OMRON

K3HB-X

Process Indicator

EN

Instruction Manual

Thank you for purchasing this OMRON product. Read this instruction manual and thoroughly familiarize yourself with the functions and characteristics of the product before using it. This product is designed for use by qualified personnel with knowledge of electrical systems. Keep this instruction manual for future reference.

OMRON Corporation

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For detailed application procedures, refer to the Digital Indicator K3HB-S, X, V, H User's Manual (Cat. No. N128). For details on using communications functions, refer to the Digital Indicator K3HB Communications User's Manual (Cat. No. N129).

Safety Precautions

Definition of Precautionary Information

ndicates a potentially hazardous situation which, if not avoided, will result in minor or moder-WARNING ate injury, or may result in serious injury or death. Additionally there may be significant property damage.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

Precautionary Information

⚠ WARNING

Do not touch the terminals while power is being supplied. Doing so may possibly result in electric shock. Make sure that the terminal cover is installed before using the product.

Always provide protective circuits in the network. Without protective circuits, malfunctions may possibly result in accidents that cause serious injury or significant property damage.

Provide double or triple safety measures in external control circuits, such as emergency stop circuits, interlock circuits, or limit circuits, to ensure safe-ty in the system if an abnormality occurs due to malfunction of the product or another external factor affecting the product's operation.

⚠ CAUTION

Do not allow pieces of metal, wire clippings, or fine metallic shavings or filings from installation to enter the product. Doing so may occasionally result in electric shock, fire, or malfunction.

Do not use the product in locations where flammable or explosive gases are present. Doing so may occasionally result in minor or moderate explosion, causing minor or moderate injury, or property damage.

Do not attempt to disassemble, repair, or modify the product. Doing so may occasionally result in minor or moderate injury due to electric

Do not use the equipment for measurements within Measurement Categories III or IV (according to IEC61010-1). Doing so may occasionaly cause unexpected operation, resulting in minor or moderate injury, or damage to the equipment. Use the equipment for measurements only within the Measurement Category for which the product is designed.

Perform correct setting of the product according to the application. Failure to do so may occasionaly cause unexpected operation, resulting in minor or moderate injury, or damage to the equipment.

Ensure safety in the event of product failure by taking safety measures, such as installing a separate monitoring system. Product failure may occasionally prevent operation of comparative outputs, resulting in damage to the connected facilities and equipment.

Tighten the screws on the terminal block and the connector lockrighten the screws of the terminal block and the conflector locking screws securely using a tightening torque within the following ranges. Loose screws may occasionally cause fire, resulting in minor or moderate injury, or damage to the equipment.

Terminal block screws: 0.43 to 0.58 N · m Connector locking screws: 0.18 to 0.22 N · m

Make sure that the product will not be adversely affected if the DeviceNet cycle time is lengthened as a result of changing the program with online editing. Extending the cycle time may cause unexpected operation, occasionally resulting in minor or moderate injury, or damage to the equipment.

Before transferring programs to other nodes or changing I/O memory of other nodes, check the nodes to confirm safety. Changing the program or I/O memory of other nodes may occasionally cause unexpected operation, resulting in minor or moderate injury, or damage to the equipment.

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- Do not use the product in the following locations. Locations subject to direct radiant heat from heating
- equipment

