

# Weighing Indicator K3HB-V

CSM\_K3HB-V\_DS\_E\_10\_3



## An Ideal Indicator for OK/NG Judgements in Automated and Picking Machines, Measuring Factors such as Pressure, Load, Torque, and Weight Using Load Cell Signal Input.

- Easy recognition of judgement results using color display that can be switched between red and green. \*
- Equipped with a position meter for monitoring operating status trends.
- External event input allows use in various measurement and discrimination applications.
- Input 0.001 mVDC or higher (0.000 to 19.999 mV range supported). External power takeoff of 100 mA at 10 VDC provided. (Models with 5-VDC power takeoff also available.)
- 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).
- Capable of high-speed sampling at 50 times per second (20 ms)
- Easy-to-set two-point scaling allows conversion and display of any user-set values.
- \* 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.



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

**Refer to Safety Precautions for All Digital Panel Meters.**

## Model Number Structure

### Model Number Legend

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

#### Base Units

K3HB-V       
1 5

##### 1. Input Sensor Code

LC: Load cell input (DC low-voltage input)

##### 5. Supply Voltage

100-240 VAC: 100 to 240 VAC  
24 VAC/VDC: 24 VAC/VDC

### Optional Boards

#### Sensor Power Supply/Output Boards

K33-    
2

#### Relay/Transistor Output Boards

K34-    
3

#### Event Input Boards

K35-    
4

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

- Communications (FLK□B/E) + DeviceNet (DRT)
- Communications (FLK□B/E) + BCD output (BCD)
- Linear current/voltage (L□B/E) + DeviceNet (DRT)

#### Base Units with Optional Boards

K3HB-V        
1 2 3 4 5

##### 2. Sensor Power Supply/Output Type Code

- None: None  
CPB: Relay output (PASS: SPDT) + Sensor power supply (10 VDC +/-5%, 100 mA) (See note 1.)  
L1B: Linear current output (0 to 20 or 4 to 20 mA DC) + Sensor power supply (10 VDC +/-5%, 100 mA) (See note 2.)  
L2B: Linear voltage output (0 to 5, 1 to 5, or 0 to 10 VDC) + Sensor power supply (10 VDC +/-5%, 100 mA) (See note 2.)  
B: Sensor power supply (10 VDC +/-5%, 100 mA)  
FLK1B: Communications (RS-232C) + Sensor power supply (10 VDC +/-5%, 100 mA) (See note 2.)  
FLK3B: Communications (RS-485) + Sensor power supply (10 VDC +/-5%, 100 mA) (See note 2.)  
CPE: Relay output (PASS: SPDT) + Sensor power supply (5 VDC +/-5%, 100 mA) (See note 1.)  
L1E: Linear current output (DC0(4) -20 mA) + Sensor power supply (5 VDC +/-5%, 100 mA) (See note 2.)  
L2E: Linear voltage output (DC0(1) -5 V, 0-10 V) + Sensor power supply (5 VDC +/-5%, 100 mA) (See note 2.)  
E: Sensor power supply (5 VDC +/-5%, 100 mA)  
FLK1E: Communications (RS-232C) + Sensor power supply (5 VDC +/-5%, 100 mA) (See note 2.)  
FLK3E: Communications RS-485 + Sensor power supply (5 VDC +/-5%, 100 mA) (See note 2.)

**Note:** 1. CPA can be combined with relay outputs only.  
2. Only one of the following can be used by each Digital Indicator: RS-232C/RS-485 communications, a linear output, or DeviceNet communications.

##### 3. Relay/Transistor Output Type Code

- None: None  
C1: Relay contact (H/L: SPDT each)  
C2: Relay contact (HH/H/LL/L: SPST-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.)  
\* A Special BCD Output Cable (sold separately) is required.

##### 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

## Watertight Cover

Model
Y92A-49N

## Rubber Packing

Model
K32-P1

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

# Specifications

## ■ Ratings

<b>Power supply voltage</b>		100 to 240 VAC (50/60 Hz), 24 VAC/VDC, DeviceNet power supply: 24 VDC
<b>Allowable power supply voltage range</b>		85% to 110% of the rated power supply voltage, DeviceNet power supply: 11 to 25 VDC
<b>Power consumption</b> (See note 1.)		100 to 240 V: 18 VA max. (max. load) 24 VAC/DC: 11 VA/7 W max. (max. load)
<b>Current consumption</b>		DeviceNet power supply: 50 mA max. (24 VDC)
<b>Input</b>		DC voltage
<b>A/D conversion method</b>		Delta-Sigma method
<b>External power supply</b>		10 VDC $\pm 5\%$ , 100 mA (models with external power supply only) or 5 VDC, 100 mA (models with external power supply only)
<b>Event inputs</b> (See note 2.)	<b>Timing input</b>	NPN open collector or no-voltage contact signal ON residual voltage: 3 V max. ON current at 0 $\Omega$ : 17 mA max. Max. applied voltage: 30 VDC max. OFF leakage current: 1.5 mA max.
	<b>Startup compensation timer input</b>	NPN open collector or no-voltage contact signal ON residual voltage: 2 V max.
	<b>Hold input</b>	ON current at 0 $\Omega$ : 4 mA max.
	<b>Reset input</b>	Max. applied voltage: 30 VDC max.
	<b>Forced-zero input</b>	OFF leakage current: 0.1 mA max.
	<b>Bank input</b>	
<b>Output ratings (depends on the model)</b>	<b>Relay output</b>	250 VAC, 30 VDC, 5 A (resistive load) Mechanical life expectancy: 5,000,000 operations, Electrical life expectancy: 100,000 operations
	<b>Transistor output</b>	Maximum load voltage: 24 VDC, Maximum load current: 50 mA, Leakage current: 100 $\mu$ A max.
	<b>Linear output</b>	Linear output 0 to 20 mA DC, 4 to 20 mA DC: Load: 500 $\Omega$ max, Resolution: Approx. 10,000, Output error: $\pm 0.5\%$ FS Linear output 0 to 5 VDC, 1 to 5 VDC, 0 to 10 VDC: Load: 5 k $\Omega$ max, Resolution: Approx. 10,000, Output error: $\pm 0.5\%$ FS (1 V or less: $\pm 0.15$ V; no output for 0 V or less)
<b>Display method</b>		Negative LCD (backlit LED) display 7-segment digital display (Character height: PV: 14.2 mm (green/red); SV: 4.9 mm (green))
<b>Main functions</b>		Scaling 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
<b>Ambient operating temperature</b>		-10 to 55°C (with no icing or condensation)
<b>Ambient operating humidity</b>		25% to 85%
<b>Storage temperature</b>		-25 to 65°C (with no icing or condensation)
<b>Altitude</b>		2,000 m max.
<b>Accessories</b>		Watertight packing, 2 fixtures, terminal cover, unit stickers, operation manual. DeviceNet models also include a DeviceNet connector (Hirose HR31-5.08P-5SC(01)) and crimp terminals (Hirose HR31-SC-121) (See note 3.)

