



PBA Series Prelube Controls



Simple, Compact, Industrial

- Full featured control for running prelube from the control or from a remote station
- Easy internal wiring connections
- Compact NEMA 12 enclosure
- Professionally engineered for safety, including a lock out switch and fully protected control and power circuits

Feature and Specifications Comparison	PBA3208	PBA3240	PBA3480	PBA1208	PBA1240
Operating voltage	208VAC	240VAC	480VAC	208VAC	240VAC
Phases	3	3	3	1	1
Pump Power rating	1.5 Hp				
Motor Protection	Included				
Low Power Remote Control Circuit	Integrated				



VARNA Products

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General

The VARNA Prelube Control Unit provides all the functions for the operation of the VARNA CF15 engine prelube pump. The front of the control has a LED illuminated push button. Optional matching remote push buttons are also available. User supplied buttons and indicator lights may also be used for remote stations to match the aesthetic of existing control panels. Control function is identical from any of the control points. Holding any of the buttons generates the 'Prelube Run' signal. As long as the signal is present, the prelube pump will run. The 'Prelube Complete' signal can come from an optional pressure switch add-on or another existing signal from the ECU or other monitoring sensors. Once the 'Prelube Complete' signal is received, the LEDs at all stations illuminate to inform the operator that the prelube cycle is complete and the engine is ready to start. In addition, the 'Prelube Run' and 'Prelube Complete' signals may be connected to various engine control devices for semi-automatic or fully-automatic prelube control.

Control unit installation is quick and easy with all control side electrical connections on a single DIN rail for easy accessibility. Four cord grips are provided to simplify sealed cable entry into the control enclosure. Conduit can also be used in place of the cord grips.

The prelube control unit is self-contained with a power disconnect / Lockout switch, a contactor for prelube pump motor operation, and a motor protection circuit to protect against phase failure, motor overload, and short circuits.

VARNA can provide preterminated, labeled cables, to your specified length, for both the two-conductor engine oil pressure switch, and four-conductor runs to external prelube control signals or pushbutton stations.

Low voltage control circuit components are protected by circuit breakers located within the prelube control cabinet so that no spare fuses need to be carried.

Motor Protection

Each model includes the appropriate motor protection for prelube pumps of a matching voltage. All versions provide 1.5 Hp protection suitable for the VARNA CF-15 pumps.

Application Engineering

It is challenging to address every possible installation type. We are always happy to help in choosing an appropriate installation setup. Give us a call for engineering assistance and support. 888-676-7774



SAFETY WARNINGS and CAUTIONS

WARNING High voltages in and around this equipment can cause serious or fatal injury. Installation, maintenance, or repair should be done by qualified personnel. Improper use of this equipment can cause serious or fatal injury.

WARNING This equipment operates high voltage. Only qualified personnel should install or maintain this equipment. Before working on this equipment make sure that ALL power to this equipment has been disconnected and that no other sources of power exist that may create an electrical shock hazard within this equipment. Electric shock can cause serious or fatal injury.

WARNING Only qualified personnel should install or maintain this equipment. This equipment uses both high voltage power and low voltage control. Note that the high and low voltage systems are isolated from each other. Crossing or other misuse of these systems can create serious electrical shock hazards in remote locations outside of this equipment. Electric shock can cause serious or fatal injury.

WARNING The prelube pump can be remotely operated at any time accidentally or purposely. Always insure that all means of energizing this equipment have been locked out or otherwise disabled during installation and maintenance of the prelube pump. Unexpected prelube pump operation during installation and maintenance can cause electrical shock hazards, contact with, or entanglement in moving or rotating parts resulting in serious or fatal injuries.

CAUTION The prelube pump can be remotely operated at any time accidentally or purposely. Make sure that all means of energizing the prelube pump are locked out or otherwise disabled before changing oil filters, disconnecting the associated oil lines, or maintaining any other equipment that may cause oil spillage by unintended prelube pump operation.

CAUTION Maximum vibration in the 10 to 55 Hz. range is 1 g RMS. Excessive vibration can damage the control box. The control box must be mounted in locations that do not receive direct vibration from the engine or other sources.

CAUTION Completely install the prelube pump and hoses to the engine prior to connecting power to the motor.

