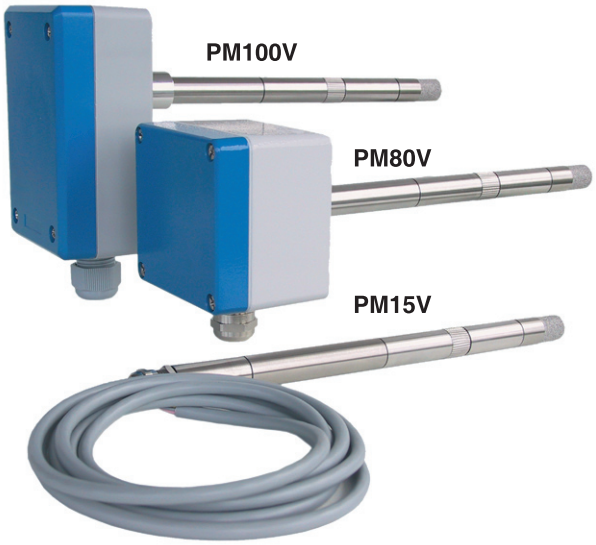
Galltec Mess- und Regeltechnik GmbH
D-71145 Bondorf · Germany
Tel. +49 (0)7457-9453-0 · Fax +49 (0)7457-3758
E-Mail: sensoren@galltec.de · Internet:www.galltec.de

MELA Sensortechnik GmbH
D-07987 Mohlsdorf (Thüringen) · Germany
Tel. +49(0)3661-62704-0 · Fax +49(0)3661-62704-20
E-mail:mela@melasensor.de · Internet: www.melasensor



Description of the Sensor

The sensor PM.. with **integrated hx-processor** measures humidity by means of a humidity-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-V" measuring head, with the calibration values stored there, and communicated on to the following electronic transmitter components as calibrated digital measuring values.

The „PMU-V" is calibrated and thus enables 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 or 4 ….20mA. The outputs can be configured differently and are defined using the software. Further measuring ranges on request.

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.

[1] *Ex works. Depending on the specific range of application a regular recalibration of the sensor head (PMU-V) has to be effected. Higher accuracies on request.*

[2] *The accuracy of the calculated values depends on both the operating point in accordance with the hx diagram and on the primary values measured.*

[3] *See load diagram*

Sensor for Humidity and Temperature with hx Processor PM-V
probe made of stainless steel
digital, exchangeable **"Plug-and-Measure Unit" PMU-V**
with outputs 0...10VDC, 0...1VDC, 0(4)...20mA
for direct output of various physical values

Digital Measuring Head PMU-V

Humidity

measuring range ..... 0..100%rh
measuring accuracy 10...90%rh at 23°C ..... ±1.5%rh [1]
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 at v=2m/s ..... < 10 s

Temperature

measuring range ..... -40...85°C
measuring accuracy ..... ±0.15 K @ 23°C
measuring element ..... (Pt1000 1/3DIN)
resolution ..... 0.01°C (readout)
ambient temperature ..... -40...85°C
protective system IP30
measuring medium ... air, pressureless, non-aggressive, non-condence
output ..... ASCII (Galltec-Protocol)
housing ..... stainless steel

Transmitter with hx Processor PMO...V

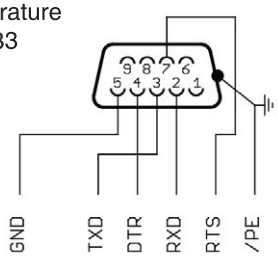
physical outputs
There are respectively 2 physical values available at the output
dew point temperature ..... 0...70°C [2]
enthalpy ..... 0...80 kJ/kg [2]
water content..... 0...100g/kg dry air [2]
absolute humidity ..... 0...20g/m³ or 0...100g/m³ [2]
wet-bulb temperature ..... -10...+50°C [2]
relative humidity ..... 0...100%rh
temperature ..... -30...+70°C; 0...+50°C; 0...100°C
electrical outputs
voltage ..... 2x 0...10VDC, or 2x 0...1VDC
or current (only PM80V and PM100V) ..... 0(4)...20mA 4-wire
linearity tolerance ..... <0.25%
power supply:

