

TEMPERATURE/HUMIDITY TRANSDUCERS TEMPERATURE/HUMIDITY CONVERTERS



R220 Series Temperature/Humidity Transducers

R320 Series Temperature/Humidity Transducers

HN-GR Series Temperature/Humidity Converters

R220 SERIES TEMPERATURE / HUMIDITY TRANSDUCERS



These transducers are dry and wet bulbs type temperature/humidity sensors with ventilating function, which can measure temperature/humidity at calm condition.

Resistance thermometer

: Pt100 or JPt100, 3-wire type

Measuring range

: Relative humidity..... 20 to 80%RH
Temperature..... 0 to 60°C

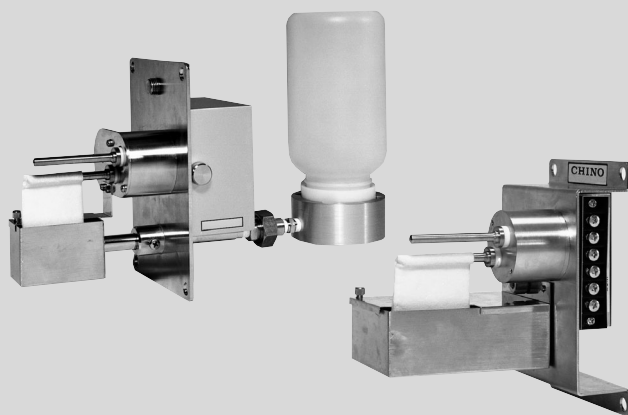
Accuracy

: Relative humidity..... $\pm 2\%$ RH
Temperature..... $\pm 0.3^\circ\text{C}$ at 0°C

Measuring condition

: Wind speed less than 3m/sec.
Ambient temperature 0 to 60°C

R320 SERIES TEMPERATURE / HUMIDITY TRANSDUCERS



These transducers are dry and wet bulbs type temperature/humidity sensors. Since the units are designed to measure temperature and humidity at places where the wind velocity exceeds 3m/sec. continuously, the ventilating function is not provided.

Resistance thermometer

: Pt100 or JPt100, 3-wire type

Measuring range

: Relative humidity..... 20 to 100%RH
Temperature..... 0 to 100°C

Accuracy

: Relative humidity..... $\pm 2\%$ RH
Temperature..... $\pm 0.3^\circ\text{C}$ at 0°C

Measuring condition

: Places where the wind velocity exceeds 3m/sec.
Ambient temperature: 0 to 60°C

HN-GR SERIES TEMPERATURE / HUMIDITY CONVERTERS



These converters indicate simultaneously both temperature and humidity by combining with the temperature/humidity transducers, R220 series or R320 series, and output analog signals of 4 to 20mA.

Input signal

: Dry bulb temperature and wet bulb temperature
Pt100 or JPt100, 3-wire type

Input range

: Relative humidity..... 0 to 100%RH
Temperature..... 0 to 100°C

Output signal

: Humidity..... 4 to 10mADC
Temperature..... 4 to 20mADC

Conversion Accuracy

: Relative humidity..... $\pm 2\%$ RH (Above 5°C, 10%RH)
Temperature..... $\pm 0.3^\circ\text{C}$ at 0°C

R220 SERIES TEMPERATURE/HUMIDITY TRANSDUCERS

MODELS R220 (Standard type)

R221 (Automatic water-feeding type)

These compact and lightweight transducers are dry and wet bulbs type temperature/humidity sensors with ventilating function.

The units employ two platinum resistance thermometers as temperature detecting elements for dry and wet bulbs, and consist of a ventilating unit, detecting elements, and a water tank for wet bulb, and others. Since the water tank is detachable and a terminal board is exposed when tilting the units forward under the wallmount condition, the wiring, check and maintenance are very easy.

These transducers are the most suitable as measuring sensors of temperature and humidity in warehouses, rooms, offices and other places, and 4 types are available for various applications.

For places where the wind velocity continuously exceeds 3m/sec, please use R320 series transducers.

R221 series prepares strainer (with adapter) to remove the foreign substance from the feed water as an option.

