Linear Sensor Indicator for High-speed, High-precision Measurement and Discrimination

- Easy recognition of judgement results using color display that can be switched between red and green. *
- Equipped with a position meter that represents measured amounts and relative positions.
- Develop a variety of measurement and discrimination applications using external event inputs.
- Series expanded to include DeviceNet models.
- Short body with depth of only 95 mm (from behind the front panel), or 97 mm for DeviceNet models.
- UL certification approval (Certification Mark License).
- CE Marking conformance by third party assessment body.
- Water-resistant enclosure conforms to NEMA 4X (equivalent to IP66).

*Visual confirmation of judgement results is not supported on models that do not have an output or models that do not support DeviceNet.

You can change the display color by setting it, but you cannot switch it based on the judgement results.

Refer to Safety Precautions for All Digital Panel Meters.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Model Number Structure

Model Number Legend

Base Units and Optional Boards can be ordered individually or as sets.

**Base Units**

- **K3HB-S**
  - 1. Input Sensor Code
    - SD: DC Process input
  - 5. Supply Voltage
    - 100-240 VAC: 100 to 240 VAC
    - 24 VAC/VDC: 24 VAC/VDC

**Optional Board**

- **Sensor Power Supply/Output Boards**
  - **K33**
  - 2. Sensor Power Supply/Output Type Code
    - None: None
    - CPA: Relay output (PASS: SPDT) + Sensor power supply
      (12 VDC +/-10%, 80 mA) (See note 1.)
    - L1A: Linear current output (0 to 20 or 4 to 20 mA DC) + Sensor power supply
      (12 VDC +/-10%, 80 mA) (See note 2.)
    - L2A: Linear voltage output (0 to 5, 1 to 5, or 0 to 10 VDC) + Sensor power supply
      (12 VDC +/-10%, 80 mA) (See note 2.)
    - A: Sensor power supply (12 VDC +/-10%, 80 mA)
    - FLK1A: Communications (RS-232C) + Sensor power supply
      (12 VDC +/-10%, 80 mA) (See note 2.)
    - FLK3A: Communications (RS-485) + Sensor power supply
      (12 VDC +/-10%, 80 mA) (See note 2.)

- **Relay/Transistor Output Boards**
  - **K34**
  - 2. Relay/Transistor Output Type Code
    - None: None
    - C1: Relay contact (H/L: SPDT each)
    - C2: Relay contact (HH/H/LL/PLST-NO each)
    - T1: Transistor (NPN open collector: HH/H/PASS/L/LL)
    - T2: Transistor (PNP open collector: HH/H/PASS/L/LL)
    - BCD: BCD output + transistor output (NPN open collector: HH/H/PASS/L/LL)
    - DRT: DeviceNet (See note 2.)

- **Event Input Boards**
  - **K35**
  - 4. Event Input Type Code
    - None: None
    - 1: 5 inputs (M3 terminal blocks), NPN open collector
    - 2: 8 inputs (10-pin MIL connector), NPN open collector
    - 3: 5 inputs (M3 terminal blocks), PNP open collector
    - 4: 8 inputs (10-pin MIL connector), PNP open collector

**Accessories (Sold Separately)**

- **K32-DICN:** Special Cable (for event inputs, with 8-pin connector)
- **K32-BCD:** Special BCD Output Cable

**Note:** The following combinations are not possible.

- Communications (FLK/A) + DeviceNet (DRT)
- Communications (FLK/A) + BCD output (BCD)
- Linear current/voltage (L/A) + DeviceNet (DRT)

**Rubber Packing**

- **Model:** K32-P1

**Note:** Rubber packing is provided with the Controller.
### Specifications

#### Ratings

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power supply voltage</strong></td>
<td>100 to 240 VAC (50/60 Hz), 24 VAC/VDC, DeviceNet power supply: 24 VDC</td>
</tr>
<tr>
<td><strong>Allowable power supply voltage range</strong></td>
<td>85% to 110% of the rated power supply voltage, DeviceNet power supply: 11 to 25 VDC</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>100 to 240 V: 18 VA max. (max. load) 24 VAC/DC: 11 VA/7 W max. (max. load)</td>
</tr>
<tr>
<td><strong>Current consumption</strong></td>
<td>DeviceNet power supply: 50 mA max. (24 VDC)</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td>DC voltage/current</td>
</tr>
<tr>
<td><strong>A/D conversion method</strong></td>
<td>Sequential comparison system</td>
</tr>
<tr>
<td><strong>External power supply</strong></td>
<td>12 VDC ±10%, 80 mA (models with external power supply only)</td>
</tr>
</tbody>
</table>

