ELECTRONICS
SYSTEMS AND DEVICES
Process Control Instrumentation

FLAMEPROOF CONTROLLER
ESD 921Exp

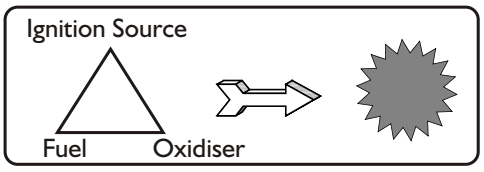
INTRODUCTION

Temperature indicators / controllers play an important part in any process industry. Quick and accurate measurement of process temperature will improve the final product quality, reliability and reduce rejection.

Temperature indicators / controllers may be installed in a variety of surroundings. However installation of electrical / electronic equipments in hazardous locations needs special considerations.

A hazardous location may be defined as one where combustible gases, vapours, fumes or dust particles are present in explosive proportions. On such locations the condition that may lead to fire or explosion is the presence of the following at the same time :

1) Flammable liquid, vapour, gas, dust or fibre in an ignitable concentration.
2) Oxidizing Media.
3) Source of ignition.



It is for such applications that ESD offers temperature indicators mounted in Explosion proof housings. However it may be noted that the specific precautions vary with the degree of hazard and the probability of it's presence.
The ESD 92 series Digital temperature indicators / Controllers are designed for fast and accurate temperature measurement. The instrument is designed using highly reliable electronic components. The process temperature is displayed directly in digits, which gives better resolution compared to analog indicator.

Our explosion proof enclosures are certified by CMRI Dhanbad and are suitable for Class I / II and group A, B.
Class I : Combustible material in the form of gas or vapour
Class II : Combustible material in the form of dust
Group A : Acetylene.
Group B: Hydrogen or similar hazardous gases.
The ESD 92 series accepts all types of Pt - 100, Thermocouples, 0 - 20 mA as well as 4 - 20 mA as input . Wide ranges of measurements are available depending on the sensor used.
The instrument is immune to mechanical vibrations. Even the mounting position will not affect the measurement accuracy. The large bright red LED seven segment display allows long distance readability. Use of highly reliable electronic components with low temperature coefficient ensure long and trouble free service. The instrument is tested for its performance under various climatic conditions.

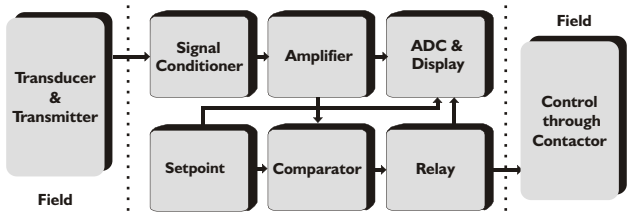
APPLICATION

Designed specially for work under hazardous conditions where possibilities of fire and explosion are extremely high e.g. Chemical reactors, Petroleum industry, etc

FEATURES

- ✓ Proven trouble free field performance
- ✓ Highly compact
- ✓ Explosion proof housing certified by CMRI (Dhanbad)
- ✓ LED display gives better readability at long range
- ✓ Fast response time
- ✓ Designed for Pt-100, Thermocouples and 4 - 20 mA input
- ✓ Maximum MTBF and minimum MTTR
- ✓ Wide supply variation and environmental band

PRINCIPLE OF OPERATION



The ESD 92 Exp series is based on the principle of a high input impedance amplifier feeding an analog to digital convertor. The input signal generated by the transducer is fed to a sensor compensation circuit, where automatic ambient compensation in case of thermocouple & lead resistance compensation in case of Pt-100 is achieved. Duly compensated signal is fed to a signal conditioning amplifier, output of which is given to digital display. The linearisation of the input signal from the transducer is done by hardware in the input circuit. This gives a standardized signal to the analog to digital convertor which drives the seven segment LED display, indicating the temperature directly.

