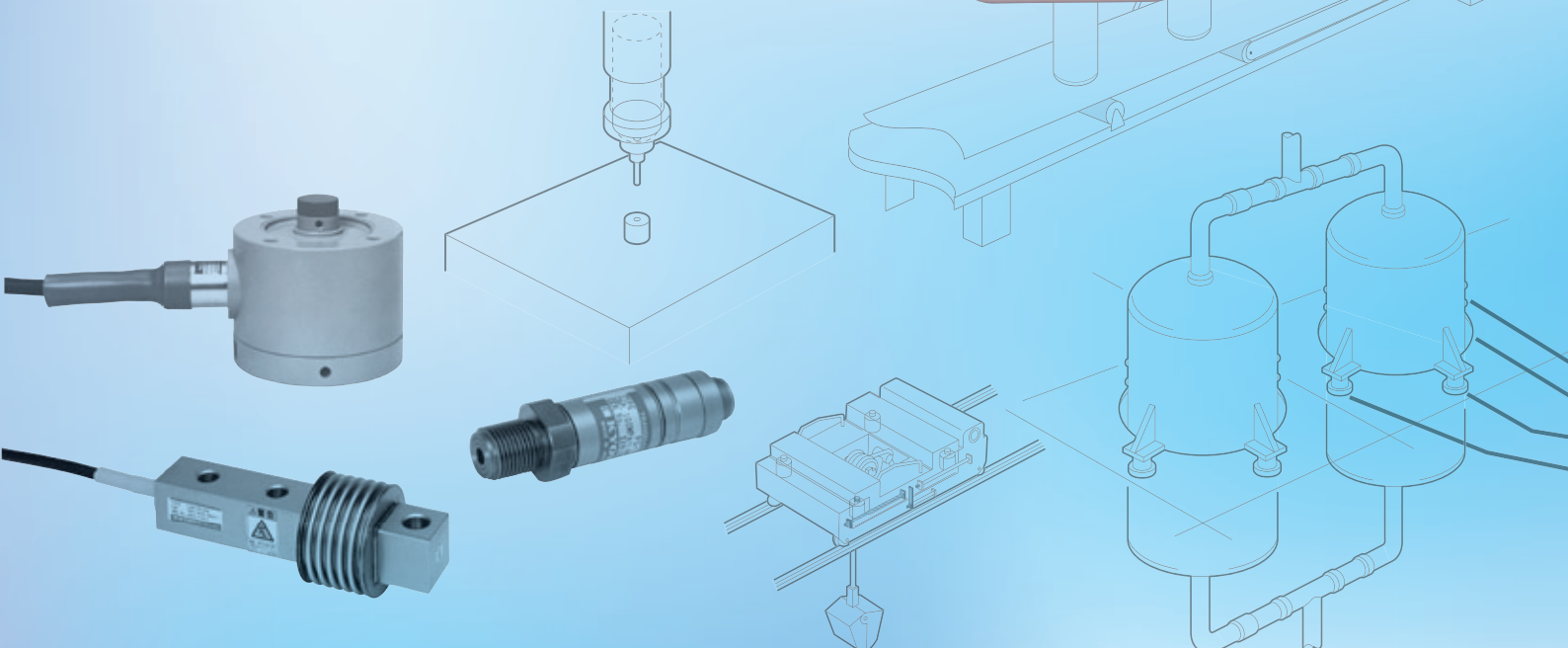
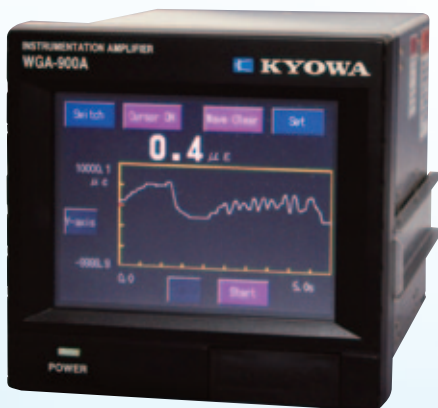


Move into the future with reliable measurements



Instrumentation Amplifiers

Selection Guide



Instrumentation Amplifiers

Kyowa's instrumentation amplifiers can be connected strain gage transducers to measure various physical quantities such as weight, and pressure.

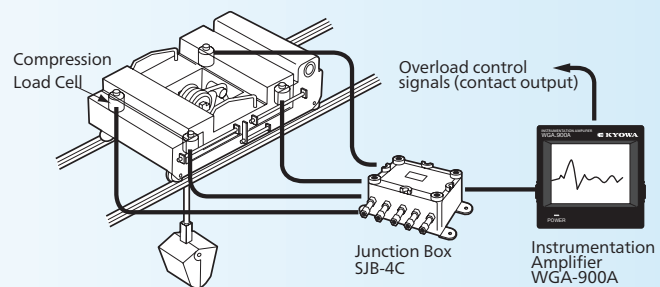
They are compact, lightweight, multi-functions and moderate price. Optimum models are available to meet your measurement purpose. Not only for measurement, but also control and judgment, Kyowa's instrumentation amplifiers are used in various industrial fields.

■ Load Cell Applied Systems

Controlling Loads of a Bucket Crane

Receiving loads from a hoisting mechanism using multiple load cells, the system detects the total weight, and then measures the real load after detects the tare. Since WGA series output analog signal to an external meter, a hoisting load can be monitored.

In addition, high & low limit signals let you know overloads and makes the system suitable for safety management.

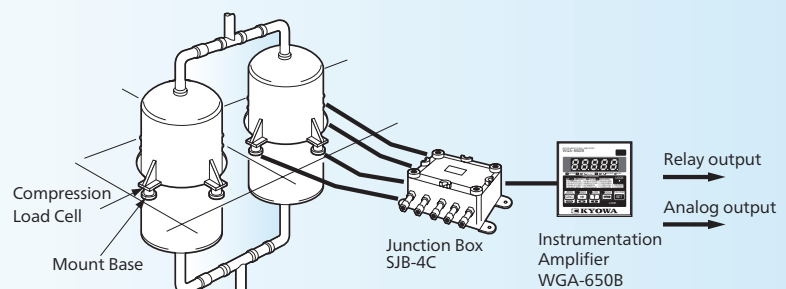


Monitoring Contents of Tanks

Weighing contents of each tank enables automation and labor saving on mixing work.

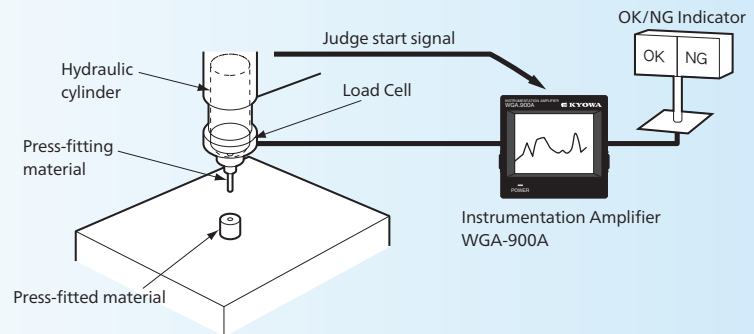
Three or four load cells are usually mounted on each tank. Output signals are summed with a junction box and then amplified.

Relay output is used to monitor the amount of material in each tank.



