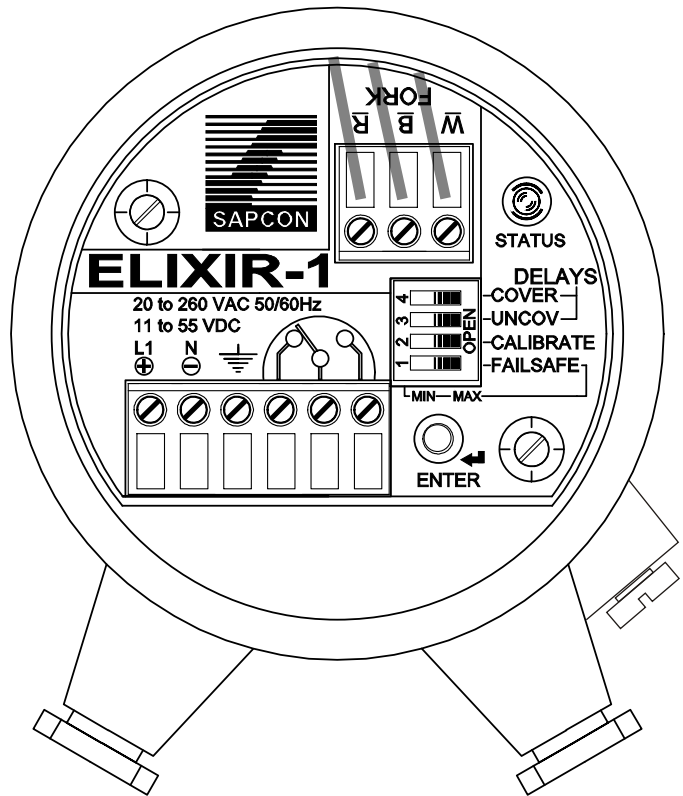
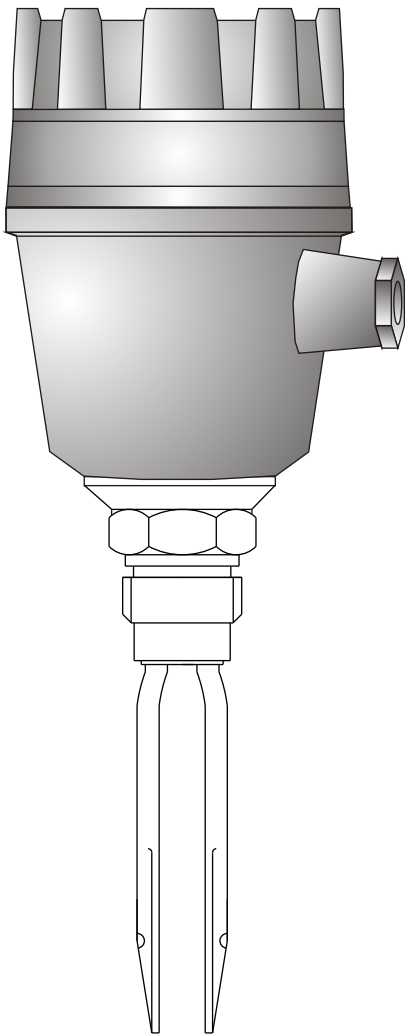


Vibrating Fork Liquid Level Limit Switch

Elixir

User's Manual



Elixir : MPSLF

ELIXIR- MPSLF Series' instrument is a Vibrating Fork Liquid Level Limit Switch. It is suitable for level detection in storage tanks, mixing containers and pipelines, for liquids that do not react with SS whose viscosity does not exceed 10000 cp and whose temperature lies within 0° to +80°C. It is suitable for most of the applications where float switches were previously employed, as well as in such places where float switches were not appropriate (due to deposit formation, turbulence, stresses and air bubbles).

TECHNICAL SPECIFICATIONS :

Housing	:	Cast aluminium weather & Flame proof suitable for mounting in hazardous area Gas Group IIA & IIB as per IS-2148
Mounting	:	Integral with Fork
Cable Entry	:	2 X 1/2" / 3/4" BSP / NPT, Brass
Gland type	:	Double Compression Gland
Mains	:	20 to 260VAC, 50/60Hz, 11 to 55VDC
Relay Output	:	One set of potential free c/o contacts rated at 6 amps, 230 AC for non-inductive loads
Time Delay Setting	:	Digital 1 to 20 seconds, Covered & Uncovered Both.
Mounting	:	Screwed - 1"/1-1/2" BSP/NPT (M) Flanged - (As per your order) Material - M S (Plated) / S S
Sensing	:	Fork, S S 316
Extension	:	Pipe, G I / S S
Material Temp. in Vessel	:	- 20 °C to 80°C/120°C/150°C
Response Time	:	0.5 secs.
Switching Indication	:	Bicolor LED, Red: Alarm, Green: Normal
Fail Safe Feature	:	Field Selectable (Minimum : Failsafe Low, Maximum : FS High)
Power Consumption	:	0.5 Watt Maximum
Tolerable Ambient Temp.	:	0 °C. to + 60 °C.
Frequency Change	:	Frequency in air : < 500 Hz (approx)
Minimum Liquid Density	:	0.7 gm/cm ³
Max. Viscosity of Liquid	:	10000 cp
Switching Hysteresis	:	5 mm (approx)
Overall Dimensions	:	Please refer enclosed probe drawing

