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SCIENTIFIC PRODUCTION
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VIBROBIT LLC

EQUIPMENT 'VIBROBIT 300'
PCB ПС10
Operation and Maintenance Manual
(ver 0)

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Operating Manual ПС10 is designed to guide users (consumers) with the basic principles and methods of work of the board settings section ПС10 (version 0), equipment "VIBROBIT 300".

This document is a supplement to ВШПА.421412.300 РЭ Equipment "VIBROBIT 300" Operating Manual.

SPE VIBROBIT LLC reserves the right to replace individual parts and components without degrading the performance of this product.

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1 Overview

1.1 Purpose

Printed circuit board ПС10 designed to link the different sections of options such as:

- vibration of support of bearings (VB)
- shaft vibration (SV)
- axial offset (AO)
- mechanical value (MV) *

* hereinafter abbreviations VB, SV, AO, MV

1.2 The board's specific features

Designations used in the manual:

M1...M7 — measuring control modules

МП1, МП2 — logic modules

MT — test module

МП1, МП2 — power Modules

1.3 Multifunctional

The board ПС10 is designed so that it can be implemented based on virtually any configuration of the measurement channels. All variants differ only in the correct jumper settings (except the AO version) in accordance with the recommendations by the layout of the section (see section 3).

To implement the AO version on the board to positions ПС10 M5...M7 modules whatever power is supplied ~ 220 (connector X27). The position of the M5...M7 modules installed МК11 compiled under option with a converter AC / DC.

1.4 Separate power supply modules and power redundancy scheme

In general, the two modules МП24.1 60W (or 50W) are provided for the power section. Each of the two modules МП24.1 feeds its part of the section. The board section integrated power redundancy scheme, which allows one module МП24.1 feed the entire section if other МП24.1 module has failed or there in the configuration section is not necessary.

1.5 Expansion of logic (for turbine units with a large number of bearings)

In the case of turbine bearings with a large number (more than seven), for the implementation of security algorithms connected in cascade more than one section VB. To this end, the board provides special connectors logical extension (X14, X35) in the case of expansion of logic from the first position if the first position is occupied by any other module (see section 1.2.4) mechanical value or speed, then use logical connectors expansion from the second position (X35, X37, X45), which are described in detail in section 2.1. For more information, see section 3.1.

If the second expansion section, there is only one module MK32, is to implement the logic necessary to connect only expansion slots (MK71 no need to install). MK32 If more than one module is necessary modules and install more MK71

1.6 Output of individual logical pin of control modules on the individual slots

Boards ПЛК01, ПЛК02 (see 1.4) are set to bring to the board connectors ПС03 logic outputs control modules, the maximum amount available in this case, five outputs. In some cases it is necessary to have a greater number of logical outputs. For this purpose, ПС10 are special connectors or separate connector pins that are connected directly to the positions of the measuring modules (X35, X37, X41, X44, X45) Appointment see section 2.1 contacts.

Additionally position M1 to the first logical output twelve connectors directly to X33 (10 ... 12) and X14 (1 ... 9) which can be isolated from the rest ПС10 with special logic jumpers S56 ... S61, S74. ...S76 (7-9 logic outputs are isolated from the rest of the logic of the time). For M2 position the first nine logic outputs directly on the terminals X45, X35, X37, but in contrast to the position of M1 can not be isolated from the rest of the logic ПС10.

1.7 Supply of relay protection

To supply the protection relay designed connector X5, which are connected to the line +24V of МП24.1 modules, protected by a resettable fuse and diode (see principal scheme).

1.8 CAN u RS485 interface

The board ПС10 provides two independent RS-485 bus interface (1-RS485 and 2-RS485). Interface Connectors 1-RS485 (X17, X33) and 2-RS485 (X47, X18) are located on the edges of the board. On both interfaces section modules consistently included realizing the topology of the "bus" (code execution control module "R2" use two interfaces: 1-RS485, 2-RS485). If the module is in the last section and the interface does not provide a transition to the next section, then on an empty interface connector must be terminated tires.

In the middle of the board made a "gap" interface lines 1-RS485, 2-RS485 (S85 jumper, S86 - for 1-RS485; S88 jumper, S87 - 2-RS485), with the possibility of termination of 120 ohm (jumper option, see. Table. 31). 1-RS485 bus is divided into two parts: 1 and 1-RS485-1-RS485-2. 2-RS485 bus is divided into two parts 2 and 2-RS485-1-RS485-2. As a result, the tires 1 and 2-RS485-1-RS485-1 connected modules M1 ... M3, МЛ1, МЛ2, and to buses 1 and 2-RS485-2-RS485-2 connected modules ... M4 M7.

There is one CAN interface, is displayed on the line connectors X17, X33. Connecting the modules is carried out in accordance with the topology of "tire."

GND CAN interface signals and two RS-485 board formed from ПС10 GND through a resistor 10 ohms.

1.9 General logic outputs

On board ПС10 logic outputs 10,11,13,14 all measuring modules are combined according to the scheme installation "or" and overlook the connectors X37, X42, and can also be connected to the module МК71 (or jumpers S44, S45, S54, S55) .

1.10 Supply section

Power supply section through connectors X4, X46 and X27.

