2:1 TECHNOLOGY FOR NAMUR OUTPUT SENSORS

The patented 2:1 technology from Pepperl+Fuchs provides potential savings of 50% on sensor wiring in hazardous areas. Signals from NAMUR sensors can be transmitted in pairs to a control device via one line. This can be done through NAMUR output sensors that have 2:1 technology or using NAMUR output sensor without 2:1 technology and using F-KD-EX2 module. Addition information about wiring and sensors with 2:1 can be found on KFD2-SRA-Ex4 data sheets.

Two-wire NAMUR safety sensors

These proximity switches are equivalent to NAMUR sensors, but when used with an approved interface device, a sensor/control unit cable malfunction can be detected; the output of the control unit automatically goes to the safe "OFF" state.

The model number for this type of sensor includes the reference -SN or S1N. They are supplied as:

- *NC contact (SN)*
- *NO contact (S1N)*

WARNING – SAFETY INTEGRITY LEVEL (SIL) UP TO SIL3 ACCORDING TO IEC 61508

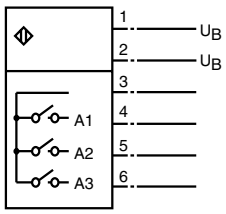
In safety-related applications the sensor must be operated with a qualified fail-safe interface from Pepperl+Fuchs, such as KFD2-SH-EX1.

Consider the "exida Functional Safety Assessment" document which is available on www.pepperl-fuchs.com as an integral part of this product's documentation.

Sensors with relay contact output

Some sensors have relay contact outputs. The maximum switching power and the type of voltage can be found in the respective data sheets. The mechanical service life data relates to the number of switching cycles for the unloaded relay contact output. Under nominal load conditions, it reduces to the value specified for the electrical life. The service life details are MTBF values.

Switching example



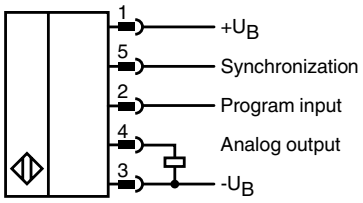
Three-wire DC analog sensors

These sensors have separate connections for the power supply and the output. An analog signal output is proportional to the measured variable. The most widely used analog signals are 4 mA to 20 mA and 0 V to 10 V.

Examples of the measured variable include the object distance, an inclination angle, a filling level, a valve position, or an acceleration value. Most analog sensors have a parameterization option that enables the output to be optimally adapted to the conditions in the application.

Analog sensors often have switching outputs for signaling threshold levels.

Switching example:



The model number for this type of sensor includes the reference -I or -U. They are supplied as:

- *Current output, e.g., 4 mA ... 20 mA (I)*
- *Voltage output, e.g., 0 V ... 10 V (U)*
- *Current/voltage output with independent load detection and function changeover (IU)*

Three-wire DC sensors with frequency output

These sensors (primarily ultrasonic sensors) indicate the measured variable within the detection area in the form of a pulse train with variable frequency. For example, when the fill level is Smin the frequency output supplies the lowest frequency value; when the fill level is Smax it supplies the highest frequency. The frequency characteristic is linear between the measurement range limits.

Application example: