Level- and temperature switch

Nivotemp NT 64, Nivovent NV 74

Installation and Operation Instructions

Original instructions
Read this instruction carefully prior to installation and/or use. Pay attention particularly to all advises and safety instructions to prevent injuries. Bühler Technologies can not be held responsible for misusing the product or unreliable function due to unauthorised modifications.

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1 Introduction

1.1 Intended Use

Level switches are used to monitor the liquid level and temperature in fluid systems. Level switches must not be used in highly flammable or corrosive liquids. The medium must not contain particles, particularly metallic particles, to prevent deposits on the float or between the float and switching tube. If necessary, filter the medium. Please note the technical data in the appendix for the specific intended use, existing material combinations, as well as temperature limits.

WARNING

All device models are solely intended for industrial applications. They are not safety components. The devices must not be used if failure or malfunction thereof jeopardises the safety and health of persons. Use in explosive areas is prohibited.

1.2 Functionality

1.2.1 Liquid level monitoring

The easyjust system on the Nivotemp NT64 and Nivovent NV74 allows the use of standardised immersion tube lengths for different size and shape oil tanks. The switching points can be configured to system needs at any time. The level contacts are inside closed housings. These are simply positioned on a contact strip with gold-plated contacts at the desired spacing. The minimum distance between two contacts is 40 mm, the grid is 10 mm.

The colour coded contacts ensure the terminal configuration for the connection is correct. The switching function as falling NC contact (NO) or as falling NO contact (NC) is determined by the position in which the contacts are installed. They can also be used as change-over contacts.

Signalling is entirely electronic, via the switching outputs.

1.2.2 Temperature monitor

The temperature is monitored via thermal element plugged into the end of the carrier board. Here the options are temperature contacts with fixed grading, a Pt 100 or a temperature transmitter with 4-20 mA outputs.

Please note the technical data in the appendix.
1.3 Design types
The level switch is equipped with different switching and analogue outputs based on the configuration. The outputs are freely programmable.

The Nivovent type can be equipped with the following options:

- **VS** Optical contamination indicator for the vent filter: analogue negative pressure display, display range 0.35 bar (5.1 PSI).
- **BFA** Filling adapter incl. ribbed flange with screen insert: This option enables adding small amounts of oil through the vent filter housing. The selected version is built into the respective housing for this purpose.
- **SSR** Stilling tube with centring disc and filling adapter: Just as with the BFA, this contains both the stilling tube option as well as the filler. The stilling tube is made from the same material as the selected immersion tube (MS/VA).
- **MT** for installation into the multiterminal: Here the basic version is built into the multiterminal (MT).
- **MTS** for installation into the multiterminal including stilling tube: In addition to the basic version, a stilling tube with centring disc is built into the multiterminal.
- **FCT** Fluid control terminal: Here the fluid control terminal (FCT) is mounted directly onto the basic version.

* not in conjunction with FCT and MT/MTS option

The SSR option is available for the Nivotemp type.

Please refer to the type plate for your equipment configuration. In addition to the job number, this also contains the item number and type designation.

1.4 Model key NT64

<table>
<thead>
<tr>
<th>Model designation</th>
<th>Version</th>
<th>MS</th>
<th>Brass</th>
<th>VA float / VA immersion tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional</td>
<td>SSR</td>
<td>Stilling tube</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature signal</td>
<td>TK... NC contact NO contact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TK50NC TK50NO = 50 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TK60NC TK60NO = 60 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TK70NC TK70NO = 70 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TK80NC TK80NO = 80 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt100 Temperature sensor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KT Temperature transmitter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Please specify position and switching function per model key, example: L1 = nnnmm NC
1.5 Model key NV74

<table>
<thead>
<tr>
<th>Type designation, HY filter</th>
<th>NV 74-HY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
<td>MS</td>
</tr>
<tr>
<td>Brass</td>
<td>VA</td>
</tr>
<tr>
<td>VA(^1) float / VA immersion tube</td>
<td></td>
</tr>
<tr>
<td>Plug connector</td>
<td>M3</td>
</tr>
<tr>
<td></td>
<td>S6</td>
</tr>
<tr>
<td></td>
<td>M12</td>
</tr>
<tr>
<td></td>
<td>2M12</td>
</tr>
<tr>
<td>Length in mm</td>
<td>280</td>
</tr>
<tr>
<td></td>
<td>370</td>
</tr>
<tr>
<td></td>
<td>500</td>
</tr>
<tr>
<td>Level measurement</td>
<td>1-4</td>
</tr>
<tr>
<td>Number of contacts(^2)</td>
<td></td>
</tr>
<tr>
<td>Level contacts</td>
<td>K</td>
</tr>
<tr>
<td></td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>NC/NO</td>
</tr>
<tr>
<td></td>
<td>change-over contact</td>
</tr>
</tbody>
</table>

