



**SENSOR - TRANSMITTER**  
**FOR**  
**RELATIVE HUMIDITY**  
**MS9015**



**TECHNICAL DESCRIPTION AND INSTRUCTION FOR USAGE**

**PLOVDIV 2013**

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## **I. ADVANTAGES**

- ✓ **High accuracy**
- ✓ **Wide temperature range -50 ÷ 140 °C**
- ✓ **Fast response and fast recovery**
- ✓ **Without any setting from the user**
- ✓ **Several corpuses for different applications**
- ✓ **Built-in temperature sensor and transmitter - option**
- ✓ **Calibration certificate from Accredited laboratory - option**

## II. ORDER CODE

### MS9015 - x.x.x.x.x.x

Name \_\_\_\_\_

Corpus \_\_\_\_\_

- 0- Protective head IP65 \*
- 1- With protective head IP65 in a distance \*
- 2- Protective box IP65 (vertical) with threaded connection\*
- 3- Protective box IP65 (horizontal) with threaded connection \*
- 4- Tube IP65 21x147x21 \*\*
- 5- Protective box IP65 82x80x56
- 6- Protective box IP65 126x86x56

**Relative humidity sensor with accuracy**

- 0- 1.5% for range (10÷90) % rh
- 1- 2% for range (10÷90) % rh

**Temperature sensor (for range -10÷110 °C)**

- 0- No
- 1- Pt100 Cl B
- 2- Pt1000 Cl B
- z- By request

**Calibration certificate from Accredited laboratory according to BDS EN 17025 (option)**

- 0- No
- 1- Yes

**Analog output - for temperature (option)\*\*\***

- 0- No
- 1- 0 ÷ 20 mA DC
- 2- 4 ÷ 20 mA DC
- 3- 0 ÷ 1 V DC
- 4- 0 ÷ 5 V DC
- 5- 0 ÷ 10 V DC
- z- By request

**Analog output - for relative humidity**

- 1- 0 ÷ 20 mA DC
- 2- 4 ÷ 20 mA DC
- 3- 0 ÷ 1 V DC
- 4- 0 ÷ 5 V DC
- 5- 0 ÷ 10 V DC
- z- By request

\* For positions 0,1,2,3 for the corpus must be specified:

n- Operation part, n=50,100,150,300,500 mm  
z- by request

G- Mechanical connection, G= M18, M20, G1/2 "  
z- by request

\*\* When tube corpus is selected, the cable length must be specified l=..... (max 300m)

\*\*\* When this option is selected, temperature transmitter is built-in (this option is available only with corpus at position 3)

**Example**

**MS9015 - 6.1.1.2.2.1**

<b>Corpus</b>	Protective box IP65 126x86x56
<b>Relative humidity sensor</b>	2% for range (10 ÷ 90) % rh
<b>Temperature sensor</b>	Pt100 Cl B
<b>Analog output for relative humidity</b>	4 ÷ 20 mA
<b>Analog output (for temp.)</b>	4 ÷ 20 mA
<b>Calibration certificate</b>	Yes

## III. FEATURES

- Optional built-in temperature sensor is not applicable to housing with protective head and protective box with threaded connection
- Optional built-in temperature transmitter is only possible in a protective box housing IP65 B
- In 3-wire current output the connection is unusual. Further specification is needed with specialists from the manufacturer

#### **IV. DESIGNATION AND PRINCIPLE OF ACTION**

The sensor – transmitter MS9015 is designed with capacitive sensor for relative humidity measurement and built-in transmitter. The analogue output signal that transmits the measured input quantity is often unified: 0 ÷ 20 mA DC; 4 ÷ 20 mA DC; 0 ÷ 1 V DC; 0 ÷ 10 V DC, and must be specified in the order code. For user facilitation MS9015 is factory set and does not need further adjustment.

