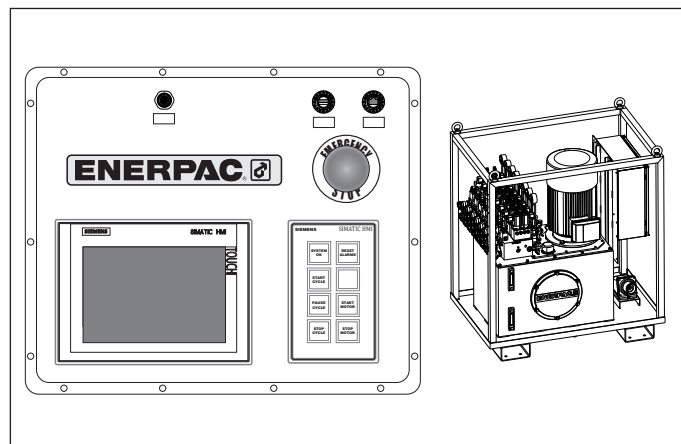


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1.0 INTRODUCTION

1.1 Overview

The SFPSSC & Sensor Synchro Kits (SFPKSS4 & -8) together with SFP pumps are Enerpac's new solution for multi-point lifting and lowering applications where uneven loads need to be positioned equal and synchronously. They are a far better alternative to using separately operated pumps or manifolds with needle valves. Split Flow Pumps are a safe and economical solution which can achieve lifting accuracy of 4% across lifting points.

The SFP with solenoid valves with the SFPSSC connected enables control movement of the load remotely and automatically. The load can be lifted/lowered simultaneously using single or double-acting cylinders. Depending on the application, the lifting points can be operated individually or simultaneously in a synchronously mode.

1.2 Application

With the SFPSSC & SFPSS 4 or - 8 kits, the user can convert a simple SFP pump into a synchronous lifting system. With this system the user can make synchronous movement up to 8 cylinders. Built in warning and stop alarms for optimum safety, it has a great accuracy of the cylinder position due to each cylinder has a pressure line dedicated.

The application possibilities are infinite with the SFPSSC & SFPSS 4 or - 8 kits, and the SFP pump, such as powering interlinked hydraulic cylinders (single or double-acting), push cylinders, stage lift, hollow plunger or lock nut cylinders. The SFPSSC has 6 work modes. The operator can navigate to any of these menus: Manual, Pre-Load, Automatic, Depressurize, Tilting and Stage Lift.

1.3 Delivery Instructions

Upon delivery all components must be inspected for damage incurred during shipping. If damage is found the carrier should be notified at once. Shipping damage is not covered by the Enerpac warranty. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

1.4 Warranty

- Enerpac guarantees the product only for the purpose for which is intended.

- Refer to the Enerpac Global Warranty document for terms and conditions of the product warranty.

Any misuse or alteration invalidates the warranty.

- Observe all instructions as communicated in this manual.
- When replacement parts are needed, use only genuine Enerpac replacement parts.

Modification to any part of the equipment outlined in this manual should not be attempted, nor any component part be replaced without first consulting Enerpac. Modifications may render the equipment dangerous. Component parts are each rated to suit the demands of the overall equipment design and replacement with similar items without provenance may lead to unexpected and dangerous accidental features.

If any equipment abuse is evident, the warranty will be invalidated and Enerpac will not be made responsible for an injury due to misuse or failure to comply with the above safety notes.

1.5 EU Declaration of Conformity



Enerpac declares that this product has been tested and conforms to applicable standards and is compatible to all CE requirements.

A copy of an EU Declaration of Conformity is enclosed with each shipment of this product.

2.0 SAFETY

Read all introductions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the product and / or damage to other property. Enerpac cannot be responsible for any damage or injury from unsafe use, lack of maintenance, or incorrect operation. Do not remove warning labels, tags, or decals. In the event of any questions or concerns arising, contact Enerpac or a local Enerpac distributor for clarification.

If you have never been trained on high-pressure hydraulic safety, consult your distributor or authorised service center for information about Enerpac Hydraulic Safety Courses.

This manual follows a system of safety alert symbols, signals, words, and safety messages to warn the user of specific hazards. Failure to comply with these warnings could result in death or serious personal injury, as well as damage to the equipment or other property.



The Safety Alert Symbol appears throughout this manual. It is used to alert you to potential physical injury hazards. Pay close attention to Safety Alert Symbols and obey all safety messages that follow this symbol to avoid the possibility of death or serious injury.

Safety Alert Symbols are used in conjunction with certain Signal Words that call attention to safety messages or property damage messages and designate a degree or level of hazard seriousness. The Signal Words used in this manual are WARNING, CAUTION, and NOTICE.

WARNING

Indicates a hazardous situation that, if not avoided, could result in death or serious personal injury.

CAUTION

Indicates a hazardous situation that, if not avoided, could result in minor or moderate personal injury.

NOTICE

Indicates information considered important, but not hazard related (e.g. messages relation to property damage). Please note that the Safety Alert Symbol will not be used with the signal word.

2.1 Safety Precautions

WARNING

Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

- Read and completely understand the safety precautions and instructions in this manual before operating the Split Flow Pump or preparing it for use. Always follow all safety precautions and instructions, including those that are contained within the procedures of this manual.
- If alternative hydraulic pumps are used, ensure that there are adequate systems to limit the working pressure to 700 bar (10,150 psi).
- Wear personal protective equipment when operating hydraulic equipment. Always wear eye protection. Safety equipment such as dust mask, non-skid safety shoes, hard hats, gloves or hearing protection (used as appropriate) will reduce personal injuries.
- Immediately replace worn or damaged parts. Use only genuine Enerpac parts from approved distributors or authorised service centers. Standard grade parts will break causing personal injury and property damage. ENERPAC parts are designed to fit properly and withstand high loads.
- To minimize risk of personal injury keep a safe distance from the tool and workpiece during operation.
- Enerpac does not recommend the use of the SFP Series pump with multiple telescopic cylinders (such as the Enerpac RT and RLT Series). However with this kit the SFP series can have the control over the cylinder speed.
- High voltage is present inside the pump even when motor is off. Before opening the pump housing or performing any maintenance or repairs, be sure that the pump power cord is disconnected from the electrical outlet or other electrical power source (refer to additional safety information in the SPF instruction sheet).
- Always make sure that the pump is stopped and disconnected from AC power supply and make sure all hydraulic pressure is released before performing any inspection, maintenance or repair procedures.
- Do not leave the pump unattended in the workplace when connected to AC power supply. Take all reasonable precautions to avoid unauthorized use.
- Take precautions so that the pump is not switched on accidentally.

- If it is not possible to unplug the pump power cord from the AC power outlet, the power must be turned off and locked out at the AC power supply.
- Always disconnect the pump from AC power supply before transporting it.
- Make sure that the pump is off before removing plug from electrical outlet.
- Do not unplug the pump by pulling on the cord. To unplug, grasp the plug, not the cord.
- Remove plug from electrical outlet when the pump is not in use and before servicing or cleaning the pump.
- If the cord and/or plug are damaged, do not connect the pump to a live electrical outlet. Repair or replace the damaged items as required and be sure the grounding conductor is properly wired before reconnecting the pump to the outlet. Consult a qualified electrician if grounding conductor wiring procedures are not completely understood or if there is any doubt as to whether the pump is properly grounded.
- Do not modify the plug provided with the pump. If the plug will not fit in the outlet, have a proper outlet installed by a qualified electrician.
- A qualified electrician should be consulted if there is any doubt as to whether an outlet box is properly grounded.
- If the pump must be reconnected for use on a different type of electric circuit, the reconnection should be made by a qualified electrician. After the reconnection, the pump should comply with all local codes and ordinances.

CAUTION

Failure to observe and comply with the following precautions could result in minor or moderate personal injury. Property damage could also occur.

- Ensure components are protected from external sources of damage, such as moving machine parts, sharp edges, weld spatter, corrosive chemicals and excessive heat or flame. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance do not expose equipment to temperatures of 65°C [150°F] or higher.
- Do not use electric pumps in an explosive atmosphere. Adhere to all local and national electrical codes. A qualified electrician must do installation and modification
- Take care to avoid sharp bends and kinks in hydraulic hoses. Bends and kinks can cause severe back-up pressure and cause hose failure. Protect hoses from dropped objects; a sharp impact may cause internal damage to hose wire strands. Protect hoses from crush risks, such as heavy objects or vehicles; crush damage can cause hose failure.
- Do not lift hydraulic equipment by the parts do not designated by that purpose. Use only the designated carrying handles.
- Avoid situations where loads are not directly centered across the entire saddle surface. Off-center loads produce considerable strain on cylinders and plungers. In addition, the load may slip or fall, causing potentially dangerous results.
- To prevent damage to pump electric motor, check specifications. Use of incorrect power source will damage the motor.
- Lubricate tools as directed in this manual prior to operation. Use only approved lubricants of high quality, following the lubricant manufacturers instructions.

NOTICE

- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Enerpac Authorized Service Centre in your area.
- To help ensure proper operation and best performance, the use of Enerpac oil is strongly recommended.

3.0 SPECIFICATIONS

SFPSSC for SFP is designed to operate and visualize the values of the movements made by one SFP remotely. SFPSSC must be connected to a Sensor Synchro Kits with 4 or 8 outputs (SFPKSS4 or SFPKSS8) by the communication cable SFP COMM-25.

Enerpac recommends the kit SFPKPT (pressure transducer removable kit) is acquired with SFPSSC. It is needed to connect pressure transducers to the SFP to have an optimal performance of the SFPSSC and SFPKSS4 or SFPKSS8 set.

It is necessary to have also a wire incremental encoder (stroke sensor) to monitor the position of cylinders plungers.

NOTICE

The SFPSSC does not allow connecting several SFPs in line. This system is only ready to operate with one unit of SFP.

NOTICE

If the SFPSSC is being used with SyncHoist System (SHS) instead please refer to L4904 for instructions.

3.1 SFPSSC description

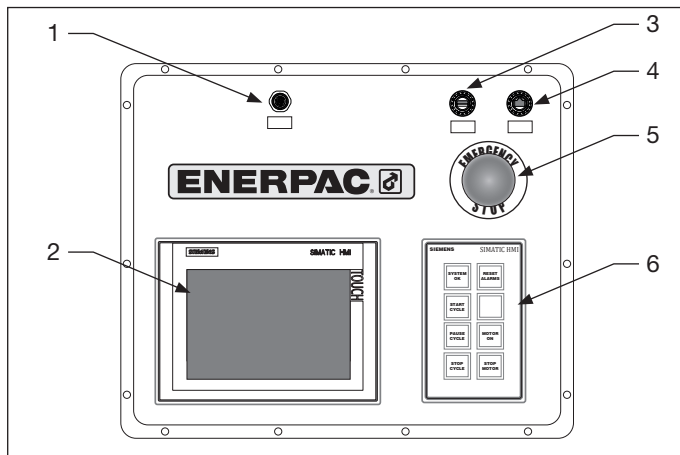


Figure 1, Major Components, SFPSSC

SFPSSC is the Single Synchro Control Box with the following buttons:

1. Communication plug
2. Touch screen
3. USB connector
4. Ethernet connection
5. Emergency stop button
6. Keypad

NOTICE

The SFPSSC is supplied in a protection/transportation case. Do not remove the SFPSSC from the case. The operator can work with the case opened. Be careful when handling weights. The weight of this case is 10 kg / 23 lbs.

