



Instruction Sheet

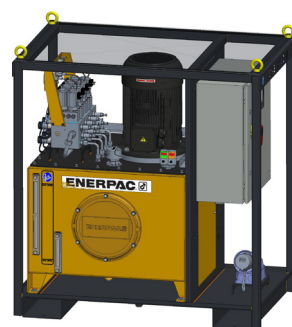
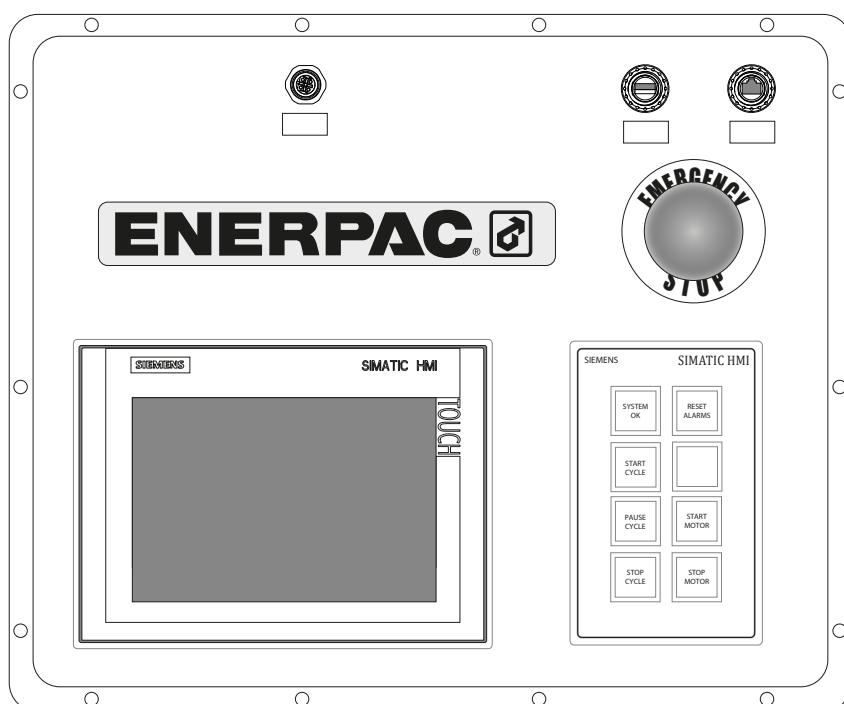
Enerpac SFPSSC Single Synchro Control Box (SyncHoist System Mode)

Document Number: L4904

Document Revision: A

Document Revision Date: 27-MAY-2025

Document Language: ENGLISH EN



To reduce the risk of injury, user must read and understand this document before use.

ABOUT US

Enerpac is a global market leader in high pressure hydraulic tools, controlled force products, portable machining, on-site services and solutions for precise positioning of heavy loads. As a leading innovator with a 110-year legacy, Enerpac has helped move and maintain some of the largest structures on earth. When safety and precision matters, elite professionals in industries such as aerospace, infrastructure, manufacturing, mining, oil & gas and power generation rely on Enerpac for quality tools, services and solutions. For additional information, visit www.enerpac.com.



www.facebook.com/enerpac



www.youtube.com/enerpac



www.linkedin.com/company/enerpac



www.twitter.com/enerpac

WARRANTY

Refer to the Enerpac Global Warranty document for terms and conditions of the product warranty. Such warranty information can be found at www.enerpac.com.

Contents

1. SAFETY	3
1.1 SAFETY PRECAUTIONS	3
2. COMPLIANCE STATEMENT	4
2.1 CONFORMANCE TO NATIONAL AND INTERNATIONAL STANDARDS	4
3. DESCRIPTION	5
4. INSTALLATION	6
3.1 CONNECTING TO THE SHP	6
4. SCREENS	6
4.1 INITIAL SCREEN	6
4.2 MAIN SCREEN	6
4.3 WORK PARAMETERS SCREEN	7
4.4 SPANS SCREEN	8
4.5 CALIBRATION SCREEN	8
4.6 OFFSET SCREEN	9
4.7 TARE SCREEN	9
4.8 MANUAL MODE SCREEN	9
4.9 PRELOAD SCREEN	10
4.10 TILTING SCREEN	10
4.11 DATA RECORDING	10
4.12 LANGUAGE SCREEN	11
4.13 USERS SCREEN	11
4.14 INSTRUCTION MANUAL SCREEN	11
4.15 HOURS COUNTER SCREEN	11
4.16 CONTROL PANEL SCREEN	11
5. OPERATION	12
5.1 SWITCHING ON THE SYSTEM	12
6.2 CALIBRATION PROCEDURE	12
6.3 MANUAL MODE	12
6.4 PRELOAD MODE	13
6.5 TILTING MODE	13
6.6 REMOTE MODE	13
6.7 SWITCHING OFF THE SYSTEM	13
7. MAINTENANCE	13
8. ALARMS LIST	14

1. Safety

Read all instructions 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 that any questions or concerns arise, contact Enerpac or a local Enerpac distributor for clarification.

Save these instructions for future use.

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 DANGER, WARNING, CAUTION, and NOTICE.

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

⚠ 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 related to property damage). Please note that the Safety Alert Symbol will not be used with the signal word.

1.1 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 SyncHoist System (SHS) or preparing it for use. Always follow all safety precautions and instructions, including those that are contained within the procedures of this manual.
- Always wear protective head-wear, ear protectors, footwear and gloves (at a minimum rigger type gloves) suitable for safe operation of the tool. The protective clothing must not interfere with safe operation of the tool or restrict the ability to communicate with co-workers.
- Be sure your workplace is safe. Follow the instructions in your workplace's standard operating procedures and be sure to observe all communicated safety precautions.
- Ensure all hydraulic components are rated to a safe working pressure of 700 bar [10,150 psi].
- Do not remove or disable the pump relief valve.
- The system operating pressure must not exceed the pressure rating of the lowest rated component in the system.
- Never set a relief valve to a higher pressure than the maximum rated pressure of the SHS. If ratings are different, relief valve setting should not exceed the setting of the lowest rated component (pump or cylinder).
- Do not overload equipment. Never attempt to move a load weighing more than the capacity of the SHS. Overloading causes equipment failure and possible personal injury.
- Always perform a visual inspection of the SHS before placing it into operation. If any problems are found, do not use the cylinder. Have the cylinder repaired and tested before it is returned to service.
- Never use a cylinder that is leaking oil. Do not use the SHS if it is damaged, altered or in need of repair.
- Always lift the cylinder using a crane or other suitable lifting device of sufficient rated capacity.
- Allow only trained and experienced personnel to supervise and perform lifting and lowering procedures.
- Be sure the operator has completed safety induction training, specific to the work surroundings. The operator should be thoroughly familiar with the controls and the proper use of the tool.
- Be certain that no persons are working on or near the SHS before moving of the load begins. Alert all personnel in advance that the procedure is about to occur.
- Lift only dead weight loads. Avoid lifting live weight loads.
- Be especially careful when lifting loads such as partially filled storage tanks, in which the center of gravity could move or shift during lifting. Be aware that the distribution of some loads can change quickly and without warning.