CAUTION The source panel must provide suitable circuit protection to protect the cable between the source panel and the Prelube Control Unit.



Prelube Control Unit Installation

1. Locate the Prelube Control Unit in an appropriate location for electrical equipment associated with the engine. There are cable grips installed for the power cable from the power source to the Control Unit and for the motor cable from the Control Unit to the Prelube Pump Motor. For mounting dimensions, see drawing.
2. Install the two power cables to and from the Prelube Control Unit.
 - a. The minimum conductor size for these power cables is 16 AWG (1.5mm²). Note that larger conductor sizes may be dictated by the length of the run, by the circuit protection device in the source power panel, by specific codes, or by standard practice.
 - b. Connect a four conductor power cable from the VAC 3 phase source panel to the blue L1, L2, L3, & Ground terminals inside the Prelube Control Unit.
 - c. Connect a second four conductor power cable from the gray T1, T2, T3, & Ground terminals inside the Prelube Control Unit to the appropriate Prelube Pump motor terminals.
3. Install the optional preterminated two-conductor prelube oil pressure switch cable from the Control Unit to the prelube oil pressure switch at the engine or ECU. VARNA P/N 6435-XX can be supplied as a kit in whatever length is required for the installation.
 - a. Install the end the cable with the sheath cut back about 5 inches into the right front cord grip and connect the wires to the two orange connectors as shown in the Figure 1.
 - b. This cable is routed from the Control Unit to the Prelube Oil Pressure switch. The black wire is connected to one of the terminals on the Prelube Oil Pressure Switch and the white wire is connected to the other terminal.
4. Wire remote prelube station(s). VARNA P/N 6436-XX can be supplied as a kit in the length required for the installation.
 - a. If a remote prelube station is not to be used, remove the front left cord grip and close the hole with a suitable plug.
 - b. Install the end with the cable sheath cut back about 5 inches (125mm) into the right front cord grip and connect the Red, Green, Black, and White wires to the red, green, black and white set of connectors also shown in Figure 1.
 - c. Rout this cable to the location of the remote prelube station. Note: The maximum length of AWG-16 (1.5mm²) cable from the Control Unit to furthest remote switch is 44 feet (13.4m). Longer cables may result in insufficient current to operate the contactor in the Prelube Control Unit.
 - d. At the remote location, use a switch or relay to contact the White wire in the Control Cable to the Black wire in the same cable. While the switch or relay is closed, the Prelube Pump will run. NOTE: The current draw through the switch or relay will be about 400 mA steady with a 4 Amp inrush. The voltage across the open switch or relay contacts will be approximately 24 VAC.
 - e. Connect the Green and Red wires in the Control Cable to a 24 Volt rated pilot lamp. When the prelube pump is running, the prelube button lamp will indicate that the preset

oil pressure has been reached at the prelube pressure switch. This signal may also be used to energize a 24 VAC relay to signal an automated engine control that the preset engine prelube oil pressure has been reached.

5. Verify that the Prelube Pump is installed and plumbed according to its installation instructions.
6. Turn on the power source to the Prelube Control Unit.
7. Turn the Manual Disconnect on the Prelube Control Unit to the ON position.
8. Verify the pump rotation by quickly tapping the RUN PRELUBE button on the Control Unit and visually checking the rotation of the fan in the motor. The pump motor must rotate counterclockwise when viewed from the fan end.
9. Verify that there is oil in the engine sump.
10. Push and hold the RUN PRELUBE button on the Control Unit. The prelube pump will run until the button is released. The lamp will illuminate when the preset engine prelube oil pressure has been reached at the prelube pressure switch.

The Remote Prelube Operator station wires connect to the BLACK, WHITE, RED, and GREEN terminals here.

The Power wires from the Source Panel connect to the BLUE terminals here.

The Prelube Oil Pressure Switch wires connect to the ORANGE terminals here.

The Power wires to the Prelube Pump motor connect to the GRAY terminals here.

