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XP3
USER'S MANUAL

COMPACT
HIGH AND LOW PRESSURE ALARM & SHUTDOWN SYSTEM

GENERAL

The XP3 alarm and shutdown system is a self supported, compact shutdown device that has been designed to provide a safe and reliable means to monitor pressure on a production process and initiate a shutdown if the reading exceeds the pre-set limits of operation.

The system has been built to withstand the adverse conditions of the oil-field environment and provide a straightforward interface with the operator. Abnormal conditions are indicated by indicator lamps (LEDs), each associated with a label indicating the condition detected.

Powered by lithium batteries, the system is expected to operate for about five years without replacing batteries and besides normal periodical functionality test, there is little or no maintenance required.

INSTALLATION

The XP3 is shipped with the battery module installed in the "storage position" for shipment. Remove the four nylon standoffs holding the battery module, rotate the module 180º and carefully re-install as shown on page 6 of this manual. The XP3 will now be energized and the green LED will blink once every second.

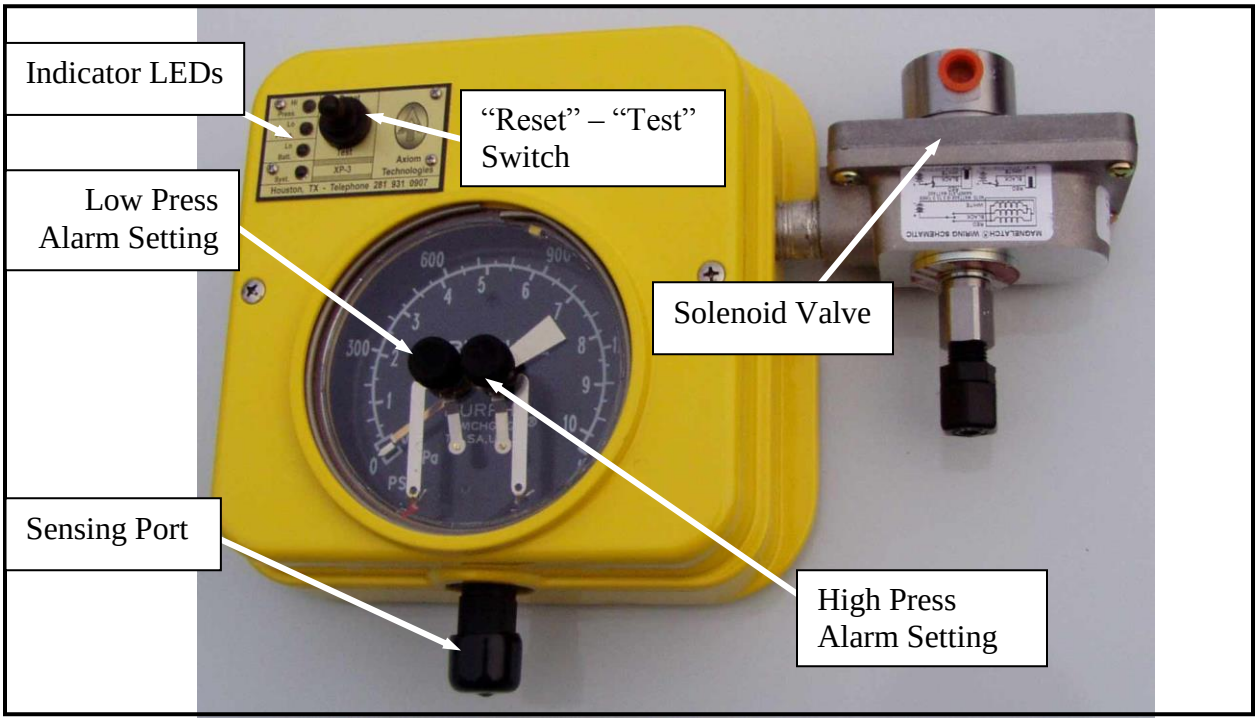

Fig. 1 XP3 General Layout

The unit can be wall mounted or mounted directly on the process line. The box is provided with a small drain hole at the bottom to drain condensation. Do not mount the XP3 sideways or upside down as this may allow rainwater to ingress and accumulate in the enclosure.

