

CONTROLLER NETWORK KIT SFPKMN

L4475

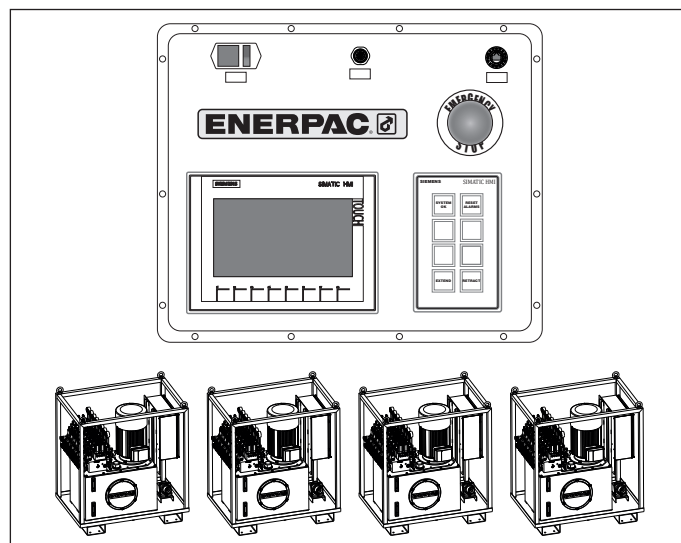
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1.0 INTRODUCTION

1.1 Overview

Enerpac is a global market leader in high pressure hydraulic tools, controlled force products and solutions for precise positioning of heavy loads.

The SFP-Series electrically driven Split Flow Hydraulic Pumps are Enerpac's new solution for multi-point lifting and lowering applications where uneven loads need to be positioned equally. 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 Split Flow Pump has manual valves with joysticks or solenoid valves with a pendant to enable controlled movement of the load. 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.

1.2 Application

The Split Flow Pumps can be used in a wide variety of lifting, lowering and pushing applications, such as: bridge deck lifting for bearing maintenance, machinery lifting and moving, skidding to move structures and buildings, and shipbuilding applications.

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 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 gear 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 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). In a multi-point application, the plunger stages of each telescopic cylinder will extend and retract at slightly different speeds. The cylinders will never be exactly synchronized and uneven lifting and lowering will result.
- 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 be certain 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.
- Be 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 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

SFPKMN controller network box for SFP must be used with at least one electric box SFPKSN and one communication cable SFPCOMM-25.

However this system has been designed to connect up to 4 SFP's to work together and to be controlled by one controller network box.

NOTICE

The controller network box does not provide synchronized movements of cylinders. The movement of each cylinder will vary slightly based on the flow reached and the load withstood.

3.1 SFPKMN description

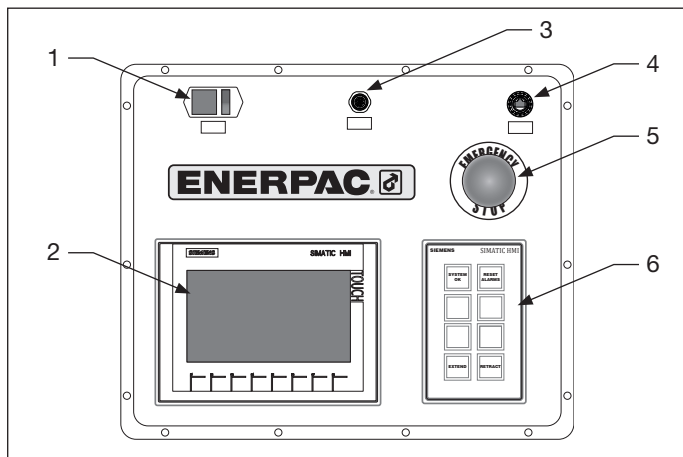


Figure 1, Major Components, SFPKMN

SFPKMN is the controller network box with the following buttons:

1. ON/OFF switch 115/240V electric supply plug
2. Touch screen
3. Communication plug
4. Ethernet connection
5. Emergency stop button
6. Key pad

NOTICE

The controller network box SFPKMN is supplied in a protection/transportation case. Do not remove the controller box from the case. The operator can work with the case opened. Be careful when handling the controller network case, the weight is 13 kg/28.6 lbs.