Connection to the terminals to produce wires connecting ПВС 2x0,75 ГОСТ 7399-97. Contacts 3, 4 X4 connector, X46 and X27 - 1 connector to connect to the earth bus bar. If the ground (Ground) is connected to the body section to pin 4 X4 connector is not allowed to connect.

Separate supply МП24 modules in positions МП1 and МП2 allows you to use up to two independent power supplies rack.

1.11 Safety recommendations

Section is fed AC voltage ~ 220V, care should be taken when working with the included section. Lines ~ 220 in the form of not insulated printed conductors directly on the circuit board and are far enough away from all the signal lines in order to fully ensure the requirements for electrical safety. The area where the 220 VAC line is highlighted in a layer of silk-screen printing and a dotted line "~ 220" mark. Care should be taken not to touch hands or conductive objects any exposed locations or solder jumpers are in the area, despite the fact that the board varnishing.

Work on the section should be carried out when disconnected connectors ~ 220 V (X4, X27, X46). Connecting cables to the section should be carried out in the absence of voltage 220 VAC input to the rack.

1.12 Logical commutation boards ПЛК01, ПЛК02.

PCB boards logical switching ПЛК01, ПЛК02 designed to output logic signals to the control module connectors board ПС10. Installed in the position МЛ1, МЛ2. Inputs items МЛ1, МЛ2 are connected in parallel for redundancy protection for dangerous levels of vibration (in case of installation in a position МЛ1, МЛ2 МК71 modules).

PCB board ПЛК01 installed in position МЛ1, is designed to output signals from the 1 st, 2 nd and 6 th logic outputs each control module connectors on the board ПС10 X35-X37, X43.

PCB board ПЛК01 installed in position МЛ2 is designed to output signals from the 1 st, 2 nd and 6 th logic outputs each control module connectors on the board ПС10 X35, X39-X43.

PCB board ПЛК02 installed in position МЛ1, is designed to output signals from the 3rd, 4th and 5th logic outputs each control module connectors on the board ПС10 X36, X37, X40, X43.

PCB board ПЛК02 installed in position МЛ2 is designed to output signals from the 3rd, 4th and 5th logic outputs each control module connectors on the board ПС10 X39-X43.

Distribution connectors for pin:

- When installing the board ПЛК01 in МЛ1 position:

Table 1 – Compliance 1,2,6 logic output pins of the connectors

Position	Logical output	Connector	Connector pin
M1	1	X37	1
M1	2	X37	2
M1	6	X35	4
M2	1	X37	3
M2	2	X37	4
M2	6	X35	5
M3	1	X43	3
M3	2	X43	4
M3	6	X35	6
M4	1	X36	1
M4	2	X36	2
M4	6	X36	4
M5	1	X36	3
M5	2	X36	7
M5	6	X36	5
M6	1	X36	8
M6	2	X36	9
M6	6	X36	6
M7	1	X35	9
M7	2	X35	8
M7	6	X35	7

- When installing the board ПЛК01 in МЛ2 position:

Table 2 – Compliance 1, 2, 6 logic output pins of the connectors

Position	Logical output	Connector	Connector pin
M1	1	X42	6
M1	2	X42	7
M1	6	X35	4
M2	1	X42	8
M2	2	X42	9
M2	6	X35	5
M3	1	X43	1
M3	2	X43	2
M3	6	X35	6
M4	1	X41	7
M4	2	X41	8
M4	6	X39	4
M5	1	X41	9
M5	2	X41	4
M5	6	X39	2
M6	1	X41	5
M6	2	X41	6
M6	6	X39	3
M7	1	X35	9
M7	2	X35	8
M7	6	X35	7
M5, M6, M7	1	X40	1,2*

* On the contacts 1, 2 Connector X40 output normally open "dry contact" on logic "2 of 3" from the first logic output modules 5, 6, 7. The logic circuit "2 of 3" is implemented by the board ПЛК01 3 miniature relays.

- *When installing the board ПЛК02 in МЛ1 position:*

Table 3 – Compliance 3, 4, 5 logic output pins of the connectors

Position	Logical output	Connector	Connector pin
M1	3	X40	4
M1	4	X37	1
M2	3	X37	2
M2	4	X37	4
M3	3	X40	3
M3	4	X37	3
M4	3	X43	4
M4	4	X36	3
M5	3	X36	2
M5	4	X43	3
M5	5	X36	1
M6	3	X36	7
M6	4	X36	9
M6	5	X36	5
M7	3	X36	4
M7	4	X36	6
M7	5	X36	8

- *When installing the board ПЛК02 in МЛ2 position:*

Table 4 – Compliance 3, 4, 5 logic output pins of the connectors

Position	Logical output	Connector	Connector pin
M1	3	X40	2
M1	4	X42	6
M2	3	X42	7
M2	4	X42	9
M3	3	X40	1
M3	4	X42	8

Position	Logical output	Connector	Connector pin
M4	3	X43	2
M4	4	X41	9
M5	3	X41	8
M5	4	X43	1
M5	5	X41	7
M6	3	X41	4
M6	4	X41	6
M6	5	X39	2
M7	3	X39	4
M7	4	X39	3
M7	5	X41	5

2 Purpose of connectors and jumpers

In section ПС10 used convenient and reliable connectors for the company Phoenix Contact. Set connector inputs and outputs section is limited to four and nine contact connectors such as MCV, DIN41612-396FSD type connectors are used for the control modules. MCV connectors with solder screw to secure the mating part. Connectors input and output signals contain only the lines relating to a specific unit and are located in close proximity to the corresponding module connector.

