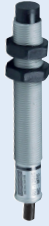


## NAMUR INDUCTIVE & CAPACITIVE SENSORS IP68 (DIN 19234)

| Diameter                       | ØM12                                                                              |                                                                                   | ØM18                                                                              |                                                                                   | ØM30                                                                               |                                                                                     | ØM40                                                                                |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| ● Flush ○ Surface              | ●                                                                                 | ○                                                                                 | ●                                                                                 | ○                                                                                 | ●                                                                                  | ○                                                                                   | ●                                                                                   | ○                                                                                   |
|                                |  |  |  |  |  |  |  |  |
| Sensing Distance               | 2mm                                                                               | 4mm                                                                               | 5mm                                                                               | 8mm                                                                               | 10mm                                                                               | 15mm                                                                                | 20mm                                                                                | 25mm                                                                                |
| Supply Voltage                 | 8,2 - 10VDC (via module)                                                          |                                                                                   | 8,2 - 10VDC (via module)                                                          |                                                                                   | 8,2 - 10VDC (via module)                                                           |                                                                                     | 8,2 - 10VDC (via module)                                                            |                                                                                     |
| Current Consumption            | ≤ 2 mA                                                                            |                                                                                   | ≤ 2 mA                                                                            |                                                                                   | ≤ 2 mA                                                                             |                                                                                     | ≤ 2 mA                                                                              |                                                                                     |
| Output Current (Metal Present) | 0,8mA Typical                                                                     |                                                                                   | 0,8mA Typical                                                                     |                                                                                   | 0,8mA Typical                                                                      |                                                                                     | 0,8mA Typical                                                                       |                                                                                     |
| Output Current (Metal Absent)  | 4mA Typical                                                                       |                                                                                   | 4mA Typical                                                                       |                                                                                   | 4mA Typical                                                                        |                                                                                     | 4mA Typical                                                                         |                                                                                     |
| Switching Frequency            | 2000Hz                                                                            |                                                                                   | 1000Hz                                                                            |                                                                                   | 500Hz                                                                              |                                                                                     | 500Hz                                                                               |                                                                                     |
| Operating Temp.                | -20 to +70 °C                                                                     |                                                                                   | -20 to +70 °C                                                                     |                                                                                   | -20 to +70 °C                                                                      |                                                                                     | -20 to +70 °C                                                                       |                                                                                     |
| Hysteresis                     | 3 to 15%                                                                          |                                                                                   | 3 to 15%                                                                          |                                                                                   | 3 to 15%                                                                           |                                                                                     | 3 to 15%                                                                            |                                                                                     |
| Cable Length                   | 2m                                                                                |                                                                                   | 2m                                                                                |                                                                                   | 2m                                                                                 |                                                                                     | 2m                                                                                  |                                                                                     |
| Cable Section                  | 2 Wire                                                                            |                                                                                   | 2 Wire                                                                            |                                                                                   | 2 Wire                                                                             |                                                                                     | 2 Wire                                                                              |                                                                                     |
| Housing Material               | Aluminium                                                                         |                                                                                   | Aluminium                                                                         |                                                                                   | Aluminium                                                                          |                                                                                     | Aluminium                                                                           |                                                                                     |

For Sensor Cables see pages 329-332

### Wiring Diagram



Ex ia, Gr T6 NAMUR sensors require a suitably approved control module to operate in intrinsically safe areas. (Please request more information)

### NAMUR control module



NAMUR sensors require a suitable Slimline Control Module to operate **SC300** or **SC301**

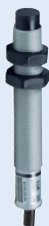
### OUTPUT:

|                 | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| NAMUR NC, Cable |                 |                 |                 |                 |                 |                 |                 |                 |
| NAMUR NC, Plug  | RI0-1202F-NCMTC | RI0-1204S-NCMTC | RI0-1805F-NCMTC | RI0-1808S-NCMTC | RI0-3010F-NCMTC | RI0-3015S-NCMTC | RI0-4020F-NCMTC | RI0-4025S-NCMTC |
|                 | -               | -               | RI0-1805F-NCMTP | RI0-1808S-NCMTP | -               | -               | -               | -               |

