Sensata SC20-ALM Loop Powered Isolating Trip Amplifier Installation Guide

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Contents

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Safe Installation and Operation Guide

⚠ **CAUTION:** This equipment is designed for possible connection to mains voltages (110V ac relay version) and must be used in accordance with this guide. If it is not, the safety protection provided by the equipment may be impaired.

⧈ This equipment relies on double/reinforced insulation for safety and does not require protective earth.

INTRODUCTION

This unit is intended to accept a 4-20 mA current signal and provide a single pole normally open solid state relay contact output. An internal switch is used to select contact closure either above or below a set point which can be adjusted by a 20-turn front panel potentiometer and measured with a voltmeter.
The power for the device is derived from the 4-20 mA input loop.

IMPORTANT

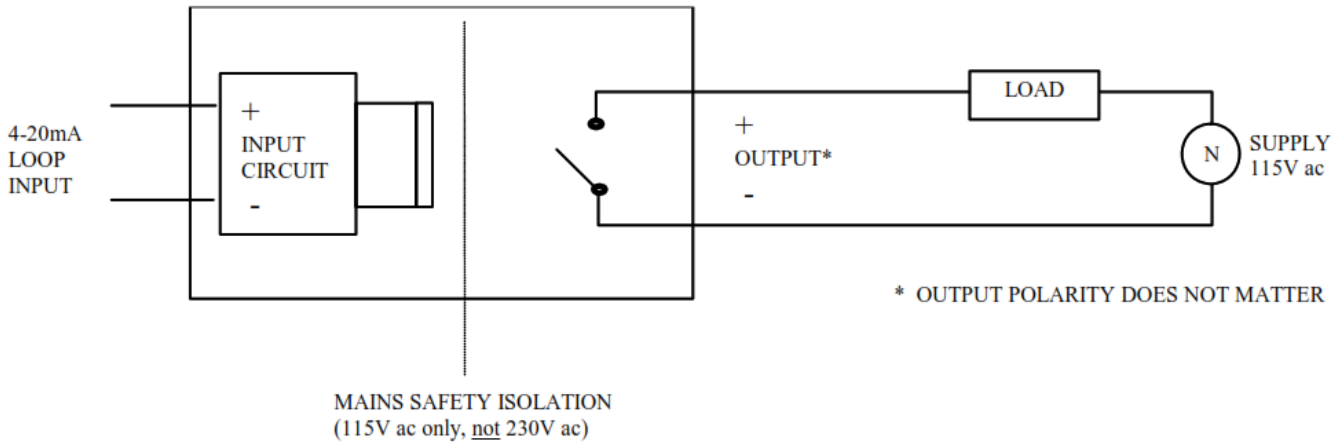
Two different relay output options exist on the SC20-ALM:

a) 24V ac/dc @ 300mA

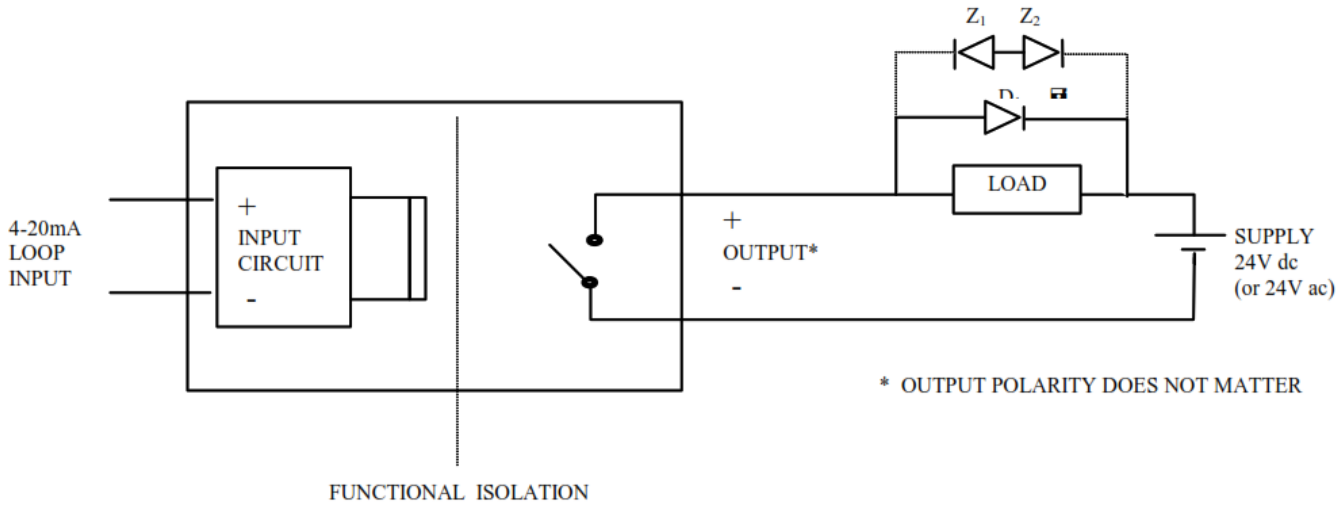
NB Voltages above 100V peak will destroy the relay. The use of freewheel/clamp diodes across the coils of external relays and other inductive loads is recommended.

b) 110/115V ac @ 130mA

NB The 110V rated output is internally protected against overvoltages up to 500V and no external clamp devices will generally be necessary. This relay type will not work with dc loads.



BLOCK DIAGRAM: 110/115V ac RELAY VERSION



*** OUTPUT POLARITY DOES NOT MATTER**

D1 RECOMMENDED TO CATCH BACK EMF FOR INDUCTIVE LOADS (dc supply) OR Z1 & Z2 (56V, 1W) (ac supply)

BLOCK DIAGRAM: 24V ac/dc RELAY VERSION

UNPACKING AND INSPECTION

Please inspect the instrument carefully for signs of shipping damage. The unit is packaged to give maximum protection but we cannot guarantee that mishandling will not have damaged the instrument. In the case of this unlikely event:

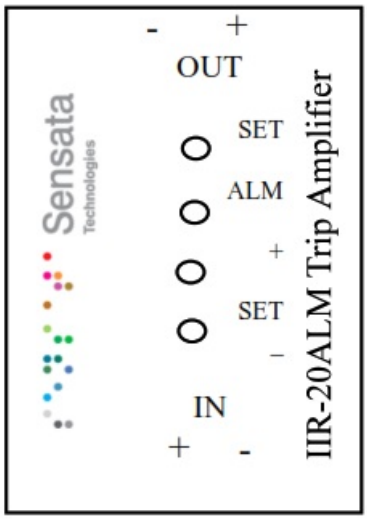
i) Do not use the instrument – physical damage may have compromised the safety insulation.
ii) Please contact your supplier immediately and retain the packaging for subsequent inspection. Assuming the unit is undamaged please check the side label as follows: On one side of the enclosure you will find the serial number label, an example of which is shown below:

Sensata Technologies	CE
PART NUMBER	SC20-ALM
INPUT	4-20mA
RELAY RATING	115V ac50/60 Hz130mA
RELAY ACTION	R > SP
SERIAL No.	ALM97-123

Please check that all the parameters are correct, especially, the Relay Rating.

WIRING CONNECTIONS AND INSTALLATION

On the front panel label, you will find the connection details for the 4-20 mA loop input and relay contacts. Please study this carefully to ensure that the unit will be wired correctly. In particular please note the following; especially in the case of the 110V ac relay option:



This symbol indicates that the unit is of Class II construction – i.e. it provides double insulation between relay contacts and 4-20 mA input wiring inside the enclosure. It is up to the installer to preserve this level of insulation outside the unit.

This symbol means CAUTION! refer to this guide.

It is recommended that bootlace ferrules are used on all wiring terminations. In any case, the maximum terminal torque of 0.4Nm must not be exceeded. If it is the resulting damage to the terminal blocks and internal connections could compromise the integrity of the safety insulation. If in doubt get a smaller screwdriver.

