CONTROL SYSTEM FOR MODULATING VALVE WITH DOUBLE-ACTING HYDRAULIC ACTUATOR

"mSafeD2"

Version: 1.0

Firmware: V1.03

OPERATION, INSTALLATION AND CONFIGURATION MANUAL

VALUES & POLICIES

1. **Volta by NAM** is **committed to the protection of the environment, the health and safety** of personnel, values that are incorporated into the design and manufacture of our products, following criteria that minimize the possibilities of fluid leaks or other failures in order to avoid consequences on the environment and the safety of personnel.
2. MMA is not responsible for damages and losses that may occur due to **improper use of our products**, lack of safety measures, repairs by others, and damage from improper storage or handling.

GENERAL WARNINGS

READ AND UNDERSTAND ALL INSTRUCTIONS prior to installation and operation of equipment. Failure to follow can result in serious personal injury, damage to equipment or the environment. The operator shall be familiar with the terminology of operation of petroleum equipment.

1. This document includes a basic guide for installation, operation, and maintenance**. The field operator shall be fully trained** in all aspects of operating pressure control equipment as well as the work to be performed. If any of the above safety procedures and policies are not followed, the work should not be performed. In such a case, consult with a representative.
2. **Safety** is a combination of knowledge, alertness, common sense, experience in the use of equipment and in the oil and gas field environment.
3. Use **Personal Protective Equipment (PPE)** according to company policies. Use proper safety tools at the service of the equipment such as a helmet, steel-toed shoes, goggles, gloves and comfortable work clothes, If working in an area with the presence of gas, always use spark-proof tools, do not smoke in the vicinity of the wellhead, do not drink alcoholic beverages before or during work. Never take any chances, remember, even low pressures can be lethal.
4. **Assess hazards** that may occur before, during, and after work. Be familiar with the facility's start-stop schedule to ensure that all power sources, electrical, pneumatic, and pressures, are insulated as appropriate before work begins.
5. All **company safety** and legal requirements will need to be met prior to working on the equipment. Pressure barriers will be fully tested prior to service. Its recommended securing two pressure booms before performing any work on the well. Always check for trapped pressure before performing an operation. All valves downstream of pressure booms must release the contained pressure.
6. **Verify the presence of H2S**. In this case, always work in pairs to identify emergencies and exposure control methods. Watch for any symptoms that indicate H2S poisoning.
7. Always use appropriate lifting devices and **follow safety rules when handling heavy products**. Never try to lift heavy objects by hand. When lifting, use your legs, not your back.
8. **Safety Notices** See last page.

OPERATION, INSTALLATION AND CONFIGURATION MANUAL

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1 Manual Change Log

Rev	*Date*	*Applies to Firmware*	*Apply to Hardware*	*Changes*
0	*JUN-24*	*1.00*	*1.0*	*Initial Release*
1	*AUG-24*	*1.02*	*1.0*	*Firmware Version Update to 1.02*
2	*NOV-24*	*1.03*	*1.0/1.1*	*Firmware Version Update to 1.03* *Added Duty Cycle and actuator minimum volume* *SCADA notes removed* *Various minor fixes*

2 Presentation

mSafeD2 box and control cabinet view.

mSafeD2

The "mSafeD2" is a self-contained hydraulic control system that incorporates electronic assistance, allowing operators to safely control a hydraulically actuated valve locally and remotely according to the required position using an external analog position signal. Its field of application is the operation, monitoring, and remote diagnosis of the situation of the actuated valve.

The "mSafeD2" comes ready to be integrated into the SCADA, making it possible to automate and optimize processes, reducing the workload of field personnel.

The control panel for modulating valves with double-acting hydraulic actuators operates by receiving a 4-20mA analog control signal, and through its internal logic, it positions the valve to align the analog position indicator also 4-20mA with the input signal.

Suitable for installation in Class 1, Div 2 classified areas. It is equipped with batteries that provide autonomy, and in the event of a power failure, the system offers the option of a fully mechanical manual backup.

The “mSafeD2” is a highly precise system when it comes to signal modulation and depending on the valve actuator's configuration, the system can achieve a precision of ± 0,1%.

- It modulates the position of a ball valve up to 10 times per hour, through a double acting actuator using a 4-20 mA analog control signal and sends a feedback signal to inform the user
- Reduced operating expenses due to fewer site visits.
- Easy installation, predictive operation with low operator training time and low maintenance.

