General Specifications

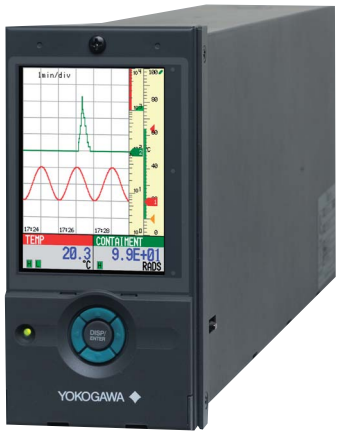
DAQSTATION
DX364

GS 04L70B01-01E

OVERVIEW

The DX364 is a paperless recorder corresponding 1/2 DIN or 3 x 6 (inch) recorders. It can be hooked up to network via Ethernet, which enables to inform by E-mail and to monitor on Web site as well as to transfer files by using FTP. Also, it can communicate with Modbus/TCP.

It comes with a four channel model. As the input signal, a DC voltage, Thermocouple or contact signal can be set to each channel. The data saved on a CF card can be converted by data conversion software to Lotus 1-2-3, Excel, or ASCII format file, facilitating processing on a PC. Not only this, the Viewer software allows a PC to display waveforms on its screen and to print out waveforms.



STANDARD SPECIFICATIONS

General Specifications

Construction

Mounting: Flush panel mounting (on a vertical plane)
Mounting may be inclined downward up to 30 degrees from a horizontal plane.

Allowable panel thickness:
2 to 26 mm

Material: Case, Bezel: drawn steel
Key Cover, Display filter: polycarbonate

Case color:
Case, Bezel, Key Cover : Charcoal grey light (Munsell 10B 3.6/0.3 or equivalent)

Dimensions:
72(W) x 144(H) x 406(D)* mm
*Rear panel depth and terminal part dimensions not included.

Weight: approx. 2.9 kg*
*without mounting brackets

Input

Number of inputs:
4 channels

Measurement interval:
125 ms, 250 ms, 25 ms (fast sampling mode*)
* A/D integration time is fixed to 1.67 ms in case of fast sampling mode.

Inputs: DCV (DC voltage), TC (thermocouple) DI (digital input for event recording), DCA (DC current with external shunt resistor attached)

Input type	Range	Measuring range	
DCV	20 mV	–20.000 to 20.000 mV	
	60 mV	–60.00 to 60.00 mV	
	200 mV	–200.00 to 200.00 mV	
	2 V	–2.0000 to 2.0000 V	
	6 V	–6.000 to 6.000 V	
	1-5V	–0.800 to 5.200 V	
	20 V	–20.000 to 20.000 V	
	50 V	–50.00 to 50.00 V	
TC	R*1	0.0 to 1760.0°C	32 to 3200°F
	S*1	0.0 to 1760.0°C	32 to 3200°F
	B*1	0.0 to 1820.0°C	32 to 3308°F
	K*1	–200.0 to 1370.0°C	–328 to 2498°F
	E*1	–200.0 to 800.0°C	–328.0 to 1472.0°F
	J*1	–200.0 to 1100.0°C	–328.0 to 2012.0°F
	T*1	–200.0 to 400.0°C	–328.0 to 752.0°F
	N*1	0.0 to 1300.0°C	32 to 2372°F
	W*2	0.0 to 2315.0°C	32 to 4199°F
	L*3	–200.0 to 900.0°C	–328.0 to 1652.0°F
	U*3	–200.0 to 400.0°C	–328.0 to 752.0°F
	WRe*4	0.0 to 2400.0°C	32 to 4352°F
DI	DCV input (TTL)	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% Re/W-26% Re (Hoskins Mfg. Co.), ASTM E988
*3 L: Fe-CuNi, DIN43710, U: Cu-CuNi, DIN43710
*4 WRe: W-3%Re/W-25%Re (Hoskins Mfg. Co.)

A/D integration time:
20 ms (50 Hz), 16.7 ms (60 Hz), or AUTO selectable (automatic selection by detection of power supply frequency)
A/D integration time is fixed to 1.67 ms (600Hz) in case of fast sampling mode.

Thermocouple burnout:
Burnout upscale/downscale function can be switched on/off (for each channel).
Burnout upscale/downscale selectable
Normal: Less than 2 kΩ, Burn out: More than 100 kΩ
Detection current: approx. 10 μ A

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1-5V range burnout:
Burnout upscale/downscale function can be switched on/off (for each channel).
Burnout upscale/downscale selectable
Upscale burnout: More than +10% of configured span
Downscale burnout: Less than -5% of configured span
Moving average:
Moving average on/off selectable for each channel
Moving average cycles 2 to 400 selectable
Calculation:
Differential computation:
Between any two channels
Available for DCV, TC and DI ranges.
Linear scaling:
Available for DCV, TC and DI ranges.
Scaling limits: -30000 to 30000
Decimal point: user-selectable
Engineering unit: user-definable, up to 6 characters
Over value: Exceeds ± 5% of scaling limits (on/off selectable)
Square root:
Available for DCV range.
Scaling limits: -30000 to 30000
Decimal point: user-selectable
Engineering unit : user-definable, up to 6 characters
Low level cut off: 0.0 to 5.0% of display span
Over value: Exceeds ± 5% of scaling limits (on/off selectable)
1-5VDC scaling:
Available for 1-5VDC range.
Scaling limits: -30000 to 30000
Display span limit: 0.800 to 5.200
Decimal point: user-selectable
Engineering unit : user-definable, up to 6 characters
Low level cut off: Fixed to lower span limit
Over value: Exceeds ± 5% of scaling limits (on/off selectable)

