KYOWA

2-channel Instrumentation Conditioner

WGC-220 Series

Intuitive operation and fast summation-difference operations

Load monitoring for quality control

Outline

WGC-220 Series devices are instrumentation conditioners with 2-channel input. They offer fast sampling, real-time summation-difference operation functionality between channels, and a wide range of control I/O functions, making them ideal for monitoring manufacturing line loads in industries such as the iron and steel industry.

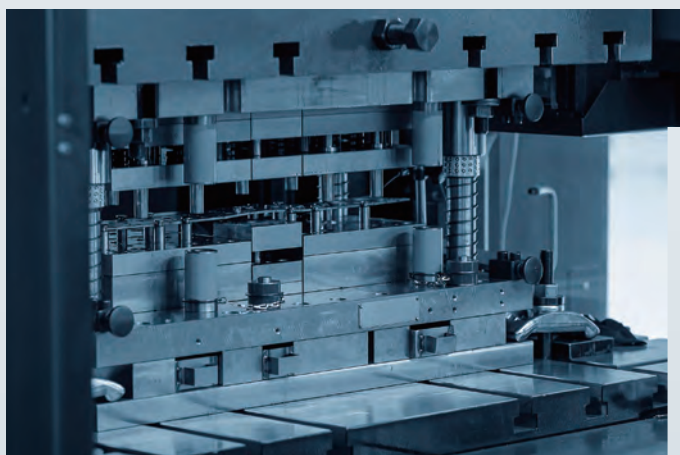Common functions
+
Hold
Zero Tracking
Error LogSettings

WGC-220A (For presses and general-purpose use)

Common functions
+
One-side operation
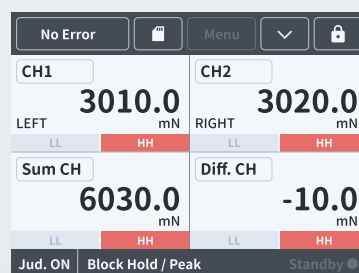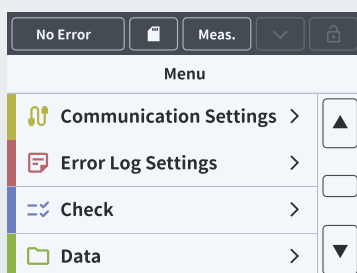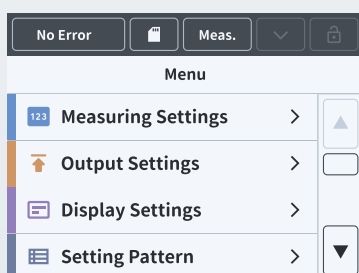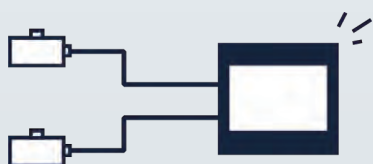
WGC-221A (For steel industry)

Features

Intuitive user interface

The included touch panel features a simple design that uses icons and a menu format for intuitive control. Displayed channels can also be customized for greater flexibility.

No Error		Meas.	∨	🔒
Menu				
123 Measuring Settings	>			▲
↑ Output Settings	>			
▤ Display Settings	>			
▤ Setting Pattern	>			▼

No Error		Meas.	∨	🔒
Menu				
⇅ Communication Settings	>			▲
▤ Error Log Settings	>			
✓ Check	>			
🗁 Data	>			▼

No Error		Menu	∨	🔒
CH1		**CH2**		
LEFT 3010.0 mN		RIGHT 3020.0 mN		
LL HH		LL HH		
Sum CH		**Diff. CH**		
6030.0 mN		-10.0 mN		
LL HH		LL HH		
Jud. ON	Block Hold / Peak			Standby ●

Many functions

4,000 operations per second between two input channels

Save/load settings and record error logs and hold values[1]
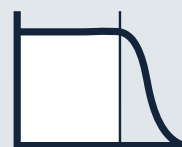
Low-pass filter and moving average functions

9pin-7pin Input conversion cable

Remote sensing[2], TEDS compatibility

Various check functions

Capable of command-based external control

*1: Recording error logs and hold values is supported on WGC-220A only
*2: Function that automatically compensates for voltage drops due to cable length

Flexible Judgment Functions

WGC-220 Series devices come equipped with eight comparators and one judger, allowing for flexible use with external systems such as PLCs and signal lights.

Comparators and Judger

This function compares measurement values with setting values, and outputs the comparison result. There are eight comparators, and the comparison method can be set to "or more" or "or less."

Up to four comparators can be selected for the judger, and comparator output can be set to "AND" or "OR."

Comparator and judger output
- Measurement screen channels: Comparator
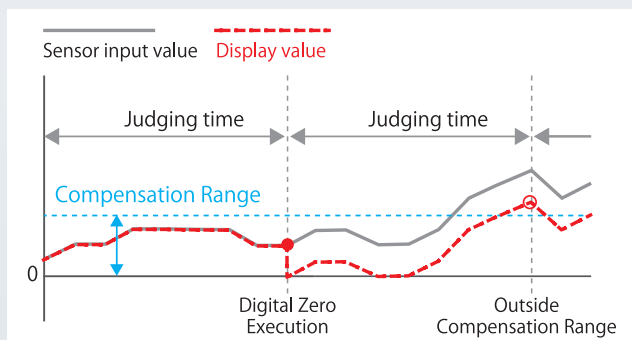- Open collector output (I/O connector): Comparator, judger
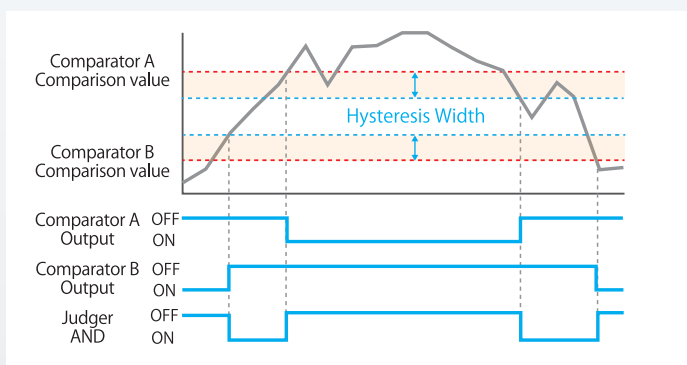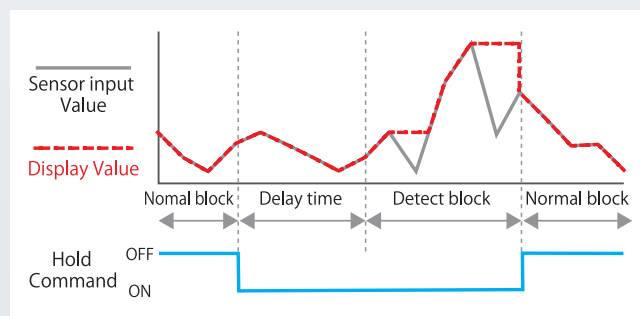

Zero tracking (WGC-220A only)

This function performs digital zero when the measurement value is within the compensation range for each judging time.

Hold function (WGC-220A only)

This is used to detect the peak, bottom, P-P, or average within a given block, and then to hold the display value. The operation mode and detection type can be set to handle a wide range of tasks.

Setting patterns

Up to four setting patterns combining comparators, the judger, and hold* can be stored. Stored settings can be easily recalled just by selecting a setting pattern.
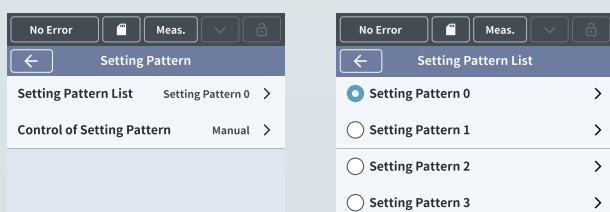
One-side operation (WGC-221A only)

One-side operation is supported as a stopgap measure if a defect occurs on one of the inputs. This is ideal for use on manufacturing lines that cannot easily be stopped.