3 Main Elements

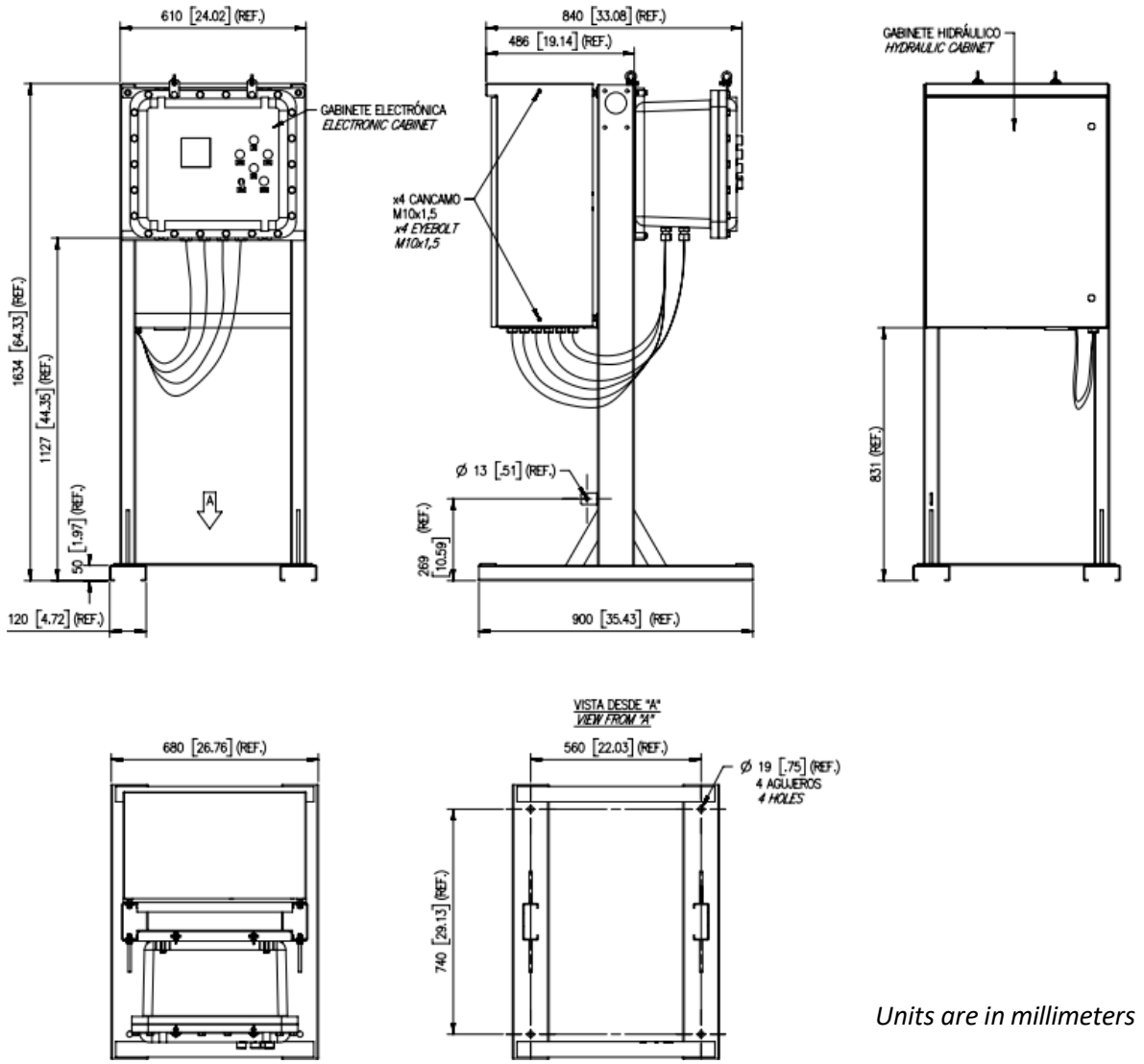
3.1 General Arrangement, Main Components and Hydraulic Circuit

The "mSafeD2" is an electro-hydraulic controller that allows complete control of ball valves in Midstream operations. It has two power batteries that are always charged by energy supplied externally or by a solar panel (optional). The battery, on demand from the electronic control, powers an electro-hydraulic pump that is responsible for providing the flow and pressure required by the hydraulic actuator of the valve to keep it in the desired position and to regulate the movement of the valve, it has two integrated solenoid valves. The system is able to modulate up to 10 times per hour.

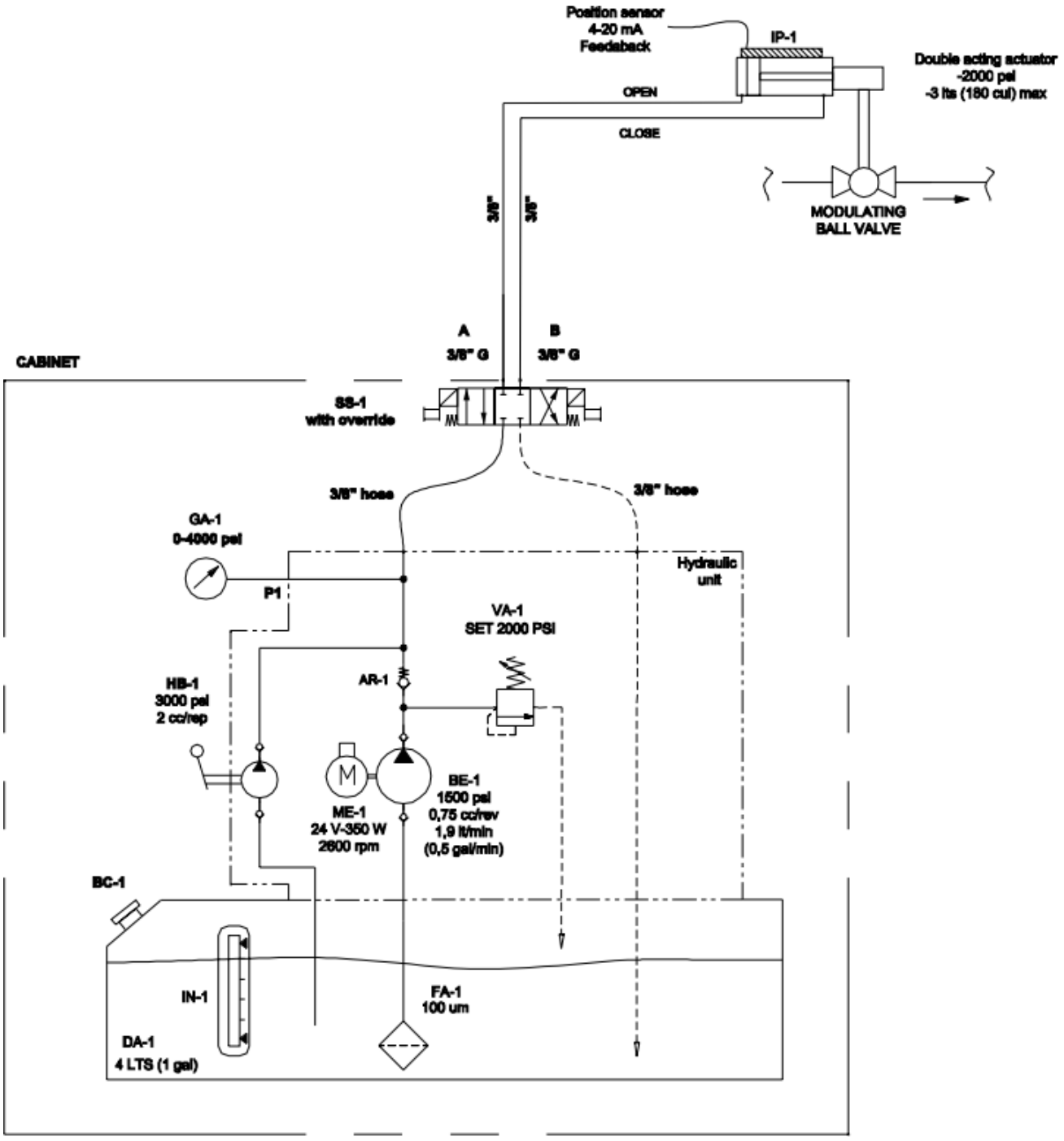
It features an actuator position stabilization system for daily temperature variations, automatically providing and releasing hydraulic fluid to maintain the desired valve position within a pre-set range.