Pressure Sensing
Connect monitored pressure to Sensing Port. Sensed pressure is not to exceed 10% of full scale as this would cause damage to the instrument and void warranty. If the flow is prone to pressure spikes, a pulsation dampener is to be installed between the sensing port and sensed fluid. It is recommended that an isolation valve be installed between the sensing port and process to allow for maintenance and testing.

NOTE: XP3 DEVICE IS TO BE MOUNTED UPRIGHT IN VERTICAL POSITION ONLY.

NOTES:

Do not exceed rated range. When connecting pressure bourdon assembly (bottom of XP3), use pipe dope or teflon tape on connection threads. Use wrench on shank to tighten or loosen bourdon connection. Do not twist case when installing, this will damage internal components and void warranty. Do not over-tighten.

Connecting the Solenoid Valve
The typical connection the solenoid valve is as follows

Port 1 (normally closed)	Supply Pneumatic Pressure (100 PSI Typ.)
Port 2 (common)	Actuator
Port 3 (normally open)	Exhaust

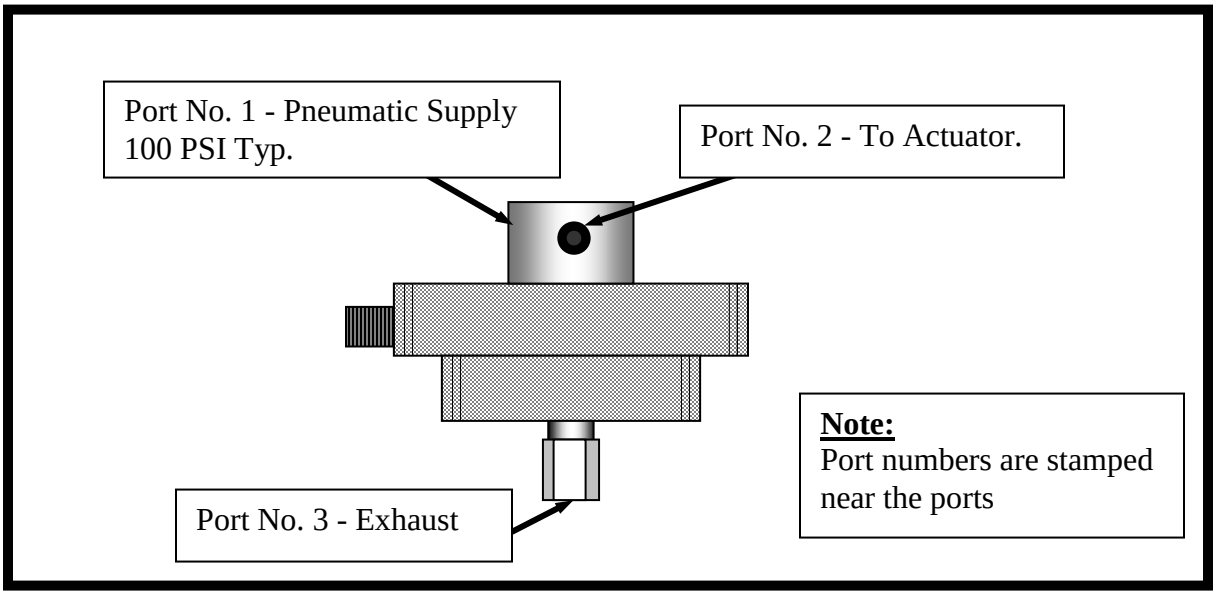

Fig. 2 Solenoid pneumatic/hydraulic typical connection

Adjusting High and Low Pressure Limits
Facing the dial, the left knob adjusts the "Low Limit" while the "High Limit" contact is adjusted with the knob on the right. To set the limit contacts, turn the knob to the desired position in the scale.

OPERATION
The system can be commanded to "Reset" or "Test" by pressing the toggle switch up or down respectively. By pushing to "Reset" the operator commands the unit to return to the flowing condition while the "Test" function allows the operator to see the last recorded cause of shutdown (corresponding LED blinks rapidly).