Display

Display unit:
3.5-inch TFT color LCD (VGA, 240 x 320 pixels)
Note) In the part of crystal display, there are some pixels that can't always turn on or off. Please understand that the brightness of screen looks uneven because of characteristics of crystal display, but it is not out of order.
Display group:
Number of assignable channels for one group: 4 channels
Display color:
Trend/Bargraph:
Selectable from 24 colors
Background:
White or black selectable
Trend display:
Trend display type:
horizontal
Number of indication channels:
4 channels per display (maximum)
Line width:
1, 2, and 3 pixels selectable
Scales: Maximum 4 scales.
Bargraph, green band area and alarm mark can be displayed on scale display.
Number of divisions: Selectable from 4 to 12 or C10 (10 divisions by main scale mark and scale values are displayed on 0, 30, 50, 70 and 100% position).
Waveform span rate:
15, 30 sec.,1, 2, 5, 10, 15, 20, 30 min., 1, 2, 4, 10 hours/div selectable
Bargraph display:
Direction: Vertical
Number of indication channels:
4 channels per display
Scales: Green band area and alarm mark can be displayed on scale display.
Number of divisions: Selectable from 4 to 12
Reference position: Bottom
Display renewal rate: 1 s
Digital indication:
Number of indication channels:
4 channels per display
Number of display:
Display renewal rate: 1 s
Information display:
Alarm summary display:
Display the list of latest 1000 alarms summary.
Jump to historical trend display by cursor pointing.
Message summary display:
Display the list of latest 450 messages and time. (includes 50 added messages)
Jump to historical trend display by cursor pointing.
Memory information:
Display the file list in internal memory.
Jump to historical trend display by cursor pointing.
Report information:
Display the report data in internal memory.
Modbus status:
Display the Modbus status.
Relay status:
Display the on/off status of internal switch and relay output.
Log display:
Log display types:
Login log, error log, communication log, FTP log, Web log, E-mail log, SNTP log, DHCP log, Modbus log
Tags:
Number of characters:
16 characters maximum
Messages:
Number of characters:
32 characters maximum
Number of messages:
100 messages (including 10 free messages)
Message adding function:
Message can be added on historical display.
Other display contents:
Status display area:
An icon appears here when an alarm is occurring, when the storage media is full or not mounted, when the CF card is error, or when the device information is being output.

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Trend display area:
Grid lines (number of divisions selectable from 4 to 12), hour : minutes on grid, trip levels (line widths are selectable from 1, 2 and 3 pixels)
Data referencing function:
Display the retrieved data (display data or event data) from internal or external memory.
Time axis operation:
Display magnification or reduction, scroll by key operation
Display auto scroll function:
Display group of monitor display (trend display, bargraph display and digital display) automatically changes in a preset interval (5, 10, 20, 30 s and 1 min).
LCD saver function:
The LCD backlight automatically dims or off (selectable) if no key is touched for a certain preset time (can be set from 1, 2, 5, 10, 30, and 60 min).
Display auto return function:
The display type automatically returns to registerd display type if no key is touched for a certain preset time (can be set from 1, 2, 5, 10, 20, 30 and 60 min)
Temperature unit:
°C or °F selectable

Data Saving Function

External storage medium:
Medium: CompactFlash memory card (CF card)
Format: FAT16 or FAT32
Internal memory:
Medium: Flash memory
Capacity: Selectable from 80MB
Maximum number of files can be saved:
400 files (total number of display data file and event data file)
Manual saving:
Data files in internal memory can be saved manually.
Selectable form all data saving or selected data saving.
Drive: CF card or USB flash drive
Automatic saving:
Display data:
Periodic saving to CF card
Event data:
In case of trigger free...Periodic saving to CF card
In case of using trigger...Save the data when sampling is finished
Media FIFO function:
Allows the oldest file to be deleted and the newest file to be saved if the free space on the CF card is insufficient or the number of files exceeds 1000 files. (on/off seletablle)
Data Saving Period:
Display data file:
Linked with the waveform span rate
Event file: Linked with the specified sampling period

In case measurement ch = 4 ch, mathematical ch = 0 ch

Display data file (approx.)

Waveform span rate (time/div)	15 s	30 s	1 min	2 min	5 min	10 min
Data saving period	0.5 s	1 s	2 s	4 s	10 s	20 s
Sampling time	46.3 h	3 days	7 days	15 days	38 days	77 days

Event data file (approx.)

Data saving period	25 ms	125 ms	0.5 s	1 s	2 s	5 s	10 s
Sampling time	3.5 h	17.4 h	2 days	5 days	11 days	28 days	57 days

Event File Sampling Period:
Selectable from 25, 125, 250, 500 ms, and 1, 2, 5, 10, 30, 60, 120, 300, and 600 s*
*Sampling period faster than measurement interval can not be selected.
Measurement data File:
The following two file types can be created.
Event file (stores instantaneous values sampled periodically at a specified sampling rate)
Display data file (stores the maximum and minimum values for each waveform span rate from among measured data sampled at measurement intervals)
Files can be created in the following combinations.
(a) Event file + display data file
(b) Display data file only
(c) Event file only
Data format: YOKOGAWA private format (Binary)
Maximum data size per file:
8,000,000 byte (8MB)
Data per channel:
Display data file:
Measurement data.....4 byte/data
Mathematical data.....8 byte/data
Event data file:
Measurement data.....2 byte/data
Mathematical data.....4 byte/data
Sampling time:
The sampling time per file (8MB) during manual data saving can be determined by the formula "number of data items per channel x interval of data saving."
This logic is explained in more detail below:
1) When handling display data files only
If we assume that the number of measuring channels is 4, the number of computing channels is 12, and the display update interval is 30 min/div (60 sec waveform span rate), then:
Number of data items per channel = 8,000,000 bytes/(8 bytes(time stamp) + 4 x 4 bytes + 12 x 8 bytes) = 66,666 data items
Sampling time per file = 66,666 x 60 sec = 3,999,960 sec = approx. 46 days
2) When handling event files only
If we assume that the number of measuring channels is 4, the number of computing channels is 12, and the data saving interval is 1 sec, then :
Number of data items per channel = 8,000,000 bytes/(8 bytes(time stamp) + 4 x 2 bytes + 12 x 4 bytes) = 125,000 data items
Sampling time per file = 125,000 x 1 sec = 125,000 sec = approx. 34 hours
3) When handling both display data files and event files
The sampling time is calculated by defining the size of data items in a display data file as 8,000,000 bytes and the size of data items in an event data file as 8,000,000 bytes. The method of calculation is the same as shown above.