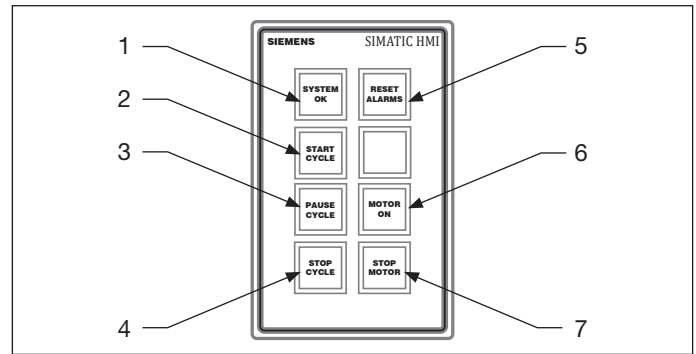


Figure 2, Major Components Key Pad

The major components of the Key Pad are:

1. System ok light: This light is on, when the system is correctly connected and ready for the work
2. Start Cycle button: Push this button to start any movement with the cylinders.
3. Pause Cycle button: In automatic movements, use this button to temporarily stop the movement. Pushing this button the parameters of the current movement (position, pressure, etc...) will be stored until the system is re-started. To restart the movement push the Start Cycle button.
4. Stop Cycle button: Push this button to stop any movement in the automatic mode. The difference with Pause Cycle button is that when this button is pushed, the parameters of the movement will be reset into the initial position of the cycle.
5. Reset alarms button: The operator must push this button to reset an alarm once the reason of the alarm has been solved.
6. Motor On button: This is a button to show if the motor of the pump is switched on. This button does not allow the motor to be switched on remotely.
7. Stop Motor button: Pushing this button, the motor of the SFP will be switched off.

There is a color code for the key pad for every button. The following paragraphs detail the meaning of the button colours:

- Start Cycle:
 - Off: Button not available
 - White: The cycle is ready to start
 - Green: The cycle is running
- Pause Cycle:
 - Off: Button not available
 - White: The cycle is ready to be paused
 - Yellow: The cycle is paused
- Stop Cycle:
 - Off: Button not available
 - Red: The cycle can be stopped
- System OK:
 - Off: No communication available or stop alarms active
 - Green: System ready
- Reset Alarms:
 - Off: No active alarms
 - Red: Active alarms

- Motor ON:
 - Off: The motor is off
 - Green: The motor is on
- Stop Motor:
 - Off: The motor is off
 - Red: The motor can be stopped.

3.2 SFPKSS4 & SFPKSS8 description

This is the electric cabinet (Sensor Synchro Kits) that allows the communication between the SFP electric cabinet and the SFPSSC.

Note that SFPKSS4 and SFPKSS8 can also be used to as part of a multiple SFP network utilizing CLNC12 network controller. Follow the instructions in this manual for setup and connection to the SFP pump. However reference L4476 for specific operation with CLNC12 network controller.

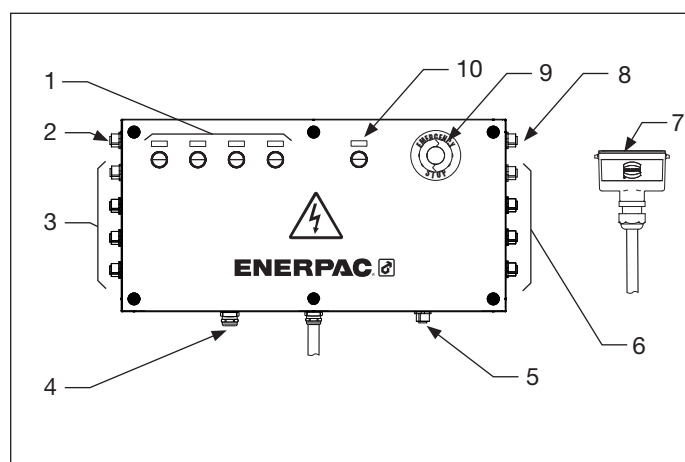


Figure 3, Major Components SFPKSS8

The Figure 3 shows the major components of SFPKSS8. Note the SFPKSS4 is a similar layout but with less connections for the stroke sensors and pressure transducers (numbers 3 & 6 in the Figure 3).

SFPKSS4 and SFPKSS8 has been designed with the following buttons:

1. SFP number indicator. This led shows with a fixed light the number of the SFP where the Kit is connected. The kit can be connected in a maximum number of 4 SFPs. When any communication failure is come up, this light will turn into a flashing light.

NOTICE

When the SFPKSS is disconnected for maintenance or transport purposes, and is reconnected later, it will remember the SFP number and configuration that had it before with that SFP.

2. Communication “IN” plug. Only available to connect several SFPs in line and be controlled by CLNC12. Refer to the instruction sheet L4476.
3. Stroke Sensor connectors. For the SFPKSS4 are available to connect up to 4 stroke sensors and with SFPKSS8 are available to connect up to 8 stroke sensors. Designed for use with Enerpac EVO-WSS series stroke sensors
4. CSFP cable plug to connect communication to the standard SFP pump control panel
5. CSSC connector, to connect the SFPKSS with SFPSSC controller through the cable SFP COMM-25.

6. Pressure transducer connectors. For the SFPKSS4 are available to connect up to 4 pressure transducers and with SFPKSS8 are available to connect up to 8 pressure transducers. Designed for use with Enerpac SFPKPT series pressure transducers
7. CBM (Pendant control cable) cable/plug to connect with SFP electric cabinet.
8. Communication “OUT” plug. Only available to connect several SFPs in serial and be controlled by CLNC12. Refer to the instruction sheet L4476.
9. Safety Stop button
10. Set Up Ok button. When the connection with SFP is correct, this button is lighting with a fixed white light.

NOTICE

Be careful when handling weights. The weight of this electric box is 10 kg / 23 lbs.

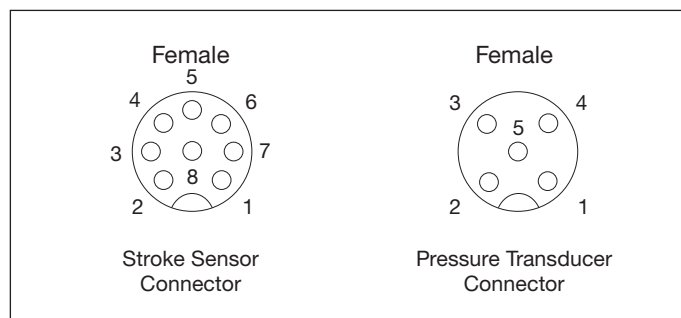


Figure 4, Sensor Connectors Detail in the SFPKSS8 & SFPKSS4

In the Figure 4 is shown the connectors details for the stroke sensors and pressure transducers. Both are 24 VDC connectors.

3.3 SFP electric panel

The electric panel includes the controls to switch the machine on.

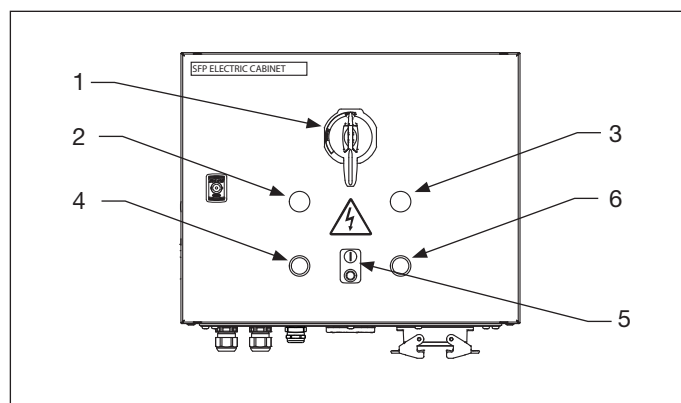


Figure 5, Electric panel

1. Main electrical switch.
2. Power on led.
3. System alarm light
4. Reset push-button.
5. Start/Stop motor push-button.
6. Decompress push-button.

3.4 CSFP cable

This is the communication cable between the SFP electric cabinet and the SFPKSS4 or SFPKSS8 Sensor Junction Boxes. It is essential together with CBM cable plug to have a good communication with the SFP pump.

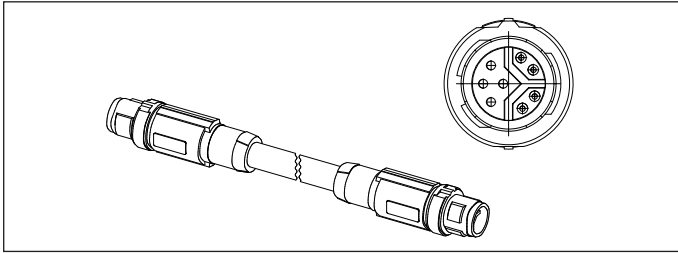


Figure 6, RJ45 ethernet hybrid cable detail

This cable is supplied with the following features:

- PUR 4x AWG20 + 4x AWG26
- 4 x Power supply 24 V 6A
- Temperature range: -30°C ... +85°C
- Length 1.5 m.
- Connection male M12 0° - male M12 0°

3.5 SFP COMM-25

This cable is used to make the communication connection between the SFPSSC and SFPKSS4 or SFPKSS8 kits.

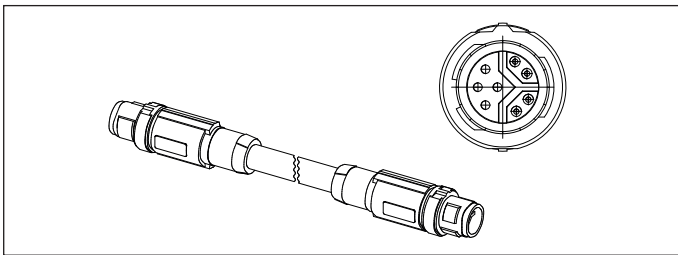


Figure 7, SFP COMM-25 cable detail

This cable is supplied with the following features:

- PUR 4x AWG20 + 1x AWG26

- 4 x Power supply 24 V 16A
- Temperature range: -20°C ... +70°C
- Length 25 m.
- Connection male M12 0° - male M12 0°

4.0 INSTALLATION

4.1 Inserting micro SD card in the SFP's Logo module

In order to convert the SFP as a connectable pump, the user must insert a micro SD card in the SFP. Four micro SD cards are supplied with the kit. It does not matter which address number is assigned to the pump, any of the 4 micro SD cards can be used.



