

36 x 72mm

Features:

- 3 Digits, 7 Segment LED Single Display
- LED Status Indicator : Set Point Lock, Defrost, Relay ON, Alarm ON
- °C / °F Selectable
- Defrost Management
- High & Low Temperature Alarm
- Compact Size

Certifications : (€ c 📢 us

Display Specifications

Display 3 Digits 7 Segment LED Single Display
Height of Display 0.4"

LED Indications Set point lock, Defrost, Relay ON, Alarm

Input Specifications

 Inputs
 NTC

 Resolution
 1 / 0.1°

 Setpoints
 1

 Indication Accuracy
 ±0.1% of Full Scale

Output Specifications

 Outputs (optional)
 1 or 2

 Control
 1

 Relay Contact
 10A @ 230V AC, resistive or 20A @ 230V AC (SPST), resistive

 Alarm Output (optional)
 5A @ 230V AC (SPST), resistive

 Contact Rating SSR Drive
 5A @ 230V AC (SPST), resistive

Functional Specifications

ON - OFF Control Action Hysteresis 0.1 to 9.9 Alarm Modes High Alarm, Low Alarm Display Offset Adjustment -19.9 to 20.0 Restart Time Delay Adjustable from 00 to 99 minutes Relay Action Heat & cool mode Defrost Time Programmable from 00 to 99 minutes Programmable from 00 to 99 (Hr / Min / Sec) **Defrost Frequency**

Specifications for NTC Sensor

Sensor Type	NTC probe
Thermistor Range	-40 to 95
Nominal Resistance	10K ohms @ 25°C

Auxiliary Supply Specifications

Supply Voltage 90 to 270V AC / DC (50 / 60Hz)

Power Consumption 5 VA max @ 230V AC

Environmental Specifications

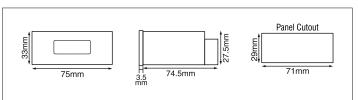
 Temperature
 Operating: 0 to 50°C (32 to 122°F)

 Storage: -20 to 75°C (-4 to 167°F)

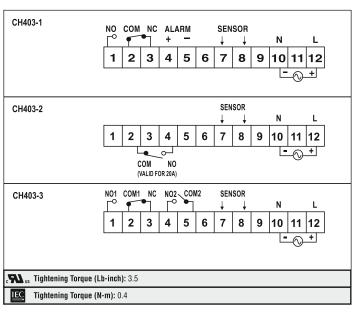
 Humidity (non - condensing)
 95% RH

 Weight
 110 g

Dimensions



Terminal Connections



Ordering Information

	OUTPUT		SUPPLY	
PRODUCT CODE	CONTROL OUTPUT	ALARM OUTPUT	VOLTAGE	CERTIFICATION
CH403-1-NTC	RELAY	SSR	85 to 270V AC / DC	C€
CH403-1-NTC-CU	RELAY	SSR	85 to 270V AC / DC	<i>∞′∠R</i> , ∋)
CH403-2-NTC	RELAY		85 to 270V AC / DC	C€
CH403-3-NTC	RELAY	RELAY	85 to 270V AC / DC	C€

Accessory (Also available separately on request)

PROBE



MODEL	Sensor type	Temperature range (°C)	Nominal Resistance
TSP04	NTC probe	-40 to +100	10 K ohms @ 25°C

Sensor provided with product

NTC Sensor	TSP04	
(see Specifications of NTC Sensor for details)		

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36 x 72

PARAMETER SPECIFICATIONS		SPECIFICATIONS
Display		2½ digit, 7 Segment display
Key		4(Capacitive Touch)
Accuracy		±1°
Control action		ON/OFF (with hysteresis programmable)
Display offset		-19.9 to 19.9
Restart time de	lay	Programmable from 0 to 19.9 minutes
Defrost time		Programmable from 0 to 99 minutes
Defrost frequer	су	Programmable from 0 to 99 (Hr / Min / Sec)
Relay action		a) Heat mode b) Cool mode
Sensor Break		'br' indicated on display
Protection		IP65 Frontal
Special Feature		IDM (Independent Downloader Module)
OUTPUT		
CH403B-1-NTC: 1) Main output: SP		DT, 10A@250VAC/30V DC
CH403B-2-NTC :		
1) Main output : SP		PST, 20A@230VAC/30V DC
CH403B-3-NTC:		
		PST, 20A@240VAC/30V DC
		DT, 5A@250VAC/30V DC
Power supply	CH403B-1-NTC : 230VAC@50/60Hz CH403B-2-NTC : 230VAC@50/60Hz CH403B-3-NTC : 230VAC@50/60Hz	
Temperature	Operating: 0 to 60°C Storage: -20 to 75°C	
Humidity	95% RH (Non-condensing)	
Weight	CH403B-1-NTC : 150 g CH403B-2-NTC : 150 g CH403B-3-NTC : 185 g	
Power consumption	CH403B-1-NTC : 3VA maximum CH403B-2-NTC : 3VA maximum CH403B-3-NTC : 3VA maximum	

