



**AEDC
MEASURING TRANSDUCER**

**Operation manual
47113964.2.030PЭ**

Contents

1 Description and Operation	3
1.1 General specification	3
1.2 Technical specification	4
1.3 Construction.....	10
1.4 Marking and sealing.....	10
1.5 Packing.....	11
2 Intended Use	12
2.1 Operational constraints	12
2.2 Completeness check.....	12
2.3 Measurement procedure.....	12
2.4 Operation in extreme conditions.....	13
3 Maintenance and repair.....	14
3.1 General maintenance.....	14
3.2 Safety	14
3.3 Order of maintenance.....	14
3.4 Metrology monitoring.....	14
4 Storage	14
5 Transportation	15
6. Utilization	15
Annex A Transducer designation.....	16
Annex B General form of the Transducer.....	18
Annex C Variants of transducer mounting	19
Annex D Diagrams of transducer connections	20

ATTENTION! THERE ARE SAFETY SYMBOLS ON THE TRANSDUCER.



WARNING! THERE IS A SAFETY SYMBOL AT THE TRANSDUCER WARNING YOU TO USE OPERATION MANUAL. IT IS ESSENTIAL IN ORDER TO DETERMINE THE NATURE OF POTENTIAL HAZARDS AND PRECAUTIONS. DO NOT PROCEED BEYOND A WARNING NOTICE UNTIL THE INDICATED CONDITIONS ARE FULLY UNDERSTOOD AND MET.



WARNING! ELECTRICAL HAZARD!

The operation manual contains information of using, packing, transportation and storage of the AEDC Measuring Transducer (hereinafter designated “transducer”). The transducer corresponds to ГOCT P 52931-2008.

Only skilled personnel is allowed to operate with transducer. Person who operate with transducer have to be electrically instructed and certified for electrical safety 3-rd grade.



WARNING! THE INPUT AND SIGNAL TERMINALS COULD BE ALIVE (UNDER THE HIGH VOLTAGE).

TO PROVIDE THE SAFETY DURING THE TRANSDUCER MOUNTING IT IS NECCESARY TO FOLLOW THE OPERATIONAL MANUAL.

1 Description and Operation

1.1 General specification

Transducer is intended for measuring direct current or direct voltage, and converting it to the unitized output signal and digital output code which is transmitted to the upper level of the automated control system.

Transducer is applied at the automated control system of manufacturing process, dispatching of industrial enterprises including dangerous manufacturing entity.

Transducer is mounted on the rail TH-35 IEC 60715-2003 or immediately on the panel.

Transducer is a hardware product without galvanic link between input circuits and output circuits.

Degrees of protections IP20 (ГOCT 14254-96, IEC 529-89).

Climatic category YXJ13.1 (ГOCT 15150-69).

Operating Environment: Group C4 (ГOCT P 52931-2008):

- Ambient Air Temperature - 40 to 55 °C;
- Relative Humidity at 35 °C up to 95 %;
- Atmospheric pressure 84-106 kPa (630-800 mm Hg).

Transducers are stable to the Vibration and concerned to N1 group according to ГOCT P 52931-2008.

Transducers are stable to the Atmospheric pressure and concerned to P1 group according to ГOCT P 52931-2008.

Reference conditions relative to each of the influence quantities are given in table 1.

Table 1 – Reference conditions of the influence quantities and tolerances or testing purposes

Influence quantity	Reference conditions (reference range)	Tolerances permitted for testing purposes applicable to a single reference value
Ambient Air Temperature	20 °C	± 5 °C
Relative Humidity	30 ... 80 %	
Atmospheric pressure	84 ... 106 kPa (630 ... 800 m Hg)	
Location	Soever	
Magnetic field of external origin	Earth's magnetic field	
Supply Voltage	220 V	- 15 to + 10%
Waveform of the voltage supply	Sinusoidal	Distortion factor shall not exceed 5%
Alternating component of the input signal	not less than 3 %	

Transducers are designated by alphanumeric coding, which is contains information about transducer's type, measurement range, designation and quantity of analog outputs, interface RS-485 availability.

The example of transducers designation is in the Annex A.

There are following transducer modifications (table 2):

Table 2 Modifications on the transducer

Type's modification	Input DC voltage from the shunt, mV	Output DC range, mA	Load resistance range, Ω
E856A1 E856A2	0 – 75	0 – 5	0 – <u>2000</u> – 3000
E856B1 E856B2		4 – 20	0 – <u>200</u> – <u>300</u> – 500
E856C1 E856C2		0 – 20	0 – <u>200</u> – <u>300</u> – 500
E856AP1 E856AP2	minus 75 – 0 – 75	0 – 2,5 – 5,0	0 – <u>2000</u> – 3000
E856BP1 E856BP2		4 – 12 – 20	0 – <u>200</u> – <u>300</u> – 500
E856CP1 E856CP2		0 – 10 – 20	0 – <u>200</u> – <u>300</u> – 500
E856EP1 E856EP2		minus 5 – 0 – 5	0 – <u>2000</u> – 3000
Note – Index 1 - for the transducer with one output, Index 2 - for the transducer with two outputs.			
Type	Input DC voltage range, V	Output DC range, mA	Load resistance range, Ω
E857A	0 – 60; 0 – 100;	0 – 5	0 – <u>2000</u> – 3000
E857B	0 – 150; 0 – 250;	4 – 20	0 – <u>200</u> – <u>300</u> – 500
E857C	0 – 500; 0 – 1000	0 – 20	0 – <u>200</u> – <u>300</u> – 500
Note – Normal value area of load resistance range is underlined			

1.2 Technical specification

Transducer provides converting of input signal within measurement range into output direct current and transmitting converted digital output code by RS-485 in accordance with table 3, 4.

Transducers are designated by alphanumeric coding, which is contains information about transducer's type, measurement range, designation and quantity of analog outputs, interface RS-485 availability. The example of transducers designation is in the Annex A.

Communications protocol is MODBUS-RTU, MODBUS-ASCII, IEC 60870-5-101.

