SHIPBORNE METEOSTATION «PERISCOPE»

Technical description

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INTRODUCTION

This technical description covers the Shipborne meteostation «Periscope» (hereinafter referred to as the «System») and any System configurations.

The technical description is intended to describe the System components, structure, operating principles, technical specifications.

The System’s scalable architecture allows for compliance with any project.

UNIVERSAL DIGITAL REPEATER DR-209M

Description

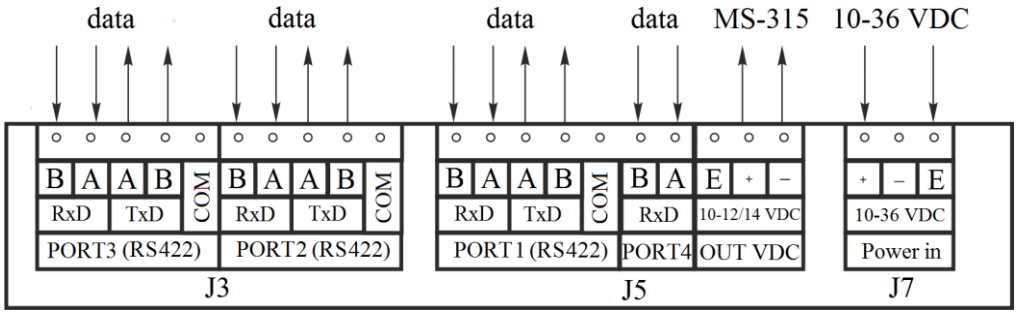
The Product is designed to receive, process and display weather parameters, received by RS-422 interface, and output processed data (parameters) to the external units. Overvoltage protective device OPD-146 is included in the Sensor's scope of supply.

Certificates

Technical specifications

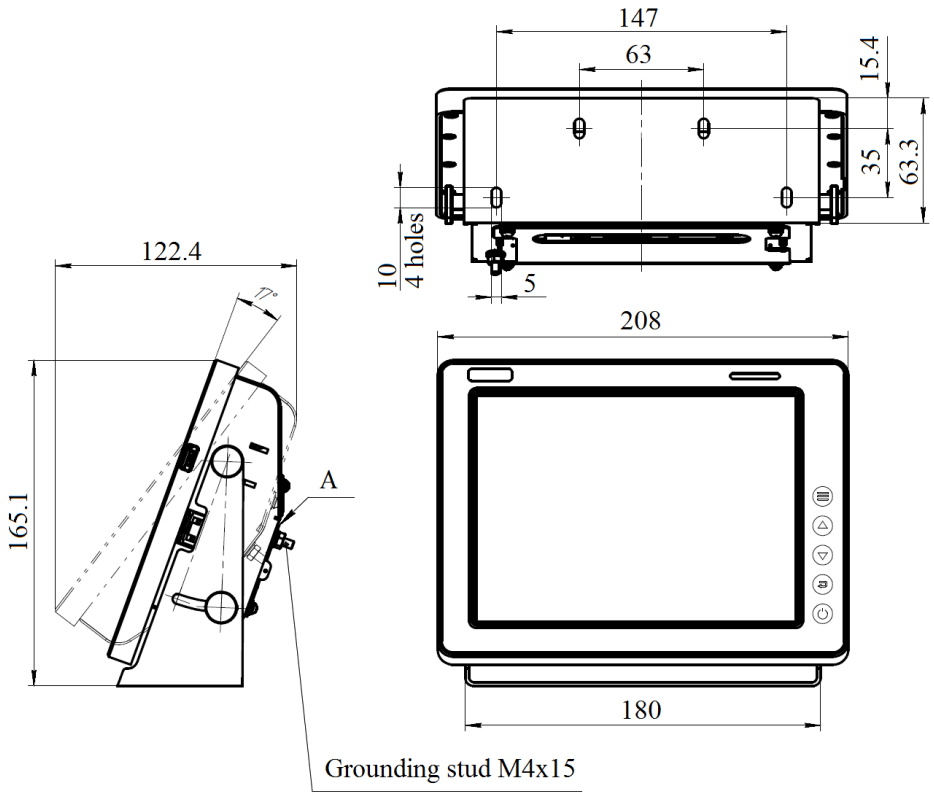
Parameter	Value	
Input voltage, VDC	10 to 36	
Power consumption, W	20	
Galvanic isolation from the power mains	+	
Overcurrent protection	+	
Reverse polarity protection	+	
Screen parameters	LCD, 8", 1024x768 pix, XGA, 4:3	
Touch panel parameters	resistive, 162x121	
Processor	ARM Cortex-A8 (AM3359)	
Flash card (portable), GB	8	
RAM, MB	512	
Number of ports	3 × RS-422 galvanically isolated (input and output port); 1 × to supply power to 12 V / 24 V to external load (sensors), power up to 25 W; 1 × USB port; 1 × Ethernet 100	
Data baud rate (reception / transmission), bit/s	4800; 9600; 19200; 38400; 57600; 76800;115200	
Input data format	IEC 61162-1.2 (NMEA 0183 ver. 1, 2) and other data types at serial data transmission	
Input data type	GNSS data – coordinates, time, date and other; atmosphere parameters – temperature, humidity, etc.; wind data; heading, bearing – true, magnetic; depth; speed; other data	
Protection degree	IP22	
Mounting	into console	on a bracket
Weight, kg	1.6	1.9
Overall dimensions, mm	160.0x208.0x69.3	165.1x208.0x122.4
Operating temperature, °C	–15 to +55	
Limiting temperature, °C	–60 to +70	
Casing material	metal	
Keyboard material (keys)	membrane (bulge)	

Connection diagram



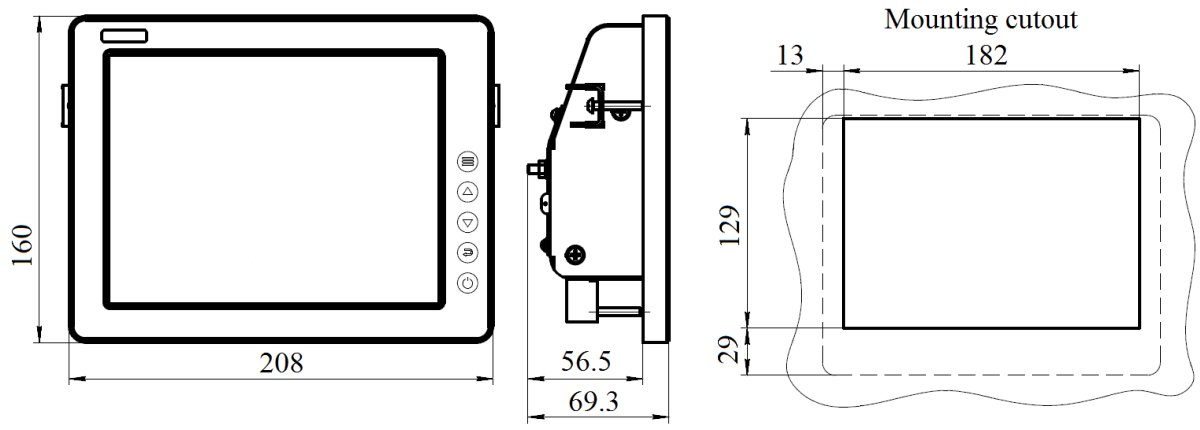
Dimensions

Mounting on a bracket



Note – When installing provide a free space 40 mm from the surface A for connecting the product.

Mounting into console



POWER SUPPLY UNIT PS-103

Description

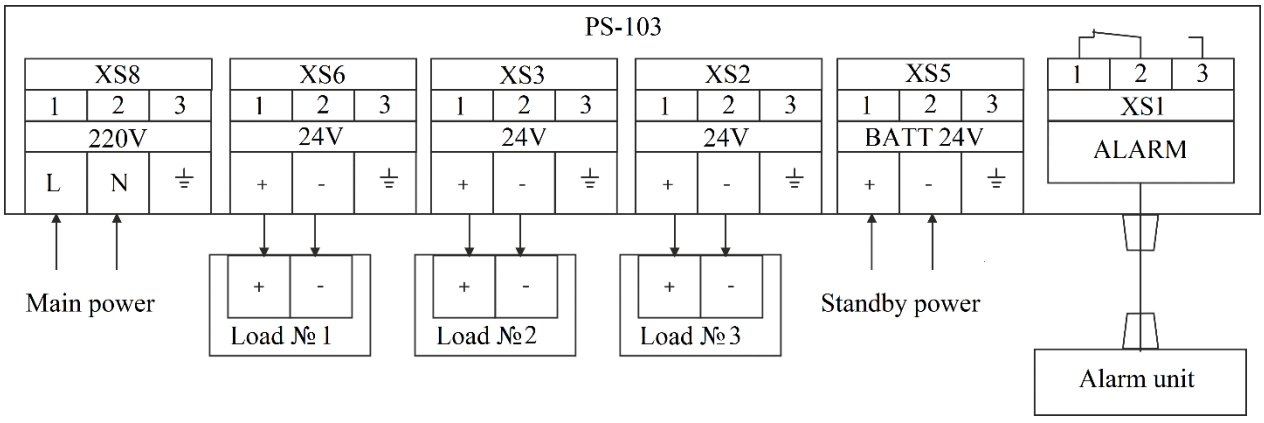
The unit is designed to supply the equipment with unregulated power 24 V DC if powered from power mains 50 Hz 220 V and standby mains 24 V DC.