The system is shipped in the "RESET" condition. The needle of the gauge touching either the "Low" or "High" set point causes the XP3 to switch the solenoid valve into "shutdown". The corresponding alarm LED will blink once a second to indicate the actual cause of the shutdown even if the alarm goes away or another alarm is later detected.

EXAMPLE. If an XP3 senses a "High Pressure" in a production line it will cause a shutdown and the "High Pressure" LED will blink. After a number of hours, because of the shutdown, the sensed pressure may fall to the point where the high pressure clears and the needle of the gauge is now touching the low pressure alarm. In this case the XP3 will continue to flash the "High Pressure" alarm LED until the operator presses "Reset". If the operator wants to confirm the cause of alarm, even after the system is back to normal, he just need to press "Test" and the XP3 will blink the "High Pressure" LED to show the last recorded cause of shutdown.

After the XP3 is installed, the operator is to set the high and low alarm settings and open the isolation valve to allow pressure into the sensing port.

If the gauge is on alarm at the time the operator presses "Reset" the existing alarm will be ignored for 30 minutes to allow the process to return to normal; there is no need to disturb the set-point before restoring the process. It is recommended not to move the set points out of the alarm condition as this involves the risk of the operator forgetting to return the alarms to the proper setting once the process returns to normal. If more than 30 minutes is needed then it is suggested that the operator presses "Reset" again before the time expires for re-starting the 30 minutes counting.

If the pressure returns to normal before 30 the minutes expires, the XP3 will re-arm itself and will initiate shutdown again if an alarm is sensed.

MAINTENANCE

The XP3 requires little maintenance but a minimum of a monthly visual examination and testing is recommended to insure that the unit as well as the systems associated with the safety shutdown is operating properly.

It is recommended that once a year the gauge pointer and High and Low limit points be cleaned with a non residue contact cleaner to insure optimum performance.

Inspecting the XP3

The XP3 is to be examined periodically and operation can be confirmed by verifying the "Syst." LED blinks every second.

The XP3 is also to be inspected to confirm that the face of the gauge is clean and the pressure indication is clearly visible. If evidence of contamination is seen on the needle of the gauge or set points, cleaning is needed to insure that contact will be made if an alarm condition is reached.

To clean the contact points or needle use a soft cloth and contact cleaner fluid. Do not use abrasives materials or fluids as they will cause damage and reduce system's reliability.

Note

Avoid opening the enclosure in a rainy or dusty environment.

The expected service life of the batteries is approximately 5 years. The XP3 routinely reads battery voltages and provides a warning if they require replacement. When the batteries are nearing end-of-life, the XP3 will blink the "Lo Batt" LED to indicate that battery replacement is needed. If the batteries are not replaced within a few days, the XP3 will initiate a "Lo Batt." shutdown, as further reduction in voltage could prevent the system from protecting the process.

WARNING - EXPLOSION HAZARD

BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS. REPLACE BATTERY MODULE WITH AXIOM TECHNOLOGIES PART NUMBER AT00000001.

WARNING

DO NOT ATTEMPT TO RECHARGE BATTERY MODULE AS THIS MAY TRIGGER AN UNSTABLE CONDITION WITHIN THE LITHIUM CELLS AND CAUSE AN EXPLOSION

Return used battery modules to Axiom Technologies for safe disposal.

REPLACING THE BATTERY MODULE

Fig. 3 Remove the screws from cover.

Fig. 4 Open the front cover.

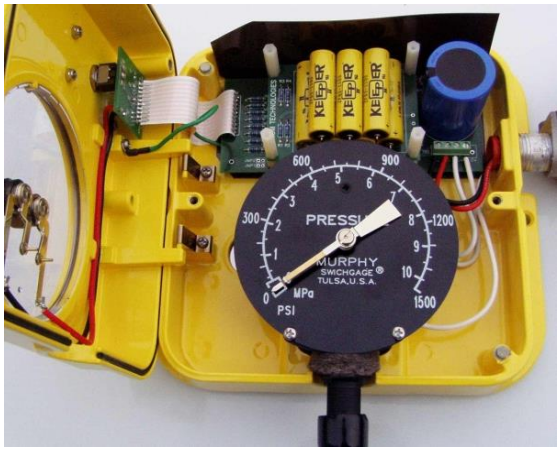

Fig. 5 The Battery module is on top of the box.