PM80 + PM100:	0 ...1V:	6 ... 30V DC / 24V AC ±10%
	0 ... 10V:	15 ... 30V DC / 24V AC ±10%
	0(4) ... 20mA:	15 ... 30V DC
PM15:	0 ... 1V:	6 ... 30V DC
	0 ... 10V:	15 ... 30V DC

electromagnetic compatibility ..... ref. EN61326-1+A1+A2
min. load resistance for voltage output ..... 10 kOhm
consumption of electronics ..... <10 mA
load for current output ..... acc. diagram
permissible ambient temperature ..... -40...+85°C
at the housing ..... -10...60°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
1 x 0...10V, 2 x 0...1V ..... ≥0,5 m/s
housing PMO100V ..... ABS light grey
PMO80V ..... aluminium die-casting,varnished
PMO15V ..... stainless steel
protective system IP64
probe material ..... stainless steel
mounting position ..... optional
contacting ..... connecting terminals 1.5mm² in the housing
PM15V length of connection cable 1.5m
"subject to technical modifications"

Humidity-Temperature Sensor PM15VS (level converter)

PM15VS
for humidity and temperature
order no. 730101023583



Humidity

measuring range ..... 0..100%rh
measuring accuracy 10...90%rh at 23°C ..... ±1.5%rh [1)]
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_{90} 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

