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«NPK MORSVYAZAVTOMATICA»

UNICONT

BATTERY CONTROL PANEL
BCP-136, BCP-136-01

Operating manual

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INTRODUCTION

This operating manual (hereinafter – OM) describes composition, structure, operation and technical service of Battery control panels BCP-136 and BCP-136-01 types (hereinafter – the Product, the BCP).

In addition to the instructions given in this document, the safety regulations and rules applicable in the field shall be observed.

Only those who have read and understood this document and those who have had special training shall be permitted to operate the Product according to the applicable regulations.

TERMS AND ABBREVIATIONS:

OM – operating manual;

TS – technical service;

CL – check list;

SC – short circuit;

CH – charger;

BCP-136 – battery control panel BCP-136;

BCP-136-01 – battery control panel BCP-136-01;

CH-105 – automatic battery charger CH-105, CH-105-24 types;

PCH-205 – power supply/automatic battery charger PCH-205;

BMU-126 – battery power measurement unit BMU-126;

DTS-135 – temperature sensor DTS-135;

SB-138 – shunt box SB-138;

SB – storage battery;

LFGS – large fine porous granulated silica gel.

Proprietary communications protocol – a protocol designed by a company that fully controls definition and operation principles of such protocol.

1 DESCRIPTION AND OPERATION OF THE PRODUCT

1.1 DESCRIPTION

The Product ensures 24/7 control of SB status and displays current values of charge (discharge) current and voltage.

1.2 MAIN TECHNICAL SPECIFICATIONS

1.2.1 The Product ensures:

a) remote settings of operation mode for connected CH-105 and PCH-205;

b) control of SB condition;

c) display of charge (discharge) current and voltage values;

d) light and sound alarm in case of SB discharge, supply voltage failure and other emergencies.

1.2.2 Table 1 describes technical specifications of the Product.

Table 1 – General technical specifications

Parameter	Type	
	BCP-136	**BCP-136-01**
Main specifications		
Rated input voltage DC, V	24 (10 to 36)*	
Power consumption, W	3.0	2.5
Integrated protection	– reverse polarity connection; – overvoltage, overload and SC; – galvanic isolation of supply mains	
Number of connected SB (simultaneous), pcs.	2	
Number of ports, pcs.**	2×RS-422 (analog and digital)	2×RS-422 (digital)
Digital interface specifications		
Purpose	data exchange with CH-105, PCH-205, BMU-126	
Max. baudrate, bit/s	115200	
Galvanic isolation	+	
Communication protocol	proprietary	
Connected units	CH-105, PCH-205, BMU-126	
Analog interface specifications		

Parameter		Type	
		BCP-136	**BCP-136-01**
Purpose		measurement of SB voltage and current passing through SB-138	
Galvanic isolation of channels		+	
Measurement range U_{shunt}, mV		80	
Measurement range U_{bat}, V		0 to 36	
Current measurement accuracy, A		0.01	
Voltage measurement accuracy, V		0.01	
Input impedance, MΩ		0.8	
Permissible shunt resistance, μм		1 to 9990	
Connected units		SB-138 and other shunt-based devices	
General specifications			
Overall dimensions, mm		211×117×55	
Overall dimensions incl. bracket, mm		255.0×143.5×65.0	
Protection degree		IP22	
Limiting temperature, °C		–60 to +70	
Operating temperature, °C		–15 to +55	
Mounting		panel; desk-top on a bracket	
Weight, kg	panel	1.46	
	desk-top on a bracket	1.57	
Note 1 “*” – supply voltage range is given in parenthesis. 2 “**” – external units are connected to one or several ports (simultaneous), using only one of the abovementioned interfaces.			

1.3 Structure and operation of the Product

1.3.1 General description

The Product is manufactured in metal casing. The Product has two ports, each of them supports digital and analog interfaces.

Digital interface connects CH-105, PCH-205 or BMU-126, receiving data on current settings, emergencies, charge current and voltage values, and then displaying them on the LED indicators. The BCP provides settings for CH-105 and PCH-205.

Analog interface connects third party chargers using SB-138.

1.3.2 Controls and LED light indicators

Figure 1 and Table 2 describe functional elements, controls and LED light indicators of the Product.

