



**Humidity-Temperature Sensor with hx processor type PM15P**

**Description of the Sensor**

The sensor PM15P measures the air humidity by means of a humidity-dependant condenser. The capacitive 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 water content, 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 or 0 ...1VDC or 0...20mA (4 wire) or 4 ...20mA (4 wire). 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.

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

**Modular Humidity Sensor with hx processor PM-P**

digital measuring head with capacitive Mela® measuring element and exchangeable "plug and measure unit" PMU-P

uses the relative air humidity and the temperature to calculate the values of the dew point temperature, water content, enthalpy, absolute humidity and wet-bulb temperature.

**Digital Measuring Head PMU-P**

**Humidity**

measuring range ..... 0..100%rh  
measuring accuracy 10...90%rh at 23°C ..... ±1.5%rh <sup>1)</sup>  
at <10%rh >90%rh ..... ±2%rh  
at <10°C >40°C ..... ±0.05%rh/K additional  
resolution ..... 0.01%rh (read out)  
response time T<sub>90</sub> at v=2m/s ..... < 10 s

**Temperature**

measuring range ..... -30...70°C  
measuring accuracy @ 23°C ..... ±0.15 K  
measuring element ..... (Pt1000 1/3DIN)  
resolution ..... 0.01°C (readout)

ambient temperature ..... -20...70°C  
protective system measuring head ..... IP30  
measuring medium ..... air, pressureless, non-aggressive  
output ..... ASCII (Galltec-Protocol)  
housing ..... plastic, black

**Transmitter with hx processor PMO15P**

physical outputs

*There are respectively 2 physical values available at the output*

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

electrical outputs

voltage ..... 2x 0...10VDC  
or voltage ..... 2x 0...1VDC  
or current ..... 2x 0(4)...20mA  
linearity tolerance ..... <0,25%  
power supply ..... 0...1V ..... 6...30V DC  
..... 0...10V ..... 15...30V DC  
..... 0(4)...20mA ..... 6...30V DC <sup>3)</sup>

load ..... acc. diagram  
electromagnetic compatibility ..... ref. EN61326  
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: 2 x 0...10 V, 0(4)...20mA ..... ≥ 1 m/s  
0...10V, 2 x 0...1V ..... ≥ 0.5 m/s  
protective system transmitter ..... IP64  
housing material ..... plastic, black  
mounting position ..... optional  
cable connection 6 x AWG24 ..... 2.5 m  
"subject to technical modifications"

## Humidity-Temperature Sensor **PM15PS (level converter)**



### PM15PS

for humidity and temperature  
order no. 700101023583

#### Humidity

measuring range ..... 0..100%rh  
measuring accuracy 10...90%rh at 23°C ..... ±1.5%rh <sup>1)</sup>  
at <10%rh >90%rh ..... ±2%rh  
at <10°C >40°C ..... ±0.05%rh/K additional  
resolution ..... 0.01%rh (read out)  
response time T<sub>90</sub> at v=2m/s ..... < 10 s

#### Temperature

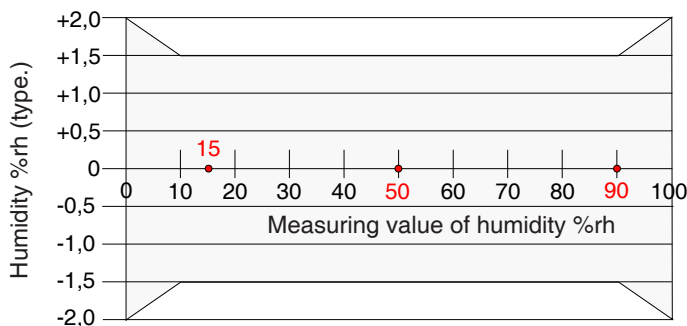
measuring range ..... -30...70°C  
measuring accuracy ..... ±0.15 K (Pt1000 1/3DIN)  
resolution ..... 0.01°C (readout)

ambient temperature ..... -20...70°C  
protective system measuring head ..... IP30  
measuring medium ..... air, pressureless, non-aggressive  
output ..... RS232  
lead SUB-D 9pin (female) ..... 1.5 m

Type	Order No.	Physical output 1	Measuring value 1	Electrical output 1	Physical output 2	Measuring value 2	Electrical output 2
<b>PMU-P</b> "plug and measure unit"	6201010232AA	relative humidity	0...100%rh	ASCII (digital)	temperature	-30...70°C	ASCII (digital)
<b>PM15P</b>  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	water content	0...100g/kg dry air	0...10VDC	temperature	-30...+70°C	0...10VDC
	700621023211	absolute humidity	0...100g/m <sup>3</sup>	0...10VDC	temperature	-30...+70°C	0...10VDC
	700620023211	absolute humidity	0...20g/m <sup>3</sup>	0...10VDC	temperature	-30...+70°C	0...10VDC
	700833023211	wet-bulb temperature	-10...+50°C	0...10VDC	temperature	-30...+70°C	0...10VDC
<b>PM15P</b>  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	water content	0...100g/kg dry air	0...1VDC	temperature	-30...+70°C	0...1VDC
	700621023221	absolute humidity	0...100g/m <sup>3</sup>	0...1VDC	temperature	-30...+70°C	0...1VDC
	700620023221	absolute humidity	0...20g/m <sup>3</sup>	0...1VDC	temperature	-30...+70°C	0...1VDC
	700833023221	wet-bulb temperature	-10...+50°C	0...1VDC	temperature	-30...+70°C	0...1VDC
<b>PM15PS</b>	700101023583	relative humidity	0...100%rh	RS232	temperature	-30...+70°C	RS232

