with Vaisala Insight PC software and Vaisala Indigo80 handheld indicator
- For information on other HMT370EX Series probe options, see HMT370EX Datasheet (B211825EN).

Vaisala HMT370EX Series HUMICAP® Humidity and Temperature Transmitters are the ideal solution for measuring humidity in hazardous areas. For measurements in oil and JET A-1 fuel, the HMT370EX Series probe options include the HMP378F and HMT378H probe variants that utilize the HUMICAP® 180L2 sensor specifically designed for oil and fuel environments.

HMT370EX probe options designed for oil and fuel measurements

The HMT370EX Series probe variant HMP378F is designed for oil moisture and temperature measurement, and the HMP378H probe variant for JET A-1 fuel moisture and temperature measurement.

Both HMP378F and HMP378H measure temperature, relative saturation, and water activity. Additionally, HMP378F measures water concentration in oil, and HMP378H measures water concentration in JET A-1 fuel and saturation temperature.

Intrinsically safe and robust

The entire HMT370EX transmitter can be installed directly in hazardous areas. It can withstand continuous exposure to potentially explosive environments that contain flammable gases or dust. Operation in either gas or dust environments requires no additional protective enclosures. A rugged design, combined with trouble-free operation, ensures a long-term solution for measurements in potentially explosive environments.

Easy configuration access with local display and Insight PC software

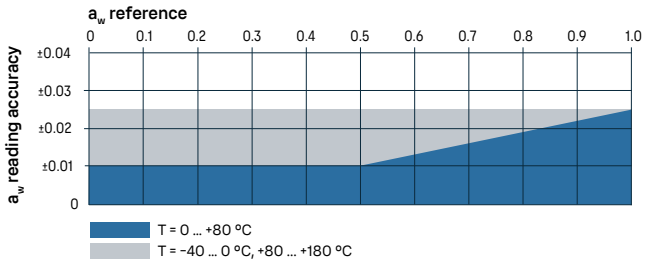
Output configuration and measurement calibration and adjustment can be carried out directly on the local display interface. For additional configuration and monitoring options, you can connect the transmitter to Vaisala Insight PC software with an accessory USB cable. The probe and transmitter body can be connected to Insight for configuration either together as one unit or separately.

Technical data

HUMICAP® 180L2 measurement performance

Water activity	
Measurement range	0–1 a_w [1]
T_{90} response time [2]	10 min
Sensor	HUMICAP® 180L2
Accuracy [3]	±0.01 a_w (±1 %RS)
Factory calibration uncertainty	±0.6 %RH (0–40 %RH) ±1.0 %RH (40–95 %RH)
Temperature	
Measurement range	−40 ... +180 °C (−40 ... +356 °F)
Accuracy at +20 °C (+68 °F)	±0.2 °C (0.36 °F)

1) 0–1 a_w corresponds to 0–100 %RH
2) At +20 °C (+68 °F) in still oil.
3) In range 0 ... 0.5 a_w, including non-linearity, hysteresis, and repeatability. See accuracy graph below.



A_W measurement accuracy

HMP378F and HMP378H ppm accuracy

JET A-1 fuel ppm accuracy (HMP378H)	±15 % of the reading (typical) [1]
Moisture in transformer oil ppm accuracy (HMP378F)	±10 % of the reading (typical) [2]

1) For more information on HMP378H and HMP378F measurements, see HMT370EX User Guide (M212305EN).
2) Note: valid for common high-voltage transformer mineral oils. For more information on HMP378F measurements, see HMT370EX User Guide (M212305EN).

Available measurement parameters for HMP378F and HMP378H

Parameter	Abbreviation	Unit
Available for both HMP378F and HMP378H		
Temperature	T	°C (°F)
Relative saturation	RS	%RS
Water activity	a_w	
Only available for HMP378F		
Water content in oil	H_2O (oil)	ppm_w [1]
Only available for HMP378H		
Water content in JET A-1 fuel	H_2O (fuel)	ppm_w
Saturation temperature	T_s	°C (°F)

1) Note: for common high-voltage transformer mineral oils. For more information on HMP378F measurements, see HMT370EX User Guide (M212305EN).

Operating environment

Operating temperature for transmitter electronics	−40 ... +60 °C (−40 ... +140 °F)
Transmitter operating temperature with display	−20 ... +60 °C (−4 ... +140 °F)
Transmitter storage temperature	−40 ... +70 °C (−40 ... +158 °F)
HMP378 probe temperature range	−70 ... +180 °C (−94 ... +356 °F)
HMP378 probe pressure range	0–4 MPa

Compliance

Electromagnetic compatibility (EMC)	EN 61326-1, industrial environment
Compliance marks	CE, China RoHS, RCM

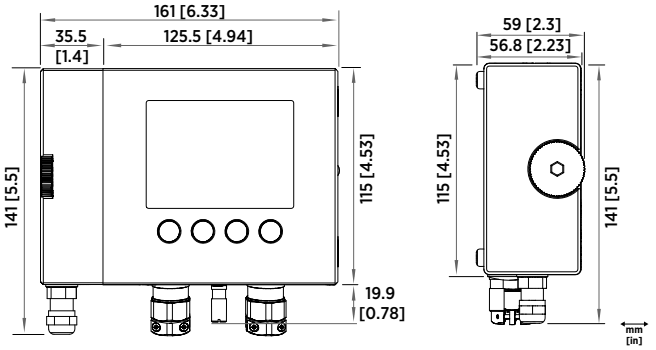
Inputs and outputs

Operating voltage	12–28 V
Analog outputs	2 outputs (two-wire, 4–20 mA) Connection via safety barriers
Typical accuracy of analog outputs at +20 °C	±0.0625 % full scale
Typical temperature dependence of analog outputs	0.005 % / °C (0.005 % / °F) full scale
Transmitter service port connection	USB cable *219690*
Probe body service port connection	USB cable *USB2*
Display options	• Graphical LCD display • Model without display [1]

1) Recommended when the transmitter is exposed to direct UV light, and for outdoor installations and high-humidity environments.