Precautions for Safe Use

- Locations where the product may come into contact with water or oil
- Locations subject to direct sunlight
- Locations where dust or corrosive gases (in particular, sulfuric or ammonia das) are present
- Locations subject to extreme temperature changes · Locations where icing or condensation may occur
- Locations subject to excessive shocks or vibration
 Do not use the product in locations subject to temperatures or humidity levels outside the specified ranges or in locations prone to condensation. If the product is installed in a panel, ensure that the temperature around the product (not the temperature around the panel) does not go outside the specified range.
- Provide sufficient space around the product for heat dissipation.
- Use and store the product within the specified temperature and humidity ranges. If several products are mounted side-by-side or arranged in a vertical line the heat dissipation will cause the internal temperature of the products to rise, shortening the service life. If necessary, cool the productss using a fan or other cooling method.
- The service life of the output relays depends on the switching capacity and switching conditions. Consider the actual application conditions and use the product within the rated load and electrical service life. . Using the product beyond its service life may result in contact welding or burning.
- Install the product horizontally.
- Mount to a panel between 1 and 8-mm thick.
- Use the specified size of crimp terminals (M3, width: 5.8 mm max.) for wiring. To connect bare wires, use AWG22 to AWG14 to wire the power supply terminals and AWG28 to AWG16 for other terminals
- (Length of exposed wire: 6 to 8 mm)
 In order to prevent inductive noise, wire the lines connected to the product separately from power lines carrying high voltages or currents. Do not wire in parallel with or in the same cable as power lines. Other measures for reducing noise include running lines along separate ducts and using shield lines.
- Ensure that the rated voltage is achieved no longer than 2 s after turning the power ON.
- 1) Allow the product to operate without load for at least 15 minutes after the power is turned ON.
- 12) Do not install the product near devices generating strong high-frequency waves or surges. When using a noise filter, check the voltage and current and install it as close to the product as possible.
- Do not use thinner to clean the product. Use commercially available alcohol.
- 14) Be sure to confirm the name and polarity for each
- terminal before wiring the terminal block and connectors 15) Use the product within the noted supply volage and
- rated load. 16) Do not connect anything to unused terminals.17) Output turns OFF when the mode is changed or
- settings are initialized. Take this into consideration when setting up the control system.

 18) Install an external circuit breaker or switch that
- conforms to IEC60947-1 and IEC60947-3 requirements and label them clearly so that the operator can quickly turn OFF the power.

 19) Use the specified cables for the communications lines and stay within the specified DeviceNet
- communications distances. Refer to the User's Manual (Cat. No. N129) for details on communications distance specifications and cables. 20) Do not pull the DeviceNet communications cables with
- excessive force or bend them past their natural bending radius. 21) Do not connect or remove connectors while the
- DeviceNet power is being supplied. Doing so will cause product failure or malfunction.
- 22) Use cables with heat resistance of 70°C min. 23) This is a class A product. In residential areas it may
- cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

Specifications -

Power supply voltage

Allowable power supply

A/D conversion method

Relay output

Transistor

Linear output

Ambient operating humidity 25% to 85%

output

Storage temperature

Characteristics

Display range

Sampling period

Dielectric strength

Noise immunity

Insulation resistance

Vibration resistance

Shock resistance

Memory protection

Installation environment

Applicable standards

Weight

ratings

Enclosure

Power consumption

Current consumption

Input

Output

ratings

Altitude

Ratings

voltage range

100 to 240 VAC 50/60Hz, 24 VAC 50/60Hz/ 24VDC

85% to 110% of the rated power supply voltage

DeviceNet power supply: 50 mA max. (24 VDC)

DC voltage, DC current, AC voltage, AC current

DeviceNet power supply: 24 VDC

DeviceNet power supply: 11 to 25 VDC

24 VAC/DC: 11 VA/7 W max. (max. load)

100 to 240 V: 18 VA max. (max. load)

250 VAC, 30 VDC, 5 A (resistive load)
Mechanical life expectancy: 5,000,000 operations
Electrical life expectancy: 100,000 operations
Maximum load voltage: 24 VDC
Maximum load current: 50 mA

0 to 20 mA DC, 4 to 20 mA DC: 500 Ω load max.

Resolution: Approx. 10,000; Output error: ±0.5 % FS

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

When the power is turned ON for models with a DC power supply, a control power supply of 1 A per

Process Indicator is required. Make sure that the power supply capacity is sufficient when using multiple Process Indicators. The recommended DC power supply is the OMRON S8VS-series Power

20 M Ω min. (at 500 VDC)

100 to 240 VAC models:

0 to 5 VDC, 1 to 5 VDC, 0 to 10 VDC: 5 K Ω load min.; Resolution: Approximately 10,000 Output error: ± 0.5 % FS, except for 1 V or less: ± 0.15 V, -0 V

2,300 VAC for 1 min between external terminals and case

±1,500 V at power supply terminals in normal or common mode 24 VAC/VDC models:

 \pm 1,500 V at power supply terminals in normal or common mode

(waveform with 1-ns rising edge and pulse width of 1 $\mu s/100$ ns)

Frequency: 10 to 55 Hz; Acceleration: 50 m/s2 10 sweeps

150 m/s² (100 m/s² for relay outputs) 3 times each in 3 axes, 6 directions

Overvoltage category II, Pollution degree 2 (as per IEC61010-1)

of 5 min each in X, Y, and Z direcrtions

Approx. 300 g (Digital Panel Meter only)

IP00 + finger protection (VDE0106/100)

UL61010-1, CAN/CSA C22.2 No. 61010-1.04

Front panel Conforms to NEMA 4X (equivalent to IP66)

EEPROM (non-volatile memory)

(evaluated by UL) EN61010-1 (IEC61010-1)

Number of rewrites: 100,000 times

Delta-Sigma method

Leakage current: 100 μA max

Ambient operating temperature -10°C to 55°C (with no icing or condensation)

2,000 m max.

