

Instructions for safe operation, installation, and maintenance.

⚠ DANGER

Understand manual before use. Operating AMKUS Rescue Systems without understanding the manual, receiving proper training, and using appropriate personal protective equipment is a misuse of AMKUS equipment. This manual does not fully address safety. Additional safety information is published in AMKUS Safety Manual LAA-001. Obtain manual at amkus.com/resources/information.



Electrically driven, truck mounted, 10,500 PSI (720 bar) twin pump hydraulic power unit for simultaneous operation of two rescue tools.



LAA-001
SAFETY MANUAL
FOR AMKUS RESCUE SYSTEMS

This manual is intended for use with manuals published by manufacturers of the prime movers (motor and pump) used in this power unit.



LAA-004
SAFETY DATA SHEET
AMKUS MV1 HYDRAULIC FLUID

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DANGER

PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and /or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.

Fire and Emergency Manufacturers and Service Association
P.O. Box 147, Lynnfield, MA 01940 • www.FEMSA.org

1.0 MEANING OF SAFETY SIGNAL WORDS

A safety related message is identified by a safety alert symbol and a signal word to indicate the level of risk involved with a particular hazard. Per ANSI standard Z535.6-2011, the definitions of the four signal words are as follows:



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to physical injury.

1.1 GENERAL WARNINGS



Servicing tools creates injury risk not found during normal product use;

- Guards removed for service create pinch points. Avoid injury during service by keeping hands and fingers away from movable mechanisms when cycling the tool under pressure. Replace guards before returning tools to service.
- Pressure stored within a hydraulic cylinder against an end stop can be suddenly released during service by disassembly of hydraulic components. Release pressure by moving cylinder slightly from the end stop before service.
- Energizing electrical connections and wiring exposed during service creates ignition and shock hazards.
- Always wear safety glasses when servicing, or testing Amkus rescue equipment.

Obtain Level 3 service technician training before servicing Amkus rescue equipment.



Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this equipment.



Be sure the system is properly grounded before applying power. Do not apply AC power before you ensure that all grounding instructions have been followed. Electrical shock can cause serious or fatal injury.



Use proper care and procedures that are safe during handling, lifting, installing, operating and maintaining operations. Improper methods may cause muscle strain or other harm.



When using electric motorized equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, injury, or death.



When using electric motorized equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, injury, or death. The following are some basic safety precautions:

Electric motor and controls are ignition sources. Flammable vapors heavier than air can accumulate in low spots. Avoid selecting these locations when setting up the equipment. Use detectors to verify safe site selection.

Electric motor and wiring are not waterproof. Don't submerge or douse electric motors or their controls. Refer to manuals from motor manufacturer for specific details.

Installation by qualified person – Power componentry properly, sized and installed, to run the equipment are the responsibility of the purchaser. Qualified electricians should install the equipment per applicable regulations (NEC, NFPA, OSHA, etc.) before the equipment can be used.

Circuit breakers matched to the motor capacity are required. Don't operate electric motors without circuit breaker protection.

Type of power cord - cord type should be rated for outdoor use, such as SW, SOW, STW, STOW, SJW, SJOW, SJTW, or SJTOW. (W service rating = outdoor and wet location)

Use of power cords - Always use a cord heavy enough to carry the current the tool will draw. Use of an undersized cord will cause a drop in line voltage resulting in loss of power and overheating.

Don't abuse the cord – Make sure the power cord is in good condition before use. Never lift or pull the equipment by the cord or yank it to disconnect from receptacle. Keep cord from heat, oil, crushing, and sharp edges. Inspect cords for damage after each use. Replace damaged cords before placing equipment in service.

Disconnect power –Disconnect the equipment from the power supply when not in use, before cleaning, inspecting, or servicing electric motors and controls.

Keep covers and guards in place and in working order

2.0 SPECIFICATIONS

AMKUS 240SS Specifications		
Length	33 in	838 mm
Width	10.25 in	260 mm
Height	21 in	533 mm
Weight	217 lbs (wet)	98.4 kg
	177 lbs (dry)	80.3 kg
Motor Input Voltage	208/240 VAC Single Phase	
Current Draw Amps (maximum)	70 Amps at 208VAC (Input)	
Number of Pumps	2	
Rated Flow Of The Pump per Port, First Stage	1 gpm	3.9 l/min
Rated Output Pressure, First Stage	6450 psi	445 bar
Rated Flow Of The Pump per Port, Second Stage	0.68 gpm	2.6 l/min
Rated Output Pressure, Second Stage	10,500 psi	724 bar
Fluid Type:	AMKUS MV1 Mineral Base Hydraulic Fluid Safety Data Sheet (SDS) for AMKUS MV1 Hydraulic Fluid is available at AMKUS.com and CHEMTREC.com (For equipment stored and operated in environments below 32 deg. F (0 deg C) contact Amkus Rescue Systems for recommendation.	
Hydraulic Fluid Reservoir Capacity:	7 gals. US	26.5 liters
Hydraulic Filter	AMKUS Part # KSS010	

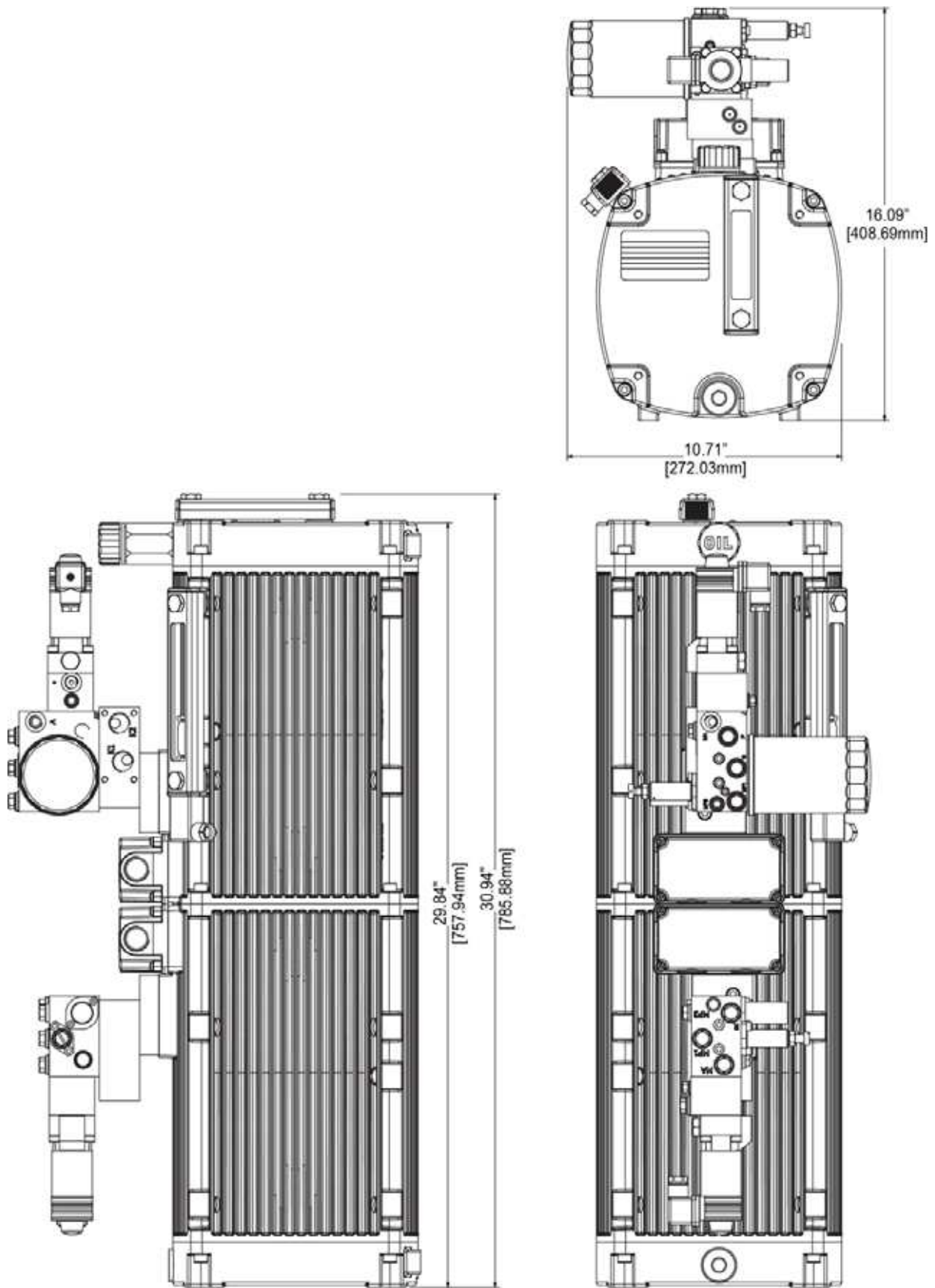
2.1 GENERAL

For two-tool simultaneous operations, the 240SS Super Simo is a true “on board” 2 circuit hydraulic rescue tool power unit. This high performance unit provides the power and tool speed needed to be used with longer length hoses such as 100, 150, and even 200 foot length hoses. The performance of the 240SS virtually eliminates long tool reaction times created by the expansion of long lengths of hydraulic hoses.