A brief description of all connectors is shown in Table 4 and in greater detail in the subsequent parts of the second section. Detailed description of the purpose of jumpers set out in section 2.2. In addition to the printed circuit board in a layer of silk screen has a detailed description of the purpose of connectors and jumpers, making it easier to work with the ПС10.

2.1 Purpose of connectors

Table 5 – Functional Description of connectors

Connector	Designation	Pin description	Page
X1	Relay pin of modules МП24.1 (МП1, МП2)	Table 19	19
X2	Test module signals МП24.1 (МП2)	Table 9	14
X3	Module МП24.1 (МП2)	Table 6	13
X4	Section supply (~220В) для МП1, МП2	Table 20	20
X5	Output voltage +24В	Table 21	20
X6	Test module signals МП24.1 (МП1)	Table 9	14
X7	Module МП24.1 (МП1)	Table 6	13
X8	Test module signals МК91 (МТ)	Table 9	14
X9	Module МК91 (МТ)	Table 6	13
X10	First control module (M1)	Table 6	13
X11	Input signals of the first module (M1)	Table 8	14
X12	Analog output signals of the first and second modules (M1, M2)	Table 10	15
X13	Synchronization input for sections SV и BV	Table 22	20
X14	Logical extension section	Table 11	16
X15	second control module (M2)	Table 6	13
X16	Input signals of the second module (M2)	Table 8	14
X17	Interface CAN, 1-RS485-2 and +24V	Table 23	21
X18	Interface 2-RS485-1	Table 24	21
X19	third control module (M3)	Table 6	13
X20	Input signals of the third module (M3)	Table 8	14
X21	output analog signals of the third module (M3)	Table 10	15
X22	fourth control module (M4)	Table 6	13
X23	Input signals of the fourth module (M4)	Table 8	14
X24	Fifth control module (M5)	Table 6	13
X25	Input signals of the fifth module (M5)	Table 8	14
X26	output analog signals of the fourth and fifth modules (M4, M5)	Table 10	15
X27	supply section (~220 В) for M5, M6, M7	Table 26	22
X28	Sixth control module (M6)	Table 6	13
X29	Input signals of the sixth module (M6)	Table 8	14

Connector	Designation	Pin description	Page
X30	Seventh control module (M7)	Table 6	13
X31	Input signals of the seventh module (M7)	Table 8	14
X32	output analog signals of the sixth and seventh modules (M6, M7)	Table 10	15
X33	Interface CAN и 1-RS485-1 and logical output M1	Table 27	22
X34	module МК71 (МЛ1)	Table 6	13
X35	cascading inputs module МК71 (МЛ1)	Table 12	16
X36	Logic module outputs МК71 (МЛ1)	Table 13	17
X37	Extras. the module inputs МК71 (МЛ1) and assembly "or" 10 and 11 output pin modules	Table 28	23
X38	module МК71 (МЛ2)	Table 6	13
X39	cascading inputs module МК71 (МЛ2)	Table 14	17
X40	Extras. inputs of the first and second modules МК71	Table 29	23
X41	Logic module outputs МК71 (МЛ2)	Table 15	18
X42	Extras. the module inputs МК71 (МЛ2) and assembly "or" 12, 13 and 14 output pin modules	Table 30	24
X43	Extras. outputs of the first and second modules МК71	Table 16	18
X44	Logic outputs module positions M4	Table 17	18
X45	Logic outputs module positions M2	Table 18	19
X46	supply section (~220В) for МП1, МП2	Table 20	20
X47	Interface 2-RS485-2	Table 24	21

2.2 Connections control modules

Table 6 – Compliance module type number-din connector

Connector	Position	Mechanical Values MK22	Axial Offset MK11	Shaft vibration MK32	Vibration of support of bearings MK32	RPM MK22
X3	МП2					
X7	МП1					
X9	MT					
X10	M1	+		+	+	+
X15	M2	+			+	+
X19	M3	+		+	+	+
X22	M4	+	+		+	+
X24	M5	+*	+*	+*	+*	+*
X28	M6	+*	+*		+*	+*
X30	M7	+*	+*	+*	+*	+*
X34	МЛ1					
X38	МЛ2					

*Note:

jumpers S28,S34,S40,S27,S37,S39,S29,S35,S41 must be set to 1-2

jumpers S25,S31,S38,S26,S32,S37 must be removed

MK11 according to variant a power source

2.3 Connections of input signals and sensors tests

Table 7 – Matching connectors input module positions on the board

Position	M1	M2	M3	M4	M5	M6	M7
Connector	X11	X16	X20	X23	X25	X29	X31

Table 8 – Designation of contacts of connectors X11,X16,X20,X23,X25,X29,X31 (measuring modules in the positions M1-M7)

