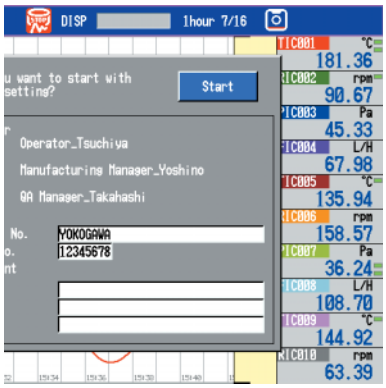
YOKOGAWA

DAQSTATION

DAQSTATION Pharmaceutical Model
Paperless Recorder for Pharmaceutical Manufacturing Applications

DX100P/DX200P

The DAQSTATION DX100P/DX200P pharmaceutical models provide electronic record keeping functions that comply with the requirements of FDA regulation 21CFR Part 11.
DAQSTATION pharmaceutical models display measured data in real-time on a high resolution color TFT liquid crystal display. Data can be saved to CompactFlash memory card or ZIP disk storage media. Electronic signatures can be added to the saved data records at the DAQSTATION itself or the included PC application software.



DAQSTATION

21 CFR Part DAQSTATION

Electronic Batch Data Management

In 1997, the United States Food and Drug Administration (FDA) issued regulation 21 CFR Part 11 (regulation for electronic records and signatures). This regulation identifies the requirements necessary for the storage of electronically produced data within the pharmaceutical industry. Using electronic records provides a solution to the problems encountered by paper based recorders, for example data being lost due to consumables such as pens and paper running out during recording, the difficulty of storing paper after data recording, and data management. Additionally it simplifies the retrieval of historical records by the ability to search by batch name.

21 CFR Part 11 Compliance

- DX100P/DX200P saves data in secure, binary encrypted files. These electronic records, include batch information, configuration settings, and the operation log of the DX100P/DX200P system access.
- Log in functions that require user name, user ID, and password security components provide controlled system access to all DX100P/DX200P functions including the application of electronic signatures.
- Electronic signatures can be applied to the electronic records by using the DX100P/DX200P secure log-in and record signing functions.

Application Software

- PC Software designed to be used in conjunction with the DX100P/DX200P can also apply electronic signatures in the same manner as the DX100P/DX200P.
- Electronic signature information is stored as an attachment to the measurement file in order to protect the original data.
- Configuration change is supported via Ethernet.

Multiple Display Functions

- Employs a 5.5–inch (DX100P) or 10.4–inch (DX200P) wide viewing angle, high resolution TFT color liquid crystal display.
- Equipped with a wide variety of display functions including trend, bar graph, digital, and overview displays.

Flexible Memory Functions

- The archive storage media includes a choice of ZIP disk or CompactFlash memory card.
- The DX100P/DX200P brings improved efficiency and reduced TCO (total cost of ownership) by eliminating paper-and-ink recording.

High Reliability

- Internal non-volatile flash memory does not require battery backup. Data and configuartion settings are saved during any power outages.
- Conforming to the IEC529-IP65 and NEMA No. 250 TYPE 4 standards, the front bezel protects against dust and water wash-down intrusion.

Improved efficiency, and quality control are keywords that companies focus on in todays manufacturing environment. As demand for these goals increases, the information required to make decisions that affects them also increases.
Until now, industrial recorders were used primarily to observe and record batch measurement data, but in order to quickly extract the precise information needed in a given situation from this expance of data, recorders with a high degree of information processing ability have become a necessity.
YOKOGAWA, the on-going world leader in recording technology, introduces its newest data acquisition station, the DX100P/DX200P DAQSTATION to all members of pharmaceutical related industries.

11 Compliance
DX100P/DX200P

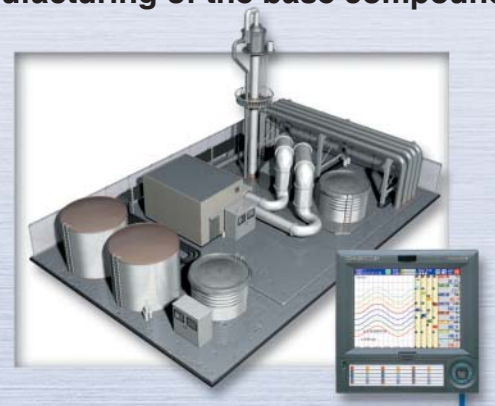
DX100P

DX200P

DAQSTATION

Currently, recorders are used in a wide range of applications during the manufacture of pharmaceutical products.

Manufacturing of the base compounds



Fine Chemical Plant
Temperature, flow and pH monitoring

Physical plant utilities monitoring
Flow, pH and power consumption monitoring

Ethernet

Product production monitoring

Blending operations
Blending speed, temperature and pH monitoring

Cold storage
Temperature and door open/close monitoring

Sterilization, Freeze-drying
Temperature and pressure monitoring

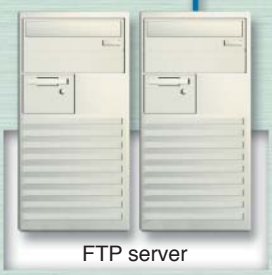
Ethernet

Internet browser

Remote monitoring
On demand monitoring via internet browser

E-mail

Email notifications
Alarm data, instantaneous values at preset times, report reception



FTP server

Centralized data management
Automatic data file transfer using FTP client function

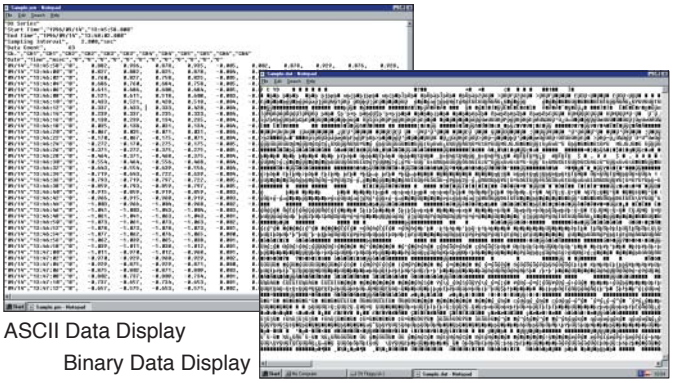
DAQSIGNIN

DAQSIGNIN
Configuration change

Complies with Electronic Recording Regulation (21 CFR Part 11)

Saving Data in Binary Format

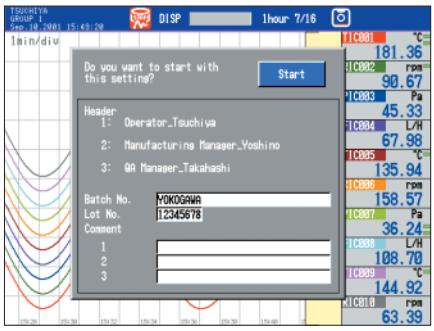
The DX100P/DX200P saves measured data, measured settings, and the operation log into one, binary file.
Binary data is tamper proof, offering a high level of security.
DX100P/DX200P and the PC software can provide an alarm if the file is damaged or altered in any way.