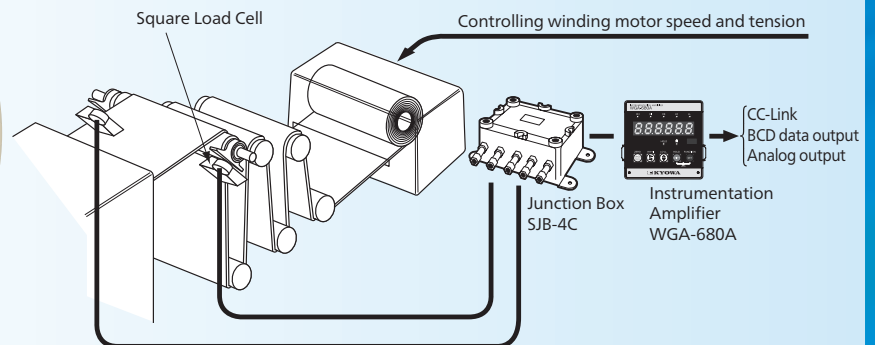
Measuring Press-fit Load

In the automotive parts industry, a compression load cell and an instrumentation amplifier is used to measure and judge the load given through press-fitting air conditioning parts. The instrumentation amplifier provides a peak hold function and outputs the judgment signal to the OK/NG indicator after comparing each measured value with the reference value. The system can be applied to similar press-fitting processes in other industries.



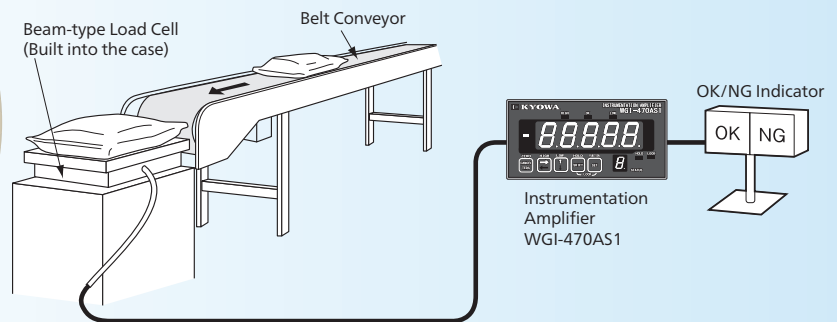
Controlling Cloth Tension

In textile industry, for the quality control, square load cells and instrumentation amplifiers are used to measure cloth tension and to make the tension uniform. The same system can be widely used for the production process for rolling steel, metal, paper, film and tape.



Measuring Flour Weight

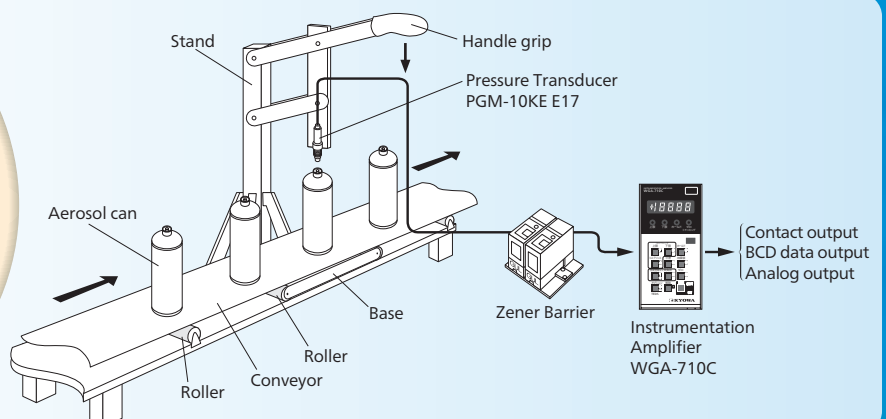
In the flour industry, load cells and instrumentation amplifiers are used to weigh the bagged material for the purpose of judging whether the weight is as specified. The result is output to an OK/NG indicator. Since the beam-type load cell is highly accurate and thin, it is suitable as a sensor for the system. The same system can also be used for weighing bagged materials in the fields of feedstuff, cement, and foods.



Pressure Transducer Applied System

Quality Control of products

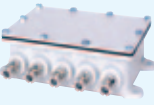
With this system, a pressure transducer detects the pressure of explosive gas which is sealed in a container, and a WGA-710C instrumentation amplifier measures the detected signal and then compare it with the preset value for OK/NG judgement. Since the measured object is explosive gas, it is an intrinsically safe system.



Instrumentation Amplifier Selection Charts

Industrial instrumentation amplifiers are lightweight, compact, multi-functional and moderate price for measurement of physical quantities such as load, pressure, displacement, torque and acceleration in combination with strain gage transducers. They are available in different models to enable selection of an optimum one for each individual measurement purpose and can be used not only for measurement but also for control and judgment.

	Models	Features	Pages
High-speed Multi-function Waveform Indicator	WGA-900A Instrumentation Amplifier	●Sampling speed: 4000 times/s ●Indication: -99999 to 99999, waveform, color LCD ●Comparators: 5 points ●Available output: BCD, D/A, RS-485, and BCD & D/A (Option) ●Touch panel ●TEDS compliant ●Data saved in the SD card 	5
General-purpose High-speed Indicator	WGA-680A Instrumentation Amplifier	●Sampling speed: 4000 times/s ●Indication: -99999 to 99999, 3-color ●Comparators: 4 points ●With D/A output ●Available output: BCD, RS-232, RS-485, and CC-Link (Option) ●TEDS compliant (Option) 	6
General-purpose Indicator	WGA-710C Instrumentation Amplifier	●Sampling speed: 15 times/s ●Indication: -1999 to 1999 ●Comparators: 4 points (Optional 8 points) ●Available output: BCD, D/A, RS-232 (Option) ●TEDS compliant ●Applicable for sensing sensors 	7
Load Indicator	WGA-650B Instrumentation Amplifier	●Sampling speed: 4 times/s ●Indication: -9999 to 9999 ●Comparators: 2 points ●Available output: BCD, D/A (Option) 	8
High-speed Calculation	WGC-140A 4-channel Instrumentation Amplifier	●Max. 4 measuring channels ●Disconnection check function ●Analog output - Output points: 5 (Signals of 4 channels and the total) - Voltage: ± 10 V - Frequency response: Up to 150 Hz 	8
General-purpose Indicator	WGI-400A Instrumentation Amplifier	●Sampling speed: 50 times/s ●Indication: -9999 to 9999 ●Comparators: 3 points ●Available output: BCD, D/A, RS-232, and RS-485 (Option) ●TEDS compliant 	9
General-purpose Indicator	WGI-470AS1 Instrumentation Amplifier	●Sampling speed: 2000 times/s ●Indication: -99999 to 99999 ●Comparators: 2 points ●Available output: BCD, RS-232, and RS-485 (Option) ●TEDS compliant 	10

	Models	Features	Pages
For built-in Equipment	WGA-200A Instrumentation Amplifier	● Analog output Voltage ± 10 V Current 4 to 20 mA ● Frequency response DC to 1, 10, 30, 100, 200, or 500 Hz, select one - Indication: Analog meter, digital display - Applicable for sensing sensors 	11
For built-in Equipment	WGA-120A  Carrier Type Instrumentation Amplifier	● Carrier type ● Analog output • Voltage ± 10 V • Current 4 to 20 mA • Frequency response up to 500 Hz 	12
For built-in Equipment	WGA-101A Instrumentation Preamplifier	● Panel mount ● Monitor terminals on the front panel ● Analog output Voltage ± 10 V Current 4 to 20 mA 	13
For built-in Equipment	WGA-100B Instrumentation Preamplifier	● Analog output • Voltage ± 10 V • Current 4 to 20 mA • Frequency response up to 500 Hz 	13
Handy Type Indicator Sensor Checker	WDS-500BE Sensor Checker WDS-180A/185AS1 Compact Digital Indicator	● Palm-size   WDS-500BE WDS-180A	14
Load Cell Conditioner	WDC-810C1 Instrumentation Controller	● Provides all input and output signals required for rolling control. ● Keypad ensures easy setting and commanding. ● Slender design facilitates installation in the operation panel. All functions and the adjustments can be set with the keyboard. 	15
Junction Boxes	SJB-C/D	 SJB-4D	15

Note: In rare cases, measuring range may be exceeded due to initial unbalance generated when a pressure transducer or a displacement transducer is used in combination with an instrumentation amplifier in WGA series. In such cases, please contact us.