Mechanical specifications

Connections	Screw terminals, 0.33–2.0 mm^2 wires (AWG 14-22)
Cable glands	M20 x 1.5
Conduit fitting	NPT 1/2″ and M16
Housing material	EN AW-6082
Housing weight	LCD transmitter: 1500 g (3.3 lb) LED transmitter: 1520 g (3.35 lb)
IP rating	IP66 (NEMA4)



HMT370EX transmitter dimensions

Ex classifications by region

NOTE: The Ex classifications show the highest level of compliance. Although lower compliance levels are not shown in the classification, they are also included in the classification. For example, compliance with Division 1 also means compliance with Division 2, and compliance with Zone 0 also means compliance with Zone 1 and Zone 2.

Europe (ATEX)	
Gas classification EU (2014/34/EU)	II 1 G Ex ia IIC T4 Ga
Dust classification	II 1 D Ex ia IIIC T_{200} 85 °C Da
Safety factors	U_i = 28 VDC, I_i = 100 mA, C_i = 12.1 nF, P_i = 700 mW, L_i = 16 µH
Environmental specifications	
T_{amb}	-40 ... +60 °C (-40 ... +140 °F)
P_{amb}	0.8 ... 1.1 bar
International (IECEx)	
Gas classification	Ex ia IIC T4 Ga
Dust classification	II 1 D Ex ia IIIC T_{200} 85 °C Da
Safety factors	U_i = 28 VDC, I_i = 100 mA, C_i = 12.1 nF, P_i = 700 mW, L_i = 16 µH
Environmental specifications	
T_{amb}	-40 ... +60 °C (-40 ... +140 °F)
P_{amb}	0.8 ... 1.1 bar
Japan (CML)	
Ex classification	Ex ia IIC T4 Ga Ex ia IIIC T_{200} 85°C Da
China (NEPSI)	
Ex classification	Ex ia IIC T3-T6 Ga
Korea (KCs)	
Ex classification	Ex ia IIC T4 Ga Ex ia IIIC T200 85 °C Da -40 °C ≤ Tamb ≤ +60 °C
US (FM)	
Ex classification	Class I, Zone 0, AEx ia IIC T4 Ga Zone 20, AEx ia IIIC T85°C Da IS Class I, Division 1, Groups A, B, C, and D T4 IS Class II, III, Division 1, Groups E, F, and G T85°C
CAN (FM)	
HMT370EX equipment rating	Intrinsically safe for: Class I, II, III Division 1, Groups A, B, C, D, E, F, and G, T4 Class I, Zone 0, Ex ia IIC T4 Zone 20, Ex ia IIIC Temperature Code T85°C Ta: -40 °C to +60 °C; IP54 (transmitter alone) IP66 (transmitter with the probe body attached)
UK (UKEX)	
Ex classification	II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T200 85 °C Da −40 °C ≤ Tamb ≤ +60 °C

Transmitter accessory availability

Accessory	Item code	Compatible models
Cable lead-through accessories		
Cable gland M20 x 1.5 for Ø 5–11 mm cable	265207SP	All models
Cable gland M20 x 1.5 for Ø 10–14 mm cable	265208SP	All models
Conduit fitting M16	265243SP	All models
Conduit fitting NPT1/2″	265240SP	All models
Dummy plug (Ex, 2 pcs)	254931SP	All models
Mounting, wiring, cable, and adapter accessories		
HMT360 retrofit mounting plate	DRW253246SP	All models
Turbine mounting kit	HMT300TMK	All models
Outdoor installation kit (weather shield)	215109	All models
USB service cable for transmitter	219690	All models
Indigo80 handheld indicator connection cable (M12-M8) for transmitter	262195SP	All models
Zener barrier for 1 channel (with 2 channels, order 2 pcs)	210664	All models
Galvanic isolator for 1 channel	212483	All models
Galvanic isolator for 1 channel	272886SP	All models
Galvanic isolator for 2 channels	272887SP	All models

Probe spare parts and accessories

Accessory	Item code	Compatible models
M12 Indigo USB Adapter cable accessory for connecting HMT370EX probes to Insight	USB2	All models
Indigo80 handheld indicator connection cable (M12-M12) for probes	272075SP	All models
Ball valve ISO 1/2 with welding joint • Pressure range at +100 °C (+212 °F) 0–40 bar (0–580 psi absolute) (during installation max. 10 bar (145 psia))	BALLVALVE-1	HMP378
Fitting body ISO1/2 solid structure	DRW212076SP	HMP378
Fitting body NPT1/2 solid structure	212810SP	HMP378
Thread adapter ISO 1/2″ to NPT 1/2″	210662SP	All models
Manual press	HM36854SP	HMP378/F/H
Stainless steel filter for high oil flow applications	220752SP	HMP378/F/H
Stainless steel filter for oil and vacuum environments	HM47453SP	All models

VAISALA

B212512EN-F © Vaisala 2026

All rights reserved. Any logos and/or product names are trademarks of Vaisala or its individual partners. Any reproduction, transfer, distribution or storage of information contained in this document is strictly prohibited. All specifications — technical included — are subject to change without notice.