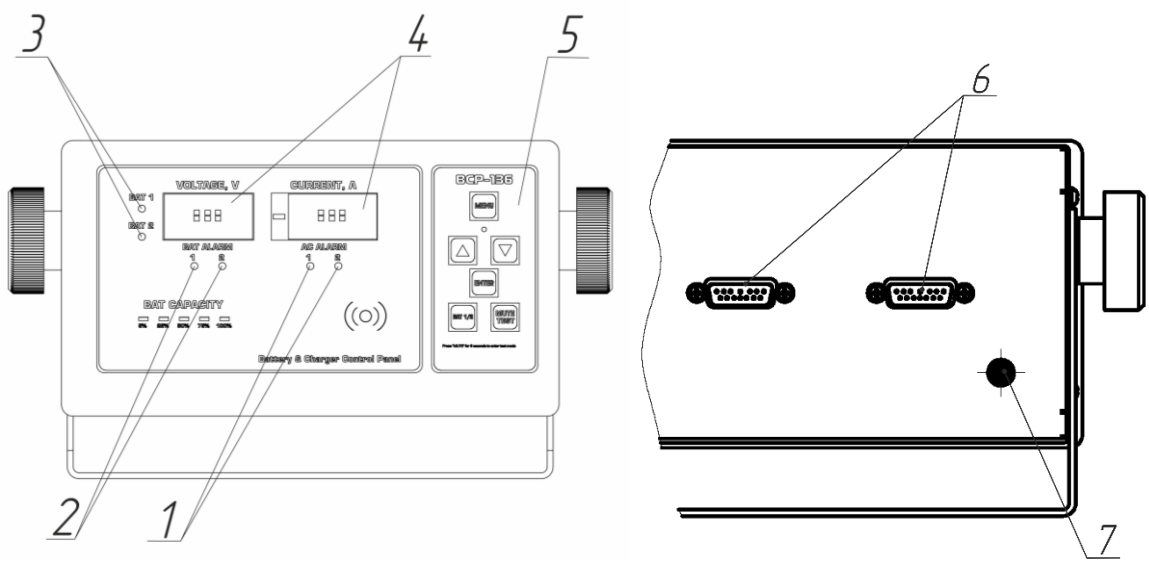


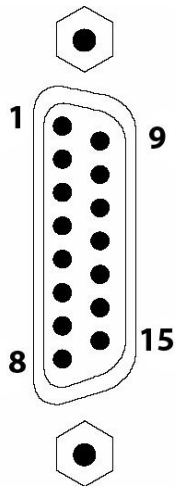
Figure 1 – The BCP

Table 2 – Functional elements, controls and LED light indicators of the Product

№	Element	Type, size, identifier	Description
1	LED	“1”	actuates under the following conditions: a) supply voltage failure on the unit, connected to the corresponding port of the BCP; b) opening of dry contacts relay, connected to the corresponding port of the BCP
		“2”	
2		“1”	alarm in SB circuit actuates under the following conditions: a) alarm occurrence (if applied with CH or PCH units); b) deviation from preset range of charge (discharge) values (if applied with device SB-138)
		“2”	
3		“BAT 1”	indicates number of the selected battery (1 or 2), which is currently displayed on the LED indicator
		“BAT 2”	
4	LED display	“Voltage, V”	displays charge (discharge) voltage and menu items, see Tables 6, 7
		“Current, A”	displays charge (discharge) current, SB temperature and menu items, see Table 7
5	Keys	“MENU”	scrolls menu items, see 2.3.2

№	Element	Type, size, identifier	Description
		“▲” и “▼”	a) backlight brightness dimming, see 2.3.4.6; b) scrolls menu items, see Tables 6, 7
		“Input”	saves the selected value, see Tables 6, 7
		“BAT 1/2”	switches LED indication to SB 1 and 2 (ports “PORT 1” and “PORT 2”)
			a) resets (mutes) sound alarm, see 2.3.4.8; b) operation test of LEDs, displays and buzzer, see 2.3.4.7
6	Connector DB-15F	“PORT 1”	connects units CH-105, BMU-126, SB-138, PCH-205
		“PORT 2”	
7	Grounding stud		main grounding element

Table 3 – Description of DB-15F pins

Type	Pin №	Purpose	Used contacts		
			Digital interface	Analog interface	Power supply
	1	GROUND	+	+	–
	2	NC	–	–	–
	3	Rx–	+	–	–
	4	Rx+	+	–	–
	5	Tx–	+	–	–
	6	Tx+	+	–	–
	7	Rele	–	+	–
	8	Rele	–	+	–
	9	NC	–	–	–
	10	SHUNT–	–	+	–
	11	SHUNT+	–	+	–
	12	VSUP+	+*	+*	+*
	13	VSUP+	+*	+*	+*
	14	VSUP–	+*	+*	+*
	15	VSUP–	+*	+*	+*

Notes
1 “*” – power supply circuit of the Product and measurement module of SB voltage are combined in order to decrease cores in the connected cable (for convenient mounting).
2 “+” – this pin is used for this interface.
3 “–” – this pin is not used for this interface.

1.3.3 Connection

Figures 2 – 4 describe connection of the Product and units PCH-205, CH-105, SB-138, BMU-126.

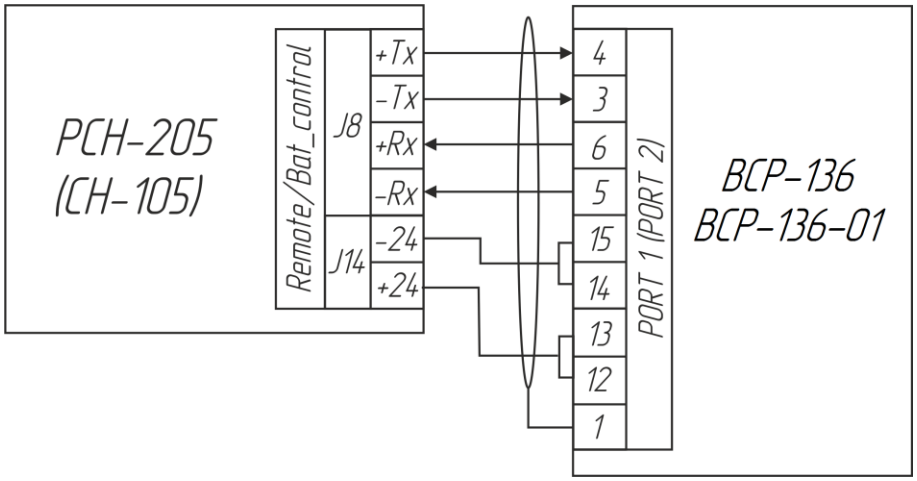
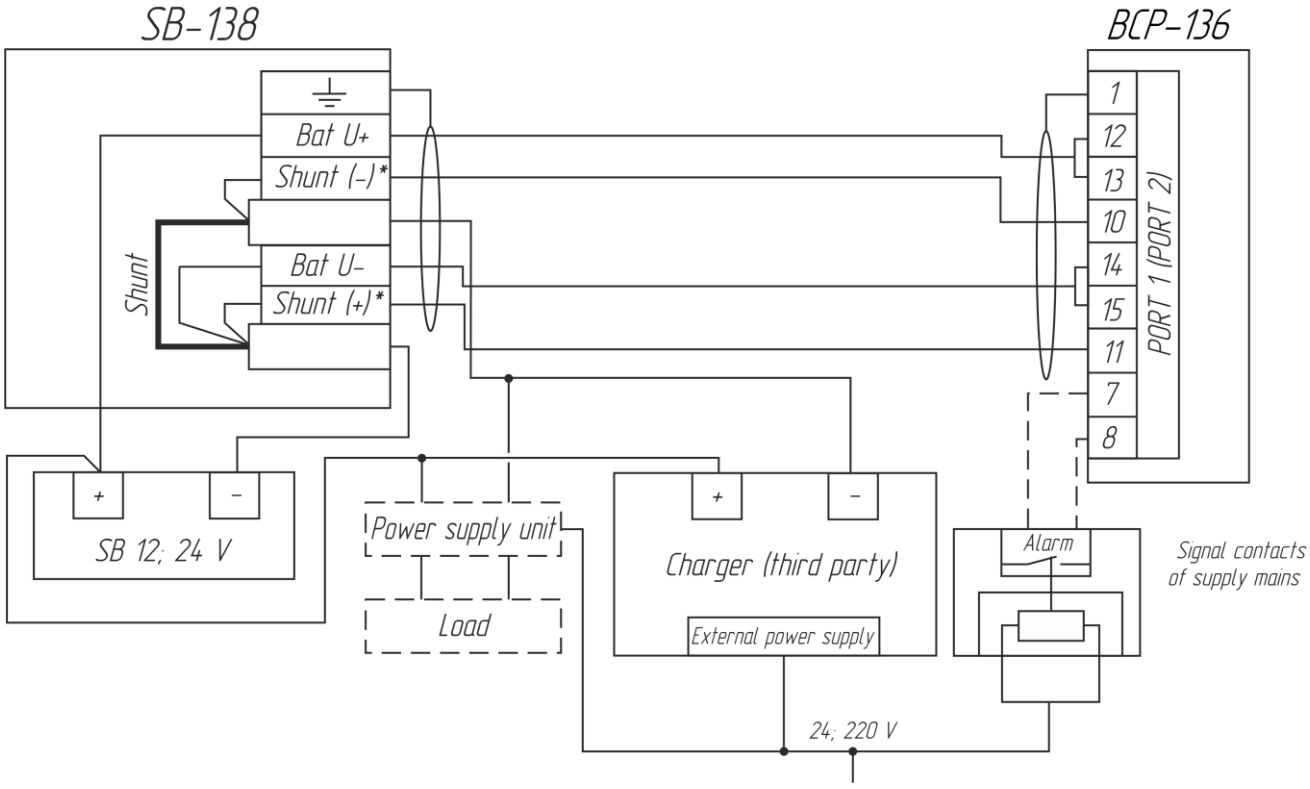


