

The SD-50X is an ideal self-powered meter that uses a 4-20mA loop to generate its own power source. It can be used to measure process variables such as flow, level, pressure and temperature.



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

SD-50X Specifications

Input configuration series connection to 4-20mA DC current loop. 3.4V drop, plus 20 Ω (equivalent of 3.9V at 20mA).

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 $\pm 0.02\%$ of reading (plus 2 digits)

Temperature coefficient typically 30ppm/ $^{\circ}\text{C}$ (plus 0.1 counts/ $^{\circ}\text{C}$ for zero offset).

Conversion rate 3 readings per second

Display 12.6mm Liquid Crystal Display

Descriptors Dip-switch selectable dummy zero/ $^{\circ}\text{C}/^{\circ}\text{F}$

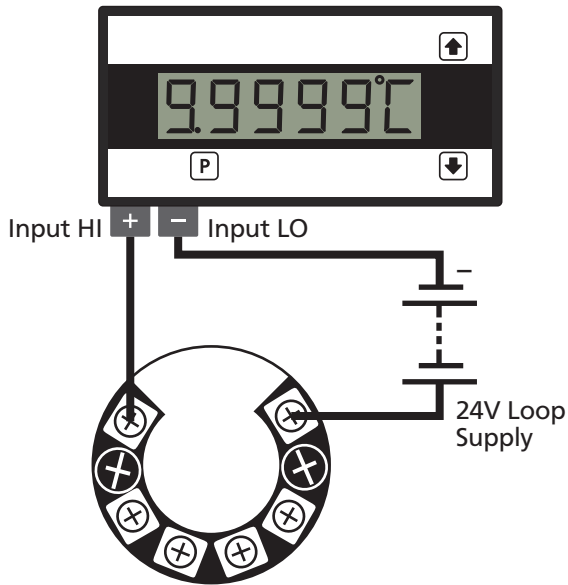
Decimal point user programmable to six positions

+/- Over-range Display shows - - - - -

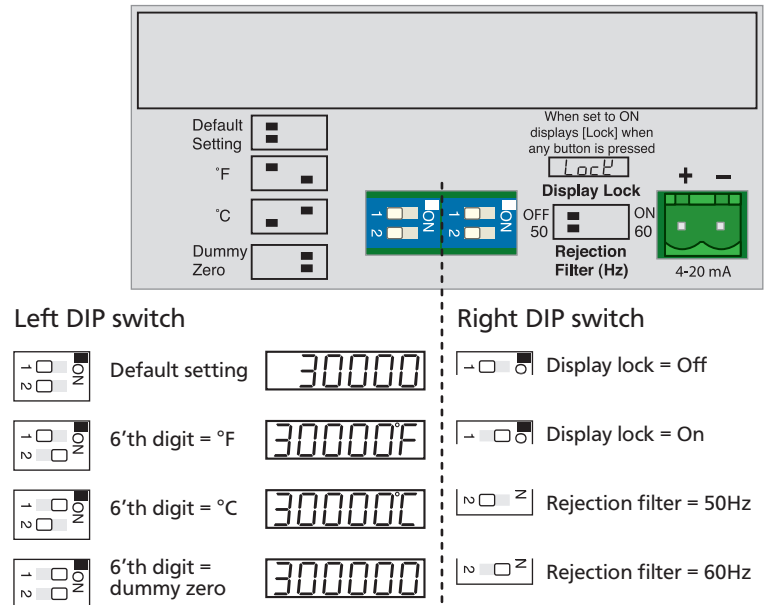
Powered from the 4-20mA current loop input signal. Min input 3.5mA, max continuous input 100mA. 3.4V drop plus 20 Ω (equivalent to 3.9V at 20mA). Typically load is 200 Ω .

Case dimensions 95x47mm. (29mm depth behind panel, including connector). 92x45mm panel cutout

Typical Application Connections



Dip Switch Settings



Two Point Calibration & Scaling

Before you begin, ensure that the DIP switch LOCK is not on.

