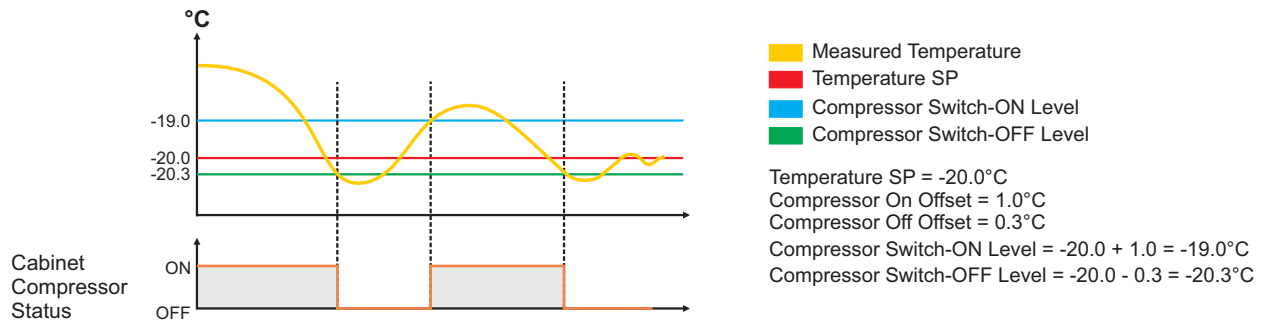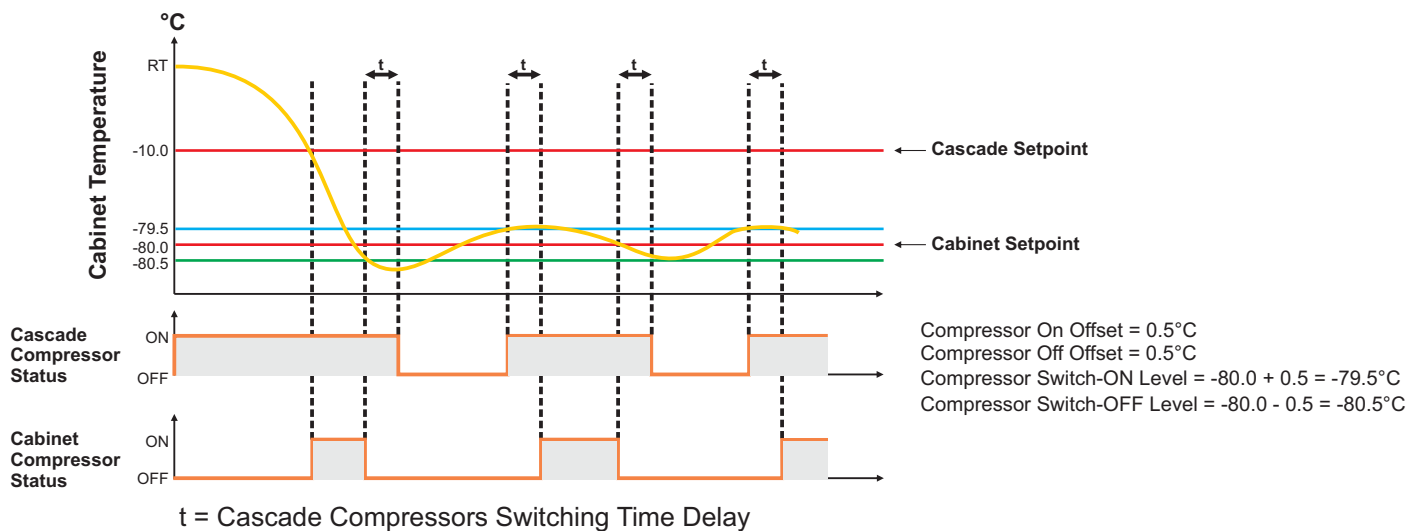## Features

