NOVALINK-CSM 2

PUMP DIAGNOSIS

Bran+Luebbe®

Part of SPX Corporation (NYSE: SPW), the Flow Technology segment designs, manufactures, installs and services highly engineered solutions used to process, blend, meter and transport fluids, in addition to air and gas filtration and dehydration. The segment supports the food and beverage, dairy, pharmaceutical, oil and gas, energy, and industrial markets worldwide.

Based in Charlotte, North Carolina, SPX Corporation (NYSE: SPW) is a global Fortune 500 multi-industry manufacturing leader with over $5 billion in annual revenue, operations in more than 35 countries and over 14,000 employees. The company's highly-specialized, engineered products and technologies are concentrated in Flow Technology and energy infrastructure. Many of SPX's innovative solutions are playing a role in helping to meet rising global demand for electricity and processed foods and beverages, particularly in emerging markets. The company's products include food processing systems for the food and beverage industry, power transformers for utility companies, and cooling systems for power plants. For more information, please visit www.spx.com.

For more than 75 years, Bran+Luebbe - now SPX Flow Technology – has been providing customers with high quality metering, processing and analysing equipment.

As part of the global SPX Corporation, we are one of the world's most reputable manufacturers of metering and process pumps, process systems as well as analyzing technologies. Our engineers have comprehensive process and applications knowledge across a wide range of markets. This has resulted in product innovations and developments which harness the latest technology whilst meeting the highest quality standards.

NOVALINK-CSM 2 (**C**ontiniuous **S**tatus **M**onitoring)

- For permanent or temporary fault analysis on oscillating displacement pumps
- Monitoring with the aid of pV diagrams (volumetric flow, diaphragm position control, service valves etc.)
- Monitoring of any other signals (diaphragm break, oil level / oil temperatures etc.)

Reap the benefits

IMPROVED PUMP AVAILABILITY

- Avoid unplanned stop times
- Long-term evaluation and wear assessment
- Early detection of symptoms long before a fault occurs
- Continuous pump monitoring in the active process (24/7)

LOWER OPERATING COSTS

- Precise fault location before starting repair
- Less repair time, lower costs

MAKE MAINTENANCE PLANNABLE

- Scope of maintenance work and time taken becomes plannable
- Lower follow-up costs

OPTIMISATION OF PRODUCTION PROCESSES

- Adaptation to any oscillating displacement pump possible
- Adaptation without fingerprint by means of automatic simulation calculation
- Safe production monitoring
- Evaluation of pump in the installed system
- Observation of pump peripherals (supply, process)
- Retrofitting possible
- Remote monitoring via network (Ethernet; UMTS/DSL)

NOVALINK Setup

Oscillating displacement pump

Optional (e.g. via VPN): SPX: Service expert

Monitoring on any PC/notebook

network

NOVALINK-Computer

Customer switch room

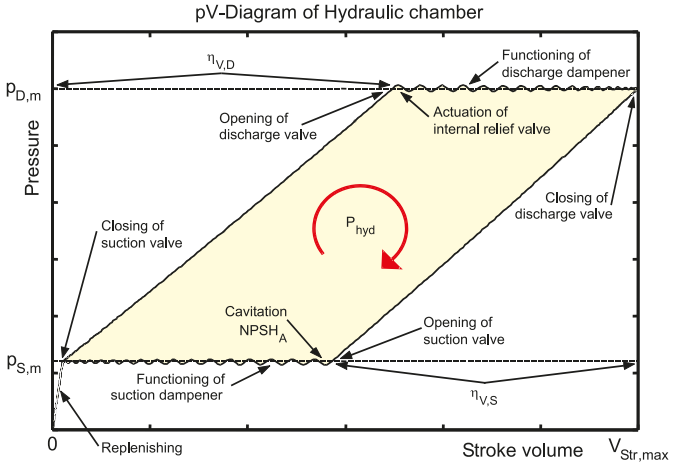
SETUP (FIG. 1)

The **NOVALINK-CSM 2** system consists of a pressure transmitter per pump head, which measures the pressure in the respective hydraulic compartment of the pump head, a rotation angle recording facility on the drive unit, the **NOVALINK-CSM 2** computer and a monitoring PC on which the evaluation software runs.

Signals from any other sensors at the pump (filling level sensor, temperature sensor etc.) can be connected.

The pump status can also be determined via a higher-order controller (e.g. a switch room).

THEORETICAL PV DIAGRAM (FIG. 2)



NOVALINK-CSM 2

PUMP DIAGNOSTIC SYSTEM

METHOD OF OPERATION

The **NOVALINK-CSM 2** system measures the pV diagrams of the pump heads for each rotation of the pump crankshaft (Fig. 2) in real time, and uses them to immediately calculate characteristic values such as the current efficiency levels, the average pressures and flow rates etc. At the same time, these values (i.e. appropriate for the current operating point of the pump) are used to simulate idealised pV diagrams and associated characteristic values, which act as reference standards for the measured diagrams and characteristic values. The signals from other external sensors can be connected.

The **NOVALINK-CSM 2** system then checks whether the measured data lies within predefined limits. Depending on this, the status ("good", "satisfactory" or "poor") of the pump is determined and signalled as a traffic light ("yellow", "amber" or "red").

SOFTWARE ON THE MONITORING PC

The information that is determined using the **NOVALINK-CSM 2** computer is transmitted by Ethernet, for example, or by radio to the monitoring PC. The following is then displayed by the evaluation software installed on the PC:

- Status display in traffic light form (Fig. 3).
- Comparison of all pV diagrams (Fig. 4).
- Simultaneous diagnosis
- History function (Fig. 5) (Comparison of old / current values and diagrams)
- Characteristic values of a pump head (Fig. 6)
- Automatic archiving of pV diagrams etc.
- Status display and limit monitoring of signals from external sensors (Fig. 7)

Fig. 3: Pump status or status of each individual pump head "Traffic Light"

Fig. 4: pV diagrams for all pump heads

Fig. 5: Display of history function

Fig. 6: pV diagram and characteristic values for a pump head

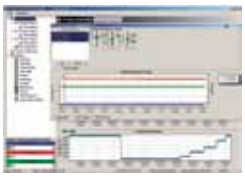


Fig. 7: Sensor signal monitoring

SPX FLOW TECHNOLOGY NORDERSTEDT GMBH

Werkstraße 4

D-22844 Norderstedt

Phone: +49 (0) 40 - 522 02 -0

Fax: +49 (0) 40 - 522 02 -444

E-Mail: branluebbe@spx.com

BL-185-GB Version: 01/2014 Issued: 01/2014