1/32 DIN Digital Panel Meter
K3GN

1/32 DIN Digital Panel Meter for Downsizing Equipment and Control Panels

- Compact size: 48 x 24 x 83 (W x H x D).
- Multi-input compatible: DC voltage/current, rotary pulse.
- Two display colors (switchable): green/red.
- Selectable outputs.
- CE marking and UL/CSA approval.
- Splash-proof construction (NEMA4X: equivalent to IP66).

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

NEW

Model Number Structure

■ Model Number Legend

K3GN-□□-□-□ 24 VDC
1 2 3 4

1. Input Type
- ND: DC voltage/current, NPN
- PD: DC voltage/current, PNP

2. Output Type
- C: 2 relay contact outputs (SPST-NO)
- C-FLK: 2 relay contact outputs (SPST-NO) and RS-485
- C-L1: 2 relay contact outputs (SPST-NO) and DC current (0 to 20 mA, 4 to 20 mA)
- C-L2: 2 relay contact outputs (SPST-NO) and DC voltage (0 to 5 V, 1 to 5 V, 0 to 10 V)
- T1: 3 transistor outputs (NPN open collector)
- T1-FLK: 3 transistor outputs (NPN open collector) and RS-485
- T1-L1: 3 transistor outputs (NPN open collector) and DC current (0 to 20 mA, 4 to 20 mA)
- T1-L2: 3 transistor outputs (NPN open collector) and DC voltage (0 to 5 V, 1 to 5 V, 0 to 10 V)
- T2: 3 transistor outputs (PNP open collector)
- T2-FLK: 3 transistor outputs (PNP open collector) and RS-485

3. Option
- None: None
- -400: Normally energized relays

4. Supply Voltage
- 24 VDC: 24 VDC

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Ordering Information

■ List of Models

Supply voltage	Input type	Output type		Model
		Judgement output	Data transmission output	
24 VDC	DC voltage, DC current, or NPN input	2 relay contact outputs (SPST-NO)	None	K3GN-NDC 24 VDC
			RS-485	K3GN-NDC-FLK 24 VDC
			DC current (0 to 20 mA, 4 to 20 mA)	K3GN-NDC-L1 24 VDC
			DC voltage (0 to 5 V, 1 to 5 V, 0 to 10 V)	K3GN-NDC-L2 24 VDC
		2 relay contact outputs (SPST-NO) Normally energized relays (See note.)	None	K3GN-NDC-400 24 VDC
			RS-485	K3GN-NDC-FLK-400 24 VDC
			DC current (0 to 20 mA, 4 to 20 mA)	K3GN-NDC-L1-400 24 VDC
			DC voltage (0 to 5 V, 1 to 5 V, 0 to 10 V)	K3GN-NDC-L2-400 24 VDC
		3 transistor outputs (NPN open collector)	None	K3GN-NDT1 24 VDC
			RS-485	K3GN-NDT1-FLK 24 VDC
			DC current (0 to 20 mA, 4 to 20 mA)	K3GN-NDT1-L1 24 VDC
			DC voltage (0 to 5 V, 1 to 5 V, 0 to 10 V)	K3GN-NDT1-L2 24 VDC
	DC voltage, DC current, or PNP input	2 relay contact outputs (SPST-NO)	None	K3GN-PDC 24 VDC
			RS-485	K3GN-PDC-FLK 24 VDC
		3 transistor outputs (PNP open collector)	None	K3GN-PDT2 24 VDC
			RS-485	K3GN-PDT2-FLK 24 VDC

Note: Refer to page 5 for information on models with normally energized relays.

Specifications

■ Ratings

Item		K3GN-ND With DC voltage, DC current, and NPN input	K3GN-PD With DC voltage, DC current, and PNP input
Supply voltage		24 VDC	
Operating voltage range		85% to 110% of the rated supply voltage	
Power consumption (at max. load) (See note 1.)		2.5 W max. (at max. DC load with all indicators lit)	
Input signal		DC voltage, DC current, no-voltage contact, open collector	
DC voltage/current input	**A/D conversion**	Double integral method	
Pulse signal input	**Pulse measurement method**	Periodic measurement method	
External power supply		None	
Control input		Present value hold or forced zero (selectable) (See note 2.)	
Outputs (Outputs depend on the model.)	**Relay contact output**	1 A, 30 VDC (resistive load), mechanical life: 50,000,000 operations min., electrical life: 100,000 operations min.	
	Transistor output	Max. load voltage: 24 VDC, Max. load current: 50 mA, Leakage current: 100 μA max.	
	Communications output	RS-485 (2-wire, half-duplex)	
	Linear output	DC current (0 to 20 mA DC, 4 to 20 mA: Load: 500 Ω max., Resolution: Approx. 10,000) DC voltage (0 to 5 VDC, 1 to 5 VDC, 0 to 10 VDC: Load: 5k Ω min., Resolution: Approx. 10,000)	---
Display		Negative LCD (backlit LCD) display 7-segment digital display, character height: 7.0 mm, and single illuminated display	
Main functions		Scaling, prescaling, teaching, average processing, forced zero, display color selection, output type selection, key protection, startup compensation timer, hysteresis	
Ambient temperature		Operating: −10°C to 55°C (with no condensation or icing) Storage: −25°C to 65°C (with no condensation or icing)	
Ambient humidity		Operating: 25% to 85%	
Altitude		2,000 m max.	
Accessories		Rubber packing, fixture, operation manual	

Note: 1. A control power supply capacity greater than the rated capacity is required when the Digital Panel Meter is turned ON. Do not forget to take this into consideration when using several Digital Panel Meters. When power is supplied, all indicators will light and outputs will be OFF. When using startup compensation time operation, the display will read "88888" and all outputs will be OFF.

2. Enabled only when using DC voltage/current input. (Min.time for control signal input: 80 ms)

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■ Characteristics

Item		K3GN-ND With DC voltage, DC current, and NPN input	K3GN-PD With DC voltage, DC current, and PNP input
Input signal		DC voltage/current (4 to 20 mA, 1 to 5 V, ±5 V, ±10 V) No-voltage contact (30 Hz max. with ON/OFF pulse width of 16 ms min.) Open collector (5 kHz max. with ON/OFF pulse width of 90 μs min.)	
Displayable range		5 digits (-19999 to 99999)	
Sampling period		250 ms	
Display refresh period		Sampling period (sampling times multiplied by number of averaging times if average processing is selected.)	
Comparative output response time (transistor outputs)		750 ms max. (transistor output) (The time required for the judgment output to be output if the input signal rapidly changes from 15% to 95% or from 95% to 15%.)	
Linear output response time		750 ms max. (The time required for the analog output to be output if the output signal rapidly changes from 15% to 95% or from 95% to 15%.)	---
Insulation resistance		20 MΩ min. (at 500 VDC) between external terminal and case. Insulation provided between inputs, outputs, and power supply.	
Dielectric strength		1,000 VAC for 1 min between external terminal and case.	
Noise immunity		±480 V on power supply terminals in normal mode, ±1,500 V in common mode, ±1 μs, or 100 ns for square-wave noise with 1 ns	
Vibration resistance		Vibration frequency: 10 to 55 Hz, Acceleration: 50 m/s² for 10 min each in X, Y, and Z directions	
Shock resistance		Models with transistor outputs: 150 m/s² three times each in 3 axes, 6 directions Models with contact outputs: 100 m/s² three times each in 3 axes, 6 directions	
Weight		Approx. 100 g (Main Unit only)	
Degree of protection	**Front panel**	NEMA4X for indoor use (equivalent to IP66),	
	Rear case	IP20	
	Terminals	IP00 and finger protection (VDE0106/100)	
Memory protection		Non-volatile memory (EEPROM) (possible to rewrite 100,000 times)	
Approved standards		UL508, CSA C22.2 No. 142	
EMC		(EMI) EN 61326 Industry Emission Enclosure: EN55011 Group 1 class A (EMS) EN 61326 Industry Immunity ESD: EN 61000-4-2: 4 kV (contact discharge), 8 kV (air discharge) Immunity RF-interference: EN 61000-4-3: 10 V/m (amplitude-modulated, 80 MHz to 1 GHz) Immunity Fast Transient Noise: EN 61000-4-4: 2 kV (power line) Immunity Burst Noise: 1 kV line to line (I/O signal line) Immunity Surge: EN 61000-4-5: 2 kV line to ground (power line) Immunity Conducted Disturbance EN 61000-4-6: 3 V (0.15 to 80 MHz) Immunity Power Frequency Magnetic EN 61000-4-8: 30 A/m (50 Hz) continuous time	

