



The self-powered SD-50X uses a 4–20mA loop to generate its own power source.

It can be used to measure a wide variety of process variables, including flow, level, pressure and temperature.

- › Simple front panel calibration
- › Easy scaling using two input values
- › Displays up to 50,000 counts
- › Easy to read LCD display
- › Low cost
- › High accuracy

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1

SPECIFICATIONS

Powered from 4–20mA current loop input signal. Min input 3.5mA, max continuous input 100mA. 3.4V drop + 20Ω (equivalent to 3.9V at 20mA). Typically load is 200Ω.

Full scale ranges standard meter is adjustable to any display span between -19,999 and +30,000. Max resolution (50,000 counts) from any signal input span between 3.5 and 27.5mA.

A/D converter 16 bit Sigma Delta

Accuracy ±0.02% of reading (plus 2 digits)

Temperature coefficient typically 30ppm/°C (plus 0.1 counts/°C for zero offset).

Conversion rate 3 readings per second

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CASING, DISPLAY & CONNECTIONS

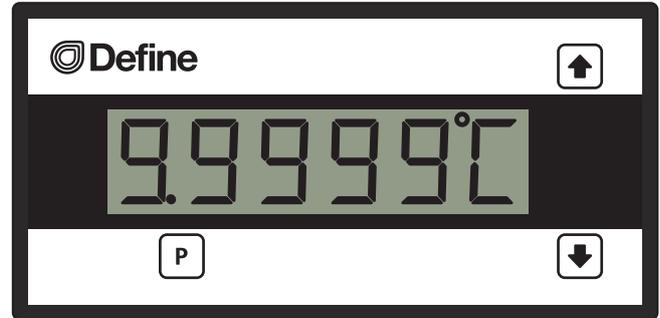
2.1 - Casing & display

Dimensions 47 x 95mm (1.85 x 3.74")
29mm (1.14") depth behind panel

Panel cutout 45 x 92mm (1.77 x 3.62")
Max panel thickness 7mm (0.28")

12.6mm LCD display 5 digits + descriptor digit (select dummy zero/°C/°F).
6 decimal point positions (see 3.2)

Display range -19,999 to 30,000
Over range display shows - - - - -
Under range display shows _ _ _ _ _



2.2 - DIP switches

Left DIP switch

Default setting 30000

6'th digit = °F 30000F

6'th digit = °C 30000C

6'th digit = dummy zero 300000

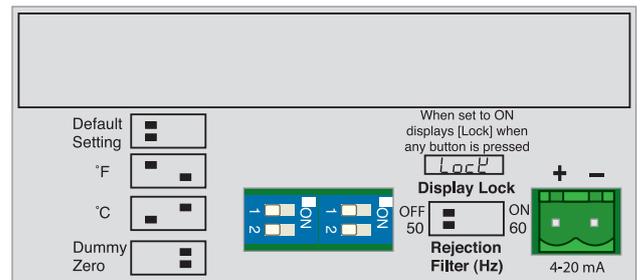
Right DIP switch

Display lock = Off

Display lock = On

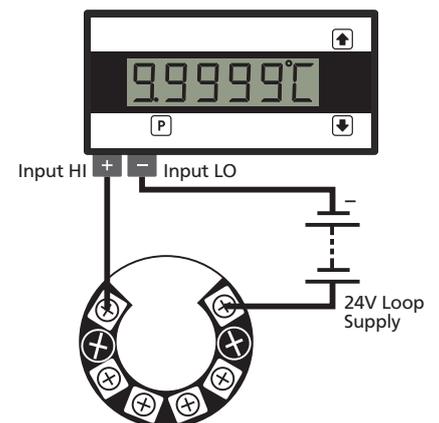
Rejection filter = 50Hz

Rejection filter = 60Hz



2.3 - Typical application connections

This diagram (right) shows the typical connection for an SD-50X display. The operational signal range of the meter is 4–20mA. The acceptable input signal range is from 3.5-27.5mA. The signal must have a compliance voltage of at least 4V (200Ω load).



Before you begin front panel setup, ensure that the DIP switch display lock is not on.

3.1 - Two point calibration & scaling

Any display value between -19,999 and 30,000 may be entered during calibration and scaling, but the maximum difference between the low and high display values cannot exceed 32,000 counts. Reverse scaling is accepted.

The input signal should be capable of adjustment between two output values for which the required display value is precisely known. Scaling can be accomplished with as little as 0.1mA difference between high and low input signals, however full scale accuracy usually requires at least a 4mA difference.

- A Press **[P]** and **[↑]** at the same time to enter the setup menu.
- B Use the **[↑]** and **[↓]** buttons to select **CAL ON**. Then press **[P]** once to accept and enter the low input mode.
- C **LO IN** appears on the display. Use the **[↑]** and **[↓]** buttons to adjust the display value to any reading between **-19,999** and **30,000**. Apply the 4mA low input calibration signal to the meter. Then press **[P]** to accept the low input calibration value and proceed to high input mode.

If the input signal is disconnected after this step, the low input values are saved and the meter automatically returns to the high input mode when signal power is reapplied.

- D **HI IN** appears on the display. Use the **[↑]** and **[↓]** buttons to adjust the display value to any reading between **-19,999** and **30,000**. Apply the 20mA high input calibration signal to the meter. Then press **[P]** to accept the high input calibration value and go back to the operational display.

3.2 - Decimal point setting

- A Press **[P]** and **[↑]** at the same time to enter the setup menu.
- B Press **[P]** once to skip past calibration mode and enter decimal point mode.
- C Use the **[↑]** and **[↓]** buttons to adjust the decimal point to the desired position. Then press **[P]** to return to the operational display.

APPENDIX

A - Error handling

Calibration error display [CALERR] If the difference between the high and low input signal is less than 0.1mA, or if the difference between the [HI IN] and [LO IN] exceeds 32,000 counts, the meter displays [CALERR]. The previously calibrated scale factor is restored.

Loss of input signal power during calibration If the input signal is disconnected, after the LOW input signal has been applied and the **[P]** button pressed, the [LO IN] value will be retained. When the signal power is reapplied, the meter automatically returns to the calibration [HI IN] mode. This feature is useful when the calibration signal cannot be adjusted between two known values without disconnecting.

Memory error display [EE Err] This indicates that the memory has been corrupted. Memory errors are usually caused by a faulty 24V DC power supply (only use an Instrument Quality power supply), or

by disconnecting from the power supply during programming. To clear this error, press the **[P]**, **[↑]** and **[↓]** buttons at the same time for a few seconds. This will reset the meter, clearing all errors and necessitating recalibration.

B - Proportional scaling

There is a 32,000 count maximum difference permitted between the [Lo in] and [hi in] display values selected during calibration. To have a display span greater than 32,000, it is necessary to proportionally scale and calibrate the meter at less than the full input signal span.

E.g. Proportional scaling at 50% of full scale: An input of 4–20mA is required to read -19,999 to +30,000. The signal span is 16mA and the display span needed is 50,000 counts. A signal change from 12mA to 20mA (8mA=50% of signal span) produces a display change from 5,000 to 30,000 (a 25,000 count change). With a [Lo in] signal of 12mA set to 5,000, and a [hi in] signal of 20mA set to 30,000, the display will then read from -19,999 to +30,000.

Or, with a [Lo in] signal of 4mA and the display set to -19,999, and with a [hi in] signal of 12mA and the display set to +5,000, the meter will display between -19,999 and +30,000.

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