Certificates

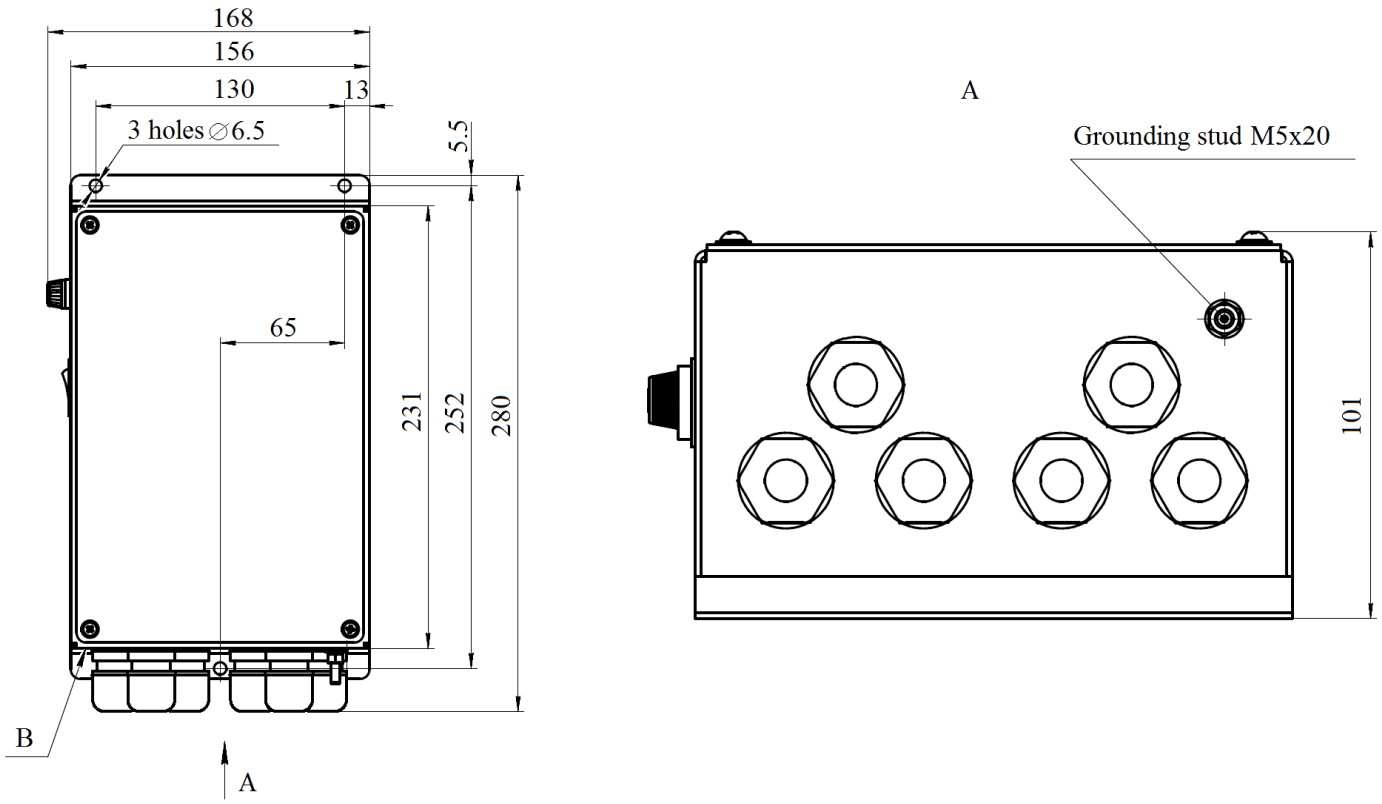
Technical specifications

Parameter	Value
Input voltage, VAC	220 (110)
Output voltage, VDC	24 (18 to 31)
Rated load current, A	10
Max. output power, W	190
Operating temperature, °C	–15 to +55
Limiting temperature, °C	–60 to +70
Material	steel
Weight, kg	4.6
Protection degree	IP22
Mounting type	wall

Connection diagram



Dimensions



Note – When installing provide a free space 80 mm from the surface B for connecting the product.

POWER SUPPLY UNIT BPS-114-24

Description

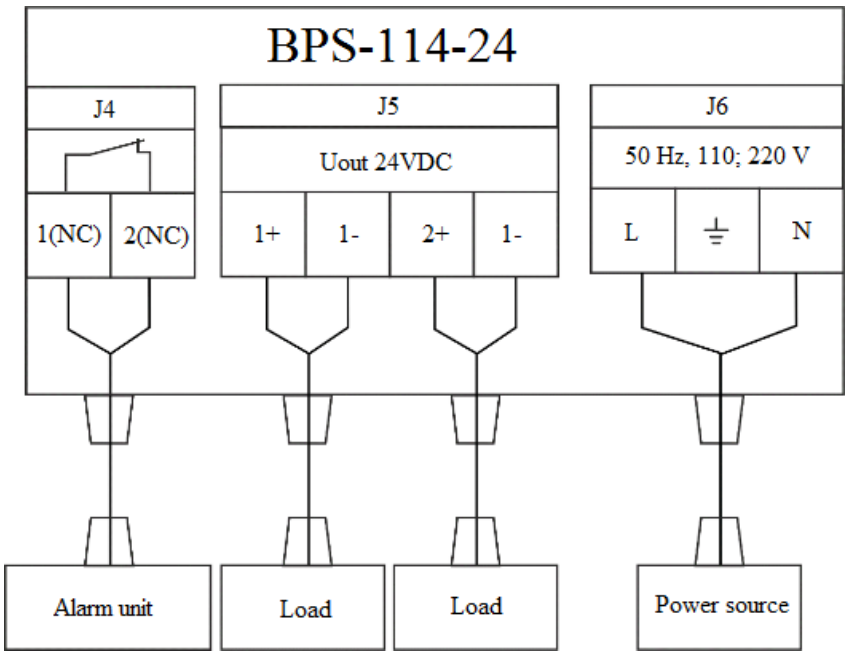
The unit is designed to supply the equipment with uninterruptible stabilized DC power supply 24 V if powered from power mains 50 Hz 220 V and unregulated voltage 24 V DC, if powered from built-in storage battery.

Certificates

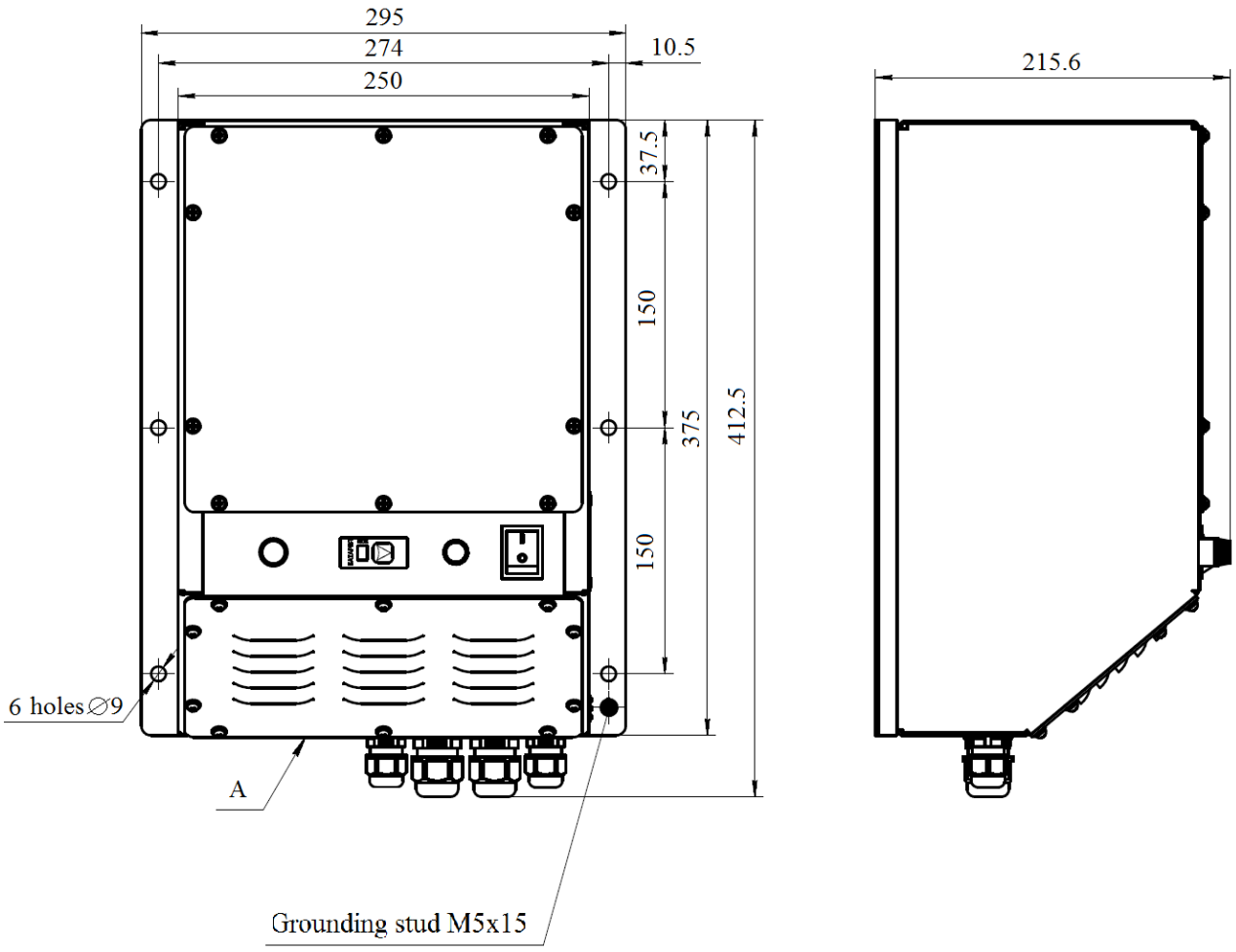
Technical specifications

Parameter	Value
Input voltage, VAC	220 (110)
Output voltage, VDC	24 (19,2 to 28)
Max. output power, W	320
Operating temperature, °C	–15 to +55
Limiting temperature, °C	–60 to +70
Weight, kg	21,7
Protection degree	IP22
Material	steel
Mounting type	wall

Connection diagram



Dimensions



Note – When installing provide a free space 120 mm from the surface A for connecting the product.

DC/DC CONVERTER DC-108

Description

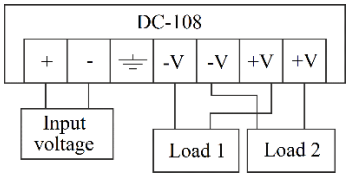
The unit is designed to convert 24 V DC into 12 V DC, supply power to shipborne equipment operating with this voltage type.

Certificates

Technical specifications

Parameter	Value	
	DC-108-24/12-50W	DC-108-24/12-150W
Input voltage, VDC	19 to 36	
Output voltage, VDC	12	
Max. output power, W	50	150
Operating temperature, °C	–15 to +55	
Limiting temperature, °C	–60 to +70	
Weight, kg	2.2	2.3
Protection degree	IP22	
Material	steel	
Mounting type	wall	

Connection diagram



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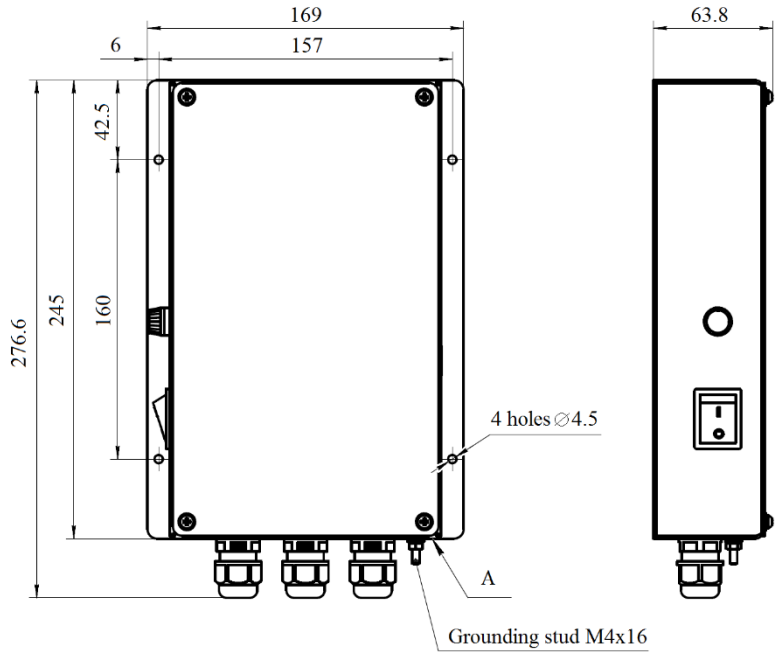


Note – When installing provide a free space 120 mm from the surface A for connecting the product.