■ Input Ranges: Measurement Range and Accuracy

Input type	Analog					Pulse			Remote
in-t	AnALG					PULSE			rmt
	DC current input	DC voltage input				Rotary pulse			
Analog range rAnGE	4 to 20 mA 4-20	Analog range rAnGE	1 to 5 V 1-5	±5 V 5	±10 V 10	Pulse frequency P-FrE	30 Hz 30	5 kHz 5P	
Connection terminal	⑤-⑥	Connection terminal	④-⑤			Connection terminal	②-③		Range of display from -19999 to 99999 using communications.
Current range (mA) 22.00 20.00 4.00 0.00 0.00		Voltage range (V) 10.00 5.000 0.000 −5.000 −10.00	5.500 0.000	5.500 −5.500	11.00 −11.00	Frequency range (Hz) 5000 4000 3000 2000 1000 0.0	30.00 0.05	5000 0	
Input impedance	60 Ω	Input impedance	1 MΩ min.			---			---
Measurement accuracy	±0.1% full scale ± one digit max. (at 23±3°C)			±0.1% full scale ± one digit max. (at 23±5°C)		±0.1% full scale ± one digit max. (at 23±5°C)			---

Note: The shaded ranges indicate default settings.

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■ Input/Output Ratings

Relay Contact Output

(Incorporating G6K Relays)

Item	Resistive load (cosϕ = 1)
Rated load	1 A at 30 VDC
Rated through current	1 A max. (at COM terminal)
Max. contact voltage	60 VDC
Max. contact current	1 A (at COM terminal)
Max. switching capacity	30 VA
Min. permissible load (P level, reference value)	10 mV, 10 μA
Mechanical life	50,000,000 operations min. (at a switching frequency of 36,000 operations/hr)
Electrical life (at an ambient temperature of 23°C)	100,000 operations min. (at the rated load with a switching frequency of 1,800 operations/hr)

Transistor Output

Rated load voltage	24 VDC
Max. load current	50 mA
Leakage current	100 μA max.

Communications Specifications

Item		RS-485
Communications method		2-wire, half-duplex
Synchronization method		Start-stop synchronization
Baud rate		1,200/2,400/4,800/9,600/19,200 bps
Transmission code		ASCII
Communications	**Reading/ Writing to the K3GN**	Read/write comparative set values, read/write scaling values, enable/ disable the writing of data through communications, forced-zero control, and other data.

Linear Output

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

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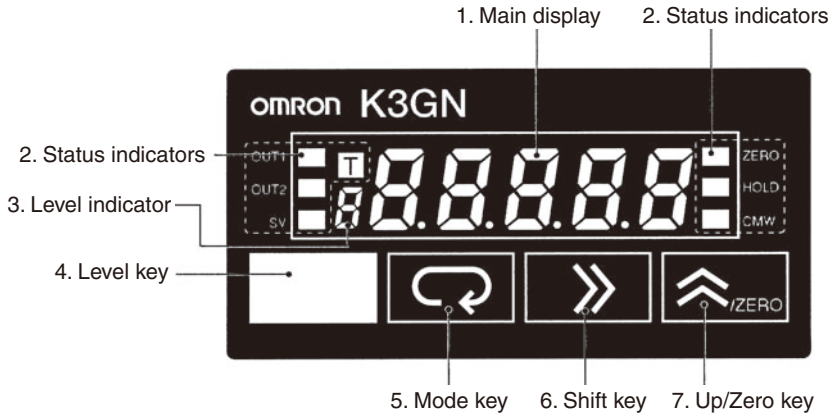
Nomenclature



Name		Functions
1. Main display		Displays process values, parameters, and set values.
2. Status indicators	**OUT1**	Lit when output 1 is ON.
	OUT2	Lit when output 2 is ON.
	SV	Lit when a set value is being displayed or changed.
	T	Lit when the teaching function is enabled. Flashes when the K3GN is in teaching operation. Lit when a calibration value is being displayed during user calibration. Flashes while reading a calibration value.
	ZERO	Lit while the forced-zero function is activated.
	HOLD	Lit when HOLD input is ON.
	CMW	Lit when communications writing is “enabled” and is out when it is “disabled.”
3. Level indicator		Displays the current level that the K3GN is in. (See below for details.)
4. Level Key		Used to change the level.
5. Mode Key		Used to allow the Main display to indicate parameters sequentially.
6. Shift Key		Used to enable that set value to be changed. When changing a set value, this key is used to move along the digits.
7. Up/Zero Key		Used to change a set value. Used to set or clear a forced-zero function when a measurement value is being displayed.

Level indicator	Level
P	Protect
Not lit	Operation
A	Adjustment
S	Initial setting
C	Communications setting
F	Advanced function setting
U	User calibration

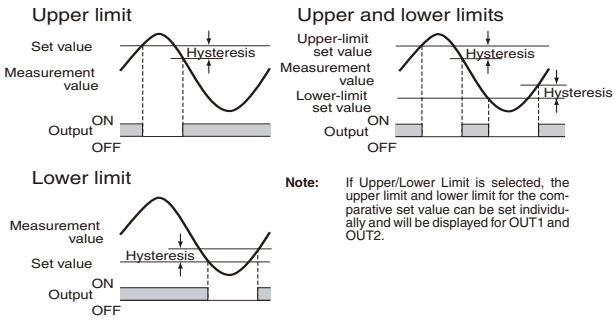
Models with Normally Energized Relays K3GN-NDC-□-400 24 VDC

- The drive operation for the output relay is reversed in these models.
- Relay contacts can be made open (i.e., OFF) when comparative set values are being judged. This is effective when constructing systems that take failsafe measures into consideration.

List of Models

Models with Normally Energized Relays
K3GN-NDC-400 24 VDC
K3GN-NDC-FLK-400 24 VDC
K3GN-NDC-L1-400 24 VDC
K3GN-NDC-L2-400 24 VDC

Relation between Output Type and Relay Output Operation



Note: If Upper/Lower Limit is selected, the upper limit and lower limit for the comparative set value can be set individually and will be displayed for OUT1 and OUT2.