*Hold function supported on WGC-220A only

Applications

Press load monitoring
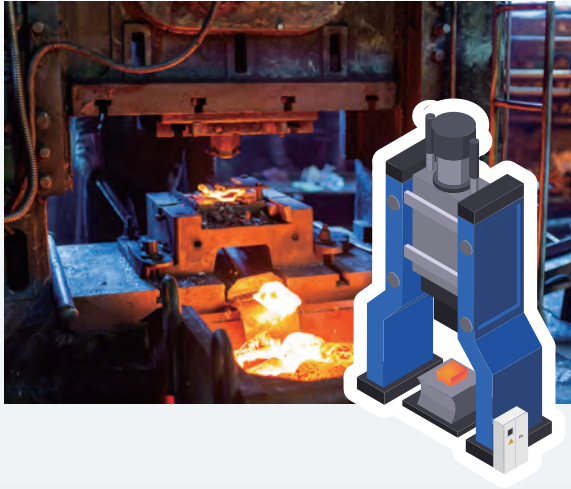
Detection roller tension management

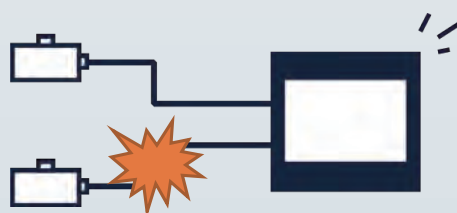WGC-220 Series devices can be used to numerically check proper loads, improving quality control. Comparators can also be used to set the upper limit and lower limit values for loads, and to transmit a signal and stop the system if an abnormality occurs that deviates from setting values.

Block Diagram

Strain gage type sensors

Loadcell,
Pressure transducers,
Displacement transducers,
Torque transducers, etc.,

【 WGC-220 Series 】

39623
89662

USB cable
N-38、N-39

PC

Setting software USB driver

Input conversion cable

U-138：4109P-R05
U-139：4109P-S32-7
(Supports remote sensing)
U-140：4109P-S32-7
(Supports TEDS)

AC power cable

P-23 : 100 V
P-28 : 200 V
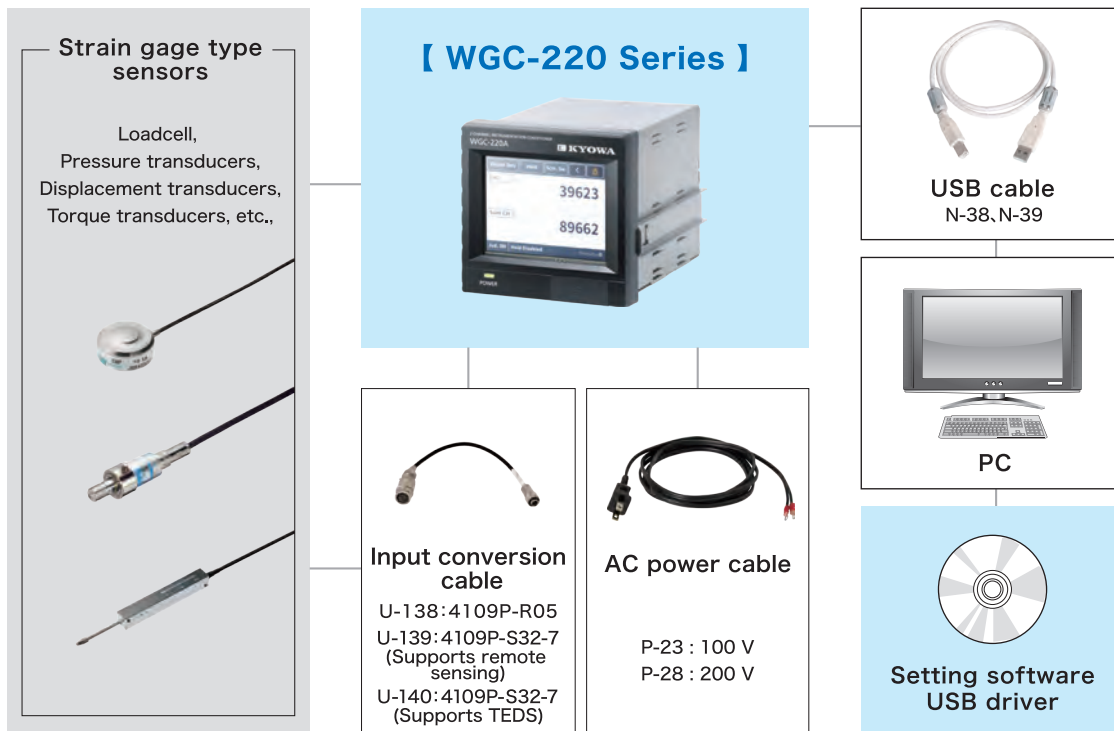
WGC-220 Series main unit and standard accessories.