In case of any eventuality on the power supply, the solenoid will remain in the closed position keeping the valve in the last position and if required can be moved with the integrated manual backup pump.

The mSafeD2 has on user interface with a display and 5 buttons to be controlled locally.



Units are in millimeters



POS.	QTY.	DESCRIPTION	BRAND
AR	1	CHECK VALVE, 5000PSI, AISI 316	VIBO
BC	1	FILLING PLUG AND BREATHER	VIBO
BE	1	EXTERNAL GEAR PUMP	VIBO
DA	1	OIL RESERVOIR, USEFUL 4 LTS	VIBO
FA	1	SUCTION TANK FILTER, AISI 316	VIBO
GA	1	GAUGE 0-4000 PSI, ø63mm, AISI 316	BEYCA
HB	1	MANUAL PUMP 2 cc/rep	VIBO
IN	1	OIL LEVEL INDICATOR	VIBO
IP	2	ANALOGIC POSITION INDICATOR (NOT SUPPLIED)	-
ME	1	ELECTRIC MOTOR, Ex “d”	VIBO
SS	2	SOLENOID VALVE 4/3, 3000 PSI, CLOSE CENTER Ex “d”	VIBO
VA	1	RELIEF VALVE	VIBO

3.2 General information

General	
Sensor Inputs **Intrinsically Secure Ex "i"**	1 Position sensor (analog signal 4-20 mA)
Available Modes of Operation	● Local operation ● Remote Operation (optional)

Hydraulic Features	
Pressure	300 to 2000 psi @ 1,9 lts/min (0,5 gal/min)
Expected Actuator	0,5 to 3 lts (30 to 180cu) double acting
Reservoir Volume	4 liters (1 Gallon)
Recommended Hydraulic Fluid	FUCHS TITAN SAF 22 AEROSHELL Fluid 4
Hydraulic Connections	2x 3/8" OD (High Pressure Actuator Connection)
Backup pump	3000 psi / 2 cc/rep (manual override on solenoids)

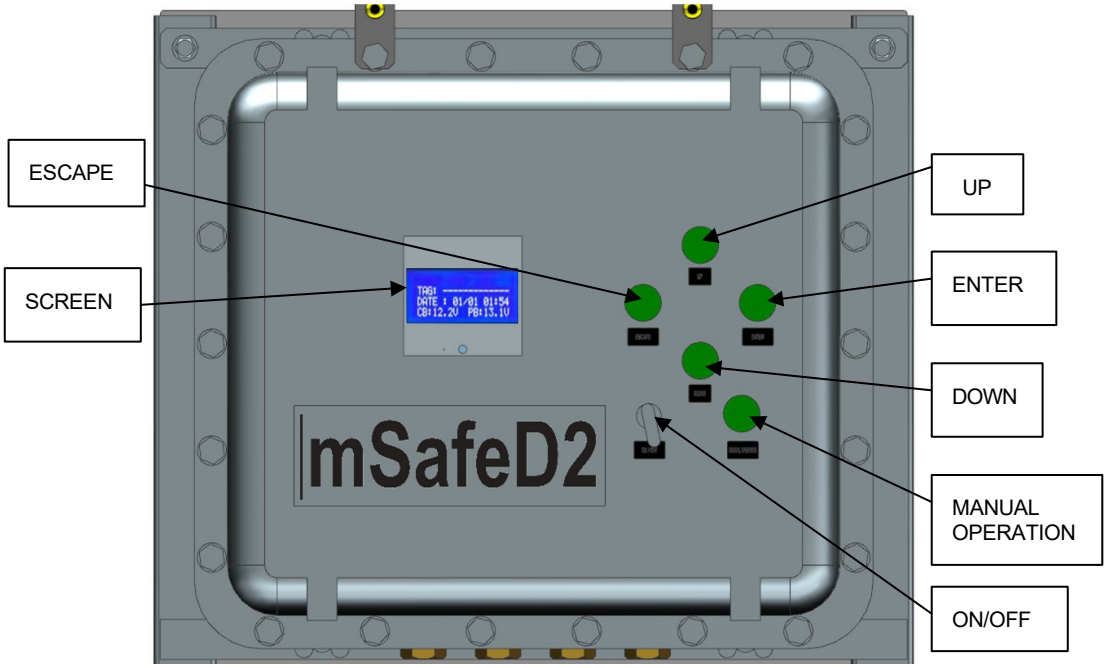
Electrical Characteristics	
Power Supply	24VDC @ 350W (Maximum)
User Interface	4x20 alphanumeric display and external 5-button keypad
Duty cycle	10 operations per hour
Power Battery	2x12V / 68 Ah Maintenance-free gel
Autonomy	Stand-by 48hs Modulating once/h 12hs

Environmental	
Ambient Operating Temperature	-20 to +45°C (-4 to +113° F)
Weight	170 kg / 375 lb
Others	Class 1, Div. 2 Suitble Per NEC 500 / API 500 4th Edition

4 User Interface

4.1 Control Panel

The control panel is located on the front of the device and has 4 navigation buttons, one for manual operation, the screen that allows interaction with the user and an ON/OFF switch.