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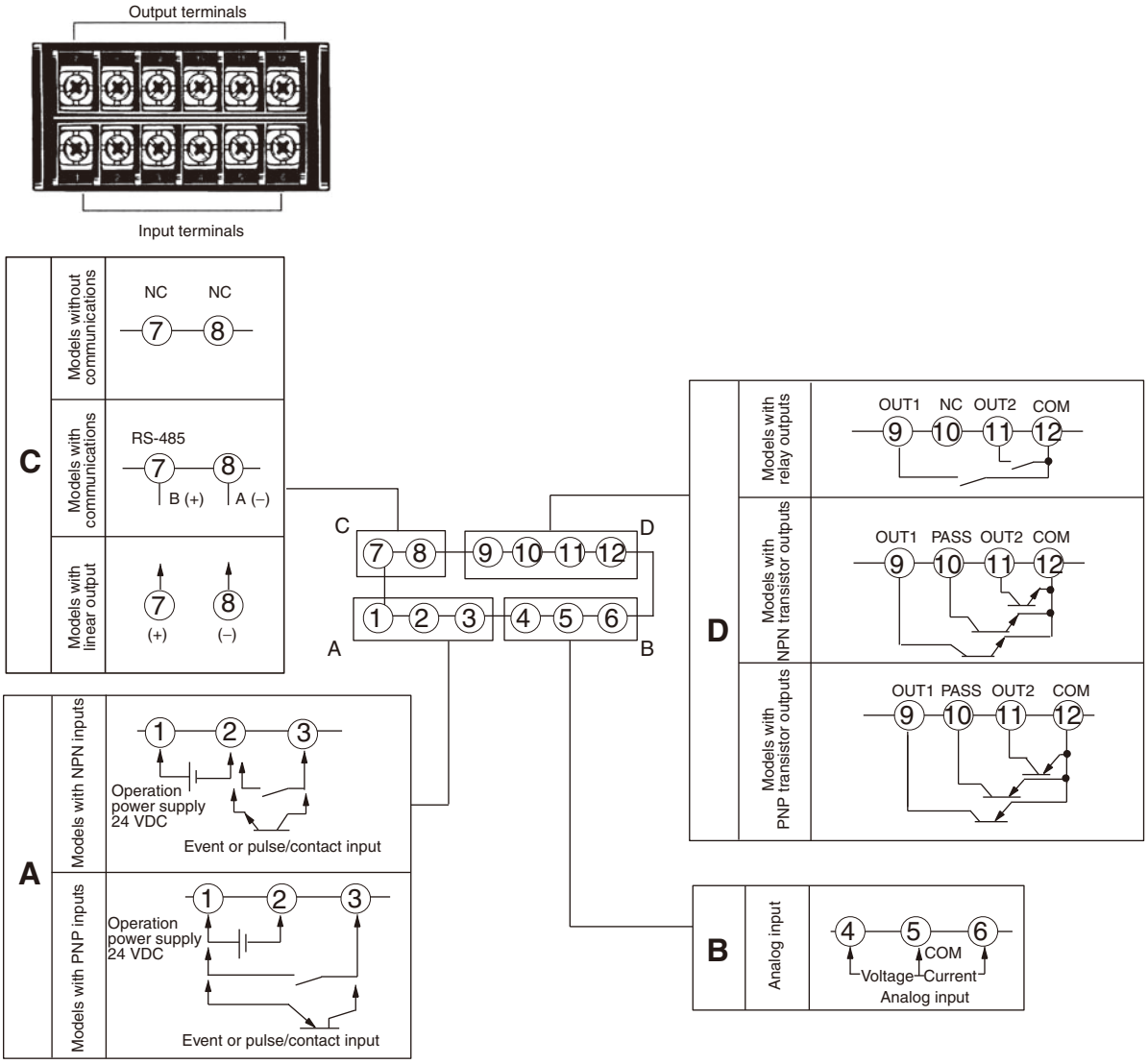
Connections

■ Terminal Arrangement



Terminal No.	Name	Description
①-②	Operation power	Connect the operation power supply.
③-②	Event input or pulse/contact input	Operates as follows depending on parameter setting: • Holds process value. • Calibrate the process value to zero and clear the forced-zero function. • Pulse or contact input.
③-①		
④,⑥-⑤	Analog input	Connect the voltage or current analog input.
⑦-⑧	Communications	RS-485 communications terminals.
	Linear output	0 to 20 mA DC, 4 to 20 mA DC
		0 to 5 VDC, 1 to 5 VDC, 0 to 10 VDC
⑨,⑪-⑫	Outputs	Outputs relay or transistor outputs. There is also a PASS output for models with transistor outputs.
⑨,⑩,⑪-⑫		

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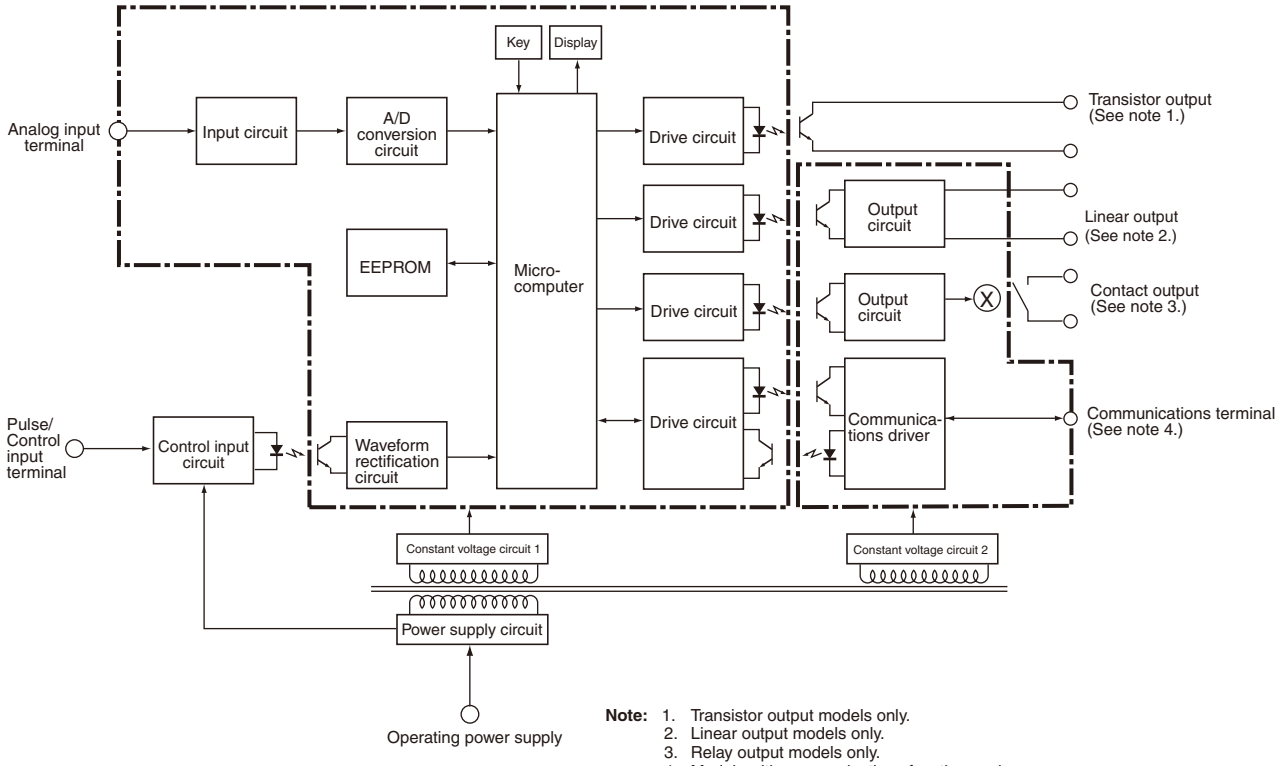
■ Block Diagram

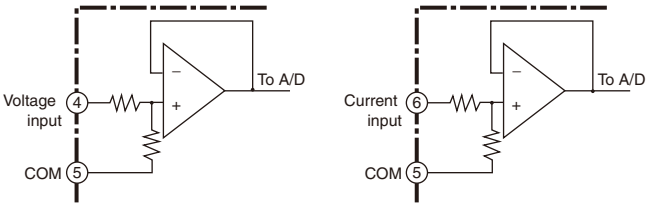


Note: 1. Transistor output models only.
2. Linear output models only.
3. Relay output models only.
4. Models with communications functions only.

■ Input Circuits

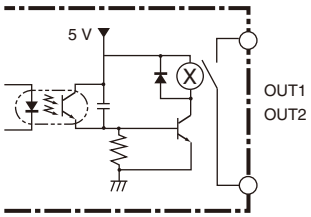
Analog Input (DC Voltage/Current)

Use terminal 5 for analog common.



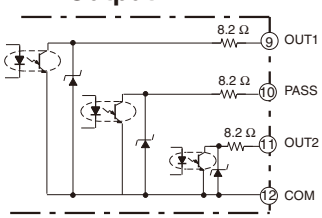
Comparative Output

Contact Output

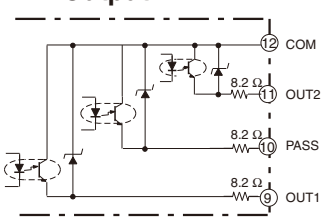


Transistor Output

NPN Output



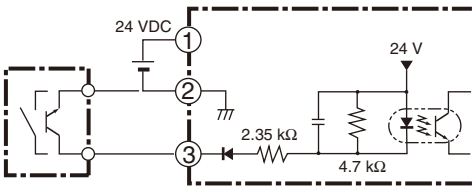
PNP Output



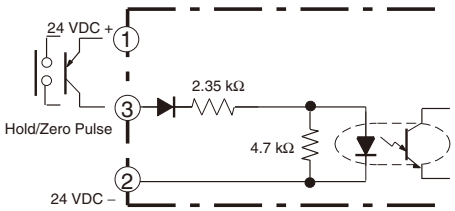
Pulse Input/Control Event Input (HOLD/ZERO)

- Use terminal 2 for the common terminal.
- Use the NPN open collector or the no-voltage contacts for the control input.

NPN Input



PNP Input



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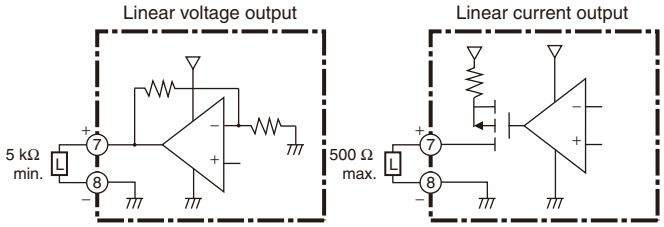
Linear Output



Note: The commons for linear output and transistor output on models with L1 and L2 are connected internally.
Depending on how the common is wired for externally connected devices, unwanted current paths for the linear output signal in the circuit may prevent the output signal from being output.
When connecting an external device, externally connect a relay to the transistor output or provide another means of insulation.

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Operating Procedures

■ Initial Setting Flowchart

Power ON

↓

Press the Level Key for 3 s min. to move to the initial setting level.

↓

Select the input type and analog type (or pulse frequency).
Set the scaling value and output type if required.

↓

For models with communications, press the Level Key for less than 1 s to move to the communications setting level.
Set the communications specification and press the Level Key for less than 1 s to move to the initial setting level.

↓

If required, move to the advanced setting level and set parameters, such as the average processing, event input assignment, hysteresis value, auto-zero time, startup compensation time, and display color change.

↓

Press the Level Key for 1 s min. to return to the operation level.

↓

Set the values for OUT1 and OUT2.

↓

Operation

Input Type

Input type	Parameter	Function
Analog	AnALG	Selects the DC voltage/current signal input.
Pulse	PULSE	Selects the pulse input signal.
Remote	rmt	Displays the communications remote data from the Programmable Controller.

Note: The default value is AnALG: Analog input.

Analog Input Type

K3GN-ND□

Input specification	Parameter	Setting range
4 to 20 mA	4-20	Values from –19999 to 99999 can be displayed with scaling. The position of the decimal point can be set as desired.
1 to 5 V	1-5	
±5 V	5	
±10 V	10	

Note: The default value is 4-20: 4 to 20 mA input range.

K3GN-NL□ (with Microvoltage Input)

Input specification	Parameter	Setting range
±199.9 mV	199.9	Values from –19999 to 99999 can be displayed with scaling. The position of the decimal point can be set as desired.
±19.99 mV	19.99	

Note: The default value is 199.9: ±199.9 mV input range.

Pulse Frequency

Input specification	Parameter	Setting range
0.05 Hz to 30.00 Hz	30	Values from –19999 to 99999 can be displayed with scaling. The position of the decimal point can be set as desired.
0 Hz to 5 kHz	5P	

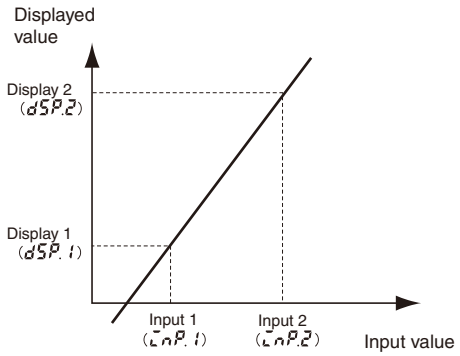
Note: The default value is 5P: 5 kHz input range.

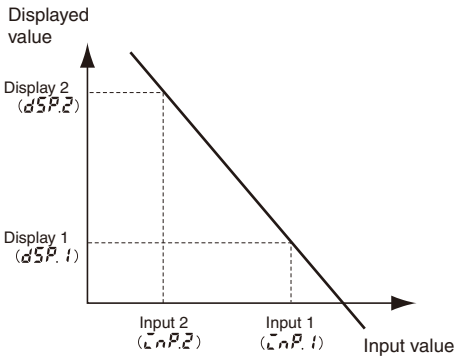
Setting Scaling

Analog Input Signal

(Refer to page 10 if a pulse input is selected.)

- The scaling will be displayed on a line connecting two points by setting Display 1 for Input 1 and Display 2 for Input 2.
  The position of the decimal point can be set as desired. If the decimal point is to be displayed, it is necessary to consider the number of digits to be displayed past the decimal point when setting the scaling display value.
  Note: When pulse input is used, the base point is the 0 point, so the settings are only the input value and the display value.





Instead of setting by inputting with the Shift Key and Up Key, current measurement values van be input as scaling input values for teaching. This is useful for making settings while checking the operation status of the K3GN.
For details on the operating procedures, refer to the *K3GN Digital Panel Meter Manual* (Cat. No. N102).

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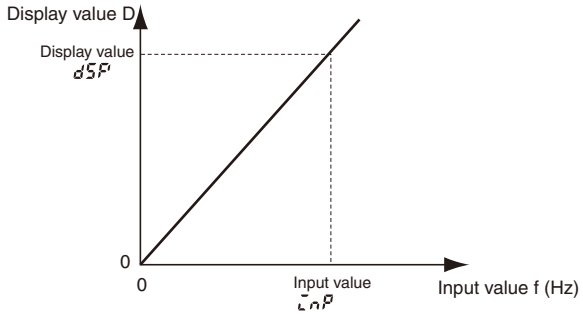
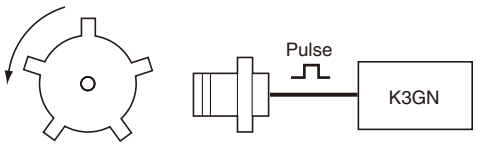
- If the K3GN is used with a pulse signal input, the display value will be the input frequency if scaling is not performed.
  Display the rate of rotation or the speed of a device or machine to which the K3GN is mounted by converting using scaling.
  The relation between input f (Hz) and display D is expressed in the form D = f x a (factor). The value depends on the display unit. The formula will be comprised as follows:
  Display using rpm: D = f x 1/N x 60, N = Number of pulses per rotation, f = Input pulse frequency (Hz) (i.e., number of pulses in one second)
  Display using m/min: D = f x π d x 1/N x 60, π d = Circumference length (m) per rotation



Prescaling Example



To display the rotational speed of a device that outputs five pulses per rotation:

D = f × 1/5 × 60, and,

If f=1,

D = 12, so

The setting will be completed by inputting inP:1 and dSP:12.