Figure 2 – Connection of PCH-205 or CH-105 via digital interface

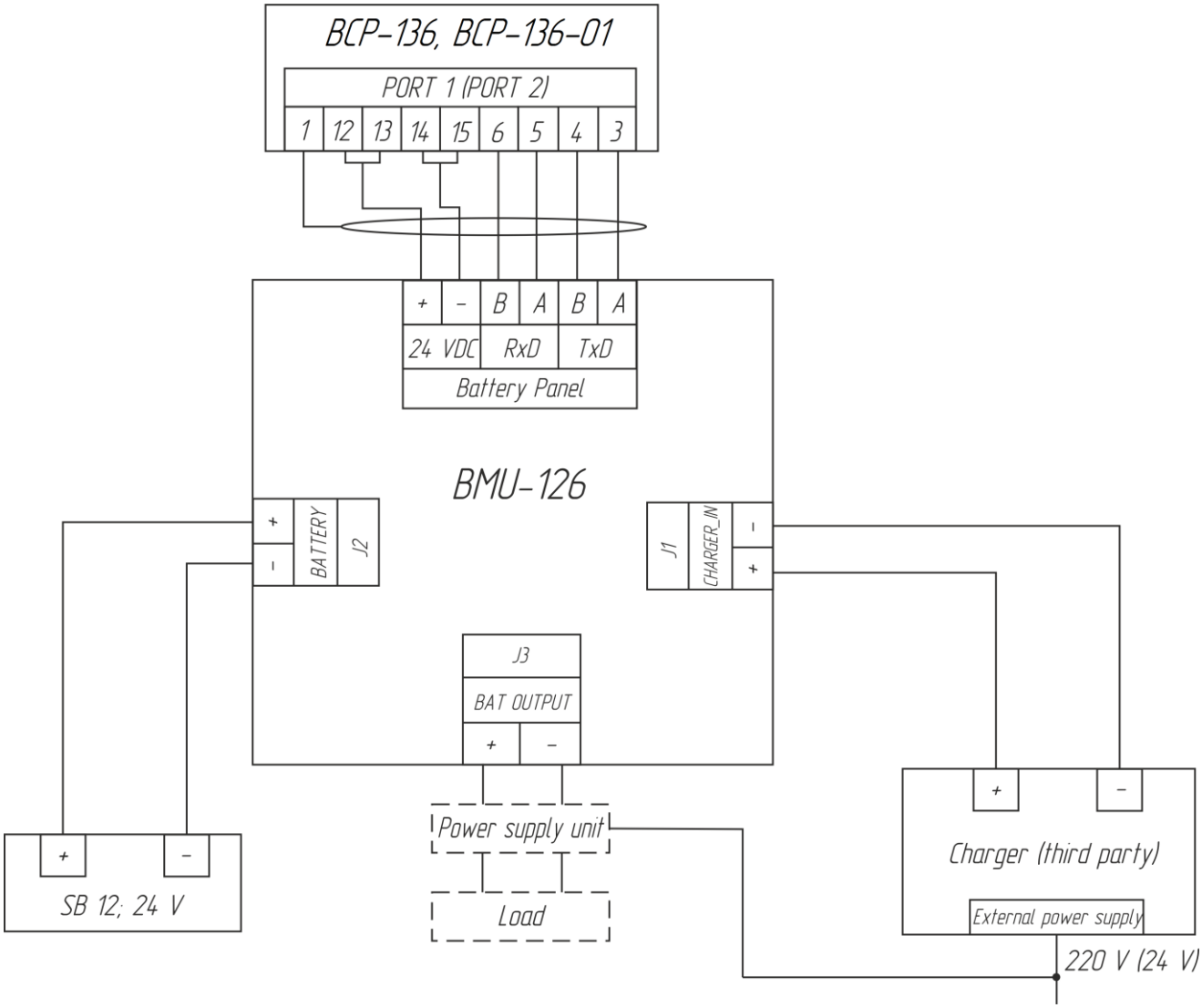


Notes

1 “*” – negative and positive sides of SB-138 are marked according to direction of current movement while charging SB.