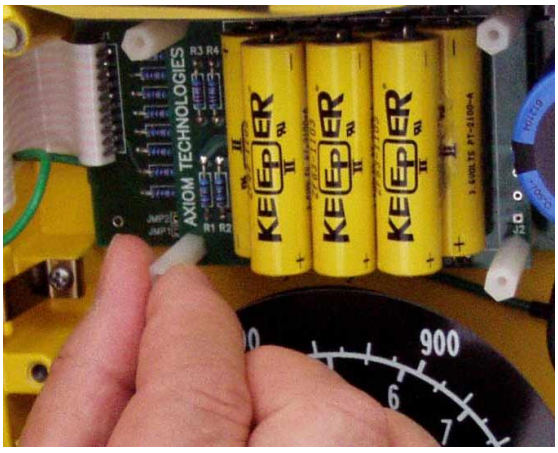

Fig. 6 Unscrew the four (4) nylon spacers holding the battery module.

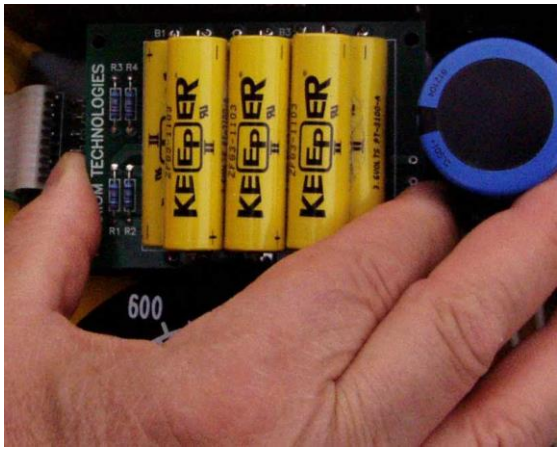

Fig. 7 Pull the old module out and return for safe disposal.

Fig. 8 Align the new battery module with the threaded studs and gently push it in place.

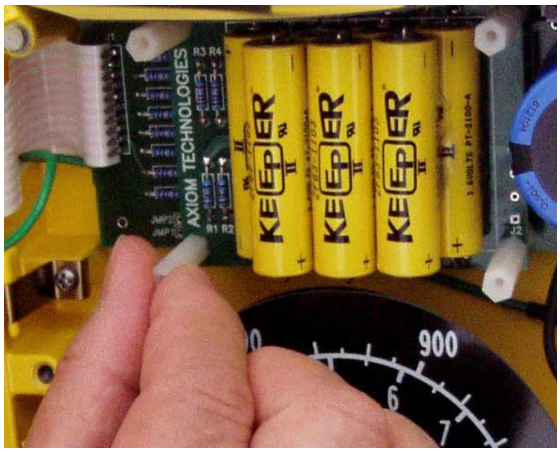

Fig. 9 Re-install nylon spacers to hold the battery module in place. Tighten by hand only.

Fig. 10 Close and secure with front screws to insure proper sealing and protection from environment.

XP3 - ENVIRONMENTAL SPECIFICATIONS

Temperature range	:	-40 to +85ºC
Humidity range	:	0 To 95% max., non-condensing
Altitude	:	2,000 m. max.
Hazardous Area Classification	:	Suitable for Class I, Division 2, Groups C & D, Hazardous Locations. Temp. Code T3C

XP3 - PRESSURE RATINGS

Sensing Pressure	:	Ranges of up to 20,000 psi max
Solenoid Valve Pressure	:	100 psi max. (standard), up to150 psi available

XP3 - ELECTRICAL RATINGS

Electrical Source	:	Dual voltage lithium battery module - 3.6 & 14.4 VDC
Current consumption	:	285 mA max. on 3.6VDC Circuits 435 mA (3 A max. pulse) on 14.4VDC Circuits