SHIMADEN HYBRID RECORDER

series SR106A / 186A

- Compact Housing
- High-Quality Ink Jet Clear Recording
- Fully Configurable Input
- Varied Digital Printing
- Menu Driven Easy Operation
- Easy Handling and Maintenance
- Chart Paper Illumination Available (Option)
- Communication Interfaces RS-485 Available (Option)



CE approved

SPECIFICATIONS

Input Recording system and								
no.of input:	SR106A: Continuous recording (1, 2, 3, 6) and dot recording (6)							
	SR186A: Continuous recording (1, 2, 3, 6) and dot recording (6, 12)							
Input signal:	Thermocouple input ••• B, R, S, K, E, J, T, N, W, L, U, PN R. T. D. input ••• Pt100, JPt100Ω DC voltage input ••• ±50mV, ±500mV, ±5V, ±50V DC current input ••• 4~20mA, 10~50mA (A shunt resistor (option) needs to be connected to the terminal.) Max. input voltage • Thermocouple, R.T.D. and DC voltage (±50mV, ±500mV) ••• ±10V DC or less • DC voltage input (±5V, ±50V) ••• ±100V DC or less							
Input signal setting								
and change:	The setting and change of input signal between thermocouple, R.T.D. and DC voltage $(\pm 50 \text{mV}, \pm 500 \text{mV}, \pm 50 \text{V})$ is possible for each channel by the setting pin in the instrument.							
Burnout function:	When th	ne thermo	ocouple or R.T.D.in	put is disconnected, th	ne recording is deflected to 100%.			
	INPUT	TYPE	°C	°F	Note			
User-selectable range (The rmocouple, R.T.D. and DC voltage):	Thermo- couple	B R S K E J T N W L U U PN JPt100 Pt100	400 ~ 1760°C 0 ~ 1760°C -200 ~ 1370°C -200 ~ 1370°C -200 ~ 800°C -200 ~ 1100°C -200 ~ 400°C 0 ~ 1300°C -200 ~ 400°C -200 ~ 400°C -200 ~ 400°C -200 ~ 600°C -200 ~ 600°C -200 ~ +50mV -500 ~ +50mV	752~ 3200°F 32~ 3200°F 32~ 3200°F -328~ 2498°F -328~ 1472°F -328~ 2012°F -328~ 752°F 32~ 2372°F 32~ 3200°F -328~ 1652°F -328~ 1652°F -328~ 152°F -328~ 1112°F -328~ 1112°F -328~ 1112°F Scaling is possible within the range of	N : NICROSIL-NISIL (IEC584) W : +side 5% Re, -side 26% Re. W (Hoskins Mfg. Co., U.S.A.) L : +side Fe, -side Cu.Ni alloy (DIN43710) U : +side Cu, -side Cu.Ni alloy (DIN43710) PN : Platinel JPt100 :JIS C 1604, 1606 Pt100 :DIN IEC751, JIS C 1604, 1606			
	DC voltag		-5 ~ +5V	-32767~32767				

be put as necessary)

SERIES SR106A / SR186A

Accuracy and resolution:

Performance under reference conditon (23±2°C, 65±10%RH, power voltage and frequency variation±1%, warm-up time 30 minutes or more, vertical mounting, free from the effect of external noise)

		Indication (d	igital)	Record	ling
IN	IPUT	Accuracy	Reso- lution	Accuracy	Reso- lution
Thermo- couple	B R S K E J T N W L U PN	± (0.15% +1 digit) (without reference junction compen- sation error)	0.1°C 0.1°C 0.1°C 0.1°C 0.1°C 0.1°C 0.1°C 0.1°C 0.1°C 0.1°C 0.1°C 0.1°C 0.1°C	Indication accuracy, ±0.25% of record- ing span	0.1mm
R.T.D.	JPt100 Pt100	± (0.15% +1 digit)	0.1°C		
DC voltage	-50~ +50m\ -500~+500mV -5~ +5V -50~+50V	/ ± (0.15% +1 digit)	10 μV 100 μV 1mV 10mV		

ote : Indication accuracy is in % of reference range. Indication accuracy of B type TC is ±0.25% between 400°C and 600°C.