WGC-220 Series Details

Item		Specifications
Strain Measuring*1 Number of Channels		2
Input connector	Shape	NDIS4109 (9 pins) receptacle Model: EPRC07-R9FNDIS
	Compatible plug	NDIS4109 (9 pins) plug Model: EPRC07-P9MNDIS
Measuring target		Strain gage transducers
Compatible bridge resistance		When bridge excitation is 5 V : 87.5 to 1000 Ω When bridge excitation is 10 V: 175 to 1000 Ω
Bridge excitation		5, 10 VDC Remote sensing possible (cable resistance up to 10 Ω round trip)
Input mode		Balanced differential input
Measuring range		Within±3.2 mV/V
Nonlinearity		Within±(0.02 %FS +1 digit)
Temperature stability	Zero point	Within±0.25 μV_{RTI}/°C
	Sensitivity	Within±0.01 %/°C
Sampling rate		4000 times/sec.
AD resolution		24 bits
Connector for analog monitor	Model	ML-800-S1H-2P
Analog monitor	Voltage output	±5 V (load resistance 5 kΩ or more)
	Output accuracy	Within±200 mV
TEDS	Interface	IEEE1451.4 Mixed Mode Transducer Interface Class2
	Applicable transducer:	Should have information written in accordance with IEEE template No. 33, cable length should be 30 m or less
Low-pass filter (Analog monitor)	Cutoff frequency	10, 30, 100, 300 Hz, None (1 kHz or over)
	Amplitude ratio at cutoff frequency	-3±1 dB
	Attenuation characteristics	-12±3 dB/oct.
DA output Connector shape		D-sub 15 pin
Number of output channels		8
Voltage output		±10 V (load resistance 2 kΩ or more) Scaling available
Insulation voltage		250 VAC for 1 minute
Conversion Speed		4 kHz
Nonlinearity		Within±0.1 %FS
Interface Indicators	Type	3.5 inch color LCD
	Display area	70.1 x 52.6 mm
	Resolution	320 x 240 dots
	Touch panel	Resistive type
	Setting range	-99999 to +99999 count
	Update speed	Numeric value display: Approx.4 times/sec.
RS-485 *2	Connector shape	D-sub 9 pin
USB 2.0 *2	Connector shape	Type-B
Data recording media	Type	industrial-use SD card *3
	Standard	SDHC
	Capacity	Up to 32 GB
	Format	FAT 32
Control I/O connector	Model	PCR-E36LMD-SL+
	Compatible plug	PCR-S36FS+ (Connector case for cable: PCR-LS36LA)
Control input	The number of points	11
	Type	Zero command, TEDS command, diagnosis command, Level test command, lock command, Add value command, Error cancellation command, Pattern Selection command 1,Pattern Selection command 2 WGC-220A : Hold command, Reset command WGC-221A : channel 1 x2 command, channel 2 x2 command
	Input format	Non-voltage contact signal, or Open collector (NPN)
	Output voltage	Approx. 12 VDC
	Output current	5 mA or less
Control output	The number of points	15
	Type	Comparator Output A, Comparator Output B, Comparator Output C, Comparator Output D, Comparator Output E, Comparator Output F, Comparator Output G, Comparator Output H, Judger Output, Error Output, Channel 1 Error, Channel 2 Error,Healthy, During SD Communication, SD capacity low
	Output format	Open collector (NPN)
	Load capacity	30 VDC, 30 mA (resistance load)
Functional Calibration	Type	Sensitivity Reg. Cal, Actual Load Cal, Numeric Value Reg. Cal, TEDS manual calibration, TEDS auto calibration Target CH: CH1, CH2
	Sum CH	1 Arithmetic expression : (CH1+CH2) x Coefficient of Multiplication
	Diff. CH	1 Arithmetic expression: (CH1-CH2) x Coefficient of Multiplication or (CH2-CH1) x Coefficient of Multiplication selectable
	Coefficient of Multiplication	x0.01 to x10.00 Target CH: Sum CH, Diff. CH (Individually configurable) Manual setting: Set any value as Coefficient of Multiplication Automatic Caln: To calculate the multiplication coefficient from Sum (difference) of current CH1 and CH2 measurements and Target Value.
	Decimal point position	Arbitrary setting is available (common with All channels)
	Unit	Can be set for each channel
Filter	Low-pass filter	10, 30, 100, 300 Hz, None (1 kHz or over)
	Moving Average	None, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 4000 times
	Minimum scale	1, 2, 5, 10, 20, 50, 100
	Target CH	Common with All channels
Digital Zero	Digital Zero Memory	When executed by main unit operation: retained By Control input, by command: Hold/not hold selectable
	Noise Monitoring Width	0 to 100 % (Percentage value for 6.4 mV/V)
	Target CH	CH1 & CH2 batch execution (Executable for each channel only when executed by operation of the main unit or by command)