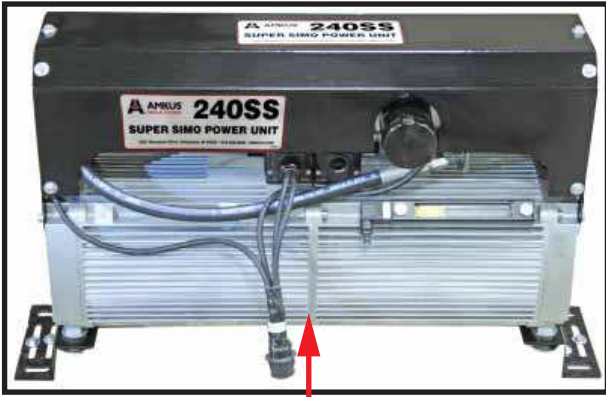
AMKUS uses another industry first Variable Frequency Drives to regulate electrical requirements. This infinitely customizable control system is set up to require only 5 amps of current at start up. Unlike other electric power units, the 240SS increases electrical power as the pressure increases through the use of a Programmable Logic Controller (PLC). Maximum electrical requirement of less than 15kW is only needed when both circuits reach 10,500 psi simultaneously.

The Programmable Logic Control Module puts the controls in one location providing master on/off switch, circuit controls, low oil, high temperature indicator lights. The Human Machine Interface (HMI) display provides system operational information as well as input and output indicators to quickly troubleshoot the system. An Ethernet interface provides a programming and troubleshooting connection for factory assistance should the need occur to interface to the power unit.

