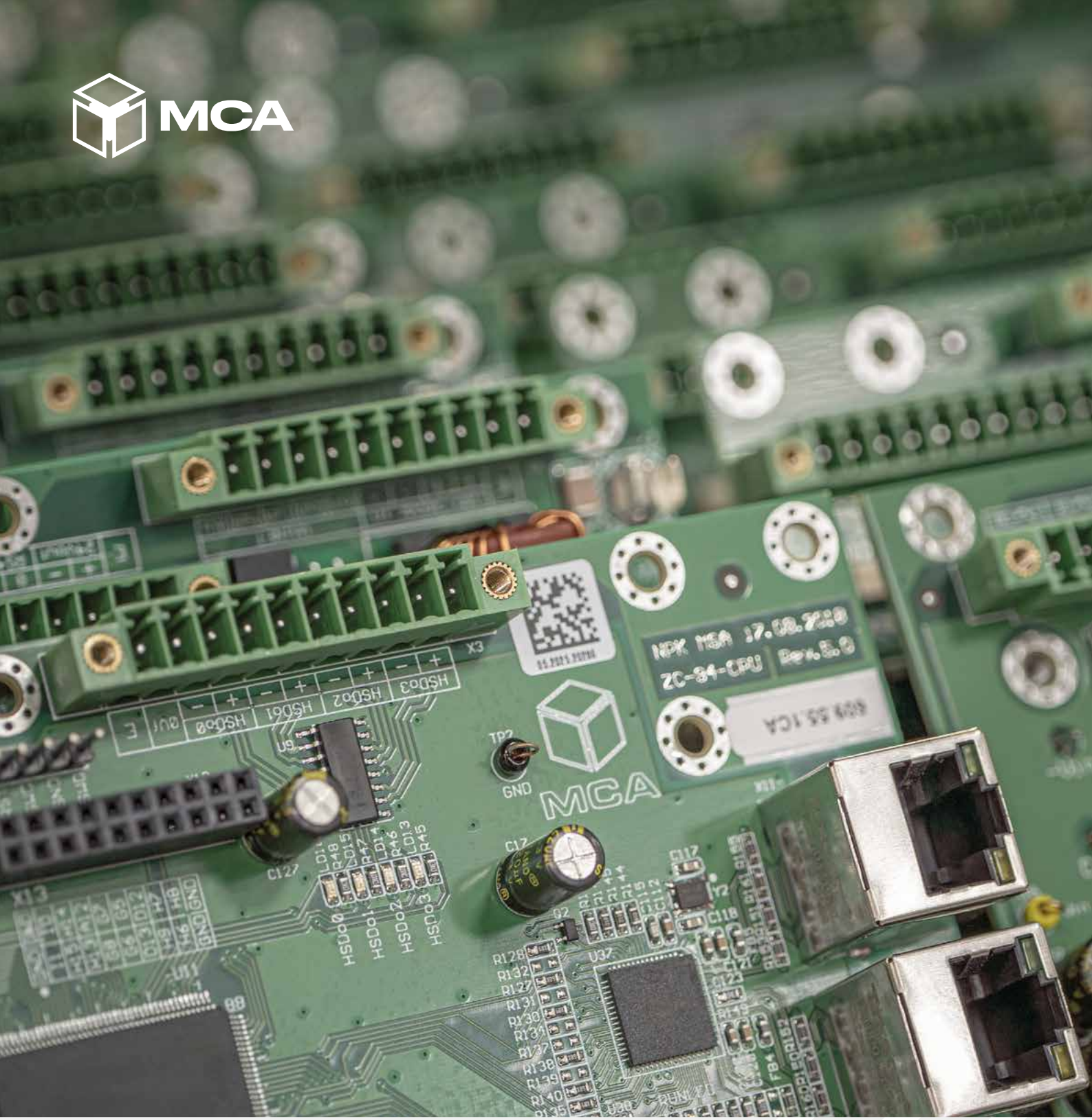
MCA



2025

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MARINE ELECTRONICS

NPK Morsvyazavtomatica Limited Liability Company

ABOUT COMPANY

NPK Morsvyazavtomatica Limited Liability Company (NPK MCA LLC) is a diversified company specializing in equipment design and manufacturing of industrial, power and shipborne equipment. The company was founded in 2003 and has been continuously growing for over 20 years. Our success is based on the innovative approach and customer care.

Under Unicont trademark NPK MCA produces electronic and mechano-electronic systems for ship control, convenience and safety of the passengers and crew. Our equipment can operate in harsh conditions of increased humidity, rolling, steady-state vibration and if there are no stationary power sources.

100%
Russian production

22 years
on the market

> 1600
employees

> 40 000 m²
manufacturing shop floor

50
dealers in Russia

> 40
dealers worldwide

Along with the manufacturing unit, NPK MCA has at its disposal research and design departments. This enables to implement innovations; therefore, reduce costs, improve quality, expand the product range and increase the production output. Our skilled professionals carefully analyze customer needs and offer the best customized solutions. Wide expertise paired with streamlined business processes enable the company to complete any project successfully.

Being reliable, cost-effective and convenient Unicont equipment complies with the current standards and has the certificates of Russian Maritime Register of Shipping and Russian Classification Society (former Russian River Register).

ФЕДЕРАЛЬНАЯ СЛУЖБА
ПО ЭКОЛОГИЧЕСКОМУ, ТЕХНОЛОГИЧЕСКОМУ И АТОМНОМУ НАДЗОРУ

ЛИЦЕНЗИЯ

Регистрационный номер **СЕ-11-101-5860** от **21 июля 2025 г.**

Лицензия выдана **обществу с ограниченной ответственностью «НПК Морсвязьавтоматика» (ООО «НПК МСА»)**

Местонахождение лицензиата **г. Санкт-Петербург, ул. Кибальчича, д. 26, литер Е**

Основной государственный регистрационный номер юридического лица (ОГРН) **1057813313909**
Идентификационный номер налогоплательщика **7842327352**

Лицензия дает право **на конструирование оборудования для ядерных установок, радиационных источников, пунктов хранения ядерных материалов и радиоактивных веществ, хранилищ радиоактивных отходов**
Объекты, на которых или в отношении которых осуществляется деятельность:
атомные станции, суда и другие плавсредства с ядерными реакторами, суда атомно-технологического обслуживания; сооружения и комплексы с промышленными и исследовательскими ядерными реакторами; другие содержащие ядерные материалы сооружения, комплексы, установки для производства, использования, переработки, транспортирования ядерного топлива и ядерных материалов;
не относящиеся к ядерным установкам комплексы, установки, аппараты, оборудование и изделия в которых содержатся радиоактивные вещества;
стационарные объекты и сооружения, не относящиеся к ядерным установкам, радиационным источникам и предназначенные для хранения ядерных материалов и радиоактивных веществ, хранения или захоронения радиоактивных отходов

Основание для выдачи лицензии **Заявление соискателя лицензии № 1085 от 18.03.2025; Решение заместителя руководителя Северо-Европейского межрегионального территориального управления по надзору за ядерной и радиационной безопасностью Федеральной службы по экологическому, технологическому и атомному надзору от 07.07.2025 №6331/В**

Срок действия лицензии **до 21 июля 2035 г.**

Лицензия действует при соблюдении прилагаемых условий действия лицензии, являющихся ее неотъемлемой частью

И. о. руководителя органа лицензирования **В.А. Джавадов**

Серия А В № 317689

ФЕДЕРАЛЬНАЯ СЛУЖБА
ПО ЭКОЛОГИЧЕСКОМУ, ТЕХНОЛОГИЧЕСКОМУ И АТОМНОМУ НАДЗОРУ

ЛИЦЕНЗИЯ

Регистрационный номер **СЕ-12-101-5861** от **21 июля 2025 г.**

Лицензия выдана **обществу с ограниченной ответственностью «НПК Морсвязьавтоматика» (ООО «НПК МСА»)**

Местонахождение лицензиата **г. Санкт-Петербург, ул. Кибальчича, д. 26, литер Е**

Основной государственный регистрационный номер юридического лица (ОГРН) **1057813313909**
Идентификационный номер налогоплательщика **7842327352**

Лицензия дает право **на изготовление оборудования для ядерных установок, радиационных источников, пунктов хранения ядерных материалов и радиоактивных веществ, хранилищ радиоактивных отходов**
Объекты, на которых или в отношении которых осуществляется деятельность:
атомные станции, суда и другие плавсредства с ядерными реакторами, суда атомно-технологического обслуживания; сооружения и комплексы с промышленными и исследовательскими ядерными реакторами; другие содержащие ядерные материалы сооружения, комплексы, установки для производства, использования, переработки, транспортирования ядерного топлива и ядерных материалов;
не относящиеся к ядерным установкам комплексы, установки, аппараты, оборудование и изделия в которых содержатся радиоактивные вещества;
стационарные объекты и сооружения, не относящиеся к ядерным установкам, радиационным источникам и предназначенные для хранения ядерных материалов и радиоактивных веществ, хранения или захоронения радиоактивных отходов

Основание для выдачи лицензии **Заявление соискателя лицензии № 1084 от 18.03.2025; Решение заместителя руководителя Северо-Европейского межрегионального территориального управления по надзору за ядерной и радиационной безопасностью Федеральной службы по экологическому, технологическому и атомному надзору от 07.07.2025 №6332/В**

Срок действия лицензии **до 21 июля 2035 г.**

Лицензия действует при соблюдении прилагаемых условий действия лицензии, являющихся ее неотъемлемой частью

И. о. руководителя органа лицензирования **В.А. Джавадов**

Серия А В № 317690

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Amplifier-multiplier of NMEA signals

MDU-102
ЦИУЛ.468363.001

INTENDED USE

Multiplication of NMEA 0183 and other signals.

DESCRIPTION

Serial communication via RS-232 and RS-422/485 interfaces from one or two sources. A check-sum test is implemented for data received via the first channel.

TECHNICAL SPECIFICATIONS

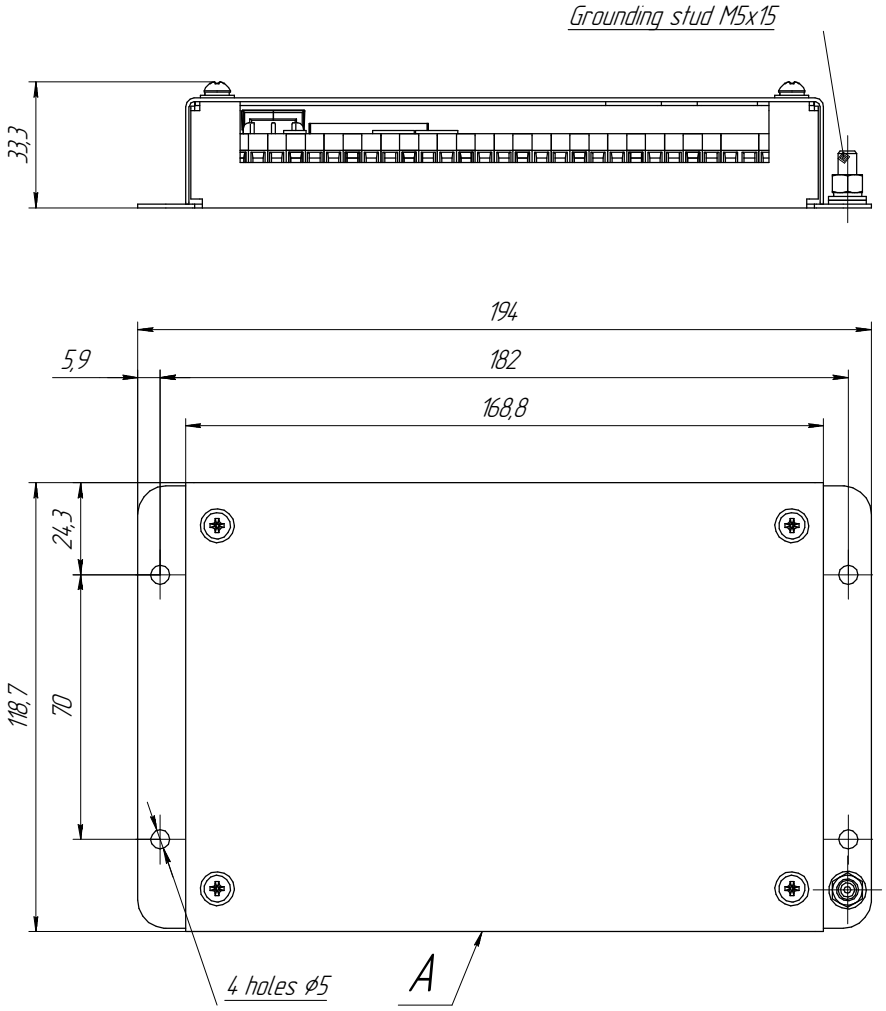
General specifications	
IP rating	IP22
Storage temperature	-60 ... +70 °C
Operating temperature	-15 ... +55 °C
Weight	0.65 kg

Inputs	
Input ports	2 (CH1, CH2)
Supported interfaces	RS-232, RS-422/485
Max. receive rate	1200 - 115200 bit/s
Galvanic isolation	+

Electrical specifications	
Supply voltage	10...36 V DC
Max. power consumption	3 W
Galvanic isolation from power mains	+
Reverse polarity protection	+
Overvoltage protection	+

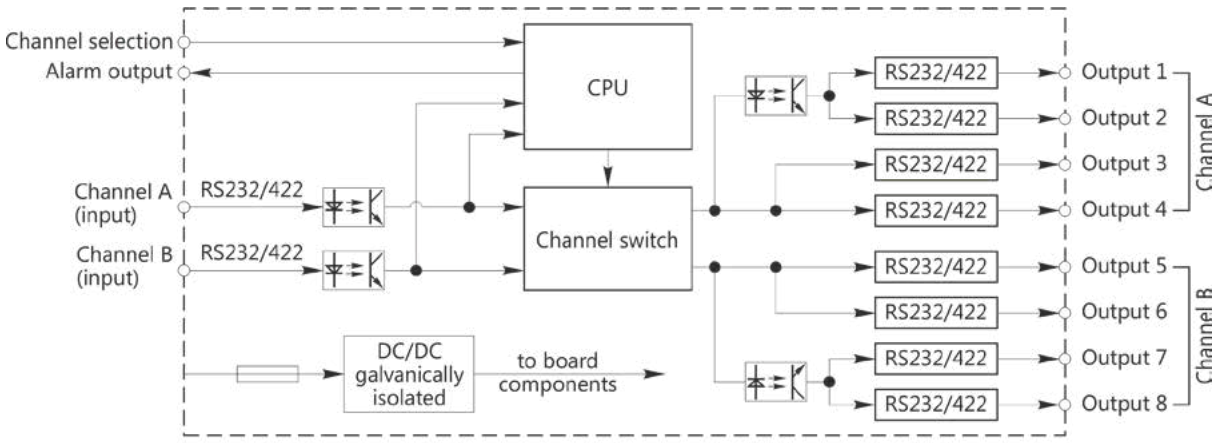
Outputs	
Output ports	8 (2×4)
Output groups	2 (A and B)
Galvanic isolation	4 non-isolated, 4 isolated.
Supported interfaces	RS-232, RS-422/485
Max. baud rate	1200 - 115200 bit/s

Overall and installation dimensions of MDU-102



When mounting, provide 60 mm from surface A to connect the product.

Functional diagram of MDU-102



NMEA 0183 signal multiplicator with integrated summarizer

ADU-202

ЦИУЛ.468363.002

INTENDED USE

Amplification and multiplication of NMEA 0183 and other signals.

DESCRIPTION

Serial communication via RS-232 and RS-422/485 interfaces. An integrated summarizer combines the input NMEA 0183 sentences and transmits the results to one or two output groups, depending on the jumpers' position on the printed circuit board.

TECHNICAL SPECIFICATIONS

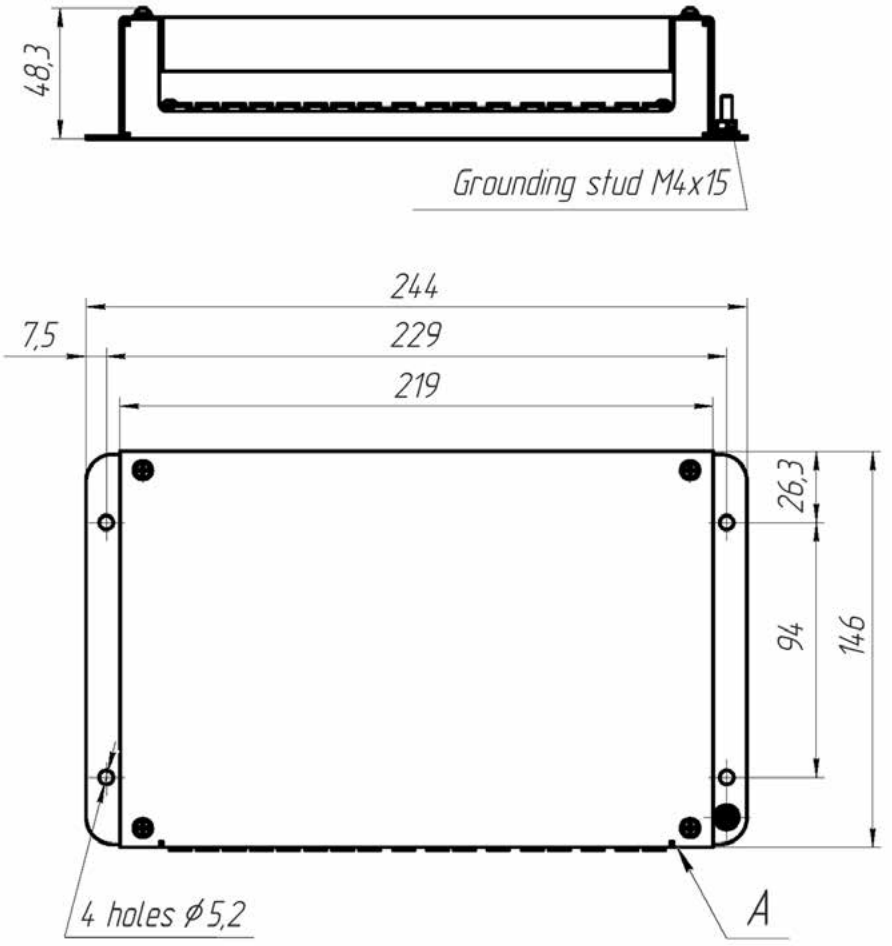
General specifications	
IP rating	IP22
Storage temperature	-60 ... +70 °C
Operating temperature	-25 ... +55 °C
Weight	1.1 kg

Inputs	
Input ports	2 (A, B)
Supported interfaces	2 (RS-232, RS-422/RS-485)
Max. receive rate	230400 bit/s
Galvanic isolation	+

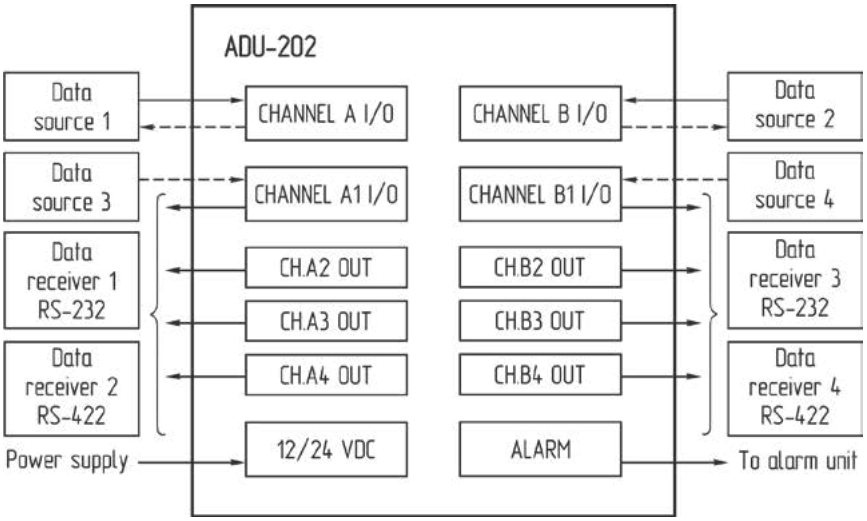
Electrical specifications	
Supply voltage	12 или 24 В постоянного тока
Max. power consumption	не более 5 Вт
Galvanic isolation from power mains	+
Reverse polarity protection	+
Overvoltage protection	+

Outputs	
Output groups	2 (A, B)
Outputs per group	4
Interfaces per output	2 (RS-232, RS-422/RS-485)
Galvanic isolation	+
Outputs, total	16
Max. baud rate	230400 bit/s

Overall and installation dimensions of ADU-202



Functional diagram of ADU-202



Bidirectional RS-232/422 converter

RS-104

ЦИУЛ.468152.010

INTENDED USE

Bidirectional conversion between RS-232 and RS-422 standards.

DESCRIPTION

The unit combines equipment operating with RS-232 or RS-422 signals on river- and sea-going vessels.

TECHNICAL SPECIFICATIONS

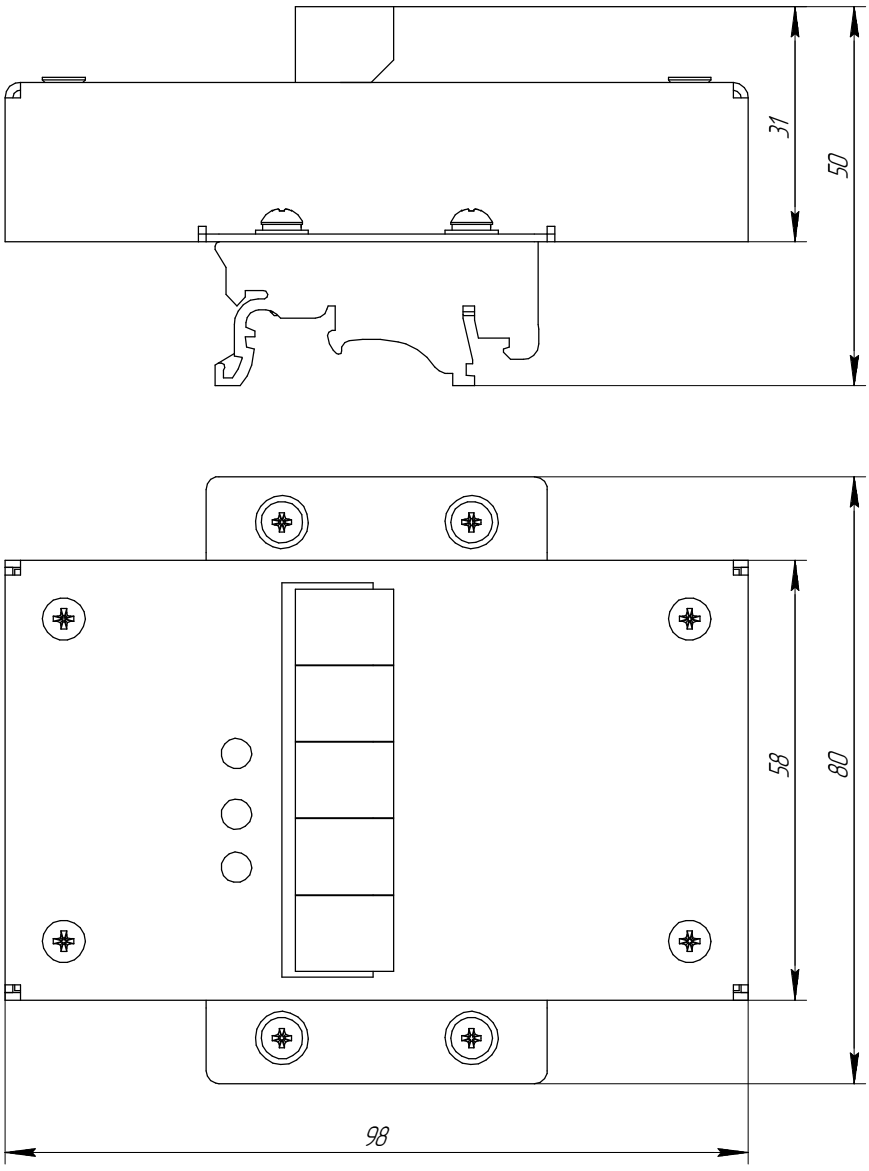
General specifications	
IP rating	IP22
Storage temperature	-60 ... +70 °C
Operating temperature	-15 ... +55 °C
Weight	0.2 kg

Inputs	
Input ports	2
Supported interfaces	RS-232 and RS-422
Receive rate	4800 - 115200 bit/s
Optoisolation of inputs/outputs	+

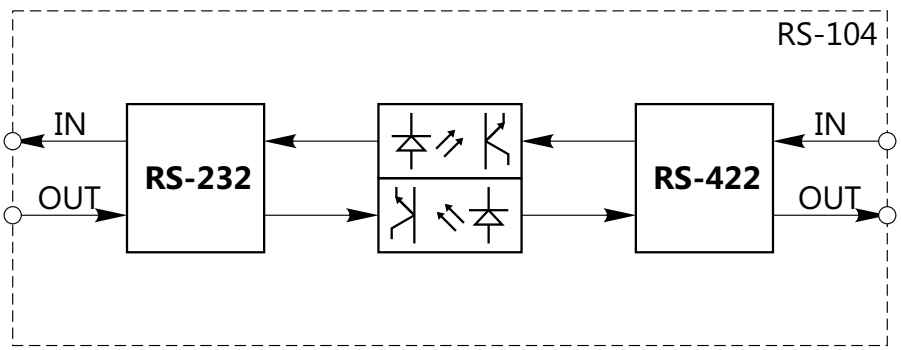
Electrical specifications	
Supply voltage	10...36 V DC
Power consumption	3 W

Outputs	
Output ports	2
Supported interfaces	RS-232 and RS-422
Baud rate	4800 - 115200 bit/s

Overall and installation dimensions of RS-104



Functional diagram of RS-104



NMEA Data combiner

NC-117
ЦИУЛ.468152.101

INTENDED USE

Receiving messages from NMEA 0183 signal sources.

DESCRIPTION

- 8 input ports RS-232/422 and 1 USB-port to receive a message,
- the received message is combined into one (according to user settings),
- and output via 4 output ports RS-232/422 and one USB-port.

The unit combines sentences:
- starting with $, ! or #
- ending with <CR> and <LF> («carriage return» (CR) and “line feed” (LF) symbols)

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

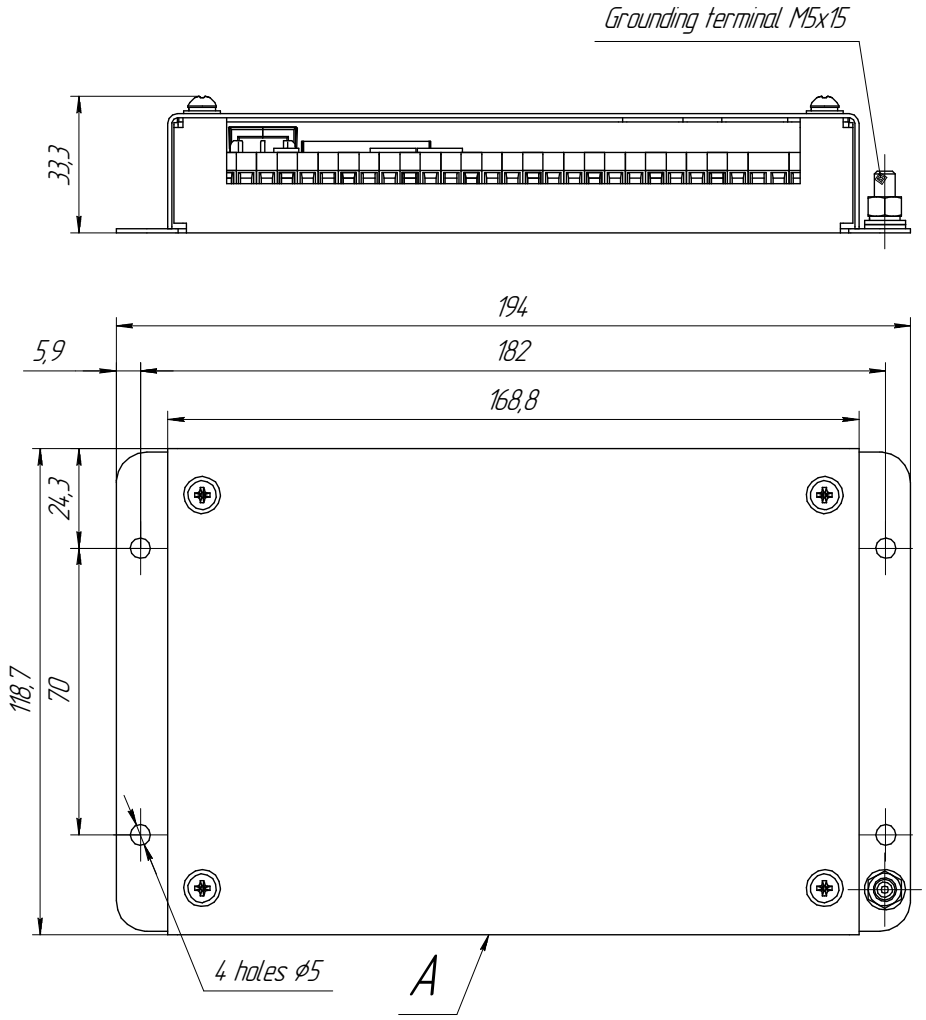
General specifications	
IP rating	IP22
Storage temperature	-60 ... +70 °C
Operating temperature	-15 ... +55 °C
Weight	0.2 kg

Inputs	
Input ports	2
Supported interfaces	RS-232 and RS-422
Receive rate	4800 - 115200 bit/s
Optoisolation of inputs/outputs	+

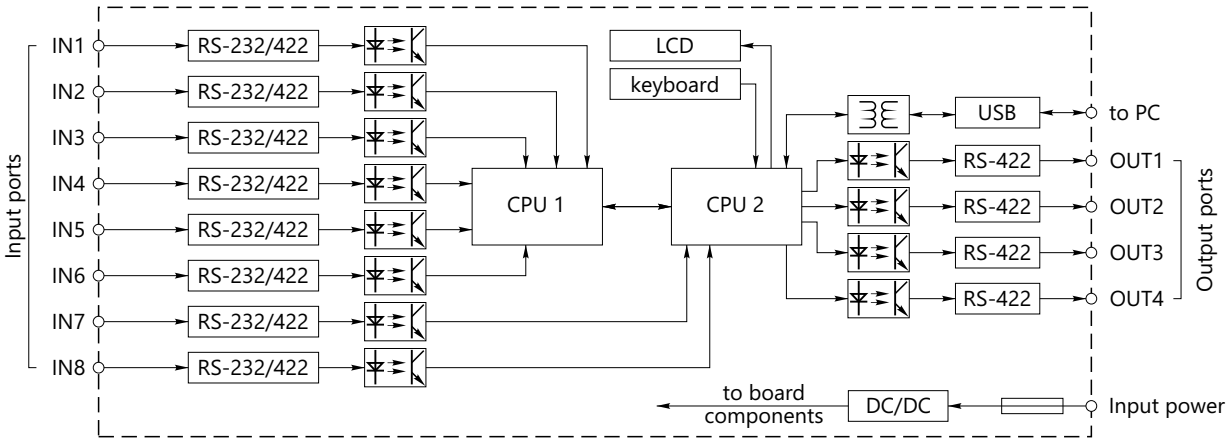
Electrical specifications	
Supply voltage	10...36 V DC
Power consumption	3 W

Outputs	
Output ports	2
Supported interfaces	RS-232 and RS-422
Baud rate	4800 - 115200 bit/s

Overall and installation dimensions of NC-117



Functional diagram of NC-117



NMEA Data combiner

NC-217
ЦИУЛ.468152.100

INTENDED USE

Receiving messages from NMEA 0183 signal sources.

DESCRIPTION

- 4 input ports RS-232/422 to receive a message,
- the received message is combined into one (according to user settings),
- and output via 12 output ports RS-232/422.

Two additional bidirectional service ports RS-232/422 and one USB port are provided.

TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Storage temperature	-55 ... +75 °C
Operating temperature	-25 ... +55 °C
Weight	3.5 kg

Inputs	
Receive rate	4800 - 115200 bit/s
Input ports	4
Supported interfaces	RS-232/422
Signal format	NMEA 0183 version 2 and 3 (checksum test CRC)
Optoisolation	+

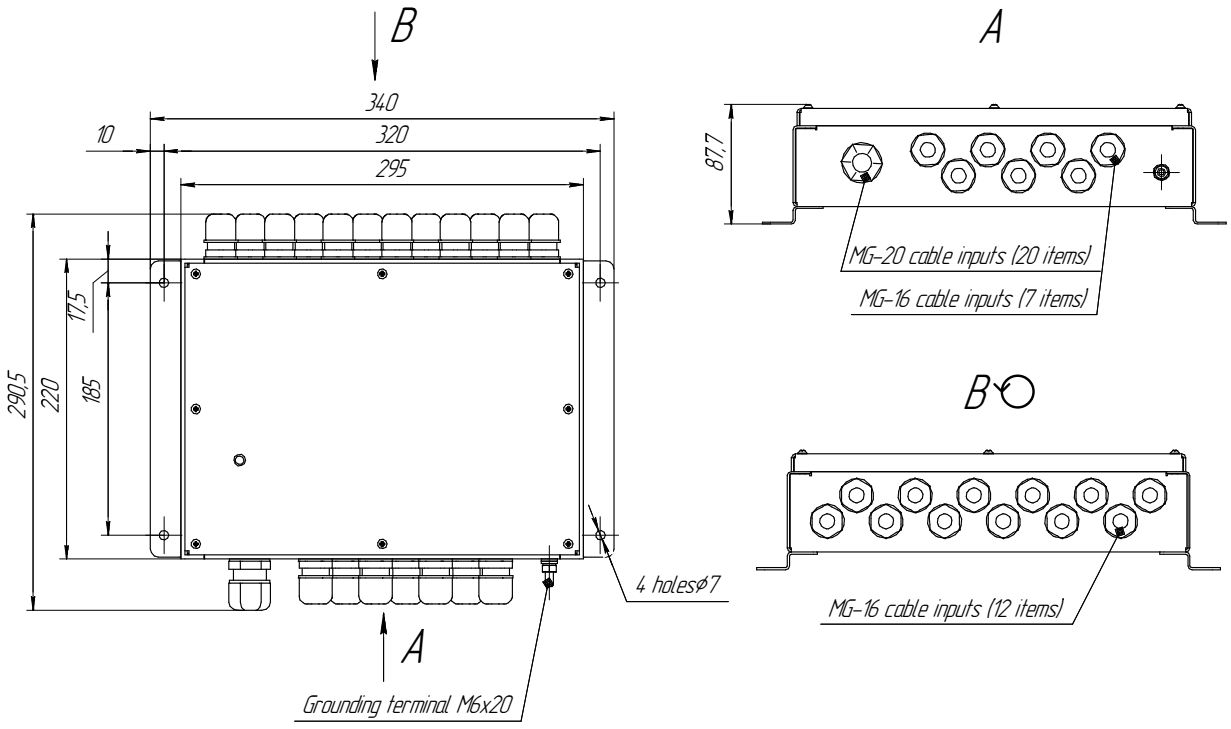
Electrical specifications	
Supply voltage	9 ... 36 V DC
Max. power consumption	20 W
Galvanic isolation from power mains	+
Reverse polarity protection	+
Overvoltage protection	+

Outputs	
Baud rate	4800 - 115200 bit/s
Output ports	12
Supported interfaces	6 x RS-232/422, 6 x R S-232/422 with terminals to supply load
Galvanic isolation	+

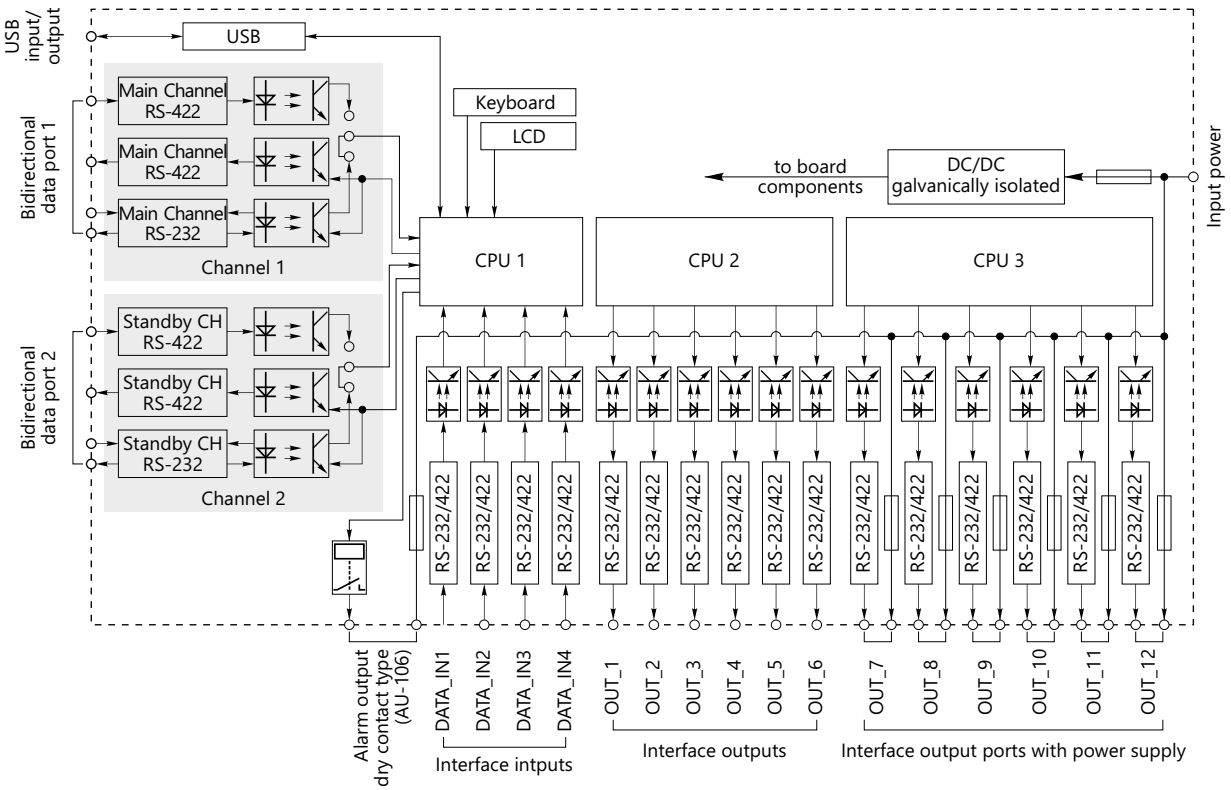
General specifications of ports	
Signal format	NMEA 0183 version 2 and 3 (checksum test)
Selection of NMEA message	Configured per each port

Specifications of additional (service) inputs /outputs	
Ports	3
Supported interfaces	2 x RS-232/422, 1 x USB

Overall and installation dimensions of NC-217



Functional diagram of NC-217



Multipurpose data converter

DFR-118

ЦИУЛ.468152.002

INTENDED USE

Receiving NMEA messages and repeating them to the units connected to the converter output port.

DESCRIPTION

Depending on the software used, the unit can:

- filter data stream, change its baud and frequency rate;
- correct letter and numeric values of NMEA sentences;
- add a checksum.

TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Storage temperature	-50 ... +75 °C
Operating temperature	-20 ... +55 °C
Max. weight	0.26 kg

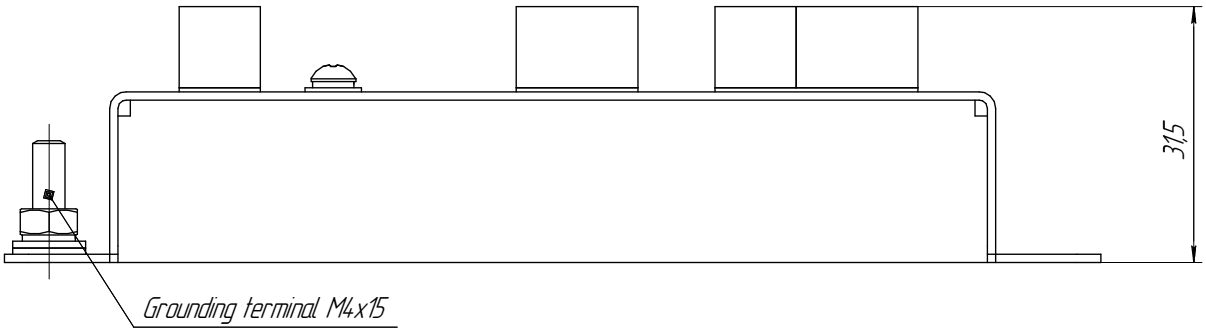
Inputs	
Input ports	1
Supported interfaces	RS-232, RS-422
Receive rate	4800 - 115200 bit/s

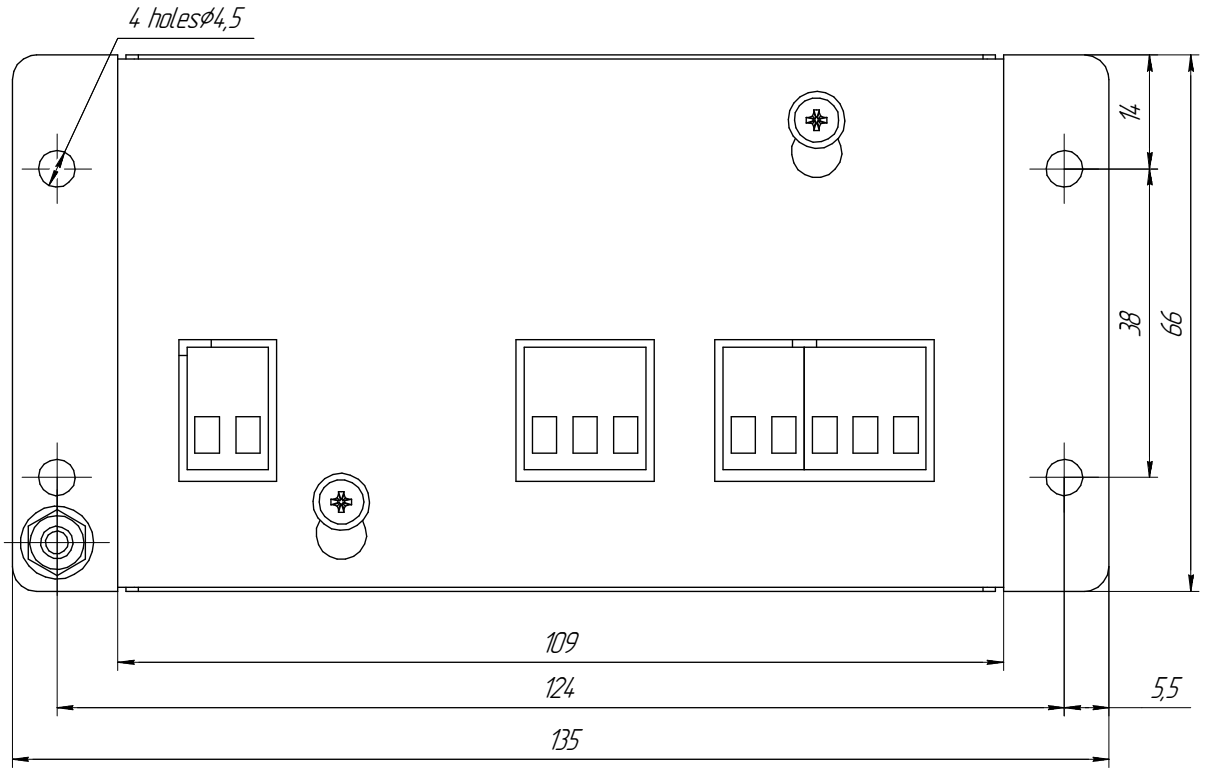
Electrical specifications	
Supply voltage	10 ... 36 V DC
Power consumption	1 W
Reverse polarity protection	+
Overvoltage protection	+

Outputs	
Output ports	1
Supported interfaces	RS-232, RS-422
Baud rate	4800 - 115200 bit/s

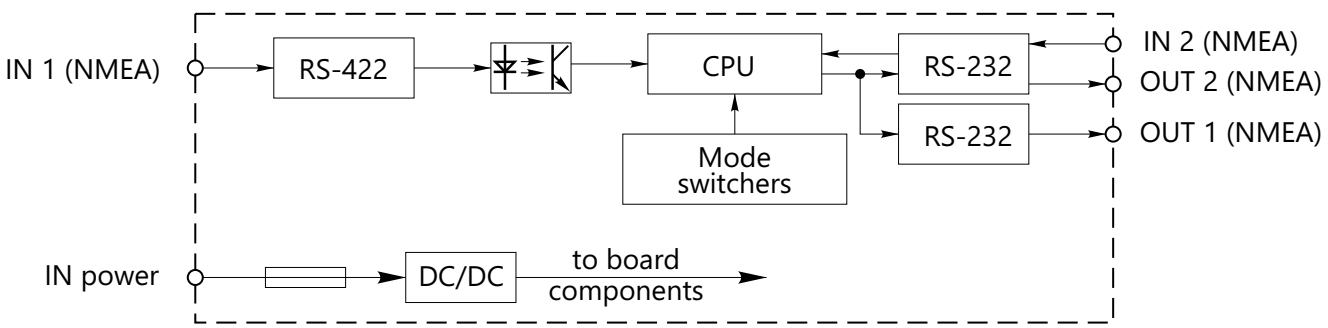
Custom software development available on request.

Overall and installation dimensions of DFR-118





Functional diagram of DFR-118



Multifunctional converter

MFC-151

ЦИУЛ.468363.008-02

RS-485 (RS-422) | USB | Ethernet | MFC Studio

INTENDED USE

Flexible control of NMEA messages.

FUNCTIONALITY

- Data-flow redirection
- Message duplication
- Decrease/increase in message transmission frequency
- Header filtering
- Message transmission with header substitution
- Message transmission with conversion of the input message's numerical field value
- Input channels redundancy
- Adding / changing IEC 61162-450 tags
- Message multiplexing

MFC-151 INTERFACES

- Ethernet (UDP unicast/multicast)
- USB interface
- 6 serial interfaces RS-422/RS-485 (4 general purpose interfaces, can be configured for input and output)

MFC-151 FEATURES

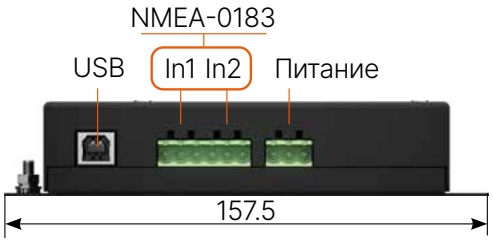
- Max. power consumption 7 W
- Wide range of supply voltage (9.5 – 36.0 V DC)
- Overvoltage protection and reverse polarity protection
- Compact metal casing, IP rating IP22
- Wide range of operating temperatures enables to use the converter in harsh environment and unheated spaces

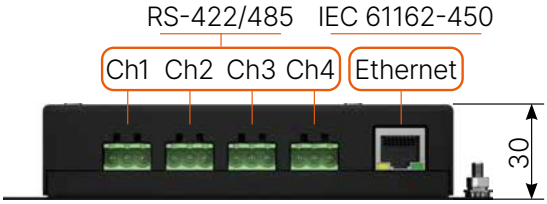
TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Operating temperature	-15 ... +55 °C
Weight	0.46 kg
Mounting	wall
Baud rate	4800 - 115200 bit/s

Electrical specifications	
Supply voltage	9.5 ... 36.0 V DC
Power consumption	9 ... 7 W
Galvanic isolation of supply mains	1 kV
Overvoltage protection and reverse polarity protection	+

Specifications of inputs/outputs	
Inputs	2 x RS-422
Configured inputs/outputs	4 x RS-422/485, 1 x Ethernet, 1 x USB





Examples	
Multiport	1 to 6 serial inputs, Ethernet pass-through to a virtual COM-порт
Multiplexer & LAN	2 inputs → 4 outputs, Ethernet redundancy
Multiplexer → LAN	1 – 6 inputs, data transmission to network
Flexible configuration	Change of speed and frequency, filtering and data transmission/ receiving to network

FUNCTIONAL DIAGRAM MFC-151

How it works

MFC-151 processes data received from several inputs. A user creates a processing scheme with the help of unique utility MFC Studio.

MFC STUDIO

MFC Studio is free of charge.

With the help of intuitive interface users can create projects by combining ready-made blocks in various configurations, as well as upload and download projects to/from the converter.

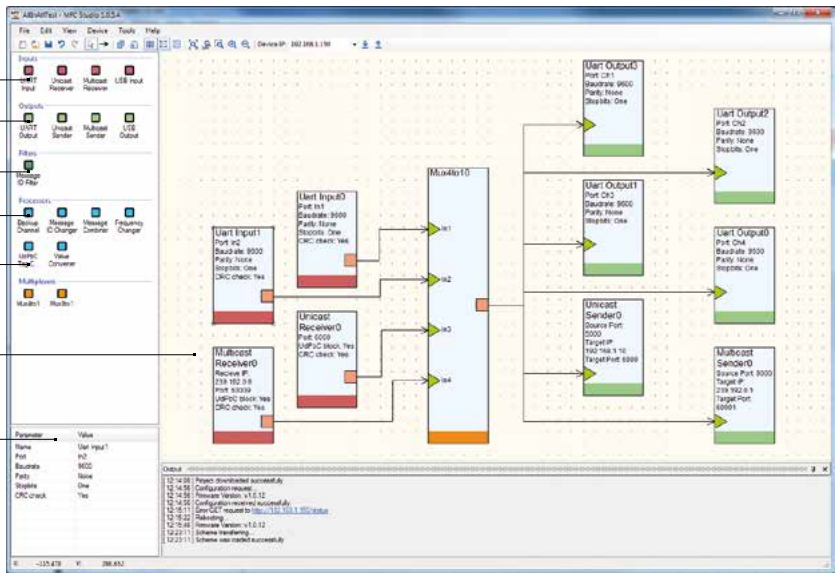
1. Select an element

inputs
outputs
filters
handlers
multiplexers

2. Drag elements to the scheme and connect them

3. Set a property per each element

4. Save the scheme and upload to MFC-151



Gyro converter / Analog-to-digital converter

ADPC-101

ЦИУЛ.468353.001

INTENDED USE

- Analog-to-digital conversion of obsolete analog signals from gyrocompasses and logs into NMEA format
- Transmission of the converted data to the navigational equipment

TECHNICAL SPECIFICATIONS

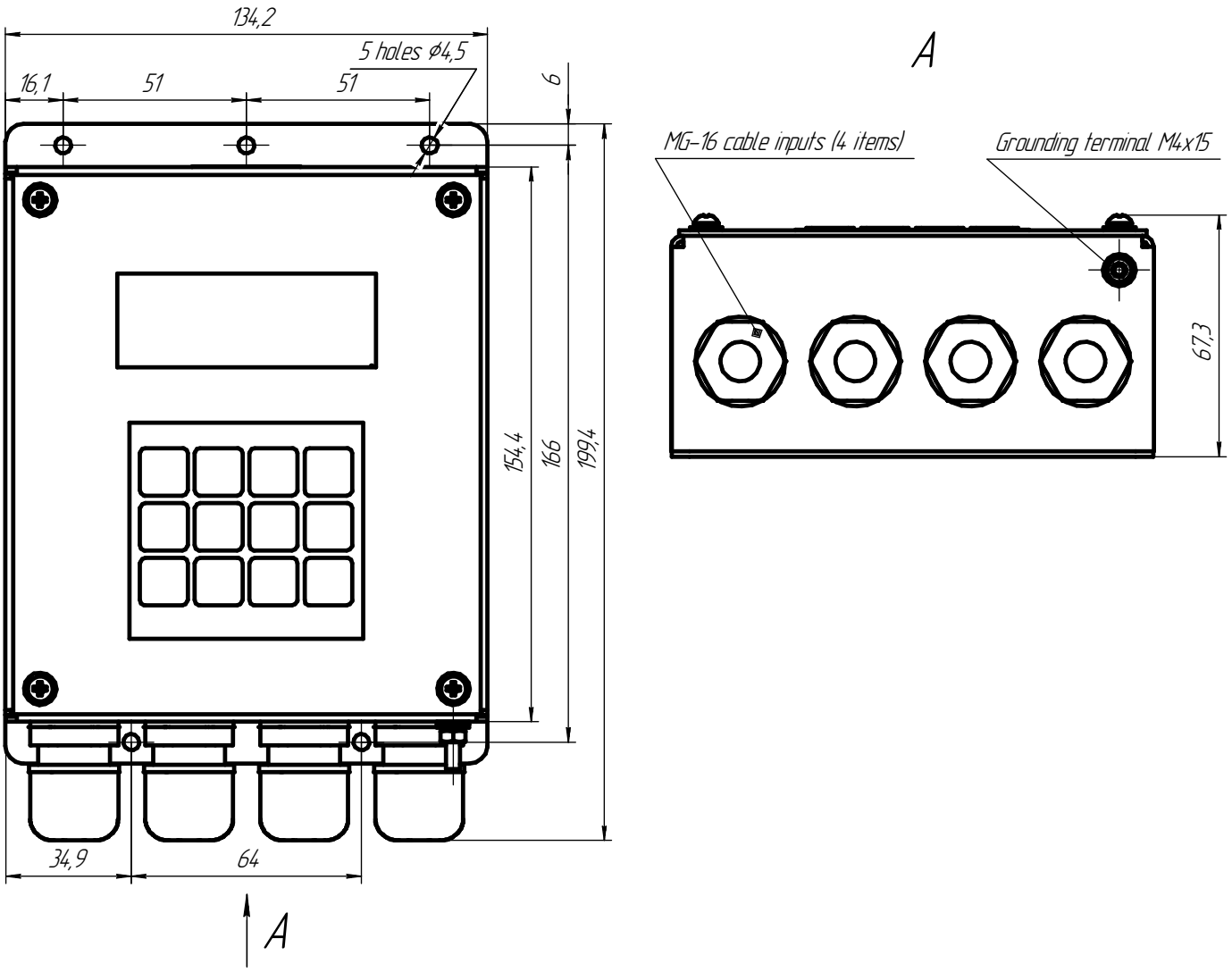
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Weight	1.2 kg

Type of the connected equipment	
Gyrocompasses	SYNCHRO type STEPPER type
Logs	stepper (pulse) type; closing contact interface

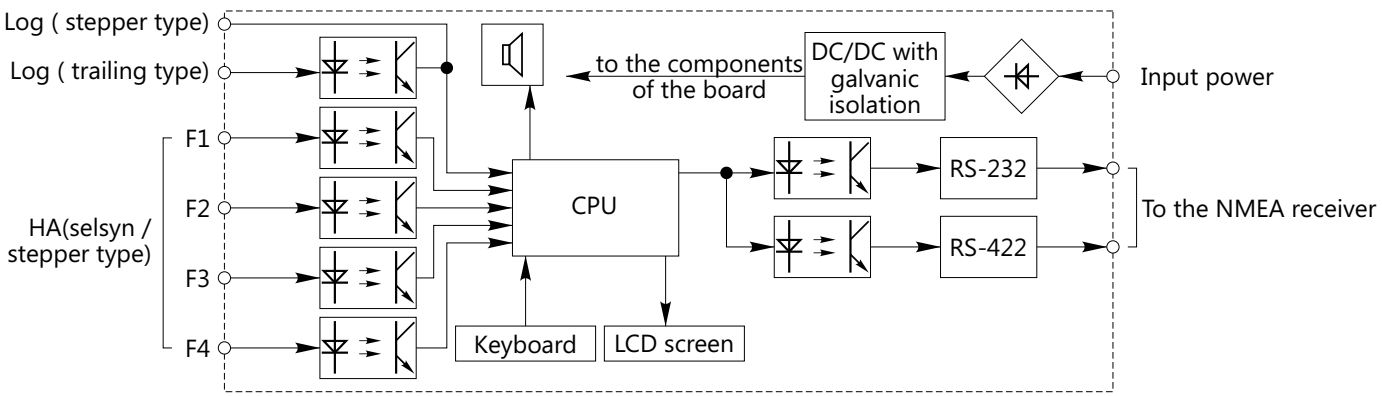
Output signal	
RS-232 and RS-422/485 ports output signal format	NMEA-0183 1-3 (IEC-61162), line checksum
Line options NMEA-0183	63 (configurable)

Input signals	
Gyrocompass:	
Sine voltage of synchro windings	+
Voltage pulses	+ (stepper interface)
Max. voltage	400 V
Gyro ratio	360x, 240x, 180, 90x, 60x, 36x
Max. frequency	500 Hz
Rate of course change (rate of turn)	up to 80 degree/s
Log:	
Voltage pulses	+ (stepper interface)
Closing contact	+
Max. voltage	400 V
Pulses per mile	100/200/300/400/500/600

Overall and installation dimensions of ADPC-101



Functional diagram of ADPC-101



NMEA 0183 to AD-10S converter

NTA-115
ЦИУЛ.468512.015

INTENDED USE

Convertion of the ship course data received in NMEA 0183 sentences into AD-10S format.

DESCRIPTION

The unit connects devices not equipped with AD-10S-output to various Furuno equipment.

TECHNICAL SPECIFICATION

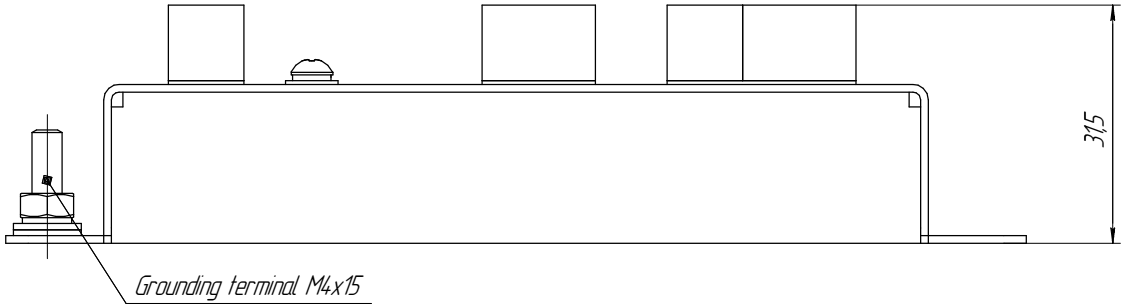
General specifications	
IP rating	IP22
Storage temperature	-55...+70 °C
Operating temperature	-20...+55 °C
Max. weight	0.3 kg

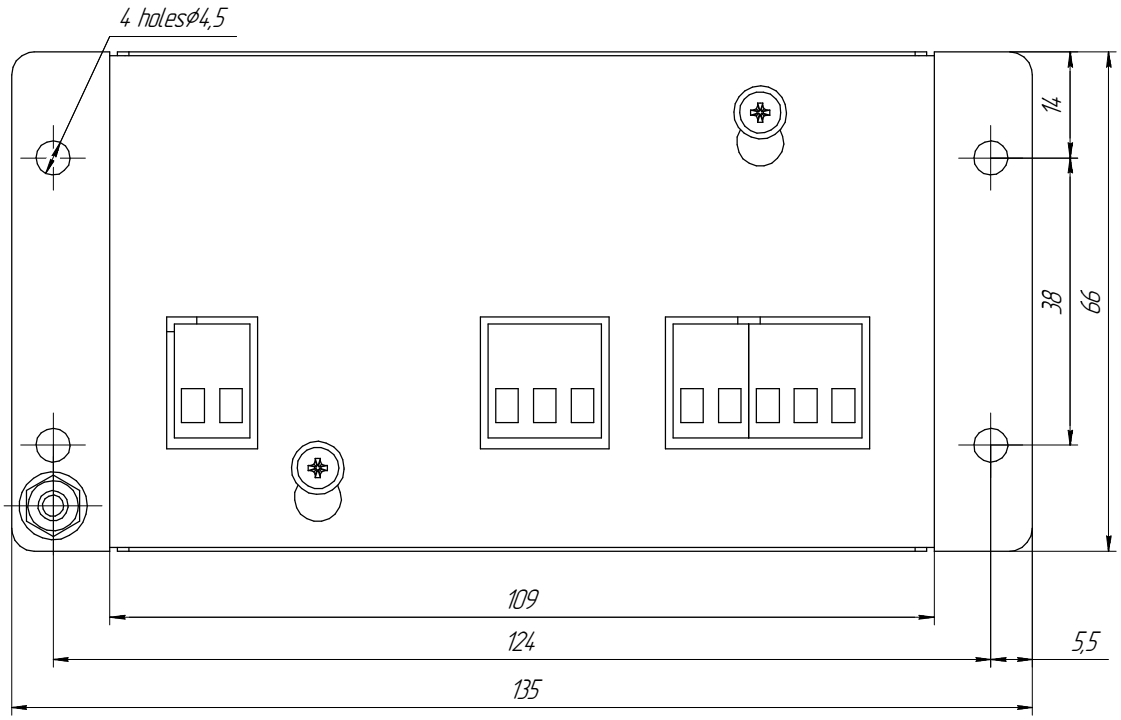
Inputs	
Supported interfaces	RS-232, RS-422
Supported NMEA sentences	xxHDT, xxOSD, xxVHW, xxHDG
Input data type	course value

Electrical specifications	
Supply voltage	8...40 V DC
Power consumption	2 W
Reverse polarity protection	+
Overvoltage protection	+

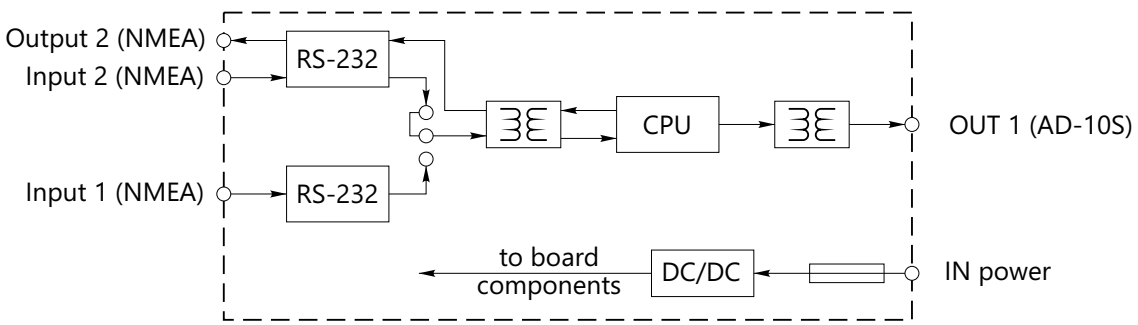
Outputs	
Output data type	AD-10S

Overall and installation dimensions of NTA-115





Functional diagram of NTA-115



Course translator

DAC-109
ЦИУЛ.468353.007

DESCRIPTION

DAC-109 converts digital course data received in NMEA format into synchrosignals to control analog repeaters and other selsyn-based equipment. The unit may be used as a digital repeater to display current course data.

TECHNICAL SPECIFICATIONS

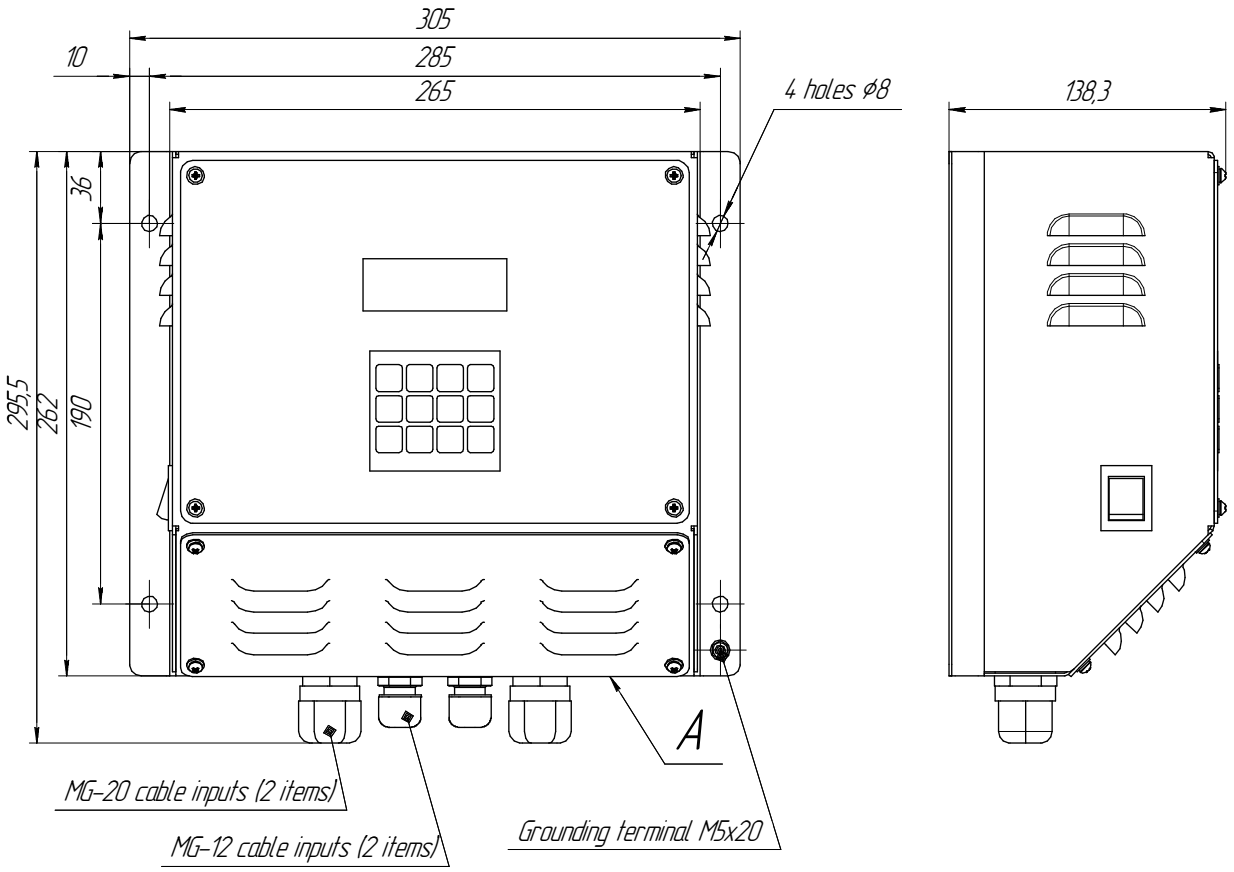
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Max. weight	6.5 kg

Electrical specifications	
Supply voltage	18...36 V DC
Max. total power of connected selsyns	250 W
Output voltage frequency	50 Hz or 500 Hz
Galvanic isolation from power mains	+
Reverse polarity protection	+
Overvoltage protection	+

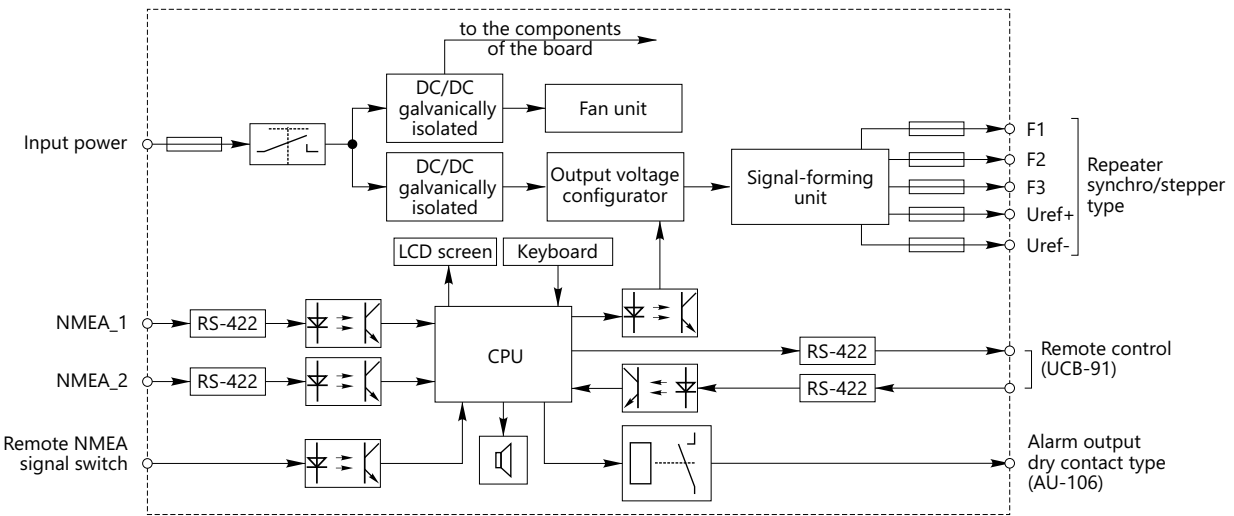
Inputs	
Input ports	1+1 (main, standby)
Supported interfaces	RS-232/422/485
Max. receive rate	115 200 bit/s
Optoisolation	+
Supported protocols	NMEA 0183 versions 1-3
Supported NMEA sentences	xxHDG, xxHDT, xxHDM

Outputs	
Max. number of connected synchro-receivers	8
Types of connected analog repeaters	Synchro/Step

Overall and installation dimensions of DAC-109



Functional diagram of DAC-109



Filter

FDA-122P

ЦИУЛ.468353.006/ЦИУЛ.468353.006-01

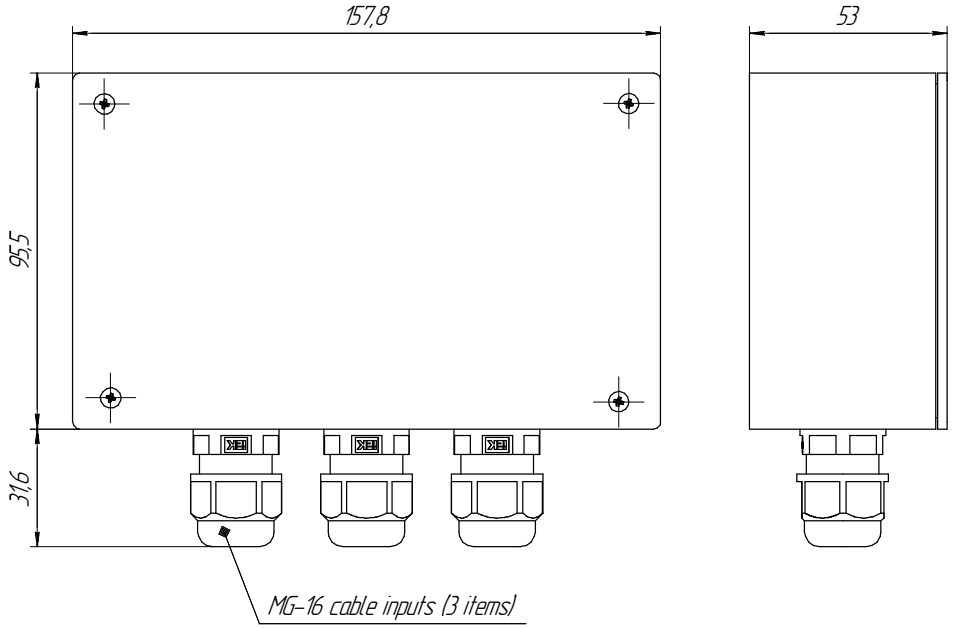
DESCRIPTION

Filter FDA-122 is intended to extract useful parts of the DAC-109 output signal, and send them to digital peripheral devices (ADPC-101, etc.) or to analog peripheral devices (an analog repeater, etc.).

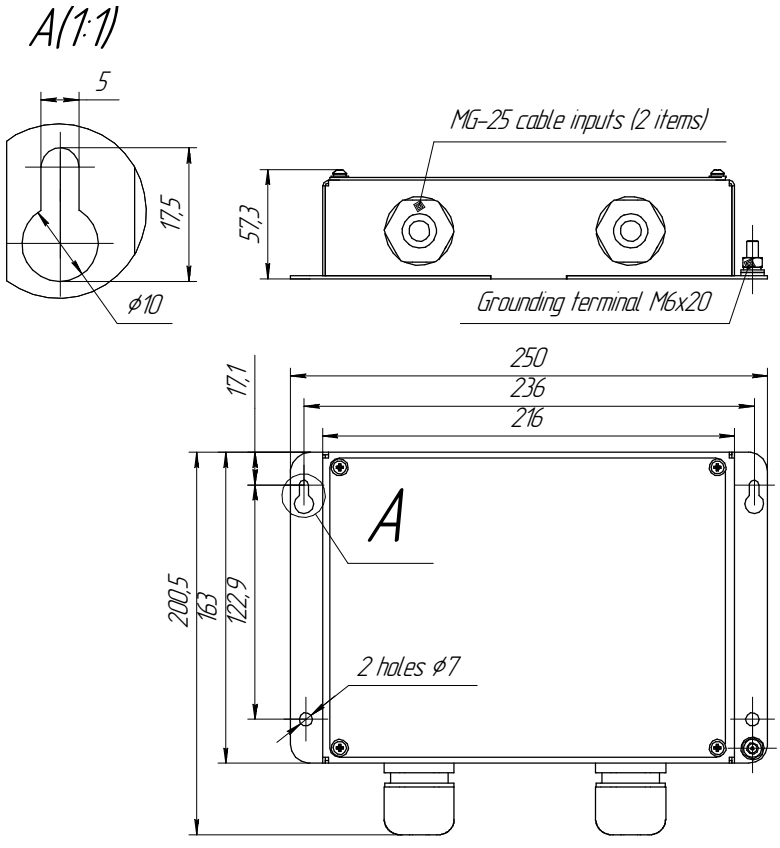
TECHNICAL SPECIFICATIONS

Model	FDA-122	FDA-122P
IP rating	IP22	IP22
Peripheral device interface	digital	analog
Operating temperature	-20...+55 °C	-20...+55 °C
Limiting temperature	-55...+70 °C	-55...+70 °C
Weight	0.3 kg	2.3 kg
Max. core section when connected	1.5 mm ^{2}	4 mm ^{2}

Overall and installation dimensions of FDA-122



Overall and installation dimensions of FDA-122P



Power supply unit

PS-103
ЦИУЛ.436131.001

INTENDED USE

Power supply for shipborne and industrial equipment with direct unregulated voltage 24 V.

BUILT-IN PROTECTION

- Galvanic isolation of power mains and load
- Current overload protection
- Input to connect standby power source 24 V (SB)

DESCRIPTION

Power supply unit with rated power 190 W to operate with single-phase AC mains, 50 (60) Hz, voltage 110/220 V.

Power is automatically switched to standby power source in the event of main power failure.
Main power failure closes dry contacts of built-in relay.

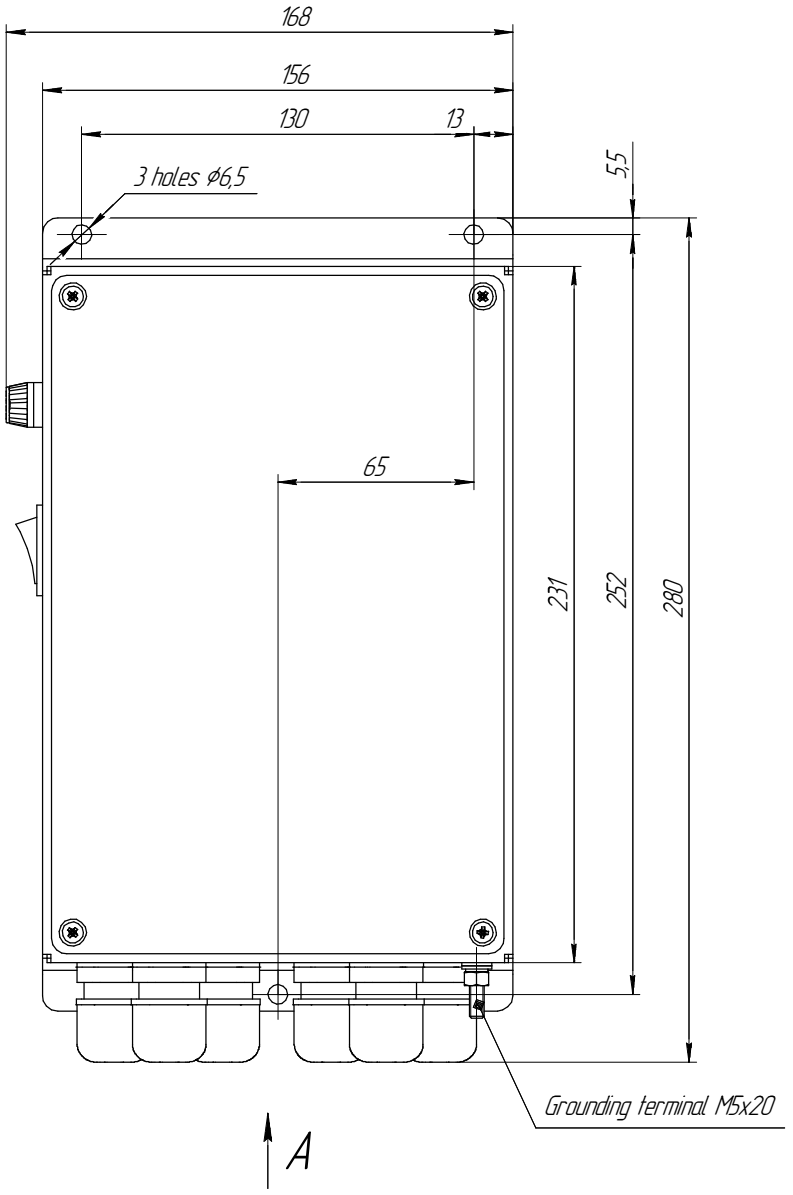
TECHNICAL SPECIFICATIONS

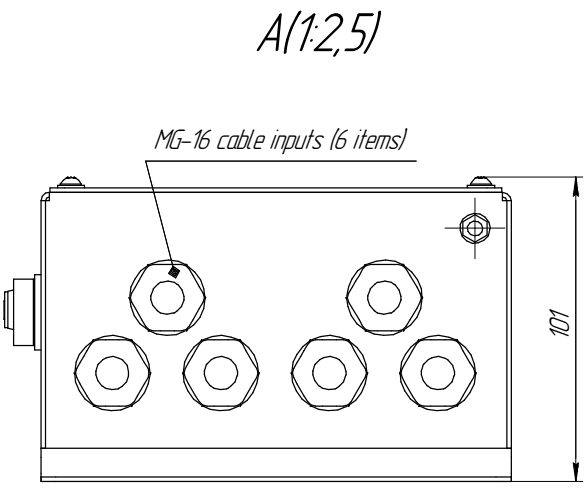
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Weight	4.4 kg
Current overload protection	+

Electrical specifications	
Supply voltage	110 (option)/ 220 V, 50-60 Hz
Output voltage	18...31 V DC
Rated power	190 W
Rated load current	10 A
Terminals of connected loads	+3
Galvanic isolation from power mains (for main power)	+

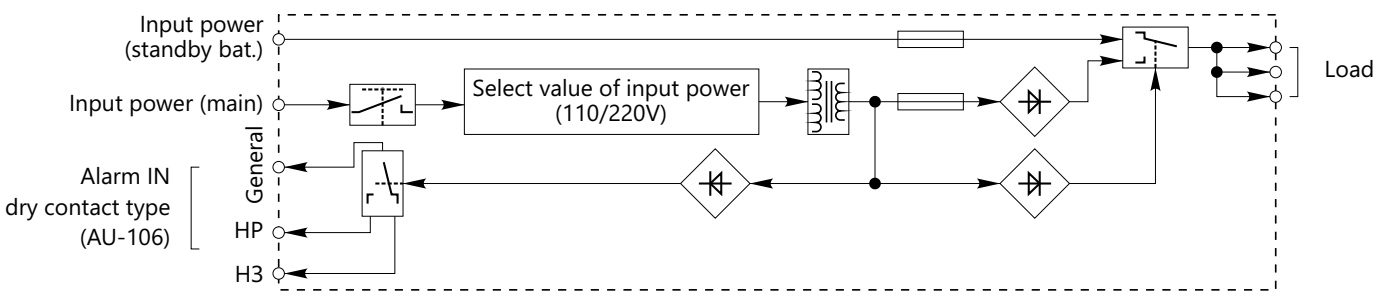
AU-106 may be used as Alarm unit (p. 62)

Overall and installation dimensions of PS-103





Functional diagram of PS-103



Power supply unit

PS-103-20
ЦИУЛ.436132.001

INTENDED USE

Power supply for shipborne and industrial equipment with direct unregulated voltage 24 V.

BUILT-IN PROTECTION

- Galvanic isolation of power mains and load
- Current overload protection
- Input to connect standby power source 24 V (SB)

DESCRIPTION

Power supply unit with rated power 500 W to operate with single-phase AC network 50 (60) Hz, voltage 110/220 V.

Power is automatically switched to standby power source in the event of main power failure. Main power failure closes dry contacts of built-in relay.