The change of
press-fit load can be monitored
by waveforms, and conformed
by numeric values



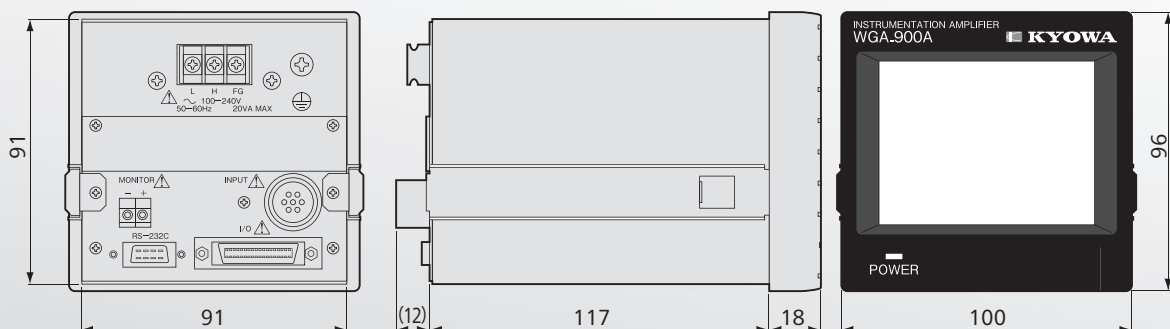
- Display of waveform
- Zoom in numeric data
- NDIS connector for sensor input
- Functions explanation by touch keys
- Data can be saved in an SD card
- TEDS compatible
- High resolution and high speed sampling (4000 times/s)
- Kyowa's original cursor functions
- Result of comparison will be showed in different colors
- Analog-hold circuit is used for detecting peak & bottom values
- Wide measuring range up to ± 3.2 mV/V (Including zero adjustment range)

Instrumentation Amplifier

WGA-900A

Models	Types
WGA-900A-0	Standard without option
WGA-900A-1	BCD output
WGA-900A-2	D/A output
WGA-900A-3	RS-485
WGA-900A-12	BCD and D/A output

Number of Channels	1
Applicable Transducers	Strain gage transducers
Applicable Bridge	87.5 Ω to 1 K Ω
Resistance	(Up to four 350 Ω transducers can be connected in parallel.)
Bridge Excitation	10 or 2 VDC, switchable
Measuring Range	± 3.2 mV/V (Including zero adjustment range)
Nonlinearity	Within ($\pm 0.02\%$ FS + 1 digit)
A/D Converter	Sampling speed: 4000 times/s Resolution: 24 bits
Analog Monitor	Voltage output: $\pm(5$ V ± 200 mV) (Load resistance 5 K Ω or more)
Display	3.5-inch STN color LCD, 320 $\times$ 240 dots, touch panel
Indication	± 99999 ; speed: 3 times/s
Sensor Output Values	± 3.2 mV/V, at 0.5-second intervals
Comparator Setting	Extra high (HH), high (HI), OK, low (LO), extra low (LL), hysteresis width, using comparators
Measuring Modes	Operation modes: Normal, peak hold, block-specified peak hold, time-specified peak hold, bottom hold, block-specified bottom hold, time-specified bottom hold, arbitrary point hold, block peak-bottom, time peak-bottom, block average, time average Detect time, delay time, comparison mode and display mode
Waveform Display	X axis setting, Y axis setting, Start mode of waveform, passed level, passed way, hold time of waveform
Control Input	Zero command, hold command, reset command, waveform command, TEDS command, measurement condition select 0 to 3 Signal formats: Non-voltage contact signal or open collector signal
Control Output	HH, HI, OK, LO, LL, healthy, abnormal channel, abnormal memory, communication error, SD, open collector output
SD Card	Saving/reading set values, setting waveform data storage, editing waveform data, formatting, and updating
Operating Temperature	0 to 40°C
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	85 to 264 VAC, 20 VA or less
Dimensions	100(W) $\times$ 96(H) $\times$ 135(D) mm (Excluding protrusions)
Weight	Approx. 1.0 kg (Excluding options)



Accurately measure
fast phenomena and
indicate the data
Various communication
interfaces such as CC-Link,
and so on

NEW



CC-Link

CE

TEDS

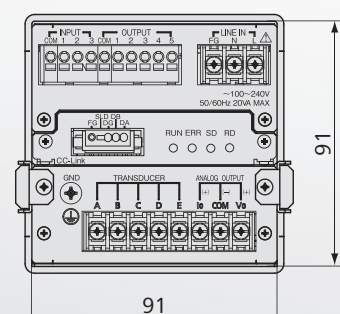
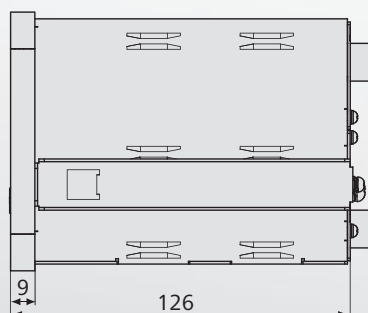
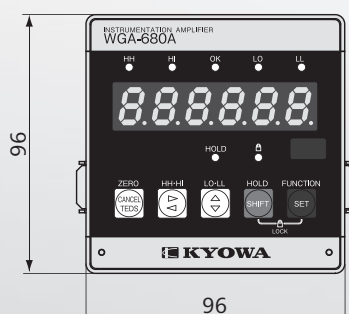
- High-speed sampling (4000 times/s)
- High-performance processing (24-bit A/D converter)
- Substantial comparison functions (Extra high, high, OK, low, and extra low)
- Analog output (A/D converter is equipped)
- Various optional interfaces (CC-Link, RS-485, RS-232C, and BCD output)
- Numeric data and comparators' LED indicate in red, green, or orange
- Plentiful hold functions (Arbitrary point hold, peak hold, bottom hold, peak to peak hold)

Instrumentation Amplifier

WGA-680A

Types Models	Power Supply	TEDS	BCD	RS232C	RS-485	CC-Link
WGA-680A-00	100 to 240 VAC					
WGA-680A-01		Yes	Yes			
WGA-680A-02		Yes		Yes		
WGA-680A-03		Yes			Yes	
WGA-680A-04	10 to 30 VDC					Yes
WGA-680A-10						
WGA-680A-11		Yes	Yes			
WGA-680A-12		Yes		Yes		
WGA-680A-13		Yes			Yes	
WGA-680A-14						Yes

Number of Channels	1
Applicable Sensors	Strain gage transducers
Applicable Bridge Resistance	87.5 to 1000 Ω (Up to four 350 Ω transducers can be connected in parallel.)
Bridge Excitation	10, 2 VDC, switchable
Measuring Range	±3.2 mV/V (Including zero adjustment range)
Zero Adjustment	Within measurement range
Range	(Not retained when power supply interrupted)
Nonlinearity	Within ±(0.02% FS+1 digit)
Stability	Zero point: Within ±0.25 μV/°C Sensitivity: Within ±0.01%/°C
Sampling Speed	4000 times/s
AD Converter	24 bits
Calibration	Actual load calibration, sensitivity registering calibration, and numeric value registering calibration
Smoothing Functions	Filters: 10, 30, 100, Flat (300Hz) Attenuation: 12 ±1 dB/oct. Moving average: None, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, and 2048 times Min. scale: 1, 2, 5, 10, 20, 50, 100, 200, 500, and 1000 counts
Adding Functions	Setting range: ±99999
Comparator Functions	The number of points: 4 Patterns: Registers 4 groups of pattern files (Comparative values) and enables switching by setting of functions Types: Extra high (HH), high (HI), OK, low (LO), extra low (LL) Setting range: ±99999 Hysteresis Width: 0 to 99999 Comparison modes: normal, at hold High Low Assignment: Enables assigning high or low to each comparator
Display	Range: ±99999 (Decimal point can be put anywhere.)
Analog (D/A) Output	Voltage Output: ±10V (Load resistance 2 k Ω or more) Current Output: 4 to 20 mA (Load resistance 500 Ω or less)
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	100 to 240 VAC, or 10 to 30 VDC
Dimensions	96(W) × 96(H) × 126(D)mm (Excluding protrusions)
Weight	Approx. 750 g (Without option)
EMC Directive	EN61326-1 (Class A)
Low Voltage Directive	EN61010-1, EN61010-2-030 (Installation category II, Pollution degree 2, Measurement category O)
RoHS Directive	EN50581