	Item		Specifications
Functional	Zero Tracking (WGC-220A only)	Zero Tracking enable	Enable/Disable (If the value is within the Compensation Range within the Judging Time, Digital Zero is automatically executed)
		Judging time	0.01 to 9.99 sec
		Compensation Range	0 to 99999 count
		Target CH	CH1 & CH2 batch execution
	Add Function	Addition Value enable	Enable/Disable
		Addition value	0 to ±99999 count Manual setting: Sets any value as an Addition Value and adds it. Tare Subtraction: Set the current measured value multiplied by -1 as the additive value and add.
		Target CH	Manual setting: CH1, CH2, Sum CH, Diff. CH (Individually configurable) Tare Subtraction: CH1, CH2 (Individual execution/ Batch execution)
		Control of Add Function	Manual, Control Input, Command
	One-side operation (WGC-221A only)		Disable, CH1 x2, CH2 x2
	Hold (WGC-220A only)	Hold enable	Enable/Disable
		Operation Mode	Block Detect, Block Hold, Time Hold, Arbitrary Hold
		Detection Type	Peak, Bottom, Peak to Peak, Average (Not selectable at Arbitrary Hold)
		Detection Time	0.01 to 9.99 sec
		Delay Time	0.00 to 9.99 sec
		Hold Value during the Detecting Block	Measured value constantly updated, measured value at holding enable
		Target CH	Batch execution of all channels.
	Comparison	The number of points	8
		Each comparator enable/disable	Selectable
		Target CH	CH1, CH2, Sum CH, Diff. CH Multiple comparators can be set on the same channel
		Comparator Name	Alphabet, Numerics, Symbol (max. 2 characters)
		Comparison Value	±99999 count, Select over or under
		Display Color	Select 1 color (total 8 colors)
		Comparator Output Logic	Positive/ Negative
		Comparison Mode	WGC-220A:Always compare. Compare at hold moment WGC-221A: Always compare
		Hysteresis Width	0 to 9999 count
		Comparison speed	4000 times/sec (When Always compare)
	Judgment	The number of points	1
		Target Comparators	Up to 4 of 8 Comparators can be selected
		Judgment Conditions	AND, OR
		Judgment Output Logic	Positive/ Negative
		Judgment Mode	WGC-220A : Always Judgment, Judge at hold moment WGC-221A : Always Judgment
	DA Output	The number of points	8
		Each DA Output enable/disable	Selectable
		Target CH	CH1, CH2, Sum CH, Diff. CH
		DA Output assignment	Measured value, Hold Value
		Scaling	Zero Display Value (Displayed value when the voltage 0 V is outputted). Full Scale Display Value (Displayed value when the voltage 10 V is outputted)