There are following transducer modifications:

Table 3

Designation	Measurement range	Output current, mA	Load resistance range, Ω	Intrinsic error	
				Analogue output γ , %	Digital output, Δ
AEDC856A1	0...75 mV	0 - 5	0 - 3000	$\pm 0,5$	–
AEDC856A2					–
AEDC856A1-RS					$\pm(0,003 A_{in} + 0,075)$ mV
AEDC856B1	0...75 mV	4 - 20	0 - 500	$\pm 0,5$	–
AEDC856B2					–
AEDC856B1-RS					$\pm(0,003 A_{in} + 0,075)$ mV

Table 3 continuation

Designation	Measurement range	Output current, mA	Load resistance range, Ω	Intrinsic error	
				Analogue output $\gamma, \%$	digital output Δ
AEDC856C1	0...75 mV	0 - 20	0 - 500	$\pm 0,5$	–
AEDC856C2					–
AEDC856C1-RS					$\pm(0,003 A_{in} + 0,075)$ mV
AEDC856AP1	-75...75 mV			$\pm 0,5$	–
AEDC856AP2					–
AEDC856AP1-RS					$\pm(0,003 A_{in} + 0,075)$ mV
AEDC856BP1	-75...75 mV	4 - 20	0 - 500	$\pm 0,5$	–
AEDC856BP2					–
AEDC856BP1-RS					$\pm(0,003 A_{in} + 0,075)$ mV
AEDC856CP1	-75...75 mV	0 - 20	0 - 500	$\pm 0,5$	–
AEDC856CP2					–
AEDC856CP1-RS					$\pm(0,003 A_{in} + 0,075)$ mV
AEDC856EP1	-75...75 mV	-5 - 0 - 5	0 - 3000	$\pm 0,5$	–
AEDC856EP2					–
AEDC856EP1-RS					$\pm(0,003 A_{in} + 0,075)$ mV
AEDC857A-60	0...60 V	0 - 5	0 - 3000	$\pm 0,5$	–
AEDC857A-RS-60					$\pm(0,003 A_{in} + 0,06)$ V
AEDC857A-100	0...100 V	0 - 5	0 - 3000	$\pm 0,5$	–
AEDC857A-RS-100					$\pm(0,003 A_{in} + 0,1)$ V
AEDC857A-150	0...150 V	0 - 5	0 - 3000	$\pm 0,5$	–
AEDC857A-RS-150					$\pm(0,003 A_{in} + 0,15)$ V
AEDC857A-250	0...250 V	0 - 5	0 - 3000	$\pm 0,5$	–
AEDC857A-RS-250					$\pm(0,003 A_{in} + 0,25)$ V
AEDC857A-500	0...500 V	0 - 5	0 - 3000	$\pm 0,5$	–
AEDC857A-RS-500					$\pm(0,003 A_{in} + 0,5)$ V
AEDC857A-1000	0...1000 V	0 - 5	0 - 3000	$\pm 0,5$	–
AEDC857A-RS-1000					$\pm(0,003 A_{in} + 1)$ V
AEDC857B-60	0...60 V	4 - 20	0 - 500	$\pm 0,5$	–
AEDC857B-RS-60					$\pm(0,003 A_{in} + 0,06)$ V
AEDC857B-100	0...100 V	4 - 20	0 - 500	$\pm 0,5$	–
AEDC857B-RS-100					$\pm(0,003 A_{in} + 0,1)$ V
AEDC857B-150	0...150 V	4 - 20	0 - 500	$\pm 0,5$	–
AEDC857B-RS-150					$\pm(0,003 A_{in} + 0,15)$ V
AEDC857B-250	0...250 V	4 - 20	0 - 500	$\pm 0,5$	–
AEDC857B-RS-250					$\pm(0,003 A_{in} + 0,25)$ V
AEDC857B-500	0...500 V	4 - 20	0 - 500	$\pm 0,5$	–
AEDC857B-RS-500					$\pm(0,003 A_{in} + 0,5)$ V

Table 3 continuation

Designation	Measurement range	Output current, mA	Load resistance range, Ω	Intrinsic error	
				Analogue output $\gamma, \%$	digital output Δ
AEDC857B-1000	0...1000 V	4 - 20	0 - 500	$\pm 0,5$	-
AEDC857B-RS-1000					$\pm(0,003 A_{in} + 1) V$
AEDC857C-60	0...60 V	0 - 20	0 - 500	$\pm 0,5$	-
AEDC857C-RS-60					$\pm(0,003 A_{in} + 0,06) V$
AEDC857C-100	0...100 V	0 - 20	0 - 500	$\pm 0,5$	-
AEDC857C-RS-100					$\pm(0,003 A_{in} + 0,1) V$
AEDC857C-150	0...150 V	0 - 20	0 - 500	$\pm 0,5$	-
AEDC857C-RS-150					$\pm(0,003 A_{in} + 0,15) V$
AEDC857C-250	0...250 B	0 - 20	0 - 500	$\pm 0,5$	-
AEDC857C-RS-250					$\pm(0,003 A_{in} + 0,25) V$
AEDC857C-500	0...500 B	0 - 20	0 - 500	$\pm 0,5$	-
AEDC857C-RS-500					$\pm(0,003 A_{in} + 0,5) V$
AEDC857C-1000	0...1000 B	0 - 20	0 - 500	$\pm 0,5$	-
AEDC857C-RS-1000					$\pm(0,003 A_{in} + 1) V$
AEDC875AA2	0...5 mA	0 - 5	0 - 3000	$\pm 0,5$	-
AEDC875AA3					
AEDC875AB2		4 - 20	0 - 500	$\pm 0,5$	
AEDC875AB3					
AEDC875AC2		0 - 20	0 - 500	$\pm 0,5$	
AEDC875AC3					
AEDC875AE2	0...5 mA	-5 - 0 - 5	0 - 3000	$\pm 0,5$	-
AEDC875AE3					
AEDC875Axx		See the table 4	See the table 4	$\pm 0,5$	
AEDC875Axxx					
AEDC875BA2	4...20 mA	0 - 5	0 - 3000	$\pm 0,5$	
AEDC875BA3					
AEDC875BB2		4 - 20	0 - 500	$\pm 0,25$	
AEDC875BB3					
AEDC875BC2		0 - 20	0 - 500	$\pm 0,25$	
AEDC875BC3					
AEDC875BE2		-5 - 0 - 5	0 - 3000	$\pm 0,5$	
AEDC875BE3					
AEDC875Bxx		See the table 4	See the table 4	$\pm 0,5 (\pm 0,25)^*$	
AEDC875Bxxx					

