WIRELESS MONITORING OF GAS SPRINGS IN THE TOOL
WIRELESS PRESSURE MONITORING
**WIRELESS PRESSURE MONITORING (WPM)**

**WIRELESS MONITORING OF GAS SPRINGS VIA BLUETOOTH LE 4.0**

The core requirements on any pressing plant are: automation and zero-defect production. The FIBRO Wireless Pressure Monitoring System (WPM) monitors gas springs in all areas in which cable or hose-reliant systems reach their technical limitations, or are simply uneconomical.

The WPM system monitors temperature and pressure in gas springs. It consists of a data part and a sensor, which transmit wireless data to any designated Windows-based system. Custom software analyses the data and initialises the necessary process control and pre-emptive maintenance steps accordingly.

**ADVANTAGES**

- Around-the-clock monitoring and documentation
- Early warning signalling prevents the production of unacceptable parts.
- Pre-emptive wear detection and targeted troubleshooting
- Prevention of downtime and secondary failures
- Minimisation of leakage points
- Streamlined construction and assembly
- Optimised maintenance intervals and reduction of maintenance and repair costs

**THE WPM SYSTEM CONTAINS UP TO FOUR COMPONENTS**

- Sensors in the pressing tool.
- Data part manages the data from the sensors in the tool and transmits its parameters to the PC or gateway.
- PC with receiver: One device for setting up and initial parametrisation of the sensors in the tool as well as the data part.
- Gateway which is permanently installed on the press, and which communicates with the sensors in the tool and the press controller. (Customer-specific).

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**Subject to alterations**
WIRELESS PRESSURE MONITORING FOR INDUSTRY 4.0 (IOT)

METHOD OF OPERATION

DETERMINE VALUES VIA BLUETOOTH

Sensors in the tool transmit the pressure and temperature values in the gas springs wirelessly.

MANAGE DATA

The data part manages the data of the sensors in the tool.

PROCESS CONTROL

The gateway provides the connection between sensors, data part and the press control.
SOFTWARE FOR SETTING UP AND EVALUATING THE SENSORS

The WPM system monitors the gas springs for error-free production before and during the use of the tool in the press.
WIRELESS PRESSURE MONITORING (WPM) SOFTWARE

SIMPLE PARAMETERISATION OF THE SYSTEM
Setting and display of the actual and setpoint values for pressure and temperature of the sensors in the tool via drag & drop.

PRODUCE ERROR-FREE
Before and during the use of tools in the press, the WPM monitors the level of pressure of all gas springs. The system reports issues before the production of unacceptable parts can occur. Definable warning and alarm value limits.

POSITION AND STATUS CONTROL OF THE GAS SPRING SENSORS IN THE TOOL
System locates defective spring in case of malfunction.

TARGETED MAINTENANCE
Temperature monitoring detects erosion before any drop of pressure occurs in the spring. Downtime can be pre-emptively reduced or avoided. The WPM system enables wear-specific maintenance intervals that significantly reduce maintenance and repair compared to fixed intervals.

STREAMLINED CONSTRUCTION AND ASSEMBLY
Tool manufacturers need solely consider the position of sensors and springs. No need to install tube lines during assembly which means leakages are a thing of the past.

DOCUMENTATION OF THE PROCESS CONTROL (PRESSURE / TIME DIAGRAM)
Record data for pressure and temperature over the entire production period.
DESCRIPTION
USB stick with Bluetooth LE 4.0 radio receiver. Via the radio receiver, including driver, the WPM software can directly access the Bluetooth wireless network (sensors and data parts). The measurement data of the sensors are recorded via the radio interface and the configuration of the sensors and the data part is performed.
DESCRIPTION
The sensor is battery operated and thus wireless. In the operating mode, the sensor cyclically transmits data via Bluetooth LE 4.0 to the gateway or the USB receiver for transmission to the WPM software. The mechanical construction is designed according to the requirements of the press (shock- and vibration-resistant). The data transmission during the programming of the sensor is encrypted.

The following data are queried:
- Limit values for pressure and temperature
- Part number (tool number)
- Part ID
- Sensor ID
- Position in the tool
- Various cycle times
- Battery status
- Transmission power

TECHNICAL SPECIFICATIONS
- Housing: plastic
- Base plate: Aluminium
- Minimess connection: Steel galvanised M12.65 x 1.5 FEM
- Pressure measuring range: 0 – 500 bar relative
- Precision: ± 2 bar
- Temperature measuring range: 0 °C to 85 °C
- Battery: Lithium Li-SoC12 2 / 3 A 3.6 V
- Signal transmission: Bluetooth LE 4.0
- Protection type: IP65 sealed with adhesive and screwed
- Operating temperature range: 0 °C to 80 °C

Order number for sensor
2480.00.91.10.01

Order number for battery reorder
2480.00.91.10.00.1
(Battery is included with the sensor.)
Battery capacity 3-4 years for “normal” tool use