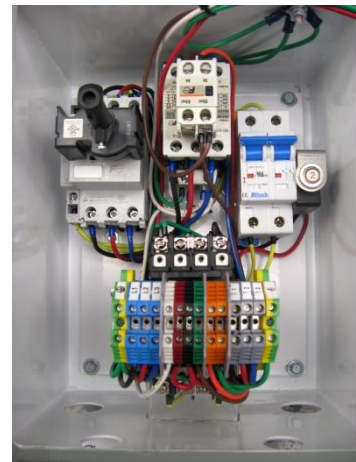


Figure 1: Wiring the Control Unit



Operation

Manual Prelube Operation

1. The engine prelube pump can be operated by pushing the prelube button on the control box. Additionally, the prelube pump can be operated at any of the optional remote prelube operator stations.
2. The Prelube pump will run while the button is pushed or the black and white wires in the control cable are connected by a switch or relay.
3. The button lamp will flash while the prelube pump is running.
4. When the preset prelube oil pressure is detected at the engine prelube pressure switch, the button lamp stays on.

Semi or fully-automatic operation

The VARNA Prelube Control Unit has three external control signals that can be used to operate the prelube pump and report the state of the engine prelube pressure switch.

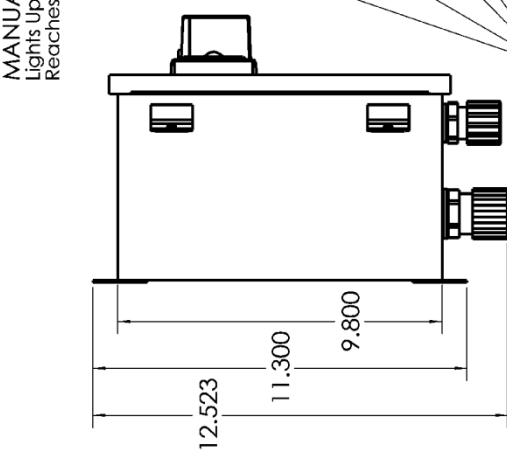
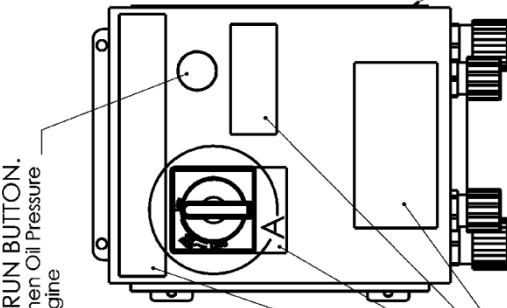
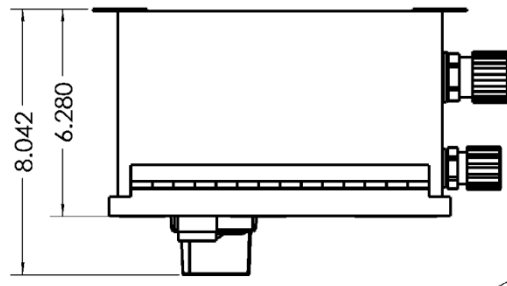
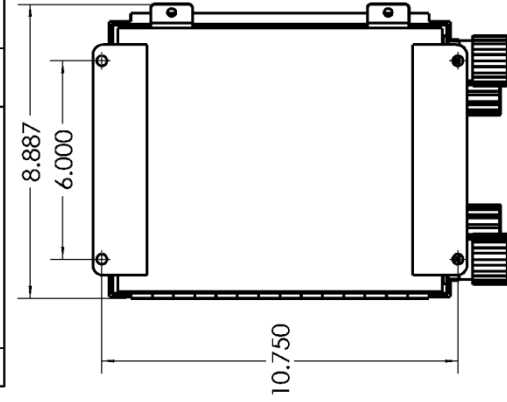
1. Prelube Run - It is an input signal to the Prelube Control Unit from a remote switch or a relay contact closure that is used to run the prelube pump. A contact closure between the White and Black connector blocks in the Prelube Control Unit will cause the prelube pump to run. The prelube pump will continue to run until the contact closure opens.
2. Prelube Pressure Reached – It is an input signal to the Control Unit from the engine Pressure Switch. A contact closure between the two orange connector blocks in the Prelube Control Unit while the prelube pump is operating will illuminate the button lamp in the control unit and any connected remote lamps.
3. Prelube Complete - It is an output signal of 24-VAC output signal from the Prelube Control Unit used to illuminate any connected button lamps. It is on the Red and Green connector blocks in the Prelube Control Unit. This signal is derived from the Pressure Switch signal.