4.2 Display Navigation System

The controller's display system is intuitive and operated via the navigation buttons.

The **ENTER** button allows you to confirm the selected option, it can be an option to access another menu or data validation.

The **UP** and **DOWN** arrow buttons allow you to navigate up and down between menu options and also change data up/down or also between available options.

The **ESCAPE button** allows you to return to the previous menu or cancel a data change without validating changes.

The **MANUAL OPERATION button** allows you to access the Manual Operation mode for local control.

The arrow on the right side of the menus pointing downwards, indicates that there are more options below and they are the ones that are observed with a gray background, which can be accessed by the corresponding arrow button of UP or DOWN.

5 Basic Operation

5.1 Power ON

To turn on the controller, turn the power dial to the ON position on the front of the device, then the screen will turn on showing the logo for 3 seconds and then the information of the device being ready for use.

5.2 General Status Information Screen

The main screens are as follows, and they are navigated cyclically by pressing the ENTER or ESCAPE button at any time. These screens do not allow any changes or operations to be performed.

```
        VOLTA BY NAM
          MSAFE D2
FW: V01.02   SN: 00001
TAG:  -----------
```

"VOLTA BY NAM" screen displays:
-It is the default screen and informs about the device name, firmware version, serial number and tag.

```
--VALVE POSITIONER--
          READY
SETPOINT:      1.0%
FEEDBACK:      0.0$   ↓
ERROR:         1.0%   ↑
OP. MODE:   OVERRIDE
PUMP ACTUATIONS: 00
IDLE TIMER:    00000
```

"VALVE POSITIONER" screen displays:
-Setpoint value (can range from 0 to 100%)
-Feedback value (can range from 0 to 100%)
-Position error. This parameter is the difference between the setpoint value and the feedback value
-The operation mode
-Number of pump actuations
-Time counter for detecting inactivity

```
-INTERNAL MEASURE.--
BOARD PWR.:    12.3V
EXT. PWR:         NO
MOTOR OVERHEAT: NO
```

"INTERNAL MEASURE" screen displays:
-Power board voltage
-External power supply
-Motor overheat protection

5.2.1 Information Screen

It is the default screen and informs about the device name, firmware version, tag and serial number.

```
        VOLTA BY NAM
          MSAFE D2
FW: V01.02   SN:00001
TAG:        -----------
```

5.2.2 Screen "VALVE POSITIONER"

```
--VALVE POSITIONER--
        READY
SETPOINT:      1.0%
FEEDBACK:      0.0$   ↓
ERROR:         1.0%   ↑
OP. MODE:   OVERRIDE
PUMP ACTUATIONS:00
IDLE TIMER:    00000
```

In the valve positioner screen, you can see the following:

STATUS:

REAL TIME STATUS	DETAIL
READY	System is ready to operate (without any error)
VALVE CLOSING	The valve is moving to the close position
VALVE OPENING	The valve is moving to the open position
FINE TUNING	The system is performing a fine-tuning adjustment
MANY CONT.ACT.!	The system has performed too many continuous actuations without reaching the desired position
W/O MAIN POWER	The external power supply is not charging the batteries
FB SENSOR DISCD.!	Feedback sensor disconnected
SP SENSOR DISCD.!	External command Setpoint signal disconnected
VALVE STROKE T OUT!	The valve stroke time out has been reached
MOTOR OVERHEAT!	Motor is overheated
MOTOR OVERDUE!	Motor has reach it maximum duty cycle

SETPOINT: is the target valve position expressed in percentage. By default, 0% is considered to correspond to the completely closed valve position and 100% corresponds to the completely open valve position.

FEEDBACK: is the measured valve position expressed in percentage. If for any reason there is no feedback signal, the screen will display "DISCONNEC".

ERROR: it is the SETPOINT – FEEDBACK difference. If the ERROR is negative, the control loop will close the valve and if it is positive, it will open the valve.

OP. MODE: is the mode of operation. There are 2 modes: NORMAL and OVERRIDE.

In NORMAL mode the SETPOINT is taken from the corresponding 4-20mA signal. In OVERRIDE mode the SETPOINT is taken from a variable set with the local user interface. If any failure occurs, it automatically goes to ERROR mode.

PUMP ACTUATIONS: number of pump performances. This variable is used to detect control loop mismatch or hardware failure. If when operating there are many oscillations and the count of these exceeds the MAX parameter. OSC. and goes to ERROR mode. The count is reset when an interval of inactivity is detected.

IDLE TIMER: time counter used to detect an interval of inactivity in which the pump does not turn on. It is used to reset the PUMP ACTUATIONS variable.

5.2.3 Screen "INTERNAL MEASURE"

On this screen, you can see the board voltage, the status of the power supply, and the status of the pump motor.

```
-INTERNAL MEASURE.--
 BOARD PWR.:   12.3V
 EXT. PWR:        NO
 MOTOR OVERHEAT:NO
```

On the **"INTERNAL MEASURE"** screen, it displays:
- The power supply to the electronic board is displayed, indicating whether the equipment is powered and if the motor is overheated or not.
"EXT PWR" indicates whether the equipment is receiving electrical power. If it shows "NO", the screen will start flashing, and the equipment will enter an ERROR state. If it displays "YES," the equipment will operate in normal mode.
"MOTOR OVERHEAT" indicates if the motor is overheated. If it shows "YES," the screen will flash, and the equipment will enter an error state. If it shows "NO," the equipment will operate normally.
When this option is set to YES, the equipment will automatically return to normal after a specified period of time.

6 Manual Operation

Manual operation of the valve can be performed at any time by pressing the "MANUAL OP" button. Select the desired operation and press "ENTER," then confirm the start of the operation by pressing "ENTER" again. If the "ESC" button is pressed before confirming the start of the operation, no changes will be made. On this screen, it displays:

-The mode in which the equipment is operating, which can be NORMAL or OVERRIDE.

-The setpoint value, which can be modified locally.

-The valve can be opened and closed locally.