2.2 OVERALL DIMENSIONS



2.3 PART IDENTIFICATION

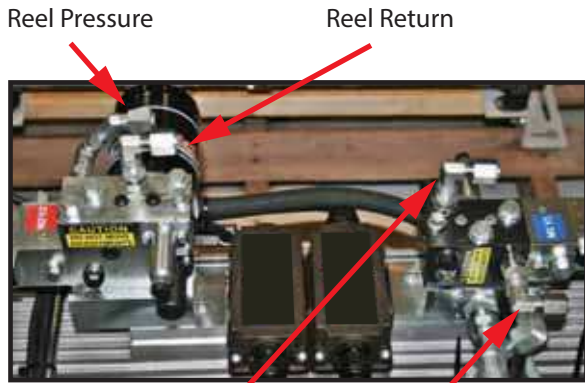


Power Unit



Receiver

Wireless Remote Control

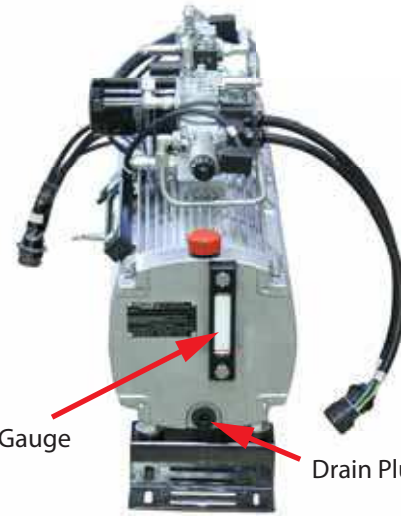


Reel Pressure

Reel Return

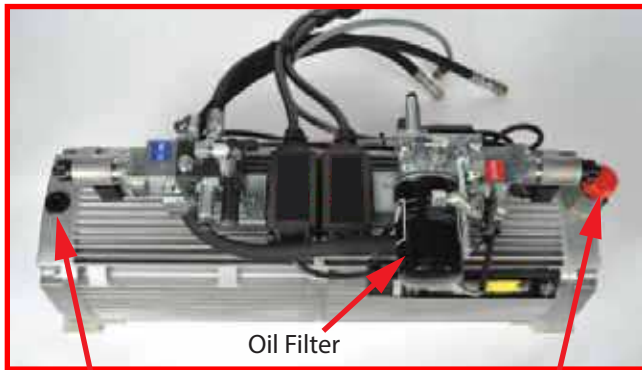
Reel Return

Reel Pressure



Sight Gauge

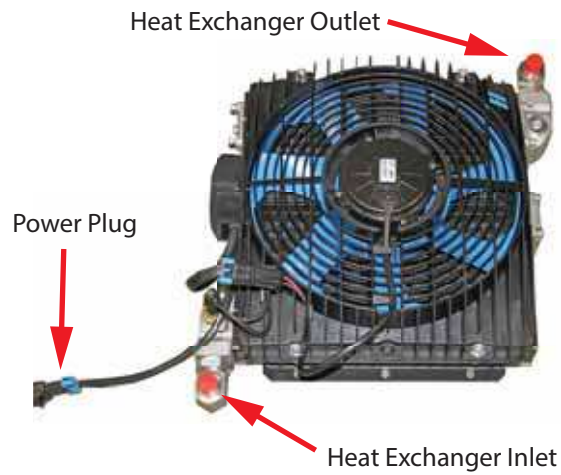
Drain Plug



Vent Cap

Oil Filter

Reservoir Fill Cap



Heat Exchanger Outlet

Power Plug

Heat Exchanger Inlet

2.4 SCREEN IDENTIFICATION



Main Screen

The main touch screen is used to operate the unit. Using the touchscreen or the button switches below, the user may:

- Start the system
- Operate either pump motor
- Open or close the pump valves

See section 6.0 for detailed operating instructions.



I/O Screen

The I/O screen shows the states of each input and output in real time. This screen is most helpful for troubleshooting a system.



Runtime Screen

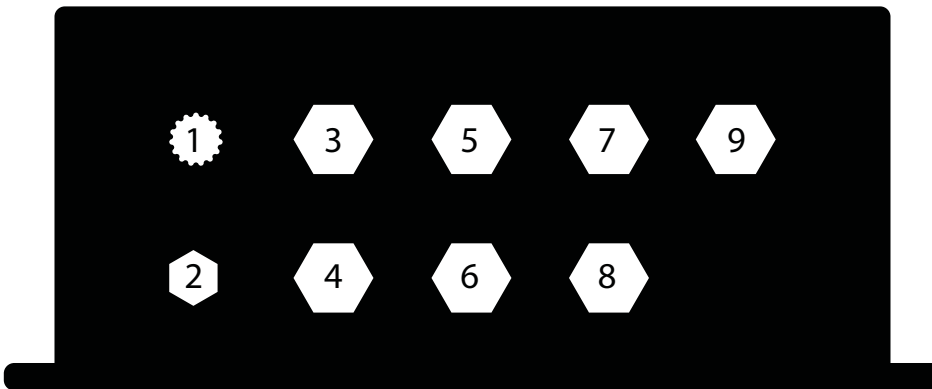
The runtime screen shows total hours of use on each motor.

2.5 WIRING IDENTIFICATION



Connection Callouts

- 1 - Radio (TR)
- 2 - HMI Ethernet (C5)
- 3 - HMI POWER/CONTROL (HMI)
- 4 - OIL/TEMP SENSORS (LVTEMP)
- 5 - 12VDC IN (12 IN)
- 6 - 12VDC OUT (12 OUT)
- 7 - MOTOR 1 (M1)
- 8 - MOTOR 2 (M2)
- 9 - 208/240VAC IN (POWER)



3.0 PROTECTIVE CLOTHING

It is the responsibility of the user to ensure that appropriate protective clothing are worn and equipment are used to provide protection from those hazards to which personnel are exposed or could be exposed while working with this product.

4.0 TRAINING

This product is designed to be used by emergency services personnel to facilitate the extrication of victims from entrapment. Its use should be limited to trained personnel only. All personnel using this equipment are assumed to have completed a course of instruction that is acknowledged as being educationally sound by the local authority having jurisdiction over such training. This document contains basic operating and maintenance instructions only.

5.0 INSTALLATION

5.1 SITE SELECTION

When selecting a location to mount the 240SS system it is important to install it inside a compartment away from the elements. For more information contact your local AMKUS dealer.

AMKUS equipment is manufactured with superior craftsmanship and quality that is backed by the standard warranty which is published on the AMKUS website.

