

Moisture and Hydrocarbon Dew Point Analyzer HCDT-5673

Product Presentation

V04EN

Agenda

- HCDT-5673 – Hydrocarbon Dew Point Analyzer
- Principal of Operation
- Main Components
- Applications
- Conclusion and Contact Information

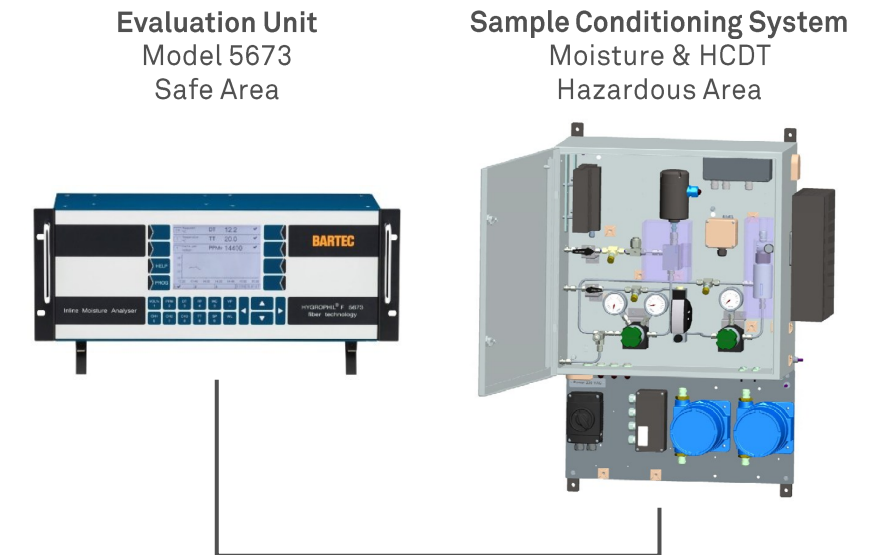
HCDT-5673
Product Presentation

HCDT-5673

Process Trace Moisture and Hydrocarbon Dew Point Analyzer

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- **Why is Moisture and HCDT measurement important?**
 - Water vapor **reduced** the **heating value** of the natural gas (Quality)
 - Liquid water causes **corrosion** on the pipeline (Safety)
 - **Liquids** collecting at lower sections and **slugs** may damage pipes and valves (Safety)
 - Frozen water may form **hydrate** which results in pressure drops, blocking and cracking (Safety)
- **HCDT-5673**
 - Consists of evaluation unit and SCS with sensors
 - Combined measurement of Moisture and HCDT in Natural Gas
 - Two different field-proven principles (Fabry-Pérot-Interferometer and Chilled Mirror)