2 Load relative to SB shall be connected in circuit after SB-138.

Figure 3 – SB-138 connection via analog interface



Note – Connect SB to the Product's analog interface port only after you make sure that SB operating parameters comply with analog interface specifications, see 2.3.4.2 and table 7.

Figure 4 – BMU-126 connection via digital interface

1.4 MEASUREMENT INSTRUMENTS, TOOLS AND APPLIANCES

Table 4 below describes consumables required for the TS.

Table 4 – Consumables required for the TS

Name and identifier of consumables	Amount of consumables	Note
Cleaning cloth	0.10 kg	To clean the Product surfaces
Rectified hydrolytic technical ethyl alcohol	0.05 l	1 To remove severe contamination from the surfaces of the Product 2 To polish surfaces of the Product with damaged paint coating
Varnish	0.05 kg	To cover surfaces of the Product in case of paint coating damage
Abrasive cloth	0.06 x 0.06 m	To polish surfaces of the Product in case of paint coating damage

1.5 MARKING AND SEALING

The Product has marking plates of connectors, and a nameplate indicating the Product name, serial number, date of manufacturing, weight, protection degree, input voltage, and power consumption.

The sealing of the Product is not provided.

1.6 PACKAGING

When delivered, the Product is packed in a corrugated board box and inner packaging (air bubble film) ensuring its transportation and storage at the warehouse.

Transport packaging is also used as a returnable packaging for transportation of the Product to the repair location and back.

The sealing of packaging is not provided.

2 INTENDED USE OF THE PRODUCT

2.1 OPERATIONAL LIMITATIONS

Install the Product according to overall and connection dimensions.

Caution! Distance between the installation site and magnetic compass shall not be less than 1 m!

Select an installation place in compliance with operational limitations (operating temperature and protection degree).

2.2 USAGE PREPARATIONS

2.2.1 Safety features

While preparing the Product for operation, check it visually and make sure there is no mechanical damage.

Before connection the Product shall be switched off and grounded.

While using the Product the staff shall follow “The technical rules for operation of electric installation” and “Safety rules for operation of electric installation” while testing electrical circuits and insulation resistance.

2.2.2 Visual check procedure

Before switching the SC on, the installer shall:

– observe visually the cable integrity and initial position of the controls;

– clean the SC from dust and dirt by clean soft cloth, if necessary;

– check fail-safe cable connections to the SC and their proper grounding.

2.2.3 Instructions on powering the Product

While connecting the Product and preparing it for operation follow the steps below:

a) transfer a piano type switch “ON/OFF” on the casing to “OFF” position;

b) transfer circuit breakers of main power switchboard to “OFF” position;

c) connect the Product using interface cable to CH-105 or PCH-205;

d) transfer circuit breakers of main power switchboard to “ON” position;

e) transfer a piano type switch on the connected unit to “ON” position.

Note – Units SB-138 and BMU-126 do not have a piano type switch, they switch on once power is supplied.

Switch the Product off in the following order – switch the Product off, switch off mains supply, disconnect interface cable.

2.3 INTENDED USE

2.3.1 Alarms

The Product has integrated sound and light alarms, see Table 5. CH-105 or PCH-205 (if used) send alarm data to the Product in digital form (via digital channel) and actuate its own signaling units (sound and light).

Table 5 – Alarms

Emergencies	**Connection type**		
	analog (SB-138)	**digital (BMU-126)**	**digital (CH-105, PCH-205)**
Input supply power failure (at signal reception based on dry contacts relay)	+	+	See Operating manual (CH-105 and PCH-205)
SB voltage is higher than the preset limit	+	+	
SB voltage is lower than the preset limit	+	+	
Exceedance of max. discharge current	–	+	
Notes 1 "+" – alarm is actuated (sound and light signaling). 2 "–" – alarm is not actuated.			

If an above-mentioned emergency occurs, the Product automatically actuates integrated alarms. To reset sound alarm, press "  " on the Product casing; light alarm will remain in operation unless the cause of alarm is removed.

2.3.2 The Product's menu

2.3.2.1 Main menu

If external units (PCH-205 or CH-105) are connected, main menu is available. Use it, to set up charge current and voltage values.

Enter the main menu by pressing button "Menu" on the Product casing, see 2.3.4.

2.3.2.2 Service menu

Use service menu during the first operation to set up types and characteristics of connected units.

The service menu enables the following settings:

a) settings of ports (to operate with external units) by selecting a parameter “dCH” “dBU”, “A1”, “A2” for the corresponding type of external unit, see Table 7;

b) disconnection of unused port (“CH1”, “CH2” – “OFF”);

c) data input of SB-138; correction of data and alarm actuation limits.

To enter the service menu, press a combination of buttons, see 2.3.4.

2.3.3 Menu structure

Figure 5 describes structure of the main menu.