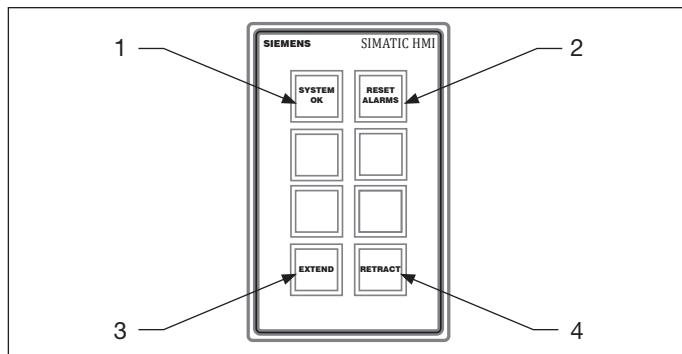


Figure 2, Major Components Key Pad

The major components of the Key Pad are:

1. System ok light: This light is on, when the system is correctly connected
2. Reset alarms button: This light becomes red when any alarm occurs in the system. The operator must push this button when the reason of the alarm has been solved.
3. Extend button: Keep pushing this button to extend the cylinders that have been selected in the touch screen
4. Retract button: Keep pushing this button to retract the cylinders that have been selected in the touch screen.

3.2 SFPKSN description

This is the electric cabinet that allows the communication between the other SFP's and the communication with the controller network box.

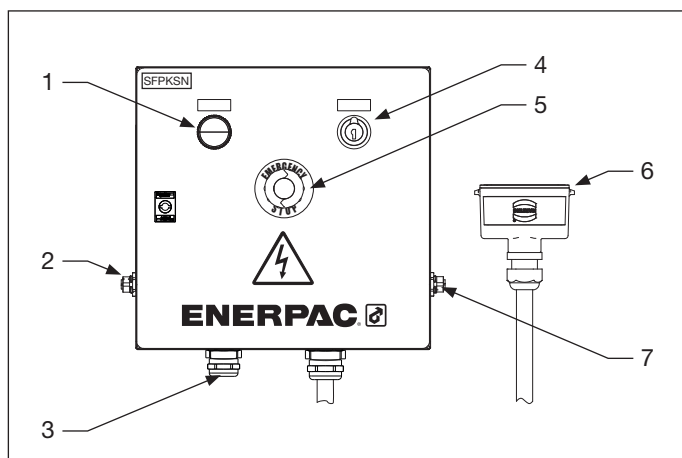


Figure 3, Major Components SFPKSN

SFPKSN is designed with the following buttons:

1. Power ON led
2. Communication "IN" plug
3. CSFP cable plug
4. End of line selector
5. Safety Stop button
6. CBM cable/plug
7. Communication "OUT" plug

NOTICE

Be careful when handling weights. The weight of this electric box is 10 kg/22 lbs.

3.3 CSFP cable

This is the communication cable between the SFP electric cabinet and the SFPKSN. It is essential together with COM cable plug to have a good communication with the SFP pump.

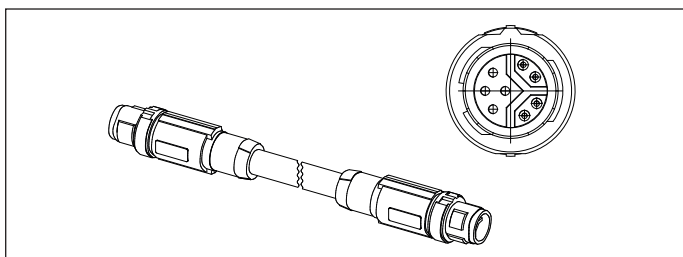


Figure 4, CSFP cable detail

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. 4.9 feet
- Connection male M12 0° - male M12 0°

3.4 SFP COMM-25

This is the communication cable between the SFPKSN electric cabinet boxes of the SFPKMN network controller.

