POSITION SENSORS

TRANSMITTERS FOR ANGULAR POSITION AND INCLINATION TRANSMITTERS

ROBUST • RELIABLE • FLEXIBLE
The correct position decides

YOUR BENEFITS AT A GLANCE

- RELIABLE OPERATION DUE TO ROBUST DESIGN AND HIGHEST PRECISION
- LOW INSTALLATION COSTS DUE TO EASY AND FAST ASSEMBLY
- TIME SAVINGS DUE TO THE INTEGRATION VIA STANDARD INTERFACES
- LOW LIFE CYCLE COSTS DUE TO THE HIGHEST USEFUL LIFE WITH CONSTANT MEASURING ACCURACY

Operating as a leading provider of high-quality instrumentation, we have pursued the goal of making electric engineering processes safer, more transparent and thus more efficient for more than 70 years.

Our products are designed especially for industrial use and ensure the smooth operation of plants, production and processes due to their high quality in terms of accuracy, reliability and longevity.

Our POSITION SENSOR portfolio offers solutions for angle, position and inclination measurement. The program covers simple installation devices through to robust applications in rough conditions. The angle and inclination measuring systems serve as an important link between mechanical and control facilities.
WE KNOW ALL THE ANGLES
ABSOLUTE ANGULAR POSITION TRANSMITTERS

High reliability and safety requirements exist in all areas of machine and plant construction. Safety-related demands on positioning tasks are constantly increasing, particularly if failures can endanger people and the environment. To meet these demands, Camille Bauer Metrawatt offers a range of high-quality absolute angular position transmitters. They acquire a rotatory or translatory movement without contact and transform it into an electrical output signal. The devices excel with these attributes:

- Unique, patented capacitive measuring method
- Absolute measured value is always available
- Time-consuming reference runs are not required
- Robust design for rough conditions
- On-site parameterisation
- Non-wearing and low maintenance
- Different versions and approvals are available

Hollow-shaft transmitter KINAX HW730

WE HAVE A NEW SLANT
ABSOLUTE INCLINATION TRANSMITTERS

Inclination transmitters are an excellent alternative to traditional angular position transmitters. There is hardly any moveable object whose position cannot be determined by inclination transmitters. They acquire – similar to a plummet – the deviation from the horizontal or vertical line within the reference point provided by the direction of the earth’s gravitational force. Compared to rotary encoders, inclination transmitters have the advantage of acquiring the inclination values directly while not requiring any mechanical coupling with the drive elements. They excel with these attributes:

- One-dimensional inclination measurement with oil-damped pendulum system or with MEMS technology
- Absolute measured value is always available
- Time-consuming reference runs are not required
- High absolute accuracy
- Very robust design with high ingress protection of housing
- High-quality materials
- On-site parameterisation
- Different versions are available

Inclination transmitter KINAX N702-INOX HART
# Overview Transmitters for Angular Position

<table>
<thead>
<tr>
<th>Type</th>
<th>WT720 THE INDUSTRIAL</th>
<th>WT720 with Flange Adapter THE ALTERNATIVE</th>
<th>HW730 THE FLEXIBLE</th>
</tr>
</thead>
</table>
| **Features** | • Robust industrial housing  
• High ingress protection  
• On-site parameterisation | • Alternative to WT707 / WT717, if on-site parameterisation | • Analogue and digital interface  
• No shaft adaption required  
• On-site parameterisation  
• Redundancy development possible |
| **Measuring principle** | capacitive | capacitive | capacitive |
| **Housing design** | ø 58 mm | ø 58 mm / ø 102 mm | ø 78 mm |
| **Type of shaft** | solid shaft | solid shaft | hollow-shaft |
| **Shaft diameter** | ø 10 mm | ø 19 mm | ø 10 mm ... ø 30 mm |
| **Measuring range** | singleturn 0...360° | singleturn 0...360° | singleturn 0...360° |
| **Electrical interface** | analogue 4...20mA | analogue 4...20mA | analogue 4...20mA |
| **Operating voltage** | 12 ... 30 VDC | 12 ... 30 VDC | 12 ... 30 VDC |
| **Linearity** | ±0.5% | ±0.5% | ≤0.5% |
| **Reproducibility** | 0.1° | 0.1° | 0.1° |
| **Premitted shaft load** | max. 80 N radial  
max. 40 N axial | max. 80 N radial  
max. 40 N axial | max. 80 N radial  
max. 40 N axial  
–  
–  
–  
–  
any |
| **Mounting position** | any | any | any |
| **Housing material** | anodized aluminum | anodized aluminum | anodized aluminum |
| **Operating temperature** | –40 ... +85 °C | –40 ... +85 °C | –40 ... +85 °C |
| **Protection** | IP67 / IP69K | IP67 / IP69K | IP67 / IP69K |
| **Approvals** | yes | yes | yes |
| **IECEx** | yes | yes | yes |
| **ATEX** | yes | yes | yes |
| **Maritime execution** | (formerly GL, Germanischer Lloyd) | yes (for analogue version) | yes (for analogue version) |
**WT707**  
**THE ROBUST**
- Analogue
- Suitable for rough conditions
- Capacitive
-Ø 102 mm
- Solid shaft
-Ø 19 mm and Ø 12 mm
- Singleturn 0°...355°
- Multiturn 1...1600 turns
- Analogue 0 / 4...20mA
- 12 ... 30 V DC/AC
- 24...60 / 85...230 VDC
- ≤0.5%
- 0.1°
- Max. 1000 N radial
- Max. 500 N axial
- Any
- Steel / Stainless steel flange
- Plastic / Aluminium hood
- −25 ... +70 °C
- IP 66
- Yes
- Yes
- Yes