NOTICE

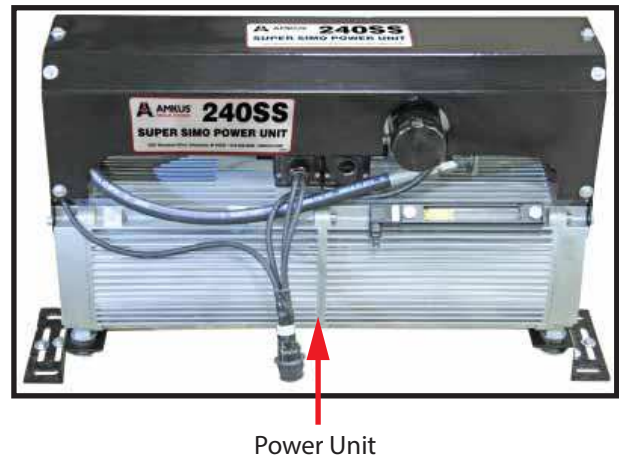
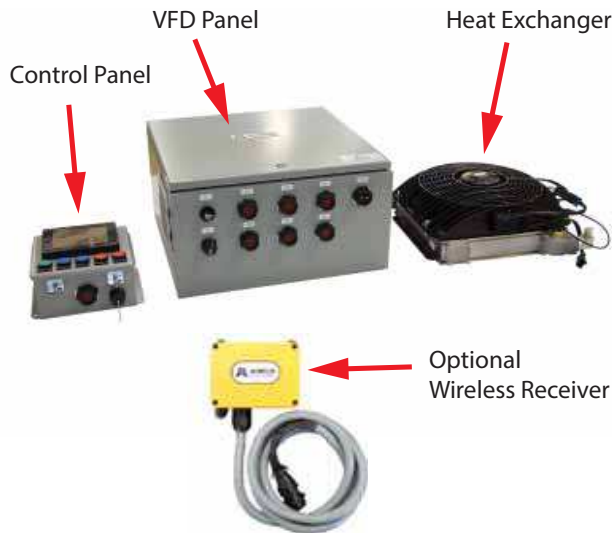
Only use AMKUS tools with AMKUS equipment. Mixing AMKUS tools with another manufacturer's equipment may cause operational problems, equipment failure, or denial of warranty claims.

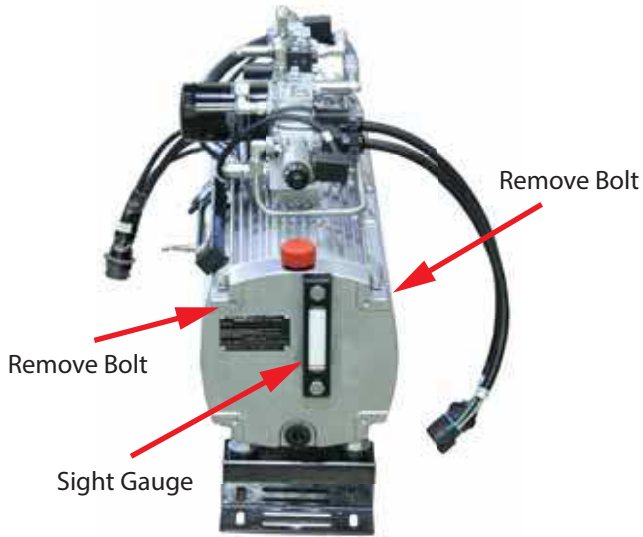
NOTICE

Only use AMKUS mineral-base hydraulic fluid in AMKUS equipment. Using another manufacturer's hydraulic fluid in AMKUS equipment may cause operational problems, equipment failure, or denial of warranty claims.

Normally, AMKUS equipment is prepared and serviced by your dealer prior to delivery. If, however, you have decided to place the equipment into service yourself, please review the following instructions carefully.

1. Remove equipment from the packing cartons and carefully inspect for damage. Damage that occurs during shipment should be reported immediately to the carrier.
2. There are 4 major components included in the 240SS Super Simo Power Unit and an optional remote control system.
 - a. VFD (Variable Frequency Drive) Panel
 - b. Control Panel
 - c. Heat Exchanger
 - d. Power Unit





1. Remove the black cover from the power unit by removing the bolts on either end of the unit.
2. Determine the location for the power unit. To allow for easier service, make sure the black cover can be removed and the sight gauge is visible.



3. The power unit has been shipped with the kinetic bushings and mounting brackets installed.



4. Install and tighten the 4 mounting bolts.

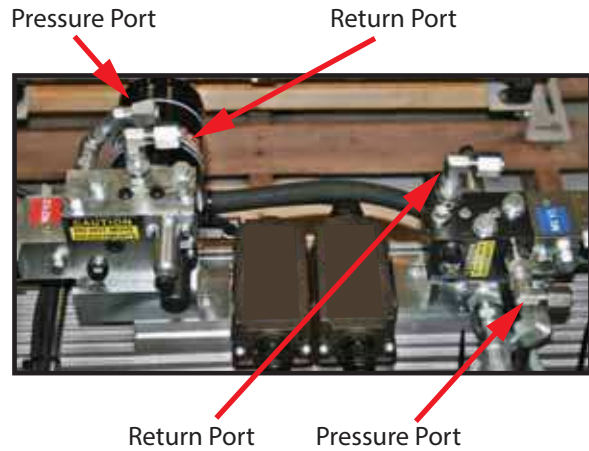


Vent Cap

Reservoir Fill Cap

5. Remove the black vent cap with a 12mm Hex Key. Unscrew the red reservoir fill cap and fill the hydraulic fluid reservoir until the sight gauge is completely full. Replace the black vent cap and the red reservoir fill cap.