\(^1\) Not in conjunction with option FCT
\(^2\) Please specify position and switching function per model key, Example: L1 = nnn mm NC
\(^3\) Not in conjunction with FCT, MT or MTS option

<table>
<thead>
<tr>
<th>Options</th>
<th>Contamination indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>BFA***</td>
<td>Filling adapter</td>
</tr>
<tr>
<td>SSR***</td>
<td>Stilling tube incl.</td>
</tr>
<tr>
<td></td>
<td>filling adapter</td>
</tr>
<tr>
<td>MT</td>
<td>for multiterminal</td>
</tr>
<tr>
<td>MTS</td>
<td>for multiterminal with</td>
</tr>
<tr>
<td></td>
<td>stilling tube option</td>
</tr>
<tr>
<td>FCT</td>
<td>for Fluidcontrolterminal</td>
</tr>
<tr>
<td>Temperature signal</td>
<td>TK...</td>
</tr>
<tr>
<td></td>
<td>NC contact</td>
</tr>
<tr>
<td></td>
<td>NO contact</td>
</tr>
<tr>
<td>TK50NC</td>
<td>TK50NO = 50 °C</td>
</tr>
<tr>
<td>TK60NC</td>
<td>TK60NO = 60 °C</td>
</tr>
<tr>
<td>TK70NC</td>
<td>TK70NO = 70 °C</td>
</tr>
<tr>
<td>TK80NC</td>
<td>TK80NO = 80 °C</td>
</tr>
<tr>
<td>Pt100</td>
<td>Temperature sensor</td>
</tr>
<tr>
<td>KT</td>
<td>Temperature transmitter</td>
</tr>
</tbody>
</table>

1.6 Scope of Delivery
- Level switch
- Product documentation
- Connection/mounting accessories (optional)
Chapter 2: Safety Instructions

2.1 Important Advice

Operation of the device is only valid if:

- the product is used under the conditions described in the installation- and operation instruction, the intended application according to the type plate and the intended use. In case of unauthorized modifications done by the user Bühler Technologies GmbH can not be held responsible for any damage,
- when complying with the specifications and markings on the nameplates,
- the performance limits given in the datasheets and in the installation- and operation instruction are obeyed,
- monitoring devices and safety devices are installed properly,
- service and repair is carried out by Bühler Technologies GmbH,
- only original spare parts are used.

This manual is part of the equipment. The manufacturer keeps the right to modify specifications without advanced notice. Keep this manual for later use.

Signal Words for Warnings

**DANGER**
Signal word for an imminent danger with high risk, resulting in severe injuries or death if not avoided.

**WARNING**
Signal word for a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.

**CAUTION**
Signal word for a hazardous situation with low risk, resulting in damaged to the device or the property or minor or medium injuries if not avoided.

**NOTICE**
Signal word for important information to the product.

Warning Signs

These instructions use the following warning signs:

- **Exclamation mark** Signals of a general hazard
- **Electric plug** Unplug from mains
- **Voltage symbol** Voltage warning
- **Goggles** Wear respiratory equipment
- **Cross** Warns not to inhale toxic gasses
- **Exclamation mark** Wear a safety mask
- **Triangle** Warns of corrosive liquids
- **Gloves** Wear gloves
- **Information symbol** General information
2.2 General hazard warnings

The equipment must be installed by a professional familiar with the safety requirements and risks.

Be sure to observe the safety regulations and generally applicable rules of technology relevant for the installation site. Prevent malfunctions and avoid personal injuries and property damage.

The operator of the system must ensure:
- Safety notices and operating instructions are available and observed,
- The respective national accident prevention regulations are observed,
- The permissible data and operational conditions are maintained,
- Safety guards are used and mandatory maintenance is performed,
- Legal regulations are observed during disposal.

Maintenance, Repair

Please note during maintenance and repairs:
- Repairs to the unit must be performed by Bühler authorised personnel.
- Only perform conversion-, maintenance or installation work described in these operating and installation instructions.
- Always use genuine spare parts.

Always observe the applicable safety and operating regulations in the respective country of use when performing any type of maintenance.

The method for cleaning the devices must be adapted to the IP protection class of the devices. Do not use cleaners which could damage the device materials.

DANGER

Toxic, acidic gases/liquids

Protect yourself from toxic, corrosive gasses/liquids when performing any type of work.
Wear appropriate protective equipment.
3 Transport and storage

Only transport the product inside the original packaging or a suitable alternative.
The equipment must be protected from moisture and heat when not in use. It must be stored in a covered, dry, dust-free room at room temperature.
4 Setup and connection

DANGER  Electric voltage
Risk of electric shock
a) Always disconnect the unit from the mains before performing work.
b) Secure the equipment from accidental restarting.
c) The equipment may only be installed, maintained and put into operation by instructed, competent personnel.
d) Always observe the applicable safety regulations for the operating site.

DANGER  Toxic, acidic gases/liquids
Protect yourself from toxic, corrosive gases/liquids when performing any type of work. Wear appropriate protective equipment.

4.1 Installation

Please note before installing the level switch!
After transport and delivery of the level switch, the switching status of the bistable contacts may be different than required for proper operation.
Therefore slide the float for the level switch along the level switch tube from below immediately before installation.
This ensures all built-in bistable contacts have a clearly defined switching status (NC or NO).
For direct installation to the tank, insert the switching tube into the designated bore (per DIN 24557, Part 2) with rubberised cork seal on the tank. It secures to the flange using the included screws and seals. Please be sure the float can move freely and to leave enough space between the tank wall and add-ons.
After removing the float, where applicable, be sure the magnet inside the float is above the fluid level. This can easily be verified with a piece of iron to determine the magnet position inside the float.

DANGER  Electric voltage
Risk of electric shock
When connecting devices, please note the maximum voltages and currents (see technical data) and use the correct wire cross-sections and circuit breakers.
When selecting the connection lines, also note the maximum operating temperatures of the devices.
Installation in special areas of application:
If the device will be installed outdoors or in wet areas, the maximum operating voltage is max. 16 V DC effective or 35 V DC.
4.2 Information on the correct operation of reed contacts in Bühler level switches

Based on their construction, reed contacts are very long lasting and reliable components. Yet the following should be considered when using them:

**Life of reed switches**

The life of reed switches can be up to $10^9$ cycles. This is reduced by high stress and / or incorrect or the absence of protective circuits when switching inductive, capacitive or lamp loads.

It's therefore important to ensure NEVER to exceed one or several of the maximum approved limits, even temporarily, and to install a contact protective circuit for loads which are not purely ohmic. Using test lamps when installing the devices is also prohibited, as these can temporarily allow too much current to flow, which can damage the reed contacts. In this case non-volatile testing equipment should always be used.

**Contact protective circuits for reed switches**

For direct current voltage a recovery diode per figure A must be connected parallel to the contact.

For alternating current voltage an RC circuit per figure B and Table 1 must be connected parallel to the contact.

**Load in VA**

<table>
<thead>
<tr>
<th>Voltage at contact V</th>
<th>10</th>
<th>25</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>R/Ohm</td>
<td>C/µF</td>
<td>R/Ohm</td>
</tr>
<tr>
<td>22</td>
<td>0.022</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>60</td>
<td>120</td>
<td>0.0047</td>
<td>22</td>
</tr>
<tr>
<td>110</td>
<td>470</td>
<td>0.0047</td>
<td>22</td>
</tr>
<tr>
<td>230</td>
<td>470</td>
<td>0.001</td>
<td>470</td>
</tr>
</tbody>
</table>

Please note the max. voltage/load ratings of the respective level contacts!

**Voltages and currents**

All Bühler level contacts with reed switch can switch minimal switching voltages of 10 µV and minimal switching currents of 1 µA.

The maximum values specified for the respective contact types apply.

Level contact with reed switches can therefore be used for SPS applications as well as for high loads (within the maximum limits) without hesitation.

**Contact material**

All reed switches in Bühler level contacts use rhodium as the contact material for the actual contact areas.

**Magnetic fields**

Avoid external magnetic fields, including from electric motors. These can interfere with the function of the reed switches.

**Mechanical loads**

Do not expose the level switch to strong blows or bending.
4.3 Adjusting the level contacts

The contacts required for the float are mounted to a galvanically gold-plated with cm scale with plastic screws. The contact housings have different colours and may only be mounted to the contact strip in the following order.

<table>
<thead>
<tr>
<th>NC contact / NO contact</th>
<th>Change-over contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top to bottom:</td>
<td></td>
</tr>
<tr>
<td>green</td>
<td>white</td>
</tr>
<tr>
<td>yellow</td>
<td>black</td>
</tr>
<tr>
<td>red</td>
<td>blue</td>
</tr>
</tbody>
</table>

Any other order may result in malfunctions.

The level contacts are arranged per order specifications at the factory but may later be moved along a 10 mm (0.4") grid. The falling NC contact (NO) or falling NO contact (NC) contact function may also be changed by turning the contact housings 180°. The housing has two arrows. The arrow pointing up indicates the current contact function.

**NOTICE**

Only tighten the plastic screw at maximal 5 cNm!

Function NO:

- NO contact with rising level
  
  = NC contact with falling level

Function NC:

- NC contact with rising level

  = NO contact with falling level

The contact logic assumes the level switch is installed in an empty tank, i.e. it is only in the operating position once filled.

**The reference point for the level switching point is at the middle of the EASYJUST level contact.**
NT64:
- Disconnect the voltage supply.
- Disconnect the plug.
- Unscrew the display housing with base and carefully pull out the top along with the adapter plug and the contact strip.
- Loosen and reposition the plastic screws on the contacts (cm scale on the back of the contact strip). Minimum spacing: 40 mm (1.6”).
- If necessary, turn 180° to change the contact function.
- Tighten the plastic screws for fastening the contact. Please note the maximum torque (max. 5 cNm).
- Slide the contact strip back into the protective tube and screw on the plug base.

**NOTICE**
Ensure the seals are positioned correctly. Replace defective seals immediately!

**Example:**

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

1. Plug connection M3 with plug base
2. Adapter plug
3. Plastic screws
4. Level contacts
5. Contact strip
6. Optional: Temperature contact (TK), Pt100 or 4-20 mA output
7. Flange
8. Switching tube
9. Float
NV74:
– Disconnect the voltage supply.
– Unscrew the filter cover and remove the filter element.
– Loosen the mounting screws and remove the filter case.
– Loosen the screws for the flange cover and remove the cover with cover seal.
– Disconnect the adapter plug from the contact strip and carefully pull the contact strip out the top.
– Loosen and reposition the plastic screws on the contacts (cm scale on the back of the contact strip). Minimum spacing: 40 mm (1.6”).
– If necessary, turn 180° to change the contact function.
– Tighten the plastic screws for fastening the contact. Please note the maximum torque (max. 5 cNm).
– Slide the contact strip back into the protective tube.
– Reattach the adapter plug to the contact strip the right way. The markings on the adapter flange and the contact strip must overlap.
– Fasten the flange cover incl. seal.
– Secure filter case, insert filter element and screw on filter cover.

**NOTICE**
Ensure the seals are positioned correctly. Replace defective seals immediately!

Example:

| 1 Filter cover | 8 Optional: Temperature contact (TK) or Pt100 |
| 2 Filter element | 9 Flange |
| 3 Filter case and seal | 10 Adapter plug |
| 4 Flange cover and seal | 11 Example: Plug connection M3 with plug base |
| 5 Plastic screws | 12 Switching tube |
| 6 Level contacts | 13 Float |
| 7 Contact strip | |

**4.4 Retrofitting a temperature sensor**

If necessary, the temperature sensor can be retrofitted. In this case, please contact our Service Department or your local representative. Please have the data in your type plate ready.
5 Operation and control

NOTICE

The device must not be operated beyond its specifications.
6 Cleaning and Maintenance

This device is maintenance-free.

The method for cleaning the devices must be adapted to the IP protection class of the devices. Do not use cleaners which could damage the device materials.

For versions with filter:

The filter element must be replaced as needed, at least 1x annually. In exceptional cases a small amount of oil can be added via the filter.

During maintenance, remember:

– The equipment must be maintained by a professional familiar with the safety requirements and risks.
– Only perform maintenance work described in these operating and installation instructions.
– When performing maintenance of any type, observe the respective safety and operation regulations.

6.1 Replacing the filter element

Replace the filter element as follows:

– Temporarily shut down the system.
– The filter cover counter-clockwise to open.
– Remove the filter element and dispose according to legal regulations.
– Insert the new filter element. Be sure to use the correct filter fineness!
– Screw on the filter cover.
– For filters with optical contamination indicator: Set the display to zero.

Hydac filter

When the maximum display value is reached, the red indicator piston will lock in place, indicating the filter service is required. Press the yellow Reset button to reset the display to zero.

Filtration Group filter

Filter contamination is indicated in percent (50%, 75% and 100%). To reset the display to zero, turn the knob in the direction of the arrow until the red part of the indicator disc is turned all the way back.

6.2 Adding small amounts of oil

Nivovent type with BFA or SSR option only:

– Temporarily shut down the system.
– The filter cover counter-clockwise to open.
– Remove the filter element.
– Slowly add oil through the nodular holes.
– Reinsert the filter element and close the cover.
– Restart the system.
7 Service and repair

This chapter contains information on troubleshooting and correction should an error occur during operation.

Repairs to the unit must be performed by Bühler authorised personnel.

Please contact our Service Department with any questions:

Tel.: +49-(0)2102-498955 or your agent

If the equipment is not functioning properly after correcting any malfunctions and switching on the power, it must be inspected by the manufacturer. Please send the equipment inside suitable packaging to:

Bühler Technologies GmbH
- Reparatur/Service -
Harkortstraße 29
40880 Ratingen
Germany

Please also attach the completed and signed RMA decontamination statement to the packaging. We will otherwise be unable to process your repair order.

