

The System of ensuring uniformity of measurements in the Republic of Belarus

E 8569C DC MEASURING TRANSDUCERS

AND

E8579C DC VOLTAGE TRANSDUCERS

VERIFICATION PROCEDURE

MII. BT.043-2002

This present procedure is applied to E 856ЭC DC measuring transducers and E 857ЭC DC voltage transducers (hereinafter - MT) and establishes a method of their checking.

The verification procedure is developed in accordance with ТКП 8.003-2011.

Intercheck interval shall be no more than 12 months when it is used in the legal metrology.

Recommended intercheck interval shall be no more than 48 months when it is used not in the legal metrology.

1 Verification operations and tools

1.1 When performing verification, the following operations shall be performed and verification tools with the characteristics that are specified in Table 1 shall be applied.

Table 1

Operation name	Verification Procedure Paragraph No.	Verification tools. Type and features	Mandatory operation at	
			initial verification	periodic verification
Visual inspection	5.1		Yes	Yes
Determination of electrical insulation resistance	5.2.1	E6-16 megohmmeter, rated voltage 500 V, accuracy class 1,5	Yes	Yes
Dielectric strength test	5.2.2	УИУ-10 universal breakdown unit, output voltage up to 10 kV, voltage setting accuracy $\pm 4\%$	Yes	No
Determination of limits of the permissible basic reduced error	5.3	1 П320 calibrator, calibrated voltage ranges 0 to 1000 V, calibrated current range 10^{-5} to 10^{-1} A, accuracy class 0.005. 2 V7-65 voltmeter, 0 to 300 V measurement range, $\pm 0.02\%$ basic error. 3 P33 measuring resistance box, 0.2 accuracy class, 0.1 to 99999.9 ohms resistance. 4 P331 electrical resistance coil, 0.01 accuracy class, Rnom- 100 Ohms. 5 RS-232/RS-485 level converter. 6 PC, P-266, 32 MB, Windows-98, Windows-XP. 8 HA3.604.006 switching button. 9 ИСН-1 stabilized voltage supply. Output AC and DC voltage 0 to 1500 V.	Yes	Yes

					МП.БТ.043-2002			
4	Dep	УИМЯ.020-2018		22.06.18				
Rev.	Sheet	Doc. No.	Sign.	Date				
Dvlpd by	Vlasenko			22.06.2018	E 856ЭC DC measuring transducers and E 857ЭC DC voltage transducers Verification Procedure	Rev.	Sheet	No. of sheets
Chkd by	Zharkov			22.06.2018		A	2	22
Reg. Control	Valentin			22.06.2018				
Approved by								
Reg. No. Orig		Signature and Date		Repl. Reg. No.	Reg. Orig. No.	Signature and Date		

Table 1 (continued)

Determination of the output signal setting time	5.4	C1-93 oscilloscope, measurement of time intervals 0.1 μ s to 1 s.	Yes	Yes
---	-----	---	-----	-----

1.2 It is allowed to use other verification tools that passed verification and provide a required accuracy of determination of metrological characteristics of the instruments being checked.

1.3 All verification tools shall have valid verification certificates.

					МП.ВТ.043-2002		Sheet
5	Dep	УИМЯ.017-2020		30.07.20			
Rev.	Sheet	Doc. No.	Sign.	Date			
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date	

2 Safety requirements

2.1 Safety requirements specified in TKII 181-2009 "Rules for technical operation of consumers' electrical installations" shall be observed during verification.

2.2 Before beginning verification, it is necessary to read the Operation Manual for the power supply and the verification tools that are used during verification.

2.3 THE FOLLOWING IS PROHIBITED:

- CARRYING OUT VERIFICATION OF A MT IN CONDITIONS AND MODES THAT DIFFER FROM THOSE SPECIFIED IN THE OPERATION MANUAL;

- CARRYING OUT VERIFICATION OF A MT IN CASE OF BREAKS IN WIRES OF EXTERNAL CONNECTION.

3 Verification officer qualification requirements

3.1 Only persons certified as verification offices in the prescribed manner are allowed for carrying out measurements at verification and processing of measurement results.

4 Verification conditions and preparation

4.1 Verification shall be carried out under the following normal conditions:

- Ambient air temperature, °C	20 ± 5
- Ambient air relative humidity, %	30 to 80
- Atmospheric pressure, kPa (mm Hg)	84-106 (630-800)
- Supply voltage, V:	220 ± 4.4; 230 ± 4,6; 24 ± 0.48
- Power frequency, Hz	50 ± 0.5
- E 856ЭC MT supply wire resistance, Ω	0.035 max.
- External magnetic field	Earth's magnetic field
- Input signal ripple, %, for E 856/5ЭC, E 856/6ЭC and -Ц modifications with RMS function	Up to 100
for other modifications of MT	Up to 15
- Input signal ripple frequency, Hz, for E 856/5ЭC, E 856/6ЭC and -Ц modifications with RMS function	100 ± 1
- Load resistance at analog output, kOhm, for a MT with the upper value of the range of change of the output signal:	
- 5 mA;	2.5 ± 0.5
- 20 mA;	0.4 ± 0.1
- 5, 10 V	95.0 ± 5.0

4.2 Before verification, a MT shall have been switched on without input signals for at least 30 minutes at a temperature 15 °C to 25 °C.

5 Verification

5.1 Visual inspection

5.1.1. Absence of mechanical damage to external parts, presence of a brand and clarity of marking shall be checked when carrying out the external inspection.

5.2 Determination of electrical insulation resistance and verification of insulation electrical strength.

5.2.1. Insulation electrical resistance shall be measured in normal conditions at a constant current according to the procedure that is specified in ГОСТ 12997-84, with a megohmmeter at a rated voltage of 500 V between the following circuits:

Network, input (inputs) - output (inputs), housing;

Input (inputs), output (outputs) - housing;

All outputs between themselves

A MT is considered to be passed if the electrical insulation resistance of the above circuits is not less than 100 MΩ.

					МП.БТ.043-2002	Sheet
5	Dep	УИМЯ.017-2020		30.07.20		3
Rev.	Sheet	Doc. No.	Sign.	Date		
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date

5.2.2 Insulation electrical strength test shall be carried as specified in ГOCT IEC 61010-1-2014. Apply test voltage between circuits for all MT (except for -II modifications) that are specified in Table 2, for -II modifications – in Table 3.