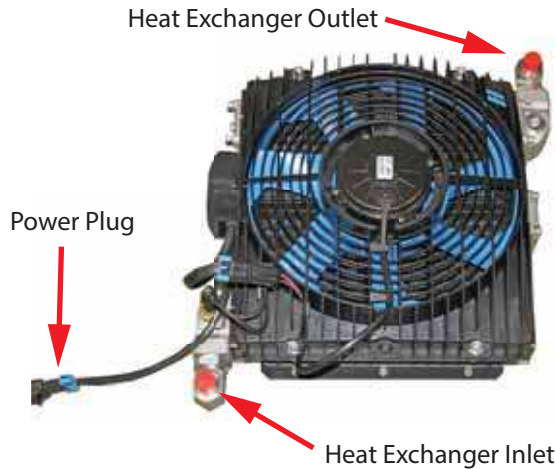
Pump 2



Pump 1

6. Connect the pressure and return hose
 If AMKUS standard couplers are being used, be sure the pressure line has a male coupler at the end of the reel. The return line will have a female coupler at the end of the reel.
 If AMKUS Mono Couplers are being used, be sure the pressure line is connected to the pressure port (P) of the female Mono Coupler and the return line is connected to the tank port (T) of the female Mono Coupler.

7. The heat exchanger supply utilizes a check valve. The flow direction can be determined by the arrow stamped on the check valve. Connect this hose to an installer provided #8 SAE 100 R2 hose and connect the other end to the inlet side of the heat exchanger. The inlet side is the port closest to the power plug.



8. The heat exchanger should be mounted in a location that allows the intake of fresh air. Caution should be taken to prevent recirculation of the heated air. The air intake side of the heat exchanger should have a minimum of 3 inches from any obstruction. The exhaust (fan) side of the heat exchanger should exhaust into free air (no back pressure).

9. The 240SS Control Panel (shown above) houses a display and 5 buttons used to operate the unit. The green button is used to start/stop the entire system. Each reel circuit has a motor button and valve control button. Refer to the operating section of this manual for further explanation of button functions.



10. Mount the 240SS Control Panel in a compartment accessible to tool operators.



11. Mount the 240SS VFD Panel in a compartment. Ensure the VFD can be accessed and the cover can be easily removed by maintenance technicians.



12. Mount the optional wireless receiver using the supplied bolt.

NOTICE

This unit should be installed in a compartment out of the elements. Plug the receiver cable into the matching plug from the VDF panel.

6.0 GETTING STARTED

6.1 INITIAL START-UP



1. Connect the hose reel hoses together before starting the system.



2. Using a hex-key wrench, remove 4 corner screws. Remove the VFD cover.



3. The VFD is shipped with the circuit breakers in the OFF position.



4. Place the VFD circuit breakers in the ON position flipping each black switch up.



5. The upper section of the Control Panel houses the touch screen display and the touch display. The green button is used to enable/disable the entire unit. Press the physical or digital green button to start the system. The screen should indicate the system has started.



6. Press the physical or digital blue M1 button to start Motor No. 1. The screen should indicate Motor No. 1 is running



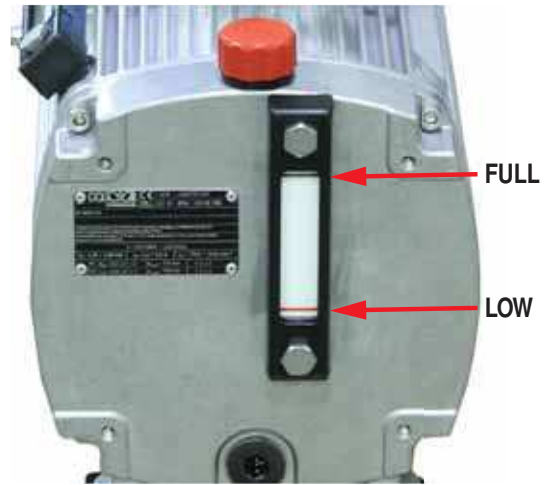
7. Press the physical or digital red M2 button to start Motor No. 2. The screen should indicate Motor No. 2 is running.



