OP1103-V01

selec HTC206

Operating Instructions



72 x 72 mm

PARAMETER	SPECIFICATIONS
Display	4 + 4 digits, Digit Height:- White Digit:- 16.7 mm Green Digit:- 9 mm 7 segment digital display
LED Indications	OUT1 : RH Control ON OUT2 : RTD Control ON AT : Auto tune
Keys	3 keys for digital setting
RH Range	0% to 100%
RTD Range	-150° to 850°
INPUT SPECIFICATIONS	
Input Signal	RH (HS-A-100) RTD (PT100)
Sampling time	250 ms
Input Filter (FTC)	0.2 to 10.0 sec for RTD
Resolution	0.1 / 1 for RH / RTD inputs
Temperature Unit	°C / °F selectable
Relay action RH	Humidifier / Dehumidifier
Relay action RTD	RE / FD
FUNCTIONAL SPECIFICATIONS	
Control Method	1) PID control with auto tuning 2) ON-OFF control (For RH: ON-OFF Control only)
Proportional band (P)	1.0 to 400.0°
Integral time (I)	0 to 9999 sec
Derivative time (D)	0 to 9999 sec
Cycle time	0.1 to 99.9 sec
Hysteresis Width	0.1 to 99.9°
Manual reset value	-19.9 to 19.9°

SENSOR INFORMATION

PARAMETER	SPECIFICATIONS
Cable Length	1 Meter
Dimensions (mm)	52 X 28.8 X 18
Input Range	5V DC
Weight (in gm)	33

OUTPUT	
RH Control output	**Relay contact (SPDT)** 10A@250V AC / 30V DC, Resistive
RTD Control output (Relay or SSR user selectable for RTD Control)	**Relay contact (SPDT)** 10A@250V AC / 30V DC, Resistive
	SSR Drive Output (Voltage Pulse) 12V DC, 50 mA
POWER SUPPLY	
Supply Voltage	90 to 270V AC / DC (AC : 50 / 60 Hz)
Power Consumption	5 VA max @230V AC
Temperature	Operating : 0 to 50°C Storage : -20 to 75°C
Humidity	95% RH (non-condensing)
Weight	

SAFETY PRECAUTIONS

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not handled in a manner specified by the manufacturer it might impair the protection provided by the equipment.

– Read complete instructions prior to installation and operation of the unit.

WARNING : Risk of electric shock.

WIRING GUIDELINES

WARNING :

1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement. Do not touch the terminals while power is being supplied.
2. To eliminate electromagnetic interference use short wire with adequate ratings; twists of the same in equal size shall be made. For the input and output signal lines, be sure to use shielded wires and keep them away from each other.
3. Cable used for connection to power source, must have a cross section of 1mm^2 or greater. These wires shall have insulation capacity made of at least 1.5kV.
4. When extending the thermocouple lead wires, always use thermocouple compensation wires for wiring. For the RTD type, use a wiring material with a small lead resistance (5Ω max per line) and no resistance differentials among three wires.
5. A better anti-noise effect can be expected by using standard power supply cable for the instrument.

MAINTENANCE

1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
2. Clean the equipment with a clean soft cloth. Do not use Isopropyl alcohol or any other cleaning agent.

INSTALLATION GUIDELINES

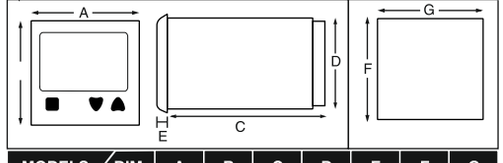
1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and Internal wiring.
2. Do not allow pieces of metal, wire clippings, or fine metallic fillings from installation to enter the product or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to the operator.
4. Use and store the temperature controller within the specified ambient temperature and humidity ranges as mentioned in this manual.

CAUTION

1. When powering up for the first time, disconnect the output connections.
2. Fuse Protection : The unit is normally supplied without a power switch and fuses. Make wiring so that the fuse is placed between the mains power supply switch and the controller. (2 pole breaker fuse - rating : 275V AC,1A for electrical circuitry is highly recommended)
3. Since this is a built-in-type equipment (finds place in main control panel), its output terminals get connected to host equipment. Such equipment shall also comply with basic EMI/EMC and other safety requirements like BSEN61326-1 and BSEN 61010 respectively.
4. Thermal dissipation of equipment is met through ventilation holes provided on chassis of equipment. Such ventilation holes shall not be obstructed else it can lead to a safety hazard.
5. The output terminals shall be strictly loaded to the manufacturer specified values / range.