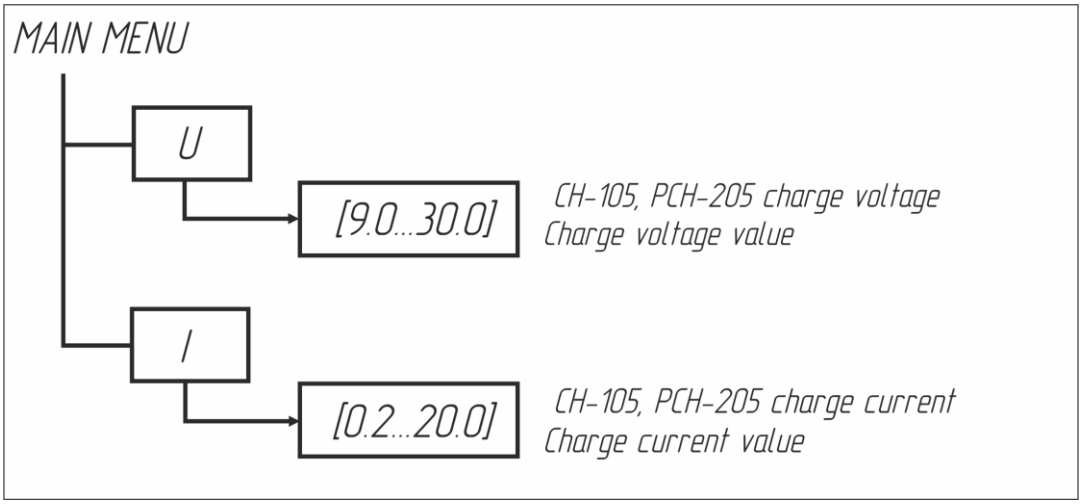


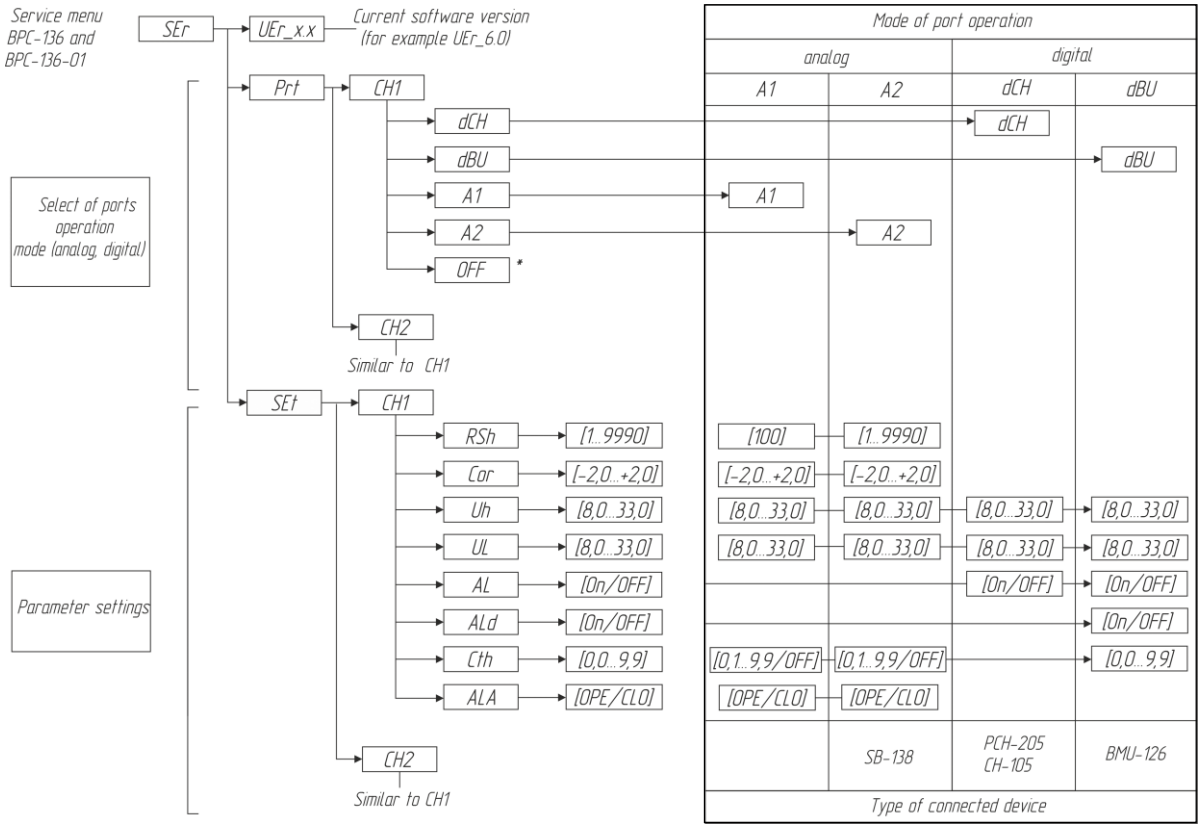
Figure 5 – Main menu structure

Table 6 briefly describes menu items.

Table 6 – Description of the main menu items

Menu item	Description
I	To select SB charge current value (measured within the range 0.1 to 20.0 A)
U	To select SB charge voltage value (measured within the range 9 to 30 V)

Depending on the operation mode, general structure of the service menu may change. Figure 6 shows available settings of the service menu.



Note – “*” means that only one port may be disconnected; both ports cannot be disconnected simultaneously.

Figure 6 – General structure of the service menu

Caution! Observe recommendations of SB manufacturer on charge characteristics before setting charge current and voltage!

Notes

1 While setting charge current and voltage values, consider max. and min. limits of connected external units.

2 If parameters are not correct and do not comply with the selected mode of operation, display will show “Err”; such settings cannot be carried out.

Table 7 briefly describes the Product’s menu items.

Table 7 – Description of service menu items

Menu item		Description	Note
UEr_x.x		Current software version	x.x (number;)
Prt	**Select of port operation mode**		
	dCH	Digital mode of port operation (RS-422 interface)	Connects CH-105, PCH-205
	dBU	Digital mode of port operation (RS-422 interface)	Connects BMU-126 (digital shunt)
	A1*	Analog mode of port operation	Connects third parties CHs. SB is connected to BCP terminal, parameter RSh = 100 μΩ (not changed)
	A2*	Analog mode of port operation	Connects SB-138
	OFF	Port is turned off	No connection
SEt	**Select of settings to receive analog data from external units operating with the Product in analog mode**		
	RSh*	Settings of shunt resistance 1 to 9990 μΩ	Set parameter RSh at 150 μΩ for analog shunt SB-138
	Cor*	Correction of zero current (changes within –2.0 to +2.0 A)	
	ALA*	Settings of alarm actuation to open (close) contacts	
	Uh	Upper limit of SB alarm actuation by voltage (changes within 8.0 to 33.0 V)	Alarm actuates, if preset value is higher than the preset value
	UL	Lower limit of SB alarm actuation by voltage (changes within 8.0 to 33.0 V)	Alarm actuates, when SB voltage drops lower than preset value
	Select of settings for BMU-126 alarms, operating with the Product in digital mode		
	AL	Switches on (off) all available alarms	
	ALd	Switches on (off) alarm signaling if max. charge current is exceeded	Only to connect BMU-126
	Cth	Alarm actuation threshold by SB max. discharge current (changes within 0.0 to 9.9 A)	Alarm actuates, if preset value is exceeded (available for port connection type dBU, ALd – ON, for connection type A1 or A2 available if preset value is higher than 0.0)
Note – "*" means that only BCP-136 has these menu items.			

