

Warranty Certificate

This instrument is warranted against any manufacturing defects for a period of twelve months from the date of installation, or eighteen months from the date of purchase, whichever is early.

Kindly note the following:

1. The warranty is limited to repairing the instrument and no responsibility is taken for any other damage resulted.
2. The warranty will be void if the instrument is opened or tampered in any way.
3. The faulty instrument has to be returned to our factory, carriage prepaid.

Product Category : Current Transmitter
ESD 201series

Model No. : _____

Serial number : _____

Date of despatch : _____

Authorised signatory :

Company seal

CURRENT TRANSMITTER

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Test Report



Kindly forward this product manual to the end user. The user is requested to read the manual thoroughly before operating the instrument.

As You Unpack

*Congratulations on buying
ESD - 201series
Current Transmitter*

As you unpack kindly ensure that

1. The material received is in good condition
2. You have received following material
 - i) ESD - 201series Current Transmitter as per your purchase order.
 - ii) This manual along with Warranty Certificate and Test Certificate

In case of any discrepancies contact our customer support department immediately.

*We are sure you will get long and troublefree service
from our instrument.*



We need your feedback :

Every attempt is made to make this manual clear and easy to understand, so that you feel confident to install, use and maintain our product. ESD welcomes your suggestions, which will help to improve this product as well as the document and make it more user friendly

Important Notes

Instrumentation Health Tips

Taking care of your equipment is just as important as buying the best equipment. So simply take the following precautions and ensure a long, trouble- free service from your temperature measurement and control system.

Use

- Three wire system for connecting Pt-100 sensor to the instrument.
- Same area of cross section for all the three wires.
- Appropriate compensating cables for connecting T/C to an instrument
- Appropriate Thermally conductive media between Thermowell & sensor sheath.
- Proper sheathing material as per application and environment.
- Proper size crimped wire termination lugs with insulated sleeves & ferrule no's.
- Proper size screw driver for making connections to the terminations and also while adjusting calibration and set points.
- Fuses of correct ratings for mains and relay outputs.

Do's

- Sensor cables must be isolated from power cables.
- Insert minimum required sensitive length in the measurement object.
- Operating temperature should be 80 % of the maximum specified temperature.
- Check that all the wiring is firm and as per wiring diagram.
- Recalibrate instruments only when errors are confirmed with the help of certified calibrators.
- Output loads connected should be within specified limits.
- Provide proper Earthing to Instrument / Instrumentation Panel.
- Select a Sensor / Instrument / Instrumentation Panel manufacturer who has the required technical knowledge and infrastructure inhouse.

Avoid

- Terminal joints or junction boxes for sensor cables.
- Exposure of thermocouple head to temperatures greater than 90°C.
- Too large sheath diameter as this may introduce time lag.
- Mechanical stresses and vibrations.
- Sharp objects for operating front panel membrane keys.
- Excessive relative humidity at installation place.
- Magnetic field / inductive pick up / noise.
- Excessive Ambient temperature at installation place.
- Direct radiant heat on instrument.
- Corrosive gasses in the surroundings.
- Chemicals or pressure wash for cleaning instruments.
- Excessive tightening of mounting accessories.
- Excessive light from being incident on displays.

Introduction

ESD - 201

In any Process Control system when the distance between the sensor location and the control room (where the Instrument is actually located) is too large then the transmission of mV / Resistance signal may not be technically and economically viable. In such circumstances process transmitters play a very crucial role.



In case a user desires to use a single sensor output for multiple instruments like recorders, controllers, indicators etc. then a transmitter can be employed for this purpose.

In case of transmitters a low level input signal from field sensor is converted to a proportional 4-20 mA current signal which is ideal for driving indicators / controllers / scanners / recorders / computers or any other instrument in series.

The ESD 201 series accepts inputs from current transformer. Wide range application is possible depending on the sensor used. The instrument is immune to mechanical vibrations. Even the mounting position will not affect the measurement accuracy.

Use of highly reliable electronic components with low tempcoefficient ensure long and trouble free service. The instrument is tested for its performance under various climatic conditions.