Examples of Sampling Time for 1 file (8MB)*:
*If sampling time exceeds 31 days, data file is divided.

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Trigger function:
Selectable from FREE or TRIG for event data saving.
Trigger mode:
Selectable from free, single or repeat trigger
Data length:
Selectable from 10, 20, 30 min, 1, 2, 3, 4, 6, 8, 12 hour, 1, 2, 3, 5, 7, 10, 14, 31 day
Pre trigger: Selectable from 0, 5, 25, 50, 75, 95, 100%
Trigger source:
Key operation, communication command or event action function

Manual sample data:
The measuring and computing data can be saved manually to the internal memory and CF card.
Trigger: Key operation, communication command or event action function
Data format:
ASCII
Max. number of data:
400 data (if exceeds 400 data, oldest data is overwritten)

Report data (only for MATH option):
Types: Hourly, daily, hourly + daily, daily + weekly, and daily + monthly
Data format:
ASCII
Drive: CF card

Display hard copy:
Trigger: Key operation, communication command or event action function
Data format:
png format
Drive/output:
CF card or communication interface

Data file retrieving function:
Data file in CF card or USB flash drive can be retrieved and displayed.
Retrieved data file:
Display data file or event data file

Saving and retrieving of configuration data:
Configuration information can be saved and retrieved as ASCII data.
Drive: CF card or USB flash drive

Alarm Function

Number of alarm levels:
Up to four levels for each channel
Alarm types:
High and low limits, differential high and low limits, high and low rate-of-change limits and delay high and low
Alarm delay time:
1 to 3600 s
Interval time of rate-of-change alarms:
The measurement interval times 1 to 32
Display: The alarm status (type) is displayed in the digital value display area upon occurrence of an alarm. A common alarm indication is also displayed.
Alarming behavior:
non-hold or hold-type can be selectable for common to all channels.
Hysteresis: On/off selectable (common to measurement channels, mathematical channels or external channels)
0.0 to 5.0% of display span (or scaling span)

Outputs:
Output: relay output (optional)
Number of internal switch:
30 points
Internal switch action:
AND/OR
Number of relay output points:
2 points (optional)
Relay action:
Energized/deenergized, hold/non-hold, AND/OR, Alarm ACK (normal/reset) alarm reflash selectable.
Alarm no logging function:
When alarm occurs, only internal switch or relay output is activated. There are no alarm display on screen and no record on alarm summary.
On/off selectable for each channel and alarm level.

Memory:
The times of alarm occurrences/recoveries, alarm types, etc. are stored in the memory.
Up to 1000 latest alarm events are stored.

Event action function

General: Particular action can be executed by particular event.
Number of event action:
40 actions can be set
Event list:

Event	Level/Edge	Description
Remote	Level/Edge	Action by remote control signal
Relay	Level/Edge	Action by relay operation
Internal switch	Level/Edge	Action by internal switch operation
Alarm	Level/Edge	Action by any alarm
Timer	Edge	Action by timer time up
Match time	Edge	Action by time up of match time timer
USER key	Edge	Action by USER key operation

Action list:

Action	Level/Edge	Description
Memory start/stop	Level	Memory start and stop
Memory start	Edge	Memory start
Memory stop	Edge	Memory stop
Event trigger	Edge	Event data sampling start
Alarm ACK	Edge	Alarm ACK
Math start/stop	Level	Computation start and stop
Math start	Edge	Computation start
Math stop	Edge	Computation stop
Math reset	Edge	Computation reset
Manual sample	Edge	Manual sample
Snapshot	Edge	Save display image to external media
Message input	Edge	Message writing
Waveform span rate change	Level	Change waveform span rate
Display data save	Edge	Save currently sampled display data to internal memory as a file
Event data save	Edge	Save currently sampled event data to internal memory as a file
Relative time timer reset	Edge	Reset relative time timer
Display group change	Edge	Change to specified display group
Time adjustment	Edge	Adjust internal clock to the nearest hour
Flag	Level	Normal: "0", Event: "1"
Setting file load	Edge	Load setting file from CF card (up to 3 setting files).
Display Freeze /Active	Edge	Freeze or Active the display
Memory clear	Edge	Clear the internal memory and trend diplay

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Security functions

General: Login function or key lock function can be set for each key operation or communication operation.

Key lock function:
On/off and password can be set for each operation key and FUNC operation.

Login function:
User name and password to login can be set.

User level and number of users:
System administrator: 5 users
General users: 30 users
10 kinds of login mode can be set for general users.

Clock

Clock: With calendar function (year of grace)

Clock accuracy:
± 10 ppm, excluding a delay (of 1 second, maximum) caused each time the power is turned on.

Time setting method:
Key operation, communication command, event action function or SNTP client function

Time adjustment method:
During memory sample:
Adjust 40 ms per second (No influence for measurement period)
During memory stop:
Adjust at a time

Time zone:
Time difference from GMT:
Settable from -13:00 to 13:00

Date display format:
Selectable from YYYY/MM/DD, MM/DD/YYYY, DD/MM/YYYY or DD.MM.YYYY

DST function (summer/winter time):
The time at which the daylight savings time adjustment is automatically calculated and configured.