SPECIFICATIONS

Model	: ESD 921 Exp
Ranges	: Std. as per chart below(other on demand)
Input	: Pt - 100 / Thermocouple / 4 - 20 mA
Indication	: 199.9 12.5 mm RED LED display
Indication accuracy	: +/- 0.5 % of full scale +/- 1 digit
Least count	: 0.1°C up to 200°C, 1°C above 200°C
Power supply	: 230 V AC, +/- 10 % , 50 Hz with earth
Relative humidity	: Less than 90 % non condensing
Ambient temperature	: 0 to 55°C
Amb. Temp compensation	: Built in up to 55°C
Accuracy deviation due to	
a) Temperature change	: +/- 0.002 %/°C , ref at 25°C
b) Supply variation	: +/- 0.001 % / V
Set points	: 1 (through ten turn potentiometer)
Set point read	: By pressing self release switch
Set point adjust	: By pressing self release switch and simultaneously turning set potentiometer
Outputs	: 1 set of potential free relay change over contact 1or 5 Amp resistive at 230V AC
Relay logic	: 1. Actual temp. < set point - Relay ON for heating application (factory set) 2. Actual temp. > set point - Relay ON for cooling application (on demand)
Relay ON indication	: 3 mm RED LED
Control sensitivity	: 0.25% of full scale
Sensor break indication	: Up scale [1 _ _ _] (down on demand)
Sensor break protection	: Relay 'Off' (relay 'On' by demand)
Input impedance	: < 10 Mohms, (only for T/C input)
Recalibration (if reqd)	: By zero and span potentiometers inside
Power consumption	: 5 VA
Mounting	: Wall
Enclosure	: IP 65 CMRI certified in die cast aluminium suitable for flameproof classification Group II A, II B temperature type B
Termination	: Screwed type suitable for 2.5mm^2 wire
Weight	: 4 kg approximately
Dimensions (mm)	: 420(H) x 235 (W) x 190 (D)
Cable glands	: 3 nos. of double compression ½"NPT flameproof glands

ORDERING INFORMATION

ESD 921Exp

X1 — Input
- **1 - Pt - 100**
- 2 - J type T/C
- **3 - K type T/C**
- 4 - R type T/C
- 5 - S type T/C
- 6 - 0 to 20 mA
- **7 - 4 to 20 mA**
- 8 - 0 to 2V DC
- 9 - Other

X2 — Range
- **0 - -50 to 50°C**
- 1 - 0 to 100°C
- 2 - 0 to 200°C
- 3 - 0 to 100%
- 4 - 0 to 400°C
- 5 - 0 to 600°C
- 6 - 0 to 800°C
- 7 - 0 to1000°C
- 8 - 0 to1200°C
- 9 - Other

X3 — Relay Output
- **1- 1 C/O 5 Amp**
- 2 - 1 C/O 10 Amp
- 3 - 2 C/O 5 Amp
- 4 - Other

X4 — Power Supply
- **1 - 230 V AC**
- 2 - 110 V AC
- 3 - 24 V AC
- 4 - 24 V DC
- 5 - Other

Input	Standard Ranges in °C		
Pt-100	-50 - 50	0 - 100	0 - 200
J	0 - 200	0 - 400	0 - 600
K	0 - 200 0 - 800	0 - 400 0 -1000	0 - 600 0 - 1200
R, S	800 -1600		
mA / mV	0 to 100 % or process value		

ALSO SELECT ESD ...

BACK END
- ✓ Pt - 100
- ✓ Thermocouple
- ✓ Thermowells
- ✓ Compensating Cables

SAME RANGE
- ✓ Single Setpoint Controllers
- ✓ Two Setpoint Controllers
- ✓ Multi Setpoint Controllers
- ✓ Dual Channel Controllers
- ✓ Multi Channel Controllers
- ✓ Blind Controllers
- ✓ Supersize Controllers

FRONT END
- ✓ Alarm Annunciators
- ✓ Automation Panels

ELECTRONICS SYSTEMS AND DEVICES
Process Control Instrumentation

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Unspecified dimensions are in mm. Photos not to the scale. Due to continuous development above details are likely to change.