**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

<b>Display range</b>		–19,999 to 99,999
<b>Sampling period</b>		20 ms (50 times/second)
<b>Comparative output response time</b>		100 ms max.
<b>Linear output response time</b>		150 ms max.
<b>Insulation resistance</b>		20 MΩ min. (at 500 VDC)
<b>Dielectric strength</b>		2,300 VAC for 1 min between external terminals and case
<b>Noise immunity</b>		100 to 240 VAC models: ±1,500 V at power supply terminals in normal or common mode (waveform with 1-ns 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-ns rising edge and pulse width of 1 μs/100 ns)
<b>Vibration resistance</b>		Frequency: 10 to 55 Hz; Acceleration: 50 m/s <sup>2</sup> , 10 sweeps of 5 min each in X, Y, and Z directions
<b>Shock resistance</b>		150 m/s <sup>2</sup> (100 m/s <sup>2</sup> for relay outputs) 3 times each in 3 axes, 6 directions
<b>Weight</b>		Approx. 300 g (Base Unit only)
<b>Degree of protection</b>	<b>Front panel</b>	Conforms to NEMA 4X for indoor use (equivalent to IP66)
	<b>Rear case</b>	IP20
	<b>Terminals</b>	IP00 + finger protection (VDE0106/100)
<b>Memory protection</b>		EEPROM (non-volatile memory) Number of rewrites: 100,000
<b>Applicable standards</b>		UL61010-1, CSA C22.2 No. 61010-1-04 EN61010-1 (IEC61010-1): Pollution degree 2/Overvoltage category II EN61326-1
<b>EMC</b>		EMI: EN61326-1 Industrial electromagnetic environment Electromagnetic radiation interference CISPR 11 Group 1, Class A Terminal interference voltage CISPR 11 Group 1, Class A EMS: EN61326-1 Industrial electromagnetic environment 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 Range and Accuracy)

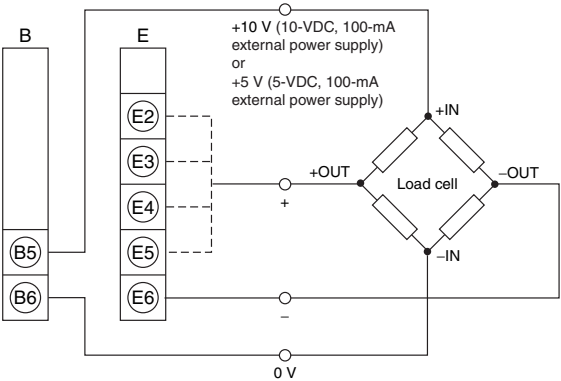
Input type	Range	Set value	Measurement range	Input impedance	Accuracy	Allowable instantaneous overload (30 s)
K3HB-VLC Load Cell, mV	A	$\overline{R} \ \overline{L} \ \overline{L}$	0.00 to 199.99 mV	1 M $\Omega$ min.	$\pm 0.1\%$ rdg $\pm 1$ digit max.	$\pm 200$ V
	B	$\overline{b} \ \overline{L} \ \overline{L}$	0.000 to 19.999 mV		$\pm 0.1\%$ rdg $\pm 5$ digits max.	
	C	$\overline{L} \ \overline{L} \ \overline{L}$	$\pm 100.00$ mV		$\pm 0.1\%$ rdg $\pm 3$ digits max.	
	D	$\overline{d} \ \overline{L} \ \overline{L}$	$\pm 199.99$ mV		$\pm 0.1\%$ rdg $\pm 1$ digit max.	

**Note:** 1. The accuracy is for an ambient temperature of 23 $\pm$ 5 $^{\circ}$ C. For all ranges, 10% or less of max. input  $\pm 0.1\%$  FS.  
2. The letters “rdg” mean “reading.”

Input type Connected terminals	$\overline{R} \ \overline{L} \ \overline{L}$ (E2) – (E6)	$\overline{b} \ \overline{L} \ \overline{L}$ (E3) – (E6)	$\overline{L} \ \overline{L} \ \overline{L}$ (E4) – (E6)	$\overline{d} \ \overline{L} \ \overline{L}$ (E5) – (E6)
(mV)	199.99			199.99
200.000				
150.000				
100.000			100.00	
50.000		19.999		
0.00	0.00	0.000		
-50.00				
-100.00			-100.00	
-150.00				
-200.00				
				-199.99
Maximum measurement range	-19.99 to 219.99 mV	-1.999 to 21.999 mV	-110.00 to 110.00 mV	-199.99 to 219.99 mV

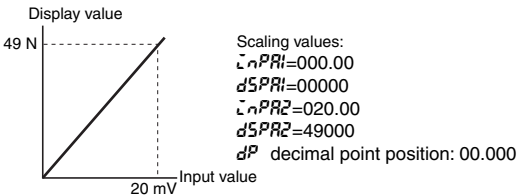
The area shown in dark shading indicates the factory setting.