#### Event inputs

- **Timing input**: NPN open collector or no-voltage contact signal
  - ON residual voltage: 3 V max.
  - ON current at 0 Ω: 17 mA max.
  - Max. applied voltage: 30 VDC max.
  - OFF leakage current: 1.5 mA max.
- **Startup compensation timer input**: NPN open collector or no-voltage contact signal
  - ON residual voltage: 2 V max.
  - ON current at 0 Ω: 4 mA max.
  - Max. applied voltage: 30 VDC max.
  - OFF leakage current: 0.1 mA max.
- **Hold input**: NPN open collector or no-voltage contact signal
- **Reset input**: NPN open collector or no-voltage contact signal
- **Forced-zero input**: NPN open collector or no-voltage contact signal

#### Output ratings (depends on the model)

- **Relay output**: 250 VAC, 30 VDC, 5 A (resistive load)
  - Mechanical life expectancy: 5,000,000 operations
  - Electrical life expectancy: 100,000 operations
- **Transistor output**: Maximum load voltage: 24 VDC, Maximum load current: 50 mA, Leakage current: 100 μA max.
- **Linear output**: Linear output 0 to 20 mA DC, 4 to 20 mA DC
  - Load: 500 Ω max,
  - Resolution: Approx. 10,000
  - Output error: ±0.5% FS
- Linear output 0 to 5 VDC, 0 to 10 VDC
  - Load: 5 kΩ max,
  - Resolution: Approx. 10,000
  - Output error: ±0.5% FS
  - (1 V or less: ±0.15 V; no output for 0 V or less)

#### Display method

- Negative LCD (backlit LED) display
  - 7-segment digital display (Character height: PV: 14.2 mm (green/red); SV: 4.9 mm (green))

#### Main functions

- Scaling function
- 2-input calculation function
- Measurement operation selection, averaging, previous average value comparison, forced-zero, zero-limit, output hysteresis, output OFF delay, output test, teaching, display value selection, display color selection, key protection, bank selection, display refresh period, maximum/minimum hold, reset

#### Ambient operating temperature

- −10 to 55°C (with no icing or condensation)

#### Ambient operating humidity

- 25% to 85%

#### Storage temperature

- −25 to 65°C (with no icing or condensation)

#### Altitude

- 2,000 m max.

#### Accessories

- Watertight packing, 2 fixtures, terminal cover, unit stickers, instruction manual
- DeviceNet models also include a DeviceNet connector (Hirose HR31-5.08P-5SC(01)) and crimp terminals (Hirose HR31-SC-121)