Log (exponential) Display Function

Input voltage measurements indicated in Log (common logarithm)

$$Y = 10^{(SU-SL)\times(X-VL)/(VU-VL)+SL}$$

where,
x: input voltage; VL: span min. value; VU: span max. value; SL: exponent scale min. value; SU: exponent scale max. value; Y: displayed value

Input Range:
DC voltage input (DCV:20/60/200 mV, 2/6/20/50 V) voltage value, display span min. value > display span max. value

Scaling Range:
1.0E_15-1.0E+15
Max. 15 decades
Scale value: exponent min. value < exponent max. value

Data Display Range:
1.0E_15-1.0E+15
(within the same decade, 1.0E□□□-9.9E□□□)
Number of displayed mantissa digits, able to select 2 or 3 digits (in basic setting mode).
3 digit time 1.0E_15-1.0E+15

Units: Optional setting available (up to 6 characters)

Alarm: H/L/T/t only
Set alarm values using voltage values.
Alarm hysteresis fixed at 0%.

Relationship between input voltage and digital value display

Partial expanded display: N/A

Differential computation: N/A

Calibration correction (/CC1): N/A

Restriction for specifying the computation function (M1):
computation results in an error when the LOG range selection channel is used in the computation equation or the report channel.

Simulation function

Event action (including remote control) or communication command allow the display updating function to disable and the internal memory and trend display to clear.

Communication Functions

Electrical specifications:
Confirms to IEEE802.3 (DIX specification for Ethernet frames)

Connection:
Ethernet (10BASE-T)

Protocols: TCP, UDP, IP, ICMP, ARP, DHCP, HTTP, FTP, SMTP, SNTP, Modbus, DX private

E-mail inform function:
E-mail is sent by events as below.
- Alarm occurring/alarm canceling
- Recover from power failure
- Memory end
- Storage medium error, FTP client function error
- Specified time period
- Report data time up (only for mathematical option)

FTP client function:
Data file auto-transfer from DX
Transferred data file:
Display data file, event data file, report data file and display image file

FTP server function:
File transfer from DX, file elimination (external media only), directory operation and file list output are available by request from host computer.

Web server function:
Display image of DX and alarm information can be displayed on web browser software

SNTP client function:
The time on DX can be synchronized to the time of a SNTP server.

SNTP server function:
The DX can operate as a SNTP server.

DHCP client function:
Network address configuration can be obtained automatically from DHCP server.
Obtained information:
IP address, subnet mask, default gateway and DNS information

Modbus client function:
Reading or writing of measurement data on other instruments are available by Modbus protocol.
Mathematical option is required to read the data from other instruments.

Modbus server function:
Output of measurement data from DX is available by Modbus protocol.

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Setting/measurement server function:
Operation, setting or output of measurement data are available by DX private protocol.
Maintenance/test server function:
Output connection information or network information of the Ethernet communication.
Instrument information server function:
Output instrument information such as serial number or model name of DX.

USB interface

USB interface specification:
Based on Rev1.1, host function
Number of ports:
1 ports (Front)
Power supply:
5V, 500mA*1
Available USB devices:
Keyboard:
104/89 keyboard (US) based on USB HID Class Ver.1.1
External medium:
USB flash drive (some of USB flash drives may not be supported by DX364)

*1: For low powered devices (bus power < 100 mA):
5V ± 5%
For high powered devices (bus power < 500 mA):
5V ± 10%

Power Supply

Rated power supply:
100 to 240 VAC (automatic switching)
Allowable power supply voltage range:
90 to 132 or 180 to 264 VAC
Rated power supply frequency:
50/60 Hz (automatic switching)
Power consumption:

Supply voltage	LCD off	Normal	Max.
100 VAC	14VA	16VA	26 VA
240 VAC	20VA	23VA	35 VA

Allowable interruption time:
Less than 1 cycle of power supply frequency

Other Specifications

Memory backup :
A built-in lithium battery backs up the setup parameters (battery life : approximately 10 years at room temperature).
Insulation resistance:
Each terminal to ground terminal:
20 MΩ or greater (at 500 VDC)
Dielectric strength:
Power supply to ground terminal:
2300 VAC (50/60 Hz), 1 min
Contact output terminal to ground terminal:
1600 VAC (50/60 Hz), 1 min
Measuring input terminal to ground terminal:
1500 VAC (50/60 Hz), 1 min
Between measuring input terminals:
1000 VAC (50/60 Hz), 1 min
Between remote control terminal to ground terminal:
1000 VDC, 1 min

Safety and EMC Standards

CSA: CSA22.2 No61010-1
Installation category II*1, pollution degree 2*2
UL: UL61010-1 (CSA NRTL/C)

CE:
EMC directive:
EN61326 compliance (Emission: Class A, Immunity: Annex A)
EN61000-3-2 compliant
EN61000-3-3 compliant
EN55011 compliant, Class A Group 1
Low voltage directive:
EN61010-1 compliant, measurement category II*3, pollution degree 2*2
C-Tick: AS/NZS CISPR11 compliant, Class A Group 1

*1: Installation Category (Overvoltage Category) II
Describes a number which defines a transient overvoltage condition. It implies the regulation for impulse withstand voltage. "II" applies to electrical equipment which is supplied from fixed installations like distribution boards.

*2: Pollution Degree
Describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to normal indoor atmosphere. Normally, only non-conductive pollution occurs.

*3: Measurement Category II
Applies to measuring circuits connected to low voltage installation, and electrical instruments supplied with power from fixed equipment such as electric switchboards.