Elixir : MPSLF

OPERATING PRINCIPLE :

A specially shaped Tuning Fork is kept vibrating by piezo electric elements. The resonant frequency of the fork changes when the tines are immersed in a fluid. The change in frequency is detected and used for switching a relay. The output contacts of the relay are in turn used for annunciation and/or control.

SYSTEM DESCRIPTION :

The Elixir level detecting system consists of a Microcontroller based Electronic Insert with Fork Probe. The instrument comprises of an Electronics & SS 316 Tuning Fork housed in a cast aluminum housing & provided with 02 nos. suitable cable entries. The Fork is of a special shape suitable for operating in liquids of specified range of viscosities. This is provided with either Screwed mounting or Flanged mounting suitable for installation on to a container or pipeline. Piezo ceramic elements are mounted inside the fork capsule and potted with epoxy compound for rendering them immune to dust, moisture and inflammable gases. The

INSTALLATION :

The Elixir MPSLF Series Probe can be installed in the vessel in almost any position. Previously existing bosses welded in any direction can be used. Since the probe can be screwed into a mounting socket suitable for supplied mounting threads and the fork length is comparatively short, it can be installed directly on pipes too. For liquids with higher viscosities, top mounting or side mounting with tines slanting downwards is preferred as then the viscous liquid can drip off faster when the level goes below the set point.

While installation of Probe, please take care of the following points:

The tine should not be bent nor should their dimensions be altered.

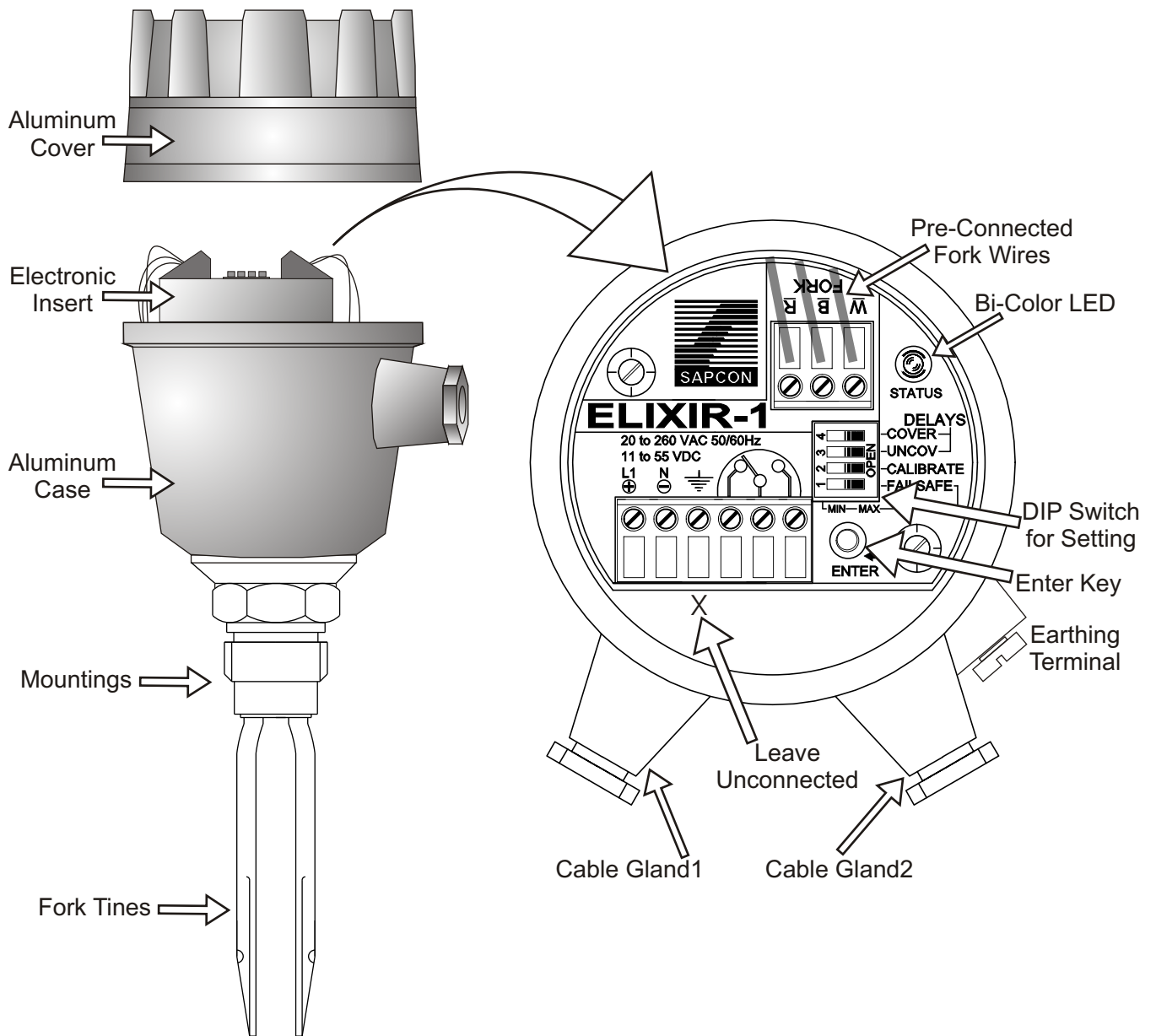
To prevent the ingress of moisture and water seepage in side mounting position, the cable entries should always point downwards.