- Keep all personnel clear of the work area while lifting or lowering is in progress. To avoid personal injury, keep hands and feet away from cylinder and load during operation.
- Maintain communication with the operator at all times during lifting or lowering to avoid accidents. Use hand signals, two-way radios or other appropriate forms of communication (as required by applicable laws and regulations) if the load is not visible to the operator.
- Operate SHS as required to ensure that the load is moved evenly and at a controlled rate.
- Closely watch the load at all times during the moving process. Stop immediately if the load becomes unstable or appears to be moving unevenly.
- Always be certain that hydraulic pressure is fully relieved and that the load is fully removed from the SHS before disconnecting hydraulic hoses, loosening hydraulic fittings, or performing any cylinder disassembly or repair procedures.
- Any components that are blocked or stuck in any way (and any parts connected to these components) will be under mechanical tension. If you release these parts, they could change position suddenly and cause serious injury could result.

CAUTION

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

- Be careful to avoid damaging hydraulic hoses. Avoid sharp bends and kinks when routing hydraulic hoses. Do not exceed the minimum bend radius specified by the hose manufacturer. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose, leading to premature hose failure.
- 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.
- Do not drop heavy objects on hoses. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to break.
- Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings.
- For optimum performance, do not expose hydraulic equipment to temperatures of 150°F [65°C] or higher. Protect all hydraulic equipment from weld spatter.
- Immediately replace worn or damaged parts with genuine Enerpac parts. Enerpac parts are designed to fit properly and to withstand high loads. Non-Enerpac parts may break or cause the product to malfunction.
- To prevent damage to pump electric motor, check specifications. Use of incorrect power source will damage the motor.
- Any modifications to the SHS could cause a dangerous situation and void the warranty.

- Keep the hydraulic and moving components clean to prevent the SHS from jamming or causing damage to itself or other equipment.
- Switch the power off before inspection, maintenance or repair of the SHS. Make sure that the relevant parts are no longer receiving power. If possible, make a connection to earth. Insulate any adjacent components that are still receiving power.
- If work does need to be performed on components receiving power, then a second person must be present in the area to switch off the main power switch in the event of an emergency. Cordon off the work zone and only use certified and properly insulated tools.
- Lubricate tools as directed in this manual prior to operation. Use only approved lubricants of high quality, following the lubricant manufacturers instructions

NOTICE

Failure to observe and comply with the following precautions could result in property damage and/or void the product warranty.

- Always use Enerpac pumps and hoses.
- Always use Enerpac replacement parts.
- Always follow the inspection and maintenance instructions contained in this manual. Perform maintenance and inspection activities at the specified time intervals.

2. Compliance Statement

2.1 Conformance to National and International Standards



Enerpac declares that these product(s) have been tested and conforms to applicable standards and the product(s) are compatible to all EU and UK Requirements.

Copies of the EU Declaration as well as the UK Self-Declaration are enclosed with each shipment.

3. Description

Enerpac Single Synchro Control Box (SFPSSC) for SynchHoist System (SHS) is designed to operate and visualize the values of the movements made by one SHS remotely.

SHS is composed of 4 specialized hydraulic cylinders (SHC). These cylinders are connected to an included SynchHoist Pump (SHP) that allows to precisely monitor and adjust each lifting point independently.

In remote mode, with the SFPSSC connected, the user can use automatic movements with the SHS. The user must set up the desired values for the corresponding parameters (position or load) for each automatic movement so the system creates a work cycle that moves the SHC until the defined values are reached.

When the Start Cycle button is pressed, the system goes into the work cycle and all fields are automatically locked and it is not possible to change them: work parameters, cylinders selection and work mode.

There are only two ways to go out of the work cycle:

1. The system reaches the defined values, either position or load.
2. The user presses the Stop Cycle button.

If an alarm comes up during the work cycle, the system is still in the work cycle so, when the alarm is solved, it goes from Alarm status to Ready status and continue with the work cycle.

Refer to L4822 for SHS Operation and Maintenance Manual in local mode.

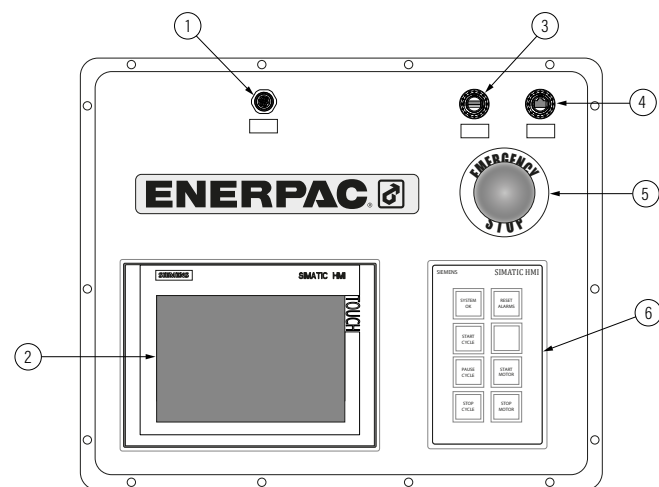


Figure 1: SFPSSC Components

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

1. Power / Communication plug
2. Touch screen
3. USB connector (for recording data purposes)
4. Ethernet connector (for programming purposes)
5. Emergency stop button
6. Keypad

NOTICE

SFPSSC is supplied in a protection/transportation case. Do not remove the master 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.

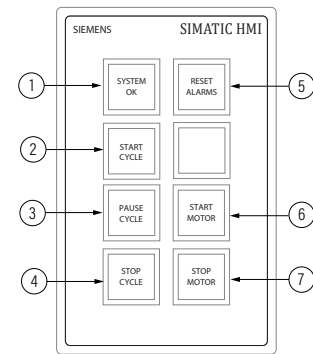


Figure 2: Keypad Buttons

1. System OK light: Turns on when the system is correctly connected and ready for the work.
2. Start Cycle button: Press to start any movement with the cylinders.
3. Pause Cycle button: Press to stop the movement (work cycle) temporarily with the intention of resuming it. Then, when the Start Cycle button is pressed again, the work cycle is resumed from that point.
4. Stop Cycle button: Press to stop the movement (work cycle) completely. Then, when the Start Cycle button is pressed again, a new work cycle is started from the beginning.
5. Reset Alarms button: Press to reset the active alarms once the alarms are solved.
6. Start Motor button: Press to switch on the SHP motor.
7. Stop Motor button: Press to switch off the SHP motor.

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 and the system is not ready due to active alarms
 - White: The motor is off and ready to be switched on
 - Green: The motor is on
- Stop Motor:
 - Off: The motor is off
 - Red: The motor can be stopped

3. Installation

3.1 Connecting to the SHP

Connect the SFPCOMM-25 cable to the SFPSSC control box communication plug (Figure 1, Item 1). Connect the SFPCOMM-25 cable to the SHP communication plug. Automatically the SFPSSC monitor is switched on and the initial screen is shown.