Pin Number	Description
1	GND
2	+24 V (1 ch)
3	sensor input (1 ch)
4	+24 V (2 ch)
5	sensor input (2 ch)
6	+24 V (3 ch)
7	sensor input (3 ch)
8	+24 V (4 ch)
9	sensor input (4 ch)

Table 9 – Pin assignment of connectors test signals X2,X6,X8 (MT, МП1, МП2)

Pin Number	Description
1	Output 1
2	Output 3
3	Output 5
4	Output 7
5	Output 9
6	Output 11
7	Output 13
8	Output 15
9	GND

2.3.1 Connectors output analog signals

Table 10 – Connectors analog output X12,X21,X26,X32 (and logical for X21)

X12		X21		X26		X32	
1	GND	1	GND	1	GND	1	GND
2	AnOut 1 (M1)	2	LogOut 3 (M3)	2	AnOut 1 (M4)	2	AnOut 1 (M6)
3	AnOut 2 (M1)	3	LogOut 4 (M3)	3	AnOut 2 (M4)	3	AnOut 2 (M6)
4	AnOut 3 (M1)	4	LogOut 5 (M3)	4	AnOut 3 (M4)	4	AnOut 3 (M6)
5	AnOut 4 (M1)	5	LogOut 9 (M3)	5	AnOut 4 (M4)	5	AnOut 4 (M6)
6	AnOut 1 (M2)	6	AnOut 1 (M3)	6	AnOut 1 (M5)	6	AnOut 1 (M7)
7	AnOut 2 (M2)	7	AnOut 2 (M3)	7	AnOut 2 (M5)	7	AnOut 2 (M7)
8	AnOut 3 (M2)	8	AnOut 3 (M3)	8	AnOut 3 (M5)	8	AnOut 3 (M7)
9	AnOut 4 (M2)	9	AnOut 4 (M3)	9	AnOut 4 (M5)	9	AnOut 4 (M7)

2.4 Connectors logic inputs and outputs X14,X35,X36,X39,X41,X43

Connector X14:

9-pin X14 connector is used to extend the logic functions section with a large number of bearings in the embodiments VB or SV. Nine X14 connector contacts correspond to the first nine logic outputs module in the M1 position. For the case of expansion of logical functions from the first position.

Table 11 – Connector pin designation X14

Pin Number	Description
1	1 - logical Output (M1)
2	2 - logical Output (M1)
3	3 - logical Output (M1)
4	4 - logical Output (M1)
5	5 - logical Output (M1)
6	6 - logical Output (M1)
7	7 - logical Output (M1)
8	8 - logical Output (M1)
9	9 - logical Output (M1)

Connector X35:

9-pin X35 connector is used for the expansion of logical functions section, is connected to the module MK71 in MЛ1 position contacts from 4 to 9. Pin 2, 3 is used for the expansion of logic functions starting from the second position.

Table 12 – Connector pin designation X35

Pin Number	Description
1	GND
2	8 - logical Output M2
3	9 - logical Output M2
4	Casc OUT 6 connected to L2C-8
5	Casc OUT 5 connected to L2B-8
6	Casc OUT 4 connected to L2A-8
7	Casc OUT 3 connected to L1C-8
8	Casc OUT 2 connected to L1B-8
9	Casc OUT 1 connected to L1A-8

Connector X36:

9-pin X36 connector is the main connector output logic signal, is connected to the module MK71 in МЛ1 position.

Table 13 – Connector pin designation X36

Pin Number	Description
1	Additional output CPLD 2
2	Additional output CPLD 1
3	Main protection output
4	Output "or" group L2C
5	Output "or" group L2B
6	Output "or" group L2A
7	Output "or" group L1C
8	Output "or" group L1B
9	Output "or" group L1A

Connector X39:

On a 4-pin connector X39 derived outputs in groups L2A, L2B, L2C from MK71 module МЛ2 position.

Table 14 – Connector pin designation X39

Pin Number	Description
1	GND
2	2_OUT_L2B
3	2_OUT_L2C
4	2_OUT_L2A

Connector X41:

9-pin X41 connector is an additional connector output logic signal, is connected to the module MK71 (МЛ2 position).

Table 15 – Connector pin designation X41

Pin Number	Description
1	5 - logical Output M5
2	4 - logical Output M5
3	3 - logical Output M5
4	Output "or" group L1C
5	Output "or" group L1B
6	Output "or" group L1A
7	Additional output CPLD 2
8	Additional output CPLD 1
9	Main protection output

● **Connector X43:**

4-pin X43 connector is an additional output connector logical MK71 signaling modules.

Table 16 – Connector pin designation X43

Pin Number	Description
1	Additional Output 1 MCU MK71 (МЛ2) (OUT-CPU1)
2	Additional Output 2 MCU MK71 (МЛ2) (OUT-CPU2)
3	Additional Output 1 MCU MK71 (МЛ1) (OUT-CPU1)
4	Additional Output 2 MCU MK71 (МЛ1) (OUT-CPU2)

Connector X44:

4-pin X44 connector is used to increase the available physical logic outputs of the module in position M4.

Table 17 – Connector pin designation X44

Pin Number	Description
1	3 - logical Output M4
2	4 - logical Output M4
3	5 - logical Output M4
4	9 - logical Output M4



Connector X45:

4-pin X45 connector is used for the expansion of logic functions on a general level (with X35, X37) starting from the second position.

Table 18 – Connector pin designation X45

Pin Number	Description
1	1 - logical Output M2
2	2 - logical Output M2
3	3 - logical Output M2
4	4 - logical Output M2

2.5 Other connectors

Connectors X1,X4,X5,X13,X17,X18,X27,X33,X37,X40,X42,X46.

Connector X1:

Table 19 – Connector pin designation X1

Pin Number	Description
1	Contact relay COM1 second module МП24.1 (МП2)
2	Contact relay COM1 first module МП24.1 (МП1)
3	Contact relay NO1 second module МП24.1 (МП2)
4	Contact relay NO2 second module МП24.1 (МП2)
5	Contact relay NC2 second module МП24.1 (МП2)
6	Contact relay COM2 second module МП24.1 (МП2)
7	Contact relay NO2 first module МП24.1 (МП1)
8	Contact relay NC2 first module МП24.1 (МП1)
9	Contact relay COM2 first module МП24.1 (МП1)

Connector X4,X46:

4-pin connectors X4, X46 - power connector section.

Table 20 – Appointment of contacts of connectors X4, X46

Pin Number	Description
1	L ~220B
2	N ~220B
3	Land Faraday FG
4	Ground (grounding)

Connector X5:

4-pin connector X5 - Output + 24V of the two power modules.

Table 21 – Connector pin designation X5

Pin Number	Description
1	+24 V modules МП24.1 (МП2) and МП24.1 (МП1) through an additional Resettable Fuses MF-MSM075 (750 mA)
2	GND
3	+24 V modules МП24.1 (МП2) и МП24.1 (МП1) through an additional Resettable Fuses MF-MSM075 (750 mA)
4	GND

Connector X13:

4-pin connector X13 — Sync input.

Table 22 – Connector pin designation X13

Pin Number	Description
1	Synchronization Channel 1
2	Synchronization Channel 2
3	An additional logic input (LG_IN) measuring modules (based on the module MK32)
4	GND

Connector X17:

9-pin connector X17 - CAN and 1-RS-485 interfaces.

Table 23 – Connector pin designation X17

Pin Number	Description
1	GND
2	+24 V through an additional resettable fuse MF-MSM020 (200 mA)
3	+24 V through an additional resettable fuse MF-MSM020 (200 mA)
4	CAN-GND
5	CAN-L
6	CAN-H
7	1-RS485-GND-2
8	1-RS485-A(+)-2
9	1-RS485-B(-)-2

Connector X18,X47:

9-pin connector X18,X47 — interface 2-RS485.

Table 24 – Connector pin designation X18

Pin Number	Описание
1	2-RS485-B(-)-1
2	2-RS485-A(+)-1
3	2-RS485-GND-1
4	GND

Table 25 – Connector pin designation X47

Pin Number	Описание
1	2-RS485-B(-)-2
2	2-RS485-A(+)-2
3	2-RS485-GND-2
4	GND

Connector X27:

3-pin X27 connector - food options for the section "Axial offset".

Table 26 – Connector pin designation X27

Pin Number	Description
1	L ~220 B
2	N ~220 B
3	FG

Connector X33:

9-pin X33 connector - CAN and RS-485 interfaces, as well as logic outputs of the module in the M1 position.

Table 27 – Connector pin designation X33

Pin Number	Description
1	10 - logical Output M1
2	12 - logical Output M1
3	11 - logical Output M1
4	CAN-GND
5	CAN-L
6	CAN-H
7	RS485-GND
8	1-RS485-A(+)
9	1-RS485-B(-)

Connector X37:

9-pin X37 connector includes assembly connected by the scheme "or" tenth and eleventh outputs control modules (M1-M7) logic outputs control module (M2), as well as additional inputs of the module MK71 (МЛ1).

Table 28 – Connector pin designation X37

Pin Number	Description
1	L-RES reset input CPLD
2	L-ENA Lock logic breaker
3	L-CPU1 additional logic input 1 MCU
4	L-CPU2 additional logic input 2 MCU
5	"or" tenths outputs
6	"or" Eleventh outputs
7	7 - logical Output M2
8	6 - logical Output M2
9	5 - logical Output M2

Connector X40:

4-pin X40 connector — additional inputs CPLD

Table 29 – Connector pin designation X40

Pin Number	Description
1	additional logic input 2 CPLD module MK71 (МЛ2)
2	additional logic input 1 CPLD module MK71 (МЛ2)
3	additional logic input 2 CPLD module MK71 (МЛ1)
4	additional logic input 1 CPLD module MK71 (МЛ1)

Connector X42:

9-pin X42 connector includes assembly connected by the scheme "or" twelfth, thirteenth and fourteenth outputs control modules (M1-M7), as well as additional inputs MK71 (MЛ2) module.

Table 30 – Connector pin designation X42

Pin Number	Description
1	"Or" thirteenth inferences M1...M7
2	"Or" fourteenth inferences M1...M7
3	Mounting "or" twelfth outputs seven control modules and outputs OUT_ERR of two MK71
4	Not used
5	Not used
6	L-RES reset input CPLD
7	L-ENA Lock logic breaker
8	L-CPU1 additional logic input 1 MCU
9	L-CPU2 additional logic input 2 MCU

2.6 Appointment of the jumpers

Table 31 – Appointment of the jumpers

Jumper	Jumper position	Description
S1	set	Contact relay COM1 МП24.1 (МП2) connected to the circuit GND (used for logic !OK МП24.1)
S73	set	Contact relay COM1 МП24.1 (МП1) connected to the circuit GND (used for logic !OK МП24.1)
S2...S17, S65...S72	set	Direct connection of test outputs МП24.1 (МП1, МП2), МК91 (MT) connectors X2, X6, X8
	removed	Connect test output МП24.1 (МП1, МП2), МК91 (MT) connectors X2, X6, X8, through capacitors 1 uF
S18, S19, S22...S24, S30, S36	set	Connecting test signal module МК71 (МЛ1) 4th input modules M1 ... M7 respectively. Inputs must operate voltage.
	removed	The test signal is disconnected from the modules in the positions M1...M7.
S20, S42	set	Terminator 120 Ohm CAN bus enabled.
	removed	Terminator 120 Ohm CAN bus disabled
S21, S43	set	Terminator 120 Ohm 1-RS485 bus enabled.
	removed	Terminator 120 Ohm 1-RS485 bus disabled.
S85 (1-2)**	set	Terminator 120 Ohm 1-RS485-1 bus enabled.
	removed	Terminator 120 Ohm 1-RS485-1 bus disabled.
S86 (1-2)**	set	Terminator 120 Ohm 1-RS485-2 bus enabled.
	removed	Terminator 120 Ohm 1-RS485-2 bus disabled.
S85 (2)-S86 (2), S85 (3)-S86 (3)	set	Bus lines 1-RS485-1, 1-RS485-2 - combined.
	removed	Bus lines 1-RS485-1, 1-RS485-2 - disconnect.
S89, S90	set	Terminator 120 Ohm 2-RS485 bus enabled.
	removed	Terminator 120 Ohm 2-RS485 bus disabled.
S88 (1-2)***	set	Terminator 120 Ohm 2-RS485-1 bus enabled.
	removed	Terminator 120 Ohm 2-RS485-1 bus disabled.
S87 (1-2)***	set	Terminator 120 Ohm 2-RS485-2 bus enabled.
	removed	Terminator 120 Ohm 2-RS485-2 bus disabled.
S87 (2)-S88 (2), S87 (3)-S88 (3)	set	Bus lines 2-RS485-1, 2-RS485-2 - combined.
	removed	Bus lines 2-RS485-1, 2-RS485-2 - disconnect.

Jumper	Jumper position	Description
S44,S45	removed	In additional logic inputs of the CPLD (module MK71 (МЛ1)) of the first and the second channel signal is fed externally to the connector X40
	set	In additional logic inputs of the CPLD (module MK71 (МЛ1)) of the first and the second channel signal comes from the tenth and eleventh logic outputs M1...M7 modules combined scheme assembly "or" respectively
S54,S55	removed	In additional logic inputs of the CPLD (module MK71 (МЛ2)) of the first and the second channel signal is fed externally to the connector X40
	set	In additional logic inputs of the CPLD (module MK71 (МЛ2)) of the first and the second channel signal comes from the thirteenth and fourteenth output logic modules in positions M1...M7 integrated scheme assembly "or" respectively
S56...S61, S74...S76	set	Connecting logic outputs 1-12 module M1 position in the overall logic of ПС10
S77...S79	set	Connect + 24V control modules in the positions of the M5 ... M7 (for the AO version must be removed)
S80...S82*	set	Connect + 24V of the second channel control modules in the positions of the M5...M7 to + 24V fourth channel (AO version)
S83	set	Connecting an additional test signal from the second module MK71 (МЛ2)
S91	(1-2)	Choose the level of fault signal module M7 - the active level (logic "0").
S91	(2-3)	Choose the level of fault signal module M7 - the active level (logic "1").
S92	(1-2)	Choose the level of fault signal module M6 - the active level (logic "0").
S92	(2-3)	Choose the level of fault signal module M6 - the active level (logic "1").
S93	(1-2)	Choose the level of fault signal module M5 - the active level (logic "0").
S93	(2-3)	Choose the level of fault signal module M5 - the active level (logic "1").

***Note:**

To supply AO protection relays provide + 24V of the second and fourth channel MK11 modules in position. M5, M6, M7. +24 V output from the second channel through the diode, it allows you to combine the +24 V scheme "OR".