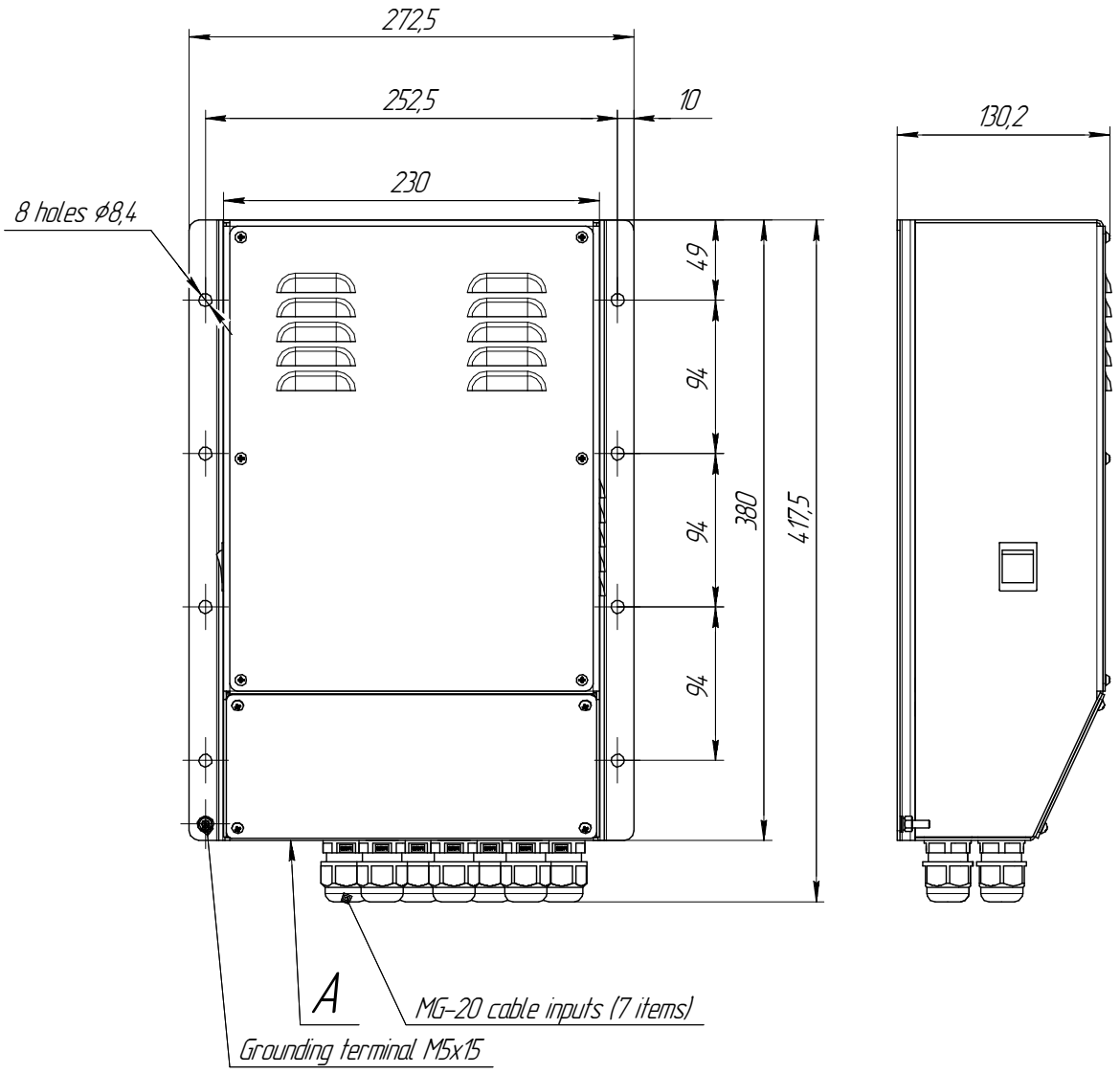
TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Weight	9.4 kg
Current overload protection	+

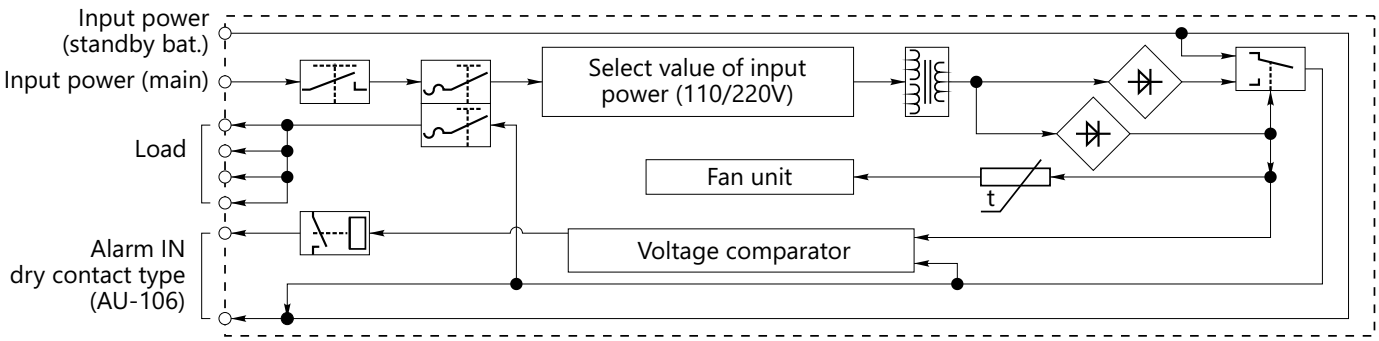
Electrical specifications	
Supply voltage	110 V (option)/220 V, 50-60 Hz
Output voltage	18...31 V DC
Rated power	450 W
Rated load current	20 A
Terminals for connected loads	4
Galvanic isolation from power mains (for main power)	+

AU-206 may be used as Alarm unit (p. 68)

Overall and installation dimensions of PS-103-20



Functional diagram of PS-103-20



Power supply unit

PS-203
ЦИУЛ.436131.002 - БП-203-12,5
ЦИУЛ.436131.002-01 - БП-203-6,5
ЦИУЛ.436131.002-02 - БП-203-3,3

INTENDED USE

Power supply of shipborne and industrial edge-sensitive equipment.

DESCRIPTION

Power supply unit with rated power 150/156/158 W to operate with single-phase AC mains 50 (60) Hz. The unit converts input voltage 110/220 V AC into regulated voltage 12/24/48 V DC.

BUILT-IN PROTECTION

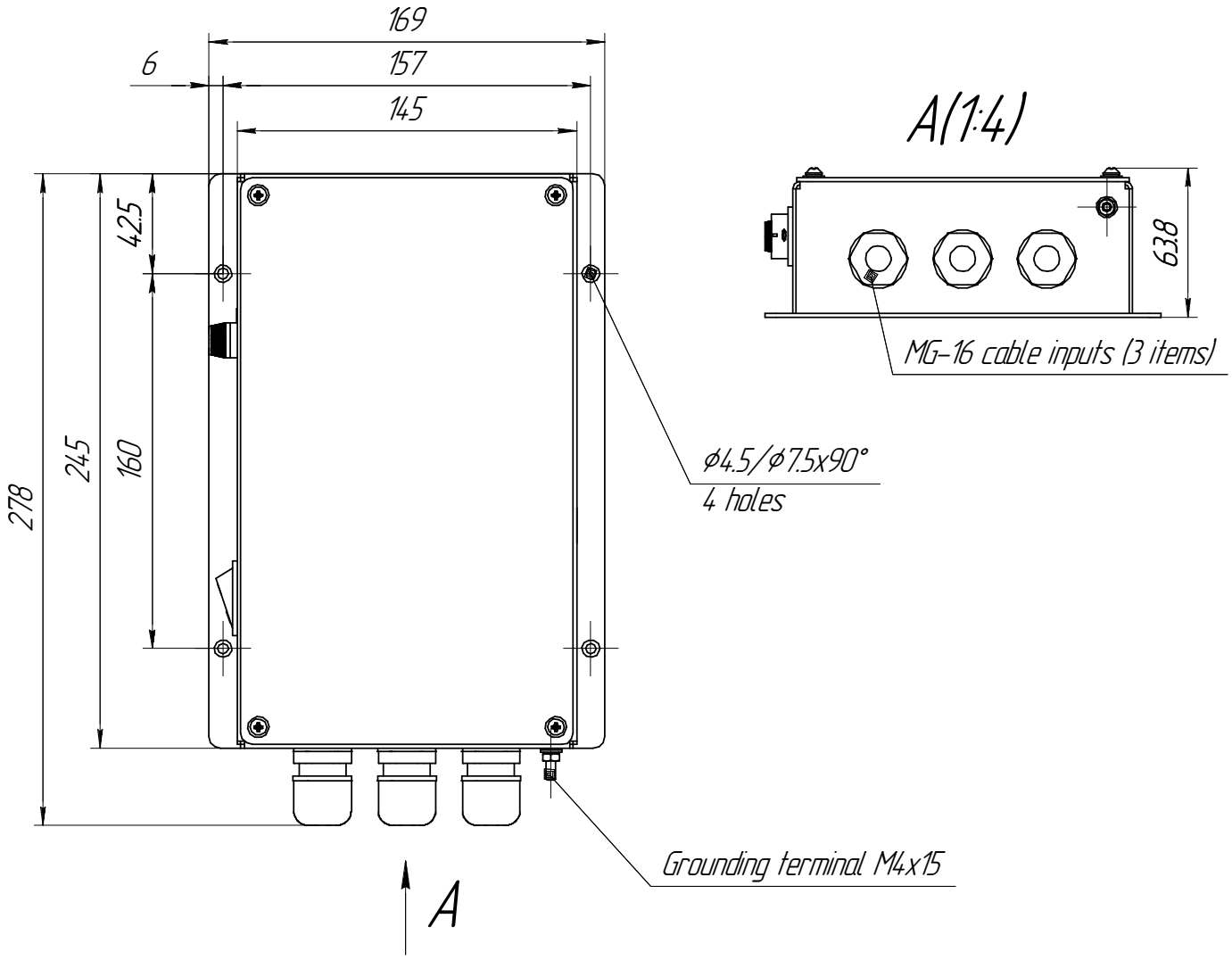
- Galvanic isolation of power mains and load
- Current overload protection

TECHNICAL SPECIFICATIONS

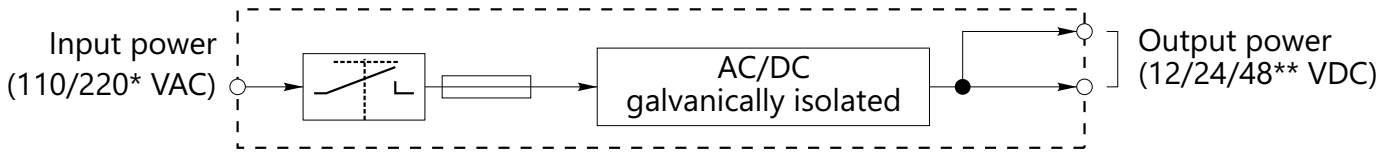
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Max. weight	2 kg
Overvoltage protection	+
Current overload protection	+

Electrical specifications			
Model	PS-203-12.5	PS-203-6.5	PS-203-3.3
Supply voltage	90...132/180...264 V, 50/60 Hz	90...132/180...264 V, 50/60 Hz	90...132/180...264 V, 50/60 Hz
Output voltage	12 V DC	24 V DC	48 V DC
Rated power	150 W	156 W	158 W
Rated load current	12.5 A	6.5 A	3.3 A
Efficiency	up to 83 %	up to 86 %	up to 86 %
Galvanic isolation from power mains	+	+	+
Terminals for connected loads	2	2	2

Overall and installation dimensions of PS-203



Functional diagram of PS-203



* Selected by switch on power unit

** Depending on design

Power supply units

PS-203-35, PS-203-40, PS-203-50, PS-203-60

ЦИУЛ.436132.005 - БП-203-60
ЦИУЛ.436132.005-01 - БП-203-50 (на 220 В)
ЦИУЛ.436132.005-02 - БП-203-50 (на 110 В)
ЦИУЛ.436132.005-03 - БП-203-40 (на 220 В)
ЦИУЛ.436132.005-04 - БП-203-40 (на 110 В)
ЦИУЛ.436132.005-05 - БП-203-35 (на 220 В)
ЦИУЛ.436132.005-06 - БП-203-35 (на 110 В)

INTENDED USE

Power supply of shipborne and industrial edge-sensitive equipment.

BUILT-IN PROTECTION

- Galvanic isolation of power mains and load
- Current overload protection
- Reverse polarity protection
- Input to connect standby power supply 12/24 V (SB)

DESCRIPTION

Power supply unit with rated power 450/600/1000/1512 W to operate with single-phase AC mains 50 (60) Hz. The unit converts input voltage 110/220 V AC into regulated voltage 12/24 V DC.

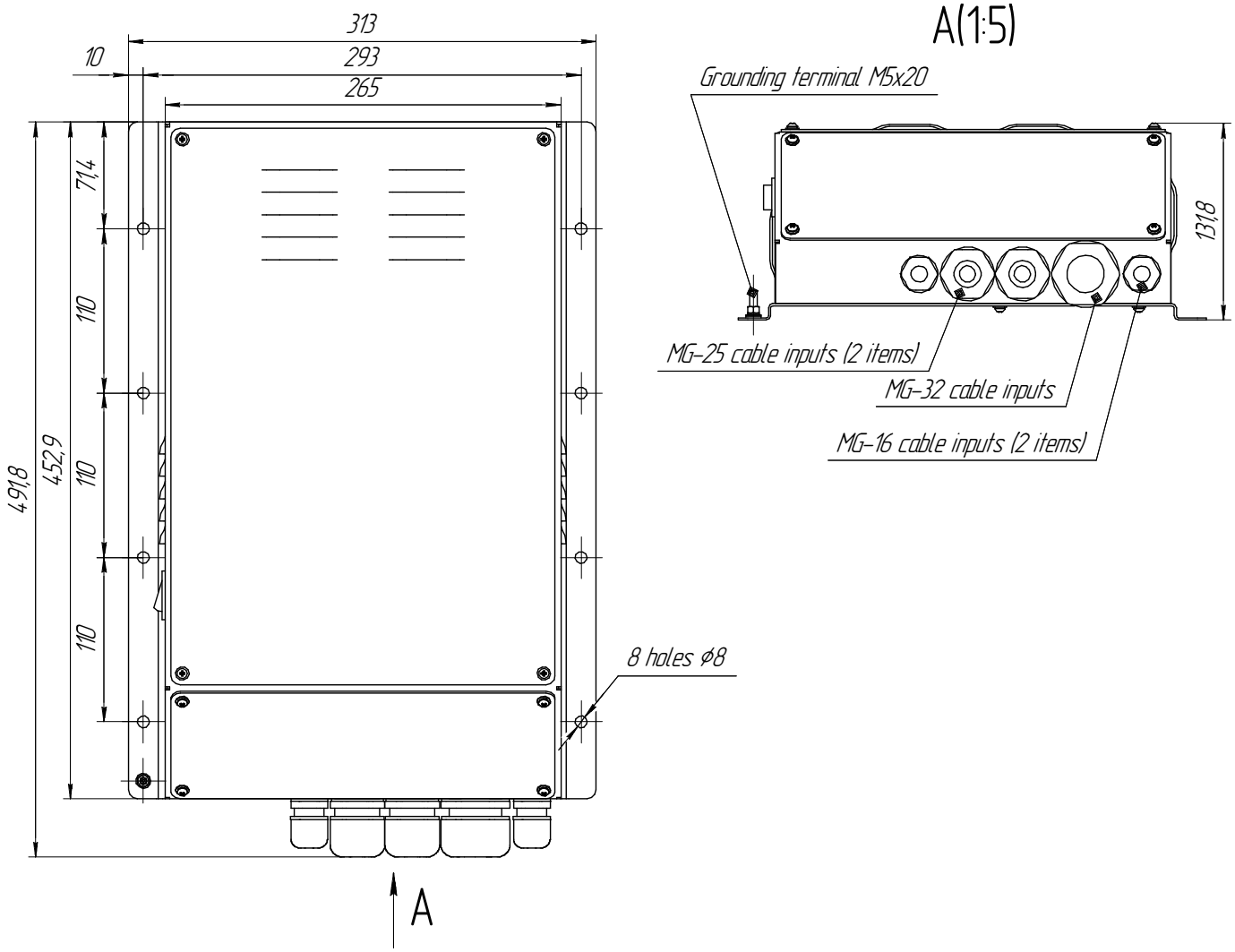
Power is automatically switched to standby power source in the event of main power failure. Main power failure closes dry contacts of built-in relay.

TECHNICAL SPECIFICATIONS

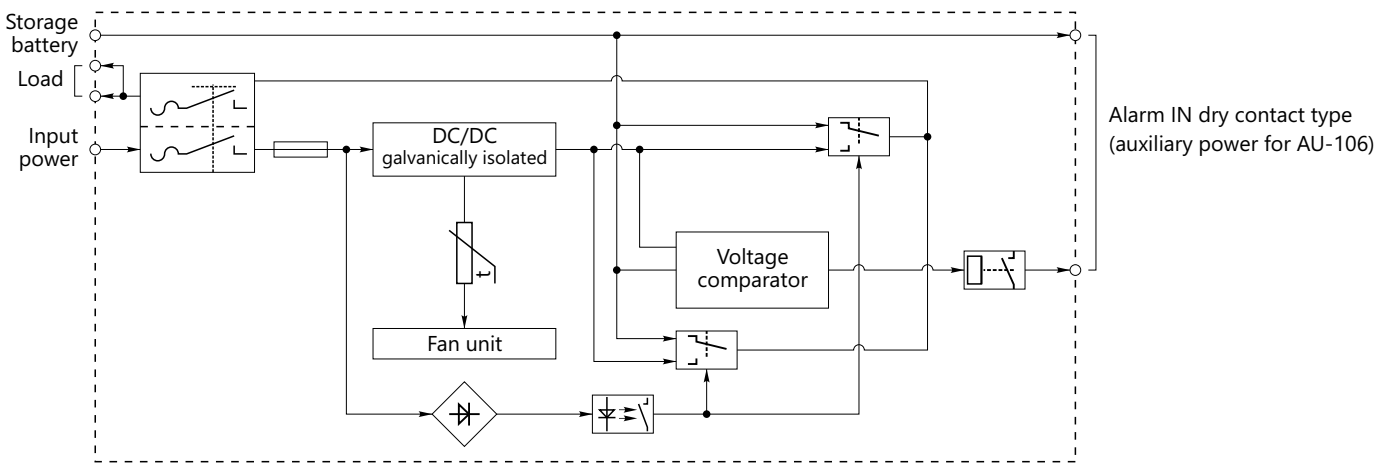
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Max. weight	9.3 kg
Efficiency	up to 90 %
Overvoltage protection	+
Current overload protection	+

Electrical specifications				
Name	PS-203-35	PS-203-40	PS-203-50	PS-203-60
Supply voltage (main)	~110/220 V, 50/60 Hz	~110/220 V, 50/60 Hz	~110/220 V, 50/60 Hz	90 - 264 V, 50/60 Hz
Supply voltage (standby)	254 - 370 V DC	254 - 370 V DC	254 - 370 V DC	127 - 370 V DC
Output voltage	12 V DC	24 V DC	12 V DC	24 V DC
Rated power	450 W	1000 W	600 W	1512 W
Rated load current	35 A	40 A	50 A	60 A
Terminals for connected loads	2	2	2	2
Galvanic isolation from power mains (main power)	+	+	+	+

Overall and installation dimensions of PS-203-35, PS-203-40, PS-203-50, PS-203-60



Functional diagram of PS-203-35, PS-203-40, PS-203-50, PS-203-60



Power supply unit

PS-303

БП-303-А2-2 (6,5А)ЦИУЛ.436131.007-002
БП-303-А2-2 (4,2А) ЦИУЛ.436131.007-001
БП-303-А2-2 (12,5А) ЦИУЛ.436131.007-003
БП-303-А2-1 (8,5А) ЦИУЛ.436132.007-001
БП-303-А1-1 (18,5А) ЦИУЛ.436132.007-002
БП-303-22-2 (4,2А) ЦИУЛ.436121.007-002
БП-303-А1-1 (12,5А) ЦИУЛ.436131.007-004
БП-303-22-2 (14,6А) ЦИУЛ.436122.007-001
БП-303-22-1 (8,5А) ЦИУЛ.436121.007-001
БП-303-21-1 (27,5А) ЦИУЛ.436122.007-002
БП-303-21-1 (12,5А) ЦИУЛ.436121.007-003
БП-303-11-1 (8,5А) ЦИУЛ.436121.007-004

INTENDED USE

Power supply of shipborne and industrial edge-sensitive equipment.

BUILT-IN PROTECTION

- Galvanic isolation of power mains and load
- Current overload protection
- Reverse polarity protection
- Input to connect standby power supply 12/24 В (SB)

DESCRIPTION

Depending on the model, the unit operates with single-phase AC mains, frequency 50 (60) Hz, voltage 220 V or network 24 V DC.

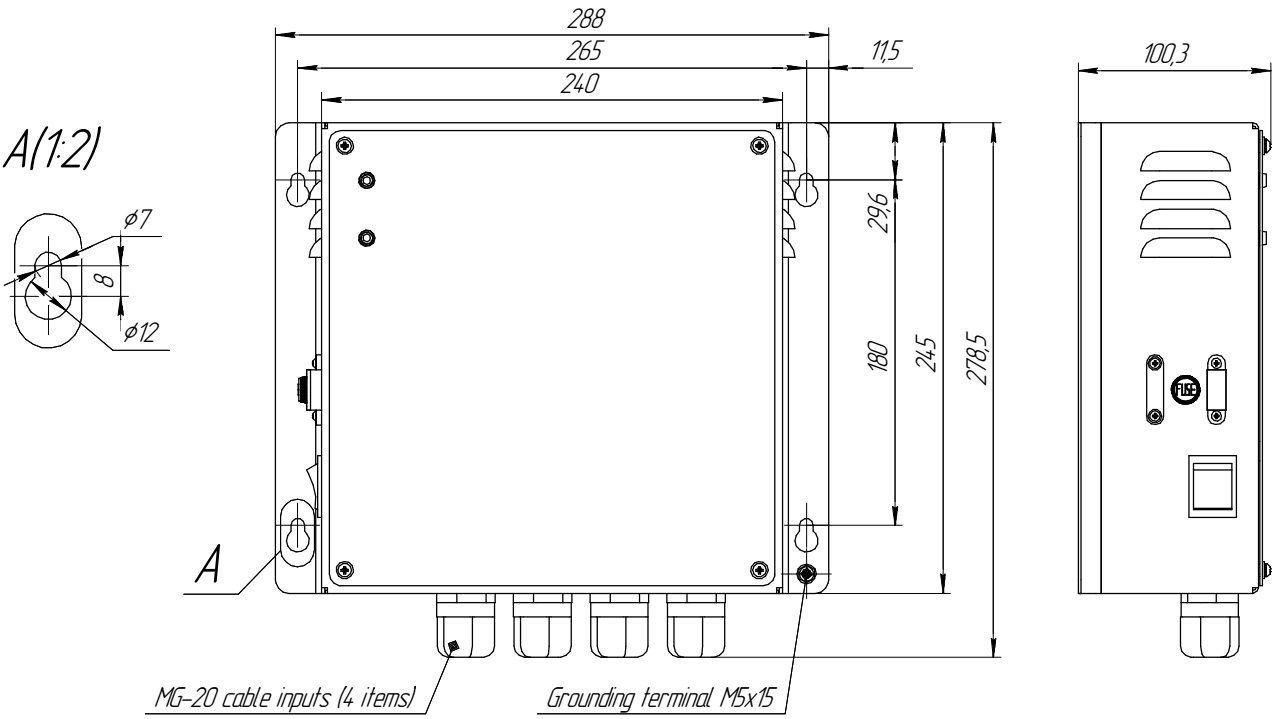
Power is automatically switched to standby power source in the event of main power failure.

Electrical specifications												
Subgroup	А	Б	Б	А	Б	Б	В	В	Г	Г	Г	Г
Model	А2-2 (4.2 А)	А2-2 (6.5 А)	А2-2 (12.5 А)	А2-1 (8.5 А)	А1-1 (12.5 А)	А1-1 (18.5 А)	22-1 (8.5 А)	22-2 (4.2 А)	22-2 (14.6 А)	21-1 (27.5 А)	21-1 (12.5 А)	11-1 (8.5 А)
ЦИУЛ	ЦИУЛ. 436131.007-001	ЦИУЛ. 436131.007-002	ЦИУЛ. 436131.007-003	ЦИУЛ. 436132.007-001	ЦИУЛ. 436131.007-004	ЦИУЛ. 436132.007-002	ЦИУЛ. 436121.007-001	ЦИУЛ. 436121.007-002	ЦИУЛ. 436122.007-001	ЦИУЛ. 436122.007-002	ЦИУЛ. 436121.007-003	ЦИУЛ. 436121.007-004
Supply voltage (main)	220 V, 50/60 Hz	220 V, 50/60 Hz	220 V, 50/60 Hz	220 V, 50/60 Hz	220 V, 50/60 Hz	220 V, 50/60 Hz	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Supply voltage (standby)	24 V DC (19...36 V)	24 V DC (19...36 V)	24 V DC (19...36 V)	24 V DC (19...36 V)	12 V DC (9...18 V)	12 V DC (9...18 V)	24 V DC (19...36 V)	24 V DC (19...36 V)	24 V DC (19...36 V)	24 V DC (19...36 V)	12 V DC (9...18 V)	12 V DC (9...18 V)
Output voltage (DC)	24 V	24 V	24 V	12 V	12 V	12 V	12 V	24 V	24 V	12 V	12 V	12 V
Output current	4.2 A	6.5 A	12.5 A	8.5 A	12.5 A	18.5 A	8.5 A	4.2 A	14.6 A	27.5 A	12.5 A	8.5 A
Pulsation	150 mV	200 mV	150 mV	120 mV	150 mV	150 mV	120 mV	150 mV	150 mV	120 mV	120 mV	120 mV
Output power	100 W	156 W	300 W	100 W	150 W	222 W	100 W	100 W	350 W	330 W	150 W	100 W
Efficiency	66,2 %	89 %	88 %	66,7 %	87,5 %	85 %	57,7 %	51,3 %	80 %	80 %	75 %	80 %
Galvanic isolation (main power)	+	+	+	+	+	+	+	+	+	+	+	+
Galvanic isolation (standby power)	+	-	-	+	-	-	+	+	-	-	-	-

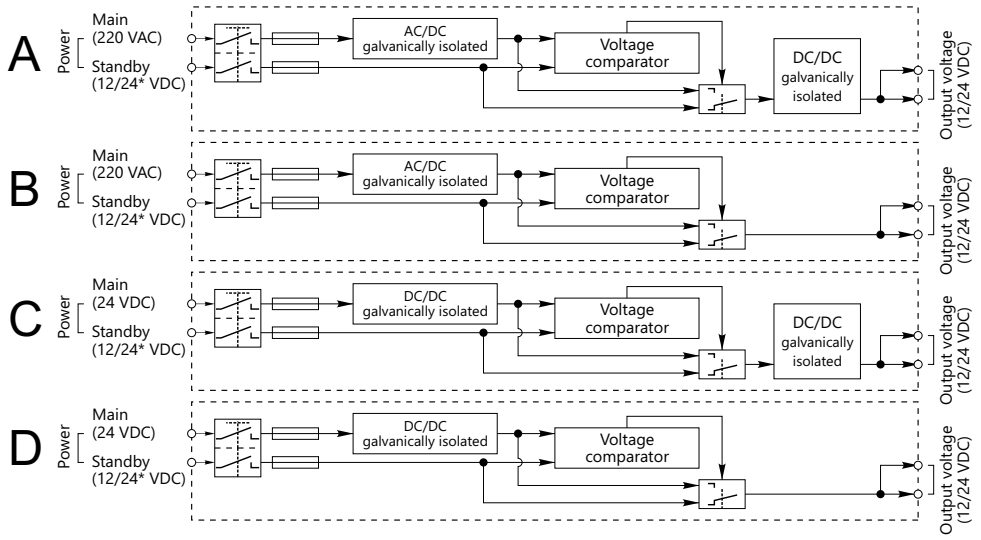
General specifications	
IP rating	IP22
Storage temperature	-60...+70°C
Operating temperature	-15...+55°C
Max. weight	4 kg

- Terminals for connected loads: 2
- Load switch to standby power: automatic
- Power recovery after mains restoration: automatic

Overall and installation dimensions of PS-303



Functional diagram of PS-303



*Depending on the design

Automatic battery charger

CH-105
ЦИУЛ.436537.305

INTENDED USE

Automatic charging of various accumulator batteries.

BUILT-IN PROTECTION

- Reverse polarity protection of main power and storage battery
- Overcurrent in SB circuit (overload/short circuit)
- Deep discharge protection (option)
- Overheat protection
  (option, if thermal sensor DTS-135 is used)

ОПИСАНИЕ

Depending on the model, the unit operates with single-phase AC mains 50 (60) Hz, voltage 110/220 V or DC network, voltage 24/110/220 V.

Max. output power – 600 W. Equipped with an.

Output to connect load.

The unit is outfitted with a built-in control and indication panel to set charging modes and display SB status.

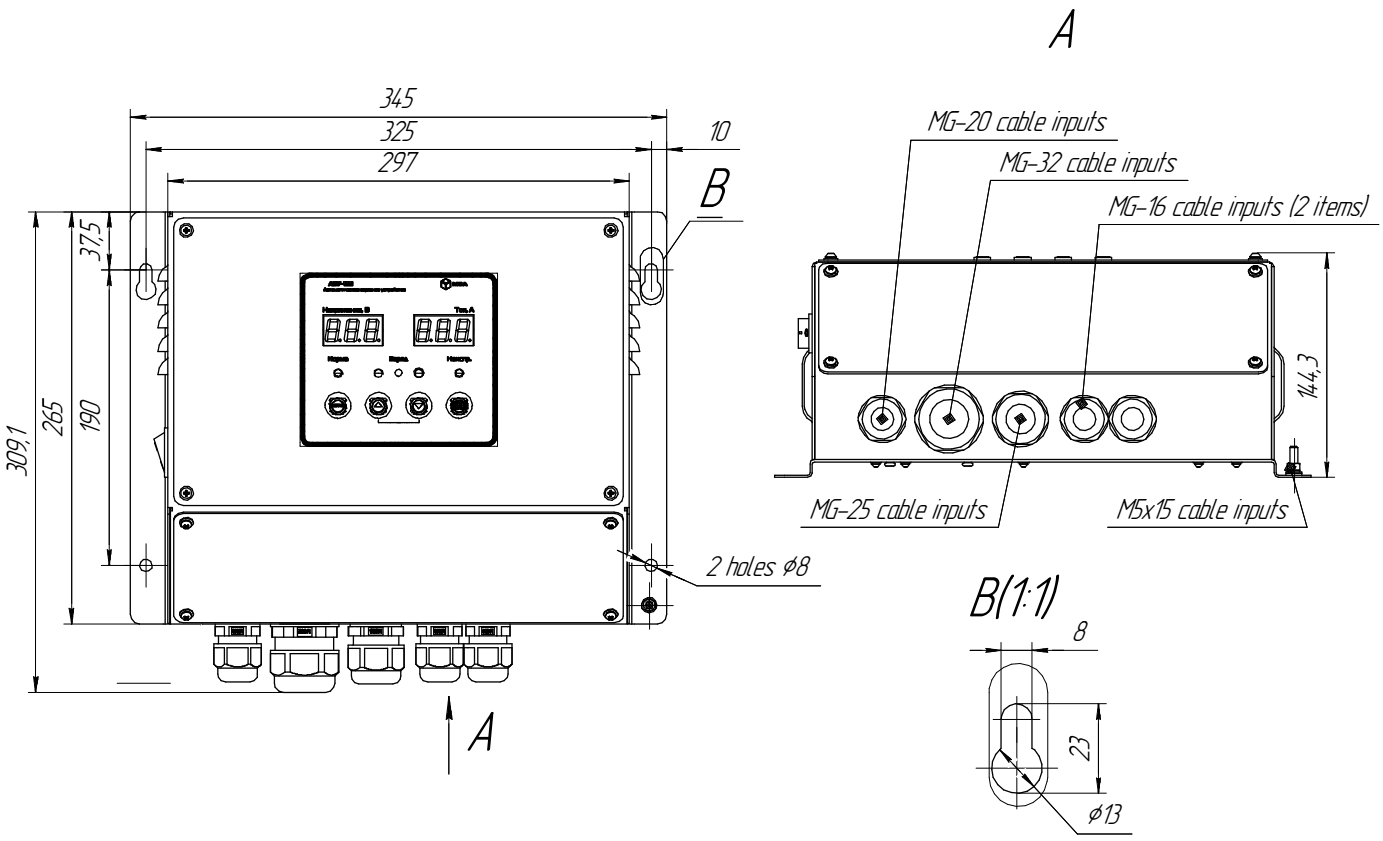
Battery control panel BCP-136 – at option (p. 44).

TECHNICAL SPECIFICATIONS

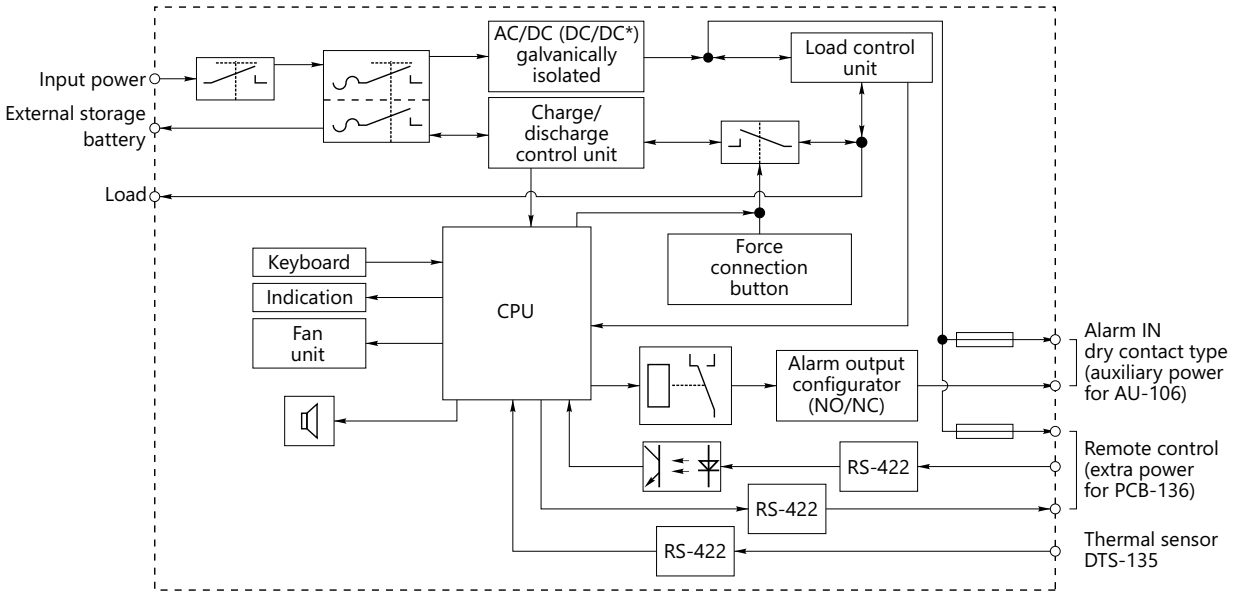
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Max. weight	7.1 kg

Electrical specifications		
Model	CH-105	CH-105-24
Supply voltage	~110/220 V, 50/60 Hz	24 V DC (18 V - 36 V)
Max. output power	600 W	500 W
Charge current	0.2 – 20.0 A	0.2 – 16.0 A
Charge voltage	9...30 V DC (to charge 12/24 V battery)	
Standard capacity of charged batteries	up to 200 A·h	up to 160 A·h

Overall and installation dimensions of CH-105



Functional diagram of CH-105



*Design with DC input is optional

Power supply / Automatic battery charger

PCH-205

ЦИУЛ.436647.001 U=220V, external control
ЦИУЛ.436647.001-01 U=220V, external control
ЦИУЛ.436647.001-02 U=110V, external control
ЦИУЛ.436647.001-03 U=110V, external control

INTENDED USE

Power supply of shipborne, transport and industrial equipment with max. total power 1000 W, unregulated voltage 24 V DC.

AVAILABLE IN TWO VERSIONS

- Standard version (fig. 1) includes a built-in control and indication panel (to set charge mode and SB status display)
- Simplified version (fig. 2) includes a battery control panel BCP-136.

DESCRIPTION

Combined power supply/battery charger operates with single-phase AC network 50 (60) Hz, voltage 110/220 V. Ensures load power supply and charges connected SB at the same time.
Power is automatically switched to standby power source in the event of main power failure.

BUILT-IN PROTECTION

- Reverse polarity protection of main power and storage battery
- Overcurrent in SB circuit (overload/short circuit)
- Deep discharge protection (option)
- Overheat protection (option, if thermal sensor DTS-135 is used, see fig. 1)

TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Max. weight	10.6 kg

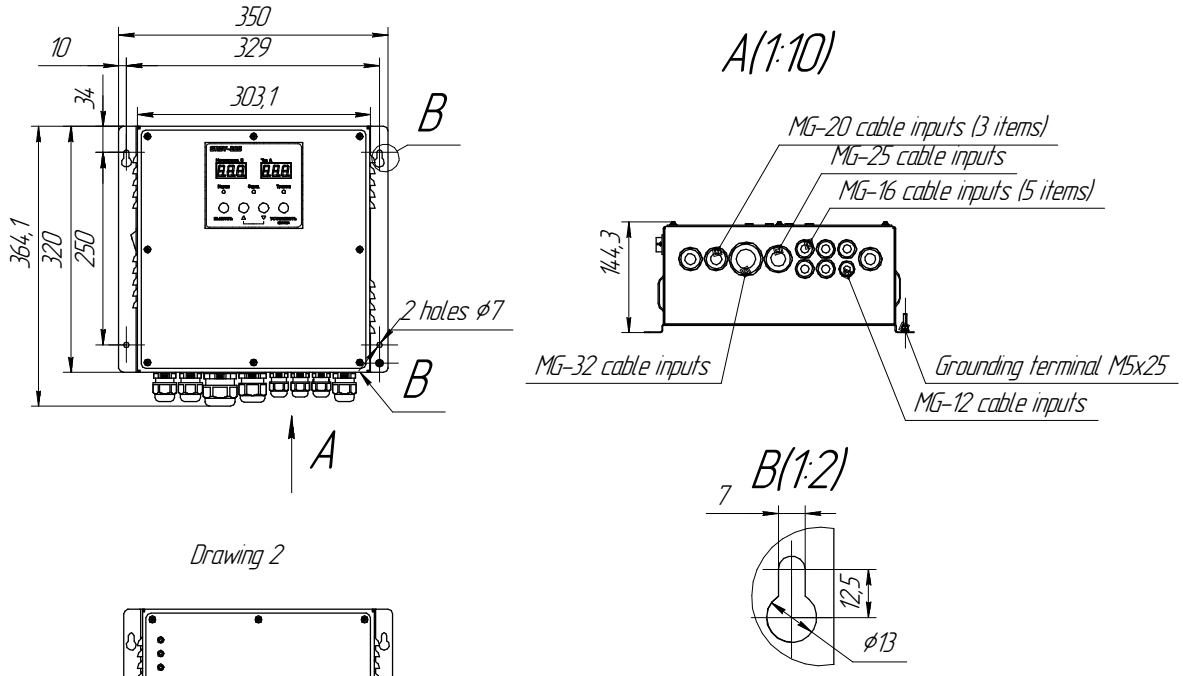
In order to comply with

Russian Register of Shipping, simplified version of PCH-205 (fig. 2) shall be used with BCP-136 (p. 42)

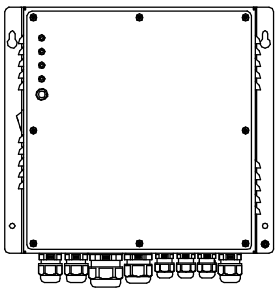
Electrical specifications		
	Built-in power supply	Built-in charger
Supply voltage	110/220 V, 50-60 Hz	110/220 V, 50-60 Hz
Output voltage	24 V regulated	9-30 V
Output current	37 A	0.2-20.0 A
Rated power	1000 W	600 W
Connected storage batteries	-	12 or 24 V, up to 200 A·h
Battery charge time	-	Max. 10 hours up to 80% capacity
Terminals to connect load	7	1 (to connect SB)

Overall and installation dimensions of PCH-205

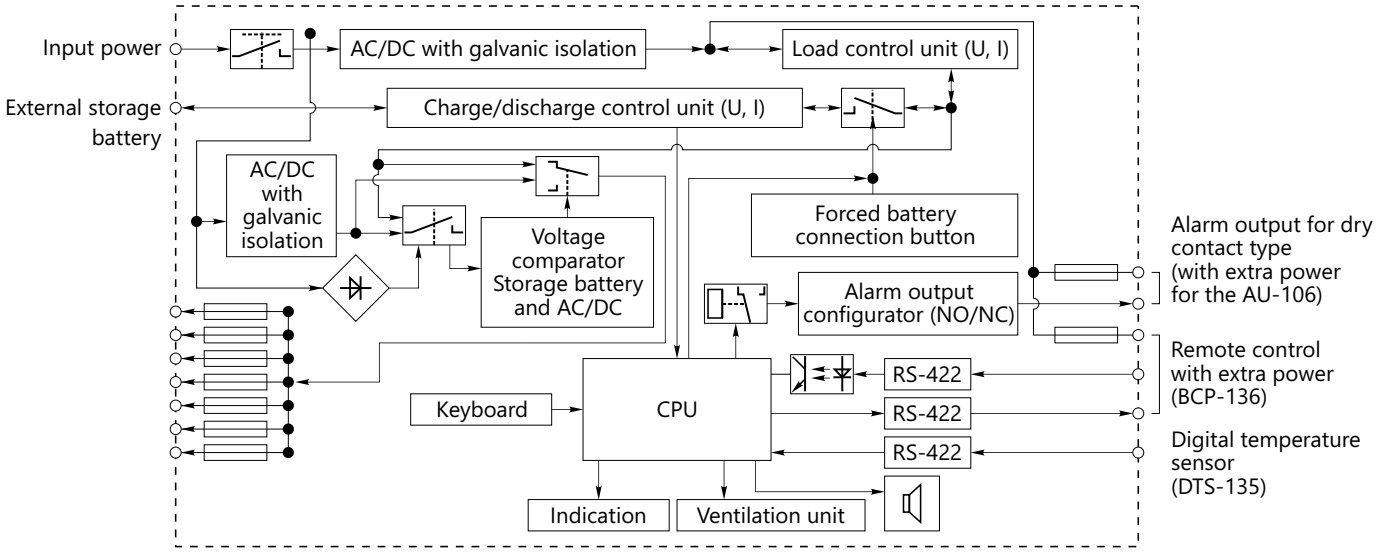
Drawing 1



Drawing 2



Functional diagram of PCH-205



Battery control panel

BCP-136
ЦИУЛ.468262.001

INTENDED USE

- Remote setting of CH-105 and PCH-205 and status control of the batteries connected to them (display of charge/discharge current and voltage actual values)
- Light and sound alarm of battery discharge on BCP-136 and/or voltage failure