Load Cell Wiring Example



Scaling Example Using Range A

Indicated on the K3HB-V as 0 to 49N in the load cell specifications (rated load 49N, recommended applied voltage 10 V, rated output 2 mV/V) (See note.)



**Note:** “2 mV/V” indicates a load cell output of 2 mV for 1 V applied voltage for the rated load (when using a load of 1 N). When the applied voltage is 10 V, the load cell output is 20 mV (2 mV  $\times$  10). The precision can be increased by entering the A1 and A2 input values by teaching, and then scaling the results.

# Common Specifications

## ■ Event Input Ratings

Input type	S-TMR, HOLD, RESET, ZERO, BANK1, BANK2, BANK4	TIMING
Contact	ON: 1 k $\Omega$ max., OFF: 100 k $\Omega$ min.	---
No-contact	ON residual voltage: 2 V max. OFF leakage current: 0.1 mA max. Load current: 4 mA max. Maximum applied voltage: 30 VDC max.	ON residual voltage: 3 V max. OFF leakage current: 1.5 mA max. Load current: 17 mA max. Maximum applied voltage: 30 VDC max.

## ■ Output Ratings

### Contact Output

Item	Resistive loads (250 VAC, $\cos\phi=1$ ; 30 VDC, L/R=0 ms)	Inductive loads (250 VAC, closed circuit, $\cos\phi=0.4$ ; 30 VDC, L/R=7 ms)
Rated load	5 A at 250 VAC 5 A at 30 VDC	1 A at 250 VAC 1 A at 30 VDC
Rated through current	5A	
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 $\mu$ A max.

### Linear Output

Item	0 to 20 mA	4 to 20 mA	0 to 5 V	1 to 5 V	0 to 10 V
Allowable load impedance	500 Ω max.		5 kΩ min.		
Resolution	Approx. 10,000				
Output error	±0.5%FS		±0.5%FS (1 V or less: no output for ±0.15 V; 0 V or less)		

### Serial Communications Output

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

**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)

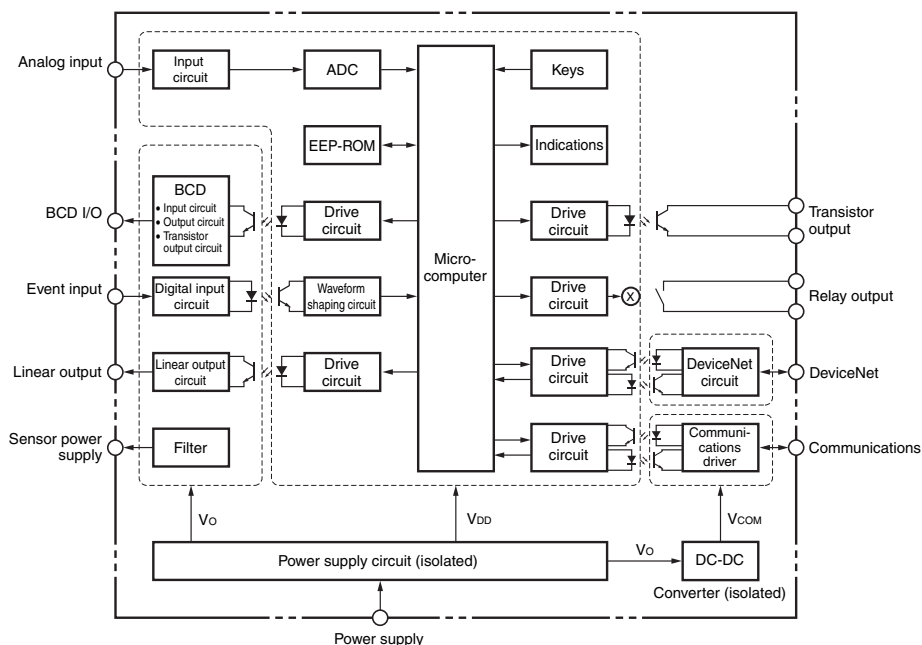
I/O signal name		Item	Rating
Inputs	REQUEST	Input signal	No-voltage contact input
	HOLD	Input current for no-voltage input	10 mA
	MAX	Signal level	ON voltage 1.5 V max.
	MIN		OFF voltage 3 V min.
Outputs	RESET		
	DATA	Maximum load voltage	24 VDC
	POLARITY	Maximum load current	10 mA
	OVER	Leakage current	100 $\mu$ A max.
	DATA VALID		
	RUN		
	HH	Maximum load voltage	24 VDC
	H	Maximum load current	50 mA
	PASS		
	L	Leakage current	100 $\mu$ A max.
	LL		