**Note:**

1. DC power supply models require a control power supply capacity of approximately 1 A per Unit when power is turned ON. Particular attention is required when using two or more DC power supply models. The OMRON S8VS-series DC Power Supply Unit is recommended.
2. PNP input types are also available.
3. For K3HB-series DeviceNet models, use only the DeviceNet Connector included with the product. The crimp terminals provided are for Thin Cables.
### Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display range</td>
<td>-19,999 to 99,999</td>
</tr>
<tr>
<td>Sampling period</td>
<td>One input: 0.5 ms; Two inputs: 1.0 ms</td>
</tr>
</tbody>
</table>
| Comparative output response times (transistor outputs) | One input: OFF to ON: 1 ms max., ON to OFF: 1.5 ms max. (The time until the comparative output is output when there is a forced sudden change in the input signal from 15% to 95% or 95% to 15%).  
Two inputs: OFF to ON: 2 ms max., ON to OFF: 2.5 ms max. (The time until the comparative output is output when there is a forced sudden change in the input signal from 15% to 95% or 95% to 15%). |
| Linear output response time                          | One input: 51 ms max. (The time until the final analog output is reached when there is a forced sudden change in the input signal from 15% to 95% or 95% to 15%).  
Two inputs: 52 ms max. (The time until the final analog output is reached when there is a forced sudden change in the input signal from 15% to 95% or 95% to 15%). |
| Insulation resistance                                | 20 MΩ min. (at 500 VDC)                                             |
| Dielectric strength                                  | 2,300 VAC for 1 min between external terminals and case              |
| Noise immunity                                        | 100 to 240 VAC models:  
-1,500 V at power supply terminals in normal or common mode (waveform with 1-μs rising edge and pulse width of 1 μs/100 ns)  
24 VAC/VDC models:  
-1,500 V at power supply terminals in normal or common mode (waveform with 1-μs rising edge and pulse width of 1 μs/100 ns) |
| Vibration resistance                                 | Frequency: 10 to 55 Hz; Acceleration: 50 m/s², 10 sweeps of 5 min each in X, Y, and Z directions |
| Shock resistance                                      | 150 m/s² (100 m/s² for relay outputs) 3 times each in 3 axes, 6 directions |
| Weight                                               | Approx. 300 g (Base Unit only)                                       |
| Degree of protection                                 | Front panel: Conforms to NEMA 4X for indoor use (equivalent to IP66)  
Rear case: IP20                                                      |
| Memory protection                                    | EEPROM (non-volatile memory)  
Number of rewrites: 100,000                                           |
| Applicable standards                                 | UL61010-1, CSA C22.2 No. 61010-1-04  
EN61010-1: Pollution degree 2/Overvoltage category II  
EN61326-1                                                          |
| EMC                                                  | EMI: EN61326 industrial applications  
Electromagnetic radiation interference  
CISPR 11 Group 1, Class A  
Terminal interference voltage  
CISPR 11 Group 1, Class A  
EMS: EN61326 industrial applications  
Electrostatic Discharge Immunity  
EN61000-4-2: 4 kV (contact), 8 kV (in air)  
Radiated Electromagnetic Field Immunity  
EN61000-4-3: 10 V/m 1 kHz sine wave amplitude modulation (80 MHz to 1 GHz, 1.4 to 2 GHz)  
Electrical Fast Transient/Burst Immunity  
EN61000-4-4: 2 kV (power line), 1 kV (I/O signal line)  
Surge Immunity  
EN61000-4-5: 1 kV with line (power line), 2 kV with ground (power line)  
Conducted Disturbance Immunity  
EN61000-4-6: 3 V (0.15 to 80 MHz)  
Power Frequency Magnetic Immunity  
EN61000-4-8: 30 A/m (50 Hz) continuous time  
Voltage Dips and Interruptions Immunity  
EN61000-4-11: 0.5 cycle, 0/180°, 100% (rated voltage) |

### Input Ranges (Measurement Ranges and Accuracy)

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Measurement range</th>
<th>Indication range</th>
<th>Input impedance</th>
<th>Accuracy (at 23±5°C)</th>
<th>Maximum absolute rated input</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC voltage/current input</td>
<td>0 to 20 mA</td>
<td>0.000 to 20.000 mA</td>
<td>-2.000 to 22.000 mA</td>
<td>120 Ω max.</td>
<td>±31 mA</td>
</tr>
<tr>
<td>4 to 20 mA</td>
<td>4.000 to 20.000 mA</td>
<td>2.000 to 22.000 mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 5 V</td>
<td>0.000 to 5.000 V</td>
<td>-0.500 to 5.500 mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 5 V</td>
<td>1.000 to 5.000 V</td>
<td>0.500 to 5.500 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>±5 V</td>
<td>±5.000 V</td>
<td>±5.500 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>±10 V</td>
<td>±10.000 V</td>
<td>±11.000 V</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The accuracy is for an ambient temperature of 23±5°C.
The range shown in dark shading indicates the factory setting.

**Sampling and Comparative Output Response Times**

The K3HB-S sampling and comparative output response times depend on the calculation methods, timing hold type, and, for simple averaging, the averaging times. Refer to the following description for details.