4. Screens

4.1 Initial Screen

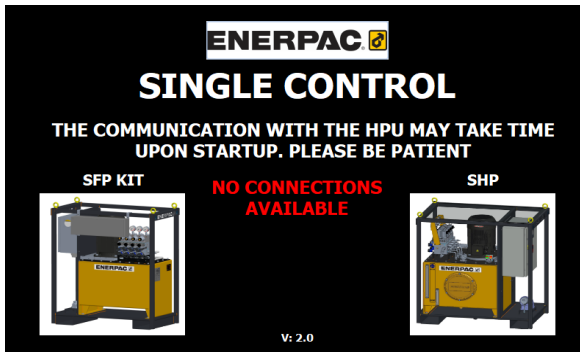


Figure 3: Initial Screen while system establishing connection

At start up the system will establish connection to the SHP. Once connection is complete, the power button will appear. If system is being used with SFP kits instead please refer to L4474 for instructions.

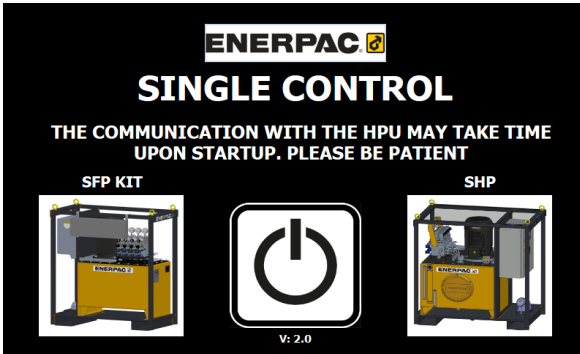


Figure 4: Initial Screen after successful connection

From this screen the operator can access the applicable system screens to set the features for the movements.

NOTICE

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

4.2 Main Screen

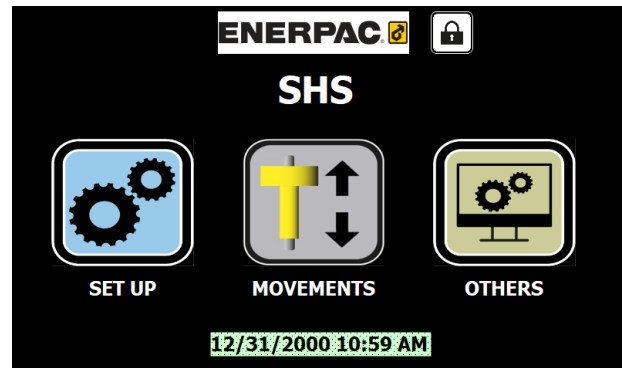


Figure 5: Main Screen Details

Tap on the lock button to lock the navigation through the screens and tap on the date/time to set up the current date and time.

The screen shows 3 main buttons: Set Up button, Movements button and Others button. The user can access to the Set Up screens to configure SHS parameters, to the Movements screen to select the type of movements and to the Others screen to adjust other features of the software not related with the movements.

When the user taps on each button a pop up comes up with shortcuts to the different screens.

Set Up pop up

In Set Up pop up, the user can access to the following screens: Work Parameters, Spans, Calibration, Offset, and Tare. The background colour of this section and screens is blue.

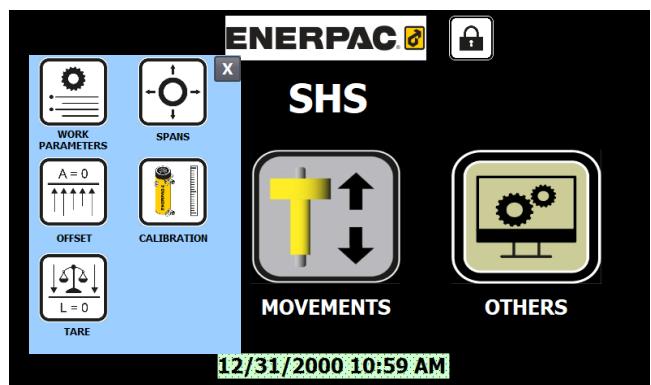


Figure 6: Set Up pop up

Movements pop up

In Movements pop up, the user can access to the following screens: Manual, Preload and Tilting. The background colour of this section and screens is gray.

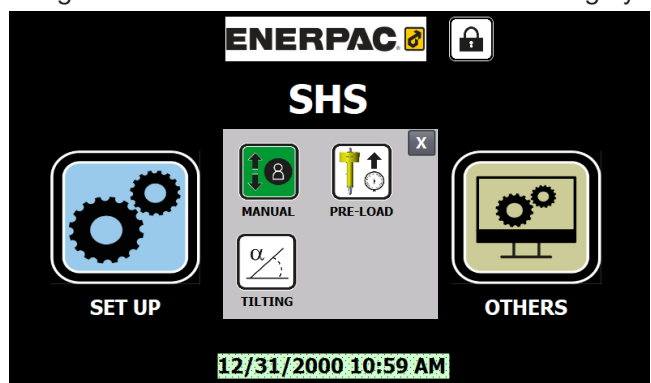


Figure 7: Movements pop up

Others pop up

In Others pop up the user can access to the following screens: Data Recording, Language, Users, Maintenance and Instruction Manual. If Maintenance is tapped, another pop up will appear with Hour Counter, Diagnostic and Control Panel options. The background colour of this section and screens is green.

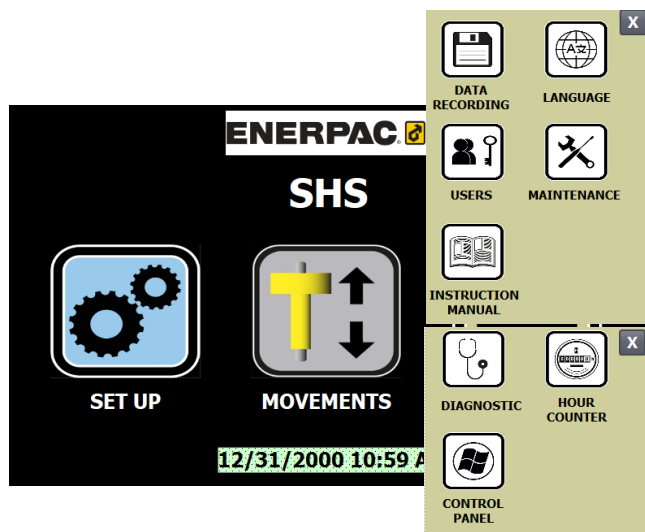


Figure 8: Others pop up

The software has a common header for all screens showing the following information:

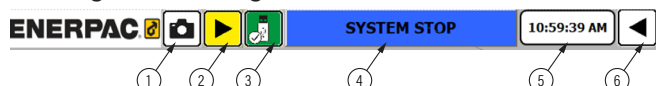


Figure 9: Screens Common Header Details

1. Screenshot: Takes a screenshot of the current screen and saves it in the USB pendrive.
2. Recording buttons: Starts and stops the data recording of the current movement. These are saved in the USB pendrive.
3. USB Connection status: Background is white if there is no USB pendrive connected. Background colour turns green when there is successful connection to a USB pendrive, and red if the user starts data recording without any USB pendrive connected.
4. System status indicator: Shows the status of the system.
5. Time section: Shows the current time. The local time can be adjusted in the Main Screen.
6. Back button: Allows to go back to the Main Screen.