- 128 X 64 STN Monochrome Graphic Display
- Sensor-1 : Cabinet Temperature
  RTD Pt100 or DC Linear (mA / V)
- Sensor-2 : Coil or Filter Temperature
  RTD Pt100 or DC Linear (mA / V) Input
- In-Built Time Delay for Compressor On-Off Operation
- Single or Dual (Cascade) Compressor Operation
- In-Built Time Delay between Cabinet & Cascade Compressor Switching
- Digital Inputs for Cabinet & Cascade Compressor HP / LP Faults
- Door Open Detection & Alarm
- RS485 MODBUS RTU Serial Port
- Universal Supply Voltage : 85 ~ 264VAC, 50/60 Hz
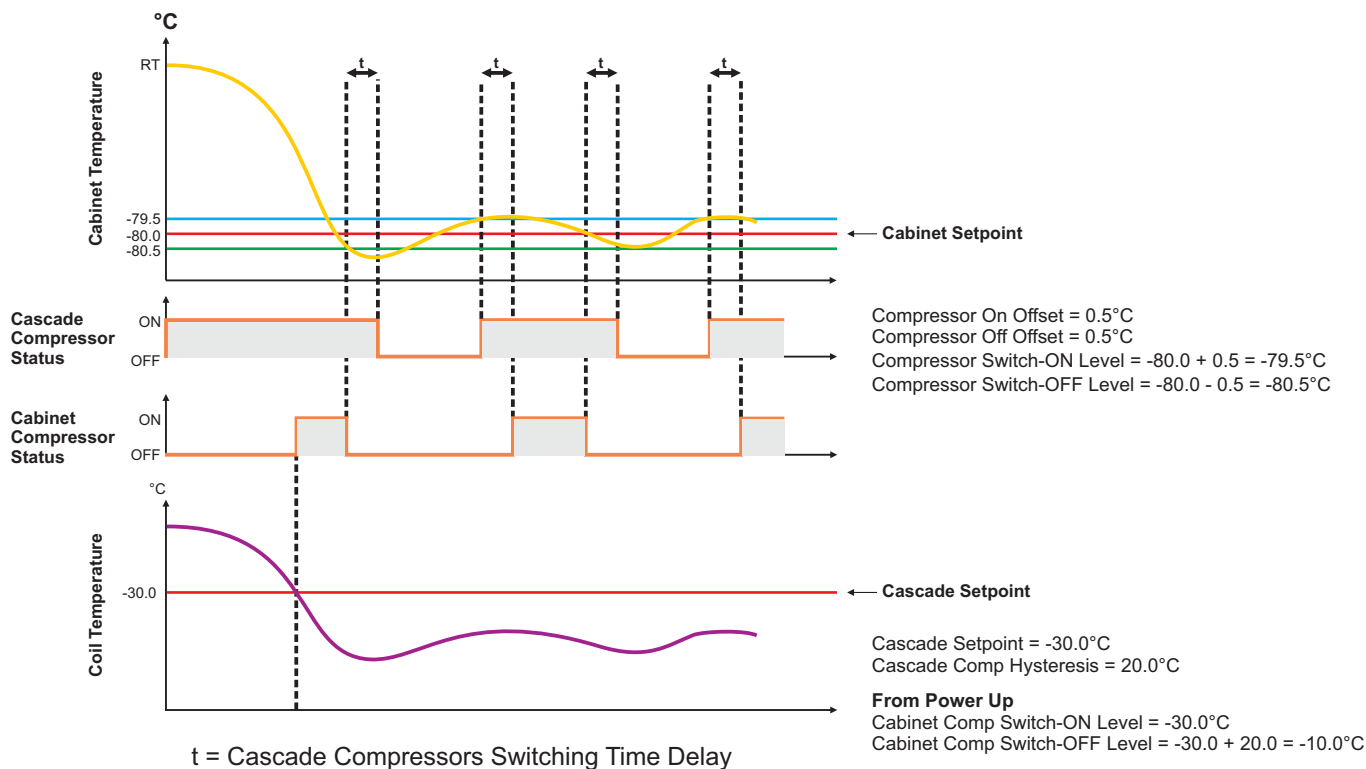

Single Compressor Operation Mode

■ Measured Temperature
■ Temperature SP
■ Compressor Switch-ON Level
■ Compressor Switch-OFF Level

Temperature SP = -20.0°C
Compressor On Offset = 1.0°C
Compressor Off Offset = 0.3°C
Compressor Switch-ON Level = -20.0 + 1.0 = -19.0°C
Compressor Switch-OFF Level = -20.0 - 0.3 = -20.3°C

Cascade Compressors Operation Mode

Compressor On Offset = 0.5°C
Compressor Off Offset = 0.5°C
Compressor Switch-ON Level = -80.0 + 0.5 = -79.5°C
Compressor Switch-OFF Level = -80.0 - 0.5 = -80.5°C

t = Cascade Compressors Switching Time Delay

Notes

- For the clarity sake, the *Compressor On-to-Off Time Delay* is not shown in the figure.
- The setpoint values shown in above figure are for illustration purpose only.