Table 2

Circuits tested	Test voltage, kV, for MT (except for modifications -II) with nominal input signal				
	1, 3, 5, 10, 30, 60 V	100, 150 V	250 V	500 V 5, 20 mA	1000 V 75 mV
Housing - all inputs	2,70		3,00	3,70	5,40
Housing - power	3,00				
Housing - all outputs	0,86				
Inputs between each other	1,35	1,50	2,21	3,31	-
Input – outputs			1,50	2,21	3,31
Input – power	1,50	2,21	2,21		
outputs – power	1,50				
Inputs between each other	0,86				

Note. Presence of circuits shall be in accordance with a modification of the MT

Table 3

Circuits tested	Test voltage, kV, for MT modification -II with nominal input signal		
	5, 20 mA; 1, 3, 5, 10, 30, 60, 100, 150 V	250 V	400, 500 V 75 mV
Housing - power	3,00		
Housing - all inputs	2,70	3,00	3,70
Housing - all outputs	0,84		
Power - all inputs	3,00		3,70
Power - all outputs	3,00		
Input – outputs 1, 2, 3	1,50		2,21
Output 1 – outputs 2, 3	0,84		
Output 2 – outputs 3			
Analog outputs between themselves	0,84		

Note. Presence of circuits shall be in accordance with a modification of the MT

MT are considered to have passed the tests if there are no discharges or repeated surface breakdowns that are accompanied by a sharp increase in current in the tested circuit.

5.3 Determination of the permissible basic reduced error limits (hereinafter referred to as the basic error)

5.3.1. Determination of the basic reduced error γ for analog outputs shall be carried out as specified in Diagrams of Annex A for each output for each channel with the values of the input signal that are specified in Table 4, in the following sequence:

- Send a signal from the calibrator to the MT input;
- Write the output signal value using the reference instrument V1 at each value of the input signal;
- Calculate the basic error of MT (γ) as a percentage using the following Formula:

					МИ.БТ.043-2002	Sheet
5	Dep	УИМЯ.017-2020		30.07.20		4
Rev.	Sheet	Doc. No.	Sign.	Date		
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date

$$\gamma = \frac{A_{B.O} - A_{B.P}}{A_N} \cdot 100 \% , \quad (1)$$

where $A_{B.O}$ is an output signal value measured with a reference instrument V1 , V;

$A_{B.P}$, A_N is an output signal calculated and normalizing value, respectively, as specified in Table 4, V.

A MT is considered to be suitable if the basic error for each output of each channel is not more than $\pm 0.5\%$.

Table 4

Input signal for			Output signal variation range									
MT with output signal	MT with one-pole input signal	MT with two-pole input signal	0-5 mA	± 5 mA	4-20 mA	0-20 mA	4-12-20 mA	0-10-20 mA	0-2.5-5 mA	0-5 V	± 5 V	± 10 V
			4-20 mA	Output signal normalizing value, A_N , V								
% of the converted input signal measurement upper limit			0.5	0.5	2.0	2.0	2.0	2.0	0.5	5	5	10
			Output signal calculated values, $A_{B.P}$, V									
4.0	0		0		0.40	0				0		
7.2	20		0.1		0.72	0.4				1.0		
10.4	40		0.2		1.04	0.8				2.0		
13.6	60	-	0.3	-	1.36	1.2	-	-	-	3.0	-	-
16.8	80		0.4		1.68	1.6				4.0		
20.0	100		0.5		2.0	2.0				5.0		
		-100		-0.5			0.40	0	0		-5.0	-10.0
		-80		-0.4			0.56	0.2	0.05		-4.0	-8.0
		-60		-0.3			0.62	0.4	0.10		-3.0	-6.0
		-40		-0.2			0.78	0.6	0.15		-2.0	-4.0
		-20		-0.1			0.94	0.8	0.20		-1.0	-2.0
		0	-	0	-	-	1.20	1.0	0.25	-	0	0
		20		0.1			1.36	1.2	0.30		1.0	2.0
		40		0.2			1.52	1.4	0.35		2.0	4.0
		60		0.3			1.68	1.6	0.40		3.0	6.0
		80		0.4			1.84	1.8	0.45		4.0	8.0
		100		0.5			2.00	2.0	0.50		5.0	10.0

MT is considered to have passed the test if the basic error for each channel and each output is not more than $\pm 0.5\%$.

For all MT, the basic reduced error γ on digital outputs, expressed as a percentage, shall be determined with Formula (2).

$$\gamma = \frac{A_{ИЗМ} - A_{расч}}{A_{НОРМ}} \cdot 100 \% , \quad (2)$$

wherein $A_{ИЗМ}$ is a measured value of the signal at the check point and displayed:

- On the PC display when determining the error for RS-485 output, units;
- On the displaying device (hereinafter referred to as PU), when determining the error for the displaying device output, in units of measurement of the signal at the input of the shunt or primary converter (for MT with connection from ex-

					МП.БТ.043-2002			Sheet
5	Dep	УИМЯ.017-2020		30.07.20				4a
Rev.	Sheet	Doc. No.	Sign.	Date				
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date		

ternal shunts or primary transducers) or in units of measurement of the converted input signal (for MT direct inclusion).

- For the displaying device output it shall be calculated with Formula (3).

$A_{ном}$ is a signal normalizing value that is:

- For RS-485 output it is equal to 5000 units;

- For the displaying device output, it is equal to the nominal value of the input signal when directly turned on or larger (by modulo) from the measurement limits of the signal at the input of the shunt or the primary measuring transducer when switched on from the shunt or the primary converter, in the appropriate units.

For the displaying device output when switched on from the shunt or $A_{расч}$ primary converter, in units of the signal at the input of the shunt or primary converter, it is calculated with Formula (3).

$$A_{расч} = A_{н.п.п} \cdot \frac{A_{вх} - A_{вх0}}{A_{вх.ном} - A_{вх0}}, \quad (3)$$

where $A_{расч}$ is a design value the displaying device readings;

$A_{вх}$ is a value of the input signal supplied to the MT (see Table 5);

$A_{вх0}$ is an input signal value that corresponds to "zero" value (checkpoint 6 of Table 5);

$A_{вх.ном}$ is a value of the input signal that corresponds to the upper value of the input range;

$A_{н.п.п}$ is a nominal value of the parameter of the primary measuring circuit, which is:

- The upper measurement limit of the converted input signal at direct connection, in the appropriate units of measurement;

- The larger (by module) from the measurement limits of the shunt input signal or the primary measuring transducer input signal when switched on from the shunt or primary transducer, in the appropriate units of measurement.

Table 5

Checkpoint	Input signal for the input signal measurement range						A _{расч} , units
	unipolar	bipolar	0-2.5-5 mA	0-10-20 mA	4-12-20 mA	4-20 mA	
1	-	-100 %	0	0	4.0 mA	-	-5000
2		-80 %	0.5 mA	2 mA	5.6 mA		-4000
3		-60 %	1.0 mA	4 mA	7.2 mA		-3000
4		-40 %	1.5 mA	6 mA	8.8 mA		-2000
5		-20 %	2.0 mA	8 mA	10.4 mA		-1000
6	0	0	2.5 mA	10 mA	12.0 mA	4.0 mA	0
7	20 %	20 %	3.0 mA	12 mA	13.6 mA	7.2 mA	1000
8	40 %	40 %	3.5 mA	14 mA	15.2 mA	10.4 mA	2000
9	60 %	60 %	4.0 mA	16 mA	16.8 mA	13.6 mA	3000
10	80 %	80 %	4.5 mA	18 mA	18.4 mA	16.8 mA	4000
11	100 %	100 %	5.0 mA	20 mA	20.0 mA	20.0 mA	5000

Notes: 1. Input signal unipolar measurement ranges: 0-5 mA; 0-20 mA; 0-75 mV; 0-1 V; 0-5 V; 0-10 V; 0-60 V; 0-100 V; 0-150 V; 0-250 V; 0-400 V; 0-500 V; 0-1000 V.