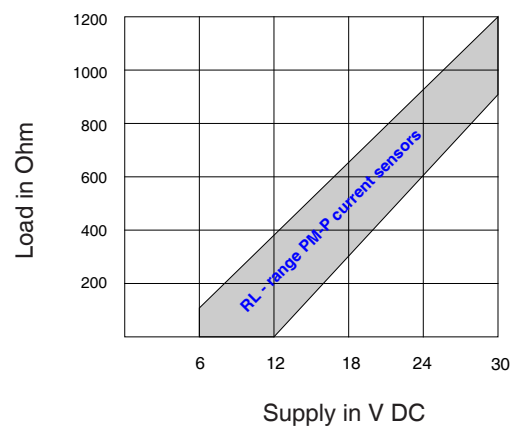
Type	Order No.	Physical output 1	Measuring value 1	Electrical output 1	Physical output 2	Measuring value 2	Electrical output 2
<b>PMU-P</b> "plug and measure unit"	6201010232AA	relative humidity	0...100%rh	ASCII (digital)	temperature	-30...70°C	ASCII (digital)
<b>PM15P</b>  <b>0...20mA</b>	700101023261	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	water content	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
<b>PM15P</b>  <b>4...20mA 4-wire</b>	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	water content	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							

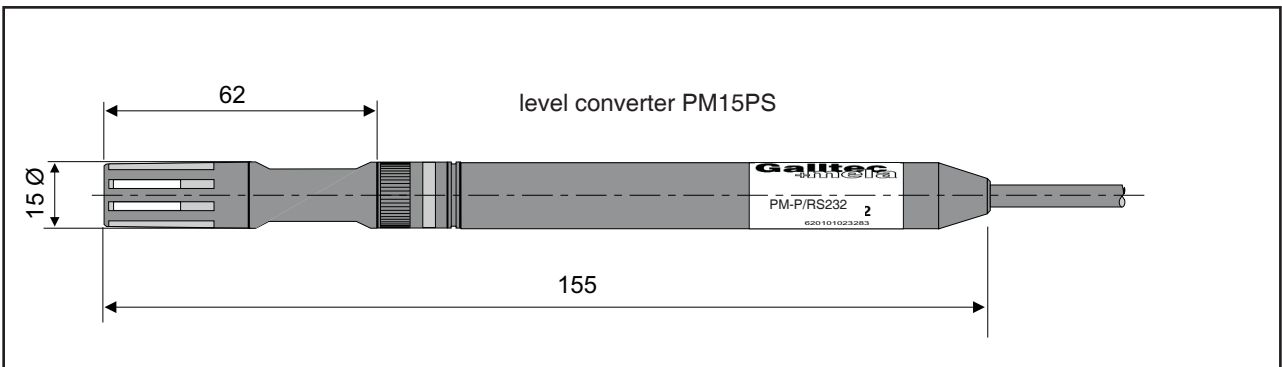
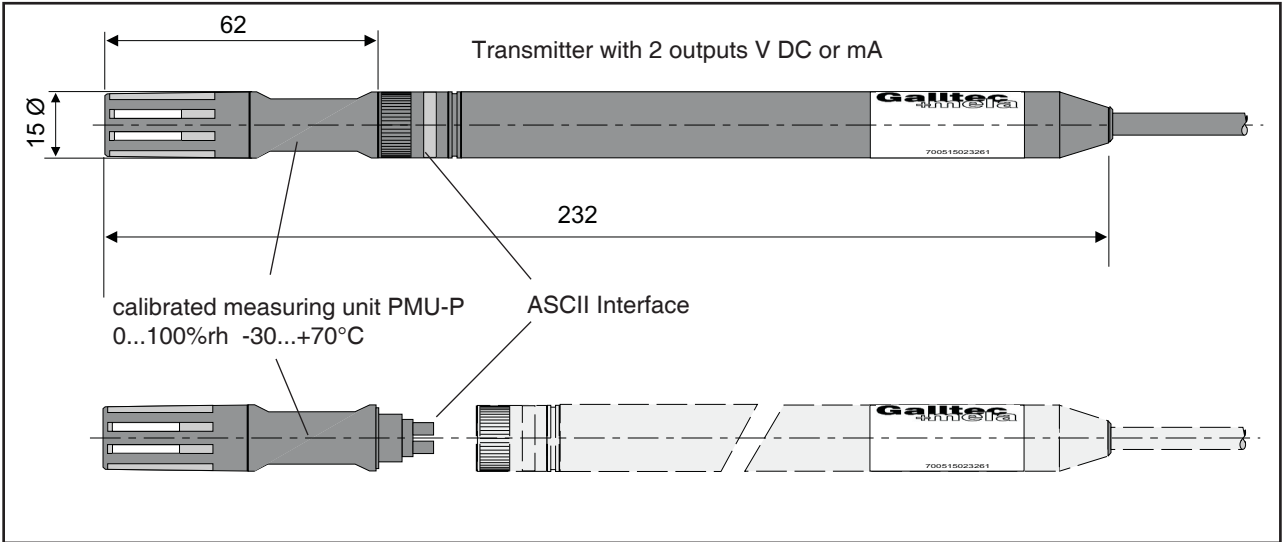
Accuracy of humidity in %rh (typ.) @ 23°C



• Calibration values (humidity generator)

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





Connection diagrams