8. Press the physical or digital blue V1 button to activate Valve No. 1. The screen should indicate Valve No. 1 is open.

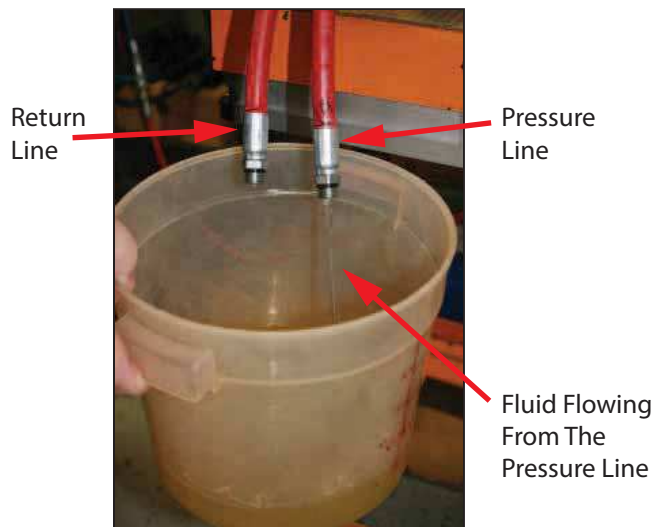


9. Press the physical or digital blue V2 button to activate Valve No. 2. The screen should indicate Valve No. 2 is open.



10. With both motors running and valves open, allow the power unit to flow through the reels for several minutes while monitoring the fluid sight gauge level. If the fluid level continues to drop after several minutes check for fluid leaks. When finished, shut the power unit off. Replenish hydraulic fluid until the sight gauge is completely full.

Verify Hose Connections



1. To verify which hose is the pressure hose, remove both couplings from the end of the hoses and place the hose ends in a bucket. Charge the appropriate valve. Fluid will flow from the pressure line. Turn off the valve once the pressure line is identified.

3. Check the sight gauge and add fluid until the sight gauge is completely full again.



Female Coupling



Male Coupling

2. If AMKUS standard couplers are being used, place the male coupler on the pressure line and the female coupler on the return line. Repeat for the other reel.

If AMKUS Mono Couplers are being used, be sure the pressure line is connected to the pressure port (P) of the female Mono Coupler and the return line is connected to the tank port (T) of the female Mono Coupler.

4. Put the black cover back in place and tighten the bolts on both ends to 25 in-lb (2.8 NM).

7.0 OPERATING INSTRUCTIONS

7.1 GENERAL

The 240SS is a simultaneous operation power unit. Two tools can be connected to a single power unit and operated either independently or simultaneously. To operate the 240SS. Ensure there is power to the unit. Begin operation by pressing the system start button. Then, press the motor button to begin building pressure. Once pressure builds, press the corresponding valve button to charge the rescue tool for operation.

After completing operations, pressing the green start button turns the entire system off.

Please note that the minimum safe bend radius of the hoses is 4 inches (101.6 mm).

7.2 OPTIONAL WIRELESS REMOTE CONTROL OPERATING INSTRUCTIONS

Wireless Remote Control



Remote Control Operation

- Rotate the Emergency Stop (1) (Red) thumb wheel clockwise and release to be sure the remote is in the operation mode.
- Press and hold both start buttons at the bottom of the remote. While holding the start buttons the remote is linking up to the receiver mounted in the apparatus so it is best to hold the start buttons pressed firmly to ensure a good signal.
- Push the M1 and/or M2 motor buttons (The motors are programmed to reach full operating speed in 5 seconds).
- Push the V1 and/or V2 valve button(s) to activate the appropriate reel circuits.
- To shut off a circuit, push the appropriate valve (5) and/or (6) button.
- To quickly shut down the entire system including the power, motors and reel circuits, push the Emergency Stop. To re-activate the system, repeat these instructions starting at number 1.

Remote Control Features

1. **Emergency Stop (Red)** – Closes both valves and powers down both motors. Press to active Emergency Stop. Rotate thumb wheel clockwise to resume normal operation.
2. **Start Buttons (Green)**- Synchronizes the remote to the receiver and activates the system..
3. **M1 Motor Switch** – Depress to activate motor for M1 circuit. Depress again to turn motor off.
4. **M2 Motor Switch** – Press to activate motor for M2 circuit. Press again to turn motor off.
5. **V1 Valve 1 Switch** – Press to activate control valve for V1 circuit. Press again to turn control valve off.
6. **V2 Valve 2 Switch** – Press to activate control valve for V2 circuit. Press again to turn control valve off.

8.0 TROUBLESHOOTING GUIDE

Any problem not resolved by the following suggestions may require you to contact your local dealer or AMKUS Rescue Systems for further guidance.

