LEWA
Creating Fluid Solutions

LEWA Smart Monitoring

Condition Monitoring, Asset Management and Remote Support for your LEWA Pumps.

Product Information

1. What is a LEWA Smart Monitoring System?

LEWA Smart Monitoring (LSM) is a condition monitoring system for your LEWA pump. With the system you always keep an eye on the current status of your pumps in operation.
Maintenance can be carried out in a targeted manner. With wear prediction unplanned shutdowns can be avoided. In this way, you can increase the availability of your system and thus reduce the entire life cycle costs. Our intelligent LEWA Smart Monitoring system is equipped with the latest Industry 4.0 technology and can be easily integrated into your production.

LEWA Smart Monitoring consist of sensors and a contol cabinet (for safe zone or the Ex-zone) with the integrated LSM software as well as a selection of possible interfaces for data transfer.

For more information watch our video:

2. LEWA Smart Monitoring Operating Principle

The system determines characteristic values and important performance indicators. This is based on the recording of the measured variables vibration, hydraulic pressure and angle of rotation. To get results, 2000 signals per pump head per second are processed and finally output by the unique LSM software. The results are characteristic values as well as diagnostic and performance parameters of the pump. This enables the condition monitoring of the pump and the connected pipe system at any time.
The output and transmission is carried out via various interfaces: A web-based interface where settings can be made and the determined characteristic values and diagnostics are visualized. An OPC UA server is provided for transmission to a control center.

3. Diagnostics overview

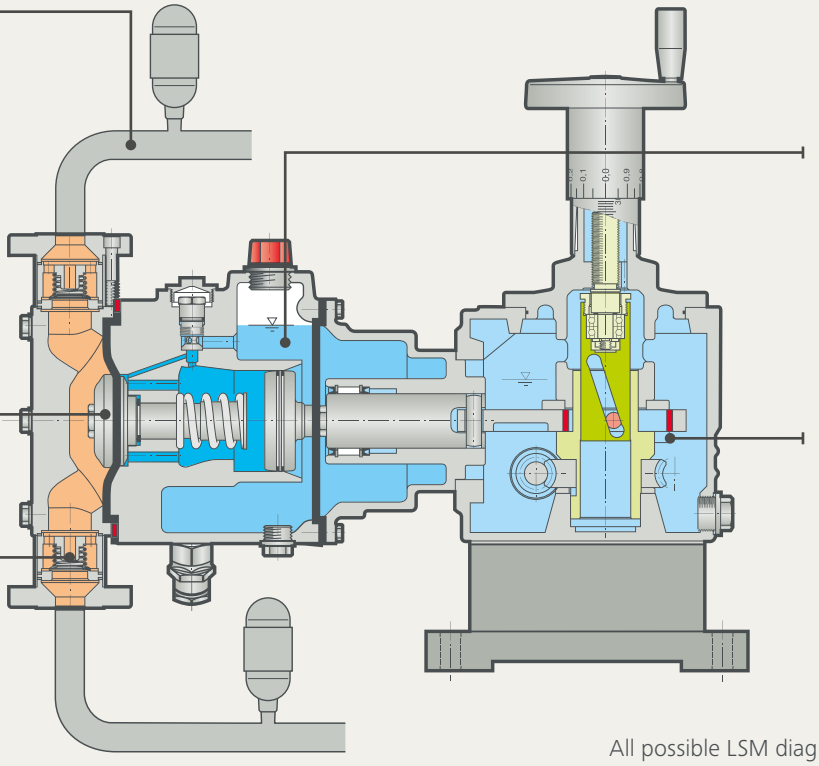
With LEWA Smart Monitoring you have access to various diagnostic and performance parameters for your pump and the connected pipe system. This enables you to detect undesirable conditions in the process and the condition of the wear parts at an early stage using a simple traffic light system.