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

## DeviceNet Communications

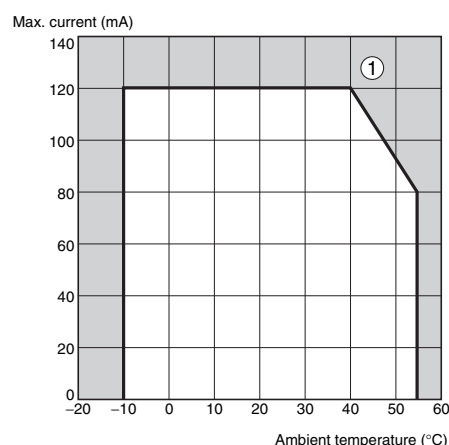
<b>Communications protocol</b>		Conforms to DeviceNet																			
<b>Supported communications</b>	<b>Remote I/O communications</b>	Master-Slave connection (polling, bit-strobe, COS, cyclic) Conforms to DeviceNet communications standards.																			
	<b>I/O allocations</b>	Allocate any 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.)																			
	<b>Message communications</b>	Explicit message communications CompoWay/F communications commands can be executed (using explicit message communications)																			
<b>Connection methods</b>		Combination of multi-drop and T-branch connections (for trunk and drop lines)																			
<b>Baud rate</b>		DeviceNet: 500, 250, or 125 Kbps (automatic follow-up)																			
<b>Communications media</b>		Special 5-wire cable (2 signal lines, 2 power supply lines, 1 shield line)																			
<b>Communications distance</b>		<table><tr><th>Baud rate</th><th>Network length (max.)</th><th>Drop line length (max.)</th><th>Total drop line length (max.)</th></tr><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></table> <p>The values in parentheses are for Thick Cable.</p>				Baud rate	Network length (max.)	Drop line length (max.)	Total drop line length (max.)	500 Kbps	100 m (100 m)	6 m	39 m	250 Kbps	100 m (250 m)	6 m	78 m	125 Kbps	100 m (500 m)	6 m	156 m
Baud rate	Network length (max.)	Drop line length (max.)	Total drop line length (max.)																		
500 Kbps	100 m (100 m)	6 m	39 m																		
250 Kbps	100 m (250 m)	6 m	78 m																		
125 Kbps	100 m (500 m)	6 m	156 m																		
<b>Communications power supply</b>		24-VDC DeviceNet power supply																			
<b>Allowable voltage fluctuation range</b>		11 to 25-VDC DeviceNet power supply																			
<b>Current consumption</b>		50 mA max. (24 VDC)																			
<b>Maximum number of nodes</b>		64 (DeviceNet Configurator is counted as one node when connected)																			
<b>Maximum number of slaves</b>		63																			
<b>Error control checks</b>		CRC errors																			
<b>DeviceNet power supply</b>		Supplied from DeviceNet communications connector																			

## Internal Block Diagram

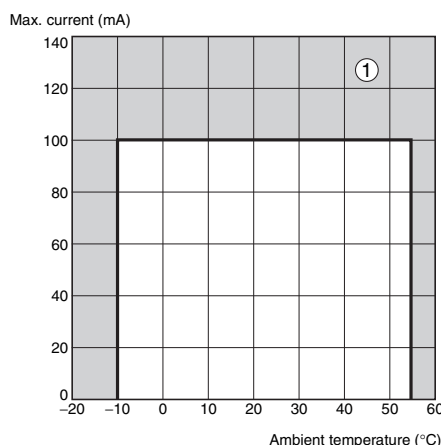


## Power Supply Derating Curve for Sensor (Reference Value)

With 12 V



With 10 V



- 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	Function
T-ZR	Turns ON when the tare zero function is executed. Turns OFF if it is not executed or is cleared.
Zero	Turns ON when the forced-zero function is executed. Turns OFF if it is not executed or is cleared. (Excluding the K3HB-H.)
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	Function
TG	Turns ON when the timing signal turns ON. Otherwise OFF.
T	Turns ON when parameters for which teaching can be performed are displayed.
HH, H, L, LL	In RUN level, turn ON when the comparative set values HH, H, 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.

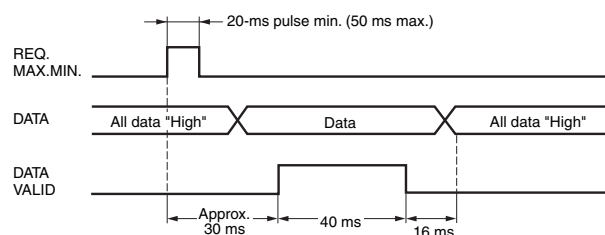
### UP Key

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.

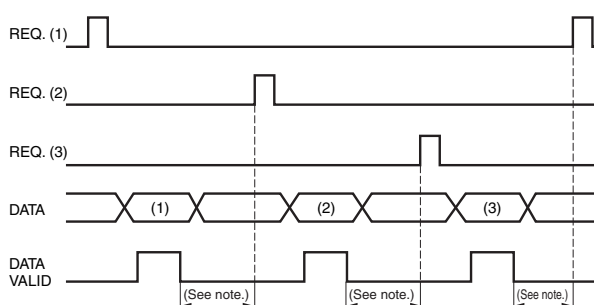
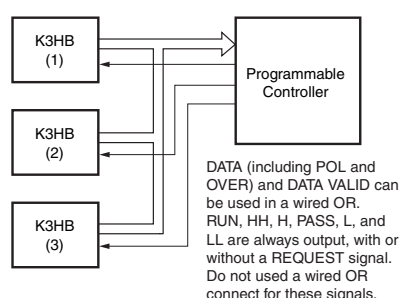
### ■ BCD Output Timing Chart

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

## Single Sampling Data Output

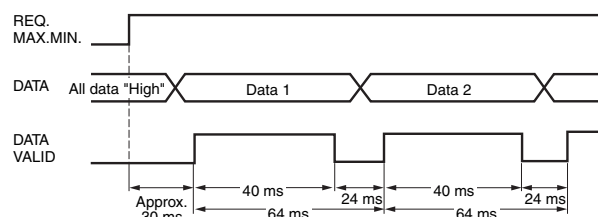


The data is set in approximately 30 ms from the rising edge of the REQUEST signal and the DATA VALID signal is output. When reading the data from a Programmable Controller, start reading the data when the DATA VALID signal turns ON. The DATA VALID signal will turn OFF 40 ms later, and the data will turn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