Output 1 Type

Output type	Parameter	Function
Upper limit	HL	Output turns ON if the measurement value ≥ comparative set value 1.
Lower limit	Lo	Output turns ON if the measurement value ≤ comparative set value 1.
Upper and lower limits	HL-Lo	The comparative upper-limit set value and comparative lower-limit set value can be set separately and expressed high and low. Output turns ON if the measurement value ≥ comparative upper-limit set value 1 or if the measurement value is ≤ comparative lower-limit set value 1.

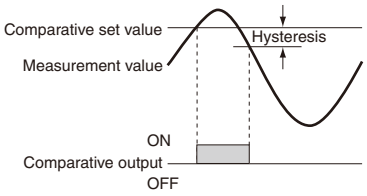
Note: The default value is HL: Upper limit.

Output 2 Type

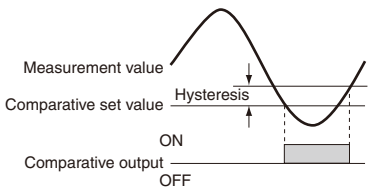
Output type	Parameter	Function
Upper limit	HL	Output turns ON if the measurement value ≥ comparative set value 2.
Lower limit	Lo	Output turns ON if the measurement value ≤ comparative set value 2.
Upper and lower limit	HL-Lo	The comparative upper-limit set value and comparative lower-limit set value can be set separately and expressed high and low. Output turns ON if the measurement value ≥ comparative upper-limit set value 2 or if the measurement value is ≤ comparative lower-limit set value 2.

Note: The default setting is Lo: Lower limit.

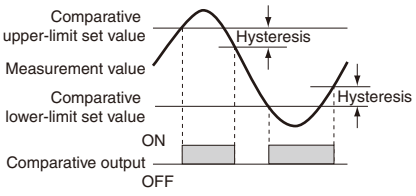
Upper Limit



Lower Limit

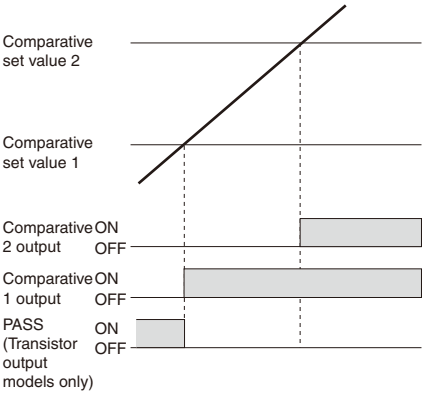


Upper and Lower Limits

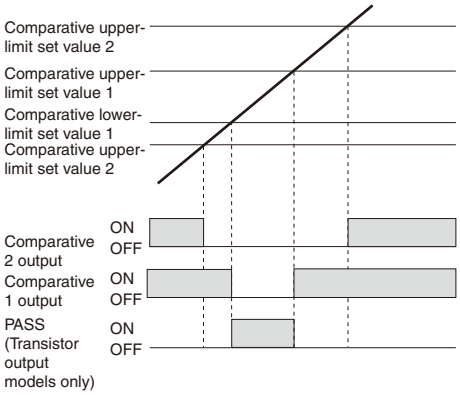


The output operations can be selected separately for OUT1 and OUT2.

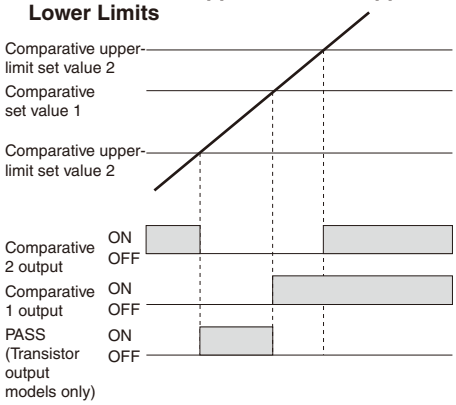
Upper Limit 2-stage Output



Threshold Output



Combination of Upper Limit and Upper/Lower Limits



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Linear Output Type

Linear output type	Parameter	Meaning of set value
Linear current type	0-20	Linear current type: 0 to 20 mA
	4-20	Linear current type: 4 to 20 mA
Linear voltage type	0-5	Linear voltage type: 0 to 5 V
	1-5	Linear voltage type: 1 to 5 V
	0-10	Linear voltage type: 0 to 10 V

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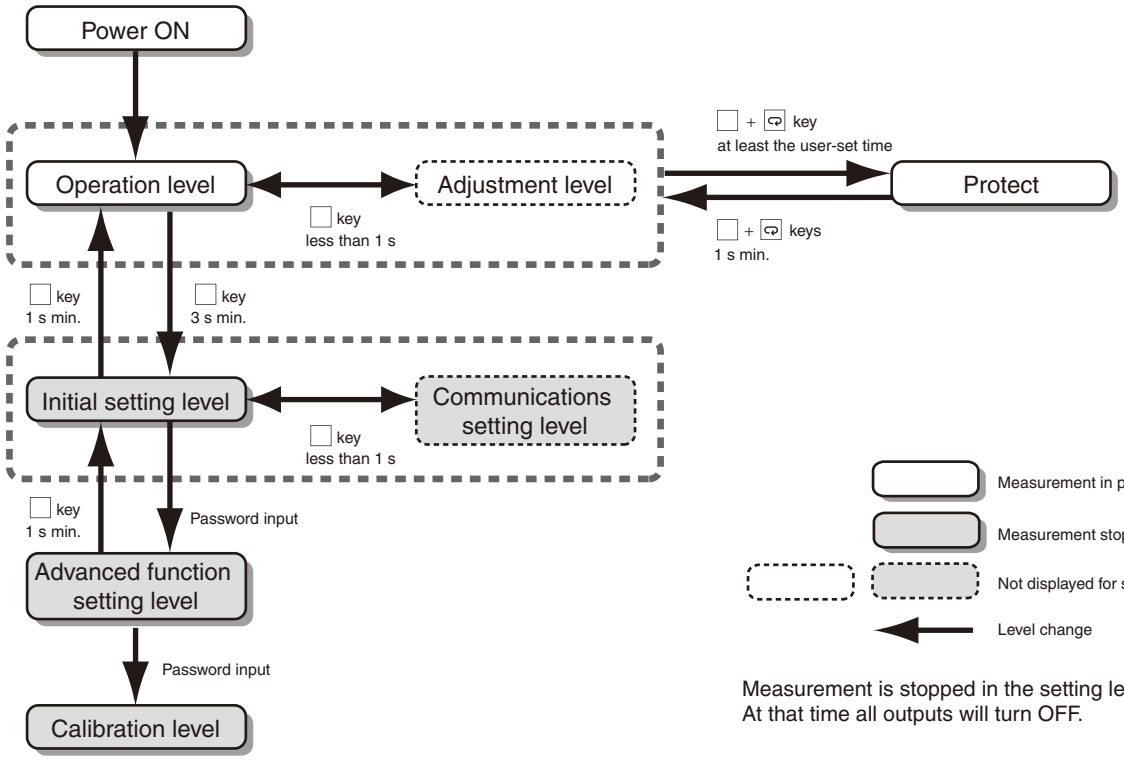
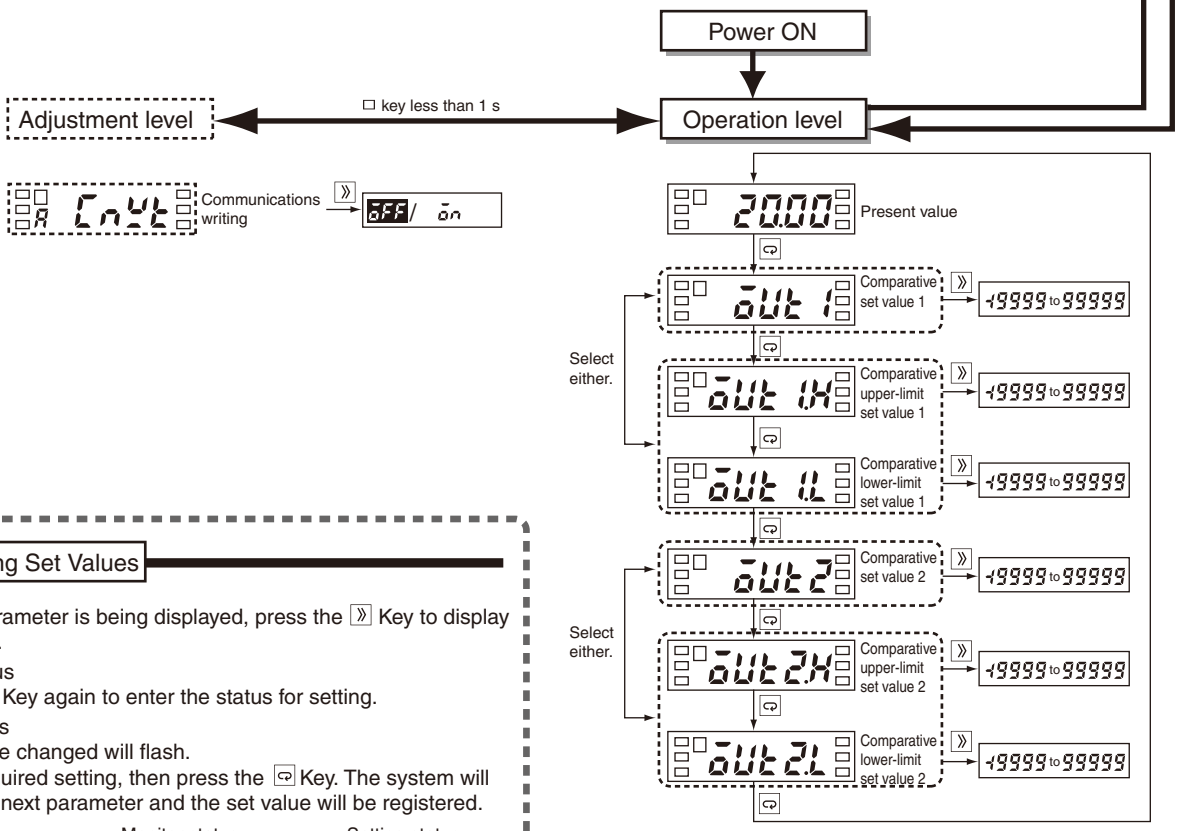
Setting Menu and Parameters