You will find the form in the appendix of these instructions, or simply request it by e-mail:

service@buehler-technologies.com.

7.1 Spare parts and accessories

Accessories

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9144 05 0010</td>
<td>Connecting cable M12x1, 4-pin, 1.5 m, angular coupling and straight plug</td>
</tr>
<tr>
<td>9144 05 0046</td>
<td>Connecting cable M12x1, 4-pin, 3.0 m, angular coupling and straight plug</td>
</tr>
<tr>
<td>9144 05 0047</td>
<td>Connecting cable M12x1, 4-pin, 5.0 m, angular coupling and strands</td>
</tr>
</tbody>
</table>
8 Disposal

Dispose of parts so as not to endanger the health or environment. Follow the laws in the country of use for disposing of electronic components and devices during disposal.
9 Appendices

9.1 Technical Data NT 64

### Basic unit

<table>
<thead>
<tr>
<th>Version</th>
<th>MS</th>
<th>VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure</td>
<td>max. 1 bar</td>
<td>max. 1 bar</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-20 °C to +80 °C</td>
<td>-20 °C to +80 °C</td>
</tr>
<tr>
<td>Float</td>
<td>SK 610</td>
<td>SK 221</td>
</tr>
<tr>
<td>Min. fluid density</td>
<td>0.80 kg/dm³</td>
<td>0.85 kg/dm³</td>
</tr>
<tr>
<td>Lengths</td>
<td>280, 370, 500 mm (standard)</td>
<td></td>
</tr>
</tbody>
</table>

#### Material/Version

- Float: rigid PU (SK 610) 1.4571 (SK 221)
- Immersion tube: Brass 1.4571
- Flange (DIN 24557): PA
- Weight at L=280 mm: approx. 200 g (MS) approx. 300 g (VA)
- Each 100 mm add: approx. 30 g (MS) approx. 50 g (VA)

#### Includes:

Mounting screws (quantity 6) and rubberised cork seal.

#### Options

- Stilling tube (SSR): Brass VA

#### Level switching output

<table>
<thead>
<tr>
<th>K101-104</th>
<th>W101/102</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>NO/NC* Change-over contact</td>
</tr>
<tr>
<td>Max. number</td>
<td>4 2</td>
</tr>
<tr>
<td>Voltage max.</td>
<td>30 V DC 30 V DC</td>
</tr>
<tr>
<td>Switching current max.</td>
<td>0.5 A 0.5 A</td>
</tr>
<tr>
<td>Contact load max.</td>
<td>10 VA 20 VA</td>
</tr>
<tr>
<td>Min. contact spacing</td>
<td>40 mm 40 mm</td>
</tr>
</tbody>
</table>

*NO= falling NC contact/NC = falling NO contact

#### Optional temperature output

<table>
<thead>
<tr>
<th>TK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature contact</td>
</tr>
<tr>
<td>Voltage max.</td>
</tr>
<tr>
<td>Switching current max.</td>
</tr>
<tr>
<td>Contact load max.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NC*</th>
<th>NO*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td></td>
</tr>
<tr>
<td>Switching point °C</td>
<td>50/60/70/80</td>
</tr>
<tr>
<td>Switching point tolerance</td>
<td>± 3 K</td>
</tr>
<tr>
<td>Hysteresis max.</td>
<td>10 K ± 3 K</td>
</tr>
</tbody>
</table>

*NC = NC contact/NO = NO contact, data for rising temperature

#### Temperature sensor

<table>
<thead>
<tr>
<th>Pt 100 Class B, DIN EN 60 751</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature sensor</td>
</tr>
<tr>
<td>Tolerance</td>
</tr>
</tbody>
</table>

#### Temperature transmitter

<table>
<thead>
<tr>
<th>KT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature transmitter</td>
</tr>
<tr>
<td>Temperature sensor</td>
</tr>
<tr>
<td>Measuring range</td>
</tr>
<tr>
<td>Supply voltage (U)</td>
</tr>
<tr>
<td>Output</td>
</tr>
<tr>
<td>Burden Ω max.</td>
</tr>
<tr>
<td>Accuracy</td>
</tr>
</tbody>
</table>