AMPLIFIER-MULTIPLIER OF NMEA SIGNALS MDU-102

Description

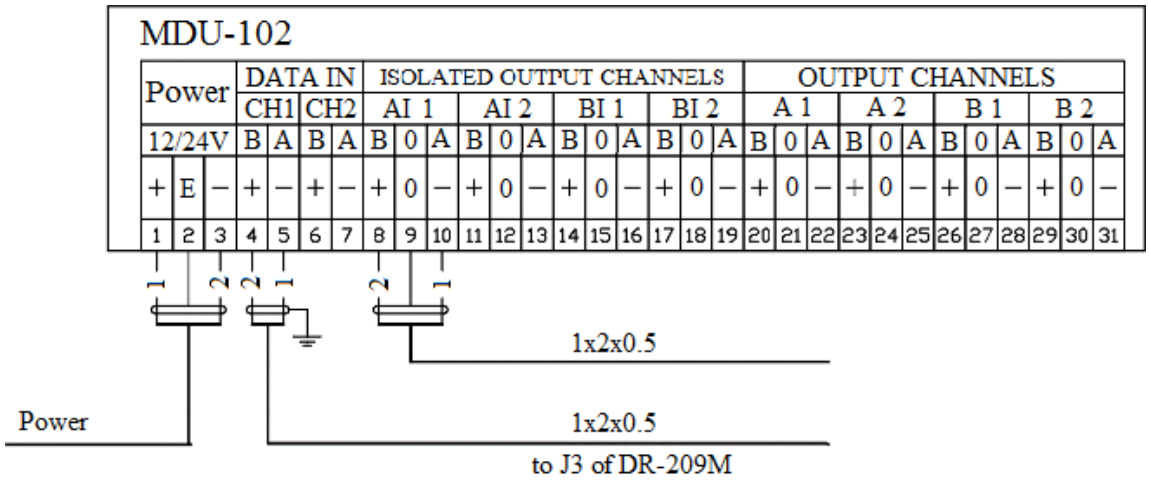
The unit is designed for signal multiplication at serial data transmission through RS-232/422/485 interfaces from one or two sources.

Certificates

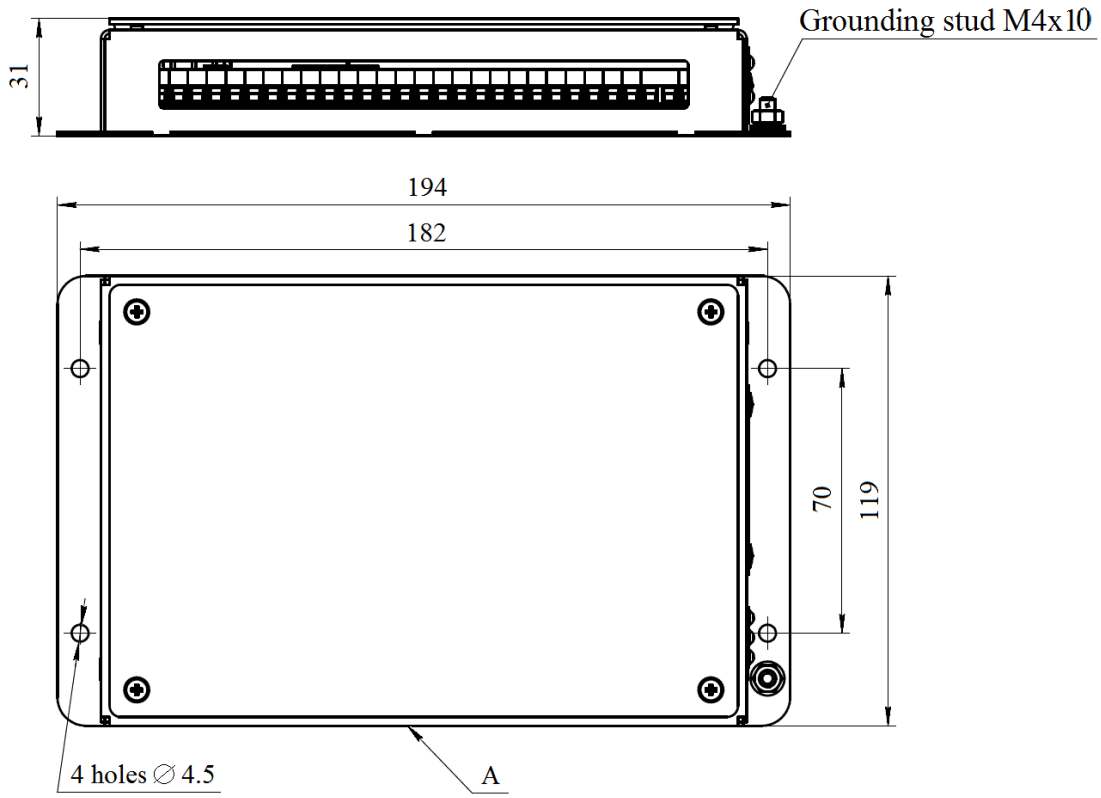
Technical specifications

Parameter	Value
Input voltage, VDC	9.5 to 36.0
Power consumption, W	3
Number of inputs	2
Number of outputs	8
Supported interfaces	RS-232/422/485
Max. data receive rate, bps	1200 to 115200
Operating temperature, °C	–15 to +55
Limiting temperature, °C	–60 to +70
Weight, kg	0.65
Protection degree	IP22
Material	steel
Mounting type	wall

Connection diagram



Dimensions



Note – When installing provide a free space 80 mm from the surface A for connecting the product.

SUMMATOR-COMBINER OF NMEA SIGNALS (SENTENCES) NC-117

Description

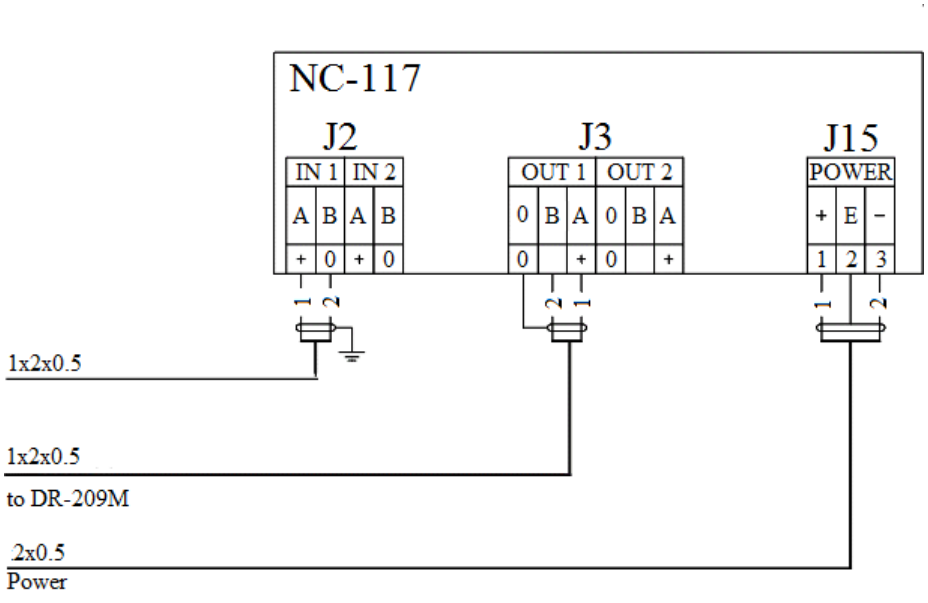
The unit is designed to receive messages from signal sources through RS-232/422, combine received signals and output NMEA 0183 by 4 x RS-422.

Certificates

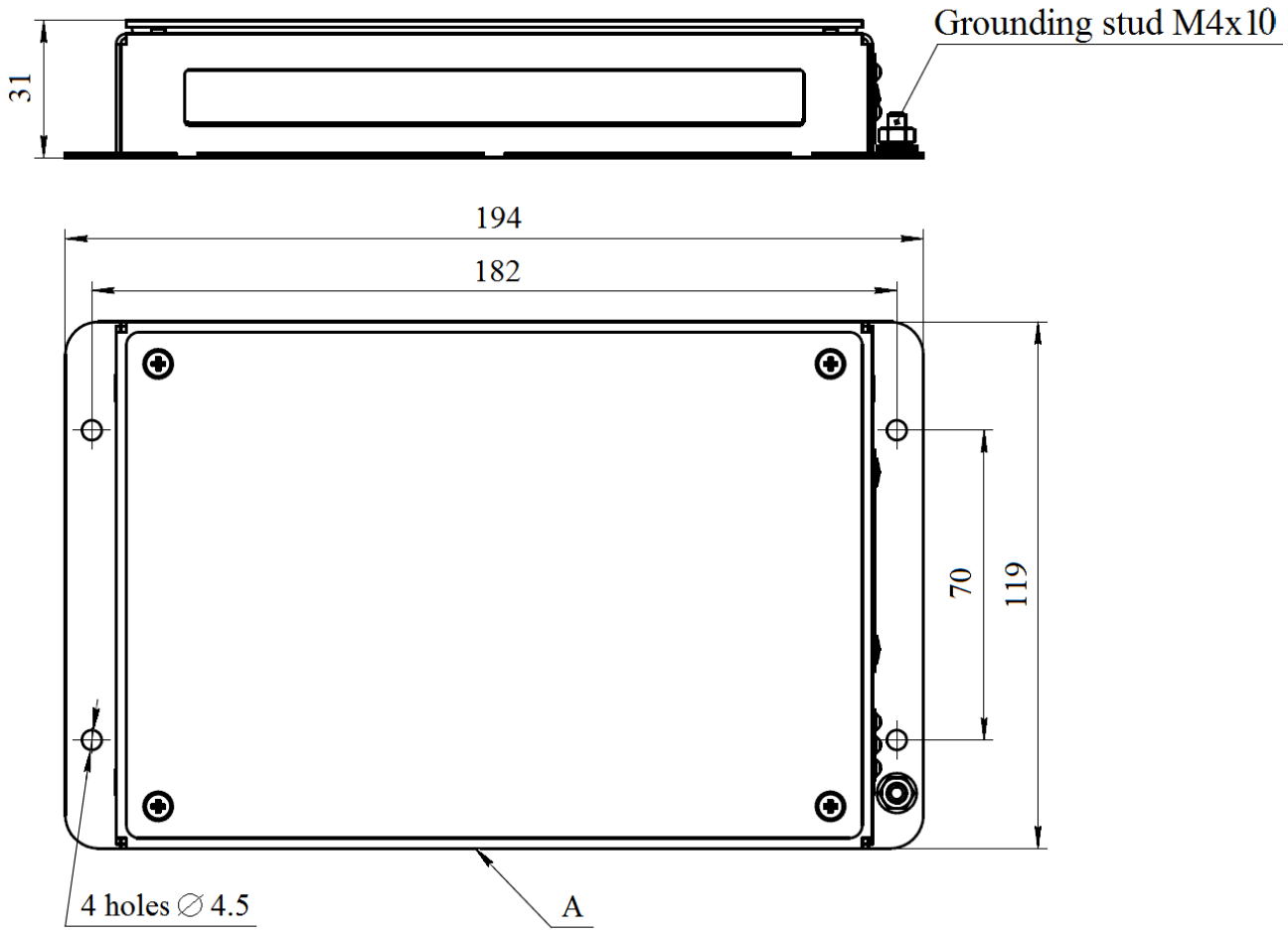
Technical specifications

Parameter	Value
Input voltage, VDC	24 (9 to 36)
Power consumption, W	7
Number of inputs	8+USB
Number of outputs	4+USB
Supported interfaces	RS-232/422
Max. data receive rate, bps	2400 to 115200
Operating temperature, °C	–15 to +55
Limiting temperature, °C	–60 to +70
Weight, kg	0.7
Protection degree	IP22
Material	steel
Mounting type	wall

Connection diagram



Dimensions



Note – When installing provide a free space 80 mm from the surface A for connecting the product.