2. Converted input signal bipolar measurement ranges: ± 5.0 mA; ±20.0 mA; ±75.0 mV; ±1 V; ±5 V; ±10 V; ±60 V; ±100 V; ±150 V; ±250 V; ±400 V; ±500 V; ±1000 V.

3. For unipolar and bipolar measuring ranges of converted input signal, the input signal at the checkpoint is specified as a percentage of the rated value of the input signal.

					МП.БТ.043-2002		Sheet
5	Dep	УИМЯ.017-2020		30.07.20			
Rev.	Sheet	Doc. No.	Sign.	Date			
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date	

MT is considered to be suitable if the main error for all values of the input signal is not more than $\pm 0.5\%$.

5.4 Determination of the output signal setting time shall be carried out according to Diagrams of Annex A, using O1 oscilloscope, with a load resistance corresponding to normal conditions. The following is required to do so:

- Set the V/div switch of oscilloscope vertical deflection channel to the 2 V/div position;
- Set the signal synchronization sweep from the first channel (“Int.1”);
- Set the “Sweep” switch to the “2 ms” position;
- Set the timing signal select switches to the “~” and “+”.
- Send a signal to the oscilloscope input 1 from the MT output.

By pressing S1 button, determine the output signal settling time, using the oscilloscope.

MT are considered to have passed the test if the output signal setting time is not more than 5 ms for E 856/21ЭC - E 856/24ЭC, E 856/27ЭC - E 856/36ЭC, E 857/11ЭC - E 857/17ЭC and 500 ms for E 856/1ЭC - E 856/16ЭC, E 857/1ЭC - E 857/7ЭC.

6 Documentation of verification results

6.1 The verification results shall be recorded in a Protocol as specified in Annex C.

6.2 Positive results of the initial verification shall be verified by applying a stamp of the verification mark to the MT housing at the points of fastening of the cover, applying a stamp-sticker to the front surface of the MT and recording the results of the verification in the certificate.

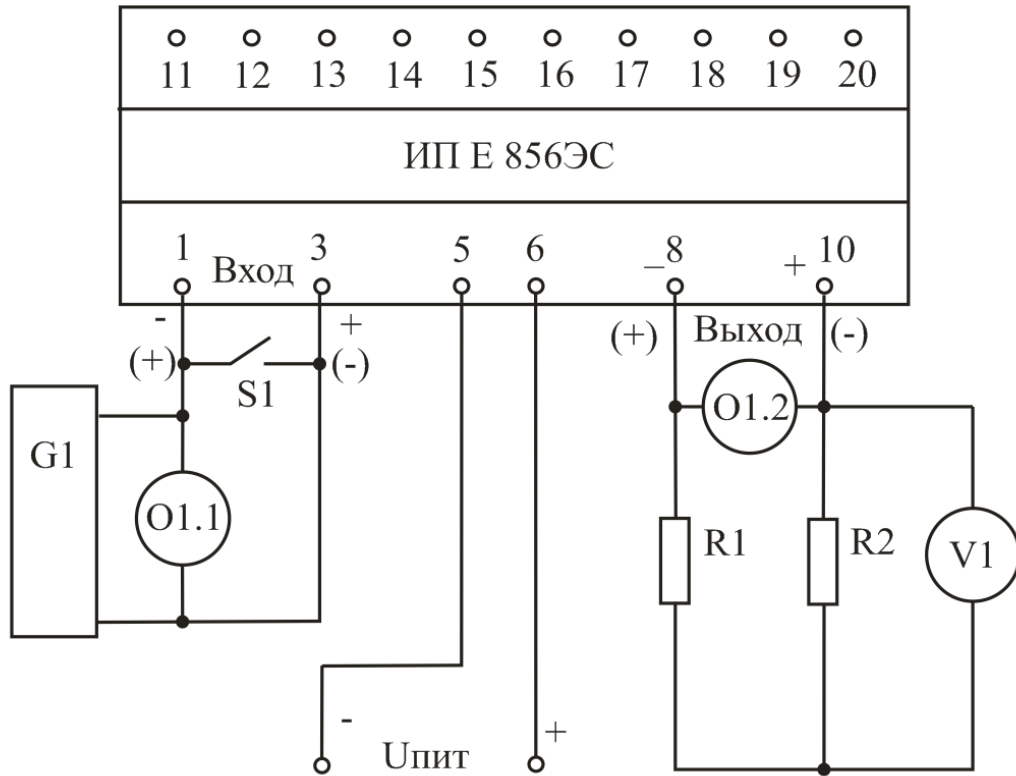
6.3. Positive results of periodic verification shall be verified by applying a verification brand to the MT housing at the points of attachment of the cover and applying a brand to the front surface of the MT.

6.4 In case of negative results of verification, the MT shall be rejected and a conclusion on unsuitability shall be issued as specified in ТКП 8.003-2011, with reasons indicated. At the same time, the verification brand stamp and the brand sticker shall be defaced.

					МП.БТ.043-2002		Sheet
5	Dep	УИМЯ.017-2020	30.07.20	5			5
Rev.	Sheet	Doc. No.	Sign.	Date			
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date	

ANNEX A
(recommended)

Wiring diagrams at MT verification



G1 - П320 programmable calibrator;

V1 - В7-65 voltmeter;

S1 - HA3.604.006 switching button.

O1 - C1-93 oscilloscope;

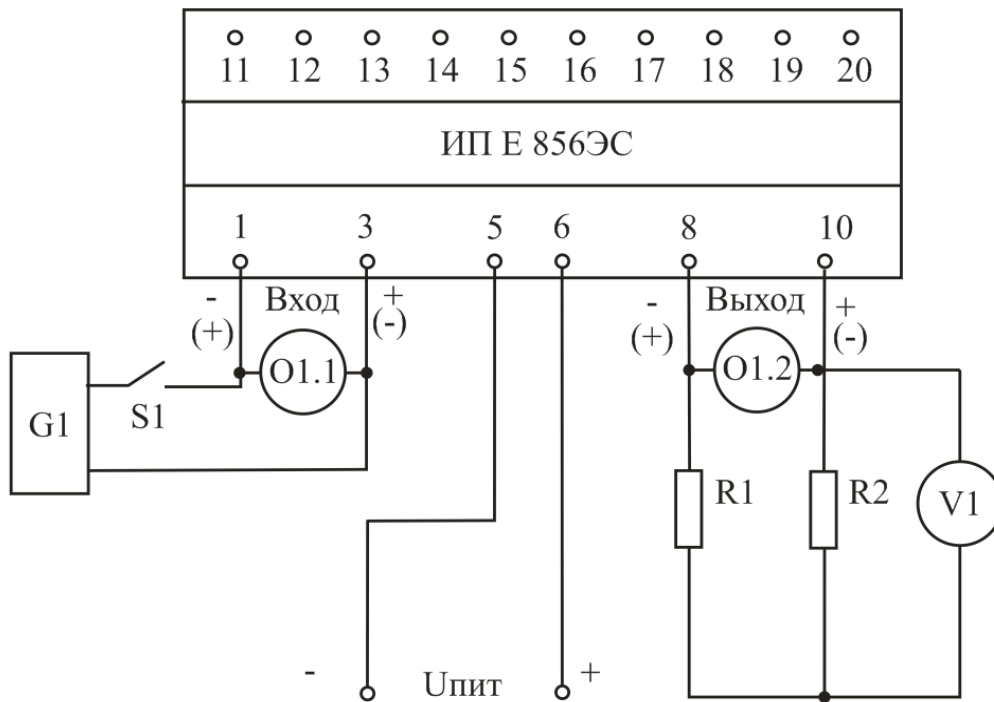
R1 - P33 measuring resistance box;

