

User manual

DES-216

Digital environmental parameters sensor



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1. GENERAL INFORMATION

1.1. WARRANTED INFORMATION

The **DES-216 sensor** is covered by a two year warranty from date of sale. In case of being damaged it will be repair or the damaged component will be replace. The warranty does not cover damage caused from improper use, materials consumption or any unauthorized changes. If the product does not function (is damaged), or not operate in accordance with the instructions, will be repaired or replaced.

All warranty and no warranty repairs must be returned with paid transport and insuring to the **CEL-MAR Company**.

CEL-MAR Company under no circumstances won't be responsible for ensuing damage from improper using the product or as a result of random causes: the lightning discharge, the flood, the fire and the like.

CEL-MAR Company is not be held responsible for damages and loss including: loss of profits, loss of data, pecuniary losses ensuing from using or the impossibility of using this product.

In specific cases **CEL-MAR Company** discontinue all warranties and in particular do not follow the user manual and do not accept terms of warranty by the user.

1.2. GENERAL CONDITIONS FOR SAFE USE

The device should install in the safe and stable place, the connecting cable should be arranged this way isn't exposed to treading, catching or tear out from sensor

Do not put device on the wet surface.

Do not connect devices for nondescript powering sources,

Do not damage or crush powering wires.

Do not make connection with wet hands.

Do not adapt, open or make holes in casings of the device!

Do not immerse device in water or no other liquid.

Do not put the fire opened on device sources: candles, an oil lamps and the like.

The device can not be used in applications that determine human life and health (eg. Medical).

1.3. CE LABEL



CE symbol on organizing the company CEL-MAR a conformity of the device to the directive of the electromagnetic **EMC 2014/30/WE** (Electromagnetic Compatibility Directive). The declaration of the agreement is accessible through the contact with the technical service at the address e-mail: service@cel-mar.pl or on the phone at the +48 41 362-12-46.

1.4. ENVIRONMENTAL PROTECTION



This label on the device inform about putting expended device with other waste materials. Device should send to the recycling. (In accordance with the act about the Electronic Appliance Expended from day 29 of July 2005)

1.5. SERVICE AND CONSERVATION

It is recommended to check the status of cases and sensor connecting cables, to eliminate the effect of mechanical damage on the quality of measurement. Technical support at the number: +48 41 362-12-46 in 8.00-16.00, from Monday to Friday

1.6. PACK CONTENTS

The sensor is delivered with: User Manual,

2. APPLICATION

DES-216 sensor is designed to measure environmental parameters like temperature, relative humidity, atmospheric pressure, illumination, sunlight in :

- offices with the use of structured cabling
- flats
- houses
- industrial buildings,
- outside buildings

via the serial 1-WIRE bus.

Use of 1-Wire bus allows:

- the cooperation of many sensors connected to the same data lines,
- the deployment of sensors in various locations up to 300m,
- powering the sensors from the bus,
- correct transmission of measurement data secure check sum CRC.

