Scope of this instruction manual:

<table>
<thead>
<tr>
<th>Types</th>
<th>RN 3001 / 3002 / 3003 / 3004 / 3005</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RN 4001</td>
</tr>
<tr>
<td></td>
<td>RN 6001 / 6002 / 6003 / 6004</td>
</tr>
</tbody>
</table>

Approvals

- CE / TR-CU
- ATEX 1/2D / IEC-Ex t IIIC
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</table>
Safety /warning notes

Installation, maintenance and commissioning may be accomplished only by qualified technical personnel.

For terminal connection of the device, the local regulations or VDE 0100 (Regulations of German electrotechnical Engineers) must be observed.

Switch off the supply voltage before opening the device.

All field wirings must have insulation suitable for at least 250V AC. The temperature rating must be at least 90°C (194°F).

In the case of handling by untrained personnel or handling malpractice, the safety of the device cannot be guaranteed.

Fields of application

Level limit switch for point level limit detection in bulk materials. Applicable as full -, demand - and empty detector.
Technical Data

Housing

**RN 3000**

- 82mm (3.22“) x 104mm (4.1“)
- 36mm (1.41“)

**RN 4000**

- 90mm (3.5“) x 115/125mm (4.5/4.9“)
- 108mm (4.3“)

**RN 6000**

- Ø120mm (Ø 4.72“) x 125mm (4.92“)
- 135mm (5.31“)
Temperature extended shaft

RN 3001
RN 3002
RN 3004

RN 6001
RN 6002
RN 6004

Ø 33mm  
(Ø 1.3“)

Dimension A  |  A = 0mm (0“)  |  A = 200mm (7.87“)  |  A = 300mm (11.8“)  |  A = 400mm (15.7“)
---|---|---|---
| 80°C (176°F)  | 150/250°C (302/482°F)  | 350°C (662°F)  | 600°C (1112°F)  |
Temperature extended shaft

RN 3003

RN 6003

Ø55/60mm
(Ø2.16/2.36“)

A

<table>
<thead>
<tr>
<th>Dimension A</th>
<th>A = 10mm (0.39“)</th>
<th>A = 75mm (2.95“)</th>
<th>A = 210mm (8.26“)</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>80°C (176°F)</td>
<td>80°C (176°F)</td>
<td>150/250°C (302/482°F)</td>
</tr>
<tr>
<td>P</td>
<td>0,8bar (11.6psi)</td>
<td>5/10bar (73/145psi)</td>
<td>0,8/5/10bar (11.6/73/145psi)</td>
</tr>
</tbody>
</table>
RN 3001
RN 4001
RN 6001

Material according to order data

\[ \varnothing 10 \text{mm} \ (\varnothing 0.39\text{“}) \]

Material according to order data

\[ L = 70 \text{mm} \ldots 1500 \text{mm} \ (2.75\text{“} \ldots 59\text{“}) \]

Rope extension

Material according to order data

\[ \varnothing 8 \text{mm} \ (\varnothing 0.31\text{“}) \]

2.000mm \ (78.7\text{“})

Pendulum shaft

1.4301 \ (304) / 1.4305 \ (303)

300 \ldots 1000 \text{mm} \ (11.8 \ldots 39.37\text{“})
Extension

RN 3002
RN 6002

Material according to order data

Ω33mm
(Ω1.3“)

Ω10mm
(Ω0.39“)

Material according to order data

L = 250mm … 4000mm (9.84“ … 158“)
Extension

RN 3002-Rope
RN 6002-Rope

Material according to order data

Ø8mm (Ø0.31")

L = 500mm ... 10,000mm (19.68"...393.7")

max. 4 kN

Ø10mm (Ø0.39")

Ø8mm (Ø0.31")

max. 28 kN

L = 1,000mm ... 10,000mm (39.37"...393.7")

Material according to order data
RN 3003
RN 6003

L = 125mm … 300mm (4.92“...11.81“)

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>139mm (5.47“)</td>
<td>50mm (1.97“)</td>
</tr>
<tr>
<td>187mm (7.28“)</td>
<td>98mm (3.9“)</td>
</tr>
</tbody>
</table>
**Extension**

**RN 3004**
**RN 6004**

Material according to order data

\[
\begin{align*}
\varnothing 33\text{mm} &\quad (\varnothing 1.3\text{“}) \\
\varnothing 10\text{mm} &\quad (\varnothing 0.39\text{“}) \\
L &\quad = 150\text{mm} \ldots 600\text{mm} (5.9\text{“} \ldots 23.6\text{“}) 
\end{align*}
\]