Weatherproofness of enclosure is guaranteed only if the cover is in place & glands adequately tightened. Damage due to accidental entry of water can be avoided if the instrument is installed in a rain shade.

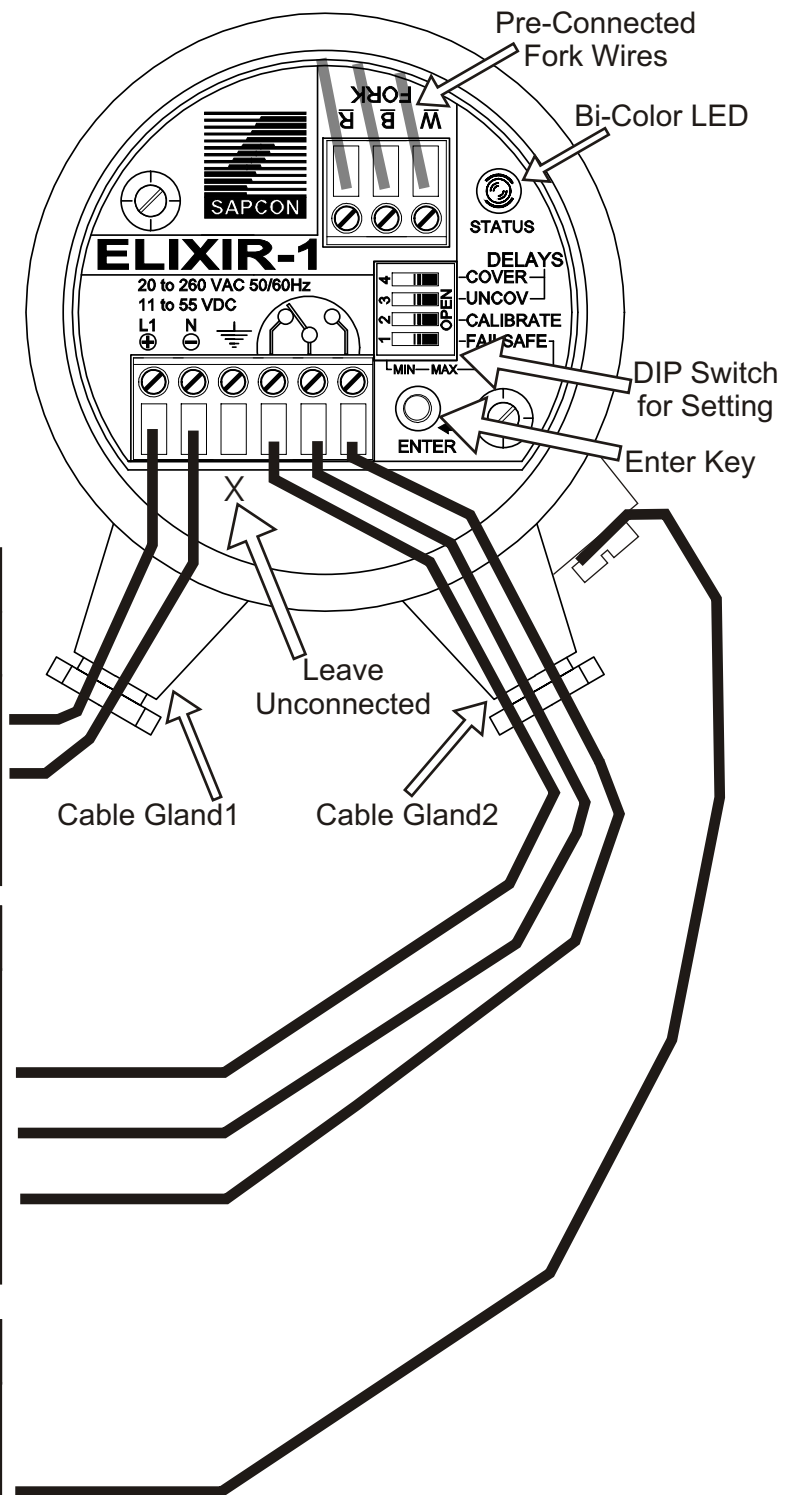
If the ambient temp. is high, the instrument should not be installed to receive direct sunlight. In case such a position of shade is not available, a heat shield should be fitted above the instrument especially if the operating temp. lies between +60 °C. & 80°C.

