



CURRENT TRANSDUCER

E842A

E842C

Operation manual

49501860.3.0009 PЭ

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This operation manual contains information for using and operating Current Transducer E842A, E842C (further – Transducer) and information on packing, transportation and storage.
Read this manual before operation.

1 Description and operation

1.1 General Information

1.1.1 Transducer is intended for a linear alternating-current converting to unified output signal of a direct current and can be applied to monitoring currents of electrical systems, in the equipment of technical diagnostics, for an integrated automation of plants of power engineering and different industries.

Transducer corresponds to engineering factors TY 4227-007-49501860-00.

Transducer is mounted on the rail TH-35 in accordance with ГOCT P MЭK 60715-2003 or immediately on the panel.

Transducer is hardware SSI product of the third order according to ГOCT 12997-84.

Operating Environment - Group C4 (ГOCT 12997-84):

- Ambient Air Temperature-30°C to 50°C;
- Relative Humidity at 35°Cup to 95 %;
- Atmospheric pressure.....84-106 kPa (630-800 mm Hg).

Climatic category: YXJ3 (ГOCT 15150-69).

Standard conditions for use:

- Ambient Air Temperature 20 ± 5 °C;
- Relative Humidity30 to 80 %;
- Atmospheric pressure.....84-106 kPa(630-800 mm Hg).

Guard level: IP00 (ГOCT 14254-96, IEC 529-89).

Transducer is single-channel hardware product without galvanic link between input and output circuits.

1.2 Characteristics

1.2.1 Transducer converts alternating current to direct current output signal according to table 1.

Table 1

Type	Input AC range, A	Output DC range, mA	Load resistance range, Ω
E842A	0 – 0,5 0 – 1,0	0 – 5	0 – <u>1000 – 1400</u> – 2500
E842C	0 – 2,5 0 – 5,0	0 – 20	0 – <u>200 – 300</u> – 500

Note – The reference range is underlined

1.2.2 Limits of intrinsic error are:

- E842A ±1,0 % of the fiducial value;
- E842C ±0,5 % of the fiducial value.

1.2.3 Variations from influencing magnitudes given in table 2.

Table 2

Name of influencing magnitude	Value of influencing magnitude	Variation, % of the fiducial value
Ambient Air Temperature	-30 to 50 °C	±0,4 on 10 °C of temperature variation
Relative Humidity	to 95 % at 35°C	±0,9
Frequency	45 to 65 Hz	±0,5
External magnetic field of frequency 45 – 65 Hz by strength	to 400 A/m	±0,5
Load resistance E842A	0 to 1000 Ω; more then 1400 to 2500 Ω	±0,5
E842C	0 to 200 Ω; more then 300 to 500 Ω	±0,25

1.2.4 When harmonic distortion is 5 %, limits of error are:

- for 2-th, 4-th, 6-th, 8-th harmonic ±1,0 % of the fiducial value;
- for 3-th, 5-th, 7-th, 9-th harmonic ±2,0 % of the fiducial value.

1.2.5 Setup time of performance:

E842A..... 5 minutes;

E842C.....10 minutes.

1.2.6 Pulsation amplitude:

E842A.....0,1 %

E842C.....0,2 %

1.2.7 Intrinsic error corresponds:

- on expiring a setup time of performance;
- at grounding one of output contacts;
- when effecting sine-wave vibrations in a frequency band from 10 up to 55 Hz with displacement amplitude 0,35 mm.

1.2.8 Setting time of output signal is 1s.

1.2.9 Transducer withstands a long-lived break of a load circuit without failures. Output voltage at a break of a load circuits is no more than 30 V.

1.2.10 Transducer withstands 120% overload by an input signal during 2 hours.

1.2.11 Transducer withstands short-term overloads by input signal according to table 3.

Table 3

Current multiplicity	Number of overloads	Duration	Interval between overloads
2	10	10 s	10 s
7	2	15 s	60 s
10	5	3 s	2,5 s

Output current, when overloading, is no more:

- 30 mA for E842A;
- 40 mA for E842C (when load resistance value is 500 Ohm).