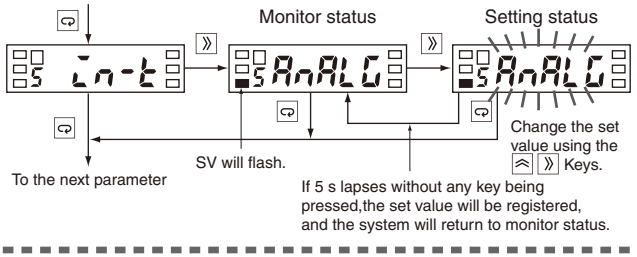


Changing Set Values

While the parameter is being displayed, press the » Key to display the set value.

Monitor Status
Press the » Key again to enter the status for setting.

Setting Status
The part to be changed will flash.
Make the required setting, then press the Key. The system will switch to the next parameter and the set value will be registered.



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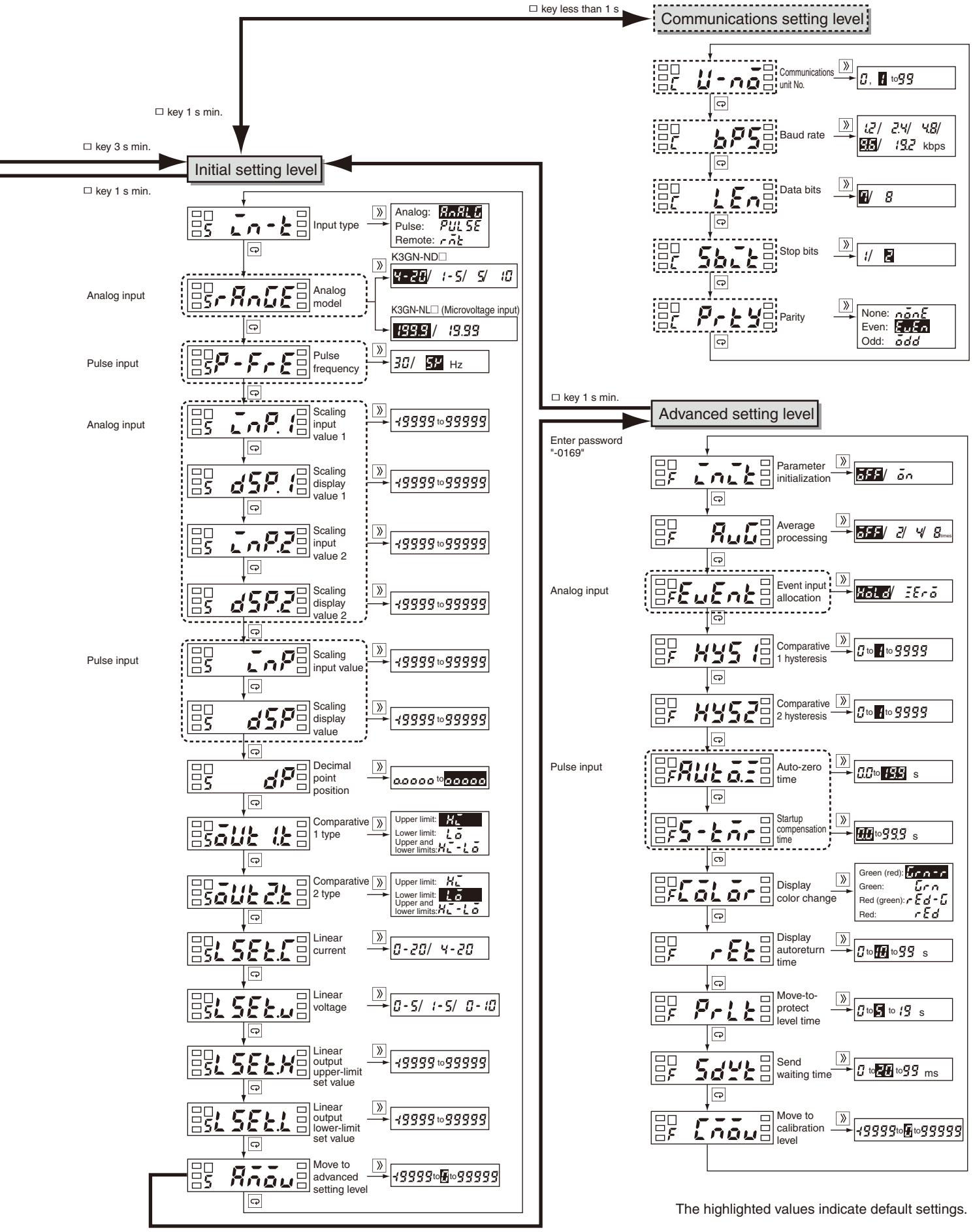

The highlighted values indicate default settings.