**Note:** Leave 20 ms min. between DATA VALID turning OFF and the REQUEST signal.

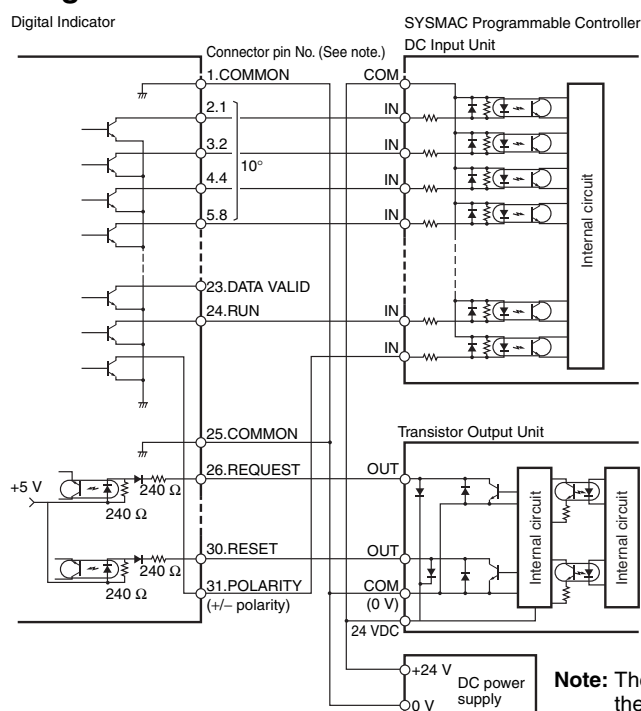
## Continuous Data Output



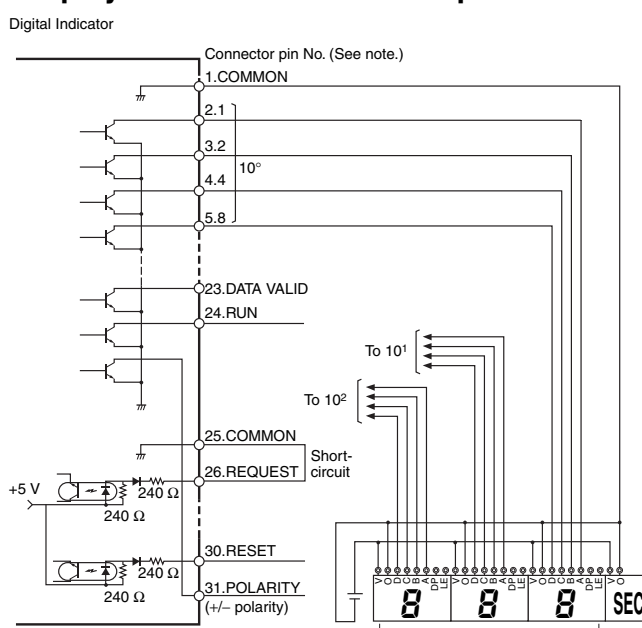
Measurement data is output every 64 ms while the REQUEST signal remains ON.

**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



## Display Unit Connection Example



**Note:** The BCD output connector pin number is the D-sub connector pin number when the BCD Output Cable (sold separately) is connected. This number differs from the pin number for the Digital Indicator narrow pitch connector (manufactured by Honda Tsushin Kogyo Co., Ltd.).

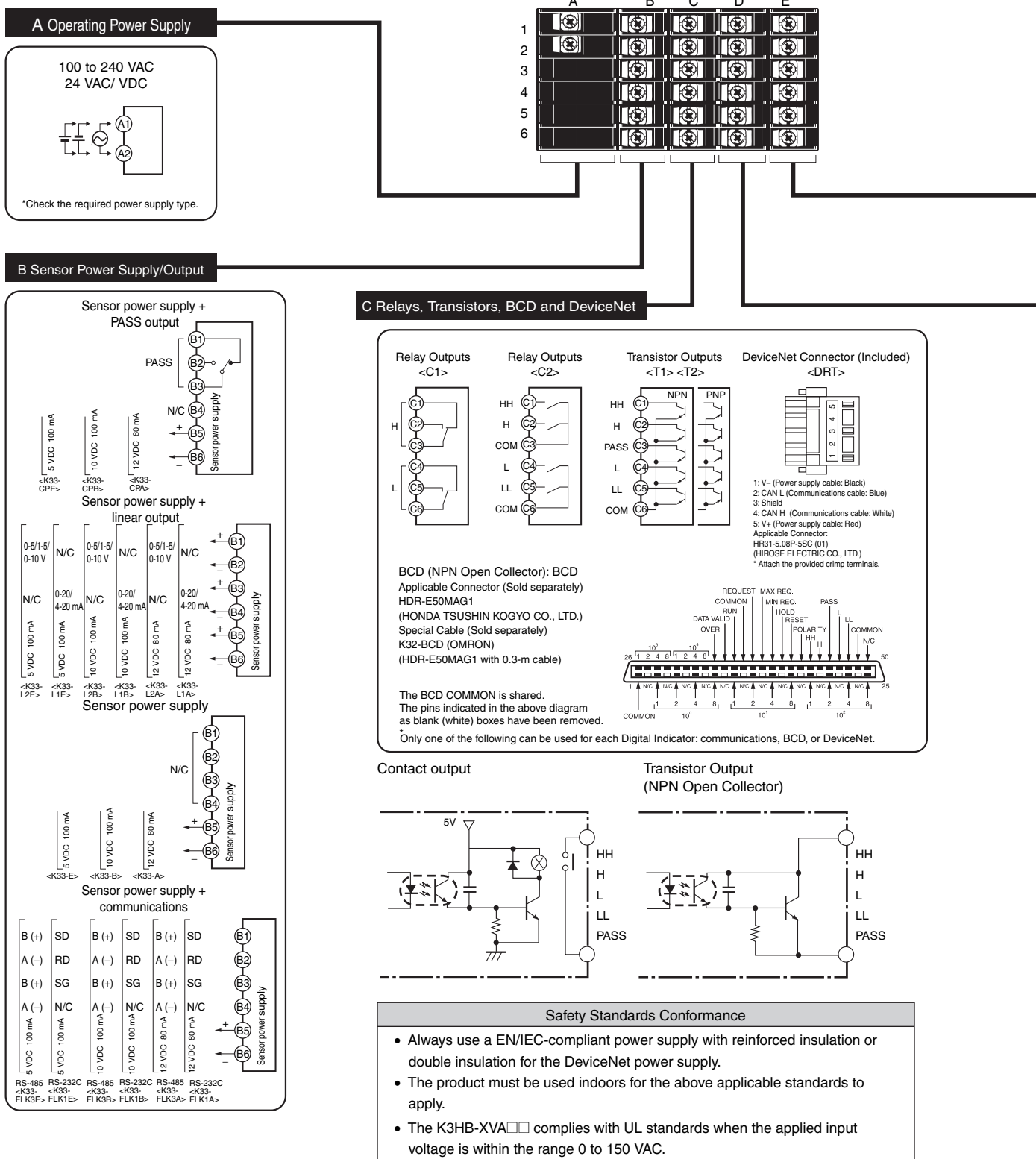
Refer to the following User's Manual for application precautions and other information required when using the Digital Indicator:  
K3HB-S/-X/-V/-H Digital Indicator User's Manual (Cat. No. N128)  
The manual can be downloaded from the following site in PDF format: OMRON Industrial Web <http://www.fa.omron.co.jp>



