Loop powered LCD indicator for in-head mounting of industrial thermometers
Safety instructions

1.1 Scope of the document

These Supplementary Instructions apply solely to the installation of the LCD-H20 indicator. The technical details given in the handbook for industrial thermometers apply unchanged unless excluded or superseded by these Instructions.

1.2 Intended use

The LCD-H20 indicator is a digital display to be installed in the 4…20 mA loop without the need for an additional external power supply.
2.1 Device description

The LCD-H20 indicator is designed for installation in a thermometer connection head with window. The indicator features 12 mm LCD digits.

The indication range is adjustable between -1999 and 9999 using three pushbuttons. No additional supply power is required.

As a rule, the LCD-H20 indicator is delivered pre-installed in a BUZ-HW connection head.

2.2 Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current input</td>
<td>4...20 mA</td>
</tr>
<tr>
<td>Operating range of the indicator</td>
<td>3.6 ... 22 mA</td>
</tr>
<tr>
<td>Voltage drop</td>
<td>2.5 V</td>
</tr>
<tr>
<td>Display</td>
<td>4 digits incl. minus sign</td>
</tr>
<tr>
<td>Scaleable from -1999 to 9999 as well as 8 to 3 decimal places</td>
<td></td>
</tr>
<tr>
<td>Scale setting</td>
<td>Using 3 pushbuttons</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-20...+70°C / -4...+158°F</td>
</tr>
<tr>
<td>Typical accuracy</td>
<td>±0.1% of programmed span ±1 digit</td>
</tr>
<tr>
<td>Cable thickness</td>
<td>≤ 1.0 mm², AWG 16</td>
</tr>
<tr>
<td>Mounting kit</td>
<td>KDST1 suitable for BUZ-HW connection head</td>
</tr>
<tr>
<td>Weight (only LDC-H20)</td>
<td>30 g / 0.07 lb</td>
</tr>
<tr>
<td>Weight (BUZ-HW connection head and LDC-H20)</td>
<td>375 g / 0.8 lb</td>
</tr>
</tbody>
</table>
2.3 Dimensions

![Diagram of installation dimensions](image)

<table>
<thead>
<tr>
<th></th>
<th>[mm]</th>
<th>°</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>17</td>
<td>0.67</td>
</tr>
<tr>
<td>b</td>
<td>Ø59</td>
<td>82.32</td>
</tr>
<tr>
<td>c</td>
<td>34</td>
<td>1.34</td>
</tr>
<tr>
<td>d</td>
<td>13.5</td>
<td>0.53</td>
</tr>
<tr>
<td>e</td>
<td>49</td>
<td>1.93</td>
</tr>
</tbody>
</table>

Figure 2-1: Installation dimensions of loop powered indicator
3 INSTALLATION

3.1 Mounting in the connection head

![Diagram of mounting in the connection head]

Figure 3-1: Installing the loop powered indicator into the BUZ-HW connection head

1. Polycarbonate window
2. Loop powered indicator LCD-H20
3. Mounting kit KDST1
4. M20 x 1.5

3.2 Configuration

3.2.1 Programming procedure

Programmed using the 3 pushbuttons located on the bottom of the indicator. The middle key is the enter key (F), the two outer keys with the up and down arrows are used to select various parameters. Positioning of the Keys on page 9.

<table>
<thead>
<tr>
<th>Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Calling up programming mode.</td>
</tr>
<tr>
<td></td>
<td>Switching between parameter and set value.</td>
</tr>
<tr>
<td></td>
<td>Save values.</td>
</tr>
<tr>
<td>▼</td>
<td>Decrease by one digit</td>
</tr>
<tr>
<td></td>
<td>Selecting or setting a parameter.</td>
</tr>
<tr>
<td>▲</td>
<td>Increase by one digit.</td>
</tr>
<tr>
<td></td>
<td>Selecting or setting a parameter.</td>
</tr>
<tr>
<td>▼ ▲</td>
<td>Exit programming mode.</td>
</tr>
<tr>
<td></td>
<td>Cancel.</td>
</tr>
</tbody>
</table>
• Hold F key down for longer than 3 s to access programming mode.
  The indicator displays the “dP” function, the first programming function in the menu: setup of the decimal point for the indicator.
• It is possible to switch back and forth between the individual programming menus by pressing the ▲ key (increase) and the ◄ key (decrease).
• Hold the F-key down again to change the selected parameters
• At the end of each programming session, any changed parameters must be saved by pressing the F key.
  Saved values are retained even after the display has been switched off.

3.2.2  Setting the decimal point (dP)
• Press the ▲ or ◄ key to set the position of the decimal point in the range of 0 to 3 digits after the decimal point.
• Press the F key to confirm.

INFORMATION!
The factory default setting is one decimal place after the point.

3.2.3  Setup of the zero point (ZErO)
• Press the ▲ or ◄ key to set the zero point of the indicator within the range of -1999 to 9999.
• Press the F key to confirm.

INFORMATION!
The factory default setting of the zero point is 0.0°C.

3.2.4  Setup of the span (SPAn)
• Press the ▲ or ◄ to set the span, or measuring range of the indicator, within the limits of -1999 to 9999.
• Press the F key to confirm.

INFORMATION!
The factory default setting is a span of 100.0.