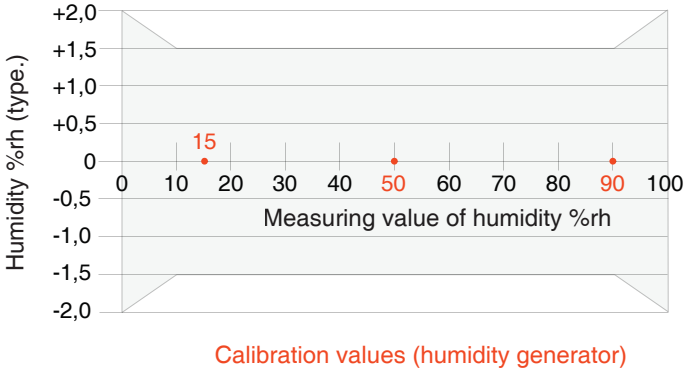
Type Survey

Type	Order No. (PM-key)	Physical output 1	Measuring value 1	Electrical output 1	Physical output 2	Measuring value 2	Electrical output 2
PMU-V "plug-and-measure unit"	630101023594	relative humidity	0...100%rh	ASCII (digital)	temperature	-30...70°C (-40...85°C)	ASCII (digital)
PM15V cable version **0...10VDC**	730101023211	relative humidity	0...100%hr	0...10VDC	temperature	-30...+70°C	0...10VDC
	730101023111	relative humidity	0...100%rh	0...10VDC	temperature	0...100°C	0...10VDC
	730101023011	relative humidity	0...100%rh	0...10VDC	temperature	0...+50°C	0...10VDC
	730305023211	dew point temperature	0...70°C	0...10VDC	temperature	-30...+70°C	0...10VDC
	730410023211	enthalpy	0...80kJ/kg	0...10VDC	temperature	-30...+70°C	0...10VDC
	730515023211	water content	0...100g/kg dry air	0...10VDC	temperature	-30...+70°C	0...10VDC
	730621023211	absolute humidity	0...100g/m³	0...10VDC	temperature	-30...+70°C	0...10VDC
	730620023211	absolute humidity	0...20g/m³	0...10VDC	temperature	-30...+70°C	0...10VDC
	730833023211	wet-bulb temperature	-10...+50°C	0...10VDC	temperature	-30...+70°C	0...10VDC
PM15V cable version **0...1VDC**	730101023221	relative humidity	0...100%rh	0...1VDC	temperature	-30...+70°C	0...1VDC
	730101023121	relative humidity	0...100%rh	0...1VDC	temperature	0...100°C	0...1VDC
	730101023021	relative humidity	0...100%rh	0...1VDC	temperature	0...+50°C	0...1VDC
	730305023221	dew point temperature	0...70°C	0...1VDC	temperature	-30...+70°C	0...1VDC
	730410023221	enthalpy	0...80kJ/kg	0...1VDC	temperature	-30...+70°C	0...1VDC
	730515023221	water content	0...100g/kg dry air	0...1VDC	temperature	-30...+70°C	0...1VDC
	730621023221	absolute humidity	0...100g/m³	0...1VDC	temperature	-30...+70°C	0...1VDC
	730620023221	absolute humidity	0...20g/m³	0...1VDC	temperature	-30...+70°C	0...1VDC
	730833023221	wet-bulb temperature	-10...+50°C	0...1VDC	temperature	-30...+70°C	0...1VDC
PM15VS	730101023583	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
PMU-V "plug-and-measure unit"	630101023594	relative humidity	0...100%rh	ASCII (digital)	temperature	-30...70°C (-40...85°C)	ASCII (digital)
PM80V duct version alu housing **0...10VDC**	740101023211	relative humidity	0...100%rh	0...10VDC	temperature	-30...+70°C	0...10VDC
	740101023111	relative humidity	0...100%rh	0...10VDC	temperature	0...100°C	0...10VDC
	740101023011	relative humidity	0...100%rh	0...10VDC	temperature	0...+50°C	0...10VDC
	740305023211	dew point temperature	0...70°C	0...10VDC	temperature	-30...+70°C	0...10VDC
	740410023211	enthalpy	0...80kJ/kg	0...10VDC	temperature	-30...+70°C	0...10VDC
	740515023211	water content	0...100g/kg dry air	0...10VDC	temperature	-30...+70°C	0...10VDC