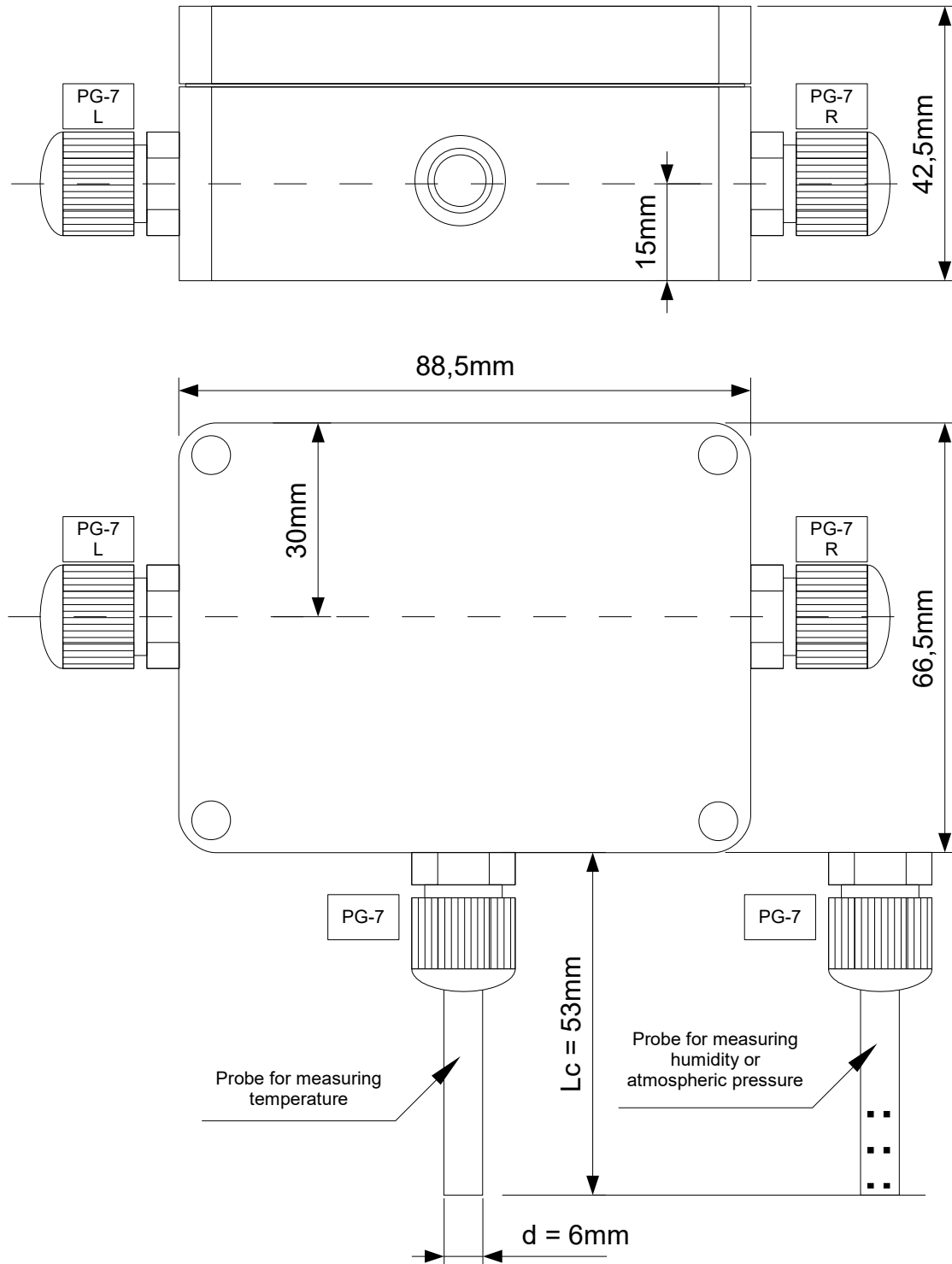
DES-216 sensor can be installed on the wall inside or outside buildings.