While screwing the Elixir MPSLF Series instrument, the hexagonal mounting bush should be turned and not the housing.

Elixir : Various Parts



Connection Diagram



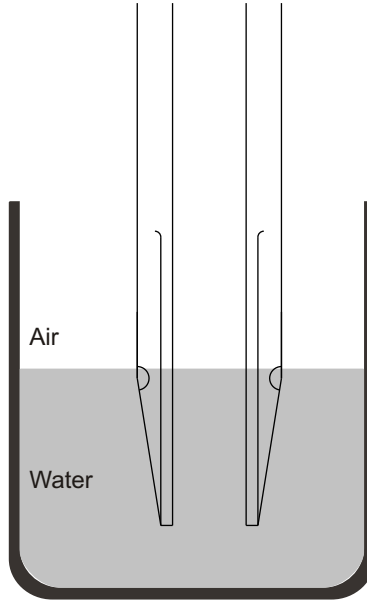
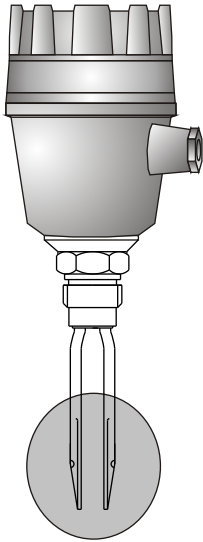
Supply Connection	
AC Supply	DC Supply
L1 (Live)	
N (Neutral)	
20VAC to 260VAC 50/60Hz	11VDC to 55VDC

Relay Contacts (Potential Free)	
Alarm Position for Covered in Maximum Failsafe Alarm Position for Uncovered in Minimum Failsafe	
	RED NC Terminal Pole
	GREEN NO Terminal
Normal Position for Uncovered in Maximum Failsafe Normal Position for Covered in Minimum Failsafe	

Earth

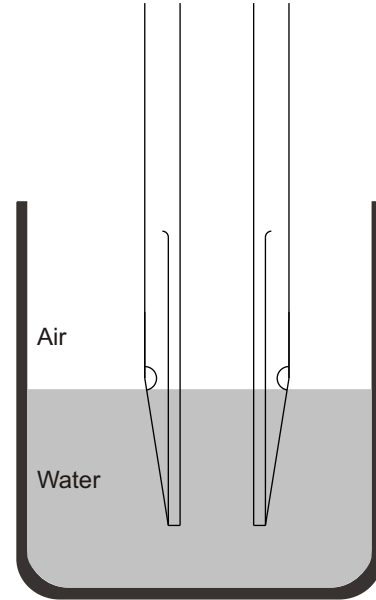
Calibration

Elixirs are factory calibrated for the water medium.
The switching point is at the notch for vertical mounting.