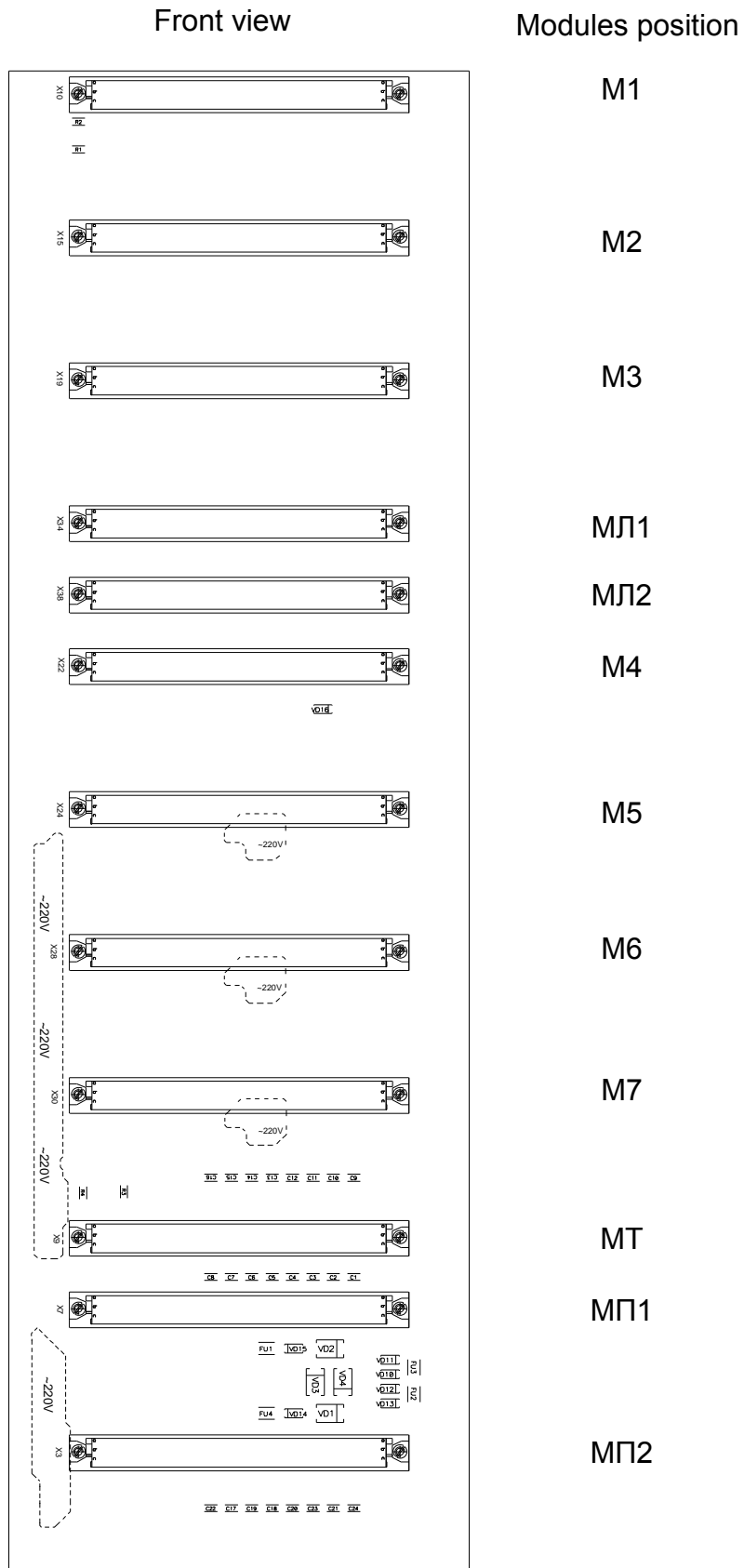
**Appropriate option settings in which the bus lines 1-RS 485-1, 1-RS485-2 disconnected.