### Output Refresh Period

The K3HB-S repeats input reads, calculation, and judgement output processing. The output refresh period differs depending on whether there are one or two inputs, as outlined below.

#### One Input

- **Input A** or **Input B**
  - Input read: Every 0.5 ms
  - Output refresh: Every 0.5 ms

#### Two inputs

- **Input A** or **Input B**
  - Input read: Every 1 ms
  - Output refresh: Every 0.5 ms

### Output Response Time

The comparative output response time is the sum of the data processing time and the output (relay or transistor) response time.

#### One Input

- **Input A** or **Input B**
  - Data processing time: 0.5 ms
  - Output response time: 0.5 ms

#### Two Inputs

- **Input A** or **Input B**
  - Data processing time: 0.5 ms
  - Output response time: 0.5 ms

**Note:** For transistor outputs:
- For one input: OFF to ON 1 ms and ON to OFF 1.5 ms
- For two inputs: OFF to ON 2 ms and ON to OFF 2.5 ms

For relay outputs:
- The relay operation time of 15 ms is added to the transistor output response times.
Common Specifications

■ Event Input Ratings

<table>
<thead>
<tr>
<th>Input type</th>
<th>S-TMR, HOLD, RESET, ZERO, BANK1, BANK2, BANK4</th>
<th>TIMING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact</td>
<td>ON: 1 kΩ max., OFF: 100 kΩ min.</td>
<td>---</td>
</tr>
<tr>
<td>No-contact</td>
<td>ON residual voltage: 2 V max.</td>
<td>OFF residual voltage: 3 V max.</td>
</tr>
<tr>
<td></td>
<td>OFF leakage current: 0.1 mA max.</td>
<td>OFF leakage current: 1.5 mA max.</td>
</tr>
<tr>
<td></td>
<td>Load current: 4 mA max.</td>
<td>Load current: 17 mA max.</td>
</tr>
<tr>
<td></td>
<td>Maximum applied voltage: 30 VDC max.</td>
<td>Maximum applied voltage: 30 VDC max.</td>
</tr>
</tbody>
</table>

■ Output Ratings

**Contact Output**

<table>
<thead>
<tr>
<th>Item</th>
<th>Resistive loads (250 VAC, cosφ=1; 30 VDC, L/R=0 ms)</th>
<th>Inductive loads (250 VAC, closed circuit, cosφ=0.4; 30 VDC, L/R=7 ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated load</td>
<td>5 A at 250 VAC</td>
<td>1 A at 250 VAC</td>
</tr>
<tr>
<td></td>
<td>5 A at 30 VDC</td>
<td>1 A at 30 VDC</td>
</tr>
<tr>
<td>Mechanical life expectancy</td>
<td>5,000,000 operations</td>
<td></td>
</tr>
<tr>
<td>Electrical life expectancy</td>
<td>100,000 operations</td>
<td></td>
</tr>
</tbody>
</table>

**Transistor Output**

<table>
<thead>
<tr>
<th>Maximum load voltage</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum load current</td>
<td>50 mA</td>
</tr>
<tr>
<td>Leakage current</td>
<td>100 µA max.</td>
</tr>
</tbody>
</table>

■ Linear Output

<table>
<thead>
<tr>
<th>Item</th>
<th>0 to 20 mA</th>
<th>4 to 20 mA</th>
<th>0 to 5 V</th>
<th>1 to 5 V</th>
<th>0 to 10 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowable load impedance</td>
<td>500 Ω max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>Approx. 10,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output error</td>
<td>±0.5%FS</td>
<td>±0.5%FS</td>
<td>±0.5%FS</td>
<td>±0.5%FS</td>
<td>±0.5%FS</td>
</tr>
</tbody>
</table>

■ Serial Communications Output

<table>
<thead>
<tr>
<th>Item</th>
<th>RS-232C, RS-485</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications method</td>
<td>Half duplex</td>
</tr>
<tr>
<td>Synchronization method</td>
<td>Start-stop synchronization</td>
</tr>
<tr>
<td>Baud rate</td>
<td>9,600, 19,200, or 38,400 bps</td>
</tr>
<tr>
<td>Transmission code</td>
<td>ASCII</td>
</tr>
<tr>
<td>Data length</td>
<td>7 bits or 8 bits</td>
</tr>
<tr>
<td>Stop bit length</td>
<td>2 bits or 1 bit</td>
</tr>
<tr>
<td>Error detection</td>
<td>Vertical parity and FCS</td>
</tr>
<tr>
<td>Parity check</td>
<td>Odd, even</td>
</tr>
</tbody>
</table>

**Note:** For details on serial and DeviceNet communications, refer to the Digital Indicator K3HB Communications User’s Manual (Cat.No. N129).

