"PATRIOT 2 -LED PROXIMITY SWITCH"
FOR DIVIDER BLOCK LUBRICATION SYSTEMS

PATTON®
DIVIDER BLOCK SYSTEMS
Pro-Tecting "Your" Compressor

IF THE RED LIGHTS ARE FLASHING, THE PROXIMITY SWITCH IS WORKING CORRECTLY!

The innovative technology of the **"PATRIOT"** proximity switch establishes a new generation of proximity switches and is the #1 choice for installation on compressor divider block systems.

"PATRIOT 2 - LED PROXIMITY SWITCH"

FEATURES:

- 5 Amp 24 Vdc - SPST N/O
- One-Piece 316 S.S. Construction
- Permanent Magnets
- Operating Temp -4°C + 85°C
- Pressure Rating 4500 PSI
- UL Class I/II/III DIV 2
- Triple Magnets Ensure Reliability in High Vibration
- No Springs to Break
- Triple LED Pulse Indication
- Epoxy Encapsulation

Part # PLP-PPS 2

UL
E521351

CLASS I/II/III, DIV 2,
GROUPS. A B C D E F G
HAZARDOUS AREAS

"2 YEAR WARRANTY"

Retrofits All Compressor Divider Blocks Except Lincoln & DropsA*

***Note:** Patton divider blocks have the same bolt pattern as DropsA. To install the Patriot, simply replace the DropsA block with a Patton block

PATTON DIVIDER BLOCK SYSTEMS
Pro-Tecting "Your" Compressor

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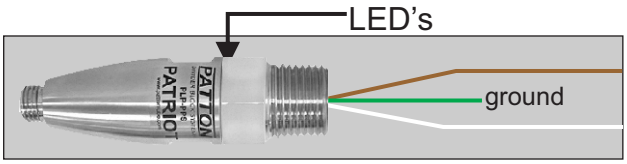
Patton Divider Block Systems
1004-B South Midkiff Rd.
Midland Texas 79701

BUILT TANK TOUGH
2-Year Factory Warranty

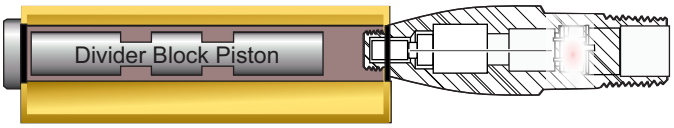
The Flashing LED's Verify Both The Divider Block & The Proximity Switch Are Working Correctly

PROBLEM:
The compressor industry has been plagued for many years with no visual indication or simple method to ensure the proximity switch is working correctly. This is an unnecessary loss of labor and revenue due to the downtime of the compressor and frustration of the technician or compressor operator.

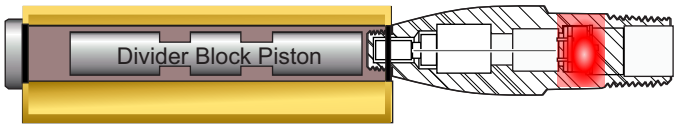
SOLUTION:
Patton's new "LED PATRIOT PROXIMITY SWITCH" is specifically designed for the compressor divider block system and incorporates solid state circuitry to power externally mounted ultra bright RED LED's with DC power from the control panel. When the piston in the divider block moves within a specified distance of the end of the proximity switch, Palladium Silver contacts close sending DC voltage to the RED LED's. The flashing RED LED's are a visual indicator for operators or service technicians, "IF THE LED's ARE FLASHING, THE PROXIMITY SWITCH IS WORKING!"



Brown Wire: 24 VDC From Control Panel to Power LED's
White Wire Return Voltage (Switch Closure to the PLC)

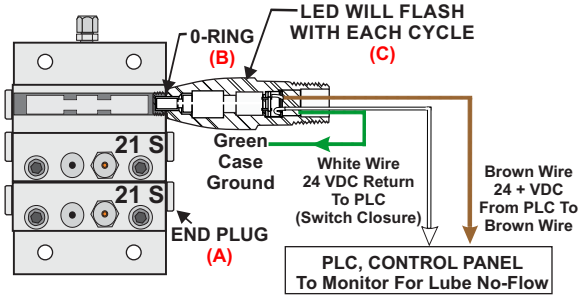


Piston to opposite end of divider block, LED's off.