Remove plug from electrical outlet before performing the following steps.

Refer to the Figure 8 to understand the following steps:

1. Open the electric cabinet of the SFP, and find the Logo module in the electric cabinet
2. Carefully insert a screwdriver with a 3-mm blade into the groove on the front of the socket and lever the socket partially out of the slot
3. Pull the socket
4. Insert the card into the holder. The entry of the card slot is chamfered on its bottom right. The edge of the cards is chamfered accordingly
5. Push the socket in until it engages
6. Close the electric cabinet.



Make sure that you insert the card into the right position in the socket until you hear an audible sound of a click.

If the SD card socket cannot be pushed in smoothly, don't push hard. Pull the card, adjust the direction, and push it in again.

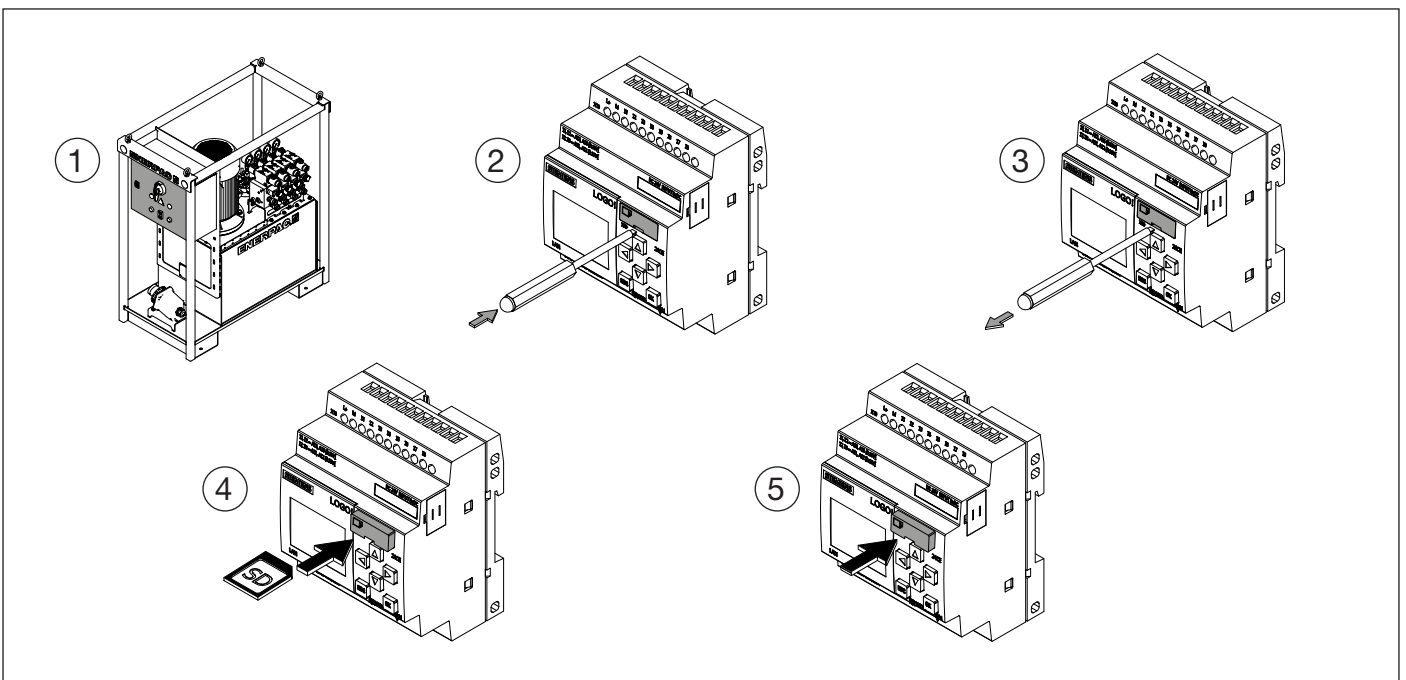


Figure 8, Inserting the SD card in the PLC of SFP pump

4.2 Installing the kit into the SFP

In order to install correctly the kit in the SFP, follow the following steps:

1. Place the SFPKSS4 or SFPKSS8 Sensor Junction Box in the upper part of the frame.
2. Attach the SFPKSS4 or SFPKSS8 as shown in the Figure 9
3. Disconnect the pendant from the SFP and connect the SFPKSS4 or SFPKSS8 in the same plug using the CBM cable. Refer to Figure 10 for a connection scheme.
4. Connect the CSFP cable to the SFPKSS4 or SFPKSS8 and to the SFP electric cabinet.

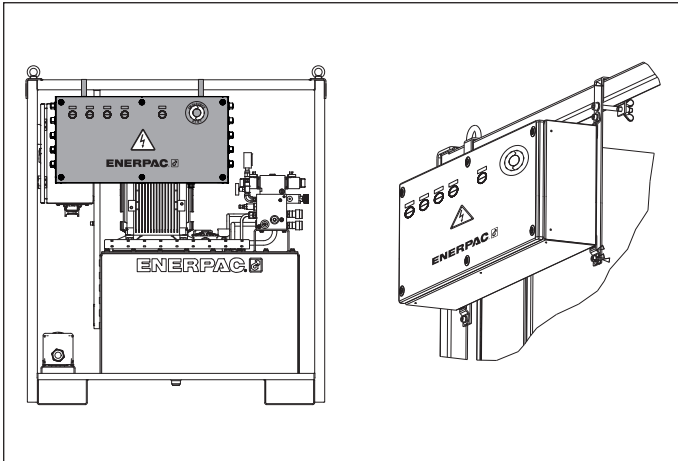


Figure 9, Attachment detail for SFPKSS8

NOTICE

It is mandatory that the operator has a full understanding of all instructions, safety regulations, cautions and warnings, before starting to operate high force tool equipment. In case of doubt, contact Enerpac.

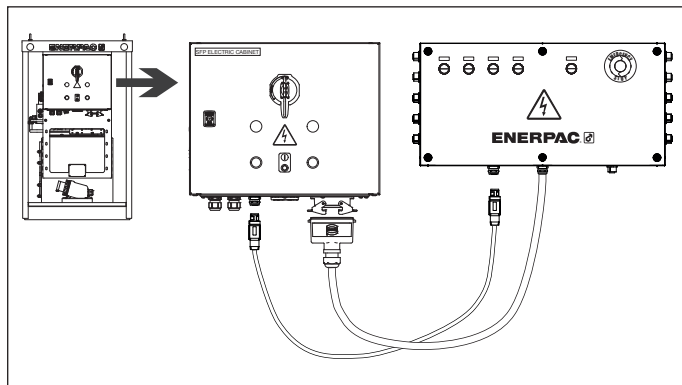


Figure 10, Electric connection of the SFPKSS8 and the SFP electric cabinet

4.3 IP assigning process

Before operating the SFP with the SSC an IP assigning process must be performed. During this process the SFPSSC control box must be disconnected from the SFPKSS4 or SFPKSS8 Sensor Junction Box.

Once the point 4.2 has been done follow the following steps:

1. Connect the SFP to the electric power source.
2. Switch on the SFP using the main power switch. Refer to the SFP instruction manual.

3. Push and hold during 5 seconds the Set Up Ok button on the SFPKSS4 or SFPKSS8 Sensor Junction Box. Refer to Figure 3, button number 10. The light will begin to flash rapidly and then stop and remain solid once the IP address is properly assigned.

NOTICE

Following this step the software will assign a new IP to the SFP. If the IP has been assigned successfully the Set Up Ok button will remain solid, and the appropriate numbered light corresponding to this address will light on the front of the SFPKSS4 or SFPKSS8. If some mistake came up during the process, the light will begin flashing again.

If something went wrong in this process follow the process described in the point 7.1 for recalling the IP factory defaults.

4.4 Connecting the SFPSSC control box.

Connect the SFP COMM-25 cable to the SFPSSC control box communication plug. Use the connector number 1 according to the Figure 1.

Connect the SFP COMM-25 cable to the SFPKSS4 or SFPKSS8 communication plug. Use the connector number 5 according to the Figure 3.

Automatically the SFPSSC monitor will be switched on and the initial screen will be shown.

Note that SFPKSS4 and SFPKSS8 can also be used to as part of a multiple SFP network utilizing CLNC12 network controller. Follow the instructions in this manual for setup and connection to the SFP pump, however reference L4476 for specific operation with CLNC12 network controller

5.0 SCREENS DESCRIPTION

5.1 Initial Screen

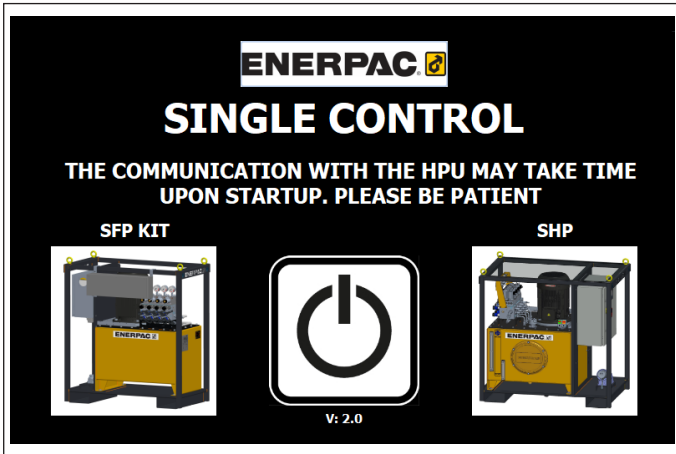


Figure 11, Initial Screen Details

This is the first screen shown by the system. From this screen the operator can access to the rest of the screens of the system and set the features for the movements.

NOTICE

If there is not any connections available, the Start Button does not appear.

When the Start button is pushed, the system will inquire the ID and Password to log into the user profile.

NOTICE

The system is submitted with the standard user profile which is recorded with the user name: energpac and password: 100.