■ BCD Output I/O Ratings

(Input Signal Logic: Negative)

<table>
<thead>
<tr>
<th>I/O signal name</th>
<th>Item</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs</td>
<td>REQUEST HOLD MAX MIN RESET</td>
<td>Input signal</td>
</tr>
<tr>
<td></td>
<td>Input current for no-voltage input</td>
<td>10 mA</td>
</tr>
<tr>
<td></td>
<td>Signal level</td>
<td>ON voltage</td>
</tr>
<tr>
<td></td>
<td>OFF voltage</td>
<td>3 V min.</td>
</tr>
<tr>
<td>Outputs</td>
<td>DATA POLARITY OVER DATA VALID RUN</td>
<td>Maximum load voltage</td>
</tr>
<tr>
<td></td>
<td>Maximum load current</td>
<td>10 mA</td>
</tr>
<tr>
<td></td>
<td>Leakage current</td>
<td>100 µA max.</td>
</tr>
<tr>
<td></td>
<td>HH</td>
<td>Maximum load voltage</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>Maximum load current</td>
</tr>
<tr>
<td></td>
<td>PASS</td>
<td>Leakage current</td>
</tr>
<tr>
<td></td>
<td>LL</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** For details on serial and DeviceNet communications, refer to the Digital Indicator K3HB Communications User’s Manual (Cat.No. N129).
DeviceNet Communications

- **Communications protocol**: Conforms to DeviceNet
- **Supported communications**: Master-Slave connection (polling, bit-strobe, COS, cyclic)
- **Remote I/O communications**: Conforms to DeviceNet communications standards.
- **I/O allocations**: Allocate any I/O data using the Configurator. Allocate any data, such as DeviceNet-specific parameters and variable area for Digital Indicators. Input area: 2 blocks, 60 words max. Output area: 1 block, 29 words max. (The first word in the area is always allocated for the Output Execution Enabled Flags.)
- **Message communications**: Explicit message communications. CompoWay/F communications commands can be executed (using explicit message communications)
- **Connection methods**: Combination of multi-drop and T-branch connections (for trunk and drop lines)
- **Baud rate**: DeviceNet: 500, 250, or 125 Kbps (automatic follow-up)
- **Communications media**: Special 5-wire cable (2 signal lines, 2 power supply lines, 1 shield line)
- **Communications distance**:

<table>
<thead>
<tr>
<th>Baud rate</th>
<th>Network length (max.)</th>
<th>Drop line length (max.)</th>
<th>Total drop line length (max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 Kbps</td>
<td>100 m (100 m)</td>
<td>6 m</td>
<td>39 m</td>
</tr>
<tr>
<td>250 Kbps</td>
<td>100 m (250 m)</td>
<td>6 m</td>
<td>78 m</td>
</tr>
<tr>
<td>125 Kbps</td>
<td>100 m (500 m)</td>
<td>6 m</td>
<td>156 m</td>
</tr>
</tbody>
</table>

The values in parentheses are for Thick Cable.

- **Communications power supply**: 24-VDC DeviceNet power supply
- **Allowable voltage fluctuation range**: 11 to 25-VDC DeviceNet power supply
- **Current consumption**: 50 mA max. (24 VDC)
- **Maximum number of nodes**: 64 (DeviceNet Configurator is counted as one node when connected)
- **Maximum number of slaves**: 63
- **Error control checks**: CRC errors
- **DeviceNet power supply**: Supplied from DeviceNet communications connector

### Internal Block Diagram

![Internal Block Diagram](image-url)
### Power Supply Derating Curve for Sensor (Reference Value)

**With 12 V**

![Graph for 12 V Power Supply Derating Curve]

**With 10 V**

![Graph for 10 V Power Supply Derating Curve]

**Note:**
1. The above values are for standard mounting. The derating curve differs depending on the mounting conditions.
2. Do not use the Sensor outside of the derating area (i.e., do not use it in the area labeled 1 in the above graphics). Doing so may occasionally cause deterioration or damage to internal components.