Other measuring ranges available upon request
## 9.2 Technical Data NV 74

### Basic unit

<table>
<thead>
<tr>
<th>Version</th>
<th>MS</th>
<th>VA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure</td>
<td>max. 1 bar</td>
<td>max. 1 bar</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-20 °C to +80 °C</td>
<td>-20 °C to +80 °C</td>
</tr>
<tr>
<td>Float</td>
<td>SK 610</td>
<td>SK 221</td>
</tr>
<tr>
<td>Min. fluid density</td>
<td>0.80 kg/dm³ with float</td>
<td>0.85 kg/dm³ with float</td>
</tr>
<tr>
<td>Lengths</td>
<td>280, 370, 500 mm (standard)</td>
<td></td>
</tr>
</tbody>
</table>

*Not available in conjunction with FCT option

### Material/Version

- **Float**: rigid PU (SK 610) / 1.4571 (SK 221)
- **Immersion tube**: Brass / 1.4571
- **Flange (DIN 24557)**: PA / PA
- **Weight at L=280 mm**: approx. 800 g / approx. 900 g
- **Each 100 mm add**: approx. 30 g / approx. 50 g

**Includes:**
Mounting screws (quantity 6) and rubberised cork seal.

### Options

- **Stilling tube (SSR)**: Brass / VA

### Vent Filter

- **All versions HY type Hydac BF 7**
- **Filter fineness**: 3 µm
- **Additional equipment**: Filler cap – n/a with filling adapter

### Level switching output

- **Max. number**: 4 / 2
- **Function**: NO / NC* / Change-over contact
- **Voltage max.**: 30 V DC / 30 V DC
- **Switching current max.**: 0.5 A / 0.5 A
- **Contact load max.**: 10 V AC / 20 V AC
- **Min. contact spacing**: 40 mm / 40 mm

*NO= falling NC contact / NC = falling NO contact

### Temperature contact

- **Function**: NC* / NO*
- **Switiching point °C**: 50 / 60 / 70 / 80 / 50 / 60 / 70 / 80
- **Switching point tolerance**: ± 3 K / ± 3 K
- **Max. hysteresis**: 10 K ± 3 K / 10 K ± 3 K

*NC NC contact / NO NO contact. All data for rising temperature*
### Nivotemp NT 64, Nivovent NV 74

<table>
<thead>
<tr>
<th><strong>Temperature contact</strong></th>
<th>TK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature sensor</strong></td>
<td>Pt 100 Class B, DIN EN 60 751</td>
</tr>
<tr>
<td><strong>Tolerance</strong></td>
<td>± 0.8 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Temperature transmitter</strong></th>
<th>KT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature sensor</strong></td>
<td>Pt 100 Class B, DIN EN 60 751</td>
</tr>
<tr>
<td><strong>Measuring range</strong></td>
<td>0 °C to +100 °C</td>
</tr>
<tr>
<td><strong>Supply voltage (U_B)</strong></td>
<td>10 - 30 V DC</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>4 - 20 mA</td>
</tr>
<tr>
<td><strong>Max. burden Ω</strong></td>
<td>(U_B - 7.5 V) / 0.02 A</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>± 1 % from end value</td>
</tr>
</tbody>
</table>

Other measuring ranges available upon request

### 9.3 Dimensions NV 74

#### Basic version

- **NBR seal**
- **GI cork seal**

#### With options

- **Contamination indicator VS**
- **Filling adapter BFA**
- **Stilling tube with centring disc and filling adapter SSR**

#### Flange drawing

- **SK 221 float for NV 74-VA**

---

Bühler Technologies GmbH

BE100020 • 02/2019
### 9.4 Standard pin assignment NT 64

**Plug connection**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>M3</th>
<th>S6</th>
<th>M12 (base)</th>
<th>2M12 (base)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pins</td>
<td>3-pin + PE</td>
<td>6-pin + PE</td>
<td>4-pin</td>
<td>4-pin / 4-pin</td>
</tr>
<tr>
<td>DIN EN</td>
<td>175301-803</td>
<td>175201-804</td>
<td>61076-2-101</td>
<td>61076-2-101</td>
</tr>
<tr>
<td>Voltage max.</td>
<td>30 V AC / V DC</td>
<td>30 V AC / V DC</td>
<td>30 V DC</td>
<td>30 V DC</td>
</tr>
<tr>
<td>Contact load max.</td>
<td>0.5 A per output</td>
<td>0.5 A per output</td>
<td>0.5 A per output</td>
<td>0.5 A per output</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP65</td>
<td>IP65</td>
<td>IP67*</td>
<td>IP67*</td>
</tr>
<tr>
<td>Cable fitting</td>
<td>PG11</td>
<td>M20x1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. number of contacts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level/temp. contacts</td>
<td>1 x K101 / 1 x TK - / -</td>
<td>3 x K101-104 / 1 x TK 1 x W101/102 / 1 x TK</td>
<td>1 x K101 / 1 x TK - / -</td>
<td>3 x K101-104 / 1 x TK 1 x W101/102 / 1 x TK</td>
</tr>
<tr>
<td>Level contacts only</td>
<td>2 x K101-102 1 x W101</td>
<td>4 x K101-104 2 x W101/102</td>
<td>4 x K101-102 2 x W101</td>
<td>4 x K101-104 1 x W101/102</td>
</tr>
</tbody>
</table>