MECHANICAL INSTALLATION

NEW **Outline Dimensions** | **Panel Cutout**



MODELS / DIM	A	B	C	D	E	F	G
HTC206	76	76	83.7	67	4.5	69	69

1. Prepare the panel cutout with proper dimensions as shown above.
2. Fit the unit into the panel with the help of clamp given.
3. The equipment in its installed state must not come in close proximity to any heating sources, caustic vapors, oils, steam, or other unwanted process by-products.
4. Use the specified size of crimp terminals (M3.5 screws) to wire the terminal block. Tighten the screws on the terminal block using the tightening torque within the range of 1.2 N.m.
5. Do not connect anything to unused terminals.

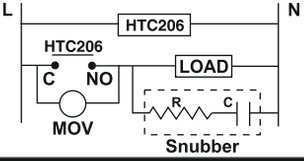
EMC GUIDELINES

1. Use proper input power cab+les with shortest connections and twisted type.
2. Layout of connecting cables shall be away from any

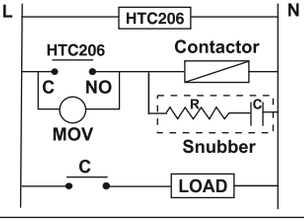
LOAD CONNECTIONS

1. The service life of the output relays depends on the switching capacity and switching conditions. Consider the actual application conditions and use the product within the rated load and electrical service life.
2. Although the relay output is rated at 5/10 amps it is always necessary to use an interposing relay orcontactor that will switch the load. This avoids damage to the controller in the event of a fault short developing on the power output circuit.
3. Always use a separate fused supply for the "power load circuit"and do not take this from the live and Neutral terminals supplying power to the controller.

For load current less than 0.5A



For bigger loads, use interposing relay / contactor



ELECTRICAL PRECAUTIONS DURING USE

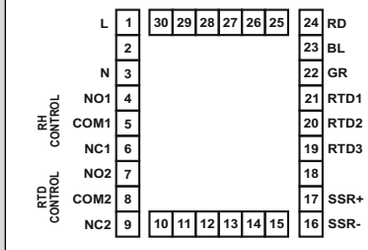
Electrical noise generated by switching of inductive loads can create momentary disruption, erratic display, latch up, data loss or permanent damage to the instrument.

To reduce noise:

a) Use of snubber circuits across loads as shown above, is recommended.

b) Use separate shielded wires for inputs.

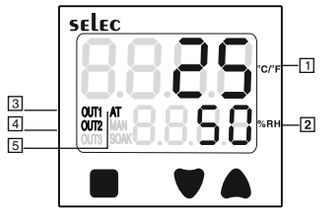
TERMINAL CONNECTIONS



RD - Red wire - +5V supply
BL - Black Wire - GND
GR - Green Wire - Signal

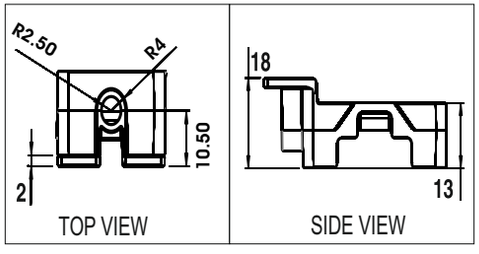
– **Use only the correct thermocouple wire or compensating cable from the probe to instrument terminals avoiding joints in the cable if possible. Failure to use the correct wire type will lead to inaccurate readings.**
Ensure that the input sensor connected at the terminals and the input type set in the temperature controller configuration are the same.