Trouble Shooting

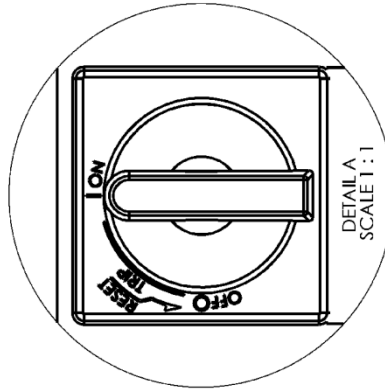
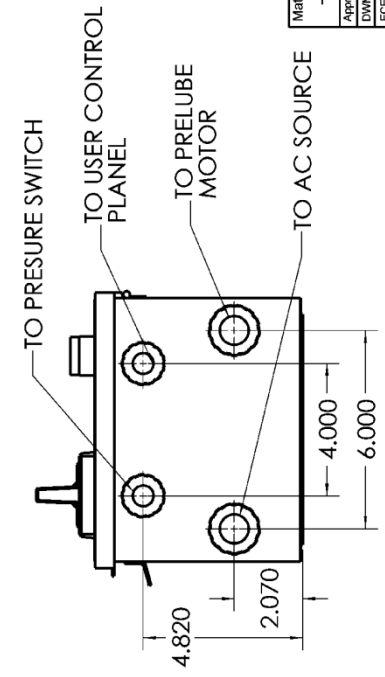
1. The button does not illuminate and the Prelube Pump does not run:
 - a. Check that the circuit breaker to the Prelube Pump Control Unit is on. It might be tripped or turned off.
 - b. Check that the disconnect switch on the Prelube Control Unit is on. It might be tripped or turned off.
 - i. If the disconnect trips immediately upon pushing the prelube button, verify that each of the 3 phase power lines into to the Prelube Control Unit has power. Also check for broken or shorted wires leading to the prelube pump motor.
 - ii. If the disconnect switch trips after 3 or more seconds, check for a jammed pump or failed motor.
 - c. Check that the low voltage component protection circuit breakers are on. They are located inside the Prelube Control Unit on the right side. To reset the dual circuit breaker force the blue lever down into the off position and then back to the on position. The button circuit breaker will pop out when tripped. To reset it, push the button back in. A miswired Remote Control station or shorted remote station wires will cause one or both of these circuit breakers to trip.
2. The pump runs but the button lamp does not turn on continuously to indicate prelube pressure at the engine.
 - a. Verify that there is adequate oil in the engine. Note: Changed oil filters or other maintenance may require a longer prelube time to purge the filters and oil lines.
 - b. Check if maintenance has been performed that would allow air in the oil lines to the pump. While the pump will self prime, it may take some time.
 - c. Check if the engine is hot and therefore the oil is thin. Oil may be present in the engine but thin oil could be flowing through the bearings and other oil paths faster than the prelube pump can supply it. Oil is flowing through the engine but it does not produce enough pressure to operate the prelube pressure switch.
 - d. Check for a failed button lamp.
 - e. Check for breaks or disconnects in the wires to the prelube oil pressure switch.
 - f. Check for leaks in the Prelube Pump suction line and fittings. These leaks are hard to find. A relatively small suction leak can keep the pump from priming.
 - g. Check for proper prelube pressure switch setting.
 - h. Check that the prelube oil pressure switch is functioning properly.
3. The button light turns on immediately when the button is pushed (no delay while the engine is filling with oil).
 - a. Check if the engine is running and therefore oil pressure is already present.
 - b. Check for shorts in the wiring to the prelube oil pressure switch.
 - c. Check that the prelube oil pressure switch is functioning properly.
 - d. Check for proper prelube pressure switch setting.
4. The prelube pump runs whenever power is applied to the control unit.
 - a. Check for shorted wire(s) to the remote prelube station.
 - b. Check for shorted or miswired remote prelube cable at the Control Unit or at the remote prelube station.