R2 - P331 electrical resistance measuring coil, 100 Ohm, $R_{ном}=100$ Ohm;

Note - S1, O1 are used only for determining the MT output signal setting time. Note. MT polarity is indicated for a MT DC voltage supplies.

Figure A.1 - E 856ЭС MT verification tool wiring diagram (except for -Ц modifications), (input current signals and output current signals)

					МП.ВТ.043-2002		Sheet
5	Dep	УИМЯ.017-2020		30.07.20			6
Rev.	Sheet	Doc. No.	Sign.	Date			
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date	



G1 - П320 programmable calibrator;

V1 - В7-65 voltmeter;

S1 - HA3.604.006 switching button.

O1 - C1-93 oscilloscope;

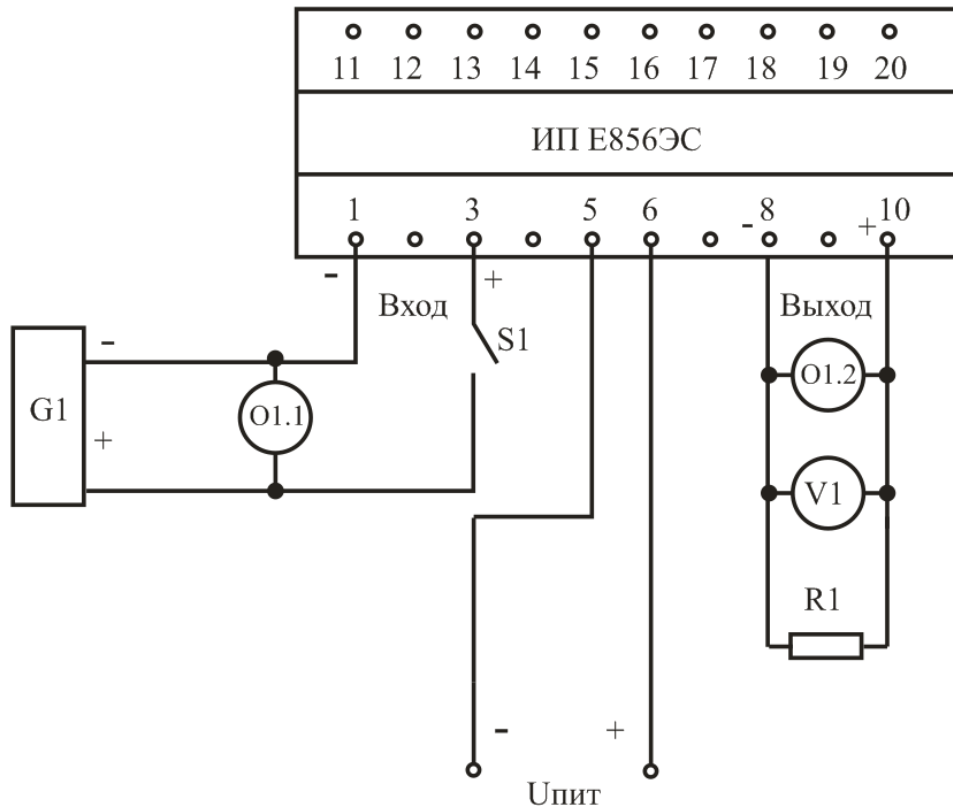
R1 - P33 measuring resistance box;

R2 - P331 electrical resistance measuring coil, 100 Ohm, $R_{НОМ}=100$ Ohm;

Note. Polarity of the power supply is specified for a DC supplied MT.

Figure A.2 - -Ц modification MT verification tool wiring diagram (input voltage signal and output current signal)

					Sheet	
5	Dep	УИМЯ.017-2020		30.07.20	МП.ВТ.043-2002	
Rev.	Sheet	Doc. No.	Sign.	Date		
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date

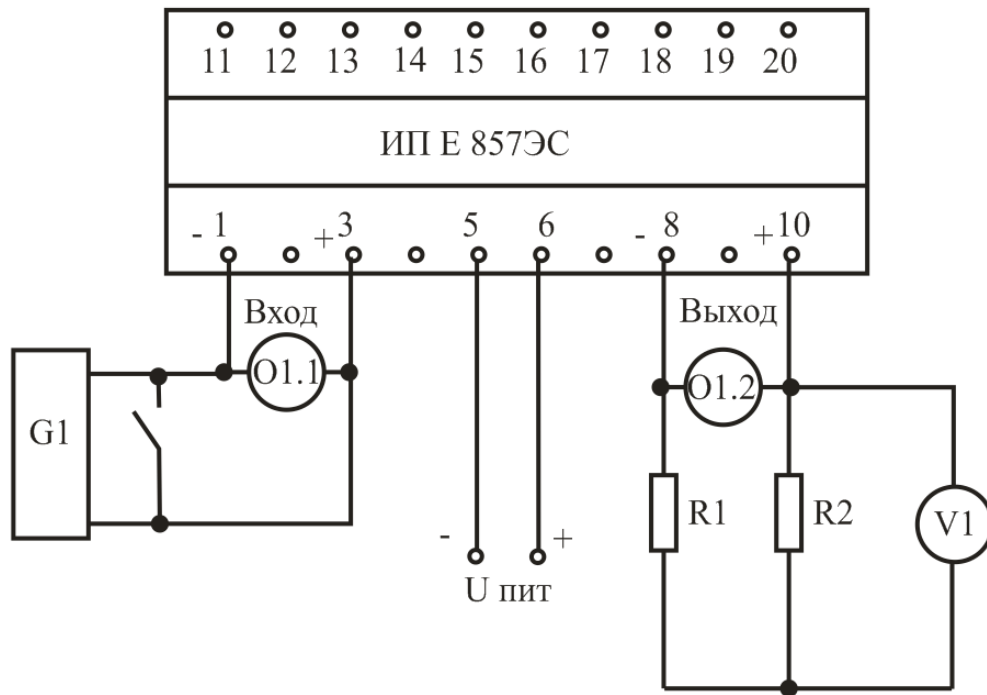


- G1 - П320 programmable calibrator;
- V1 - В7-65 voltmeter;
- S1 - HA3.604.006 switching button.
- O1 - C1-93 oscilloscope;
- R1 - P33 measuring resistance box;

Note. Polarity of the power supply is specified for a DC supplied MT.