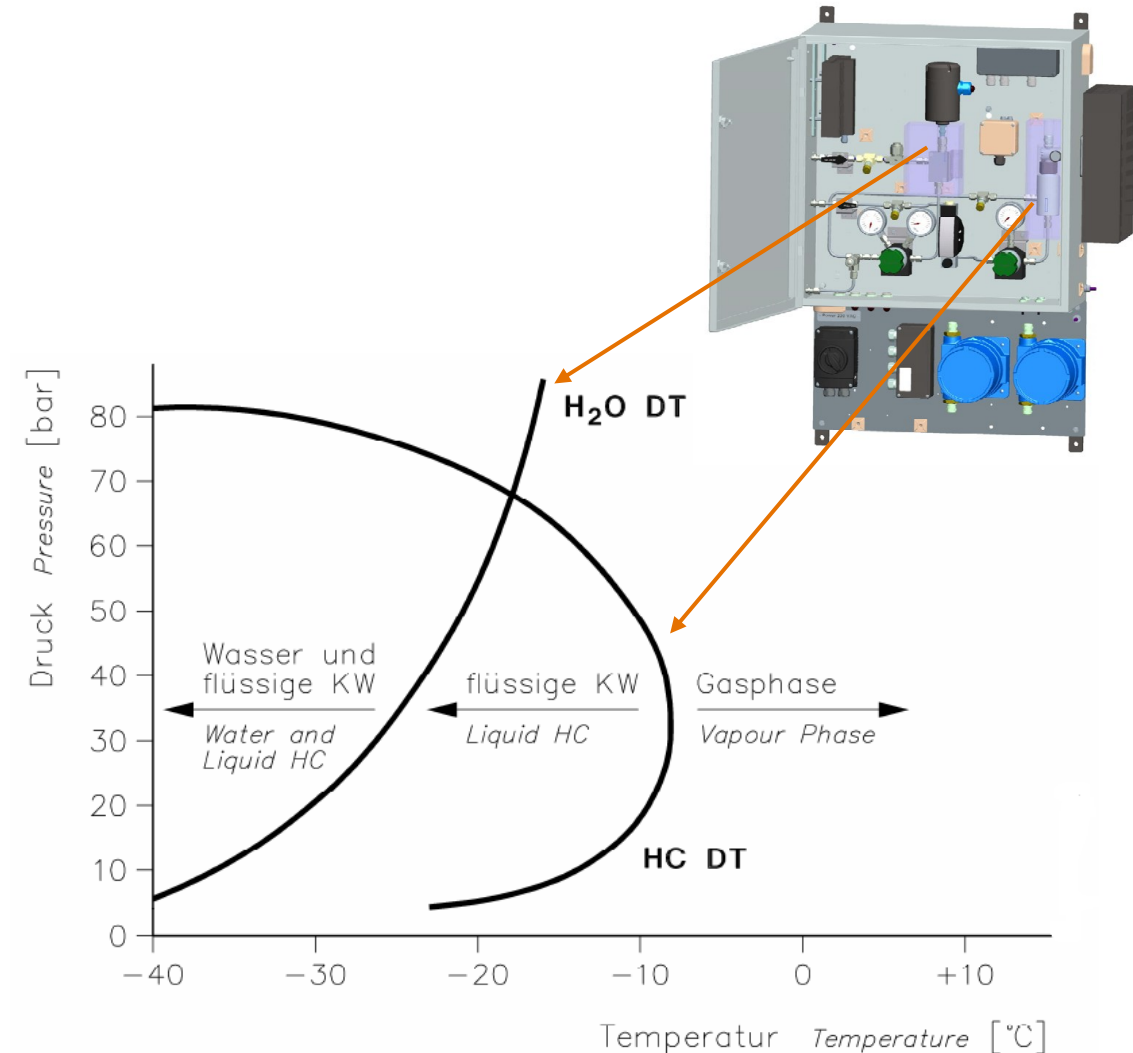


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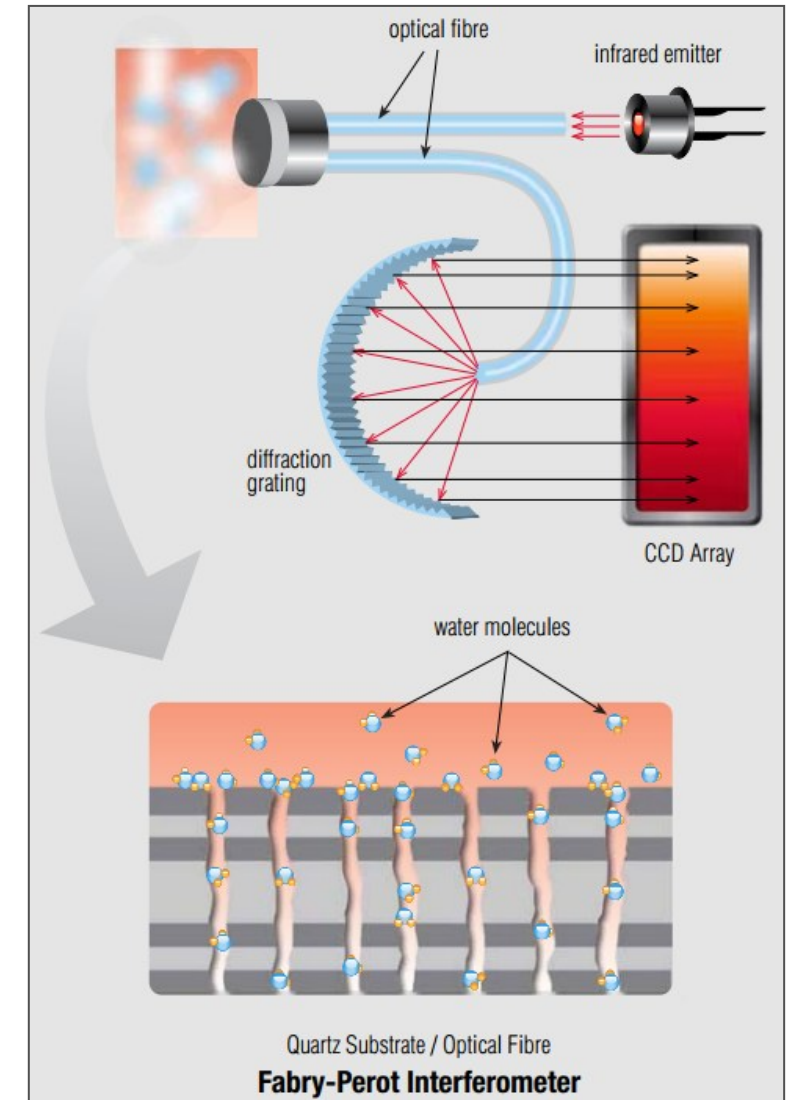
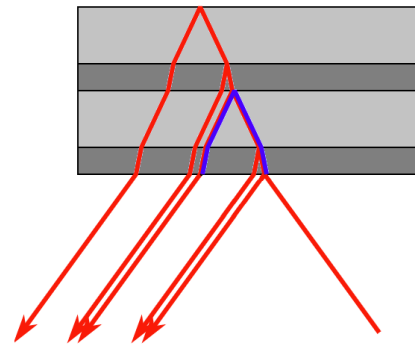
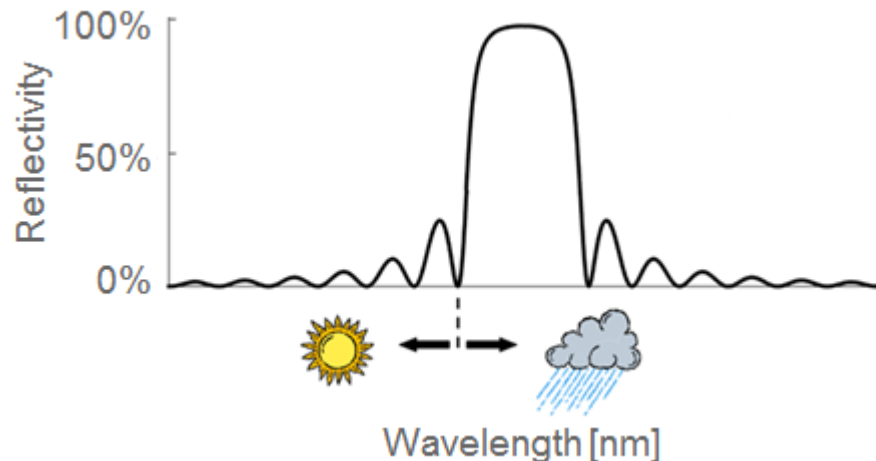
- **Moisture Measurement**
 - Optical Fabry-Pérot-Interferometer
 - Pressure: Line pressure
 - Precision: $\pm 1\text{ }^{\circ}\text{C}$ (Dew Point Temperature $+20\text{ }^{\circ}\text{C}$ to $-80\text{ }^{\circ}\text{C}$)
 - Moisture Content calculation DIN EN ISO 18453 (GERG)
- **HCDT Measurement**
 - Chilled Mirror Principle
 - Pressure: Cricondentherm point (e.g. 28 barg)
 - Precision: $\pm 1\text{ }^{\circ}\text{C}$
 - HCDT calibration on a defined condensate amount (e.g. detection at 5 mg/m^3)



Principle of Operation – Trace Moisture Measurement

Fabry-Pérot Interferometer

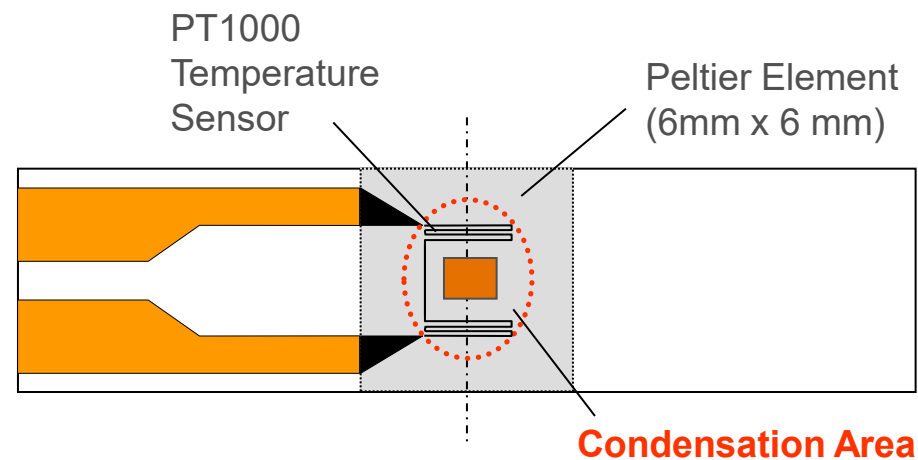
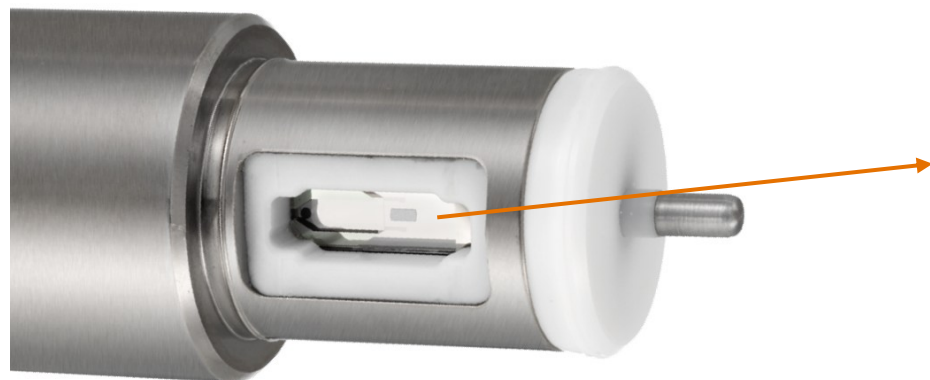
- Moisture sensitive sensor element consists of a series of alternating high and low refracting **microporous layers**
- Fabry-Pérot Interferometer** is an optical resonator with two reflective thin mirrors
- Porous layers** made of ZrO₂ and SiO₂ with pores diameters of 0.3 nm
- Water molecules** adsorb and desorb in the porous layers depending on the present water partial vapour pressure which **changes the refractive index**
- The **peak wavelength** will be **monitored** with a compact Polychromator unit



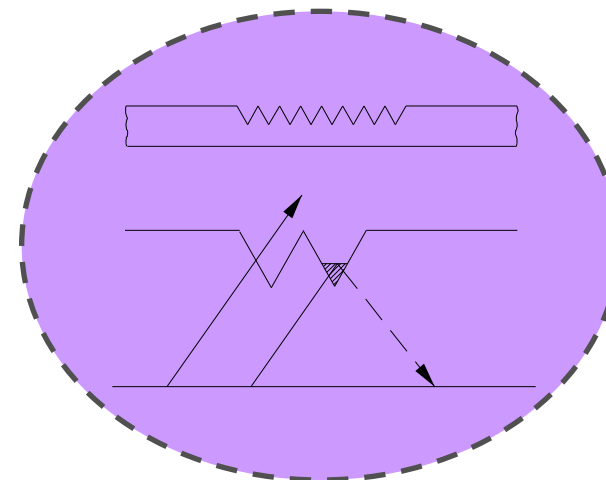
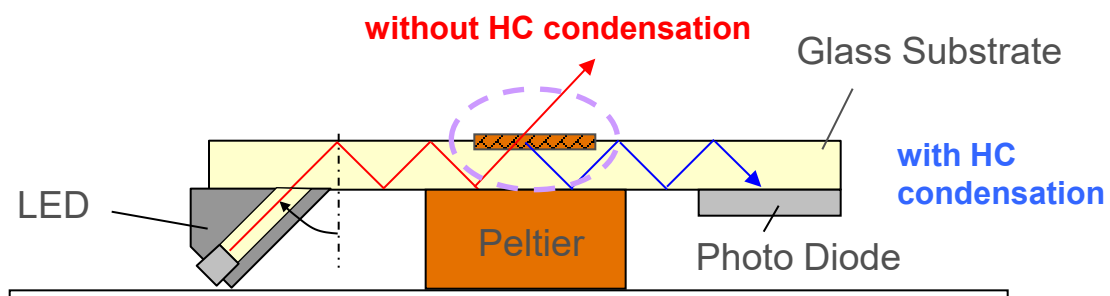
Principle of Operation – HCDT Measurement

Chilled Mirror Principle

- HCDT Sensor (Tip) - top view



- HCDT Sensor (Tip) - side view



Evaluation Unit

Main Components

- **Linux Operation System**
- Touch screen (graphic display with 320x240 dots)
- Data logger
- **Up to 3 measurement channels** or combination of moisture and HCDT
- Moisture Content calculation according DIN EN ISO 18453 (GERG)
- Three measurements per minute
- **Modbus RTU & TCP, Profibus, RS232, 3 x 0/4...20mA current outputs, USB**
- ERROR and LIMIT relays (change-over contact)
- ATEX, CSA, IECEx and TR CU approvals
- Power supply: DC 10...36V or AC 100...240V
- 19-inch rack mountable or usable as desktop device
- Suitable for Class 1 / Div. 1 (Zone 1) with Ex-d casing

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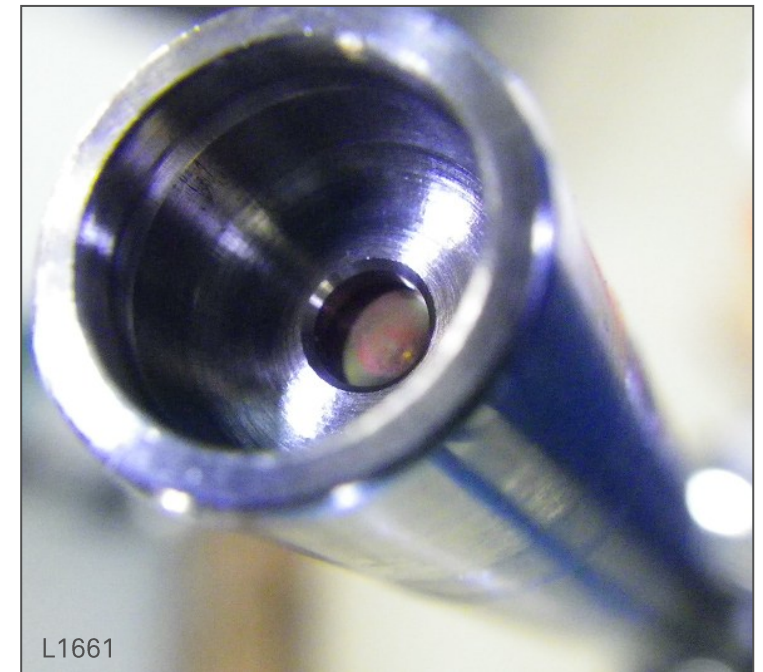