**RN 3005**

Material according to order data

\[
\begin{align*}
97\times 82\text{mm} &\quad (3.82\times 3.22\text{“}) \\
90\text{mm} &\quad (3.5\text{“}) \\
1.4305 (303) &\quad 1.4301 (304) \\
87\text{mm} &\quad (3.43\text{“}) \\
200\text{mm} &\quad (7.87\text{“})
\end{align*}
\]
Measuring vane

Rectangular vane

1.4301 (304) / 1.4404 (316L)

A | B
---|---
50mm (1.97“) | 98mm (3.86“)
50mm (1.97“) | 150mm (5.9“)
50mm (1.97“) | 250mm (9.84“)
98mm (3.86“) | 98mm (3.86“)
98mm (3.86“) | 150mm (5.9“)
98mm (3.86“) | 250mm (9.84“)

Notched

1.4301 (304) / 1.4404 (316L)

80mm (3.15“) 40mm (1.57“)
Measuring vane

Boot shaped vane

1.4301 (304)/1.4404 (316L)

98mm (3.86“)

40mm (1.57“)

106mm (4.17“)

35mm (1.38“)

28mm (1.1“)

26mm (1.02“)

77mm (3.03“)

1.4301 (304)/1.4404 (316L)

98mm (3.86“)
Measuring vane

Hinged vane double side

1.4301 (304)/
1.4404 (316L)

Hinged vane single side

1.4301 (304)/
1.4404 (316L)

b=28mm (1.1") / 37mm (1.46")
Measuring vane

Rubber vane

Universal vane

Plastic PP
RN 3000

RN 4000

(1) See type plate
(2) with internal heating
(1) See type plate
(2) with internal heating

RN 3000 / RN 6000
min. -0.9 bar (-13.1 psi)
(1) max. 0.8 / 5 / 10 bar (11.6 / 73 / 145 psi)

RN 4000
min. -0.9 bar (-13.1 psi)
max. 0.8 bar (11.6 psi)

(1) See type plate
Application

RN 3001
RN 4001
RN 6001

(1) Protective angle (canopy) in case of high mechanical load
RN 3001
RN 4001
RN 6001

max. 400N
max. 1,5kN

Pendulum shaft
Rope extension
<table>
<thead>
<tr>
<th>L max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 3.000mm (118.1“)</td>
</tr>
<tr>
<td>2 4000mm (158”)</td>
</tr>
</tbody>
</table>

(1) Mechanical support
(2) Incline installation with option 32 (bearing at tube end)
RN 3002-Rope
RN 6002-Rope

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>min. 500mm (19.68”)</td>
</tr>
<tr>
<td>2</td>
<td>max. 10,000mm (394”)</td>
</tr>
</tbody>
</table>

(1) Max. pulling force 4kN / 28kN, see type plate
L max.

300mm (11.81")
L max.

300mm (11.81")
Loading bellow
Assembly

Example: Insertion of the hinged vane in a long socket

Fixing / Sealing

Teflon gasket or flat gasket

Sealing
(1) Certified welding sleeve prescribed
(2) Metal-metal support gap-free
(3) Teflon tape
(4) Welding (observe hygiene guidelines)
Alignment

Ingress protection IP 66

Option: Weather protection cover

for Ex only approved for Zone 22
Electrical connection

RN 3000
RN 4000

RN 6000

Terminals according to selected version
Electrical connection - RN 3000 / RN 4000

**Version**
- AC
- DC
- Universal voltage

---

**Diagram**

- max. 1,5mm² (AWG16)
- 1 1 2 PE
- L N PE
- max. 10A HBC 250V T/F
- max. 250V AC, 2A, 500VA (cosφ = 1)
- max. 300V DC, 2A, 60W

---

**Version (4)**

<table>
<thead>
<tr>
<th>Supply</th>
<th>Signal output</th>
<th>Alarm output</th>
<th>see typeplate</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC 24/48/115/230V ±10% (5), 50/60Hz max. 4VA</td>
<td>DC 24V DC ±15% (5), max. 2,5W</td>
<td>Universal voltage 24V DC ±15% (5), max. 4W 22...230V ±10% (5), 50/60Hz, max. 10VA</td>
<td></td>
</tr>
</tbody>
</table>

(1) Supply
(2) Signal output
(3) Alarm output
(4) see typeplate
(5) including 10% from EN 61010
Electrical connection - RN 3000 / RN 4000

Version
- PNP

24V DC ±15% (1)
max. 0,6A

(1) including 10% from EN 61010
Electrical connection - RN 6000

Version
- AC
- DC

Version \(^{(4)}\)