Output of 1 k Hz voltage signals is possible



- Compact and strong against noise, therefore suitable for industrial equipment
- Wide variety of functions, ensures various applications
- Key lock to prevent mis-operation
- Keys with LED, the key status may be seen at a glance
- Suitable excitation voltage for a transducer is switchable (10, 5, and 2.5 VDC)
- Built-in remote signal detection circuit enables accurate measurement
- Built-in analog peak-hold circuit enables to capture peak values of fast phenomena
- Set parameters are stored in a non-volatile memory, and can be restore upon power on.
- A variety of options just for meeting your needs.

Instrumentation Amplifier

WGA-710C

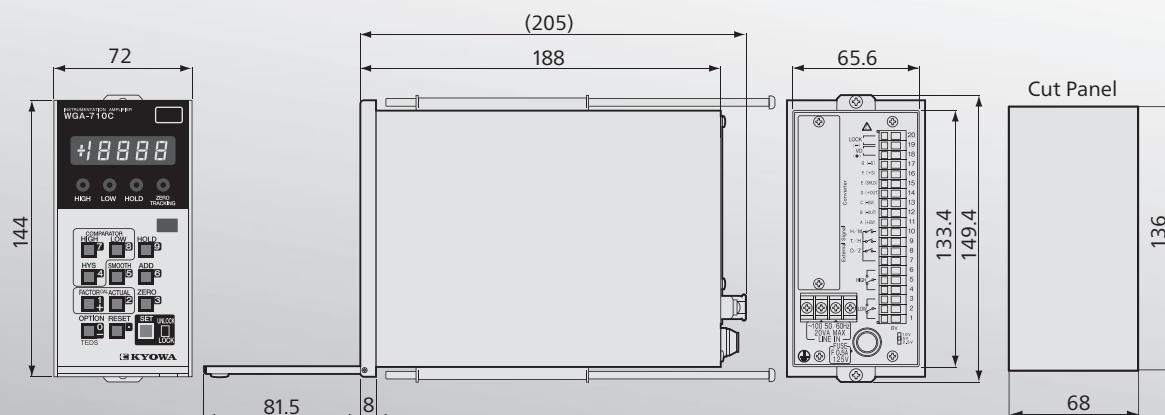
Types Models	Power supply (VAC)	H/L*	Peak hold functions	BCD data output	EIA-232-D (RS-232C)	D/A Converter	Analog amplifier	8-step comparator
WGA-710C-0	100	Yes	Yes					
WGA-710C-0 A115	115	Yes	Yes					
WGA-710C-0 A200	200	Yes	Yes					
WGA-710C-0 A220	220	Yes	Yes					
WGA-710C-1	100	Yes	Yes	Yes				
WGA-710C-1 A115	115	Yes	Yes	Yes				
WGA-710C-1 A200	200	Yes	Yes	Yes				
WGA-710C-1 A220	220	Yes	Yes	Yes				
WGA-710C-2	100	Yes	Yes		Yes			
WGA-710C-2 A115	115	Yes	Yes		Yes			
WGA-710C-2 A200	200	Yes	Yes		Yes			
WGA-710C-2 A220	220	Yes	Yes		Yes			
WGA-710C-3	100	Yes	Yes			Yes		
WGA-710C-3 A115	115	Yes	Yes			Yes		
WGA-710C-3 A200	200	Yes	Yes			Yes		
WGA-710C-3 A220	220	Yes	Yes			Yes		
WGA-710C-4	100	Yes	Yes			Yes		
WGA-710C-4 A115	115	Yes	Yes			Yes		
WGA-710C-4 A200	200	Yes	Yes			Yes		
WGA-710C-4 A220	220	Yes	Yes			Yes		
WGA-710C-5	100	Yes	Yes				Yes	
WGA-710C-5 A115	115	Yes	Yes				Yes	
WGA-710C-5 A200	200	Yes	Yes				Yes	
WGA-710C-5 A220	220	Yes	Yes				Yes	
WGA-710C-6	100	Yes	Yes					Yes
WGA-710C-6 A115	115	Yes	Yes					Yes
WGA-710C-6 A200	200	Yes	Yes					Yes
WGA-710C-6 A220	220	Yes	Yes					Yes
WGA-710C-12	100	Yes	Yes	Yes	Yes			
WGA-710C-12 A115	115	Yes	Yes	Yes	Yes			
WGA-710C-12 A200	200	Yes	Yes	Yes	Yes			
WGA-710C-12 A220	220	Yes	Yes	Yes	Yes			
WGA-710C-14	100	Yes	Yes	Yes		Yes		
WGA-710C-14 A115	115	Yes	Yes	Yes		Yes		
WGA-710C-14 A200	200	Yes	Yes	Yes		Yes		
WGA-710C-14 A220	220	Yes	Yes	Yes		Yes		

* High/low limit comparators

11 to 30 VDC models are on request

Remote-sensing function cannot be used simultaneously with TEDS function.

Number of Channels	1
Measuring Range	±3.2 mV/V (±6400 μm/m)
Display	±9999 (Decimal point can be put anywhere)
Sampling Speed	Approx. 15 times/s
Options	BCD data output, D/A converter, RS-232C, isolated analog amplifier, and 8-step comparator
Operating Temperature	-10 to 40°C
Operating Humidity	20 to 80%RH (Non-condensing)
Power Supply	100, 115, 200, or 220 VAC (Select one)
Dimensions	72(W)×144(H)×188(D) mm (Excluding protrusions)
Weight	Approx. 1.7 kg



Suitable for monitoring or controlling slow phenomena such as load or weight



Instrumentation Amplifier

WGA-650B

- Wide no-load zero adjustment range (± 2 mV/V)
- High/low limit comparators (Relay contact output)
- Indicated value can be output in a range of 0 to 10 V or 4 to 20 mA.
- Indication range -1999 to 19999
- Up to 4 transducers with 350 Ω bridge resistance can be connected in parallel.

Types	Models	Power Supply
Standard	WGA-650B-0 M448	85 to 132 VAC
	WGA-650B-0 M449	170 to 264 VAC
With BCD output	WGA-650B-1 M448	85 to 132 VAC
	WGA-650B-1 M449	170 to 264 VAC

Number of Channels	1
Bridge Excitation	10, 2 VDC, switchable
Measuring Range	0 to 2.5 mV/V
Sampling Speed	4 times/s
Nonlinearity	Within $\pm(0.03\% \text{ FS} + 1 \text{ digit})$
Stability	Zero point: $\pm 0.5 \text{ VRTI} / ^\circ\text{C}$ Sensitivity: $\pm 0.0025\% / ^\circ\text{C}$
Operating Temperature	-10 to 50 $^\circ\text{C}$
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	85 to 132 or 170 to 264 VAC, 20 VA or less
Dimensions	96(W) x 96(H) x 139(D) mm (Excluding protrusions)
Weight	Approx. 1.3 kg