5.2 Main Screen

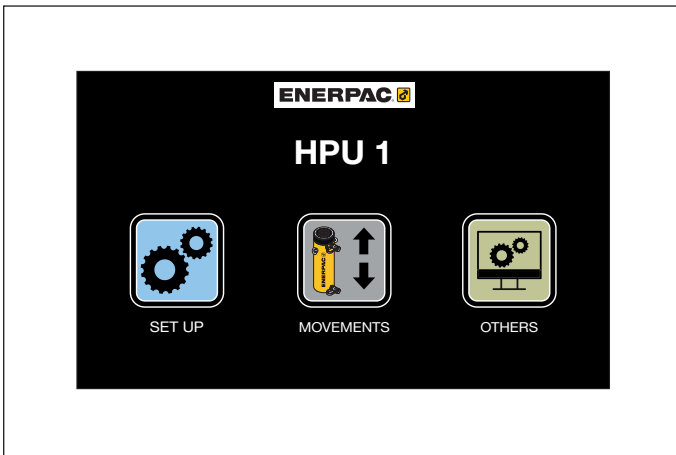


Figure 12, Details of Main Screen

This is the general screen of the software. From this screen the user can access to the set up screens in order to set up parameters of the SFP, to the movements screen in order to make the movements of the cylinders and to the others screen where the operator can adjust other parameters of the software not related with the movements. Refer to Figure 12 to see a picture of the screen.

The screen shows the connected SFP and 3 buttons, Set Up button, Movements button and Others button.

When the user tap on each button a pop up come up with shortcuts to the screens belonging to each section. Refer to Figure 13 to see the pop up of each section.

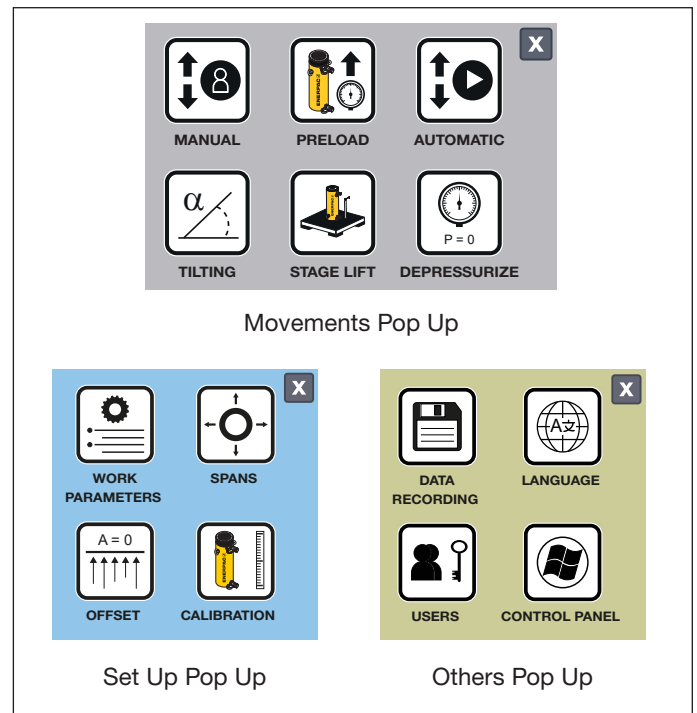


Figure 13, Pop Up Details

Movements pop up

In this pop up the user can access to the screen Manual, Preload, Automatic, Tilting, Stage Lift and Depressurize. Tapping in each button the user can access to the screens of movements section. The background color of this section is gray. Every screen of this section will have a gray background.

NOTICE

When the SFPKPT kit is not connected, the buttons for Preload and Stage Lift will be inactive. Refer to the point "5.4 Special Parameters Screen" for activation purposes.

Set Up pop up

In this pop up the user can access to the screen Work Parameters, Spans, Offset and Calibration. Tapping in each button the user can access to the screens of Set Up section. The background color of this section is blue. Every screen of this section will have a blue background.

Others pop up

In this pop up the user can access to the screen Data Recording, Language and Users. Tapping in each button the user can access to the screens of Others section. The background color of this section is yellow. Every screen of this section will have a yellow background.

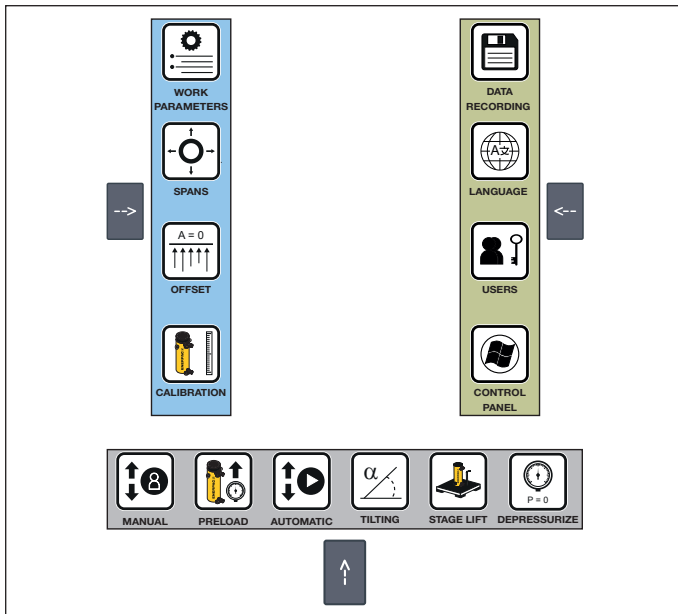


Figure 14, Slides Details

In the screens of each section there is an arrow which allows to merge a slide with the shortcuts to the screens of the section. By this way the system facilitates to the user the navigation between the screens.

In order to see the slides of that section, the user must tap the arrow placed in the screen. This arrow is placed in a different place in each section. For Set up section the arrow is placed on the left of the screen, for the Movements section the arrow is placed on the lower right corner of the screen and for the Others section the arrow is on the right of the screen. Refer to Figure 14 to see the slides of every section.

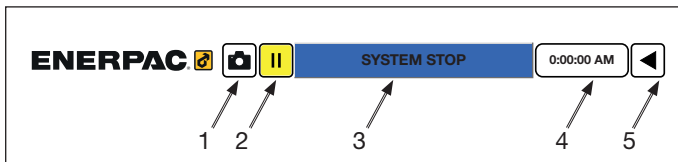


Figure 15, Details of the Common Header of Screens

The software has a common header for all screens. This header has the following buttons (Refer to Figure 15):

1. Snapshot: This button makes a snapshot of the current screen and save it in USB memory.
2. Recording buttons: Pushing to this button the user can start, pause and stop the data recording of the current movement. This values will be saved in the USB memory
3. System status indicator: In this section the software inform about the status of the system.
4. Time section: This section shows the current time. The local time can be adjusted in the control panel of the system. Refer to the paragraph 5.17 for further details
5. Back button: The user can go through this button to the Main Screen

5.3 Parameters Screen

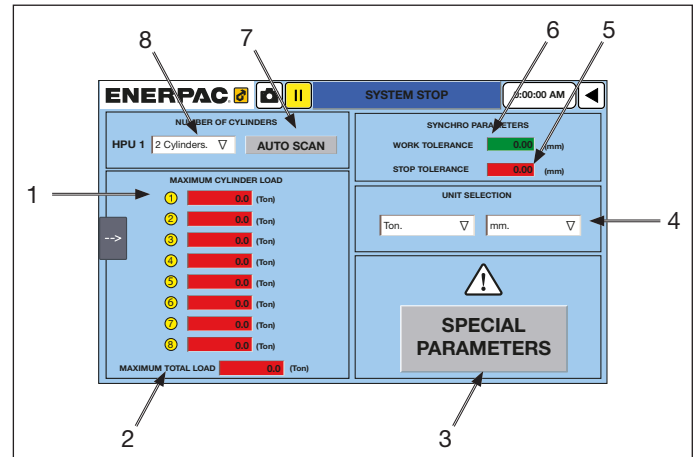


Figure 16, Parameters Screen Details

In this screen the user must define some movements and security parameters of the system. In this screen there are the following components:

1. Maximum Cylinder Load: The user must type the maximum load expected of each cylinder. When this value is exceeded a warning alarm will be shown by the system but the movement will not be stopped.
2. Maximum Total Load: The user must type the maximum load expected of the whole cylinders which are to be involved in the current application. When this value is exceeded the movement will be stopped by the system.



The maximum load expected of each cylinder or of the total cylinders must be always lower than the cylinders capacity. Refer to the cylinders features to know the maximum capacity of each cylinder.

3. Special Parameters button: Pushing this button, the user can access to the special parameters screen (Refer to the paragraph 5.4 for further details). The system will require an user name (parameters) and password (200)
4. Units Selection: The user can select the units whereby the system will show the values. This values can be:
 - Load units: lbs/1000, Ton (1000 kg), s Ton (2000 lbs) and kN.
 - Dimensional units: mm or inches.
5. Stop Tolerance: When multiple cylinders are being synchronized in a movement, there is a range of desynchronization between the most extended and the most retracted cylinder. The user must type in this box which is the maximum admissible value between the most extended and the most retracted cylinder. If this value is exceed the system will stop the movement through a stop alarm.
6. Work Tolerance: The user must type in this box which is the synchronization value between the most extended and the most retracted cylinder. If this value is exceed the system will stop the most extended cylinder until the most retracted cylinder is inserted into the typed range.
7. Auto Scan tool: Pushing this button the system will find the number of cylinders that are connected and available for the work. This scanning is based in finding the number of connections of the pressure transducers. Therefore is important all the pressure transducers connections are correctly connected before performing this tool. Refer to Figure 17 to see the advises that come up when using the scanning tool).
8. Manual cylinders selecting: The user can choose from this drop down window the number of cylinders which are connected to the SFP.

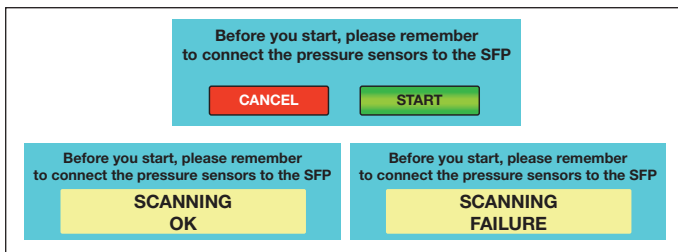


Figure 17, Advises in Auto Scan Tool

5.4 Special Parameters Screen

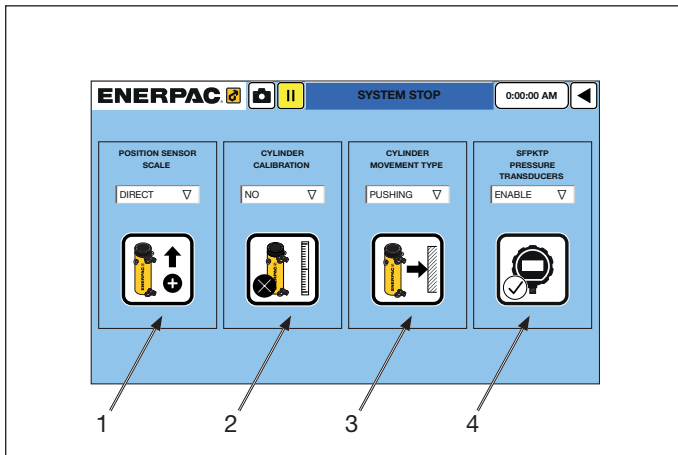


Figure 18, Special Parameters Screen Details

The access to this screen is locked by an ID (parameters) and password (200). The user can access to this screen from the Parameters screen (Refer to paragraph 5.3).

