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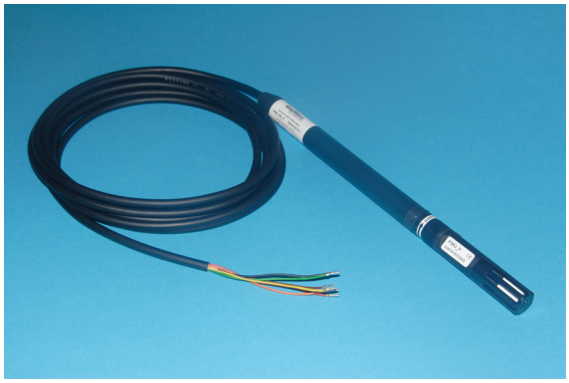


PM15P

Modular Sensor for Humidity and Temperature with hx processor

Description of the Sensor

The sensor PM15P measures the air humidity by means of a humidiy-dependant condenser. The capacitive Mela® humidity measuring element, produced using thinfilm technology, consists of a base plate, on which the electrodes are housed and a hygroscopic polymer layer above it. The hygroscopic polymer layer absorbs water molecules from the medium to be measured (air) or releases them, thereby altering the capacity of the condenser.

The humidity or temperature values measured are calculated in the exchangeable PMU-P measuring head, with the calibration values stored there, and communicated on to the following electronic transmitter components as calibrated digital measuring values.

The PMU-P measuring heads are calibrated and thus enable a replacement within seconds. Replaced measuring heads can be recalibrated in the factory.

The transmitter with the hx processor uses the values of the relative humidity and the temperature to calculate the dew point temperature, the enthalpy, the mixing ratio, the absolute humidity or the wet-bulb temperature, in accordance with the laws of physics. The values are emitted at two analogue outputs with the standardised signals 0...10VDC, 0...1VDC, 0...20mA or 4...20mA. The outputs can be configured differently and are defined using the software.

The Mela® measuring element is protected by a filter and a basket guard. The sensors are designed for unpressurised systems, the measurement medium is non-aggressive air.
Please consult the application instructions for the sensing elements (product info sheet no. A 1) or check with the manufacturer for further information which you need to bear in mind when using humidity sensors with capacitive sensing elements.

1) Ex works. Depending on the specific range of application a regular recalibration of the measuring head (PMU-P) has to be effected.
2) Higher accuracies on request.
3) The accuracy of the calculated values depends on both the operating point in accordance with the hx diagram and on the primary values measured.
4) See load diagram

Digital Measuring Head PMU-P

Humidity

measuring range	0...100%rh
measuring accuracy 10...90%rh at 25°C	±1.5%rh 1)2)
at <10%rh or >90%rh	±2%rh
at <10°C or >40°C	±0.05%rh/K additional
resolution	0.01%rh (read out)
hysteresis	< 1%rh
protection against dust	PTFE-pocket filter

Temperature

measuring element	Pt1000 1/3DIN
measuring range	-40...+85°C
measuring accuracy	±0.15 K at 25°C
resolution	0.01 K (read out)
influence of temperature (TK)	<0.005 K/K

Transmitter PMO15P with hx processor

physical outputs

dew point temperature	0...70°C 3)
enthalpy	0...80 kJ/kg 3)
mixing ratio	0...100g/kg dry air 3)
absolute humidity	0...20g/m³ or 0...100g/m ³)
wet-bulb temperature	-10...+50°C 2)
relative humidity	0...100%rh
temperature ranges	-30...+70°C; 0...+50°C; 0...100°C

There are respectively 2 physical values available at the output

response time t_{63} at v=2m/s with PTFE-pocket filter	< 15 s

electrical outputs

voltage	2x 0...1VDC or 2x 0...10VDC
current	2x 0(4)...20mA
linearity	<0.25%
power supply 0...1V	6...30V DC
0...10V	15...30V DC
0(4)...20mA	6...30V DC 4)
load	acc. diagram
electromagnetic compatibility	ref. EN 61326-1
min. load resistance for voltage output	10 kOhm
consumption of electronics	<10 mA
permissible ambient temperature	-20...+70°C
max. air speed	15m/s

minimum air speed across the measuring head

for output: 2x 0(4)...20mA	1 m/s
2x 0...10V, 2x 0...1V	≥0.5 m/s
protective system transmitter	IP 64
housing material	plastic, black
mounting position	optional
cable connection 6 x AWG24	2.5 m

ESD protection advice

All PM15P sensors are made up of a PMO15P transmitter with a PMU-P sensor head and contain components which can be damaged by the effects of electrical fields or by charge equalisation when touched. This is why the PMU-P sensor heads, that can be supplied separately and that are suitable for being exchanged on location, are packaged in conductive, reusable ESD protected bags.