Suitable for controlling load balance and total load



4-channel Instrumentation Amplifier

WGC-140A

- Up to 4 units of 350 Ω strain gage type transducers can be connected independently to respective amplifier circuits.
- Circuits are designed to make it difficult for a channel with transducer trouble to affect other channels.
- Switchable indicated value, channel to channel or the total
- Analog voltage output of all channels and the total
- High/low limit comparators for the total value
- High-speed output suitable for control, I/O delay approx. 10 ms
- Sensor check and self-test functions
- Indication range -19999 to 19999 with decimal point anywhere

Number of Channels	Max. 4
Bridge Excitation	5 VDC
Measuring Range	$\pm 3 \text{ mV/V}$ (Including zero adjustment range)
Display	± 19999 (Decimal point can be put anywhere)
Operating Temperature	-10 to 55 $^\circ\text{C}$
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	100 to 240 VAC, 30 VA or less
Dimensions	96(W) x 96(H) x 139(D) mm (Excluding protrusions)
Weight	Approx. 1.2 kg

Possible of monitoring load or pressure with analog output



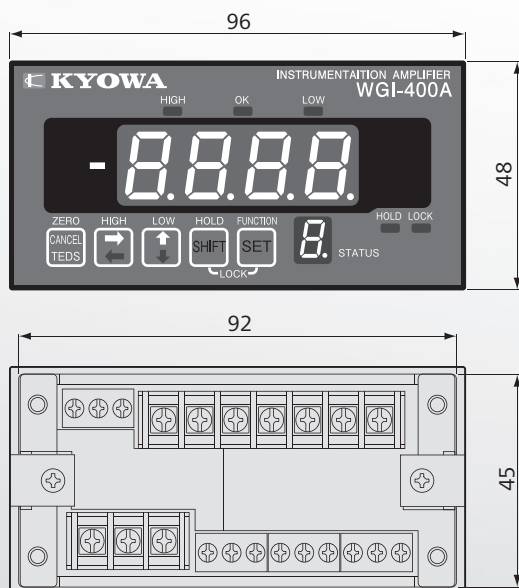
Instrumentation Amplifier

WGI-400A

- Compact, 48×96 mm (Front surface)
- Wide measuring range ± 3.2 mV/V
- 3 sensitivity registration modes (Actual load calibration, sensitivity-registered calibration, numerical value-registered calibration)
- Switchable 4 high/low limit patterns in memory
- Level test with desired set-value
- Wide power supply voltage range: 100 to 240 VAC, 10 to 30 VDC (Selectable)
- 3 optional functions: RS-232C, RS-485, and BCD output

Models	Options
WGI-400A-00	AC operation without optional function
WGI-400A-01	AC operation with BCD output
WGI-400A-02	AC operation with RS-232C
WGI-400A-03	AC operation with RS-485
WGI-400A-10	DC operation without optional function
WGI-400A-11	DC operation with BCD output
WGI-400A-12	DC operation with RS-232C
WGI-400A-13	DC operation with RS-485

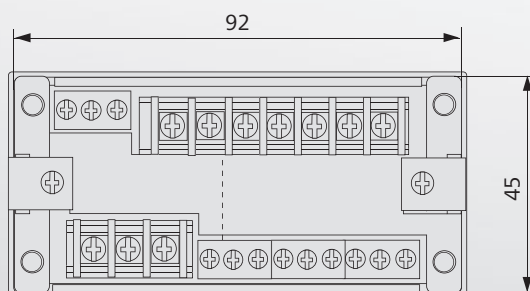
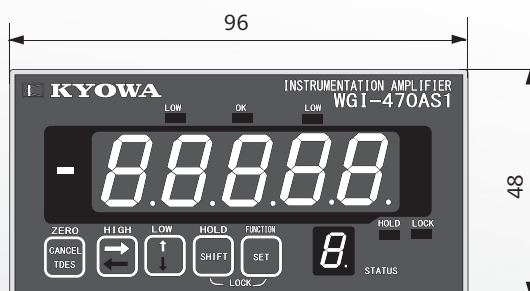
Number of Channels	1
Bridge Excitation	2 VDC, 30 mA or 4V DC, 50 mA, switchable
Measuring Range	± 3.2 mV/V (including zero adjustment range)
Display	± 9999
EMC Directive	EC61326-1(class A)
Low Voltage Directive	EN61010-1, EN61010-2-030 (Installation Category II, Pollution Degree 2, Measurement Category O)
Operating Temperature	-10 to 50°C
Power supply	100 to 240 VAC, 10 to 30 VDC, selectable
Dimensions	96(W) x 48(H) x 142(D) mm (Without option)
Weight	Approx. 500 g



A high-speed, compact, and high-performance indicator for industrial instrumentation



TEDS



Instrumentation Amplifier

WGI-470AS1

- High-speed sampling: 2000 times/s
- Small size: 48×96 mm (Front surface)
- 2-analog output: Simultaneous voltage and current output, individual scaling
- Peak holds: 5 types of peak holds
- Wide power supply voltage range: 100 to 240 VAC
- 3 sensitivity registrations: actual load calibration, sensitivity registration calibration, and numerical value registration calibration
- TEDS function: Automatic sensitivity registration, TEDS file automatic sensitivity registration
- Options: RS-232C, RS-485, BCD output

Models	Options
WGI-470AS1-00	No option
WGI-470AS1-01	BCD output
WGI-470AS1-02	RS-232C
WGI-470AS1-03	RS-485

Number of Channels	1
Bridge Excitation	2, 10 VDC, switchable
Measuring Range	±3.2 mV/V (Including zero adjustment range)
Display	±99999, polar LED
Sampling Speed	2000 times/s
Nonlinearity	±(0.02%FS±1 digit)
Stability	zero point: ±0.25 μ VRT/°C Sensitivity: ±0.01%/°C
Analog output	Simultaneous dual output of voltage & current Data update: 2000/s (For simultaneous use of voltage and current, 1000/s) Voltage output: ±10 V, independent arbitrary scaling possible Current output: 4 to 20 mA, independent arbitrary scaling possible Automatic settings with rated capacity fully scaled possible (At sensitivity registration, at automatic sensitivity registration) Nonlinearity: ±0.1%FS
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85%RH (Non-condensing)
Power supply	100 to 240 VAC 22 VA or less
Dimensions	96(W) × 48(H) × 142(D) mm (Excluding protrusions)
Weight	Approx. 400 g



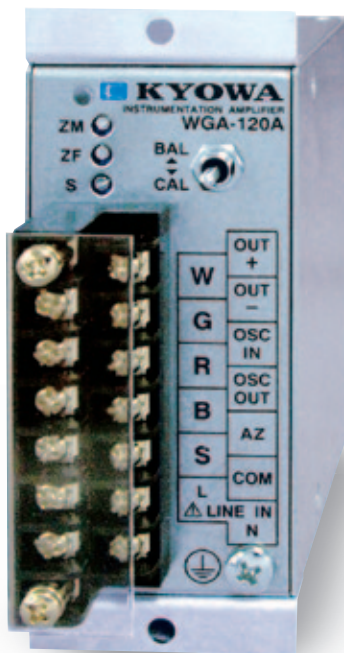
- Multi-functional and versatility
- Voltage output, current output, and remote sensing are standard equipped.
- Compact, firm, dustproof and drip proof

Number of Channels	1
Bridge Excitation	10, 4, 2 VDC (Select one) Remote sensing possible
Full Scale Output	Voltage $\pm 10\text{V}$ (1mV/V when BV=10 V) Isolation output (-5 V to 10 V) Current 4 to 20 mA
Calibration	0.25, 0.5, 1, 1.5, 2 mV/V (Select one)
Frequency Response	DC to 1, 10, 30, 100, 200, 500 Hz (select one)
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	100 VAC or 200 VAC (Select one)
Dimensions	60(W) $\times$ 150(H) $\times$ 250(D) mm (Excluding protrusions)
Weight	Approx. 1.5 kg

