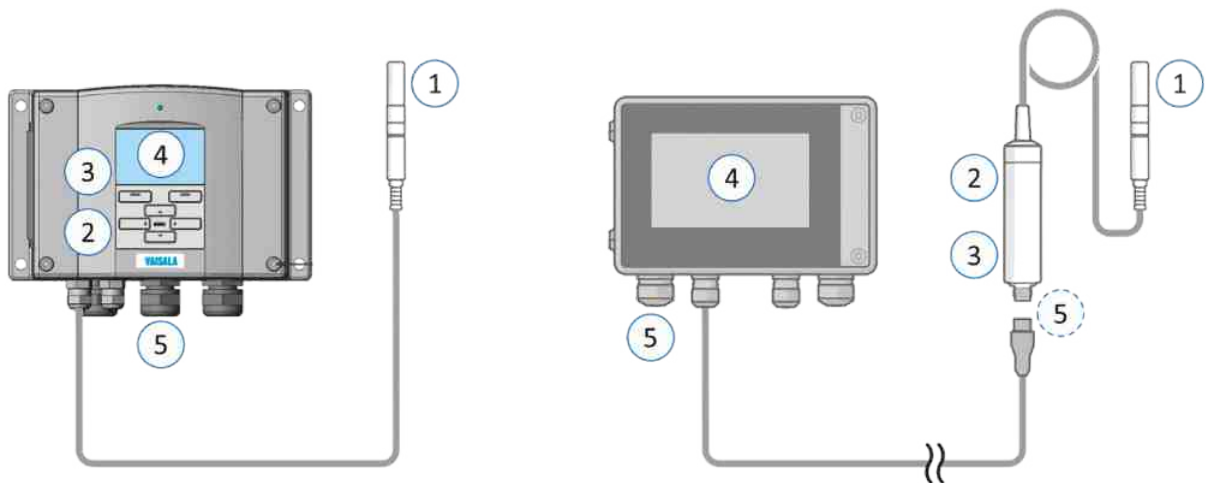


## Comparison of Vaisala humidity and temperature instruments for demanding industrial applications

### The most significant difference - Interchangeable probes

The new Indigo platform is built on the same measurement technology as its predecessor, the HMT330 series. The most significant and widely desired feature of the Indigo platform is the interchangeability of the smart probes. Many functionalities that were traditionally located inside the transmitter are now built into the smart probe instead, allowing for field swapping and cross-functional configurations. The following picture illustrates the basic functionalities of the measurement instruments.



#### 1. Physical measurement - Probe head

Both the design concepts of the HMT330 and Indigo smart probes are built on Vaisala's proven HUMICAP<sup>®</sup> capacitive thin-film polymer sensor technology. The probe head structures, filters, and installation accessories are fully compatible, which means that, for example, the HMP5 humidity probe fits the same process connection as the HMT335 probe.

#### 2. Signal conditioning

Vaisala HUMICAP<sup>®</sup> is a capacitive thin film polymer sensor and it is always accompanied by resistive temperature measurement. These electrical quantities must be properly conditioned in order to obtain a high-quality measurement signal. In the HMT330 platform this conditioning is performed inside the transmitter housing. This means that the probe is a permanent part of the transmitter and cannot be removed without compromising measurement reliability.

Signal conditioning in Indigo smart probes happens in the probe body, and therefore it is not tied to the transmitter.

### 3. Analog-digital converter

Conditioned analog signals are converted into digital format. To reveal the physical quantities being measured, the measurement signals must be further processed by adding various factors, such as linearization, pressure model, and calibration factors, etc. These physical quantities can be, for example, relative humidity and temperature or a calculated humidity parameter, such as dew point temperature.

Analog-digital conversion in Indigo smart probes takes place in the probe body, and therefore these probes can be used independently without the need for a separate transmitter. Measurement readings from the standalone probes are available in digital Modbus RTU format.

### 4. HMI - Human-Machine interface

The need for a local display and interactivity with the instrument depends on the specific application. The user interface can often be

a valuable tool, for example, in the case of a process failure or if there is a need for local troubleshooting.

The HMT330-series transmitters can be ordered with or without a local user interface. The Indigo platform offers the choice of either a standalone smart probe without a local user interface or connection to an Indigo transmitter.

### 5. M2M - Machine-to-machine communication

Often these measurements are used for process control. The system interface can be either an analog signal, for example 4 ... 20 mA, 0 ... 10 V, or digital, for example Modbus RTU.

The output of a standalone Indigo probe is limited to Modbus RTU only, but the interface selection can be extended by connecting it to an Indigo transmitter. For example, the Indigo520 transmitter offers the same system interfaces as the HMT330 in addition to new interface options.

MEASUREMENT PERFORMANCE AND SPECIFICATIONS			
	HMP probe	HMT330 Series	Additional information
RH specified accuracy	0.8 %RH	1.0 %RH	At 20 °C
Temperature specified accuracy	0.1 °C	0.2 °C	At 20 °C
Sensor purge	Optional	Optional	
Probe heating	Optional for HMP7	Optional for HMT337	
Latest-generation HUMICAP® R2 sensor	Standard	Optional	
Replaceable HUMICAP® sensor	Optional for HMP3	Optional for HMT331 & HMT333	

FEATURES AND FUNCTIONALITIES				
	HMP probe	Indigo201, Indigo202	Indigo520	HMT330 series
Probe connection	Interchangeable probe with M12 5-pin connector	Directly to the host, or with intermediate M12 5-pin cable	M12 5-pin cable	Fixed cable
Display	-	Optional	Standard	Optional
Human-machine interface	-	WLAN + smartphone or PC	Touchscreen	* Keypad
Connectivity to PC	USB-cable + Free Insight PC software	WLAN + built-in web server	RJ45-ethernet cable + built-in web server	USB-cable + terminal program e.g. putty
Analog outputs	-	Indigo201: 3 outputs	4 outputs	2 outputs (3rd optional)
Relays	-	Indigo201: 2 relays	2 relays	Optional
Digital communication	Modbus RTU	Indigo202: Modbus RTU	Modbus TCP/IP	Optional, Modbus RTU, Modbus TCP/IP
Galvanically isolated signal	Not isolated	Standard	Standard	Optional
Operating temperature	-40 ... +60 °C	-40 ... +60 °C * -20 ... +60 °C	-20 ... +60 °C	-40 ... +60 °C * 0 ... +60 °C
IP rating	IP66	IP65	IP66	IP66, *IP65
Operating voltage	Standalone: ** 15 ... 30 VDC Otherwise powered by the host device	** 15 ... 30 VDC, 24 VAC	Configurable in order phase: 15 ... 35 VDC / 24 VAC, 100 ... 240 VAC, PoE+	Configurable in order phase: 10 ... 35 VDC / 24 VAC, 100 ... 240 VAC
Signal and supply voltage connections	M12 5-pin connector	Screw terminals	Screw terminals with configurable cable glands and conduit fittings	Screw terminals with configurable cable glands and conduit fittings
Data logging	-	-	Standard	Optional

\* With display

\*\* Minimum voltage for HMP7 is 18 VDC

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