ASCII Data Display
Binary Data Display

Batch Function

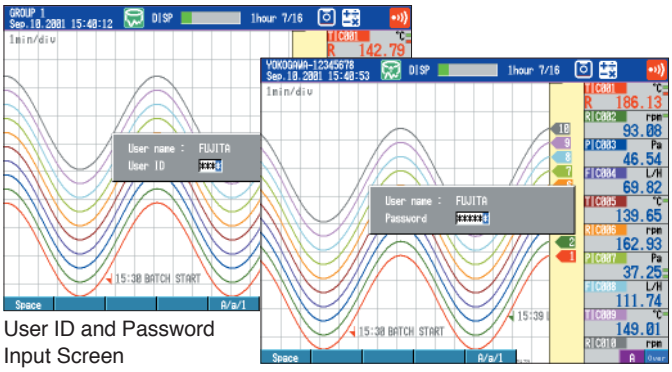
A batch name (batch number + lot number) can be assigned in operation mode which is accessible to users with appropriate access rights. It is possible to configure automatic incrementing of lot numbers at the start of each batch if necessary. Assigning batch names provides a reference that you can use to retrieve historical measurement data.
You can also store comments related to the measured data along with 3 lines of User information.



Batch Name Input Screen

Log In Function

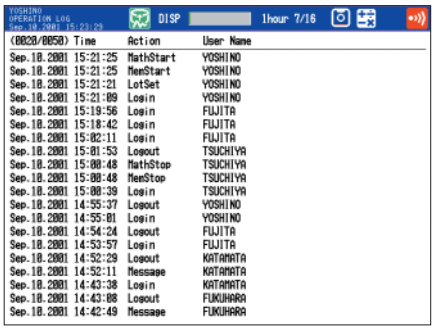
Administrators can assign up to 90 user names in the system mode, and by configuring log in modes, can specify which functions are available to each user, as well as limiting the number of people operating the DX100P/DX200P. With log in mode settings the recorder operation can be determined on a user by user basis.



User ID and Password Input Screen

Audit Trail

The configuration of the DX100P/DX200P cannot be changed whilst the DX100P/DX200P is storing data. Configuration changes made are automatically stored to the recorder media once any changes have been completed.



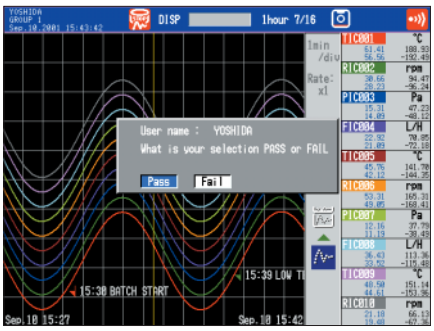
(0020/0050) Time	Action	User Name
Sep.10.2001 15:21:25	MathStart	YOSHINO
Sep.10.2001 15:21:25	MemStart	YOSHINO
Sep.10.2001 15:21:21	LotSet	YOSHINO
Sep.10.2001 15:21:09	Login	YOSHINO
Sep.10.2001 15:19:56	Login	FUJITA
Sep.10.2001 15:18:42	Login	FUJITA
Sep.10.2001 15:02:11	Login	FUJITA
Sep.10.2001 15:01:53	Logout	TSUCHIYA
Sep.10.2001 15:00:48	MathStop	TSUCHIYA
Sep.10.2001 15:00:48	MemStop	TSUCHIYA
Sep.10.2001 15:00:39	Login	TSUCHIYA
Sep.10.2001 14:55:37	Logout	YOSHINO
Sep.10.2001 14:55:01	Login	YOSHINO
Sep.10.2001 14:54:24	Logout	FUJITA
Sep.10.2001 14:53:57	Login	FUJITA
Sep.10.2001 14:52:29	Logout	KATAMATA
Sep.10.2001 14:52:11	Message	KATAMATA
Sep.10.2001 14:43:38	Login	KATAMATA
Sep.10.2001 14:43:08	Logout	FUKUHARA
Sep.10.2001 14:42:49	Message	FUKUHARA

Operation Log Screen

Complies with Electronic Recording Regulation (21 CFR Part 11)

Electronic Signature Function

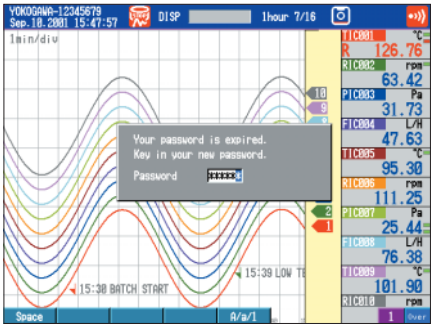
After a batch is complete it is displayed in the DX100P/DX200P's historical display mode, or by use of the associated PC software. After checking the historical data ,it is possible to sign the batch record. Information concerning the batch review such as, Pass/Fail determination and comments, can be added as the record is signed. Three levels of signature are possible such as operator level, supervisor level, and quality control level. The original data is in no way affected. Signing a record involves inputting a password, or user ID and password. With the sign record function, you no longer need paper copies for document control.



Sign Record

Log In Function

A user name and password, or user name, user ID, and password are necessary to log in. The DX100P/DX200P checks each user name against previous user IDs and passwords, and prevents duplicate password registration. Additionally the DX100P/DX200P checks for duplicate user names.
Also, with the automatic password expiration function, persons attempting to log in with passwords exceeding previously entered expiration dates will be prompted to have their passwords renewed.



Password Renewal

Validation Documentation

Documents such as IQ (Installation Qualification) and OQ (Operational Qualification) must be completed as part of an FDA compliant system within a pharmaceutical manufacturing plant.
Validation Documentation (sold separately) is a tool that can help you simplify the process of validating the DX100P/DX200P within an FDA validated process.