3. COOPERATION WITH OTHER 1-WIRE DEVICES

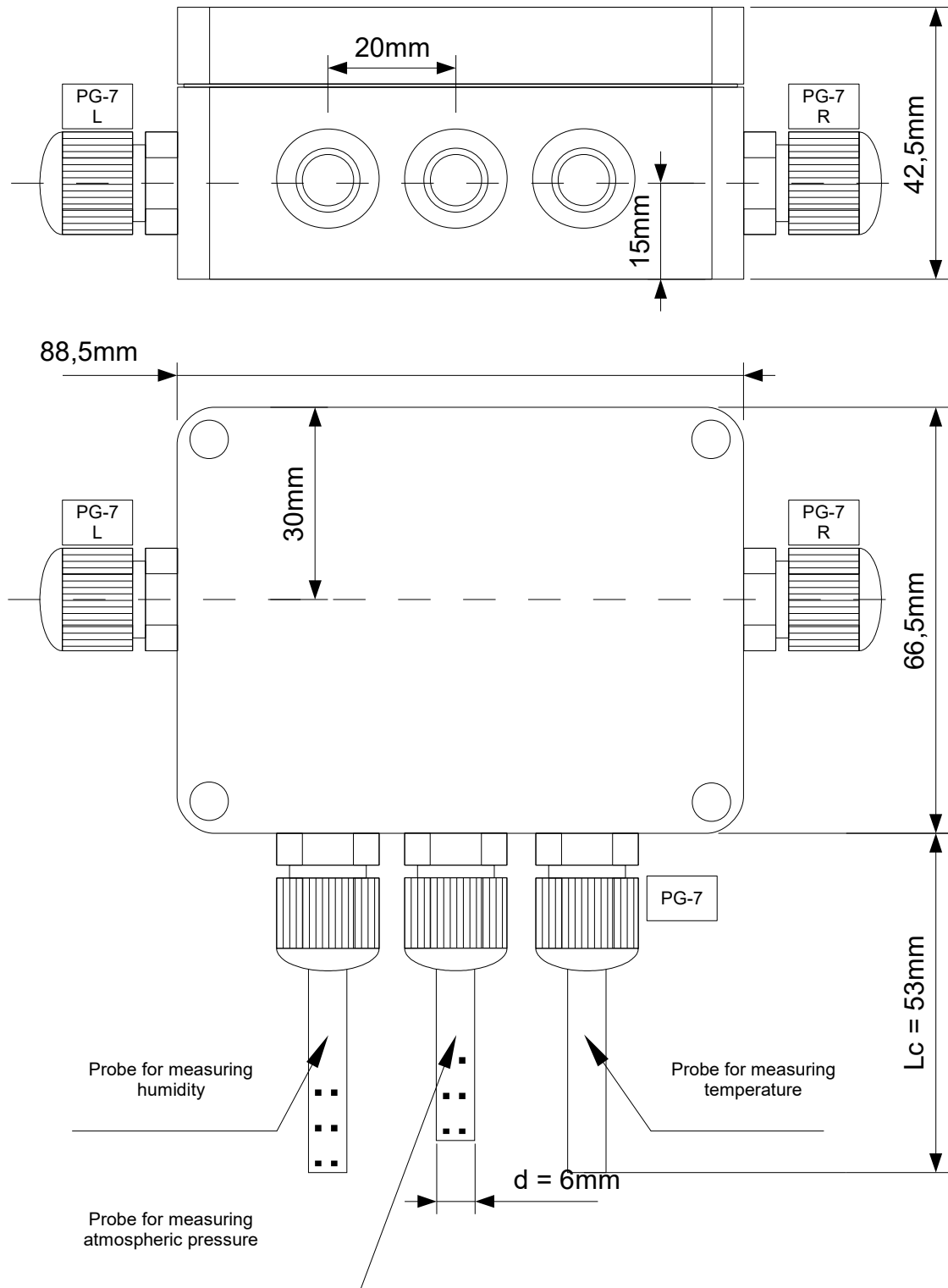
DES-216 sensor cooperates with 1-WIRE devices used for creation of monitoring and control systems for environmental parameters:

- ADA-401WP Measuring Module 1-WIRE to MODBUS-RTU,
- DNB-400 Passive 1-WIRE Bus Splitter,
- DNB-215 Passive 1-WIRE Bus Splitter,
- DNB-200 Passive 1-WIRE Bus Splitter,
- Other 1-WIRE sensors eg. DTS-RJ45, DTS-103, DTS-107, DES-200, DES-216, DES-300.