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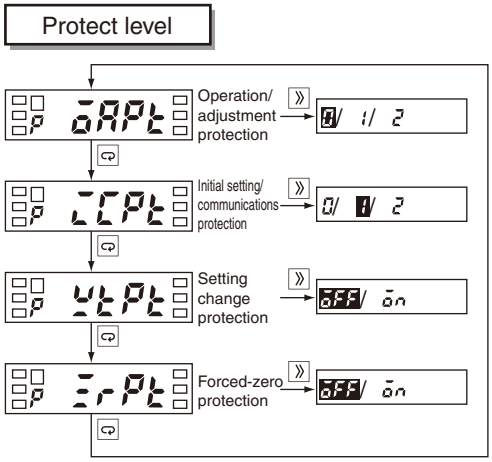

- Restricts menu display and writing in the operation level and adjustment level.
- Restricts menu display and moving for the initial setting level, communications setting level, and advanced setting level.
- Restricts changes to setup by operating the keys on the front panel.
- Restricts forced-zero operation by operating the keys on the front of the panel. (This item is not displayed if pulse input is used.)

Operation/Adjustment Protection

Restricts key operation in the operation level and adjustment level.

Setting	Operation level		Moving to adjustment level
	Present value display	Comparative value display	
0	Allowed	Allowed	Allowed
1	Allowed	Allowed	Prohibited
2	Allowed	Prohibited	Prohibited

- The default setting is 0.
- Protection is not enabled when the setting is 0 (initial setting).

Setting Change Protection

Restricts changes to settings.

Setting	Details
OFF	Changes to settings using the keys are allowed. (Moving to setting status is allowed.)
ON	Changes to settings using the keys are prohibited. (Moving to setting status is prohibited.)

- The default setting is OFF.

Note: Changes to protection level parameters, moving to advanced function setting level, and moving to calibration level are all allowed.

Initial Setting/Communications Protection

Restricts moving to the initial setting level, communications setting level, and advanced function setting level.

Setting	Moving to initial setting level	Moving to communications level
0	Allowed (message for moving to advanced function setting level displayed)	Allowed
1	Allowed (message for moving to advanced function setting level not displayed)	Allowed
2	Prohibited	Prohibited

- The default setting is 1.

Forced-zero Protection

Restricts the executing or clearing of a forced zero by using the keys.

Setting	Details
OFF	Executing or clearing of forced zero allowed.
ON	Executing or clearing of forced zero prohibited.

- The default setting is OFF.

■ Error Displays (Troubleshooting)

If an error occurs, error information will be displayed on the main display. Check the error according to the display and correct the error as indicated.

Main display	Level display	Error details	Correction
E111 (E111)	Not lit	Memory error: RAM	Cycle the power supply. If the display does not change, replacement is required. If the error is removed, the original error may have been caused by noise. Check that there are no possible sources of noise nearby.
E111 (E111)	5	Memory error: EEP	
S.Err (S.Err) flashing	Not lit	Input error or input range exceeded.	The outputs will all turn OFF. Check that the input wiring is correct, that there is no disconnection, or short-circuit, and that the input type is correct. Alternatively, limit the
99999 flashing	Not lit	Display range over: Upper limit	This is not an error. It is displayed when the display range is exceeded even if the present value is within the input range and control range. Limit the input value and display value to within the range.
-19999 Flashing	Not lit	Display range over: Lower limit	

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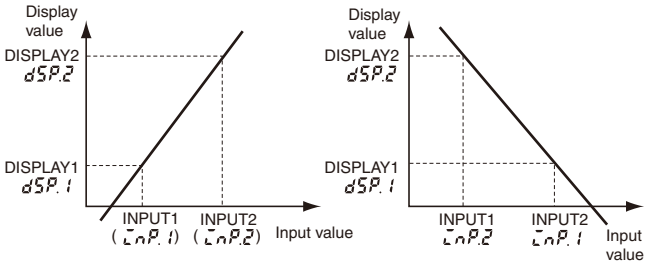
Operation

■ Main Functions

Scaling

The K3GN includes a scaling function that can convert the input signal to a desired value and display that value.

The displayed values can be freely adjusted to shift values, to create reversed displays, or to create positive/negative displays.



Teaching

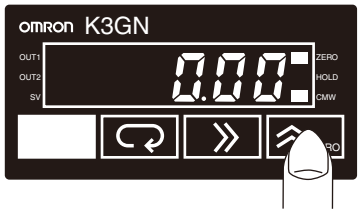
Teaching is used when using scaling or setting comparative set values to set the present measurement values as the set values instead of inputting with the Shift and Up/Zero Keys. Teaching is useful for making settings while checking the operation status of the K3GN.

Average Processing

Average processing can be performed for measurement values using four levels (OFF, 2 times, 4 times, or 8 times). Average processing stabilizes displayed values by averaging the corresponding input signals that fluctuate dynamically. Select the appropriate number of averaging times depending on the application.

Forced-zero Function

It is possible to shift from a value to the zero point with one touch of the Up/Zero Key on the front panel (for example, when adjusting reference values).



Note: This function can be used only when forced-zero operation protection is released.

Changing the Display Color

The color of the value displayed can be set to either red or green. Make the setting according to the purpose and application of the equipment in which the K3GN is installed. The display color can also be set to change from green to red, or from red to green, according to the status of the comparison criteria.

Output Type Selection

Output operation for comparative set values can be freely selected.
Upper limit: Output ON if the measurement value ≥ comparative set value.
Lower limit: Output ON if the measurement value ≤ comparative set value.
Upper/lower limit: Output ON if the measurement value ≥ comparative upper-limit set value or if the measurement value is ≤ the comparative lower-limit value.

Key Protection

Key protection is used to restrict changes to displays and settings using the front panel keys and to restrict menu display and movement of operation levels. This function is effective for preventing misuse during operation.

Startup Compensation Time (Rotary Pulse Input Only)

The startup compensation time parameter keeps the measurement operation from sending an unnecessary output corresponding to instantaneous, fluctuating input from the moment the K3GN is turned ON until the end of the preset period.

Hysteresis

The hysteresis of comparative outputs can be set to prevent the chattering of relay or transistor outputs.

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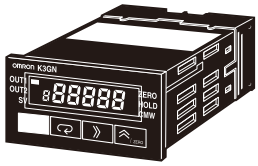
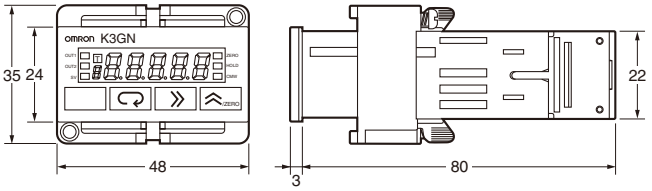
Dimensions

Note: All units are in millimeters unless otherwise indicated.

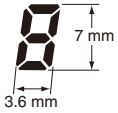
K3GN



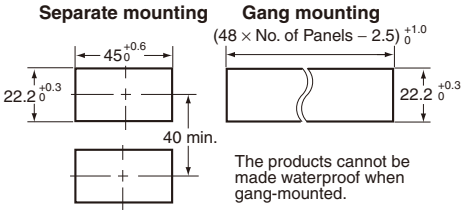


The K3GN uses M3 terminals. A terminal cover is provided.

Main Display Character Size



Panel Cutout Dimensions

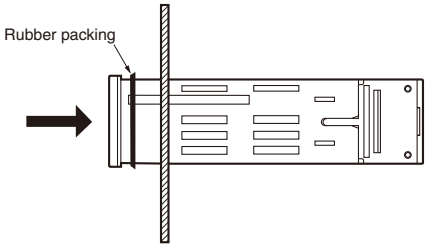


The products cannot be made waterproof when gang-mounted.

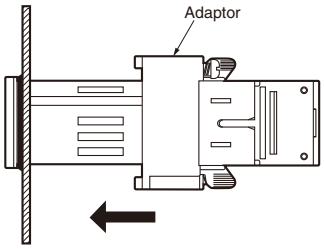
- For installation, insert the K3GN panel into the rectangular hole, insert the adaptor from the rear, and push it in to reduce the gap between the panel surface and the adaptor. Secure the Unit with the screws. For water-proof installation, insert the rubber gasket onto the body of the K3GN.
- If multiple mounted Units are used, make sure the ambient temperature for the K3GN does not exceed the specified temperature.

