Datasheet Sigma 05

Modular Sensor Platform

Sigma 05

Modular Sensor Platform

The Sigma 05 is a modular platform for intelligent probes with analogue outputs and display. Due to the pluggable, interchangeable probes the device is suitable even for harsh and challenging environment. The Sigma 05 is available with polycarbonate or die-cast aluminium enclosure.

Flexibility: Multiple Probes and Measurands

The Sigma 05 accommodates an RS485 bus with up to three E+E plug-and-play probes with Modbus RTU protocol. The measurands can be assigned to the two freely selectable and scaleable analogue outputs and to the optional graphic display.

Plug-and-Play

Sigma 05 features automatic detection of E+E plug-and-play probes and performs an autonomous, rule based hub setup. Therefore, an easy change of the probes is possible.

Configuration and Adjustment

The free PCS10 Product Configuration Software allows for easy setup of the Sigma 05, measurand assignment and thresholds, display layout, scaling of the analogue outputs and adjustment of the connected probes.

Examples of Plug-and-Play Sensors with Sigma 05

CO_2, humidity, temperature and pressure sensor with EE872 probe
Sigma 05 with die-cast aluminium enclosure

Air velocity and temperature sensor with EE680
Sigma 05 with die-cast aluminium enclosure

Moisture in oil sensor with MOP301 probe
Sigma 05 with Polycarbonate enclosure

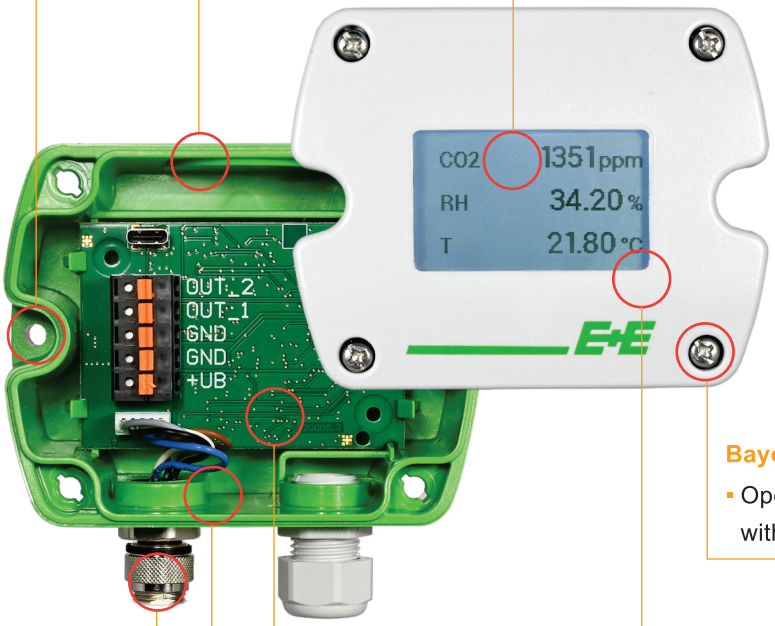
Humidity and temperature sensor up to 120 °C (248 °F) with
HTP501 probe, Sigma 05 with Polycarbonate enclosure

Features

External Mounting Holes
- Mounting with closed cover
- Electronics protected against construction site pollution
- Easy and fast mounting

Display with backlight
- Configurable display layout
- Up to 3 freely selectable measurands
- Status information
- Indicates measurands beyond predefined range

Knockout for ½" Conduit Fitting (US)



Bayonet Screws
- Opend / closed with a ¼ rotation

M12 Probe connection
- Up to 3 probes
- Directly on Sigma 05 or with M12 cables up to 10 m

Flush-mounted display
- No dirt accumulation in protruding edges

Enclosure
- IP65 / NEMA 4 (X)
- Appropriate for harsh environment
- Polycarbonate or die-cast aluminium

Electronics
- 2 voltage or current outputs, freely selectable and scaleable
- USB-C service interface
- Status indication via LEDs
- Components on PCB underside for optimum protection against mechanical damage during installation

Test report
According DIN EN 10204-2.2

Sigma 05 with Plug-and-Play Probe

Together with any plug-and-play probe, Sigma 05 becomes a modular sensor with interchangeable probe.