TECHNICAL SPECIFICATIONS

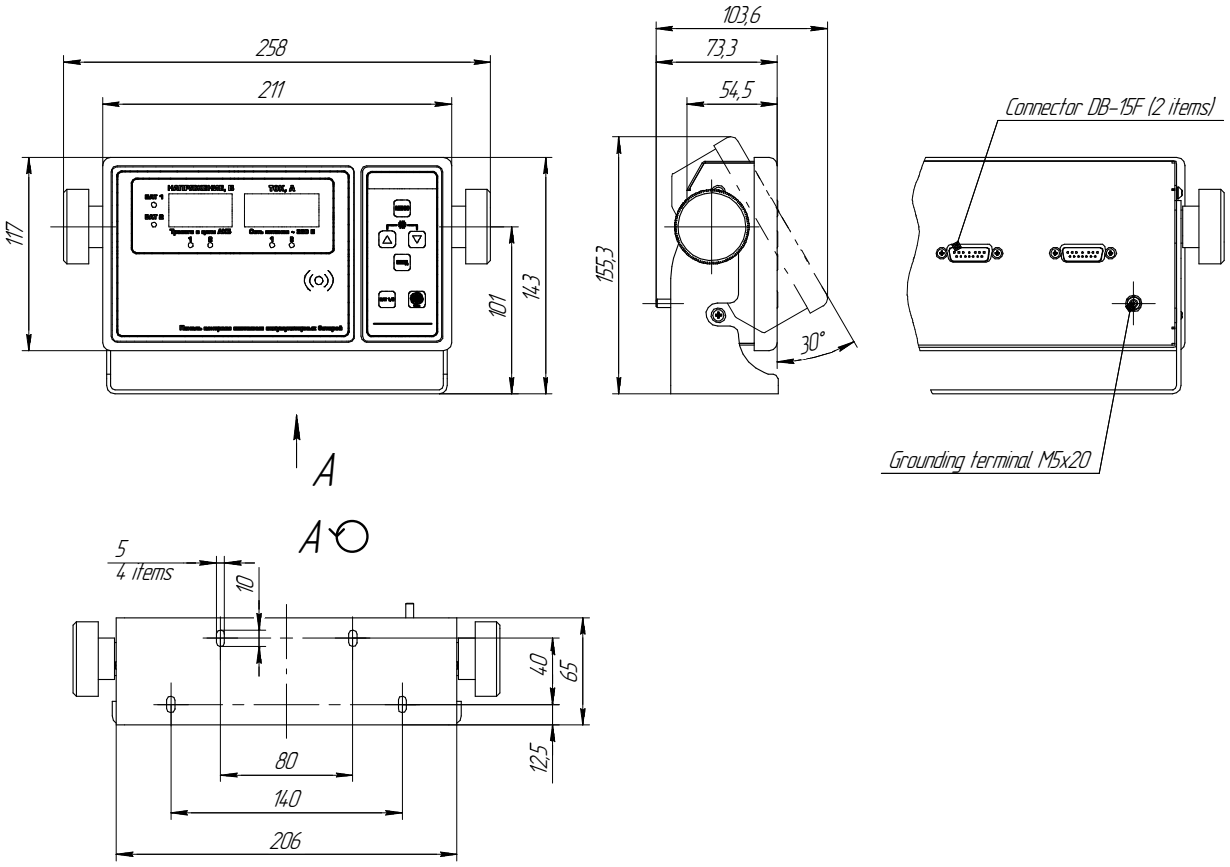
General specifications		
IP rating	IP22	
Storage temperature	-60...+70 °C	
Operating temperature	-15...+55 °C	
Mounting	desk	panel
Weight	1.57 kg	1.46 kg

Specifications of digital interface	
Input ports	2
Supported interfaces	RS-422
Max. receive rate	115200 bit/s
Optoisolation of input ports	+

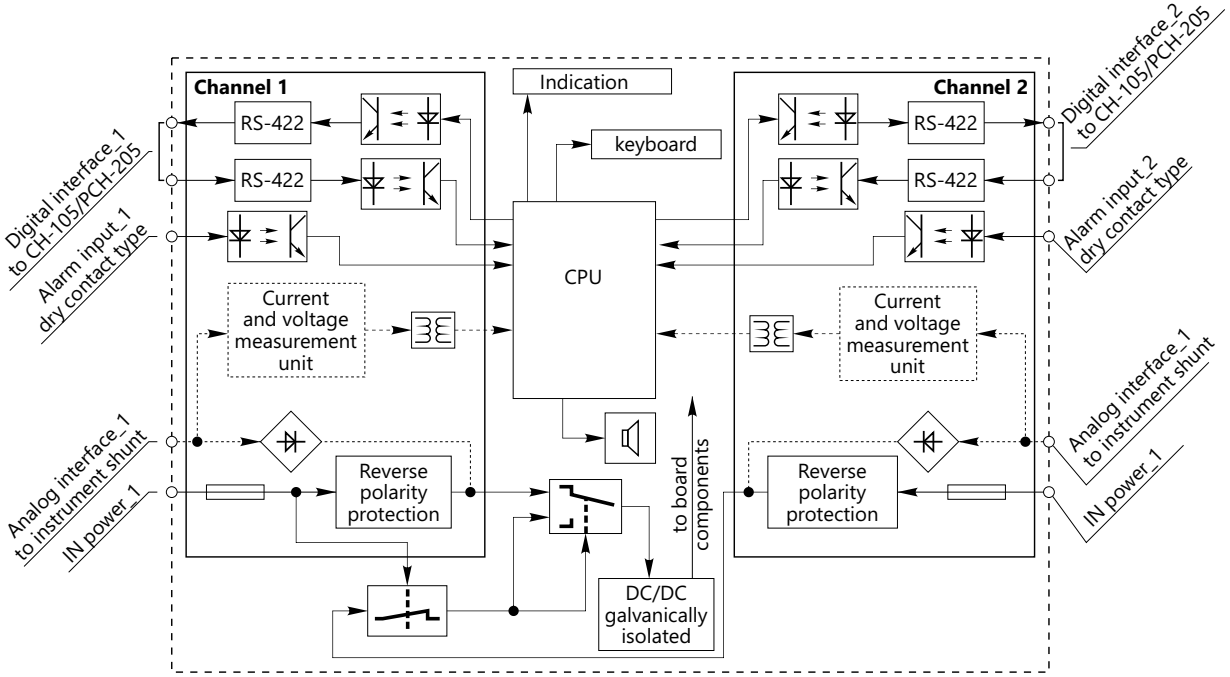
Electrical specifications	
Supply voltage	10...36 V DC
Max. power consumption	3 W
Galvanic isolation from supply mains	+
Reverse polarity protection	+
Overvoltage protection	+
Гальваническая изоляция от питающей сети	+

Specifications of analog interface	
Input ports	2
Galvanic isolation of input ports	+
Measuring range Uresistor	-80...80 mV
Measuring range Ubattery	0-36 V
Current measurement accuracy	0.1 A (format XX.X)
Voltage measurement accuracy	0.1 V (format XX.X)
Input resistance	0.8 MOhm

Overall and installation dimensions of BCP-136



Functional diagram of BCP-136



DC/DC converter

DC-108

DC-108-48/5-50W ЦИУЛ.436121.001-10
DC-108-48/24-50W ЦИУЛ.436121.001-13
DC-108-48/24-150W ЦИУЛ.436121.001-11
DC-108-48/12-50W ЦИУЛ.436121.001-14
DC-108-48/12-150W ЦИУЛ.436121.001-12
DC-108-24/5-50W ЦИУЛ.436121.001-09
DC-108-12/5-50W ЦИУЛ.436121.001-08
DC-108-12/12-50W ЦИУЛ.436121.001-15
DC-108-24/24-150W ЦИУЛ.436121.001-07
DC-108 24/24-50W ЦИУЛ.436121.001-04
DC-108 24/24-150W ЦИУЛ.436121.001-01
DC-108 24/12-50W ЦИУЛ.436121.001-03
DC-108 24/12-150W ЦИУЛ.436121.001
DC-108 12/24-50W ЦИУЛ.436121.001-02
DC-108 110/24-150W ЦИУЛ.436121.001-06
DC-108 110/12-150W ЦИУЛ.436121.001-05

INTENDED USE

To supply power to various edge-sensitive equipment.

BUILT-IN PROTECTION

- Galvanic isolation of power mains and load
- Current overload protection
- Input overvoltage protection

DESCRIPTION

DC converter operates with DC network 12/24/110 V and converts input voltage 110 V AC into regulated voltage 12/24 V DC.

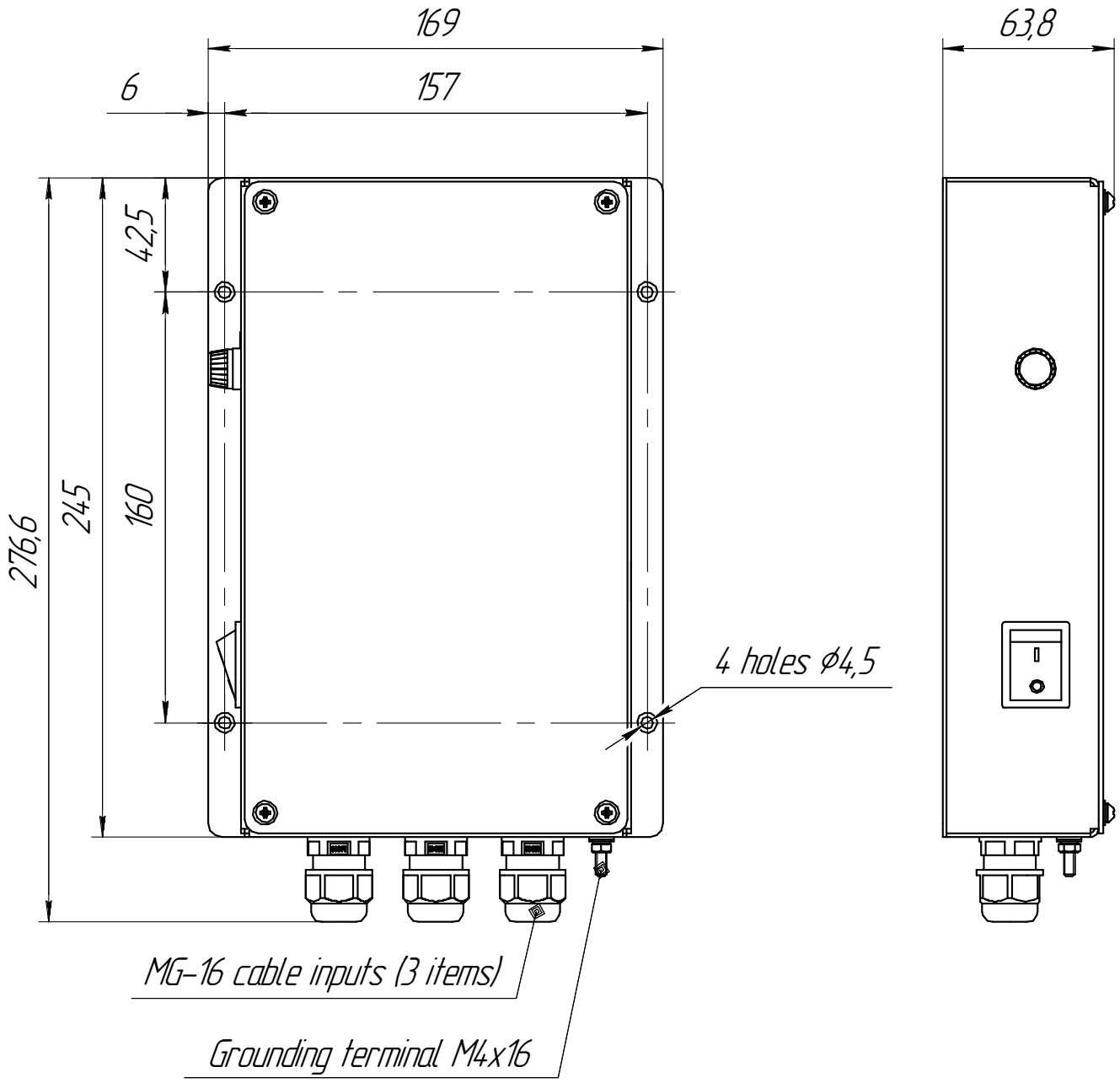
TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Weight	1.9 kg

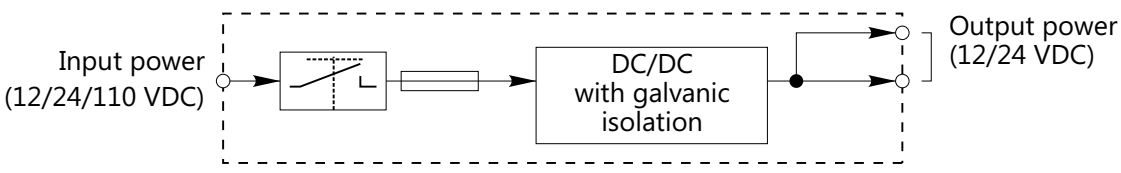
Name	Supply voltage	Output voltage	Output power	Voltage consumption (max.)	Power consumption (max.)	Efficiency
DC-108 (12/24-50)	12 (9.2...18) V DC	24 V DC	50 W	2.1 A	70 W	74 %
DC-108 (24/24-50)	24 (19...36) V DC	24 V DC	50 W	2.1 A	70 W	80 %
DC-108 (24/12-50)	24 (19...36) V DC	12 V DC	50 W	4.2 A	70 W	75 %
DC-108 (24/12-150)	24 (19...36) V DC	12 V DC	150 W	12.5 A	200 W	75 %
DC-108 (110/12-150)	110 (72...144) V DC 110(82...132) V, 50/60 Hz	12 V DC	150 W	12.5 A	200 W	79 %
DC-108 (24/24-150)	24 (19...36) V DC	24 V DC	150 W	6.3 A	200 W	77 %
DC-108 (110/24-150)	110 (72...144) V DC 110 (85...132) V, 50/60 Hz	24 V DC	150 W	6.3 A	200 W	82 %

The DC-108 can be optionally designed with various power and voltage.

Overall and installation dimensions of DC-108



Functional diagram of DC-108



* depending on the version

DC/DC converter

DC-108-1000
ЦИУЛ.436122.003

INTENDED USE

To supply power to various edge-sensitive equipment.

BUILT-IN PROTECTION

- Galvanic isolation between the power mains and load
- Current overload protection
- Input circuit overvoltage protection

DESCRIPTION

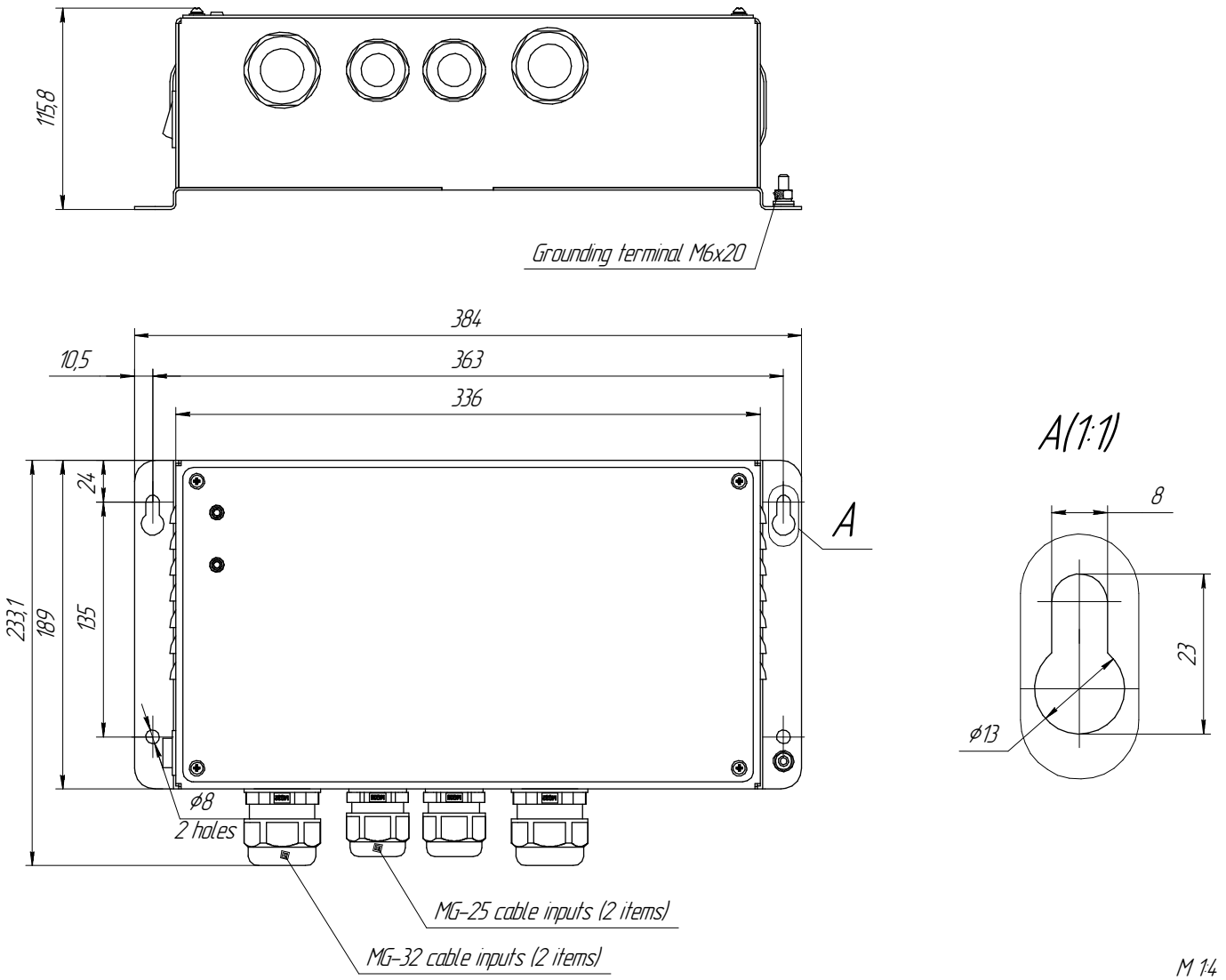
The unit converts unregulated DC voltage into regulated.

TECHNICAL SPECIFICATIONS

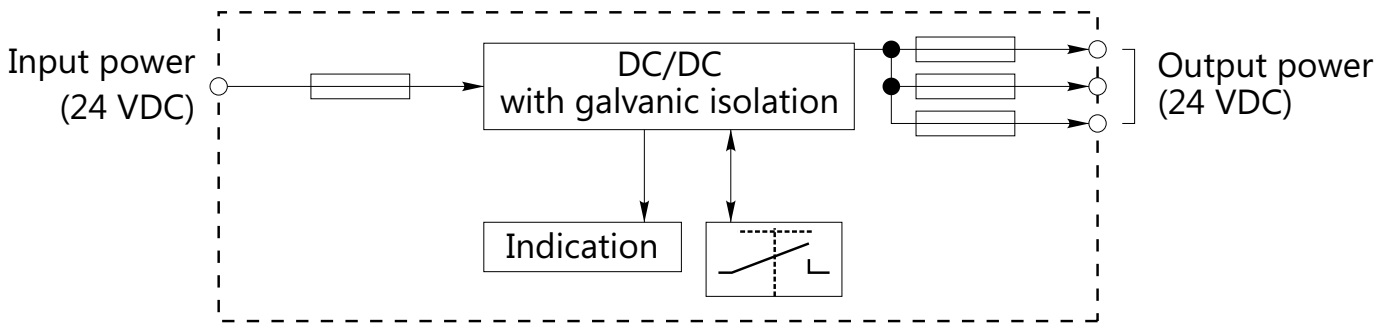
General specifications	
Overall dimensions	384 x 233.1 x 115.8 mm
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Weight	6 kg
Efficiency	up to 88 %

Electrical specifications	
Supply voltage	19-36 V DC
Output voltage	24 V DC
Rated power	960 W
Pulsation	150 mV
Rated load current	40 A
Terminals to connect loads	3
Galvanic isolation from power mains	+

Overall and installation dimensions of DC-108-1000



Functional diagram of DC-108-1000



Power supply unit

BPS-114
ЦИУЛ.461524.006

INTENDED USE

Uninterruptable power supply of the equipment with input voltage 12 V DC.

BUILT-IN PROTECTION

- Galvanic isolation between the power mains and load
- Current overload protection

DESCRIPTION

Front panel includes a charge indicator of built-in accumulator battery and mains power indicator.

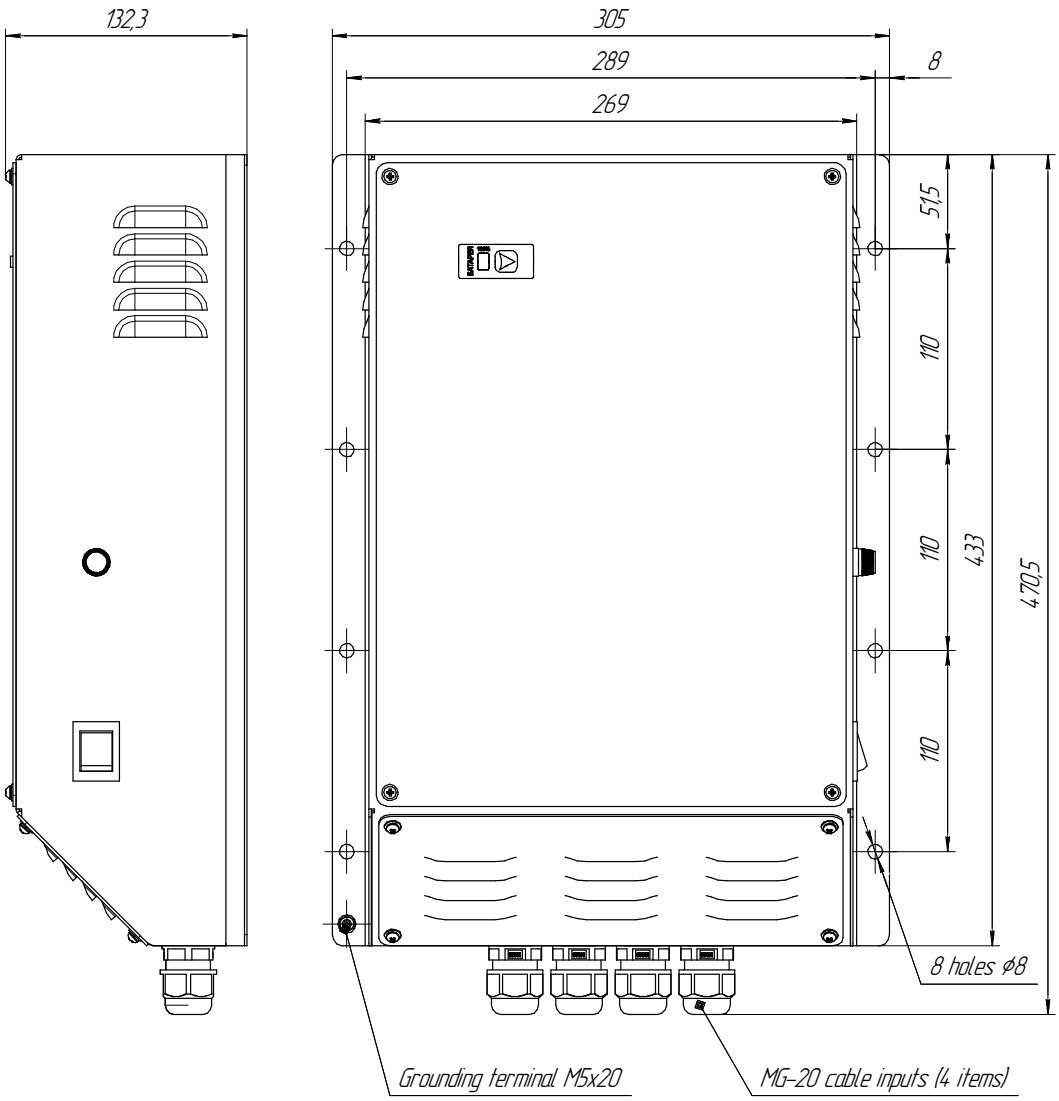
Power is automatically switched to standby power source in the event of main power failure.
Power failure actuates dry contacts closing of built-in relay and actuates sound and light alarm.

TECHNICAL SPECIFICATIONS

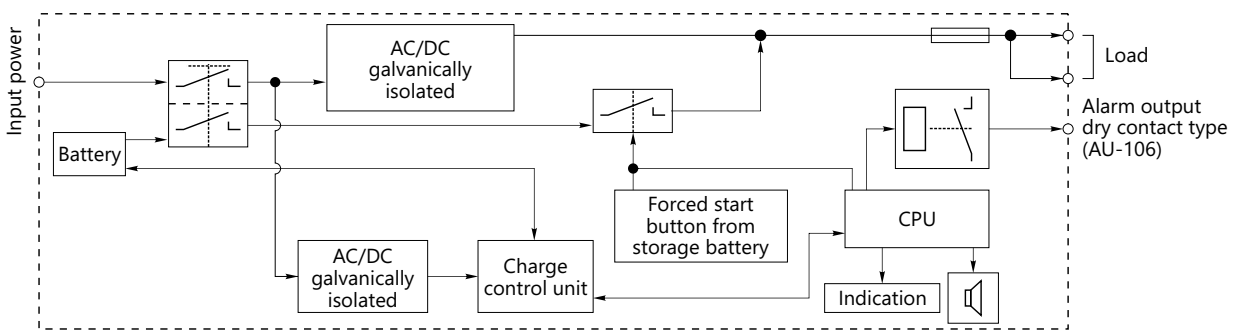
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Max. weight	13.4 kg

Electrical specifications	
Supply voltage	~110/220 V, 50/60 Hz
Output voltage (operation from the mains)	14.5 V DC
Output voltage (operation from the battery)	9.5...14 V DC
Rated output power	160 W
Max. operation time from the battery under load 11A	min. 60 minutes
Efficiency	Up to 84 %
Terminals to connect loads	2
Battery	sealed lead acid battery, maintenance-free, 12 V (20 A·h)

Overall and installation dimensions of BPS-114



Functional diagram of BPS-114



Power supply unit

BPS-114-24
ЦИУЛ.461524.001

INTENDED USE

Uninterruptable power supply of the equipment with input voltage 24 V DC.

BUILT-IN PROTECTION

- Galvanic isolation between the power mains and load
- Current overload protection

DESCRIPTION

Front panel includes a charge indicator of built-in accumulator battery and mains power indicator.

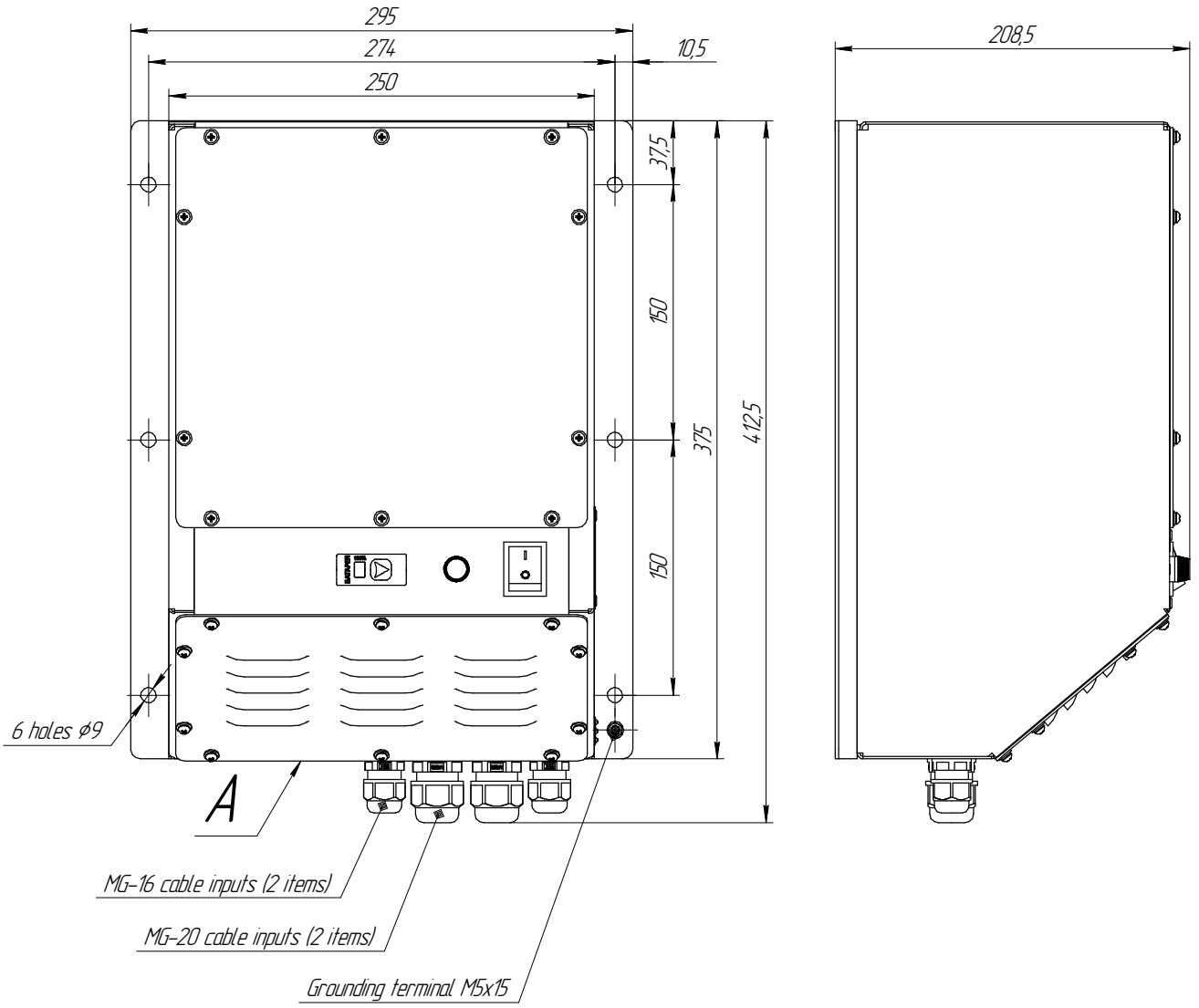
Power is automatically switched to standby power source in the event of main power failure.
Power failure actuates dry contacts closing of built-in relay and actuates sound and light alarm.

TECHNICAL SPECIFICATIONS

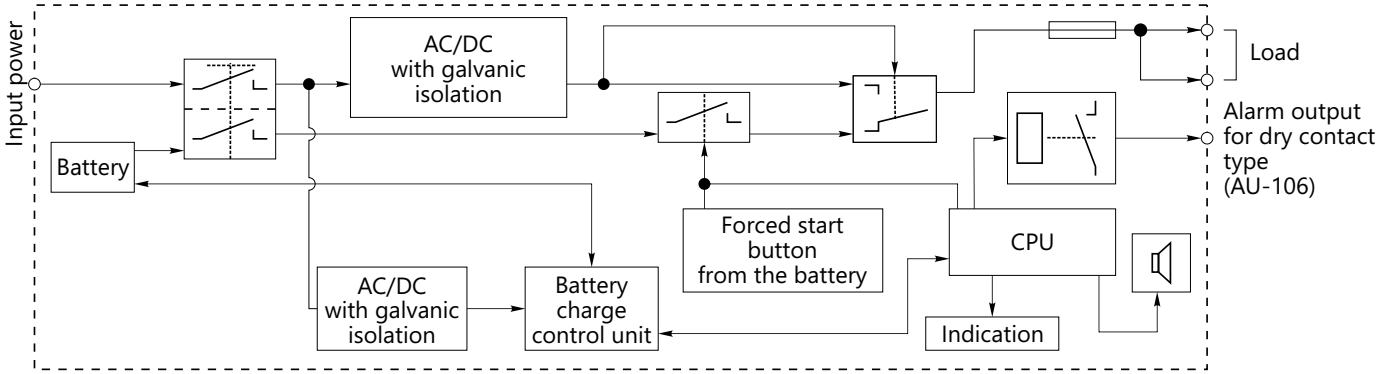
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Weight	21.7 kg

Electrical specifications	
Supply voltage	~110/220 V, 50/60 Hz
Output voltage (operation from the mains)	28.4 V DC
Output voltage (operation from the battery)	19.2...28 V DC
Rated output power	320 W
Max. operation time from the battery under load 11A	min. 60 minutes
Efficiency	up to 87 %
Terminals to connect loads	2
Battery	sealed lead acid battery, maintenance-free, 2x12 V (20 A·h)

Overall and installation dimensions of BPS-114-24



Functional diagram of BPS-114-24



Battery power measurement unit

BMU-126
ЦИУЛ.411136.001

INTENDED USE

Monitoring of actual voltage and current values of accumulator battery.

DESCRIPTION

To ensure remote control of charge/discharge current and SB voltage when using third-party charging devices. Readings are transmitted to battery control panel BCP-136 via RS-422 interface.

TECHNICAL SPECIFICATIONS

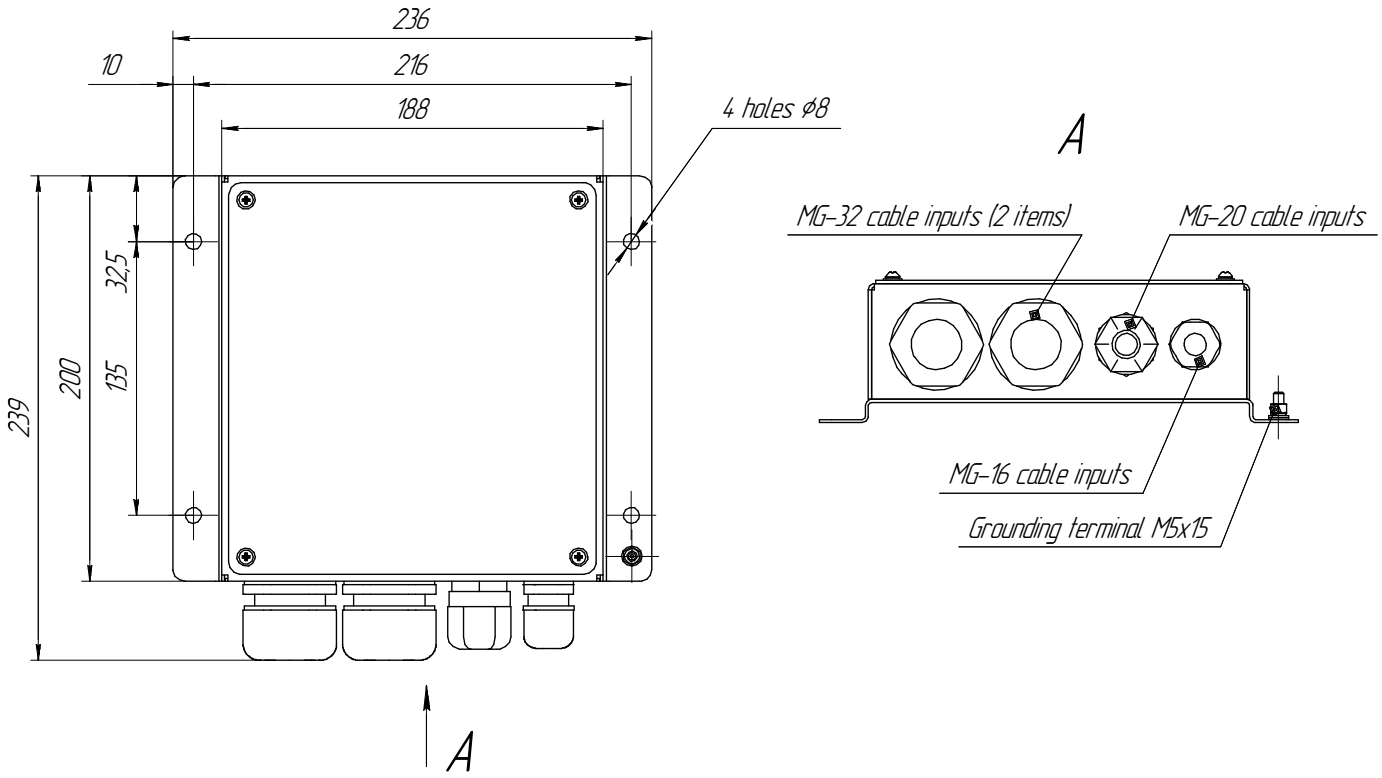
General specifications	
IP rating	IP22
Storage temperature	-60...+70°C
Operating temperature	-15...+55°C
Weight	2,1 kg

Operating parameters		
Measurement accuracy	current	0.2 A
	voltage	0.1 V
Max. value of measured current		50 A
Max. value of measured voltage		36 V

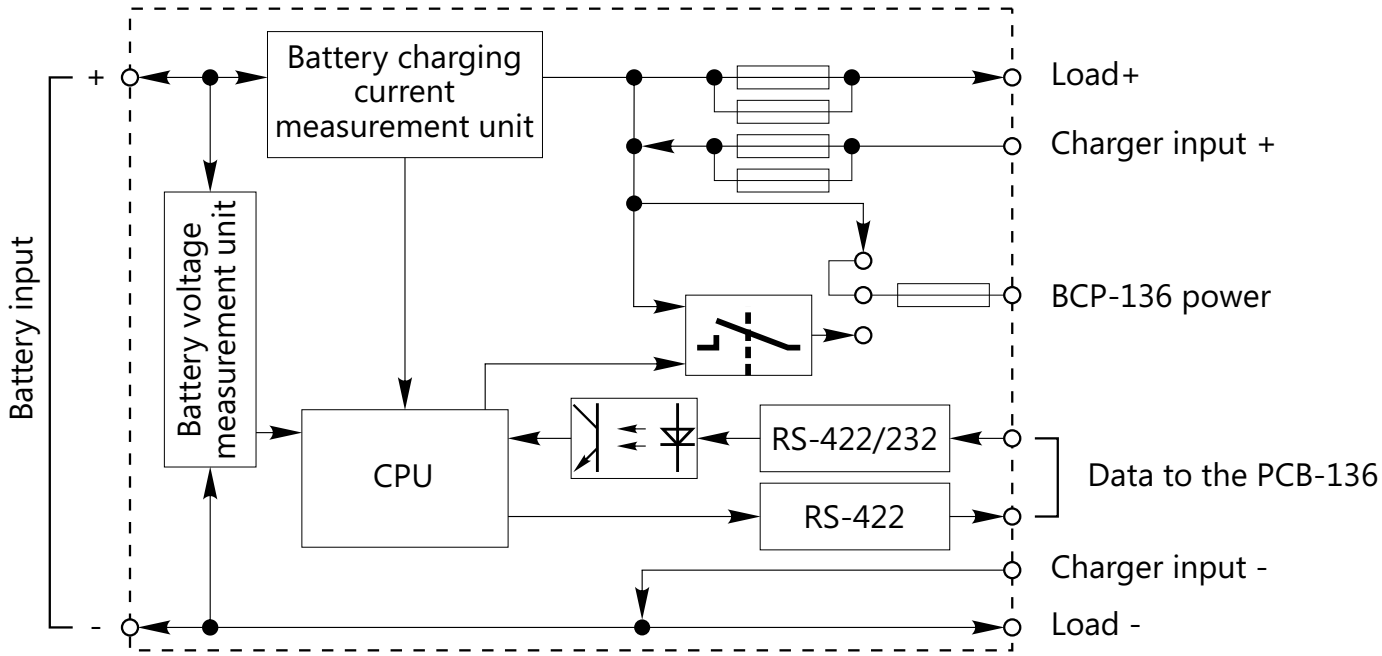
Electrical specifications	
Supply voltage	9.5-36 V DC
Max. power consumption	5 W
Reverse polarity protection	+
Overcurrent protection	+

Outputs	
Output ports	1
Supported interfaces	RS-422
Max. baud rate	9600 bit/s
Galvanic isolation from power mains	+ (when powered from external source)

Overall and installation dimensions of BMU-126



Functional diagram of BMU-126



Fuse box

FB-137
ЦИУЛ.646223.001

INTENDED USE

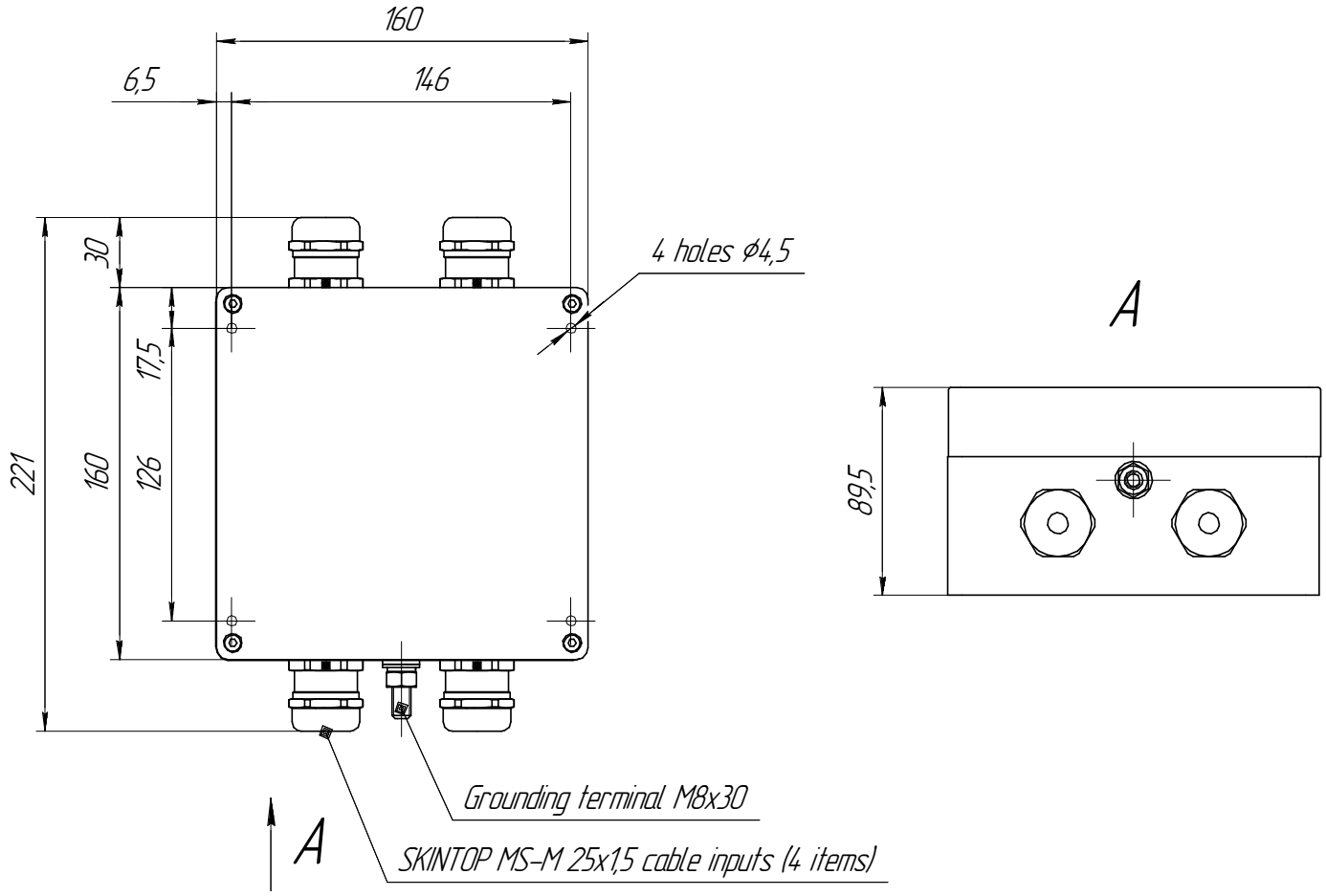
Protection of electric circuits and relevant elements from short circuit or overload.