1.2.12 Input Power Consumption:

E842A.....1 V·A

E842C.....1,5 V·A

1.2.13 Isolation between input and output circuits withstands a testing voltage of practically sine-wave shape by frequency from 45 up to 65 Hz during 1 min:

- 2,5 kV RMS – in standard conditions;
- 1,5 kV RMS – to 95% R.H. at 35°C.

1.2.14 Electrical insulation resistance of input and output circuits relative to a case and among themselves is not less:

- 40 MΩ - in standard conditions;
- 10 MΩ - to 80% R.H. at 50°C;
- 2 MΩ - to 95% R.H. at 35°C

1.2.15 Overall dimensions 70x80x77 mm.

1.2.16 Weight 0,3 kg.

1.2.17 Average error-free running time 50000 hour.

1.2.18 Average durability..... 10 years.

1.3 Construction

1.3.1 General form of Transducer can be seen in Annex B.

1.3.2 Transducer has the following parts:

- Case;
- Cover;
- Component board;
- Measuring transformer;
- Latch.

1.3.3 The contacts established on a cover ensure strengthening a component board and reliable contact of conductors of a plated circuit to the leads.

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 Functional description

1.4.1 Transducer is carried out on a principle of direct conversion. It falls into the transducers of a rectifier type.

1.4.2 Transducer Schematic is shown in Annex A.

Transducer Schematic is composed of following parts:

- measuring transformer which is also element of a galvanic isolation;
- bridge rectifier;
- smoother reducing a ripple of a rectified signal;
- current-limited circuit on the voltage-reference diodes which safeguard simultaneously a transducer output from occurrence of a signal of a reverse polarity.

1.5 Marking and sealing

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

- The name and type designation;
- Manufacturer's mark;
- Input and output signals rated;
- Unit symbols of input and output signals;
- Overvoltage category;
- Load resistance range;
- Module of intrinsic error;
- Designation of numbers and polarity of terminal;
- Serial number and two last digits of issue Year.

1.5.2 Sealing of the transducer is yielded with a bitumen mastic №1 (according to ГOCT 18680-73) applies on one of four located on a cover screws.

1.6 Packing

1.6.1 The transducers are delivered in transport container.

1.6.2 In transport container there is:

- Operation manual (1 copy for set of 50 transducers or on separate delivering);
- Packing leaf.

1.6.3 The transducer is packaged into individual packing.
The passport is inserted inside the individual packing.

2 Uses to assignment

2.1 Operational constraints

2.1.1 The transducers are not intended for operation in requirements explosion-hazard and hostile environment.

2.1.2 The transducers must not be effected by direct heat up to temperature more 50°C. The transducers should be placed on the premises without sharp temperature fluctuation and off the sources of strong electromagnetic field.

2.2 Preparation for use

2.2.1 Check integrity of packing after deriving the transducer. Unpack it. Take out the transducer, make exterior survey, and get sure that any apparent mechanical damages are missing. Check completeness of delivering according to table 4.

Table 4

Name and nomenclature	Quantity
Transducer	1
Current transducer E842A, E842C. Passport	1
Current transducer E842A, E842C. Operation manual	1*
Individual package	1
Latch	1**
* On a batch in quantity 50 pieces, delivered at the one address	
** Set on the case	

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

2.3 Use

2.3.1 All operations on mounting and maintenance should be making with observance of live rules on provision of safe service.

2.3.2 Make arranging a place of mounting of the transducer on plant according to Annex C.

2.3.3 Installation of the transducer on plant

2.3.3.1 When mounting the transducer *on the rail*:

- place a latch according to figure C.1 to link the protuberances of a case to edge of the rail;
- push a case up to its fixing.

The mounting of the transducer on the rail is supposed at mount the rail on a horizontal or vertical plane.

When the rail is mounted on the vertical plane, its distortion from a horizontal position should not be more than 15°.

2.3.3.2 When mounting the transducer *on the panel*:

- fix a latch on the panel with the help of two screws according to figure C.2;
- pull the transducer over a latch against the stop.