4.3 Work Parameters Screen

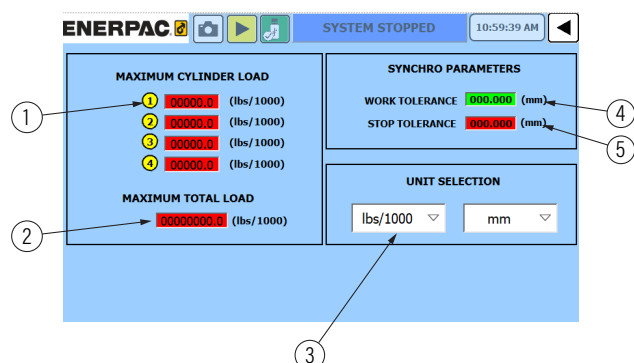


Figure 10: Work Parameters Screen Details

1. Maximum Cylinder Load: Enter the maximum load expected for each cylinder. If this value is exceeded a warning alarm is displayed (Refer to Section 8, Alarms List). This alarm is triggered whether the cylinder is selected or not.

WARNING

Maximum cylinder load must not be greater than cylinders capacity.

2. Maximum Total Load: Enter the maximum load expected for the cylinders involved in the current application. If this value is exceeded, the system stops the movement and a stop alarm is displayed (Refer to Section 8, Alarms List).

NOTICE

The parameter Maximum Cylinder Load is checked against each cylinder Load value in the corresponding movement screen and the parameter Maximum Total Load is checked against Total Load value in the corresponding movement screen.

3. Units Selection: The user can select the system units:
 - Length units: mm or inches.
 - Load units: lbs/1000, Ton (1000 kg), s Ton (907,18 kg) and kN.
4. Work Tolerance: Enter the distance allowed between the higher and lower position of the cylinders during a synchronized movement. If this value is exceeded the system stops the closer cylinder to the target position until the farther cylinder gets to a position inside tolerance.
5. Stop Tolerance: Enter the maximum distance allowed between the higher and lower position of the cylinders during a synchronized movement. If this value is exceeded, the system stops the movement and displays a stop alarm (Refer to Section 8, Alarms List).

NOTICE

When units are changed, all values are automatically updated to new units.

4.4 Spans Screen

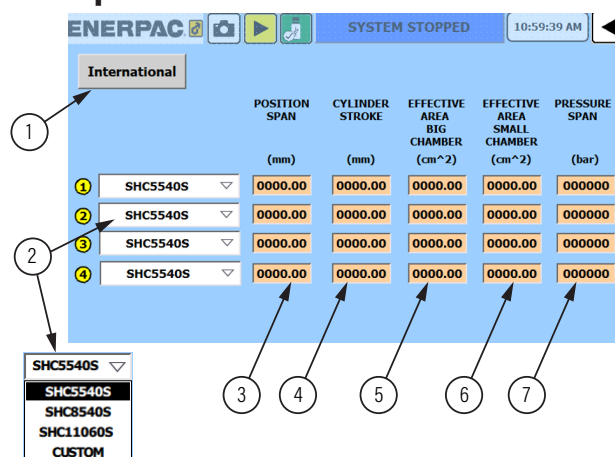


Figure 11: Spans Screen Details

In this screen the user must select the appropriate SHC through the drop-down menu.

1. Units button: Select the system units: International System of Units (Metric) and Imperial System of Units (Imperial).

2. SHC Drop-Down Menu: Choose the SHC from the standard ones or custom. If the user selects a standard model, all values are loaded automatically. If custom is selected, the system allows the user to input the specifications of the custom cylinder, from item 3 to item 7.

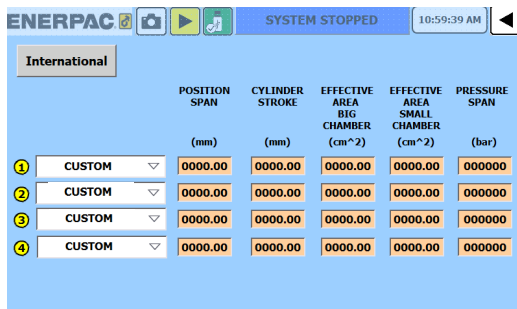


Figure 12: Spans Screen Custom Cylinder

3. Position Span: Shows the maximum length of the stroke sensor installed on the selected SHC.
4. Cylinder Stroke: Shows the maximum stroke of the selected SHC.
5. Effective Area Big Chamber: Shows the effective area of the piston chamber.
6. Effective Area Small Chamber: Shows the effective area of the rod chamber.
7. Pressure Span: Shows the maximum capacity of the pressure transducer.

4.5 Calibration Screen

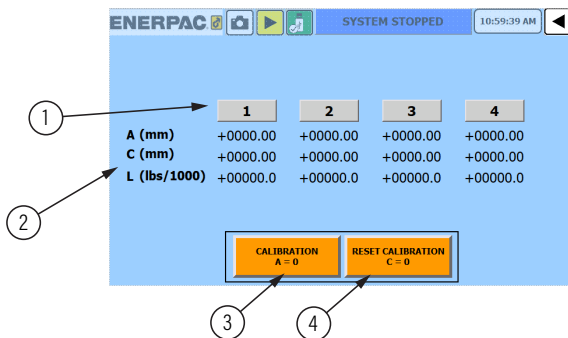


Figure 13: Calibration Screen Details

Calibration process allows to have the same reference between plunger position and internal sensor stroke.

Calibration process must be performed with all cylinders fully extended to set that position as the zero position in the system. Thus, positive increments in position mean that the load is being lifted (the cylinder retracts) and negative increments in position mean that the load is being lowered (the cylinder extends).

1. Cylinder Selection: Shows the cylinders selected in the pendant. When a cylinder is selected, the button becomes orange.
2. System Values:
 - Position: The absolute position is the position of the cylinder plunger taken from the initial zero. This initial zero is set when Calibration button is pressed with the cylinder fully extended.
 - C (Calibration value): The calibration value is a memory variable that stores the absolute position when calibration is performed.
 - Load: This value shows the load being withstood by each cylinder in the current moment.

3. Calibration Button (POS=0): Press and hold for 3 seconds to convert the reading of the stroke sensor to 0 mm (fully extended cylinder calibration) and store this value in variable C.

NOTICE

Calibration must be performed with cylinders fully extended.

4. Reset Calibration Button (C=0): Press and hold for 3 seconds to reset the calibration (variable C takes the value 0 mm). Position (POS) shows the reading of the stroke sensor.