EE872 EE072 EE074 EE671 EE680 MOP301 HTP501 Sigma 05

EE872 Modular Probe for CO_2, Humidity, Temperature and Ambient Pressure: www.epluse.com/ee872.
EE072 Humidity and Temperature Probe: www.epluse.com/ee072.
EE074 Temperature Probe: www.epluse.com/ee074.
EE671 Air Velocity Probe: www.epluse.com/ee671.
EE680 Air Velocity and Temperature Probe for Laminar Flow: www.epluse.com/ee680.
MOP301 Moisture in Oil Probe up to 120 °C (248°F): www.epluse.com/mop301.
HTP501 Humidity and Temperature Probe up to 120 °C (248 °F): www.epluse.com/htp501.

DNV Approval Optional

The Sigma 05 Modular Sensor Platform is available with DNV approval combined with MOP301 moisture in oil and HTP501 humidity and temperature probes. Please refer to the probes' datasheets for all details.

MOP301 HTP501 Sigma 05

DNV approval available optionally for Sigma 05 Modular Sensor Platform for moisture in oil and humidity

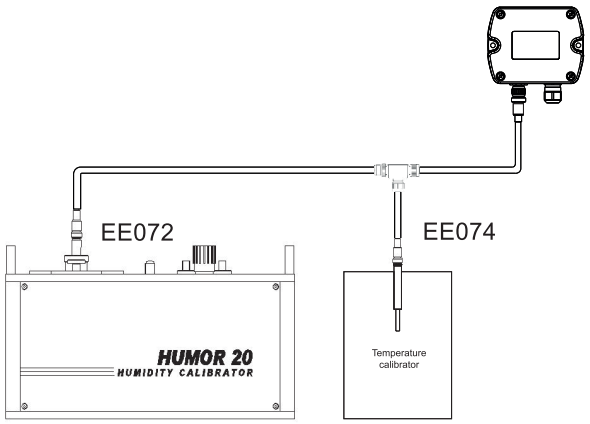
Reference Probe

A functional and accuracy check of the Sigma 05 can be performed by connecting the E+E Reference Probe Modbus RTU instead of the regular sensing probes. The reference probe supplies fixed values for a wide choice of measurands and features an individual test report. Refer to the Reference Probe Modbus RTU Quick Guide at www.epluse.com/sigma05 for further details.

Reference probe Modbus RTU

Field Loop Calibration

The modular design of the E+E sensor platform facilitates the loop calibration or adjustment in the field, as required by the FDA (Food and Drugs Administration) regulated industries. Using extension cables, the sensing probes can be inserted into portable calibrators without dismounting the Sigma 05 host device.

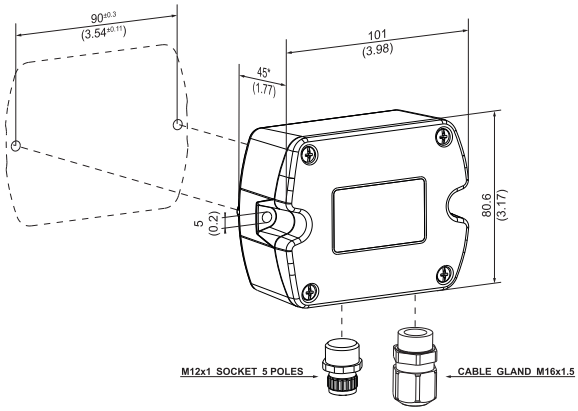


The illustration shows the EE072 humidity probe placed into the Humor 20 high end portable humidity calibrator and the EE074 temperature probe in a dry block calibrator.

Dimensions

Values in mm (inch)

Polycarbonate or die-cast aluminium enclosure



*The polycarbonate enclosure without display: 46 mm (1.81").

Technical Data

Probe connection

Max. number of sensing probes[1)]	3
Max. number of measurands	5 (2 on the analogue outputs, 3 on the display)
Electrical connection	M12x1 socket 5 poles

1) Compatible E+E probes see section “Plug-and-Play Probe” above.

