Turbidity and Suspended Solids Transmitter

We reserve the right to continuously improve our products and make any change in the stated specifications and dimensions without prior notice.
General

MJK SuSix® turbidity and suspended solids sensors are designed for measurement by immersing the sensor into open tanks, wells and containers or in-line pipe mounting.

The SuSix® transmitter is rugged and designed to handle tough applications. The scratch-proof sapphire optics, the PUR cable and the heavy duty sensor housing ensure long life, even where scaling and bio-fouling are problems.

Applications

- Sewage and wastewater plants
- Drinking water
- Biologic control
- Sludge treatment
- Filtering stations
- Groundwater pump stations

Application examples for measuring with SuSix® on a wastewater plant.

One Sensor - Full Range

The sensor provides a full range from 0.001 to 9999 FNU/NTU for turbidity and 0.001 to 400 g/l (SiO₂) for suspended solids measurements. The turbidity measurement complies with ISO 7027.

The SuSix® is equipped with beam forming optics for multi-angle detection of turbidity and suspended solids. This advanced optical system is combined with a progressive algorithm using neural logic to generate a reliable high quality measurement.

The sensor compensates for errors due to fouling or aging of the optical array and compensates for gas bubbles in the sample.

Calibration

The SuSix® sensor is provided with factory calibration for turbidity, and zero point factory calibration for suspended solids.

A single point in-situ calibration can be conducted for many applications. For more rigorous or difficult applications a two- or three-point calibration is also possible.
SuSix® Turbidity and Suspended Solids Transmitter

### High Quality Materials

The SuSix® sensor is constructed of stainless steel with chromium-dioxide coating and scratch resistant sapphire lenses in a highly polished stainless steel sensor face.

An optional self-cleaning wiper system is available for particularly dirty and difficult applications.

### Flexible Installation

MJK’s modular design allows up to 300 meters (950ft.) between the sensor and the converter, and the Display Unit can be mounted up to 1000 m (3000 ft.) from the signal converter with ordinary twisted wires.

One Display Unit can control up to four Mag-Flux® converters and/or SuSix® signal converters for greater economy, space savings and an improved overview of the multiple measurement values.

### Simple to Operate

The SuSix® Display Unit has a mobile phone-like menu structure and can display text in several selectable languages.

### PC Connection

SuSix® allows downloading setup configurations, uploading new instrument software updates and display customization. The onboard data logger captures 20,000 readings which are displayed as an electronic graph and can be retrieved as a CSV file on a PC. This connectivity is achieved with a common USB port and the free MJK Field Link software.

### Flexible In- and Outputs

The SuSix® converter has one 4-20 mA analogue output, two digital outputs for alarms or control, and one digital input for resetting alarms, batches, etc.

### User-definable Text

Up to five lines of text and readings can be configured by the user. The graphic display is automatically adjusted to show the largest characters possible. Alarms can be displayed as pop-up alarms until they are reset.

### Modbus® Communication

The Display Unit uses the Modbus® RTU communication protocol to connect to the SuSix® Converter. The converter can in turn connect to SCADA systems with its Modbus® communication protocol. Register lists are available upon request by our customers.
SuSix Turbidity and Suspended Solids Transmitter

Specifications

### Converter and Display Unit

#### Converter
- **Accuracy**: +/- 0.1% of reading
- **Measuring input**: RS 485
- **Analog output**: One active 4 - 20 mA, galvanically isolated (max. load 800 Ω)
- **Digital outputs**: One voltage-free electromechanical relay (max. 50 V DC / 1 A)  
  One optically isolated MOSFET relay (max. 50 VAC / V DC / 120 mA)
- **Digital inputs**: One, max. 30 V DC, < 5 V DC = 0 (low), > 10 V DC = 1 (high), pulse length > 100 ms
- **Communication**: MODBUS® RTU-mode, 9600 baud, 2-wire RS 485, slave-mode
- **Interface**: RS 485 for connection to Display Unit or PLC
- **Power supply**: 24 V AC, 50 / 60 Hz  ± 10 % or  
  115 V AC, 50 / 60 Hz  ± 10 % or  
  230 V AC, 50 / 60 Hz  ± 10 %  
  Power consumption max. 10 W
- **Cabinet material**: Polycarbonate, glass reinforced
- **Enclosure rating**: IP 67, NEMA 6
- **Temperature range**: - 20 ... 60 °C
- **Weight**: 1.1 kg
- **CE approvals**: EN 61000-6-4:2001, EN 61000-6-2:2001

#### Display Unit
- **Enclosure rating**: Dust and waterproof IP 67, NEMA 6 (when mounted on Converter)
- **Housing material**: Polycarbonate, glass reinforced
- **Protection lid**: Transparent polycarbonate
- **Display**: White backlit LCD-display (64 x 128 pixels) with softkeys
- **Indication**: Indication measurement, configuration and graph
- **Clock**: Real-time clock with built-in battery backup
- **Communication**: MODBUS® RTU-mode, 9600 baud, 2-wire RS 485, master-mode
- **Interface**: RS 485
- **Memory**: 256 Kb Flash memory, 20.000 entries with date, time and value
- **Interface**: USB 1,1 type mini B, Female
- **Temperature range**: - 20 ... 60 °C

