CONTROL PANELS

HEATREX

Heatrex can provide a control system for any electric process heating application. Standard and custom sized enclosures, along with standard and custom designed control operation, give Heatrex the flexibility to supply a wide range of control panels to complete the heater control system.

Our experienced engineering staff can design control systems ranging from ON/OFF logic to fully proportional SCR, multiple channel and ramp/soak control with computer interface capability.

Heatrex offers two standard control panel designs: Fully proportional SCR control and ON/OFF contactor control. All components are factory mounted and wired in compliance with the National Electric Code and are UL and/or CSA listed.

A Vernier control panel can also be supplied. Vernier control utilizes contactors, one SCR controller, and a microprocessor-based sequencer. The sequencer controls the staging of the contactors and the SCR controller. The SCR controller serves to fill in the gaps between the step-controlled stages. Vernier control is not quite as accurate as full SCR control, but more accurate than contactor (step) control.

Custom control panels, designed specifically for your application, are also available.

Control Panel Quick Selection/Application Guide

	Agency Listing	UL Type Rating			Max Amp Rating	Availability	Cost	Page
		4	4X	12				
873 Series Contactor Panel	cULus	X^2	X^2	X^2	96	Stock	$	3
873 Series SCR Panel	cULus	X^2		X^2	96	Stock	$	4
870 Series Contator Control Panel	cULus/CSA	X	X^1	X	576	Assembly Stock	$$	5-6
870 Series SCR Control Panel	cULus/CSA	X	X^1	X	576	Assembly Stock	$$	7-8

(1) Available as Option
(2) Although designed and tested for use in outdoor locations, agency rating is Type 1 only

The Quick Ship Contactor Temperature Control panel provides fast shipment, compact packaging, and is pre-engineered for resistive load applications. The panel is completely assembled, pre-wired, tested, and ready for trouble free installation and operation.

Designed for use in industrial environments and outdoor installations.[4]
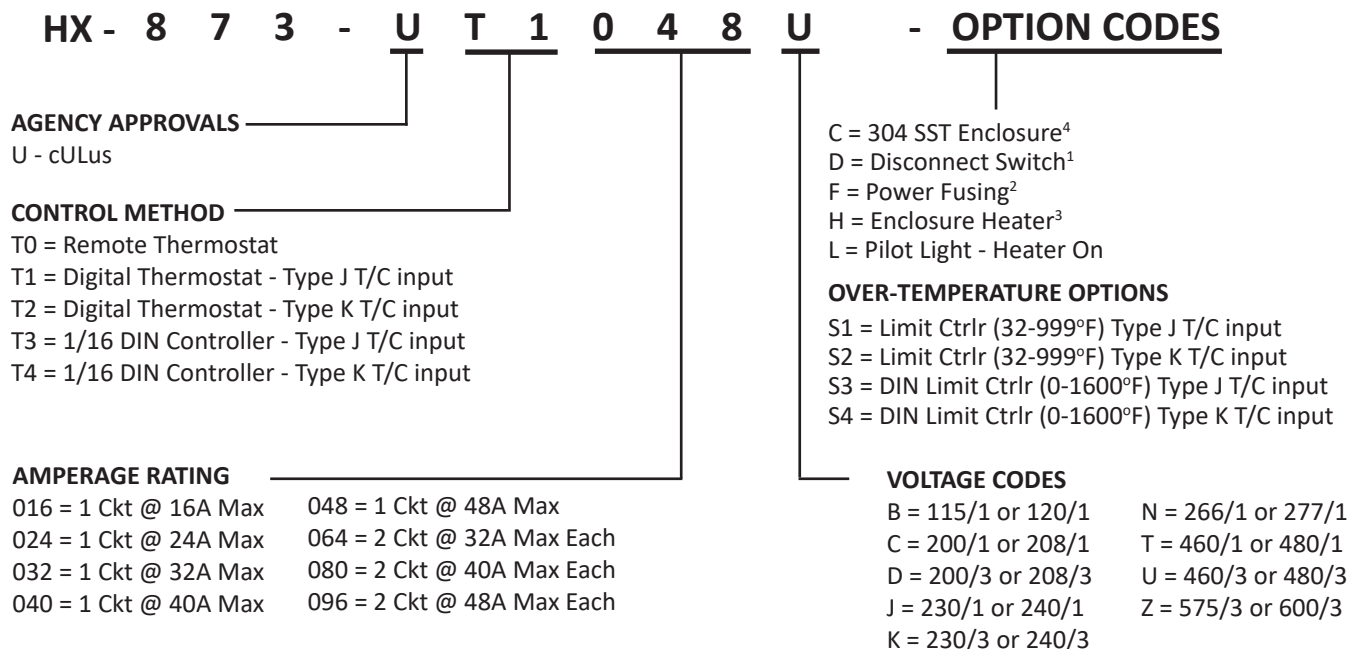
STANDARD CONSTRUCTION FEATURES:
- NEMA 4X Fiberglass Enclosure
- 16"H x 14"W x 8"D Enclosure for 1 Circuit (48A max)
- 20"H x 16"W x 8"D Enclosure for 2 Circuits (48-96A)
- Single or Three Phase Loads
- 50 Amp Contactor for Resistive Loads (per circuit)
- 120 VAC Control Transformer
- UL Listed[4] and evaluated by UL to CSA stds -cULus
- Wiring Diagram Permanently Affixed to the Inside of the Cover
- Terminals for Customer Supplied Remote Interlock
- Short Circuit Current Rating of 5 KA