Alarm Indications

- a) High Alarm: Display alternates between 'HA/PV'
- b) Low Alarm : Display alternates between 'LA/PV'
- c) Door Open Alarm : Display alternates between 'dO/PV

A 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.

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

WARNING: Risk of electric shock.

WIRING GUIDELINES

MARNING:

- 1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement. Use lugged terminals to meet M3 screws.
- 2. Wiring shall be done strictly according to the terminal Layout with shortest connections. Confirm that all connections are correct.
- 3. To eliminate electromagnetic interference use of short wire with adequate ratings and twists of the same in equal size shall be made.
- 4. Cable used for connection to power source, must have a cross section of 1mm² or greater. These wires shall have insulation capacity made of at least 1.5KV.

INSTALLATION GUIDELINES

A CAUTION:

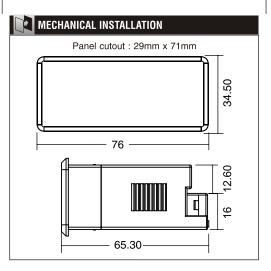
- 1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after Installation and internal wiring.
- 2. Conductors must not come in contact with the internal Circuitry of the equipment or else it may 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.

A CAUTION:

- 1. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
- 2. Fuse Protection:
- The equipment does not have a built-in-type fuse. Installation of external fuse of rating 275VAC/1Amp for electrical circuitry is highly recommended.
- 3. 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.
- 4. The output terminals shall be strictly loaded to the manufacturer specified values/range.

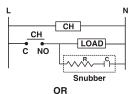
MAINTENANCE

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

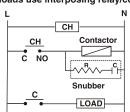


TYPICAL CONNECTIONS FOR LOADS

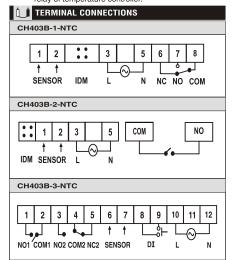
1) For load current less than 0.5A



2) For bigger loads use interposing relay/contactor



NOTE: Use snubber as shown above to increase life of internal relay of temperature controller.

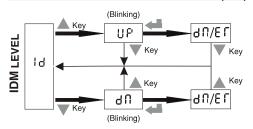


FRONT PANEL DESCRIPTION

1 Process-value/ Parameter display/ Set point display	Display process value and its error condition Display parameter symbols in configuration menu for 1 sec and then the parameter values Displays set point value
2 Alarm	Indicates Alarm condition
3 Defrost	Indicates defrost in progress
4 Main output	Indicates main output ON
5 Temperature Unit	Indication for selected Temperature Unit (°C/°F)

SPECIAL FEATURE

INDEPENDENT DOWNLOADER MODULE (IDM)



	IDM Level		
Display	Parameter Description		
19	Independent Downloader Module		
UP	Upload from product to IDM		
97	Download from IDM to product		
90	Operation Successful		
٤٢	Operation unsuccessful		

Note:

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

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

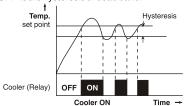
Doc. name: OP INST CH403B OP855-V03(Page 1 of 2)

USER GUIDE

1) ON/OFF control action (for cooler):

The relay is 'OFF' up to the set temperature and 'ON' above the set temperature. As the temperature of the system drops, the relay is switched 'OFF' at a temperature slightly lower than the set point.

Hysteresis: The difference between the temperature at which relay switches 'ON' and at which relay switches 'OFF' is the hysteresis or dead band.