TECHNICAL SPECIFICATIONS

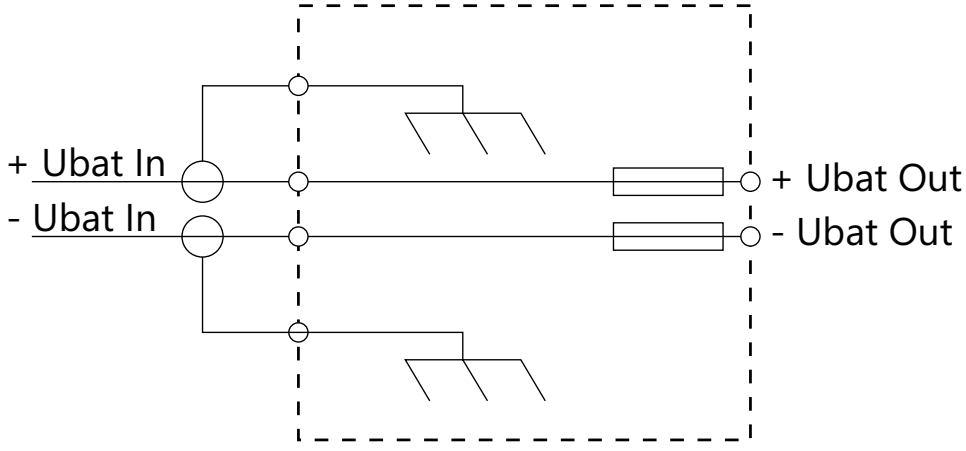
General specifications	
IP rating	IP65
Storage temperature	-60...+70°C
Operating temperature	-40...+55°C
Weight	1.74 kg

Electrical specifications	
Operating voltage	12-250 V DC or 400 V AC
Rated current	50 A

Overall and installation dimensions of FB-137



Functional diagram of FB-137



Junction box

KP-124
ЦИУЛ.469436.109-04

INTENDED USE

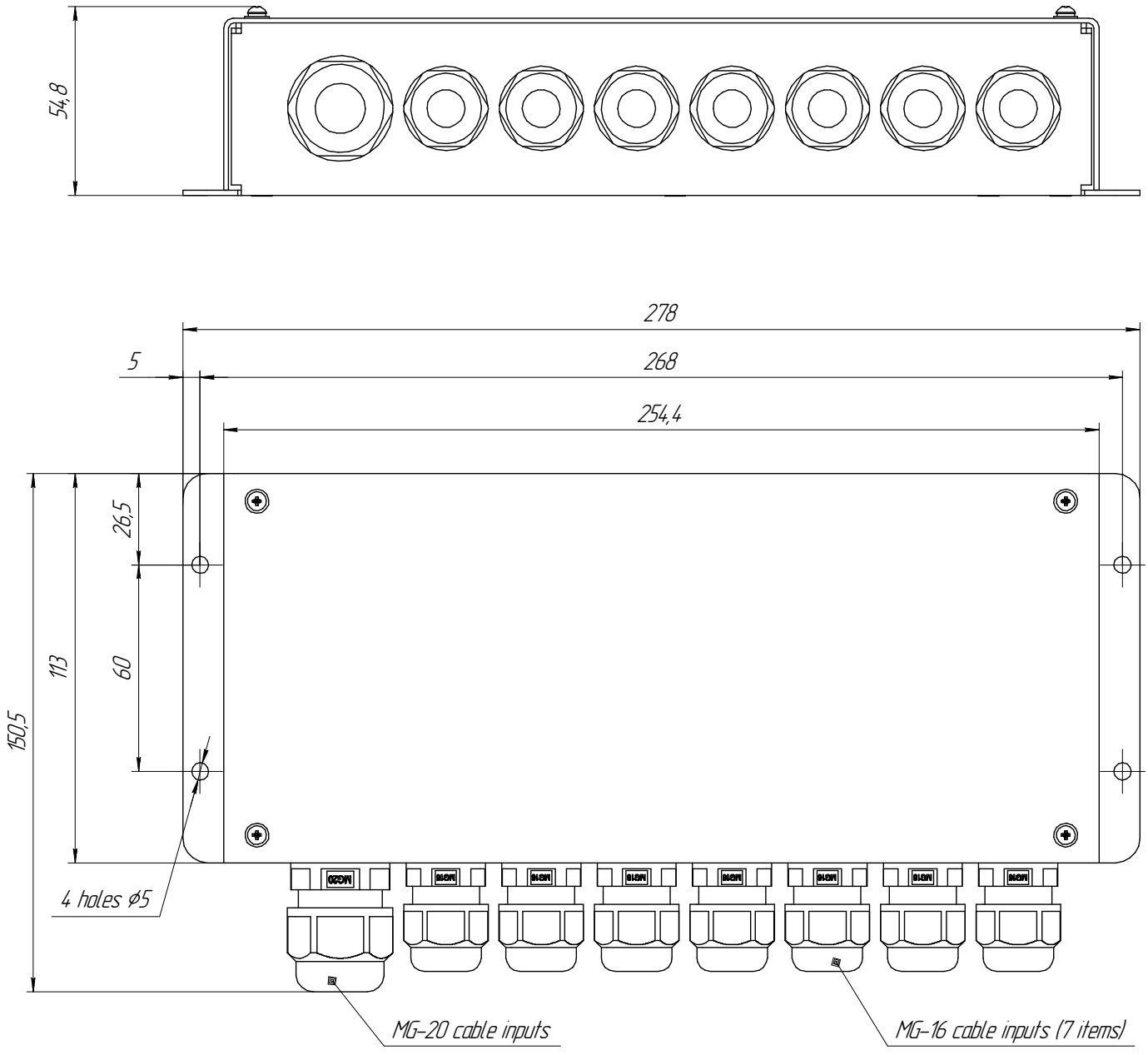
Connection of several users to a single feed circuit.

TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Storage temperature	-60...+70°C
Operating temperature	-20...+55°C
Weight	1.4 kg

Electrical specifications			
Model	KP-124	KP-124П	KP-124C
Total number of terminals	8	8	8
Terminals to connect users	7	7	7
Contacts in terminal	6	3	3
Max. permissible voltage	250 V	220 V	220 V
Max. permissible current	5 A	20 A	10 A

Overall and installation dimensions of KP-124



VHF-interface (to connect VDR/SVDR)

VI-116
ЦИУЛ.468151.002

INTENDED USE

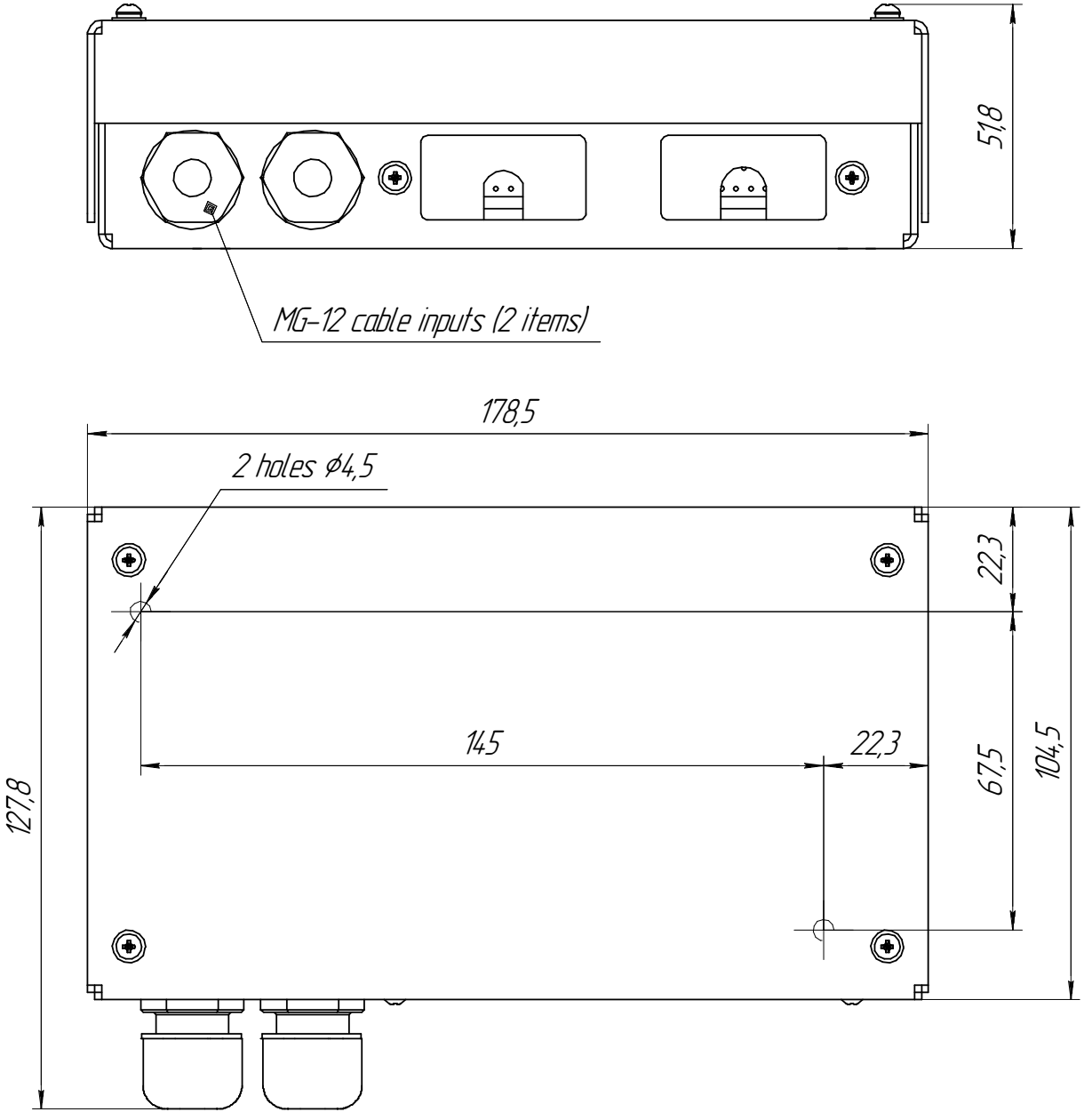
Interface of voyage data recorders with VHF-radio stations:
- Sailor RT-2048 (Debeg 6348, Husun 2048),
- Sailor RT-4822 (Debeg 6322, Husun 4822, Sperry 4822, Scanti VHF 1000 DSC),
- Furuno FM-8500.

TECHNICAL SPECIFICATIONS

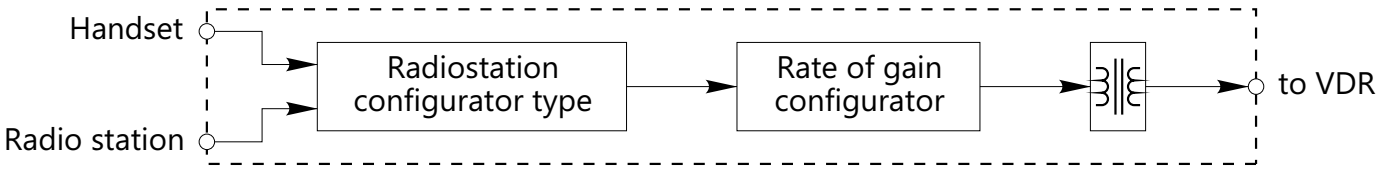
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-20...+55 °C
Weight	1 kg

Electrical specifications	
Supply voltage	10...36 V DC
Power consumption	500 mW
Max. power of analog output signal	100 mW
Max. amplitude of analog output signal	10 V
Frequency bandwidth	100 Hz - 15 kHz

Overall and installation dimensions of VI-116



Functional diagram of VI-116



Alarm unit

AU-106
ЦИУЛ.425548.001

INTENDED USE

Light and sound signaling notifies a navigator of emergency operation mode caused by other equipment.

BUILT-IN PROTECTION

- Reverse polarity protection
- Overvoltage protection of power circuit

DESCRIPTION

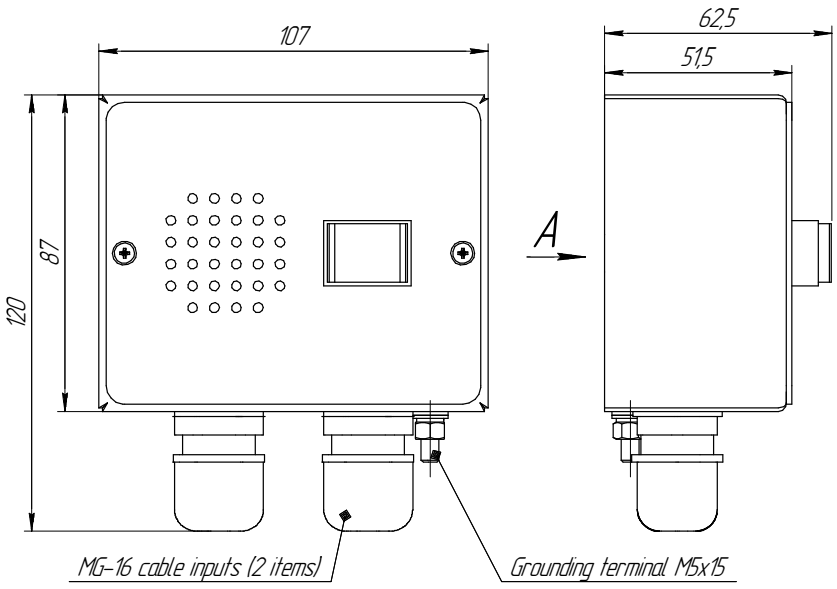
Alarm is actuated when relay dry contacts close/open or voltage level changes.

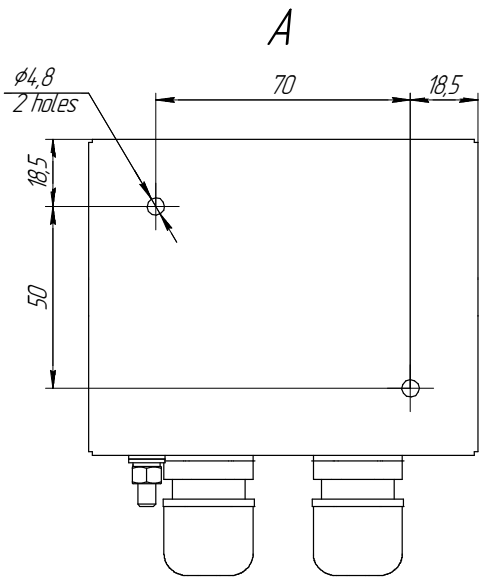
TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Max. weight	0.5 kg

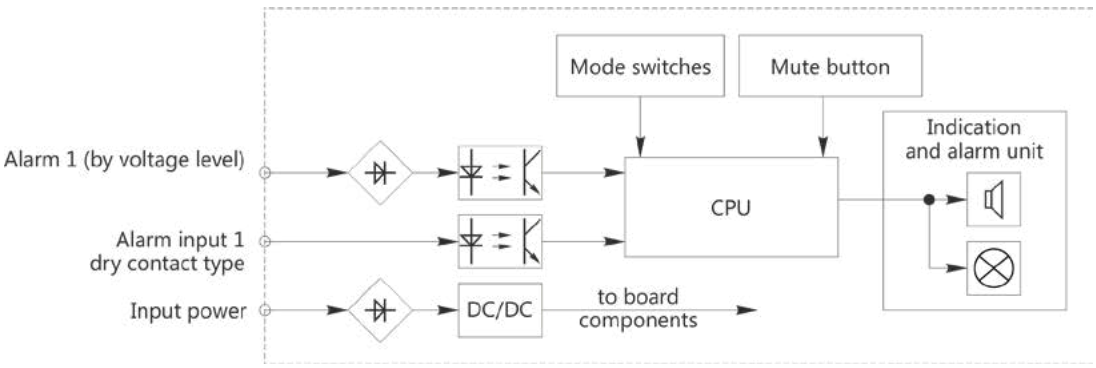
Electrical specifications	
Supply voltage	15...30 V DC
Consumption current	< 50 mA
Consumption current on «Relay» input	< 2 mA
Voltage levels on «U» input	5/12/24/110/220 V
Signaling units inputs	Dry relay contact/ Voltage level

Overall and installation dimensions of AU-106





Functional diagram of AU-106



Alarm unit

AU-206
ЦИУЛ.425548.002

INTENDED USE

Control of the activation of external alarms on up to five simultaneously connected devices, having a dry contact type output.

BUILT-IN PROTECTION

- Reverse polarity protection
- Current overload protection
- Overvoltage protection in power circuit
- Current overload protection on the “power” output

DESCRIPTION

Triggered at least on a single output, an alarm causes sound/visual signal and closing of “power” output contacts, where external alarm devices may be connected (e.g. lamps, loudspeakers, etc.).

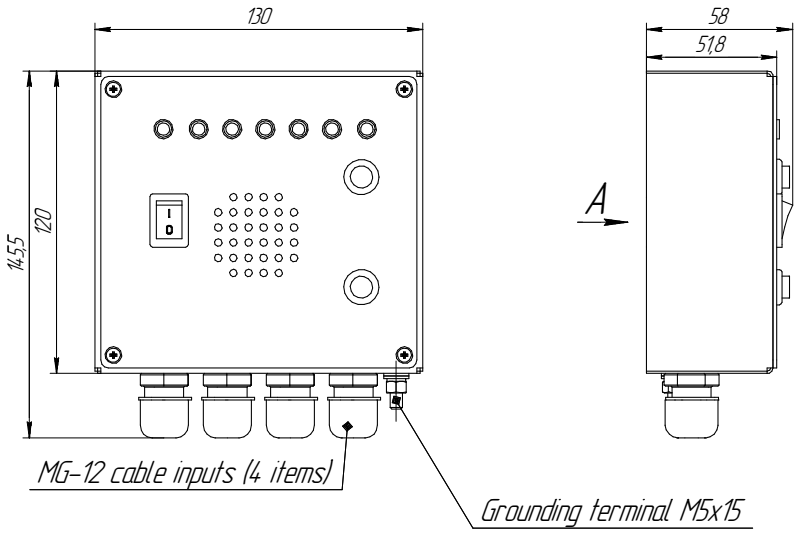
TECHNICAL SPECIFICATIONS

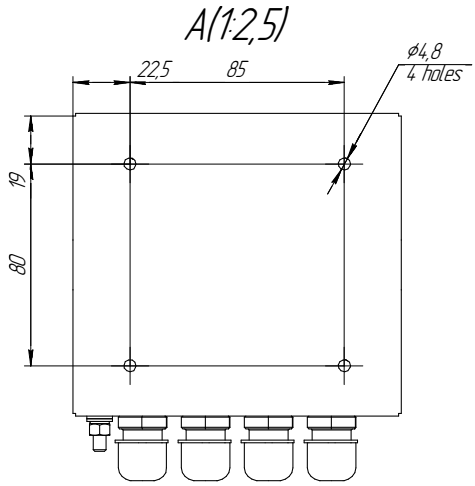
General specifications	
IP rating	IP22
Storage temperature	-60...+70 °C
Operating temperature	-15...+55 °C
Max. weight	0.7 kg

Specifications of inputs/outputs	
Inputs	5
Type of input	Dry contacts opening sensor
Voltage on power output	Equal to power supply voltage

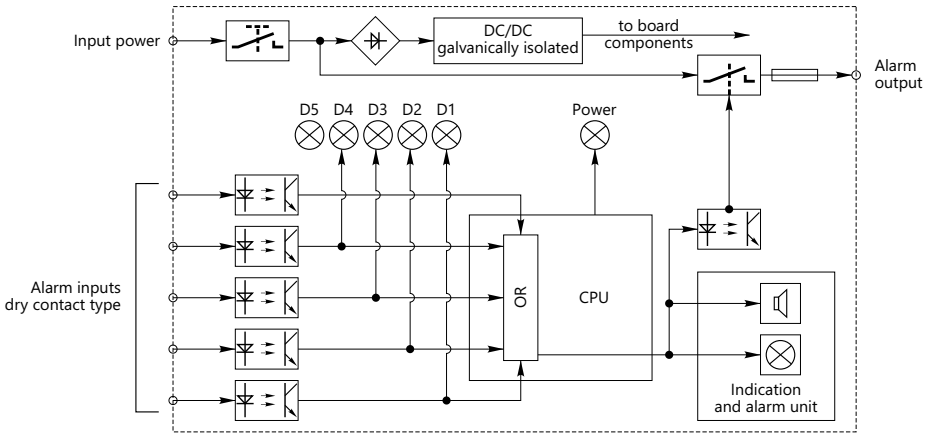
Electrical specifications	
Supply voltage	10...36 V DC
Max. power consumption	3 W
Galvanic isolation from power mains	+
Reverse polarity protection	+
Overvoltage protection	+

Overall and installation dimensions of AU-206





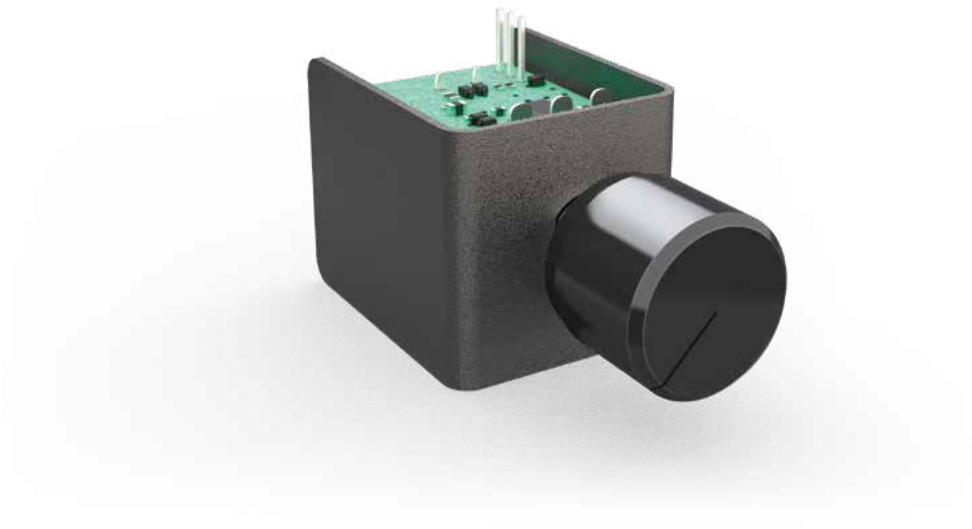
Functional diagram of AU-206



Dimmer

DM-107

ЦИУЛ.421212.001



INTENDED USE

Smooth adjustment of load
power by potentiometer rotation.

DESCRIPTION

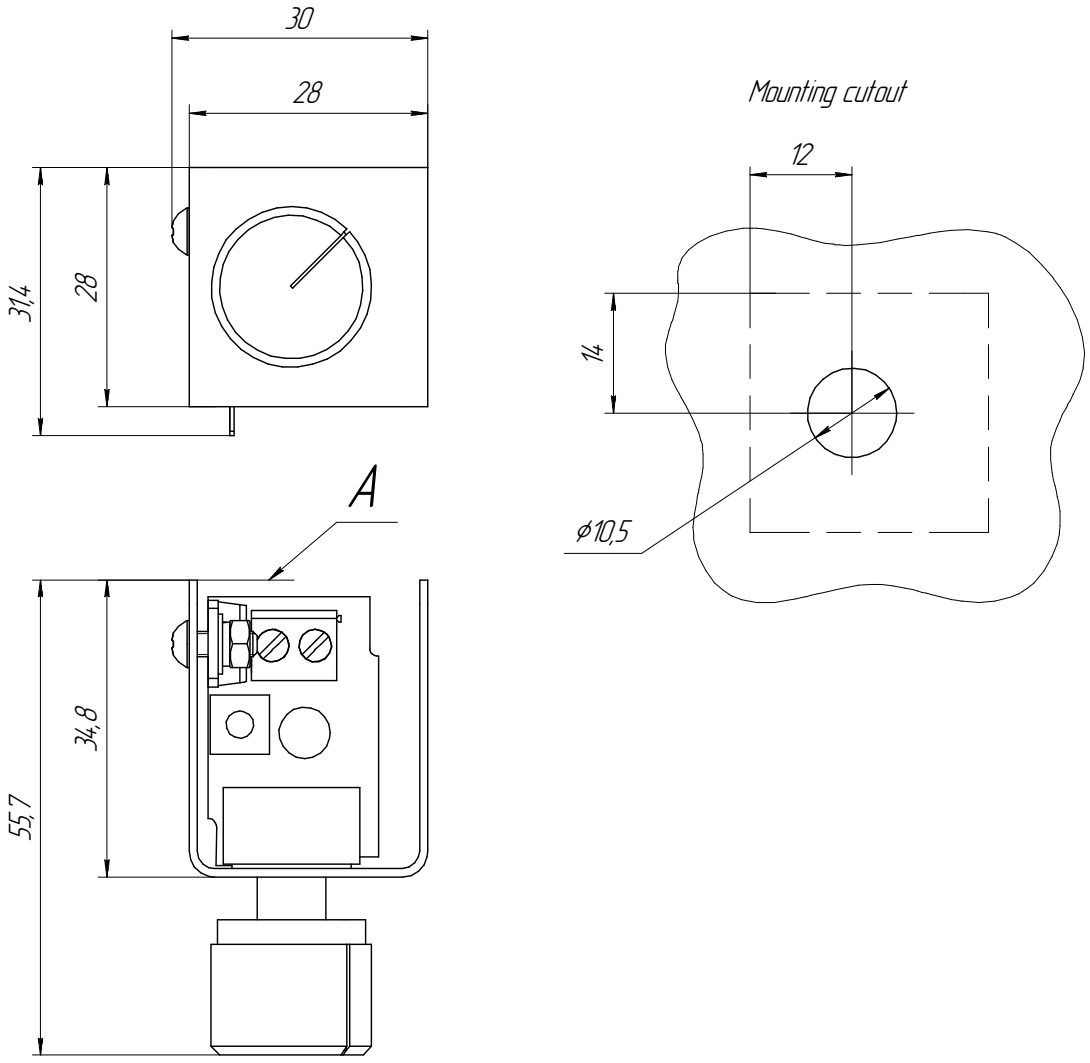
Low-voltage power regulator for DC circuits.
The load may be resistive (lighting lamps, resistors, etc.)
and inductive (solenoids, valves, engines, etc.).

TECHNICAL SPECIFICATIONS

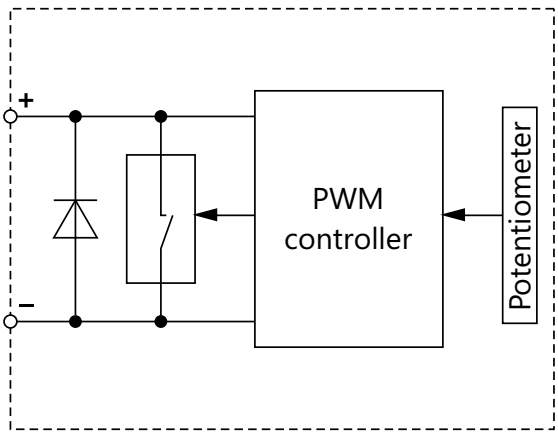
General specifications	
Storage temperature	-60...+70 °C
Operating temperature	-20...+60 °C
Weight	0.12 kg

Электрические характеристики	
Operating voltage range	18...36 V DC
Consumption current	1.1 mA
Type of connected load	resistive, inductive (except capacitive)
Max. switching current	3.2 A
Regulated power	up to 100 W
Tuning range	0...90 %
Limit of min. power level	0...50 %
Operating frequency of PWM generator	200±20 Hz

Overall and installation dimensions of AU-107



Functional diagram of AU-107



Dimmer

DM-207
ЦИУЛ.424211.002

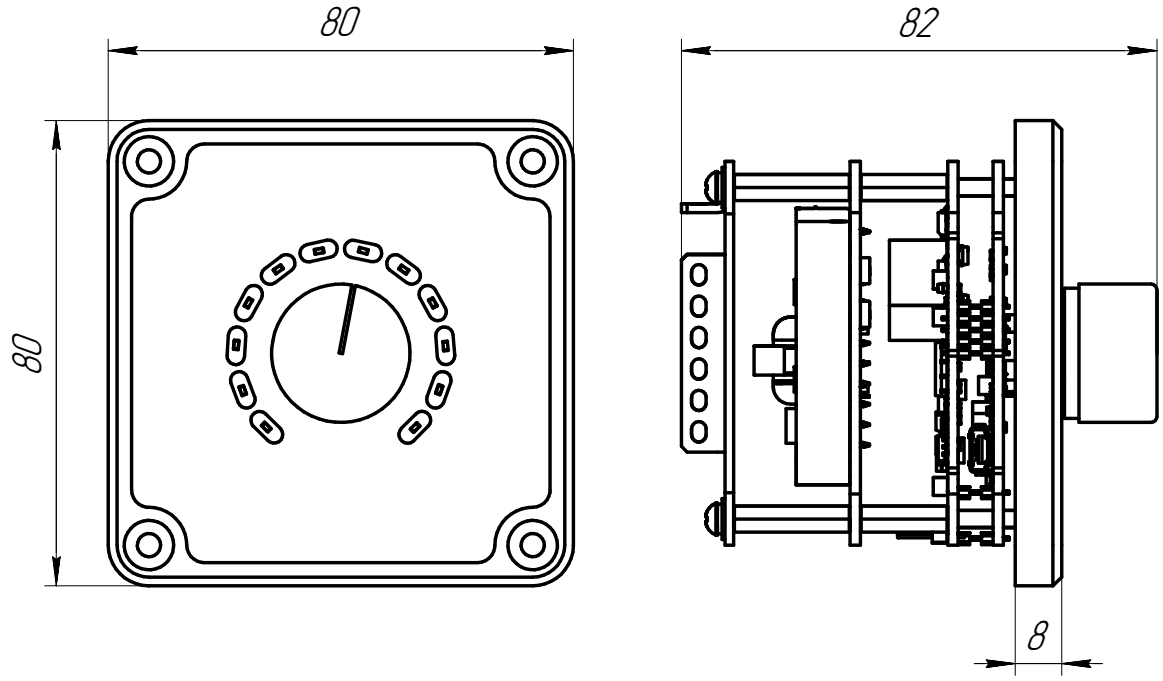
INTENDED USE

Brightness control of the displays MV-xx04/xx05/xx06/xx07 series and MVPC-xx04/xx05/ xx06/xx07 series, and repeater DR-209M.

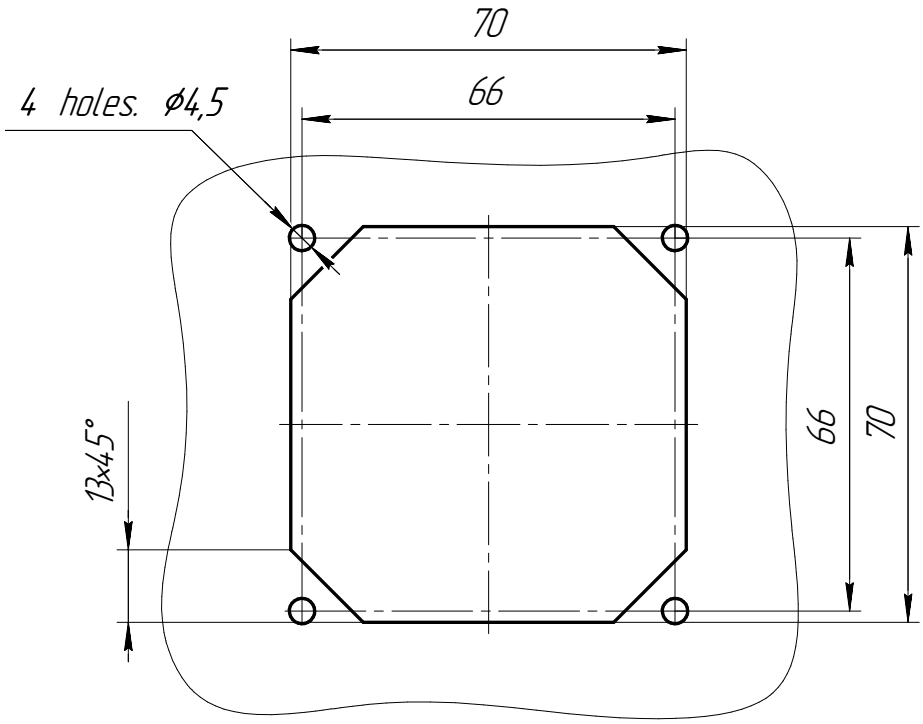
TECHNICAL SPECIFICATIONS

IP rating	IP22
Input voltage, V DC	24 (19...36)*
Interface	RS-422
Sentence format	$UNBRG, xx*hh, where xx – value from 0 to 100, hh – checksum
Setting range	0...100 %
Operating temperature	–20...+60 °C
Limiting temperature	–55...+75 °C
Weight	0.39 kg
Mounting	panel
* Supply voltage range	

Overall and installation dimensions of DM-207



Mounting cutout



Lamp

L-112
ЦИУЛ.676312.001

INTENDED USE

Night lighting for workstations, console controls and other equipment.

DESCRIPTION

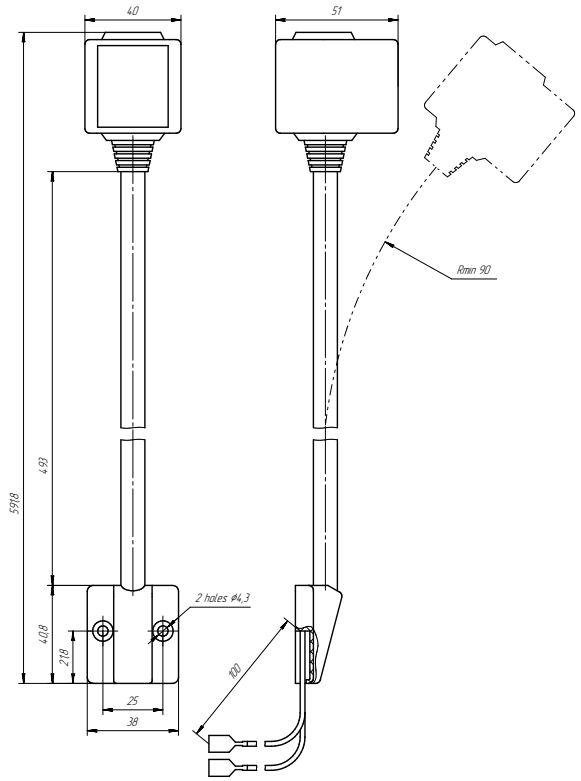
A gooseneck holder allows easy adjustment. Two-hole base is a perfect solution for a secure mounting on any surface.

TECHNICAL SPECIFICATIONS

General specifications		
Name	L-112-24	L-112-12
IP rating	IP22	IP22
Storage temperature	-60...+70 °C	-60...+70 °C
Operating temperature	-15...+55 °C	-15...+55 °C

Electrical specifications		
Supply voltage	24 V DC	12 V DC
Power consumption	10 W	5 W
Bulb type	halogen	halogen

Overall and installation dimensions of L-112



Marine LCD display

MV-xx04, MV-xx05

DESCRIPTION

Display of textual, graphic and other data.

Wide range of application:
- Electronic mapping
- Displays of radar station
- Video surveillance and automation systems
- Workstations
- Automated systems, etc.

Range of displays with diagonal 10” - 46”
and ratio 5:4, 4:3, 16:9, 16:10.

A potentiometer on the front panel is used
to adjust the display backlight.

BUILT-IN PROTECTION

Galvanic isolation from power mains

OPTIONS

- Touch screen
- High brightness matrix
- Change of front panel IP rating (for IP56)
- Optical bonding

Depending on the model, the unit can operate
with 12/24 V DC, and single-phase mains,
frequency 50 (60) Hz 110/220 V AC.