Figure A.3 - E 856ЭС MT verification tool wiring diagram (except for -Ц modification), (input voltage signal and output voltage signal)

					МП.ВТ.043-2002		Sheet
5	Dep	УИМЯ.017-2020		30.07.20			8
Rev.	Sheet	Doc. No.	Sign.	Date			
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date	



G1 - П320 programmable calibrator;

V1 - В7-65 voltmeter;

S1 - HA3.604.006 switching button.

O1 - C1-93 oscilloscope;

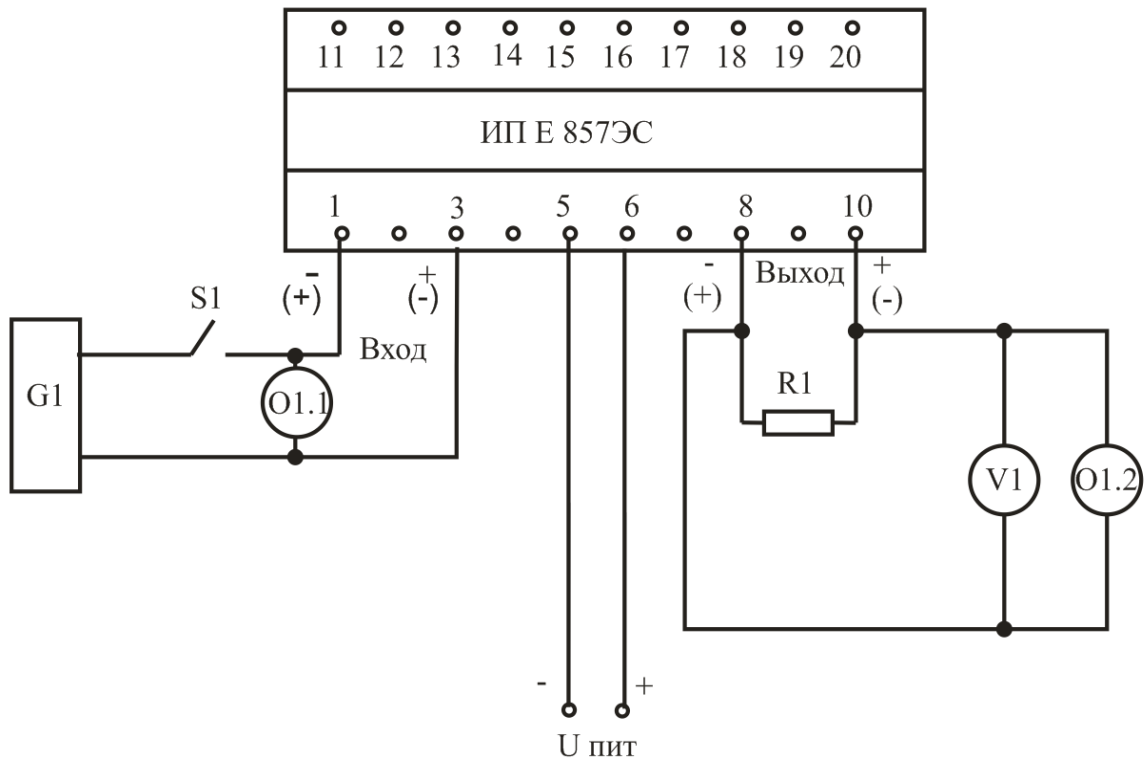
R1 - P33 measuring resistance box;

R2 - P331 electrical resistance measuring coil, $R_{НОМ}=100$ Ohm;

Note - S1, O1 are used only for determining the MT output signal setting time. Note. MT polarity is indicated for a MT DC voltage supplies.

Figure A.4 - E 857ЭC MT verification tool wiring diagram (except for -Ц modifications), output current signal

					Sheet	
5	Dep	УИМЯ.017-2020		30.07.20	МП.БТ.043-2002	
Rev.	Sheet	Doc. No.	Sign.	Date		
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date

