

Rotonivo®

Level limit switch

Information RN 3000

list of contents



	page
introduction	G1

mode of operation	G1

selection guide	G2

approvals	G2

technical data	G3 - G6

electrical connection	G7

safety items	G8

mounting	G8

price list	P0 - P25

Subject to technical change and price change.

All dimensions in mm.

All units of this pricelist are
CE certified.

Of course there are other unit variations than
specified possible.

Please speak with our consulting technicians.

introduction

■ The **ROTONIVO RN 3000** is an electromechanical level-limit-switch and is used for level monitoring of bulk goods. It is used wherever

- dustlike
- powdery
- granulated
- granular

media are handled.

■ Designed to the modular system, **ROTONIVO** level limit switches are used as

- full detector
- demand detector
- empty detector

at

- | | |
|----------------------|----------------------|
| - silos | - bunkers |
| - hoppers | - weigher containers |
| - storage containers | - discharge pipes |
| - small containers | |

■ **ROTONIVO RN 3000** level limit switches are

- | | |
|------------------|---|
| - compact | - simple |
| - robust | - reliable |
| - no maintenance | - insensitive to environmental influences |

They can be equipped for over- and underpressure and also for very high or low temperatures.

■ Thousands of **ROTONIVO** level limit switches have stood the test in several applications like

- chemical industry
- wood industry
- building materials industry
- food processing industry
- mechanical engineering
- plastics industry

mode of operation

A low revolution synchronous induction gearing motor drives a rotating measuring vane, which is for example mounted at a container.

As soon as the material level, which is to be checked, reaches the measuring vane, it is handicapped in his rotation.

The synchronous induction motor is freely suspended within the housing. The caused reaction torque is used to operate a micro switch giving a suitable electrical signal and to stop the motor.

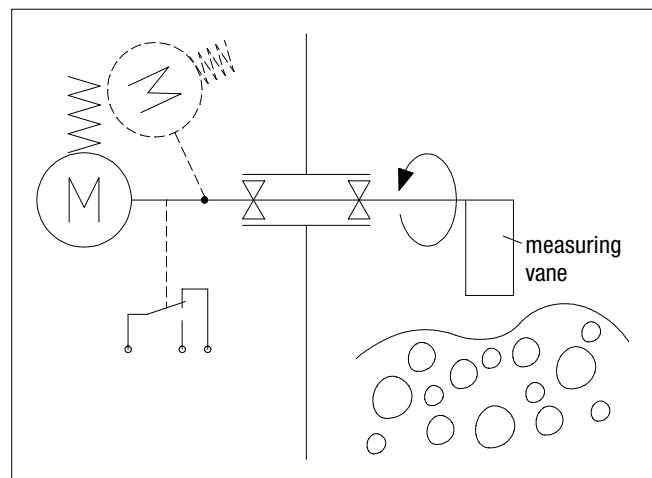
When the vane becomes free again due to the drop in material level, a spring draws the motor back into his operating position, the micro switch returns to his initial position and the motor is switched on. The electrical output signal is then switched over.

option rotation control

Due to the rotation control it is possible, to recognize a possible fault of the unit in time. The following fault sources are observed:

- motor
- gear
- electronic for motor power supply
- failure of mains voltage
- defect of the connecting wires

Faults that occur are detected through electronic means, and the alarm relays is initiated.





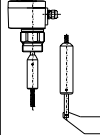
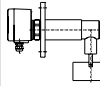
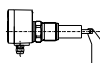
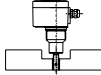

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Level limit switch



Information RN 3000
selection guide - approvals

selection guide

type \ application	RN 3001	RN 3002	RN 3002-ropo	RN 3003	RN 3004	RN 3005	RN 3006
							
full detector	X	X	X	X	X		X
demand detector	X		X*	X	X		X
empty detector	X		X*	X	X		X
loading telescope						X	
vertical	X	X	X		X	X	X
oblique from the top	X				X		X
horizontal	X			X	X		X
oblique from the bottom	X				X		X
dustEx zone 10/11***	X	X	X	X	X	X	X
temperature upto 220°C** ***	X	X	X	X	X		
container over pressure -1 upto 10bar ***	X	X	X	X	X	X	X

* not for zone 10/11

** zone 10/11 upto 200°C

***version depends on selection-code in pricelist

approvals

For the **ROTONIVO** types **RN 3001** to **RN 3006** the approvals for the dust explosion zone 10/11 are available (zone 10 inside container, zone 11 outside container).

technical data

dimensions

For detailed dimensions of the types RN 3001 - 3006 see pricelist (page P0 - P25).

mechanical data

housing	die-casted housing RAL 5010 gentian blue
enclosure	IP 65 to EN 60529
process connection	thread or flange according to selection
material process-connection	aluminium, steel galvanized or stainless steel
material vane shaft and measuring vane	stainless steel
tolerance length "L"	±10mm
bearing	ball bearing, dusttight
sealing	radial rotary shaft sealing DIN 3760
friction clutch	protection of the gearing of impacts of the measuring vane
pickup delay	approx. 1.3 sec
sensitivity	adjustable via reset force of spring or geometry of measuring vane
speed of measuring vane	1 1/min

electrical data

mains voltage	220..240V 50-60Hz (changeable to 110..120V)
	110..120V 50-60Hz (changeable to 220..240V)
	48V 50-60Hz (changeable to 24V)
	24V 50-60Hz (changeable to 48V)
	24V DC
	all voltages +10% / -15%
installed load	3VA (3W)



connection terminal	1x max. 1.5mm ²
screwed cable gland	1x M20x1.5 (optional 2x PG13.5) (for type RN 3006 3-pole plug instead of M20x1.5 possible)
signal output	floating microswitch AC max. 250V, 2A, 500W (cosφ=1) DC max. 300V, 2A, 60W (type with plug: the contact normally-open or normally-closed is not floating)
connection diagram	inside of cover, datasheet
protection class	I

operating conditions

container over-pressure	max. 0.8 bar or max. 5 bar or max. 10 bar
powderdensity	depends on mounting position and geometry of measuring vane (down to 20g/l possible)
feature of bulk material	suitable for nearly all materials
maintenance	not required

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Level limit switch

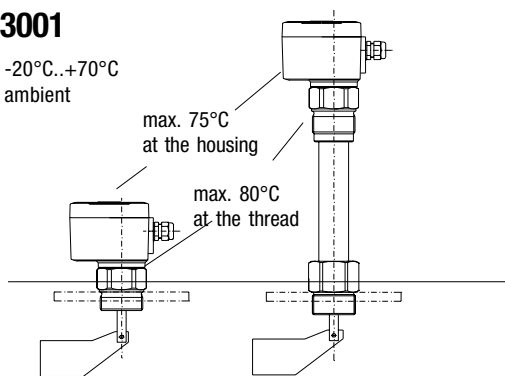


Information RN 3000
technical data

operating temperatures

RN 3001

-20°C..+70°C
ambient

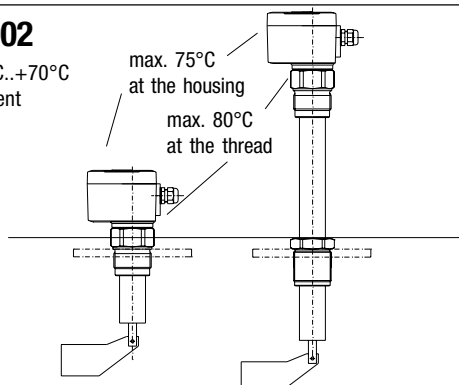


-20°C..+80°C
type for container
temperature max.80°C

-20°C..+150°C or
-20°C..+220°C (Z10 +200°C)
type for container temperature
max.150/220°C

RN 3002

-20°C..+70°C
ambient

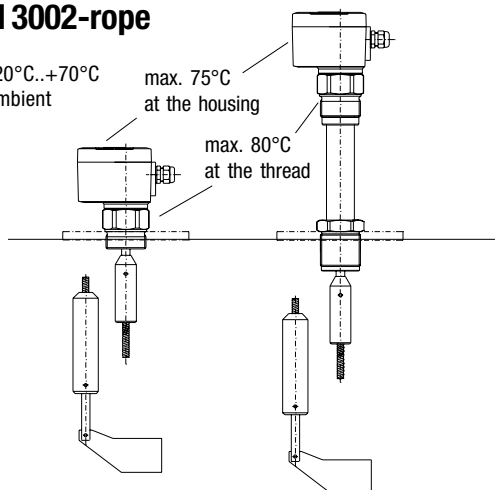


-20°C..+80°C
type for container
temperature max.80°C

-20°C..+150°C or
-20°C..+220°C (Z10 +200°C)
type for container temperature
max.150/220°C

RN 3002-rope

-20°C..+70°C
ambient

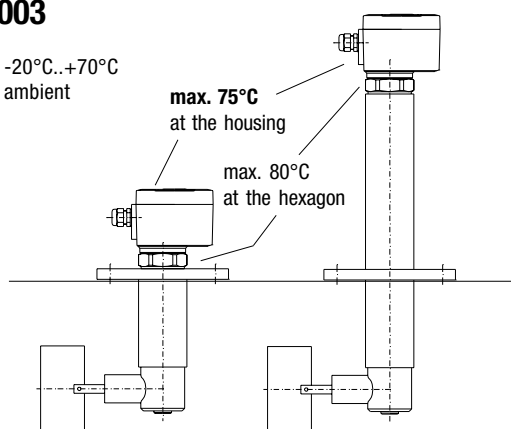


-20°C..+80°C
type for container
temperature max.80°C

-20°C..+150°C or
-20°C..+220°C (Z10 +200°C)
type for container temperature
max.150/220°C

RN 3003

-20°C..+70°C
ambient

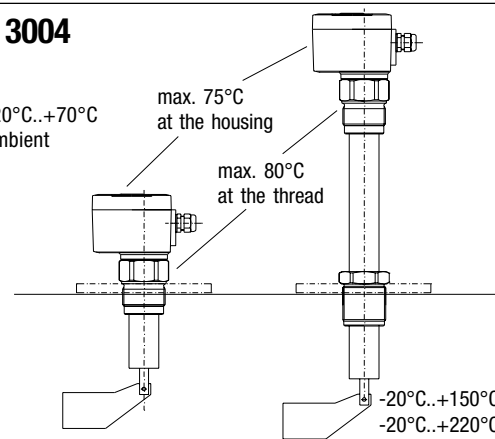


-20°C..+80°C
type for container
temperature max.80°C

-20°C..+150°C or
-20°C..+220°C (Z10 +200°C)
type for container temperature
max.150/220°C

RN 3004

-20°C..+70°C
ambient

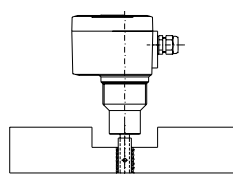


-20°C..+80°C
type for container
temperature max.80°C

-20°C..+150°C or
-20°C..+220°C (Z10
+200°C)
type for container temperature
max.150/220°C

RN 3005

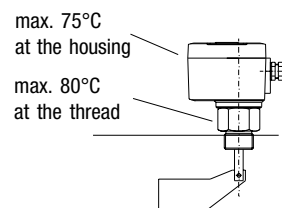
-20°C..+70°C
ambient



-20°C..+70°C

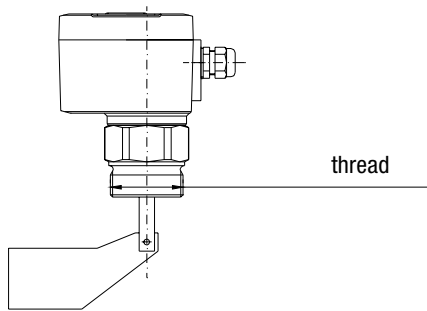
RN 3006

-20°C..+70°C
ambient



-20°C..+80°C
container

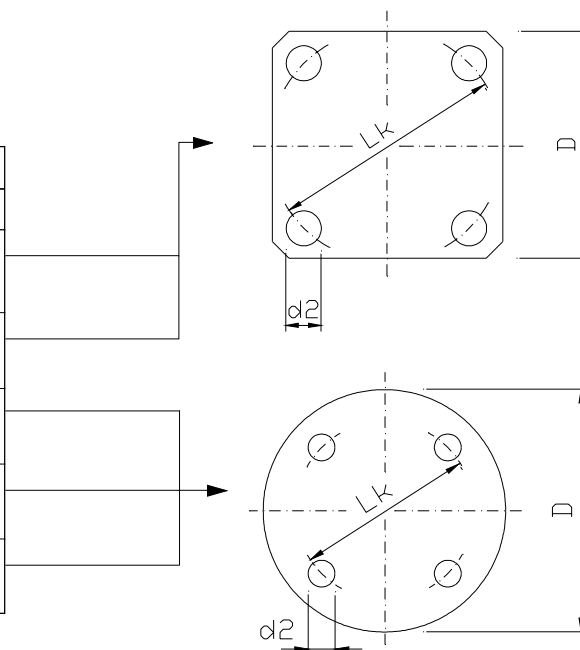
process connection thread



type	thread
RN 3001 RN 3002 RN 3002-rope RN 3004 RN 3005	G 1 ½ DIN 228
RN 3006	G 1 DIN 228 M32 x 1.5 M30 x 1.5

process connection flange

type	number of holes	d2	Lk	D	T (thickness)
flange 150x150	4	18	170	150	10
flange 150x150	4	14	170	150	10
flange DN32 PN6	4	14	90	120	14
flange DN100 PN6	4	18	170	210	16
flange DN100 PN16	8	18	180	220	20



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Level limit switch

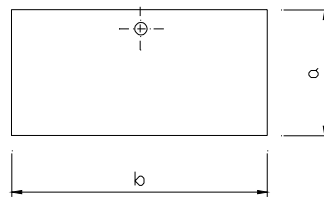
Information RN 3000
technical data



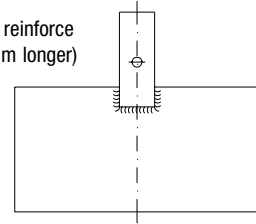
measuring vane

dimensions rectangular vane	
a	b
50	98
50	150
50	250
98	98
98	150
98	250

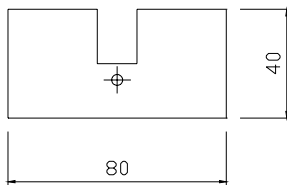
rectangular vane



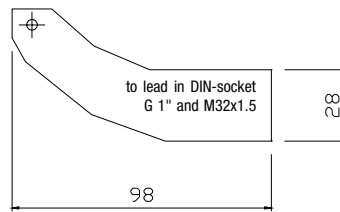
measuring vane reinforce
("L" will be 16mm longer)



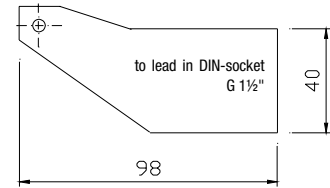
noched



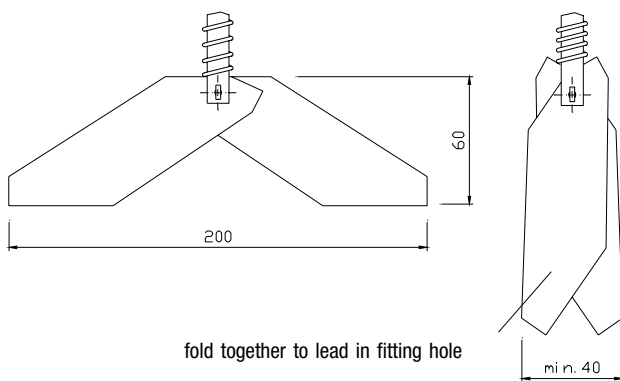
boot shaped vane



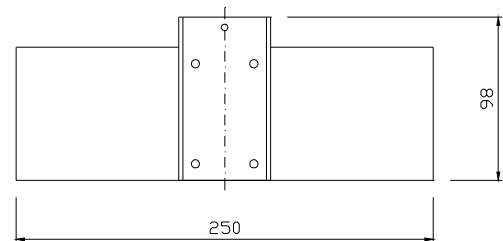
boot shaped vane



hinged vane

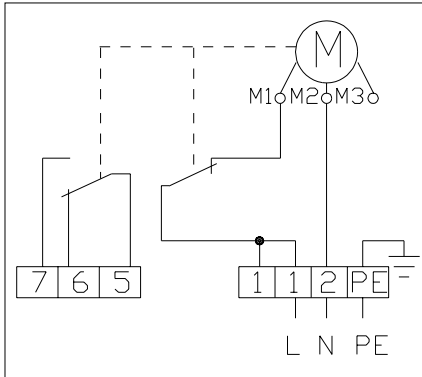


rubber vane

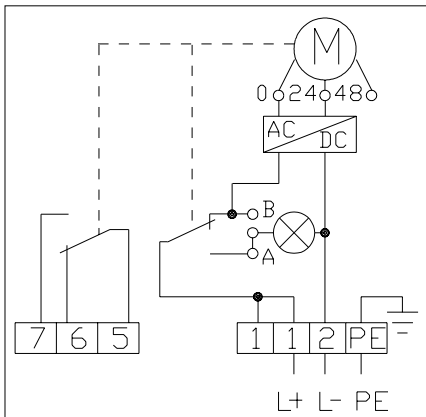


version without rotation control

AC design

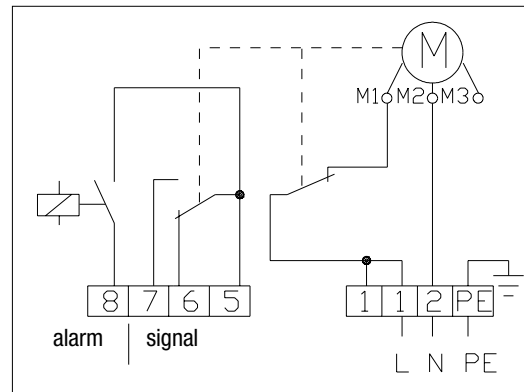


DC design

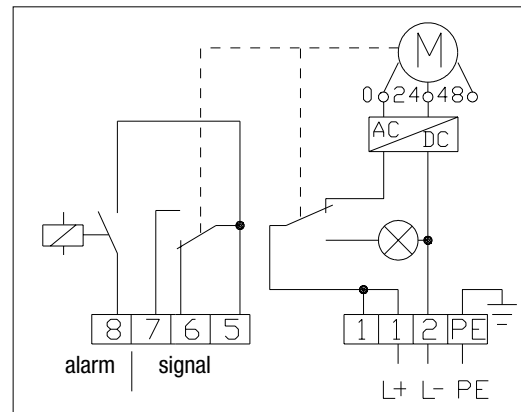


version with rotation control

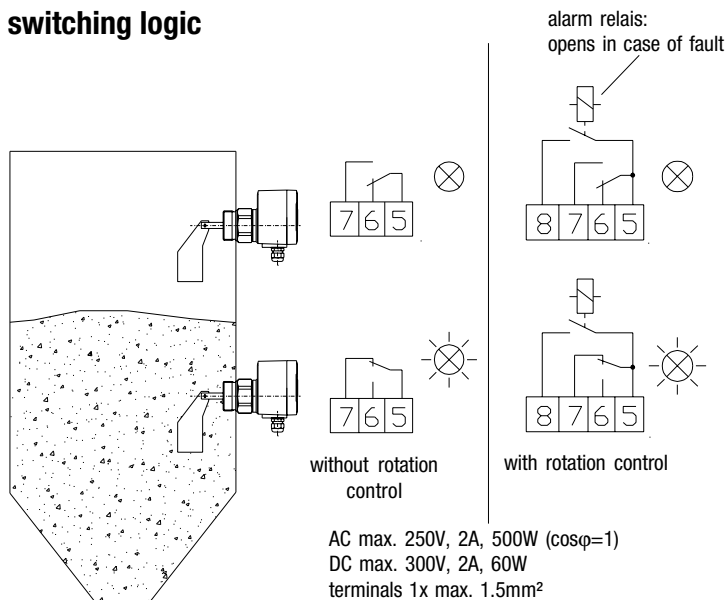
AC design



DC design



switching logic

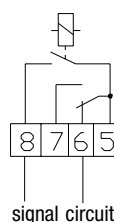


rotation control

switching and timing behaviour:

If the vane is not submerged, the rotating vane shaft will send pulses at 20sec intervals. In case of fault, the pulses are missed. After 30sec the alarm relays will open.

connection example:



Full detector with maximum security:
full signal or
failure of mains voltage or
defect of the connecting wires or
defect unit
will open the signal circuit.

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Level limit switch



Information RN 3000
safety items - mounting

safety items

- Switch off the mains voltage before opening the housing.
Dangerous voltage!
Set into operation only with closed lid of the housing.
- Use a fuse for the mains voltage (max. 4A) and the signal output (max. 4A).
- A voltage disconnecting switch must be provided near the switch.
- A FI protective switch is necessary.
- Compare the mains voltage applied with the specifications given on the label before switching the device on.
- For terminal connection of the device, the local regulations or VDE 0100 (regulations of German electrotechnical engineers) must be observed.
- In the case of inexpert handling or handling malpractice, the electric safety of the device cannot be guaranteed.
- When the device is mounted in areas in which there is danger of dust explosion zone 10, the pertinent rules and regulations must be observed.
- Isolating signal output - mains voltage: 3kV~
- Provide protection for relay contacts to protect the device against spikes, if inductive loads are connected.

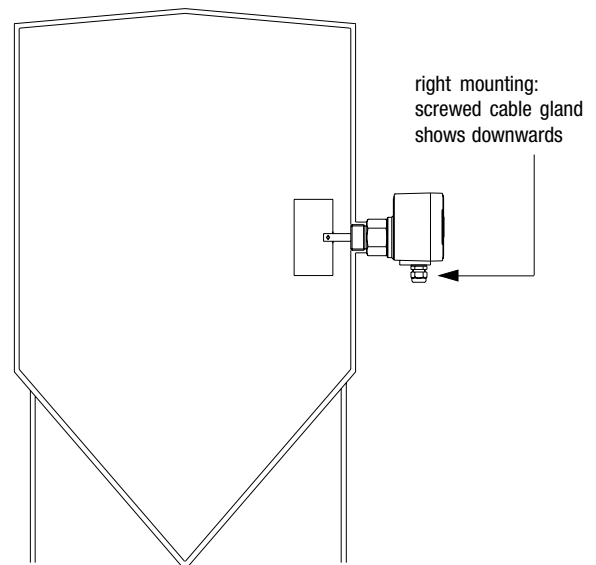
mounting

The unit must be mounted with the thread or the flange on the container. Mounting may be vertical, oblique or horizontal. For the individual mounting of the several ROTONIVO-types see pricelist.

The electrical connections are made in accordance with the connection diagram. Make sure, that the cable in the screwed cable gland is seated tightly without fail.

After mounting, turn the housing in the right direction. The screwed cable gland (or plug) must show downwards (see drawing right hand). This makes sure, that the unit works fine and protects, that water enters into the housing through the screwed cable gland.

When the unit is used in the open, we recommend to use the weather-protection-cover. It protects the unit against moisture, heat, cold and prevents the formation of condensation water in the interior of the housing. Adjusting the unit at site is not required.



adjustment of the spring

The spring is adjustable in 3 positions. It should be changed only if necessary.

"light": for light material;
"central": suitable for nearly every material;
"strong": for strong cacking material;
Factory setting is "central".

The spring can be changed via a small plier.