Input resistance: Insulation resistance: Dielecric strength:	Thermocouples: > $10M\Omega$ ±50mV: > $10M\Omega$ ±500mV: Approx. $100k\Omega$ ±5V and ±50V: Approx. $1M\Omega$ 100M (between each terminal and earth, at 500V DC) Input terminal-input terminal: 500V AC, 1min. Power supply terminal-ground: 2000V AC, 1min. Input terminal-ground: 500V AC, 1min. Power supply terminal-input terminal: 2000V AC, 1min. Alarm terminal-alarm terminal: 750V AC, 1min.
Reference junction compensation accuracy:	K, E, J, T, N, L, U, PN ±0.5°C R, S, B, W ±1°C
Recording System	
Writing system: Chart width: Chart paper: Chart speed:	Ink jet system, 6 colors SR106A: 100mm, SR186A: 180mm SR106A: Z-fold 15m long, SR186A: Z-fold 20m long SR106A: Continuous recording type 5~400mm / h, continuous recording 401~1500mm / h, intermittent recording Dot recording type 5~1500mm / h Each can be set in 1 mm / h steps. SR186A: Continuous recording type 5~300mm / h, continuous recording 301~1500mm / h, intermittent recording Dot recording type 5~1500mm / h Each can be set in 1 mm / h steps.

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Recording cycle:	Dot recording 30 sec. / all points Continuous recording Depends on chart speed
	<calculation equation=""></calculation>
	SR106A: Recording cycle (sec.) = $\frac{400}{\text{Chart speed (mm / h)}}$
	(Recording cycle is more than 2 sec.)
	SR186A: Recording cycle (sec.) = $\frac{450}{\text{Chart speed (mm / h)}}$
	(Recording cycle is more than 3 sec.)
Measuring cycle:	Input 1 to 3 points ··· 160ms Input 6 or 12 points ··· 320ms
Service life of ink:	(Depends on operating condition)
	SR106A: About 6 months for 6 points of linear recording at 20mm / h of chart speed. SR186A: About 6 months for 6 points of linear recording at 25mm / h of chart speed.
Printing System	
Periodic data printing:	Measured value, Unit, Date, Time, Time line, Chart speed, Channel no.
List printing:	(1) Measured value list (Date, Time, Channel no., Measured value, Unit)
	(2) Parameter list (Date, Time, Channel no., Recording Range, Scaling, Unit, Alarm set value, Chart speed, Tag no.)
	(3) Test pattern (all characters and color patterns)
Alarm printing:	Channel no., alarm type (HH, H, L, LL), output relay no., on / off time
Burnout printing:	Burnout channel no. and time
Other:	Ink shortage message, automatic range selection mark, recording start mark, chart speed change mark
	SR106A: Printing is not possible above 401mm / h (continuous recording) or 51mm / h (dot
	recording)
	SR186A: Printing is not possible above 301mm / h (continuous recording) or 51mm / h (dot recording)
Alarm	
Number of alarms:	Max.4 levels (H, L, HH, LL) for each channel
Alarm action indication:	Kind of alarm and output relay no.are indicated for each channel upon occurrence of alarm.
Printing:	Channel no., kind of alarm, output relay no.and on / off time are printed on chart paper.
Output: Hysteresis:	See optional specifications. Approx. 0.5% of recording span
Operating Environmental Influence	
Power supply variation influence:	Voltage variation: SR106A ••• 85~150V AC or 150~300V AC (50 or 60Hz)
	SR186A ••• 85~300V AC (50 or 60Hz) 100V AC basic,
	Change in indication ••• ± (0.1% + 1 digit) max.
	Change in recording <u>••</u> ±0.2% of recording span max.
	Frequency variation: 47~63Hz (100V AC), 50Hz basic Change in indication ••• ± (0.1% + 1 digit) max.
	Change in recording ••• ±0.2% of recording span max.
Input signal source resistance	
or writing resistance influence:	Thermocouple ••• 10 μ V per 100 Ω Voltage input ••• Variation of 0.1% change of resistance
	Change in indication $-$ ± (0.1% + 1 digit) max.
	Change in recording ••• ±0.2% of recording span max.
	R.T.D. ••• Variation of resistance with changes in 10Ω per wire
	Change in indication $\therefore \pm (0.1\% + 1 \text{ digit}) \text{ max.}$ Change in recording $\therefore \pm 0.2\%$ of recording span, max.
	(3 wires should be balanced.)
Temperature influence:	Change in indication $\cdot \cdot \cdot \pm (0.3\%+1 \text{ digit}) / 10^{\circ}\text{C}$, max.
	Change in recording ±0.5% / 10°C max.