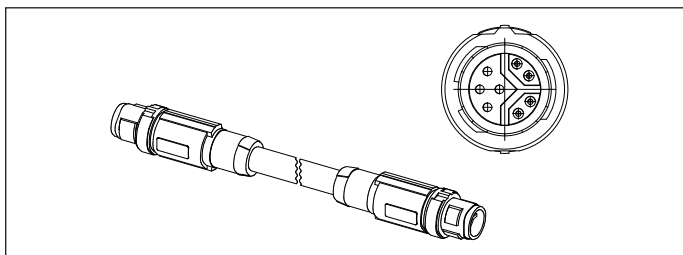


Figure 5, SFP COMM-25 cable Detail

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. 82 feet
- Connection male M12 0° - male M12 0°

3.5 Power cord 230V (110V for North America).

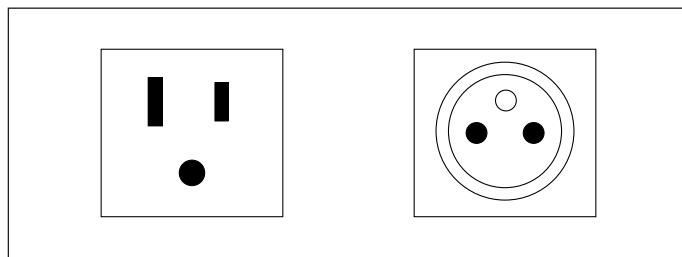


Figure 6, Detail for Power Cord of the SFPKMN

This is the cable to supply the SFPKMN with electric power. It has the following features:

- IEC 13C 115/240V AC 10 A
- Length 5 m. (16,4 feet)
- Male type F / female IEC 320 C13

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 card 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 7 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

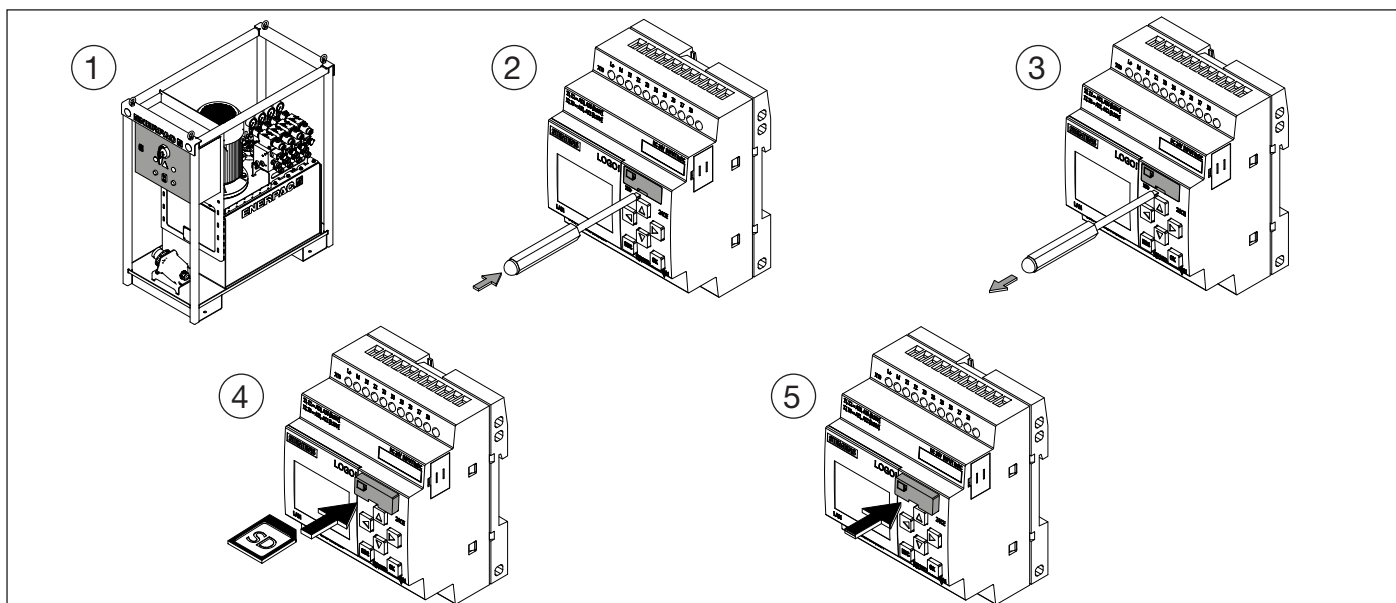


Figure 7, Inserting the SD card in the PLC of SFP pump

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.

NOTICE

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.

4.2 Installing the kit into the SFP

In order to install the kit correctly into the SFP pump, the following steps must be taken:

In case of using only one SFP pump.