*With moulded cable box. Other plug connections available upon request.*
The standard assignment specified here applies to the max. number of contacts possible and contact function NO.
### 9.5 Standard pin assignment NV 74

#### Plug connection

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>M3</th>
<th>S6</th>
<th>M12 (base)</th>
<th>2M12 (base)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pins</td>
<td>3-pin + PE</td>
<td>6-pin + PE</td>
<td>4-pin</td>
<td>4-pin / 4-pin</td>
</tr>
<tr>
<td>DIN EN</td>
<td>175301-803</td>
<td>175201-804</td>
<td>61076-2-101</td>
<td>61076-2-101</td>
</tr>
<tr>
<td>Voltage max.</td>
<td>30 V AC / V DC</td>
<td>30 V AC / V DC</td>
<td>30 V DC</td>
<td>30 V DC</td>
</tr>
<tr>
<td>Contact load max.</td>
<td>0.5 A per output</td>
<td>0.5 A per output</td>
<td>0.5 A per output</td>
<td>0.5 A per output</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP65</td>
<td>IP65</td>
<td>IP67*</td>
<td>IP67*</td>
</tr>
<tr>
<td>Cable fitting</td>
<td>PG11</td>
<td>M20x1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. number of contacts</td>
<td>1 x K101-104 / 1 x TK - / -</td>
<td>3 x K101-104 / 1 x TK 1 x W101/102 / 1 x TK</td>
<td>1 x K101-104 / 1 x TK - / -</td>
<td>3 x K101-102 / 1 x TK 1 x W101 / 1 x TK</td>
</tr>
<tr>
<td>Level/Temp. contacts</td>
<td>2 x K101-104 1 x W101/102</td>
<td>4 x K101-104 2 x W101/102</td>
<td>4 x K101-104 2 x W101/102</td>
<td>4 x K101-104 1 x W101/102</td>
</tr>
<tr>
<td>Level contacts only</td>
<td>2 x K101-104 1 x W101/102</td>
<td>4 x K101-104 2 x W101/102</td>
<td>4 x K101-104 2 x W101/102</td>
<td>4 x K101-104 1 x W101/102</td>
</tr>
</tbody>
</table>

* With moulded cable box. Other plug connections available upon request.
### Nivotemp NT 64, Nivovent NV 74

#### Connection schematic

<table>
<thead>
<tr>
<th>M3</th>
<th>S6</th>
<th>M12 (base)</th>
<th>2 x M12 (base)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="M3" /></td>
<td><img src="image2" alt="S6" /></td>
<td><img src="image3" alt="M12" /></td>
<td><img src="image4" alt="2 x M12" /></td>
</tr>
</tbody>
</table>

**K101-104**
- Level contact(s)

**W101/102**
- Level contact(s)

**K101-104**
- Level contact(s) and Pt100

**W101/102**
- Level- and temperature contact(s)

The standard assignment specified here applies to the max. number of contacts possible and contact function NO.
9.6 Definitions

NO = NO contact
NC = NC contact
TK = thermal contact
KT = temperature transmitter
PT = temperature sensor Pt100

Note on the temperature transmitter: The analogue output can be loaded with max. +30 V DC.
10 Attached documents

- Declaration of conformity: KX100020
- RMA - Decontamination Statement
Hiermit erklärt Bühler Technologies GmbH, dass die nachfolgenden Produkte den wesentlichen Anforderungen der Richtlinie 2014/30/EU (Elektromagnetische Verträglichkeit / electromagnetic compatibility) in ihrer aktuellen Fassung entsprechen.

Produkt / products: Niveauschalter und -geber / Level switches and gauges
Typ / type: Nivotemp 61D, 63, 64, 64D, 67XP, MD, M-XP
Nivovent 71D, 73, 74, 74D, 77XP

Die Betriebsmittel dienen zur Überwachung des Füllstandes und der Temperatur in Fluidsystemen. The equipment is designed for monitoring level and temperature in fluid systems.

Das oben beschriebene Produkt der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union: The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

EN 61326-1:2013

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. This declaration of conformity is issued under the sole responsibility of the manufacturer.

Dokumentationsverantwortlicher für diese Konformitätserklärung ist Herr Stefan Eschweiler mit Anschrift am Firmensitz. The person authorised to compile the technical file is Mr. Stefan Eschweiler located at the company’s address.