SERIES SR106A / SR186A

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Mounting position influence:
                                         Inclination within 30°
                                         Change in indication - \pm (0.1\% + 1 \text{ digit}) \text{ max.}
                                         Change in recording -- ±0.2% of recording span max.
   Vibration influence:
                                         Linear vibration with 10~60Hz of frequency and 0.02G of acceleration is applied to each
                                         of 3 directions for 2 hours.
                                         Change in indication - \pm (0.1\% + 1 \text{ digit}) \text{ max.}
                                         Change in recording - ±0.2% of recording span max.
                                         120dB at 50, 60Hz±0.1Hz
   Common mode noise rejection:
   Series mode noise rejection:
                                         30dB at 50. 60Hz+0.1Hz
   Chart paper influence:
                                         Standard temperature / humidity: 20°C, 65%RH
                                         Expansion at 85%RH - 0.4% max.
                                         Contraction at 35%RH ... 0.5% max.
Power Requirement
                                         SR106A: 100~120V AC or 200~240V AC
   Supply voltage:
                                         SR186A: 100~240V AC
   Frequency:
                                         50 / 60Hz
                                         SR106A: About 20VA, 100V AC, without option
Power comsumption:
                                                    About 26VA, 100V AC, with option
                                         SR186A: About 22VA, 100V AC, without option
                                                    About 37VA, 100V AC, with option
Transportation / Storage
   Temperature limit:
                                         0~50°C
   Humidity limit:
                                         20~80%RH, non-condensing is required (temperature \times humidity < 3200)
   Vibration:
                                         10~60Hz, 0.02G
Physical Data
   Mounting method:
                                         Panel flush mounting
                                         \alpha = 90 \sim 60^{\circ}
   Weight:
                                         SR106A: Approx. 2.8kg (without option)
                                                    Approx. 3.3kg (with option)
                                                                                                 α
                                         SR186A: Approx. 6kg (without option)
                                                    Approx. 7kg (with option)
   External dimensions:
                                         SR106A: 144 \times 144 \times 199mm (H\times W \times D)
                                         SR186A: 288 \times 288 \times 199mm (H\times W \times D)
   Panel cutout:
                                         SR106A: 137 × 137mm
                                         SR186A: 281 × 281mm
Optional Specifications
   Chart illumination:
                                         Cold cathode fluorescent
   Alarm output / 3-points
                                        (1) Alarm output (DO):
   external control:
                                            SR106A: 6 points relay contact output (1a)
                                            SR186A: 6 or 12 points relay contact output (1a)
                                            Note: Individual channel operation or common operation available
                                            Relay contact capacity: 240V AC, 3A (resistive load) 30V DC, 3A (resistive load)
                                         (2) External control (DI):
                                            The following control is possible with external contact signal.
                                            · Recording start / stop:
                                              Recording start / stop is effective by a contact signal.Recording is started when the
                                              contact is closed and stopped when it is open.
                                            · Chart speed change:
                                              Selection between normal and remote chart speeds is effected by a contact signal
                                              Remote chart speed is selected when the contact is closed and normal when the
                                              contact is open.
                                            · Measured value printing:
                                              Measured value list printing (date, time, channel no., measured value, unit)
                                              is effected by a contact signal. Printing is started when the contact is closed.
                                                    For external control, use a dry contact.
                                            Note:
                                                     Contact capacity: 12V DC, 0.05A, N.O.(1a) contact
Interface function:
                                         RS-485 interface for transmitting measured value and receiving the condition of setting.
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Communication system	Half-Duplex Bit Serial
Synchronizing type	Start-stop synchronizing
Code	Binary Data length: 8 bits
	Parity: odd number / even
	number / none
	Stop bit: 1 or 2
Communication speed	2400, 4800, 9600, 19200 bps
Number of units connected	Max. 31 units
Communication distance	Max. 1km