Problem	Solution
Tool lacks power or speed	Check hydraulic fluid level in power unit reservoir.
Fluid leaks at fittings or hoses	Check tightness of hose fittings. Replace damaged hoses.
Tools do not operate	Check to see that the power unit is running. Check to see that the line is charged. Check hydraulic fluid level in power unit reservoir.

9.0 ROUTINE MAINTENANCE

Obtain appropriate level service technician training before servicing AMKUS Rescue Systems equipment. For more information contact your local AMKUS Rescue Systems dealer about service levels and training courses .

9.1 ROUTINE MAINTENANCE FOR HYDRAULIC PUMP

Normally, you will have a maintenance agreement for your system with your local dealer. However, if you have decided to service the equipment yourself, please review the following instructions carefully.

Check the hydraulic fluid level sight gage after every use. Fluid should be "clear-gold". Cloudy, milky, brownish, or smelly fluid indicates contamination. Contact your local dealer or AMKUS Rescue Systems. A noticeable drop in fluid level indicates fluid loss. Investigate and correct the cause of loss, add MV1 hydraulic fluid as needed. Change oil filter after every 100 hours of pump operation. Change hydraulic fluid after every 300 hours of pump operation.

OIL CHANGE PROCEDURE; remove the fill plug/vent cap. Place a drain pan under the drain plug. Unscrew the drain plug being careful not to lose it. Allow the hydraulic fluid to drain completely. Clean and reinstall the drain plug. Replace the filter. Fill the hydraulic fluid reservoir with new AMKUS MV1 fluid. Reinstall the fill plug/vent cap. Cycle rescue tools several times to purge air from the hydraulic hoses.

The next step is to purge air from the hydraulic hoses.

The rated hydraulic pressure at maximum output is 10,500 psi +/- 500 psi (724 bar +/- 34 bar). Verify performance by periodic testing using a pressure gauge. If performance falls outside of this range, contact your local dealer or AMKUS Rescue Systems.

▲ WARNING DO NOT ATTEMPT TO ADJUST THE INTERNAL PRESSURE RELIEF SETTING! Pressure relief valves are NOT user serviceable. User adjustment is a misuse of this equipment.

9.2 ROUTINE MAINTENANCE FOR HOSES

After each use, hoses should be wiped clean with a light cleaner such as Simple Green®. Inspect hoses for damage to the rubber outer cover. Damage which exposes the wire braided reinforcement subjects the wire to corrosion and may weaken the hose.

9.3 ROUTINE MAINTENANCE FOR COUPLINGS

Use care when making hydraulic connections by avoiding dirt, sand, and water puddles at the scene. Even with care, residual oils on the moving parts will gradually accumulate dirt and grit making connections difficult. Couplings and dust caps can be periodically cleaned using an automotive type aerosol solvent de-greaser. Avoid water-based cleaning products. Apply a light spray lube (automotive, lock, or gun type) to keep the collars moving easily. Avoid covering a clean coupling with a dirty dust cap.

9.4 MAINTENANCE RECORDS

It is the responsibility of the user to keep maintenance records for each component of the rescue system. Maintenance shall be performed by qualified service technicians in accordance with the recommendations as outlined in this manual.

10.0 PARTS, SERVICE AND TECHNICAL INFORMATION

Parts, service and technical information may be obtained from your local AMKUS dealer, or by contacting AMKUS Rescue Systems.

11.0 DECOMMISSIONING

When decommissioning any AMKUS Rescue Systems Tool or power supply local regulations shall be followed. For proper disposal information contact your local AMKUS Rescue Systems dealer.

12.0 INSPECTION, CLEANING, DECONTAMINATION, AND STORAGE

BEFORE BEING PLACED BACK IN SERVICE, power units must be inspected to this checklist;

1. Check to see that all markings are legible. Contact your local dealer or AMKUS Rescue Systems for replacement labels.
2. Wipe tool, hoses, fittings and couplings clean (see routine maintenance for hoses and couplings).
3. Inspect the power unit, hoses, fittings and couplings after each use for damage, leakage and excessive wear.
4. If the power unit becomes contaminated, determine the nature of the contamination. IE: biological, chemical, radioactive. The authority having jurisdiction may follow internal decontamination guidelines or request technical advice from AMKUS.
5. Check the hydraulic fluid levels after each use. Replenish as necessary with AMKUS MV1 mineral based hydraulic fluid.

▲ WARNING Any power unit failing any part of the checklist is unsafe for use and must have the problem corrected before use or being placed back into service. Operating a power unit that has failed the checklist is a misuse of this equipment.

AMKUS RESCUE SYSTEMS
amkus.com

4201 Montdale Drive, Valparaiso, IN 46383-4098 USA
800-592-6587 • 219-548-5000 • Fax 219-476-1669