4.6 Offset Screen

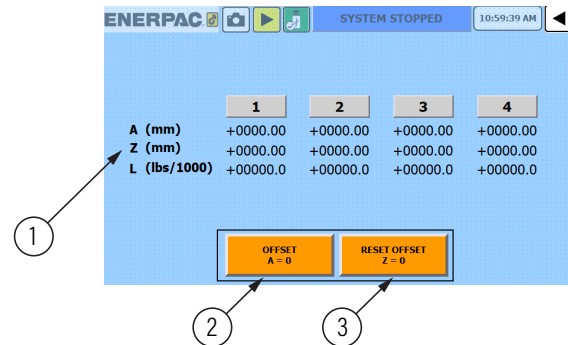


Figure 14: Offset Screen Details

Making an offset is useful to have a reference of the initial position before performing any operation.

1. Movement Values: Refer to Section 5.5 for L (Load) definition.
 - A (Absolute position): The absolute position is the position of the cylinder plunger taken from the initial zero. This initial zero is set when Offset button is pressed.
 - Z (Offset Variable): Memory variable for a movement reference.
2. Offset Button (A=0): Press and hold for 3 seconds to convert the reading of the stroke sensor to 0 mm and store this value in variable Z.

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.

3. Reset Offset Button (Z=0): Press and hold for 3 seconds to convert the offset value (variable Z takes the value 0 mm). Position (A) adds the offset value to its current value.

$$A_t = A_i + Z$$

4.7 Tare Screen

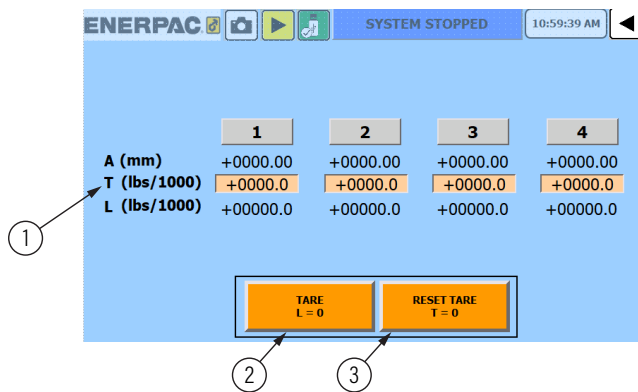


Figure 15: Tare Screen Details

Tare is used to set the initial load as zero so the structure attaching the cylinders to the load is not accounted as part of the real load.

1. Movement values: Refer to Section 5.5 for A (Absolute position) and L (Load) definitions.
 - T (Tare Value): Memory variable for the initial load.
2. Tare Button (L=0): Press and hold for 3 seconds to set all cylinders load (L) to 0 and tare value (T) stores the current load.
3. Reset Tare Button (T=0): Press and hold for 3 seconds to set tare value (T) to 0 and each cylinder load (L) to the current load.

4.8 Manual Mode Screen

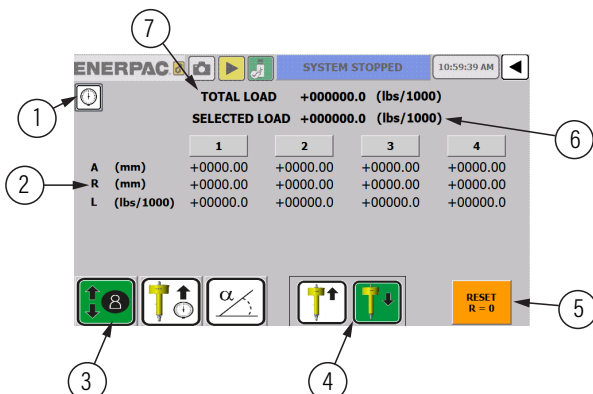


Figure 16: Manual Mode Screen Details

In manual mode, cylinders can be moved with a total control of the movement. This work mode is used to make small positioning movements in the application.

1. Pressure Data button: Enables and disables the pressure readings of all system cylinders. Pressures are shown in the screen as PB, big chamber pressure, and PS, small chamber pressure.
2. Movement values: pressures are shown below load after pressing pressure data button.
 - A (Absolute position): Shows the cylinder position taken from the initial zero.
 - R (Relative position): Shows the relative position for each cylinder. It can be reset to zero pressing the reset button.
 - L (Load): Shows each cylinder load.
3. Manual Mode button: Select this button to activate the manual mode. When this button is selected, the background colour turns green.

4. Lift / Lower buttons: Select the direction of the movement, lift or lower.
5. Reset button (R=0): Press and hold for 3 seconds to reset the relative position (R) to zero.
6. Selected Load value: Shows the sum of selected cylinders load.
7. Total Load value: Shows the sum of all cylinders load.

4.9 Preload Screen

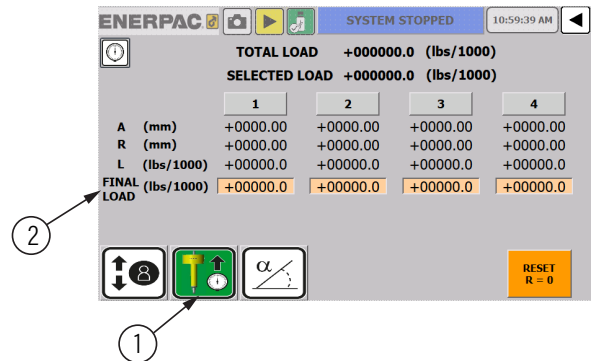


Figure 17: Preload Screen Details

Preload mode is used to tighten the slings holding the load.

Only specific elements for this mode are explained here. Refer to Section 5.8 for all common elements.

1. Preload Mode button: Select this button to set the preload movement. When this button is selected, the background colour turns green.
2. Final Load: Input the load value that cylinders must reach. When all cylinders reach this load value, the movement stops.

4.10 Tilting Screen

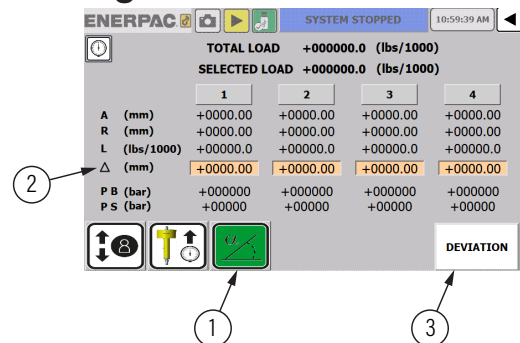


Figure 18: Tilting Screen Details

In tilting mode, cylinders perform synchro movements, finishing at the same time. Each cylinder can have a different target position set by the user.

Only specific elements for this mode are explained here. Refer to Section 5.8 for all common elements.

1. Tilting Mode button: Select this button to set the tilting movement. When this button is selected, the background colour turns green.
2. Delta Final Position: Input the increment of the current position that each cylinder must reach. This value can be positive (to retract the cylinder) or negative (to extend the cylinder) and set individually for each cylinder.
3. Deviation button: Shows the Deviation screen to check the current tilting movement details.



All cylinders finish the movements at the same time. Cylinders with smaller deltas will have more stops and waiting time cylinder with greater deltas. Consider this behaviour to avoid uncontrolled movements.