ANALOG-TO-DIGITAL CONVERTER ADPC-101

Description

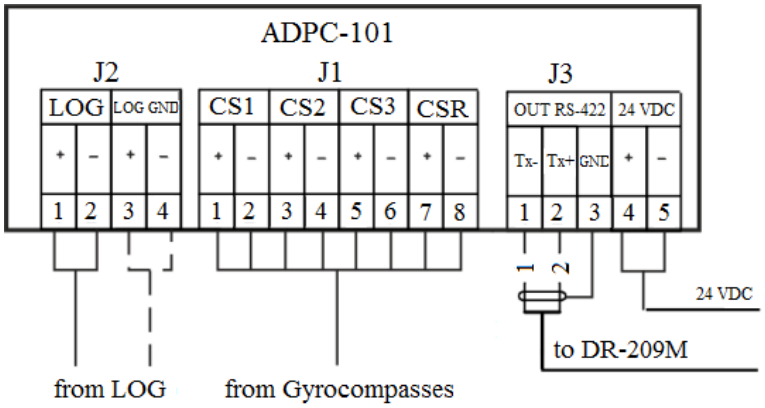
The unit is designed to ensure analog-to-digital conversion of analog signals received from gyrocompass and log in NMEA 0183 format.

Certificates

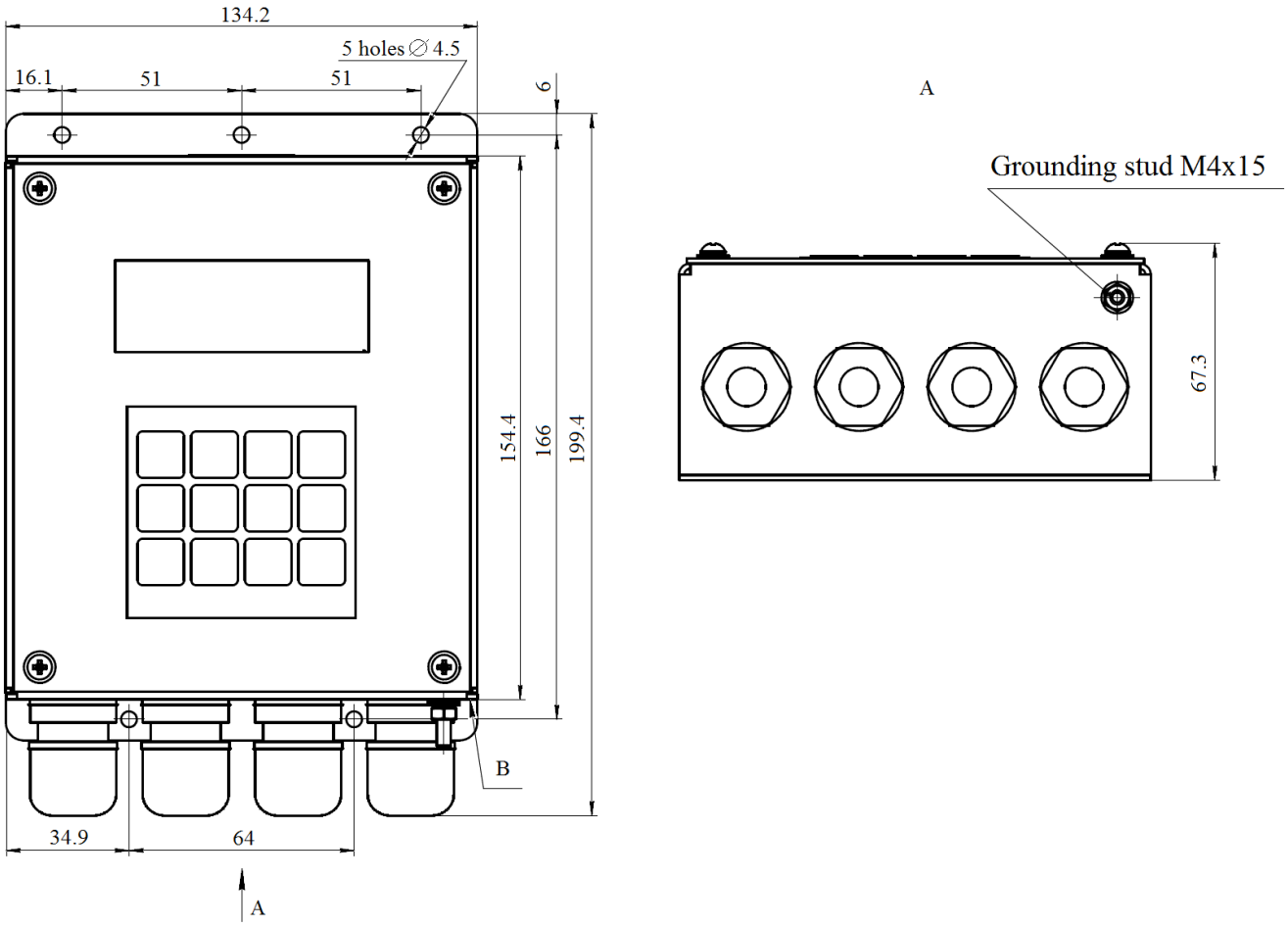
Technical specifications

Parameter	Value
Input voltage, VDC	24 (9.6 to 36.0)
Power consumption, mA	150
Gyrocompasses	synchro or stepper type
Logs	stepper (pulse) type or «closing» contact interface
Output signal format	standard line NMEA 0183 with line checksum
Number of options for line output	63
Speed, knots	0 to 99.9
Heading, degrees	0 to 359.9
Operating temperature, °C	–15 to +55
Limiting temperature, °C	–60 to +70
Weight, kg	1.2
Protection degree	IP22
Material	steel
Mounting type	wall

Connection diagram



Dimensions



Note – When installing provide a free space 80 mm from the surface B for connecting the product.

METEOROLOGICAL SENSOR WXT

Description

The unit is designed to measure wind speed and direction, amount and intensity of precipitation, air temperature and humidity, atmospheric pressure, for uninterruptible monitoring of changes in wind speed and direction.

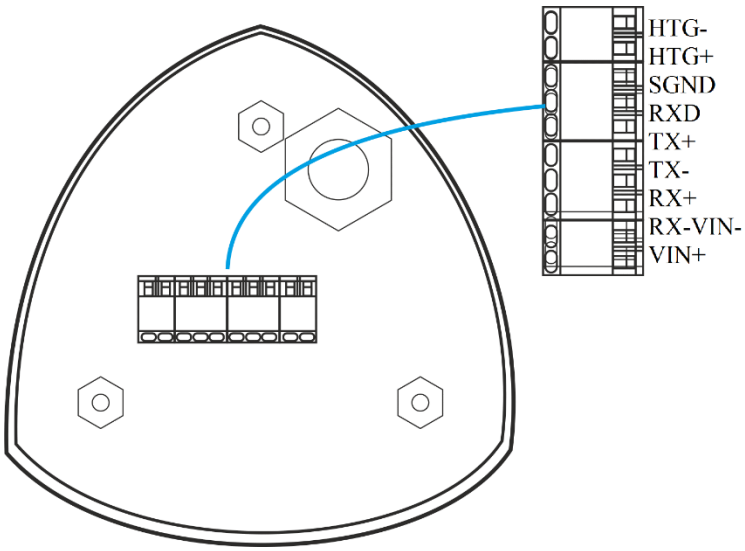
Certificates

Technical specifications

Parameter	Value			
	WXT536	WXT533	WXT532	WXT535
Input voltage, VDC	6 to 24			
Power consumption, W	0.1			
Output signal format	NMEA 0183			
Interface	RS-422			
Protection degree with installation kit	IP66			
Protection degree w/o installation kit	IP65			
Weight, kg	2.38	2.10	0.75	0.65
Pressure, hPa	600000 to 1100000			
Relative humidity, %	0 to 100			
Operating temperature, °C	–52 to +60			
Limiting temperature, °C	–60 to +70			
Air temperature				
Range, °C	–52 to +60	–	–	–52 to +60
Output resolution, °C	0.1			0.1
Accuracy, °C	±0.3			±0.3
Measurement units	°C, °F			°C, °F
Barometric pressure				
Range, hPa	600 to 1100	–	–	600 to 1100
Accuracy at 0 to +30 °C, hPa	±0.5			±0.5
Accuracy at –52°C to +60°C, hPa	±1			±1
Measurement units	hPa, Pa, bar, mmHg, inHg			hPa, Pa, bar, mmHg, inHg
Relative humidity				
Range, %	0 to 100 rh	–	–	0 to 100 rh
Output resolution, %	0.1 rh			0.1 rh
Accuracy at 0 to 90% rh, %	±3			±3
Accuracy at 90 to 100% rh, %	±5			±5
PTU Measuring interval at one second step, s	1 to 3600			1 to 3600

Parameter	Value			
	WXT536	**WXT533**	**WXT532**	**WXT535**
Wind direction				
Range	0° to 360°			–
Output resolution	1°			
Accuracy at 10 m/s	±3°			
Update interval at 1 s step, s	1 to 3600			
Wind speed				
Range, m/s	0 to 60			–
Accuracy at 10 m/s	±3			
Output resolution, m/s	0.1 (km/h, mph, knots)			
Measurement units	m/s, km/h, mph, knots			
Update interval at 1 s step, s	1 to 3600			
Precipitation				
Rainfall	Cumulative accumulation after the latest auto or manual reset		–	Cumulative accumulation after the latest auto or manual reset
Collecting area, cm^2	60			60
Output resolution, mm	0.01			0.01
Field accuracy for long-term accumulation, %	5			5
Measurement units	mm, inch			mm, inch
Rain intensity				
Range, mm/h	0 to 200		–	0 to 200
Measurement units	mm/h, inch/h			mm/h, inch/h

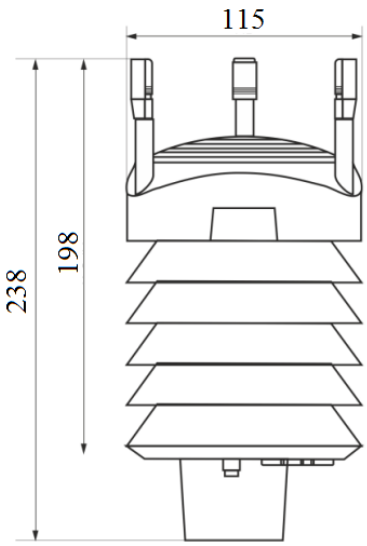
Connection diagram



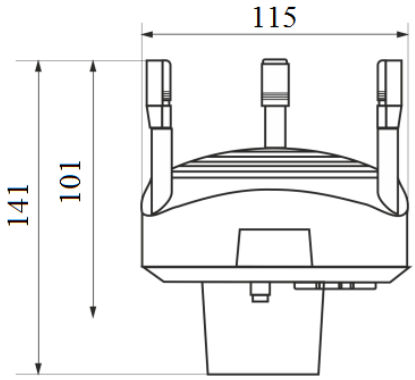
Pin №	Circuit
1 VIN+	Vin+
2 VIN–	Vin –
3 RX–	Data in (RX–)
4 RX+	Data in (RX+)
5 TX–	Data in (TX–)
6 TX+	Data in (TX+)
7 RX	–
8 SGND	–
9 HTG+	Vh+
10 HTG–	Vh–

Dimensions

WXT536, WXT535



WXT533, WXT532



METEOROLOGICAL SENSOR WX

Description

The unit is designed to measure air temperature and humidity, atmospheric pressure, wind speed and direction, define vessel's roll angle, location using built-in GPS and two-axis compass.