3.2.5  Limit of the indicator range (Li)
This parameter is used to set the overload limit of the displayable range.
• When the parameter is set to “Li = 0” and the current exceeds a value of 20 mA, the message “+OL” is displayed. “−OL” is displayed when the current is less than 4 mA.
• When the parameter is set to “Li = 1”, the displayable range is increased by 10% beyond the limits of 4...20 mA before “+OL” or “−OL” is displayed.

INFORMATION!
The factory default setting is “Li = 1”.

INFORMATION!
The factory default setting is one decimal place after the point.
3.2.6 Setup of the filter [FiLT]

When there is interference with the 4...20 mA signal, it is possible to set a higher filter value “FiLT” in order to obtain a more stable and accurate display.

- Press the „↑“ key to increase the filter value and the „↓“ key to decrease the filter value.
- Filter values ranging from 1 to 8 can be set where “FiLT = 1” represents a switched off filter and the display value is updated in this case every 250 ms.
- If “FiLT > 1”, the update time of 250 ms is multiplied by the respective set filter value. If, for example, “FiLT = 5” the display value is updated every 1.25 s.

**INFORMATION!**
The factory default setting is “FiLT = 2”.

3.2.7 Setup of the resolution [riS]

This function is used to set the resolution of the display. Adjustable values for “riS” are: 1, 2, 5 and 10

- When “riS = 1” all possible digits within the programmed measuring range are shown continuously.
- When “riS = 2”, the steps of two consecutive values are doubled, i.e. odd values can then no longer be displayed (0, 2, 4, 6, 8, …).

**INFORMATION!**
It is recommended that the resolution only be reduced when the measuring range is extremely large, e.g. 10000 points or when the 4...20 mA signal is very unstable. If that is not the case, the maximum resolution is always set: “riS = 1”. That corresponds to the factory default setting.

3.2.8 Summary

```
<table>
<thead>
<tr>
<th>Key</th>
<th>Function</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change with ↑ or ↓</td>
<td>Setup of the decimal point</td>
<td>dP / 000.0</td>
</tr>
<tr>
<td></td>
<td>Setup of the zero point</td>
<td>ZErO / 0.0</td>
</tr>
<tr>
<td></td>
<td>Span (setting the measuring range)</td>
<td>SPAn / 100.0</td>
</tr>
<tr>
<td></td>
<td>Limit of the indicator range</td>
<td>Li / 1</td>
</tr>
<tr>
<td></td>
<td>Filter setting</td>
<td>FiLT / 2</td>
</tr>
<tr>
<td></td>
<td>Display resolution</td>
<td>riS / 1</td>
</tr>
<tr>
<td>F</td>
<td>Calling up the programming mode, switching between parameters and set value, save</td>
<td></td>
</tr>
<tr>
<td>„↓“</td>
<td>Decrease one digit</td>
<td>9 to 0</td>
</tr>
<tr>
<td>„↑“</td>
<td>Increase one digit</td>
<td>0 to 9</td>
</tr>
<tr>
<td>„↑“ + „↓“</td>
<td>Exit programming mode, cancel (without saving)</td>
<td></td>
</tr>
</tbody>
</table>
```
4.1 Connection diagram

Figure 4-1: Loop powered indicator wiring
1. 4...20 mA
2. Power supply 24 VDC
3. Red
4. Black
5. Input
6. Output
7. 2-wire transmitter
5.1 Normal mode

No settings are carried out on the display in normal mode.

5.2 Calibration

Simultaneously pressing the ▲ and ▼ keys for longer than 3 s opens the calibration menu. In the calibration menu it is possible to calibrate the values for the zero point and the span of the A/D converter on the digital display. Shorten loop circuit before starting calibration, refer to Connection diagram on page 9, connection 3 and 4.

CAUTION!
Only trained personnel with the appropriate equipment may adjust these settings. Incorrect calibration influences the proper functioning of the indicator.

Step 1: Zero point calibration
- Select the C4 calibration procedure for zero point calibration from the calibration menu by pressing the ▲ or ▼ key.
- Supply the input of the indicator with a current of 4 mA and wait until the display stabilises.
- Press the F key until “CAL” appears on the display.
  After a few seconds the new value for the zero point is displayed.
- Simultaneously press the ▲ + ▼ keys to exit the “zero point calibration menu” and continue with full scale calibration.

Step 2: Full scale calibration
- Select the C20 calibration procedure for the measuring range from the calibration menu by pressing the ▲ or ▼ key.
- Supply the display input with a current of 20 mA and continue as with the zero point calibration.
6.1 Service

No service measures are necessary with this indicator.

6.2 Ordering information

<table>
<thead>
<tr>
<th>Designation</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD-H20 indicator</td>
<td>70LCDH2001</td>
</tr>
<tr>
<td>LCD-H20 indicator mounted in BUZ-HW connection head</td>
<td>70LCDH2011</td>
</tr>
<tr>
<td>Custom configuration of display</td>
<td>70CAL00001</td>
</tr>
</tbody>
</table>
KROHNE product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level meters
- Temperature meters
- Pressure meters
- Analysis products
- Measuring systems for the oil and gas industry
- Measuring systems for sea-going tankers

Head Office KROHNE Messtechnik GmbH
Ludwig-Krohne-Str. 5
D-47058 Duisburg (Germany)
Tel.: +49 (0)203 301 0
Fax: +49 (0)203 301 10389
info@krohne.de

The current list of all KROHNE contacts and addresses can be found at:
www.krohne.com