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Electrical Connections on the Converter

<table>
<thead>
<tr>
<th>Connection</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SuSix</strong> Sensor</td>
<td>Connection for SuSix Sensor</td>
</tr>
<tr>
<td><strong>+</strong></td>
<td>A</td>
</tr>
<tr>
<td><strong>-</strong></td>
<td>B</td>
</tr>
<tr>
<td><strong>GND</strong></td>
<td>Shield</td>
</tr>
<tr>
<td><strong>+DC</strong></td>
<td>GND</td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>Display unit</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Display unit</td>
</tr>
</tbody>
</table>

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GB 5.1 SuSix 071005
**Data Sheet**  

**SuSix® Turbidity and Suspended Solids Transmitter**

### Specifications

**SuSix® Sensor**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbidity</td>
<td>0.001 - 9999 FNU/NTU (^1)</td>
</tr>
<tr>
<td>Suspended solids</td>
<td>0.001 - 400 g/l (SiO(_2))</td>
</tr>
<tr>
<td>Measurement principle</td>
<td>Infrared-diode system and beam focusing (л = 860 nm)</td>
</tr>
<tr>
<td>Turbidity</td>
<td>Two-channel-90° scattered light measuring corresponding to DIN/EN 27027/ISO7027</td>
</tr>
<tr>
<td>Suspended solids</td>
<td>Six-channel, multi-angle with modified absorption</td>
</tr>
<tr>
<td></td>
<td>2 channels are used for absorption</td>
</tr>
<tr>
<td>Materials</td>
<td>Head: Stainless steel DIN 1.4460 — Body: Stainless steel DIN 1.4435</td>
</tr>
<tr>
<td></td>
<td>Optical lenses: Sapphire — O-ring: Viton</td>
</tr>
<tr>
<td></td>
<td>Wiper (optional): PA (GF), TPU — Cable: PUR</td>
</tr>
<tr>
<td>Cable</td>
<td>3 x 2 x 0.34 mm², outer diameter Ø 8.3 mm</td>
</tr>
<tr>
<td>Cable length</td>
<td>10 m (customized lengths, optional (^2))</td>
</tr>
<tr>
<td>Response time</td>
<td>1 second</td>
</tr>
<tr>
<td>Flow velocity</td>
<td>No limit</td>
</tr>
<tr>
<td>Power supply</td>
<td>24 V DC (15-30 V DC)</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Approx. 45 mA</td>
</tr>
<tr>
<td>Output</td>
<td>RS 485, 9600 baud, 2-wire</td>
</tr>
<tr>
<td>Accuracy (turbidity)</td>
<td>Better than 3% of actual concentration</td>
</tr>
<tr>
<td>Accuracy (susp. solids)</td>
<td>Better than 5% of actual concentration (depends on calibration and media)</td>
</tr>
<tr>
<td>Temperature range</td>
<td>0 - 60 ºC — short term to 80 ºC — with wiper 0 to 50 ºC</td>
</tr>
<tr>
<td>Enclosure rating</td>
<td>IP 68 to IEC 529 (10 m) / 10 bar pipe mounted, NEMA 6x</td>
</tr>
<tr>
<td>Weight</td>
<td>1.3 kg</td>
</tr>
<tr>
<td>Approvals</td>
<td>CE: EN61010-1, EN61326-1 — ATEX: Ex II 3G</td>
</tr>
</tbody>
</table>

\(^1\) 4000 upwards FNU internal manufacturer norm.  
\(^2\) Can be delivered with other cable lengths on request.

### Mechanical Dimensions

**Immersion Fitting**

- **SuSix® Immersion fitting**  
  order no. 155215

**Sensor**

- Wall bracket for extension
- Extension for universal bracket
- Universal bracket

**Insertion Fitting**

- **SuSix® insertion fitting**  
  order no. 155210

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SuSix® Turbidity and Suspended Solids Transmitter

### Order Numbers

**SuSix® Converters**
- 206304: SuSix® Converter w/ display, 10 - 30 V DC
- 206305: SuSix® Converter w/ display, 115 / 230 V AC
- 206306: SuSix® Converter w/ display, 24 V AC
- 206307: SuSix® Converter without display, 10 - 30 V DC
- 206308: SuSix® Converter without display, 115 / 230 V AC
- 206309: SuSix® Converter without display, 24 V AC
- 207930: Wall mounting kit / Junction box for sensor cable
- 207935: Panel mounting bracket

**SuSix® Sensors**
- 206310: SuSix® Sensor
- 206312: SuSix® Sensor w/ wiper

**Accessories for SuSix® Sensors**
- 206350: Wiper kit (5 pcs.)
- 206355: Wiper repair kit
- 206360: Gasket pulling/insertion tool
- 691120: Cable for SuSix® sensor (PUR)

**Fittings for SuSix® Sensors**
- 155210: SuSix® Insertion fitting
- 155215: SuSix® Immersion fitting

**Accessories for SuSix® Sensor Fittings**
- 200205: Universal bracket
- 200210: Wall bracket for extension
- 200215: Extension for universal bracket