Stefan Eschweiler
Geschäftsführer – Managing Director

Frank Pospiech
Geschäftsführer – Managing Director

Bühler Technologies GmbH, Harkortstr. 25, D-40880 Ratingen, Tel. +49 (0) 21 02 / 49 89-0, Fax. +49 (0) 21 02 / 49 89-20
Internet: www.buehler-technologies.com
**RMA-Formular und Erklärung über Dekontamination**

**RMA-Form and explanation for decontamination**

**RMA-Nr. / RMA-No.**  

Die RMA-Nummer bekommen Sie von Ihrem Ansprechpartner im Vertrieb oder Service. Sie möchten den RMA number from your sales or service representative.

Zu diesem Rücksendeschein gehört eine Dekontaminationserklärung. Die gesetzlichen Vorschriften schreiben vor, dass Sie uns diese Dekontaminationserklärung ausgefüllt und unterschrieben zurück senden müssen. Bitte füllen Sie auch diese im Sinne der Gesundheit unserer Mitarbeiter vollständig aus. This return form includes a decontamination statement. The law requires you to submit this completed and signed decontamination statement to us. Please complete the entire form, also in the interest of our employee health.

<table>
<thead>
<tr>
<th><strong>Firma/ Company</strong></th>
<th><strong>Ansprechpartner/ Person in charge</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name/ Name</td>
</tr>
<tr>
<td></td>
<td>Abt./ Dept.</td>
</tr>
<tr>
<td></td>
<td>Tel./ Phone</td>
</tr>
<tr>
<td></td>
<td>E-Mail</td>
</tr>
<tr>
<td></td>
<td>Serien-Nr./ Serial No.</td>
</tr>
<tr>
<td></td>
<td>Artikel-Nr./ Item No.</td>
</tr>
</tbody>
</table>

**Grund der Rücksendung/ Reason for return**  

<table>
<thead>
<tr>
<th>☐ Kalibrierung/ Calibration</th>
<th>☐ Modifikation/ Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Reklamation/ Claim</td>
<td>☐ Reparatur/ Repair</td>
</tr>
<tr>
<td>☐ andere/ other</td>
<td></td>
</tr>
</tbody>
</table>

**Bitte spezifizieren/ Please specify**

**Ist das Gerät möglicherweise kontaminiert?/ Could the equipment be contaminated?**

| ☐ Nein, da das Gerät nicht mit gesundheitgefährdenden Stoffen betrieben wurde. | ☐ Nein, da das Gerät ordnungsgemäß gereinigt und dekontaminiert wurde. | ☐ Ja, kontaminiert mit: |

**Bitte Sicherheitsdatenblatt beiliegen/ Please enclose safety data sheet**

Das Gerät wurde gespült mit:  

**Diese Erklärung wurde korrekt und vollständig ausgefüllt und von einer dazu befugten Person unterschrieben. Der Versand der (dekontaminierten) Geräte und Komponenten erfolgt gemäß den gesetzlichen Bestimmungen.**

This declaration has been filled out correctly and completely, and signed by an authorized person. The dispatch of the (decontaminated) devices and components takes place according to the legal regulations.

Falls die Ware nicht gereinigt, also kontaminiert bei uns eintrifft, muss die Firma Bühler sich vorbehalten, diese durch einen externen Dienstleister reinigen zu lassen und Ihnen dies in Rechnung zu stellen.

**Firmenstempel/ Company Stamp**

**Datum/ Date**

**rechtsverbindliche Unterschrift/ Legally binding signature**
Die Analyse defekter Baugruppen ist ein wesentlicher Bestandteil der Qualitätssicherung der Firma Bühler Technologies.

Um eine aussagekräftige Analyse zu gewährleisten muss die Ware möglichst unverändert untersucht werden. Es dürfen keine Veränderungen oder weitere Beschädigungen auftreten, die Ursachen verdecken oder eine Analyse unmöglich machen.


Analysing defective assemblies is an essential part of quality assurance at Bühler Technologies.

To ensure conclusive analysis the goods must be inspected unaltered, if possible. Modifications or other damages which may hide the cause or render it impossible to analyse are prohibited.

Electronic assemblies may be sensitive to static electricity. Be sure to handle these assemblies in an ESD-safe manner. Where possible, the assemblies should be replaced in an ESD-safe location. If unable to do so, take ESD-safe precautions when replacing these. Must be transported in ESD-safe containers. The packaging of the assemblies must be ESD-safe. If possible, use the packaging of the spare part or use ESD-safe packaging.

Observe the above specifications when installing the spare part. Ensure the part and all components are properly installed. Return the cables to the original state before putting into service. When in doubt, contact the manufacturer for additional information.