Subject to alterations
WIRELESS PRESSURE MONITORING
SENSOR, MEASURING COUPLING, FILLING ADAPTER

INSTALLATION EXAMPLE

Sensor connection to gas spring

Order extra: 2480.00.24.01
Measuring coupling with valve for connection to gas spring

Order extra: 2480.00.24.02
Measuring coupling with valve for connection to control fitting

2480.00.24.01/.02
- Measuring coupling 2480.00.24.01 with valve for connection to gas spring
- Measuring coupling 2480.00.24.02 with valve for connection to control fitting

2480.00.90.00.10
Filling adapter for miniature test port connection

Order No. G d SW l l₁
2480.00.24.01 G 1/8 14 14 22 8
2480.00.24.02 G 1/4 19 19 21 10

SW = width across flats

Subject to alterations
WIRELESS PRESSURE MONITORING

DATA PART

DESCRIPTION
A data part is installed on each tool. It stores all the tool data, as well as a list of all sensors that are found on the tool. Up to 128 sensors can theoretically be managed in one tool. Via the CHECK button, the Data part can perform a quick tool scan (sensor condition such as pressure, battery and reception) with all the pressure sensors in the simplest manner. The Data part receives the connection with the gateway or the read-out device (for example PC) and transmits its tool data. A tool change can be communicated to the gateway via the LOGIN button on the Data part.

ADVANTAGE
▪ Wireless pressure monitoring
▪ Tool data are always available on the tool
▪ Tool can also be used on press/machine without gateway
▪ Data evaluation by gateway, PC (WPM software) or both possible in parallel
▪ Quick access to sensor data via short Bluetooth LE 4.0 cycle times
▪ Fast tool check by pressing a button on the Data part with optical evaluation

TECHNICAL SPECIFICATIONS
Housing: plastic
Base plate: Aluminium
Battery compartment cover: Aluminium
Signal transmission Bluetooth LE 4.0
Impermeability: IP65 sealed with adhesive and screwed
Operating temperature: 0 °C to 55 °C

2480.00.91.10.00.1
Order number for battery reorder
(Two batteries are included with the Data part.)
Battery capacity 3-4 years for “normal” tool use

Subject to alterations
**DESCRIPTION**

The gateway, fieldbus 2480.00.91.40 is used to connect the sensors and the Data part to the press control. Without connection to the PLC, an evaluation must be carried out manually via the WPM software. By means of the pressure limit values stored in the Data part, the gateway can initiate a warning or switch-off via the interface for press control.

The mounting location on the press should be chosen in such a way that a good radio connection to the sensors in the tool is ensured.

Installation in the control cabinet is not possible due to the shielding of the metal box.

**TECHNICAL SPECIFICATIONS**

- Housing: plastic
- Base plate: Aluminium
- Signal transmission: Bluetooth LE 4.0
- Impermeability: IP65, screwed
- Operating temperature: 0 °C to 55 °C
- Voltage supply: +24V DC±20%

**THE DEVICE OFFERS THE FOLLOWING OPTIONS**

- Communication with the sensors on the tool
- Communication with the Data part providing the tool data
- USB interface for communication with the WPM software
- Interface to the machine control

The standard version has the standard interfaces digital I/O, relay contacts, EtherCAT fieldbus and Ethernet fieldbus. Other interfaces upon request.

**INTERFACES**

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<thead>
<tr>
<th>Port</th>
<th>Description</th>
<th>Connector</th>
<th>Pin Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>X28</td>
<td>USB device. Direct connection (tunnelled) to the radio chip</td>
<td>M8</td>
<td>4-pin</td>
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<tr>
<td>X01</td>
<td>Power supply</td>
<td>M12</td>
<td>4-pin</td>
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<tr>
<td>X10</td>
<td>Ethernet 100 MBit</td>
<td>M12</td>
<td>4-pin</td>
</tr>
<tr>
<td>X32</td>
<td>EtherCAT fieldbus input 4 x in</td>
<td>M12</td>
<td>4-pin</td>
</tr>
<tr>
<td>X33</td>
<td>EtherCAT fieldbus output 4 x in</td>
<td>M12</td>
<td>4-pin</td>
</tr>
<tr>
<td>X72</td>
<td>Digital inputs, galvanically isolated from the system. 4 x in</td>
<td>M12</td>
<td>5-pin</td>
</tr>
<tr>
<td>X71</td>
<td>Digital outputs, galvanically isolated from the system. 4 x out, 0.5A</td>
<td>M12</td>
<td>8-pin</td>
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<tr>
<td>X70</td>
<td>Digital outputs, relay, 24V, 1A. 1 x on, 2 x around</td>
<td>M12</td>
<td>8-pin</td>
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</tbody>
</table>
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