Table 3 continuation

Designation	Measurement range	Output current, mA	Load resistance range, Ω	Intrinsic error	
				Analogue output $\gamma, \%$	digital output Δ
AEDC875CA2	0...20 mA	0 - 5	0 - 3000	$\pm 0,5$	—
AEDC875CA3					
AEDC875CB2		4 - 20	0 - 500	$\pm 0,25$	
AEDC875CB3					
AEDC875CC2		0 - 20	0 - 500	$\pm 0,25$	
AEDC875CC3					
AEDC875CE2		-5 - 0 - 5	0 - 3000	$\pm 0,5$	
AEDC875CE3					
AEDC875Cxx		See the table 4	See the table 4	$\pm 0,5 (\pm 0,25)^*$	
AEDC875Cxxx					
AEDC875EA2	-5...5 mA	0 - 5	0 - 3000	$\pm 0,5$	—
AEDC875EA3					
AEDC875EB2		4 - 20	0 - 500	$\pm 0,5$	
AEDC875EB3					
AEDC875EC2		0 - 20	0 - 500	$\pm 0,5$	
AEDC875EC3					
AEDC875EE2		-5 - 0 - 5	0 - 3000	$\pm 0,5$	
AEDC875EE3					
AEDC875Exx		See the table 4	See the table 4	$\pm 0,5$	
AEDC875Exxx					

A_{in} - value of input quantity

* The Values in brackets are only for B and (or) C output types.

Note – sign «x» at the designation of the AEDC875 transducer– designation of the analogue output type.

There are A, B, C or E types.

Table 4

Analogue output type	Output current, mA	Load resistance range, Ω
A	0 - 5	0 - 3000
B	4 - 20	0 - 500
C	0 - 20	0 - 500
E	minus 5 - 0 - 5	0 - 3000

1.2.2 Nominal transfer function for analogue output is linear in accordance with formula:

I_{out} – output current value;

$I_{out\ min}$, $I_{out\ max}$ – minimal and maximum value of the output current range;

$A_{in\ min}$, $A_{in\ max}$ – minimum and maximum value of the measurement range;

A_{in} – value of the input measurand.

1.2.3 Additional transfer function is nonlinear for AEDC875 transducer with A, B, C analogue input and outputs, when the control inputs are short-circuited.

1.2.4 Permissible limits of the intrinsic error γ for analogue outputs are presented in the table 3.

Maximum value of the output current range is taken as fiducial value.

A fiducial value for AEDC875 is a maximum measurement range value (when nonlinear transfer function is applied).

1.2.5 Permissible limits of the intrinsic error for digital outputs are presented in the table 3. Nominal quantization step q and output code value are presented in the table 5.

Table 5

Measurement range	Nominal quantization step,	Output code value
0 ... 75 mV	0,0183195 mV	4094
minus 75...75 mV	0,036639 mV	\pm 2047
0... 60 V	0,0146556 V	4094
0... 100 V	0,024426 V	4094
0 ... 150 V	0,036639 V	4094
0 ... 250 V	0,061065 V	4094
0 ... 500 V	0,12213 V	4094
0 ... 1000 V	0,24426 V	4094

1.2.6 Permissible value of alternating component of the input signal is 100%. Frequency of the alternating component - 45 to 1000 Hz.

1.2.7 Setup time of performance is 10 min.

1.2.8 Setting time of output signal is 0,5 s.

1.2.9 Ripple amplitude is no more than 0,25 %:

- for A and E analogue output types, when resistance load is less than 1000 Ω ;
- for B and C analogue output types, when resistance load is less than 250 Ω .

1.2.10 Intrinsic error corresponds to requirements of 1.2.4, 1.2.5:

- on the expiry of a setup time;
- when auxiliary supply voltage fluctuating from 187 up to 242 V; auxiliary supply frequency fluctuating from 48 up to 52 Hz;

- under effecting sine-wave vibrations in a frequency band from 10 up to 55 Hz with displacement amplitude 0,15 mm.

1.2.11 Limits of the permissible additional error:

- alteration of the ambient temperature influences as 0.5 limits of intrinsic error per 10 °C within values 25...55 °C and minus 30...15 °C for analogue output. For digital output the value of additional error is $\pm(0,0005 A_{in} + 0,0015 A_{in\ max})$ of the measurand units;

- alteration of the relative humidity influences as 0.5 limits of the measurand units.

1.2.12 Transducer withstands a long-lived break of a load circuit without failures. An output voltage at a break of a load circuit is no more than 30 V.

1.2.13 Transducer withstands such overloads as:

- 120% overload by an input signal during 2 hours;

- tenfold overload by input signal during 30 s.

Output current during overloading :

- 5.5 mA for A and E analogue output type;

- 21 mA for B and C analogue output type.

1.2.14 Transducer meet the requirements of the EMC as A category equipment according to ГOCT P 51522.

1.2.15 Isolation between different outputs of transducer withstands a testing voltage of practically sine-wave shape by frequency from (50 ± 2) Hz during 1 min., table 6.

1.2.16 Electrical insulation resistance of circuits pointed in 1.2.11, 1.2.12 is not less:

- 40 M Ω - in reference conditions;

- 10 M Ω - to 80% R.H. at 50°C;

- 2 M Ω - to 95% R.H. at 35°C.