### Component Names and Functions

- **Max/Min status indicator**
  - Turns ON when the maximum value or minimum value is displayed in the RUN level.

- **Level/bank display**
  - In RUN level, displays the bank if the bank function is ON. (Turns OFF if the bank function is OFF.)
  - In other levels, displays the current level.

- **Comparative output status indicators**
  - Display the status of comparative outputs.

- **Status indicators**
  - **Display**
    - **T-ZR**
      - Turns ON when the tare zero function is executed. Turns OFF if it is not executed or cleared.
    - **Zero**
      - Turns ON when the forced-zero function is executed. Turns OFF if it is not executed or cleared (including the time it is)
    - **Hold**
      - Turns ON/OFF when hold input turns ON/OFF.

- **PV display**
  - Displays PVs, maximum values, minimum values, parameter names, and error names.

- **Position meter**
  - Displays the position of the PV with respect to a desired scale.

- **SV display**
  - Displays SV and monitor values.

- **SV display status indicators**
  - **Display**
    - **T-G**
      - Turns ON when the timing signal turns ON. Otherwise OFF.
    - **T**
      - Turns ON when parameters for which teaching can be performed are displayed.
    - **HH, L, L, LL**
      - In RUN level, turn ON when the comparative set values HH, L, L, and LL are displayed.

- **MAX/MIN Key**
  - Used to switch the display between the PV, maximum value, and minimum value and to reset the maximum and minimum values.

- **LEVEL Key**
  - Used to switch level.

- **MODE Key**
  - Used to switch the parameters displayed.

- **SHIFT Key**
  - Used to change parameter settings. When changing a set value, this key is used to move along the digits.

- **UP Key**
  - When changing a set value, this key is used to change the actual value. When a measurement value is displayed, this key is used to execute or clear the forced-zero function or to execute teaching.
**Single Sampling Data Output**

A REQUEST signal from a Programmable Controller or other external device is required to read BCD data.

The data is set in approximately 30 ms from the rising edge of the REQUEST signal and the DATA VALID signal is output. When reading the data from a Programmable Controller, start reading the data when the DATA VALID signal turns ON. The DATA VALID signal will turn OFF 40 ms later, and the data will turn OFF 16 ms after that.

**Continuous Data Output**

Measurement data is output every 64 ms while the REQUEST signal remains ON.

Note: If HOLD is executed when switching between data 1 and data 2, either data 1 or data 2 is output depending on the timing of the hold signal. The data will not go LOW.

**Programmable Controller Connection Example**

Digital Indicator

**Display Unit Connection Example**

Digital Indicator

Refer to the following User's Manual for application precautions and other information required when using the Digital Indicator:


The manual can be downloaded from the following site in PDF format: OMRON Industrial Web http://www.fa.omron.co.jp
Connections

Terminal Arrangement

Note: Insulation is used between signal input, event input, output, and power supply terminals.

A Operating Power Supply

100 to 240 VAC
24 VAC / VDC

*Check the required power supply type.

B Sensor Power Supply/Output

Sensor power supply + PASS output

Sensor power supply + linear output

Sensor power supply

Relay Outputs

Transistor Outputs

DeviceNet Connector (Included)

BCD (NPN Open Collector): BCD
Applicable Connector (Sold separately)
HDR-E50MAG1
(HONDA TSUSHIN KOGYO CO., LTD.)
Special Cable (Sold separately)
K32-BCD (OMRON)
(HDR-E50MAG1 with 0.3-m cable)

The BCD COMMON is shared.
The pins indicated in the above diagram as blank (white) boxes have been removed.
Only one of the following can be used for each Digital Indicator: communications, BCD, or DeviceNet.