Covered

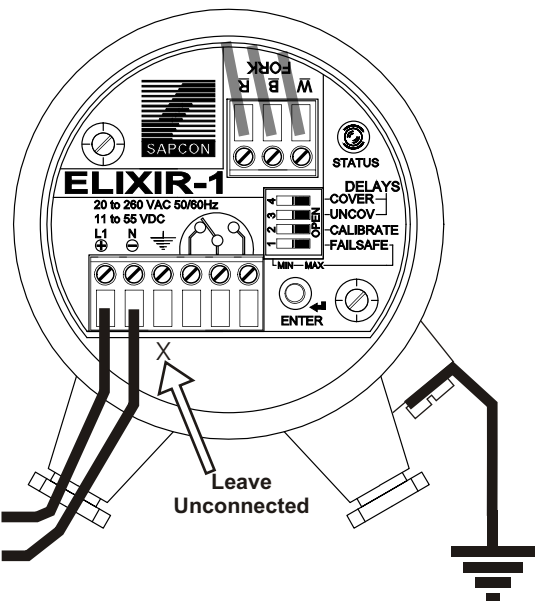
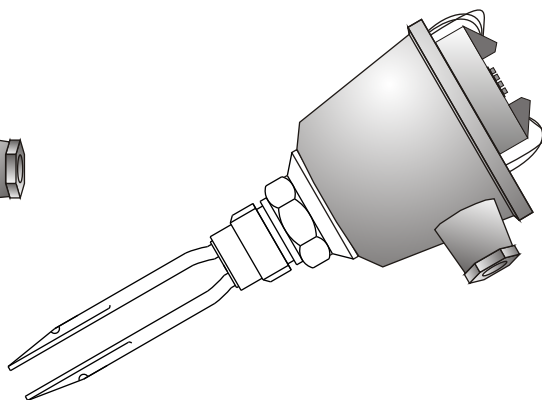
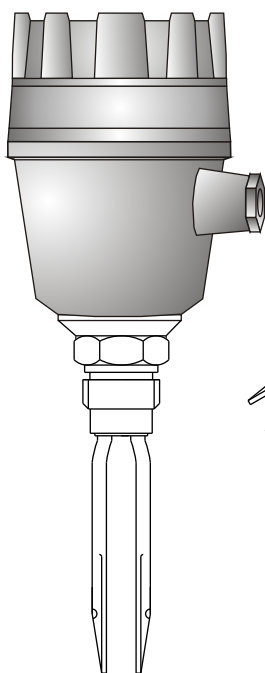
Alarm in Maximum Failsafe
Normal in Minimum Failsafe



Uncovered

Normal in Maximum Failsafe
Alarm in Minimum Failsafe

To Modify the factory supplied calibration, open the aluminum cover, connect the supply connections as shown in supplied connection diagram. (Note that earthing on **green terminal** should not be connected). Turn the supply on. The Vibration should be felt on the fork tines. These are very mild vibrations.



Supply Connection	
AC Supply	DC Supply
L1 (Live)	+
N (Neutral)	-
20VAC to 260VAC 50/60Hz	11VDC to 55VDC

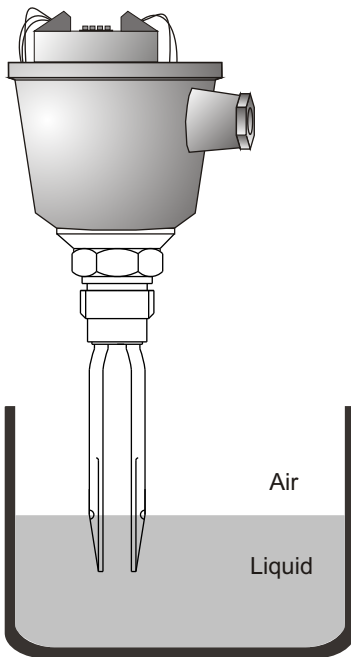
Calibration

Following example calibrates the Elixir at notch point for a given liquid.

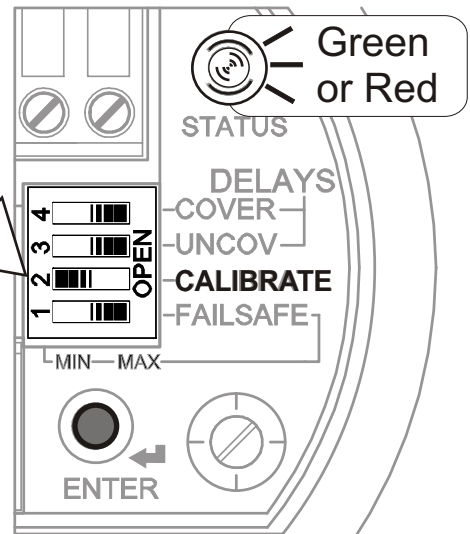
To start with calibration, Set Calibration Switch to close position (Close is opposite of OPEN on the DIP switch)

Make sure that Status LED is not blinking for Error. Read More about errors in Error Indication Section.

Dip the fork till the notch point



A Small screwdriver can be used for closing and opening of DIP switch



Then press ENTER

The Status LED will blink in RED color. Blinking indicates that Elixir is registering the switch point position. Keep ENTER key pressed for 4 to 5 blinks. Then release the ENTER key.