1.2.17 Power Supply Consumption is no more 5.5 V·A.

1.2.18 Power Consumption of the measurement circuit is shown at the table 7.

1.2.19 Overall dimensions: 120x80x77 mm.

1.2.20 Weight is no more 0,7 kg.

Table 6

Transducer type designation	Circuits under test	Testing voltage; RMS , kV	
		Reference conditions	Influenced by upper relative humidity value
AEDC856	between case and all circuits	4,5	2,5
	between supply circuit and output circuits	2,5	1,5
	between output circuits	0,5	0,3
AEDC857	between case and all other circuits;		
	between input circuit and all other circuits		
	-transducers with measurement range:60;100;150;250 V;	2,5	1,5
	-transducers with measurement range: 500 V;	3,5	2,0
	-transducers with measurement range: 1000 V	4,5	2,5
	between supply circuit and output circuits	2,5	1,5
	between output circuits	0,5	0,3
AEDC875	between case and all circuits; between supply circuit and output circuits	2,5	1,5
	between input and output circuits; between output circuits	0,5	0,3

Table 7

Transducer type designation	Measurement range	Power consumption, mW
AEDC856	0 ...75 mV	0,001
	minus 75...75 mV	0,001
AEDC857	0... 60 V	100
	0... 100 V	150
	0 ... 150 V	250
	0 ... 250 V	400
	0 ... 500 V	600
	0 ... 1000 V	1000
AEDC875	0...5 mA	12,5
	4...20 mA	60
	0...20 mA	60
	minus 5...5 mA	12,5

1.3 Construction

1.3.1 General Form of the transducer is presented in Annex B.

1.3.2 Transducer has the following parts:

- Case;
- Cover;
- Input stage board;
- Output stage boards; (one, two or three boards depending on modification)
- Supply transformer;
- RS-485 interface module;
- Latch.

Case and Cover are produced of plastic material.

Divider board and Output stage boards are connected with Input stage board by soldering. Some modifications are used the connection of the divider and output stage boards inside of the case by guide plate.



Contacts established on a cover ensure strengthening of the board and provide the connection between traces and lead wires.

The cover is mounted to a case through four screws, which can be sealed up.

The latch ensures mounting the transducer to the rail or panel depending on variant of installation.

1.4 Marking and sealing

1.4.1 The following information is marked on a cover of the transducer:

- The name and type designation;
- Manufacturer's mark;
- The nominal values of voltage and frequency of the supply;
- Load resistance range;
- The value of maximum power consumption;
- Values and units of the input and output signals;
- The category of measurements;
- Designation of numbers and purposes of terminals;
- The sign  ;
- The sign  (only for AEDC857 transducer with 1000V measurement range
- Serial number and two last digits of Issue Year.
- Inscription «Made in Russia»
- The sign of conformity (granting the registered declaration conformity).

Note – Upper value of the measurement range, given in Annex A as designation, isn't marked.

1.4.2 Sealing of the transducer is yielded with a bitumen mastic №1 (according to ГОСТ 18680-73) applies on one cover screw out of four.

1.5 Packing

1.5.1 Transducers are delivered in distribution packaging.

1.5.2 The packing note and operation manual is enclosed in the transport container.

1.5.3 The transducer is packaged into individual packing.

The passport and CD with software are inserted inside of the individual packing.

2 Intended Use

2.1 Operational constraints

2.1.1 Do not operate the transducer in the presence of explosion-hazard and hostile environment.

2.1.2 The transducer must not be effected by direct heat up to temperature more 55°C.

2.1.3 The transducer should be placed on the premises without sharp temperature fluctuation and far off of the sources of strong electromagnetic field.

2.2 Completeness check

2.2.1 Check integrity of packing after deriving the transducer. Unpack it. Take out the transducer, make external examination, and be convinced of absence of visual mechanical failures. Check completeness of delivering according to table 8.

Table 8

Name and nomenclature	Designation	Quantity
Transducer		1
AEDC measuring transducer. Passport	47113964.2.023IIC	1
AEDC measuring transducer. Operation manual	47113964.2.023PЭ	1
Terminal block 15EDGK-3.81-04P	In case of RS-485 is inbuilt	1
CD with software		1
Protective sticker		5
Latch		1*
Individual package		1
* Set on the case		

2.2.2 Check the correspondence of information on a transducer cover to required parameters.

2.3 Measurement procedure

2.3.1 Preparation for measuring

2.3.1.1 Mounting of the transducer is carried up in accordance with project documentation of measuring system (measuring channel).

2.3.1.2 All operations on mounting and maintenance should be making in accordance with rules of providing electrical safety.



ATTENTION! BUILDING WIRING WORK SHOULD INCLUDE THE AUTOMATIC SUPPLY DISCONNECTION DEVICE OR CLOSELY SET SWITCHING-OFF DEVICE FOR MANUAL SHUTTING DOWN OF THE TRANSDUCER .

APPLYING OF THE 1 A ELECTRIC FUSE IN THE EXTERNAL CIRCUIT IS RECOMMENDED.

2.3.1.3 Before mounting transducer (in case of RS-485 interface is inbuilt) it is necessary to set a transducer address and requiring data exchange parameters by service software «SetDigOut».

A computer for this purpose have to meet following minimum system requirements:

- Windows XP/Vista/7;
- USB interface ;
- CD-ROM.

To be configuration is authorized apply only valid password. The default password of the transducer is «12345»

The default data exchange parameters of RS-485 interface :

- communication protocol - MODBUS ASCII;
- baud rate – 9600 bps;
- stop bit quantity – 2;
- parity – NO;
- address device – 1;
- register address «Output code (Nout)»- 0x000000.

Before the connection of the transducer unstick the protection sticker from the cover.

If it isn't assume to use the interface RS-485(2) after configuration, the protective patch should be placed on the transducer front panel.

2.3.1.4 Mounting the transducer *on the rail*:

- place a latch according to figure C.1 to link the projection of the case to rail edge;
- push the case to fix.

It is permitted to mount transducer on the rail on a horizontal or vertical plane.

The distortion of the rail at the vertical plane towards the horizontal position should not be more than 15°.

2.3.1.5 Mounting of the transducer *on the panel*:

- fix a latch on the panel by two screws according to figure C.2;
- pull the latch over the transducer by special construction hollow on the case.

Use two 4 mm diameter screws to fasten a latch on the panel. Screws shouldn't overhang beyond the bound of the mounting area. Mounting the transducer on a latch is necessary to provide not less than 15 mm space for initial fixing of the transducer.