Principle Of Operation

The ESD 201 series is based on the principle of converting the output signal generated by the transducer to current.

Sensor compensation circuit, is achieved. Duly compensated signal is fed to a signal conditioning amplifier.

Features :

- Proven field performance
- Highly compact
- Din Rail mounting
- Dust and vermin proof enclosure with epoxy powder coating.
- Fast response time
- Maximum MTBF and minimum MTTR

Look-up Table

Temperature V/s Sensor output

Temp in °C	Pt-100 Res. in Ω	T/C Output in mV (Reference junction at 0°C)			
		Fe-Ko (J)	Cr-Al (K)	Pt-Pt-13% Rh (R)	Pt-Pt-10% Rh (S)
-150	39.71	-6.499	-4.912	-	-
-100	60.25	-4.632	-3.553	-	-
-50	80.31	-2.431	-1.889	-	-
-25	90.13	-1.239	-0.368	-	-
0	100.00	0.000	0.000	0.000	0.000
10	103.90	0.507	0.397	0.111	0.055
15	105.85	0.762	0.597	0.082	0.084
20	107.79	1.019	0.798	0.171	0.113
22	108.57	1.122	0.879	0.123	0.125
24	109.35	1.225	0.960	0.135	0.137
26	110.12	1.392	1.041	0.147	0.148
28	110.90	1.432	1.122	0.158	0.161
30	111.67	1.536	1.203	0.232	0.173
32	112.45	1.640	1.285	0.183	0.185
34	113.22	1.745	1.366	0.195	0.197
36	113.99	1.849	1.468	0.207	0.210
38	114.77	1.994	1.529	0.220	0.222
40	115.54	2.058	1.611	0.296	0.235
50	119.40	2.585	2.022	0.363	0.299
60	123.24	3.115	2.436	0.431	0.365
70	127.07	3.649	2.850	0.501	0.432
80	130.89	4.186	3.266	0.573	0.502
90	134.70	4.725	3.681	0.643	0.573
100	138.50	5.268	4.095	0.723	0.645
120	146.06	6.359	4.919	0.879	0.795
140	153.58	7.457	5.733	1.041	0.950
160	161.04	8.560	6.539	1.208	1.109
180	168.46	9.667	7.338	1.380	1.273
200	175.84	10.777	8.137	1.557	1.440
250	194.07	13.553	10.151	2.017	1.873
300	212.02	16.325	12.207	2.498	2.323
350	229.67	19.089	14.292	2.997	2.786
400	247.04	21.846	16.395	3.511	3.260
500	280.90	27.388	20.640	4.580	4.234
600	313.59	33.096	24.902	5.696	5.237
700	345.13	39.130	29.128	6.860	6.274
800	-	-	33.277	8.072	7.345
900	-	-	37.325	9.203	8.448
1000	-	-	41.269	10.503	9.585
1100	-	-	45.108	11.846	10.754
1200	-	-	48.828	13.224	11.947
1300	-	-	-	14.624	13.155
1400	-	-	-	16.035	14.368
1500	-	-	-	17.445	15.576
1600	-	-	-	18.842	16.771

$$^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$$

$$^{\circ}\text{K} = 273.15 + ^{\circ}\text{C}$$

Calibration Procedure :

Warning: This procedure is to be carried out strictly by technical persons as per instructions given in this manual.

The instrument is calibrated at the factory using accurate calibrating equipment traceable to international standards. No calibration should be required in normal course, however if the instrument requires recalibration, the procedure to be followed is given below.

Switch on the supply and allow 5 min. to achieve thermal stability and proceed as follows. (consider range 0 to 1 Amps)

1. Remove the sensor from its terminals and connect a stable AC current source in its place.
2. Connect a calibrated milli Ammeter to the output terminals with proper polarity.
3. Feed signal corresponding to Lower limit of range (0 Amp).
4. The Ammeter should show 4 mA (0mA for 0-20mA range).
5. If the displayed mA on Ammeter is incorrect turn the potentiometer marked 'ZERO' to get correct reading on the display (Clock Wise - CW - to increase & Counter Clock Wise - CCW - to decrease).
6. Feed signal corresponding to Upper limit of range (1 Amp)
7. The Ammeter should show 20 mA.
8. If the displayed mA on Ammeter is incorrect turn the potentiometer marked 'SPAN' to get correct reading on the display (CW to increase & CCW to decrease).

