

## Special features

- touchless technology, mag-
netic measurement
- enables for transmissive
measurements
- electrical range $360^{\circ}$
- current output and 2 additional programmable PNP switch outputs
- simple mounting
- lateral magnet offset up to
$\pm 3 \mathrm{~mm}$
- protection class IP67
- unlimited mechanical lifetime
- resolution 12 bit
- independent linearity $\pm 0.5 \%$

The sensor utilizes the orientation of a magnetic field for the determination of the measurement angle. Therefore, a magnet is attached to the rotating shaft. The magnetic field orientation is evaluated with an integrated circuit. The output voltage is proportional to the caluclated angle.

The sensor is mounted with two bolts protruding the housing with the integrated elongated holes, allowing for simple output adjustment.
The sensor is totally sealed and therefore is not sensitive to dust, dirt or moisture.

Electrical connection is provided by a shielded cable or lead wires which are molded into the housing.

The two-part design of the sensor Series RFC and its position marker offers the customer maximum variability when mounting the sensor. The absence of shaft and bearing makes the assembly insensitive to customer application tolerances.

The tansmissive measurement through a variety of non-magnetic materials is an advantage over shaft type sensors.

Two additional PNP switch outputs enable a precise detection of limiting positions for applications such as drive systems. Separate limit switches for these functions can be replaced hereby.

The switch positions on/off of each separate output can be chosen freely across the electrical range. Via a teach in process these positions are taught to the sensor. The sensor does not need to be accessible as the teach in

Description
Housing
high grade, temperature resistant plastic
Electrical connections shielded cable $8 \times 0,25 \mathrm{~mm}^{2}$
works through the output cable. The cable length for programming can be up to 10 m . Programmed switch positions are stored non volatile for at least 50 years. Using multiple sensors the use of the Teach In Box (Z-RFC-T01) is recommended. It can easily be looped into the cabling. A terminal block is used to connect the sensor, the teach in goes via buttons. The user is guided optically by LEDs.

NOVOHALL
Angle Sensor touchless technology transmissive with 2 PNP switching outputs
Series RFC4800
Model 600


When the shaft marking is pointing to cable, the sensor is located in electrical center position.

| Connection assignment | Wire color |
| :--- | :--- |
| Signal | Cable outlet |
| Supply voltage | Green |
| GND | Brown |
| Signal output 4...20 mA | White |
| Switching output channel 1 | Red |
| Switching output channel 2 | Pink |
| Programming line 1 | Yellow |
| Programming line 2 | Grey |
| Programming line 3 | Blue |
| Shield | Shield with additional wire |



Die Schaltausgänge Ein/Aus $1 / 2$ sind frei programmierbar innerhalb des Messbereiches