1. Press **P** and **Up** at the same time to enter the *Setup Menu*.
2. Use the **Up** and **Down** buttons to select [**CAL ON**].
3. Press **P** once to enter the *Low Input* mode.
4. [**LO IN**] appears on the display. Use the **Up** and **Down** buttons to adjust the display value to any reading between -19,999 and 30,000.
Note that the maximum display span is 32,000 counts. Reverse scaling is accepted.
5. 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.
6. [**HI IN**] appears on the display. Use the **Up** and **Down** buttons to adjust the display value to any reading between -19,999 and 30,000.
Note that the maximum display span is 32,000 counts. Reverse scaling is accepted.
7. 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.

Decimal Point Setting

Before you begin, ensure that the DIP switch LOCK is not on.

1. Press **P** and **Up** at the same time to enter the *Setup Menu*.
2. Press **P** once to skip past the *Calibration Mode* and enter *Decimal Point Setting* mode.
3. Use the **Up** and **Down** buttons to adjust the decimal point to the desired position.
4. Press **P** once to return to the operational display.

Min/Max Ranges

Min/Max input signal range and compliance voltage

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). For scaling and calibration, 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.

Maximum display readings

The display range is -19,999 to +30,000. If the display exceeds these limits it shows _ _ _ _ _ for over-range, or _ _ _ _ _ for under-range.

Maximum range of input values for calibration

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.

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 retained in memory.

Loss of input signal power during calibration

If the input signal is disconnected, after the LOW input signal has been applied and the Prog button pressed, the [LO IN] value will be retained. When the signal power is re-applied, 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]

[EE Err] 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**, **Up** and **Down** buttons at the same time for a few seconds. This will reset the meter, clearing all errors and necessitating recalibration.

Proportional Scaling

Spans exceeding 32,000 counts of display require proportional scaling

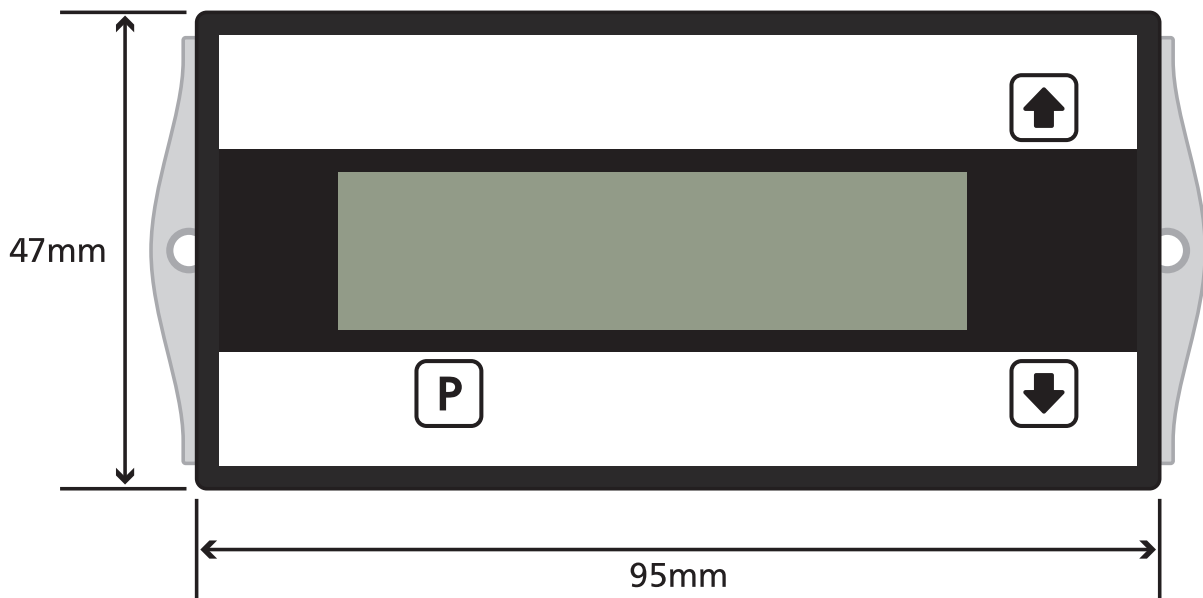
There is a 32,000 count maximum difference permitted between the [Lo in] and [hi in] display values selected during calibration. To have a display span greater than 32,000, it is necessary to proportionally scale and calibrate the meter at less than the full input signal span.

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.

Case Dimensions

Front view



Top view

(Maximum panel thickness = 7mm)