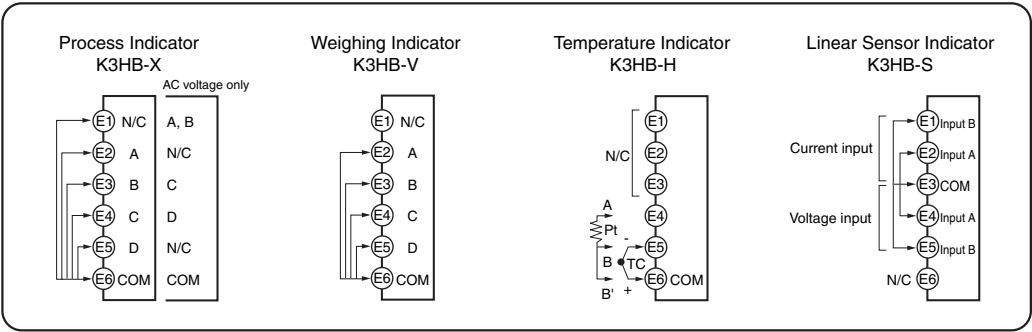
## Connections

### Terminal Arrangement

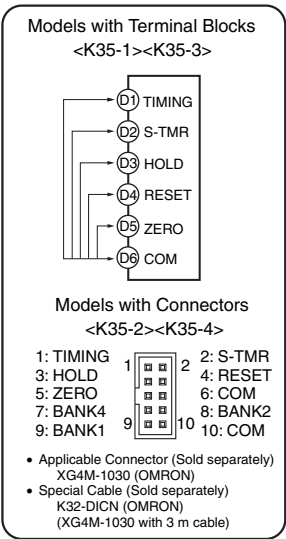
**Note:** Insulation is used between signal input, event input, output, and power supply terminals.



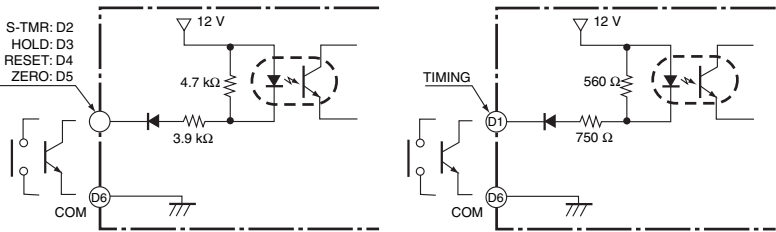
E Analog Input



D Event Input



- Use terminal pin D6 as the common terminal.
- Use NPN open collector or no-voltage contacts for event input.  
PNP types are also available.



BCD Output Cable

Model	Shape	Pin arrangement
K32-BCD	<p>Cover: HDR-E50LPA5 (manufactured by Honda Tsushin Co., Ltd.)</p> <p>Connector: HDR-E50MAG1 (manufactured by Honda Tsushin Co., Ltd.)</p> <p>D-sub connector (37-pin female) Cover: 17JE-37H-1A (manufactured by DDK) Connector: Equivalent to 17JE-13370-02 (manufactured by DDK) Stand: 17L-002A (manufactured by DDK)</p>	

**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)

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

Model	Appearance	Wiring																						
K32-DICN	<p>The diagram shows a cable with an 8-pin connector. The pins are numbered 1 through 8. A dimension line indicates a length of 3,000 mm (3 m). A label 'Cable marking' points to the cable. A small inset shows a detail of the connector.</p>	<table><tr><th>Pin No.</th><th>Signal name</th></tr><tr><td>1</td><td>N/C</td></tr><tr><td>2</td><td>S-TMR</td></tr><tr><td>3</td><td>HOLD</td></tr><tr><td>4</td><td>RESET</td></tr><tr><td>5</td><td>N/C</td></tr><tr><td>6</td><td>COM</td></tr><tr><td>7</td><td>BANK4</td></tr><tr><td>8</td><td>BANK2</td></tr><tr><td>9</td><td>BANK1</td></tr><tr><td>10</td><td>COM</td></tr></table>	Pin No.	Signal name	1	N/C	2	S-TMR	3	HOLD	4	RESET	5	N/C	6	COM	7	BANK4	8	BANK2	9	BANK1	10	COM
Pin No.	Signal name																							
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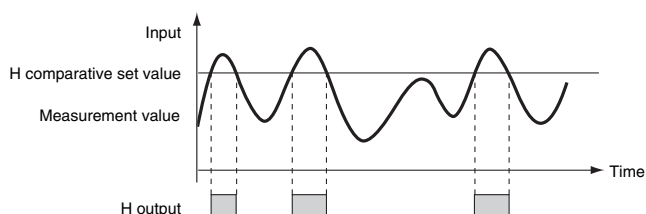
## ■ Main Functions

### Measurement

#### Timing Hold

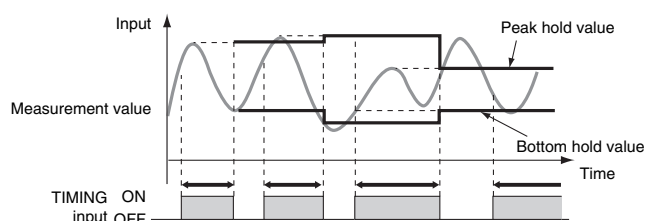
##### Normal

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



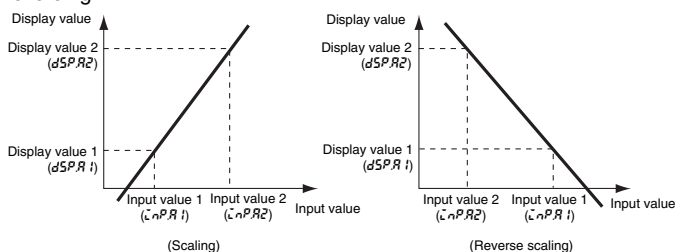
##### Peak Hold/Bottom Hold

- 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.



#### 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 settings while monitoring the operating status, for calculating amounts by tare reduction (to measure only the contents), or when the result should be zero but the display is not zero for some reason.

#### Standby Sequence

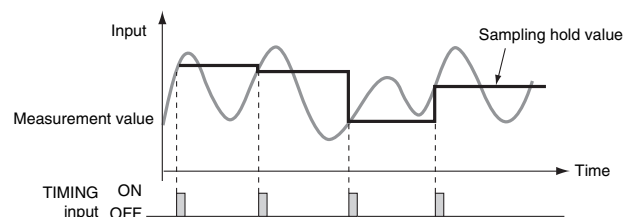
Turns the comparative output OFF until the measurement value enters the PASS range.

#### Average Processing

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

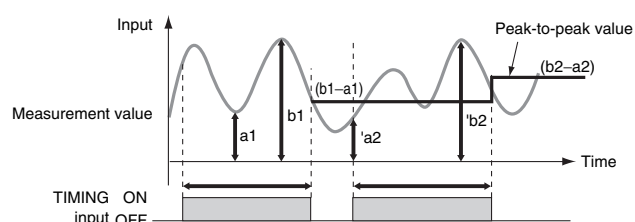
##### Sampling Hold

- Holds the measurement at the rising edge of the TIMING signal.



##### Peak-to-peak Hold

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



#### Previous Average Value Comparison

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

## Input Compensation/Display

### Forced-zero

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

### Tare Zero

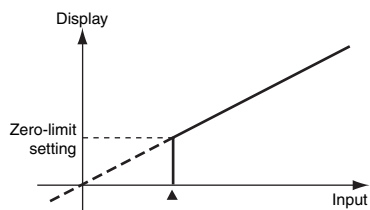
Shifts the current value measured with a forced zero to 0 again. It is possible to measure two or more compounds separately and then, by releasing the tare zero and forced-zero, measure the combined total.

### 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.)



### Interruption Memory

- 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).

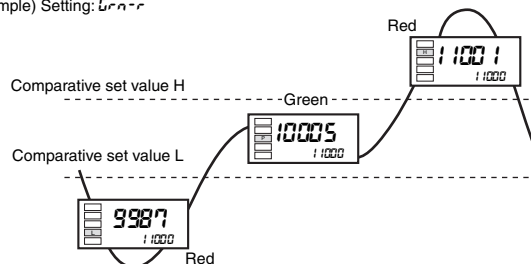
### Display Refresh Period

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:  $\overline{G} \overline{R} \overline{R}$



### Display Value Selection

The current display value can be selected from the present value, the maximum value, and the minimum value.

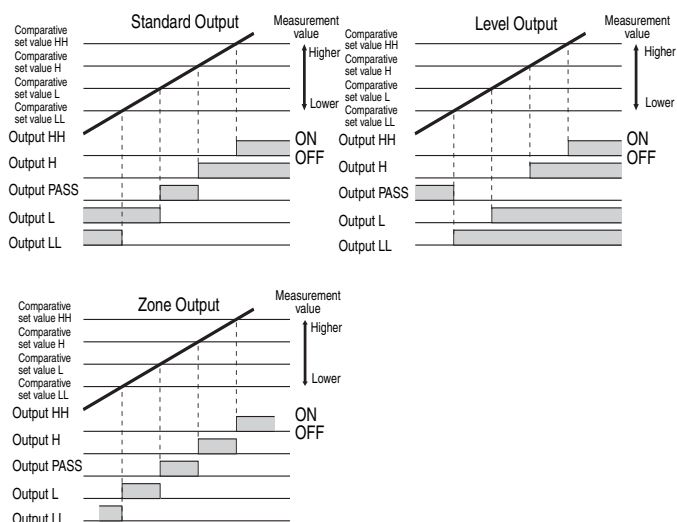
### Step Value

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.)