Diagnostics overview

8 system diagnostics:
- Pulsation discharge side too high
- System pressure too high
- System pressure too low
- Pulsation suction side too high
- Discharge side closed
- Suction pressure too low
- Suction side closed
- Flow rate too low

6 pump head diagnostics:
- Maintenance necessary
- Pump head efficiency too low
- Temperature too high
- Diaphragm rupture
- Gas in fluid
- Volumetric efficiency too low

8 valve diagnostics:
- Discharge valve does not open
- Discharge valve does not close
- Discharge valve closes too late
- Leakage pressure valve
- Suction valve does not open
- Suction valve does not close
- Leakage suction valve
- Suction valve closes too late



4 hydraulics diagnostics:
- Snifting phase missing
- Snifting valve closes too early
- Snifting valve closes too late
- Hydraulic leakage

4 drive diagnostics:
- Drive unit efficiency too low
- Overall efficiency too low
- Maintenance necessary
- CO_2 balance

All possible LSM diagnostics are shown in the picture. Additional sensors may be required (temperature, diaphragm rupture and motor power).

4. Advantages of LEWA Smart Monitoring System

– Permanent monitoring of key performance indicators such as motor speed, stroke duration, pressure phase, pulsation behavior, hydraulic function and fluid compressibility

– Output of error states in plain text with exact error localizatio

– Condition monitoring of the connected piping system as well as the conveying fluid, also calculation of the flow rate

– Predictive maintenance and clear diagnosis increase the availability of the pump and system

– Historical data for operating analysis and profitability calculation based on pump efficiency

– Data connection to the local control center via standard OPC UA interface

– Connection to LEWA customer portal for additional services such as digital asset management, digital documentation and life cycle file

– Data integrity and data security

5. Digital Services Offerings

Operational Analyses and Reports – We analyze the operating data of LEWA Smart Monitoring at highest level. You receive significant reports from us on the performance of your pump in the period under assessment. We also make specific recommendations for optimizing operation and maintenance. In addition to evaluating characteristic values, we create load spectra and phase statistics to evaluate the efficiency of your pump. We not only find out whether your pump is running safely and stably, but also whether its optimum operating point is being reached. In the first year of operation, the system analysis and reports are free of charge!

Remote Service – The LEWA service center supports you with fault diagnosis and data analysis. Together with you, our service engineers check the operating data of the LEWA Smart Monitoring system via remote connection. In this way, error conditions are quickly identified and remedial measures initiated.

Excellent service – you choose the right offer

Rate	Prepaid	Flatrate
Scenario	LEWA supports on request	LEWA offers a complete proactive monitoring of the LSMs/pump
Service	As on request, e.g – Parameterization and fingerprinting – Fine adjustments system – Support Software – Remote support – Consulting by phones/e-mail – Short reports	Proactive service e.g. info on pump status (errors and diagnoses) Included services: – All services on “prepaid” rate – Software maintenance (licence fee) – Two operational analyses and reports per year – Monthly review and feedback
Requirements	Transmission of data or access to LEWA Smart Interface	Online LSM and contact person
Pricing model	Hourly-based service contingent offered	Monthly flatrate with a duration of 1 year

Software maintenance – The software license includes security updates as well as new functions, free of charge in the first year, therafter yearly license fees.

6. Scope of Supply and Technical Information (1/2)

Sensors for Ex-Area

Pressure transmitter type WIKA IS-3 (1 x per pump head)
– Resolution16bit, measuring frequency 1 kHz, output 4-20mA
– Range (depending on max. pressure)
– Ex ia IIC T5; IP 65
– Temperature range: -20 to +80 degrees Celsius
– Diaphragm, casing, circular plug-in connector: stainless steel

Vibration sensor Typ CTC M/AC915 (or AC913)-1A EX (1 x per pump head)
– Measurement range16g, output signal IEPE signal
– Temperature range -40 to +121 degree Celsius
– Ex ia IIC T3/T4 (T4 only up to temperatures of +80 degrees Celsius)
– Casing stainless steel 316L

Trigger sensor type Pepperl & Fuchs NJ (1 x per pump)
– Ex ia IIC T5; IP 65

Variant 1

Control cabinet for safe area

– Type: Rittal AX control cabinet, IP 65
– Dimension: 600 x 600 x 250 mm (height x width x depth)
– Material: sheet steel, coated RAL 7035