These are the buttons shown in this screen:

1. Position sensor scale: Depending on where is placed the stroke sensor the user must select one of these two options. When the cylinder's plunger movement and the stroke sensor's wire are extending (positive movement), the movement is called Direct. When the cylinder is extending but the stroke sensor wire is retracting (negative movement) the movement is called Indirect. Refer to Figure 19 for further details.

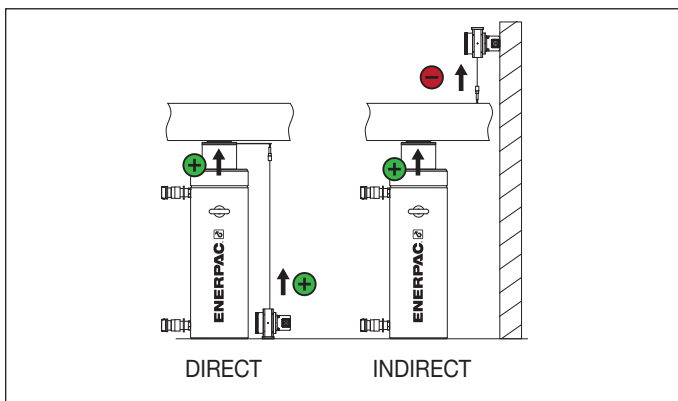


Figure 19, Direct and Indirect layout

2. Cylinder calibration selection: The user must set if the calibration is going to be carried out or not, depending on the type of cylinder used. Refer to Figure 20 for details.

NOTICE

Calibration operation must be carried out depending on how the hook of the stroke sensor is attached. If the hook is attached to the plunger, the calibration must be done. If the hook is attached directly to the load to be moved, then the calibration must be avoided. A cylinder with a internal stroke sensor must be calibrated too.

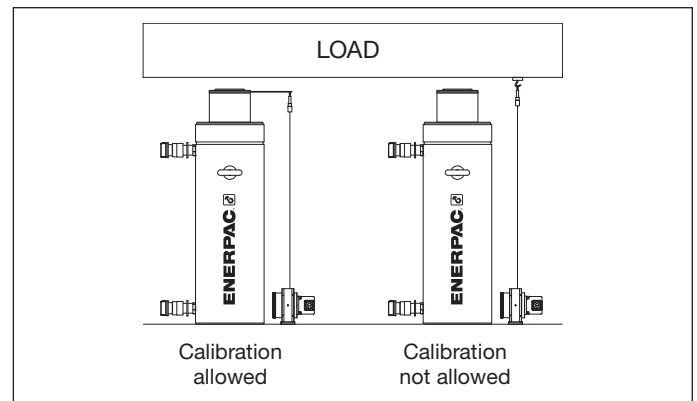


Figure 20, Calibration conditions

3. Cylinder movement type: This button does not have optional selection. It remembers to the user that only can be used cylinders with pushing purposes.
4. SFPKPT kit installed: When the pressure transducer kit is installed this option must be enabled in order to see the hidden options in the rest of the screens.

5.5 Spans Screen

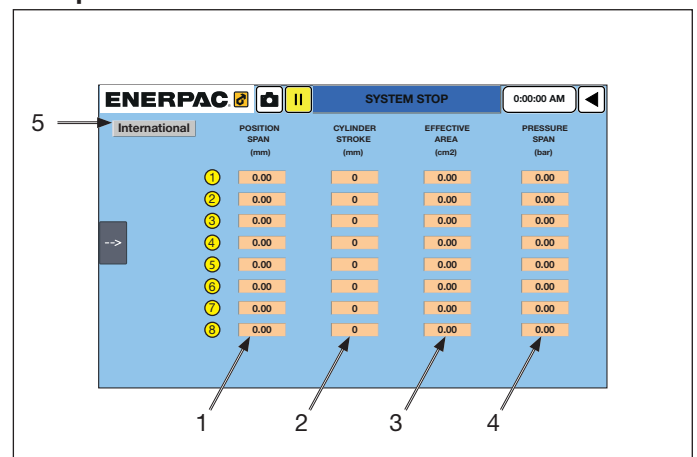


Figure 21, Spans Screen Details

In this screen the user can enter the parameters of the elements used with the SFP in the movements, such as the cylinders installed in the application, the stroke sensors and the pressure transducers used to set the calculations of the movement.

There are up to 8 rows corresponding to the parameters of the elements connected to each cylinder. Row 1 will belongs to the parameters of the elements that monitor the cylinder 1, row 2 to cylinder 2, etc.

In the boxes the user can type the following data (Refer to Figure 21 for the position number):

1. Position span: The user must type the maximum range of the stroke sensor which monitor each cylinder.
2. Cylinder stroke: The user must type the maximum stroke of the cylinder.
3. Effective area: The user must type the surface area of the pushing side of the cylinder.
4. Pressure span: The user must type the maximum range of the pressure transducer.
5. Units button: The user can switch a different units system pushing this button. The units can be international for the International System of Units, or Imperial for the Imperial System of Units.

NOTICE

The user can find the values of the previous parameters in the label or features description of each element.

5.6 Offset Screen

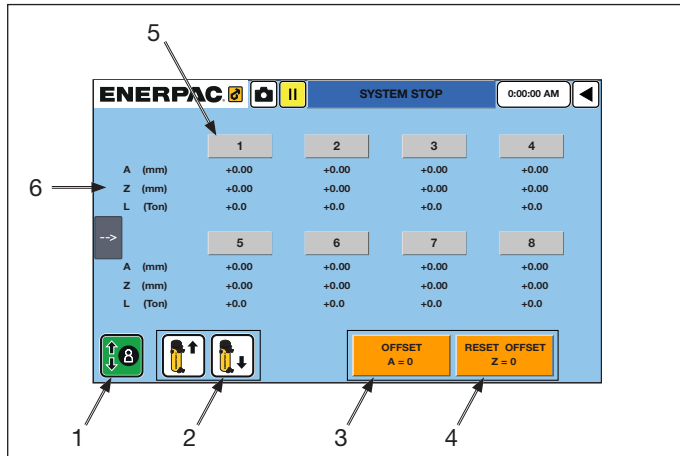


Figure 22, Offset Screen Details

Offset is generally used to have a dimension reference when a load is going to be lifted to an unknown dimension and that load is subsequently lowered to the same location. As the stroke sensor wire usually needs to be extended a short distance to engage the bottom of the load, the offset screen can save that value so the user can reference that starting point after the lift is completed. By assigning an offset value prior to starting to lift the load, the user will have a reference point where the lift started.

“A” value normally represents the absolute extension of the stroke sensor between 0 and full extension. When the user press and hold the Offset button (A=0), the current “A” value is stored in the memory as “Z”, and “A” is reset to zero. “A” now becomes your reference value for the starting point of the lift. When the lift is complete, the user can press Reset button (Z=0) to reset “A” back to normal value.

In this screen is found the following elements:

1. Manual button: Select this button to activate the manual mode operation. When this button is selected, the background color of the button will become green. Use this button to make small movements in the application. Refer to paragraph “5.8 Manual Screen” and “6.4 Manual Mode” for further details concerning the manual movements.
2. Upward / Downward buttons: When the manual button is selected the sense of the movement buttons selection is needed. This can be upward to get out the plunger of the cylinder, and downward to get in the plunger of the cylinder. The user must select what type of sense of the movement is going to have the movement to be executed.
3. Offset button: Push and hold this button during 3 seconds to convert the value A into 0 and Z will keep the current value of A.

NOTICE

The offset value does not disappear when the equipment is turned off or there is a power failure. This value is maintained until the operator performs a Reset of the Offset value.

4. Reset Offset button: Push and hold this button during 3 seconds to convert the value Z into 0 and A will take the current value of Z and will add it to the current value.

$$A_i = A_j + Z$$

5. Cylinders selection buttons: The user must select the cylinder which will be involved in the movement or operation. When a cylinder is selected, the button will become green.

6. Movement values: There are some values that the system can shows during the movement. These are:

- A (Absolute position): The absolute position is the position of the plunger of the cylinder taken from the initial zero. This initial zero is the zero set in the calibration screen (Refer to paragraph 5.7 for further details).
- Z (Offset variable): Memory variable for a movement reference.
- L (Load withstood by cylinder): This value shows the load is being withstood by each cylinder in the current moment.

NOTICE

The parameter L will not be activated in any screen when the SFPKPT kit is not connected and not enabled in the special parameters screen. Refer to the point 5.4 for further information.

5.7 Calibration Screen

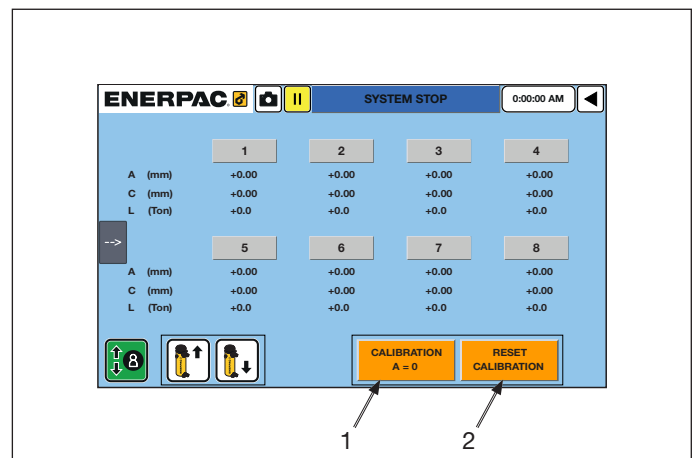


Figure 23, Calibration Screen Details

When the stroke sensor wire is connected to the cylinder plunger, the system reads the extended length of the wire (A value). In that moment A has a real reading of the sensor and each cylinder will have a different value of A. Refer to Figure 24 for details.

In order to equalize the stroke sensor position with the plunger position, the user must carry on with a calibration of the cylinder. When the calibration work is performed, all the cylinders will have value A = 0 when retracted.

This screen has the similar elements than the Offset screen.

Two buttons are the difference:

1. Calibration: If the calibration is allowed, based on the place of the stroke sensor (refer to paragraph 5.4 for further details), this button allows calibrating (equalize the cylinder and the stroke sensor) and set the Absolute position of the cylinder (A = 0). The user must push and hold during 3 seconds this button to be the value effective.

CAUTION

This step should be only be done with the sensor connected to the plunger and the plunger fully retracted to ensure that sensor will be properly calibrated.

2. Reset Calibration button: If during the calibration works something was wrong, this button allows to back to the previous value of the Absolute position and reset the calibration done.