The following protective measures must be taken when exchanging a PMU-P sensor head on the PMO15P transmitter:

- Before unpacking the PMU-P sensor head, ensure electrical potential equalisation between you and your environment.
- Pay particular attention to ensuring that this potential equalisation is maintained while you are exchanging the PMU-P sensor head.
- Only store or transport the PMU-P sensor head in the ESD protective bag supplied, or in comparable packaging

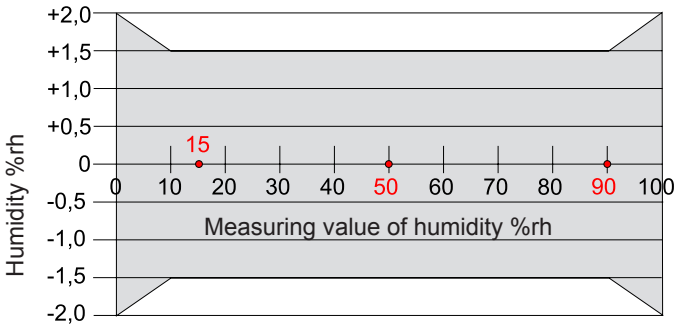
Type	Order No.	Physical output 1	Measuring value 1	Electrical output 1	Physical output 2	Measuring value 2	Electrical output 2
PMU-P "plug and measure unit"	6201010232AA	relative humidity	0...100%rh	ASCII (digital)	temperature	-30...70°C	ASCII (digital)
PM15P **0...10VDC**	700101023211	relative humidity	0...100%rh	0...10VDC	temperature	-30...+70°C	0...10VDC
	700101023111	relative humidity	0...100%rh	0...10VDC	temperature	0...100°C	0...10VDC
	700101023011	relative humidity	0...100%rh	0...10VDC	temperature	0...+50°C	0...10VDC
	700305023211	dew point temperature	0...70°C	0...10VDC	temperature	-30...+70°C	0...10VDC
	700410023211	enthalpy	0...80kJ/kg	0...10VDC	temperature	-30...+70°C	0...10VDC
	700515023211	mixing ratio	0...100g/kg dry air	0...10VDC	temperature	-30...+70°C	0...10VDC
	700621023211	absolute humidity	0...100g/m³	0...10VDC	temperature	-30...+70°C	0...10VDC
	700620023211	absolute humidity	0...20g/m³	0...10VDC	temperature	-30...+70°C	0...10VDC
	700833023211	wet-bulb temperature	-10...+50°C	0...10VDC	temperature	-30...+70°C	0...10VDC
PM15P **0...1VDC**	700101023221	relative humidity	0...100%rh	0...1VDC	temperature	-30...+70°C	0...1VDC
	700101023121	relative humidity	0...100%rh	0...1VDC	temperature	0...100°C	0...1VDC
	700101023021	relative humidity	0...100%rh	0...1VDC	temperature	0...+50°C	0...1VDC
	700305023221	dew point temperature	0...70°C	0...1VDC	temperature	-30...+70°C	0...1VDC
	700410023221	enthalpy	0...80kJ/kg	0...1VDC	temperature	-30...+70°C	0...1VDC
	700515023221	mixing ratio	0...100g/kg dry air	0...1VDC	temperature	-30...+70°C	0...1VDC
	700621023221	absolute humidity	0...100g/m³	0...1VDC	temperature	-30...+70°C	0...1VDC
	700620023221	absolute humidity	0...20g/m³	0...1VDC	temperature	-30...+70°C	0...1VDC
	700833023221	wet-bulb temperature	-10...+50°C	0...1VDC	temperature	-30...+70°C	0...1VDC