Certificates

Technical specifications

Parameter	Value		
	110WX[1)2)]	**120WXH**	**220WX[2)]**
Input voltage, VDC	9 to 40		
Power consumption, W	0.70	0.65	1.10
Interface	RS-422, RS-232	RS-422, CAN	RS-422, CAN
Protection degree	IP56		
Weight, kg	0.30		
Operating temperature, °C	–40 to +55		
Limiting temperature, °C	–60 to +70		
Air temperature			
Range, °C	–40 to +80		
Output resolution, °C	0.1		
Accuracy, °C	±1.1		
Measurement units	°C		
Barometric pressure			
Range, hPa	300 to 1100		
Accuracy, hPa	±0,5		
Output resolution, hPa	0.1		
Measurement units	hPa		
Relative humidity			
Range, %	0 to 100 rh		
Output resolution, %	0.1 rh		
Accuracy, %	±5 rh		
Measurement units	% rh		

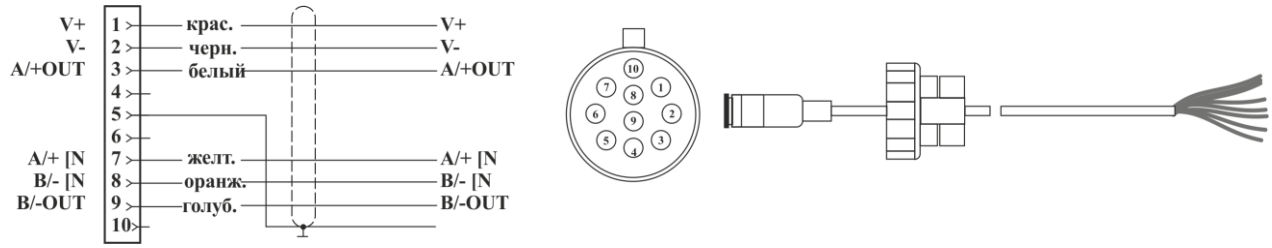
[1)] These models operate with two-axis compass. Major errors in course defining may occur in case of roll or pitch. Therefore, the corresponding errors of true wind direction may occur as well. To minimize or remove the errors use data from external compass.

[2)] Sensors allow for humidity sensors connection (at option). To install the sensors, unscrew two plugs on the sensor casing cover, install the humidity sensor and tighten the screws.

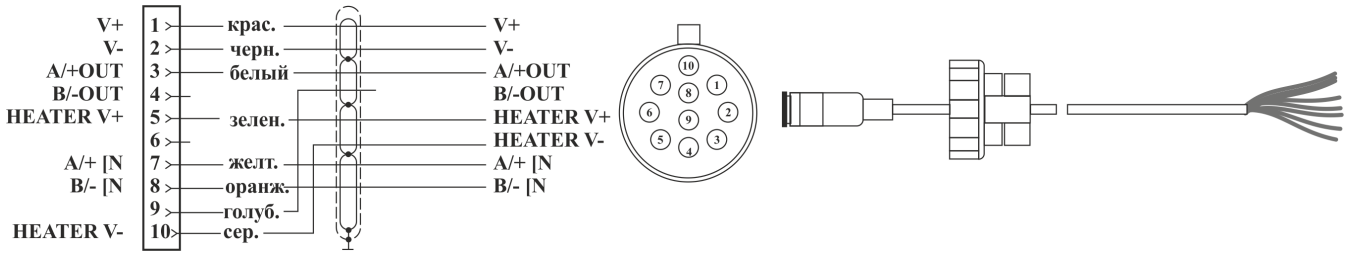
Parameter	Value		
	110WX[1)2)]	**120WXH**	**220WX[2)]**
Wind direction			
Range	0° to 359.9°		
Output resolution, m/s	0.10		
Accuracy at 10 m/s	±3°		
Measurement units	° (degrees)		
Wind speed			
Range, m/s	0 to 40		
Output resolution, %	0.1		
Accuracy at 10 m/s	5		
Measurement units	m/s		
Tilt angle			
Range	–	50°	
Output resolution		0,1°	
Accuracy		±1°	
Measurement units		°	
Three-axis compass			
Range	–	–	0 to 359°
Accuracy			±1° static ±2° dynamic

Connection diagram

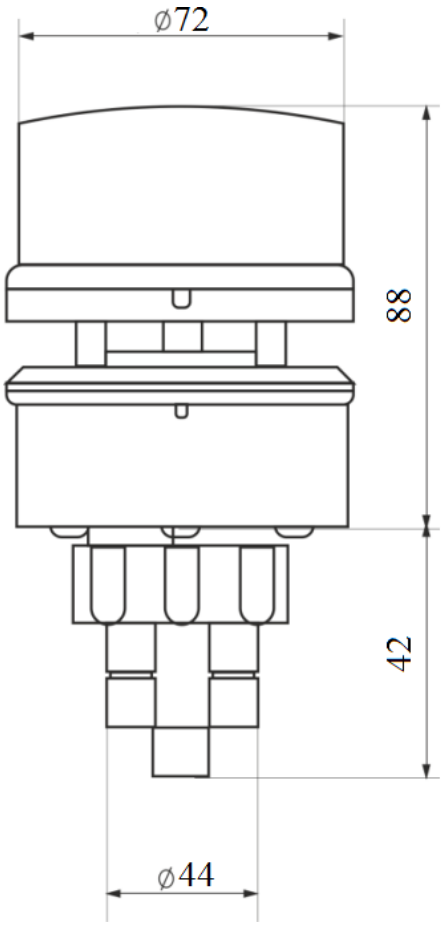
Connection diagram without heating



Connection diagram with heating



Dimensions



METEOROLOGICAL SENSOR WINDOBSERVER 65

Description

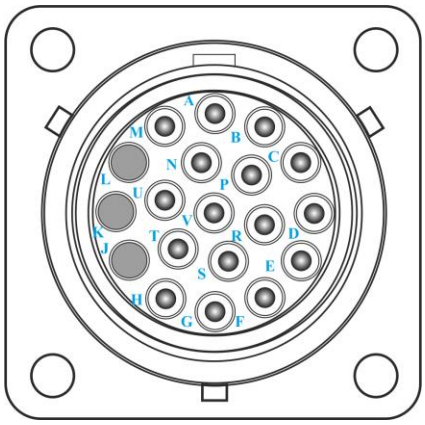
The unit is designed to measure wind speed and direction.

Certificates

Technical specifications

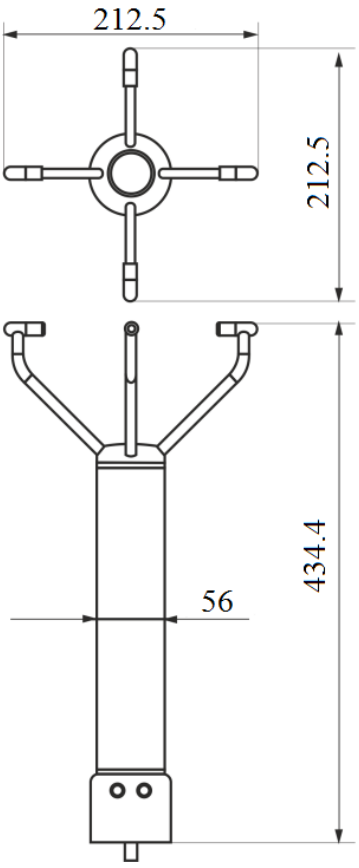
Parameter	Value
Input voltage, VDC	9 to 30 (40 mA – 12 VDC)
Heating (optional)	3A – 24 V AC or DC
Weight, kg	1.4
Protection degree	IP66
Humidity, % RH	0 to 100
Operating temperature, °C	–52 to +60
Limiting temperature, °C	–60 to +70
Precipitation, mm/h	300
EMC	EN 61000-6-2: 2001, EN 61000-6-3: 2001
Icing	MILSTD810F Method 521.2 Procedure I
Calibration	Not required
Interface	RS422/RS485 full duplex/half duplex
Baud rate	1200 to 38400
Formats	8 bit data; odd, even or no parity
Software	Service (display and recording)
	Operational (display and recording settings)
	Software security level against intentional and unintentional measurements complies with «medium» level
Wind speed	
Range, m/s	0 to 65
Starting threshold, m/s	0.01
Accuracy at 12 m/s, %	±2
Output resolution, m/s	0.01
Offset, m/s	±0.01
Wind direction	
Range	0° to 359°
Accuracy	±2°
Output resolution	1°
Ultrasonic output rate, Hz	1, 2, 4, 5, 8 or 10
Parameters	NMEA
Measurement units	m/s, knots, mph, kph, ft/min
Averaging, s	1 to 3600

Connection diagram



Pin №	Pair	Colour	Circuit
P	1	green	TXB+
C	1	black	TXA–
U	2	white	RXB+
V	2	black	RXA–
R	3	red	V+
D	3	black	V–
M	4	blue	0 V
N	4	black	Not used
A	5	yellow	Heater+
B	5	black	Heater–
H	6	brown	–
G	6	black	–
E	7	orange	–
F	7	black	–
T	8	white	–
S	8	red	–
L	9	green	–
K	9	red	–
J	–	–	–

Dimensions



METEOROLOGICAL SENSOR MS-315

Description

The unit is designed to measure air temperature and humidity, atmospheric pressure, wind speed, amount and intensity of precipitation.

The sensor includes overvoltage protective device (OPD-146).