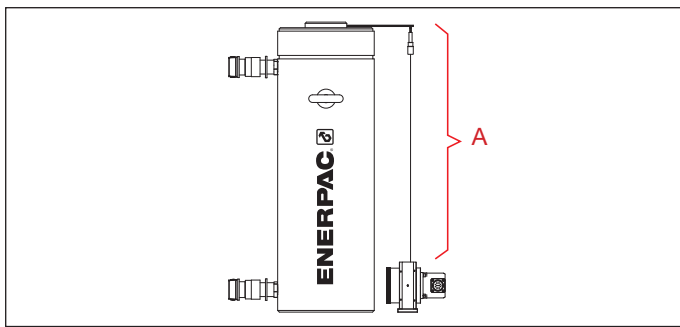


Figure 24, Detail of A value in a general purpose cylinder

5.8 Manual Screen

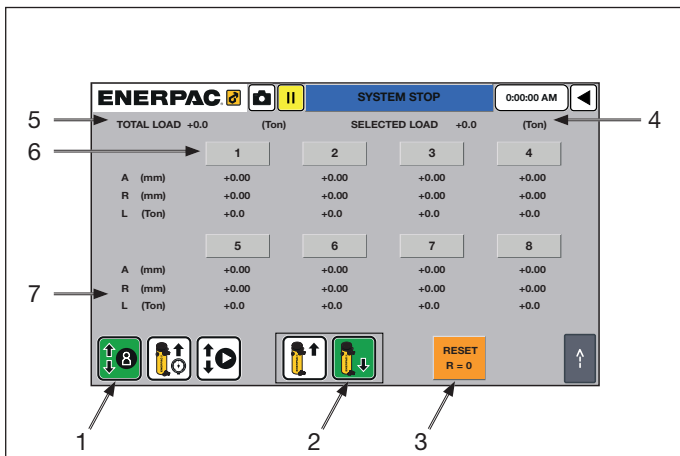


Figure 25, Manual Screen Details

This screen belongs to the movements section. In this section the user must select the type of the movements which is going to be executed.

In the case of the manual movements, the user can move the cylinders having a total control of the movement. The user can extend or retract the cylinder plunger by pushing and holding the start cycle button, and pause the movement just releasing the button. This work mode is used to make small positioning movements in the application.

The user can see the following elements in this screen (Refer to Figure 25 for reference numbers):

1. Manual button: Select this button to activate the manual mode in the movement. When this button is selected, the background color of the button will become green.
2. Extend / Retract buttons: When the manual button is selected the user must also choose a direction of motion. This can be extend to get the plunger out of the cylinder, and retract to get the plunger into the cylinder. The user must set what direction of the movement is going to be executed.
3. Reset Relative position button: This button resets the relative position of each active cylinder to zero. Push this button to reset this value. For further details about the relative position, refer to the point 7 of this section.
4. Selected Load value: This value shows the load is being withstood by the selected cylinders in that moment.
5. Total Load value: This value shows the load is being withstood by all cylinders in that moment. This will be the sum of loads of the complete system.
6. Cylinders selection buttons: The user must select the cylinder which will be involved in the movement. When a cylinder is selected, the button will become green.

7. Movement values: There are some values that the system can show during the movement. These are:

- A (Absolute position): The absolute position is the position of the sensor taken from the initial zero. This initial zero can be adjusted to match the cylinder plunger position in the calibration screen (Refer to paragraph 5.7 for further details).
- R (Relative position): The relative position is the position of the plunger of the cylinder taken from the last zero set point. This is the reference value that the system uses to maintain synchronization between lifting points. (to reset position refer to the point 3 of this section).
- L (Load withstood by cylinder): This value shows the load is being withstood by each cylinder in the current moment.

NOTICE

The parameter L will not be activated in any screen when the SFPKPT kit is not connected and not enabled in the special parameters screen. Refer to the point 5.4 for further information.

Load values are obtained through the calculation of the pressure in the line of that cylinder and the effective area of each cylinder typed in the spans screen (paragraph 5.5). These values therefore will be approximated with some error margin.

The points from 4 to 7 are common elements in the movements screens. This elements will not be explained again in the following paragraphs.

5.9 Preload Screen

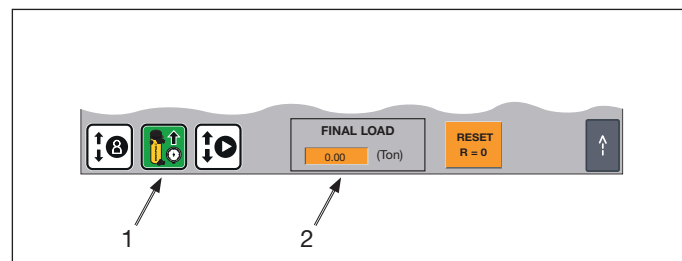


Figure 26, Preload Screen Details

The Preload screen contains the same elements than in the manual screen (Figure 25). Only changes the elements shown in the Figure 26.

In this work mode, the operator has to define a target load that each cylinder must sustain. Cylinder pistons will automatically move until each cylinder comes to support the specified load.

NOTICE

Enerpac recommends carrying out this step prior to lifting a structure in Automatic mode because in this way the user ensures that all the cylinders are in full contact with the structure. The operator should enter a small load value to ensure that all cylinders support that value.

In this screen there is two important elements:

1. Preload button: Select this button to set the preload movement in the system. When this button is selected, the background color of the button will become green.
2. Final Load parameter: The user must type the final load that each cylinder must reach to finish the cycle. When all the cylinders selected reach this value, the cycle will be finished.

NOTICE

Enerpac recommends setting the final load value less than 10% of the expected load at each cylinder.

5.10 Automatic Screen

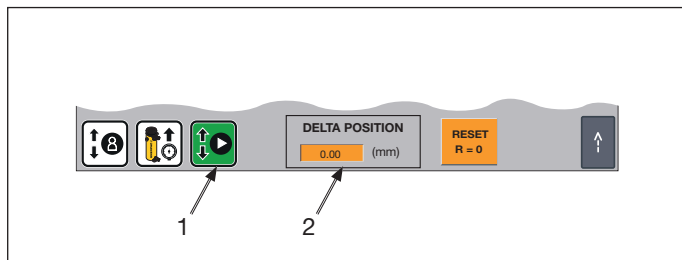


Figure 27, Automatic Screen Details

The Automatic screen contains the same elements than the manual screen (Figure 25). Only the elements shown in the Figure 27 change from the manual screen.

This is the best working option to make a synchronized movement of the cylinders into a known reference. In this work mode the user types a distance increment value (Delta) and cylinders move synchronously that distance.

In this screen there are the following elements:

1. Automatic button: Select this button to activate the automatic mode in the movement. When this button is selected, the background color of the button will become green.
2. Delta Position value: The user must type in this box the increment of the current position which the cylinders must reach in the next cycle. This value can be positive (if extending cylinders) or negative (if retracting cylinders).

NOTICE

When the cylinder calibration has been performed, the system will not let to the user to type a value higher than the stroke capacity of the cylinders. It is important the parameter of the cylinder stroke is correctly entered into the Span screen (paragraph 5.5) to avoid cylinders damage.

When the cylinder calibration was not performed the system will use as the limit of the stroke the stroke sensor maximum range, to avoid stroke sensor damage.

5.11 Tilting Screen

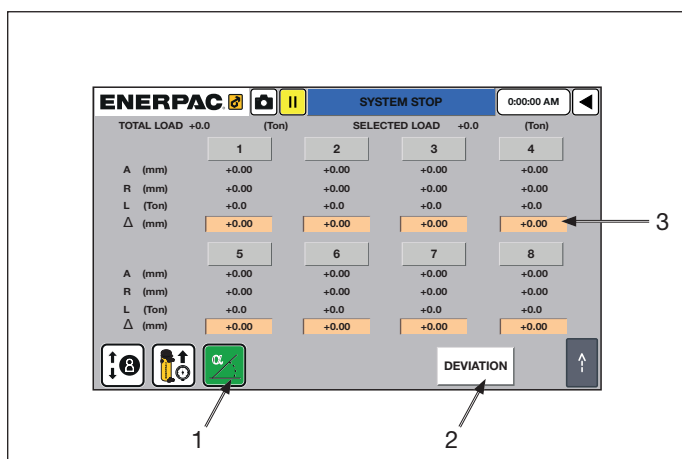


Figure 28, Tilting Screen Details

This movement allows making movements with load inclination purposes. This movement allows setting a different target for each cylinder and make a synchronous movement of every cylinder in such a way that all the cylinders finish at the same time.

The Tilting screen contains the same elements than in the manual screen (Figure 25). Only changes the elements shown in the Figure 28.

In this screen there are the following elements:

1. Tilting mode button: Select this button to set the tilting movement in the system. When this button is selected, the background color of the button will become green.
2. Deviation button: This button shows the deviation screen. In this screen the user can check the details of the current tilting movement.
3. Delta Final Position: The user must type in this box the increment of the current position which the cylinders must reach in the next cycle. This target can be positive (if extending cylinders) or negative (if retracting cylinders). This value can be set individually for each cylinder.

CAUTION

At the end of each cycle, all the cylinders will finish at the same time. The cylinders with bigger stroke will have more stops and waiting time than those with less stroke. Consider this features to avoid uncontrolled movements.

5.12 Deviation Screen

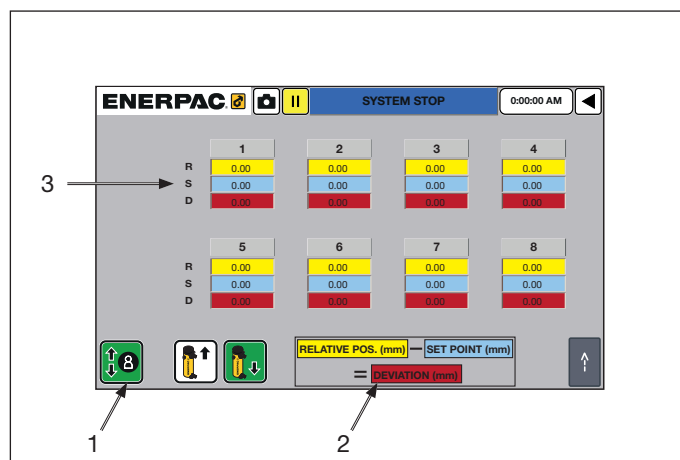


Figure 29, Deviation Screen Details

In this screen the user can check the details of the current tilting movement.

In this screen there are the following elements:

1. Manual button: Select this button to activate the manual mode operation. When this button is selected, the background color of the button will become green. Use this button to make small movements in the application. Refer to paragraph "5.8 Manual Screen" and "6.4 Manual Mode" for further details concerning the manual movements.
2. Key formula: This area shows the formula used to make the calculations of tilting movement.
 - Relative Position — Set Point = Deviations
3. Values of each cylinder to make the tilting movement:
 - R (Relative Position): This value shows the current position of the plunger of the cylinder.
 - S (Set Point): This value is the theoretical position which should have the plunger in the current moment, according to the internal calculations made by the system in order to all the cylinders reach the final delta target at the same time.
 - D (Deviation): This value is the difference between the theoretical position that should have the plunger according to the internal calculations of the software (set point), and the real position of the plunger in the current movement (Relative position).