FRONT PANEL DESCRIPTION

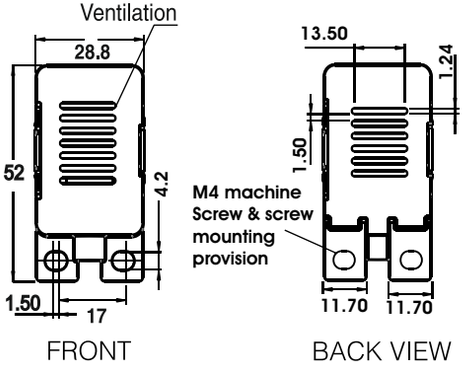


1	Process-value/ Parameter display/ Set point display	1) Display process value of RTD. 2) Displays the parameter symbols at configuration mode/online menu. 3) Displays error conditions of RTD. (Refer Table 2 on page 2)
2	Parameter setting display	1) Display process value of RH. 2) Displays the parameter settings at configuration mode/online menu. 3) Displays error conditions of RH.
3	Control output1 indication	The OUT1 is lit when the RH control output 1 is ON
4	Control output 2 indication	The OUT2 is lit when the RTD control output 2 is ON
5	Tune	Auto tune (AT) : Blinking

SENSOR DIMENSION (TOP & SIDE)

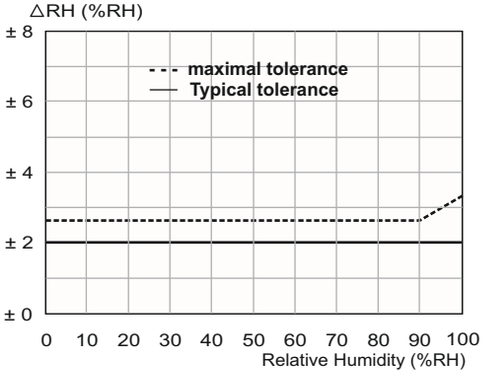


SENSOR DIMENSION (FRONT & BACK)

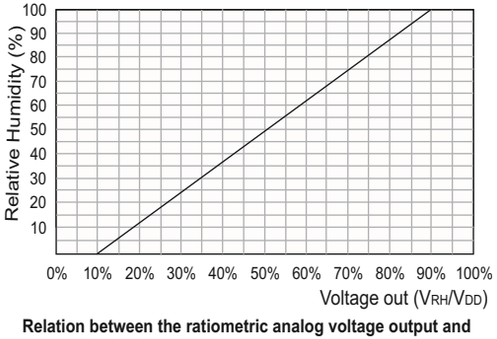


NOTE :1) All Dimenstions in mm.
2) Length of the cable can be increased by using compensation cable upto 3 meter. After that accuracy may vary by 1% / Meter.

HUMIDITY SENSOR PERFORMANCE



Tolerance of RH at 25°C



Relation between the ratiometric analog voltage output and measured relative humidity.

RECOMMENDED OPERATING CONDITION

1. The sensor shows best performance when operated within recommended normal humidity range of 20 to 80%RH, respectively.
2. Long term exposure to conditions outside normal range, especially at high humidity, may temporarily offset the RH signal.
3. After returning to normal humidity range the sensor will slowly come back to calibration state by itself.
4. Prolonged exposure to extreme condition may accelerate ageing.

FRONT KEYS DESCRIPTION

FUNCTIONS	KEY PRESS
ONLINE	
To view Level 0	Press ▼ key for 3 sec.
To view Level 1	After Level 0 press ■ + ▲ key
To view Level 2	Press ▲ key for 3 sec.
To view Protection Level	Press ▲ + ▼ keys for 3 sec.
To view online parameters	Lower display selectable between SETH/SETT using ▲ key.
To change online parameter values	Press up key then Press ■ + ▲ / ▼ to change parameter value.

PROGRAMMING MODE

To view parameters on the same level.	▲ or ▼ key once to view the next or previous function in operational menu.
To increase or decrease the value of a particular parameter.	■ + ▲ to increase and ■ + ▼ to decrease the function value. **Note :** Parameter value will not alter when respective level is locked.

NOTE : The unit will auto exit programming mode after 30 seconds of inactivity.

OR By pressing the ▲ or ▼ or ▲ + ▼ keys for 3 seconds.

INPUT RANGES (Table1)

FOR RTD

INPUT		RANGES	
Resolution		1	0.1
PT100	°C	-150 to 850	-150 to 850
	°F	-238 to 1562	-199 to 999

ERROR DISPALY (Table2)

When an error has occured, the upper display indicates error codes as given below.