2. Display Offset adjustment:

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. Defrost mode:

The unit has two modes of defrost - Auto and Manual. The Auto mode can be set by programming required defrost frequency between 0 and 99 (Hr/Min/Sec). The defrost frequency excludes the defrost time. To enable Manual defrost press key continuously for 4 sec. Defrost is valid only for cool mode. During defrost relay remains OFF for a period = Programmed defrost time. Defrost once enabled can be disabled only at power ON. Defrost is disabled if Defrost frequency = 0 or Defrost time = 0.

4. Restart time delay:

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 temperature, but will not restart for a minimum of 2 mins, even if the differential is achieved earlier.

5. Alarm acknowledgment:

To acknowledge the alarm, press A key.

6. Sensor Break:

- When set as 0, main relay is OFF during sensor break. When set as 1, main Relay is OFF for 10 min & On for
- 4 min (OFF First) during sensor break.

7. Lock Parameter :

- When set as 0, Configuration parameters & setpoint Are editable
- When set as 1, Configuration parameters & setpoint are read only.

8. Alarm Indicator:

When FN is set as AL, Alarm function is enabled.
 HA alarm is generated when PV >= HA, display toggles every 1 sec between PV & HA Value.
 LA alarm is generated when PV <= LA, display toggles every 1 sec between PV value & LA.

9. Resolution :

• When set as 0.1,

PV auto ranges to Resolution 0.1 for -19.9 > PV > 19.9 SP range is limited from -19.9 to 19.9

• (If LA<-19.9 or HA>19.9)

10.Set Point High Limit:

This function provides highest set point which can be set.

11.Set Point Low Limit:

This function provides lowest set point which can be set.

12. Door Open mode:

- When set as 0, the door open alarm occurs when DI input is open (after door open alarm delay)
- When set as 1, the door open alarm occurs when DI input is closed (after door open alarm delay)

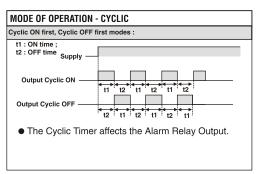
13. Power on Reset:

- This Function is used for Retention of timer mode.

 When enabled timer will start from the set value.
- When enabled, timer will start from the set value when power ON.
- When disabled, timer will start from the previous value where it was before power OFF.

CONFI	CONFIGURATION INSTRUCTIONS			
KEY Functions	ONLINE	CONFIGURATION MENU	Set point	
4	 ▶ Press once to view SP (°C/*F blinking) ▶ Press for 3 sec to edit SP (Setpoint value blinking) 	Press once to start editing current parameter value. (Parameter value blinking) After editing, press again to store current parameter value.(C/ F blinking)	> Press once to exit Setpoint view / edit mode.	
▲ +▼	> Press for 3 sec to enter configuration menu.			
	➤ Press once to acknowledge Alarm.➤ Press once to see the remaining time.	> To view next parameter OR Increment parameter value.	➤ Increment setpoint.	
	> Press for 3 sec to enable Manual Defrost.	> To view previous parameter OR Decrement parameter value.	> Decrements setpoint.	
♠		> Press for 3 sec to exit configuration menu.	> Press 3 Sec to exit Setpoint view / Edit mode	

OPERATIONAL MENU				
Display (For 1sec)	Description	Default Value	Range	Condition
P1	Control mode	CL	CL/HT	NA
P2	High alarm	100	SP to 100°	NA
P3	Low alarm	-50	-50° to SP	NA
SH	Set Point High Limit	90	SP to 90°	NA
SL	Set Point Low Limit	-40	-40° to SP	NA
P4	Hysteresis	0.5	0.1° to 9.9°	NA
P5	Display offset	0	-19.9° to 9.9°	NA
P6	Restart time delay	3.0	0 to 19.9 min	NA
P7	Defrost time	0	0 to 99 min	NA
P8	Defrost Frequency	1	0 to 99 min	Defrost time>0
P9	Defrost Frequency unit	Н	H/M/S	Defrost time>0
PU	Display Unit	°C	°C / °F	NA
LP	Lock Parameter	0	0/1	NA
RS	Resolution	0.1	0.1 / 1	NA
FN	Relay 2 Function	AL	OF/AL/TM	NA
T1	Power On Reset	Y	Y/N	
T2	On time unit	М	H/M/S	
тз	OFF time unit	М	H/M/S	
Т4	ON time resolution	1	0 or 0.1	Visible only when FN = TM
Т5	OFF time resolution	1	0 or 0.1	Applicable only for CH403B-3-NTC
Т6	ON time	10	1 to 199	
Т7	OFF time	10	1 to 199	
Т8	OFF First / ON First	0	0 or 1	
Т9	S. BRK-Cyclic OFF/Cyclic Continue	0	0 or 1	
E1	Sensor break alarm delay	0	0 / 1	NA
E2	Door open alarm delay	5	5 to 99s	NA
E3	Door open mode	0	0/1	NA
F5	Reset all(Set to factory default)	0	0 / 1	NA