This screen is only for information proposal. The user cannot type or select any value.

5.13 Stage Lift Screen

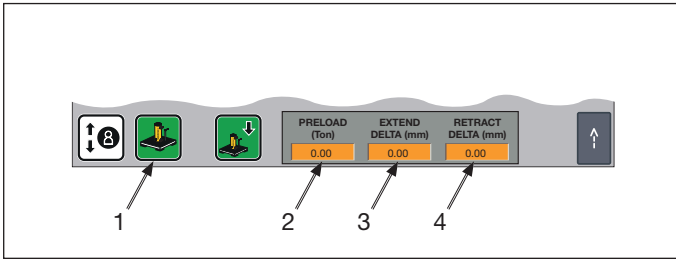


Figure 30, Stage Lift Screen Details

The Stage Lift screen contains the same elements than the manual screen (Figure 25). Only the elements shown in the Figure 30 change from the manual screen.

This work mode is the ideal solution to use the climbing jacks. The stage lift movement is a semiautomatic cycle that is done in 4 steps / stages. After each step the system ask for the operator confirmation in order to begin the next step.

In this screen there are the following elements:

1. Stage Lift button: Select this button to activate the automatic mode in the movement. When this button is selected, the background color of the button will become green.
2. Preload value: The user must type the final load that each cylinder must reach to finish the first step. This value is typically used to get the first contact with the load by the cylinders.
3. Extend Delta value: The user must type the final position of the cylinder in this step. The cylinder will extend (or retract for lowering purposes depending on positive or negative values) the plunger. This value is typically used to move the load to the next height.
4. Retract Delta value: The user must type the final position of the cylinder in this step. The cylinder will retract the plunger to place the outer blocks to have a support to make a lifting or lowering to a new level.

Refer to the paragraph 6.9 for further details on how to use this work mode.

5.14 Depressurize Screen

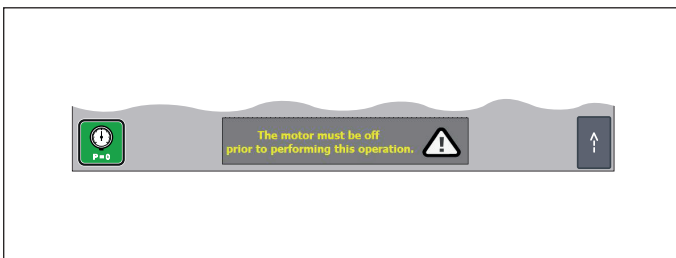


Figure 31, Depressurize Screen Details

The Depressurize screen contains the same elements than in the manual screen (Figure 25). Only the elements shown in the Figure 31 change from the manual screen.

After working with the system, the hoses and jacks may still contain some residual pressure. Using this work mode, the system will relase the total pressure of the equipment (pumps, pipes, hoses and cylinders).

This screen shows a warning to indicate the user that the motor must be off before depressurizing. When the process is started, a warning screen reminds the operator of the risk taken using this working mode with the cylinders withstanding a load.



It is totally forbidden depressurizing the system while the load is over the cylinders. If the system is pressure released with load in the cylinders could result in death or serious personal injury and property damage.

5.15 Data Recording

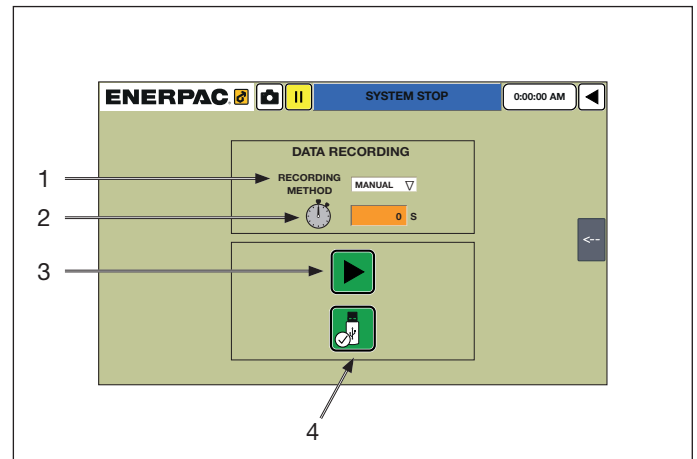


Figure 32, Data Recording Screen Details

With this screen the operator can record the movement data into a external drive.

In this screen there are the following elements (Refer to Figure 32):

1. Recording method: Select the recording method (manual or automatic) for recording movement data purpose. When the manual option is selected, the system will record only when the user pushes the record button. When automatic mode is selected, the system will automatically record the data when the system is moving.
2. Time period: The user must type the frequency of the data recording. The units used are seconds.
3. Start record button: Push this button to start recording the data of the movements in the drive selected.
4. Storage hardware: The user must select the desired hardware where the data will be stored. This hardware can be in a USB memory.

5.16 Language screen

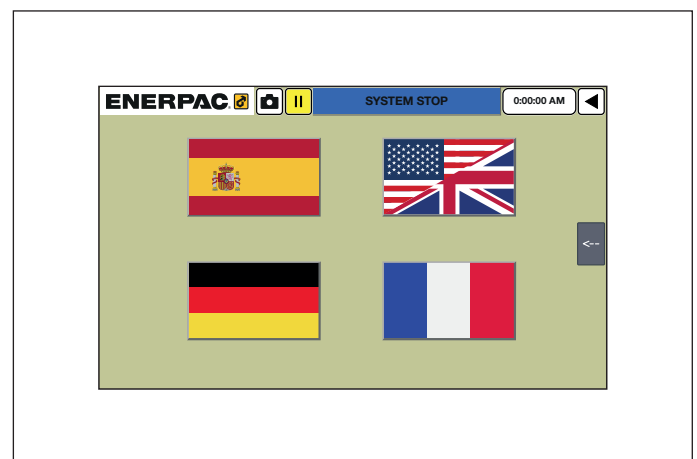


Figure 33, Language Screen Details

The user can choose the alarms language in this screen. Select the language desired and tap the back button to go to the main screen.

6.4 Manual Mode

Manual mode is used to move cylinders in a free way. This mode is used commonly to set the cylinders for maintenance purposes.

NOTICE

Be informed that with this mode the cylinders does not make a synchronized movement between them.

In order to work with this mode, follow the steps below:

1. Ensure that all elements are correctly plugged and does not exist any alarm
2. Go to manual screen. Refer to paragraph number 5.8 to further details
3. Select manual button
4. Select the cylinders movements outward or inward
5. Select the cylinders which are going to be involved in the movement by tapping the cylinders buttons. When the cylinder is selected, the button background becomes green.
6. Start motor in the SFP
7. Press and hold down the Start cycle button in the keypad. Cylinder will be moved until button is released. Refer to Figure 2 to further details.
8. When cylinders plunger are placed in the desired position, release cycle button and the movement will be stopped.

6.5 Preload Mode

Enerpac recommends carrying out this step prior to lifting a structure in the Automatic mode because in this way the user ensures that all the cylinders are in full contact with the structure. The operator should enter a small load value (i.e. 200 kN) to ensure that all cylinders withstand that value of the load.

This mode allows to have a real reference of the position of the load, and avoid some cylinders make unladen work.

In order to work with this mode, follow the steps below:

1. Ensure that all elements are correctly plugged and does not exist any alarm
2. Go to Preload screen. Refer to paragraph 5.9 for screen details.
3. Select the Load mode button.
4. Type the final load that cylinders must reach.
5. Select the cylinders which are going to be involved in the movement by tapping the cylinders buttons. When the cylinder is selected, the button background becomes green.
6. Switch on the motor in the SFP
7. Press the Start Cycle button in the keypad
8. When every cylinder reach the final load, the system will stop the cycle.

NOTICE

When this movement has been finished the system has a real reference of the position of the load. When every cylinder are touching the load, the operator must press reset button to have a new zero for the relative position.

Enerpac recommends also making an Offset when the cylinders reached the final load after performing the Preload mode. Using this step the user will have a provisional zero in case of needed.

With this work mode, the cylinders do not make a synchronized movements to reach the target.

6.6 Automatic Mode

This is the best option of working in order to make a synchronized movement of the cylinders into a known distance reference. In this work mode the user types a height target and cylinders move to that target synchronously.

In order to work with this mode, follow the steps below:

1. Ensure that all elements are correctly plugged and does not exist any alarm
2. Go to Automatic screen. Refer to paragraph 5.10 for further details
3. Select the automatic mode button
4. Type Delta Position parameter. Delta Position is the distance that the plunger of the cylinders must be moved. This distance can be positive or negative, depending on the movement sense (extending or retracting).

CAUTION

Ensure that the cylidners are in contact with the load and that the R=0 reset button has set all relative values to zero.

NOTICE

The system will not allow the operator to enter a value higher than the stroke capacity of the cylinders. It is important the parameter of the cylinder stroke is correctly entered into the Span screen (paragraph 5.5) to avoid cylinders damage (only for cylinders calibrated case, refer to the notice in the paragraph 5.5).

5. Select the cylinders which are going to be involved in the movement by tapping the cylinders buttons. When the cylinder is selected, the button background becomes green.
6. Start motor in the SFP
7. Press Start Cycle button in the keypad
8. When the cylinders reach the delta position, the system will stop the movement and will keep in waiting state (the system keeps the current values) in the case the user wants to make a new cycle with the same parameters.

6.7 Tilting Mode

This movement allows to the user to make movements with load inclination purposes. This movement allows the user to set a different target for each cylinder and make a synchronous movement of each cylinder in such a way that all the cylinders finish at the same time.

In order to work with this mode, follow the steps below:

1. Ensure that all elements are correctly plugged and does not exist any alarm
2. Go to the Tilting screen. Refer to paragraph 5.11
3. Select the cylinders which are going to be involved in the movement by tapping the cylinders buttons. When the cylinder is selected, the button background becomes green.

CAUTION

Ensure that the cylinders are in contact with the load and that the R=0 reset button has set all relative values to zero.

4. Type the delta position (the increment of the current position) of every cylinders selected. Delta Position can be negative or positive
5. Select Tilting button

6. Start motor in the SFP.
7. Press Start Cycle button in the keypad.
8. When the cylinders reach the delta position, the system will stop the movement and will keep in waiting state (the system keeps the current values) in the case the user wants to make a new cycle with the same parameters.

6.8 Depressurize Mode



It is totally forbidden depressurizing the system while the load is over the cylinders. If the system is pressure released with load in the cylinders could result in death or serious personal injury and property damage.

