QUIETUNIT

REFRIGERATION DUTY CONDENSING UNITS

CONTROLLER FUNCTIONS

XC35CX controller regulates and manages condensing unit functions:

- Drive ON/OFF (fixed capacity) compressors
- Drive ON/OFF (fixed speed) condenser fans
- Drive variable speed condenser fans (0-10V control)
- Provide relay output to run defrost events (*)
- Generates alarm codes for running conditions outside of specified range
- Provide programming options for condensing unit lock-out (Repetitive Alarm codes conditions)
- Provide display options for running parameters and alarm codes
- Provide means for communicating operating parameters and alarming conditions for remote monitoring systems

XC35CX replaces the following components:

- Low Pressure control
- Discharge Thermostat
- Compressor Time Delay
- Pressure/Temperature switch for staggering Fixed Speed Condenser Fans
- System 450 or P352 controllers for variable speed condenser fans
- Defrost Time Clock (*)

CONTROLLER & COMPONENTS

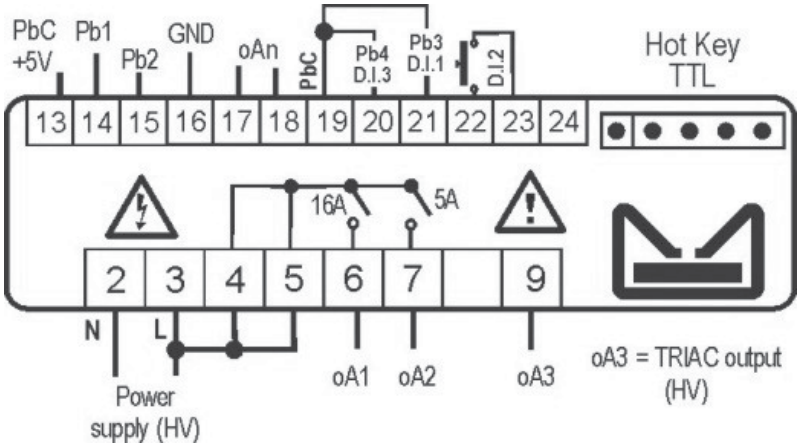
- XC35CX Controller
- Pressure Transducers (Ratiometric 0-5VDC)
- Temperature Sensors (NTC86k, NTC10k, PT1000)
- Monitoring Adapter Tool (RS485 output converter)

CONTROLLER INPUTS, PRESSURE AND TEMPERATURE SENSORS

Pb1 Suction pressure transducer (ratiometric transducer 0-5V), Terminals #13, #14 and #16
Pb2 Condensing pressure transducer (ratiometric transducer 0-5V), Terminals #13, #15 and #16
Pb3 Discharge temperature sensor, Terminals #19 and #21 (Low temp units only (L8))

CONTROLLER OUTPUTS

oA1 Relay Output (16A), Terminal #3 and #6
oA2 Relay Output (5A), Terminals #3 and #7 (*)
oAn Analogue Output, Terminals #17 & #18 (EC Fan speed control input)



(*) Controllers with firmware 3.8 and higher only

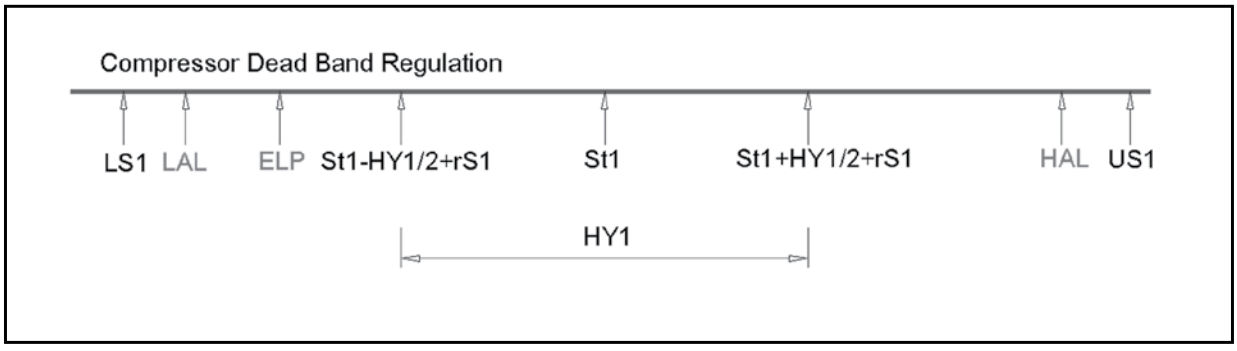
FIXED COMPRESSOR REGULATION (Controlling parameters: Configuration Setpoint and alarms)