OPTIONAL FEATURES:
- ☐ Digital Indicating Thermostat (°F only) 32-999°F range
- ☐ Digital 1/16 th DIN Process Controller with RS485 Communications available (°F or °C) 0-1600°F range
- ☐ Disconnect Switch[1]
- ☐ Power Fusing[2]
- ☐ Enclosure Heater[3]
- ☐ Pilot Light for Indication of Heater "ON"
- ☐ Digital Indicating Limit Control with manual reset (°F only) 32-999°F range
- ☐ 1/16th DIN Digital Indicating Limit Control with manual reset (°F or °C) 0-1600°F range
- ☐ 304 SST NEMA 4X Enclosure[4]

ORDERING INFORMATION
Quick Ship, build your catalog number

HX - 8 7 3 - U T 1 0 4 8 U - OPTION CODES

AGENCY APPROVALS
U - cULus

CONTROL METHOD
T0 = Remote Thermostat
T1 = Digital Thermostat - Type J T/C input
T2 = Digital Thermostat - Type K T/C input
T3 = 1/16 DIN Controller - Type J T/C input
T4 = 1/16 DIN Controller - Type K T/C input

AMPERAGE RATING
016 = 1 Ckt @ 16A Max   048 = 1 Ckt @ 48A Max
024 = 1 Ckt @ 24A Max   064 = 2 Ckt @ 32A Max Each
032 = 1 Ckt @ 32A Max   080 = 2 Ckt @ 40A Max Each
040 = 1 Ckt @ 40A Max   096 = 2 Ckt @ 48A Max Each

C = 304 SST Enclosure[4]
D = Disconnect Switch[1]
F = Power Fusing[2]
H = Enclosure Heater[3]
L = Pilot Light - Heater On

OVER-TEMPERATURE OPTIONS
S1 = Limit Ctrlr (32-999°F) Type J T/C input
S2 = Limit Ctrlr (32-999°F) Type K T/C input
S3 = DIN Limit Ctrlr (0-1600°F) Type J T/C input
S4 = DIN Limit Ctrlr (0-1600°F) Type K T/C input

VOLTAGE CODES
B = 115/1 or 120/1   N = 266/1 or 277/1
C = 200/1 or 208/1   T = 460/1 or 480/1
D = 200/3 or 208/3   U = 460/3 or 480/3
J = 230/1 or 240/1   Z = 575/3 or 600/3
K = 230/3 or 240/3

Note:
1.   NEC code requires disconnecting means within sight of a heater.
2.   Power fusing is required by NEC for panels greater than 48 amps.
3.   Heater is recommended for outdoor panels in cold environments with ambient below 32°F.
4.   Although designed and tested for use in outdoor locations, UL rating is Type 1 only.

873 Series Quick Ship SCR Control Panel

The Quick Ship SCR Temperature Control panel provides fast shipment, precise temperature control, compact packaging, and is pre-engineered for resistive load applications. The panel is completely assembled, pre-wired, tested, and ready for trouble free installation and operation.