### Capacitive NAMUR Sensors

|                  |   |   |   |   |                 |                 |   |   |
|------------------|---|---|---|---|-----------------|-----------------|---|---|
| NC, Metal, Cable | - | - | - | - | RC0-3010F-NCMTC | RC0-3020S-NCMTC | - | - |
| NC, Metal, Plug  | - | - | - | - | RC0-3010F-NCMTP | RC0-3020S-NCMTP | - | - |

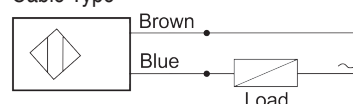
## AC INDUCTIVE SENSORS IP68

| Diameter            | ØM12                                                                                |                                                                                     | ØM18                                                                                |                                                                                     | ØM30                                                                                 |                                                                                       | ØM40                                                                                  |                                                                                       |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ● Flush ○ Surface   | ●                                                                                   | ○                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                    | ○                                                                                     | ●                                                                                     | ○                                                                                     |
|                     |  |  |  |  |  |  |  |  |
| Sensing Distance    | 2mm                                                                                 | 4mm                                                                                 | 5mm                                                                                 | 8mm                                                                                 | 10mm                                                                                 | 15mm                                                                                  | 20mm                                                                                  | 25mm                                                                                  |
| Supply Voltage      | 20 - 250VAC                                                                         |                                                                                     | 20 - 250VAC                                                                         |                                                                                     | 20 - 250VAC                                                                          |                                                                                       | 20 - 250VAC                                                                           |                                                                                       |
| Current Consumption | ≤ 2 mA                                                                              |                                                                                     | ≤ 2 mA                                                                              |                                                                                     | ≤ 2 mA                                                                               |                                                                                       | ≤ 2 mA                                                                                |                                                                                       |
| Output Current      | 400mA                                                                               |                                                                                     | 400mA                                                                               |                                                                                     | 400mA                                                                                |                                                                                       | 400mA                                                                                 |                                                                                       |
| Switching Frequency | 10Hz                                                                                |                                                                                     | 10Hz                                                                                |                                                                                     | 10Hz                                                                                 |                                                                                       | 10Hz                                                                                  |                                                                                       |
| Operating Temp.     | -20 to +70 °C                                                                       |                                                                                     | -20 to +70 °C                                                                       |                                                                                     | -20 to +70 °C                                                                        |                                                                                       | -20 to +70 °C                                                                         |                                                                                       |
| Hysteresis          | 3 to 15%                                                                            |                                                                                     | 3 to 15%                                                                            |                                                                                     | 3 to 15%                                                                             |                                                                                       | 3 to 15%                                                                              |                                                                                       |
| Cable Length        | 2m                                                                                  |                                                                                     | 2m                                                                                  |                                                                                     | 2m                                                                                   |                                                                                       | 2m                                                                                    |                                                                                       |
| Cable Section       | 2 Wire                                                                              |                                                                                     | 2 Wire                                                                              |                                                                                     | 2 Wire                                                                               |                                                                                       | 2 Wire                                                                                |                                                                                       |
| Housing Material    | Aluminium                                                                           |                                                                                     | Aluminium                                                                           |                                                                                     | Aluminium                                                                            |                                                                                       | Aluminium                                                                             |                                                                                       |

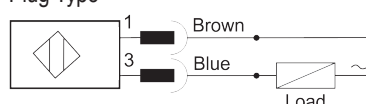
For Sensor Cables see pages 329-332

### Wiring Diagram

#### Cable Type



#### Plug Type



**Note:** These sensors are not protected against sustained current fault conditions. The fitting of an external inline 0, 4A fuse is therefore advised.

### OUTPUT:

|           | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| NO, Cable | RI1-1202F-NOMTC | RI1-1204S-NOMTC | RI1-1805F-NOMTC | RI1-1808S-NOMTC | RI1-3010F-NOMTC | RI1-3015S-NOMTC | RI1-4020F-NOMTC | RI1-4025S-NOMTC |
| NC, Cable | RI1-1202F-NCMTC | RI1-1204S-NCMTC | RI1-1805F-NCMTC | RI1-1808S-NCMTC | RI1-3010F-NCMTC | RI1-3015S-NCMTC | RI1-4020F-NCMTC | RI1-4025S-NCMTC |
| NO, Plug  | RI1-1202F-NOMTP | RI1-1204S-NOMTP | RI1-1805F-NOMTP | RI1-1808S-NOMTP | RI1-3010F-NOMTP | RI1-3015S-NOMTP | -               | -               |
| NC, Plug  | RI1-1202F-NCMTP | RI1-1204S-NCMTP | RI1-1805F-NCMTP | RI1-1808S-NCMTP | RI1-3010F-NCMTP | RI1-3015S-NCMTP | -               | -               |





## ■ Capacitive Sensors - Sensitivity Adjustment

### INFLUENCES OF ENVIRONMENTAL CONDITIONS

**Temperature** variations will cause the sensing distance of capacitive sensors to vary by up to 25%. This factor becomes important when detecting a low dielectric material through, for example, glass (see table of dielectric constants).

**Earthing** of metal targets causes an increase in effective sensing distance.

**Humidity, dew, dust, etc.** can also affect the reliable operation of capacitive sensors. It is advisable to mount the sensors in such a way that these factors have minimal effect.

To minimise the effects of environmental conditions, all Rhomberg capacitive sensors come with a multi-turn potentiometer to adjust the sensing distance. When adjusting the sensor, the sensitivity should be set between the minimum and maximum operational points. In applications where materials of a low dielectric need to be detected without coming into contact with the sensor, a PTFE separation is recommended. If there is any doubt, then it is advisable to verify the suitability of the sensor for the application by in-field testing. (Rhomberg sales representatives are qualified to assist in this regard.)

### SENSITIVITY ADJUSTMENT

The sensitivity adjustment screw at the rear of the sensor facilitates fine tuning for the particular application. If, for example, the sensor is being utilised to sense a fluid through a glass window on a container, the sensor can be tuned to ignore the effect of the glass but respond to the liquid behind the glass. Similarly the sensor can be tuned to ignore the froth on top of a liquid. Sensitivity of the sensor increases when the multi-turn adjustment screw at the rear is turned clockwise. 15 turns of the screw will tune the sensor from minimum to maximum sensitivity. If turned to maximum (15 turns clockwise), the sensor becomes over sensitive and responds even if no target substance is present. If turned to a minimum (15 turns anti-clockwise, it will ignore any substance).

### LED INDICATION

• For normally Open (NO) sensors a ● red LED illuminates when a target is sensed.

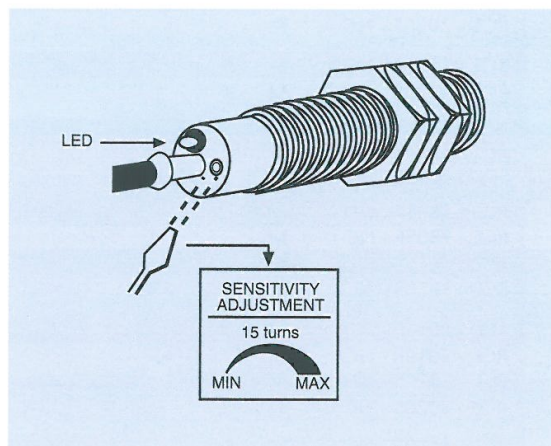
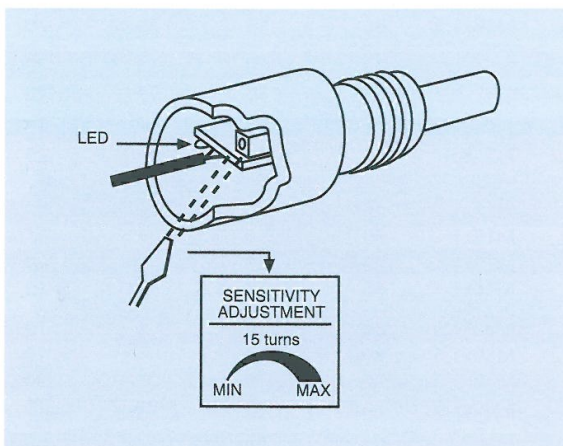
• For normally Closed (NC) sensors a ● green LED is extinguished.

**Note:** For NAMUR sensors, which are always NC, the ● green LED illuminates when no target is present.

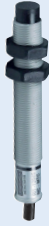
### ENVIRONMENTAL CONDITIONS

Submersion-proof and Dust-proof to IP 67

Operating Temperature: -20° C to + 70°C



## NAMUR INDUCTIVE & CAPACITIVE SENSORS IP68 (DIN 19234)

| Diameter                       | ØM12                                                                              |                                                                                   | ØM18                                                                              |                                                                                   | ØM30                                                                               |                                                                                     | ØM40                                                                                |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| ● Flush ○ Surface              | ●                                                                                 | ○                                                                                 | ●                                                                                 | ○                                                                                 | ●                                                                                  | ○                                                                                   | ●                                                                                   | ○                                                                                   |
|                                |  |  |  |  |  |  |  |  |
| Sensing Distance               | 2mm                                                                               | 4mm                                                                               | 5mm                                                                               | 8mm                                                                               | 10mm                                                                               | 15mm                                                                                | 20mm                                                                                | 25mm                                                                                |
| Supply Voltage                 | 8,2 - 10VDC (via module)                                                          |                                                                                   | 8,2 - 10VDC (via module)                                                          |                                                                                   | 8,2 - 10VDC (via module)                                                           |                                                                                     | 8,2 - 10VDC (via module)                                                            |                                                                                     |
| Current Consumption            | ≤ 2 mA                                                                            |                                                                                   | ≤ 2 mA                                                                            |                                                                                   | ≤ 2 mA                                                                             |                                                                                     | ≤ 2 mA                                                                              |                                                                                     |
| Output Current (Metal Present) | 0,8mA Typical                                                                     |                                                                                   | 0,8mA Typical                                                                     |                                                                                   | 0,8mA Typical                                                                      |                                                                                     | 0,8mA Typical                                                                       |                                                                                     |
| Output Current (Metal Absent)  | 4mA Typical                                                                       |                                                                                   | 4mA Typical                                                                       |                                                                                   | 4mA Typical                                                                        |                                                                                     | 4mA Typical                                                                         |                                                                                     |
| Switching Frequency            | 2000Hz                                                                            |                                                                                   | 1000Hz                                                                            |                                                                                   | 500Hz                                                                              |                                                                                     | 500Hz                                                                               |                                                                                     |
| Operating Temp.                | -20 to +70 °C                                                                     |                                                                                   | -20 to +70 °C                                                                     |                                                                                   | -20 to +70 °C                                                                      |                                                                                     | -20 to +70 °C                                                                       |                                                                                     |
| Hysteresis                     | 3 to 15%                                                                          |                                                                                   | 3 to 15%                                                                          |                                                                                   | 3 to 15%                                                                           |                                                                                     | 3 to 15%                                                                            |                                                                                     |
| Cable Length                   | 2m                                                                                |                                                                                   | 2m                                                                                |                                                                                   | 2m                                                                                 |                                                                                     | 2m                                                                                  |                                                                                     |
| Cable Section                  | 2 Wire                                                                            |                                                                                   | 2 Wire                                                                            |                                                                                   | 2 Wire                                                                             |                                                                                     | 2 Wire                                                                              |                                                                                     |
| Housing Material               | Aluminium                                                                         |                                                                                   | Aluminium                                                                         |                                                                                   | Aluminium                                                                          |                                                                                     | Aluminium                                                                           |                                                                                     |

For Sensor Cables see pages 329-332

### Wiring Diagram



Ex ia, Gr T6 NAMUR sensors require a suitably approved control module to operate in intrinsically safe areas. (Please request more information)

### NAMUR control module



NAMUR sensors require a suitable Slimline Control Module to operate **SC300** or **SC301**

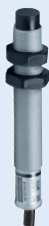
### OUTPUT:

|                 | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| NAMUR NC, Cable |                 |                 |                 |                 |                 |                 |                 |                 |
| NAMUR NC, Plug  | RI0-1202F-NCMTC | RI0-1204S-NCMTC | RI0-1805F-NCMTC | RI0-1808S-NCMTC | RI0-3010F-NCMTC | RI0-3015S-NCMTC | RI0-4020F-NCMTC | RI0-4025S-NCMTC |
|                 | -               | -               | RI0-1805F-NCMTP | RI0-1808S-NCMTP | -               | -               | -               | -               |

### Capacitive NAMUR Sensors

|                  |   |   |   |   |                 |                 |   |   |
|------------------|---|---|---|---|-----------------|-----------------|---|---|
| NC, Metal, Cable | - | - | - | - | RC0-3010F-NCMTC | RC0-3020S-NCMTC | - | - |
| NC, Metal, Plug  | - | - | - | - | RC0-3010F-NCMTP | RC0-3020S-NCMTP | - | - |

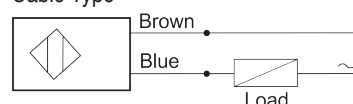
## AC INDUCTIVE SENSORS IP68

| Diameter            | ØM12                                                                                |                                                                                     | ØM18                                                                                |                                                                                     | ØM30                                                                                 |                                                                                       | ØM40                                                                                  |                                                                                       |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ● Flush ○ Surface   | ●                                                                                   | ○                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                    | ○                                                                                     | ●                                                                                     | ○                                                                                     |
|                     |  |  |  |  |  |  |  |  |
| Sensing Distance    | 2mm                                                                                 | 4mm                                                                                 | 5mm                                                                                 | 8mm                                                                                 | 10mm                                                                                 | 15mm                                                                                  | 20mm                                                                                  | 25mm                                                                                  |
| Supply Voltage      | 20 - 250VAC                                                                         |                                                                                     | 20 - 250VAC                                                                         |                                                                                     | 20 - 250VAC                                                                          |                                                                                       | 20 - 250VAC                                                                           |                                                                                       |
| Current Consumption | ≤ 2 mA                                                                              |                                                                                     | ≤ 2 mA                                                                              |                                                                                     | ≤ 2 mA                                                                               |                                                                                       | ≤ 2 mA                                                                                |                                                                                       |
| Output Current      | 400mA                                                                               |                                                                                     | 400mA                                                                               |                                                                                     | 400mA                                                                                |                                                                                       | 400mA                                                                                 |                                                                                       |
| Switching Frequency | 10Hz                                                                                |                                                                                     | 10Hz                                                                                |                                                                                     | 10Hz                                                                                 |                                                                                       | 10Hz                                                                                  |                                                                                       |
| Operating Temp.     | -20 to +70 °C                                                                       |                                                                                     | -20 to +70 °C                                                                       |                                                                                     | -20 to +70 °C                                                                        |                                                                                       | -20 to +70 °C                                                                         |                                                                                       |
| Hysteresis          | 3 to 15%                                                                            |                                                                                     | 3 to 15%                                                                            |                                                                                     | 3 to 15%                                                                             |                                                                                       | 3 to 15%                                                                              |                                                                                       |
| Cable Length        | 2m                                                                                  |                                                                                     | 2m                                                                                  |                                                                                     | 2m                                                                                   |                                                                                       | 2m                                                                                    |                                                                                       |
| Cable Section       | 2 Wire                                                                              |                                                                                     | 2 Wire                                                                              |                                                                                     | 2 Wire                                                                               |                                                                                       | 2 Wire                                                                                |                                                                                       |
| Housing Material    | Aluminium                                                                           |                                                                                     | Aluminium                                                                           |                                                                                     | Aluminium                                                                            |                                                                                       | Aluminium                                                                             |                                                                                       |

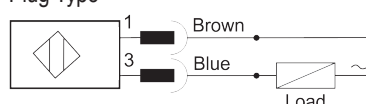
For Sensor Cables see pages 329-332

### Wiring Diagram

#### Cable Type



#### Plug Type



**Note:** These sensors are not protected against sustained current fault conditions. The fitting of an external inline 0, 4A fuse is therefore advised.

### OUTPUT:

|           | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| NO, Cable | RI1-1202F-NOMTC | RI1-1204S-NOMTC | RI1-1805F-NOMTC | RI1-1808S-NOMTC | RI1-3010F-NOMTC | RI1-3015S-NOMTC | RI1-4020F-NOMTC | RI1-4025S-NOMTC |
| NC, Cable | RI1-1202F-NCMTC | RI1-1204S-NCMTC | RI1-1805F-NCMTC | RI1-1808S-NCMTC | RI1-3010F-NCMTC | RI1-3015S-NCMTC | RI1-4020F-NCMTC | RI1-4025S-NCMTC |
| NO, Plug  | RI1-1202F-NOMTP | RI1-1204S-NOMTP | RI1-1805F-NOMTP | RI1-1808S-NOMTP | RI1-3010F-NOMTP | RI1-3015S-NOMTP | -               | -               |
| NC, Plug  | RI1-1202F-NCMTP | RI1-1204S-NCMTP | RI1-1805F-NCMTP | RI1-1808S-NCMTP | RI1-3010F-NCMTP | RI1-3015S-NCMTP | -               | -               |