TYPES

● R220-□0 (Standard Type)

This is the basic type of the R220 series, and widely used in general.

The water tank capacity is about 300ml, and it should be refilled about every 5 days.

● R220-□0W (Dualcouple Type)

Two pairs of the resistance thermometers for wet and dry bulbs are built-in for control and record of temperature and humidity at the same time in temperature/humidity chambers, etc. Each dry bulb protective tube and wet bulb protective tube contains two pairs of resistance thermometers.

● R221-□0 (Automatic Water-feeding Type)

This is suitable to use in high temperature or low humidity places where water is heavily consumed. Water can be supplied continuously by connecting a pipe to a water supply or a tank. Level detecting float switch turns on and off an solenoid valve to keep the water level constant.

● R221-□0W

(Automatic Water-feeding and Dualcouple Type)

This automatic water-feeding type is provided with two pairs of the resistance thermometers for dry and wet bulbs for control and record of temperature and humidity.



MODEL R220-10



MODEL R221-10

MODEL

R22□-□0□

Type

- 0 : Standard type
- 1 : Automatic water-feeding type

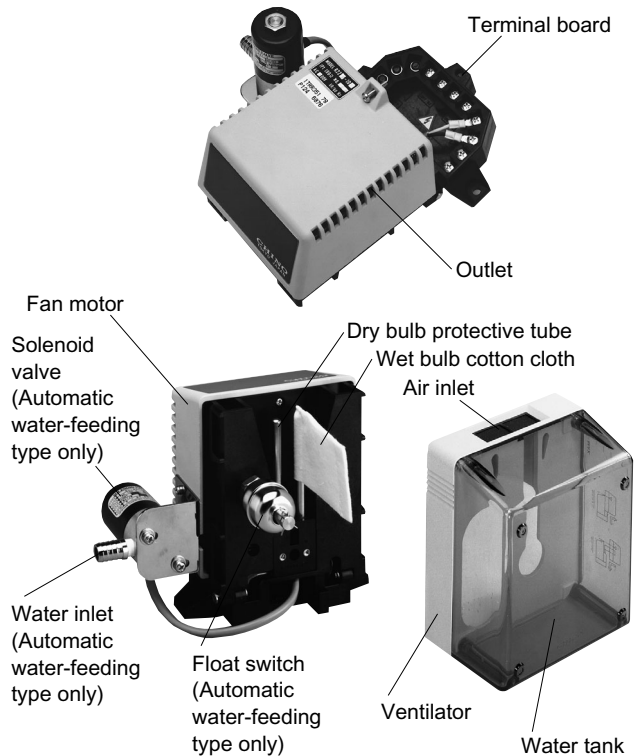
Elements

- 1 : JPt100
- 3 : Pt100

No. of pairs of elements

- Blank : Single element type
- W : Dualcouple type

CONFIGURATION



GENERAL SPECIFICATIONS

Case:	Motor cover.....	Diecast aluminum
	Ventilating part.....	Heat-resisting ABS resin
	Water tank.....	Acrylic resin
Color:	Case.....	White
	Water tank.....	Semi-transparent gray
Mounting:	Vertical wallmount type	
Weight:	R220.....	About 1kg
	R221.....	About 1.5kg

Measuring range:

Relative humidity.....	20 to 80%RH
Temperature.....	0 to 60°C

Accuracy rating:

Relative humidity.....	±2%RH
Temperature.....	±0.3°C at 0°C

Measuring condition

Wind speed less than 3m/sec.
Ambient temperature 0 to 60°C

Resistance thermometer:

Pt100 or JPt100, 3-wire type

Water tank capacity:

About 300ml

Ambient temperature:

0 to 60°C

Power supply:

100V AC or 200VAC, 50/60Hz

Power consumption:

R220.....	About 11VA
R221.....	About 21VA

Accessories:

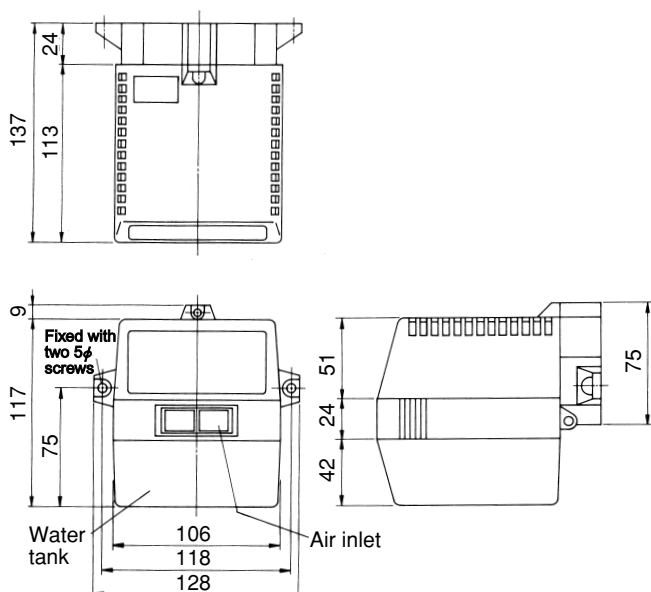
8-conductor cord (Model WP81)..... 5m or 10m
Cotton cloth for wet bulb..... 5 sheets

Options:

Strainer and adapter

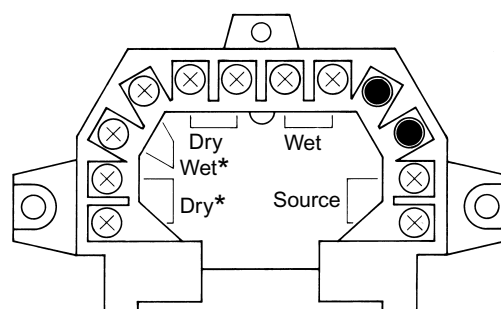
EXTERNAL DIMENSIONS

Model R220-□0, R220-□0W



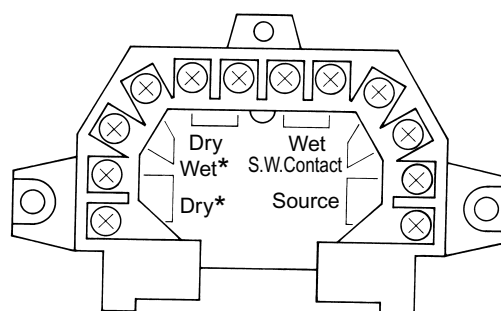
TERMINAL BOARD

Model R220-10, R220-10W



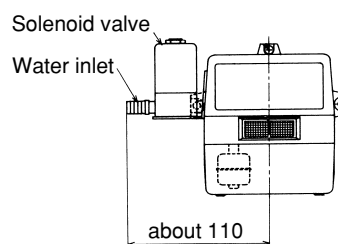
*R220-□0W Only

Model R221-10, R221-10W

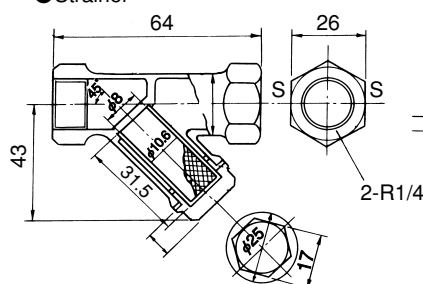


*R221-□0W Only

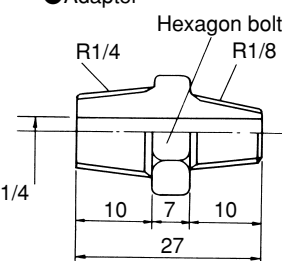
Model R221-□0, R221-□0W



Strainer



Adapter



Unit : mm

R320 SERIES TEMPERATURE/HUMIDITY TRANSDUCERS

MODELS R320 (Standard type)

R321 (Automatic water-feeding type)

R322 (Inside-wall mounting type)

R323 (Internal pressure regulating type)

These compact and lightweight transducers are dry and wet bulbs type temperature/humidity sensors. Since the units are designed to measure temperature and humidity at places where the wind velocity continuously exceeds 3m/sec, the ventilating function is not provided.