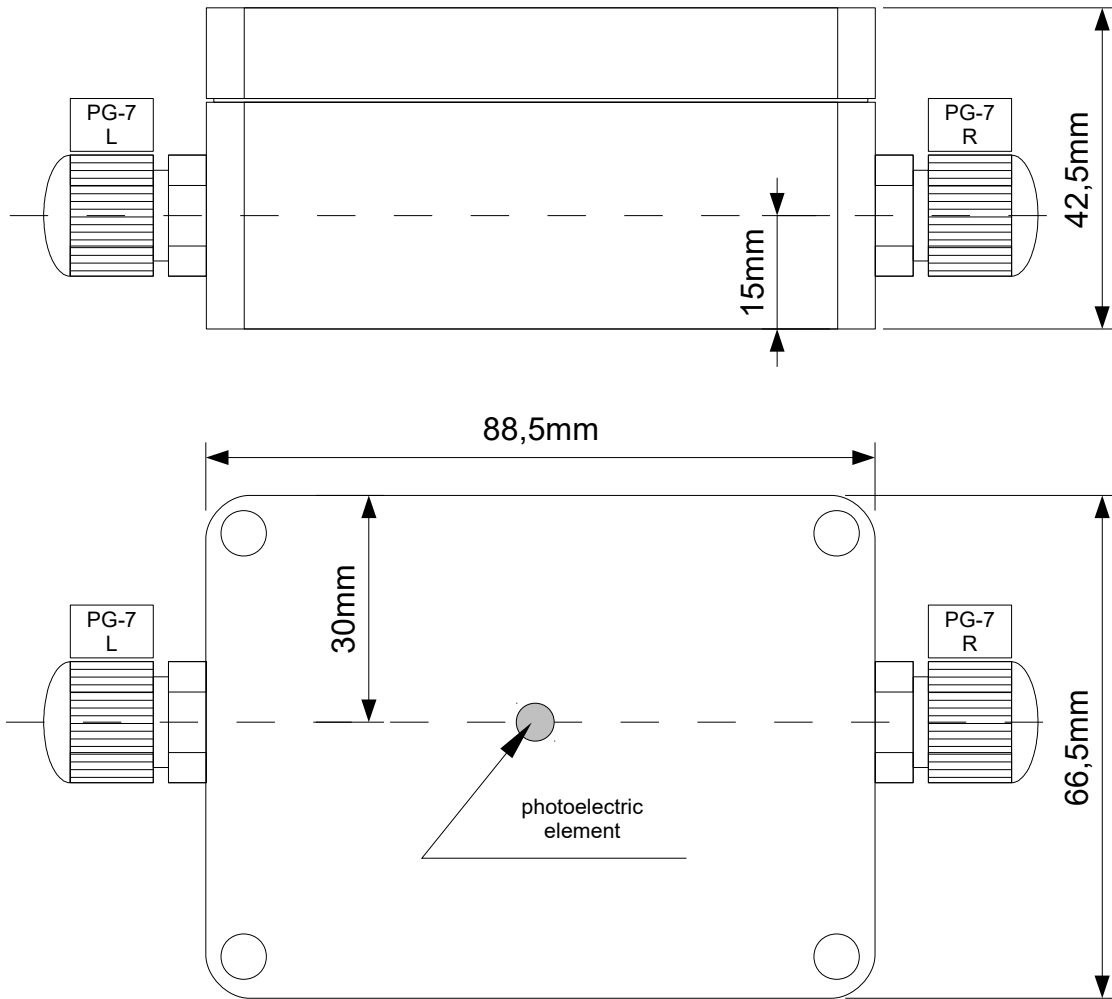
4. VIEW OF TEMPERATURE OR HUMIDITY OR ATMOSPHERIC PRESSURE SENSOR



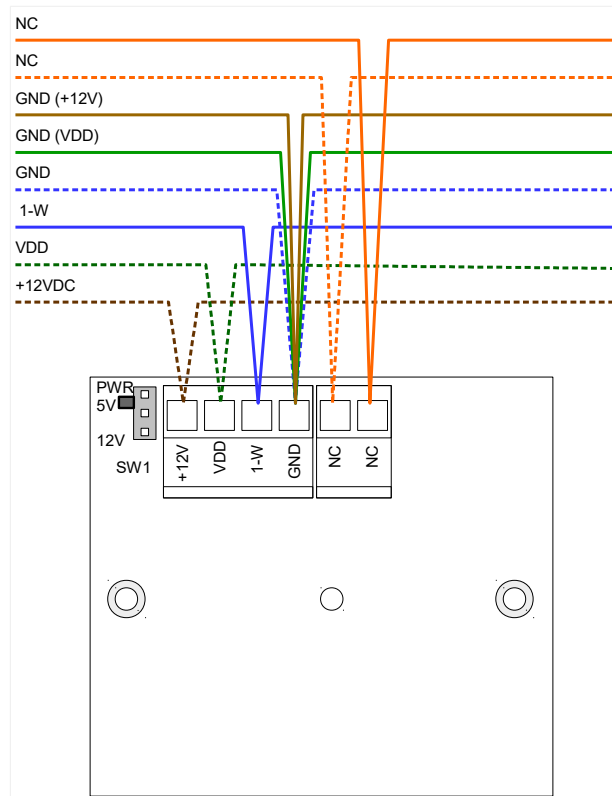
5. VIEW OF TEMPERATURE AND HUMIDITY AND ATMOSPHERIC PRESSURE SENSOR



6. VIEW OF LIGHTING, SUNLIGHT SENSOR



7. CONNECTION OF 1-WIRE BUS



Example connection of 1-WIRE bus and power supply 12VDC, made by UTP 4x2x0,5 cable Cat.5, to the sensor.