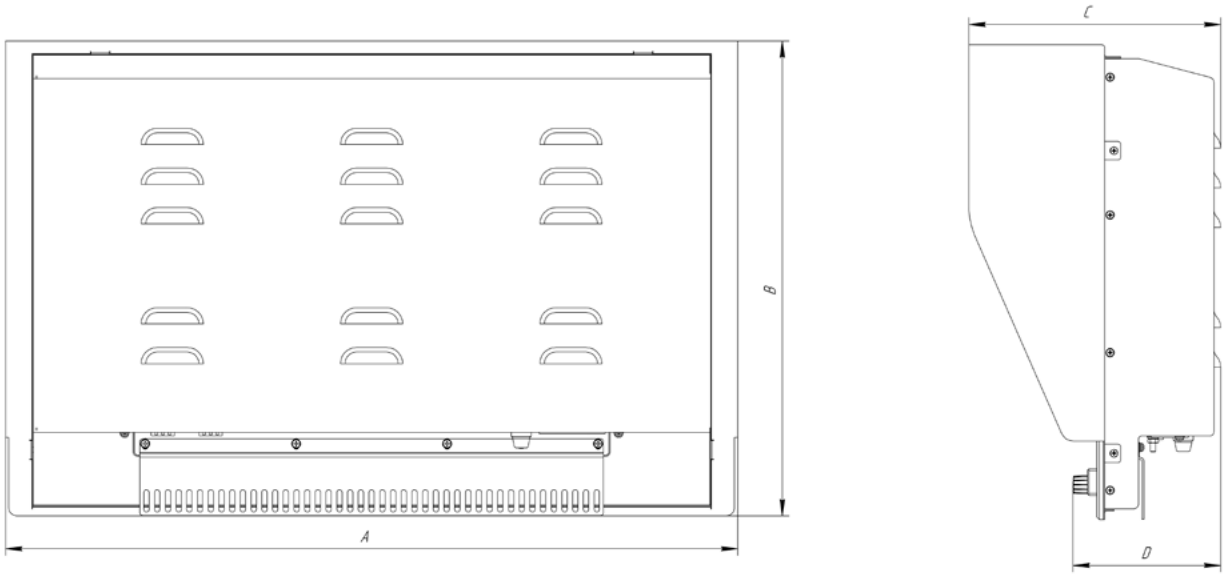
TECHNICAL SPECIFICATIONS OF MV-XX04

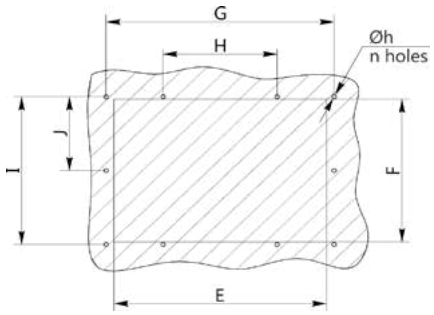
Model	MV-1204	MV-1504	MV-1704	MV-1904	MV-2104
Diagonal	12.1"	15"	17"	19"	21.3"
Format (aspect ratio)	4:3	4:3	5:4	5:4	4:3
Resolution (pix.)	1024×768	1024×768	1280×1024	1280×1024	1600×1200
Viewable area, mm	246×184	304×228	337×270	376×301	432×324
Angle of view (min.)	160 °	160 °	160 °	178 °	178 °
Contrast ratio	700:1	800:1	1000:1	700:1	1400:1
Brightness, cd/m²	500 (>500 option)				
Screen surface	With non-reflective glass layer / touch screen (option)				
Sensor control signal	USB				
Brightness remote control	no / RS-232/422				
Built-in speakers	no	no	yes	yes	yes
Optical bonding	At option				
Communication ports (interfaces)	VGA (RGB), DVI, HDMI, DP				
Max. power consumption, W	30	30	30	50	60
Supply voltage	~110/220 V, 50-60 Hz / 19...36 V DC / 9.6...18 V DC				
IP rating	IP22 / IP56 (option) – front panel, IP22 – other surfaces				
Operating temperature, °C	-15...+55				
Storage temperature, °C	-60...+70				

TECHNICAL SPECIFICATIONS OF MV-XX05

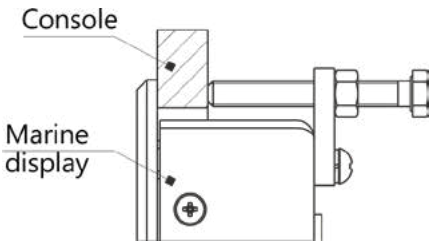
Model	MV-1005	MV-2105	MV-2305	MV -2405	MV -2705	MV -3205	MV -4205	MV -4605
Diagonal	10,1"	21,5"	23"	24"	27"	31,5"	42"	46"
Format (aspect ratio)	16:9	16:9	16:9	16:10	16:9	16:9	16:9	16:9
Resolution (pix.)	1280×800	1920×1080	1920×1080	1920×1200	1920×1080	1920×1080	1920×1080	1920×1080
Viewable area, mm	216×135	476×268	509×286	518×324	597×336	698×392	930×523	1018×572
Angle of view (min.)	176 °	178 °	178 °	178 °	178 °	178 °	178 °	178 °
Contrast ratio	1300:1	3000:1	1000:1	1000:1	1000:1	3000:1	4000:1	4000:1
Brightness, cd/m²	360	250...500 (>500 option)	300	250...500 (>500 option)		250...700 (>700 option)		
Screen surface	Non-reflective glass layer / touch screen (option)							
Sensor control signal	USB							
Brightness remote control	no / RS-232/422 (option)							
Built-in speakers	-	yes	yes	yes	yes	yes	yes	yes
Optical bonding	-	At option						
Communication ports (interfaces)	VGA (RGB), DVI, HDMI, DP							
Max. power consumption, W	30	60	60	60	75	100	120	170
Supply voltage	~110/220 V, 50-60 Hz / 19...36 V DC / 9.6...18 V DC					~110/220 V, 50-60 Hz / 19...36 V DC		
IP rating	IP22 / IP56 (option) – front panel, IP22 – other surfaces							
Operating temperature, °C	-15...+55							
Storage temperature, °C	-60...+70							

Dimensional drawing of MV-xx panel mounting





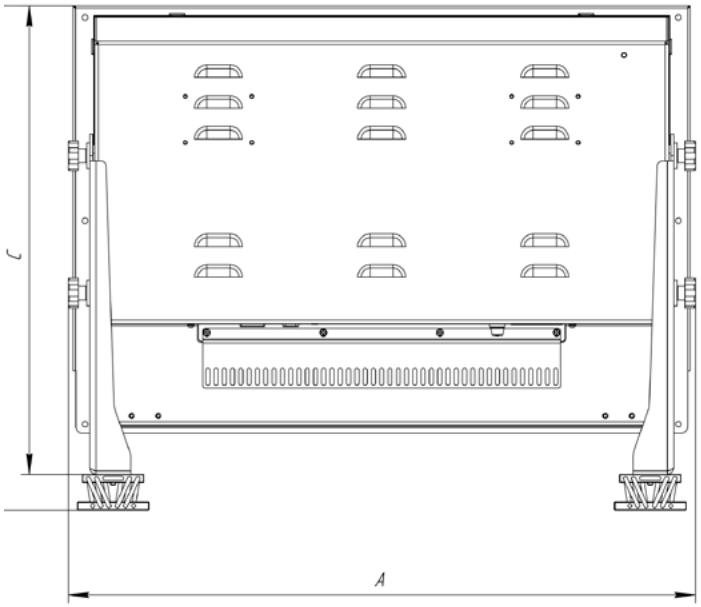
Optional panel mounting through mounting holes

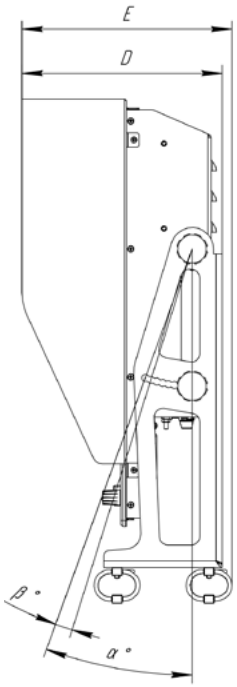


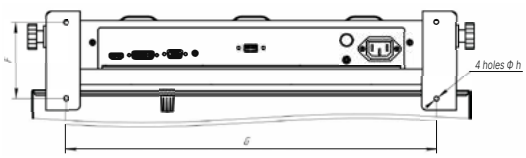
Optional mounting with bolt and lock nut

Model	A	B	C	D	E	F	G	H	I	J	h	n
1204	327	263	146,5	88	297	251	307	-	245	-	4,3	4
1504	384,5	314	181	102,5	348	300	360,5	-	293	146,5	5,5	6
1704	416,5	359,5	190	111,5	379,5	346	393,5	-	339	169,5	5,5	6
1904	454	388,5	190	111,5	419	377	431	-	368	184	5,5	6
2104	514	412,5	190	111,5	479	401	491	-	392	196	5,5	6
2105	553	358,5	190	111,5	518	347	530	-	338	169	5,5	6
2305	591	377,5	190	111,5	555	365	568	-	357	178,5	5,5	6
2405	603	417,5	190	111,5	568	406	580	-	397	198,5	5,5	6
2705	673	423,5	189,5	110	638	412	650	-	403	201,5	5,5	6
3205*	792	528	104	122	760	493	774	258	510	255	6,6	10
4205*	1045	672	104	122	1014	640	1027	343	654	327	6,6	10
4605*	1138,5	724,5	104	122	1107,5	692	1120,5	368,5	706,5	353,25	6,6	10
* models w/sunshields												

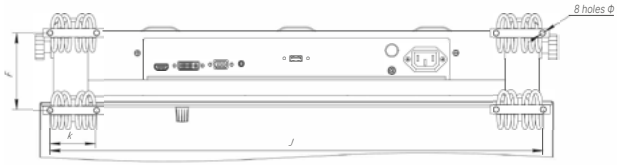
Dimensional drawing of MV-xx with a desk-top bracket and vibration isolators







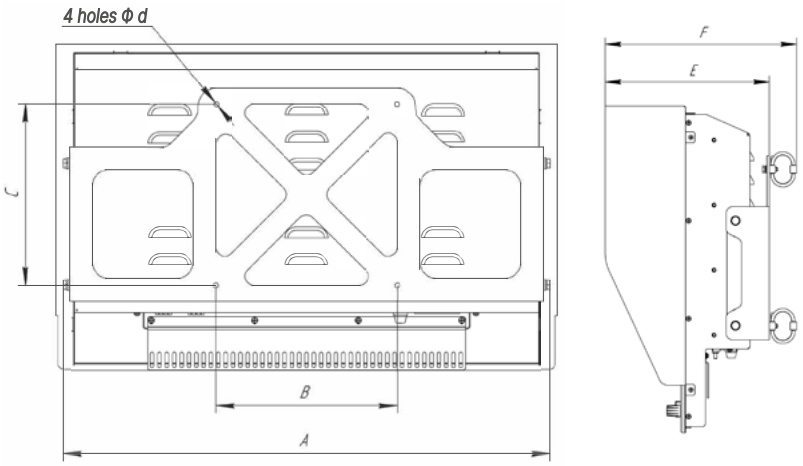
Mounting holes location if mounted on a bracket with vibration isolators (Type 1)



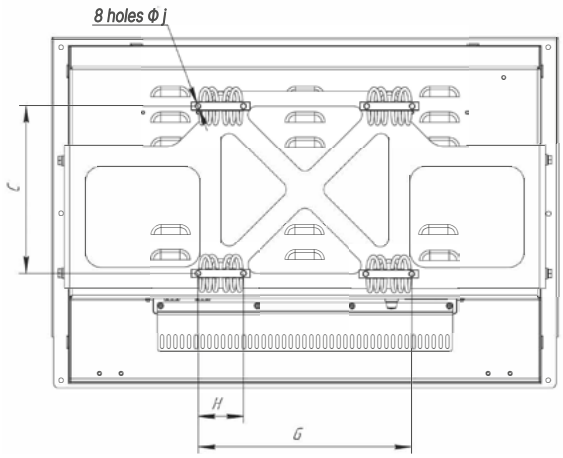
Mounting holes location if mounted on a bracket with vibration isolators (Type 2)

Model	Vibration isolator type	A	B	C	D	E	F	G	h	J	k	L	a	b	Pitch
1204	no	320	-	293,5	186,6	-	64	267	4,5	-	-	-	20	2,5	2,5
1504	no	363,5	-	344	227,8	-	102	282,5	5,5	-	-	-	20	2,5	2,5
1704	no	396,5	-	389,5	231,3	-	100	310,5	5,5	-	-	-	20	2,5	2,5
1904	no	464	-	428,5	196	-	87,2	376	5,5	-	-	-	20	2,5	2,5
2104	no	524	-	452,5	196	-	87,2	436	5,5	-	-	-	20	2,5	2,5
2105	no	563	-	398,5	196	-	90	475	5,5	-	-	-	20	2,5	2,5
2305	CTBP-10	601	452,5	417,5	196	205,5	90	513	5,5	567	54	6	20	2,5	2,5
2405	CTBP-10	613	492,5	457,5	196	205,5	90	525	5,5	579	54	6	20	2,5	2,5
2705	CTBP-10	682,5	521,5	486,5	196	205,5	90	594	5,5	648,5	54	6	20	2,5	2,5
3205*	BMT-25	626	620,5	578	130	130	-	-	7	537	80	7	20	5	2,5
4205*	BMT-25	498	764	722	167	175	-	-	7	400	80	7	20	5	2,5
4605*	BMT-25	418	820	777,5	166	196	-	-	7	320	80	7	25	5	2,5
* models w/sunshields															

Dimensional drawing of MV-xx with a wall bracket and vibration isolators



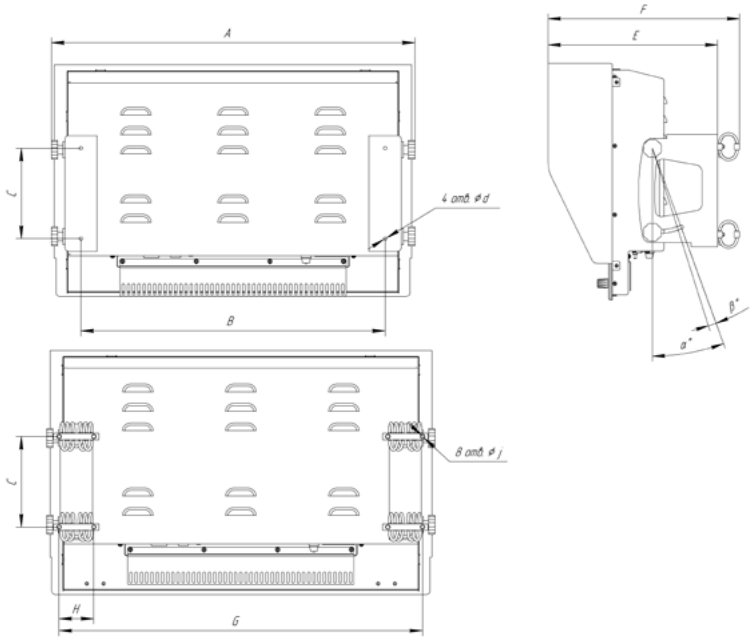
Type 1



Type 2

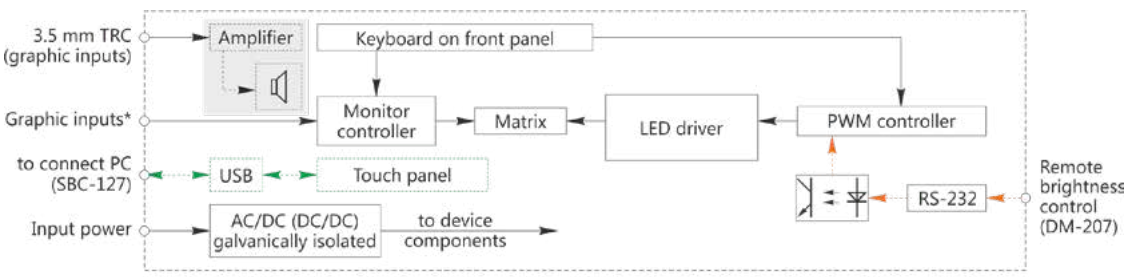
Model	Vibration isolator type	A	B	C	d	E	F	G	H	j	α	β	Pitch
1204	no	338	270	90	4,5	218,5	-	-	-	-	20	2,5	2,5
1504	no	363,5	282,5	114	5,5	269,5	-	-	-	-	20	2,5	2,5
1704	no	390,5	306,5	140	5,5	273	-	-	-	-	20	2,5	2,5
1904	no	410	320	140	5,5	271	-	-	-	-	20	2,5	2,5
2104	no	524	432	140	5,5	270,5	-	-	-	-	20	2,5	2,5
2105	no	563	471	140	5,5	270,5	-	-	-	-	20	2,5	2,5
2305	CTBP-10	601	509	140	5,5	270,5	305,5	563	54	6	20	2,5	2,5
2405	CTBP-10	613	521	140	5,5	270,5	305,5	575	54	6	20	2,5	2,5
2705	CTBP-10	684	592	140	5,5	270	305	646	54	6	20	2,5	2,5
3205*	BMT-25	626	-	310	-	181	223,5	470	80	7	15	10	2,5
4205*	BMT-25	498	-	236	-	190	232	405	80	7	15	10	2,5
4605*	BMT-25	418	-	256	-	254	296,5	325	80	7	20	10	2,5
* models w/sunshields													

Dimensional drawing of MV-xx with non-adjustable wall bracket



Model	Type of vibration isolator	A	B	C	d	E	F	G	H	j
1204	no	325	313	169,75	4,5	194	-	-	-	-
1504	no	349,5	334,6	193	5,5	199,5	-	-	-	-
1704	no	382,5	370,5	215	5,5	203	-	-	-	-
1904	no	438	200	200	5,5	209,5	-	-	-	-
2104	no	498	200	200	5,5	209,5	-	-	-	-
2105	no	537	200	200	5,5	209,5	-	-	-	-
2305	CTBP-10	575	200	200	5,5	209,5	244,5	254	54	6
2405	CTBP-10	587	200	200	5,5	209,5	244,5	254	54	6
2705	CTBP-10	656,5	200	200	5,5	209	244	254	54	6
3205*	BMT-25	638	-	310	7	123,5	166	400	80	7
4205*	BMT-25	658	-	611	7	87	129	638	80	7
4605*	BMT-25	574	-	663,5	7	98,5	141	554	80	7
* models w/sunshields										

Functional diagram of MV-xx



Optionally.

* Various options are available depending on design. See Table of Technical Characteristics.

Marine LCD

MV-xx06, MV-xx07

DESCRIPTION

Display of graphic, text and other data.

A wide range of application:
- Electronic mapping
- Radars
- Surveillance and automation systems
- Workstations
- Automated systems, etc.

A range of displays with glass front surface 10” - 46” and aspect ratio 5:4, 4:3, 16:9, 16:10.

Backlight brightness is dimmed using touch keys on the front panel.

IP rating of front panel — IP56.

BUILT-IN PROTECTION

- Galvanic isolation from power mains

OPTIONS

- Built-in speakers
- Touch screen
- High brightness matrix

Depending on the model, can operate with 12/24 V DC, and single-phase mains, frequency 50 (60) Hz and 110/220 V AC.

TECHNICAL SPECIFICATIONS OF MV-XX06

Model	MV-1006	MV-1206	MV-1506	MV-1706	MV-1906	MV-2106
Diagonal	10,4"	12,1"	15"	17"	19"	21,3"
Format (aspect ratio)	4:3	4:3	4:3	5:4	5:4	4:3
Resolution (pix.)	1024 x 768	1024 x 768	1024 x 768	1280 x 1024	1280 x 1024	1600 x 1200
Viewable area, mm	210 x 157	246 x 184	304 x 228	337 x 270	376 x 301	432 x 324
Angle of view (min.)	176 °	160 °	160 °	160 °	178 °	178 °
Contrast ratio	3000:1	700:1	800:1	1000:1	700:1	1400:1
Brightness, cd/m²	250...500 (>500 option)					
Screen surface	Non-reflective glass layer / touch screen (option)					
Sensor control signal	USB	USB	USB	USB	USB	USB
Remote brightness control	no / RS-232/422					
Built-in speakers	no	no	no	no	no	no
Communication ports (interfaces)	VGA (RGB), DVI, HDMI, DP					
Max. power consumption, W	30	30	30	30	50	60
Supply voltage	~110/220 V, 50-60 Hz / 19...36 V DC / 9.6...18 V DC					
IP rating	IP56 – front panel, IP22 – other surfaces					
Operating temperature, °C	-15...+55					
Storage temperature, °C	-60...+70					

TECHNICAL SPECIFICATIONS OF MV-XX07

Model	MV -1007	MV -2107	MV -2307	MV -2407	MV -2707	MV -3207	MV -4207	MV -4607
Diagonal	10,1"	21,5"	23"	24"	27"	31,5"	42"	46"
Format (aspect ratio)	16:9	16:9	16:9	16:10	16:9	16:9	16:9	16:9
Resolution (pix.)	1280x800	1920x1080	1920x1080	1920x1200	1920x1080	1920x1080	1920x1080	1920x1080
Viewable area, mm	216x135	476x268	509x286	518x324	597x336	698x392	930x523	1018x572
Angle of view (min.)	178°	178°	178°	178°	178°	178°	178°	178°
Contrast ratio	1300:1	3000:1	1000:1	1000:1	1000:1	3000:1	4000:1	4000:1
Brightness, cd/m²	360	250...500 (>500 option)	300	250...500 (>500 option)		250...700 (>700 option)		
Screen surface	Non-reflective glass layer / touch screen (option)							
Sensor control signal	USB							
Remote brightness control	no/ RS-232/422 (option)							
Built-in speakers	no	yes	yes	yes	yes	yes	yes	yes
Communication ports (interfaces)	VGA (RGB), DVI, HDMI, DP							
Max. power consumption, W	30	60	60	75	75	100	120	170
Supply voltage	~110/220 V, 50-60 Hz / 19...36 V DC / 9.6...18 V DC					~110/220 V, 50-60 Hz / 19...36 V DC		
IP rating	IP56 – front panel, IP22 – other surfaces							
Operating temperature, °C	-15...+55							
Storage temperature, °C	-60...+70							

Marine LCD

MV-xx08

DESCRIPTION

Display of graphic, text and other data.

A wide range of application:
- Electronic mapping
- Radars
- Surveillance and automation systems
- Workstations
- Automated systems, etc.

A range of displays with glass front surface 10” - 46” and aspect ratio 5:4, 4:3, 16:9, 16:10.

Backlight brightness is dimmed using touch keys on the front panel.

IP rating of front panel — IP56.

BUILT-IN PROTECTION

- Galvanic isolation from power mains

OPTIONS

- Built-in speakers
- Touch screen
- High brightness matrix

Depending on the model, can operate with 12/24 V DC, and single-phase mains, frequency 50 (60) Hz and 110/220 V AC.

TECHNICAL SPECIFICATIONS OF MV-XX08

Parameter	MV-1508	MV-1708	MV-1908	MV-2108	MV-2108-1	MV-2308	MV-2408	MV-2708	MV-3208	MV-4208	MV-4608
Diagonal [1]	15"	17"	19"	21,3"	21,5"	23"	24"	27"	31,5"	42"	46"
Format (aspect ratio)	4:3	5:4		4:3	16:9		16:10	16:9			
Resolution (pix.)	1024 x 768	1280 x 1024		1600 x 1200	1920 x 1080		1920 x 1200	1920 x 1080			
Viewable area, mm	304 x 228	337 x 270	376 x 301	432 x 324	476 x 268	509 x 286	518 x 324	597 x 336	698 x 392	930 x 523	1018 x 572
Brightness, cd/m²	from 500					from 300	from 500		from 700		
Angle of view (vertical/horizontal)	150°/160°	140°/160°	178°/178°								
Contrast ratio	from 700:1	from 1000:1									
Screen surface	Non-reflective glass layer; Touch screen with sensor control signal RS-232 (option); Touch screen with sensor control signal USB (option)										
Speakers	no										
Communication ports (interfaces), pcs 3)	DVI-D – 1; DP – 1; HDMI – 1; audio input – 1; USB 2.0 – 1 (touch screen connection); RS-232 – 1 (touch screen connection); remote brightness control (RS-232) – 1										
Max. power consumption, W	30	41	51	60	59	39	60	40	109	125	240
Input voltage, V 4)	AC 50 (60) Hz, 220 (180.0 – 264.0); AC 50 (60) Hz, 110 (90.0 – 132.0); DC 24 (19.0 – 36.0)										
IP rating	IP56										
Operating temperature, °C	–15...+55										
Limiting temperature, °C	–60...+70										

1) Non-standard diagonals on request.
2) Angles of view are specified relative to the screen centre.
3) Number and types of interfaces may be different.
4) Operating voltage range.

Marine panel computers

MVPC-xx04, MVPC-xx05

DESCRIPTION

A wide range of application:
- Electronic mapping
- Radars
- Surveillance and automation systems
- Workstations
- Automated systems, etc.

A range of compact computers combined with displays 10” - 46” and aspect ratio 5:4, 4:3, 16:9, 16:10.

Depending on the model, can operate with 12/24 V DC, and single-phase mains, frequency 50 (60) Hz and 110/220 V AC.

OPTIONS
- Built-in speakers
- Touch screen
- High brightness matrix
- Change of front panel IP rating (IP56)
- Optical bonding

BUILT-IN PROTECTION
- Galvanic isolation from power mains

HARDWARE SPECIFICATIONS

Parameter	MVPC - 1005	MVPC - 1004	MVPC - 1204	MVPC - 1504	MVPC - 1704	MVPC - 1904	MVPC - 2104	MVPC - 2105	MVPC - 2305	MVPC - 2405	MVPC - 2705	MVPC - 3205	MVPC - 4205	MVPC - 4605
Processor	Intel Pentium					Intel Core i7 Intel Core i5 Intel Core i3								
RAM	8 GB					8 - 64 GB								
HD	SSD, 120 - 1024 GB					SSD, 120 - 4096 GB								
Supported interfaces	Ethernet 10/100/1000 Base-T – 1 pc, HDMI – 1 pc, USB 2.0 – 3 pcs, COM – 2 pcs, audio input, audio output, microphone – 1 pc.					Ethernet 10/100/1000 Base-T – 2 pcs, HDMI – 2 pcs USB 2.0 – from 5 pcs COM (RS-232; RS-422; RS-485) – 4 pcs, audio input, audio output, microphone – 3 pcs.									

TECHNICAL SPECIFICATIONS OF MVPC-XX04

Parameter	MVPC-1004	MVPC -1204	MVPC -1504	MVPC -1704	MVPC -1904	MVPC -2104
Diagonal*	10,4"	12,1"	15"	17"	19"	21,3"
Format (aspect ratio)	4:3	4:3	4:3	5:4	5:4	4:3
Resolution (pix.)	1024 x 768	1024 x 768	1024 x 768	1280 x 1024	1280 x 1024	1600 x 1200
Viewable area, mm	210 x 157	246 x 184	304 x 228	337 x 270	376 x 301	432 x 324
Angle of view (min.)	178°	160°	160°	160°	178°	178°
Contrast ratio	3000:1	700:1	800:1	1000:1	1000:1	1400:1
Brightness, cd/m²	250...500 (>500 option)					
Screen surface	Non-reflective glass layer or touch screen (option)					
Max. power consumption, W	60	60	75	75	150	150
Supply voltage (one of available options)	AC (50...60) Hz, 220 V (180...264 V) / 110 V (90...132 V) DC 24 V (19...36 V)					
IP rating	IP22 or IP56 (option) – front panel, IP22 – other surfaces					
Type of connectors (one of available options)	standard / secure					
Operating temperature, °C	-15...+55					
Storage temperature, °C	-60...+70					
* Non-standard screen diagonals are available on request						

TECHNICAL SPECIFICATIONS OF MVPC-XX05

Parameter	MVPC-1005	MVPC -2105	MVPC -2305	MVPC -2405	MVPC -2705	MVPC -3205	MVPC -4205	MVPC -4605
Diagonal*	10,1"	21,5"	23"	24"	27"	31,5"	42"	46"
Format (aspect ratio)	16:10	16:9	16:9	16:10	16:9	16:9	16:9	16:9
Resolution (pix.)	1280×800	1920×1080	1920×1080	1920×1200	1920×1080	1920×1080	1920×1080	1920×1080
Viewable area, mm	217×136	476×268	509×286	518×324	597×336	698×392	930×523	1018×572
Angle of view (min.)	170°	178°	178°	178°	178°	178°	178°	178°
Contrast ratio	1300:1	3000:1	1000:1	1000:1	1000:1	3000:1	4000:1	4000:1
Brightness, cd/m²	360	250...500 (>500 option)	300	250...500 (>500 option)		250...700 (>700 option)		
Screen surface	Touch screen	Non-reflective glass layer or touch screen (option)						
Max. power consumption, W	60	160	170	180	180	190	200	200
Supply voltage (one of available options)	AC (50...60) Hz, 220 V (180...264 V) / 110 V (90...132 V) DC 24 V (19...36 V)							
IP rating	IP22 or IP56 (option) – front panel, IP22 – other surfaces							
Type of connectors (one of available options)	standard / secure							
Operating temperature, °C	-15...+55							
Storage temperature, °C	-60...+70							
* Non-standard screen diagonals are available on request								

Marine panel computers

MVPC-xx06, MVPC-xx07

DESCRIPTION

A wide range of application:

- Electronic mapping
- Radars
- Surveillance and automation systems
- Workstations
- Automated systems, etc.

A range of compact computers combined with displays 10” - 46” and aspect ratio 5:4, 4:3, 16:9, 16:10.

Front panel IP rating — IP56.

BUILT-IN PROTECTION

Galvanic isolation from power mains

OPTIONS

- Built-in speakers
- Touch screen
- High brightness matrix

Depending on the model, can operate with 12/24 V DC and single-phase mains 50 (60) Hz, 110/220 V AC.

HARDWARE SPECIFICATIONS

Parameter	MVPC-1006	MVPC-1007	MVPC-1206	MVPC-1506	MVPC-1706	MVPC-1906	MVPC-2106	MVPC-2107	MVPC-2307	MVPC-2407	MVPC-2707	MVPC-3207	MVPC-4207	MVPC-4607
Processor	Intel Pentium					Intel Core i7, Intel Core i5, Intel Core i3								
RAM	8 GB					8 - 64 GB								
HD	SSD, 120 - 1024 GB					SSD, 120 - 4096 GB								
Supported interfaces	USB 2.0 – 3 pcs. Ethernet 10/100/1000 Base-T –1/2 pcs. audio input, audio output, microphone –1pc. HDMI – 1 pc. COM – 2 pcs.					USB 2.0 – from 4 pcs. Ethernet 10/100/1000 Base-T – 2 pcs. audio input, audio output, microphone – 3 pcs. HDMI – 2 pcs. COM (RS-232; RS-422; RS-485) – 4 pcs.								

TECHNICAL SPECIFICATIONS OF MVPC-XX06

Parameter	MVPC-1006	MVPC -1206	MVPC -1506	MVPC -1706	MVPC-1906	MVPC -2106
Diagonal*	10,4"	12,1"	15"	17"	19"	21,3"
Format (aspect ratio)	4:3	4:3	4:3	5:4	5:4	4:3
Resolution (pix.)	1024 x 768	1024 x 768	1024 x 768	1280 x 1024	1280 x 1024	1600 x 1200
Viewable area, mm	210 x 157	246 x 184	304 x 228	337 x 270	376 x 301	432 x 324
Angle of view (min.)	178 °	160 °	160 °	160 °	178 °	178 °
Contrast ratio	3000:1	700:1	800:1	1000:1	1000:1	1400:1
Brightness, cd/m²	250...500 (>500 option)					
Screen surface	Non-reflective glass layer or touch screen (option)					
Max. power consumption, W	60	60	60	60	150	150
Supply voltage (one of available options)	AC (50...60) Hz, 220 V (180...264 V) / 110 V (90...132 V) DC 24 V (19...36 V)					
IP rating	IP56 – front panel, IP22 – other surfaces					
Type of connectors (one of available options)	standard / secure					
Operating temperature, °C	-15...+55					
Storage temperature, °C	-60...+70					
* Non-standard screen diagonals are available on request						

TECHNICAL SPECIFICATIONS OF MVPC-XX07

Parameter	MVPC-1007	MVPC-2107	MVPC-2307	MVPC-2407	MVPC-2707	MVPC-3207	MVPC-4207	MVPC-4607
Diagonal*	10,1"	21,5"	23"	24"	27"	31,5"	42"	46"
Format (aspect ratio)	16:10	16:9	16:9	16:10	16:9	16:9	16:9	16:9
Resolution (pix.)	1280 x 800	1920x1080	1920x1080	1920x1200	1920x1080	1920x1080	1920x1080	1920x1080
Viewable area, mm	217x136	476x268	509x286	518x324	597x336	698x392	930x523	1018x572
Angle of view (min.)	170 °	178 °	178 °	178 °	178 °	178 °	178 °	178 °
Contrast ratio	1300:1	3000:1	1000:1	1000:1	1000:1	3000:1	4000:1	4000:1
Brightness, cd/m²	360	250...500 (>500 option)	300	250...500 (>500 option)		250...700 (>700 option)		
Screen surface	Non-reflective glass layer or touch screen (option)							
Max. power consumption, W	60	150	150	150	150	200	200	200
Supply voltage (one of available options)	AC (50...60) Hz, 220 V (180...264 V) / 110 V (90...132 V) DC 24 V (19...36 V)							
IP rating	IP56 – front panel, IP22 – other surfaces							
Type of connectors (one of available options)	standard / secure							
Operating temperature, °C	-15...+55							
Storage temperature, °C	-60...+70							
* Non-standard screen diagonals are available on request								

Marine panel computers

MVPC-xx08, MVPC-xx09

DESCRIPTION

A wide range of application:

- Electronic mapping
- Radars
- Surveillance and automation systems
- Workstations
- Automated systems, etc.

A range of compact computers combined with displays 10” – 46” and aspect ratio 5:4, 4:3, 16:9, 16:10.

IP rating all panels — IP56.

BUILT-IN PROTECTION

Galvanic isolation from power mains

OPTIONS

- Built-in speakers
- Touch screen
- High brightness matrix

Depending on the model, can operate with 12/24 V DC and single-phase mains 50 (60) Hz and 110/220 V AC.

HARDWARE SPECIFICATIONS

Parameter	MVPC-1508	MVPC- 1509	MVPC- 1708	MVPC- 1709	MVPC- 1908	MVPC- 1909	MVPC- 2108	MVPC- 2109	MVPC- 2108-1	MVPC- 2109-1	MVPC- 2308	MVPC- 2309	MVPC- 2408	MVPC- 2409	MVPC- 2708	MVPC- 2709	MVPC- 3208	MVPC- 3209	MVPC- 4208	MVPC- 4209	MVPC- 4608	MVPC- 4609
Processor	Intel Core i5				Intel Core i5																	
RAM	8 GB				8 - 64 GB																	
HD	SSD, 120 - 1024 GB				SSD, 120 - 4096 GB																	
Supported interfaces	USB 3.0 – 4 pcs. Ethernet 10/100/1000 Base-T – 2 pcs. audio input, audio output, microphone – 1 pc. HDMI – 2 pcs. DisplayPort – 2 pcs.				USB 3.0 – 4 pcs. Ethernet 10/100/1000 Base-T – 2 pcs. (option – 4 pcs.) audio input, audio output, microphone – 1 pc. HDMI – 2 pcs. COM (RS-232/422/485) – 4 pcs. DisplayPort – 2 pcs.																

TECHNICAL SPECIFICATIONS OF MVPC-XX08

Parameter	MVPC-1508	MVPC-1708	MVPC-1908	MVPC-2108	MVPC-2108-1	MVPC-2308	MVPC-2408	MVPC-2708	MVPC-3208	MVPC-4208	MVPC-4608
Diagonal*	15"	17"	19"	21,3"	21,5"	23"	24,1"	27"	31,5"	42"	46"
Format (aspect ratio)	4:3	5:4		4:3	16:9		16:10	16:9			
Resolution (pix.)	1024 x768	1280x1024		1600 x1200	1920x1080		1920 x1200	1920x1080			
Viewable area, mm	304x228	338x270	376x301	432x324	476x268	509x286	518x324	597x336	698x392	930x523	1018x572
Contrast ratio	from 700:1		from 1000:1								
Brightness, cd/m²	from 500					from 300	from 500	from 700			
Angle of view (vertical/ horizontal)	150° /160°	140° /160°	178°/178°								
Screen surface	Non-reflective glass layer or non-reflective touch screen										
Max. power consumption, W	60	60	122	137	128	114	114	120	194	210	268
Input voltage, V	220 (180 - 264) AC, 50 (60) Hz 110 (90 - 132) AC, 50 (60) Hz 24 (19.6 – 36.0) DC										
IP rating	IP56										
Type of connectors	standard										
Operating temperature, °C	-15...+55										
Storage temperature, °C	-60...+70										

* Non-standard screen diagonals are available on request
** Specified brightness may be different on request
*** Power consumption is specified at max. processor load using all ports

TECHNICAL SPECIFICATIONS OF MVPC-XX09

Parameter	MVPC-1509	MVPC-1709	MVPC-1909	MVPC-2109	MVPC-2109-1	MVPC-2309	MVPC-2409	MVPC-2709	MVPC-3209	MVPC-4209	MVPC-4609
Diagonal*	15"	17"	19"	21,3"	21,5"	23"	24,1"	27"	31,5"	42"	46"
Format (aspect ratio)	4:3	5:4		4:3	16:9		16:10	16:9			
Resolution (pix.)	1024 x768	1280x1024		1600 x1200	1920x1080		1920 x1200	1920x1080			
Viewable area, mm	304x228	338x270	376x301	432x324	476x268	509x286	518x324	597x336	698x392	930x523	1018x572
Contrast ratio	from 700:1		from 1000:1								
Brightness, cd/m²	from 500					from 300	from 500	from 700			
Angle of view (vertical/ horizontal)	150° /160°	140° /160°	178°/178°								
Screen surface	Non-reflective glass layer or non-reflective touch screen										
Max. power consumption, W	60	60	122	137	128	114	114	120	194	210	268
Input voltage, V	220 (180 - 264) AC, 50 (60) Hz 110 (90 - 132) AC, 50 (60) Hz 24 (19.6 – 36.0) V DC										
IP rating	IP56										
Type of connectors	secure										
Operating temperature, °C	-15...+55										
Storage temperature, °C	-60...+70										

* Non-standard screen diagonals are available on request
** Specified brightness may be different on request
*** Power consumption is specified at max. processor load using all ports

Marine computer unit

MPC-127

DESCRIPTION

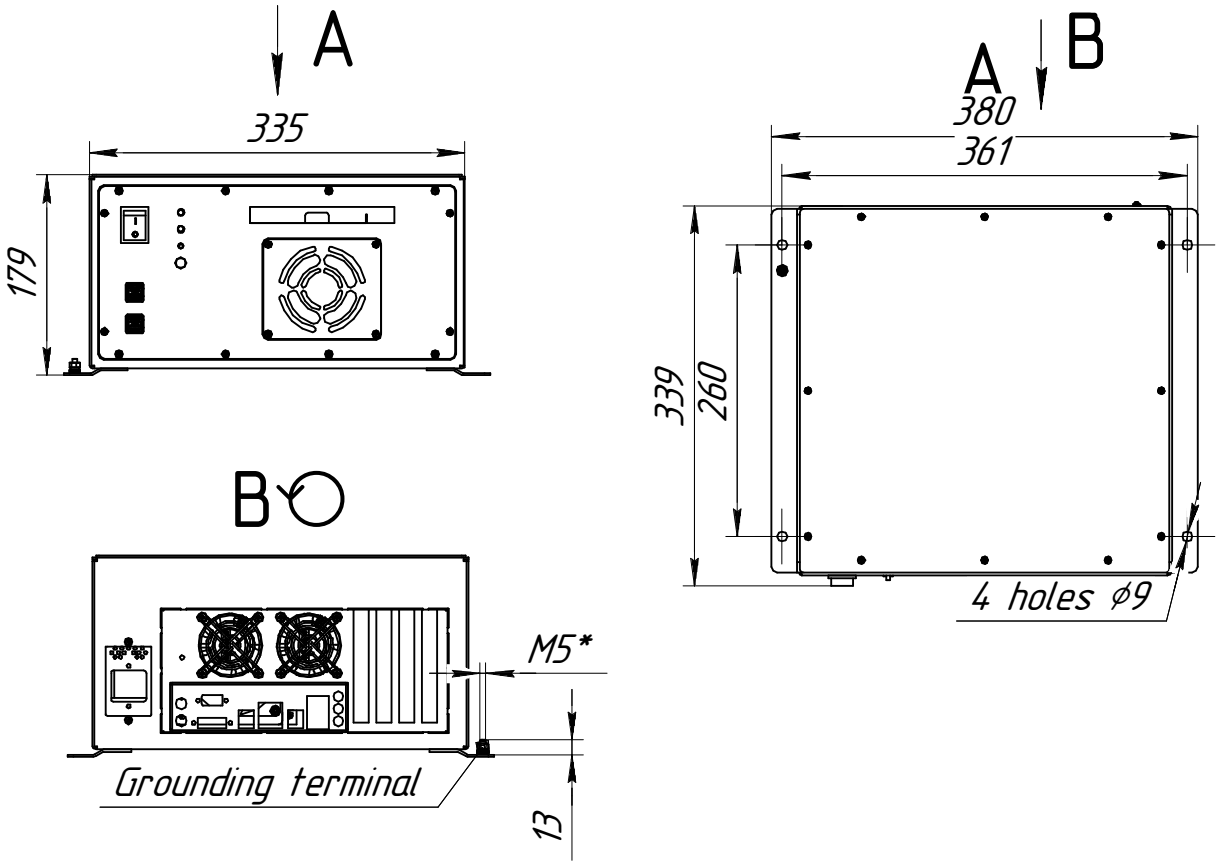
A wide range of application:
- Electronic mapping
- Radars
- Surveillance and automation systems
- Workstations
- Automated systems, etc.

Depending on the model, can operate with 24 V DC and with single-phase mains 50 (60) Hz and 220 V AC.

OPTIONS

- Discrete graphics
- Network adapter
- Trusted platform module or RAID-controller

Overall and installation dimensions of MPC-127



TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Storage temperature	-55...+70 °C
Operating temperature	-15...+55 °C
Mounting	Wall
Type of connectors	Standard or secure

Electrical specifications	
Supply voltage	AC 50...60 Hz, 220 V /110 V DC 24 V (19...36 V)
Power consumption	max. 550 W

Hardware specifications	
Processor	Intel Core i3 / Intel Core i5 / Intel Core i7 / Intel Pentium / Intel Core i9 / Intel Xeon
Graphics card, GB	discrete, 1024 / 2048 / 4096 / 6144
RAM, GB	4 / 8 / 16 / 32 / 64
HD	120 - 6144 GB
Software*	Windows 7×64 / Windows 10×64 / Astra Linux Special Edition
Remote start/reset	yes (option)
* Other software on request	

Ports		
Interface		Number of ports
Audio ports	standard	3 (input, output, microphone) 1 (common audio port)
	secure	
USB ports		6
Port to connect monitor (VGA/DVI)		1xDVI / 1xHDMI / 1xDP
LAN (Ethernet 10/100/1000 Base-T)		1 (up to 3 at option)
COM		1 (up to 5 at option)

Marine computer unit

MPC-127

DESCRIPTION

A wide range of application:
- Electronic mapping
- Radars
- Surveillance and automation systems
- Workstations
- Automated systems, etc.