Basic Setup Parameters and Settings "P1" programming level System Modes

Parameter	Description	Low	Med	Prog. Level
St1	SETPOINT 1 for compressor regulation (suction line)	**7**	**27**	Pr1
HY1	Regulation band for SETPOINT 1	**14**	**20**	Pr1
2on	Minimum delay between two compressor start-ups (min)	**0**		Pr1
2oF	Delay between compressor switch-off and start-up (min)	**2**		Pr1

Advanced Setup Parameters and Settings "P2" programming level

Parameter	Description	Low	Med	Prog. Level
oA1	Digital output AUX1 configuration (Relay 16A)	CP1		Pr2
CPb	Compressor regulation probe (suction pressure transducer)	P1		Pr2
rtY	Type of regulation: dead band	db		Pr2
rS1	Offset for HY1, used to move the regulation band above and below the setpoint St1	0		Pr2
LS1	Minimum value for SETPOINT 1	-13		Pr2
US1	Maximum value for SETPOINT 1	135		Pr2
Con	Compressor ON in case of probe error (min)	5		Pr2
CoF	Compressor OFF in case of probe error (min)	5		Pr2
dnF	Minimum time for any compressor activation (min)	0	0.3	Pr2
dLP	DLT probe selection (Low temp units only)	P3		Pr2
dLt	Discharge line temperature for compressor (°F) (Low temp units only)	230		Pr2
dth	Differential for compressor restart after a dLt alarm (°F)	30		Pr2
dLd	DLT alarm activation delay (sec)	60		Pr2
dCt	Cooling time for compressor after DLT alarm (min)	3		Pr2
dLn	Number of DLT alarms in dLi hours before lock out	4		Pr2
dLi	Time interval (in hours) in which to check dLn number of DLt alarms	0		Pr2
LAL	Lower limit for pressure alarm on suction line (psi)	-13	8	Pr2
HAL	Higher limit for pressure alarm on suction line (psi)	130	130	Pr2
ELP	Electronic pressure control threshold (Low pressure alarm on suction line) (psi)	-2	10	Pr2
PEn	Max number of pressure control activations (ELP) before signaling an alarm	5	5	Pr2
PEi	Interval of time to count the actuations of the pressure control (ELP) before lock out	10	10	Pr2



- Compressor is activated when Suction pressure (Pb1) is higher than St1+HY1/2+rS1
- Compressor is inactivated when Suction pressure (Pb1) is lower than St1-HY1/2+rS1
- If Suction pressure is lower than **LAL** then **LA** alarm code generated (auto reset)
- If Suction pressure is higher than **HAL** then **HA** alarm code generated (auto reset)
- If Suction pressure is lower than **ELP** then **ELP** alarm code generated (auto reset)
- If **ELP** occurs **PEn** times within **PEi** then **ELL** (Electronic pressure switch lockout) alarm code generated (manual reset required)
- If Discharge Temperature (Pb3) is higher than **dLt** then **dLt** alarm code generated (auto reset)
- If **dLt** occurs **dLn** times within **dLi** then alarm code generated (manual reset required)