3.1 CONNECTIONS

IN- 4-20mA Input -ve	The conductor of the 4-20 mA loop is normally at a more ve potential.
IN+ 4-20mA Input +ve	The conductor of the 4-20 mA loop is normally at a more+ve potential.
OUT-Relay Output -ve	Relay output contacts. Polarity is unimportant.
OUT+Relay Output +ve	Relay output contacts. Polarity is unimportant.

3.2 NOTES ON PROCESS INPUTS AND OUTPUTS

a) Operational

CAUTION! The input is protected to a current of 30 mA. The input will be damaged by the application of any voltage source which is not limited to or fixed at less than 30 mA. See Section 1 of this guide for comments regarding the protection of the relay output.

b) Safety

The input circuit is classed as Separated Extra Low Voltage (SELV). This means that it must not be externally connected to voltages exceeding 30V ac or 60V dc, nor does it generate voltages above these limits internally. For the 110/115V ac relay version the output circuit is classed as hazardous live and must be treated accordingly.

3.3 INSTALLATION (and removal)

The 20-ALM unit clips directly onto the 'Top Hat' (TS35) symmetrical DIN rail or TS32 asymmetrical G-rail. Mounting orientation is not important. Ensure the ambient temperature is below 55 o C. NOTE: Good airflow around the unit will maximize reliability. The use of bootlace ferrules is recommended on wiring terminations. Do not exceed the terminal torque rating of 0.4 Nm – Use an appropriate screwdriver. This unit can be removed from the DIN rail by gently levering the protrusion on the DIN rail clip up from the top of the rail (assuming the unit is mounted vertically and upright) with a small screwdriver and lifting the top away from the DIN rail.

OPERATION

The 20-ALM unit has the following front panel components:

(i) ALM LED

This will be lit when the relay output contacts are closed (i.e. in the 'ALARM' condition)

(ii) Set Potentiometer

This is a 20-turn device and adjusts the set point from below 4 mA (fully counter-clockwise) to above 20 mA (full clockwise). The set point can be monitored on the 'SET' terminals.

iii) SET Terminals + and

A voltage of 0.4 – 2.0V corresponds to a 4-20mA span.

The relay set-up is indicated on the serial number label as follows:

R > SP means the relay will close above the set point

R < SP means the relay will close below the set point

To change the relay action, gently lever off the side of the unit with the serial number label on it:

Switch button closest to DIN rail clip: R > SP

Switch button furthest from DIN rail clip: R < SP

WARNING

Always isolate the output voltage before opening the unit.

ELECTRICAL AND ENVIRONMENTAL SPECIFICATION

5.1 POWER SUPPLY AND INSTALLATION CATEGORY:

Installation Category (according to IEC 664):II* (applies to 110/115V ac relay version only)

Pollution Degree (according to EN61010-1 1993): 2

Relay voltage (stated on serial no label):24V ac/dc nominal or 115V ac nominal

Power consumption: Loop supply = 30mA @ 3.5V maximum

Equipment Class (according to IEC 536): II

External fusing requirement (minimum): Not required

5.2 ENVIRONMENTAL CONDITIONS (units are for indoor use):

Operating altitude:	Sea level to 2000m
Operating temperature:	0 to 55 o C
Storage temperature:	– 40 to +70o C
Operating/storage humidity	0 to 90% RH

If it is required to exceed any of these parameters, please contact the factory.

5.3 COMPLIANCE WITH EUROPEAN COMMISSION DIRECTIVES:

The SC20-ALM units comply with the following directives:

EMC	BS EN61326
LVD Standard	EN61010-1

Documents / Resources

	Sensata SC20-ALM Loop Powered Isolating Trip Amplifier [pdf] Installation Guide SC20-ALM Loop Powered Isolating Trip Amplifier, SC20-ALM, Loop Powered Isolating Trip Amplifier, Isolating Trip Amplifier, Loop Powered Trip Amplifier, Trip Amplifier, Amplifier