Moisture Sensor L1661

Main Components

- **Wetted parts of the moisture sensor model L1661:**
 - Sensor shaft: Stainless steel 1.4571 or Alloy C-276 2.4819
 - Sealing ring: FFKM (Perlast ® G90LT)
 - Optical multi-layer (SiO₂ and ZrO₂)
- **Combined moisture and Pt100-temperature sensor** (4-wire class A)
- Calibrated dew point range: -80 °C to +20 °C (-112 °F to +68 °F)
- In-line and in-situ **up to 20 MPa** (2900 PSI)
- Long term stable, reproducible, accurate (± 1 Kelvin)
- **Working temperature** range: -30 °C to +60 °C (-22 °F to +140 °F)
- ATEX and IECEx as standard / others on request
- Suitable for use in Hydrogen up to 100%

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HCDT Sensor

Main Components

- Measurement Range:
 - Standard Range: -20 °C to +5 °C HCDT
 - Extended Range: -30 °C to +20 °C HCDT (including improved CIP – Clean in place)
- Sensor **validation** at **independent laboratory** on request
- Long term stable, reproducible, accurate (± 1 Kelvin)
- HCDT **calibration** on a defined **condensate amount** (e.g. detection at 5 mg/m³)
- Pressure: max. 40 bar(g)
- ATEX and IECEx as standard / others on request
- Suitability for Gas mixtures with 20% or 100% H₂ content is in progress.

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Sample Conditioning System 5985-72

Main Components

- Sample Conditioning System for Moisture and HCDT sensor
- Designed as pre-SCS also for GC, O₂, H₂S and further instruments required in metering stations
- The sample conditioning system is marked **CE** and for ATEX II 2G Ex h IIC T3 Gb X
- It offers bypasses for uninterrupted maintenance
- Safety feature with remote shut off
- The technical design of the SCS is in accordance
 - with the technical code of the DVGW (German technical and scientific association for gas and water) G488 (A)
 - and is in compliance with sound engineering practice according to PED 2014/68/EG article 4, section 3.
- Suitable for Gas mixtures with 10% or 20% H₂
- Reduced scope possible (Customized)



Natural Gas – Custody Transfer

- Quality control of the received gas on the contracted parameters (moisture and hydrocarbon dew point)
- Typical measurement range: -25 to -5 °C (HCDT)
- Typical stream composition: Natural Gas

Problems for process:

- If the hydrocarbon dew point is too high the risk of hydrate formation is increased
- Exceeding the contracted parameters could lead to shutting off the pipeline

Requirement for measurement:

- Comparison with other instruments - PLHC

Fuel Gas for Turbines

- Quality control of the received gas on the contracted parameters (moisture and hydrocarbon dew point)
- Typical measurement range: -25 to -5 °C (HCDT)
- Typical stream composition: Natural Gas

Problems for process:

- Liquid formation in the burner tubes due to pressure reduction from natural gas line pressure
Flashbacks may rise the metal temperature up to unacceptable levels which lead to coking and damage
- Droplets also form on the blades and burn at high temperature which decreases the efficiency

Requirement for measurement:

- Reliability and short cycle times are mandatory

Conclusion and Contact Information

- The HCDT-5673 is also suitable for many other applications.
- Feel free to contact our application specialists for further information and application check.

Get in touch with us! We'd love to hear from you:

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