2.3.4 Settings

2.3.4.1 Settings of ports operation modes

To carry out ports settings for the connected external unit, a user shall:

a) simultaneously press and hold keys "▲ and ▼" during 5 sec, unless left indicator displays "Prt";

b) press “ENTER” to confirm the select (left indicator displays “Prt”);

c) using keys “▲ and ▼” select port “CH1” or “CH2” on the right indicator (corresponds to “PORT 1” or “PORT 2” of the Product);

d) press button “ENTER” to confirm the select;

e) using “▲ and ▼” select type of connection “dCH”, “dBU”, “A1”, “A2”; available types of connections are shown in Table 7;

g) press “ENTER” to confirm the select;

h) press “MENU” as many times as necessary to return to main operation mode.

Note – If only one external unit is connected to the Product ports, unused port must be switched off (select “OFF” in the service menu of the Product) to prevent from false triggering of alarm.

2.3.4.2 Settings of analog interface (available only for BCP-136)

To input specific parameters required for operation with SB-138 via analog interface, a user shall:

a) simultaneously press and hold keys “▲ and ▼” during 5 sec, unless left indicator displays “Prt”;

b) using “▲ and ▼” select “SEt” on the right indicator;

c) press button “ENTER” to confirm the select (the left indicator will display “SEt”);

d) using “▲ and ▼” select port “CH1” or “CH2” on the right indicator (corresponds to “PORT 1” or “PORT 2” of the Product);

e) press “ENTER” to confirm the select;

f) using “▲ and ▼” select a required parameter: “RSh”, “Cor”, “Uh”, “UL”, “Cth”, “ALA”; for the description of the parameters, see Table 7;

h) press “ENTER” to confirm the select;

i) using “▲ and ▼” set up the required value, see Table 7;

k) press “ENTER” to confirm the select;

l) press “MENU” as many times as necessary to return to main operation mode.

2.3.4.3 Settings of digital interface (to connect BMU-126)

To set up several special parameters required for the Product operation with BMU-126 (via digital interface), a user shall:

a) simultaneously press and hold keys “▲ and ▼” during 5 sec, unless left indicator displays “Prt”;

b) using “▲ and ▼” select “SEt” on the right indicator;

c) press button “ENTER” to confirm the select (the left indicator will display “SEt”);

d) using “▲ and ▼” select port “CH1” or “CH2” on the right indicator (corresponds to “ПОРТ 1” or “ПОРТ 2” of the Product);

e) press “ENTER” to confirm the select;

f) using “▲ and ▼” select the required parameter: “AL”, “ALd”, “Cth”, “Uh”, “UL”; for the description of the parameters, see Table 7;

h) press “ENTER” to confirm the select;

i) using “▲ and ▼” set the required value, see Table 7;

k) press “ENTER” to confirm the select;

l) press “MENU” as many times as necessary to return to main operation mode.

2.3.4.4 Charge current settings

To set up the required value of charge current, provide the steps below:

a) press “MENU” button several times, unless the left indicator displays «I»;

b) using “▲ and ▼” input the required charge current value;

c) press “ENTER” to save the value to the non-volatile memory of the Product.

2.3.4.5 Charge voltage settings

To set up the required value of charge voltage, provide the steps below:

a) press “MENU” button several times, unless the left indicator displays “U”;

b) using “▲ and ▼” input the required value of charge voltage;

c) press “ENTER” to save the selected value to the non-volatile memory of the Product.

2.3.4.6 Backlight brightness adjustment

Every time you switch on the Product, backlight brightness is automatically set to the maximum, regardless of what level was set up before the switching off.

Adjust backlight brightness in main operation mode.

a) To decrease brightness by one level, press "▼". To decrease brightness by several levels, press "▼" several times or press and hold it.

b) To increase brightness by one level, press "▲". To increase brightness by several levels or to the maximum level, press "▲" several times or press and hold it.

2.3.4.7 Activation of "TEST" function

To test operation of audiovisual elements (LEDs, displays and buzzer), use function "Test". To activate the function, provide the following steps:

a) press and hold "  " during 3 sec, unless all LEDs start lighting up, and integrated speaker initiates continuous sound signal;

b) release "  "; the Product will return to main operation mode.

2.3.4.8 Alarm reset (mute)

In the event of alarm press "  " to disable it (see Table 2).

Once you press "  ", sound signaling stops. Light signaling will continue operation unless the cause of alarm is removed; but intermittent light signaling will change to the continuous one.

2.3.4.9 SB current temperature

The Product has a special function, which allows for displaying temperature of charged battery. The BCP receives data on SB temperature from PCH-205 or CH-105 by digital interface. PCH-205 or CH-105 control SB heating with the help of temperature sensors, which are fastened on SB and have electrical connection to CH-105 and PCH-205.

To activate this function, provide the following steps:

a) in main operation mode press "ENTER", the left indicator will display «t», the right one will display current SB temperature (if there is no temperature sensor, the right indicator will display "– – –");

b) the Product will transfer to main operation mode after 10 sec; LED displays will show present values of charge voltage and current.

Note – If you press "ENTER" for the second time during temperature data display, the Product will return to operation mode.

2.3.4.10 Default settings

The Product is delivered from the Manufacturer plant with devices PCH-205 or CH-105 set for operation. Connect the units via “PORT 1”.

Table 8 describes default settings and factory settings of BCP-136 and BCP-136-01.

Table 8 – Default settings and factory settings of BCP-136 and BCP-136-01

Setting	Item	Value
Default settings		
Operation modes of ports	CH1	“dCH”
	CH2	“OFF”
Factory settings		
Parameter “A1” at actuation	RSh	100 μΩ
	Cor	–0.9 A
	Uh	29.5 V
	UL	23.5 V
	Cth	OFF
	ALA	Ope
Parameter “A2” at actuation	RSh	150 μΩ
	Cor	–0.9 A
	Uh	29.5 V
	UL	23.5 V
	Cth	OFF
	ALA	Ope

3 TECHNICAL SERVICE OF THE PRODUCT

3.1 GENERAL DESCRIPTION

Before performing the TS the staff shall familiarize with the Product structure and operation features.