4.10.1 Deviation Screen

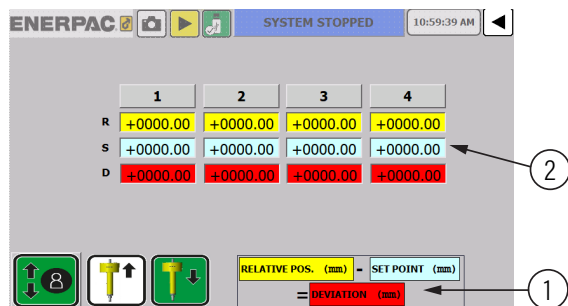


Figure 19: Deviation Screen Details

In this screen the user can check the current tilting movement details. This screen is only for information proposal. The user cannot input or select any value.

- Key formula: Shows the formula used to make tilting movements calculations.
 - Relative Position — Set Point = Deviation
- Tilting movement values for each cylinder:
 - R (Relative Position): Shows the current position of the cylinder.
 - S (Set Point): Shows the theoretical position that the cylinder should have, according to the internal calculations done by the system for all cylinders to reach the final delta target at the same time.
 - D (Deviation): Difference between the theoretical position and the real position.

4.11 Data Recording

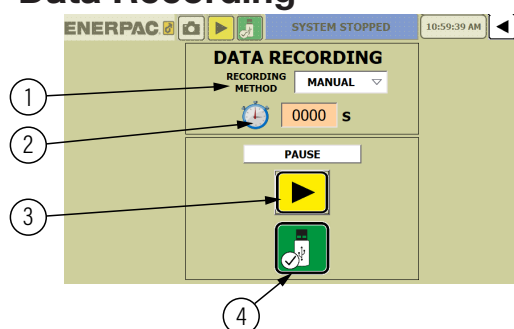


Figure 20: Data Recording Screen

In this screen the user can record movement data into an external storage device.

- Recording mode: Select the recording mode (manual or automatic), for recording movement data purpose. When the manual option is selected, the system only records the record button is pressed (Figure 26, Item 2). When automatic mode is selected, the system automatically records the data when the system is moving.
- Time period: Input the frequency of data recording in seconds.
- Start recording buttons: Starts and stops the data recording in the USB drive. When there is no USB drive connected, button background turns red.

- Storage: Shows the USB drive in which the recording is saved. When the recording starts, the icon turns green.

Data is stored in an Excel file with the following fields:

- Time
- Sequence
- Position unit
- Load unit
- Absolute position (1-4)
- Relative position (1-4)
- Load (1-4)

4.12 Language Screen

The user can choose the alarms language in this screen.



Figure 21: Language Screen

4.13 Users Screen

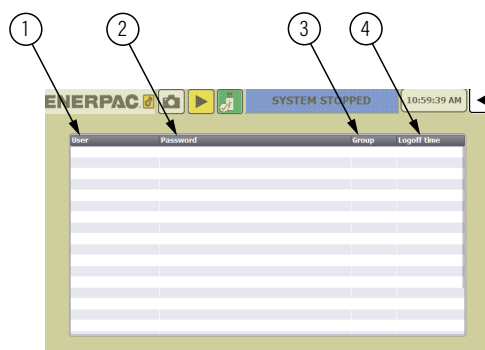


Figure 22: Users Screen Details

In this screen, the user can create and set several users to manage the system.

- User: Select a cell to type a new user.
- Password: Input the password corresponding to the user.
- Group: Choose a group name for the user.
- Log off time: Input the number of minutes to log off the system with that user.

NOTICE

Users screen is only reachable by the user logged with parameters profile. Id: parameters, password: 200.

4.14 Instruction Manual Screen

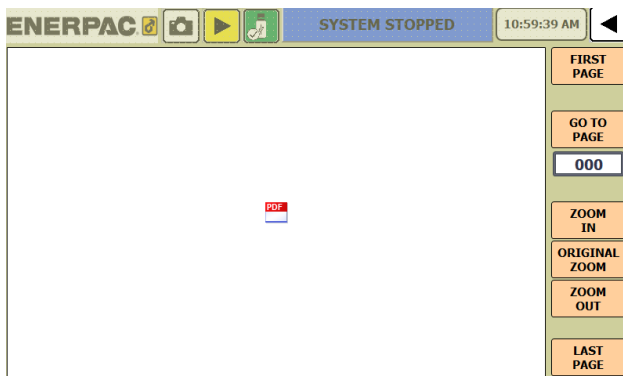


Figure 23: Instruction Manual Screen

In this screen, the operator can access to the Operations and Maintenance Manual.

4.15 Hours Counter Screen

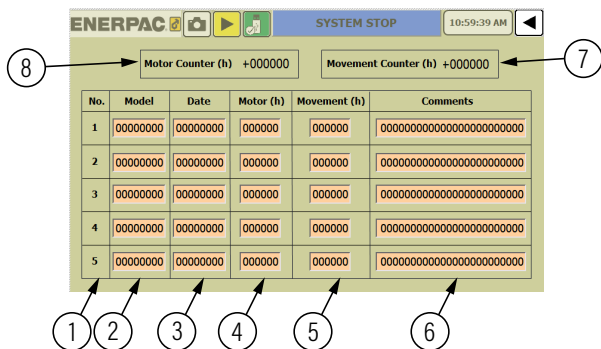


Figure 24: Hours Counter Screen

In this screen the user can have a record of the services done to the HPU.

1. Row number: The operator can have up to 5 records.
2. Model number: The user can type the model number of the pump.
3. Date: The user can type the date when the service was done.
4. Number of working hours of the motor: The user can type the number of working hours of the motor when the service is done.
5. Number of movement hours: The user can type the number of hours in which movements have been done.
6. Comments column: The user can enter some brief descriptive comment.
7. Movement counter: This parameter is given to have a reference of how many hours the pump has been working making movements.
8. Motor counter: This parameter is given to have a reference of how many hours the motor has been switched on.

NOTICE

Motor counter and movement counter are different, because the pump can be switched on with the motor working but with no movement in the valves or cylinders.

4.16 Control Panel Screen

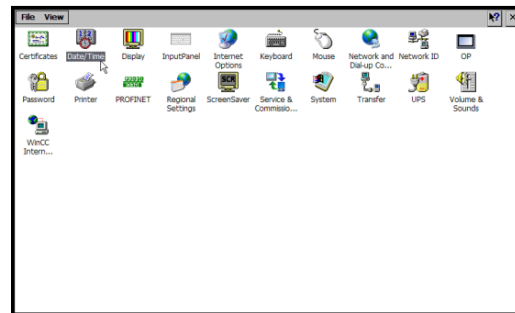


Figure 25: Control Panel Screen

In this screen the user can set date and time of the system. In order to do it, the user must access to the panel control of the system.

WARNING

In the control panel there are many other icons and options that can be changed. Enerpac dissuades touching other icon except the date and time. Malfunctioning and unset risk exist when other parameters in this screen are changed.