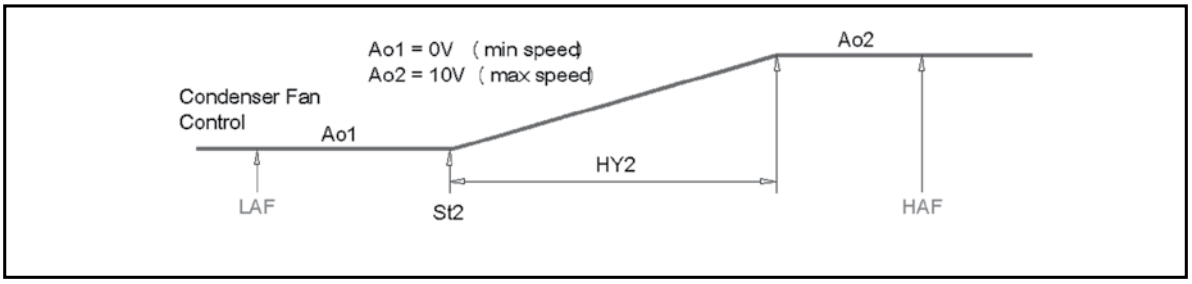
CONDENSER FAN REGULATION (Controlling parameters: configuration setpoint and alarms)

Basic Setup Parameters and settings "P1" programming level

Parameter	Description	Setting	Prog. Level
St2	Set point 2 (for CONDENSER FAN)	175	Pr1
HY2	Hysteresis for set point 2	15	Pr1

Advanced Setup Parameters and settings "P2" programming level

Parameter	Description	Setting	Prog. Level
oAn	Analogue output configuration (PWM or 0-10V)	EFn	Pr2
FPb	Fan probe	P2	Pr2
LS2	Minimum value for SETPOINT 2	125	Pr2
US2	Maximum value for SETPOINT 2	205	Pr2
LAF	Lower limit for pressure alarm on discharge line (psi)	100	Pr2
HAF	Higher limit pressure alarm on discharge line (psi)	410	Pr2
HFC	Compressor stop in case of alarm HAF	no	Pr2
dHF	Delay before stopping the compressor in case of an alarm due to high pressure	30	Pr2
PnF	Max number HAF alarms before lock out	5	Pr2
PiF	Interval of time to count the actuations HAF alarms before lock out (min)	60	Pr2



- Fan activated when Condensing pressure (Pb2) is higher than St2
- Fan runs at maximum speed when Condensing pressure (Pb2) is higher than St2 +HY2
- Fan runs at reduced speed proportional to Condensing pressure (Pb2) between St2 and St2 + HY2
- If Condensing pressure is lower than **LAF** then **L2** alarm code is generated (auto reset)
- If Condensing pressure is higher than **HAF** then **H2** alarm code is generated (auto reset)
- If **HAF** occurs **PnF** times within **PiF** then **HLL** (High pressure lockout alarm) alarm code is generated (manual reset required)

REAL TIME CLOCK SETTING:

1. Press and Hold until "HUr" is displayed.
2. Press SET. Value for "HUr" will show in display.
3. Adjust with or to set hour.
4. Press SET. Parameter "Min" will show in display.
5. Press SET again. Value for "Min" will show in the display.
6. Adjust with or to set minutes.
7. Press SET. Parameter "dAY" will show in display.
8. Press SET again. Value for "dAY" will show in display.
9. Adjust with or to set day of the week.
10. Press SET. Parameter "Hd1" will show in the display

EXIT: Press both SET + , or wait for 30 sec.

DEFROST AND PUMPDOWN DURATION SETTINGS:

- **Pdt = Pumpdown duration. Default setting 2 min**
  If after defrost initiation (Relay oA2 activation), compressor continues to work beyond "Pdt" time then alarm code "ALP" will be generated. Compressor will be stopped and defrost will continue until "otd" time elapses or input i2F is activated.