Normal Operating Conditions

Power voltage:
90 to 132 or 180 to 250 VAC
Power supply frequency:
50 Hz ±2%, 60 Hz ±2%
Ambient temperature:
0 to 50 °C
Ambient humidity:
20% to 80% RH (at 5 to 40 °C)
10% to 50% RH (at 40 to 50 °C)
Vibration: 10 to 60 Hz, 0.2 m/s^2 or less
Shock: Not acceptable
Magnetic field:
400 A/m or less (DC and 50/60 Hz)
Noise:
Normal mode (50/60 Hz):
DCV: The peak value including the signal must be less than 1.2 times the measuring range.
TC: The peak value including the signal must be less than 1.2 times the measuring thermal electromotive force.
Common mode noise voltage (50/60 Hz):
250 Vrms AC or less for all ranges
Maximum noise voltage between channels (50/60 Hz):
250 Vrms AC or less
Mounting position:
Can be inclined up to 30 deg backward. Mounting at an angle away from the perpendicular is not acceptable.
Warm-up time:
At least 30 min after power on
Installation location:
In-room
Altitude: Less than 2000 m

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Standard Performance

Measuring and Recording Accuracy:

The following specifications apply to operation of the recorder under standard operation conditions.

Temperature:
23 ± 2 °C

Humidity:
55% ± 10% RH

Power supply voltage:
90 to 132 or 180 to 250 VAC

Power supply frequency:
50/60 Hz ± 1%

Warm-up time:
At least 30 min.

Other ambient conditions such as vibration should not adversely affect recorder operation.

Input	Range	Measurement accuracy (digital display)		Max. resolution of digital display
		A/D integration time: 16.7ms or more	A/D integration time: 1.67ms (fast sampling mode)	
DCV	20 mV	±(0.05% of rdg + 12 digits)	±(0.1% of rdg + 40 digits)	1 µV
	60 mV	±(0.05% of rdg + 3 digits)	±(0.1% of rdg + 15 digits)	10 µV
	200 mV			10 µV
	2 V	±(0.05% of rdg + 12 digits)	±(0.1% of rdg + 40 digits)	100 µV
	6 V	±(0.05% of rdg + 3 digits)	±(0.1% of rdg + 15 digits)	1 mV
	1-5 V			1 mV
	20 V			1 mV
	50 V			10 mV
TC (Excluding RJC accuracy)	R	±(0.15% of rdg + 1°C) However, R, S: ±3.7°C at 0 to 100°C ±1.5°C at 100 to 300°C B: ±2°C at 400 to 600°C Accuracy at less than 400°C is not guaranteed.	±(0.2% of rdg + 4°C) However, R, S: ±10°C at 0 to 100°C ±5°C at 100 to 300°C B: ±7°C at 400 to 600°C Accuracy at less than 400°C is not guaranteed.	0.1°C
	S			
	B			
	K	±(0.15% of rdg + 0.7°C) However, ±(0.15% of rdg + 1°C) at -200 to -100°C	±(0.2% of rdg + 3.5°C) However, ±(0.15% of rdg + 6°C) at -200 to -100°C	
	E	±(0.15% of rdg + 0.5°C) However, ±(0.15% of rdg + 0.7°C) at -200 to -100°C	±(0.2% of rdg + 2.5°C) However, ±(0.2% of rdg + 5°C) at -200 to -100°C	
	J			
	T			
	L			
	U			
	N	±(0.15% of rdg + 0.7°C)	±(0.3% of rdg + 3.5°C)	
	W	±(0.15% of rdg + 1°C)	±(0.3% of rdg + 7°C)	
	WRe	±(0.2% of rdg + 2.5°C) However, ±4°C at 0 to 200°C	±(0.3% of rdg + 10°C) However, ±18°C at 0 to 200°C	

Measurement accuracy in case of scaling (digits):
= measurement accuracy (digits) x scaling span (digits)/measurement span (digits) + 2 digits
Decimals are rounded off to the next highest number.

Reference junction compensation:
INT (internal) /EXT (external)
selectable (common for all channels)

Reference junction compensation accuracy:
Types R, S, B, W, WRe: ± 1.0 °C
Types K, J, E, T, N, L, U: ± 0.5 °C
(Above 0 °C, input terminal temperature is balanced. The internal reference junction compensation of Type B is fixed to 0°C.)

Maximum allowable input voltage:
± 60 VDC (continuous) for all input ranges

Input resistance:
Approx. 10 MΩ or more for DCV ranges of 200 mVDC or less and TC
Approx. 1 MΩ for more than 2 VDC ranges

Input source resistance:
DCV, TC: 2 kΩ or less

Input bias current:
10 nA or less (approx. 100nA for TC range with burnout function)

Maximum common mode noise voltage:
250 Vrms AC (50/60 Hz)

Maximum noise voltage between channels:
250 Vrms AC (50/60 Hz)

Interference between channels:
120 dB (when the input source resistance is 500 Ω and the inputs to other channels are 30 V)

Common mode rejection ratio:

A/D integration time 20 ms:
More than 120 dB (50 Hz ± 0.1%, 500 Ω imbalance between the minus terminal and ground)

A/D integration time 16.7 ms:
More than 120 dB (60 Hz ± 0.1%, 500 Ω imbalance between the minus terminal and ground)

A/D integration time 1.67 ms:
More than 80 dB (50/60 Hz ± 0.1%, 500 Ω imbalance between the minus terminal and ground)

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Normal mode rejection ratio:
A/D integration time 20 ms:
More than 40 dB (50 Hz ± 0.1%)
A/D integration time 16.7 ms:
More than 40 dB (60 Hz ± 0.1%)
A/D integration time 1.67 ms:
50/60Hz is not rejected.

Effects of Operating Conditions

Ambient temperature: (Only for 16.7 ms A/D integration time or more)
With temperature variation of 10 °C
DCV, TC: ± (0.1% of rdg + 0.05% of range) or less
Excluding the error of reference junction compensation
Power supply:
With variation within 90 to 132 V and 180 to 250 VAC (50/60 Hz):
Within measurement accuracy
With variation of ± 2 Hz from rated power frequency (at 100 VAC):
Within measurement accuracy
Magnetic field:
AC (50/60 Hz) and DC 400 A/m fields:
± (0.1% of rdg + 10 digits) or less
Input source resistance:
(1) DCV range (with variation of +1 kV)
200 mVDC range or less:
± 10 μ V or less
2 VDC range or greater:
± 0.15% of rdg or less
(2) TC range (with variation of +1 kΩ)
± 10 μ V

Transport and Storage Conditions

The following specifies the environmental conditions required during transportation from shipment to the start of service and during storage as well as during transportation and storage if this instrument is temporarily taken out of service.
No malfunction will occur under these conditions without serious damage, which is absolutely impossible to repair; however, calibration may be necessary to recover normal operation performance.
Ambient temperature:
-25 °C to 60 °C
Humidity: 5% to 95% RH (No condensation is allowed.)
Vibration: 10 to 60 Hz, 4.9 m/s^2 maximum
Shock: 392 m/s^2 maximum (while being packed)

SPECIFICATIONS OF OPTIONAL FUNCTIONS

Alarm Output Relays (/A1)
An alarm signal is output from the rear panel as a relay contact signal.
Number or output:
2 points
Relay contact rating:
250 VDC/0.1 A (for resistance load), 250 VAC (50/60 Hz)/3 A
Terminal configuration:
SPDT (NO-C-NC). Energized-at-alarm/ deenergized-at-alarm,
AND/OR, and hold/non-hold actions are selectable.

Fail/Status Output (/F1)
The relay contact output on the rear panel indicates the occurrence of CPU failure or selected status.
FAIL output relay:
The relay contact output on the rear panel indicates the occurrence of CPU failure.
Relay operation: CPU normal: Energized, CPU failure: Deenergized
Status output relay:
The relay contact output on the rear panel indicates the occurrence of selected status
Relay operation: Status detection: Energized

Status	Description
Memory status	Relay is energized when internal memory or external storage media is in the following conditions: Abnormality in the internal memory When automatic saving of settings to the external storage media is ON • When the remaining space on the external storage medium reaches 10%. (without Media FIFO function ON) • When an abnormality occurs with the external storage medium, and auto save fails • When the external storage medium is not inserted, operation is same as when automatic saving of settings to the external storage media is Off When automatic saving of settings to the external storage media is Off • When the remaining space on the internal memory reaches 10% • When the number of data file which is not saved to external storage media exceeds 390 *Not including USB memory connected to the instrument.
Measurement Failure	Relay energized upon A/D converter abnormality or burnout detection
Comm. failure	Relay energized when communication error occurs in the Modbus client
Memory stop	Relay energized upon memory stop

Relay contact rating:
250 VDC/0.1 A (for resistance load), 250 VAC (50/60 Hz)/3A

Mathematical Functions (/M1)
Used for calculating data, displaying trends and digital values, and recording calculated data assigned to channels.
Channel assignable to calculated data:
Up to 12 channels (101 to 112)
Max. character length of expression:
120 characters
Operation:
General arithmetic operations:
Four arithmetic operations, square root, absolute, common logarithm, natural logarithm, exponential, power, relational operations (>, ≥, <, ≤, =, ≠), logic operations (AND, OR, NOT, XOR)
Statistical operations:
TLOG (Average, maximum, minimum, summation and P-P value of time series data)
CLOG (Average, maximum, minimum, summation and P-P value of channel series data)

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Special operations:
PRE (Previous data)
HOLD(a):b (Hold data of "b" in case of "a" is not "0")
RESET(a):b (Reset data of "b" and restart in case of "a" is not "0")
CARRY(a):b (If "b" exceeds "a", "b-a" becomes computation results)
Conditional operation:
[a?b:c] (Execute "b" in case of "a" is not "0", or execute "c" in case of "a" is "0")
Constant: Up to 60 constants (K01 to K60)
Digital data input via communication:
Up to 24 data (C01 to C24)
Remote status input:
Remote input status (0/1) can be used in mathematical expression
Up to 4 inputs (D01 to D04)
Status input:
Internal switch status (S01 to S30), relay status (I01 to I02) and flag status (F01 to F08) can be used in mathematical expression
Report functions:
Number of report channels:
up to 12 channels
Report type:
Hourly, daily, hourly + daily, daily +weekly and daily + monthly
Operation:
Max. 4 types are selectable from average, maximum, minimum, instantaneous and summation
Data format:
ASCII
Long term rolling average:
Computation interval:
1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 sec., 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 min
Number of sampling:
1 to 1500

24 VDC/AC Power Supply (/P1)

Rated power supply: 24 VDC or 24 VAC (50/60Hz)
Allowable power supply voltage range:
21.6 to 26.4 VDC/AC
Insulation resistance:
Power supply to ground terminal: 20 MΩ or greater (at 500 VDC)
Dielectric strength:
Power supply to ground terminal: 500 VAC (50/60 Hz), 1 min
Max. power consumption:

Supply voltage	LCD off	Normal	Max.
24 VDC	6VA	8VA	13VA
24 VAC (50/60 Hz)	14VA	15VA	25VA

Remote Control (/R1)

This option allows four functions to be controlled remotely by a contact input.
Please refer the part of "Event action function" for functions to be controlled.