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FUNCTIONS

	Function	Description
Range se	tting	Recording range can be set for each channel.
Input setting		Any input can be set for each channel.
Skip funct	ion	Used to skip recording, indication and alarm at any measuring point.
	Measured value list	Date, time, and measured value unit can be printed.
List printing function	Parameter list	Date, time, recording range, scaling, unit, kind of input, alarm set value, chart speed, and tag no. can be printed.
List prin fune	Test patten	All characters and color patterns can be printed.
periodic da	ata printing function	Time, data, chart speed, measured value and unit can be printed at fixed intervals. Printing can be enabled / disable from keyboard.
Alarm prir	ting function	Time,channel no., kind of alarm, and output relay no. can be printed when alarm is on or off.
Unit indica	ation	Engineering units such as °C, °F, %, mV, mA, kg / cm², Q , etc., are indicated (setting from keyboard).
Scaling fu	nction	Scaling with DC voltage input is possible. (Setting of decimal point is also possible within range of-32767~32767).
Subtract f	unction	Difference between any channels is recorded (channel is set from keyboard).
Auto-range recording		Recording range is automatically changed for recording in event of overrange or underrange (setting with keyboard). (setting with keyboard). This function is not available for combination of zone recording and expansion / contraction recording.
Zone recording		Recording area is divided into max. of 3 (SR106A) and 4 (SR186A) zones for recording. This function is not available for combination of automatic range selection and expansion / contraction recording.
Enlarged / reduced recording		A Part of recording area of each channel is expanded or contracted for recording. This function is not available for combination of automatic range selection and zone recoring.
Square-ro	ot extraction function	Square-root extraction of DC voltage inputs is possible.
Daily repo	rt function	Measured value of every hour for a day (24 data) in each channel is stored for printing. Max., min., and average values are also printed at same time. ON-OFF operation, ON-OFF of each channel and operation start time can be set from keyboard.
Data sum	funtion	Integrated value of every hour for a day (24 data) in each channel is stored for printing (integration in 1 sec. steps). Total value for a day is also printed at same time. ON-OFF operation, ON-OFF of each channel and operation start time can be set from keyboard.
Memory backup		Set data and clock function are protected by built-in lithium battery (expected battery life is approx 10 years, under normal temperature).
Input filter		Response is delayed according to sudden changes in input of each channel (1st order lag filter). Time constant setting range: 0 to 900 sec. (setting from keyboard)
Burnout fu	unction	When thermocouple or R.T.D. input is disconnected, it is deflected 100%. Also, it is indicated and printed at same time.
Passcode		4-digit pass code security is available.
Language		English, German, or French can be selected for display and printing.

ORDERING INFORMATION

ITEMS	CODE									SPECIFICATIONS		
SERIES	SR106A-									Hybrid recorder, DIN 144 \times 144mm		
		1								1 Continuous recording		
DECODDING		2								2 Continuous recording		
RECORDING SYSTEM		3								3 Continuous recording		
OTOTEM		6								6 Continuous recording		
		7								6 Dot recording		
			1							Thermocouples B, R, S, K, E, J, T, N, W, L, U, PN		
INPUT			2							R.T.D (Pt100)		
INFUT			3							±50mV, ±500mV, ±5V, ±50V DC		
			5							4~20mA Availble with shunt resistor (option)		
						Japanese						
				Е						English		
POWER SUP					84-					85~150V AC, 50 / 60Hz		
TOWER SOF					85-					150~300V AC, 50 / 60Hz		
		N				0				Without		
ONARTIALE		/11				1				With		
	PUT / EXTERNA		ודואר	RUI			0			Without		
							1			6-points alarm output / 3-points external control		
			0		Without							
								5		RS-485		
REMARKS									0	Without		
ILLIVIANIO									9	With (Please consult before ordering.)		

Spare and Optional Parts

Items	Туре	Remarks
Chart paper (50 divisions) \times 6 charts / box	SRX00DL-5000S	
Recording head × 1	SRZH1001 (PHZH 1001)	
Alarm output / external control unit	SRZK1601	6-points alarm output / 3-points external control
Chart paper illumination	SRZL1001	With cable connector
Shunt resistor 10 ±0.1%	SRZT1101	For 4~20mA or 10~50mA input
Interface unit	SR7D6467CI	RS-485

• Standard Range (Factory-set when shipped)

Code	Input	Standard / Rating	Range
1	Thermocouple	К	0~1200°C
2	R.T.D.	Pt100	0~ 500°C
3	DC voltage	-5~5V	0~ 100