Accessories

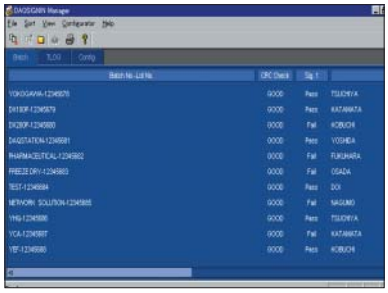
DX100P (Electronic file)	438221	DX200P (Electronic file)	438224
DX100P (A4 sized paper)	438222	DX200P (A4 sized paper)	438225
DX100P (Letter sized paper)	438223	DX200P (Letter sized paper)	438226

DAQSIGNIN (21 CFR Part 11 Compliance Application Software)

DAQSIGNIN (standard accessory software package) allows you to display batch records and measured data along with operation logs and configuration data that have been stored on the DX100P/DX200P. Additionally electronic signatures can be added to the files, allowing for example quality control to sign records within a network environment at some time after the records have been completed.

Data Management Software

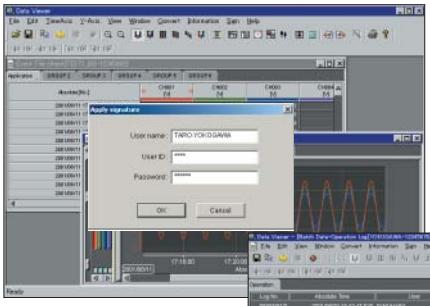
The data management software allows you to search for batch records by batch number, lot number etc, and review them using the viewer function. Whilst opening batch records the following data can be seen; batch number, lot number, file status, sign record status, measurement start and stop times, and the device ID. Also, you can perform a sort on the batch records by batch number, date, and other criteria.



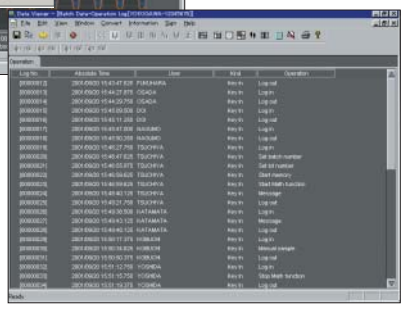
Management Software

Viewer Software

By entering the correct password or user ID/passwords, you can sign data files generated by the DX100P/DX200P that you have redisplayed or checked in trend, digital, circular, alarm table display, message table display, and other formats to an attached data file without changing the original data. If someone signed the file previously, you can confirm the signature status, check the comments, and then sign it yourself under your own log in.
Along with checking the configuration settings and operation log on the DX100P/DX200P, you can also make printouts for each batch record. Also, you can read in numerical values from the displayed data using the cursor, perform interval arithmetic, and convert files to ASCII, Excel, and Lotus 1-2-3 format.



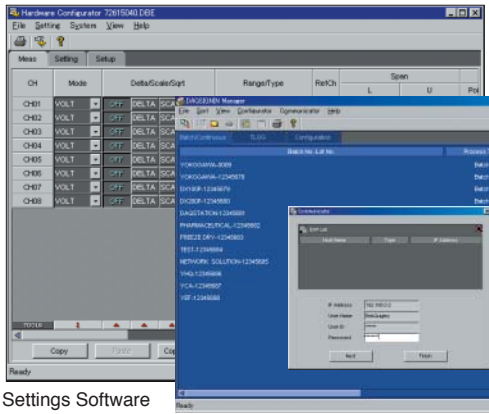
Electronic Signature



Operation Log

Settings Software

You can display, edit, and save configuration settings related to the measurement and calculation channels, and settings related to the screen display and other items, and transfer them via Ethernet or external medium to the DX100P/DX200P. Only Administrator can change the configuration via Ethernet. (When recording or MATH is stopped.) Also, by opening several setting files, you can compare how the configuration changes were carried out, and obtain an audit trail.
You can also print out the configuration, and control them as paper documents.



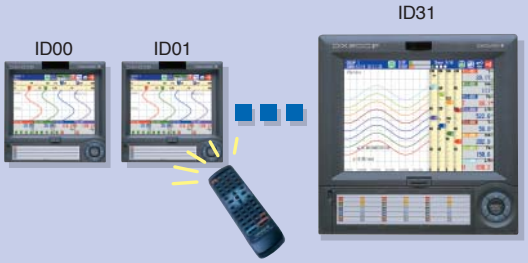
Settings Software

Communicator

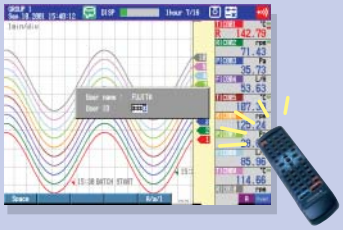
Pursuing good operability with new functions

Easy Text Entry Option

A new wireless remote control option greatly simplifies text entry operations on DX100P/DX200P models.
Control and setting parameters can now be input by remote control !



All operations can be performed by the remote control terminal.
One remote control can operate up to 32 DX100P/DX200P units.



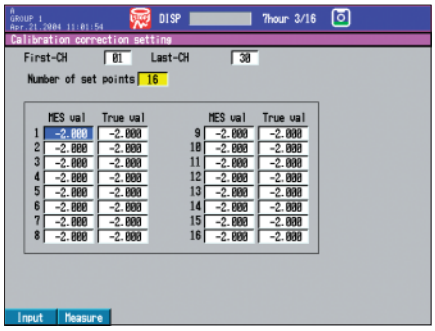
The remote control can:log into a DX100P/DX200P
enter long text messages enter setting paramete

Barcode Protocol *(when /C2 option specified)*

User Name or User ID for logging in, free message, batch information and batch comment can be entered via barcode scanner.
Operation log is saved as well as key operation from the front panel.

Calibration Correction Option

Calibration Correction can be set maximum 16 points per each channel.