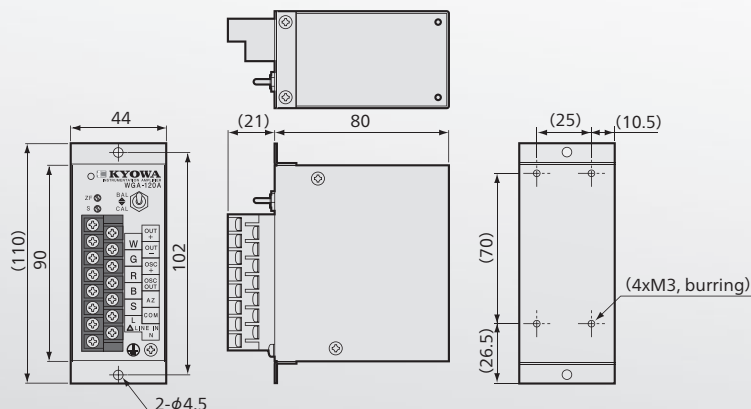


A Carrier Type Instrumentation Amplifier features strong against noise

NEW



CE



Carrier Type Instrumentation Amplifier

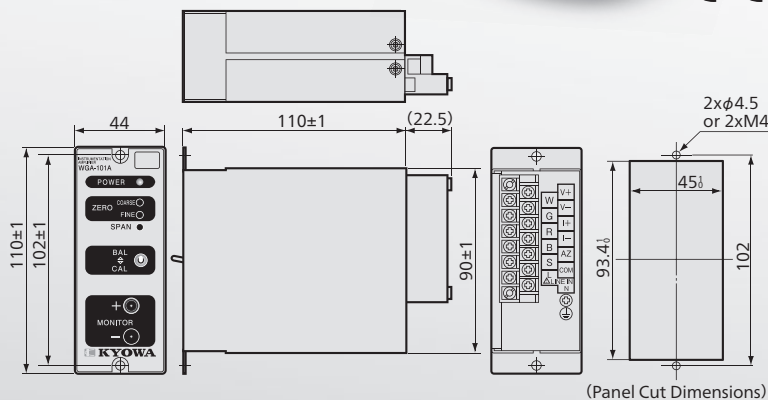
WGA-120A

- Strong against noise from inverter motors
- Rich in lineup for variety applications
- Voltage/current output switchable

Models	Power Codes	Power Supply	Power Consumption	Balance Adjustment
WGA-120A-00	DC	10.5 to 15 VDC	3.5W or less	Manual
WGA-120A-01	100 VAC	90 to 110 VAC	6.5VA or less	
WGA-120A-02	200 VAC	180 to 220 VAC	6.5VA or less	
WGA-120A-03	240 VAC	216 to 264 VAC	6.5VA or less	
WGA-120A-10	DC	10.5 to 15 VDC	3.5W or less	Automatic (Also possible with external contact)
WGA-120A-11	100 VAC	90 to 110 VAC	6.5VA or less	
WGA-120A-12	200 VAC	180 to 220 VAC	6.5VA or less	
WGA-120A-13	240 VAC	216 to 264 VAC	6.5VA or less	

Number of Channels	1
Applicable Transducers	Strain gage transducers
Applicable Bridge Resistance	87.5 to 1000 Ω (Up to four 350 Ω transducers can be connected in parallel. Bridge excitation voltage is limited to 2 or 1 Vrms for transducers with bridge resistance less than 175 Ω)
Bridge Excitation	5 Vrms, 2 Vrms, or 1 Vrms, Square wave (Switchable by changing internal jumper connection)
Full Scale Output	Voltage: ±10 V (Load resistance: 2 k Ω or more) Current: 4 to 20 mA (Load resistance: 500 Ω or less, voltage output: 0 to 10 V) (Switchable by changing internal jumper connection)
Zero Adjustment	Within ±1.5 mV/V, manual balance or auto balance by selecting model.
Sensitivity Adjustment	×2000, ×4000, ×10000 (Switchable by changing internal jumper connection) Adjustable between ×0.4 and ×1.0 by the trimmer.
Calibration	Calibration by the parallel resistance method 0.25mV/V or 0.05mV/V at 350 Ω bridge resistance (Switchable by changing internal jumper connection)
Frequency Response	10, 30, 100, or 500 Hz (Switchable by changing internal jumper connection)
Nonlinearity	Within ±0.1%FS
SN Ratio	53dBp-p or more [Conditions] Sensitive: ×10000, ×0.5 (Adjustment by the trimmer) Frequency response: 500 Hz Bridge resistance: 120 Ω Bridge excitation: 2 Vrms
Stability	Temperature Zero: Within ±0.2 μVRTI/°C Sensitivity: Within ±0.05%/°C Time Zero: Within ±0.5 μVRTI/8 H Sensitivity: Within ±0.2%/8 H [Conditions] Sensitive: ×10000, ×0.1 (Adjustment by the trimmer) Bridge resistance: 120 Ω Bridge excitation: 2 Vrms
EMC Directive	EN61326-1(Class A)
Low Voltage Directive	EN61010-1, EN61010-2-030 (Installation Category II, Pollution Degree 2, Measurement Category O)
RoHS Directive	EN50581
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	Refer to table above.
Dimensions	44(W) x 90(H) x 80(D) mm (Excluding protrusions)
Panel Cut Dimensions	45.0 x 93.4 mm
Weight	DC power supply model: Approx. 350 g AC power supply model: Approx. 450 g

Compact, suitable for panel mounting



Instrumentation Amplifier

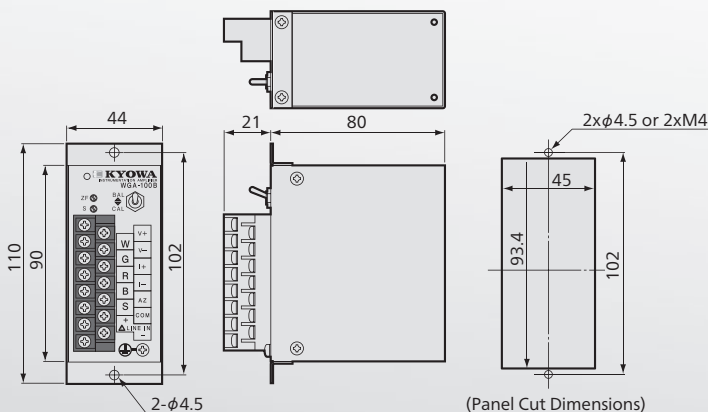
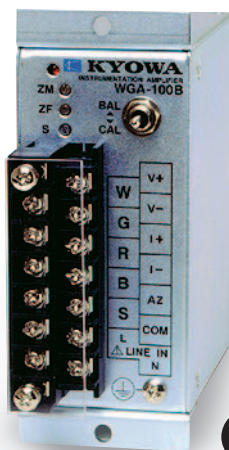
WGA-101A

- Moderate price, high performance and easy operation
- Simultaneous output of voltage and current signals
- Bridge excitation, sensitivity, calibration value and frequency response range are switchable.