Certificates

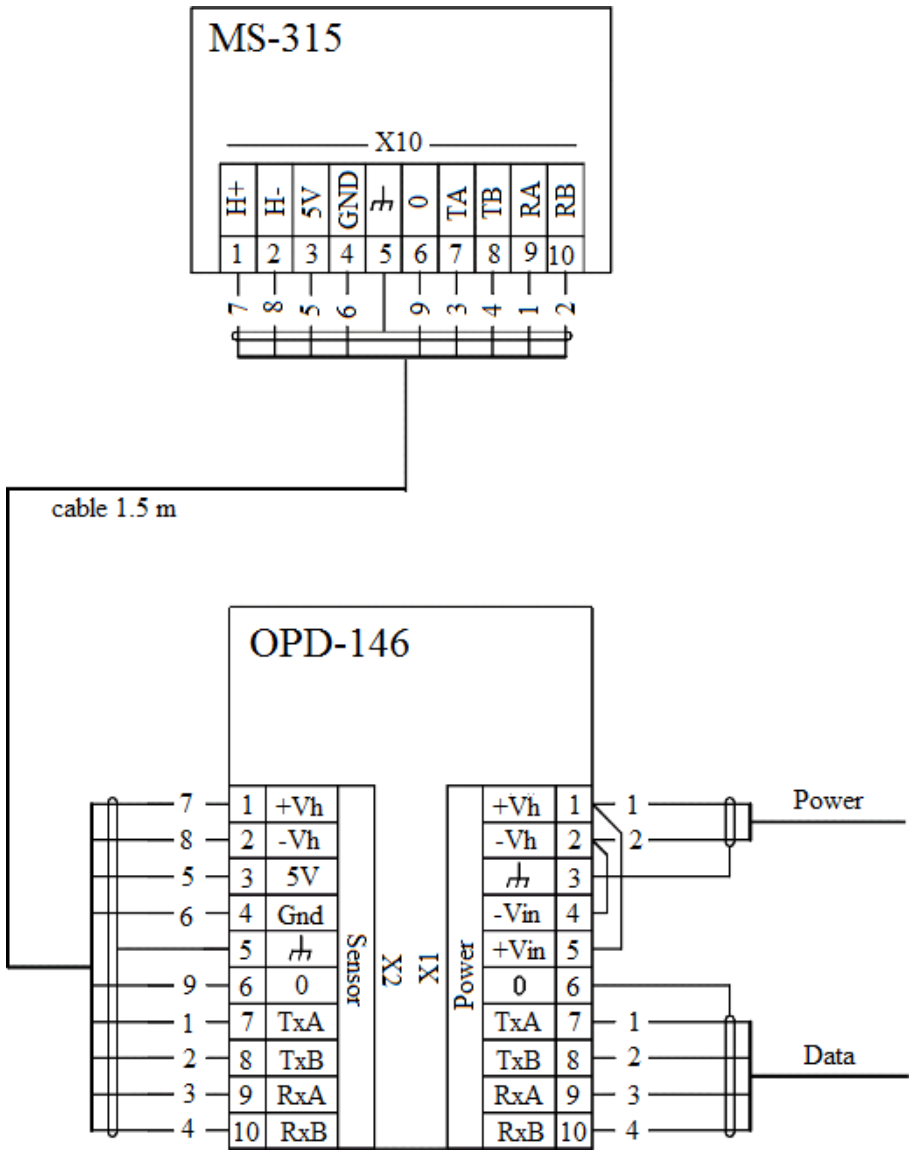
Technical specifications

Parameter	Value
Input voltage, VDC	18 to 36
Input voltage of heating, VDC	9 to 36
Power consumption, W	18
Power consumption with optional hood heaters, W	10
Interface	RS-422
Protection degree	IP56
Weight, kg	1.6
Operating temperature, °C	–52 to +60
Limiting temperature, °C	–60 to +70
Air temperature	
Range, °C	–52 to +60
Absolute measurement error, °C	
- within range –52 °C to –40 °C inclusively	±0.3
- within range –40 °C to +60 °C	±0.2
Barometric pressure	
Range, hPa	300 to 1200
Absolute measurement error, hPa	
- at temperature –52 °C to 0 °C inclusively	±1
- at temperature 0 °C to +40 °C inclusively	±0.3
- at temperature +40 °C to +60 °C	±1
Relative humidity	
Range, %	0 to 100
Absolute measurement error, %	
- within range 0.8 % to 90 % inclusively	±2
- within range 90 % to 100 %	±3
Wind speed	
Range, m/s	0.5 to 65.0
Absolute measurement error, m/s	
- within range 0.2 to 10 m/s inclusively	±0.3
- within range 10 to 65 m/s	±(0.3+0.02·V)[1)]

Parameter	Value
Wind direction	
Range	0 to 360
Absolute measurement error	±2
Precipitation amount	
Range, mm	0 to 999
Absolute measurement error, mm	±(0.5+0.02·M)[2)]
Precipitation intensity	
Range, mm/h	0 to 200
Absolute measurement error, mm/h	±(0.5+0.03·H)[3)]

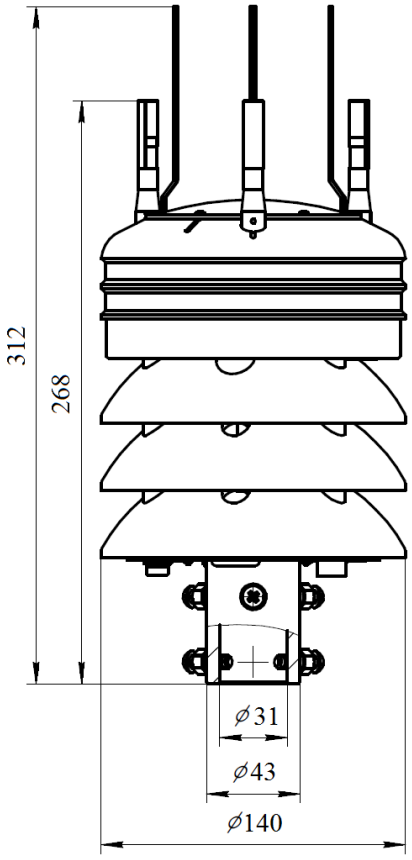
[1)] V – Airflow rate.
[2)] M – Precipitation amount.
[3)] H – Precipitation intensity.

Connection diagram

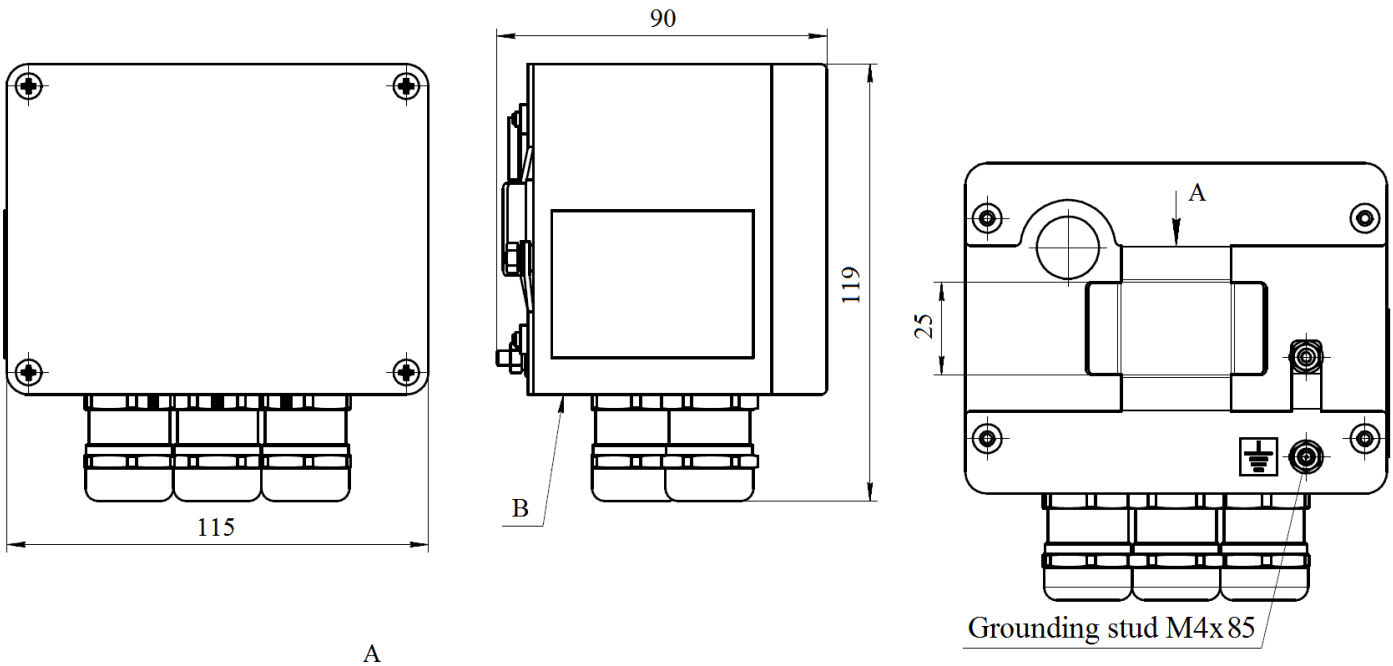


Dimensions

MS-315



OPD-146



Note – When installing provide a free space 80 mm from the surface B for connecting the product.

METEOROLOGICAL SENSOR MS-PTW-315

Description

The unit is designed to measure air temperature and humidity, atmospheric pressure.

The sensor includes overvoltage protective device (OPD-146).

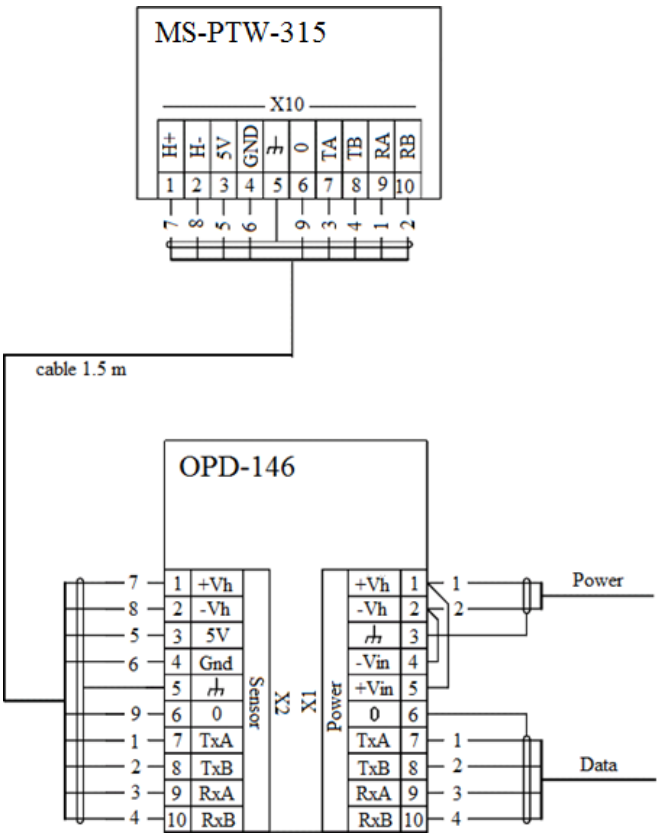
Certificates

Technical specifications

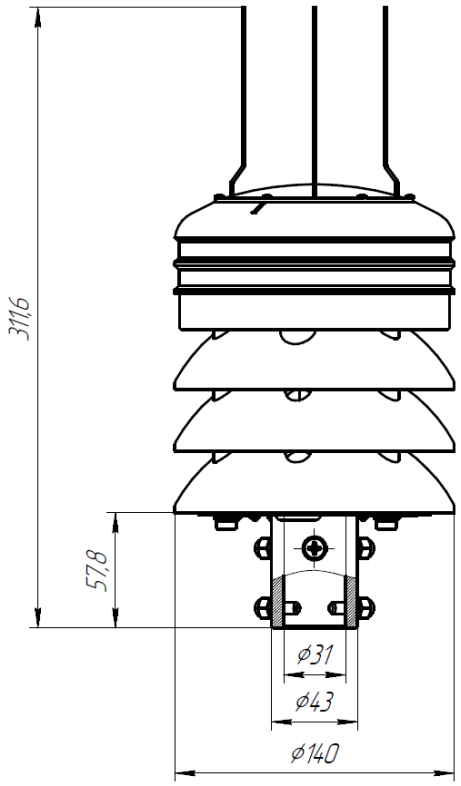
Parameter	Value
Input voltage, VDC	18 to 36
Input voltage of heating, VDC	9 to 36
Power consumption, W	18
Power consumption with optional hood heaters, W	10
Interface	RS-422
Protection degree	IP56
Weight, kg	1.6
Operating temperature, °C	–52 to +60
Limiting temperature, °C	–60 to +70
Air temperature	
Range, °C	–52 to +60
Absolute measurement error, °C	
- within range –52 °C to –40 °C inclusively	±0.3
- within range –40 °C to +60 °C	±0.2
Barometric pressure	
Range, hPa	300 to 1200
Absolute measurement error, hPa	
- at temperature –52 °C to 0 °C inclusively	±1
- at temperature 0 °C to +40 °C inclusively	±0.3
- at temperature +40 °C to +60 °C	±1
Relative humidity	
Range, %	0 to 100
Absolute measurement error, %	
- within range 0.8 % to 90 % inclusively	±2
- within range 90 % to 100 %	±3
Precipitation amount	
Range, mm	0 to 999
Absolute measurement error, mm	$\pm(0.5+0.02\cdot M)$[1)]
Precipitation intensity	
Range, mm/h	0 to 200
Absolute measurement error, mm/h	$\pm(0.5+0.03\cdot H)$[2)]

[1)] M – Precipitation amount.
[2)] H – Precipitation intensity.