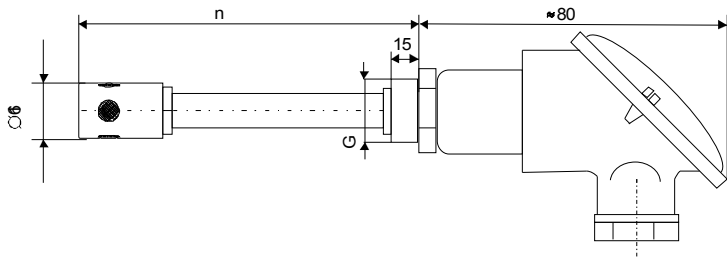
Sensor - transmitter is available in several corpuses for different applications depending on: the installation, the temperature range and the protection class of the electronics. The relative humidity measurement sensor is protected with a removable protective cap. With the option of built-in sensor and temperature transmitter, the user is given the opportunity for compactness and cost reduction.

The model is applicable for control and monitoring in:

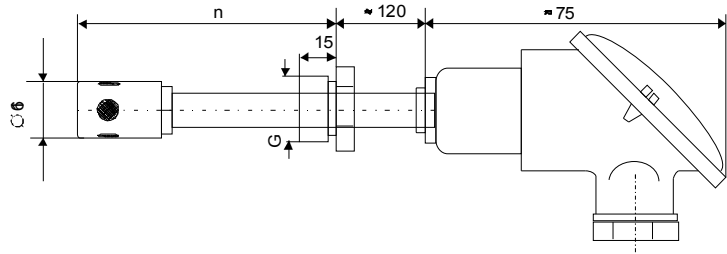
- ✓ dry rooms
- ✓ chambers for the pharmaceutical industry
- ✓ warehouses for storage of fruits and vegetables
- ✓ production rooms and other

## V. TECHNICAL DATA AND CORPUSES

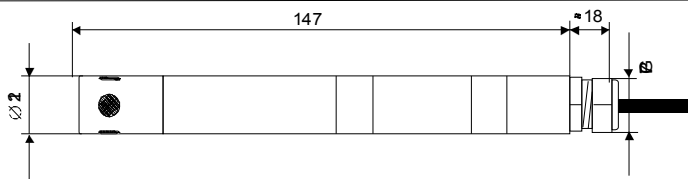
<b>Analogue inputs</b>				
<b>Sensor</b>		<b>Relative humidity</b>		<b>Temperature</b>
- sensitive element		capasitive		Pt100, Pt1000, other by request
- measurement accuracy		2 % 1,5 % (by request)		Class B other by request
- measurement range		5 ÷ 95 % rh		By request in limits -60 ÷ 140 °C
<b>Analogue outputs</b>				
		<b>for 0 ÷ 100 % rh</b>		<b>for range by request</b>
Current 2-wire		4 ÷ 20 mA		4 ÷ 20 mA
Current 3-wire (option)		0 ÷ 20 mA		0 ÷ 20 mA
Voltage 3-wire		0 ÷ 10 V (other by request)		0 ÷ 10 V (other by request)
-instability from the temperature		100 ppm/°C		100 ppm/°C
<b>Power supply</b>				
Power supply		12 ÷ 36 V DC		
<b>Storage</b>				
Storage temperature		-20 ÷ 70 °C		
Storage relative humidity		without condensation 10 ÷ 90 % rh		
<b>MS9015</b>	<b>With protective head (C3/C4)</b>	<b>Protective box with threaded connection</b>	<b>Protective box for wall mounting</b>	<b>Tube</b>
Corpus	- Stainless steel Nr.1.4571 Head - Aluminum IP65	ABS IP65	ABS IP65	Polyacetal A4 (black) IP65
Overall dimensions	n = 50, 100, 150, 300, 500 mm, G = 1/2", M18, M20* * Other dimensions are possible	H-82x56x80 mm V-82x80x56 mm	A-126x86x56 mm B-82x80x56 mm	21x21x147 mm
Sensor operating temperature	-50 ÷ 140 °C		-20 ÷ 70 °C	
Transmitter operating temperature	-20 ÷ 70 °C			
Operating relative humidity	5 ÷ 95 % rh			
Relative humidity sensor	1	1	1	1
Temperature sensor (option)	-	-	1	1
Temperature transmitter (option)	-	-	B	-
Weight	min 100 g	min 100 g	max 200 g	~100 g
<b>Applications</b>	For environments with higher temperatures	For aggressive environments	For aggressive environments	For general application in different areas
<b>Advantages</b>	Threaded connection, Resistant corpus for high temperatures etc.	Threaded connection with two variants for mounting etc.	Compact box for easy wall mounting	For hand held devices with fixed cable and wall mounting with a clamp



