USER MANUAL FOR H2 GAS ALARM SYSTEM

INSTALLATION:

The H_2 Gas Alarm System monitors the H2 level as **% LEL (LEL- Low Explosive Limit)** in the battery room and triggers an alarm, when the H_2 value exceeds the set point. Provide 24 Volts / 2 Amps DC supply to the panel. Fix the H_2 Gas Alarm System as high as possible in the battery room. Fix the panel in such a way that the sensor should face downwards. Use "L" bracket for mounting the panel.

OPERATION:

On power up condition, the system counts down from 120 seconds to 0 as a start-up delay to warm-up the sensor. Other system's function will not work during the start-up delay condition. The system starts to count down the seconds from 120 to 0. After completion of start-up delay, the system monitors the H_2 level in the environment and displays it continuously. When the H_2 level exceeds set point (Alarm condition), the Hooter relay, Exhaust fan relay and internal buzzer will be turned on and display starts blinking.

There are two operating modes in this system, listed below.

- Auto Mode
- Manual Mode

The operating mode can be selected by the user.

System's operation under Auto Mode:

In Auto Mode, the system resets the alarm condition itself if the measured H_2 level reduces below the set point. (Hooter relay, Exhaust fan relay and internal buzzer will be turned - off automatically)

System's operation under Manual Mode:

In Manual Mode, the system waits for user to reset the alarm condition even if the measured ambient H_2 level goes below the set point. The EXIT Key is used to reset from alarm condition.

Operations of keys:

There are four keys available in the system to edit all parameters. Name of the keys are given below.

- ENTER
- UP
- DOWN
- EXIT

The EXIT key is used for three operations that are enumerated below.

- To Mute the hooter and internal buzzer if the alarm is triggered while the system is under Auto Mode
- Reset an alarm condition when the system is under Manual Mode
- Exit from the menu options

Parameters:

Available parameters are listed below.

- System ID (Id)
- Baud rate (br)
- Offset (OFS)
- Set point (SPt)
- Time Duration (dUr)
- Exhaust fan cycle (EFC)
- Exhaust fan duration (EFd)
- Auto or Manual Mode selection (Ann)

The short form of parameter name, which is mentioned in the braces, can be seen by the user on display. Find the short definition of each parameter below.

System ID: Is used for RS485 communication. The range of System ID is from 1 to 255.

Baud rate: Is used for RS485 communication. Only two baud rates are available. 192 mean 19200 bits per second. 96 mean 9600 bits per second.

Offset: Is used to adjust the measured H_2 gas level. The measured H_2 gas level will be displayed after adding the Offset. The range of offset is from 0 % LEL to -5 % LEL. (Do not change the offset value unless required)

Set point: Is the maximum allowable H_2 gas level value in unit of % LEL. If the measured H_2 gas level reaches the set point, the alarm will be triggered. The range of set point is from 1 % LEL to 99 % LEL.

Time Duration: If H_2 gas level is equal to or greater than the set point for the period of time duration in unit of seconds, the alarm will be triggered.

Exhaust Fan Cycle : Exhaust fan is controlled automatically by this system. This parameter holds the numerical value which specifies the cycle time of exhaust fan to be turned 'ON'. The range of this parameter is from 5 minutes to 720 minutes. For example, if numerical value '30' is assigned to this parameter, this system will turn on the exhaust fan for every 30 minutes irrespective of alarm condition. *See Note below.*

Exhaust Fan Duration : This parameter holds the numerical value which specifies the 'ON' duration of exhaust fan. The range of this parameter is from 1 minute to 60 minutes. For example, if numerical value '5' is assigned to this parameter, this system will keep the exhaust fan in 'ON' condition for 5 minutes irrespective of alarm condition. *See Note below.*

Auto or Manual Mode selection: This parameter holds the binary digit value which specifies the operation mode of this system. 0 means Auto Mode. 1 means Manual Mode.

Note: For example, if Exhaust Fan Cycle is 30 minutes and Exhaust Fan Duration is 5 minutes, the Exhaust Fan will be turned on for the period of 5 minutes for every 30 minutes once.

To edit any parameter:

- Press 'ENTER' key to see the parameters.
- Press 'UP' or 'DOWN' key to navigate the parameters.
- If the desired parameter is displayed, press enter key to see the value of that parameter.
- Press "UP' key to increase the value of that parameter
- Press 'DOWN' key to decrease the value of that parameter
- If the desired value is reached, press 'ENTER' key to save that value and press EXIT. To abort any change / To exit without saving, press 'EXIT' key to exit without saving.

Communication:

All the parameters, state of exhaust fan (whether it is in 'ON' condition or 'OFF' condition) and state of this system (whether this system is under alarm condition or normal condition) can be monitored by the BMS system through RS485 port (MODBUS protocol). For detailed information, refer 'H_2 Gas Alarm System MODBUS Address Specification' document.

Outputs:

- Potential free output to control the exhaust fan
- 24 V, DC supply output for Hooter (Consider the polarity when connecting Hooter)
- Potential free output that reflects the state of this system (whether this system is under alarm condition or normal condition)
- Analog output which reflects instant value of measured ambient H2 level (4 to 20mA) corresponds to 0 % LEL to 100 % LEL)
- RS485 port