Designed for use in industrial environments and outdoor installations.[4]

STANDARD CONSTRUCTION FEATURES:
- NEMA 4/12 Painted Steel Enclosure
- 20"H x 16"W x 8"D Enclosure for 1 Circuit (48A max)
- 24"H x 20"W x 8"D Enclosure for 2 Circuits (48-96A)
- Single or Three Phase Loads
- 50 Amp SCR Power Controller (per circuit)
- 50 Amp Safety Contactor (per circuit)
- 120 VAC Control Transformer
- UL Listed[4] and evaluated by UL to CSA stds -cULus
- Wiring Diagram Permanently Affixed to the Inside of the Cover
- Terminals for Customer Supplied Remote Interlock
- Short Circuit Current Rating of 5 KA

OPTIONAL FEATURES:
- ☐ Digital 1/16th DIN PID Process Controller with RS485 Communications available
- ☐ Disconnect Switch[1]
- ☐ Power Fusing[2]
- ☐ Enclosure Heater[3]
- ☐ Pilot Light for Indication of Power "ON"
- ☐ Digital Indicating Limit Control with manual reset (°F only) 32-999°F range
- ☐ 1/16th DIN Digital Indicating Limit Controller with manual reset (°F or °C) 0-1600°F range
- ☐ 304 SST NEMA 4X Enclosure[4]

ORDERING INFORMATION
Quick Ship, build your catalog number

HX - 8 7 3 - U E 1 0 4 8 U - OPTION CODES

AGENCY APPROVALS
U - cULus

CONTROL METHOD
E0 = Customer Supplied 3-32 VDC Pulsed Input
E1 = 1/16 DIN Controller - Type J T/C input
E2 = 1/16 DIN Controller - Type K T/C input
E3 = Customer Supplied 4-20 mA Input
E4 = Customer Supplied 0-10 VDC Input

AMPERAGE RATING
016 = 1 Ckt @ 16A Max   048 = 1 Ckt @ 48A Max
024 = 1 Ckt @ 24A Max   064 = 2 Ckt @ 32A Max Each
032 = 1 Ckt @ 32A Max   080 = 2 Ckt @ 40A Max Each
040 = 1 Ckt @ 40A Max   096 = 2 Ckt @ 48A Max Each

C = 304 SST Enclosure[4]
D = Disconnect Switch[1]
F = Power Fusing[2]
H = Enclosure Heater[3]
L = Pilot Light - Heater On
(across safety contactor)

OVER-TEMPERATURE OPTIONS
S1 = Limit Ctrlr (32-999°F) Type J T/C input
S2 = Limit Ctrlr (32-999°F) Type K T/C input
S3 = DIN Limit Ctrlr (0-1600°F) Type J T/C input
S4 = DIN Limit Ctrlr (0-1600°F) Type K T/C input

VOLTAGE CODES
B = 115/1 or 120/1   N = 266/1 or 277/1
C = 200/1 or 208/1   T = 460/1 or 480/1
D = 200/3 or 208/3   U = 460/3 or 480/3
J = 230/1 or 240/1   Z = 575/3 or 600/3
K = 230/3 or 240/3

Note:
1. NEC code requires disconnecting means within sight of a heater.
2. Power fusing is required by NEC for panels greater than 48 amps.
3. Heater is recommended for outdoor panels in cold environments with ambient below 32°F.
4. Although designed and tested for use in outdoor locations, UL rating is Type 1 only.

The 870 Series Contactor Temperature Control panel is ON/OFF process temperature control and is recommended for applications that do not demand precise temperature control. Systems with two or more heating stages utilize an electronic sequencer (step controller) driven by a proportional output temperature controller to minimize the amount of load cycling while providing good temperature control. The panel is completely assembled, pre-wired, tested, and ready for trouble free installation and operation. Designed for use in industrial environments and outdoor installations.
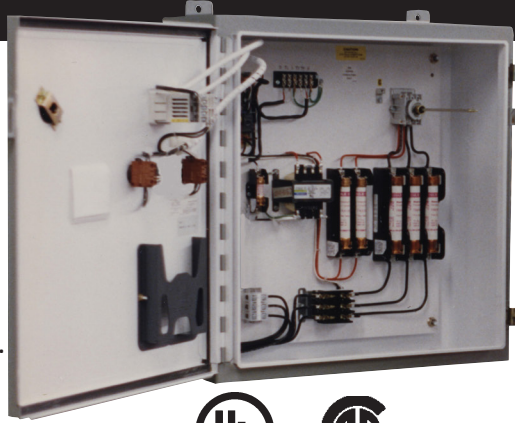
STANDARD CONSTRUCTION FEATURES:

- UL Listed/CSA Approved
- NEMA 4/12 Painted Steel Enclosure[1]
- PID self-tuning temperature controller (adjustable process temperature with standard type "J" thermocouple input)
- Over-temperature controller (adjustable temperature limit with standard type "J" thermocouple input)
- Disconnecting 50 Amp contactor for resistive loads (per circuit)
- 120 VAC control power transformer with primary and secondary fusing
- Power circuit fusing
- Microprocessor-based sequencer (for panels with two or more heating stages)
- Door interlocking disconnect switch
- Manual reset pushbutton with built-in pilot light (red) for "OVER-TEMPERATURE" alarm
- Selector Switch – ON/OFF with built-in pilot light (green) for "POWER ON" indication
- Terminals for customer supplied remote interlock
- Wiring diagram permanently affixed to the inside of the cover
- Short Circuit Current Rating of 5 KA

OPTIONAL FEATURES:

☐ **Control Relays** – These relays are activated by safety devices, such as a flow switch or remote shutoff.
☐ **Indicator Lights** – Additional indicator lights may be specified for visual indication of system status, such as "LOW TEMPERATURE".