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

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	30 X / 2
PARAMETER	SPECIFICATIONS
Display	3 digit, 7 Segment display
Key	4(Capacitive Touch)
Accuracy	±1°
Control action	ON/OFF (with hysteresis programmable)
Display offset	-19.9 to 19.9
Restart time delay	Programmable from 0 to 99.9 minutes
Defrost time	Programmable from 0 to 99 minutes
Defrost frequency	Programmable from 0 to 99 (Hr / Min / Sec)
Relay action	a) Heat mode b) Cool mode
Sensor Break	'br' indicated on display
Protection	IP65 Frontal
Special Feature	IDM (Independent downloader module)
CUIDUIT	

OUTPUT

CH403C-1-NTC:

1) Main output : SPDT, 10A@250VAC/30V DC

Power supply	CH403C-1-NTC : 230VAC@50/60Hz
Temperature	Operating: 0 to 60°C Storage: -20 to 75°C
Humidity	95% RH (Non-condensing)
Weight	CH403C-1-NTC : 150g
Power consumption	CH403C-1-NTC : 3VA maximum

Alarm Indications

a) High Alarm: Display alternates between 'HA/PV' b) Low Alarm: Display alternates between 'LA/PV'

A 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.

CAUTION: 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. Use lugged terminals to meet M3 screws.
- 2. Wiring shall be done strictly according to the terminal Layout with shortest connections. Confirm that all connections are correct.
- 3. To eliminate electromagnetic interference use of short wire with adequate ratings and twists of the same in equal size shall be made.
- 4. Cable used for connection to power source, must have a cross section of 1mm² or greater. These wires shall have insulation capacity made of at least 1.5KV.

INSTALLATION GUIDELINES

A CAUTION:

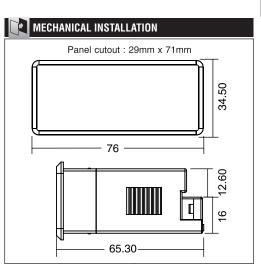
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- 2. Conductors must not come in contact with the internal Circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
- 3. Circuit breaker or mains switch must be installed 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.

A CAUTION:

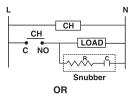
- 1. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
- 2. Fuse Protection:
- The equipment does not have a built-in-type fuse. Installation of external fuse of rating 275VAC/1Amp for electrical circuitry is highly recommended.
- 3. Thermal dissipation 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.
- 4. The output terminals shall be strictly loaded to the manufacturer specified values/range.

MAINTENANCE

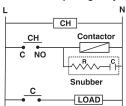
- 1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
- 2. Please clean the equipment with a clean soft cloth. Do not use Isopropyl alcohol or any other cleaning agent.



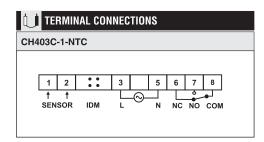
TYPICAL CONNECTIONS FOR LOADS 1) For load current less than 0.5A

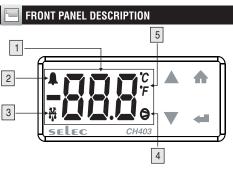


2) For bigger loads use interposing relay/contactor



NOTE: Use snubber as shown above to increase life of internal relay of temperature controller.





<u>—</u>
Display process value and its error condition Display parameter symbols in configuration menu for 1 sec and then the parameter values Displays set point value
Indicates Alarm condition
Indicates defrost in progress
Indicates main output ON
Indication for selected Temperature Unit (°C/°F)

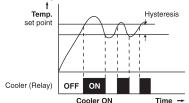


USER GUIDE

1) ON/OFF control action (for cooler):

The relay is 'OFF' up to the set temperature and 'ON' above the set temperature. As the temperature of the system drops, the relay is switched 'OFF' at a temperature slightly lower than the set point.

Hysteresis: The difference between the temperature at which relay switches 'ON' and at which relay switches 'OFF' is the hysteresis or dead band.



