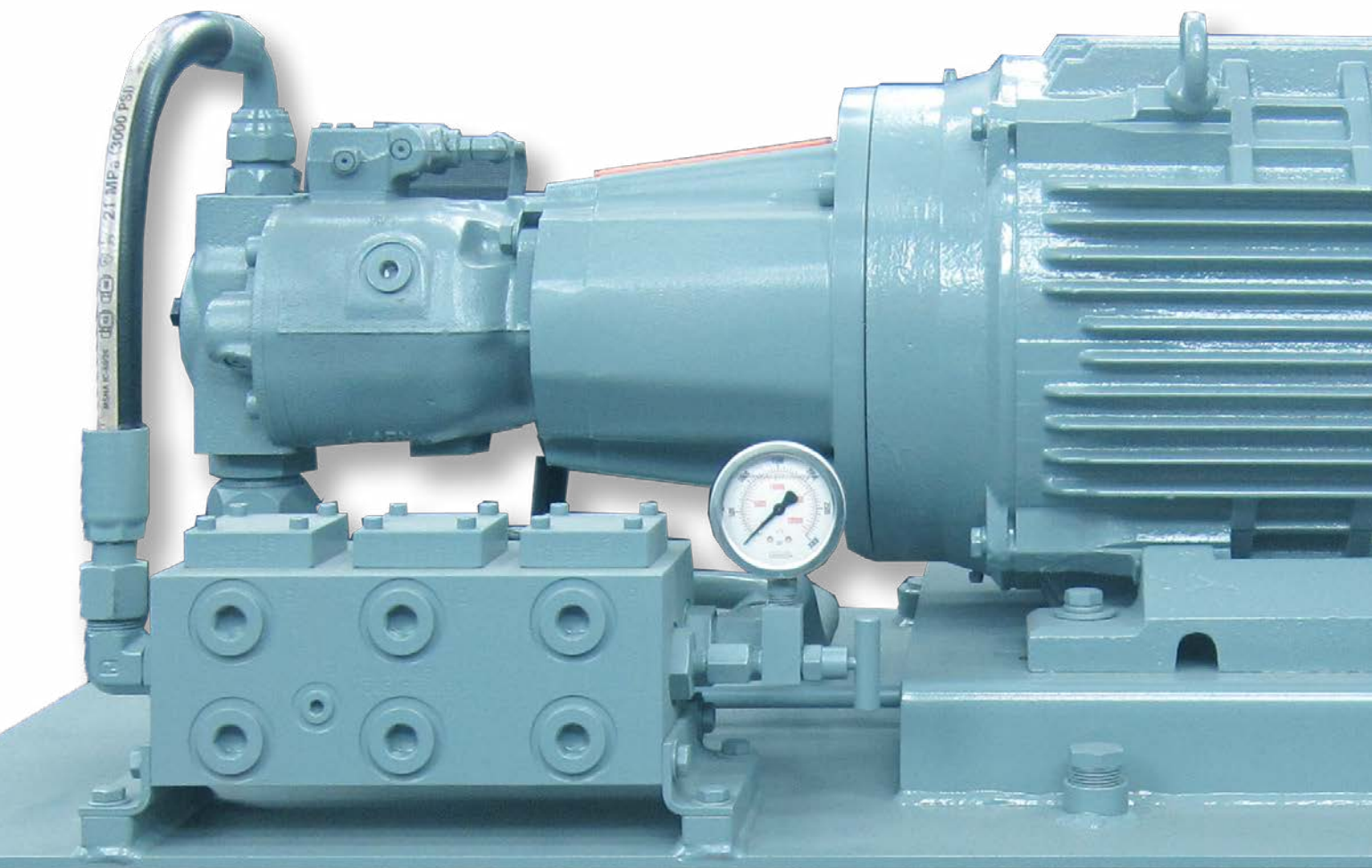# ADDING SCADA TO YOUR HYDRAULIC POWER UNIT

ADDING SCADA TO YOUR HYDRAULIC POWER UNIT

With an increased focus on plant productivity and equipment reliability, SCADA systems are more often seen as effective tools to reduce downtime while increasing asset reliability in hydraulic systems. SCADA (supervisory control and data acquisition) refers to a computer system that essentially gathers and analyzes real-time data. These systems affect not only you but also your customers.

SCADA systems let you monitor critical sensors and data points, providing information on your plant's network or localized HMI. Having dates and information about a hydraulic system provides key values that help you maintain and protect your assets and improve productivity and reliability.

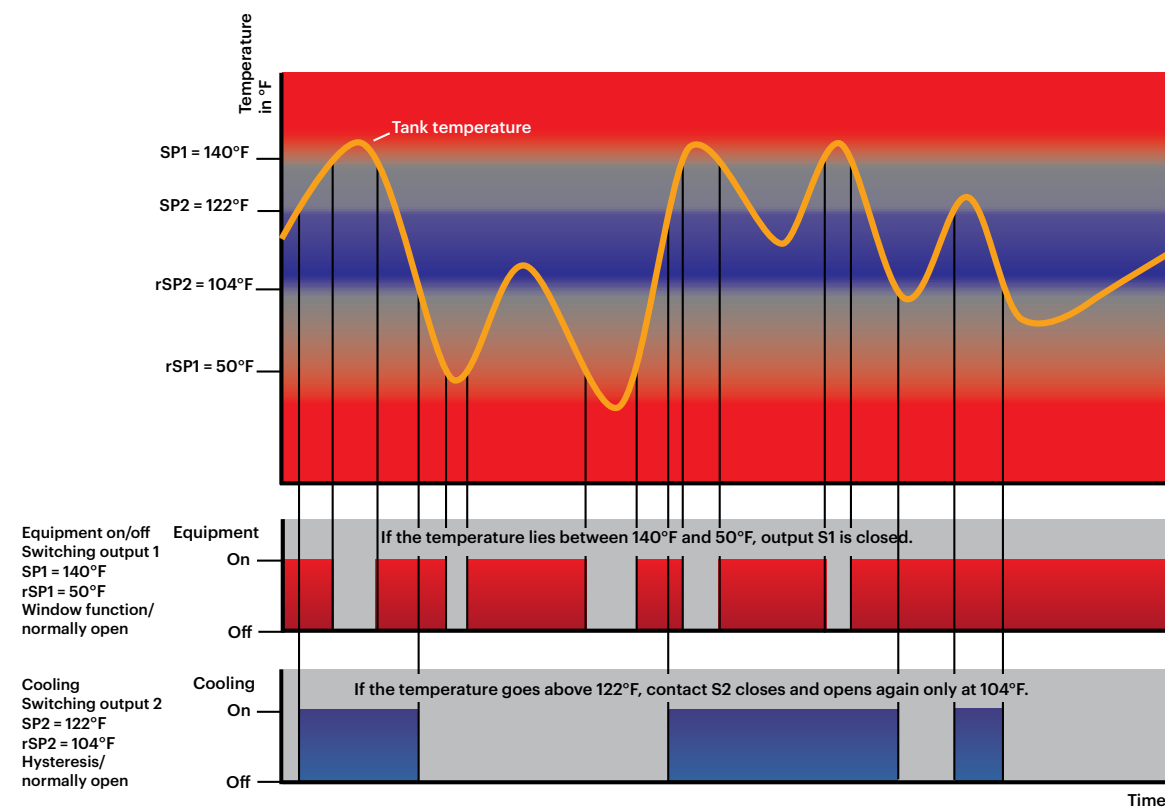You can monitor the following elements of your hydraulic power unit with a SCADA system:

- Reservoir temperature

- Fluid contamination/particle counter

- Pressure sensors

- Level sensors

RESERVOIR TEMPERATURE

Maintaining a stable temperature within your hydraulic power unit will prolong its life and improve hydraulic oil health. Over-temperature and under-temperature alarms can be monitored and recorded to provide information about temperature-related failures. Cold temperatures can cause cavitation or efficiency losses, and high temperatures can also affect system performance.

How hot is too hot? Hydraulic fluid temperatures above 180°F (82°C) damage most seal compounds and accelerate oil degradation. While you should avoid hydraulic system operations above 180°F in general, fluid temperature is too high when viscosity falls below the optimum value for the hydraulic system's components, which can occur well below this temperature depending on the fluid's viscosity grade.