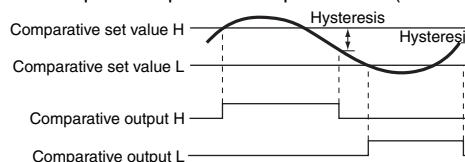
### Output Logic

Reverses the output operation of comparative outputs for comparative results.

### Hysteresis

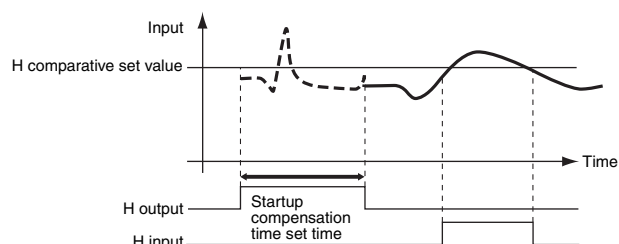
Prevents comparative output chattering when the measurement value fluctuates slightly near the set value.

Example: Comparative Output Pattern (Standard Output)



### Startup Compensation Timer

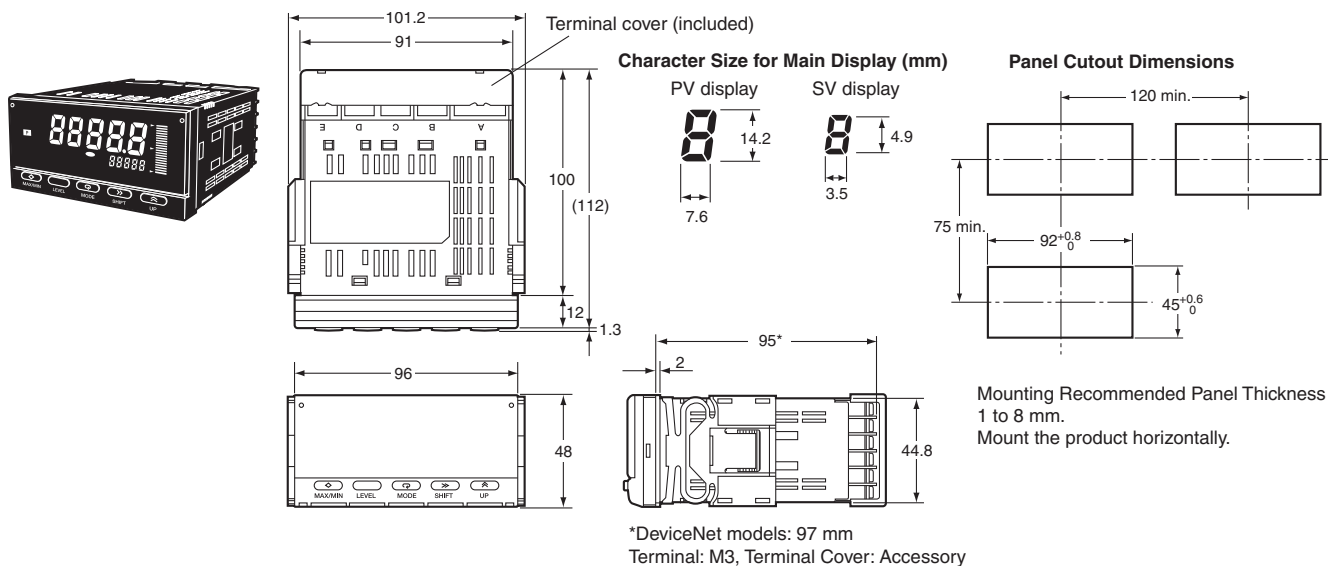
Measurement can be stopped for a set time using external input.



### PASS Output Change

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

## Dimensions

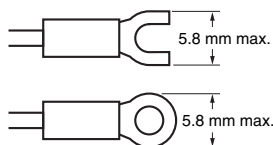


## ■ Wiring Precautions

- 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.

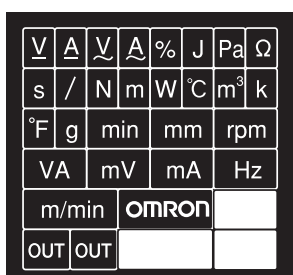
## Wiring

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



## Unit Stickers

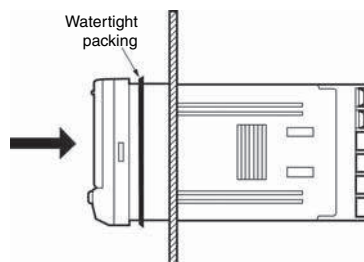
- Select the appropriate units from the unit sticker sheets provided and attach the sticker to the Indicator.



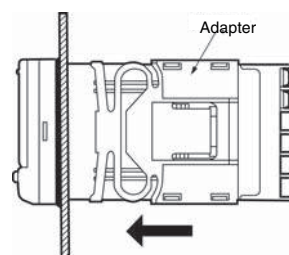
**Note:** When using for meters, such as weighing meters, use the units specified by regulations on weights and measures.

## ■ 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.

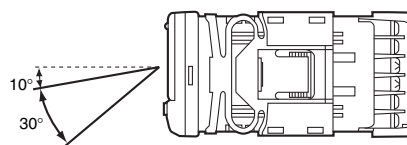


3. Insert the adapter into the grooves on the left and right sides of the rear case and push until it reaches the panel and is fixed in place.



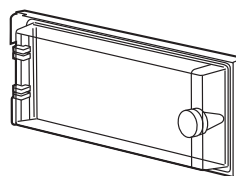
## ■ LCD Field of Vision

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



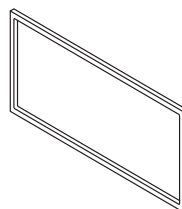
## ■ Watertight Cover

Y92A-49N



## ■ Rubber Packing

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.

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