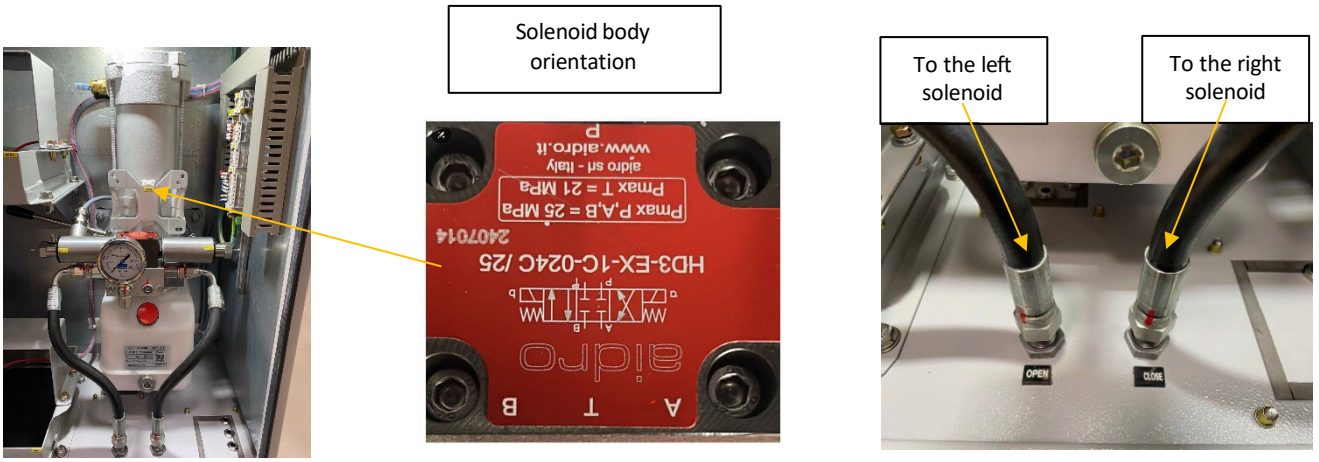
-A manual reset of the equipment can be performed

```
--MANUAL OPERATION--
→MODE CFG.:OVERRIDE
 SP. MANUAL:50.0%
 CLOSE VALVE        ↓
 OPEN VALVE
→RESET              ↑
```

6.1 Hydraulic Manual Override

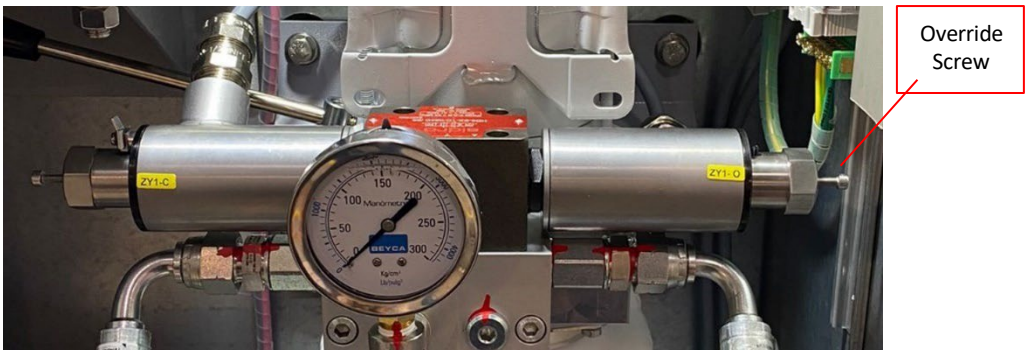
The override mode is necessary when, due to some eventuality, the "mSafeD2" cannot control the valve through the electrohydraulic unit. Mode to control the valve using a manual pump. Below is the detailed process for manual pumping in or power lost once the cabinet is open:

1° Ensure that the positions of the solenoids are correct. The correct position would be, Facing the panel, the solenoid on the left corresponds to the valve open position, and the solenoid on the right corresponds to the valve closed position.

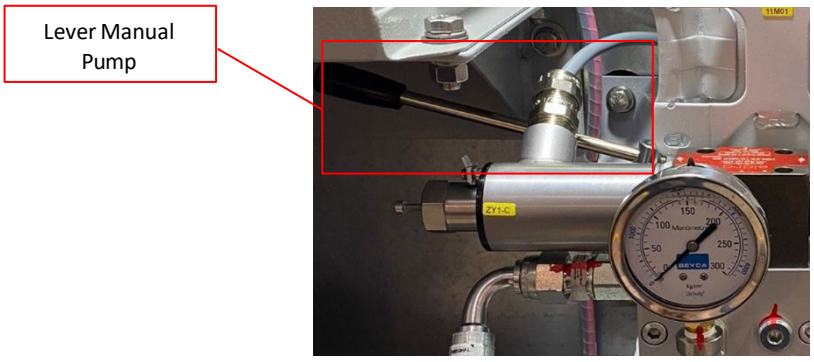


2° For manual pumping, and depending on the desired valve movement (whether to open, close, or position it at a specific point), the override screw must be adjusted enough to move the solenoid stem.

*It is important that the opposite override screw is loosened so it does not impede the adjustment of the other screw. This process will also be useful to depressurize the hydraulic lines in the event that the electrohydraulic unit becomes inoperative.



3° Once the previous step is completed, operate the manual pump using the indicated lever. It is important to monitor the pressure using the gauge while performing manual pumping and ensure it does not exceed 2000 psi (maximum actuator pressure).



4° Once the manual pumping process is complete, the override screws should be loosened and ensured that they are not sufficiently engaged to lock the system in NORMAL mode.

DANGER **Do not leave the override screws tightened, as this will prevent the equipment from functioning correctly.**

7 Change settings & Passwords

To access the different configuration screens, it is required to enter a 4-digit numeric password, there are two passwords with different levels of access.

The two levels of configuration are called USER configuration and ADVANCED configuration and are accessed from any of the Information Screens by pressing the ENTER button for 2 seconds

The USER configuration with password 1234 allows you to access:

USER SETTINGS.