2. Display Offset adjustment:

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. Defrost mode:

The unit has two modes of defrost - Auto and Manual. The Auto mode can be set by programming required defrost frequency between 0 and 99 (Hr/Min/Sec). The defrost frequency excludes the defrost time. To enable Manual defrost press key vontinuously for 3 sec. Defrost is valid only for cool mode. During defrost relay remains OFF for a period = Programmed defrost time. Defrost once enabled can be disabled only at power ON. Defrost is disabled if Defrost frequency = 0 or Defrost time = 0.

4. Restart time delay :

This parameter is used to protect the compressor from restarting in a short period of time and can be set between 0 to 99.9 minutes.

Example: If this parameter is set at 2 mins, the relay will cut off at the set temperature, but will not restart for a minimum of 2 mins, even if the differential is achieved earlier.

5. Alarm acknowledgment:

To acknowledge the alarm, press key.

6. Sensor Break:

- When set as 0, main relay is OFF during sensor break. When set as 1, main Relay is OFF for 10 min & On for
- 4 min (OFF First) during sensor break.

7. Lock Parameter:

- When set as 0, Configuration parameters & setpoint Are editable
- When set as 1, Configuration parameters & setpoint are read only.

8. Alarm Indicator :

• When FN is set as AL, Alarm function is enabled. HA alarm is generated when PV >= HA, display toggles every 1 sec between PV & HA Value. LA alarm is generated when PV <= LA, display toggles every 1sec between PV value & LA.

9. Resolution:

When set as 0.1.

PV ranges from -40.0 > PV > 90.0

When set as 1

PV ranges from -40 to 90

10. Set Point High Limit:

This function providing higher set point which can

11. Set Point Low Limit:

This function providing lower set point which can be set.

CONFIGURATION INSTRUCTIONS KEY Set point ONLINE CONFIGURATION MENU **FUNCTIONS** Press once to view SP (°C/°F blinking) > Press once to start editing current parameter value. Press once to exit Setpoint view / > Press for 3 sec to edit SP (Parameter value blinking) edit mode. > After editing, press again to store current parameter value. (Setpoint value blinking) (°C/°F blinking) + Press for 3 sec to enter configuration menu. Press for 3 sec to enable Manual Defrost. > To view previous parameter OR Decrement parameter value. > Decrements setpoint. > To view next parameter OR Increment parameter value. > Press once to acknowledge Alarm.

> Press for 3 sec to exit configuration menu.

OPERATIONAL MENU				
Display (For 1sec)	Description	Default Value	Range	Condition
P1	Control mode	CL	CL/HT	NA
P2	High alarm	100	SP to 100°	NA
P3	Low alarm	-50	-50° to SP	NA
SH	Set Point High Limit	90	SP to 90°	NA
SL	Set Point Low Limit	-40	-40° to SP	NA
P4	Hysteresis	0.5	0.1° to 9.9°	NA
P5	Display offset	0.0	-19.9° to 19.9°	NA
P6	Restart time delay	3.0	0 to 99.9 min	NA
P7	Defrost time	0	0 to 99 min	NA
P8	Defrost Frequency	1	0 to 99 min	Defrost time>0
P9	Defrost Frequency unit	Н	H/M/S	Defrost time>0
PU	Display Unit	°C	°C/°F	NA
LP	Lock parameter	0	0 / 1	NA
RS	Resolution	0.1	0.1 / 1	NA
FN	Alarm Indicator	AL	AL/OF	NA
E1	Sensor break alarm	0	0/1	NA
F5	Reset all (Set to factory default)	0	0/1	NA

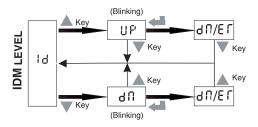
SPECIAL FEATURE

Edit mode.

INDEPENDENT DOWNLOADER MODULE (IDM)

Press 3 Sec to exit Setpoint view /

> Increment setpoint.



IDM Level			
Display	Parameter Description		
19	Independent Downloader Module		
UP	Upload from product to IDM		
٩٢	Download from IDM to product		
90	Operation Successful		
٤٢	Operation unsuccessful		

Note:

1) IDM Level - IDM should be connected before powering on the unit to enter in IDM Level.

2) Long Press 🌨 key for 3 sec to exit from IDM mode.

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

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

Selec Controls Pvt. Ltd., India

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