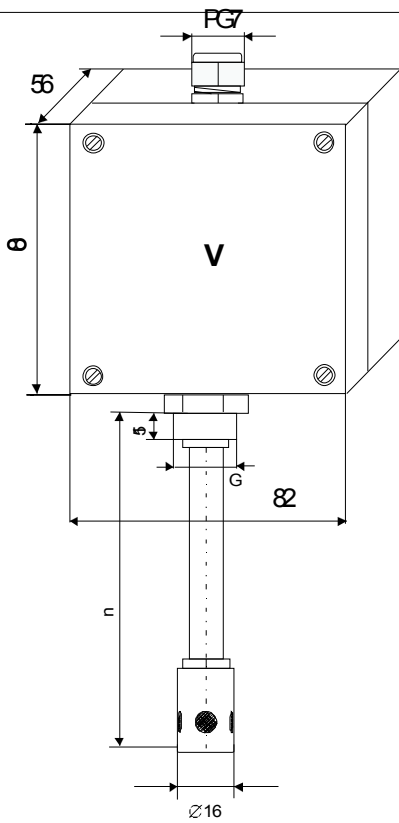
**C3 -  
PROTECTIVE  
HEAD**



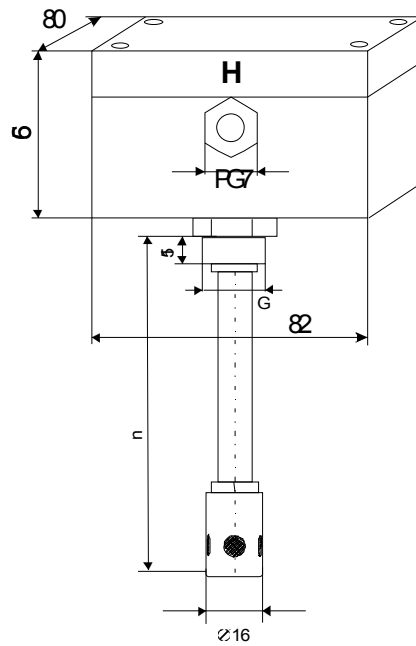
**C4 -  
WITH PROTECTIVE HEAD  
IN A DISTANCE**