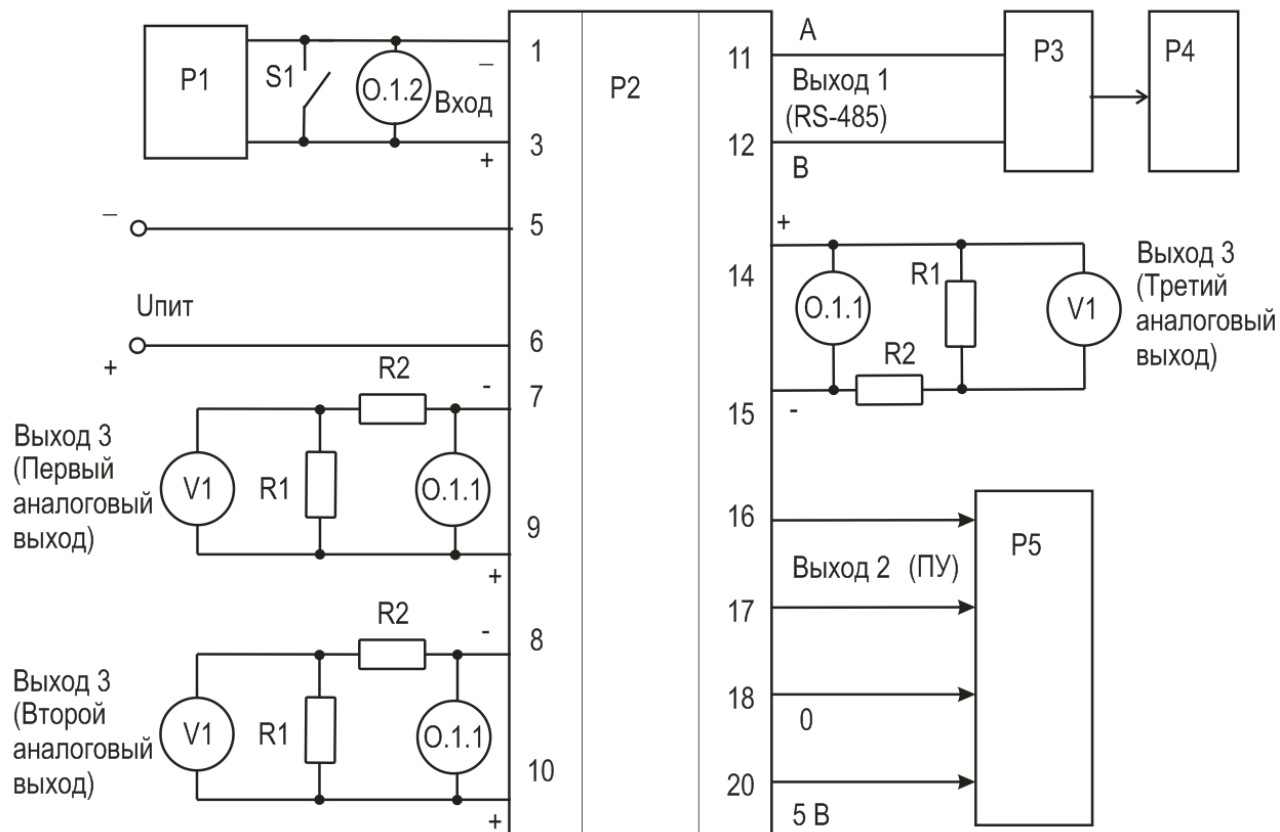


G1 - П320 programmable calibrator;
 S1 - HA3.604.006 switching button.
 V1 - B7-65 voltmeter;
 O1 - C1-93 oscilloscope;
 R1 - P33 measuring resistance box;

Note - S1, O1 are used only for determining the MT output signal setting time. Note. MT polarity is indicated for a MT DC voltage supplies.

Figure A.5 - E 857ЭС MT verification tool wiring diagram (except for -Ц modifications), output voltage signal

					Sheet	
5	Dep	УИМЯ.017-2020		30.07.20	МП.ВТ.043-2002	
Rev.	Sheet	Doc. No.	Sign.	Date		
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date

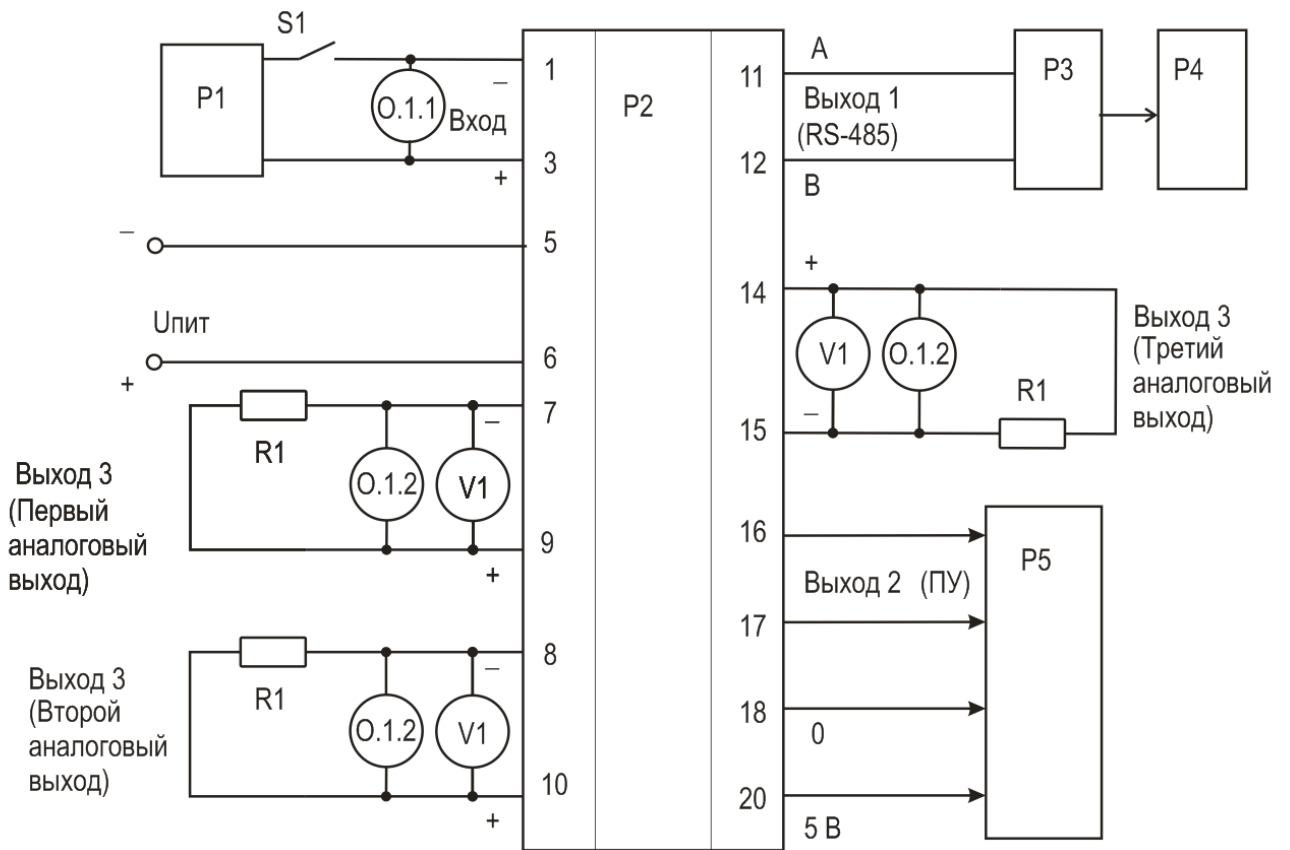


- P1 - ПЗ20 programmable calibrator;
- P2 - МТ;
- P3 - RS-232/RS-485 level converter;
- P4 - РС;
- P5 - ПУ-25 displaying device;
- V1 - В7-65 voltmeter;
- R1 - П331 electrical resistance measuring coil, 100 Ohm;
- R2 - П33 measuring resistance box;
- O1 - С1-93 universal oscilloscope;
- S1 - HA3.604.006 switching button.

Note. Polarity of the power supply is indicated for a MT supplied from a DC voltage.

Figure A.6 - Ц modification MT verification tool wiring diagram, input current signals and output current signals (up to three analog outputs)

					МП.БТ.043-2002		Sheet
5	Dep	УИМЯ.017-2020		30.07.20			8с
Rev.	Sheet	Doc. No.	Sign.	Date			
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date	