(1) Agency listed for UL Type 4 or 4X only
(2) Agency listing for purged panels is cULus only (not CSA)

☐ **Audible Alarm Package** – Includes a horn, pilot light, latching relay and a push button for silencing the horn.
☐ **Low Liquid Cutoff** – The relay is mounted and wired with sensing probe shipped loose for field installation.
☐ **Motor Starter** – This package consists of a motor starter for pump motor start-up. Motor starter is internally mounted and field connected to the pump motor.
☐ **Special Controllers** – The customer may specify the use of special process or over-temperature controllers for a different temperature range, sensor input, control mode, etc.
☐ **Panel Heater** – A heater and thermostat are provided to prevent condensation and maintain minimum ambient temperature for electrical components.
☐ **Wire Markers** – Identification markers are attached to both ends of all control and power wires.
☐ **Tagging of Internal Parts** – Permanent tags are attached to the subpanel near internal parts and marked with component titles as noted on the wiring diagram.
☐ **Explosion-Resistant Panel** – A cast aluminum enclosure is rated for Class I, Groups C & D and Class II, Groups E, F & G (NEMA 7, 9).
☐ **Purged Panels[2]** – Type Z for Class I, Division 2 areas Type X for Class I, Division 1 areas.
☐ **Optional Temperature Inputs** – Type "K" thermocouple inputs or "RTD" inputs.
☐ **Stainless Steel Panel Enclosure (NEMA 4X)** – This construction provides extra corrosion resistance for harsh environments[1].
☐ **Special Ratings** – 100 KA interupting amp rating.

ORDERING INFORMATION
Build your catalog number

HX - 8 7 0 - Z C 0 0 4 8 B U - 0 0 0 0 0 0

AGENCY APPROVALS
 U - cULus
 N = Non-UL
*Z - cULus/CSA

CONTROL METHOD
 C = Contactor
 S = SCR

AMP RATING
(Rounded to the nearest Amp)

NEMA TYPE
 A = (1) Standard Indoor — non-hazardous location
*B = (4) Standard Outdoor — non-hazardous location
 C = (7,9) Standard Indoor — hazardous location
 D = (4,7,9) Standard Outdoor - hazardous location
 E = (4X,7,9) Outdoor w/salt spray — hazardous and non-hazardous locations
 F = (9) Indoor Class II, Groups E, F, G hazardous locations only
 G = (4X) Outdoor w/salt spray — non-hazardous location
 J = (12) Dust-tight Indoor — non-hazardous location

SERIAL NUMBER
(Only used with custom designs)

VOLTAGE CODES
C = 208/1	T = 480/1
D = 208/3	U = 480/3
J = 240/1	X = 575/3
K = 240/3	Z = 600/3
O - custom voltage	

*Standard Catalog Construction

CATALOG CONTACTOR CONTROL PANELS

Max KW 240/3	Max KW 480/3	No. of Circuits	Amps Per Circuit	Catalog Number with Maximum Amps		Dimensions (Inches)			Estimated Weight (lbs)
				240V/3PH	480V/3PH	Height	Width	Depth	
19	39	1	48	870-ZC0048BK	870-ZC0048BU	24	24	8	90
39	79	2	48	870-ZC0096BK	870-ZC0096BU	30	30	8	140
59	119	3	48	870-ZC0144BK	870-ZC0144BU	36	30	8	165
79	159	4	48	870-ZC0192BK	870-ZC0192BU	42	30	8	180
99	199	5	48	870-ZC0240BK	870-ZC0240BU	48	36	8	270
119	239	6	48	870-ZC0288BK	870-ZC0288BU	48	36	8	275
139	279	7	48	870-ZC0336BK	870-ZC0336BU	60	36	12	345
159	319	8	48	870-ZC0384BK	870-ZC0384BU	60	36	12	350
179	359	9	48	870-ZC0432BK	870-ZC0432BU	*60	48	12	630
199	399	10	48	870-ZC0480BK	870-ZC0480BU	*60	48	12	635
219	438	11	48	870-ZC0528BK	870-ZC0528BU	*60	60	12	720
239	478	12	48	870-ZC0576BK	870-ZC0576BU	*60	60	12	725

*These panels have double doors and 12" high floor stands.