Digital

Probe interface	RS485
Protocol **Factory settings** **Supported Baud rates**[1)] **Measured data types**	Modbus RTU 9600 Baud, 8 databits, parity even, 1 stop bit 9600, 19200, 38400, 57600, 76800 und 115200 FLOAT32 and INT16

1) For details on the communication setting refer to the User Manual and the Modbus Application Note at www.epluse.com/sigma05.

Outputs

Analogue

Two freely selectable and scalable outputs	0 - 1 / 0 - 2,5 V / 0 - 5 / 0 - 10 V 4 - 20 mA 3-wire 0 - 20 mA 3-wire	-1 mA < I_L < 1 mA R_L < 500 Ω R_L < 500 Ω	I_L = load current R_L = load resistance
Accuracy of analogue outputs at 20 °C (68 °F)	0.02 % FS for 0 - 10 V and 0 - 20 mA		FS = full scale

General

Power supply class III USA & Canada: Class 2 supply necessary	15 - 30 V DC		
Supply current to the probes, max.	0.5 A		
Electrical connection	Screw terminals max 2.5 mm²		
Cable glands	Cable gland M16x1.5, for cable ∅4...8 mm (0.16...0.31")		
Configuration interface	USB-C on the electronics board		
Working and storage conditions **Without display** **With Display**	0…95 %RH, non-condensing 700…1200 mbar -40…+60 °C (-40...+140 °F) -20…+50 °C (-4...+122 °F)		
Enclosure		**Plastic**	**Metal**
	Material	Polycarbonate	Aluminium Al 383
	Protection rating[1)]	IP65 / NEMA 4X	IP65 / NEMA 4
	Conformity	UL94 V-0, with Display UL94 HB approved	
Electromagnetic compatibility	EN 61326-1:2013 FCC Part15 Class A	EN 61326-2-3:2013 ICES-003 Class A	Industrial Environment DNV-CG-0339
Conformity	CE UKCA DNV[2)]		
Type approval	DNV Certificate No. TAA00003FA		
Configuration software	PCS10 Product Configuration Software Free download from www.epluse.com/pcs10.		

1) With appropriate cable / probe connector (M12x1 female), see section “Accessories” below.
2) DNV scope of approval: please refer to ordering guide.

Ordering Guide

	Feature	Description	Code
			Sigma05-
Hardware configuration	Approval	Without DNV approval	No code
		DNV[1)]	AP2
	Enclosure material	Polycarbonate (PC)	HS1
		Die-cast aluminium Al 383	HS3
	Display	Without display	D0
		Display with backlight	D2
Software setup - analogue outputs	Output signals	0 - 1 V	GA1
		0 - 5 V	GA2
		0 - 10 V	GA3
		0 - 20 mA	GA5
		4 - 20 mA	GA6
	Unit	Metric (SI)	U1
		Non metric (US/GB)	U2

1) DNV approval available for polycarbonate (PC) enclosure with and without display, and for aluminium without display only

Order Example

SIGMA05-AP2HS1D2GA6U1

Feature	Code	Description
Approval	AP2	DNV
Enclosure material	HS1	Polycarbonate (PC)
Display	D2	Display with backlight
Output signals	GA6	4 - 20 mA
Unit	U1	Metric (SI)

Accessories

For further information see datasheet "Accessories".

Accessories	Code
Modbus configuration adapter	HA011018
PCS10 Product Configuration Software (Free download: www.epluse.com/pcs10)	PCS10
Connection cable M12-M12 unshielded L = 2 m (6.6 ft) L = 5 m (16.4 ft) L = 10 m (32.8 ft)	 HA010813 HA010814 HA010815
Reference Probe Modbus RTU	HA010406
Power supply adapter 100 - 240 V AC to 24 V DC not DNV approved	V03
USB cable for PC connection (USB-A to USB-C)	HA010327
M12 Y adaptor	HA030204
M12x1 cable connector for self-assembly, 5 pole socket	HA010708
M12x1 cable connector for self-assembly, 5 pole plug	HA010706
Protection cap for M12 female connector	HA010781
Protection cap for M12 male connector	HA010782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