		Auto Scaling	Enable/Disable (Valid only for CH1 and CH2) (If enabled, set the value of Rated Display to Full Scale Display Value when calibrating)
		Reflects Minimum Scale	Enable/Disable
	Display Settings	Number of channels displayed	1, 2, 4
		Indication	Numerics
		Comparator Name	Alphabet, Numerics, Symbol (max. 8 characters)
		Zero nearly Zero	Enable/Disable Setting range: 1 to 9 count Target CH: Sum CH, Diff. CH (If Display Value is within the set range, Display Value is automatically set to zero)
		Display Value Averaging	Enable/Disable
	Setting Pattern	The number of patterns	4
		Setting range	WGC-220A:Comparison function settings, Judgment function settings, Hold function settings WGC-221A:Each Calibration value, Addition value, Comparison function settings, Judgment function settings, Digital Zero Values, DA Output function settings
		Control of Setting Pattern	Manual, Control Input, Command
	Communication Settings	Interface	USB, RS-485
		Transmission Speed setting	9600, 19200, 38400 bps
		Delimiter setting	Received Delimiter: CR, LF, CRLF SendingDelimiter: CR, LF, CRLF
		Device ID	01 to 99 (RS-485 only)
		Transmission Mode	WGC-220A:Output at Hold (USB only), Tx and Rx (USB, RS-485) WGC-221A:Tx and Rx
	Error Log Settings (Hold Value with Comparator ON) (WGC-220A only)	Recorded data	Hold Values recorded from the time the target Comparator is turned ON up to 30 second before are recorded on the SD card
		Error Log	Enable/Disable
		Target Comparator	Select from 8 comparators, multiple comparators can be selected
		Recording time	30 sec.
	Check function	Original Value Check	Display range: -3.2000 to 3.2000 mV/V (5 digits) Display accuracy: within ±0.1 %FS
		Level Test	Arbitrary values can be displayed Level Test Value: ±99999 count Add Level Test Value to Display Value: Enable/Disable Control of Level Test: Manual/Control Input/Command
		Power-on Check	Enable/Disable (Check Contents: Bridge Excitation, Built-in Memory)
		Other Checks	Bridge Excitation, Control I/O, Communication, SD card, Built-in Memory, Touch Panel, Display Color, LED
	Data	Setting save	Save all settings to SD card
		Setting read	Read all settings from SD card
		Checking Error Log (Hold Value with Comparator ON) (WGC-220A only)	Displays up to the latest 20 files and allows confirmation of file names (Data references are not allowed). Deletion of the displayed file is possible.
	Configuration Settings		Language (Japanese/English), Backlight off Time, Date & Time, Version, Update, SD Card Format, Set Initialize ta