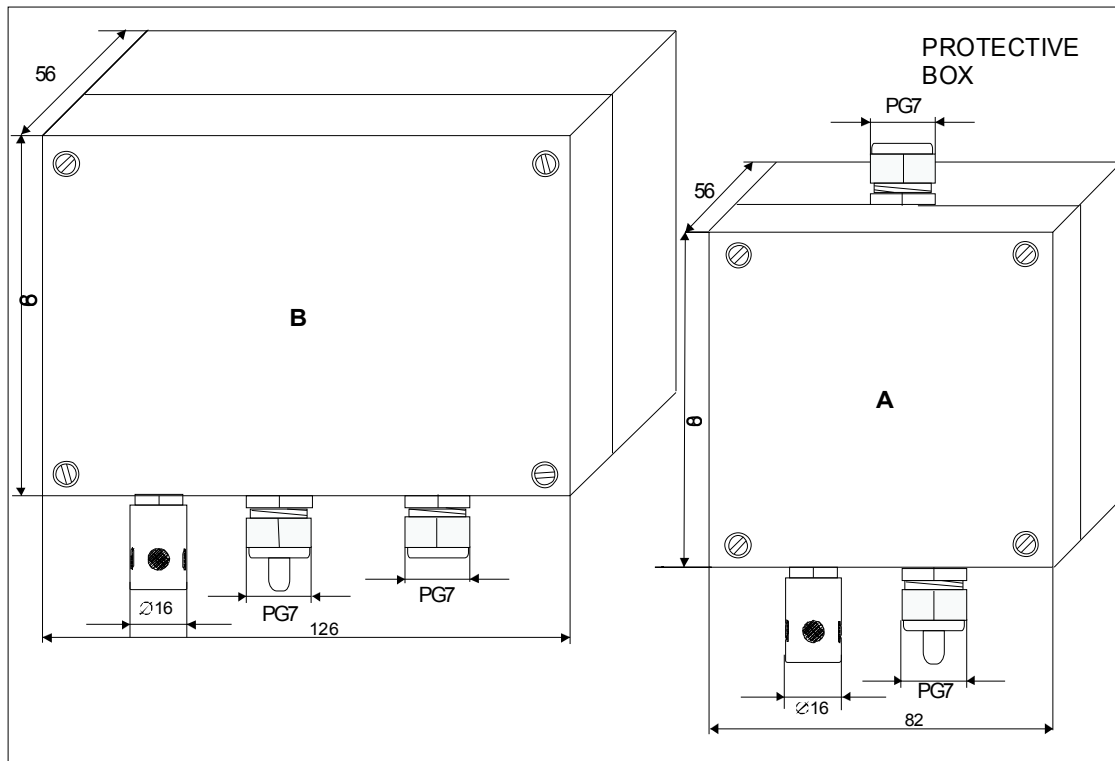


**TUBE**



**PROTECTIVE BOX  
WITH THREADED  
CONNECTION**

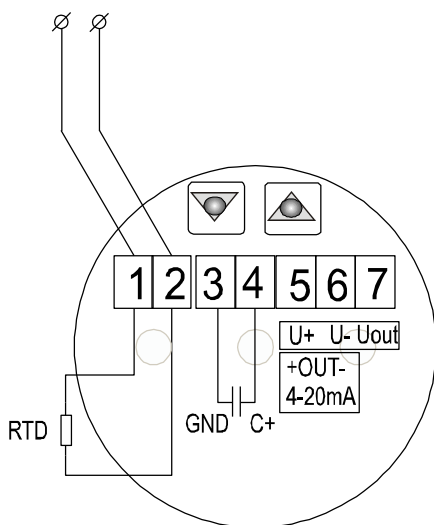




## VI. TERMINAL AND ELECTRICAL CONNECTION

### 1. Terminal of a relative humidity transmitter MS9015

#### Transmitter for relative humidity MS9015



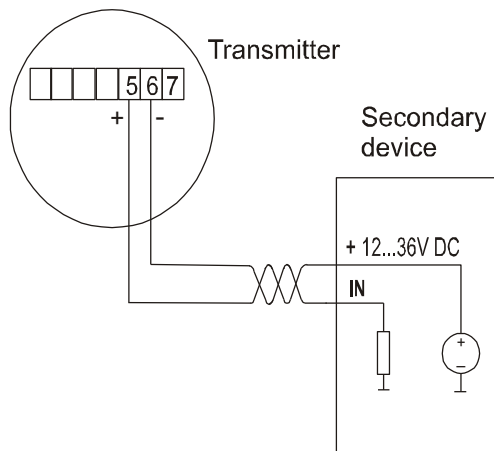
Notes :

- ✓ The specified terminal is not possible for tube mounting. For tube mounting the connection is made by the manufacturer and output wires are labeled according to the analog output signal
- ✓ Terminals 1 and 2 are used for affixing of the temperature sensor
- ✓ The built-in temperature sensor is platinum RTD Pt100 or Pt1000, according to the request
- ✓ **Don't touch terminals 3 and 4 of the capacitive sensor and two sensors above them. The incorrect usage could lead to incorrect operation of the transmitter.**

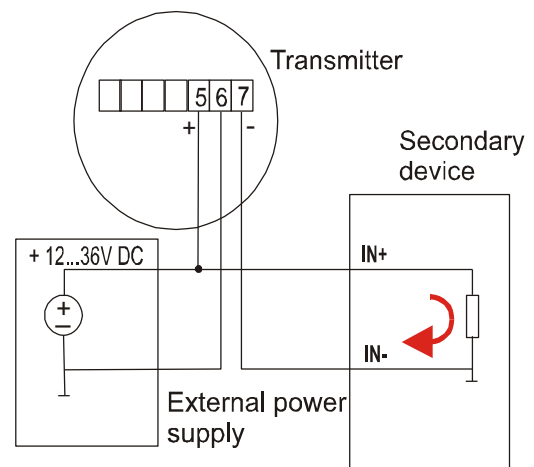
# 1.1 Electrical connection of the analogue output of MS9015