1. Place the SFPKSN electric box in the upper part of the frame.
2. Attach the SFPKSN as shown in the Figure 9
3. Disconnect the pendant from the SFP and connect it into the SFPKSN in the same plug using the SFPKSN communication plug. Refer to Figure 10 for a connection scheme.
4. Connect the CSFP cable for the SFP electric cabinet.
5. Connect the SFP COMM-25 cable to the SFPKSN "IN" plug.
6. Connect the SFP COMM-25 cable to the SFPKMN communication plug.
7. Turn the selector "END OF LINE" into "YES" position.

In case of using more than one SFP pump (up to 4 units).

1. Follow the previous steps from 1 to 4 for every SFP pumps to be connected. Refer to Figure 8 for a connection scheme.
2. Connect the SFP COMM-25 cable to the SFPKSN "IN" plug in the first SFP.
3. Connect the SFP COMM-25 cable to the SFPKMN communication plug.
4. Connect a second cable SFP COMM-25 to the "OUT" plug in the SFPKSN and the end of that cable to the "IN" plug of the second SFP.
5. Turn the selector "END OF LINE" to the position "NO".

6. Repeat steps from 4 to 5 in the rest of SFPs.
7. In the last SFP, turn the selector "END OF LINE" into "YES" position.

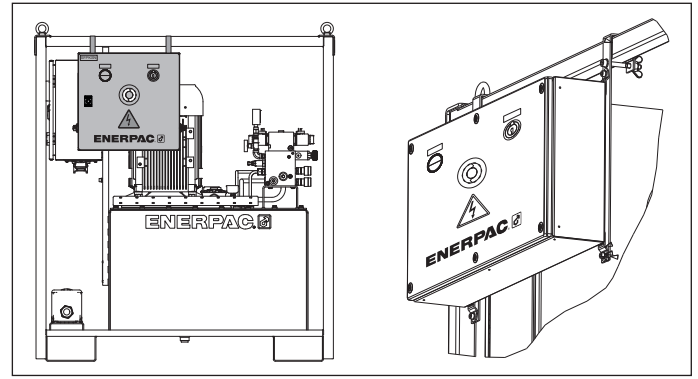


Figure 9, Attachment detail for SFPKSN

NOTICE

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

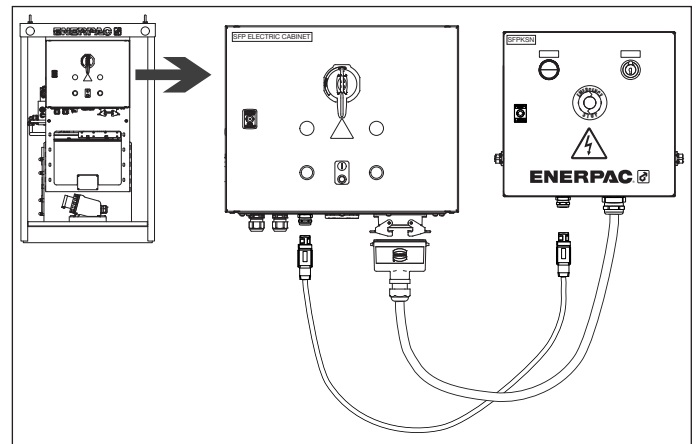


Figure 10, Electric connection of the SFPKSN and the SFP electric cabinet

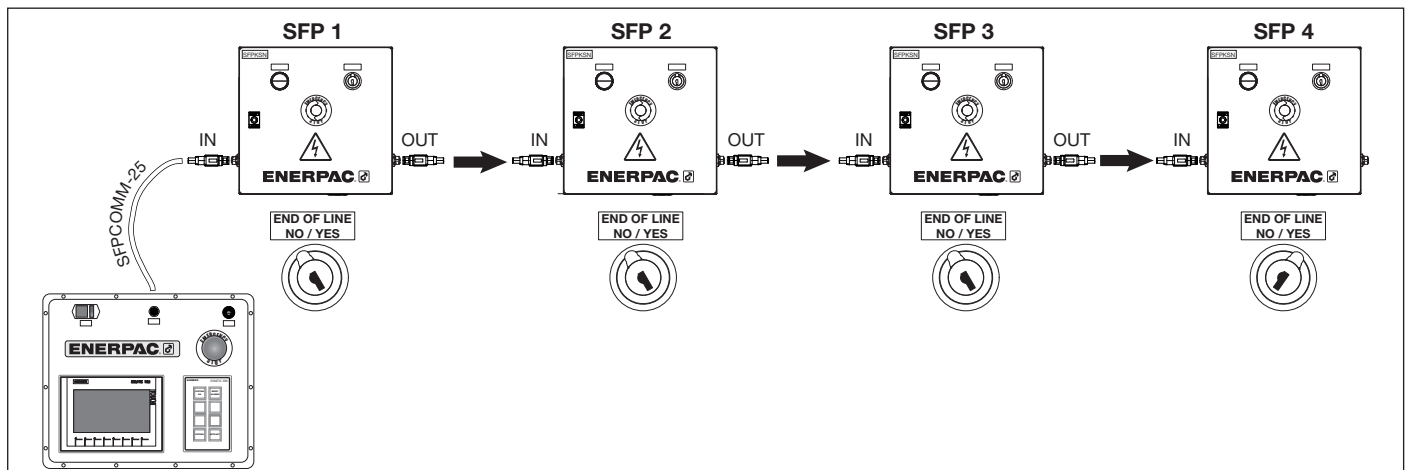


Figure 8, Scheme Connection for 4 SFPs with 1 SFPKMN and 4 SFPKSN

5.0 SCREENS DESCRIPTION

5.1 Main Screen

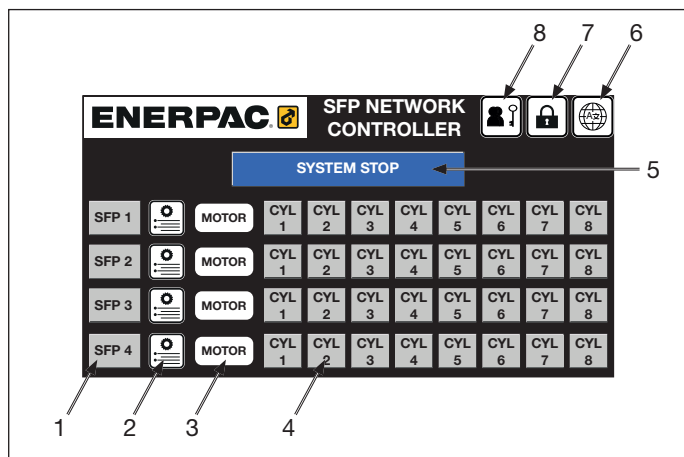


Figure 12, Details of Main Screen