	740621023211	absolute humidity	0...100g/m³	0...10VDC	temperature	-30...+70°C	0...10VDC
	740620023211	absolute humidity	0...20g/m³	0...10VDC	temperature	-30...+70°C	0...10VDC
	740833023211	wet-bulb temperature	-10...+50°C	0...10VDC	temperature	-30...+70°C	0...10VDC
PM80V duct version alu housing **0...1VDC**	740101023221	relative humidity	0...100%rh	0...1VDC	temperature	-30...+70°C	0...1VDC
	740101023121	relative humidity	0...100%rh	0...1VDC	temperature	0...100°C	0...1VDC
	740101023021	relative humidity	0...100%rh	0...1VDC	temperature	0...+50°C	0...1VDC
	740305023221	dew point temperature	0...70°C	0...1VDC	temperature	-30...+70°C	0...1VDC
	740410023221	enthalpy	0...80kJ/kg	0...1VDC	temperature	-30...+70°C	0...1VDC
	740515023221	water content	0...100g/kg dry air	0...1VDC	temperature	-30...+70°C	0...1VDC
	740621023221	absolute humidity	0...100g/m³	0...1VDC	temperature	-30...+70°C	0...1VDC
	740620023221	absolute humidity	0...20g/m³	0...1VDC	temperature	-30...+70°C	0...1VDC
	740833023221	wet-bulb temperature	-10...+50°C	0...1VDC	temperature	-30...+70°C	0...1VDC
PM100V duct version ABS housing **0...10VDC**	750101023211	relative humidity	0...100%rh	0...10VDC	temperature	-30...+70°C	0...10VDC
	750101023111	relative humidity	0...100%rh	0...10VDC	temperature	0...100°C	0...10VDC
	750101023011	relative humidity	0...100%rh	0...10VDC	temperature	0...+50°C	0...10VDC
	750305023211	dew point temperature	0...70°C	0...10VDC	temperature	-30...+70°C	0...10VDC
	750410023211	enthalpy	0...80kJ/kg	0...10VDC	temperature	-30...+70°C	0...10VDC
	750515023211	water content	0...100g/kg dry air	0...10VDC	temperature	-30...+70°C	0...10VDC
	750621023211	absolute humidity	0...100g/m³	0...10VDC	temperature	-30...+70°C	0...10VDC
	750620023211	absolute humidity	0...20g/m³	0...10VDC	temperature	-30...+70°C	0...10VDC
	750833023211	wet-bulb temperature	-10...+50°C	0...10VDC	temperature	-30...+70°C	0...10VDC
PM100V duct version ABS housing **0...1VDC**	750101023221	relative humidity	0...100%rh	0...1VDC	temperature	-30...+70°C	0...1VDC
	750101023121	relative humidity	0...100%rh	0...1VDC	temperature	0...100°C	0...1VDC
	750101023021	relative humidity	0...100%rh	0...1VDC	temperature	0...+50°C	0...1VDC
	750305023221	dew point temperature	0...70°C	0...1VDC	temperature	-30...+70°C	0...1VDC
	750410023221	enthalpy	0...80kJ/kg	0...1VDC	temperature	-30...+70°C	0...1VDC
	750515023221	water content	0...100g/kg dry air	0...1VDC	temperature	-30...+70°C	0...1VDC
	750621023221	absolute humidity	0...100g/m³	0...1VDC	temperature	-30...+70°C	0...1VDC
	750620023221	absolute humidity	0...20g/m³	0...1VDC	temperature	-30...+70°C	0...1VDC
	750833023221	wet-bulb temperature	-10...+50°C	0...1VDC	temperature	-30...+70°C	0...1VDC