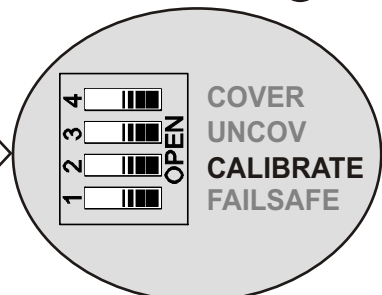
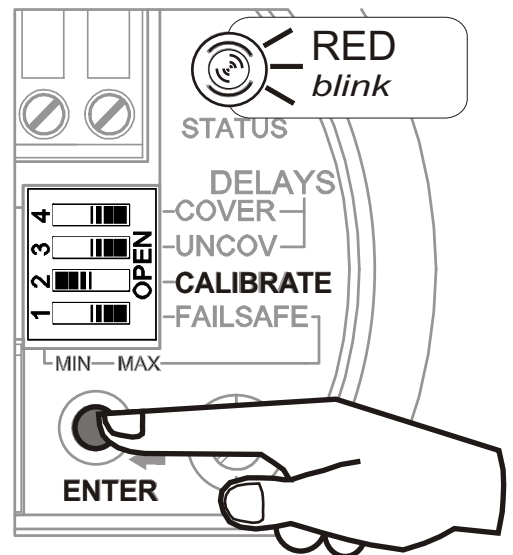
On Release, the status LED should :
Turn RED for Maximum Failsafe Selection
Turn Green for Minimum Failsafe Selection,
Which indicates that calibration is correct.

Now test the calibration by dipping and removing the tines from Liquid.
During Calibration, Delays are automatically bypassed.
 Switching should occur as explained in the last page.

If Calibration is correct, put the calibration switch back to the OPEN position

Else, Elixir will indicate Error after 2 minutes of pressing the ENTER key for the last time. Refer Error Indications Section for more details.

If Calibration is incorrect, Repeat the above stated steps once again.



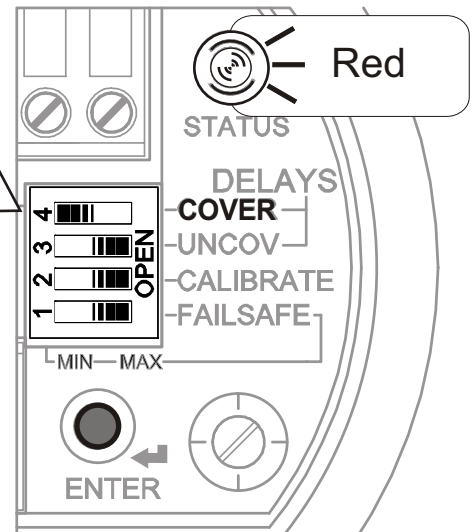
Time Delays

Following example sets the cover delay of 2 seconds.

To set the cover delay, Set COVER switch to close position.
(Close is opposite of OPEN on the DIP switch)

Make sure that Status LED is not blinking for Error.
Read More about errors in Error Indication Section.

A Small screwdriver
can be used for
closing and opening
of DIP switch



Then press ENTER and keep it pressed

The Status LED will Blink.

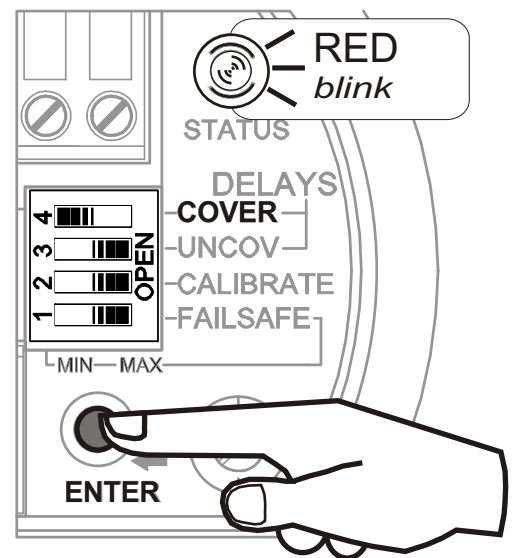
Count the Blinks of LED.

To Set a delay two seconds, Two Blinks will be required.

After two blinks, Release the ENTER key.

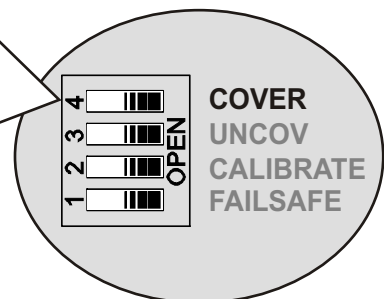
Delay is entered, but not saved.

To save and test the cover delay, put the cover switch back to
the open position.



To Test, dip the tines into the liquid until the switching point.
Elixir will start blinking in RED if switch point is reached.
It will blink for the number of seconds, for which, the cover delay is set.