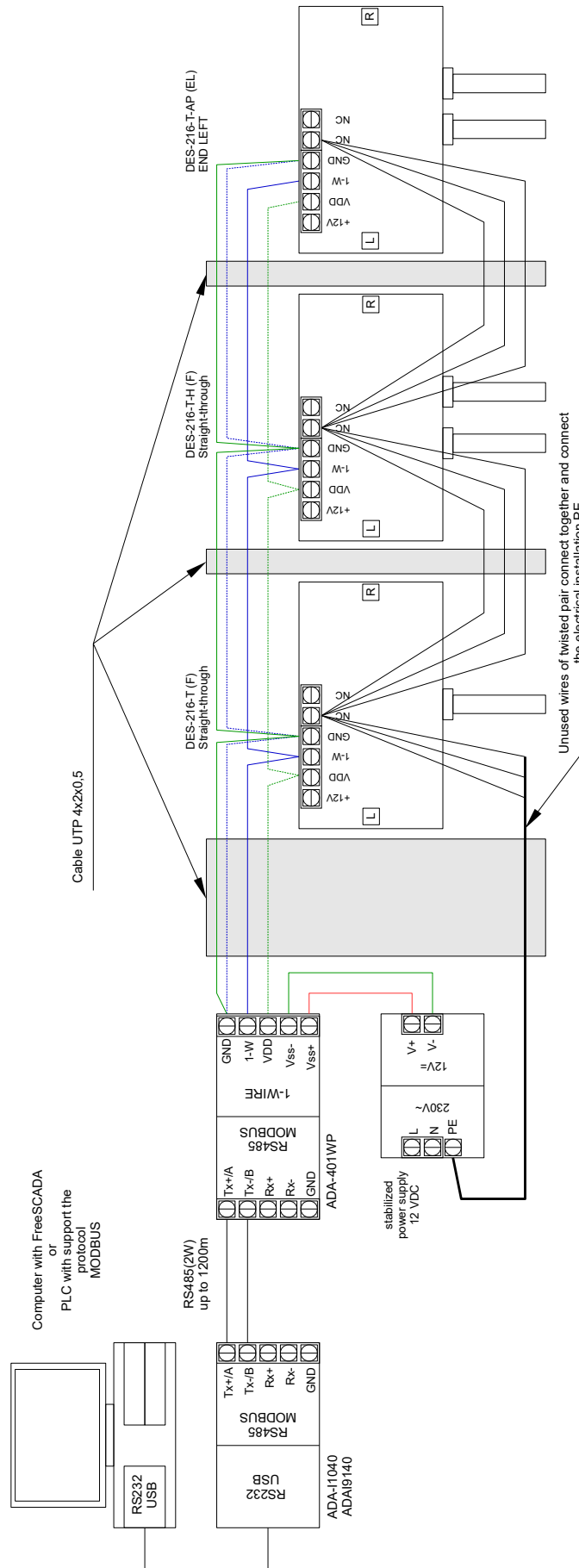
8. CONFIGURATION OF SENSOR POWER SUPPLY

DES-216 sensor can be powered of 5VDC from VDD line of 1-WIRE bus or from additional switching power supply 12DC. Power supply method depend on connection of 1-WIRE bus, and setting of SW1 switch, like in the table below.

SW1 switch setting	Description
5V	Sensor powering of 5VDC eg. from VDD line.
12V	Sensor powering of 12VDC eg. from additional switching power supply

In case of the voltage lower than 4,95 VDC on terminals VDD – GND, we recommend power supply 12DC for sensors: humidity and atmospheric pressure sensor and lighting.