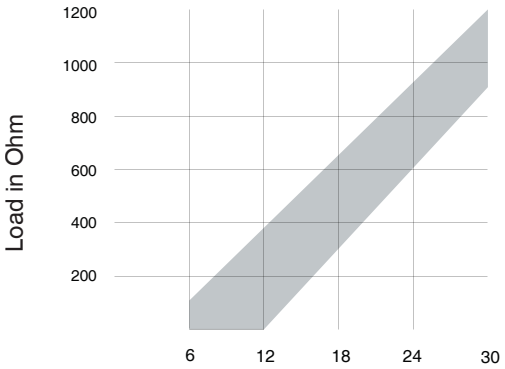
Type	Order No.	Physical output 1	Measuring value 1	Electrical output 1	Physical output 2	Measuring value 2	Electrical
PMU-V "plug-and-measure unit"	630101023594	relative humidity	0...100%rh	ASCII (digital)	temperature	-30...70°C (-40...85°C)	ASCII (digital)
PM80V duct version alu housing **0...20mA 4-wire**	740101023261	relative humidity	0...100%rh	0...20mA	temperature	-30...+70°C	0...20mA
	740101023161	relative humidity	0...100%rh	0...20mA	temperature	0...100°C	0...20mA
	740101023061	relative humidity	0...100%rh	0...20mA	temperature	0...+50°C	0...20mA
	740305023261	dew point temperature	0...70°C	0...20mA	temperature	-30...+70°C	0...20mA
	740410023261	enthalpy	0...80kJ/kg	0...20mA	temperature	-30...+70°C	0...20mA
	740515023261	water content	0...100g/kg dry air	0...20mA	temperature	-30...+70°C	0...20mA
	740621023261	absolute humidity	0...100g/m³	0...20mA	temperature	-30...+70°C	0...20mA
	740620023261	absolute humidity	0...20g/m³	0...20mA	temperature	-30...+70°C	0...20mA
	740833023261	wet-bulb temperature	-10...+50°C	0...20mA	temperature	-30...+70°C	0...20mA
PM80V duct version alu housing **4...20mA 4-wire**	740101023271	relative humidity	0...100%rh	4...20mA	temperature	-30...+70°C	4...20mA
	740101023171	relative humidity	0...100%rh	4...20mA	temperature	0...100°C	4...20mA
	740101023071	relative humidity	0...100%rh	4...20mA	temperature	0...+50°C	4...20mA
	740305023271	dew point temperature	0...70°C	4...20mA	temperature	-30...+70°C	4...20mA
	740410023271	enthalpy	0...80kJ/kg	4...20mA	temperature	-30...+70°C	4...20mA
	740515023271	water content	0...100g/kg dry air	4...20mA	temperature	-30...+70°C	4...20mA
	740621023271	absolute humidity	0...100g/m³	4...20mA	temperature	-30...+70°C	4...20mA
	740620023271	absolute humidity	0...20g/m³	4...20mA	temperature	-30...+70°C	4...20mA
	740833023271	wet-bulb temperature	-10...+50°C	4...20mA	temperature	-30...+70°C	4...20mA
PM100V duct version ABS housing **0...20mA 4-wire**	750101023261	relative humidity	0...100%rh	0...20mA	temperature	-30...+70°C	0...20mA
	750101023161	relative humidity	0...100%rh	0...20mA	temperature	0...100°C	0...20mA
	750101023061	relative humidity	0...100%rh	0...20mA	temperature	0...+50°C	0...20mA
	750305023261	dew point temperature	0...70°C	0...20mA	temperature	-30...+70°C	0...20mA
	750410023261	enthalpy	0...80kJ/kg	0...20mA	temperature	-30...+70°C	0...20mA
	750515023261	water content	0...100g/kg dry air	0...20mA	temperature	-30...+70°C	0...20mA
	750621023261	absolute humidity	0...100g/m³	0...20mA	temperature	-30...+70°C	0...20mA
	750620023261	absolute humidity	0...20g/m³	0...20mA	temperature	-30...+70°C	0...20mA
	750833023261	wet-bulb temperature	-10...+50°C	0...20mA	temperature	-30...+70°C	0...20mA
PM100V duct version ABS housing **4...20mA 4-wire**	750101023271	relative humidity	0...100%rh	4...20mA	temperature	-30...+70°C	4...20mA
	750101023171	relative humidity	0...100%rh	4...20mA	temperature	0...100°C	4...20mA
	750101023071	relative humidity	0...100%rh	4...20mA	temperature	0...+50°C	4...20mA
	750305023271	dew point temperature	0...70°C	4...20mA	temperature	-30...+70°C	4...20mA
	750410023271	enthalpy	0...80kJ/kg	4...20mA	temperature	-30...+70°C	4...20mA
	750515023271	water content	0...100g/kg dry air	4...20mA	temperature	-30...+70°C	4...20mA
	750621023271	absolute humidity	0...100g/m³	4...20mA	temperature	-30...+70°C	4...20mA
	750620023271	absolute humidity	0...20g/m³	4...20mA	temperature	-30...+70°C	4...20mA
	750833023271	wet-bulb temperature	-10...+50°C	4...20mA	temperature	-30...+70°C	4...20mA