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Use two screws with a diameter 4 mm to fasten a latch on the panel. Screws should not overhang a mounting plane of the latch.

When mounting the transducer on a latch it is necessary to provide on object a place not less than 15 mm for initial fixing of the transducer.

2.3.4 Fix exterior conductive wires on contacts according to the table of connections, which is located on a cover of the transducer.

2.3.5 Verify the correspondence of output parameters of a radiant of a signal to data-ins of the transducer. Verify quality of wiring.

2.3.6 Turn on an input signal on the transducer.

2.4 Operation in extreme conditions

2.4.1 You should turn out the transducer immediately in case of originating an emergency condition of operation.

3 Maintenance and repair

3.1 Safety

3.1.1 The qualified personnel should execute operations of maintenance.

3.1.2 The transducer corresponds to ГOCT P 52319-2005 (IEC 61010-1:2001).

3.1.3 IT IS FORBIDDEN: TO CHANGE EXTERIOR ASSOCIATIONS, WHEN INPUT SIGNAL IS AVAILABLE IN THE TRANSDUCER.

3.2 Order of maintenance

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

- to turn input signal off;
- to delete from a case a dust;
- to test a condition of a case; to be convinced of absence of mechanical failures; to test a condition of mounting;
- to turn input signal on the transducer after the termination of survey on.

3.2.2 If the transducer is mounted on the rail, you can carry demounting by release of a latch by a screwdriver inserted into a recess in the bottom of the case.

3.3 Troubleshooting data

3.3.1 You can see the enumeration of possible defects and methods of their elimination in table 5.

Table 5

Defect	Probable reason	Method of elimination
Intrinsic error exceeds an acceptable value insignificantly	The tuning of the transformer is necessary	Make tuning with the help of by adjusting windings of the transformer
The output signal is not present at presence of an input signal	Break or short closure in wiring	Check voltages on capacitors C1, C2, C3. Eliminate break or short closure
The voltage on secondary windings of a measuring transformer misses	Break or short closure of secondary windings of the transformer	Exchange an transformer
The voltage on an rectifier output misses	One of diodes (V1 - V4) does not work	Exchange an out-of-order diode

3.3.2 The specialized repair enterprise eliminates all failures.

The transducer should pass calibration after repair and be sealed up.

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3.3.3 You can see the mode of operations of E842A key elements in table 6 (for load resistance 2,4 kΩ).

Table 6

Circuit element	Voltage (± 10%)	
	alternating	direct
Secondary winding of the transformer T1	32 V	
Capacitor C1		31 V
Capacitor C2		27 V
Capacitor C3		12 V

3.3.4 You can see the mode of operations of E842C key elements in table 7 (for load resistance 500 Ω).

Table 7

Circuit element	Voltage (± 10%)	
	alternating	direct
Secondary winding of the transformer T1	25 V	
Capacitor C1		24 V
Capacitor C2		22 V
Capacitor C3		10 V

3.4 Metrology monitoring

3.4.1 To confirm real values of the metrology characteristics and fitness of the transducer to application, they can be exposed to calibration according to the document 49501860.3.0009 МП «Преобразователи измерительные переменного тока E842A, E842C. Методика поверки» (Current transducers E842A, E842C. Calibration procedure), which was matched with ВНИИМС (All-Russian Research Institute).

The transducer should be calibration on 1-year interval determined by the requirements of this document.

4 Storage

4.1 Before introduction in operation the transducers should be stored in storehouses according to ГOCT 12997-84.

4.2 Storage conditions for transducers in transport container:

- Ambient Air Temperature5 to 50 °C;
- Relative Humidity at 25°C up to 80 %.

4.3 Storage conditions for transducers in individual packing:

- Ambient Air Temperature10 to 35 °C;
- Relative Humidity at 25°C up to 80 %.

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

5 Transportation

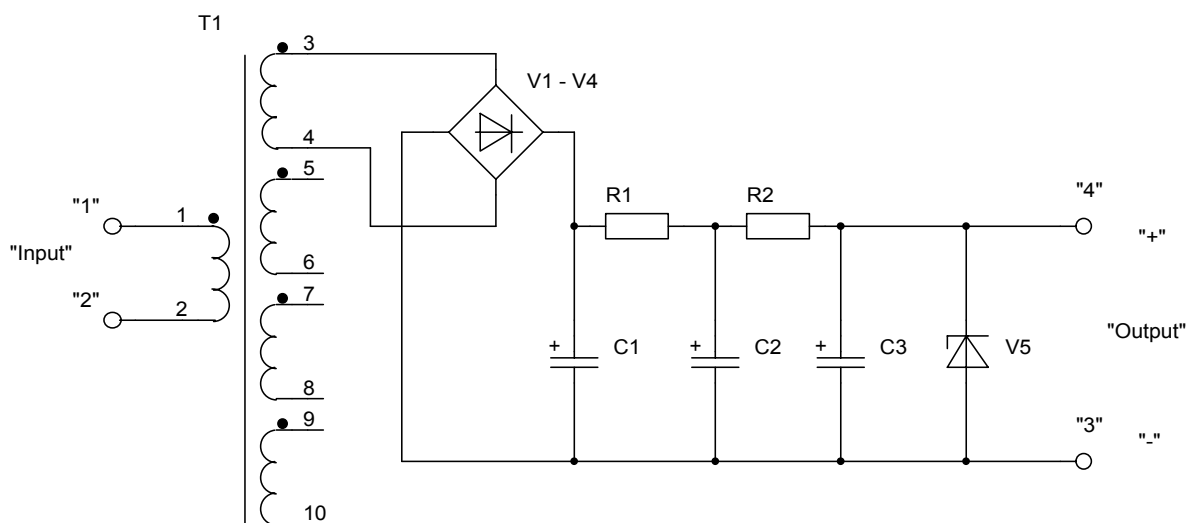
5.1 The transducers in transport container can be transported in the closed vehicles of any kind.

When air transportation the transducers should be disposed in heated hermetic bays.

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

- Ambient Air Temperature-50 to 50 °C;
- Relative Humidity at 35°Cup to 95 %;
- Atmospheric
- pressure.....84 to 106 kPa (630 to 800 mm Hg);
- Impacts with peak shock acceleration 98m/sec².

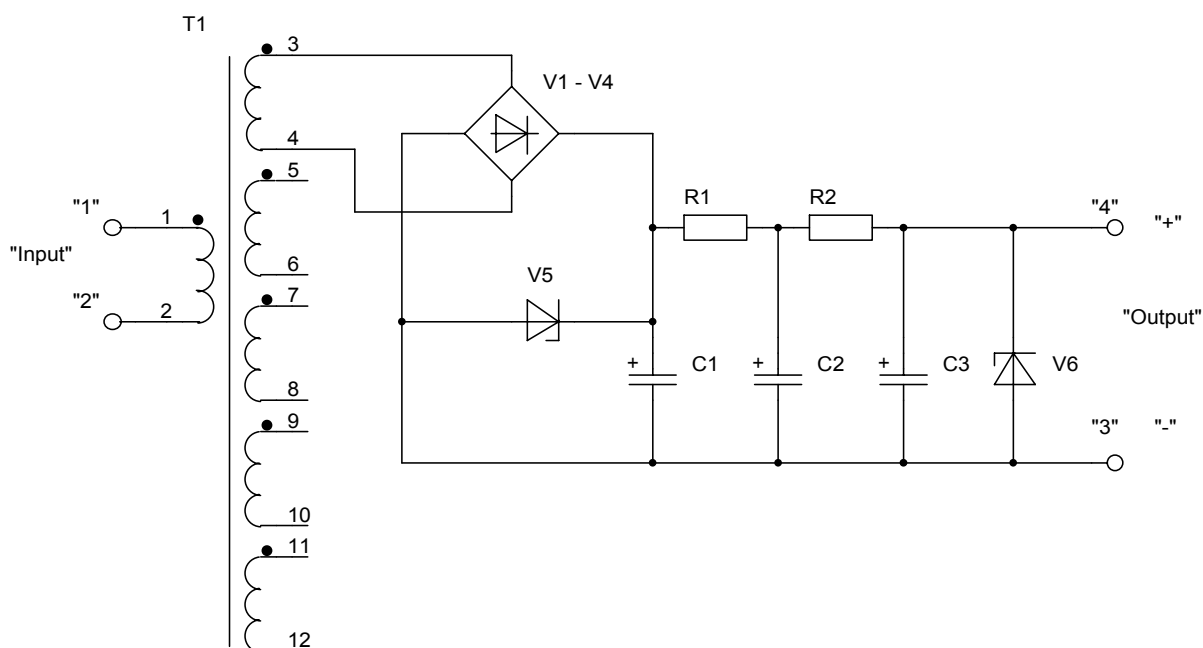
Annex A (informative) Transducer Schematic



