VF00, VF10, VF20
IMMERSION TEMPERATURE SENSORS

GENERAL
These immersion temperature sensors can be employed for hot and cold water installations in the following control systems:

- EAGLE
- LION
- TIGER
- PANTHER
- Excel 5000, Excel 500, and Excel 800
- Excel Web and Excel Web II
- Honeywell I/O modules
- LYNX, SERVAL, Excel 10, and Excel 12

or other systems using Pt 1000, NTC 10k, or NTC 20k temperature sensing elements.

The sensors with a stainless steel immersion well are also suitable for registering potable water temperature.

FEATURES
- Pt 1000, NTC 10k, or NTC 20k temperature sensing element
- Wide sensing range
- High accuracy
- Choice of three different probe lengths: 65, 150, and 300 mm
- Models available with either IP54 or IP65 rating
- Bayonet ¼ turn cover screws for fast installation
- External mounting holes, no need to remove cover

SPECIFICATION
Nominal value
- Pt 1000 1000 Ω at 0 °C (32 °F)
- NTC 10k 10 kΩ at 25 °C (77 °F)
- NTC 20k 20 kΩ at 25 °C (77 °F)

Accuracy
- Pt 1000 (IEC751 Class B) ±0.3 K at 0 °C (32 °F)
- NTC 10k, NTC 20k ±0.2 K at 25 °C (77 °F)

Sensitivity
- Pt 1000 ≈ 3.85 Ω/K
- NTC 10k -440 Ω/K at 25 °C (non-linear)
- NTC 20k ≈ -934.5 Ω/K at 25 °C (non-linear)

Time constant
< 30 s (using brass / stainless steel immersion well)

Electrical connection
VF00/VF10/VF20 terminals for 2 x 1.5 mm² cable
Cable gland M16x1.5, UL 94-V2

Ambient limits (housing)
Storage temperature -30...+70 °C (-22...+158 °F)
Humidity 5...95% rh, non-condensing

Safety (terminal box)
Protection standard IP54
IP65

Flame retardant
UL94-V0 rated plastic enclosure

Dimensions
See section "Dimensions" on pg. 3.

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**Models**

<table>
<thead>
<tr>
<th>OS-no.</th>
<th>length mm (inch)</th>
<th>L&lt;sub&gt;PROBE&lt;/sub&gt;</th>
<th>IP rating</th>
<th>sensor type</th>
<th>sensing temperature limits (probe)</th>
<th>immersion well</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF00-1B54</td>
<td>150 (5.91)</td>
<td></td>
<td>IP54</td>
<td>Pt 1000</td>
<td>-40...+150 °C</td>
<td>WB150</td>
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<tr>
<td>VF00-1B65</td>
<td>150 (5.91)</td>
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<td>IP65</td>
<td>Pt 1000</td>
<td>-40...+150 °C</td>
<td>WB150</td>
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<tr>
<td>VF00-1B54NW</td>
<td>150 (5.91)</td>
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<td>IP54</td>
<td>Pt 1000</td>
<td>-40...+150 °C</td>
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<tr>
<td>VF00-3B54NW</td>
<td>300 (11.81)</td>
<td></td>
<td>IP54</td>
<td>Pt 1000</td>
<td>-40...+150 °C</td>
<td>--</td>
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<tr>
<td>VF10-1B54T</td>
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<td>IP54</td>
<td>NTC 10k</td>
<td>-40...+150 °C</td>
<td>WB150</td>
</tr>
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<td>VF20-3B54</td>
<td>300 (11.81)</td>
<td></td>
<td>IP54</td>
<td>NTC 20k</td>
<td>-40...+150 °C</td>
<td>WB300</td>
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<tr>
<td>VF20-3B54S</td>
<td>300 (11.81)</td>
<td></td>
<td>IP54</td>
<td>NTC 20k</td>
<td>-40...+150 °C</td>
<td>WS300</td>
</tr>
<tr>
<td>VF20-1B54S</td>
<td>150 (5.91)</td>
<td></td>
<td>IP54</td>
<td>NTC 20k</td>
<td>-40...+150 °C</td>
<td>WS150</td>
</tr>
<tr>
<td>VF20-1B65</td>
<td>150 (5.91)</td>
<td></td>
<td>IP65</td>
<td>NTC 20k</td>
<td>-40...+150 °C</td>
<td>WS150</td>
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<tr>
<td>VF20-1B65S</td>
<td>150 (5.91)</td>
<td></td>
<td>IP65</td>
<td>NTC 20k</td>
<td>-40...+150 °C</td>
<td>WS150</td>
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<tr>
<td>VF20-1B54</td>
<td>150 (5.91)</td>
<td></td>
<td>IP54</td>
<td>NTC 20k</td>
<td>-40...+150 °C</td>
<td>WB150</td>
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<tr>
<td>VF20-5B54</td>
<td>65 (2.56)</td>
<td></td>
<td>IP54</td>
<td>NTC 20k</td>
<td>-40...+150 °C</td>
<td>WB50</td>
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**Immersion Well**