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



Calibration values (humidity generator)

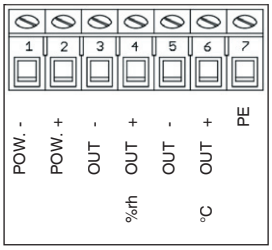
Load for 0(4)...20mA current version



Connection diagrams

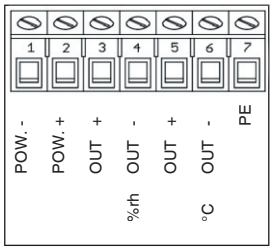
Connection diagram PM80V, PM100V

Voltage output 0...10VDC or 0...1VDC



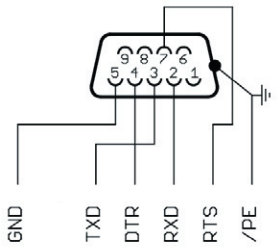
negative poles are bridged

Current output 0...20mA or 4...20mA (4-wire)

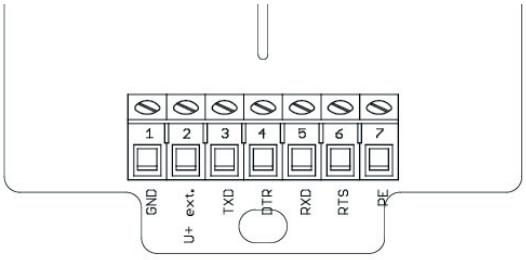


positive poles are bridged

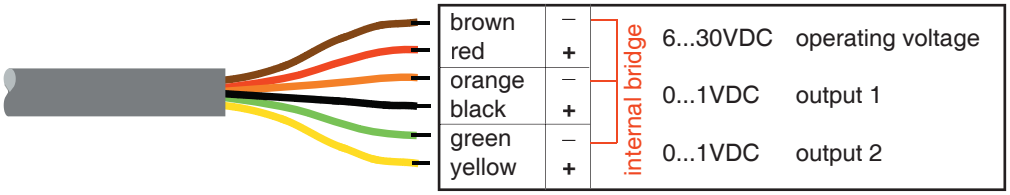
Connection diagram PM15VS for RS232



Connection diagram PM80VS, PM100VS for RS232

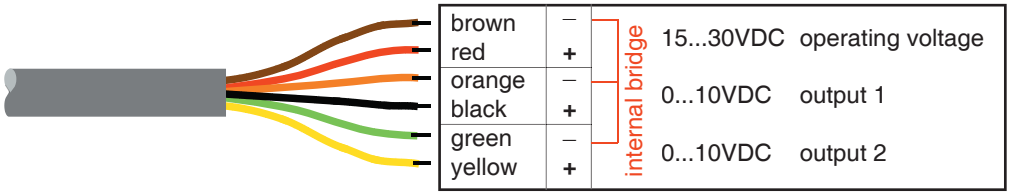


Voltage output 2 x 0...1VDC



⊖ = Common (not galvanically separated)