Item		Specifications
General	Power connector	M3 terminal block
	Power supply	100 to 240 VAC 50 / 60 Hz
	Power consumption	20 VA or less (at 100 VAC)
	Operating Temperature Humidity	-10 to 40 ℃, 20 to 85 % (Noncondensing)
	Storage Temperature	-20 to 50 ℃
	Dimensions	100 (W) x 96 (H) x 135 (D) mm (Not include protrusions)
	Weight	Approx. 970 g
	Port	GND port M4 Bind

* Concentrations of the 10 restricted substances designated in ANNEXII of RoHS Directive are less than the maximum allowable (excluding exceptions for applying usage prohibition measures).

*1. Strain measuring part specifications apply to the state in which the temperature has stabilized after a preheating time of 30 minutes.

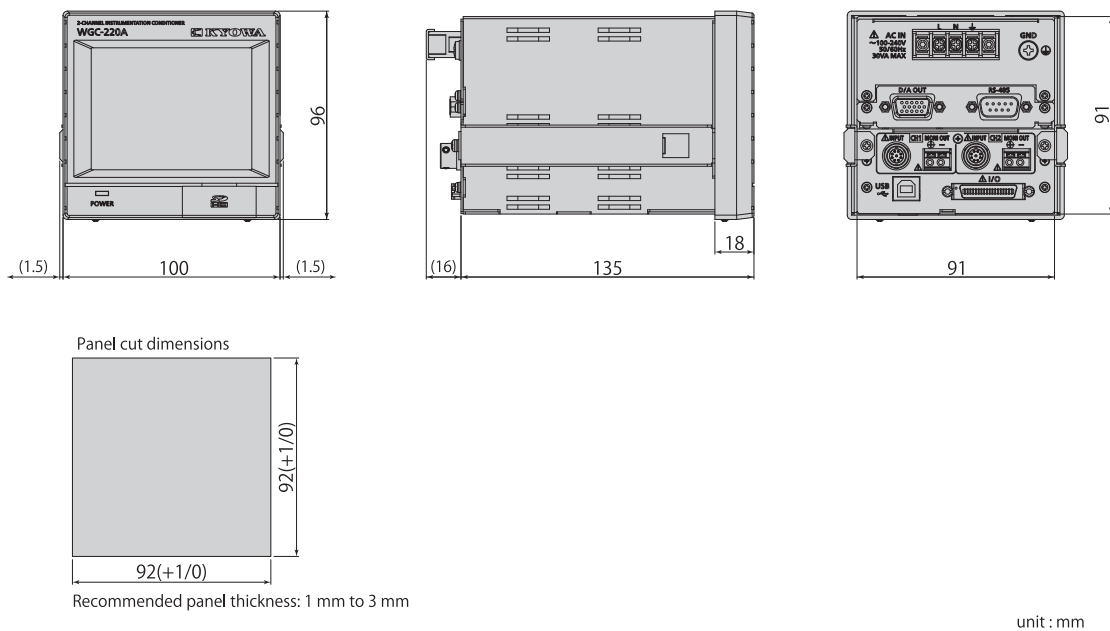*2. Simultaneous RS-485 and USB communication is not possible.

*3. The following SD card has been tested by KYOWA.
    Manufacturer : HAGIWARA Solutions   Model : NSDB-004GS(N24SEI   Capacity : 4 GB

【 Accessories 】	CD (INSTRUCTION MANUAL, Setting PC Software, USB driver)

【Optional Accessories】	P-23 100 VAC power cable (1.0 m)	N-38 USB cable (1.0 m)	U-138 4109P-R05 jack (0.2 m)
	P-28 200 VAC power cable (1.0 m)	N-39 USB cable (2.0 m)	U-139 4109P-S32-7 (Supports remote sensing) (0.2 m)
			U-140 4109P-S32-7 (Supports TEDS) (0.2 m)

Dimensions

96

WGC-220A

POWER

(1.5)   100   (1.5)

(16)   135

18

91

91

Panel cut dimensions

92(+1/0)

92(+1/0)

Recommended panel thickness: 1 mm to 3 mm

unit : mm

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⚠ **Safety Precautions**

Be sure to observe the safety precautions given in the instruction manual, in order to ensure correct and safe operation.

■ Specifications and designs are subject to change without notice.
■ Please contact us if using the detailed products for special applications.
■ Detailed company and product names are the trademarks or registered trademarks of their respective owners.
■ The warranty details can be found on the "Product Warranty" attached to the product and on the our website.
■ Unauthorized use or reproduction of contents of this catalog are prohibited.
■ All dimensional drawings use "millimeters" as the standard unit. "mm" has been omitted for convenience.

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ISO 14001

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