- **otd = Defrost duration. Default setting 40 minutes.**

SETTING "Pdt" OR "odt"

1. Press SET and for 3 sec
2. Scroll with or until "Pdt" or "otd" is displayed.
3. Press SET. Value for "Pdt" or "otd" will show in display (default values: 2 min / 40 min)
4. Change the value for "Pdt" or "otd" with or until desired value is displayed
5. Press SET again. New value for "Pdt" or "otd" will be stored and saved.
6. Press both SET and or wait 30 seconds to EXIT

(*) Controllers with firmware 3.8 and higher only

REAL TIME CLOCK AND DEFROST FUNCTIONS (Controlling parameters: Configuration Setpoint, alarms and defrost schedule)

Parameter	Description	Low	Medium	Prog. Level
Std	Set point for Pump-down	7	27	Pr2
HYd	Hysteresis for Pump-down	14	20	Pr2
Pdt	Pump down duration	2		Pr1
otd	Off time defrost duration	40		Pr1
oA2	Digital output AUX2 configuration (Relay 5A)	PdU		Pr2
i2F	Digital input 2 function	PdE		Pr2
i2P	Digital input 2 polarity	CL		Pr2
dF1	1st Defrost Cycle starting time	nu		Pr1
dF2	2nd Defrost Cycle starting time	nu		Pr1
dF3	3rd Defrost Cycle starting time	nu		Pr1
dF4	4th Defrost Cycle starting time	nu		Pr1
dF5	5th Defrost Cycle starting time	nu		Pr1
dF6	6th Defrost Cycle starting time	nu		Pr1
dF7	7th Defrost Cycle starting time	nu		Pr1
dF8	8th Defrost Cycle starting time	nu		Pr1

DEFROST SCHEDULE CONFIGURATION (*)

- By default no defrost events are scheduled
- It is possible to program up to 8 Defrost events (setup parameters dF1 through dF8)
- To initiate Defrost events setup dF1 through dF8 parameters as shown below
- Setup as many defrost events as required (up to 8 events)
- Adjustment resolution for Defrost events is 10 min
- Any Dfx parameter with any value different than "nu" will initiate defrost at the time defined by Dfx value
- Set to "nu" all Dfx parameters that are not required to initiate any Defrost cycle (default setting)
- Example for Dfx settings to initiate four defrost cycles starting at 12:00 PM, 18:00 PM, 00:00 AM and 06: 00 AM
  - Set Df1 --> 12:00
  - Set Df2 --> 18:00
  - Set Df3 --> 00:00
  - Set Df4 --> 06:00
  - Set Df5 through Df8 --> "nu"
- Defrost Cycle by default is programed for 40 min. ("otd" parameter)
- If new duration for defrost cycle is required change parameter "otd" accordingly
- Electrical Defrost termination is either by time ("otd" parameter) or by temperature with digital input provided by Defrost termination thermostat (see typical wiring diagrams for electrical defrost systems)
- Parameters i2F (Digital input function) and i2P (Digital input polarity) are preset to complete digital input termination of Defrost Cycle (see default settings for Defrost configuration parameters table)

1. Press and Hold until "HUr" is displayed.
2. Press multiple times until parameter "dF1" shows in display.
3. Press SET. Value for "dF1" will show in display.
4. Adjust with or to set first defrost event. (in 10 min. increments)
5. Press SET again. Parameter "dF2" will show in display.
6. Adjust with or to set second defrost event. (in 10 min. increments)
7. Press SET again. Parameter "dF3" will show in display.
8. Adjust with or to set third defrost event. (in 10 min. increments)

Continue with the same procedure to set all required defrost events.

To inactivate "x" Defrost event, set parameter "dFx" to "nu" value.

MANUAL INITIATION / TERMINATION OF THE DEFROST CYCLE

1. Press and Hold when system is in refrigeration to start defrost.
2. Press and Hold when system is in defrost to start refrigeration.