The ADVANCED configuration with MASTER password 3030, allows access in addition to the previous ones: ADVANCED CONFIGURATION.

USERNAME and MASTER passwords can be modified.

USERPASS >>CONFIGURATIONS>> USERCONFIG.>> CHANGE LEVEL1 PASS

```
C H A N G E   P A S S :
→ U S E R:          1 2 3 4
```

MASTERPASS >> CONFIGURATIONS>> ADVANCECONFIG.>> CHANGE LEVEL2 PASS

```
C H A N G E   P A S S :
→ M A S T E R       3 0 3 0
```

WARNING

Passwords serve a security function; they should only be held by authorized personnel and it is highly recommended that the original passwords be changed.

Access by unauthorized personnel to any of the restricted parameters may result in damage to people, equipment, or the environment.

8 User configurations

USERPASSWORD >> CONFIGURATIONS >> USERCONFIG.

After entering the password and accessing the user settings, the screen shown below will appear.

Browsing, select the option you want to modify by pressing the ENTER button.

```
USER CONFIG.:
→ DATE / TIME
  TAG CHANGE
  CHANGE LEVEL1 PASS
  ABOUT US...
```

8.1 Date & Time

USERPASSWORD >> CONFIGURATIONS >> USERCONFIG. >> DATE / TIME

On this screen you can set the DATE and TIME, using the navigation system, pressing the ENTER button will go into edit mode.

```
DATE / TIME:
→ DATE:     MM / DD / YYYY
  TIME:     HH:MM:SS
```

To change the DATE first you will see that DD (Days) flashes, modify the value with the arrows buttons and press the ENTER button, it will flash MM (Months), modify the value with the arrows buttons and press the ENTER button, it will flash YYYY (Years), modify the value and press the ENTER button, the new values will be recorded. If you press the ESC button at any point in the process, the changes will not be recorded.

To change the TIME, you will first see that HH (Hours) flashes, modify the value with the arrow buttons and press the ENTER button, it will flash MM (Minutes), modify the value with the arrow buttons and press the ENTER button, SS (Seconds) will flash, modify the value and press the ENTER button, the new values will be recorded. If you press the ESC button at any point in the process, the changes will not be recorded.

Note: The controller has an internal battery to store the date and time.

8.2 Change TAG

USERPASSWORD >> CONFIGURATIONS>> USERCONFIG. >> CHANGE TAG

On this screen you can edit the TAG (tag or identification of the device) on which the driver is installed.

```
TAG CHANGE:
→ TAG:      - - - - - - - - - - -
```

9 Advanced configuration

MASTERPASS >> CONFIGURATIONS>> ADVANCECONFIG.

```
ADVANCED CONFIG.:
→POSITIONER CONFIG.
 CALIBRATE POSITION ↓
 CHANGE LEVEL2 PASS ↑
 FACTORY RESET
```

This screen allows access to position settings, setpoint and feedback calibration, master key change, and factory reset.

9.1 Positioner Config.

MASTERPASS >> CONFIGURATIONS>> ADVANCECONFIG.>> POSITIONER CONFIG.

```
POSITIONER CONFIG.:
---COARSE ERROR-----
→MAX.VALUE:      5.0%
-OPERATION TIMEOUT-↓
 VALUE:         060S↑
---PUMP OFF DELAY---
 VALUE:         000CS
--VALVE STAB. DELAY-
 VALUE:         095CS
-FINE ERROR ENABLE--
 ENABLED:          NO
-----FINE ERROR-----
 MAX.VALUE:       2.0%
-----PULSE WIDHT----
 VALUE:         015CS
-----IDLE TIME-----
 VALUE:         015CS
--MAX. OSCILLATIONS-
 VALUE:         015
--ACTION IF FAILS---
 VALUE:      LAST POS.
OVERUSE PROTECTION-
 VALUE:         20MIN
```

COARSE ERROR:

This is the allowable measurement error in percentage. This can be adjusted to the desired measurement error.

OPERATION TIMEOUT:

The time margin within which the setpoint signal must match the feedback signal. If the modulation exceeds the configured time, the equipment will enter an error state and stop.

PUMP OF DELAY:

This parameter corresponds to the delay that occurs during the pump shutdown when the solenoid is ON and the pump is OFF. The default value is 0. This parameter is useful to avoid sudden valve movements due to mechanical inertia. The unit is centiseconds, which equals 0.01 seconds or intervals of 10 milliseconds.

VALVE STAB. DELAY:

This parameter is similar to the previous one. It corresponds to the delay that occurs during the pump shutdown when the solenoid is ON and the pump is OFF. The default value is 0. This item is useful to avoid sudden valve movements due to mechanical inertia. The correct value for this delay is the time needed for the valve to stop moving when all control signals are OFF. The unit is centiseconds, which equals 0.01 seconds or intervals of 10 milliseconds.

FINE ERROR ENABLE:

Enables/disables fine error adjustment function.

FINE ERROR:

This item shows the fine-tuning adjustment parameter.

PULSE WIDTH:

The pulse duration of the pump ignition used in fine adjustment. The unit is centiseconds, which equals 0.01 seconds or intervals of 10 milliseconds.

IDLE TIME:
Parameter used in conjunction with the MAX. OSC. parameter and the variables PUMP ACTUATIONS and IDLE TIMER to limit control loop oscillations. Each time the pump is activated, the idle timer starts. This is a counter used to detect a period of inactivity. When this timer completes, it resets PUMP ACTUATIONS, which is a counter for the number of times the pump has been activated

MAX. OSC.:

Parameter used in conjunction with the IDLE TIME parameter and the variables PUMP ACTUATIONS and IDLE TIMER to limit control loop oscillations.

ACTION IF FAILS:

This parameter specifies the desired position of the valve when the equipment enters error mode. The equipment can be configured to position the valve either at the **last known position**, **closed position** or in the **open position**.

The following table detail the potential errors and the actions the equipment takes in response to them:

ERRORS	OP. MODE
FEEDBACK DISCONNECT	NORMAL
SETPOINT PLC DISCONNECT	NORMAL

OVERUSE PROTECTION:

This parameter set a limit to the usage time per hour of the motor in minutes.