2.3.1.6 Connect exterior conductive wires on terminals according to the diagram of transducer connections.

The recommended diagrams are given in the Annex D.

To configure one of the outputs of the AEDC875 transducer to nonlinear transfer function it's necessary to short-circuit appropriate inputs.

A transducer connection by RS-485 interface should be executed with shielded twisted pair in accordance to Figure D.7.

The wire section should be not less 0.2 mm².

The wave resistance of the wire should be 120 Ω

2.3.1.7 Verify the correspondence of the signal source output parameters to requiring data-in of the transducer. Verify quality of wiring.

2.3.2 Measuring

2.3.2.1 Apply supply voltage and input signal to the transducer.

2.3.2.2 Transducer is a permanently connected equipment. After applying supply voltage and input signal, transducer functions the main operation as a unit of the measurement system.

2.3.2.3 The result of measurement $A_{in.mes.}$ is a value of measured input signal, which is determined by inverse transformation function for analogue outputs, and defines as product of $N \cdot q$ for digital output (q – nominal quantization step).

Permissible limits of intrinsic error in accordance with 1.2.4 and 1.2.5.

2.3.2.4 If the operating environment of the transducer differs from data in the table 1, in this case maximum permissible error is defined as arithmetical sum of the permissible limits of intrinsic error and the largest permissible error changes due to influencing quantities (according with 1.2.11).

2.4 Operation in extreme conditions

2.4.1 Turn out the transducer immediately in case of originating an emergency condition of operation.



Apply the automatic disconnection supply device or closely set switching-off device for manual shutting down of the transducer.

3 Maintenance and repair

3.1 General maintenance

3.1.1 The field inspection for transducer operation should be carried by persons, who have the responsibility for this equipment.

3.1.2 The cover of the transducer should not be opened during operation.

3.1.3 The manufacturer eliminates all defects originating during operation.

3.2 Safety

3.2.1 The qualified personnel should execute operations of maintenance.

3.2.2 The transducer corresponds to the IEC 61010-1:2001 (ГОСТ Р 52319-2005). Type of insulation – basic insulation. Pollution degree – 2. Measurement category - III.



3.2.3 WARNING! THE INPUT AND SIGNAL TERMINALS COULD BE ALIVE (UNDER THE HIGH VOLTAGE).

TO AVOID THE ELECTRICAL SHOCK IT IS FORBIDDEN: TO CHANGE EXTERIOR CONNECTIONS, WHEN INPUT SIGNAL IS APPLIED TO THE TRANSDUCER.

3.3 Order of maintenance

3.3.1 It is recommended to carry out routine inspection in field quarterly. For this purpose:

- switch-off the input signal and auxiliary supply;
- remove dust from case;
- test a condition of the case; to be convinced of absence of mechanical failures; to test a condition of mounting;
- turn the input signals and auxiliary supply on.

3.3.2 If the transducer is mounted on the rail you can carry demounting. Insert a screwdriver into a recess in the bottom of the case and release a latch.

3.4 Metrology monitoring

3.4.1 To confirm real values of the metrology characteristics and availability of the transducer to application, it can be exposed to verification (calibration) according to engineering data of the transducer, which was matched with ВНИИМС (Russian Research Institute for Metrological Service).

Recalibration interval is 6 year.

4 Storage

4.1 Before commissioning the transducer should be stored in storehouses according to ГОСТ Р 52931-2008.

4.2 Storage conditions for transducers in transport container:

- Ambient Air Temperature 5 to 40 °C;
- Relative Humidity at 25 °C up to 80 %.

4.3 Storage conditions for transducers in individual packing:

- Ambient Air Temperature 10 to 35 °C;
- Relative Humidity at 25 °C up to 80 %.

4.4 The presence of a dust, steams of acids and alkalis, aggressive gases and other harmful admixtures resulting corrosion should not exceed the contents of the corrosion-active agents for the atmosphere of a type 1 (ГОСТ 15150-69).

5 Transportation

5.1 Transducers could be transported in transport container in the closed vehicles of any type.

Transducers should be disposed in heated hermetic bays when air transporting.

5.2 Values of climatic and mechanical effects on the transducer at transportation should be in limits:

- Ambient Air Temperature - 50 to 55 °C;
- Relative Humidity at 35 °C up to 95 %;
- Atmospheric pressure, kPa (mm Hg) 84-106 (630-800).
- Vibration is defined as group N2 by ГOCT 52931 when vehicle or air transportation.

6. Utilization

6.1 Transducer contains no harmful substances and components, which is hazardous for the environment and people health.

6.2 To utilize the transducer – demount the supply transformer. Cooper winding wire take to the non-ferrous metal receiving point. Metal parts take to scrap receiving point. Fasteners having no signs of corrosion, may be used as a spare mount. Case, cover, electronic components and boards take off for industrial utilization

Annex A
(informative)
Transducer designation

Transducer A E D C 8 5 6 A P 1 - RS TY 4227-014-47113964-2011

	Output RS-485 availability: Without marking – unavailable RS – available (only for transducer with one analogue output)
	Quantity of analogue outputs 1 2
	Measurement range: Without marking – 0...75 mV across shunt P - minus 75...75 mV across shunt
Analogue output type: A – output current 0...5 mA; B – output current 4...20 mA; C – output current 0...20 mA; E – output current minus 5... 5 mA	

Figure A.1

Transducer A E D C 8 5 7 A - RS - 1 0 0 TY 4227-014-47113964-2011

	Maximum measurement range value, V * 60 100 150 250 500 1000
	Output RS-485 availability: Without marking – unavailable RS – available
Analogue output type: A – output current 0...5 mA; B – output current 4...20 mA; C – output current 0...20 mA;	

* Maximum measurement range value is not marked on the design letter at the transducer cover

Figure A.2

Transducer A E D C 8 7 5 A B 2 TY 4227-014-47113964-2011

Quantity of analogue outputs 2 3
Analogue output type: A – output current 0...5 mA; B – output current 4...20 mA; C – output current 0...20 mA; E – output current minus 5... 5 mA
Analogue input type: A – output current 0...5 mA; B – output current 4...20 mA; C – output current 0...20 mA; E – output current minus 5... 5 mA

AEDC875 transducer with the same name outputs.