Installation

1. Insert the K3GN into the panel cut-out hole.
2. For a waterproof installation, insert the rubber gasket onto the body of the K3MA-J.

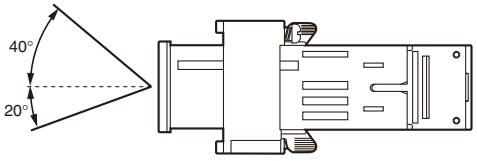


3. Fit the adaptor into the grooves on the left and right sides of the rear case, then push it until it contacts the panel to secure the K3MA-J.



Angle of View

The K3GN is designed to provide the best visibility at the angles shown in the following diagram.



■ Rubber Packing

The Rubber Packing ensures a waterproof level conforming to NEMA4X. Depending on the operating environment, deterioration, contraction, or hardening of the Rubber Packing may occur, making replacement necessary. Contact your OMRON representative if replacement is required.

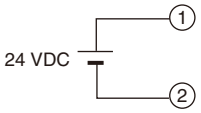
■ Wiring Precautions

- Wire the power supply with the correct polarity. Wiring with incorrect polarity may result in damage or burning.
- Wire the terminals using crimp terminals.
- Tighten terminal screws to a torque of approx. 0.5 N·m.
- Wire signal lines and power lines separately to reduce the influence of noise.

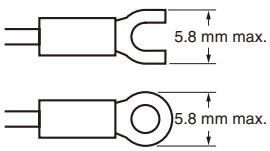
■ Wiring

Power Supply

- Input 24 VDC to terminals 1 and 2.



- Use M3 crimp terminals of the type shown below.



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Measurement Input

The following table shows the relation between input ranges and input terminals.

Input range		Input terminals
DC voltage/DC current	4 to 20 mA	⑤-⑥
	1 to 5 V	④-⑤
	±5 V	
	±10 V	
No-voltage contacts and NPN open collector (Models with NPN inputs)		②-③
No-voltage contacts and PNP open collector (Models with PNP inputs)		①-③

Be sure to read the Precautions for Correct Use and other information required when using the K3GN in the following user's manual.
K3GN Digital Panel Meter User's Manual (Cat.No. N102)

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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Safety Precautions for All Digital Panel Meters

Refer to the *Precautions* section for each Digital Panel Meter for specific precautions applicable to each Digital Panel Meter.

⚠ WARNING

Electrocution may possibly occur. Never touch terminals when the power is ON. During operation, be sure that all terminal covers are attached to models for which terminal covers are included.

Serious injury, significant property damage, or a serious accident resulting from abnormal operation may possibly occur. Never use the product on a network without a protective circuit. Provide double or triple safety measures, including emergency stop circuits, interlock circuits, and limit circuits, in external control circuits to ensure safety in the entire system if an abnormality occurs due to malfunction of the product or another external factor affecting the product's operation.

⚠ CAUTION

Minor electric shock, fire, or malfunction may occasionally occur. Do not allow pieces of metal, wire, or fine metal shavings or filings from installation work to enter the product.

Moderate or minor injury or property damage resulting from explosion may occasionally occur. Do not use the product in locations where flammable or explosive gases are present.

Do not use the K3HB-X for measurements within Measurement Categories III, or IV (according to IEC 61010-1), and do not use the K3HB-S, K3HB-V, K3HB-H, K3HB-R, K3HB-P, K3HB-C, K3MA-J, K3MA-L, K3MA-F, or K3GN for measurements within Measurement Categories II, III, or IV (according to IEC 61010-1). Otherwise, unexpected operation, resulting in minor or moderate injury, or damage to the equipment may occasionally occur. Use the equipment for measurements only within the Measurement Category for which the product is designed.

Minor or moderate injury, or damage to equipment resulting from unexpected operation may occasionally occur. Do not operate the product if the settings of the product do not match the application. Be sure to make the correct the settings according to the application.

Property damage to equipment or facilities connected to the product may occasionally occur if the comparative outputs cease to operate resulting from product failure. Do not operate the product unless measures, such as installing a separate monitoring system, have been taken to ensure safety.

Minor or moderate injury, or damage to equipment resulting from fire may occasionally occur if screws become loose. Do not operate the product unless the screws on the terminal block and the connector locking screws have been tightened securely using a tightening torque within the following ranges.

Terminal block screws: 0.74 to 0.90 N·m for M3.5 screws,
0.43 to 0.58 N·m for M3 screws

Confirm the designated torque for connector locking screws for each specific model.

Minor or moderate injury, or damage to equipment resulting from unexpected operation following changes to online edit programs may occasionally occur. Do not operate the product unless it has been confirmed that no adverse effects will result even if the DeviceNet cycle time is extended.

Minor or moderate injury, or damage to equipment resulting from unexpected operation may occasionally occur when transferring a program to another node or changing the contents of the I/O memory. Do not perform either of these operations without confirming safety at the destination node.

Minor or moderate injury resulting from electric shock may occasionally occur. Do not attempt to disassemble, repair, or modify the product.

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■ Precautions for Safe Use

1. Do not use the product in the following locations:
   - Locations subject to direct radiant heat from heating equipment
   - Locations where the product may come into contact with water or oil
   - Outdoor locations or locations subject to direct sunlight
   - Locations where dust or corrosive gases (in particular, sulfuric or ammonia gas) are present
   - Locations subject to extreme temperature changes
   - Locations where icing or condensation may occur
   - Locations subject to excessive shocks or vibration
2. 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.
3. Provide sufficient space around the product for heat dissipation.
4. Heat generated by the product itself can raise its interior temperature and shorten its service life. Do not install multiple products side-by-side or stacked one on top of the other. If this kind of installation cannot be avoided, provide the products with forced cooling, such as that using fans.
5. 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.
6. Install the product horizontally.
7. Install each product on a designated panel of the recommended thickness.
8. When using crimp terminals or bare conductor connections, use the parts and materials that are designated for each model.

Item / Model	Crimp terminal	Bare conductor connection		Sheath stripping allowance
		Power supply	Other than power supply	
K3TF	M3.5	AWG22 to AWG14 (cross-sectional area: 0.326 to 2.081 mm^2)	AWG22 to AWG16 (cross-sectional area: 0.326 to 1.309 mm^2)	6 to 8 mm
K3HB Series K3MA Series K3GN	M3, width of 5.8 mm max.		AWG28 to AWG16 (cross-sectional area: 0.081 to 1.309 mm^2)	

9. 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 shielded wires.
10. Make sure that the rated voltage is achieved within 2 s after turning ON the power.
11. Allow the product to warm up 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.
13. Do not use thinner to clean the product. Use commercially available alcohol for cleaning.
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 specified supply voltage and rated load.
16. Do not connect anything to unused terminals.
17. Outputs turn OFF when the mode is changed or settings are initialized. Take this into consideration when setting up the control system.
18. Install and provide proper indications for a switch or circuit breaker that complies with the requirements of IEC 60947-1 and IEC 60947-3 to enable the operator to quickly turn OFF the power.
19. Provide a DeviceNet communications distance that satisfies the range given in the specifications, and use the designated communications cable. For cable details, refer to the *DeviceNet Catalog* (Cat. No. Q102).
20. Do not bend or pull the DeviceNet communications cable with excessive force.
21. Do not attach or remove connectors with the DeviceNet power turned ON. Doing so may cause product failure or malfunction.
22. Use wire that is capable of withstanding heat of 70°C min. to wire the K3HB series.

■ Precautions for Correct Use

For detailed information, refer to *Technical Guide for Digital Panel Meters*.

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- Systems, machines, and equipment that could present a risk to life or property.

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