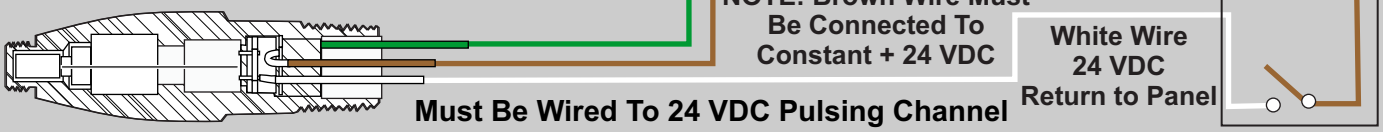


When piston travels within a specific distance of the Patriot, LED's turn on indicating the internalpiston and proximity switch are functioning correctly

INSTALLATION:
1. Install switch on any available divider block section, left or right side.
2. Remove end plug (A) from divider block where proximity switch will be installed.
3. Ensure 0-ring (B) is in place on switch housing.
4. Replace end plug with proximity switch
5. ⚠ **OVER TIGHTENING WILL DESTROY THE SWITCH**
   Torque to 6 lb-ft torque max!
6. **CAUTION**: Switch must not come in contact with divider block piston. If the piston hits the end of the proximity switch, the force can cause premature failure!



"PATRIOT" Proximity Switch



Supply Voltage	*Rated Current*	*Max. Voltage*
24 VDC	50mA Min 150mA MAX	30V AC/DC

NOTE: Minimum Current For Max LED Brightness = 50mA
3.2 Minimum Voltage Drop Across Switch
NOTE: Target PLC Input Impedance ≤2000 Ohms Max
LED's will not light at higher impedance

⚠ **CAUTION:** Switch is Polarity Sensitive
The brown wire must have constant voltage from the control panel!
If a volt/ohm meter displays continuity but the LED's do not light, switch the brown and white wires in the control panel.

⚠
OVER TIGHTENING WILL DAMAGE THE SWITCH
Maximum Torque: 6 lb-ft max

***Support All Conduit & Connections To Eliminate Excess Weight on Switch!**

***Do Not** tighten conduit connections to the switch when installed on the divider block or switch will be over tightened causing premature or immediate failure!!