**WT717**  
**THE ROBUST**
- Analogue
- Suitable for rough conditions
- Capacitive
-Ø 102 mm
- Solid shaft
-Ø 19 mm and Ø 12 mm
- Singleturn 0°...355°
- Multiturn 1...1600 turns
- Analogue 0 / 4...20mA
- 12 ... 30 V DC/AC
- 24...60 / 85...230 VDC
- ≤0.5%
- 0.1°
- Max. 1000 N radial
- Max. 500 N axial
- Any
- Steel / Stainless steel flange
- Plastic / Aluminium hood
- −25 ... +70 °C
- IP 66
- Yes
- Yes
- Yes

**3W2**  
**THE COMPACT**
- Almost infinite resolution
- No wear and maintenance
- Capacitive
-Ø 48 mm
- Solid shaft
-Ø 2 mm and Ø 6 mm
- Singleturn 0°...355°
- Multiturn 1...1600 turns
- Analogue 0 / 4...20mA
- 12 ... 30 V DC/AC
- ≤0.5%
- 0.1°
- Max. 16 N radial
- Max. 25 N axial
- Any
- Aluminium
- −25 ... +70 °C
- IP 50
- Yes
- Yes
- Yes

**2W2**  
**THE COMPACT**
- Parameterisation via software
- Capacitive
-Ø 48 mm
- Solid shaft
-Ø 2 mm and Ø 6 mm
- Singleturn 0°...355°
- Analogue 4...20mA
- 12 ... 30 V DC/AC
- ≤0.5%
- 0.1°
- Max. 16 N radial
- Max. 25 N axial
- Any
- Aluminium
- −25 ... +70 °C
- IP 50
- Yes
**OVERVIEW INCLINATION TRANSMITTERS**