1 Blink is equal to 1 second during switching.



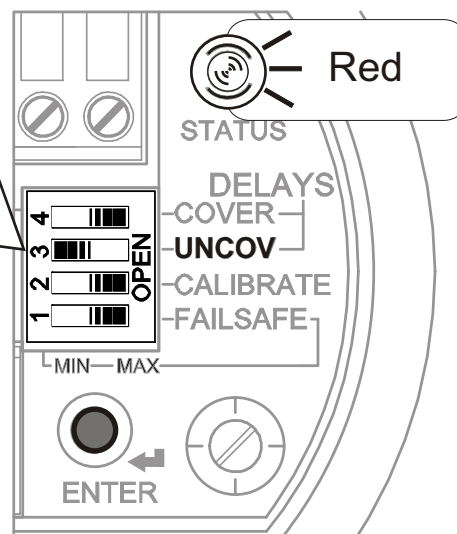
Time Delays

Following example sets the uncover delay of 2 seconds.

To set the uncover delay, Set UNCOV switch to close position.
(Close is opposite of OPEN on the DIP switch)

Make sure that Status LED is not blinking for Error.
Read More about errors in Error Indication Section.

A Small screwdriver can be used for closing and opening of DIP switch



Then press ENTER and keep it pressed

The Status LED will Blink.

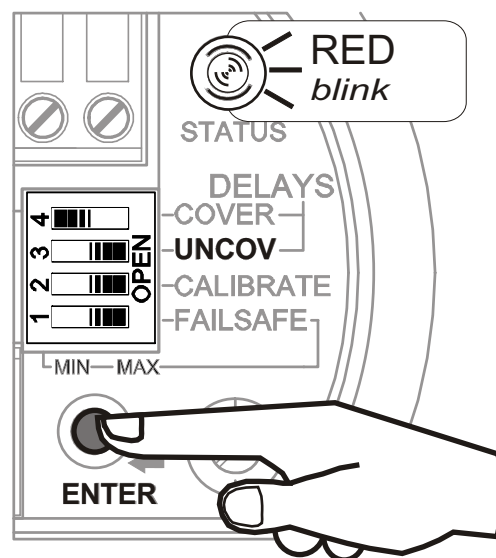
Count the Blinks of LED.

To Set a delay two seconds, Two Blinks will be required.

After two blinks, Release the ENTER key.

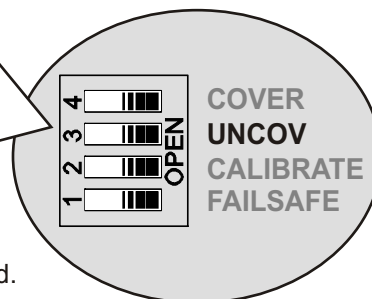
Uncover Delay is entered, but not saved.

To save and test the cover delay, put the cover switch back to the open position.



To Test, dip the tines into the liquid until the switching point.
Elixir will start blinking in RED if switch point is reached.
It will blink for the number of seconds, for which, the cover delay is set.

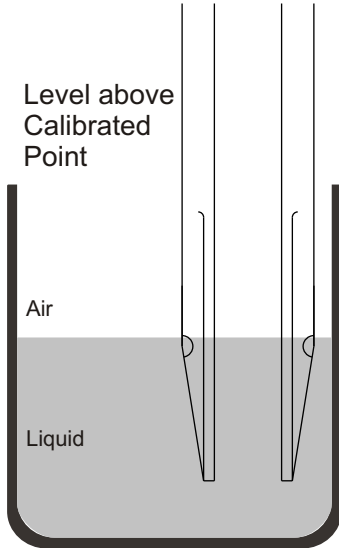
Now, Remove the tines from the liquid, until the other switch point.
Elixir will start blinking in GREEN to indicate uncover switch point is reached.
It will blink for the number of seconds, for which, the uncover delay is set.



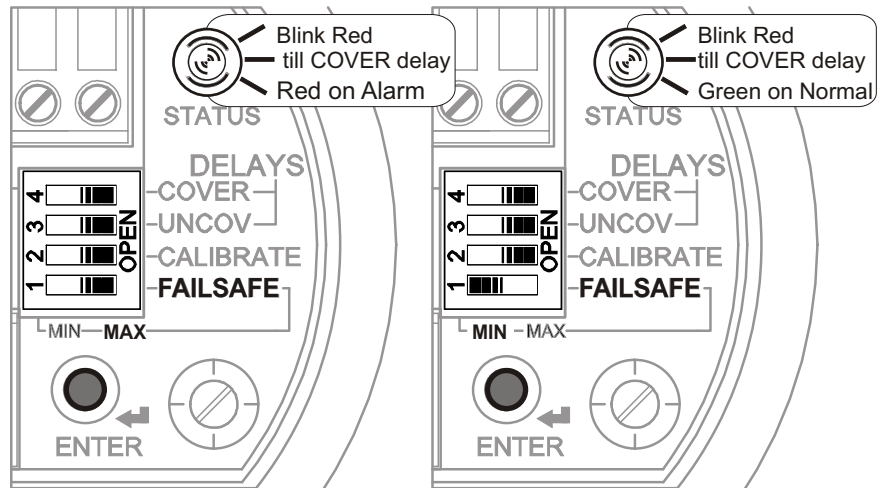
1 Blink is equal to 1 second during switching.