Error	Meaning	Control Output Status
S.br	Sensor break / over range condition	OFF
S.rE	Sensor reverse / under range condition	OFF

HTC206

Programming online parameters

RH Setpoint : Default : 0.0

Range : HSPL to HSPH

Pressing ▲ key will show on Upper display : SEtH
Lower display : <0.0>
Press ■ + ▲ / ▼ keys to increment / decrement SEtH value.

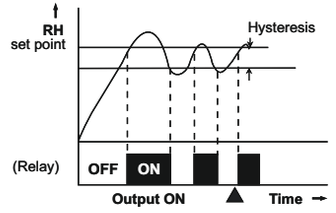
RTD Setpoint : Default : 50.0

Range : TSPL to TSPH

Following will be displayed Upper display: SEtt
Lower display: < 50.0 >
Press ■ + ▲ / ▼ keys to increment / decrement Value. SEtt

USER GUIDE

1) ON/OFF control action (for Humidity / RTD) :
The relay is 'OFF' up to the set RH (Relative Humidity) and 'ON' above the set RH (Relative Humidity). As the RH (Relative Humidity) of the system drops, the relay is switched 'OFF' at a RH (Relative Humidity) slightly lower than the set point.
Hysteresis : The difference between the RH (Relative Humidity) at which relay switches 'ON' and at which relay switches 'OFF' is the hysteresis or dead band.



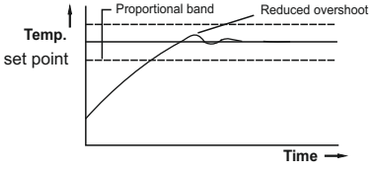
2. Display Offset adjustment (HdbS / tdbS):
This function is used to adjust the display value in cases where it is necessary for display value to agree with another recorder or indicator, or when the sensor cannot be mounted in correct location.

3. Restart time delay (rtdL):
This parameter is used to protect the compressor from restarting in a short period of time and can be set between 0 to 99 minutes.
Example : If this parameter is set at 2 mins, the relay will cut off at the set RH, but will not restart for a minimum of 2 mins, even if the differential is achieved earlier.

4. Resolution(HrES / trES) :
When set as 0.1 for RH
PV auto ranges to 0.0 % < PV < 100.0%
When set as 0.1 for RTD
PV auto ranges to -150% < PV < 850.0% for °C
PV auto ranges to -199% < PV < 999.9% for °F

5. Self Tune (ST) : It is used where modification of PID parameters is required repeatedly due to frequent change in process condition eg. Setpoint.

- Tune LED blinks at slower rate when Self-tuning is in progress.
- At the completion of self-tuning, Tune LED stop blinking.



Self-tuning is initiated under the following conditions :
1) When setpoint is altered.
2) When tune mode is altered. (TUNE=ST)

- ST will start only if PV < 50% of setpoint.
- ST will work only when TACT=RE.

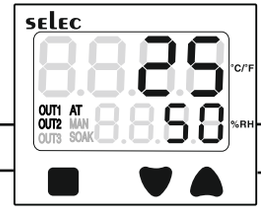
CONFIGURATION INSTRUCTIONS

KEY FUNCTIONS

▲ ⇨	Press once to view online parameters	Press for 3 sec to enter Level 2	Press once to view next parameter in configuration menu
▼ ⇨	Press for 3 sec to enter Level 0	Press once to view previous parameter in configuration menu	▲+▼ ⇨ Press for 3 sec to enter protection Level
■ + ▲ or ■ + ▼ ⇨	Allows the user to increase or decrease associated parameter value	▲ or ▼ or ▲+▼ ⇨	To exit configuration menu press any of these keys for 3 sec

OPERATIONAL MENU

POWER ON



Note : At power ON lower display shows (momentary) PT100

Press ▼ key for 3sec.

After Level 0 press ■+▲ key

Press ▲ key for 3sec.

Press ▲+▼ keys for 3sec.