## 1. Current analog output

1.1 The transmitter is supplied by a secondary device (2-wire current connection 4-20mA)

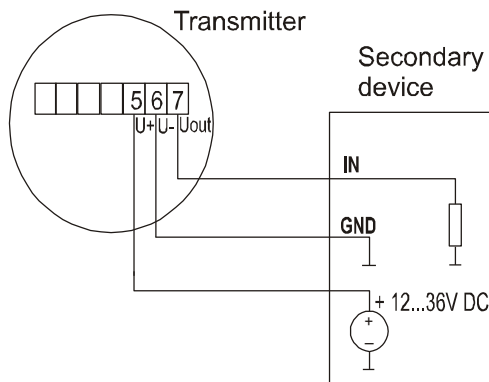


\*1.2 The transmitter is supplied by an external power supply (3-wire current connection)

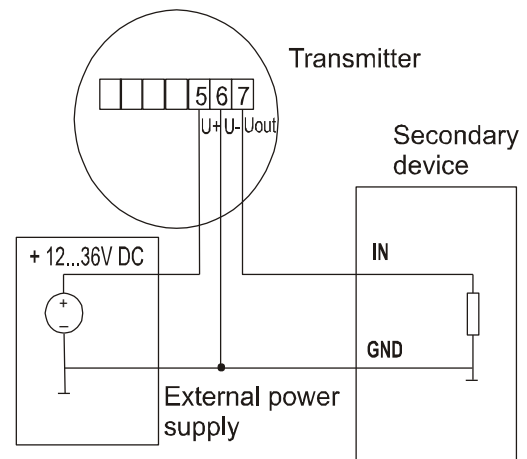


## 2. Voltage analog output

2.1 The transmitter is supplied by a secondary device



2.2 The transmitter is supplied by an external power supply

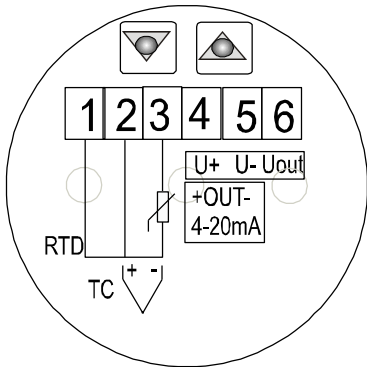


- ✓ In 3-wire current output the connection is **unusual**. Further specification is needed with specialists from the manufacturer. **The output current is to the positive potential of the power supply.**
- ✓ The MS9015 transmitter allows changing the default settings. For that you have to contact with specialists from the manufacturer.



## 2. Terminal of the temperature transmitter MS9014:

### Temperature transmitter MS9014

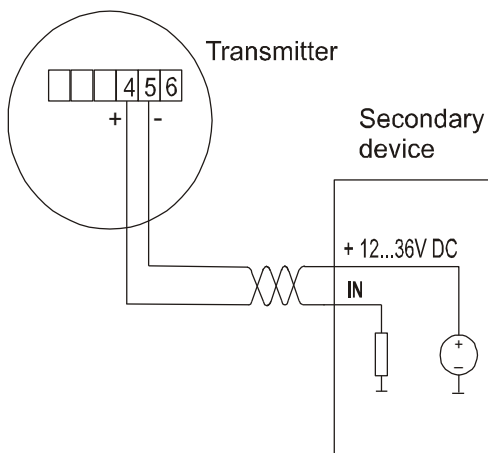


- ✓ The temperature transmitter can be built-in in protective box corpus (B) only
- ✓ In 3-wire current output the connection is **unusual**. Further specification is needed with specialists from the manufacturer. **The output current is to the positive potential of the power supply.**