5. Operation

5.1 Switching On the System

1. Perform a visual check of hoses and cylinders, ensuring they are not bent and they are in the correct position.
2. Make sure that hose plugs are correctly inserted in.
3. Check the oil level. If cylinders are extended, the reservoir level should be low.
4. Check that the safety stop pushbuttons are released.
5. Turn on the main switch in the SHP.
6. Check for alarms in the SFPSSC control. If any alarm has come up, check and solve the root cause and press the reset alarm button in the keypad.
7. Turn the key in the Local/Remote Key Switch to remote mode.

6.2 Calibration Procedure

NOTICE

Calibration must be performed with cylinders fully extended.

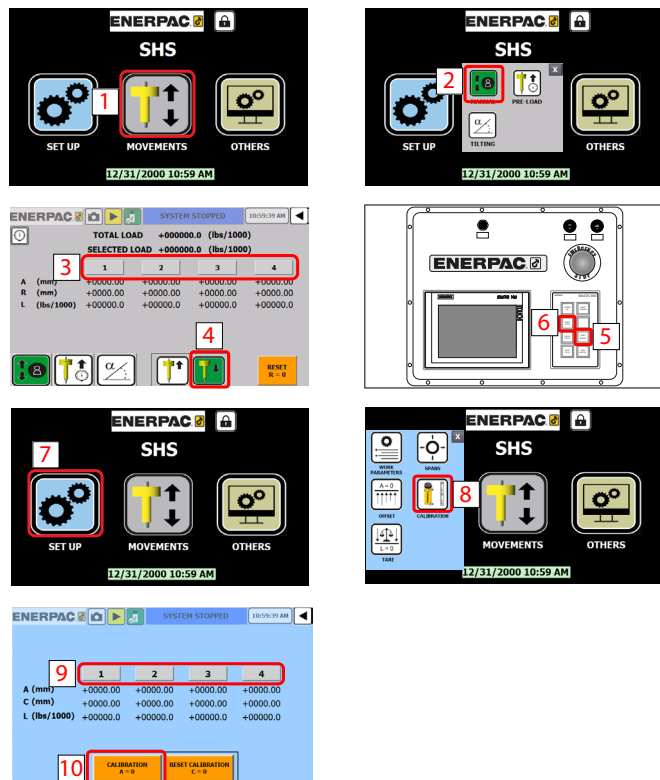


Figure 26: Calibration Procedure

1. Go to Movements.
2. Go to Manual mode.
3. Select the cylinders to be moved.
4. Select Lower in direction button.
5. Press Start Motor button in the keypad to start the SHP motor.
6. Press and hold the Start Cycle button in the keypad until the cylinders are fully extended.
7. Go to Set Up.
8. Go to Calibration mode.
9. Select the cylinders to be calibrated.
10. Press and hold the calibration button for 3 seconds.

NOTICE

If there is any error while calibrating the cylinders, press and hold reset calibration button for 3 seconds. Repeat the previous steps to restart the calibration procedure.

6.3 Manual Mode

WARNING

Be sure the operator has completed safety induction training, specific to the work surroundings. The operator must be familiar with the controls and the proper use of the tool.

WARNING

Keep all personnel clear of the work area while lifting or lowering is in progress. Alert all personnel before any operation.

CAUTION

Make sure the setup is stable and check all hydraulic connections before any operation.

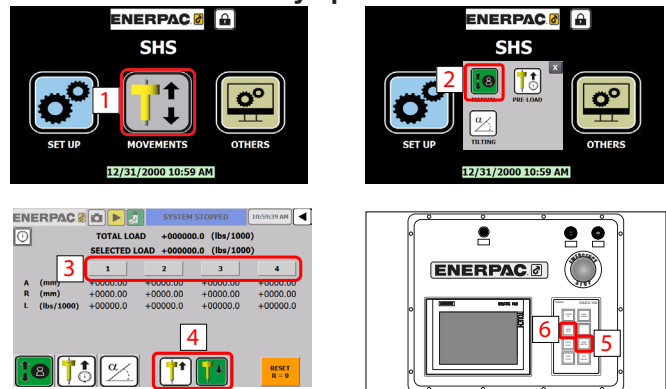


Figure 27: Manual Mode Procedure

1. Go to Movements.
2. Go to Manual mode.
3. Select the cylinders to be moved.
4. Select the direction of the movement, lift or lower.
5. Press Start Motor button in the keypad to start the SHP motor.
6. Press and hold the Start Cycle button in the keypad.
 - Release the button when the cylinders reach the desired position.

6.4 Preload Mode

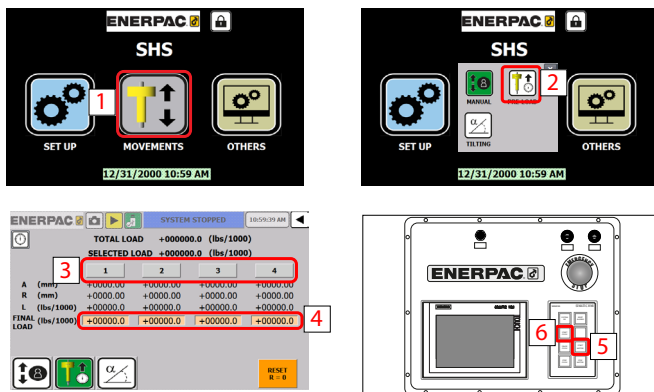


Figure 28: Preload Mode Procedure

1. Go to Movements.
 2. Go to Preload mode.
 3. Select the cylinders to be moved.
 4. Input the Final Load value the cylinders must reach.
 5. Press Start Motor button in the keypad to start the SHP motor.
 6. Press the Start Cycle button in the keypad.
- Movement stops when all cylinders reach the final load value.

6.5 Tilting Mode

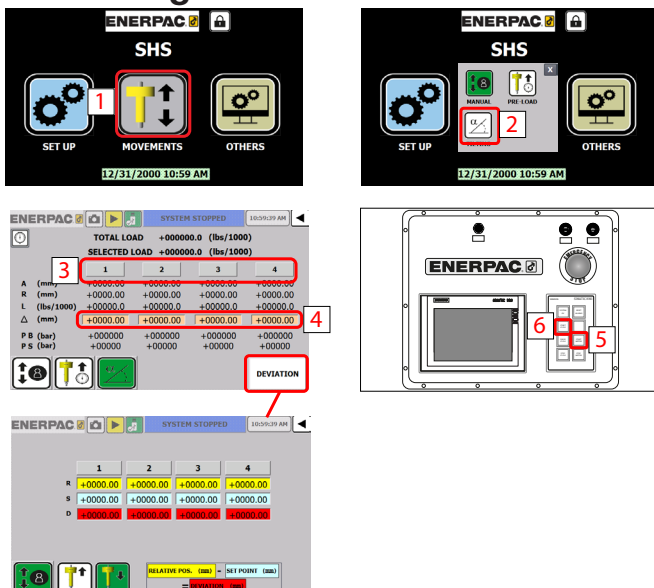


Figure 29: Tilting Mode Procedure

1. Go to Movements.
 2. Go to Tilting mode.
 3. Select the cylinders to be moved.
 4. Input the Delta Final Position value each cylinder must reach.
 5. Press Start Motor button in the keypad to start the SHP motor.
 6. Press the Start Cycle button in the keypad.
- Go to Deviation to check the details during the movement. Refer to Section 5.10.1.
 - Movement stops when all cylinders reach the final delta position.