Contact output

Transistor Output
(NPN Open Collector)

Safety Standards Conformance

- Always use a EN/IEC-compliant power supply with reinforced insulation or double insulation for the DeviceNet power supply.
- The product must be used indoors for the above applicable standards to apply.
- The K3HB-X Vapor complies with UL standards when the applied input voltage is within the range 0 to 150 VAC.
**E Analog Input**

**Weighing Indicator K3HB-V**

<table>
<thead>
<tr>
<th>Signal Name</th>
<th>Pin No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/C</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
</tr>
<tr>
<td>COM</td>
<td>6</td>
</tr>
</tbody>
</table>

**Temperature Indicator K3HB-H**

<table>
<thead>
<tr>
<th>Signal Name</th>
<th>Pin No.</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>A</td>
<td>2</td>
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<tr>
<td>B</td>
<td>3</td>
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<tr>
<td>C</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
</tr>
<tr>
<td>COM</td>
<td>6</td>
</tr>
</tbody>
</table>

**Linear Sensor Indicator K3HB-S**

<table>
<thead>
<tr>
<th>Signal Name</th>
<th>Pin No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/C</td>
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<tr>
<td>A</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
</tr>
<tr>
<td>COM</td>
<td>6</td>
</tr>
</tbody>
</table>

**D Event Input**

**Models with Terminal Blocks <K35-1>-<K35-3>**

- TIMING: D2
- HOLD: D3
- RESET: D4
- ZERO: D5

**Models with Connectors <K35-2>-<K35-4>**

- Applicable Connector (Sold separately) XG4M-1030 (OMRON)
- Special Cable (Sold separately) K32-DICN (OMRON) (XG4M-1030 with 3 m cable)

**BCD Output Cable**

<table>
<thead>
<tr>
<th>Model</th>
<th>Pin arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>K32-BCD</td>
<td>N/C 1</td>
</tr>
</tbody>
</table>

**Special Cable (for Event Inputs with 8-pin Connector)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Appearance</th>
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</thead>
<tbody>
<tr>
<td>K32-DICN</td>
<td>Pin No. 1</td>
</tr>
<tr>
<td></td>
<td>2 S-TMR</td>
</tr>
<tr>
<td></td>
<td>3 HOLD</td>
</tr>
<tr>
<td></td>
<td>4 RESET</td>
</tr>
<tr>
<td></td>
<td>5 N/C</td>
</tr>
<tr>
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<td>6 COM</td>
</tr>
<tr>
<td></td>
<td>7 BANK4</td>
</tr>
<tr>
<td></td>
<td>8 BANK2</td>
</tr>
<tr>
<td></td>
<td>9 BANK1</td>
</tr>
<tr>
<td></td>
<td>10 COM</td>
</tr>
</tbody>
</table>

Note: The BCD Output Cable has a D-sub plug. Cover: 17JE-37H-1A (manufactured by DDK); Connector: equivalent to 17JE-23370-02 (D1) (manufactured by DDK)
**Main Functions**

**Measurement**

**Input Calculation**

- Two input circuits are provided. The input ranges for these circuits can be set independently. For example, one can be set to 4 to 20 mA and the other can be set to 1 to 5 V.
- In addition to calculations such as K (constant)–A (input for one circuit), it is possible to perform calculations based on the inputs for both circuits, such as A+B and A–B, making it possible to perform thickness measurement and level-difference measurement using displacement and length-measuring sensors.

**Timing Hold**

**Normal**

- Continuously performs measurement and always outputs based on comparative results.

**Peak Hold/Bottom Hold**

- Measures the maximum (or minimum) value in a specified period.

**Scaling**

Scaling converts input signals in any way required before displaying them. The values can be manipulated by shifting, inverting, or +/– reversing.

**Peak-to-peak Hold**

- Measures the difference between the maximum and minimum values in a specified period.

**Average Processing**

Average processing of input signals with extreme changes or noise smooths out the display and makes control stable.

**Previous Average Value Comparison**

Slight changes can be removed from input signals to detect only extreme changes.

**Teaching**

Settings for scaling can be made using the present measurement values instead of inputting values with the SHIFT and UP Keys. This is a convenient function for making the settings while monitoring the operating status.