Terminal box for mounting on/nearby the pump in hazardous areas

– Ex i terminal box R. Stahl; for Ex i-signals of the instruments
– Material GRP (glass fiber reinforced plastics); cable glands plastic
– Approved for Ex zone 1 IIC T4; IP 65
– For ambient temperature -40 to +60 degree Celsius
– Dimensions 170 x 341 x 150 mm (height x width x depth)

Variant 2

Control cabinet for mounting on/nearby the pump in hazardous areas (Ex-Area, zone1)

– Type: Ex d cabinet; IP 65; Manufacturer: R. Stahl
– Dimensions: 480 x 480 x 330 mm (height x width x depth)
– Material: aluminum alloy AlSi7Mg0.3, unpainted; IP 65; Ex dB IIB+H2 T4
– Version 2A. without heating, for ambient temperature +5 … + 40 °C

No terminal box is necessary

6. Scope of Supply and Technical Information (2/2)

Variant 1

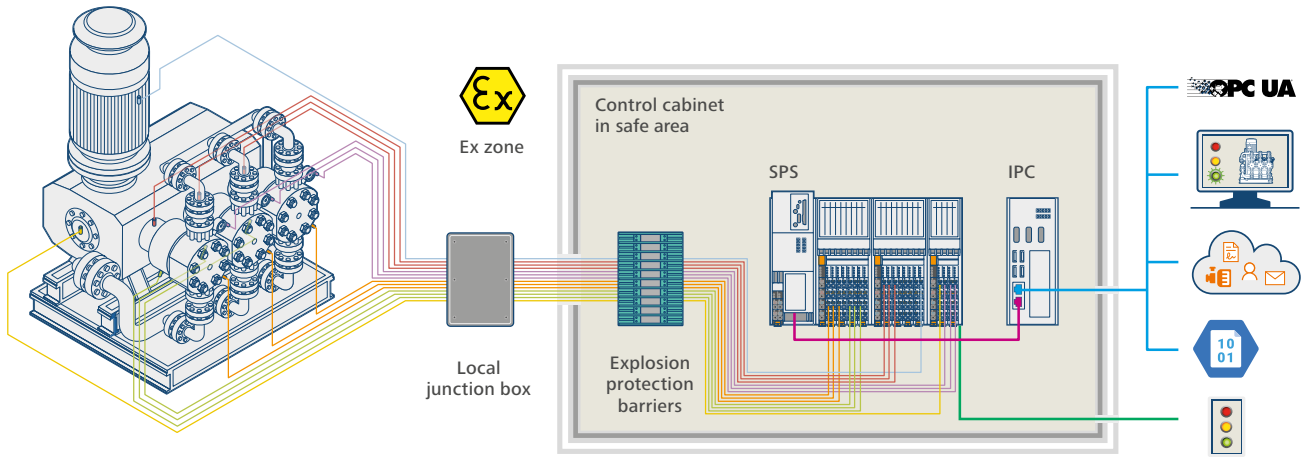
Wiring

– Wiring of instruments to junction box in LEWA scope of supply
– Cable length: 3m, cable type: Lapp Ölflex EB blue (for Ex i sensors), special cable for vibration sensors (CTC shielded blue)
– Wiring of junction box to control cabinet by client

Variant 2

Wiring

– Wiring of instruments to control cabinet on skid in LEWA scope of supply
– Cable trays in stainless steel cable type: Lapp Ölflex EB blue (for Ex i sensors), special cable for vibration sensors (CTC shielded blue)



LSM system setup – exemplary representation

LSM hardware (integrated in control cabinet)

– PLC: PS Control Phoenix Contact AXC (PLCNEXT: AXL F DI8/1 DO8/1; AXL F CNT2 INC2 1 and AXL F AI8 1F)
– IPC: Industry PC Typ UNO 1372G
– Transmitter barrier type Pepperl & Fuchs
– IEPE sensor supply unit type Roga Instruments
– Power supply: 24VDC; 4A

Software package with license certificate (yearly fees occure)

– Data acquisition and data reduction
– Determination of significant parameters
– Diagnostics
– OPC UA communication and integrated user interface
– Safety and functional updates

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