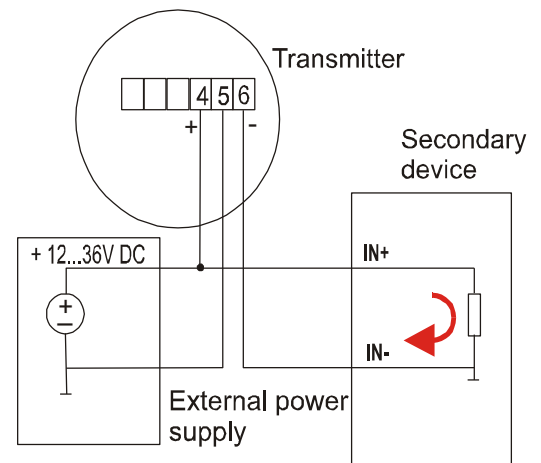
## 2.1 Electrical connection of the analogue output of MS9014

### 1. Current analog output

1.1 The transmitter is supplied by a secondary device (2-wire current connection 4-20mA)

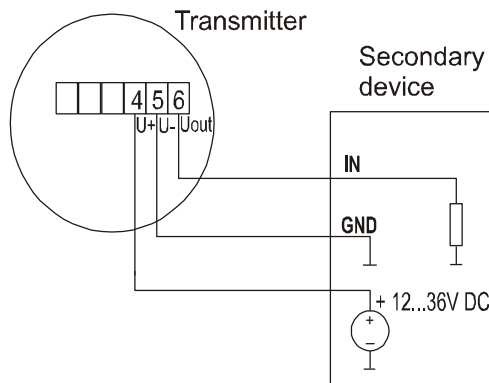


\*1.2 The transmitter is supplied by an external power supply (3-wire current connection)

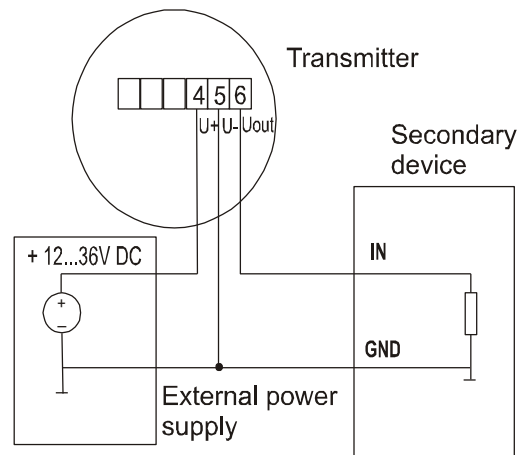


### 2. Voltage analog output

2.1 The transmitter is supplied by a secondary device



2.2 The transmitter is supplied by an external power supply



## VIII. ACTIONS AGAINST INTERFERENCE

### Recommendations for use of connecting wires

- ✓ For longer distances for lines subjected to electromagnetic interference is desirable to use wire twisted pair
- ✓ For better noise protection can be used shielded cable that must be grounded only at one end.
- ✓ Wires that transmit a similar type of signals can be packed together, but if the signals are different, the wires must be separated to prevent electromagnetic interaction.
- ✓ When there have to be crossed wires with different signal types this must be done at an angle of 90 degrees and a long distance
- ✓ Wires, which carry weak signals and wires connecting the sensors to the controller must not be near contactors, motors, generators, radios and wires, which carry large currents.

## WARRANTY CARD

Warranty Card № : .....  
Warranty : ..... months  
Serial number : .....  
The product is bought by : .....  
with invoice № : ...../..... 20.....

## WARRANTY CONDITIONS

The warranty is valid only if this warranty card is filled legibly in ink, signed and stamped.  
The warranty consists of free repair of all manufacturing defects that can occur during the warranty period. **The repair is done by presenting of this warranty card in the service base with which is bought the product.** The warranty does not cover damage caused by poor transport, poor storage, incorrect usage, forces of nature, failure to follow instructions and when others made an attempt to remove the defects. In these cases the defect can only be removed for a fee.

Service during the warranty period and settlement of claims is done under the current legislation.

## REPAIRS MADE IN THE SERVICE BASE

Service	Data of entry	Order number	Type of the repair	Date of delivery	Performer of the repair

Seller:.....

Buyer:.....

Bulgaria, 4000 Plovdiv, 4 Murgash str.  
Tel.: (+359 32) 642 519, 640 446 fax: (+359 32) 640 446  
[www.microsyst.net](http://www.microsyst.net) e-mail: [info@microsyst.net](mailto:info@microsyst.net)