REV.	DESCRIPTION	DATE	APPROVED



BOX HINGE

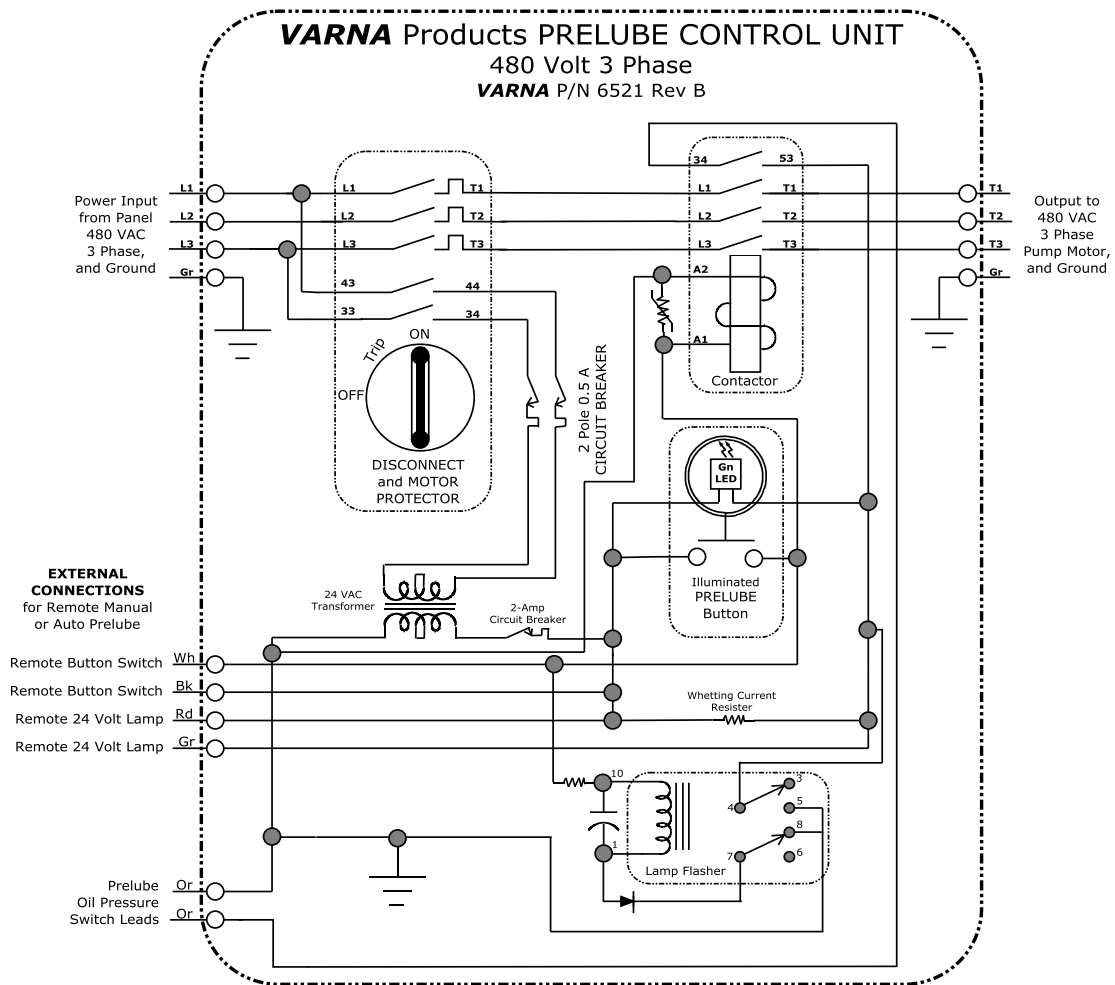
LABELS



- NOTES:
1. NEMA 12 STEEL ENCLOSURE.
 2. POWER REQUIREMENTS:
 - MOTOR-460VAC 3Ø, 2.2A.
 - CONTROL-24VAC, 400 mA.
 - (4A MAX. INRUSH)
 3. WEIGHT: ~17LBS.

Material:		Transportation Research Corp. (TRC)		Voice: 530-676-7770
VARNA Products		SPECIAL DIMENSIONS		Fax: 530-676-7786
Approvals	Date	Control Box 460V		
DWN, MSA	9/7/13/09	3ØAC/24VAC		
ECOA #		PART NO.		
		6521		
		SCALE: 1:3		

SOLID MODEL FILES AVAILABLE ON REQUEST



How to connect remote Prelubing stations
to the VARNA Products P/N 6441 Prelube Unit.