<table>
<thead>
<tr>
<th>Type</th>
<th>N702 THE ANALOGUE</th>
<th>N702-SSI THE COMMUNICATIVE</th>
<th>N702-CANopen THE DIGITAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Features</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measuring principle</td>
<td>magnetic with pendulum</td>
<td>magnetic with pendulum</td>
<td>magnetic with pendulum</td>
</tr>
<tr>
<td>Housing design</td>
<td>ø 60 mm</td>
<td>ø 60 mm</td>
<td>ø 60 mm</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0 … 360°</td>
<td>0 … 360°</td>
<td>0 … 360°</td>
</tr>
<tr>
<td>Pendulum damping</td>
<td>at 25° tilt &lt;1 sec.</td>
<td>at 25° tilt &lt;1 sec.</td>
<td>at 25° tilt &lt;1 sec.</td>
</tr>
<tr>
<td>Electrical interface</td>
<td>4...20 mA</td>
<td>SSI / binary</td>
<td>CANopen</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>9...33 VDC</td>
<td>9...33 VDC</td>
<td>9...33 VDC</td>
</tr>
<tr>
<td>Linearity</td>
<td>0.05%</td>
<td>0.05%</td>
<td>0.05%</td>
</tr>
<tr>
<td>Resolution</td>
<td>14 Bit</td>
<td>14 Bit</td>
<td>14 Bit</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Vertical to the measured object</td>
<td>Vertical to the measured object</td>
<td>Vertical to the measured object</td>
</tr>
<tr>
<td>Housing material</td>
<td>aluminium coated</td>
<td>aluminium coated</td>
<td>aluminium coated</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>–30 to +70 °C</td>
<td>–30 to +70 °C</td>
<td>–30 to +70 °C</td>
</tr>
<tr>
<td>Protection</td>
<td>IP66</td>
<td>IP66</td>
<td>IP68</td>
</tr>
<tr>
<td>Connection</td>
<td>sensor plug M12</td>
<td>sensor plug M12</td>
<td>sensor plug M12</td>
</tr>
<tr>
<td>N702-INOX</td>
<td>N702-INOX HART</td>
<td>N705-MEMS 4...20mA</td>
<td>N705-MEMS CANopen</td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>THE EXTREMELY ROBUST</strong></td>
<td><strong>THE ANALOGUE</strong></td>
<td><strong>THE DIGITAL</strong></td>
<td><strong>THE EXTREMELY ROBUST</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Seawater resistant stainless steel housing</td>
<td>• Analogue interface 4...20 mA</td>
<td>• Digitale Schnittstelle CANopen</td>
<td></td>
</tr>
<tr>
<td>• Analogue interface 4...20 mA</td>
<td>• Digital HART interface</td>
<td>• Über CANopen Schnittstelle programmierbar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Programmable via HART interface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>magnetic with pendulum</td>
<td>magnetic with pendulum</td>
<td>Microelectromechanical capacitive tilt angle system</td>
<td></td>
</tr>
<tr>
<td>ø 60 mm</td>
<td>ø 60 mm</td>
<td>60 x 60 x 30 mm</td>
<td></td>
</tr>
<tr>
<td>0 ... 360°</td>
<td>0 ... 360°</td>
<td>0 ... 360°</td>
<td></td>
</tr>
<tr>
<td>at 25° tilt &lt;1 sec.</td>
<td>at 25° tilt &lt;1 sec.</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>4...20 mA</td>
<td>4...20 mA / HART</td>
<td>4...20 mA</td>
<td></td>
</tr>
<tr>
<td>8...33 VDC</td>
<td>12...30 VDC</td>
<td>18...33 VDC</td>
<td></td>
</tr>
<tr>
<td>0.05%</td>
<td>0.05%</td>
<td>0.05%</td>
<td></td>
</tr>
<tr>
<td>14 Bit</td>
<td>14 Bit</td>
<td>14 Bit</td>
<td></td>
</tr>
<tr>
<td>Vertical to the measured object</td>
<td>Vertical to the measured object</td>
<td>Perpendicular to the measurement object</td>
<td></td>
</tr>
<tr>
<td>stainless steel INOX AISI 316Ti (1.4571)</td>
<td>stainless steel INOX AISI 316Ti (1.4571)</td>
<td>Aluminium</td>
<td></td>
</tr>
<tr>
<td>–30 to +70 °C</td>
<td>–30 to +70 °C</td>
<td>–40 to +70 °C</td>
<td></td>
</tr>
<tr>
<td>IP68</td>
<td>IP68</td>
<td>IP67</td>
<td></td>
</tr>
<tr>
<td>Threaded cable connection with fix connection cable</td>
<td>Threaded cable connection with fix connection cable</td>
<td>Connector M12</td>
<td></td>
</tr>
</tbody>
</table>

**Measuring principle**
- Magnetic with pendulum
- Microelectromechanical capacitive tilt angle system

**Housing design**
- ø 60 mm
- 60 x 60 x 30 mm
- 70 x 70 x 30 mm

**Measuring range**
- 0 ... 360°
- 0 ... 360°
- 0 ... 360°
- 0 ... 360°

**Pendulum damping**
- at 25° tilt <1 sec.
- at 25° tilt <1 sec.
- at 25° tilt <1 sec.
- at 25° tilt <1 sec.

**Electrical interface**
- 4...20 mA
- SSI / binary
- CANopen
- 4...20 mA / 4...20 mA
- 4...20 mA / HART
- 4...20 mA / 4...20 mA

**Operating voltage**
- 9...33 VDC
- 9...33 VDC
- 9...33 VDC
- 8...33 VDC
- 12...30 VDC
- 18...33 VDC
- 9...42 VDC

**Linearity**
- 0.05%
- 0.05%
- 0.05%
- 0.05%
- 0.05%
- 0.05%
- 0.05%

**Resolution**
- 14 Bit
- 14 Bit
- 14 Bit
- 14 Bit
- 14 Bit
- 14 Bit

**Mounting position**
- Vertical to the measured object
- Vertical to the measured object
- Perpendicular to the measurement object

**Housing material**
- Aluminium coated
- Stainless steel INOX AISI 316Ti (1.4571)
- Stainless steel INOX AISI 316Ti (1.4571)

**Operating temperature**
- –30 to +70 °C
- –30 to +70 °C
- –30 to +70 °C
- –30 to +70 °C
- –30 to +70 °C
- –30 to +70 °C
- –40 to +70 °C

**Protection**
- IP66
- IP68
- IP68
- IP67
- IP67

**Connection**
- Sensor plug M12
- Sensor plug M12
- Threaded cable connection with fix connection cable
- Connector M12
- 2 x Connector M12
WHAT MOVES US …
BEING ALWAYS IN TUNE WITH THE TIMES AND PROVIDING CUSTOM-MADE
SOLUTIONS FOR PRECISE AND RELIABLE POSITION MEASUREMENT IN ANY APPLICATIONS.
NOW AND IN FUTURE.