Figure A.3

Transducer A E D C 8 7 5 A B B C TY 4227-014-47113964-2011

Analogue output type 3 (if available): A, B, C или E
Analogue output type 2: A, B, C или E
Analogue output type 1: A – output current 0...5 mA; B – output current 4...20 mA; C – output current 0...20 mA; E – output current minus 5... 5 mA
Analogue input type: A – output current 0...5 mA; B – output current 4...20 mA; C – output current 0...20 mA; E – output current minus 5... 5 mA

AEDC875 transducer with the differ name outputs.

Figure A.4

Annex B
(informative)
General form of the Transducer

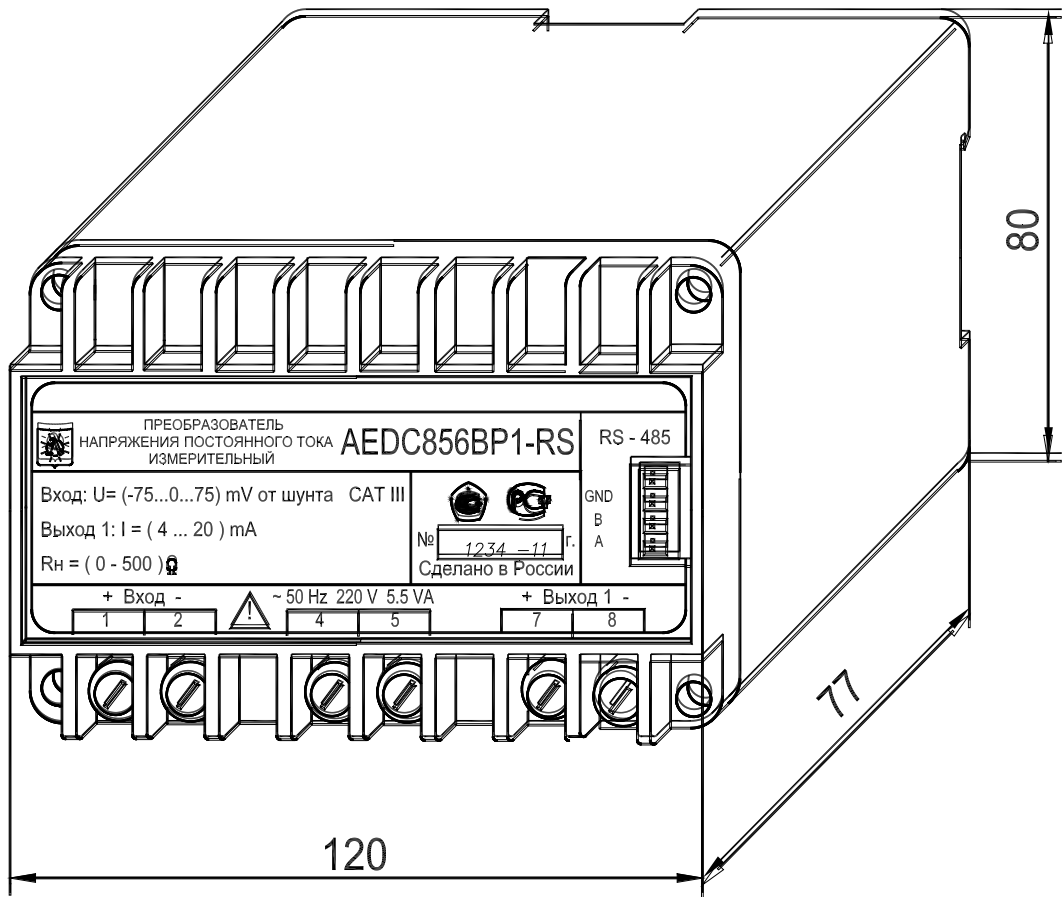


Figure B.1

Annex C (informative)

Variants of transducer mounting

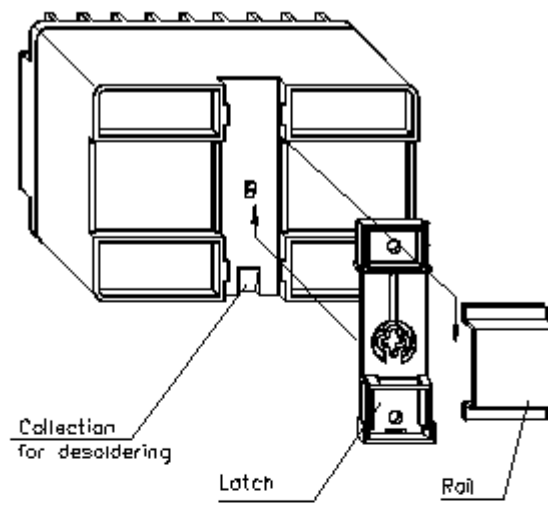


Figure C.1 Mounting on the Rail

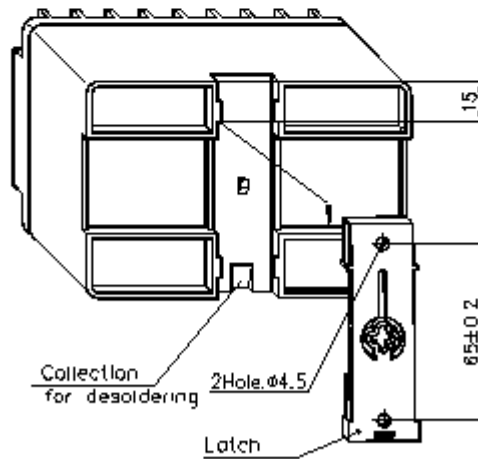


Figure C.2 Mounting on the Panel

Annex D (informative) Diagrams of transducer connections

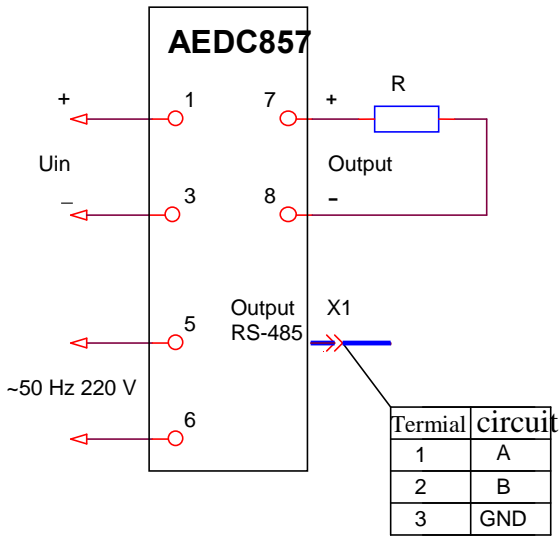


Figure D.1 Transducer AEDC857 with analogue output and RS-485 interface.