9.2 Calibrate Position.

MASTERPASS >> CONFIGURATIONS >> ADVANCECONFIG. >> CALIBRATE POSITION

```
CALIBRATE POSITION:
→PRESS TO OPEN
 PRESS TO CLOSE
 OPEN POS.: 100.0% ↓
 CLOSE POS.: 0.0% ↑
 SWAP SOLENOIDS: NO
 SWAP 4-20 SIG.: NO
```

On this screen, the valve position calibration is detailed. If **PRESS TO OPEN** is pressed, the pump will turn on, and the valve will open until the button is released. Similarly, if **PRESS TO CLOSE** is pressed, the valve will close. Using these manual commands, position the valve in the **OPEN** position, then go to the desired **OPEN POS.** line and press **ENTER** twice to save this data. Next, similarly use these manual commands to position the valve in the **CLOSED** position, then go to the **CLOS. POS.** line and press **ENTER** twice to save this data. If it happens that when **PRESS TO OPEN** is pressed, the valve closes instead of opening, this can be corrected using the **SWAP SOLENOIDS** option.

It is also possible to invert the position feedback signal using the **SWAP 4-20 SIGNAL** option.

9.3 Factory Reset.

MASTERPASS >> CONFIGURATIONS >> ADVANCECONFIG. >> FACTORY RESET

```
FACTORY RESET:
 PRESS:
  ENTER TO CONFIRM
  ESC. TO CANCEL
```

CAUTION

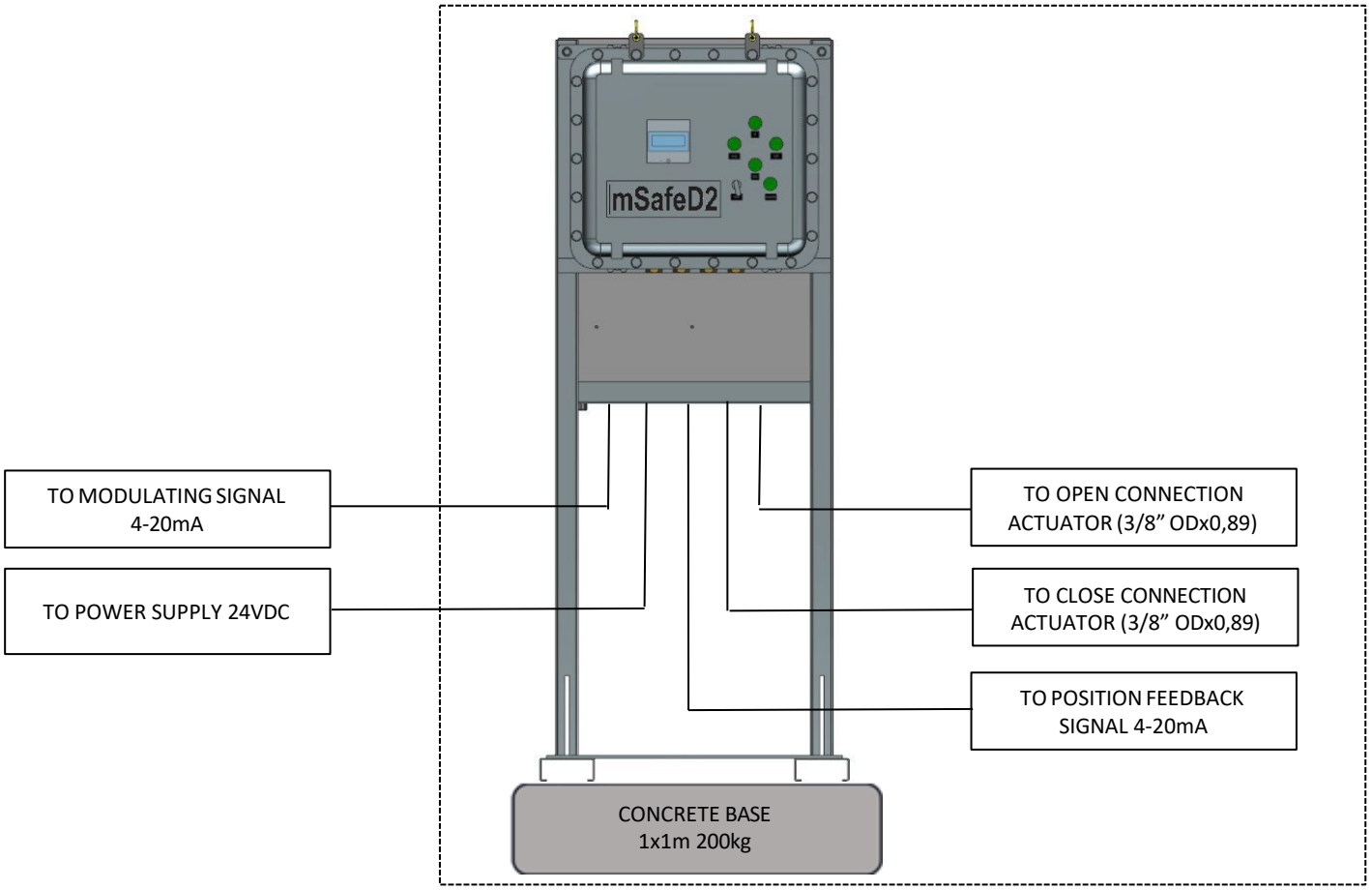
FACTORY RESET: This operation discards all the modifications made by the user previously and restores ALL variables to the original factory settings.

10 Assembly & Installation

WARNING

Study and follow the following instructions very carefully, they indicate how to fix and connect correctly and safely the "mSafeD2" controller.