Calibration correction function (/CC1)

Corrects the measurement value of each channel using segment linearizer approximation.
Number of segment points:
2 to 16

APPLICATION SOFTWARE

DAQSTANDARD for DXAdvanced

(DXA120/S2: Log/Simulation functions setting available)
Operating environment
OS: Microsoft Windows 2000/XP
Processor: Pentium II 333 MHz or higher (Pentium III 600 MHz or higher recommended)
Memory: Free area of 32 MB or more (128 MB or more recommended)
Disk device:
CD-ROM drive that is applied to Windows 2000/XP
Hard disk: Free area of at least 100 MB
Display card:
Compatible with Windows 2000/XP
Can display 32,000 colors or higher (64,000 colors or higher recommended)
Printer: A printer and printer driver compatible with Windows 2000/XP
Basic function (packages)
Configuration software:
External memory medium: configuration of setting and basic setting mode
Configuration via communication: configuration of setting and basic setting mode without communication configuration (ex. IP address)
Data viewer software:
Numbers of display channels:
32 channels for each group, at most 50 groups
Display function:
Waveform display, digital display, circular display, list display, report display etc.
File connection display:
Connect data files that are divided because of auto-save during continuous data collecting or power failure, and then display (can connect up to total 5 million)
Section computation:
Maximum, minimum, average, effective and P-P value
Data conversion:
File conversion to ASCII, Lotus 1-2-3 or MS-Excel format
Print out:
Print out displayed data

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MODEL AND SUFFIX CODES

Model code	Suffix code	Optional code	Description
DX364			Daqstation DX364 4ch, 125ms (Fast sampling mode: 25ms)
Internal memory	–1		Standard memory (80MB)
External media	–4		CF card (with media)
Display language	–2		English, degF, DST (with English DAQSTANDARD)
Options		/A1	Alarm output 2 points *1
		/F1	FAIL/Status output *1
		/M1	Mathematical functions
		/P1	DC/AC24V power supply
		/R1	Remote control 4points
		/CC1	Calibration correction function

*1 /A1, /F1 cannot be specified together.

Application Software

Model code	Description	O S
DXA120/S2	DAQSTANDARD for DXAdvanced	Windows 2000/XP

STANDARD ACCESSORIES

Product	Qty
Mounting brackets kit	1set*1
Terminal screws (Spares M4)	3
DX364 User's Manual	1
User's Manuals for the DX1000/DX1000N/ DX2000 (CD-ROM)	1
DAQSTANDARD software (DXA120/S2, CD-ROM)	1
CF card (32MB)	1

*1 Mounting bracket: 2pcs
Support mounting bracket: 1pcs
Tail hold bracket: 1pcs
Tail hold bracket attachment screw (M4): 2pcs

OPTIONAL ACCESSORIES

Product	Model code (part number)	Specification
Shunt resister (for screw input terminal)	415920	250 Ω±0.1%
	415921	100 Ω±0.1%
	415922	10 Ω±0.1%
DX364LCD Assy for Replacement	DX36490	–
CF card adapter	772090	–
CF card	772091	128MB
	772092	256MB
	772093	512MB
	772094	1GB
Mounting bracket	B8708FA	–
Support mounting bracket	B8708FH	–
Tail hold bracket	B8708FN	–

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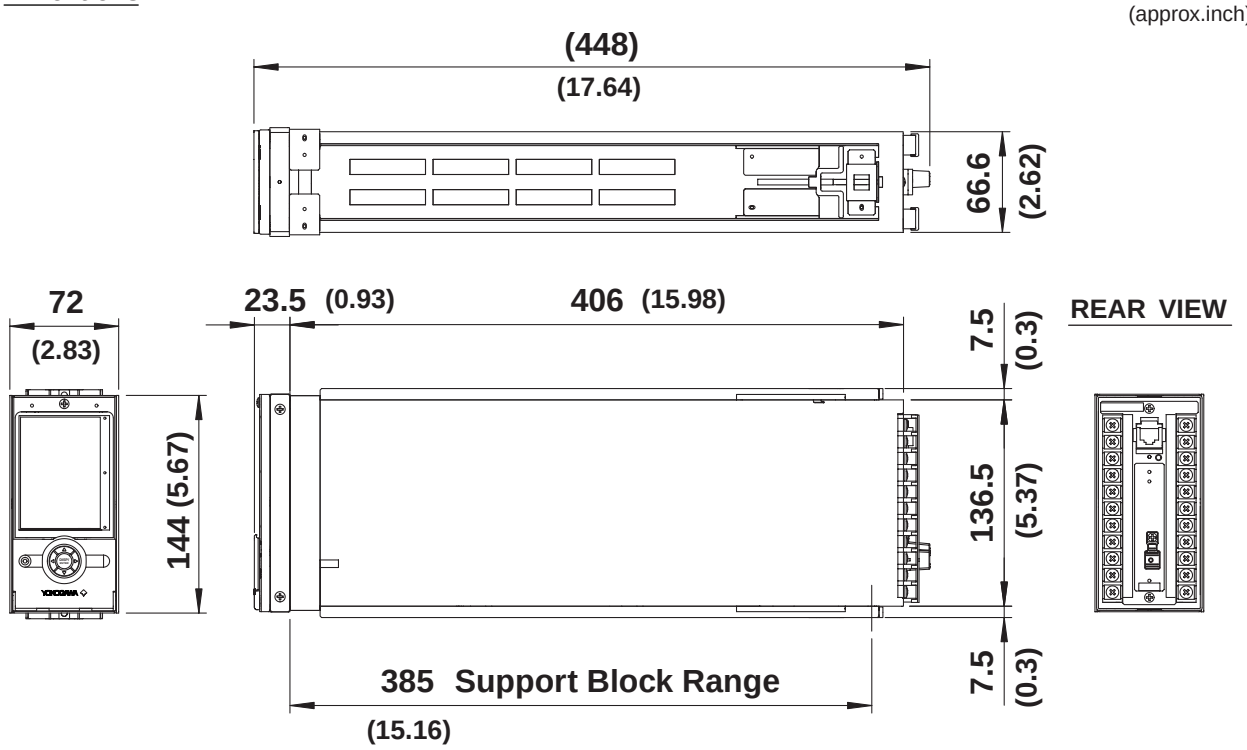
DIMENSIONS