In order to provide safe and reliable operation for the Product, the staff shall maintain technical service № 1 (hereinafter – TS-1) – semi-annual TS.

TS-1 is carried out on the equipment in operation.

3.2 SAFETY FEATURES

While providing TS the staff shall follow instructions, see 4.2

3.3 MAINTENANCE ROUTINE

The list of works for all types of the TS is given in Table 8.

Maintenance routine procedure is described in the CL, see Tables 9, 10.

Table 4 describes consumables required for the TS.

Table 8 – TS works

CL №	Type of work	TS
		TS-1
1	Visual check of the Product	+
2	Operation test	+
Note: “+” – work is obligatory.		

Table 9 – CL № 1. Visual check of the Product

To be done	Routine	Man-hours per 1 Product
Examine the Product	1 Check completeness and appearance of the Product; mechanical damage, paint defects must be absent; marking plates shall be present; legends shall be read easily 2 Clean up the Product surfaces with clean cloth 3 Remove severe contamination, parts of corrosion, oil spots from the metal surfaces – using ethyl alcohol, avoiding its penetration inside the Product; all surfaces clean dry by clean cloth and dry up 4 If varnish paint coating is damaged, polish it with sand paper, then clean with alcohol-soaked cloth, cover with varnish and dry up	1 person 5 mins
Check reliability of cable and bus connection to the Product	1 Check that connectors and attaching screws are tightened; provide further tightening if necessary 2 Check the cable intactness (no mechanical damage) within visibility	1 person 5 mins

Table 10 – Check list № 2. Operation test

To be done	Routine	Man-hours per 1 Product
Test operation of the Product	1 Connect the Product using interface cable to a unit (CH-105, PCH-205, other charger) 2 Switch the unit on (CH-105, PCH-205, other charger) 3 Check charge (discharge) current and charge (discharge) voltage of SB	1 person 5 mins

4 CURRENT REPAIR OF THE PRODUCT

4.1 GENERAL DESCRIPTION

Control operation of the Product by displayed values of charge (discharge) current and charge (discharge) voltage of SB, as well as LED lighting up of the connected SB.

To provide diagnostics of the problems, see Table 11.

If a problem cannot be diagnosed or trouble shooting cannot be provided, contact the Manufacturer's service center.

4.2 SAFETY FEATURES

Only qualified personnel, examined in occupational safety may perform repair works.

The Product must be grounded before repair works. Check the grounding of the Product.

It is PROHIBITED to put a poster "DO NOT switch on! Under Operation!", when power supply switch is in OFF position.

Replacing defected parts, cards and modules when power of device under repair is ON is STRICTLY PROHIBITED.

Installation, commissioning and repair works are PROHIBITED in the room, where less than 2 people present.

4.3 CURRENT REPAIR

The service personnel can provide repair works as described in Table 11.

Repair of other defects/malfunctions shall be carried out only by specialists or authorized representatives of the Manufacturer.

Table 11 – Possible problems/defects and troubleshooting

Problem/defect	Possible reasons	To do
The Product does not switch on	Interface cable has poor connection to “PORT 1” or “PORT 2”	Connect the interface cable
	Interface cable defect	Replace the interface cable
Indicators show «Err»	Wrong settings	Provide the settings according to Tables 7, 8
SB temperature is not displayed	DTS-135 is not connected	Connect DTS-135
	Incorrect connection of DTS-135	Connect DTS-135 according to connection diagram

5 STORAGE

The Product must be stored in packaging inside areas complying with the required storage conditions (+5°C to +40°C) with the concentration of dust, oil, moisture and aggressive impurities in the air within the required limits for the working areas of production facilities.

After storage or transportation of the Product below +10°C, it must be unpacked only in heated premises and left in normal climate conditions for 12 hours beforehand.

6 TRANSPORTATION

The Product must be transported in the Manufacturer's transportation package in closed means of transport.

Types of shipment:

- motor vehicle and railroad transportation in closed means of transport (covered cars, multipurpose containers);

- air transportation (in sealed and heated compartments);

- sea transportation (in dry service spaces).

The Product must be transported in compliance with transportation rules applicable for each means of transport.

During loading/unloading operations and transportation, the requirements indicated on warning labels on the boxes/packaging must be observed, and no impacts are permitted since they can affect the safety and performance of the Product.

Inside the means of transport, the packed device must be firmly secured/fastened.

7 DISPOSAL

New equipment, the parts of the Product damaged during operation, and any out-age equipment must not be disposed as standard household wastes, since they contain the materials suitable for re-use.

Decommissioned and non-used components of the Product must be delivered to a special waste disposal center licensed by local authorities. You can also send an over-age equipment/unit to the manufacturer for its further disposal.

Proper disposal of Product components allows avoiding possible negative environmental and health impacts, and it also allows for proper restoration of components with substantial energy and resources saving.

During operation and upon completion of its service life, the equipment is not hazardous for health and environment

This unit must be disposed according to the rules applied to electronic devices

Any products marked with a crossed trash bin must be disposed separately from standard household wastes

APPENDIX A
(INFORMATIVE)
REGULATORY DOCUMENTS
SAMPLE CONNECTION OF SAILOR 6081

Connection is carried out to the first or second port. A1 describes settings for the first port. The second port has similar settings.

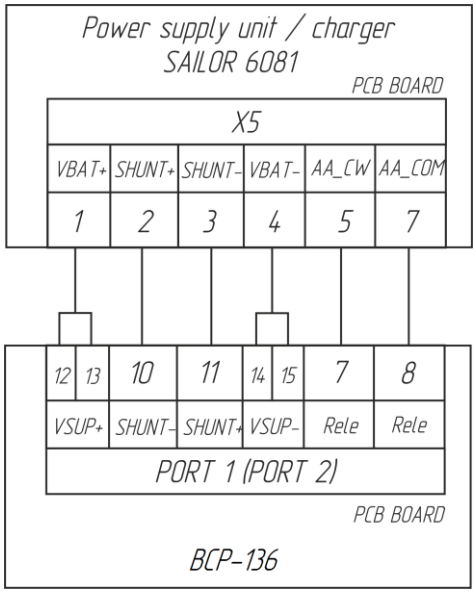


Figure A.1 – Connection diagram

Access to service menu is described in 2.3.4.1.