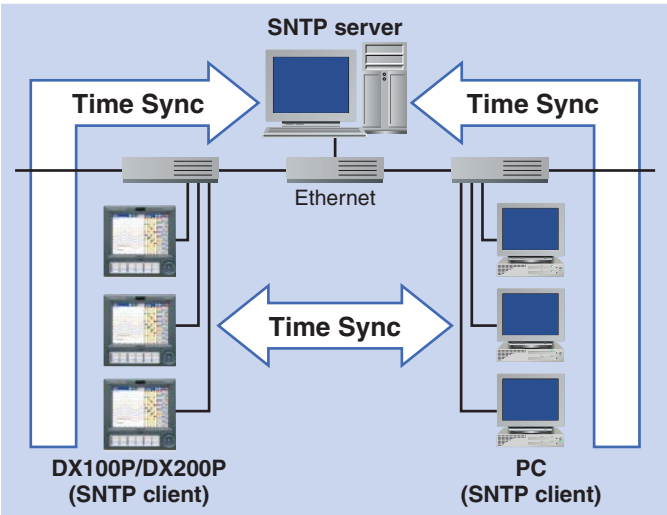


Calibration Correction Setting Screen

Time Synchronization Function with Network *(SNTP*)*

**Simple Network Time Protocol*

SNTP client function of DX100P/DX200P allows its time to be synchronized to time of SNTP server. Also, DX100P/DX200P operates as SNTP server.
The SNTP function allows the whole system to be managed precise time by synchronizing the time with some DX100P/DX200P and the other instruments of SNTP client function.



Specifications

SPECIFICATIONS

See the DX100P/DX200P General Specifications documents (GS 04L05A01-00E, 04L06A01-00E) for complete product specifications.

Standard Specifications

General Specifications

Attachment: Embedded panel (vertical panel)
The attachment angle may be slanted 30° to the rear. Left-right horizontal.
Attached panel thickness: 2–26 mm
Materials Case: Steel
Bezel: Polycarbonate
Front filter: Polycarbonate
Paint colors Bezel: Charcoal gray light (Munsell 10B 3.6/0.3 or equivalent)
Case: Grayish blue-green (Munsell 2.0B 5.0/1.7 or equivalent)
Front panel dustproof/water resistance specifications:
Compliant with IEC529-IP65
Compliant with NEMA No. 250 TYPE4 (except icing test)

■ Input Unit

Number of inputs and measurement periods:

Model	Inputs	Measurement Period	Event file sampling period
DX102P	2	125ms	125,250,500ms, 1,2,5,10,30,60,120, 300,600s
DX104P	4		
DX106P	6	1 second (2 seconds for A/D integration time of 100 ms)	1,2,5,10,30,60,120, 300,600s
DX112P	12		
DX204P	4	125ms	125,250,500ms, 1,2,5,10,30,60,120, 300,600s
DX208P	8		
DX210P	10	1 second (2 seconds for A/D integration time of 100 ms)	1,2,5,10,30,60,120, 300,600s
DX220P	20		
DX230P	30		

Measuring range:

Input	Range	Measuring Range
DCV	20mV	-20.00 – 20.00mV
	60mV	-60.00 – 60.00mV
	200mV	-200.0 – 200.0mV
	2V	-2.000 – 2.000V
	6V	-6.000 – 6.000V
	20V	-20.00 – 20.00V
	50V	-50.00 – 50.00V
TC	R *1	0.0 – 1760.0°C
	S *1	0.0 – 1760.0°C
	B *1	0.0 – 1820.0°C
	K *1	-200.0 – 1370.0°C
	E *1	-200.0 – 800.0°C
	J *1	-200.0 – 1100.0°C
	T *1	-200.0 – 400.0°C
	N *1	0.0 – 1300.0°C
	W *2	0.0 – 2315.0°C
	L *3	-200.0 – 900.0°C
	U *3	-200.0 – 400.0°C
RTD *5	Pt100 *4	-200.0 – 600.0°C
	JPt100 *4	-200.0 – 550.0°C
DI	Voltage input	OFF: less than 2.4 V ON: more than 2.4 V
	Contact input	Contact ON/OFF

*1 R, S, B, K, E, J, T, N: IEC584-1 (1995), DIN IEC584,JIS C 1602-1995
*2 W: W-5% Rd/W-26% Rd (Hoskins Mfg. Co.), ASTM E988
*3 L: Fe-CuNi, DIN43710, U: Cu-CuNi, DIN43710
*4 Pt100: JIS C 1604-1997, IEC 751-1995, DIN IEC751-1996, JPt100: JIS C 1604-1989,JIS C 1606-1989
*5 Measuring current: i = 1mA

Thermocouple burnout: Detector ON/OFF switching (can be set for each channel)
Burnout upscale/downscale switching

Calculations :
Differential calculation : The difference between any two channels can be calculated.
Calculable inputs : DCV, TC, RTD
Linear scaling : Scalable inputs : DCV, TC, RTD
Scalable range: -30000–30000
Square root: Scalable inputs : DCV
Scalable range: -30000–30000

■ Display

Display: DX100P: 5.5-inch color TFT LCD (320 × 240 pixels)
DX200P: 10.4-inch color TFT LCD (640 × 480 pixels)
*Some LCD display pixels may remain constantly on or off. Also, brightness variations may occur due to the properties of the liquid crystal. Please note that this does not mean the display is broken.

Trend/bar graph display colors: DX100P: Any of 12 colors
DX200P: Any of 16 colors
Background: White or black
Status display: Display group name, login user name (when using login function), time (year/month/date, hour:minute:second), batch name, recording operation, memory status, media status, calculation status, email status, main alarm display
Display types: Measurement data display (trend display, digital display, bar graph display), overview display, information display (alarm summary, alarm ACK summary, message summary, memory summary), historical display

Trend Display
Number of screens: 6 (6 groups)
Number of display channels: DX100P: Up to 6 channels per screen or all channels
DX200P: Up to 10 channels per screen or all channels
Waveform update rates: DX102P, DX104P: 15/30 seconds; 1/2/5/10/15/20/30 mhÂ-utes; 1/2/4/10 hours/div
DX106P, DX112P: 1/2/5/10/15/20/30 minutes; 1/2/4/10 hours/div
DX204P, DX208P: 15/30 seconds; 1/2/5/10/15/20/30 minutes; 1/2/4/10 hours/div
DX210P, DX220P, DX230P: 1/2/5/10/15/20/30 minutes; 1/2/4/10 hours/div
Direction: Vertical or horizontal
Thickness: 1, 2, or 3 dots
Scale: DX100P: 6
DX200P: 10
Message display: Display of messages input through key input
Other displayed information: Digital value display, tripline, grid, hour:minute, update rate

Digital Display
Number of screens: 6 (6 groups)
Number of display channels: DX100P: Up to 6 channels per screen or all channels
DX200P: Up to 10 channels per screen or all channels
Update rate: 1 second
Display contents: Measurements, channel/tag names, units, alarm statuses

Bar Graph Display
Number of screens: 6 (6 groups)
Number of display channels: DX100P: Up to 6 channels per screen or all channels
DX200P: Up to 10 channels per screen or all channels
Update rate: 1 second
Direction: Vertical or horizontal
Scale: 4 to 12
Reference position: Edge or center (only during horizontal display)
Display contents: Measurements, channel/tag names, scale upper/lower limits, units, alarm statuses, upper/lower limit alarm points

Overview Display
Update rate: 1 second
Display contents: Measurements and alarm statuses on all channels

Information Display
Display types: Alarm summary, alarm ACK summary, message summary, memory information, etc.