ORDERING INFORMATION

ITEMS	TEMS CODE									SPECIFICATIONS		
SERIES	SR186A-									Hybrid recorder, DIN 288 \times 288mm		
		1								1 Continuous recording		
		2								2 Continuous recording		
RECORDING		3								3 Continuous recording		
SYSTEM		6								6 Continuous recording		
		7								6 Dot recording		
		8								12 Dot recording		
			1							Thermocouples B, R, S, K, E, J, T, N, W, L, U, PN		
INPUT			2							R.T.D (Pt100)		
INFUT			3							± 50mV, ±500mV, ±5V, ±50V DC		
			3		_					4~ 20mA Available with shunt resistor (option)		
MENU INSTRI				J						Japanese		
				Е						English		
POWER SUPP	PLY			86-					85~300V AC, 50 / 60Hz			
	R ILLUMINATIC	NNI				0				Without		
	R ILLOWINA HC					1				With		
							0			Without		
ALARM OUTP	UT / EXTERNA	LCC	DNT	ROL	-		1			6-points alarm output / 3-points external control		
							2			12-points alarm output / 3-points external control		
								0		Without		
INTERFACE FUNCTION					5		RS-485					
REMARKS									0	Without		
REIVIARNS									9	With (Please consult before ordering.)		

Spare and Optional Parts

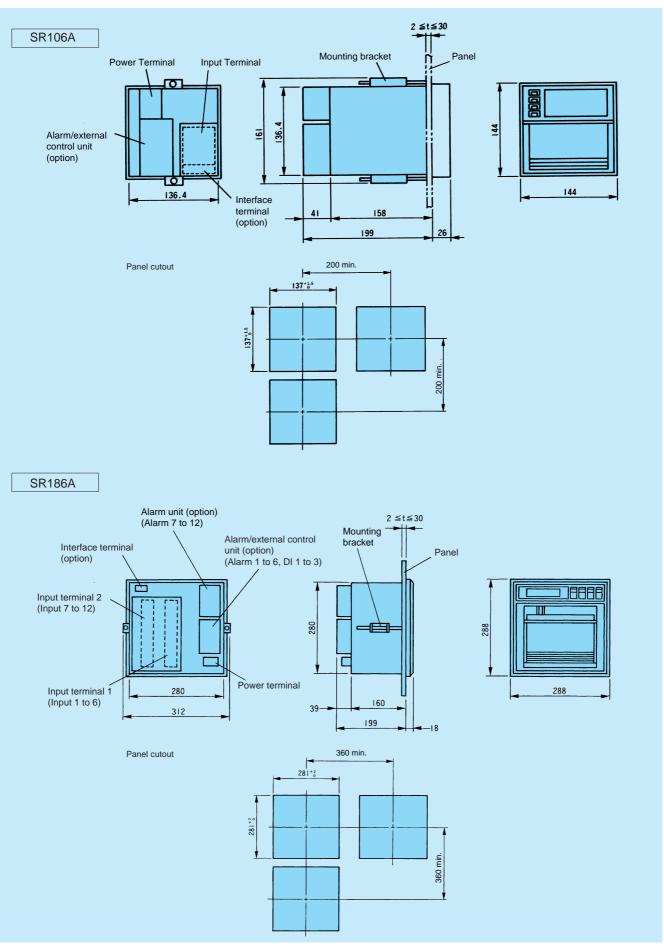
Items	Туре	Remarks		
Chart paper (100 divisions) \times 6 charts / box	SRX00BL-1000R			
Recording head × 1	SRZH8001 (PHZH8001)			
Alarm output / external control unit	SRZK8601	6-points alarm output / 3-points external control		
Alarm output / external control unit	SRZK8201	12-points alarm output / 3-points external control		
Chart paper illumination	SRZL8001	With cable connector		
Shunt resistor $10\Omega \pm 0.1\%$	SRZT8101	For 4~20mA or 10~50mA input		
Interface unit	SR7D0834C2	RS-485		

• Standard Range (Factory-set when shipped)

Code	Input	Standard / Rating	Range	
1	Thermocouple	К	0~1200°C	
2	R.T.D.	Pt100	0~ 500°C	
3	DC voltage	-5~5V	0~ 100	