-19999 to 99999

20 ms

Installation • Dimensions

101.2

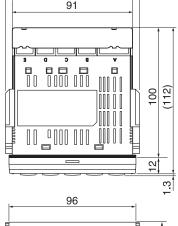
⇗

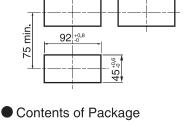
Units: mm

Panel Cutout Dimensions

Insert the Process Indicator into the cutout, fit the adapter into the grooves on the left and right sides of the rear case, and then push the Process Indicator into the panel so that there are no gaps between it and the panel.

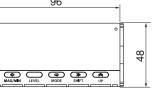
120 min.

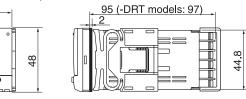




· Main Unit

- Manual
- · Terminal cover Fixture
- · Waterproof packing · Unit labe DeviceNet Connector*
- Crimp Terminals (HIROSE ELECTRIC CO., LTD.: HR31-SC-121) -DRT models





Names and Functions of Parts

SV display status Level/bank display PV display MAX/MIN status indicator Position meter Comparative output status indicators SV display Status SHIFT UP indicators MAX/MIN MODE Up kev When the UP-key is pushed while measuring, Forced-zero is done. When the UP-key is pushed for 1s or more, Forced-Zero is released. please turn on Forced-zero-protecting when you want to invalidate the function. Shift key MAX/MIN key Mode key Level key

Measurement Range (CAT II)

EN61326-1

Rear case IP20

Input type		Set value	Measurement range	Terminal No.
DC voltage	Α	A ud	±199.99 V	E2-E6
	В	b ud	±19.999 V	E3-E6
	С	[ud	±1.9999 V	E4-E6
	D	d ud	1.0000 to 5.0000 V	E5-E6
DC current	Α	8 88	±199.99 mA	E2-E6
	В	6 Rd	±19.999 mA	E3-E6
	С	[Rd	±1.9999 mA	E4-E6
	D	d Ad	4.000 to 20.000 mA	E5-E6
AC voltage	Α	88	0.0 to 400.0 V	E1-E6
	В	<i>ხ uR</i>	0.00 to 199.99 V	E1-E6
	С	[48	0.000 to 19.999 V	E3-E6
	D	d uR	0.0000 to 1.9999 V	E4-E6
AC current	Α	8 88	0.000 to 10.000 A	E2-E6
	В	6 AA	0.0000 to 1.9999 A	E3-E6
	С	[88	0.00 to 199.99 mA	E4-E6
	D	d 88	0.000 to 19.999 mA	E5-E6

Conformity to Safety Standards

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-XVA□□ complies with UL standards when the applied input voltage is within the range 0 to 150 VAC.

Error Display

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PV display	SV display	Description of error	Countermeasure	
UNIT)	Err (ERR)	An unexpected Unit was detected.	Check the Unit's model number and mount it in the correct position.	
Unit (UNIT)	[H [; (CHG)	Displayed the first time the power is turned ON after mounting a new Unit.	Press the \square [LEVEL] key for at least 3 s. to register the new Unit configuration.	
disp)	Err (ERR)	Display error	Repair is necessary. Consult your OMRON representative.	
545 (SYS)	Err (ERR)	Internal memory error		
EEP)	ور (ERR)	Error in non-volatile memory	Press the \square [LEVEL] key in this state for at least 3 s to return to the factory settings. (See note 1.)	
5. <i>E</i> (S.ERR)	Normal	Input error	Return the input to within the measurement range.	
99999 or 19999 (flashing)	operation	The input value is out of range or the PV is either greater than 93933 or less than - 13393.	Return the input to within the displayable range.	

The parameters already set are returned to the factory settings. If the problem still persists after performing initialization, repair is necessary.

Suitability for Use

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with

Know and observe all prohibitions of use applicable to this

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

See also Product catalog for Warranty and Limitation of

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