4 Part Split Screen Display (DX200P)
Display contents: The screen is divided into four windows. Any display type/display group may be displayed in the windows from measurement data display or information display.
Number of stored display types: 4 maximum

Data Reference Functions
Functions: Redisplay of data from internal memory or removable storage media
Display data: Display data files, event data files
Display layout: Full screen
Time-axis actions: Reducing, enlarging, scrolling

■ Storage Functions

Removable storage media: The following removable storage media options are available when ordering a system:
*Zip drive
*Compact Flash memory card (up to 512 MB)
File types The following data are saved on removable storage media:

File types	Data contents	Format
Display data	Maximum and minimum values in the waveform update period, from data sampled in the measurement period	Binary
Event data	Instantaneous values sampled in specified sampling period	Binary
Manual sample data	Instantaneous values for each key input or contact input	ASCII
Statistical calculation (TLOG) data*	Data at TLOG time-out	Binary
Report data*	Data at report time-out	ASCII
Configuration file	Settings for operation/engineering mode, system administrator, general user, and login mode setting	Binary

*When using the calculation option (/M1)

Data saving period: Display data: Linked to waveform update rate.
Event data: Specify the sampling period.
Measured data files: Select one of two file types, and create files of that type
• Display data file
• Event file
Data size:
Display data: Measurement data: 4 bytes/record
Calculation data: 8 bytes/record

Specifications

See the DX100P/DX200P General Specifications documents (GS 04L05A01-00E, 04L06A01-00E) for complete product specifications.

Event data: Measurement data: 2 bytes/record
Calculation data: 4 bytes/record

Sampling time: Example (for DX106P: 6 measurement channels, 0 calculation channels)

Display data files only

Display updating (min/div)	1 minutes	5 minutes	20 minutes	30 minutes	60 minutes	240 minutes
Saving interval (seconds)	2 seconds	10 seconds	40 seconds	60 seconds	120 seconds	480 seconds
Sampling Time	Approx. 86 hours	Approx. 18 days	Approx. 72 days	Approx. 108 days	Approx. 217 days	Approx. 868 days

Event data files only

Display updating (min/div)	1 minutes	5 minutes	10 minutes	30 minutes	60 minutes	120 minutes
Sampling Time	Approx. 69 hours	Approx. 14 days	Approx. 28 days	Approx. 86 days	Approx. 173 days	Approx. 347 days

File saving method: Auto save
Display data file: Saved to removable storage media at fixed intervals (10 minutes to 31 days).
Event file: Saved to removable storage media at fixed intervals (3 minutes to 31 days) when using free trigger.

■ Log in Function: Not all operations are allowed when starting login mode with the power ON (only the monitor display can be switched (on/off selectable)) . Enter user name, user ID, and password to login to the DX100P/DX200P.
System administrator: 3 names can be registered, access to all keys available
General user: 90 names can be registered, and access to key operations and limitations on the sign record function can be assigned using the login mode settings.
Login mode settings: 30 patterns
Password expiration: Select Off, 1 month, 3 months, or 6 months

■ Batch Function: In operation mode, you can input a batch name (a batch number plus an 8 digit lot number for a maximum of 32 characters) and a comment (up to 3 lines, 32 characters each). Automatic incrementing of lot numbers at each batch start. Preset headers 1, 2, and 3 (each having a maximum of 64 characters) can be viewed on the batch input screen.
Display event data files: The following information is added to the attached data file:
- User name
- Header 1 (can be used for the application description etc.)
- Header 2 (can be used for the supervisor name etc.)
- Header 3 (can be used for the manager name etc.)
- Batch name (a batch number plus an 8-digit lot number for up to 32 characters)
- Comments (up to 32 characters, 3 lines each)

■ Sign Record Function: After checking the measured data, electronic signatures on 3 levels, pass/fail determinations, and comments (up to 32 characters) can be recorded.

■ Alarm Functions
Number of settings: Maximum 4 per channel
Alarm types: Upper/lower limits, difference upper/lower limits, change rate increase/decrease limits, delay upper/lower limits (alarm delay)
Change rate alarm interval: Measurement period × 1–15
Hysteresis: Switched between ON (0.5% of display span) and OFF (same for all channels/levels)
Display: Status (alarm type) display and common alarm display shown on digital display unit when alarm occurs. Switching between display holding/non-holding.
Notification: Email notification
Storage: Stored information: Alarm occurrence/clear time, alarm type
Number of stored records: Most recent 240 records maximum
ACK: Specific or global alarms can be controlled
Output:
Output points: DX100P (with option): 2, 4, or 6 points
DX200P (with option): 2, 4, 6, 12, or 24 points
Operations: Switching between excitation/non-excitation, holding/non-holding

■ Communications Interface
Media: 10BASE-T
Protocol: SMTP, HTTP, FTP, TCP, UDP, IP, ARP, ICMP, SNTP
Email sending function:
Notification types: The following information is presented by email:
Alarm notification: Alarm information is presented when an alarm occurs or is cleared
System notification: Notification of time when power is interrupted/restored
Notification of time remaining when internal memory overwriting starts
Notification of remaining free space when remaining space in storage media falls to 10% or 6 MB.
Periodic notification: Periodic notification of instantaneous values at preset times or intervals
Report notification: Notification of report data when report time-out occurs (with /M1 option)
User invalid: Notification of user becoming invalid because of entering the wrong password three times.
Notification addressee: 2 address groups
(multiple addresses may be specified in each group, with a maximum of 150 characters per group)

Web server function: Displays the DX100P/DX200P's screen, alarm information, instantaneous values, etc. on a browser.
FTP client function: Automatic file transfer from DX100P/DX200P unit (display data files, event files, report file snap shot file)
FTP server function: Manual file transfer of information on removable storage media, directory editing, file deletion, and checking free space on removable storage media, working through a host computer
Monitor function: Real-time remote monitoring of DX100P/DX200P measurement data (special protocol)
Setting function: Configuration of DX100P/DX200P via communication (special protocol)
SNTP client function: The time on the DX100P/DX200P can be synchronized to the time of a SNTP server.
SNTP server function: The DX100P/DX200P can operate as a SNTP server.