FEATURES

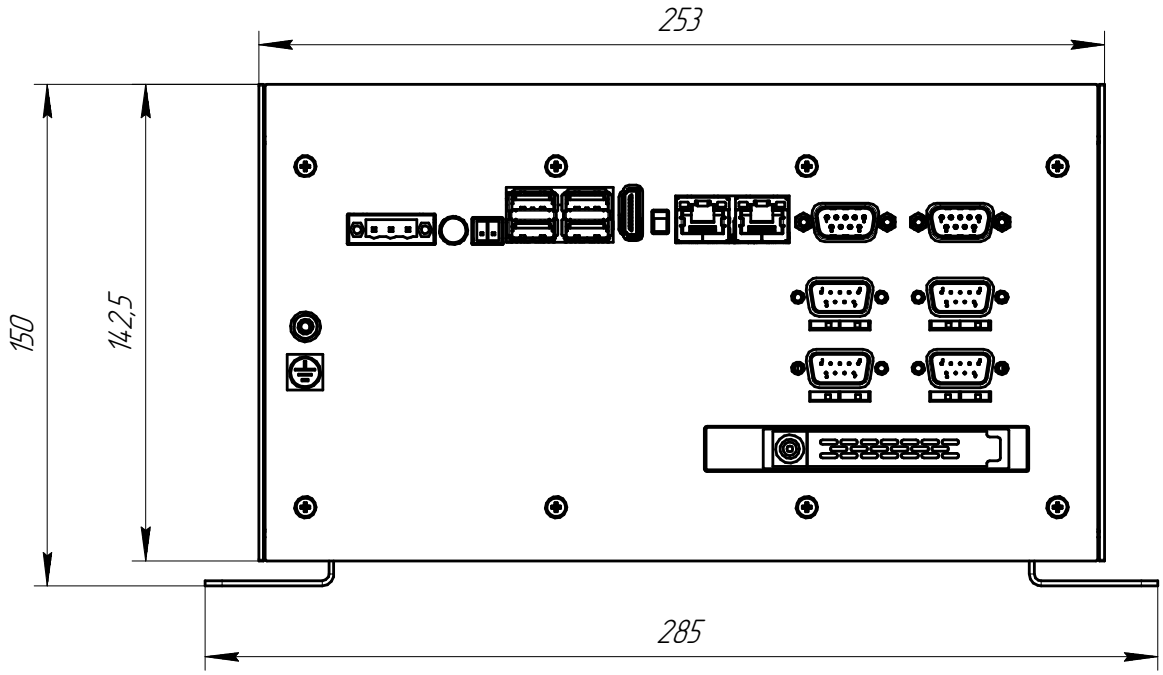
- Passive cooling
- Expansion boards ensure increased number of ports

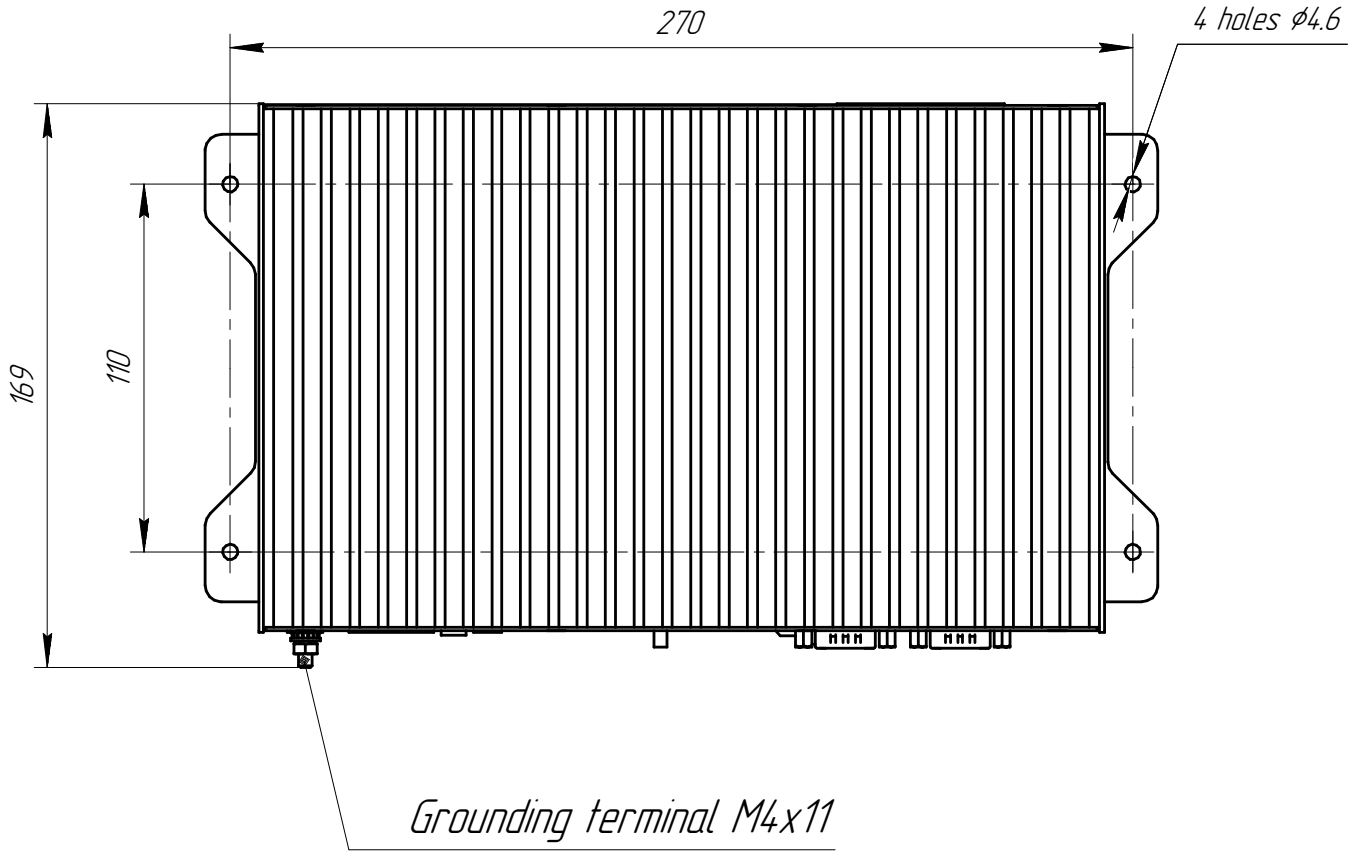
TECHNICAL SPECIFICATIONS

Supply voltage	DC 24 V (19...36 V) AC50...60 Hz, 220 V /110 V
Processor	Intel Core i5
RAM, GB	4 / 8 / 16 / 32 / 64
HD	120 - 6144 GB
Software*	Windows 7×64 / Windows 10×64 / Astra Linux Special Edition
* Other software on request.	

Power consumption	max. 50 W
IP rating	IP22
Storage temperature	-55...+70 °C
Operating temperature	-15...+55 °C
Mounting	wall
Type of connectors	standard

Overall and installation dimensions of MPC-127





Marine computer unit

MPC-19-4

DESCRIPTION

A wide range of application:
- Electronic mapping
- Radars
- Surveillance and automation systems
- Workstations
- Automated systems, etc.

ATX motherboard-based Marine computer unit is mounted into 19” cabinet.

Built-in RAID-controller enables to backup data based on motherboard functionality.

BUILT-IN PROTECTION

- Galvanic isolation of power mains and load
- Connector for standby power source

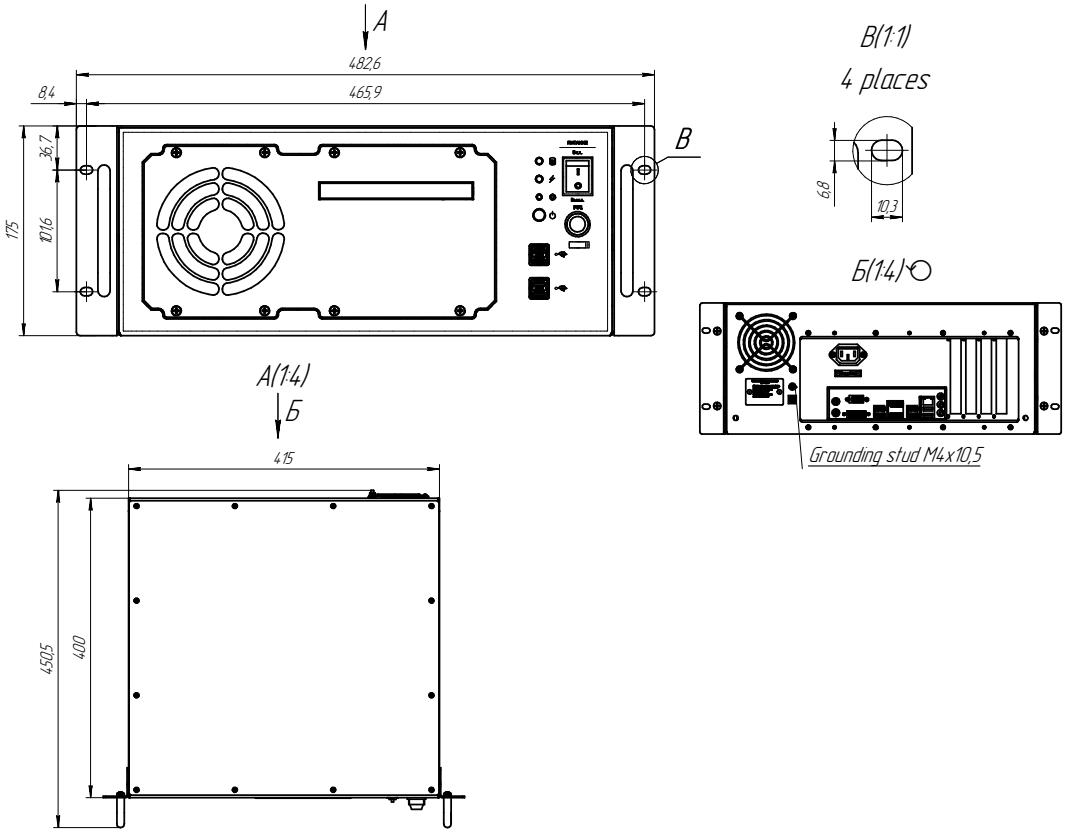
If main power fails, the unit utomatically switches to the standby power source.

OPTIONS

- Discrete graphics
- Network interface card
- COM-port expander
- Trusted platform module or RAID-controller
- Other software on request

Depending on the model, can operate with 24 V DC and with songle-phase mains 50 (60) Hz and 110/220 V AC.

Overall and installation dimensions of MPC-19-4



TECHNICAL SPECIFICATIONS

General specifications	
IP rating	IP22
Storage temperature	-55...+70 °C
Operating temperature	-15...+55 °C
Mounting	19" rack
Type of connectors	Standard or secure

Electrical specifications	
Supply voltage	AC 50...60 Hz, 220 V (180...264 V) / 110 V (90...132 V) 24 V DC (19...36 V)
Power consumption	max. 550 W

Hardware specifications	
Processor	Intel Core i3 / Intel Core i5 / Intel Core i7 / Intel Pentium / Intel Core i9 / Intel Xeon
Graphics card, GB	discrete 1024 / 2048 / 4096 / 6144
RAM	4 / 8 / 16 / 32 / 64 GB
HD	120 - 6144 GB
Software*	Windows 7×64 / Windows 10×64 / Astra Linux Special Edition
Remote start/reset	yes (option)
* Other software on request	

Specifications of ports		
Type of interface		Number of ports
Audio ports	standard	3 (input, output, microphone)
	secure	1 (common audio port)
USB ports		6
Port to connect monitor		1xVGA, 1xDVI / 1xHDMI
LAN (Ethernet 10/100/1000 Base-T)		1 (up to 3 at option)
COM (RS-232)		1 (up to 5 at option)

Digital repeater (LED)

DR-109

ЦИУЛ.467845.001

INTENDED USE

The built-in LED indicator displays ship speed and heading, depth below keel, current time and weather conditions.

DESCRIPTION

Display of digital data received in NMEA 0183 sentences via RS-232 and RS-422/485 serial interfaces. Ship turn rate may be displayed on the built-in LED linear regardless of main data.

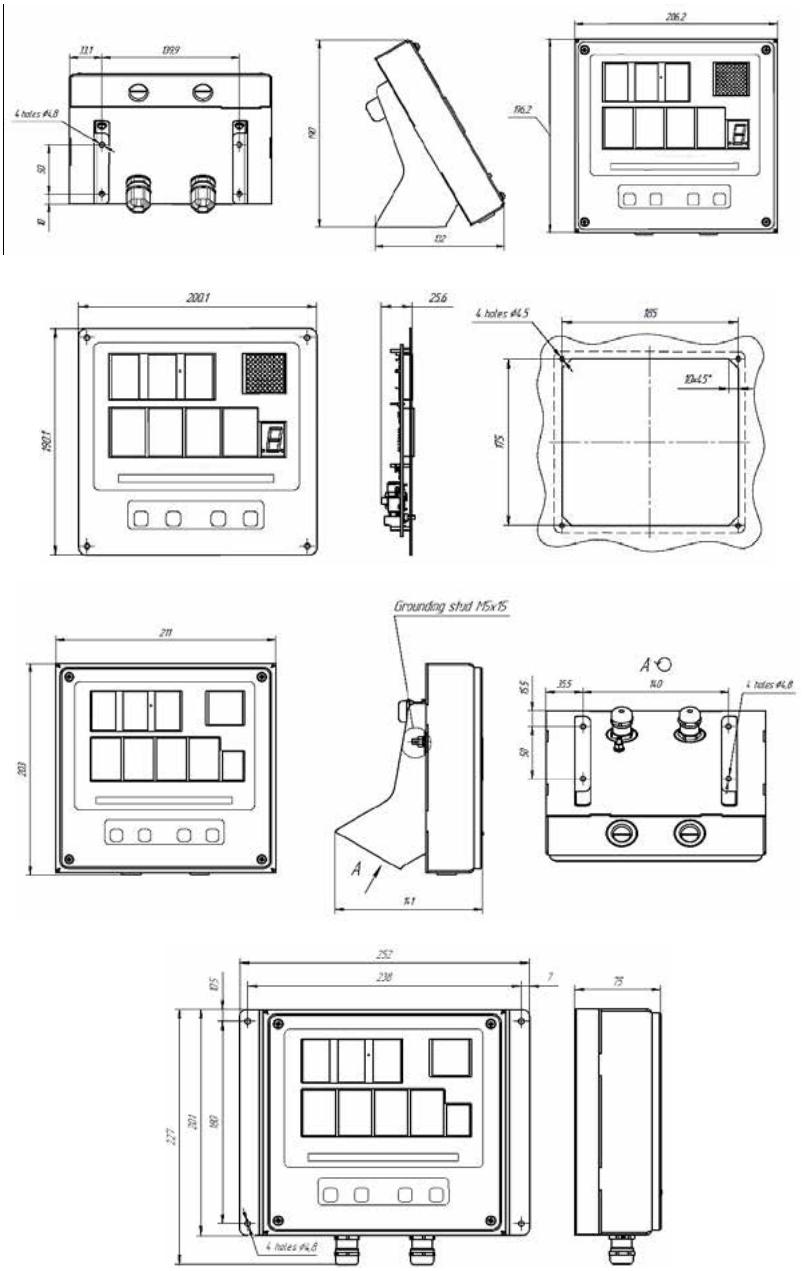
TECHNICAL SPECIFICATIONS

General specifications	DR-109			DR-109W	
IP rating	IP22	IP22	IP22	IP56	IP56
Storage temperature	-60...+70 °C	-60...+70 °C	-60...+70 °C	-60...+70 °C	-60...+70 °C
Operating temperature	-15...+55 °C	-15...+55 °C	-15...+55 °C	-15...+55 °C	-15...+55 °C
Mounting	panel	wall	bracket	wall	wall
Weight	0.58 kg	1.4 kg	1.63 kg	2.3 kg	2.6 kg

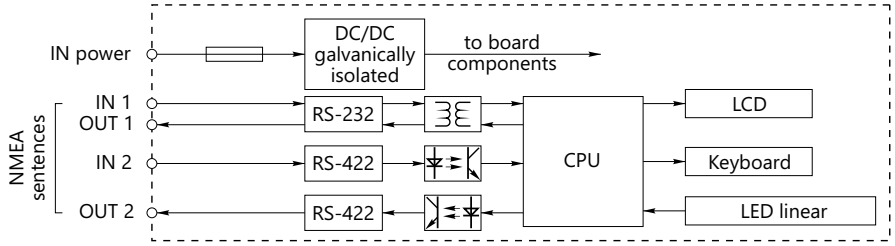
Specifications of inputs	
Number of input ports	2
Supported interfaces	RS-232 и RS-422
Max. receive rate	115200 bit/s

Electrical specifications	
Supply voltage	18...36 VDC
Max. power consumption	10 W
Galvanic isolation from power mains	+
Reverse polarity protection	+

Overall and installation dimensions of DR-109



Functional diagram of DR-109



Multipurpose digital repeater (LCD)

DR-209, DR-209W

ЦИУЛ.467846.001
ЦИУЛ.467846.001-01

INTENDED USE

Display of ship speed and heading, depth below keel, current time and weather conditions.

DESCRIPTION

Displays NMEA-sentences data from various ship equipment on a monochrome LCD monitor in user-friendly format. Rebroadcasts the received NMEA data by three communication channels.

TECHNICAL SPECIFICATIONS

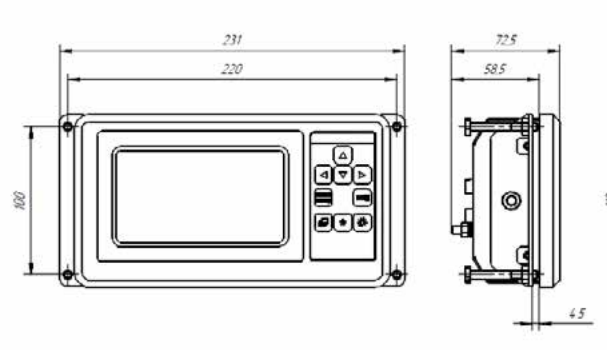
General specifications			
	DR-209		DR-209W
IP rating	IP22	IP22	IP56
Storage temperature	-60...+70 °C	-60...+70 °C	-60...+70 °C
Operating temperature	-15...+55 °C	-15...+55 °C	-40...+55 °C
Mounting	panel	bracket	wall
Weight	1.45 kg	1.7 kg	5 kg

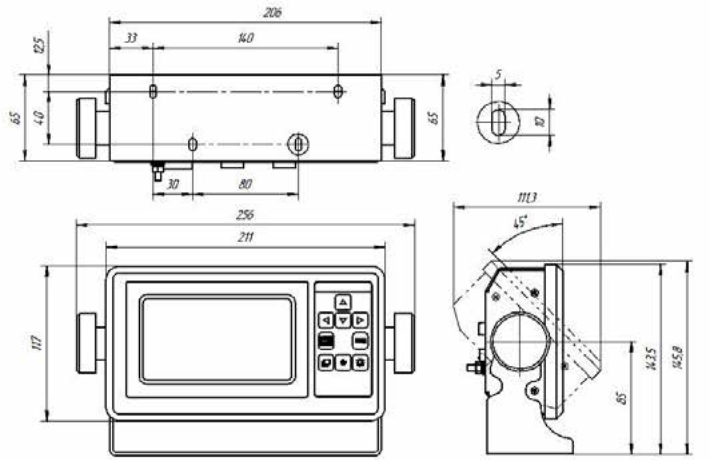
Electrical specifications	
Supply voltage	10...36 V DC
Max. power consumption	12 W
Galvanic isolation from power mains	+
Reverse polarity protection	+
Overvoltage protection	+

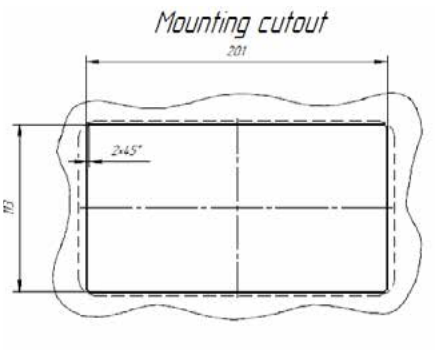
Specifications of inputs	
Number of input ports	2
Supported interfaces	RS-422
Max. receive rate	57600 bit/s
Galvanic isolation	+

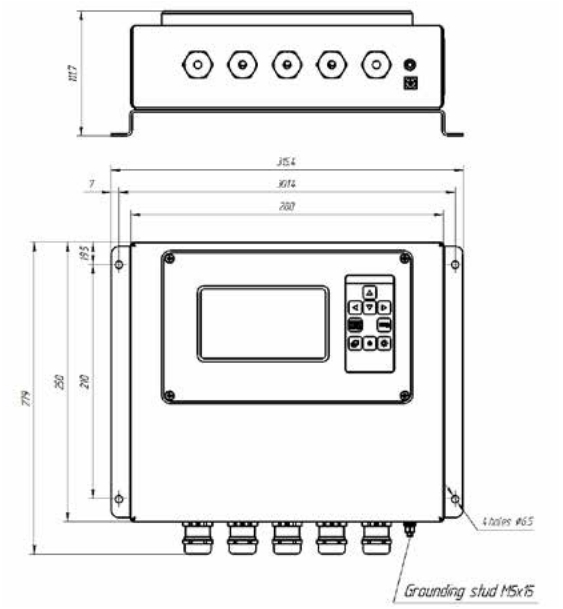
Specifications of outputs	
Number of output ports	4
Supported interfaces	RS-232, RS-422/485
Max. baudrate	57600 bit/s
Galvanic isolation	+

Overall and installation dimensions of DR-209

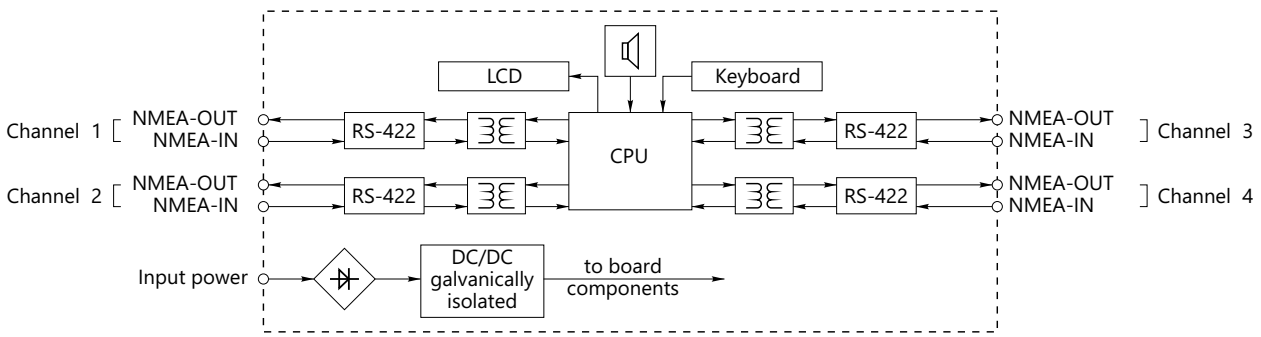








Functional diagram of DR-209



Multipurpose digital repeater

DR-209M
ЦИУЛ.467846.009

INTENDED USE

Display of ship speed and heading, depth below keel, current time and weather conditions.

DESCRIPTION

Displays NMEA-sentences data from various ship equipment on a colour LCD monitor in user-friendly format. Rebroadcasts the received NMEA data by three communication channels.

Equipped with a touch screen, an output 12/24 V to connect the equipment.

TECHNICAL SPECIFICATIONS

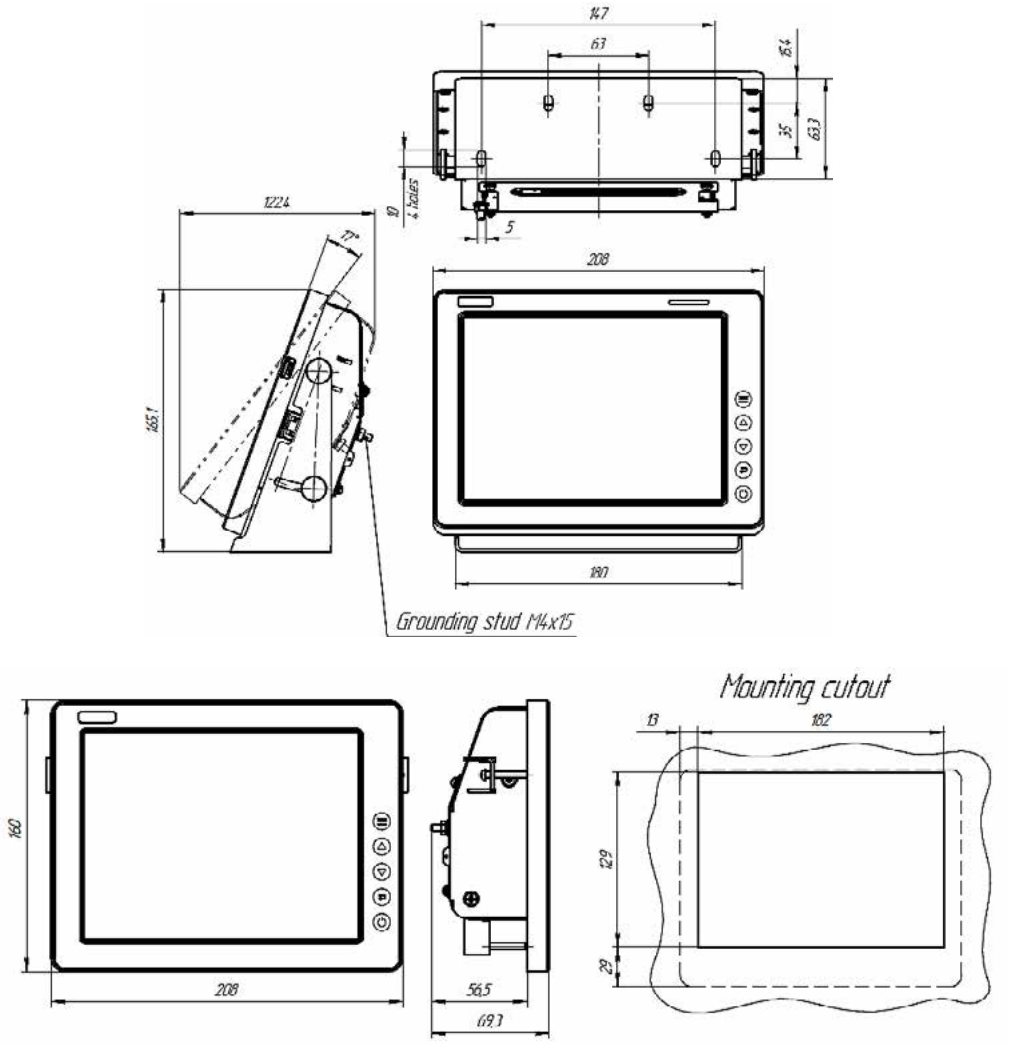
General specifications		
IP rating	IP22	
Storage temperature	-60...+70 °C	
Operating temperature	-15...+55 °C	
Mounting	panel	bracket
Weight	1.6 kg	1.9 kg

Specifications of inputs	
Number of input ports	3
Supported interfaces	RS-422/485
Max. receive rate	115200 bit/s
Galvanic isolation	+

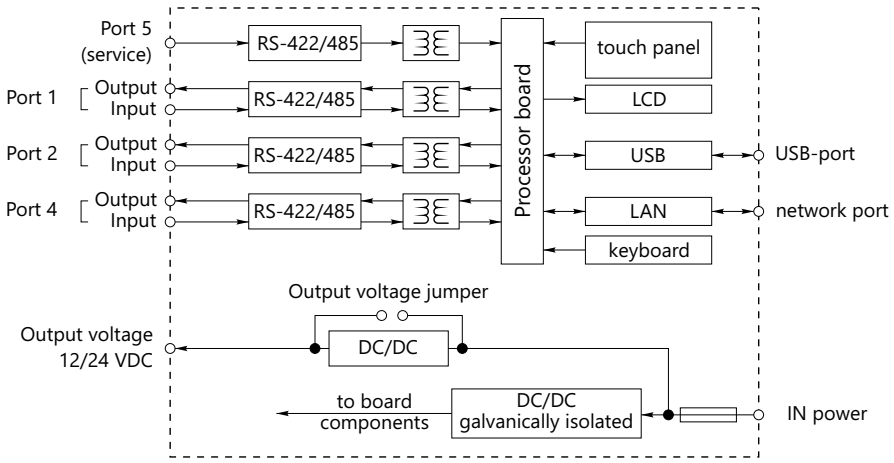
Electrical specifications	
Supply voltage	10...36 V DC
Max. power consumption	20 W
Galvanic isolation from power mains	+
Reverse polarity protection	+
Overvoltage protection	+

Specifications of outputs	
Number of output ports	3
Supported interfaces	RS-422/485
Max. baud rate	115200 bit/s
Galvanic isolation	+

Overall and installation dimensions of DR-209M



Functional diagram of DR-209M



Multipurpose digital repeater

DR-209MG

ЦИУЛ.467846.009

INTENDED USE

Display of ship speed and heading, depth below keel, current time and weather conditions.

DESCRIPTION

Displays NMEA-sentences data from various ship equipment on a colour LCD monitor in user-friendly format. Rebroadcasts the received NMEA data by three communication channels.

Equipped with a touch screen, an output 12/24 V to connect the equipment..

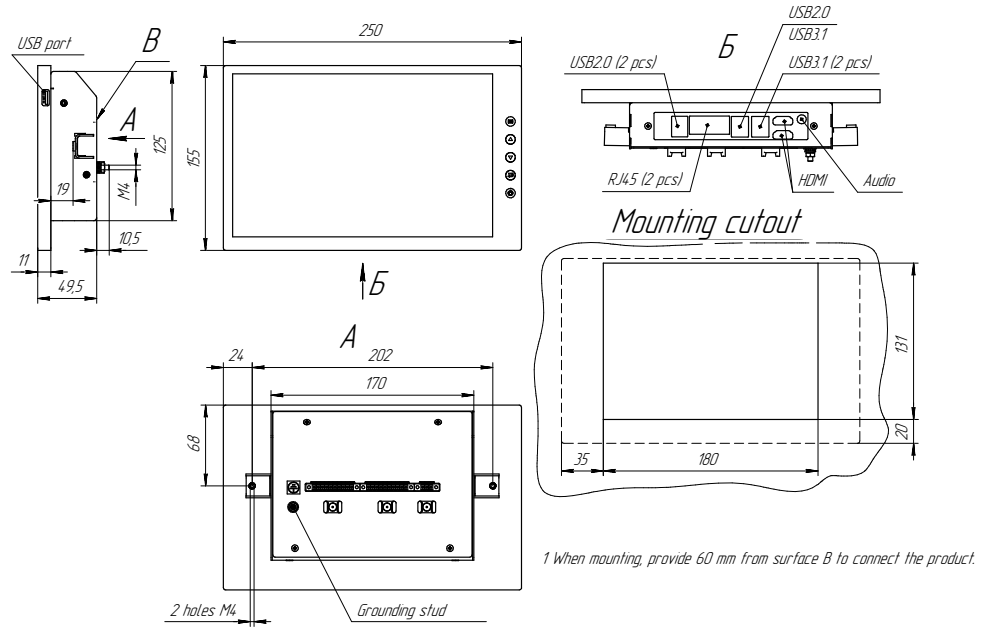
TECHNICAL SPECIFICATIONS

General specifications		
IP rating	IP22	
Storage temperature	-60...+70 °C	
Operating temperature	-15...+55 °C	
Mounting	panel	bracket
Weight	1.6 kg	1.9 kg

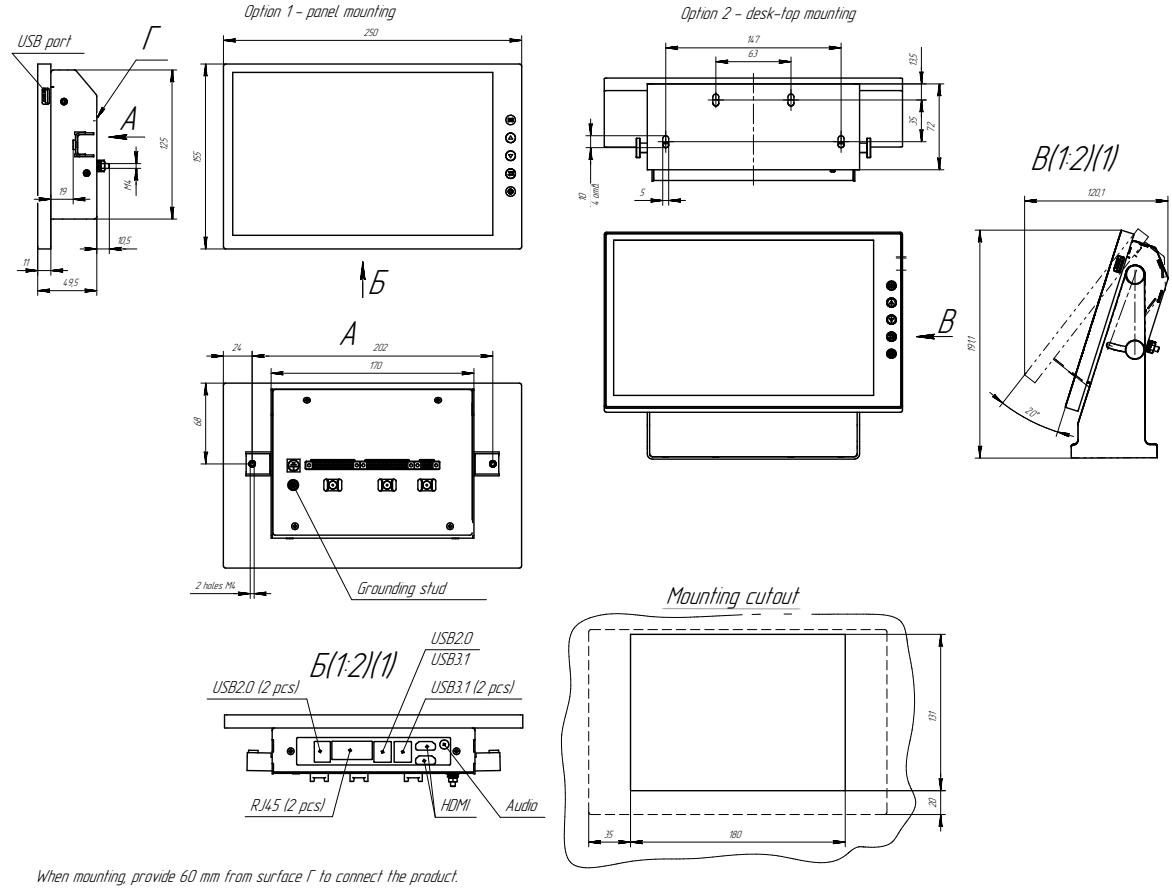
Specifications of ports	
Type of interface	Ports
USB ports	7
COM ports (RS-422/485)	3
HDMI ports	2
LAN ports	2
Audio port	1

Electrical specifications	
Supply voltage	10...36 V DC
Max. power consumption	20 W
Galvanic isolation from power mains	+
Reverse polarity protection	+
Overvoltage protection	+

Overall and installation dimensions of DR-209MC



1 When mounting, provide 60 mm from surface В to connect the product.



When mounting, provide 60 mm from surface Г to connect the product.

Steering repeater

DR-309
ЦИУЛ.467847.001

INTENDED USE

Display of ship course data.

DESCRIPTION

Display of the ship course data received in NMEA-sentences from various digital sources using a card and LED indicator. Retransmission of the NMEA data via an RS-422 (or CAN – at option).

IP rating IP24 – at option.

TECHNICAL SPECIFICATIONS

General specifications		
IP rating	IP22	
Storage temperature	-60...+70 °C	
Storage temperature	-15...+55 °C	
Mounting	panel	bracket
Weight	2 kg	2.3 kg

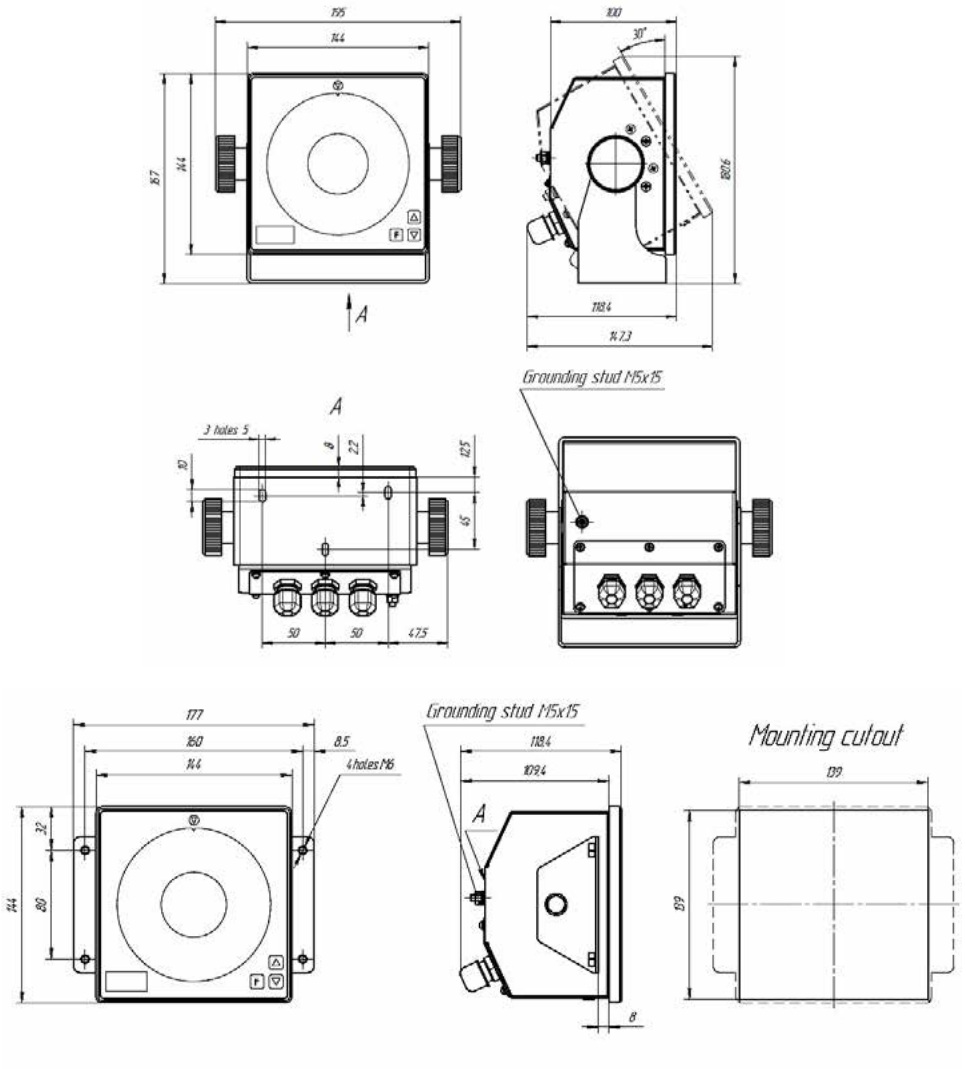
Specifications of inputs	
Number of input ports	2
Supported interfaces	RS-232 / RS-422
Max. receive rate	115200 bit/s
Optoisolation	+
Supported sentences	$xxHDT, $xxHDG, $xxHDM

Electrical specifications	
Supply voltage	11...36 V DC
Max. power consumption	12.5 W
Galvanic isolation from power mains	+
Reverse polarity protection	+
Overvoltage protection	+

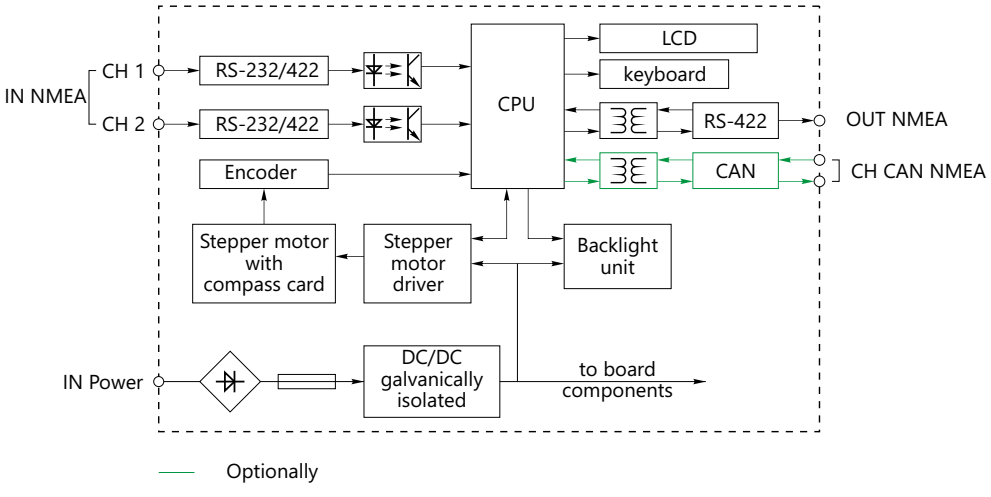
Specifications of outputs	
Number of output ports	1
Supported interfaces	RS-232 / RS-422
(CAN at option)	115200 бит/с
Max. baud rate	115200 bit/s
Galvanic isolation	+

Operating specifications		
Follow up speed		>12 °/s
Resolution capacity	Character display	0.1 °
	Compass card indicator	0.5 °

Overall and installation dimensions of DR-309



Functional diagram of DR-309



MARINE CONVECTION HEATERS UNITHERM

Marine convection heater

UNITHERM UT-300 – UT-2000

INTENDED USE

Room heating in any navigational area
(not containing any explosive mixtures in the air).