Models	Power Supply	Balance Adjustment
WGA-101A-00	10 to 30 VDC, 3.5 W or less	Manual
WGA-101A-01	100 VAC ±10%, 5 VA or less	
WGA-101A-02	200 VAC ±10%, 8 VA or less	
WGA-101A-10	10 to 30 VDC, 3.5 W or less	Automatic (Also possible with external contact)
WGA-101A-11	100 VAC ±10%, 5 VA or less	
WGA-101A-12	200 VAC ±10%, 8 VA or less	

Number of Channels	1
Bridge Excitation	10, 5 or 2 VDC, switchable
Full Scale Output	Dual output of ±10 V, 4 to 20 mA
EMC Directive	EN61326-1(Class A)
Low Voltage Directive	EN61010-1, EN61010-2-030 (Installation Category II, Pollution Degree 2, Measurement Category O)
RoHS Directive	EN50581
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	100, 200 VAC, or 10 to 30 VDC, select one
Dimensions	44(W) x 90(H) x 110(D) mm (Excluding protrusions)
Weight	650 g or less

Suitable for measurement of load, pressure, torque, and displacement



Instrumentation Amplifier

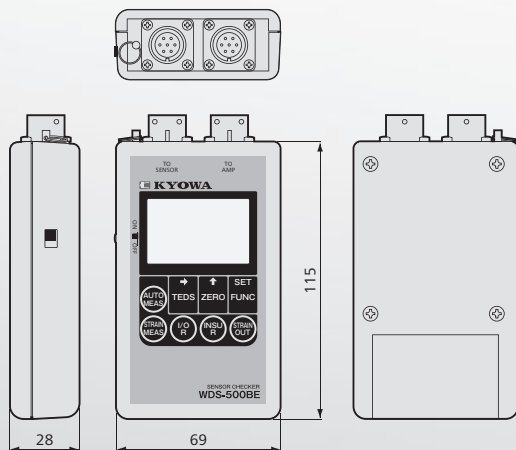
WGA-100B

- Moderate price & high performance
- Simultaneous output of voltage and current signals
- Bridge excitation, sensitivity, calibration value and frequency response range are switchable.

Models	Power Supply	Balance Adjustment
WGA-100B-00	10 to 30 VDC, 3.5 W or less	Manual
WGA-100B-01	100 VAC ±10%, 5 VA or less	
WGA-100B-02	200 VAC ±10%, 8 VA or less	
WGA-100B-10	10 to 30 VDC, 3.5 W or less	Automatic (Also possible with external contact)
WGA-100B-11	100 VAC ±10%, 5 VA or less	
WGA-100B-12	200 VAC ±10%, 8 VA or less	

Number of Channels	1
Bridge Excitation	10 or 5 VDC, switchable
Full Scale Output	Dual output of ±10 V, 4 to 20 mA
EMC Directive	EN61326-1(Class A)
Low Voltage Directive	EN61010-1, EN61010-2-030 (Installation Category II, Pollution Degree 2, Measurement Category O)
RoHS Directive	EN50581
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 80%RH (Non-condensing)
Power Supply	100, 200 VAC, or 10 to 30 VDC, select one
Dimensions	44(W) x 90(H) x 80(D) mm (Excluding protrusions)
Weight	Approx. 400 g

A pocket-size checker
is easily to check
a strain gage
transducer and
a strain amplifier



Sensor Checker

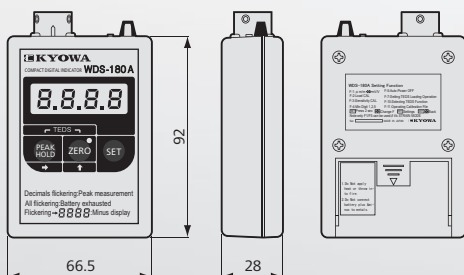
WDS-500BE

- Enables checking of both strain gage transducers and strain amplifiers
- Strain, I/O resistance or isolation resistance can be measured individually by pressing relative keys
- All these variables can be measured simultaneously in automatic mode.
- Enables to check an amplifier by measuring the strain output from the amplifier
- Compact & lightweight, just palm size
- Powered by 2 pieces of AA size dry batteries.

Models	Connectors
WDS-500BE-0	Round connector (PRC03 female)
WDS-500BE-1	Square connector (3RT01 female)

Applicable Instruments	Strain-gage transducers, strain amplifiers
Operating Temperature	-5 to 40°C
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	2 AA size dry batteries
Weight	Approx. 220 g (Including dry batteries)
Dimensions	69(W)×115(H)×28(D)mm (Excluding protrusions)
Measuring Range	Strain: ± 5 mV/V (± 10 k μ m/m) I/O Resistance: 0 to 2000 Ω Isolation Resistance: 0 M to 300 M Ω
Strain Output	0.000 to ± 5.000 mV/V (0.01 mV/V steps) 0 to ± 10 k μ m/m (10 μ m/m steps)

Suitable for simple measurement
and checking of a load, pressure or
displacement transducer



WDS-180A (WDS-185A1 is the same dimensions)

Compact Digital Indicator

WDS-180A /185A1

- WDS-180A is TEDS compatible, thus automatic register sensitivity possible.
- Measured values can be indicated either in μ m/m or mV/V.
- Auto power-off function, no worry about forgetting turn off the power.
- Indicates physical quantity by actual load calibration or sensitivity registration calibration, and easy to measurement.

Number of Channels	1
Bridge Excitation	WDS-180A: 1V (Constant voltage) WDS-185A1: 2 mA (Constant current)
Measuring Range	± 5 mV/V (± 10 k μ m/m)
Indication	-9999 to 9999
Operating Temperature	-5 to 40°C
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	2 AA size dry batteries
Dimensions	66.5(W)×92.0(H)×28.0(D) mm (Excluding protrusions)
Weight	Approx. 180 g (Including batteries)

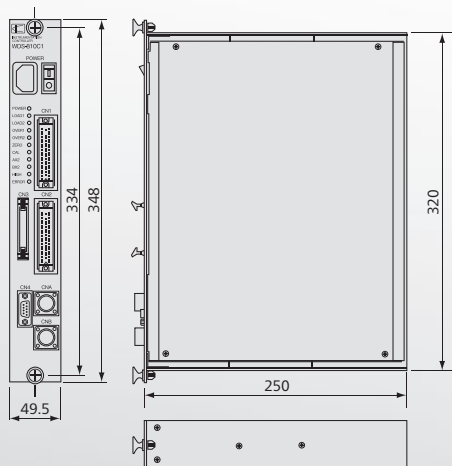
**Thin design
and suitable
for compression
and tension control**



Instrumentation Controller

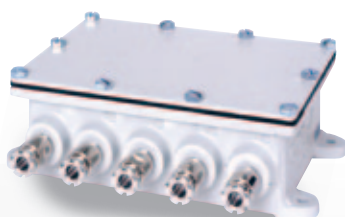
WDC-810C1

- Easy to match necessary I/O signals as a compression controller
- Setting by keyboard Simplifies operation commands and operation
- Wide range of applications



Number of Channels	2 (A-side, B-side)
Bridge Excitation	10 VDC
Measuring Range	±2.5mV/V
D/A Output	None
	A-alone output
	B-alone output
	A+B and output
	A-B polarity difference output
Operating Temperature	-10 to 40°C
Operating Humidity	20 to 85%RH (Non-condensing)
Power Supply	100 VAC
Dimensions	348(H)×49.5(W)×250(D) mm(Excluding protrusions)
Weight	Approx. 3.3 kg

**Cable connections for load cells
and more integrated input
of multi-transducer**



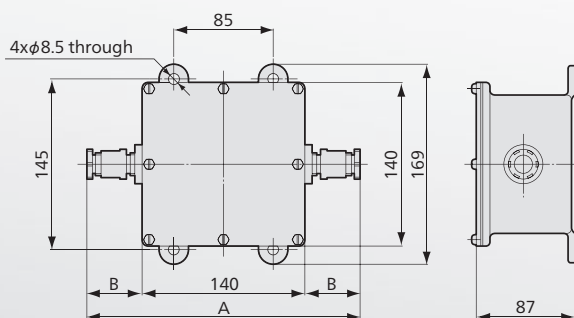
Junction Box

SJB-C/D

A junction box is used when connecting a load cell and amplifier using an extension cable or when connecting cables of multiple load cells to an amplifier using a single cable for weighing a tank or hopper.