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

This screen has the following buttons:

1. SFP selector button: The operator can select the SFP that is going to be operative. When the SFP is selected the button becomes green.
2. Set up button: With this button the operator can set the number of cylinders that will be operative in each SFP.
3. Motor status indicator: The operator can check if the motor of each SFP is ON/OFF.
4. Cylinder selector button: The operator can select which cylinder will be moved in the operation.
5. System status indicator: This label shows the status of the general system. This can be SYSTEM STOP, EXTEND and RETRACT.
6. Language screen: This button shows the language selection screen.
7. Log off button: Pushing this button the current user will log off from the system.
8. Users screen: This button shows the users screen. The operator can change passwords and set new users and hierarchy of permissions.

NOTICE

The system is supplied with the ID: enerpac and password: 100.

5.2 Users screen

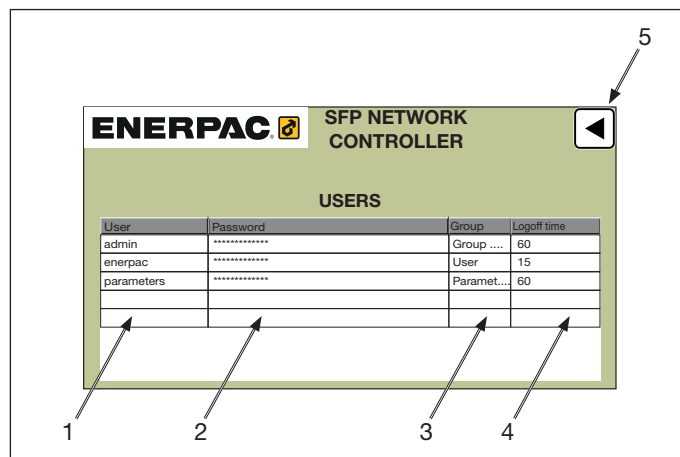


Figure 13, Details of User Screen

In this screen the operator can create and set several users to manage the system. In this screen there are the following buttons:

1. User: The operator must tap with the finger the cell of the table and type a new user.
2. Password: in the next column, the operator must tap and type the password corresponding to the user
3. Group: Tap and select a group name for that user
4. Logoff time: Tap and type time in minutes to log off the system with that user
5. Back button: Push this button to go back to the main screen.