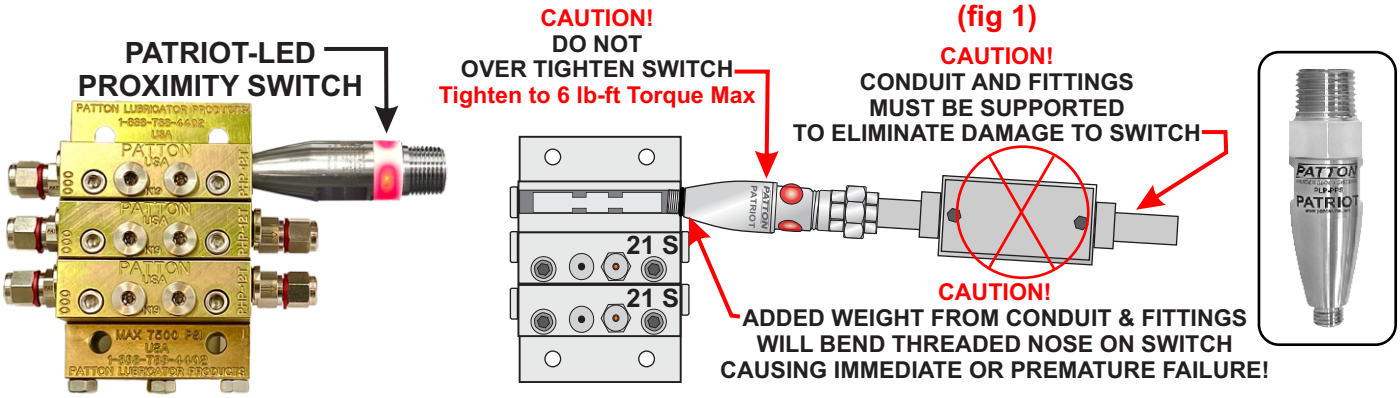
⚠ ***DO NOT CONNECT GREEN GROUND WIRE TO BROWN OR WHITE WIRES!***

Troubleshooting Guide For "PATRIOT-LED" PROXIMITY SWITCH

PATTON® DIVIDER BLOCK SYSTEMS

PROBLEM	POSSIBLE CAUSE	SERVICE PROCEDURE AND/OR CORRECTION
COMPRESSOR SHUTDOWN ON LUBE NO-FLOW **1.** Switch closure indicator on control panel, PLC or lube monitor does not blink. Control panel indicates lube no-flow. LED'S on Patriot switch do not blink. Visual cycle indicator on divider block confirms the divider block assembly and pistons are operating correctly. (Continued On Next Page)	**(1) The Proximity Switch Has Been Over Tightened!** **A. Switch was over tightened during installation.** When the switch is over tightened the torque stretches the threads on the nose of the switch, damaging the internals, causing failure. Do Not Over Tighten, Torque to 6 lb- ft Max **B. Electrical conduit and connections were installed on the switch after the switch was installed on the divider block.** The technician installed the conduit and condulet box on the switch and forcibly rotated the condulet box to position it in a correct direction for easy access to the wiring. As the conduit was rotated and tightened on the switch, the switch was also rotated and over tightened, causing failure.(see fig 1)	With the divider block cycling, connect the leads of volt/ohm meter to the brown and white wires of the proximity switch. The meter should show continuity or voltage changes (on-off) as the divider block cycles. If there is no indication of continuity/voltage, the switch internals have been damaged. **REPLACE THE SWITCH!** To test the new switch after it is installed on the divider block and connected to the control panel, cycle the divider block assembly by SLOWLY pumping clean oil through the system with a purge gun. The volt/ohm meter should display continuity or voltage change, and the LED's should light with each cycle of the divider block. **Note:** ***The brown wire must have constant voltage!*** If the meter displays continuity but the LED's do not light, switch the brown and white wires in the control panel. **Note**: The proximity switch must be connected to power for manual testing. Touch the nose of the switch to a piece of carbon steel, this closes the internal contacts. As you place the steel on the nose of the switch, listen for a clicking sound of the internals and check for continuity on volt/ohm meter.
	(2) Threaded Nose On The Switch Is Bent! **A.** Technician installed conduit and a condulet box on the switch, after the switch was installed on the divider block. The extended length of conduit and condulet box were left hanging on the switch without support. Vibration combined with the added weight of the condulet box hanging on the switch, caused the threaded nose of the switch to bend, causing failure. (see fig 1) **B.** Conduit and electrical box were installed on the switch and left hanging in the air without support. The conduit was pulled or stepped on bending the threaded nose of the switch causing failure. (see fig 1)	Remove the switch from the divider block, lay it on a flat surface and slowly roll it paying attention to the threaded nose. As you roll the switch, (if the nose is bent) it will be obvious. If the nose is bent, the internals have been damaged causing failure. **REPLACE THE SWITCH!** To test the new switch after it is installed on the divider block and connected to the control panel, cycle the divider block assembly by SLOWLY pumping clean oil through the system with a purge gun. The volt/ohm meter should display continuity or voltage change, and the LED's should light with each cycle of the divider block. **Note:** ***The brown wire must have constant voltage!*** If the meter displays continuity but the LED's do not light, switch the brown and white wires connected to the control panel. **Note**: The proximity switch can be manually tested by touching the nose of the switch to a piece of carbon steel, this closes the internal contacts. As you place the steel on the nose of the switch, listen for a clicking sound of the internals and check for continuity on volt/ohm meter.

(fig 1)



Troubleshooting “PATRIOT LED" Proximity Switch Continued:

PROBLEM	POSSIBLE CAUSE	SERVICE PROCEDURE AND/OR CORRECTION
COMPRESSOR HAS SHUT DOWN ON LUBE NO-FLOW **1.** Switch closure indicator on control panel, PLC or lube monitor does not blink. Control panel indicates lube no-flow. LED'S on Patriot switch do not blink. Visual cycle indicator on divider block confirms the divider block assembly and pistons are operating correctly.	**(3) Divider Block Piston Contacted The Nose of The Switch Causing Failure!** **A.** When divider block systems are operating against excessive differential pressures between the lubrication points, the pistons in the divider blocks will bounce back and forth rapidly hitting the end plugs of the block and the nose of the switch. **B.** Service technician connected a purge gun to the divider block to pre-lube and purge the divider block system of air. When the lever on the purge gun is pumped rapidly, a large volume of oil is quickly forced into the divider block causing the pistons to strike the divider block end plugs. ***CAUTION: Rapidly pumping oil into any divider block assembly will cause the pistons to hit the end plugs of the block, damaging the pistons and causing immediate or premature failure of both the divider block and switch.***	With the divider block cycling, connect the leads of volt/ohm meter to the brown and white wires of the proximity switch. The meter should display continuity or voltage changes (on-off) as the divider block cycles. If there is no indication of continuity or voltage, the switch internals have been compromised. **REPLACE THE SWITCH!**. To test the new switch after it is installed on the divider block and connected to voltage in the control panel, cycle the divider block assembly by SLOWLY pumping clean oil through the system with a purge gun. The volt/ohm meter should display continuity or voltage change, and the LED's should light with each cycle of the divider block. **CAUTION:** When purging air from the divider block system with a purge gun, the service technician must always pump oil into the system SLOWLY! ***Rapidly pumping oil into any divider block assembly will cause the pistons to hit the end plugs of the block, damaging the pistons and causing immediate or premature failure of both the divider block and switch.*** **Note**: The proximity switch can be manually tested after it is connected to 24 VDC. Touch the nose of the switch to a piece of carbon steel, this closes the internal contacts. As you place the steel on the nose of the switch, listen for a clicking sound of the internals and check for continuity on volt/ohm meter.
COMPRESSOR CONTINUES TO RANDOMLY SHUT DOWN ON LUBE NO-FLOW, WITH NO OBVIOUS CAUSE **2.** The Compressor Continues to Experience Erratic or Phantom Lube No-Flow Shutdowns. Switch closure indicator on control panel, PLC or lube monitor is blinking indicating normal operation of the system. Visual cycle indicator confirms the divider block system is operating correctly.	**A. Faulty Wiring From Switch to Control Panel** Wiring in conduit is breaking contact or grounding to conduit. **B. Control Panel** Control panel has issues with firmware/hardware. **C. Air in The Oil Supply Caused by Oil Level in The Crankcase** **(1)** Oil level in crankcase is too high. **(2)** Oil level in crankcase is too low. Both scenarioes,1 & 2 will introduce air into the system causing erratic movement of the pointer on the pressure gauge, compressor shutdown or blown rupture discs. **D. Gas in The Divider Block System** Gas has migrated into the divider block system due to leaking check valves. **Note:** Gas in the divider block system will cause erratic movement of the point on the pressure gauge, compressor shutdown or blown rupture discs.	**A.** Connect brown and white wires from switch to a volt/ohm meter with control panel powered. The meter should display continuity or voltage (on-off) as the divider block cycles. If the meter displays voltage or continuity, the switch is good. **B.** Test control panel for correct functionality per manufacturers instructions. **C. Proper Crankcase Oil Level is Critical!** **(1) The Oil Level In Sight Glass Is Too High:** The oil level in sight glass should be slightly over the halfway mark with the compressor running. When the crankcase is over filled, the rotating crankshaft can contact the oil causing it to foam. The oil pump forces the frothy oil with air into the system. **(2) The Oil Level In The Sight Glass Is Too Low:** If the oil level in the compressor crankcase is too low, the oil pump can create a vortex in the oil and pull air into the pump. The oil pump forces the oil with air bubbles into the divider block system causing the lube pump and divider block pistons to air lock. **Note: Where should the oil level be in the sight glass?** **(1)** The oil level on the compressor crankcase should always be approx. 3/4 full in the sight glass when compressor is running. **(2)** The oil level should be at the top of the sight glass when the compressor is shutdown. **D.** Use a heat gun to check the temperatures of all check valves. Check valves with extreme elevated temperatures are leaking gas into the system. **Note:** You can identify a leaking check valve by touch, a leaking check valve is much hotter to the touch.

	POSSIBLE CAUSE & CORRECTION
LED'S DO NOT LIGHT	**The Patriot Switch is Polarity Sensitive** ***The brown wire must have constant voltage!*** If the volt/ohm meter displays continuity but the LED's do not light, switch the brown and white wires connected to the control panel.

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