DESCRIPTION

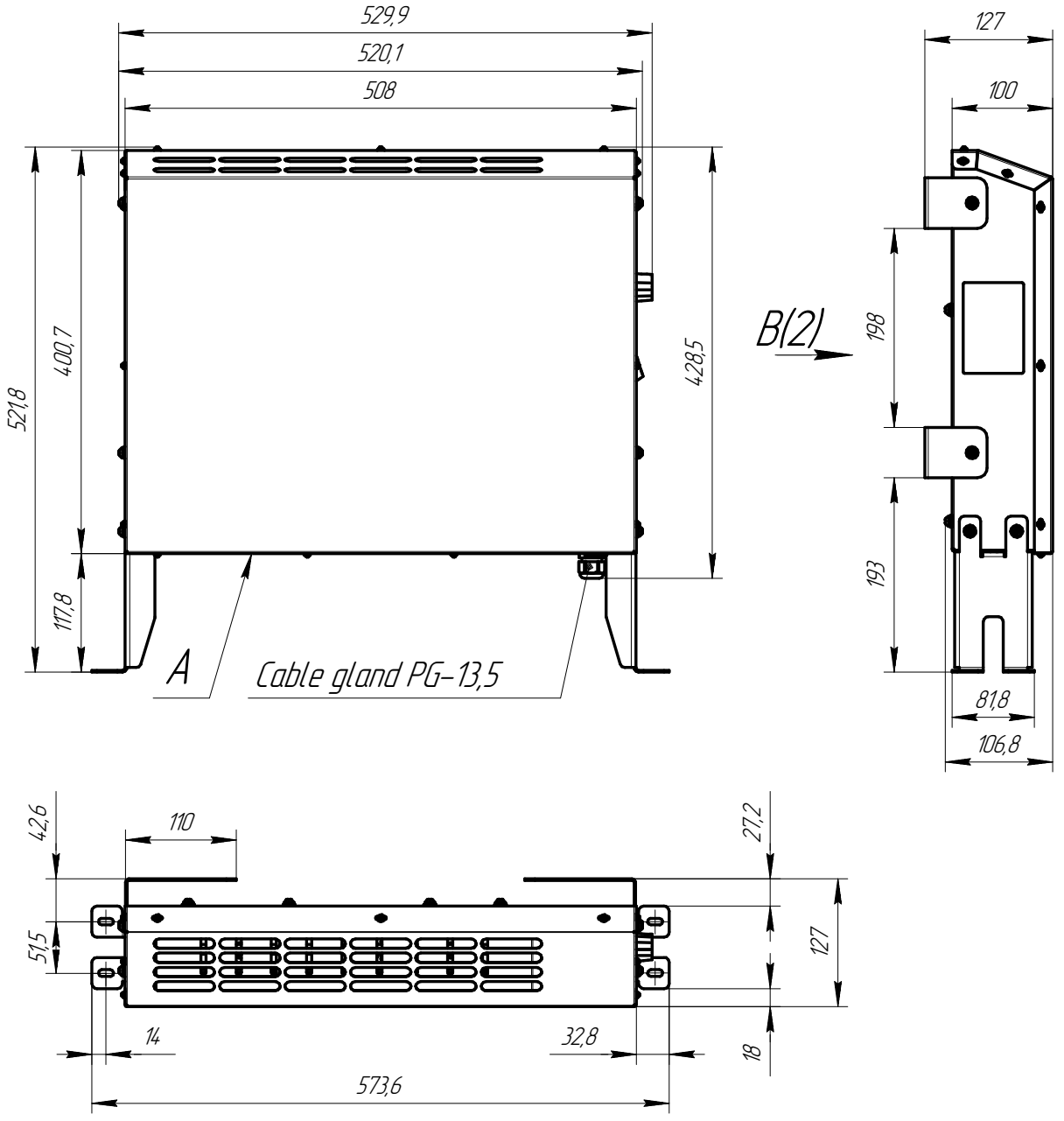
Stationary marine convection heaters (UT)
with tubular heating elements.
May be used in industrial environments.

TECHNICAL SPECIFICATIONS

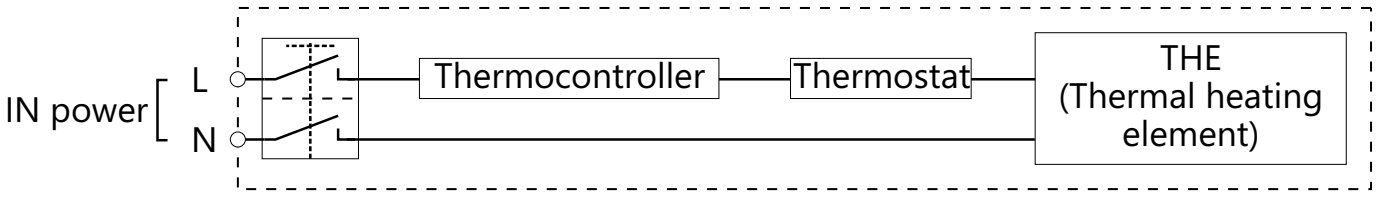
Model	Code	Input voltage 50 Hz, V AC	Power, W	Heated volume *, m³	Weight, kg
UT-300	ЦИУЛ.681934.113	220 (198...242); 380 (342...418) – 2 phases	380	7	9,5
UT-300	ЦИУЛ.681934.112		220		
UT-500	ЦИУЛ.681934.163		380	12	
UT-500	ЦИУЛ.681934.162		220		
UT-600	ЦИУЛ.681934.123		380	14	
UT-600	ЦИУЛ.681934.122		220		
UT-800	ЦИУЛ.681934.133		380	19	10,0
UT-800	ЦИУЛ.681934.132		220		
UT-1000	ЦИУЛ.681934.173		380	23	
UT-1000	ЦИУЛ.681934.143		220		
UT-1200	ЦИУЛ.681934.143		380	29	
UT-1200	ЦИУЛ.681934.142		220		
UT-1500	ЦИУЛ.681934.183		380	35	10,5
UT-1500	ЦИУЛ.681934.182		220		
UT-1800	ЦИУЛ.681934.153		380	43	
UT-1800	ЦИУЛ.681934.152		220		
UT-2000	ЦИУЛ.681934.193		380	47	
UT-2000	ЦИУЛ.681934.192		220		

IP rating: IP22
Operating temperature: -15...+55 °C
Limiting temperature: -60...+70 °C
* Approximate volume

Overall and installation dimensions of UT-xx



Functional diagram of UT-xx



Marine convection heater

UT-C-300 – UT-C-2000

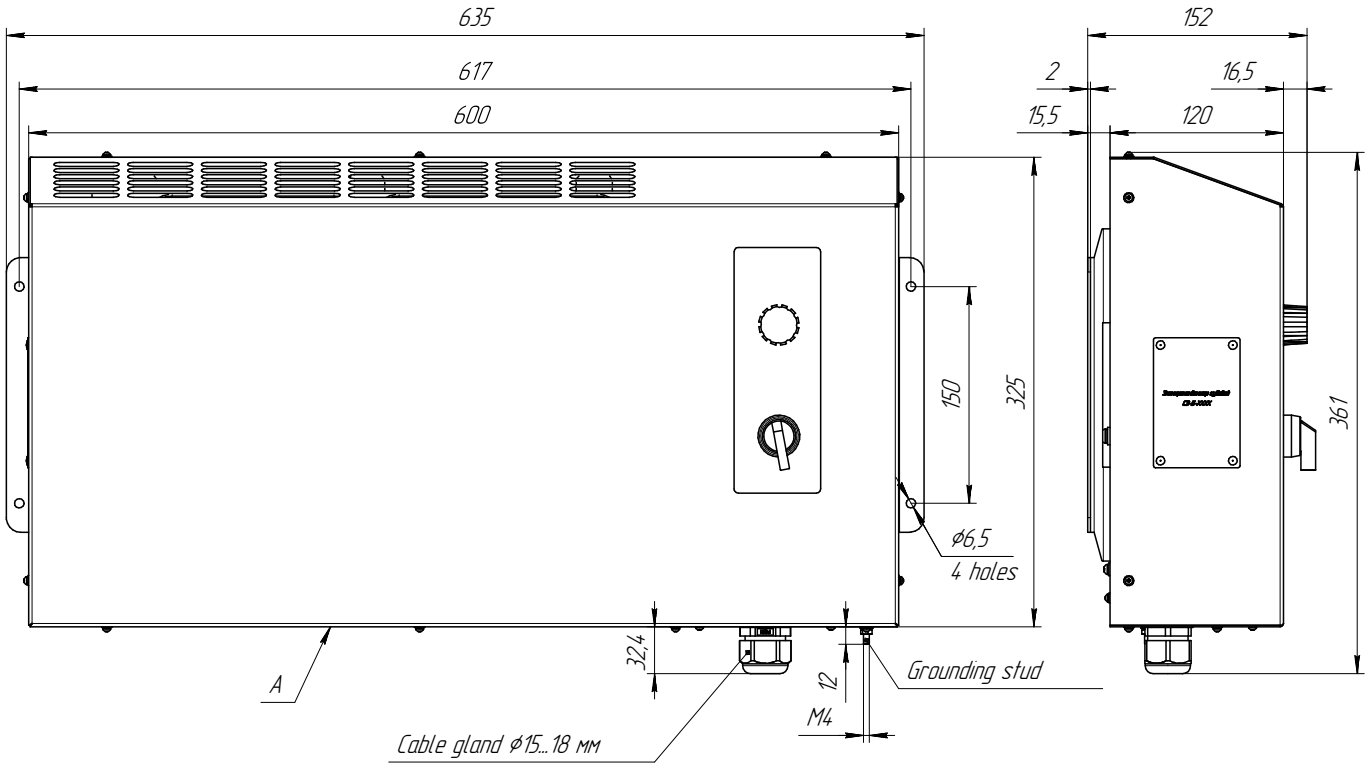
INTENDED USE

Room heating in any navigational area.
IP rating – IP44.

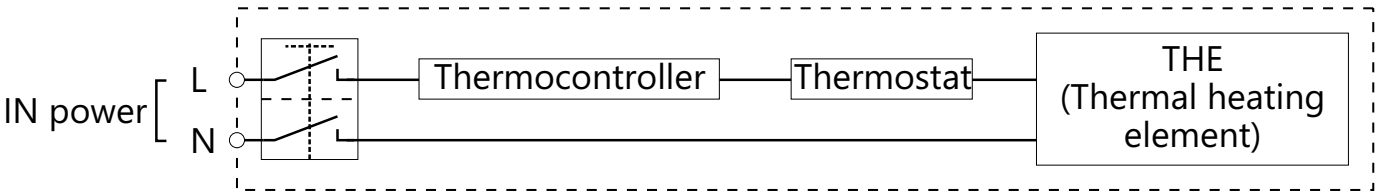
ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

Model	Code	Power, W	Voltage, frequency 50 Hz, V AC	Phases	Weight, kg	Heated volume, m^3
UT-C-300	ЦИУЛ.681934.212	300	220	1	12,5	7
UT-C -300	ЦИУЛ.681934.213		380	2		
UT-C -500	ЦИУЛ.681934.262	500	220	1	12,5	12
UT-C -500	ЦИУЛ.681934.263		380	2		
UT-C -600	ЦИУЛ.681934.222	600	220	1	12,5	14
UT-C -600	ЦИУЛ.681934.223		380	2		
UT-C -800	ЦИУЛ.681934.232	800	220	1	12,5	19
UT-C -800	ЦИУЛ.681934.233		380	2		
UT-C -1000	ЦИУЛ.681934.272	1000	220	1	12,5	23
UT-C -1000	ЦИУЛ.681934.273		380	2		
UT-C -1200	ЦИУЛ.681934.242	1200	220	1	14,0	29
UT-C -1200	ЦИУЛ.681934.243		380	2		
UT-C -1500	ЦИУЛ.681934.282	1500	220	1	14,0	35
UT-C -1500	ЦИУЛ.681934.283		380	2		
UT-C -1800	ЦИУЛ.681934.252	1800	220	1	14,0	43
UT-C -1800	ЦИУЛ.681934.253		380	2		
UT-C -2000	ЦИУЛ.681934.292	2000	220	1	14,0	47
UT-C -2000	ЦИУЛ.681934.293		380	2		
Operating temperature: -15...+55 °C Limiting temperature: -60...+70 °C						

Overall and installation dimensions of UT-СБ-xx



Functional diagram of UT-C-xx



Marine heater

MH-S

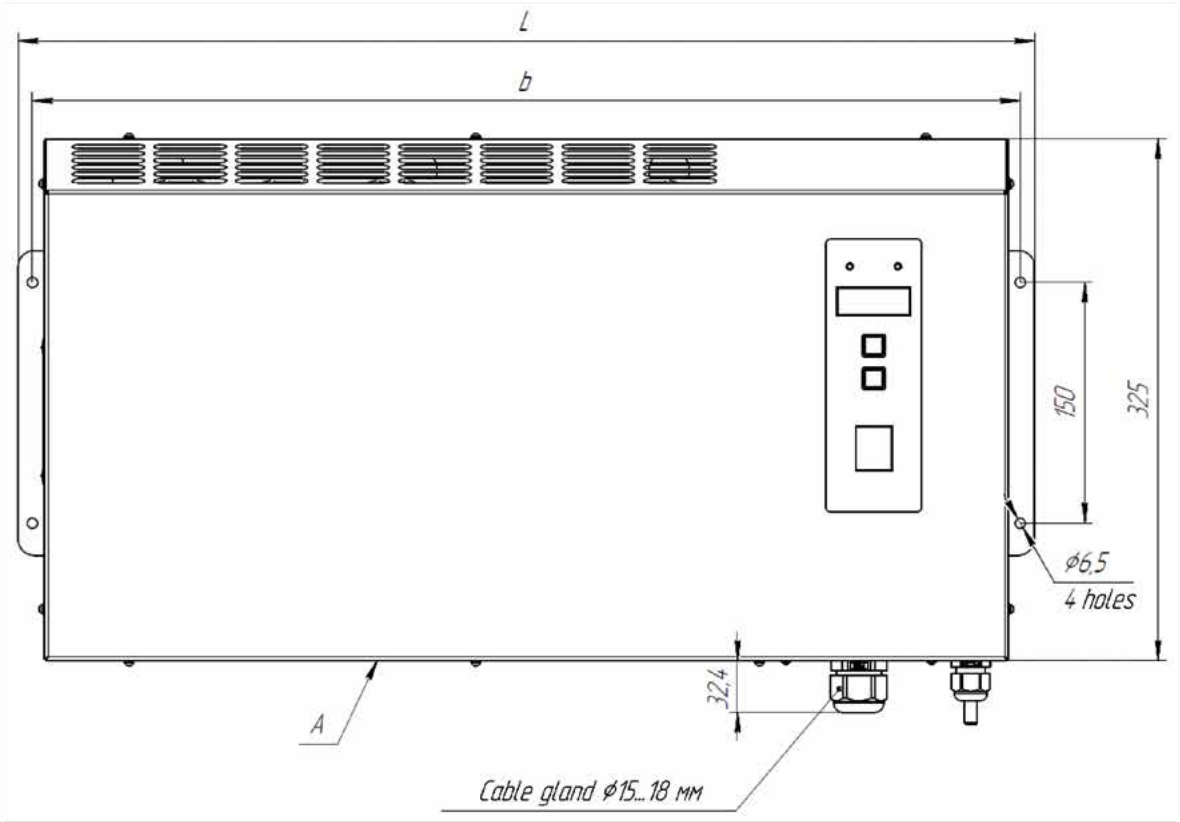
DESCRIPTION

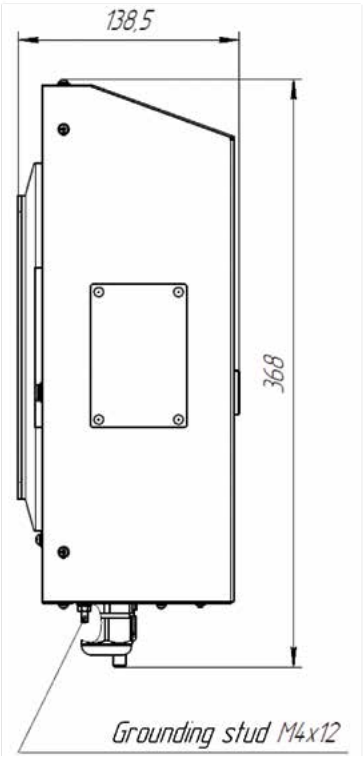
Marine heater MH-S is intended to heat rooms in any navigational area (not containing any explosive mixtures in the air).
May be used in industrial environments

TECHNICAL SPECIFICATIONS

Model	Code	Power, W	Voltage, V	AC frequency, Hz	Phases	Weight, kg	Heated volume, m^3
MH-S-300	ЦИУЛ.681934.311	300	220 (180 - 264)	50 - 400	1	11,0	7
MH-S-300	ЦИУЛ.681934.313		380 (342 - 418)		3		
MH-S-500	ЦИУЛ.681934.321	500	220 (180 - 264)	50 - 400	1	12,8	12
MH-S-500	ЦИУЛ.681934.323		380 (342 - 418)		3		
MH-S-600	ЦИУЛ.681934.331	600	220 (180 - 264)	50 - 400	1	13,0	14
MH-S-600	ЦИУЛ.681934.333		380 (342 - 418)		3		
MH-S-800	ЦИУЛ.681934.341	800	220 (180 - 264)	50 - 400	1	13,0	19
MH-S-800	ЦИУЛ.681934.343		380 (342 - 418)		3		
MH-S-1000	ЦИУЛ.681934.351	1000	220 (180 - 264)	50 - 400	1	13,3	23
MH-S-1000	ЦИУЛ.681934.353		380 (342 - 418)		3		
MH-S-1200	ЦИУЛ.681934.361	1200	220 (180 - 264)	50 - 400	1	13,3	29
MH-S-1200	ЦИУЛ.681934.363		380 (342 - 418)		3		
MH-S-1500	ЦИУЛ.681934.371	1500	220 (180 - 264)	50 - 400	1	13,3	35
MH-S-1500	ЦИУЛ.681934.373		380 (342 - 418)		3		
MH-S-1800	ЦИУЛ.681934.381	1800	220 (180 - 264)	50 - 400	1	13,3	43
MH-S-1800	ЦИУЛ.681934.383		380 (342 - 418)		3		
MH-S-2000	ЦИУЛ.681934.391	2000	220 (180 - 264)	50 - 400	1	13,3	47
MH-S-2000	ЦИУЛ.681934.393		380 (342 - 418)		3		

Overall and installation dimensions of MH-S





I/O devices switching unit

KWMS-143
ЦИУЛ.468349.009-XX

INTENDED USE

Control of the connected computers by means of a single console to save resources and workspace as a part of shipborne automation and navigation systems, surveillance systems, etc.

DESCRIPTION

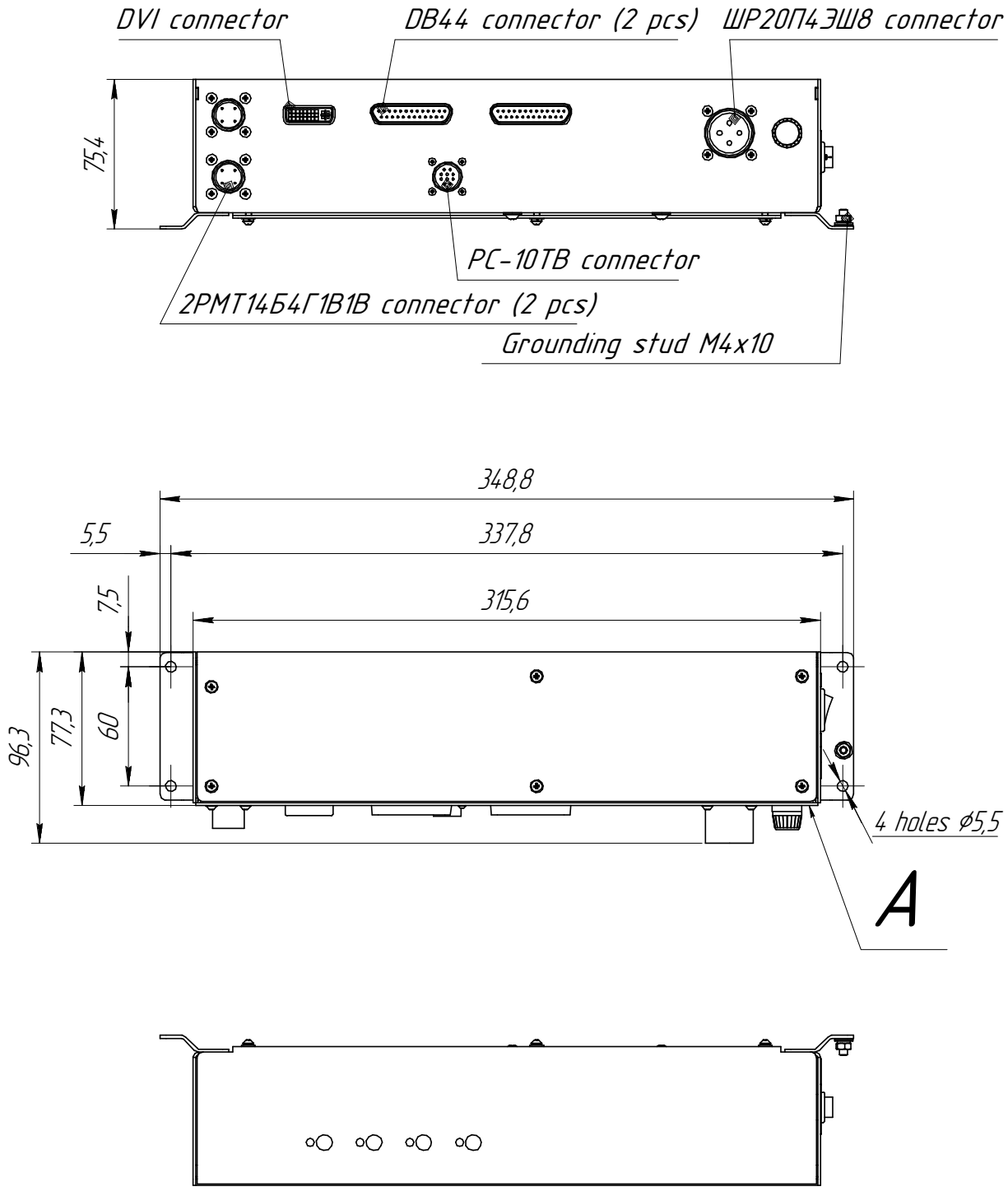
Depending on the model, operates with mains 12 or 27 V DC andsingle-phase mains, frequency 50 Hz and voltage 110/220 V AC.

Model with external control to switch the connected devices remotely and control the central unit is available.

TECHNICAL SPECIFICATIONS

Name		KWMS-143									
		-202-П		-104-П		-104		-204		-116	
Type		ЦИУЛ.468349.009-XX									
Supply voltage	220 V, 50 Hz	-00	-01	-08	-09	-16	-17	-24	-25	-32	-33
	110/220 V, 50 Hz	-02	-03	-10	-11	-18	-19	-26	-27	-34	-35
	27 V DC ± 10 %	-04	-05	-12	-13	-20	-21	-28	-29	-36	-37
	12 V DC ± 10 %	-06	-07	-14	-15	-22	-23	-30	-31	-38	-39
Standard		Stand.	secure	Stand.	secure	Stand.	secure	Stand.	secure	Stand.	secure
Mounting		wall						rack			
External control panel		KWMS -143-ПУ202		KWMS -143-ПУ104		-	-	-	-	-	-
Connected monitors		2	2	1	1	1	1	2	2	1	1
Connected computers		2	2	4	4	4	4	4	4	16	16
Switching modes		4	4	1	1	1	1	4	4	1	1
Power consumption		11 W	11 W	13 W	13 W	6 W	6 W	6 W	6 W	6.5 W	6.5 W
IP rating		IP22	IP22	IP22	IP22	IP22	IP22	IP22	IP22	IP22	IP22
Operating temperature		-15...+55 °C						-15...+55 °C			
Storage temperature		-55...+70 °C						-55...+70 °C			
Video signal interface		DVI-I	DVI-I	DVI-D	DVI-D	DVI-D	DVI-D	DVI-I	DVI-I	VGA	VGA
Video quality (pix.) at 60 Hz		2560 × 1600		1920 × 1200		1920 × 1200		2560 × 1600		1920 × 1200 (30 м*) 1600 × 1200 (40 м*) 1280 × 1024 (50 м*)	
Cascading		Yes	Yes	No	No	No	No	Yes	Yes	Да	Да
Keyboard and manipulator connection interface		USB	USB	USB	USB	USB	USB	USB	USB	USB and PS/2	USB and PS/2
Audio input (microphone)		+	+	-	-	+	+	-	-	+	+
Audio output (speaker)		+	+	+	+	+	+	-	-	+	+
* Max. distance of computer from the product											

Overall and installation dimensions of KWMS-143



When mounting, provide 200 mm from surface A to connect the product.

DESCRIPTION

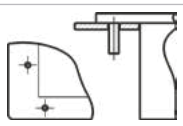
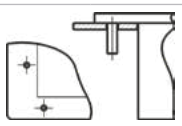
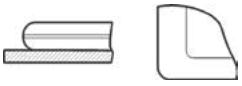
Input and output devices for marine computers:
- Keyboard with trackball
- Keyboard with touchpad
- Keyboard w/manipulator
- Manipulators – trackball, touchpad, mouse
- Input panels with installed keyboard, manipulator and other controls

Depending on the model, the devices are equipped with various sets of keys and connected via PS/2 and/or USB.

Intended for operation under operating conditions specified in GOST RV 20.39.304 for devices 2.1.1, 2.1.2, 2.2.1, 2.3.1, 2.3.2, 2.3.3.

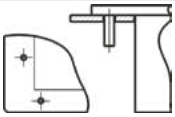
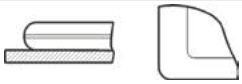
Keyboard with trackball

TBK-xx
ЦИУЛ.467254.001
ЦИУЛ.467254.002
ЦИУЛ.467254.007

Code	ЦИУЛ.467254.001		ЦИУЛ.467254.002		ЦИУЛ.467254.007	
Model	TBK-1368	TBK-1378	TBK-1369	TBK-1379	TBK-1569	TBK-1579
Interface	USB	PS/2	USB	PS/2	USB	PS/2
Dimensions	392 × 127.5 × 33.5 mm		324 × 127.5 × 33.5 mm		416 × 166.5 × 44.5 mm	
Number of keys, pcs.	105		89		89	
Key life	1 mln. clicks		1 mln. clicks		1 mln. clicks	
Key travel	0.6 mm		0.6 mm		0.6 mm	
Keystroke force	2.6 N		2.6 N		2.6 N	
Layout	RU/ENG		RU/ENG		RU/ENG	
Type of trackball	mechanical		mechanical		mechanical	
Ball diameter	25 mm		25 mm		25 mm	
Casing material	aluminum		aluminum		aluminum	
Rotation force	50 g		50 g		50 g	
Trackball life	6 mln. rotations		6 mln. rotations		6 mln. rotations	
Ball material	aluminum		aluminum		aluminum	
Mounting	panel		panel		panel	
IP rating	IP54 (front panel)		IP54 (front panel)		IP54	
Operating temperature	-15...+55 °C		-15...+55 °C		-15...+55 °C	
Storage temperature	-55...+70 °C		-55...+70 °C		-55...+70 °C	
Weight	1.3 kg		1.2 kg		2.6 kg	
Mounting type	Threaded stud 		Threaded stud 		No 	

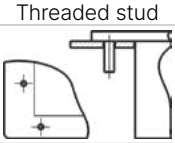
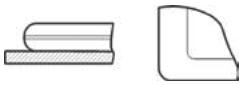
Keyboard with touchpad

TCK-xx
ЦИУЛ.467254.009

Code	ЦИУЛ.467254.009		ЦИУЛ.467254.014	
Model	TCK-1369	TCK-1379	TCK-1569	TCK-1579
Interface	USB	PS/2	USB	PS/2
Dimensions	416 × 159 × 32 mm		416 × 166.5 × 44.5 mm	
Number of keys, pcs.	89		89	
Key life	1 mln. clicks		1 mln. clicks	
Key travel	0.6 mm		0.6 mm	
Keystroke force	2.6 N		2.6 N	
Layout	RU/ENG		RU/ENG	
Touchpad type	capacitive		capacitive	
Touchpad active area	65 x 50 mm		65 x 50 mm	
Material	aluminum		aluminum	
Mounting	panel		Desk-top	
IP rating	IP54 (front panel)		IP54	
Operating temperature	-15...+55 °C		-15...+55 °C	
Storage temperature	-55...+70 °C		-55...+70 °C	
Weight	1.4 kg		2.6 kg	
Mounting type	Threaded stud		No	
				

Keyboard with touchpad

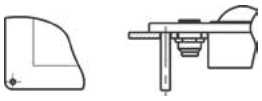
K-XX
ЦИУЛ.467254.009

Code	ЦИУЛ.467254.018		ЦИУЛ.467254.016	
Model	K-1369	K-1379	K-1568	K-1578
Interface	USB	PS/2	USB	PS/2
Dimensions	343 × 159 × 20 mm		445 × 166.5 × 46 mm	
Number of keys, pcs.	86		103	
Key life	1 mln. clicks		1 mln. clicks	
Key travel	0.6 mm		0.6 mm	
Keystroke force	3 N		2.6 N	
Layout	RU/ENG		RU/ENG	
Material	aluminum		aluminum	
Mounting	panel		Desk-top	
IP rating	IP54 (front panel)		IP54	
Operating temperature	-15...+55 °C		-15...+55 °C	
Storage temperature	-55...+70 °C		-55...+70 °C	
Weight	1.4 kg		2.6 kg	
Mounting type	Threaded stud		No	
				

Manipulators

M-xx

Code	ЦИУЛ.468317.001		ЦИУЛ.468317.002		ЦИУЛ.468317.003	
Model	TBM-2368	TBM -2378	TBM-2369	TBM-2379	TBM-2369	TBM-2379
Interface	USB	PS/2	USB	PS/2	USB	PS/2
Dimensions	134 × 107 × 41 mm		100 x 116 x 50 mm		134 x 107 x 41 mm	
Number of keys, pcs.	2		3		2	
Key life	3 mln. clicks		3 mln. clicks		3 mln. clicks	
Key travel	0.5 mm		0.5 mm		0.5 mm	
Keystroke force	4 N		4 N		4 N	
Type	mechanical		laser		capacitive	
Ball diameter / Touchpad diameter	38 mm		50 mm		65 x 50 mm	
Life, min.	2 mln. rotations		2 mln. rotations		--	
Material	Stainless steel (front panel)		Phenol polymer (ball), stainless steel (front panel)		Stainless steel (front panel)	
Mounting	panel		panel		panel	
IP rating	IP54		IP54		IP54	
Operating temperature	-15...+55 °C		-15...+55 °C		-15...+55 °C	
Storage temperature	-55...+70 °C		-25...+70 °C		-55...+70 °C	
Weight	0.4 kg		0.7 kg		0.4 kg	
Mounting type	Threaded stud		Threaded stud		Threaded stud	

Code	ЦИУЛ.468317.004		ЦИУЛ.468317.006
Model	M-1568	M-1578	TBM-23678
Interface	USB	PS/2	USB+PS/2
Dimensions	116 × 62 x 39 mm		100 x 116 x 40 mm
Number of keys, pcs.	3		3
Key life	3 mln. clicks		1 mln. clicks
Key travel	0.3 mm		1.3 mm
Keystroke force	1.5 N		4 N
Type	laser		mechanical
Ball diameter	-		50 mm
Ball life, min.	-		2 mln. rotations
Material	silicon coating (casing)		stainless steel (front panel and ball)
Mounting	Desk-top		panel
IP rating	IP54		IP54
Operating temperature	-15...+55 °C		-15...+55 °C
Storage temperature	-25...+70 °C		-25...+70 °C
Weight	0.26 kg		1.1 kg
Mounting type	No		Threaded stud
			

Input panel

ПВ-2368

ЦИУЛ.467254.020

DESCRIPTION

Complete device includes keyboard K-2369 and manipulator TBM-2369 in the steel casing.

EQUIPPED WITH

- KVM-switch
- USB port under protective cover – 2 pcs
- Duplicate keys for manipulator TBM-2369

TECHNICAL SPECIFICATIONS

Code	ЦИУЛ.467254.020
Model	ПВ-2368
Type of connectors	secure
Interface	2 x USB
USB external connection (passthrough)	2 x USB front panel (2 x USB output to rear panel)
Dimensions	550 × 226 × 108 mm
Number of keys, pcs.	83
Number of trackball keys	3 + 2 (duplicate)
Key life	1 mln. clicks
Key travel	1.2 mm
Keystroke force	1.2 N
Layout	RU/ENG
Type	laser
Ball diameter	50 mm
Material	steel, aluminum
Ball material	Phenol polymer

Rotation force	50 g
Ball life, min.	2 mln. rotations
Mounting	panel
IP rating	IP54 (front panel)
Operating temperature	-15...+55 °C
Storage temperature	-60...+70 °C
KBM switch	3 positions
Computer connection	2 DVI ports
Monitor connection	1 DVI port
Weight	4 kg
Mounting type	Threaded stud

Compact keyboard

UKT-801

ЦИУЛ.467254.022

INTENDED USE

Control of computers via PS/2 or USB (depending on the model).

DESCRIPTION

Built-in trackball substitutes computer mouse, so the keyboard is a perfect solution for limited workspace.

TECHNICAL SPECIFICATIONS

General specifications	
Overall dimensions	292 × 160 × 26.3 mm
IP rating	IP20
Max. weight	0.45 kg

Operating specifications	
Interface	PS/2 (USB)
Number of keys	86
Pointing device	Ball 16 mm with two keys
Keys	Membrane, quiet tactile responce
Supported software	Windows 98/2000/XP/7/10, Astra Linux

Speed control lever

RUS-225
ЦИУЛ.421251.018
ЦИУЛ.421251.018-01
ЦИУЛ.421251.018-02
ЦИУЛ.421251.018-03
ЦИУЛ.421251.018-10
ЦИУЛ.421251.018-11
ЦИУЛ.421251.018-12
ЦИУЛ.421251.018-13

OPERATION PRINCIPLE

The product is designed for remote control of engine speed in forward and reverse directions.

The product converts current position of the levers into electrical signal using an absolute encoder. Depending on the model, RUS 225 can be equipped with one or two levers. The product can provide synchronous and asynchronous speed control simultaneously on two channels with two levers.

When the lever is rotated, the signal generated by the encoder is sent to the processing board, where the sensor datagram is processed and converted into an output signal using an NMEA-like protocol via an RS-232 or RS-422 interface. In addition, signals about the current status of the device itself are transmitted.

TECHNICAL SPECIFICATIONS

Max. rated power consumption, W	12
Input voltage, V	24
Overall dimensions (W x D x H), mm	250 x 130 x 130
Weight, kg	1.5
Operating temperature, °C	–15...+55
Limiting temperature, °C	–50...+70
IP rating	IP44
Mounting	panel
RS-422 connectors, pcs.	2

DESCRIPTION

All output NMEA sentences begin with identifier '$' and end with hex checksum separated from The message body with '*'.

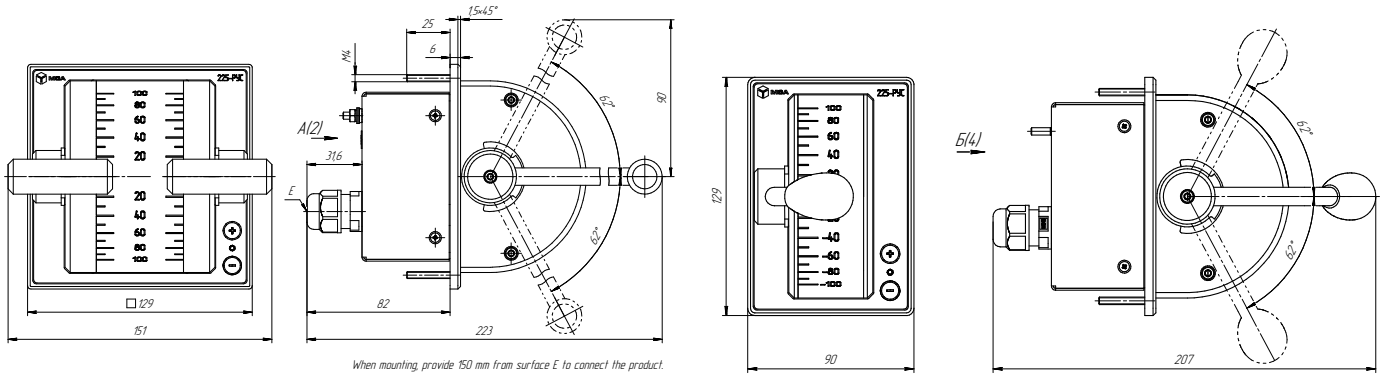
Messages are transmitted in 8-bit ASCII coding.

EXAMPLE

$LAT0,-123.2,96.1,1,-15348,-15320,24340,24389*6E.

	РУС-225 ЦИУЛ. 421251.018	РУС-225 ЦИУЛ. 421251.018-01	РУС-225 ЦИУЛ. 421251.018-02	РУС-225 ЦИУЛ. 421251.018-03	РУС-225 ЦИУЛ. 421251.018-10	РУС-225 ЦИУЛ. 421251.018-11	РУС-225 ЦИУЛ. 421251.018-12	РУС-225 ЦИУЛ. 421251.018-13
Model	00	01	02	03	10	11	12	13
Shaft travel	stepless				stepwise			
Type of lever	double	double	single	single	double	double	single	single
Lever orientation (see dimensional drawing)	vertical	horizontal	vertical	horizontal	vertical	horizontal	vertical	horizontal
Note Model 00 is standard. Indicated conditionally								

Overall and installation dimensions of RUS-225



Azimuth lever

LAT-219
ЦИУЛ.421251.001
ЦИУЛ.421251.001-01
ЦИУЛ.421251.001-03
ЦИУЛ.421251.001-04
ЦИУЛ.421251.001-05
ЦИУЛ.421251.001-07

INTENDED USE

The product is designed to set rotation direction and (or) actuator speed remotely. Used in the control systems of propulsion-steering column, water jet and other devices.

DESCRIPTION

All output NMEA sentences begin with identifier '$' and end with hex checksum separated from the message body with '*'.

Messages are transmitted in 8-bit ASCII coding.

COMMUNICATION PROTOCOL

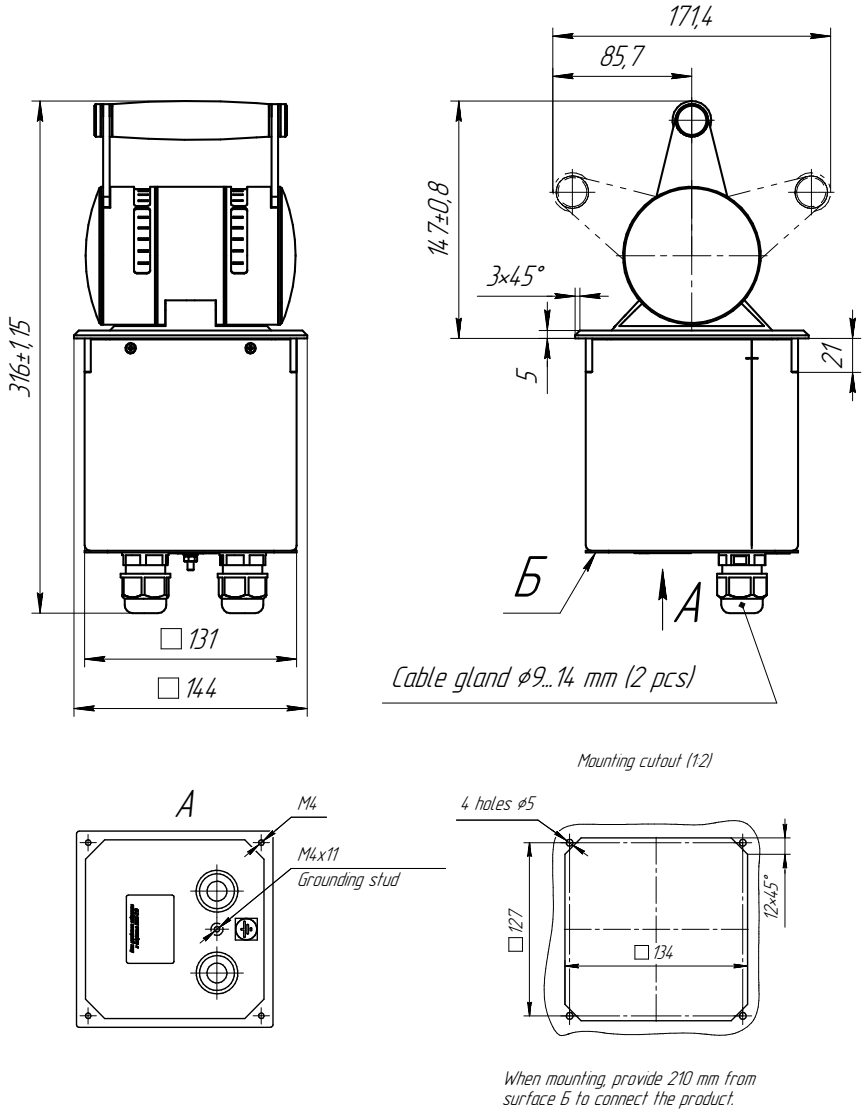
The device pairing protocol defines communication via RS-232 and RS-422 interfaces (the device is equipped with two communication ports) using an NMEA-like protocol. The device sends a message containing data about the current position of the control lever and the status of the device itself, simultaneously on two communication channels with a frequency of 20 Hz.

EXAMPLE

$LAT0,-123.2,96.1,1,-15348,-15320,24340,24389*6E.

Communication parameters of RS-232 and RS-422	
Baudrate	115200 baud/s
Parity check	No
Stop-bit	1

Overall and installation dimensions of LAT-219



TECHNICAL SPECIFICATIONS

Code	Reverse	Rotary mechanism
ЦИУЛ.421251.001	yes	full-turn
ЦИУЛ.421251.001-01	no	full-turn
ЦИУЛ.421251.001-03	yes	limited rotation angle (±60°)
ЦИУЛ.421251.001-04	no	limited rotation angle (±60°)
ЦИУЛ.421251.001-05	yes	without rotation
ЦИУЛ.421251.001-07	yes	limited rotation angle (±35°)

Parameter	Value
Max. rated power consumption, W	12
Input voltage, VDC	24
Overall dimensions (W x D x H), mm	316×144×144
Weight, kg	5
Operating temperature, °C	–15...+55
Limiting temperature, °C	–50...+70
IP rating	IP44
Mounting	Panel
RS-422 connectors, pcs.	2

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