■ Power Supply
Rated supply voltage: 100–240 VAC (automatic switching)
Operating supply voltage range: 90–132, 180–264 VAC
Rated supply frequency: 50/60 Hz (automatic switching)
DX100P power consumption:

Power supply voltage	With LCD saver ON	Normal mode	Maximum
100 VAC	Approx. 30 VA	Approx. 32 VA	Approx. 45 VA
240 VAC	Approx. 42 VA	Approx. 47 VA	Approx. 62 VA

DX200P power consumption:

Power supply voltage	With LCD saver ON	Normal mode	Maximum
100 VAC	Approx. 50 VA	Approx. 53VA	Approx. 75 VA
240 VAC	Approx. 78 VA	Approx. 80 VA	Approx. 106 VA

Normal operating requirements

Supply voltage ranges : 90 to 132, 180 to 250 V AC
Supply frequencies : 50 Hz ± 2%, 60 Hz ± 2%
Ambient temperature : 0–50°C
Ambient humidity : 20 to 80% RH (at 5 to 40°C)

Reference performance specifications

Measurement and display accuracy: (reference operating conditions: temperature of 23 ± 2°C, humidity 55 ± 10% RH, supply voltage of 90 to 132 or 180 to 250 V AC, supply frequency of 50/60 Hz ± 1%, minimum 30 minutes warmup time; no vibrations or other which would adversely affect the performance of measuring instruments)

Input type	Range	Measurement accuracy (digital reading)	Maximum digital reading resolution
DC voltage	20 mV	±(0.1% of rdg + 2 digits)	10 µV
	60 mV		10 µV
	200 mV		100 µV
	2 V		1 mV
	6 V		1 mV
	20 V		10 mV
	50 V	±(0.1% of rdg +3 digits)	10 mV
Thermocouple (without reference junction compensation ccuracy)	R	±(0.15% of rdg + 1°C)	0.1°C
	S	R and S are ±3.7°C for 0 to 100°C, and	
	B	±1.5°C for 100 to 300°C B is ±2°C for 400 to 600°C; accuracy not guaranteed for less than 400°C	
	K	±(0.15% of rdg +0.7°C) ±(0.15% of rdg +1°C) for -200 to -100°C	
	E	±(0.15% of rdg +0.5°C)	
	J	±(0.15% of rdg +0.5°C)	
	T	±(0.15% of rdg + 0.7°C) for -200 to -100°C	
	N	±(0.15% of rdg +0.7°C)	
	W	±(0.15% of rdg +1°C)	
	L	±(0.15% of rdg +0.5°C)	
	U	±(0.15% of rdg + 0.7°C) for -200 to -100°C	
RTD	Pt100 JPt100	±(0.15% of rdg + 0.3°C)	

Reference junction compensation: INT (internal)/EXT (external) switching (common to all channels)
Reference junction compensation accuracy:
Types R, S, B, W: ±1°C
Types K, J, E, T, N, L, U: ±0.5°C (for measurement at 0°C or higher)
Maximum input voltage: 2 VDC or lower voltage range and thermocouple: ±10 VDC (continuous)
6 VDC or higher voltage range:±60 VDC (continuous)
Input resistance: 2 VDC or lower voltage range and thermocouple:10ΩMor higher
6 VDC or higher voltage range:approximately 1 MΩ
Input external resistance: DC voltage, thermocouple input:2 kΩ or lower
RTD input:1 wire, 10 Ω or less (all three wires equal)
Input bias current: 10 nA or less
Maximum common mode noise voltage:
250 VAC rms (50/60 Hz)
Common mode rejection ratio (CMRR):
120 dB (50/60 Hz ±0.1%, 500Ω unbalanced, across minus terminal and ground)

Normal mode rejection ratio (NMRR):
40 dB (50/60 Hz ±0.1%)
Maximum noise voltage across channels:
250 VAC rms (50/60 Hz)
Interference across channels: 120 dB (for 500Ω input external resistance and 60 V input to other channel)

Option specifications

■ Easy Test Entry
Number of units under control : Up to 32 units by ID setting
Max. communication distance : Up to 8m, depending on battery strength area of use
Operational functions
- User Name/User ID/Password input for logging in
- Message input
- Engineering mode setting
- System mode setting
- Trend/Digital/Bar Graph display change

■ Calibration Correction
Functions: Input value correction with linearization
Points: Selectable from off, 2 to 16
Target channel: Measurement channel
Target range: All range mode

■ Alarm Relay Contact Output (/AR1, /AR2, /A3, /A4*, /A5*)
Functions: Relay output through back side when alarm occurs
Outputs: 2, 4, 6, 12* or 24*
Relay contact capacitance: 250 VDC/0.1 A (resistance load), 250 VAC (50/60 Hz)/3 A
Output form: NO-C-NC (switching between excitation/non-excitation, AND/OR, holding/non-holding)
* /A4 and /A5 are for DX200P only.

■ Serial Communications (/C2, /C3)
Functions: Allows the host computer to control (available control commands are limited) the DX100P/DX200P as well as receive data from the DX100P/DX200P.
Media: EIA RS-232 (/C2) or RS-422-A/485 (4-wire) (/C3) compliant
Protocol: Special protocol or Modbus
Synchronization method: Start-stop synchronization
Communication method (RS-422-A/485):
4-wire half-duplex multi-drop connection (1:N, where N is 1–32)
Transfer rate: 1200, 2400, 4800, 9600, 19200, 38400 bps
Data length: 7/8 bits
Stop bit: 1 bit
Parity: ODD, EVEN, NONE
Maximum communication distance: 1.2 km (RS-422-A/485)
Communication mode: Control and settings I/O are in ASCII mode.
Measurement data are output in ASCII or binary mode.
Modbus communication: Operation mode: RTU MASTER or RTU SLAVE
RTU MASTER: Capable of data acquisition for 8 packet groups.
Registers of a continuous data type in the same slave can be registered in a single packet group.
RTU SLAVE: Outputs measurement/calculation data and alarm statuses.
Evaluated Barcode Scanner Metrologic Inc.
MS 9540-RS (RS-232 interface)
Symbol Technologies Inc.
LS 1902-RS (RS-232 interface)

■ VGA Output (/D5, DX200P only)
Enables connection to external display device.

