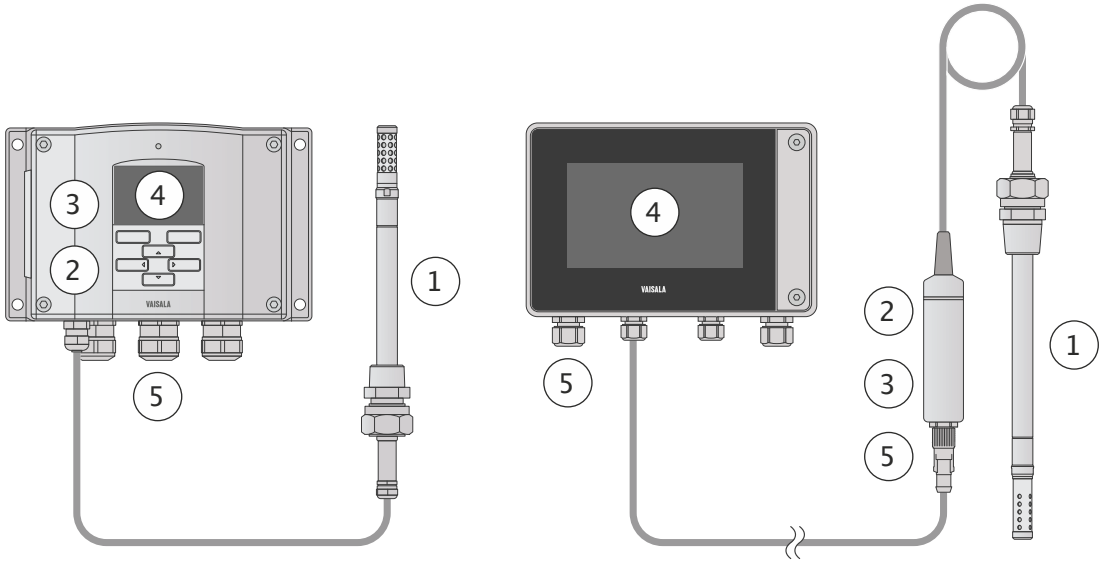
Comparison of Vaisala moisture in oil instruments for demanding applications

The most significant difference – Interchangeable probes

The new Indigo platform is built on the same measurement technology as its predecessor, the MMT330 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

The design concepts of both the Indigo platform's smart probes and the MMT330 are built on Vaisala's proven HUMICAP® capacitive thin-film polymer sensor technology. The probe head structures, filters, and installation accessories are fully compatible, which means that the MMP8 humidity probe fits the same process connection as the HMT338 probe.

2. Signal conditioning

Vaisala HUMICAP® 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 MMT330 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.

In Indigo-compatible smart probes, signal conditioning happens in the probe body, and is therefore 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 for mineral transformer oil can be e.g. water activity, relative saturation or calculated ppm.

Analog-digital conversion in Indigo-compatible 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

Whether you will need a local display and user interface will depend on your specific application. A local user interface is often a valuable tool, e.g. in case of a process failure or whenever local troubleshooting is needed.

Both Indigo500 series and MMT330 series transmitters are available with or without a local user interface. In the Indigo platform, the transmitters provide you with the option of a local and fully graphical user interface, with the compatible smart probes operating either in standalone mode or connected to the transmitter.

5. M2M – Machine-to-machine communication

These measurements are often used for process control. The system interface can be either an analog signal, e.g. 4 ... 20 mA, 0 ... 10 V, or digital, such as Modbus RTU.

The output of a standalone Indigo-compatible probe is limited to Modbus RTU only, but the interface selection can be extended by connecting it to an Indigo transmitter. The Indigo500 series transmitters offer added interface options in addition to those of the MMT330.

MEASUREMENT PERFORMANCE AND SPECIFICATIONS			
	MMP probe	**MMT330 Series**	**Additional information**
RS specified accuracy	1 %RS	2 %RS	At 20 °C
Temperature specified accuracy	0.2 °C	0.2 °C	At 20 °C
Latest-generation HUMICAP® 180L2 sensor	Standard	Standard	
Replaceable HUMICAP® sensor	Optional	Optional	

FEATURES AND FUNCTIONALITIES				
	MMP probe	**Indigo510**	**Indigo520**	**MMT330 series**
Probe connection	Interchangeable probe with M12 5-pin connector	M12 5-pin cable	M12 5-pin cable	Fixed cable
Display	-	Optional	Optional	Optional
Human-machine interface	-	*Touchscreen	*Touchscreen	* Keypad
Connectivity to PC	USB-cable + Free Insight PC software	RJ45-ethernet cable + built-in web server	RJ45-ethernet cable + built-in web server	USB-cable + terminal program e.g. putty
Analog outputs	-	2 outputs	4 outputs	2 outputs (3rd optional)
Relays	-	None	2 relays	Optional
Digital communication	Modbus RTU	Modbus TCP/IP	Modbus TCP/IP	Optional, Modbus RTU
Galvanically isolated signal	Not isolated	Standard	Standard	Optional
Operating temperature	Probe head: -40 ... +180 °C Probe body: -40 ... +80 °C	-40°C ... +60°C *-20°C ... +60°C	-40...+60°C *-20...+55°C	-40 ... +60 °C * 0 ... +60 °C
IP rating	IP66	IP66	IP66	IP66, *IP65
Housing	Metal	Metal	Metal	Metal
Operating voltage	Standalone: 15 ... 30 VDC Otherwise powered by the host device	11 ... 35 VDC / 24 VAC	Configurable in the order phase: 15 ... 35 VDC / 24 VAC, 100 ... 240 VAC, PoE+	Configurable in the order phase: 10 ... 35 VDC / 24 VAC, 100 ... 240 VAC
Signal and supply voltage connections	M12 5-pin connector	Screw terminals with configurable cable glands and conduit fittings	Screw terminals with configurable cable glands and conduit fittings	Screw terminals with configurable cable glands and conduit fittings
Data logging	-	Standard	Standard	Optional

* With display

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