Deploy mode DSPLAY key DSP SEL DSPLAY key DSP SEL DSPLAY key DSP SEL SEL DSPCATOR TO BE THAN THE CONTRACT AND THE CONTRACT A	Display mode						
DSP SE Pess code input display Whatever the current state, operation moves to the next mode when thicky is pressed. Speed SE Note: If PASS CODE = 0, Manchart Marchart Speed SE Sub-chart Option Speed Sub-chart Option Sectorat Option SE SE Aams SE SE Pessodd imput display is skipped. SE SE Option SE SE Pessodd methic key is pressed. SE Periodic primout ENT Periodic primout ENT Periodic primout ENT Periodic primout ENT ENT Prout Prout Prout Prout Prout Prout SE Dially		Desc	ription of keys				
Main chart speed If this pressed when data are to be registered following specification or when registration is not needed, there is a move to the display of the next set item. SEE Option SEE Option Aarms If this pressed when data are to be registered following specification or when registration is not needed, there is a move to the display of the next set item. SEE Option Aarms If this pressed when this key is pressed. Aarms If this pressed when this key is pressed. Aarms If this pressed when this key is pressed. Aarms If this pressed when this key is pressed. Aarms If this pressed when this key is pressed. Aarms If this pressed when this key is pressed. Aarms If this pressed when this key is pressed. Aarms If this pressed when this key is pressed. SEE ENT ENT Record format Standard Auto-range Zoom Standard Auto-range Zoom SEE DC voltage ENT ENT Incurrent list SEE To data display mode SEE Disty report function SEE SEE Option SEE To data display mode SEE <td< td=""><td></td><td>Whate</td><td>ver the current state, pressed.</td><td></td><td>ext mode when this</td></td<>		Whate	ver the current state, pressed.		ext mode when this		
Subchart speed Option display mode when this were serve for specification and selection of data. To return to the beginning of the parameter settings, press the DISPLA key once and then press the SELECT key. Alarms SEL ENT ENT Recording Logging interval Record format Model Tend ENT ENT Record range When OFF Zone Zone Zone Zone Zone Subchart In case of thermocouples, R. T. D. ENT ENT ENT SEL Do voltage ENT Massing range Rooter Engineering Units SEL Do voltage ENT In case of thermocouples, R. T. D. ENT ENT SEL Daily report function SEL SEL Option SEL Daily report function SEL Option SEL To data display mode User definable unit User definable unit SEL To data display mode User definable unit User definable unit SEL To data display mode Diser definable unit User definable unit User definable unit SEL To data dis	SEL Note : If PASS CODE = 0, this display is skipped.	If this por whe	pressed when data a n registration is not n	are to be registered follow			
Alarms Key once and then press the SELECT Key. Alarms ENT Recording Logging interval mode Trend Periodic printout ENT SEL ENT Record format Standard SEL ENT Periodic printout ENT SEL DC voltage Input Inputs Inputs ENT SEL DC voltage ENT ENT SEL DC voltage Inputs ENT Inputs Fingineering Inputs Standard SEL ENT Itist print-out Scale printout Test pattern Detection SEL Selection Daily report function Selection SEL To data display mode Time setting DSPLAY SEL FEED + SEL Ink monitor clear Backlash Calibration Precord zero- SEL - Alarm latch User definable unit - Senauge zero <td>Sub-chart Option</td> <td>display</td> <td colspan="4">display mode when this key is pressed.</td>	Sub-chart Option	display	display mode when this key is pressed.				
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Time setting DISPLAY SEL FEED + SEL • Alarm latch Ink monitor clear Backlash calibration Record zero- span calibration • Alarm latch	Interface						
SEL · Alarm latch Ink monitor clear Backlash calibration Record zero- span calibration · Alarm latch		To data display mode					
Ink monitor clear Backlash Record zero- • Alarm latch Ink monitor clear Backlash Record zero- • Language selection				ISPLAY			
calibration span calibration - Language selection							

EXTERNAL DIMENSIONS



A Warning

• This product is designed for the control of temperature, humidity and other physical values for the general industrial equipment. It is not to be used for any purpose which regulates the prevention of serious effects on human life or safety. No warranty, express or implied is valid if used without proper safety measures.

Caution

• If the possibility of loss or damage to your system or property as a result of failure of any part of the process exists, proper safety measures must be made before the instrument is put into use as to prevent the occurrence of trouble.



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