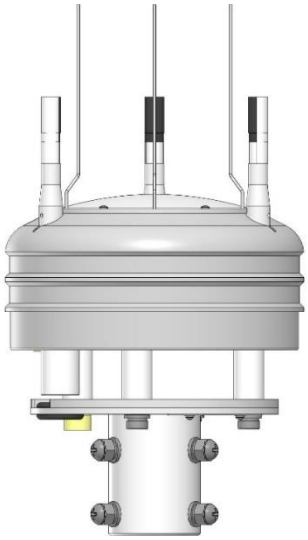
Connection diagram



Dimensions



METEOROLOGICAL SENSOR MS-SDW-315



Description

The unit is designed to measure wind speed and direction.

The sensor includes overvoltage protective device (OPD-146).

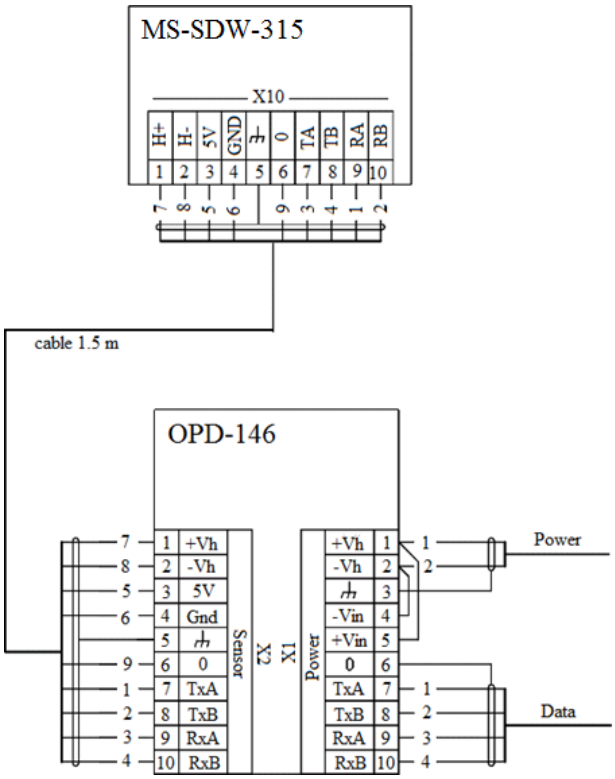
Certificates

Technical specifications

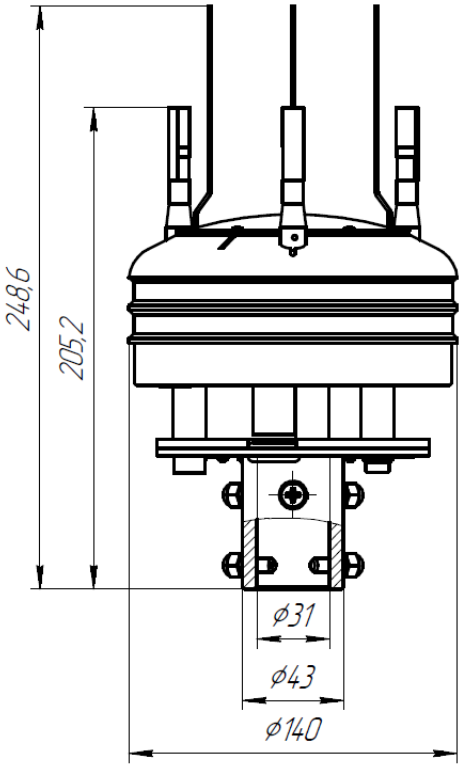
Parameter	Value
Input voltage, VDC	18 to 36
Input voltage of heating, VDC	9 to 36
Power consumption, W	18
Power consumption with optional hood heaters, W	10
Interface	RS-422
Protection degree	IP56
Weight, kg	1.6
Operating temperature, °C	–52 to +60
Limiting temperature, °C	–60 to +70
Relative humidity	
Range, %	0 to 100
Absolute measurement error, %	
- within range 0.8 % to 90 % inclusively	±2
- within range 90 % to 100 %	±3
Wind speed	
Range, m/s	0.5 to 65.0
Absolute measurement error, m/s	
- within range 0.2 to 10 m/s inclusively	±0.3
- within range 10 to 65 m/s	$\pm(0.3+0.02\cdot V)^{1)}$
Wind direction	
Range	0 to 360
Absolute measurement error	±2

[1)] V – Airflow rate.

Connection diagram



Dimensions



CLOUD-RANGE METER CL 31

Description

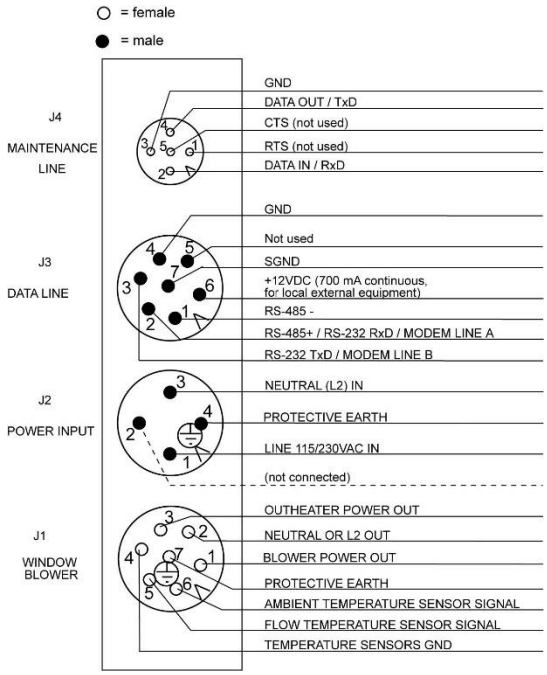
The unit is designed to measure cloud height and vertical visibility.

Certificates

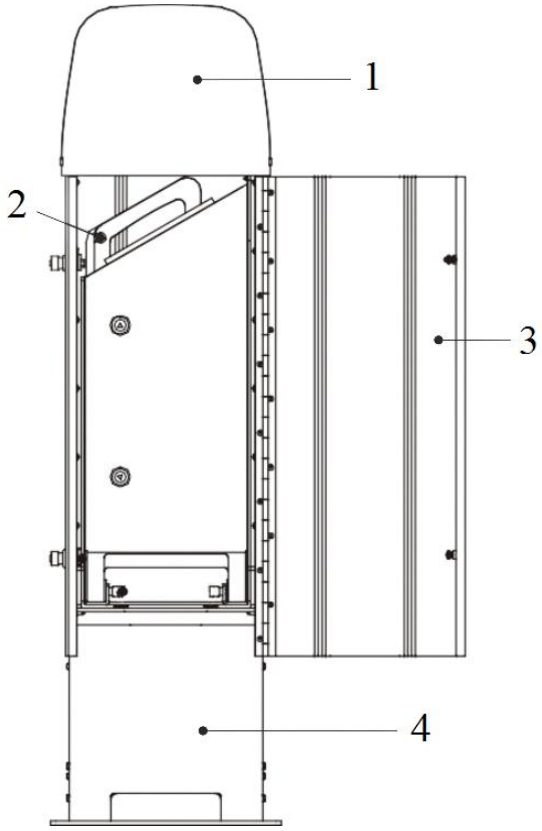
Technical specifications

Parameter	Value
Input voltage, VAC	220 ± 10%
Input voltage (standby), VDC	12
Power consumption, W	310
Power consumption of measurement unit, W	15
Power consumption of internal heating, W	100
Power consumption of window blower heater, W	175
Power consumption of window blower, W	20
Frequency (min/max), Hz	49 to 51
Overvoltage protection	Filter, varistor
Dimensions: Measurement unit, mm Height with shield, mm	 620x235x200 1190
Weight: Measurement unit, kg Shield and blower, kg	 12.0 18.5
Protection degree	IP65
Operating temperature, °C	–40 to +60
Measurement performance	
Range, m	5 to 7500
Measurement resolution, m	10 or 5
Cloud reporting resolution, m	5
Reporting interval, s	2 to 120
Measurement interval (default), s	2
Measurement interval (in high-resolution mode), s	3
Operating environment	
Temperature range, °C	–50 to +50
Humidity, %	93
Max.wind speed, m/s	50
Vibration, Hz	5 to 13.2; ±1.0 mm 13.2 to 100; ±0.7g

Connection diagram

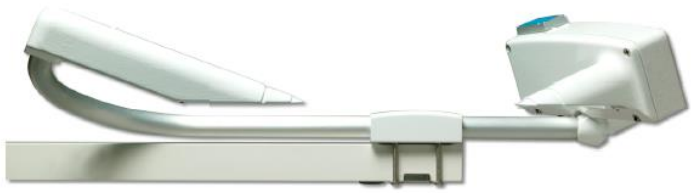


Unit



1 – Shield
2 – Measurement Unit
3 – Measurement unit cover
4 – Shield

VISIBILITY SENSOR PDW 12/ PDW 22



Description

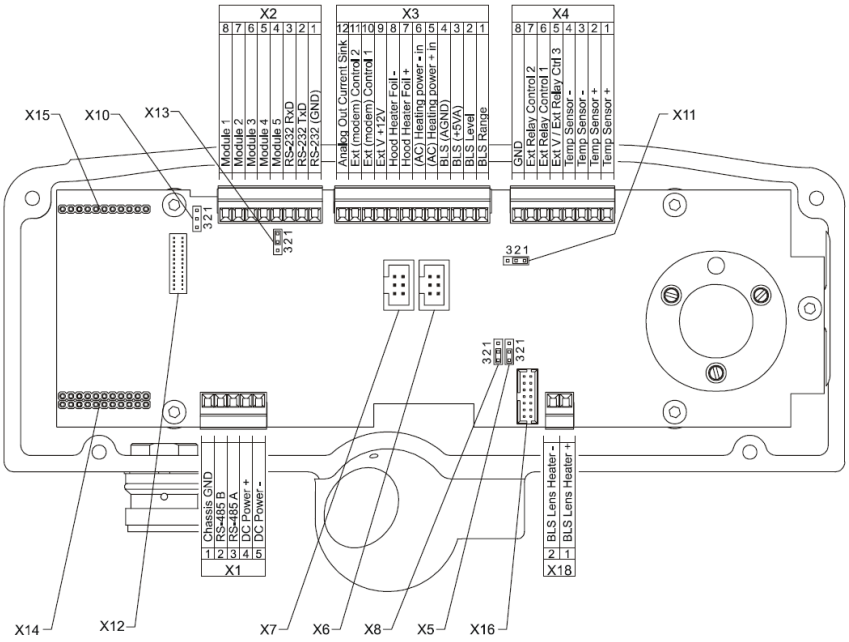
The unit is designed to measure visibility (meteorological optical range, MOR).