10.1 General Mounting Arrangement

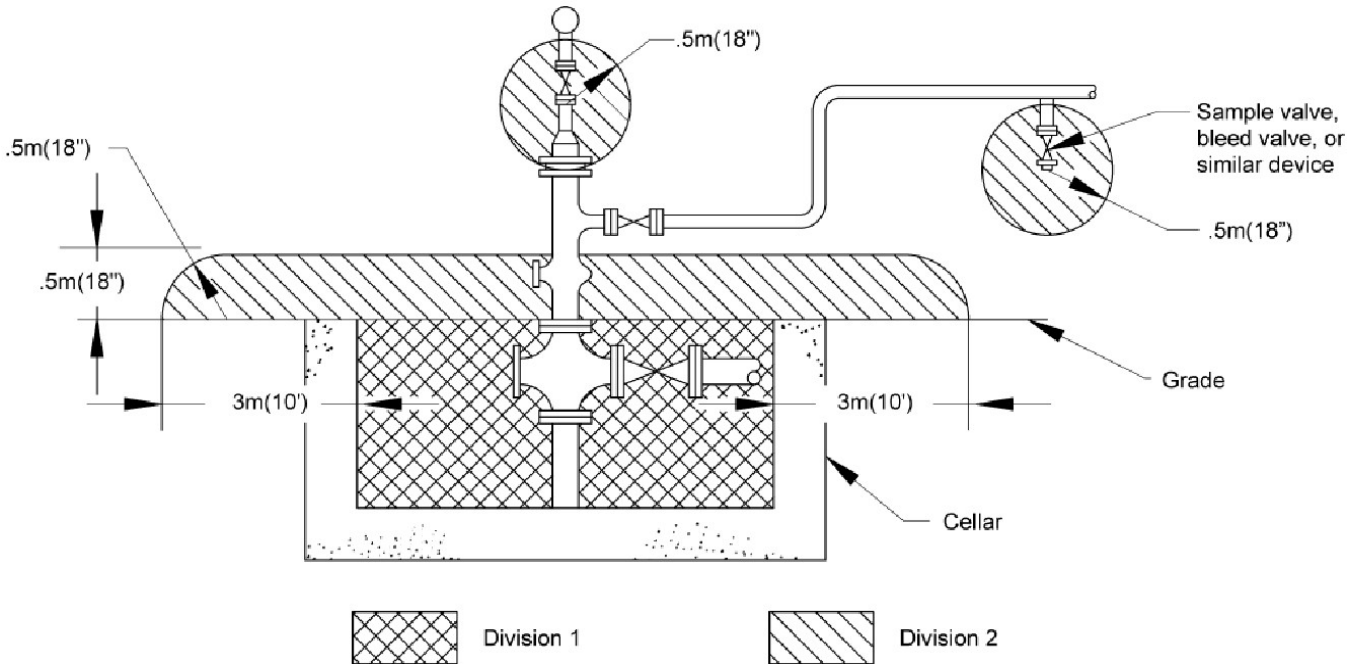


10.2 Field mounting installation

1) The "mSafeD2" must be fixed to the ground by screws to a concrete base.
2) Locate the place to attach the controller, usually the best place is in front of the valve and in a straight line where the hydraulic valve is located. Have access planned for maintenance tasks.

DANGER

When choosing the place to fix the "mSafeD2", take into account the minimum distances for its installation according to the following drawing of the API RP 500 standard.



10.3 Hydraulic installation

DANGER

Like any hydraulic circuit, the hydraulic valves of the mSafeD2 are susceptible to dirt and impurities that may enter the closed circuit, so extreme care is required when performing this type of hydraulic installation in a dusty and dirty environment. The ingress of foreign particles or traces of Teflon will result in premature equipment failure, internal leaks, or erratic operations. It is recommended to ensure proper deburring of the pipes, keep them plugged and blow them up before their final installation.

1) Make hydraulic connections from the "mSafeD2" to each actuator using the 3/8" OD tube connectors. It is advisable to lay pipes in trays or pits for this purpose, seeking to ensure that the route makes as few changes of direction as possible, as well as using the diameters and thicknesses indicated in the connection diagram.

WARNING

Verify that each hydraulic outlet is connected to its corresponding hydraulic actuator and valve.

2) Fill the internal reservoir with oil. At start-up, oil should be added while the pipes are filled.

11 Maintenance

11.1 List of tasks and recommended spare parts

The mSafeD2 is a low-maintenance piece of equipment, to ensure its optimal operating condition and safety, the following preventive maintenance plan must be followed.

Frequency	Description	Notes	Code
Every 1 year *(Offline t.: 1 hour)*	General Control	Verification of operational performance according to instructions	-
	Relief Valve Control & Adjustment	Recommended set: 2000 psi	-
Every 3 years *(Offline t.: 1 hour)*	Power Battery Replacement	12v / 65 Ah	AB139844
	Adjustment of all electrical terminals.	-	-
Every 5 years *(Offline t.: 2 hours)*	Replacement of 4 Liters (1 Gallon) of hydraulic oil	FUCHS TITAN SAF 22 (For temperatures down to 5°F)	P0000061
		AEROSHELL Fluid 4 (For temperatures down to -13°F)	P0000064
Exceptional Parts (1 spare per 20	Complete Hydraulic Unit	12V / 0.8cm3	73238-1
	Fuse 20A	20A - 10x38mm	AB1202915

12 Firmware Changes

~~**V 1.00**~~
- First Issue

~~**V 1.02**~~
-Minor Fixes
-Optimization of Valve Failure Configuration
-Integration of Swap Signal 4-20mA
-Optimization of 100% Valve Opening

V 1.03
-Added Fail Open function
-Added max operating motor ON protection
-Added General Status on -Valve Positioner- screen
-A confirmation request on normalize is added
-If the feedback sensor is disconnected it moves to safe position by time

SAFETY INFORMATION

CAUTION

Indicates a situation in which moderate personal injury and/or failure of operation could occur.

WARNING

Indicates a situation that, if not avoided, could result in severe personal injury and/or failure of operation.

DANGER

It indicates a situation that, if not avoided, will result in serious injury **or death**.

RECOMMENDATION

It indicates a best practice that **has nothing to do with personal safety.**