The units employ two platinum resistance thermometers as temperature detecting elements for dry and wet bulbs. These transducers are the most suitable as measuring sensors of temperature and humidity in chambers or ducts where the wind velocity exceeds 3m/sec. continuously, and 4 types are available for various applications. For places where is calm or the wind velocity is either below 3m/sec, or not stable, please use R220 series transducers with ventilating function. R321 series prepares strainer (with adapter) to remove the foreign substance from the feed water as an option.

TYPES

● **Standard Type (R320)**

This is provided with a water pot and detecting elements inside the flange, and with a terminal box and a water tank in the outside.

● **Automatic Water-feeding Type (R321)**

This is suitable to use in high temperature or low humidity places where water is heavily consumed. Water can be continuously supplied connecting a pipe to a water supply or a tank. The water pot is provided with a level detecting float switch which turns on and off a solenoid valve to keep the water level constant continuously.

● **Inside-wall Mounting Type (R322)**

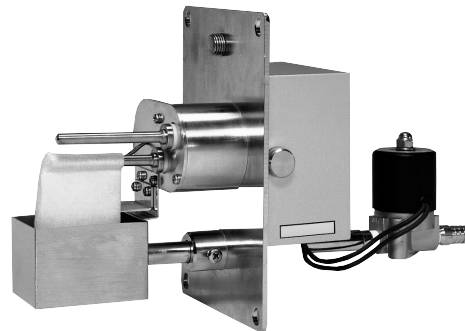
Unlike the standard and other types, the unit is mounted inside wall. A large water pot is attached instead of a water tank.

● **Internal Pressure Regulating Type (R323)**

This is used in places where there is a pressure difference between the inside and the outside. The unit is the standard type attaching a pressure balancing tube to keep the water level at the specified position in the water pot.



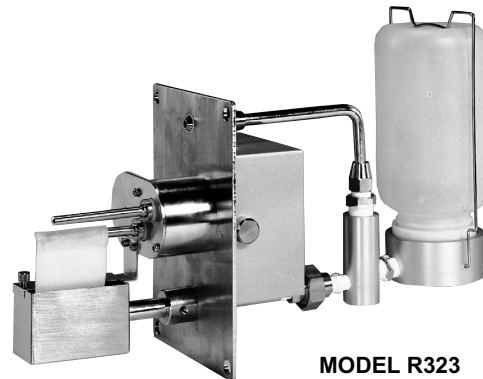
MODEL R320



MODEL R321



MODEL R322



MODEL R323

MODEL

R32□-□0□

Type

- 0 : Standard type
- 1 : Automatic water-feeding type
- 2 : Inside-wall mounting type
- 3 : Internal pressure regulating type

Elements

- 1 : JPt100
- 3 : Pt100

No. of pairs of elements

- Blank : Single element type
- W : Double element type

GENERAL SPECIFICATIONS

Main body: No.3 nickel-planted brass
 Mounting: Vertical wallmount with bolts
 Weight: About 2.2kg

Measuring range:

Relative humidity..... 20 to 100%RH
 Temperature..... 0 to 100°C

Accuracy rating:

Relative humidity..... $\pm 2\%$ RH
 Temperature..... $\pm 0.3^\circ\text{C}$

Measuring condition:

Wind speed exceeding 3m/sec.
 Ambient temperature 0 to 60°C

Resistance Thermometer:

Pt100 or JPt100, 3-wire type

Water pot: R320, R321, R323.... 60ml
 R322..... 400ml

Ambient temperature:

0 to 60°C (R320, R321, R323.....Outside flange)

Power supply: 100VAC, 50/60Hz

Accessories: R320, R322, R323

6-conductor cord (Model WV61)..... 5m

R321

8-conductor cord (Model WP81)..... 5m

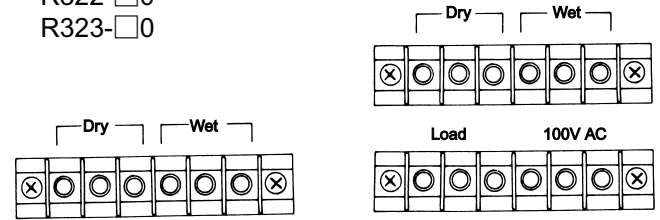
Cotton cloth for wet bulb..... 5 sheets

Options: Strainer and adapter (Common to R221)

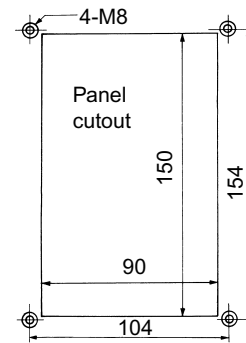
TERMINAL BOARD

● R320-□0
 R322-□0
 R323-□0

● R321-□0



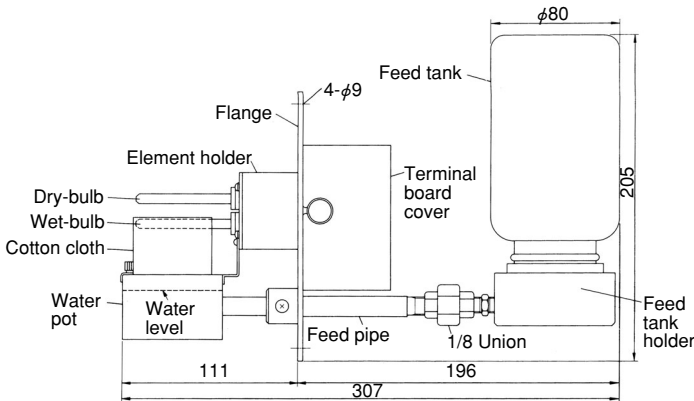
MOUNTING HOLES



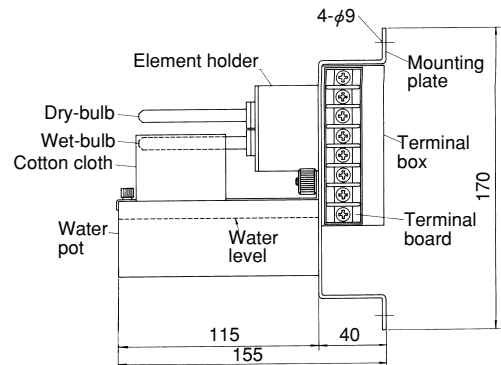
Unit : mm

EXTERNAL DIMENSIONS

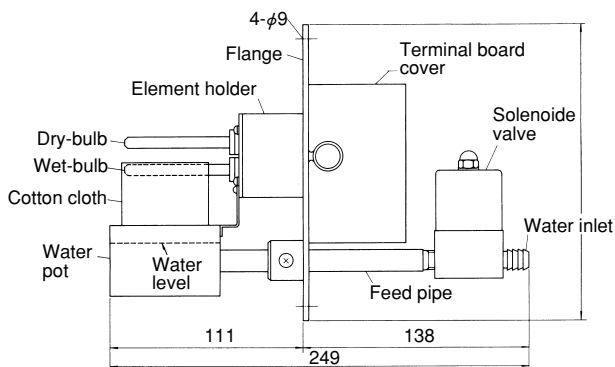
● Model R320



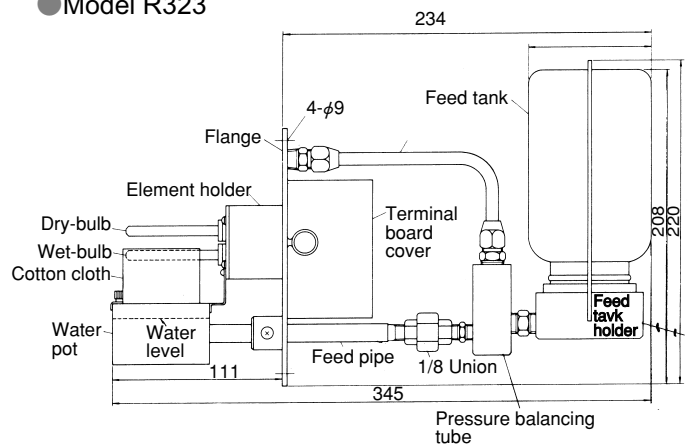
● Model R322



● Model R321



● Model R323



Unit : mm

HN-GR SERIES TEMPERATURE/ HUMIDITY CONVERTERS

These converters indicate simultaneously both temperature and humidity by connecting with the temperature/humidity transducers, R220 series or R320 series, and output analog signals of 4 to 20mA.

6 kinds of humidity unit such as absolute humidity and relative humidity are selectable to display and output. The humidity and temperature outputs are isolated and arbitrary scalable on both outputs. Also, communication interface is available as an option.



■ GENERAL SPECIFICATIONS

Input signal: Dry bulb temperature and bulb temperature
Pt100 or JPt100, 3-wire type

Input range: Relative humidity..... 0 to 100%RH
Temperature..... 0 to 100°C

Conversion Accuracy:

Relative humidity..... $\pm 2\%$ RH
(Temperature : Above 5°C,
Humidity : Above 10%RH)

Temperature..... 0.3°C

Display: Humidity (or wet bulb temperature)
..... 4-digit LED

Temperature..... 4-digit LED

Output signal: Humidity (or wet bulb temperature)
..... 4 to 20mADC

Temperature..... 4 to 20mADC

Load resistance: 600Ω or less, with isolator

Note: Output changes in accordance with
humidity units.

Humidity calculation:

Absolute humidity (g/m²)

Relative humidity (%RH)

Mixing ratio (g/kg)

Steam pressure (kPa)

Dew point (°C)

Wet bulb temperature (°C)

Alarm output: Contact output 2 points, by one common
terminal

2 points of humidity (or wet bulb
temperature) and temperature or
higher/lower limits in either humidity or
temperature.

Contact capacity

Resistive load..... 100VAC 0.5A

..... 200VAC 0.2A

Hold: Hold both display and output by external
contact signal(standard equipped to
communication interface)

Communication interface:

RS232C, RS422A or RS485 (to be specified
as an option)

Working temperature range:

0 to 50°C

Power supply: 100 to 240VAC 50/60Hz

Allowable voltage fluctuation:

85 to 264VAC

Power consumption:Maximum about 15VA

Weight: About 0.6kg

■ MODEL

HN-GR3F1□

Communication interface

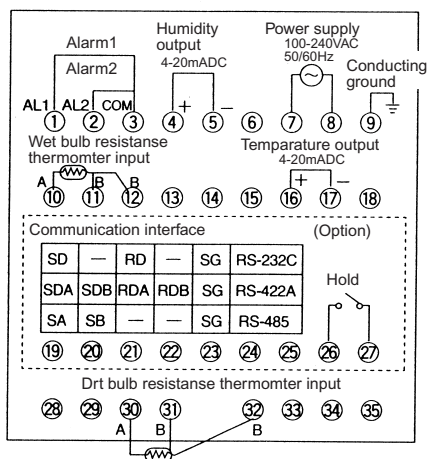
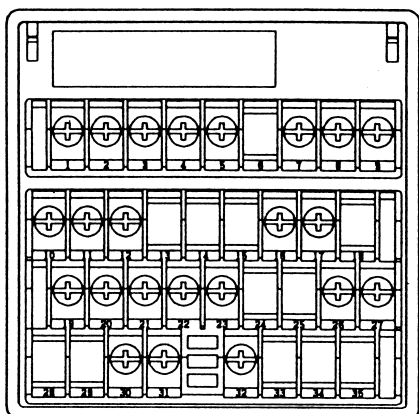
N : Not provided