NOTES:

- Parameters "Std" and "Hyd" are set with the same values as "St1" and "HY1".
- It is recommended to re-adjust accordingly if "St1" and "HY1" are modified.
- Parameter "Pdt" is set to 2 min.
- If after this time has eleapsed and compressor has not stopped then compressor is forced, OFF and "ALP" label will be displayed. (Pressing any button on the keypad will erase "ALP")

(*) Controllers with firmware 3.8 and higher only

PROBE CONFIGURATIONS

Parameter	Description	Setting	Prog. Level
Suction Probe (Pb1), Suction Pressure Transducer			
P1P	Suction pressure probe P1 presence	Y	Pr2
P1C	Suction pressure transducer configuration	0-5	Pr2
P1i	Start of scaling for Suction pressure transducer (psi)	-15	Pr2
P1E	End of scaling for Suction pressure transducer (psi)	135	Pr2
P1F	Suction pressure transducer calibration (psi)	0	Pr2
P1d	Suction pressure transducer reading error delayed (min)	15	Pr2
Condensing Probe (Pb2), Condensing Pressure Transducer			
P2P	Condensing pressure probe P2 presence	Y	Pr2
P2C	Condensing pressure transducer configuration	0-5	Pr2
P2i	Start of scaling for Condensing pressure transducer (psi)	0	Pr2
P2E	End of scaling for Condensing pressure transducer (psi)	507	Pr2
P2F	Condensing pressure transducer calibration (psi)	0	Pr2
P2d	Probe P2 reading error delayed (if P2C=0-5) (min)	0	Pr2
Discharge Temperature Probe (Pb3), Discharge Temperature Sensor			
P3P	Discharge temperature P3 sensor presence	n *	Pr2
P3C	Probe P3 configuration	ntC	Pr2
P3F	Probe P3 calibration (°F)	0	Pr2
dEr	Delay before activating probe error (sec)	0	Pr2
PnF	Max number HAF alarms before lock out	5	Pr2
PiF	Interval of time to count the actuations HAF alarms before lock out	60	Pr2

* n - when probe is not active Y - when probe is active (low temp models only)

USER INTERFACE: Display, Icon description

LED	STATUS	MEANING
°C	ON	Unit of measurement for temperature is Celsius degrees
°F	ON	Unit of measurement for temperature is Fahrenheit degrees
bar	ON	Unit of measurement for pressure is Bar
PSI	ON	Unit of measurement for pressure is PSI
1	ON	Relay output oA1 enabled
	BLINKING	Delay in relay output oA1 activation
2	ON	Relay output oA2 enabled
	BLINKING	Delay in relay output oA2 activation
3	ON	Relay output oA3 enabled
	BLINKING	Delay in relay output oA3 activation
	ON	Analogue output active
	ON	(SER) Service menu
	BLINKING	(SER) Outputs in service mode
	ON	(ALR) Alarm active
	ON	(MEM) At least an alarm present into memory
	BLINKING	(MEM) A new alarm is occured and need to be checked
	ON	Real Time Clock Menu(*)

USER INTERFACE: Keyboard, Navigation modes

SET	**Standard visualization:** Used to see and modify the SETPOINT values. In programming mode, it is used to modify a parameter or confirm an operation **ALARM menu:** Keep it pressed for 3 sec in order to reset an alarm
	(UP) Programming mode: Used to browse the parameter list **With inserted HOT-KEY:** start the parameter UPLOAD function (from HOT-KEY to internal memory) **INFO menu:** Used to browse the INFO menu
	(DOWN) Programming mode: Used to browse the parameter list **With inserted HOT-KEY:** start the parameter DOWNLOAD function (from internal memory to the HOT-KEY) **INFO menu:** Used to browse the INFO menu
Start	**Manual load restart:** If parameter r1F=rSt, press this button to restart the loads and previously stopped due to safety alarm **ON-OFF:** If parameter r2F=onF, keep this button pressed for 3 sec to switch ON and OFF the instrument
	SERVICE / CLOCK (*): to enter CLOCK (*) and SERVICE menu
	STORED ALARMS: Gives access to the stored alarms (MEM)