Certificates

Technical specifications

Parameter	Value	
	PWD12	**PWD22**
Input voltage, VDC	12 to 50	
Input voltage of heating	24 VAC or 24 VDC	
Power consumption, W	6	
Power consumption with optional hood heaters, W	65 (at 24 VDC)	
Mounting type	to the mast	
Outputs	RS-232, RS-485 (2-wire) Three relay controls (open collector) Analog output current: 0 to 1 mA or 4 to 20 mA 8-m power/data cable standard	
Auxiliary data	Alarm messages on low visibility. Three adjustable alarm limits to set three relay control circuits	
	Alarm messages on hardware status (fail/warning). Third relay control circuit may also be driven by hardware status	
Dimensions, mm	199x695x404	220x720x320
Weight, kg	3	
Protection degree	IP66	
Operating environment		
Operating temperature, °C	–40 to +55	
Operating humidity, %	0 to 100	
Wind, m/s	60	
Optical specifications of light transmitter		
Light source	near IR-range LED	
Peak wavelength	875 nm	
Base photodiode	To control light source	
Backscatter photodiode	To block and measure contamination	
Eye safety	Safety features comply with international standard IEC/EN 60 825-1; edition 1.2	
Optical specifications of light receiver		
Detector	photodiode	
Optical filter/window	glass RG780	
Backscatter light source	near IR-range LED to block and measure contamination	
Measurement performance		
Observation range of MOR, m	10 to 2000	10 to 20000
Accuracy, %	±10 at 10 to 2000 m	±10 at 10 to 10 000 m ±15 at 10 to 20 km
Constancy of measurement results, %	+5	
Update interval, s	15	

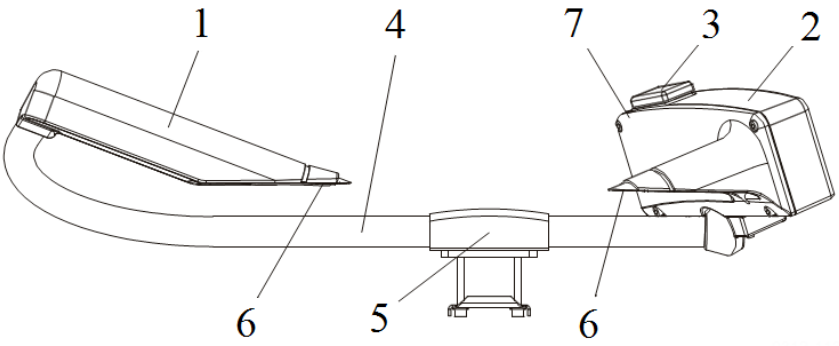
Connection diagram



Pin and connector №	Value
X1-1	Chasis (ground)
X1-2	RS-485 (B) white
X1-3	RS-485 (A) brown
X1-4	DC power for measurement electronics (+, red)
X1-5	DC power for measurement electronics (-, black)
X2-1	RS-232 (ground, grey)
X2-2	RS-232 (TxD, green)
X2-3	RS-232 (RxD, yellow)
X2-4	Module 5
X2-5	Module 4
X2-6	Module 3
X2-7	Module 2
X2-8	Module 1
X3-1	Background brightness sensor PWL111 (range, yellow)
X3-2	Background brightness sensor PWL111 (level, green)
X3-3	Background brightness sensor PWL111 +5 V (analog, red) X3
X3-4	Background brightness sensor PWL111 (AGND, black)
X3-5	Individual powe input of hood heaters PWH111 (+, brown/green and white /green)
X3-6	Individual powe input of hood heaters PWH111 (-, white/yellow and yellow/brown)
X3-7	Hood heater film (+) PWH111
X3-8	Hood heater film (-) PWH111
X3-9	External voltage +12 V (analog output current source (pink))
X3-10	Control over 1 external unit (modem)
X3-11	Control over 2 external units (modem)
X3-12	Sink of analog output current (range is selected by jumper X13),blue
X4-1	Temperature sensor PT100 (+, blue)
X4-2	Temperature sensor PT100 (+, yellow)
X4-3	Temperature sensor PT100 (-, red)
X4-4	Temperature sensor PT100 (-, green)
X4-5	External relay control circuit 3 (by default) or external voltage +12 V (selected by jumper X11), violet
X4-6	External relay control circuit 1 (grey/pink)
X4-7	External relay control circuit 2 (red/blue)
X4-8	Ground

Pin and connector №	Value
X5 and X8	Jumpers between pins 2 and 3 (by default): Lens heaters are powered with DC voltage throught pins X1-4 and X1-5. Jumpers between pins 1 and 2: Lens heaters are powered with individual voltage (AC or DC) through pins X3-5 and X3-6
X6	Connector №1 of RAINCAP sensor. To connect one plate rain sensor. For two plate rain sensors of unit PWD22/52, a cable, marked with black stripe (inclined forward plate), is connected to pin X6
X7	Connector №2 of RAINCAP® sensor is used only in model PWD22/52 (inclined backward plate)
X9	Restart
X10-1	+5 volt ampere
X10-2	Aux: input ADC CPU (internally connected to X3-2)
X10-3	AGND
X11	Jumper between pins 1 and 2 (by default): output pin X4-5 is used as pin of external relay control circuit 3. Jumper between pins 2 and 3: output pin X4-5 is used as external voltage output
X12	Connector to program FLASH-memory
X13	Jumper between pins 1 and 2 (by default): output analog current range 4 to 20 mA (pins X3-9 and X3-12). Jumper between pins 2 and 3: output analog current range 0 to 1 mA (pins X3-9 and X3-12)
X14	Module connector
X15	Module connector
X16	Transmitter connector (pin 14 is not used)
X18-1	Heater of background brightness sensor PWL111 (+, white)
X18-2	Heater of background brightness sensor PWL111 (-, blue)

The unit



1 – transmitter
2 – controller or receiver
3 – clean plate
4 – temperature sensor
5 – mounting clamp
6 – hood heaters (at option)
7 – place for heater of background brightness sensor (at option)

WAVE HEIGHT SENSOR W5G

WG5-DR-CP

WG5-DR-EX

Description

The unit is designed to measure wave height.

Certificates

Technical specifications

Parameter	WG5-DR-CP	WG5-DR-EX (explosion proof version)
	Value	
Input voltage	24 to 64 VDC or 65 to 240 VAC	
Power consumption, W	8 (for sensors), 4.8 (for measurement unit)	
Operating temperature, °C	–40 to +65 (for sensors) –20 to +65 (for measurement unit)	
Humidity, %	0 to 100	
Protection degree	IP67	
Dimensions of sensors, mm	265 x 245	217 x 319 x 378
Dimensions of measurement unit, mm	170 x 172 x 85	
Weight, kg	12.5	14.4
Material	stainless steel	chromatized aluminum
Interfaces	2 x RS-232, 2 x Ethernet, 2 x USB 2.0	
Heave		
Range, m	2 to 75	
Accuracy, mm	±3	
Frequency, Hz	10	
Water level		
Accuracy, cm	±1	
Processing	10 s, 1 min, 5 min, 10 min	
Interval, min	1	
Wave height		
Range, m	2 to 60	
Accuracy, cm	±1	
Processing	SWAP per 20 min data block	
Interval, min	1	
Wave period		
Range, s	1 to 100	
Accuracy, ms	±50	
Processing	SWAP per 20 min data block	
Interval, min	1	
Wave direction		
Wave direction	0° to 359.9°	
Accuracy	±2°	
Processing	SWAP per 20 min data block	
Interval, min	1	

CURRENT SENSOR 4830R

Description

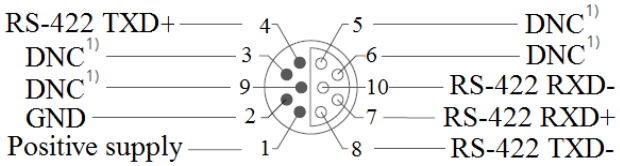
The unit is designed to measure current speed and direction.

Certificates

Technical specifications

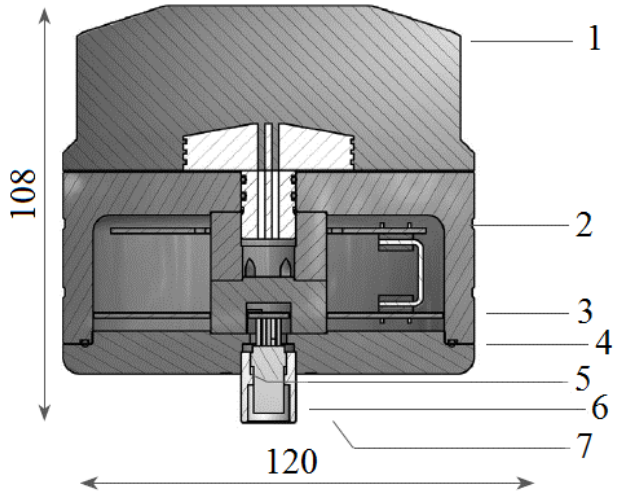
Parameter	Value
Input voltage, VDC	6 to 14
Operating temperature, °C	–5 to +50
Depth capability, m	300
Interfaces	RS-232; RS-422
Output	9600 baud, 8 data bit, no parity,1 stop bit, Xon/Xoff
Maximum cable length, m	1500
Current speed	
Range, cm/s	0 to 300
Accuracy, cm/s	±0.15
Output resolution, cm/s	0.1
Current direction	
Range	0° to 359.9°
Accuracy	±5° for 0° to 15° tilt ±7.5° for 15° to 35° tilt
Output resolution	0,01°
Air temperature	
Range, °C	–5 to +40
Accuracy, °C	0.1
Output resolution, °C	0.01
Measurement period, s	30
Tilt circuitry	
Range	0° to 35°
Accuracy	±1.5°
Output resolution	0.01°
Compass circuitry	
Output resolution	0,01°
Range	±3°
Frequency, MHz	1.9 to 2.0
Power, W	25 in 1 ms / pulse

Connection diagram



[1)]DNC – Do Not Connect.

Dimensions



1 – transducer head
2 – analog board
3 – digital board
4 – o-ring
5 – o-ring groove
6 – receptacle
7 – receptacle housing