5.3 Language screen

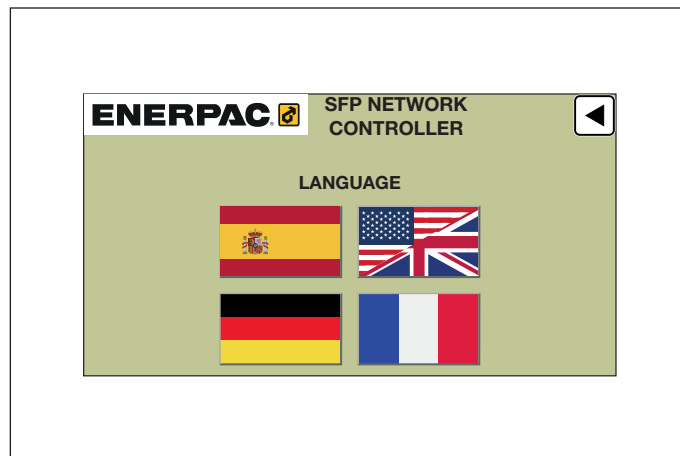


Figure 14, Language Screen

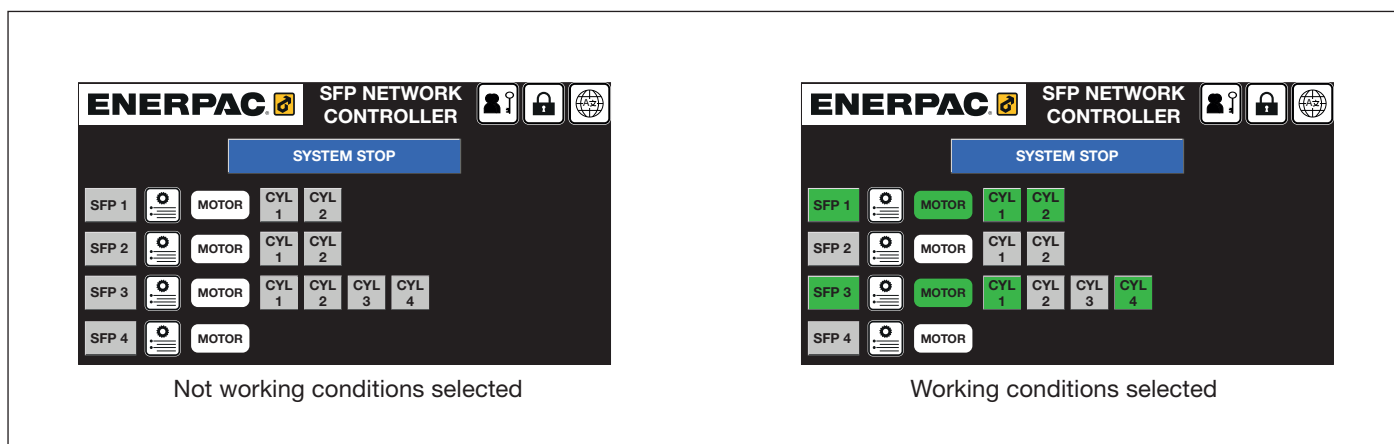


Figure 11, Example of Main Screens Operating with 3 SFP Connected

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

6.0 OPERATION

6.1 Switching ON the system.

Do the following steps to switch on the system:

1. Be sure every safety stop button is not activated. Check on the electric cabinet box of the SFP, in the electric cabinet of the SFPKSN and SFPKMN control box.
2. Turn ON the main switch on the electric cabinet on the SFP
3. Switch ON the SFPKMN with switch item 1, see Figure 1.