<table>
<thead>
<tr>
<th>OS-no.</th>
<th>material</th>
<th>length mm (inch)</th>
<th>L&lt;sub&gt;WELL&lt;/sub&gt;</th>
<th>connection</th>
<th>P&lt;sub&gt;max&lt;/sub&gt;</th>
<th>max. flow rate</th>
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<tbody>
<tr>
<td>WS50</td>
<td>stainless steel</td>
<td>50 (1.97)</td>
<td></td>
<td>R1/2&quot; / ISO, PN25</td>
<td>25 bar</td>
<td>30 m/s</td>
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<tr>
<td>WB50</td>
<td>brass</td>
<td>50 (1.97)</td>
<td></td>
<td>R1/2&quot; / ISO, PN25</td>
<td>13 bar</td>
<td>26 m/s</td>
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<tr>
<td>WS150</td>
<td>stainless steel</td>
<td>135 (5.31)</td>
<td></td>
<td>R1/2&quot; / ISO, PN25</td>
<td>25 bar</td>
<td>7.5 m/s</td>
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<tr>
<td>WB150</td>
<td>brass</td>
<td>135 (5.31)</td>
<td></td>
<td>R1/2&quot; / ISO, PN25</td>
<td>13 bar</td>
<td>5 m/s</td>
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<tr>
<td>WS300</td>
<td>stainless steel</td>
<td>285 (11.22)</td>
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<td>R1/2&quot; / ISO, PN25</td>
<td>25 bar</td>
<td>2 m/s</td>
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<tr>
<td>WB300</td>
<td>brass</td>
<td>285 (11.22)</td>
<td></td>
<td>R1/2&quot; / ISO, PN25</td>
<td>13 bar</td>
<td>1.2 m/s</td>
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DIMENSIONS

Fig. 1. Immersion temperature sensor, dimensions in mm (inches)

Fig. 2. Immersion well, dimensions in mm (inches)

INSTALLATION

<table>
<thead>
<tr>
<th>wiring run</th>
<th>max. length</th>
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<tbody>
<tr>
<td>Sensor to controller</td>
<td>200 m (660 ft)</td>
</tr>
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</table>

Offset due to wire resistance per 10 m of distance from sensor to controller, when using the VF00 (Pt 1000):

<table>
<thead>
<tr>
<th>type of wire</th>
<th>temperature offset Pt 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 mm² (AWG20)</td>
<td>0.18 °C (0.324 °F)</td>
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<tr>
<td>1.0 mm² (AWG17)</td>
<td>0.09 °C (0.162 °F)</td>
</tr>
<tr>
<td>1.5 mm² (AWG15)</td>
<td>0.06 °C (0.108 °F)</td>
</tr>
</tbody>
</table>

NOTE: Use shielded wiring in areas with high EMI. Keep 15 cm (5.9”) minimum distance between sensor lines and 230 Vac power lines.

ELECTRICAL CONNECTION

The wiring of the temperature sensor must be in accordance with the overall wiring circuit diagram.

The terminals are not polarized. Thus, connecting the wires in reverse will not result in any malfunction.

Honeywell

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