Level 0 (Humidity)

Display	Description	Default Value	Range
HRES	Humidity Display Resolution	0.1	0.1 / 1
HSPL	Humidity Set point low	0	0 to HSPH
HSPH	Humidity Set point high	100	HSPL to 100
HACT	Humidity Control action for RH	dHUA	DHUM / HUM
HHYS	Humidity Hysteresis	0.5	0.1 to 99.9%RH
Hdbs	Humidity Display bias	0.0	-19.9 to 19.9%RH
rtdl	Restart time delay	0.00	0.00 to 59.59 (Mins.)
HrSt	Level 0 Factory default (Reset all)	no	NO / YES

Level 1 (Temperature)

Display	Description	Default Value	Range
tRES	Temperature Display Resolution	0.1	0.1 / 1
un it	Temperature unit	°C	°C / °F
tSPL	Temperature Set point low	-150	Min range of PT100 to TSPH
tSPH	Temperature Set point high	850	TSPL to max range of PT100
FtC	Filter time constant	1.0	0.2 to 10.0 sec
tACt	Temperature control action for RTD	rE	RE / FD
CntL	Control logic	Pid	PID / ONF
Out	Control Output Selection	rLy	RELAY / SSR / BOTH
tHYS	Temperature Hysteresis	0.5	0.1 to 99.9°
tdbS	Temperature display bias	0.0	-19.9 to 19.9°
trSt	Level 1 Factory default (Reset all)	no	NO / YES

Level 2

Display	Description	Default Value	Range
tUnE	Tune	St	ST / AT / OFF
P	Proportional band	100	1.0 to 400.0°
I	Integral time	120	0 to 9999 sec
d	Derivative time	30	0 to 9999 sec
CYCA	Cycle time mode	AUto	AUTO / USR.F
CYCt	Cycle time	15.0	0.1 to 99.9 sec
AnLP	Manual reset	0.0	-19.9 to +19.9°
Pb.C	Proportional band-cool	100	1.0 to 400.0°
CYt.C	Cycle time-cool	15.0	0.1 to 99.9 sec

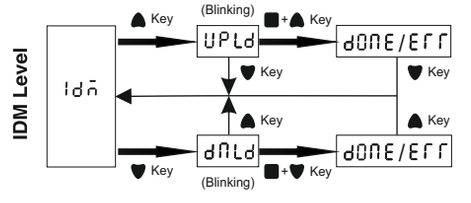
Protection Level

Display	Description	Default Value	Range
SP-H	Lock Setpoint Humidity	unLY	UNLK / LOCK READ
SP-t	Lock setpoint Temperature	unLY	UNLK / LOCK READ
LuL0	Lock level 0	unLY	UNLK / LOCK READ
LuL 1	Lock level 1	unLY	UNLK / LOCK READ
LuL2	Lock level 2	unLY	UNLK / LOCK READ

Note

1. Locking parameters (LVL0 or LVL1 or LVL2 or SP-H or SP-T) will not permit change in the value of respective level parameters.
2. Continuous operation of ■+▲/▼ keys for SP or other parameters makes update speed faster in 3 stages after 3 sec.

IDM Level



Display	Parameter Description
Idn	IndependentDownloader Module
UPLd	Upload from product to IDM
dnLd	Download from IDM to product
dONE	Operation Successful
ErR	Operation unsuccessful

Note:
1) IDM Level - IDM should be connected before powering on the unit to enter in IDM Level.
2) Long Press ▲ or ▼ key for 3 sec to exit from IDM mode.

Caution: After Downloading, switch of the unit and then remove the IDM

CALIBRATION CERTIFICATE

Model No : HTC206

Claimed Accuracy :
for RH input:
± 3% for RH 10% to 80%
± 4% for Below 10% & Above 80%
for RTD input:
(20 min of warm up time)
For RTD inputs : 0.1% of FS ±1□C

Standard used for Calibration of product is traceable to NABL

The calibration of this unit has been verified at the following values :

SENSOR SELECTION	VERIFICATION VALUE (°C)
RTD	0.0
	323.5
	800.0

Note :- The verification values are approximate values with ± 5°C range.

The RTD curves are linearized in this microprocessor based product; and hence the values interpolated across the input range are also equally accurate ; at every point in the curve.

Unit is accepted as accuracy is within the specified limit of claimed accuracy and certificate is valid upto one year from the date of issue.

(Specifications are subject to change, since development is a continuous process.)

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