■ FAIL/Memory End Output (/F1)
Select FAIL output, memory output, or batch start/stop output on 2 relay outputs.
FAIL Output: Relay output when system error occurs
Memory mode output: Relay output a specified number of hours before internal memory overwriting starts (1, 2, 5, 10, 20, 50, or 100 hours), or when available space on the external memory medium falls below 10% or 6 MB.
Batch start/stop: Batch start/stop status relay output
User invalid: When a user becomes invalid because of entering the wrong password three times.
Login status: When the login function is enabled and there is a user logged in the DX100P/DX200P.
Relay contact capacitance: 250 VDC/0.1 A (resistance load), 250 VAC (50/60 Hz)/3 A

■ Clamped Input Terminal (/H2)
A clamped input terminal is used as an input terminal.

■ Desktop Type (/H5[ ], /H5)
Includes carrying handle and power cord (model /H5 does not include power cord)

■ Mathematical Functions (/M1)
These functions enable the calculations listed below, as well as displaying and recording trends and digital values on calculation channels.
Number of calculation channels: DX102P, DX104P: 8 channels
DX106P, DX112P: 12 channels
DX204P, DX208P: 8 channels
DX210P, DX220P, DX230P: 30 channels
Calculation types:
General calculations: Arithmetic calculations (+, -, *, /), square roots, absolute values, common logarithms, exponents, powers, relational calculations (<, >, =, ≠), logical calculations (AND, OR, NOT, XOR)
Statistical calculations: Time-series data averages, maximum values, minimum values, totalized values
Moving averages: Moving averages are determined for calculation results.
Constants DX100P: Up to 12 constants can be set.
DX200P: Up to 30 constants can be set.
Online digital communications input: Can be used for calculation formulas other than statistical calculations.
DX100P: 12 channels
DX200P: 30 channels
Remote inputs: Up to 8 remote inputs can be used. Remote statuses (0/1) can be used in calculation formulas.
Reporting functions:
Report types: Hourly reports, daily reports, hourly + daily reports, daily + weekly reports, daily + monthly reports
Calculation types: Average values, maximum values, minimum values, totalized values

■ Cu10/Cu25 RTD Input/3-Wire Isolated RTD Input (/N1)
This option enables Cu10 and Cu25 inputs in addition to the standard inputs.

■ 3-Wire Isolated RTD Input (/N2)
With this option, all RTD input points are isolated (A, B, and b are all isolated).
*Only available with the DX106P, DX112P, DX210P, DX220P, and DX230P.

■ 24 VDC/AC Power Driven Model (/P1)
Rated supply voltage: 24 VDC or 24 VAC (50/60 Hz)
Operating supply voltage range: 21.6 to 26.4 VDC/AC
DX100P power consumption:

Power supply voltage	With LCD saver ON	Normal mode	Maximum
24 VAC	Approx. 17 VA	Approx. 19 VA	Approx. 30 VA
24 VAC(50/60 Hz)	Approx. 28 VA	Approx. 32 VA	Approx. 45 VA

DX200P power consumption:

Power supply voltage	With LCD saver ON	Normal mode	Maximum
24 VAC	Approx. 34 VA	Approx. 35 VA	Approx. 54 VA
24 VAC(50/60 Hz)	Approx. 50 VA	Approx. 53 VA	Approx. 76 VA

■ Remote Control (/R1)
The remote control can be used to control the following through contact input (as many as 8 points can be set)
- Memory start/stop (level)
- Time setting (time set to reference time through contact; trigger; 250 ms or greater)
- Calculation start/stop (level)
- Calculation data reset (trigger; 250 ms or greater)
- Manual sampling (trigger; 250 ms or greater)
- Message writing (as many as 8 types can be set; trigger; 250 ms or greater)
- Alarm ACK (trigger; 250 ms or greater)
- Snapshot (trigger; 250 ms or greater)

■ 24 VDC Transmitter Power Supply Output (/TPS2*, /TPS4, /TPS8*)
Output voltage: 22.8–25.2 VDC (for rated load current)
Rated output current: 4–20 mA DC
Maximum output current: 25 mA DC (overcurrent assured operation current: approximately 68 mA DC)

Model Code

DX100P

Model code	Suffix code		Optional code	Description
DX102P				DAQSTATION DX100P (2ch)
DX104P				DAQSTATION DX100P (4ch)
DX106P				DAQSTATION DX100P (6ch)
DX112P				DAQSTATION DX100P (12ch)
External Memory	-3			CompactFlash memory card (CF+Adapter)
	-5			250MB Zip (with medium)
Display Language		-2		English/German/French, deg F & Summer/winter time
Option Specifications			/AR1	Alarm output 2 points/Remote control *1*2
			/AR2	Alarm output 4 points/Remote control *1*2
			/A3	Alarm output 6 points *1*3
			/C2	RS-232 interface (including MODBUS) *4*5
			/C3	RS-422-A/485 interface (including MODBUS) *4*5
			/F1	FAIL/memory end output *3
			/H2	Clamped input terminal
			/H5	Desktop type(without power cord, screw type power terminal) *6
			/H5[ ]	Desktop type (with power cord)*7
			/M1	Mathematical function (with report function)
			/N1	Cu10,Cu25 RTD input/3 legs isolated RTD
			/N2	3 legs isolated RTD *8
			/P1	24V DC/AC power supply
			/R1	Remote control
			/TPS2	24V DC Power Supply for Transmitter(2 loop) *9
			/TPS4	24V DC Power Supply for Transmitter (4 loop) *10
			/KB1	Easy Text Entry (with input terminal) *11*12
			/KB2	Easy Text Entry (without input terminal) *11
			/CC1	Calibration Correction

*1 /AR1,/AR2 and /A3 cannot be specified together. *2 If /AR1 or /AR2 is specified, /R1 cannot be specified. *3 If /A3 is specified, /F1 cannot be specified. *4 /C2 and /C3 cannot be specified together. *5 In case that Modbus master function is utilized, /M1 must be specified. *6 In case that 24 VDC/AC power supply(/P1) and desktop type are specified, /H5 must be specified. /P1 and /H5[ ] cannot be specified together. *7 /H5[ ](D-Power cord UL, CSA st'd, F-Power cord VDE st'd, R-Power cord SAA st'd, J-Power cord BS st'd, H-Power cord GB st'd) *8 /N2 cannot be specified for DX102P and DX104P. *9 In case that /TPS2 is specified, /TPS4, /AR2, /A3 or /F1 cannot be specified. *10 In case that /TPS4 is specified, /TPS2, /AR1, /AR2, /A3 or /F1 cannot be specified. *11 /KB1 and /KB2 cannot be specified together. *12 In case that /KB1 is specified, input terminal(4382 27) is attached.