## Switch outputs ON/OFF $1 / 2$ positions are freely programmable inbetween electrical angle limits



Position marker Z-RFC-P02


[^0]| Type designations | supply voltage 24 V |  |
| :---: | :---: | :---: |
| Mechanical Data |  |  |
| Dimensions | see dimension drawing |  |
| Mounting | with 2 M4 screws（included） |  |
| Mechanical travel | 360 continuous | 。 |
| Maximum operational speed | unlimited | $\mathrm{min}^{-1}$ |
| Weight | ca． 50 | g |
| Electrical Data |  |  |
| Supply voltage Ub | 24 （18．．．30） | VDC |
| No－load supply current（ Ub＝ 24 V ） | max． 30 | mA |
| Reverse voltage | yes（supply lines and current output） |  |
| Short circuit protection of current output | yes（vs．GND and＋Ub） |  |
| Measurement range | 0．．． 360 | 。 |
| Update rate | 5000 typ． | measur．／s |
| Resolution | 12 bit |  |
| Repeatability | 0.1 | 。 |
| Hysteresis | $\leq 0.1$ | － |
| Independent linearity | $\leq 0.5$ of signal range | \％ |
| Output signal | $4 . .20$（burden max． $500 \Omega$ ） | mA |
| TC | typical 80 | ppm／K |
| Insulation resistance（500 VDC） | $\geq 10$ | $\mathrm{M} \Omega$ |
| Cable length | see ordering specifications |  |
| Cross－section cable | see ordering specifications |  |
| Environmental Data |  |  |
| Temperature range | －40．．．＋85 | ${ }^{\circ} \mathrm{C}$ |
| Vibration（IEC 60068－2－6） | $\begin{aligned} & 5 \ldots .2000 \\ & A_{\max }=0.75 \\ & a_{\max }=20 \end{aligned}$ | Hz mm g |
| Shock（IEC 60068－2－6） | 50 （6 ms） | g |
| Life | mechanical unlimited；＞ 50000 h MTBF |  |
| Protection class（DIN 40050 ／IEC 529） | IP67 |  |
| EMC compatibility | EN 61000－4－2 <br> EN 61000－4－3 <br> EN 61000－4－4 <br> EN 61000－4－6 <br> EN 61000－4－8 <br> EN 55011 |  |
| Working distance A／magnet constant | Z－RFC－P01：A＝ $0 \ldots 1.5 \mathrm{~mm} /$ magnet constant $=1.85\left[{ }^{\circ} / \mathrm{mm}^{2}\right]$ <br> Z－RFC－P02：A $=0 \ldots 4 \mathrm{~mm} /$ magnet constant $=0.8\left[{ }^{\circ} / \mathrm{mm}^{2}\right]$ <br> （Position marker see separate data sheet） |  |
| Lateral magnet offset （will cause additional linearity error） | max．$\pm 3 \mathrm{~mm}$（Z－RFC－P02），max．$\pm 1.5 \mathrm{~mm}$（Z－RFC－P01） <br> The maximum error which is caused by lateral offset between sensor and position marker may be approximated as follows： <br> Error $\left[{ }^{\circ}\right]=$ magnet constant $\times(\text { offset }[\mathrm{mm}])^{2}$ <br> The magnet constant depends from the position marker． <br> Example：Z－RFC－P02：magnet constant $=0.8{ }^{\circ} / \mathrm{mm}^{2}$ ；offset $=0,5 \mathrm{~mm}$ <br> Error［ ${ }^{\circ}$ ］$=0.8^{\circ} / \mathrm{mm}^{2} \times(0.5 \mathrm{~mm})^{2}=0,2^{\circ}$ |  |

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| Switching output properties | 2 outputs PNP positive switched. Voltage ratiometric with Ub |
| :--- | :--- |
| Type | 30 mA guaranteed over full termperature range |
| Max. output current | short circuit proof vs. VCC and GND, <br> self reset after elemination of short circuit <br> Outputs protected against short-time transients $>40 \mathrm{~V}$ |
| Safety precautions for outputs | $<=0.1^{\circ}$ |
| Switch edge width | $\pm 1^{\circ}$ |
| Acccuracy swithing edges | $\pm 1.5^{\circ}$ |
| Switch hysteresis | selectable via teach-in |
| Width of switching zone | minimum 50 years |
| Data preservation of memory | The sensor itself has no operating elements, the teach-in is carried out via connecting cable <br> programming unit Z-RFC-T01 (recommended) |
| Teach-In process of switching points | unlimited |
| Teach-In Medium | possible |
| Number of reprogramming cycles | unprogrammed (outputs off) |
| Reset switching positions to factory setting of the external |  |
| Switching positions factory setting |  |

## Ordering specifications

Supply voltage Ub
1: Ub = 24 VDC ( $18 \ldots 30 \mathrm{VDC}$ )

Output signal
7: 4 ... 20 mA with 2 PNP switch outputs

Characteristic (angle output)
1: positive gradient CW

Electrical connection 431: Round cable 8-pol. 0.5 m ( $0.25 \mathrm{~mm}^{2}$; shielded)


## Required accessories

Position marker Z-RFC-P01, Art.No. 005660;
Position marker Z-RFC-P02, Art.No. 005661
(see separate data sheet RFC position markers)
Teach In Box Z-RFC-T01
Art.No. 056075
Available on request
Cable versions
Customized connectors
Specific angle ranges /
characteristics
Other interfaces
Preprogrammed switch outputs


[^0]:    Further position markers see separate data sheet.