Поз. Position	Наименование Name	Кол. Quant	Примечание Remark
C1...C3	Конденсатор К50-35 - 63 В - 10 мкФ	3	Capacitor
R1	Резистор С2-33м-0,25И-680 Ом+-5% А-Д ШКАБ.434110.007ТУ	1	Resistor
R2	Резистор С2-33м-0,25И-3 кОм+-5% А-Д ШКАБ.434110.007ТУ	1	Resistor
T1	Трансформатор (см. табл.)	1	Transformer according to table
V1...V4	Диод КД522Б дРЗ.362.029 ТУ	4	Diode
V5	Стабилитрон КС524Г ХЫ0.336.000 ТУ	1	Voltage-reference

Обозначение Designation	T1	Входной ток, А Input AC range, A
49501860.3.0009	49501860.5.0023	0 - 5,0
-01	49501860.5.0023-01	0 - 2,5
-02	49501860.5.0023-02	0 - 1,0
-03	49501860.5.0023-03	0 - 0,5

Figure A.1 Transducer E842A



Поз. Position	Наименование Name	Кол. Quant	Примечание Remark
C1...C3	Сараситор RLC 013 47mkF/ 50 V; +- 20%	3	Philips
R1	Резистор С2-33м-0,25И-130 Ом+-5% А-Д ШКАБ.434110.007ТУ	1	Resistor
R2	Резистор С2-33м-0,5И-560 Ом+-5% А-Д ШКАБ.434110.007ТУ	1	Resistor
T1	Трансформатор (см. табл.)	1	Transformer according to table
V1...V4	Диод КД247Г аАО.336.838 ТУ	4	Diode
V5	Стабилитрон Д816Д аАО.336.545 ТУ	1	Voltage-reference
V6	Стабилитрон КС512А аАО.336.002 ТУ	1	Voltage-reference

Обозначение Designation	T1	Входной ток, А Input AC range, A
49501860.3.0009 -04	49501860.5.0024	0 - 5,0
-05	49501860.5.0024-01	0 - 2,5
-06	49501860.5.0024-02	0 - 1,0
-07	49501860.5.0024-03	0 - 0,5