Voltage output 2 x 0...10VDC

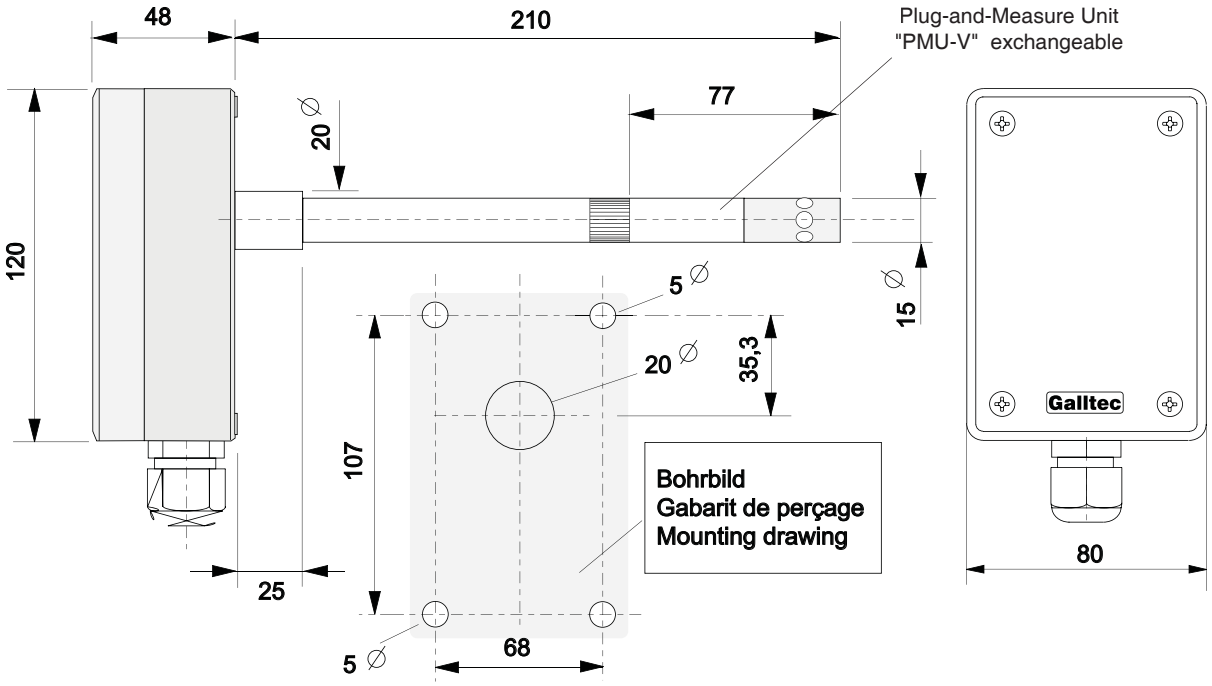


[3] see load diagram

⊖ = Common (not galvanically separated)

Humidity-Temperature Sensor PM100V

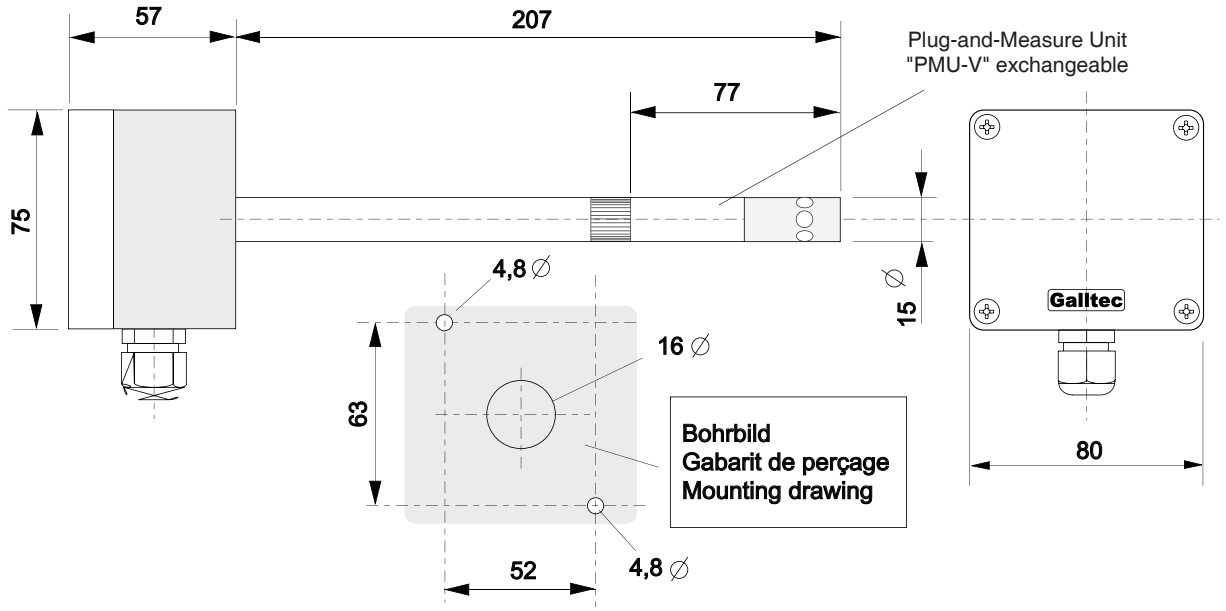
with plastic housing IP64



The electrical connection must only be carried out by properly qualified personnel.

Humidity-Temperature Sensor PM80V

with housing made of aluminium die-casting IP64



Humidity-Temperature Sensor PM15V

in cable version