Dimentions

Unit : mm
(approx.inch)

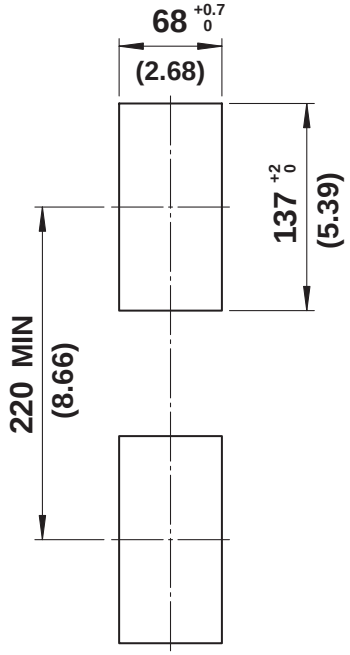


Note: If not specified, the tolerance is ±3%. However, for dimentions less than 10mm, the tolerance is ±0.3mm.

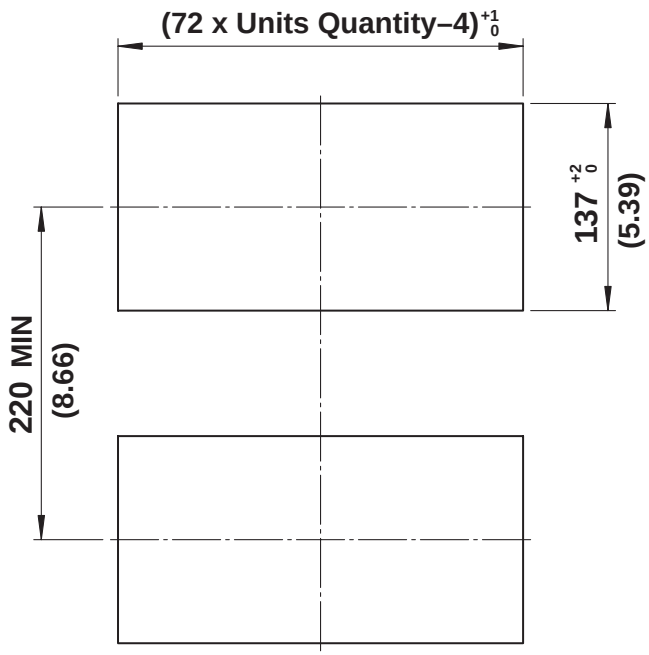
Panel Cutout & Spacing (2 to 26 panel thickness)

Unit : mm
(approx. inch)

Single-Unit Mounting



Side-by-Side Mounting



Note : If not specified, the tolerance is ±3%. However, for dimensions less than 10 mm, the tolerance is ±0.3 mm.

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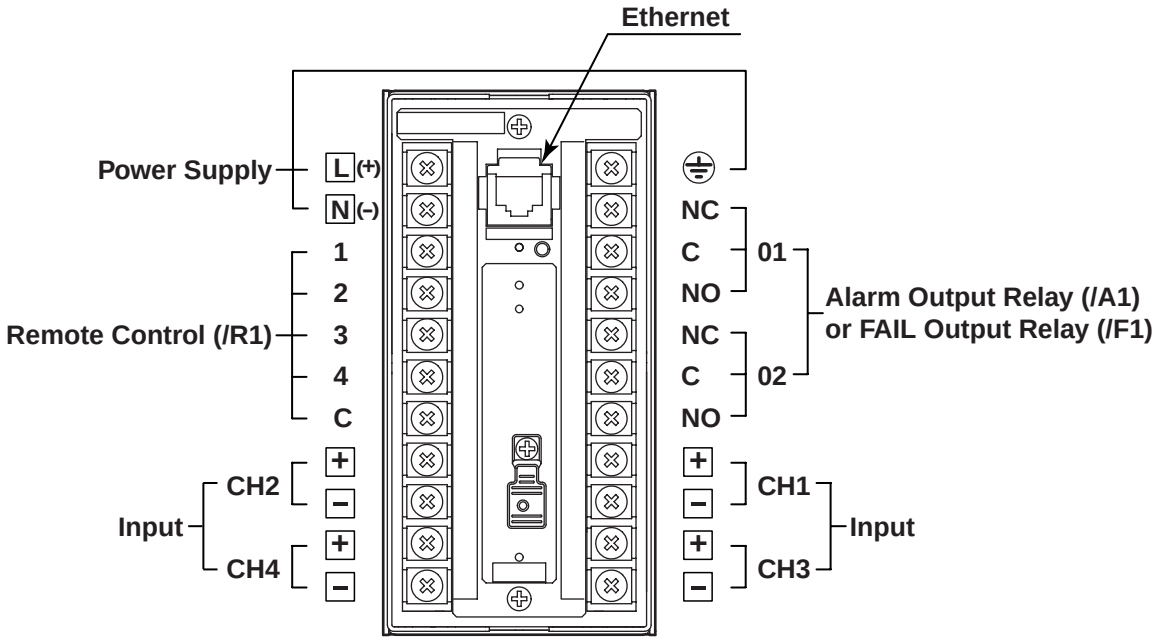
Rear Terminal



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