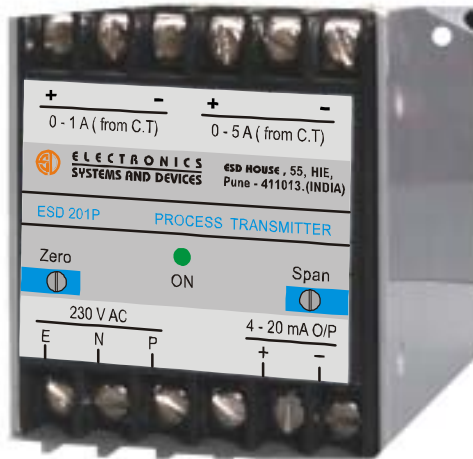
Repeat steps 3 to 8 till there is zero error at both calibration points.

Specifications

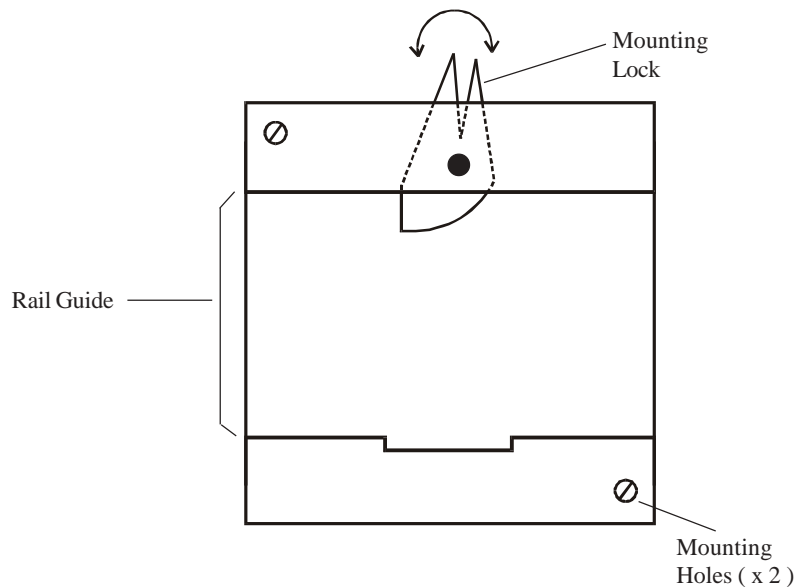
Model	: ESD 201
Inputs	: One
Input	: 0 to 1 Amp or 0 to 5 Amp from Current Transformer
Accuracy	: +/- 0.5 % of FS
Output	: 4 - 20 mA or 0 - 20 mA / 0 - 10 V DC
Max. Load	: 600 Ω
Power supply	: 230 V AC, +/- 10 % , 50 Hz with Earth
Ambient Temp. range	: 0 to 55 °C
Amb. Temp. compensation	: Built in upto 55 °C (for T/C)
Relative Humidity	: 90 % Non Condensing
Weight	: 400 grams approximately
Mounting	: DIN Rail
Dimensions (overall)	: 70 (L) x 60 (W) x 110 (H) mm

Illustrations

Top View



Bottom View



Installation Procedure :

Also observe **Instrumentation Health Tips** page 10

The instrument should be mounted in a place where it is clearly visible and accessible.

1. Make connections as shown in connection diagram (page 6) .
2. Mount the instrument as close to the current transformer as possible.
3. Ensure proper earthing to the instrument.
4. Output load connected should be less than the maximum specified load. (600 Ω)
5. Connect a series combination of 0.1 μF /600 V non polarised capacitor & 220 Ω 1/2 W resistor across phase & neutral.



Check the calibration of the instruments every six months. In case of error recalibrate using certified calibrators to ensure precise & accurate monitoring and control of process parameters.