6.2 Setting up the number of SFPs connected

The operator must set the number of SFPs that are connected in line and the number of cylinders that are going to work in the movement. For this purpose, the following steps must be followed:

1. Go into the main screen and type ID and password in order to log on into the system.
2. Tap on the appropriate SFP buttons to define the number of cylinders in the setup in the next movement. (By default the first time the system is switched on, it keeps the last configuration saved).

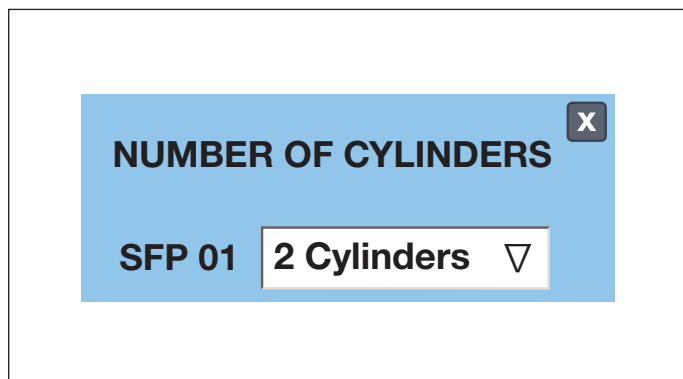


Figure 15, Pop Up Merged when Set up button is tapped

NOTICE

If the SFP is not connected the cylinders associated to that SFP will not be shown in the main screen.

In the Figure 11 shows an example of what the main SFPKMN screens will show when it is working with 3 SFP pumps.

In this example the screen on the left shows the main screen with 4 SFP pumps, but SFP4 shows no cylinders, this is because pump SFP4 has not been connected (only working with 3 pumps).

In the case shown there is the following connected layout:

- The SFP1 has 2 operative cylinders
- The SFP2 has 2 operative cylinders
- The SFP3 has 4 operative cylinders
- The SFP4 is not connected

In the moment shown, the operator did not select any working condition yet.

6.3 Operating with the SFPKMN controller network box.

1. Select the SFP that is going to be operated by tapping the SFP button. The button will become green when the SFP is correctly selected.
2. Select the cylinders that are going to be moved by tapping the number of the cylinders in the row of the desired SFP.
3. Push motor ON button on the electric cabinet of each electric cabinet.
4. The motor indicator on the SFPKMN will become green.
5. Push in the key pad extend or retract the cylinders selected to operate the selected cylinders (see figure 3).

In the Figure 11 on the right side is shown the case of the main screen with several working conditions, which are:

- SFP 1 is selected and working with the cylinders 1 & 2
- SFP 2 is not selected and thus not working in that moment
- SFP 3 is selected and working with cylinder 1 & 4
- SFP 4 is not connected.

As shown in the screen (motor button in green) in that moment the user can operate with the SFPs retracting or advancing the plunger of the cylinder.

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.

8.0 ATTACHED DOCUMENTS

In the attached document 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.

9.0 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.

ALARM CHART		
ALARM	POSSIBLE CAUSE	SOLUTION
SFP (#) Motor OFF	The motor of the SFP N is off.	Switch the SFP number N on, with the main switch in the electric cabinet .
SFP (#) communication failure	- The SFP (#) is switched off - The SFP N has the communication cable not connected - The SFP N has the communication cable damaged.	- Switch the SFP number N on, with the main switch in the electric cabinet - Check the connection of the cable and connect it correctly - Contact Enerpac to order a new part.
Controller Safety Relay	The controller safety relay has been activated due to an electric cause.	Check and solve the root cause and push the reset alarm button in the key pad on the SFPKMN
Controller Emergency Stop	The emergency stop of the Controller is activated.	Switch off the emergency stop of the controller.
Safety line	The safety line is wrong	Check the communication cable
Controller 24V. DC Protection failure.	The Controller DC protection has been activated due to an electric cause	Check and solve the root cause and push the reset alarm button in the key pad on the SFPKMN

ATTACHED DOCUMENT TABLE		
DOCUMENT NUMBER	OBSERVATION	PRODUCT CODE BEGINNING
ECSFPKSN.pdf	Electric Scheme of SFPKSN	A
SFPCOMM-25.pdf	Electric Scheme of SFPCOMM-25 cable	A
SFPKMN.pdf	Electric Scheme of SFPKMN	A