After working with the system, the equipment can remain with residual pressure. Using this work mode, the system will release the total pressure of the equipment (pumps, pipes, hoses and cylinders).

In order to work with this mode, follow the steps below:

1. Be sure that no load is being withstood by the cylinders
2. Go to Depressurize screen. Refer to the paragraph 5.14 for further details.
3. All the cylinders are selected automatically.
4. Push the Stop Motor button in the keypad to turn the motor off.
5. Press Start Cycle button in the keypad.
6. The system requires a second check to be sure the cylinders do not have any load. When it is confirmed that no load is withstood by the cylinders, tap Yes button. Refer to Figure 36.

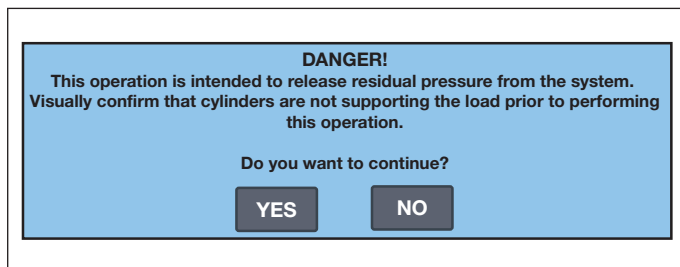


Figure 36, Warning advise for pressure releasing purposes

7. Press and hold the depressurize button in the SFP electric cabinet to start depressurizing. The cylinders will be depressurized in seconds.

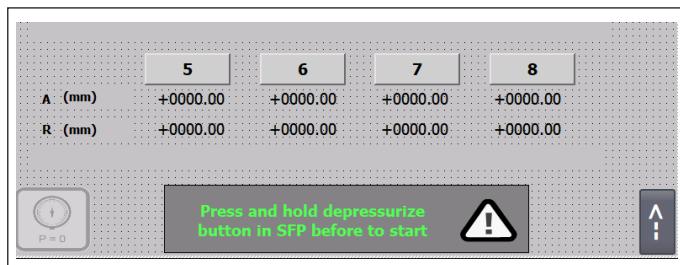


Figure 37, Warning advise to press the button in the SFP

6.9 Stage Lift Mode

Climbing Jacks overcome the usual limitation of lifting height imposed by the cylinder's plunger stroke length. Large objects can be lifted or lowered with this system. Use climbing jacks for this purpose.

There is a sequence that must be performed always with this Stage Lift mode:

Step 1: Once the lifting jack is placed on a solid support under the load (with a retracted plunger), extend the plunger in the preload mode until touching the load (Refer to the preload parameter in the Figure 26).

Step 2: Plunger extends, lifting the load and giving clearance to insert two outer blocks under the spreading plate. (Refer to the Extend Delta parameter in the Figure 26).

Step 3: Plunger retracts, giving clearance to position the central blocks which will support the plunger plate for the next extension. (Refer to the Retract Delta parameter in the Figure 26).

Step 4: Plunger extends, lifting the load, giving clearance to insert two new blocks, placed crosswise under the spreading plate.

In order to work with this mode, follow the steps below:

1. Ensure that all elements are correctly plugged and does not exist any alarm
2. In BLS special cylinders, stroke sensors make a negative reading when the plunger is going out. Remember that indirect reading must be selected in this case. Go to the Special parameters screen (refer to paragraph Figure 18) and select indirect option.
3. Go to stage lift screen (Refer to paragraph 5.13).
4. Select the stage lift button
5. Select the movement sense lifting or lowering case
6. Type preload, extend delta and retract delta parameters.
7. Switch on the motor in the SFP
8. Push start cycle button on the keypad
9. All the cylinders will start to extend the plunger until they reach that pressure value typed in preload. When all cylinders reach preload value, the system will have finish the first stage and will require the operator confirmation for the next step.
10. Push start cycle button on the keypad
11. The load will be lifted synchronously until reaching delta position value. When all cylinders reach extend delta value, the system will have finish the second stage and will require the operator confirmation for the next step
12. Insert two outer blocks under the spreading plate.
13. Push start cycle button in order to start the third step
14. The load will be lowered until reaching delta negative position. When all cylinders reach retract value, the system will have finish the third stage and will require the operator confirmation for the next step
15. Push start cycle button in order to start the fourth step
16. Cylinders will move plunger until the initial position
17. Insert the central outer blocks under the plunger

In the previous steps has been described the procedure for lifting a load. Lowering a load has the same procedure but replacing the parameters in the Special Parameters screen and removing the outer blocks instead of adding new blocks.

7.0 MAINTENANCE

There is a small inline fuse of 10A inside the main power connection switch. If a short circuit occurs, this fuse will need to be replaced.

The HMI screen requires some basic care including the following:

- Keep the screen clean of dirt and other debris at all times. These materials may get embedded in the screen and cause irregular function.
- Keep the screen dry at all times. Immediately clean any liquid off the screen.
- Keep the screen clean using a soft cloth with a mild screen cleaning solution if necessary.
- Keep the cover of the protective case closed when not using the controller to prevent damage and to keep the screen clean.

7.1 IP factory recall process

When any mistake during the set up or when the micro SD card is replaced into the Logo device, a factory recall IP must be performed.

In order to reset the IP follow the following steps (The SFPSSC monitor must be disconnected from the SFPKSS4 or SFPKSS8):

1. Disconnect the SFP COMM-25 cable from the SFPKSS4 or SFPKSS8.
2. Connect the SFP to the electric power source.
3. Switch on the SFP using the main power switch. Refer to the SFP instruction manual.
4. On the SFPKSS4 or SFPKSS8 electric cabinet push and hold during 20 seconds the Set Up Ok button. Refer to the figure Figure 3 button number 10.

NOTICE

When the Set Up Ok button is pushed the light will be flashing rapidly. After 20 seconds the light will be flashing more slowly. In this moment, the IP has been reset successfully.

5. The operator must push the Set Up Ok button one more time and release it again (not hold).

NOTICE

Following the step 4 the SSC will create a new IP to the SFP. If the IP has been created successfully the light of the Set Up Ok button will be switched off. If some mistake came up during the process, the light will be flashing again into a high frequency.

6. Refer to the point 4.3 in order to reassign a new IP.

8.0 ALARM GUIDE

Only qualified hydraulic technicians should service the pump or system components. A system failure may or may not be the result of a pump malfunction. To determine the cause of the problem, the complete system must be included in any diagnostic procedure.

Refer to the alarm chart for a list of alarms and possible causes. The alarm chart is not all-inclusive, and should be considered only as an aid to help diagnose the most common problems. For repair service, contact your local Authorized Enerpac Service Center.

ALARMS CHART		
ALARM	POSSIBLE CAUSE	SOLUTION
Safety Stop: Control Cabinet	Safety Stop is activated.	- Deactivate Safety Stop button. - Reset alarm.
Stop Tolerance Exceeded. Reset Relative Positions	The difference between Relative Positions of selected cylinders is bigger than "Work Tolerance" parameter.	- Review the Relative Positions of selected cylinders. - Reset the Relative Positions. - Reset alarm.
HPU Communication Failure	The SFP does not communicate correctly with the SFPSSC.	- Check the connected cables between SFPSSC and the electric cabinet of SFP. - Reset alarm.
Maximum Total Load	The system has reached to the parameter typed Maximum Total Load.	- Check if the Maximum Total Load parameter is set correctly. - Check if the Load is blocked in the motion. - When the root cause has been checked and solved, reset alarm.
Synchronization Alarm	In Automatic Mode, the difference between the positions of the fastest and the slowest cylinder is bigger than "Stop Tolerance" parameter.	- Check the parameter, considering that "Stop Tolerance" must be at least 3 times the "Work Tolerance". If it is incorrect, change it. - If the "Tolerance" parameters are correct, reset alarm and continue the cycle. - If the alarm is activated again, visually check the state of the stroke sensor and the cylinder. You may need to use Manual mode to adjust cylinders back into working tolerance. Be sure to use care when operating the system manually to avoid possible injury or death.
Motor OFF.	The motor is switched off when is trying to carry on a movement	- Switch On the motor on the SFP electric cabinet. - Reset alarm.
Impossible To Start Tilting. All Values Must Be Others Than 0	The value typed in the delta position of each cylinder is zero	- Type a delta position different than zero or deselect the cylinder to be moved. - Reset alarm.
Maximum Cylinder (#) Load	The pressure of the cylinder (#) has exceeded the value entered in the "Maximum Cylinder Load" parameter.	- Check the parameter, considering the load weight and the cylinder characteristics. If it is incorrect, change it. - Check "Effective Area" and "Pressure" spans. If one of them is incorrect, change it. - Reset alarm. The alarm can only be reset by adjusting the load alarm parameter or by reducing the actual load on the cylinder using manual mode. Take care when using manual mode to avoid injury or death.
Cylinder (#) Stroke Signal Failure	The stroke sensor signal of the indicated (#) cylinder is not reaching to the PLC.	- Visually check the position transducer and the cable. - Reset alarm.
Cylinder (#) Absolute Sensor Position Value Below Lowest Admissible Limit	The stroke sensor associated to (#) cylinder is not extended or connected to the load or the plunger of the cylinder.	- Extend the stroke sensor wire and connect it to the element to be moved. - Reset alarm.
Cylinder (#) Pressure Signal Failure	The pressure transducer signal of the indicated (#) cylinder is not reaching to the PLC.	- Visually check the pressure transducer and the cable. - Reset alarm.

ALARMS CHART		
ALARM	POSSIBLE CAUSE	SOLUTION
Safety Stop: Control Panel	Safety Stop is activated pressing on safety stop button at SFPKSS8 (figure 3, item 9).	- Deactivate Safety Stop button. - Reset alarm pressing on reset alarms button at key pad (figure 2, item 5).
Safety Stop: Single Synchro Controller	Safety Stop is activated pressing on emergency stop button at SFPSSC (figure 1, item 5).	- Deactivate Safety Stop button. - Reset alarm pressing on reset alarms button at key pad (figure 2, item 5).
SFP Cabinet Relay Off	Safety Stop is activated pressing on at /figure, item).	- Deactivate Safety Stop button. - Reset alarm pressing on at /figure, item).

9.0 ATTACHED DOCUMENTS

In the following table, there are documents that facilitate the interpretation of this manual. Click on the reference number of the documents in the table to show the attached documentation.

DOCUMENT NUMBER	OBSERVATION	PRODUCT CODE BEGINNING
ECSFPKSS4.pdf	Electric Scheme of SFPKSS4	A
ECSFPKSS8.pdf	Electric Scheme of SFPKSS8	A
SFPCOMM-25.pdf	Electric Scheme of SFPCOMM-25 cable	A
SFPSSC.pdf	Electric Scheme of SFPSSC	A