**Standby Sequence**

Turns the comparative output OFF until the measurement value enters the PASS range.
Input Compensation/Display

**Forced-zero**
Forces the present value to 0. (Convenient for setting reference values or deducting tares for weight measurement.)

**Tare Zero**
Shifts the current value measured with a forced zero to 0 again. It is possible to measure two or more compounds separately and then, by releasing the tare zero and forced-zero, measure the combined total.

**Zero-trimming**
Compensates for mild fluctuations in input signals due to factors such as sensor temperature drift, based on OK (PASS) data at measurement. (This function can be used with sampling hold, peak hold, or bottom hold.)

**Zero-limit**
Changes the display value to 0 for input values less than the set value. It is enabled in normal mode only. (This function can be used, for example, to stop negative values being displayed or to eliminate flickering and minor inconsistencies near 0.)

The minimum and maximum values when the power supply is turned OFF can be saved if interruption memory is turned ON.

If interruption memory is ON, the maximum and minimum values after the last resetting will be displayed.

If interruption memory is OFF, the maximum and minimum values will be displayed after the power supply is turned ON (or after the reset input is performed).

**Display Refresh Period**
The display refresh period can be lengthened to reduce flickering and thereby make the display easier to read.

**Display Color Selection**
Values can be displayed in either red or green. With comparative output models, the display color can also be set to change according to the status of comparative outputs (e.g., green to red or red to green).

Example) Setting: grn-r

**Display Value Selection**
The current display value can be selected from the present value, the maximum value, and the minimum value.

**Step Value**
It is possible to specify (i.e., restrict) the values that the smallest displayed digit can change by. For example, if the setting is 2, the smallest digit will only take the values 0, 2, 4, 6, or 8 and if the setting is 5, it will only take the values 0 or 5. If the setting is 10, it will only take the value of 0.
Output

Comparative Output Pattern

The output pattern for comparative outputs can be selected. In addition to high/low comparison with set values, output based on level changes is also possible. (Use the type of output pattern appropriate for the application.)

Hysteresis

Prevents comparative output chattering when the measurement value fluctuates slightly near the set value.

Example: Comparative Output Pattern (Standard Output)

Startup Compensation Timer

Measurement can be stopped for a set time using external input.

PASS Output Change

Comparative results other than PASS and error signals can be output from the PASS output terminal.

Dimensions

![Dimensions Diagram]

Character Size for Main Display (mm)

PV display 7.6
SV display 3.5

Panel Cutout Dimensions

Mounting Recommended Panel Thickness 1 to 8 mm.
Mount the product horizontally.

*DeviceNet models: 97 mm
Terminal: M3, Terminal Cover: Accessory
■ Wiring Precautions

- For terminal blocks, use the crimp terminals suitable for M3 screws.
- Tighten the terminal screws to the recommended tightening torque of approx. 0.5 N·m.
- To prevent inductive noise, separate the wiring for signal lines from that for power lines.

Wiring

- Use the crimp terminals suitable for M3 screws shown below.

Unit Stickers

- Select the appropriate units from the unit sticker sheets provided and attach the sticker to the Indicator.

Note: When using for meters, such as weighing meters, use the units specified by regulations on weights and measures.

■ Mounting Method

1. Insert the K3HB into the mounting cutout in the panel.
2. Insert watertight packing around the Unit to make the mounting watertight.
3. Insert the adapter into the grooves on the left and right sides of the rear case and push until it reaches the panel and is fixed in place.

■ LCD Field of Vision

The K3HB is designed to have the best visibility at the angles shown in the following diagram.

■ Rubber Packing (Sold Separately)

K32-P1

If the rubber packing is lost or damaged, it can be ordered using the following model number: K32-P1.

(Depending on the operating environment, deterioration, contraction, or hardening of the rubber packing may occur and so, in order to ensure the level of waterproofing specified in NEMA4, periodic replacement is recommended.)

Note: Rubber packing is provided with the Controller.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

In the interest of product improvement, specifications are subject to change without notice.
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   c. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid.
   d. Delivery and shipping dates are estimates only; and
   e. Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.

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