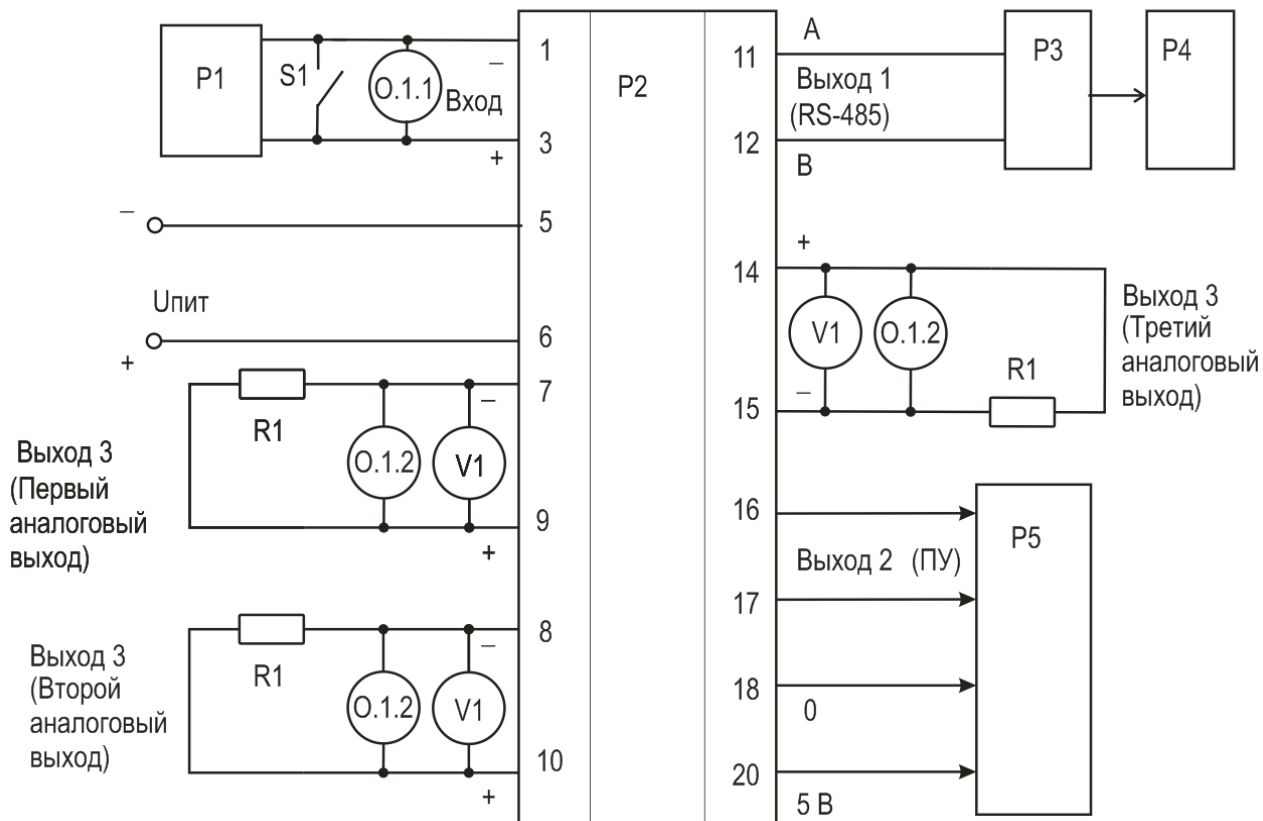


- P1 - ПЗ20 programmable calibrator;
- P2 - МТ;
- P3 - RS-232/RS-485 level converter;
- P4 - PC;
- P5 - ПУ-25 displaying device;
- V1 - В7-65 voltmeter;
- R1 - P33 measuring resistance box;
- O1 - C1-93 universal oscilloscope;
- S1 – HA3.604.006 switching button.

Note. Polarity of the power supply is specified for a DC supplied MT.

Figure A.9 - Ц modification MT verification tool wiring diagram, input voltage signal and output current signal

					МП.БТ.043-2002		Sheet
5	Dep	УИМЯ.017-2020		30.07.20			8d
Rev.	Sheet	Doc. No.	Sign.	Date			
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date	

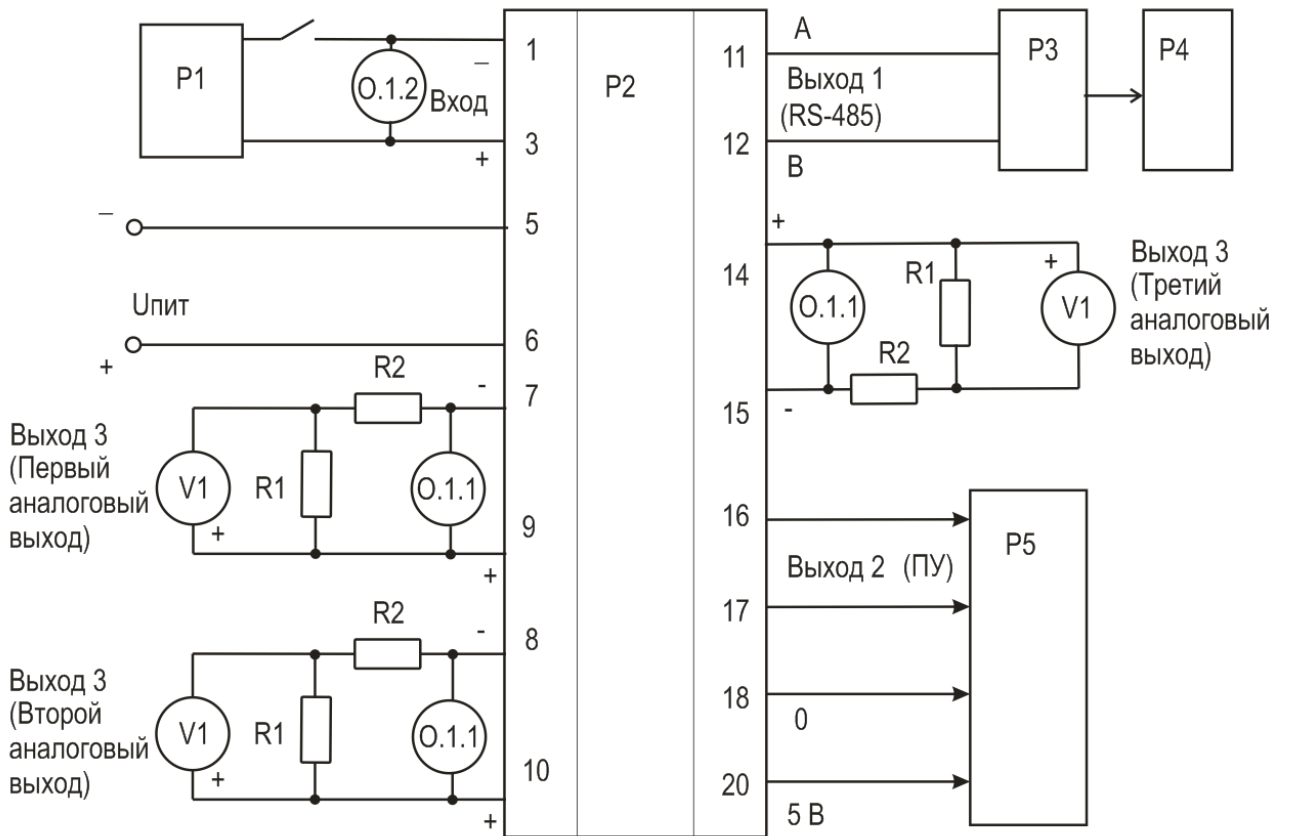


- P1 - ПЗ20 programmable calibrator;
- P2 - МТ;
- P3 - RS-232/RS-485 level converter;
- P4 - РС;
- P5 - ПУ-25 displaying device;
- V1 - В7-65 voltmeter;
- R1 - P33 measuring resistance box;
- O1 - C1-93 universal oscilloscope;
- S1 – HA3.604.006 switching button.