6.6 Remote Mode

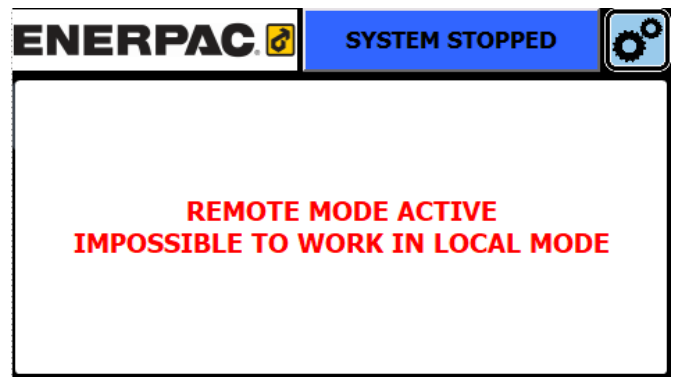


Figure 30: Remote Mode

1. When the remote mode active, the local mode is disabled.

6.7 Switching Off the System

1. Press the Stop Motor button in the keypad to switch off the motor.
2. Turn off the main switch in the SHP.

7. 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. Alarms List

Only qualified hydraulic technicians should service pump or system components. 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 only considered as an aid to help diagnose the most common problems. For repair service, contact Authorized Enerpac Service Center.

ALARMS CHART			
ALARM	TYPE	POSSIBLE CAUSE	SOLUTION
Motor OFF.	S	A movement has been attempted with the motor powered off.	- Reset the alarm. - Start the motor.
Synchronization Alarm.	S	In Tilting mode, the Deviation value is bigger than the Stop Tolerance parameter in a single cylinder.	- Check the Stop Tolerance parameter. If it is incorrect, change it. - If it is correct, reset the alarm and continue the cycle. - If the alarm is occurs again, visually check the cylinder. - Check delta values to be sure they are not too exaggerated (e.g. Delta 1: 2 mm / Delta 2: 1000 mm)
Maximum Total Load.	S	The total sum of cylinder loads (selected and non-selected) has exceded the value entered in the "Maximum Total Load" parameter.	- Check the parameter, considering the load weight and the cylinder characteristics. If it is incorrect, change it. - Check the cylinder model in spans screen. - If "Maximum Total Load" parameter is correct, the load weight is bigger than the theoretical value expected in the application. Ask to the engineer about it. - Reset alarm. The alarm only can be reset by entering a parameter bigger than the Maximum Total Load.
Soft Starter Failure.	S	The motor could not be started correctly and the soft starter goes to error.	- Check the motor phases. - Make sure the tension is correct. - Visually check the cables. - Reset alarm.
Safety Stop: Pendant (Local Mode). Safety Stop: Control Cabinet. Safety Stop: Controller (Remote Mode).	S	Each alarm shows depending on the working mode.	Rearm the Stop button and reset the alarm
Impossible To Start Tilting. All Values Must Be Other Than Zero.	S	Delta final position must be different than zero for al cylinders.	- Adjust delta positions. - Reset the alarm.
Stop Oil Level.	S	The oil level is too low. Irreparable damage can be caused to the pump if the system is working at this level.	- Check if the oil level is low through the visual level. - If the visual level offers a different reading than the sensor, then the sensor is faulty and must be repaired. - If the oil level on the visual level is low, then refill the tank through the filling cup. - Reset alarm.

ALARMS CHART			
ALARM	TYPE	POSSIBLE CAUSE	SOLUTION
Motor Overload.	S	The circuit breaker has been tripped, due to an excessive consumption, overheating, short circuit....	- Open the electrical cabinet and reactivate the electrical protection breaker. - Ensure that the electrical current corresponds to the characteristics of the motor. - Reset alarm.
Impossible Start Preload. Increase / Decrease Load NOT allowed at the same time.	S	The final load value is lower than the current load of at least one cylinder. The movement can only be in one direction.	- Adjust final load values. - Reset the alarm.
Local / Remote selector changed during a movement.	S	The control mode has been changed in the local/remote switch in the electrical cabinet.	- Check the switch in the electrical cabinet. - Make sure it is in the corresponding mode, local or remote. Key is needed to change the mode. - Reset alarm.
Maximum Cylinder (#) Load.	W	The load withstand by the cylinder (#) has exceeded the entered value in Maximum Cylinder Load parameter.	- Check the parameter, considering the load weight and the cylinder characteristics. If it is incorrect, change it. - Check the cylinder model in spans screen. - Reset the alarm. It only can be reset by entering a parameter bigger than the previous cylinder load.
Cylinder (#) Big Chamber Pressure Signal Failure.	W	The pressure transducer signal of indicated (#) cylinder big chamber is not reaching the PLC.	- Visually check the pressure transducer and the cable. - Reset alarm.
Cylinder (#) Small Chamber Pressure Signal Failure.	W	The pressure transducer signal of indicated (#) cylinder small chamber is not reaching the PLC.	- Visually check the pressure transducer and the cable. - Reset alarm.
Cylinder (#) Stroke Signal Failure.	W	The stroke sensor signal of indicated (#) cylinder is not reaching the PLC.	- Visually check the stroke sensor cable. - Reset alarm.
Clogged Return Oil Filter.	W	The filtering element of the return filter is clogged.	- Do not work in this state for very long periods. Working life of the pump decreases due to the contaminated oil. Replace the filtering element. - Sometimes an instant depressurization of several cylinders at the same time may cause an overpressure of the return filter and activate the alarm. Check if this is a temporary event, reset the alarm and continue working. - Reset the alarm.
Low Oil Level.	W	The oil level is low.	- Check if the oil level is low through the visual level. - If the visual level offers a different reading than the sensor, then the sensor is faulty and must be repaired. - If the oil level on the visual level is low, then refill the tank through the filling cup. - When the root cause has been checked and solved, reset alarm.

ALARMS CHART			
ALARM	TYPE	POSSIBLE CAUSE	SOLUTION
Low Oil Temperature.	W	The oil has not reached the minimum working temperature.	- Check if the oil temperature is low in the digital thermometer. - If the thermometer offers a different reading than the sensor, then the sensor is faulty and must be repaired. - If the temperature on the thermometer is low, wait until the oil warms up. The machine should not be exposed to low temperatures. - Reset the alarm.
High Oil Temperature.	W	The oil has exceeded the maximum work temperature (65°C).	- Check if the oil temperature is high through the digital thermometer. - If the thermometer offers a different reading than the sensor, then the sensor is faulty and must be repaired. - If the temperature on the thermometer is high, wait until the oil cools down. The machine should not be exposed to heat sources. - Reset the alarm.
24V DC Protection Failure (#).	W	The indicated (#) DC protection has been tripped, due to an excessive consumption, overheating, short circuit.	- Open the electrical cabinet and reactivate the DC protection. - Reset alarm.

NOTES

[illegible]

NOTES

[illegible]