Cascade Compressors Operation Mode (with Coil Sensor)

°C

Cabinet Temperature

RT

t

-79.5
-80.0
-80.5

← Cabinet Setpoint

Cascade Compressor Status — ON / OFF

Cabinet Compressor Status — ON / OFF

Compressor On Offset = 0.5°C
Compressor Off Offset = 0.5°C
Compressor Switch-ON Level = -80.0 + 0.5 = -79.5°C
Compressor Switch-OFF Level = -80.0 - 0.5 = -80.5°C

°C

Coil Temperature

-30.0 ← Cascade Setpoint

Cascade Setpoint = -30.0°C
Cascade Comp Hysteresis = 20.0°C

From Power Up
Cabinet Comp Switch-ON Level = -30.0°C
Cabinet Comp Switch-OFF Level = -30.0 + 20.0 = -10.0°C

t = Cascade Compressors Switching Time Delay

Notes

- For the clarity sake, the *Compressor On-to-Off Time Delay* is not shown in the figure.
- The setpoint values shown in above figure are for illustration purpose only.

Specifications

Display	
Graphic LCD	128 X 64 STN Monochrome
Keys	
Type	6 Tactile Switches
Functions	SCROLL PAGE ALARM ACK UP DOWN ENTER
Analog Inputs	
Sensor-1 Cabinet Temperature (User Programmable)	RTD Pt100, 3 wire DC Linear : 0-20 mA, 4-20 mA, 0-5 V, 0-10 V, 1-5 V
Sensor-2 Coil or Filter Temperature (User Programmable)	RTD Pt100, 3 wire DC Linear : 0-20 mA, 4-20 mA, 0-5 V, 0-10 V, 1-5 V *(Sensor-2 input can be disabled if not required)*
Accuracy	RTD Pt100 : ± 0.25% of reading ± 0.1°C DC Volts/Current : ± 0.25% of reading ± 1 LSD
Display Resolution	Fixed 0.1°C (for both Sensor-1 & Sensor-2 Temperature)
Zero Offset	User Adjustable (Independent for Sensor-1 & Sensor-2 Temperature)
ADC	16 Bit (±32,768 Counts), Sigma-Delta ($\Sigma\Delta$)
Sampling Time	250mS (4 Samples per Second)
Common Mode Rejection	> 100dB at 50/60 Hz
Signal Conditioning	L-C Analog Filter on Each Input

Cascade Compressor HP / LP Monitoring

Input	Digital Input (Potential-free Contacts) from High + Low Pressure Switch *(This feature can be enabled / disabled by user)*
Function	If there is either High or Low pressure fault then both Cascade & Cabinet compressors are switched-off for safety. The Compressors are switched-on again only after fault is removed and acknowledged.

Cabinet Compressor HP / LP Monitoring

Input	Digital Input (Potential-free Contacts) from High + Low Pressure Switch *(This feature can be enabled / disabled by user)*
Function	If there is either High or Low pressure fault then Cabinet compressor (and also Cascade Compressor in case of Cascade Mode) are switched-off for safety. The Compressor(s) are switched-on again only after fault is removed and acknowledged.

Door Status Monitoring

Input	Digital Input (Potential-free Contacts) from Door Switch
Function	Alarm Alert on Door Opening for Longer than Set Time

Alarm System

Process Alarm	Alarm on Cabinet Temperature crossing High / Low Limits
Filter Safety Alarm	Alarm on Filter Temperature exceeding High Limit
Cascade Compressor Pressure Fault Alarm	Alarm on HP / LP Fault
Cabinet Compressor Pressure Fault Alarm	Alarm on HP / LP Fault
Door Open Alarm	Alarm on Door Open
Audio Alert	In-Built Buzzer (Beeper)
Output	SSR Output (12 VDC @ 30 mA, Short - Circuit Protected)
Alarm Acknowledge	Front Panel Alarm Acknowledge (Mute) Key

Temperature Control Loop

Type	ON-OFF with Compressor Switching & Cascade Switching Time Delays
Control Parameters	Control Band (Hysteresis)
Output	Separate SSR Drive (12 VDC @ 30 mA, Short - Circuit Protected) Outputs for Cabinet & Cascade Compressors

Serial Communication

Port	RS485, 2-wire, Half Duplex, Start-Stop Synchronized
Protocol	Modbus RTU
Baud Rate	Settable : 4800, 9600, 19200, 38400, 57600
Parity	Settable : None, Even, Odd
Max. Units per Loop	31
Max. Distance	1200 Metres

Power Supply

Type	Switch Mode (SMPS)
Line Voltage	85 to 264 VAC, 50/60Hz
Consumption	5VA Max

Physical

Mounting	Plug-in with Panel Mounting Clamps
Overall Dimensions	80 (H) X 160 (W) X 68.2 (D), mm
Panel Cutout	75 (H) X 150 (W), mm
Terminals	3.5 mm Pitch, Pluggable Terminal Blocks

Environmental

Operating Ambient	0~55°C & 5~90%RH Non-condensing
Storage Temperature	-10 to +70 °C
Atmospheres	Not Suitable for use in Corrosive or Explosive Atmospheres. The Panel in which the Instrument is Mounted must be free of Electrically Conductive Pollution.

Back Panel Terminations