Note. Polarity of the power supply is specified for a DC supplied MT.

Figure A.8 - Ц modification MT verification tool wiring diagram, input current signal and output voltage signal

					МП.ВТ.043-2002	Sheet
5	Dep	УИМЯ.017-2020	30.07.20			8e
Rev.	Sheet	Doc. No.	Sign.	Date		
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date



- P1 - П320 programmable calibrator;
- P2 - МТ;
- P3 - RS-232/RS-485 level converter;
- P4 - PC;
- P5 - ПУ-25 displaying device;
- A1 - В7-65 voltmeter in the AC measurement mode;
- V1 - В7-65 voltmeter;
- R1 - P331 electrical resistance measuring coil, 100 Ohm;
- R2 - P33 measuring resistance box;
- O1 - C1-93 universal oscilloscope;
- S1 – HA3.604.006 switching button.

Note. Polarity of the power supply is indicated for a MT supplied from a DC voltage.

Figure A.9 - Wiring diagram of verification tools for -II modification MT that have an input voltage signal and an output current signal

					МП.ВТ.043-2002	Sheet
5	Dep	УИМЯ.017-2020		30.07.20		8f
Rev.	Sheet	Doc. No.	Sign.	Date		
Reg. No. Orig	Signature and Date	Repl. Reg.	Reg. Orig. No.	Signature and Date		

**ANNEX B
(for reference)**

Wiring diagrams

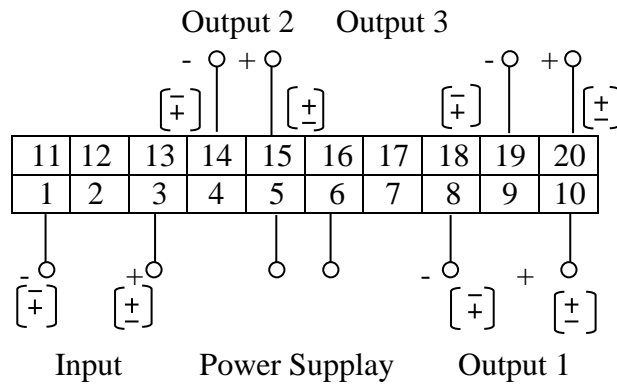


Figure B.1 - Single-channel MT wiring diagram (except for -И modifications)

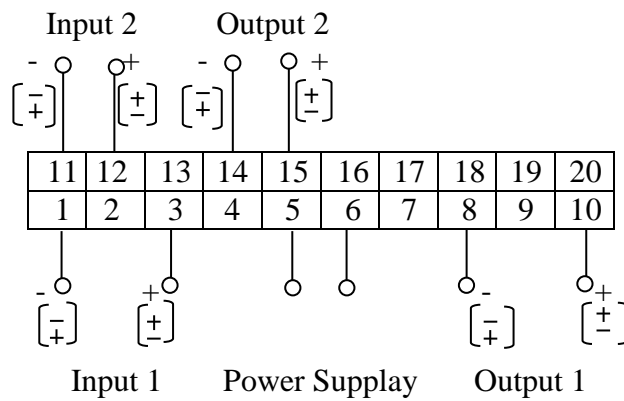
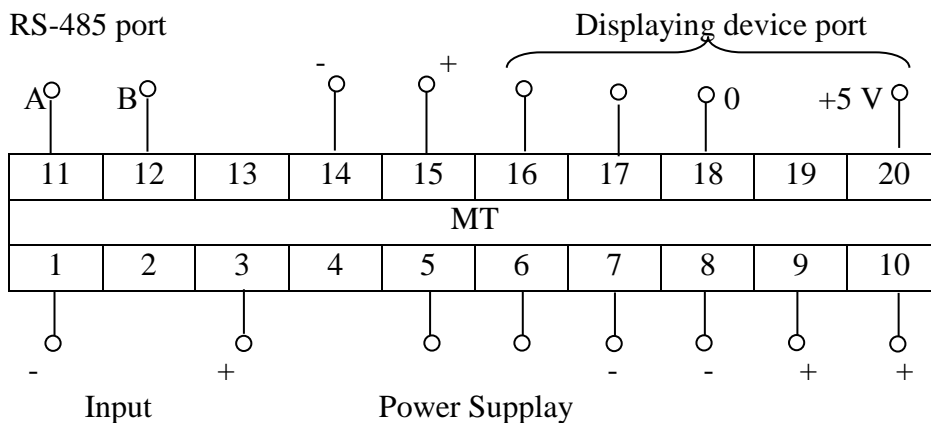


Figure B.1 - Two-channel MT wiring diagram (except for -И modifications)



Note - The first analog output - pins 8, 10;
 The second analog output - pins 14, 15;
 The third analog output - pins 7, 9;

Figure B.3 - И modification MT wiring diagram

					МП.БТ.043-2002				Sheet
5	Dep	УИМЯ.017-2020		30.07.20					9
Rev.	Sheet	Doc. No.	Sign.	Date					
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.		Signature and Date		

ANNEX C
(recommended)

Verification Protocol for E 856ЭC DC MT (E 857ЭC DC voltage MT)

No. _____ Date of verification _____
Manufacturer Energo-Soyuz LLC Customer _____
Location of verification _____

Conditions of the verification:

- ambient temperature, ° C _____
- relative humidity, % _____
- atmospheric pressure, mm HG _____
- mains supply voltage, V _____
- mains supply frequency, Hz _____
- vibration, shaking, shocking _____ no
- external magnetic field _____ Earth's magnetic field
- load resistance, kOhm _____

Verification tools _____

RESULTS OF VERIFICATION

1 External examination _____
(meets requirements, does not meet requirements)

2 Determination of electrical insulation resistance
Checked circuits _____ Measured value _____

(meets requirements, does not meet requirements)

3 Dielectric strength test
Checked circuits _____ Test voltage _____

(meets requirements, does not meet requirements)

4 Determination of the output signal setting time
Measured value _____

(meets requirements, does not meet requirements)

5 Determination of the basic reduced error
Input signal _____ Measured output signal _____ Main error, % _____

(meets requirements, does not meet requirements)

Conclusion:
Converter _____
fits, does not fit. Indicate the reason

Verification officer _____ **Signature** _____

					МИ.БТ.043-2002	Sheet
5	Dep	УИМЯ.017-2020		30.07.20		10
Rev.	Sheet	Doc. No.	Sign.	Date		
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date

Change Log

No. of change	Numbers of sheets (pages)				Sheets, total (pages) in the doc.	Docu-ment No.	Your applied document Ref. No. and date	Signature	Date
	changed	substituted	new	cancelled					

					МИ.БТ.043-2002	Sheet
5	Dep	УИМЯ.017-2020	30.07.20			11
Rev.	Sheet	Doc. No.	Sign.	Date		
Reg. No. Orig		Signature and Date		Repl. Reg.	Reg. Orig. No.	Signature and Date