Temperature in °F

SP1 = 140°F
SP2 = 122°F
rSP2 = 104°F
rSP1 = 50°F

Tank temperature

Equipment on/off
Switching output 1
SP1 = 140°F
rSP1 = 50°F
Window function/
normally open

Equipment
On

Off

If the temperature lies between 140°F and 50°F, output S1 is closed.

Cooling
Switching output 2
SP2 = 122°F
rSP2 = 104°F
Hysteresis/
normally open

Cooling
On

Off

If the temperature goes above 122°F, contact S2 closes and opens again only at 104°F.

Time

FLUID CONTAMINATION/ PARTICLE COUNTER

Most machine and component manufacturers specify a target ISO cleanliness level for equipment to achieve optimal performance. A SCADA system can track and record ISO codes to provide predictive and proactive equipment failure information related to contamination. Contamination types include:

- New oil: new fluid is not necessarily clean.

- Generated contamination: abrasive wear, cavitation wear, fatigue wear, erosive wear and corrosive wear.

- External contamination: reservoir breathers, cylinder rod glands and hydraulic hose.

Fluid Cleanliness Required for Typical Hydraulic Components

Components	ISO Code
Servo control valves	17/14/11
Proportional valves	18/15/12
Vane and piston pumps/motors	19/16/13
Directional & pressure control valves	19/16/13
Gear pumps/motors	20/17/14
Flow control valves, cylinders	21/18/15
New unused fluid	21/18/15

Above, you'll see fluid cleanliness requirements for typical hydraulic components, along with a particle counter that communicates the 4u/6u/14u channels to the SCADA system. By collecting real-time ISO codes, you can pinpoint specific system issues or internal maintenance processes that can be improved.

PRESSURE SENSORS

Pressure sensors can be either pressure transducers or pressure switches. Most filters use a Delta-P pressure switch, which indicates when to change a filter. A SCADA system can provide a date stamp for when the filter bypass switch has been indicated, and a local user can be notified via local display or network escalation. Monitoring the time it takes to change a filter can also provide management and stakeholders with valuable information on maintenance reliability.

Pressure transducers provide analog output to your SCADA system to maintain system performance within a predetermined range. They can also be used for:

- Main system pump pressure: pressure spikes and low pressure indicate that system calibration is required.

- Accumulator precharge pressure: precharge loss can drastically upset system function, causing equipment failure, loss of production and poor manufacturing quality.

LEVEL SENSORS

Level sensors provide critical information related to system reliability. The minimum level sensor would be a low-level switch tied to the SCADA system and pump-motor control. This process protects the pump from cavitating and degrading the system in the future. Multiple level switches can also provide you with information related to premature failure.

Level transducers provide additional protection for hydraulic system performance while providing information about your oil loss. Oil leaks raise environmental concerns such as emergency cleanup and hazardous waste. By capturing and recording proper oil levels, you can protect yourself from unplanned downtime and environmental issues.

OTHER AREAS FOR SCADA HYDRAULIC PERFORMANCE

SCADA systems can also be used in several other applications related to your hydraulic power unit. They include:

- Case drains for hydraulic pumps

- Horsepower consumption for prime movers

- Moisture sensors for hydraulic oil, indicating heat exchanger failure

- Suction ball valve switches for pumps

- ITM (interactive technical manual) upgrades

To learn more, contact your local Mi Fluid Power Solutions branch to speak with a hydraulic specialist today.
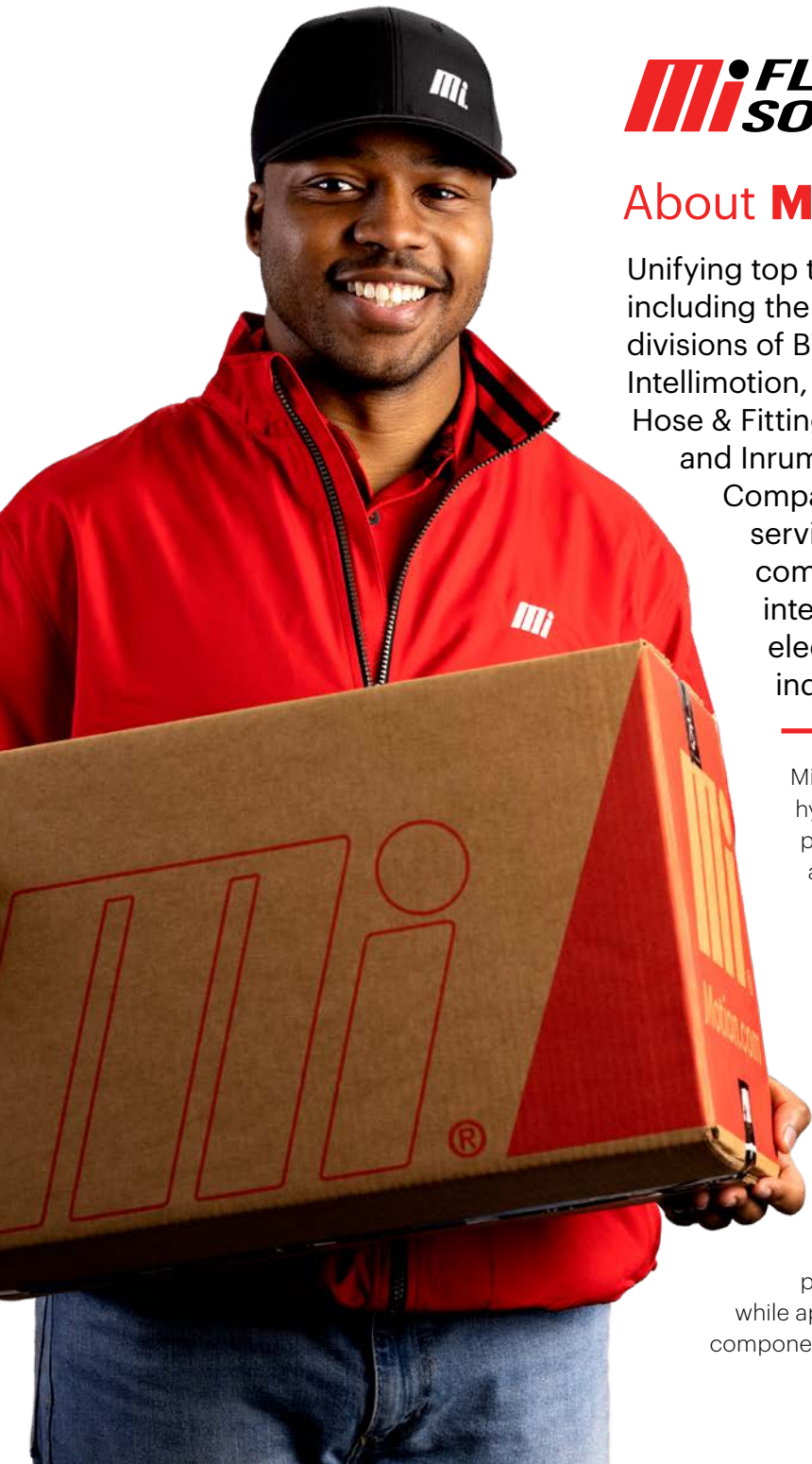
Mi FLUID POWER SOLUTIONS

About **Mi Fluid Power Solutions**

Unifying top tier fluid power business units—including the former Kaman Fluid Power divisions of BW Rogers, Catching FluidPower, Intellimotion, Calkins Fluid Power, Northwest Hose & Fittings, Western Fluid Components, and Inrumec along with Hydraulic Supply Company and Motion's OE Mobile service capabilities—Mi FPS is a complete provider of fluid power, integrated electronic controls and electromechanical technologies for industrial and mobile equipment.

Mi Fluid Power Solutions' main focuses are hydraulics, pneumatics, lubrication, filtration, process pumps, precision industrial tooling and factory automation products. New and serviced components range widely from hydraulic pumps and motors to valves and cylinders of virtually any size. The new brand comprises North America's largest network of over 65 on-demand retail fluid power hydraulic and industrial hose assembly stores and support facilities, including repair, build and engineering capabilities. Mi FPS serves the automotive, aerospace, metals, logistics, mobile offroad equipment, mining, medical, pharmaceutical and many other industries, while applying the highest-quality fluid power components and engineered systems.