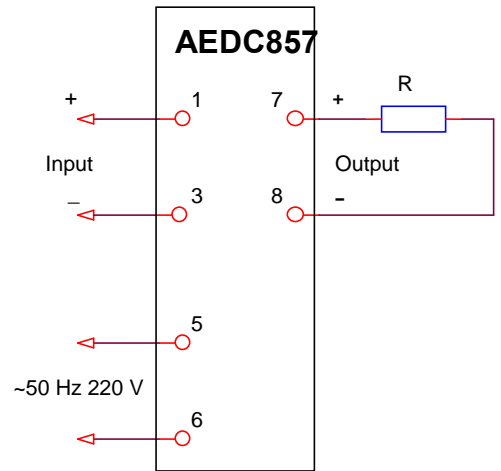


Figure D.2 Transducer AEDC857 with analogue output.

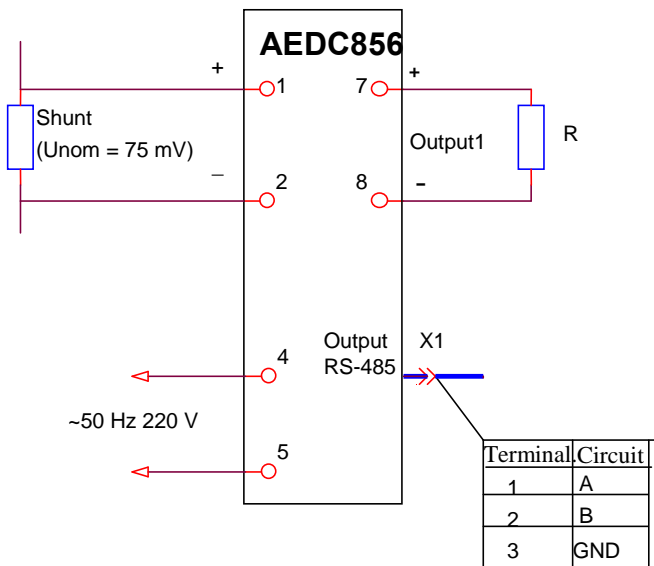


Figure D.3 Transducer AEDC856 with analogue output and RS-485 interface.

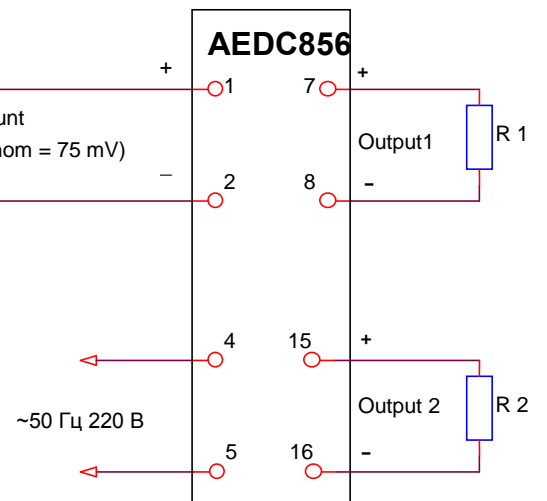


Figure D.4 Transducer AEDC856 with two analogue output.

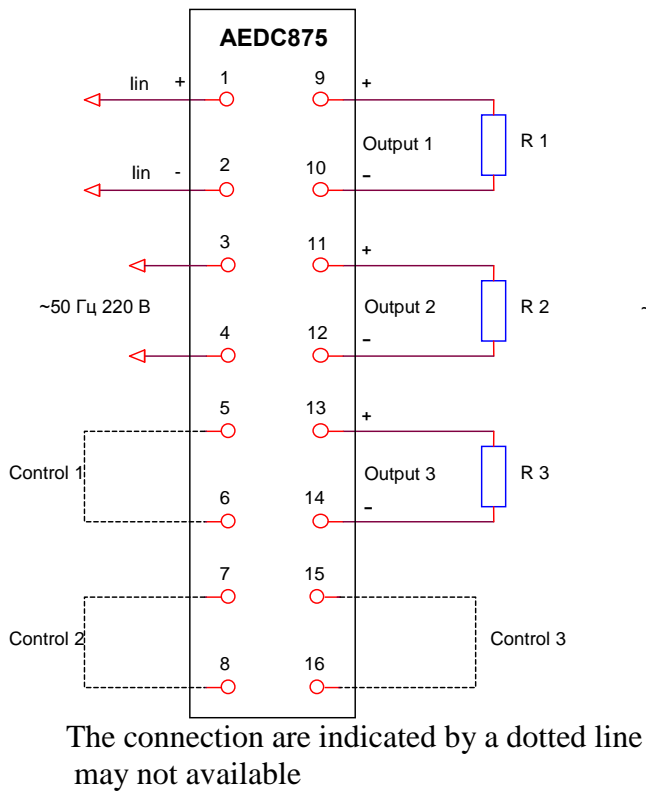


Figure D.5 Transducer AEDC875 with 3 analogue outputs and control inputs.