DX200P

Model code	Suffix code		Optional code	Description
DX204P				DAQSTATION DX200P (4ch)
DX208P				DAQSTATION DX200P (8ch)
DX210P				DAQSTATION DX200P (10ch)
DX220P				DAQSTATION DX200P (20ch)
DX230P				DAQSTATION DX200P (30ch)
External Memory	-3			CompactFlash memory card (CF+Adapter)
	-5			250MB Zip (with medium)
Display Language		-2		English/German/French, deg F & Summer/winter time
Option Specifications			/AR1	Alarm output 2 points/Remote control *1*2
			/AR2	Alarm output 4 points/Remote control *1*2
			/A3	Alarm output 6 points *1
			/A4	Alarm output 12 points *1
			/A5	Alarm output 24 points *1*3
			/C2	RS-232 interface (including MODBUS) *4*5
			/C3	RS-422-A/485 interface (including MODBUS) *4*5
			/D5	VGA output
			/F1	FAIL/memory end output *3
			/H2	Clamped input termial
			/H5	Desktop type (without power cord, screw type power terminal)*6
			/H5 [ ]	Desktop type (with power cord) *7
			/M1	Mathematical function (with report function)
			/N1	Cu10,Cu25 RTD input/3 legs isolated RTD
			/N2	3 legs isolated RTD *8
			/P1	24 VDC/AC power supply
			/R1	Remote control
			/TPS4	24V DC Power Supply for Transmitter (4 loop) *9
			/TPS8	24V DC Power Supply for Transmitter (8 loop) *10
			/KB1	Easy Text Entry (with input terminal) *11*12
			/KB2	Easy Text Entry (without input terminal) *11
			/CC1	Calibration Correction

*1 /AR1,/AR2,/A3,/A4 and /A5 cannot be specified together. *2 If /AR1 or /AR2 is specified, /R1 cannot be specified. *3 If /A5 is specified, /F1 cannot be specified. *4 /C2 and /C3 cannot be specified together. *5 In case that Modbus master function is utilized, /M1 must be specified. *6 In case that 24 VDC/AC power supply(/P1) and desktop type are specified, /H5 must be specified. /P1 and /H5[ ] cannot be specified together. *7 /H5[ ](D-Power cord UL, CSA st'd, F-Power cord VDE st'd, R-Power cord SAA st'd, J-Power cord BS st'd, H-Power cord GB st'd) *8 /N2 cannot be specified for DX204P and DX208P. *9 In case that /TPS4 is specified, /TPS8, /AR2, /A3 or /F1 cannot be specified. *10 In case that /TPS8 is specified, /TPS4, /A5 cannot be specified. /A4 and /F1 cannot be specified together. *11 /KB1 and /KB2 cannot be specified together.
*12 In case that /KB1 is specified, input terminal(4382 27) is attached.

Software

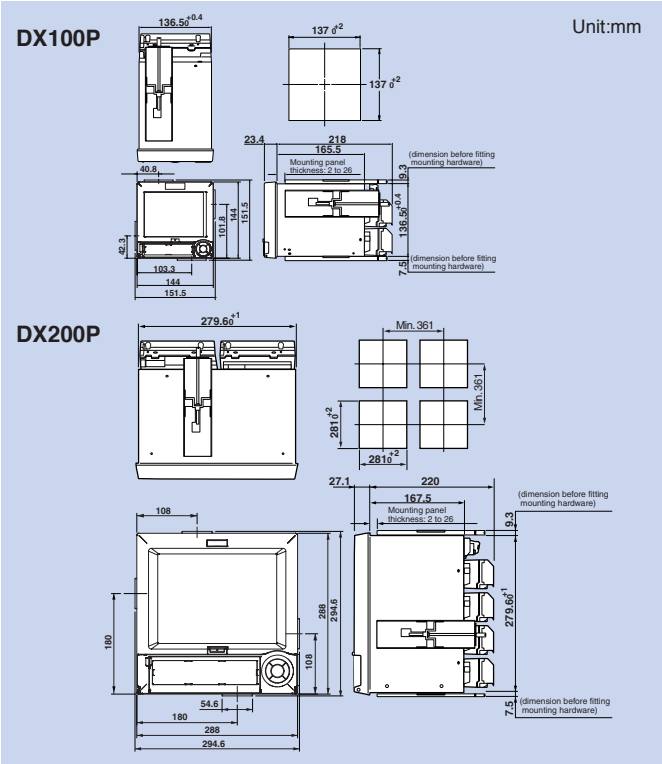
Model Code	Description	OS
DXA150-02	DAQSIGNIN	Windows 98/Me/NT 4.0/2000/XP

Accessories

Accessories (Sold separately)

Product	Model(Part number)	Specifications
Validation Document	438221	Electronic file for DX100P
	438222	A4 sized paper for DX100P
	438223	Letter sized paper for DX100P
	438224	Electronic file for DX200P
	438225	A4 sized paper for DX200P
	438226	Letter sized paper for DX200P
Shunt resistor for screw terminal	415920	250Ω±0.1%
	415921	100Ω±0.1%
	415922	10Ω±0.1%
Shunt resistor for clamped terminal	438920	250Ω±0.1%
	438921	100Ω±0.1%
	438922	10Ω±0.1%
Zip disk	A1056MP	250MB
CompactFlash memory card (CF+Adapter)	B9968NL	32MB or more
Fuse	A1347EF(DX100P)	250V, 1ATL
	A1352EF(DX100P/P1)	250V, 4ATL
	A1423EF(DX200P)	250V, 1.25ATL
	A1463EF(DX200P/P1)	250V, 6.3ATL
Mounting bracket	B9900BX	–
Input terminal	438227	For /KB1, /KB2 option

Dimensions



When mounting the DX100P/DX200P in the panel, use 2 panel mounting brackets. They can be attached in a left/right or top/bottom configuration. For the top/bottom and left/right panel cut dimensions, refer to our General Specifications (GS04L05A01-00E/04L06A01-00E). If not specified, the tolerance is ±3%, however if less than 10 mm, the tolerance is ±0.3 mm.

NOTICE

- Before operating the product, read the instruction manual thoroughly for proper and safe operation.
- If this product is for use with a system requiring safeguards that directly involve personnel safety, please contact the Yokogawa sales offices.

YOKOGAWA

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