Failsafe Selection

In Elixir, Failsafe are applied as soon as its DIP switch is set for the required failsafe operation.



Covered

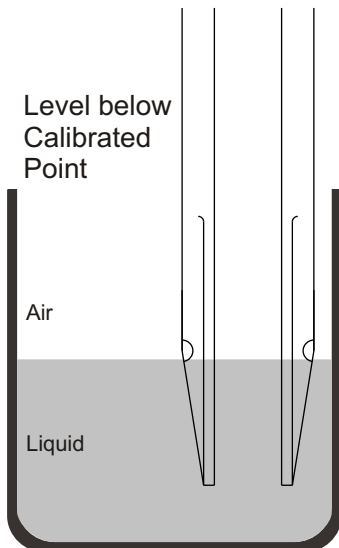


Alarm in Maximum Failsafe

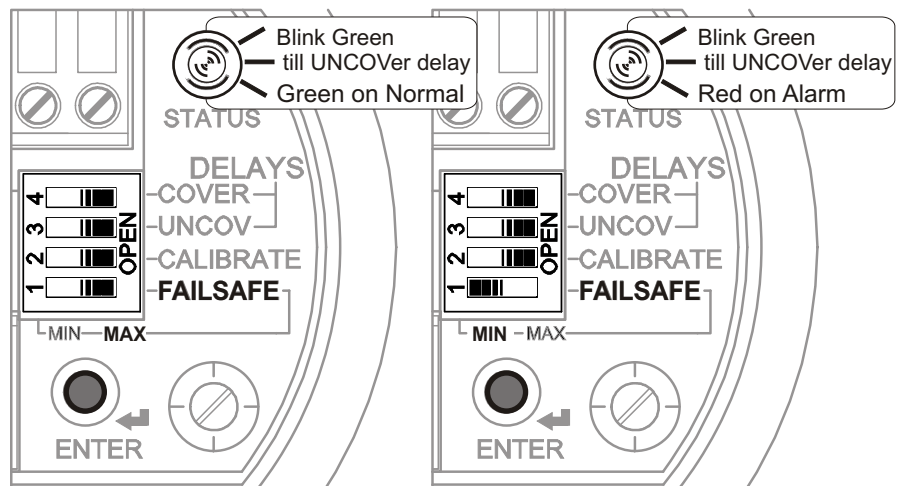
Normal in Minimum Failsafe

Covered always blinks in RED irrespective of Failsafe Selection

During Alarm Relay Contacts are as shown on the Elixir Panel
(Pole Terminal Connected to NC Terminal)



Uncovered



Normal in Maximum Failsafe

Alarm in Minimum Failsafe

Uncovered always blinks in GREEN irrespective of Failsafe Selection

During Alarm Relay Contacts are as shown on the Elixir Panel
(Pole Terminal Connected to NC Terminal)

Error Indication

In Elixir, Errors are indicated for operators mis-handeling of the instrument in the view of instrument protection and proper setting of the instrument.

Error Indication:

On Error Status LED starts blinking in RED and GREEN alternately at a faster rate.
Normal LED blinks are always 1 Blink per Second in either RED or GREEN color.

Nature of the error are:

1. Incomplete Calibration.
2. Incomplete Delay Settings.
3. Two or more than two commands are asked at once.

To avoid Errors:

1. Always complete the calibration by putting the CALIBRATION switch back to OPEN position.
This can be done within 2 minutes of releasing ENTER for the last time for calibration purpose.
2. Always complete the delay settings by putting the DELAY switches back to OPEN position.
This can be done within 2 minutes of releasing the ENTER for DELAY setting purpose.
3. Make sure that Only 1 one switch is at the CLOSE position among CALIBRATE, COVER & UNCOV.
Failsafe switch can be OPEN or CLOSE and is not a source of Error.

Resetting Error:

Bring the CALIBRATE, COVER & UNCOV switches to OPEN position.

Press ENTER key.

LED alternate color blinking will STOP.

Is re-calibration needed? :

Only if the cause of Error was incomplete calibration.

MAINTENANCE :

The electronics of Elixir MP SLF Series instrument needs no maintenance.

When cleaning and checking the vessel, free the tuning fork from deposits. If the material has tendency to form a hard sticky deposit, the instrument must be checked more often.

Make sure that the cable ducts and the lid are tightly sealed so that no moisture seeps into the instrument.

FAULT FINDING PROCEDURE :

If the instrument fails, check

- That the Elixir SLF Series instrument is correctly connected.
- That the connections for low/high alarm and the tuning fork are correct.
- That the tines vibrate when free from material.
- That the indicating devices connected to the output are functioning correctly.