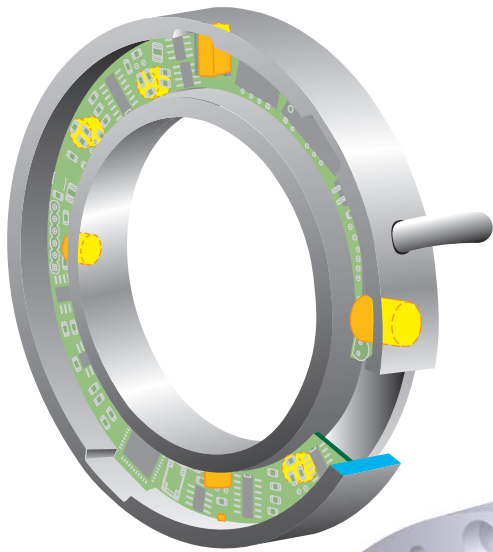


Improved Spindle monitoring



**3SA
Ring**
SPINDLE
SENSOR
SYSTEM
AND
ANALYSIS

outer ring with
9 bearing sensors,
signal memory
and sensorbus fixed
in front of first bearing

**Documentation
of the spindle load**

**Monitoring of
bearing/spindle damage**

Monitoring of imbalances

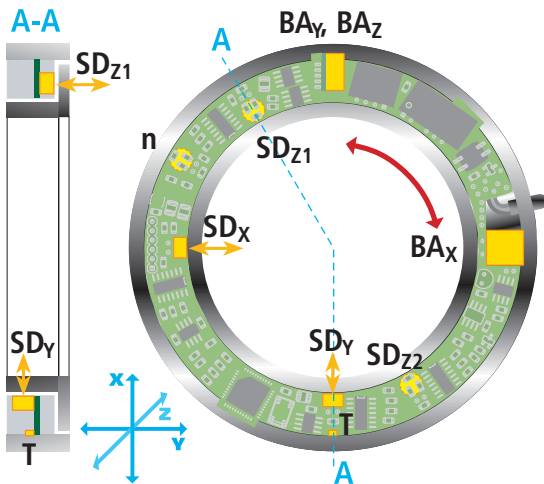
**Passing of signals to CNC or PROMOS 2
Compensation of spindle shaft position**

**Increase of spindle availability,
quality and knowledge**

Condition based maintenance

Tool and process monitoring

Spindel Sensor System and Analyzation Ring



3SA Ring measures 10 spindle features with 9 sensors:

- 3D Shaft Displacement (SD) at 2 μ m resolution with 4 inductive displacement sensors
- 3D Bearing Acceleration (BA), 1 radia up to 10 kHz with ICP output signal, 1 radial, 1 axial up to 1 kHz
- Shaft Speed Sensor (n), 1 impulse/revolution
- 1 Temperature Sensor (T)
- counts time when spindle-on-power
counts time when spindle-on-speed

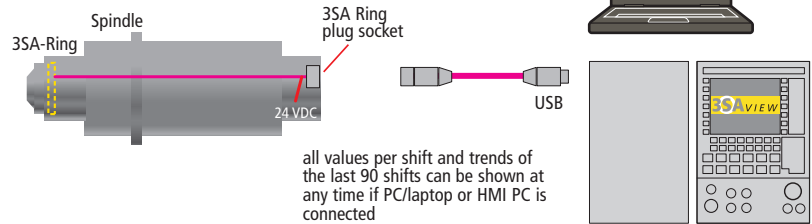
Integrated memory samples max. and min. values of all sensors one time per shift (8 h)

the cable contains 24 VDC power in, all signals output via PROMETEC Sensor Bus and ICP

different sizes on request

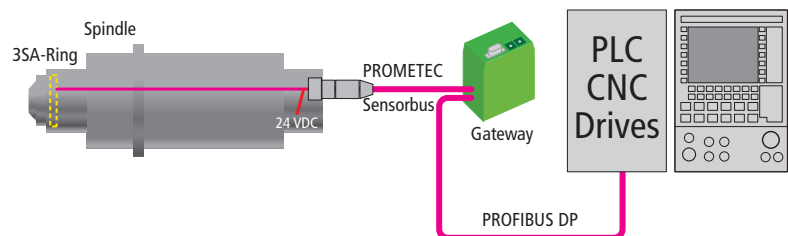
A **Standard application:**

- 3SA Ring samples the selected values = stand alone crash sensor for later interpretation/documentation



B **Optional Application:**

- 3SA -Ring samples the selected values (like A)
- CNC/PLC reads the values and/or the signals from 3SA Ring and shows trends
- CNC corrects spindle/tool position



C **Optional Application:**

- 3SA -Ring samples the selected values (like A)
- CNC/PLC reads the values and/or the signals from 3SA Ring and shows trends
- CNC corrects spindle/tool position (like B)
- PROMOS 2 reads signals from 3SA-Ring with 1 kHz sampling rate
- PROMOS 2 uses the signals for Tool, Process and Spindle Monitoring, CDR