Type	Order No.	Physical output 1	Measuring value 1	Electrical output 1	Physical output 2	Measuring value 2	Electrical output 2
PMU-P "plug and measure unit"	6201010232AA	relative humidity	0...100%rh	ASCII (digital)	temperature	-30...70°C	ASCII (digital)
PM15P	700101023261	relative humidity	0...100%rh	0...20mA	temperature	-30...+70°C	0...20mA
	700101023161	relative humidity	0...100%rh	0...20mA	temperature	0...100°C	0...20mA
	700101023061	relative humidity	0...100%rh	0...20mA	temperature	0...+50°C	0...20mA
	700305023261	dew point temperature	0...70°C	0...20mA	temperature	-30...+70°C	0...20mA
	700410023261	enthalpy	0...80kJ/kg	0...20mA	temperature	-30...+70°C	0...20mA
	700515023261	mixing ratio	0...100g/kg dry air	0...20mA	temperature	-30...+70°C	0...20mA
	700621023261	absolute humidity	0...100g/m³	0...20mA	temperature	-30...+70°C	0...20mA
	700620023261	absolute humidity	0...20g/m³	0...20mA	temperature	-30...+70°C	0...20mA
	700833023261	wet-bulb temperature	-10...+50°C	0...20mA	temperature	-30...+70°C	0...20mA
PM15P	700101023271	relative humidity	0...100%rh	4...20mA	temperature	-30...+70°C	4...20mA
	700101023171	relative humidity	0...100%rh	4...20mA	temperature	0...100°C	4...20mA
	700101023071	relative humidity	0...100%rh	4...20mA	temperature	0...+50°C	4...20mA
	700305023271	dew point temperature	0...70°C	4...20mA	temperature	-30...+70°C	4...20mA
	700410023271	enthalpy	0...80kJ/kg	4...20mA	temperature	-30...+70°C	4...20mA
	700515023271	mixing ratio	0...100g/kg dry air	4...20mA	temperature	-30...+70°C	4...20mA
	700621023271	absolute humidity	0...100g/m³	4...20mA	temperature	-30...+70°C	4...20mA
	700620023271	absolute humidity	0...20g/m³	4...20mA	temperature	-30...+70°C	4...20mA
	700833023271	wet-bulb temperature	-10...+50°C	4...20mA	temperature	-30...+70°C	4...20mA
	further outputs and measuring ranges on demand						

0...20mA

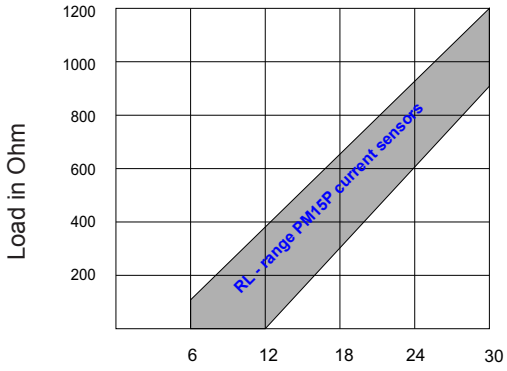
4...20mA

Accuracy of humidity in %rh at 25°C

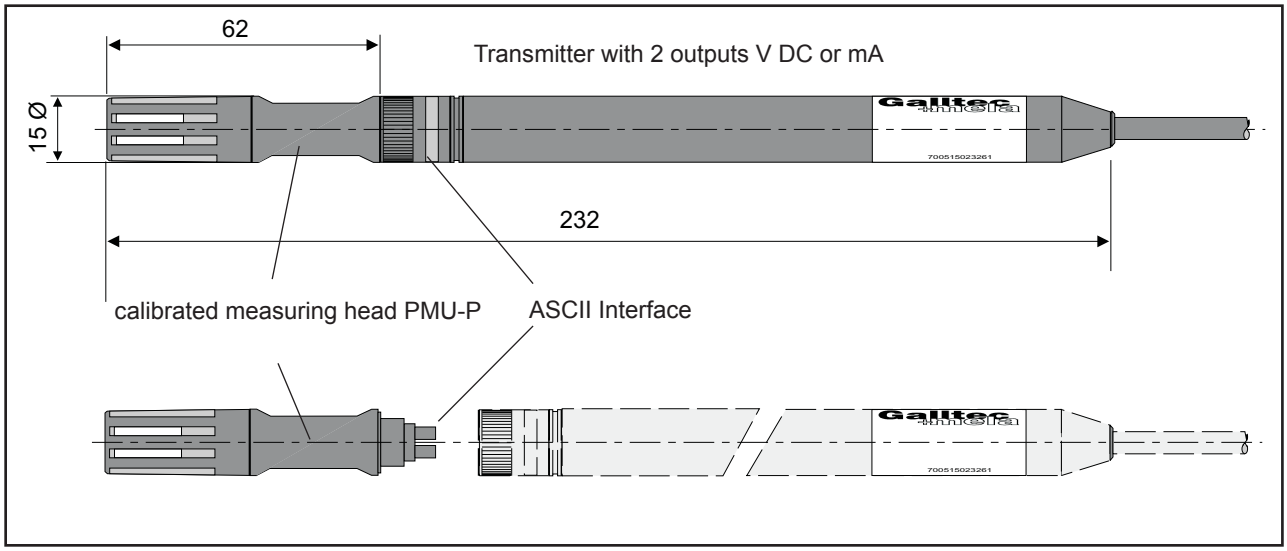


• Calibration values (humidity generator)

Load for 0(4)...20mA current version



Dimensions



Connection diagrams