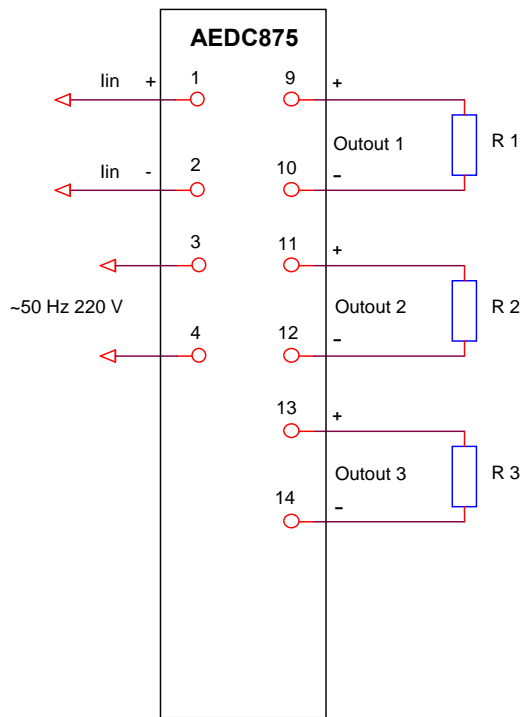


Figure D.6 Transducer AEDC875 with 3 analogue outputs.

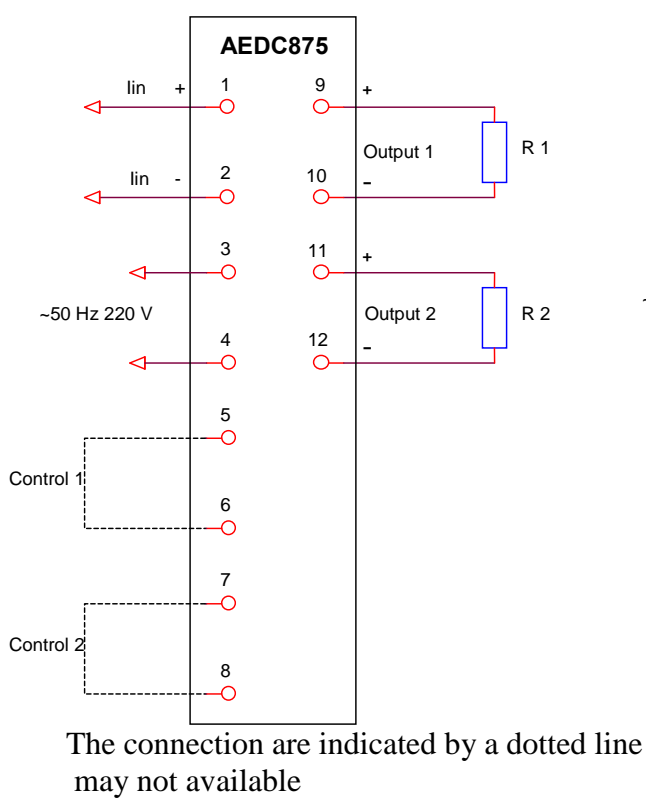


Figure D.7 Transducer AEDC875 with two analogue outputs and control inputs

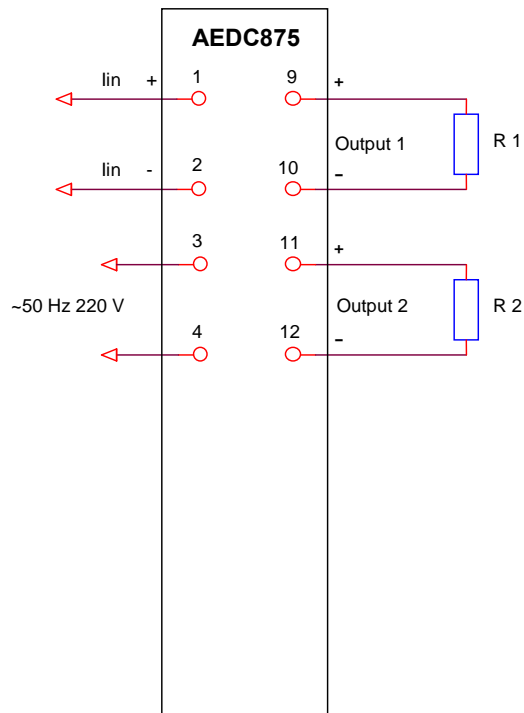
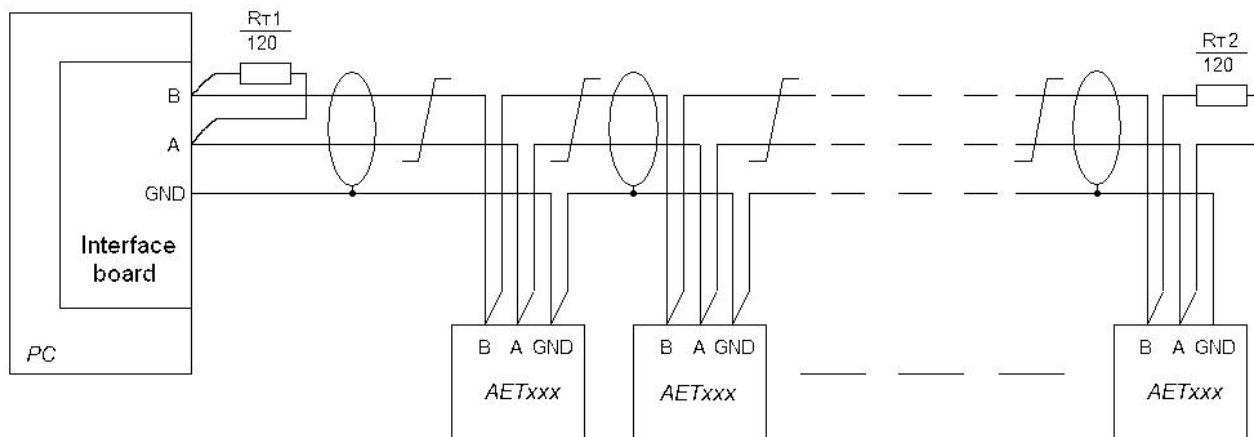


Figure D.8 Transducer AEDC875 with two analogue outputs.



R_{T1}, R_{T2} – Resistor C2-33-0,25 W – $120 \Omega \pm 5\%$
 Wire section is no less than $0,2 \text{ mm}^2$

Figure D.9 Interface connection RS-485