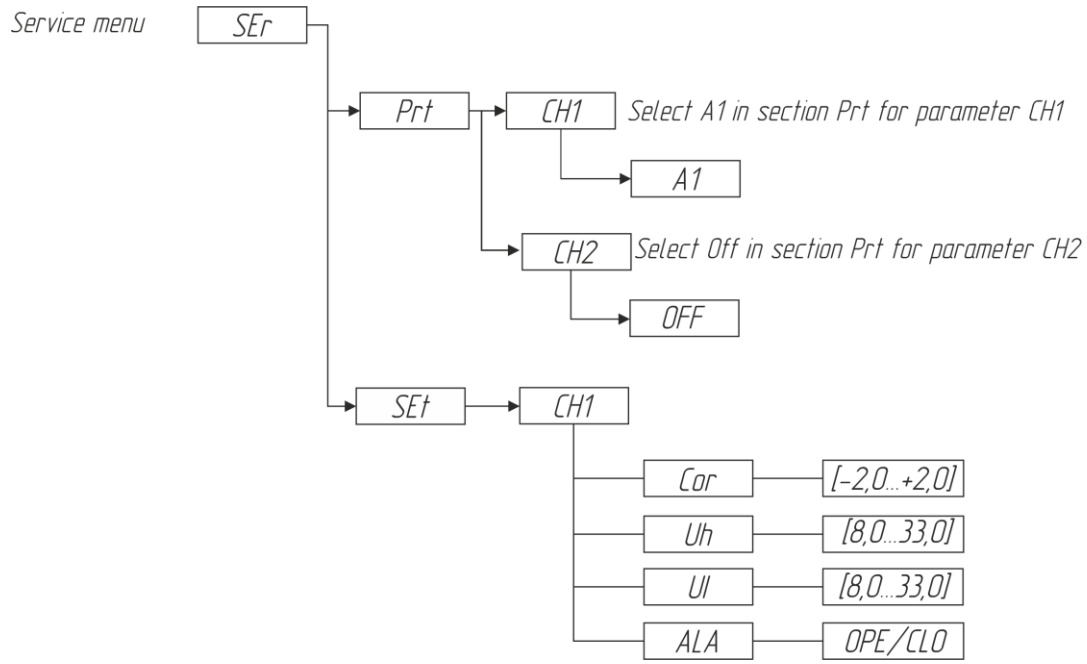


Figure A.2 – Structural diagram of the Product settings

Notes

1 Parameter “Cor” (section “SEt”) of submenu “CH1” allows for setting up displacement current (correcting reading of current).

2 Parameters “Uh” and “Ul” (section “SEt”) of submenu “CH1” allows for setting upper and lower limits of alarm actuation (min. and max. voltage level).

3 Parameter “ALA” (section “SEt”) of submenu “CH1” allows for setting an alarm actuation parameter (closing or opening of terminal contacts).

APPENDIX B
(INFORMATIVE)
OVERALL AND INSTALLATION DIMENSIONS

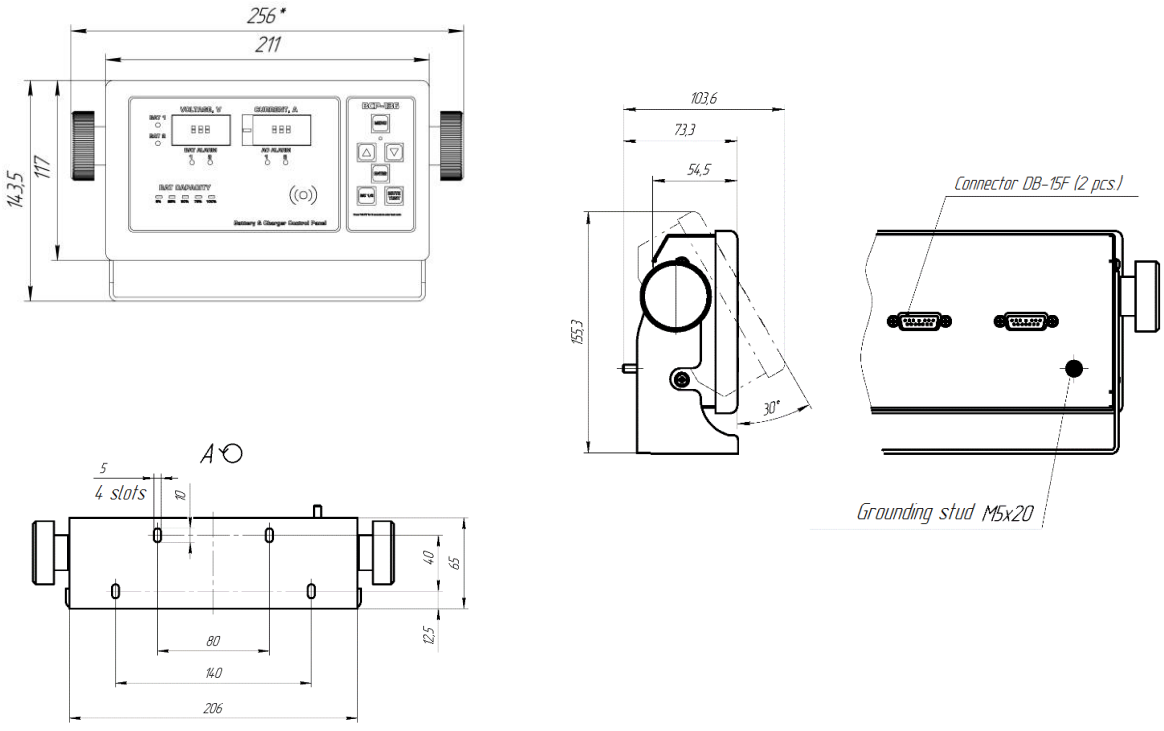


Figure B.1 – Overall and installation dimensions of the Product