R : RS232C

A : RS422A

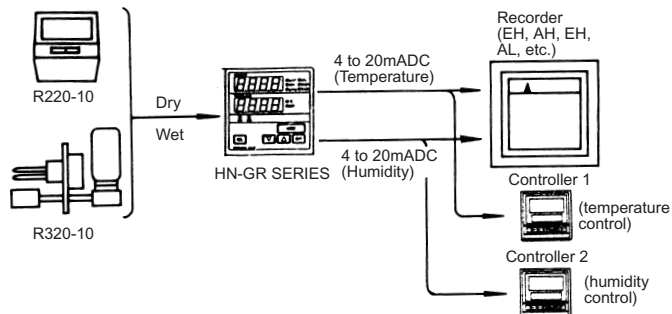
S : RS485

TERMINAL BOARD

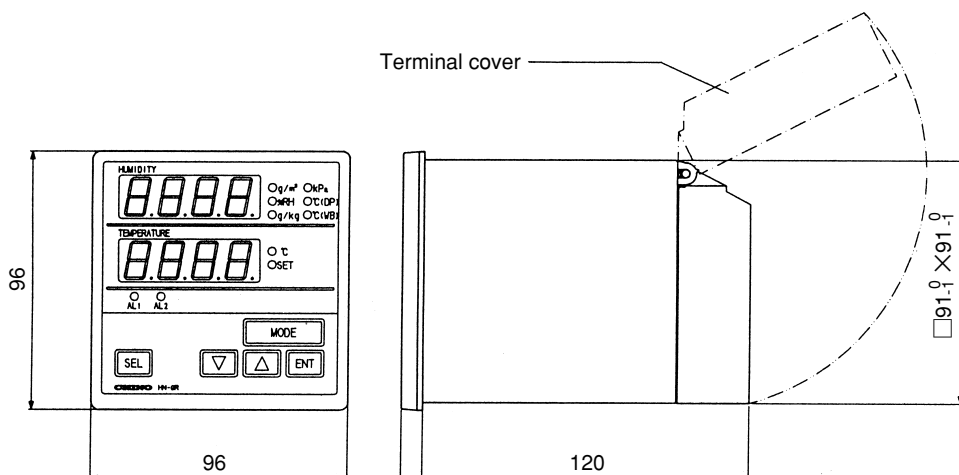


CONFIGURATION

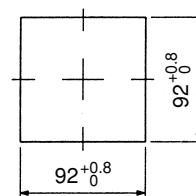
Recording and control of temperature and humidity



EXTERNAL DIMENSIONS



Panel cutout



Unit : mm

WET BULB TEMPERATURE CONVERSION TABLE

Dry bulb Temperature(°C) \ Humidity (%RH)	100	90	80	70	60	50	40	30	20	10
5	5.0	4.3	3.6	2.9	2.2	1.4	0.6	-0.1	-0.9	-1.7
10	10.0	9.2	8.3	7.4	6.5	5.6	4.6	3.7	2.6	1.6
15	15.0	14.0	13.0	12.0	10.9	9.7	8.6	7.3	6.1	4.8
20	20.0	18.9	17.7	16.5	15.2	13.8	12.4	11.0	9.4	7.8
25	25.0	23.7	22.4	21.0	19.5	18.0	16.3	14.5	12.6	10.6
30	30.0	28.6	27.1	25.5	23.9	22.1	20.1	18.1	15.8	13.4
35	35.0	33.5	31.8	30.1	28.2	26.2	24.0	21.6	19.0	16.1
40	40.0	38.3	36.6	34.7	32.6	30.4	27.9	25.2	22.2	18.8
45	45.0	43.2	41.3	39.3	37.0	34.6	31.9	28.8	25.4	21.4
50	50.0	48.1	46.1	43.9	41.5	38.8	35.8	32.5	28.6	24.0
55	55.0	53.0	50.9	48.5	45.9	43.1	39.8	36.1	31.8	26.6
60	60.0	57.9	55.7	53.2	50.4	47.4	43.9	39.9	35.1	29.2
65	65.0	62.8	60.4	57.8	54.9	51.7	48.0	43.6	38.4	31.9
70	70.0	67.7	65.2	62.5	59.4	56.0	52.1	47.5	41.8	34.6
75	75.0	72.6	70.0	67.1	64.0	60.4	56.2	51.3	45.2	37.3
80	80.0	77.5	74.8	71.8	68.5	64.7	60.3	55.2	48.7	40.1
85	85.0	82.4	79.6	76.5	73.0	69.1	64.5	59.1	52.2	43.0
90	90.0	87.3	84.4	81.2	77.6	73.5	68.7	63.0	55.8	45.8
95	95.0	92.2	89.2	85.9	82.1	77.9	72.9	66.9	59.3	48.7
100	100.0	97.1	94.0	90.5	86.7	82.3	77.1	70.8	62.9	51.6

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