Figure A.2 Transducer E842C

Annex B
(informative)
General form of the transducer

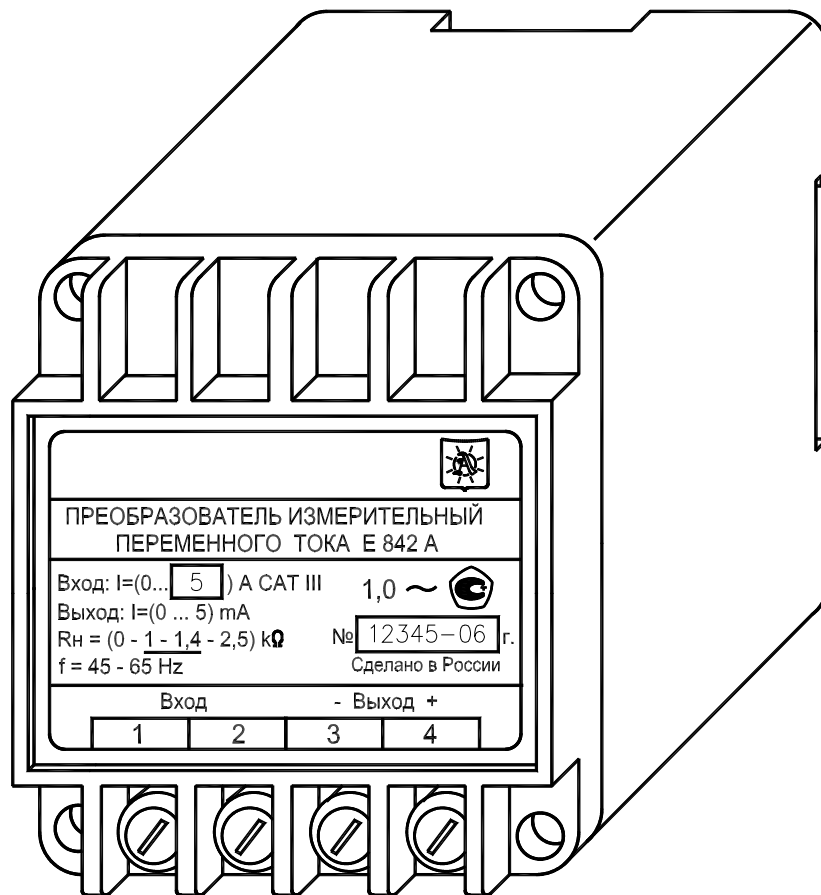


Figure B.1

Annex C
(informative)
Variants of Transducer mounting

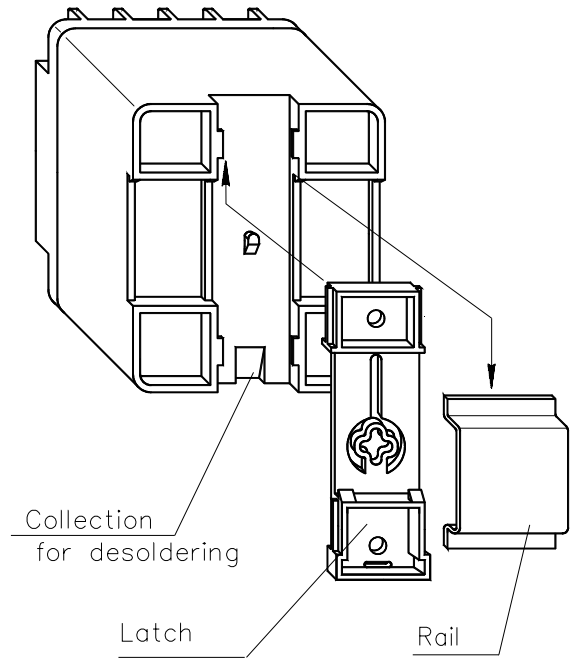


Figure C.1 Mounting on the rail

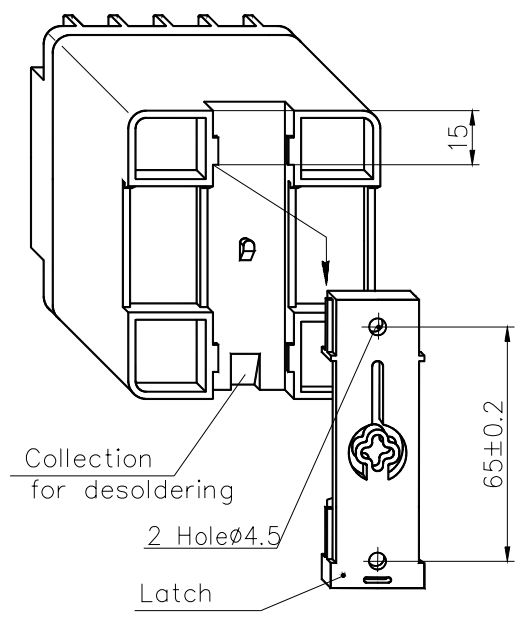


Figure C.2 Mounting on the panel