9. EXAMPLE OF SENSORS CONNECTION — POWERING 5VDC



11. VERSIONS

DES-216 - - - - -

Sensor type:

Temperature sensor (-30°C ... +70°C)	T
Relative humidity sensor (0% ... 100%)	H
Atmospheric pressure sensor (150hPa ... 1150hPa)	AP
Sunlight sensor (0% ... 100% Lux)	SL
Lighting sensor (0% ... 100% Lux)	L

External diameter of measuring part d [mm]:

Lighting, sunlight sensor	0
Temperature, relative humidity, atmospheric pressure sensors	6

Length of measuring part Lc [mm]:

Lighting, sunlight sensor	0
50 (standard) / 100 / 150 / 200 – for temperature, relative humidity, atmospheric pressure sensors	50

Material covers the measuring unit:

Lighting, sunlight sensor	0
brass - tube placed in the gland (<i>discontinued</i>)	1
stainless steel 1.4541 - tube placed in the gland	2

Connection type:

Straight-through	F
End right	ER
End left	EL

Order example:

Product symbol: **DES-216-T-H-AP-6-50-2-ER**

T-H-AP – sensors: temperature, relative humidity and atmospheric pressure,

6 – sensor diameter d = 6mm,

50 – length Lc = 50mm,

2 – stainless steel 1.4541 - tube placed in the gland; material covers the measuring unit,

ER – end right (input of 1-WIRE bus from right side of the sensor).

11.1. COMBINING OF MEASUREMENTS

In DES-216 sensor can be combine measurements/sensors together, as in the table below

Measurement	T	H	AP	L	SL
T	-	+	+	+ / -H, -SL	+ / -H, -L
H	+	-	+	-	-
AP	+	+ / -L, -SL	-	+ / -H, -SL	+ / -H, -L
L	+ / -H, -SL	-	+ / -H, -SL	-	-
SL	+ / -H, -L	-	+ / -H, -L	-	-

+ = measurement can be combine,

- = measurement cannot be combine.

12. PARAMETERS

<i>Parameters</i>	<i>Data</i>
Parameters of Temperature Sensor	
Measuring range of temperature	-30°C ... +60°C
1-WIRE Transducer	DS18B20
Temperature measurement range by the transmitter	-55°C ... 125°C
Measuring accuracy of temperature transducer	+/-0,5°C in the scope -10°C...+85°C
Temperature transducer resolution	12 bits (0,06°C)
Operating temperature	-30°C ... +60°C
Parameters of Humidity Sensor	
Measuring range of relative humidity	0% ... 100% RH
Measuring accuracy of relative humidity	+/-3,50% RH
Operating temperature	-30°C ... +60°C
Parameters of Atmospheric Pressure Sensor	
Measuring range of atmospheric pressure	150 hPa ... 1150 hPa
Measuring accuracy of atmospheric pressure	+/-15 hPa
Operating temperature	-30°C ... +60°C
Parameters of Sunlight Sensor	
Measuring range of sunlight	0% ... 100%
Measuring accuracy of sunlight	+/-1%
Operating temperature	-30°C ... +60°C
Parameters of Lighting Sensor	
Measuring range of lighting	0% ... 100% Lux
Measuring accuracy of lighting	+/-1%
Operating temperature	-30°C ... +60°C
General Parameters	
Supply voltage	VDD=5VDC from the bus or from additional power 12VDC
Max. power	10-20mW
Protection from reverse power polarization	YES Warning! on reverse power connection, is shorted VDD to GND
Bus cabling	Recommended UTP 4x2x0.5 AWG24 PC twisted cable
Cover	
Operating temperature	from -30°C to +60°C
Material	Polystyrene
Protection degree	IP65
Dimensions	88,4 x 66,4 x 42,2 mm
Weight	0,05 kg
Storing and Transportation	
Storage temperature	-40°C ÷ +70°C
Humidity	5 ÷ 95% - non-condensing

Dear Customer,

Thank you for purchasing **CEL-MAR Company** products.

We hope that this user manual helped you to connect and start up the purchased device. We also wish to inform you that we are a manufacturer of: data transmission converters with interface RS232, RS485, RS422, USB, Current Loop, Fiber Optic Converters, 1-Wire, ETHERNET, Wi-Fi; digital sensors as: temperature, humidity, pressure, illumination; power supply

Please express your opinion by e-mail or phone on this product, and advise us how we can satisfy you present and future of expecting.

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