<table>
<thead>
<tr>
<th></th>
<th>AC</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>24/48/115/230V ±10(^{(4)}), 50/60Hz max. 4VA</td>
<td>24V DC ±15(^{(4)}), max. 2,5W</td>
</tr>
<tr>
<td>Signal output</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) Supply
(2) Signal output
(3) see typeplate
(4) including 10% from EN 61010
(5) not inductive
Electrical connection - RN 6000

Version
- Universal voltage

(1) Supply
(2) Signal output
(3) Alarm output
(4) including 10% from EN 61010
(5) not inductive

max. 24V DC ±15% (4), max. 2,5W
22...230V ±10% (4)
50/60Hz, max. 10VA

max. 4mm² (AWG12

max. 10A HBC 250V T/F

max. 250V AC, 5A (5)
max. 30V DC, 4A (5)
Switching logic

Signal output without FSL/FSH
Signal output with FSL/FSH

RN 3000/4000:
FSL  FSH

RN 6000:
FSL  FSH

(1) yellow
(2) green
Signal output delay

RN 3000
RN 4000

RN 6000
Alarm output
Version with rotation control

No error

RN 3000/4000: RN 6000:

Error

red
Setting

Setting of the spring force

(1) Spring
(2) light: for light material
(3) central: universal
(4) strong: for very sticky material

Maintenance

Normally not necessary
Permitted relative pressure

-0.2...+0.1 bar
(-2.9...+1.45 psi)

Zone borders

RN 3000
RN 4000
RN 6000

(1) 2D
(2) Db
(3) 21

(1) 1D
(2) Da
(3) 20

(1) Category ATEX  (2) EPL (IEC-Ex)  (3) Zone
<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>Max. surface temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zone 21</strong></td>
<td><strong>Zone 20</strong></td>
</tr>
<tr>
<td>30°C (86°F)</td>
<td>50°C (122°F)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>40°C (104°F)</td>
<td>60°C (140°F)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>50°C (122°F)</td>
<td>70°C (158°F)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>50°C (122°F)/</td>
<td>80°C (176°F)</td>
</tr>
<tr>
<td>60°C (140°F)</td>
<td></td>
</tr>
<tr>
<td>50°C (122°F)</td>
<td>90°C (194°F)</td>
</tr>
<tr>
<td></td>
<td>100°C (212°F)</td>
</tr>
<tr>
<td></td>
<td>110°C (230°F)</td>
</tr>
<tr>
<td></td>
<td>120°C (248°F)</td>
</tr>
<tr>
<td></td>
<td>130°C (266°F)</td>
</tr>
<tr>
<td></td>
<td>140°C (284°F)</td>
</tr>
<tr>
<td></td>
<td>150°C (302°F)</td>
</tr>
<tr>
<td></td>
<td>160°C (320°F)</td>
</tr>
<tr>
<td></td>
<td>170°C (338°F)</td>
</tr>
<tr>
<td></td>
<td>180°C (356°F)</td>
</tr>
<tr>
<td></td>
<td>190°C (374°F)</td>
</tr>
<tr>
<td></td>
<td>200°C (392°F)</td>
</tr>
<tr>
<td></td>
<td>210°C (410°F)</td>
</tr>
<tr>
<td></td>
<td>220°C (428°F)</td>
</tr>
<tr>
<td></td>
<td>230°C (446°F)</td>
</tr>
<tr>
<td></td>
<td>240°C (464°F)</td>
</tr>
<tr>
<td></td>
<td>250°C (482°F)</td>
</tr>
</tbody>
</table>

(1) When using the electronic "universal voltage".
Installation

RN 3000
RN 4000

RN 6000

(1) A mech. pull relief must be provided
(2) Connect to plant ground
For installation and field wiring the respectively valid installation regulations of the respective country must be observed.

Commissioning only with closed lid.

Do not remove the lid (cover) while circuits are alive.

Before opening the lid take care, that no dust deposits or whirlings are present.

The installation has to be done in a way, that mechanical friction or impact does not cause sparks between the aluminium enclosure and steel.

For process temperatures over 230°C the delivered sealings of the flanges and of the sliding sleeve must be checked regulary for good order and condition.

Cable Glands:

Installation according to the regulations of the country, where the product is installed.
Not used entries have to be closed with blanking elements certified for this purpose.
Where applicable the factory provided parts must be used.
A strain relief must be provided for the field wiring cables, when the device is installed with the factory provided cable glands.
The diameter of the field wiring cable must match to the clamping range of the cable clamp.
If other than the factory provided parts are used, following must be ensured:
The parts must have an approval adequate to the approval of the level sensor (certificate and type of protection).
The approved temperature range must be from the min. ambient temperature of the level sensor to the max. ambient temperature of the level sensor increased by 10Kelvin.
The parts must be mounted according to the instructions of the supplier.