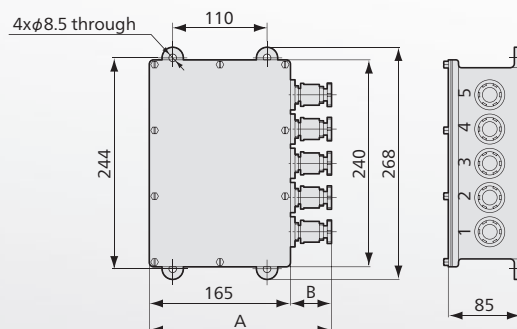
Models	Number of Connectable Load Cells	Applicable Cable Diameters	Remarks
SJB-1C	1	10 to 11 mm (15C)	4-conductor (0.5 mm ²) shielded cable
SJB-4C	4	7 to 8 mm (10B)	4-conductor (0.3 mm ²) shielded cable
SJB-1D	1		
SJB-4D	4		

●SJB-1C,1D



Models	A	B	Weight (Approx.)
SJB-1C	234	47	2.3 kg
SJB-1D	226	43	2.2 kg

●SJB-4C,4D



Models	A	B	Weight (Approx.)
SJB-4C	212	47	4.7 kg
SJB-4D	208	43	4.4 kg

Load Cells for Compressive Load Measurement

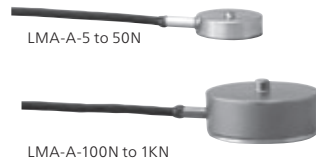
Small-sized, for Load Distribution Measurement

LMA-A

Small-sized Compression Load Cell

5 N to 1 kN

*TEDS-installed versions can be manufactured.



Ultra-small

LMB-A

Small-sized Compression Load Cell

10 N to 2 kN

*TEDS-installed versions can be manufactured.



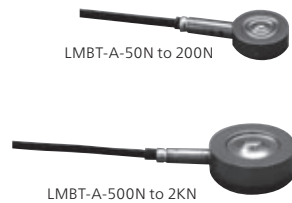
Ultra-small for High Temperature (100°C)

LMBT-A

Small-sized Compression Load Cell

50N to 2kN

*TEDS-installed versions can be manufactured.



Diameter: 21 mm

LMR-S-SA2

Small-sized Compression Load Cell

2 to 20 kN

LMR-S-2KNSA2

LMR-S-5 to 20KNSA2



Small-sized, for Load Distribution Measurement

LMC-A

Small-sized Compression Load Cell

5 kN to 50 kN

*TEDS-installed versions can be manufactured.



Connector-equipped

LCX-A-ID

Small-sized Compression Load Cell

500 N to 20 kN

*TEDS installed



Stainless Steel

LCN-A

Small-sized Compression Load Cell

500 N to 20 kN

*TEDS-installed versions can be manufactured.



Nonlinearity: Within $\pm 0.05\%$ RO

LC-V

Small-sized Compression Load Cell

50 to 200 kN

*TEDS-installed versions can be manufactured.



Compact and Large Capacity

LCV-A

Small-sized Compression Load Cell

500 kN, 1 MN

*TEDS-installed versions can be manufactured.



For High Temperature

LC-FH

High Temp. Compression Load Cell

500 N to 200 kN

-10 to 150 °C

*TEDS-installed versions can be manufactured.



As Thin as 25 to 50 mm in Total Height

LCK-A

Thin Compression Load Cell

5 to 200 kN

*TEDS-installed versions can be manufactured.



Nonlinearity Within $\pm 0.02\%$ RO

LCH-F

High-accuracy Compression Load Cell

100, 200 kN



For Compressive Load Measurement

Explosion-proof

LCS-D

Small-sized Compression Load Cell

5 to 50 kN



Stainless Steel

LC-J

Corrosion-resistant Compression Load Cell

5 to 200 kN



*TEDS-installed versions can be manufactured.

Large Capacity

LC-E

General-purpose Compression Load Cell

2 MN, 5 MN



*TEDS-installed versions can be manufactured.

For Press Forming

LCW-C-SA3

Washer-type Load Cell

10 to 300 kN



LCW-C-20KN25SA3

LCW-C-300KN60SA3

Compact & lightweight

LUB-B

Beam-type Load Cell

50 N to 20 kN



LUB-100KB to 2TB

*TEDS-installed versions can be manufactured.

For Food Tanks and Hoppers

LCTS-B

Stainless Steel Load Cell

5 to 100 kN



*TEDS-installed versions can be manufactured.

For Tanks and Hoppers

LCTA-A

Thin Load Cell "Multi Force Sensor"

500 N to 3 kN



*TEDS-installed versions can be manufactured.

For Tanks and Hoppers

LCTB-A

Thin Load Cell "Multi Force Sensor"

5 to 50 kN



*TEDS-installed versions can be manufactured.

For Tanks and Hoppers

LC TE-A

Thin Load Cell "Multi Force Sensor"

10 to 100 kN



*TEDS-installed versions can be manufactured.

For Tanks and Hoppers

LCTD-A

Thin Load Cell "Multi Force Sensor"

100 to 300 kN



*TEDS-installed versions can be manufactured.

For Tensile Load Measurement

Nonlinearity: Within $\pm 0.03\%RO$

LTZ-A

High-accuracy Tension Load Cell

500 N to 50 kN



LTZ-50 to 200KA

*TEDS-installed versions can be manufactured.

For High Temperature or Low Temperature

LT-FH/FL

Tension Load Cell

500 N to 50 kN

LT-FH: -10 to 150 °C

LT-FL: -196 to 30 °C



*TEDS-installed versions can be manufactured.

Load cells for Both Tensile and Compressive Load Measurement

Compact

LUX-B-ID

Compact Tension/Compression Load Cell

±50 N to ±20 kN



Thin but Large Capacity

LUK-A

Compact Tension/Compression Load Cell

±5 k to ±2 MN



LUK-A-5 to 20KN

*TEDS-installed versions can be manufactured.

Nonlinearity: Within ±0.02%RO

LUH-F

High-accuracy Tension/Compression Load Cell

±500 N to ±200 kN



LUH-50 to 500KF

Compact & lightweight

LUR-A-SA1

Compact Tension/Compression Load Cell

±50 N to ±2 kN



Pressure Transducers

Highly Accurate

PGL-A

Small-sized Pressure Transducer

1 to 50 MPa



PGL-A-A

*TEDS-installed versions can be manufactured.

-196 to 200°C

PHL-A

Small-sized High/Low-Temperature Pressure Transducer

1 to 50 MPa



PHL-A- B

*TEDS-installed versions can be manufactured.

Highly Reliable

PG-U

Pressure Transducer

200 kPa to 50 MPa



PG-10KU,20KU

Moderate Price

PGS-A

Small-sized Pressure Transducer

1 to 50 MPa



Long-term stable

PG-H

High Pressure Transducer

100, 200 MPa



Highly Accurate

PGM-H

Small-sized Pressure Transducer

500 kPa to 50 MPa



*TEDS-installed versions can be manufactured.

Flush Diaphragm Type

PGM-E

Small-sized Pressure Transducer

1 to 50 MPa



PGM-10, 20KE

*TEDS-installed versions can be manufactured.

TEDS is the acronym of Transducer Electronic Data Sheet, which is incorporated into a transducer. By reading the electronic data from the transducer, the measuring instrument is automatically placed in proper measuring conditions without manual adjustment. The format of the transducer electronic data written in the sheet is provided in IEEE 1451.1. The data is roughly classified into the following 3 types:

1	Common data	Transducer identification data including the following items
		Manufacturer identification code Model number code Serial number
2	Template	Transducer performance data including the following items
		Type of transducer Detecting physical variable Rated capacity Rated output
		Input resistance Recommended excitation voltage Date of calibration
		Note: For transducers providing both positive and negative output signals, an average of both output signals is written as the rated output.
3	User data	Maintenance and services data

You can count on Kyowa.

Feel free to contact us,
if there is something you would like to know or
do not understand about Kyowa products.

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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 are subject to change without notice for improvement.



Manufacture's Representative