***Appropriate option settings in which the tire 2-RS 485-1, 2-RS485-2 disconnected.

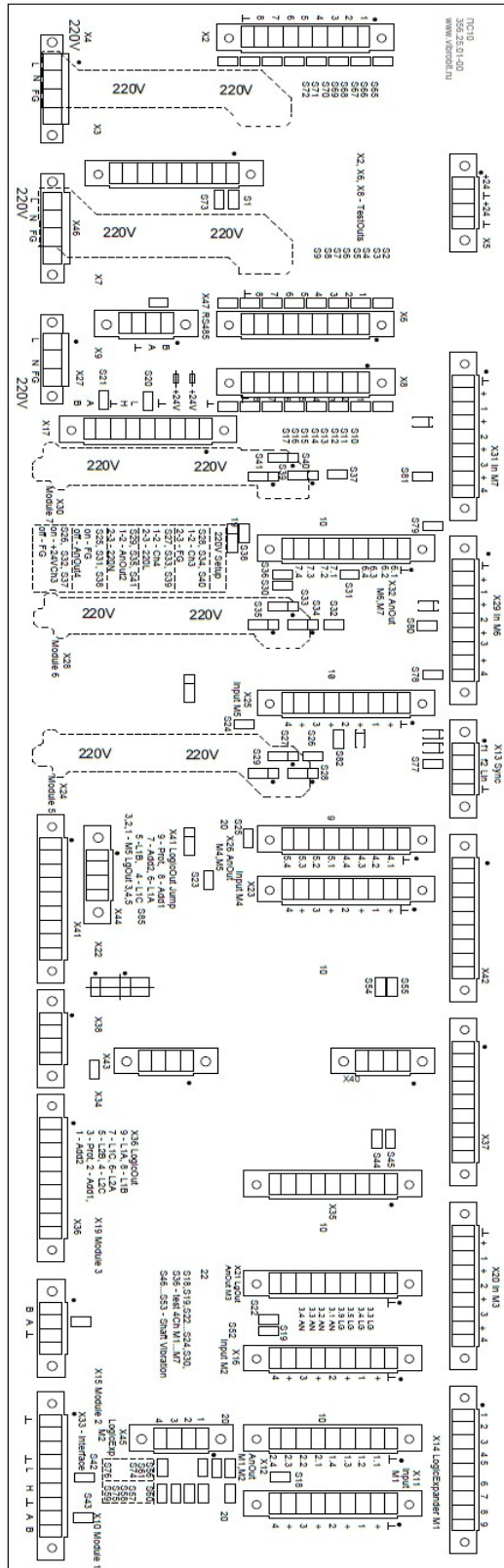
Table 32 – Appointment of Jumper ~ 220V

Jumper	Jumper position	Description
S26,S32, S37	set	Contact B11 module positions M5(6,7) is connected to the socket X25 (X29, X31) and is a +24 V line third channel sensor. "Axial Offset" is used for all versions except for the section option
	removed	Contact B11 module positions M5(6,7) is disconnected from the socket X25 (X29, X31) (+24V third channel encoder), as It is the line FG. "Axial Offset" option is used for the section
S29,S35, S41	1-2	Contact C16 module positions M5(6,7) is connected to the socket X26 (X32) and an analog current output of the second channel. "Axial Offset" is used for all versions except for the section option
	2-3	Contact C16 module positions M5(6,7) is connected to the power connector and the X27 is a neutral wire (~ 220N). "Axial Offset" option is used for the section
S28,S34, S40	1-2	Contact C12 module positions M5(6,7) is connected to the socket X25 (X29, X31) is the input of the third channel. "Axial Offset" is used for all versions except for the section option
	2-3	Contact C12 module positions M5(6,7) is connected to the power connector and the X27 is the line FG. "Axial Offset" option is used for the section
S27,S33, S39	1-2	Contact C14 module positions M5(6,7) is connected to the connectors X25 (X29, X31) and a second input channel. "Axial Offset" is used for all versions except for the section option
	2-3	Contact C14 module positions M5(6,7) is connected to the power connector and the X27 is the phase conductor (L ~ 220 B). "Axial Offset" option is used for the section
S25,S31, S38	set	Contact C18 module positions M5(6,7) is connected to the connectors X26 (X32) and an analog current output of the fourth channel. "Axial Offset" is used for all versions except for the section option
	removed	Contact C18 module positions M5(6,7) is disconnected from the connector X26 (X32), as It is the line FG. "Axial Offset" option is used for the section

2.7 Location of connectors and jumpers



Back view



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Appendix B: Setup Form

Map order № _____

Board number _____
(Shows adjuster)

1. Parameters of measurement channels

Connecting capacitors to test lines

№ Jumper	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S65	S66	S67	S68	S69	S70	S71	S72	
set																									

Connecting to a fourth input modules M1...M7 the test signal from the module MK71 (MЛ1).

№ Jumper	S18	S19	S22	S23	S24	S30	S36
set							

2. Jumpers ~220V

Line +24V third sensor channel module M5, M6, M7 or FG line.

№ Jumper	S26	S32	S37
set			

The line of the second analog output channel module M5, M6, M7 or line ~ 220N.

№ Jumper	S29	S35	S41
1-2			
2-3			

Input third module channel M5, M6, M7 or FG line.

№ Jumper	S28	S34	S40
1-2			
2-3			

Input second module channel M5, M6, M7 or line ~ 220L.

№ Jumper	S27	S33	S39
1-2			
2-3			

The line of the analog output of the fourth channel module M5, M6, M7 or FG line.

№ Jumper	S25	S31	S38
set			

The line of the analog output of the fourth channel module M5, M6, M7 or FG line.

№ Jumper			
set			

3. Jumpers interfaces

Terminator 120 Ohm CAN bus.

№ Jumper	S20	S42
set		

Terminator 120 Ohm 1-RS485 bus.

№ Jumper	S21	S43	S85(1-2)	S86(1-2)
set				

Combining the 1-RS-485 bus.

№ Jumper	S85(2)-S86(2)	S85(3)-S86(3)
set		

Terminator 120 Ohm 2-RS485 bus.

№ Jumper	S89	S90	S88(1-2)	S87(1-2)
set				

Combining the 2-RS-485 bus.

№ Jumper	S87(2)-S88(2)	S87(3)-S88(3)
set		

4. Special jumper

№ Jumper	S1	S73	S77	S78	S79	S80	S81	S82	S83
set									

Selecting a source for additional CPLD input module MC 71 (MЛ1).

№ Jumper	S44	S45
set		

Selecting a source for additional CPLD input module MC 71 (MЛ2).

№ Jumper	S54	S55
set		

5. Location module section

Module position	M1	M2	M3	МЛ1	МЛ2	M4	M5	M6	M7	MT	МП1	МП2
Module type												
Serial №												
Note												

Compiled _____ / _____ / Date « ____ » _____ 20__ г.