+	To lock and unlock the keyboard
SET +	To enter the programming parameter menu
SET +	To exit from INFO and ALARM menu and from programming parameter menu

(*) Controllers with firmware 3.8 and higher only

SET POINTS VISUALIZATION, MODIFICATION

Visualization:

1. Press and release the SET button
2. SUCTION: the display will show the label St1 (Suction Pressure)
3. Press the SET button again to show the value of St1
4. CONDENSING: press the SET button once again
5. The display shows label St2 (Condensing Pressure)
6. Press the SET button again to show the value of St2

EXIT: Press both SET + UP or wait for 30 sec

Modification:

1. Press the SET button for 3 sec
2. The display will show St1
3. Press the SET button again to show the value of St1 (Suction Pressure)
4. Change the value of St1 by pressing the UP or DOWN
5. Press the SET button to save the set value in memory and move to St2
6. The display will show St2 (Condensing Pressure)
7. Press the SET button again to show the value of St2
8. Change the value of St2 by pressing the UP or DOWN

EXIT: Press both SET + UP or wait for 30 sec

Parameter Programming: Accessing Programing menu level, Parameter modification:

1. Keep both SET+DOWN buttons pressed for 3 sec
2. The display will show the name of the first parameter in the Pr1 level menu
3. Keep both SET+DOWN buttons pressed for 7 sec (if required to enter Pr2 level)
4. The display will show the label Pr2
5. Select the parameter to modify by using UP or DOWN buttons
6. Press the SET key to access to the stored value
7. Change the value of the parameter using the UP and DOWN buttons
8. Press the SET button to store the new value and move to the next parameter

EXIT: Press both SET + UP or wait for 30 sec

Programming controller with HOT-KEY

1. Turn off the device
2. Insert HOT-KEY into the 5-pin port paying attention to the polarity and then turn the device on again
3. The list of parameters present in the HOT-KEY memory will be automatically downloaded into the device memory. The word “doL” will appear during this operation. At the end of this operation the display will blink the “End” label
4. After 10 sec the device will restart automatically
5. Remove the HOT-KEY

NOTE: the "Err" message on the display indicates that the operation is not successful (transfer error). In this case, turn off and then on again the device in order to restart the operation or remove the HOT-KEY to abort the operation.

ALARM MENU: Alarm Codes, Alarm Logs, Alarm Reset

Alarm Codes

Code	Description
HA	High pressure alarm on the suction line
LA	Low pressure alarm on the suction line
H2	High pressure alarm on the discharge line
HLL	High pressure lockout alarm
L2	Low pressure alarm on the discharge line
dLt	High Discharge temperature alarm
dLL	Lockout due to DLT alarm
ELP	Electronic pressure switch (warning)
ELL	Electronic pressure switch (lockout)
HP	High pressure alarm from external sensor (warning)
LP	Low pressure alarm from external sensor (warning)
HPL	High pressure alarm from external sensor (lockout)
ALP (*)	Pump down time longer than programmed (*)

Alarm Visualization

1. Press the alarm archive (MEM) button 
2. Scroll with UP or DOWN button up to label AL0 (first alarm event memorized)
3. Press SET button to enter the event submenu
4. The encoding label relative to the logged event (Alarm Code) will be displayed
5. Press SET button again to display the duration of the alarm event recorded
6. Press the SET button to move to the next alarm event

Alarm Reset

1. Enter the ALARM menu
2. To reset the alarm list, keep the SET button pressed for 5 sec until the message "CLr" blinks on the display
3. To reset the only event displayed, keep the ALR button pressed for 3 sec until the message "rSA" blinks on the display

NOTE: the current alarms will not reset

MORE INFORMATION AND FUNCTIONALITIES

For more controller functions and information please refer to controller instruction manual, available at https://climate.emerson.com/documents/xc15cx-xc35cx-en-gb-3723474.pdf or scan this QR code:

CONTROLLER INSTRUCTION MANUAL

(*) Controllers with firmware 3.8 and higher only