The 870 Series SCR Control panel is a fully proportional process temperature control panel that utilizes SCR Power Controllers to modulate the entire heater load directly, varying the heater output from 0 to 100% of the total heater KW. Working on a four second time base, the heater will be energized only for the number of AC cycles necessary to produce the exact amount of heat required. The resulting precise control and rapid response make the 870 Series SCR Control Panel the best choice for applications that must accommodate material flow changes and still provide precise temperature control. The panel is completely assembled, pre-wired, tested, and ready for troublefree installation and operation. Designed for use in industrial environments and outdoor installations.
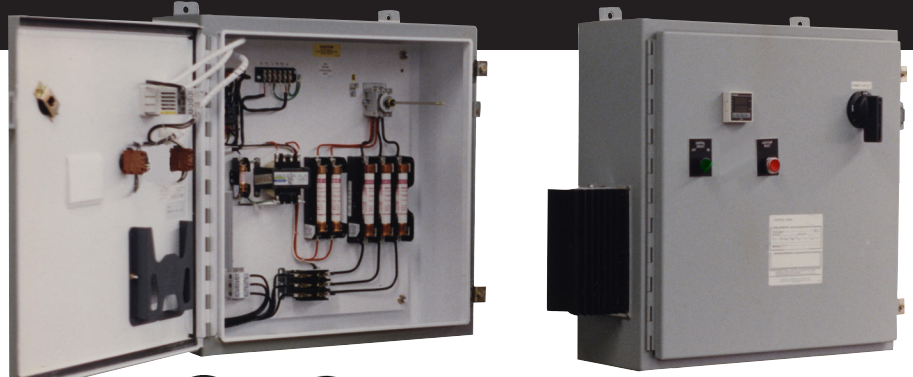
STANDARD CONSTRUCTION FEATURES:

- UL Listed/CSA Approved
- NEMA 4/12 painted steel enclosure[1]
- PID self-tuning temperature controller (adjustable process temperature with standard type "J" thermocouple input)
- Over-temperature controller (adjustable temperature limit with standard type "J" thermocouple input)
- Disconnecting 50 amp safety contactor for resistive loads (per circuit)
- 120 VAC control power transformer with primary and secondary fusing
- Power circuit fusing
- Three-phase, zero cross-fired SCR power controllers
- Door interlocking disconnect switch
- Manual reset pushbutton with built-in pilot light (red) for "OVER-TEMPERATURE" alarm
- Selector Switch – ON/OFF with built-in pilot light (green) for "POWER ON" indication
- Terminals for customer supplied remote interlock
- Wiring diagram permanently affixed to the inside of the cover
- Short Circuit Current Rating of 5KA

OPTIONAL FEATURES:

- ☐ **Control Relays** – These relays are activated by safety devices, such as a flow switch or remote shutoff.
- ☐ **Indicator Lights** – Additional indicator lights may be specified for visual indication of system status, such as "LOW TEMPERATURE".

- ☐ **Audible Alarm Package** – Includes a horn, pilot light, latching relay and a push button for silencing the horn.
- ☐ **Low Liquid Cutoff** – The relay is mounted and wired with sensing probe shipped loose for field installation.
- ☐ **Motor Starter** – This package consists of a motor starter for pump motor start-up. Motor starter is internally mounted and field connected to the pump motor.
- ☐ **Special Controllers** – The customer may specify the use of special process or over-temperature controllers for a different temperature range, sensor input, control mode, etc.
- ☐ **Panel Heater** – A heater and thermostat are provided to prevent condensation and maintain minimum ambient temperature for electrical components.
- ☐ **Wire Markers** – Identification markers are attached to both ends of all control and power wires.
- ☐ **Tagging of Internal Parts** – Permanent tags are attached to the subpanel near internal parts and marked with component titles as noted on the wiring diagram.
- ☐ **Explosion-Resistant Panel** – A cast aluminum enclosure is rated for Class I, Groups C & D and Class II, Groups E, F & G (NEMA 7, 9).
- ☐ **Purged Panels[2]** – Type Z for Class I, Division 2 areas Type X for Class I, Division 1 areas.
- ☐ **Optional Temperature Inputs** – Type "K" thermocouple inputs or "RTD" inputs.
- ☐ **Stainless Steel Panel Enclosure (NEMA 4X)** – This construction provides extra corrosion resistance for harsh environments[1].
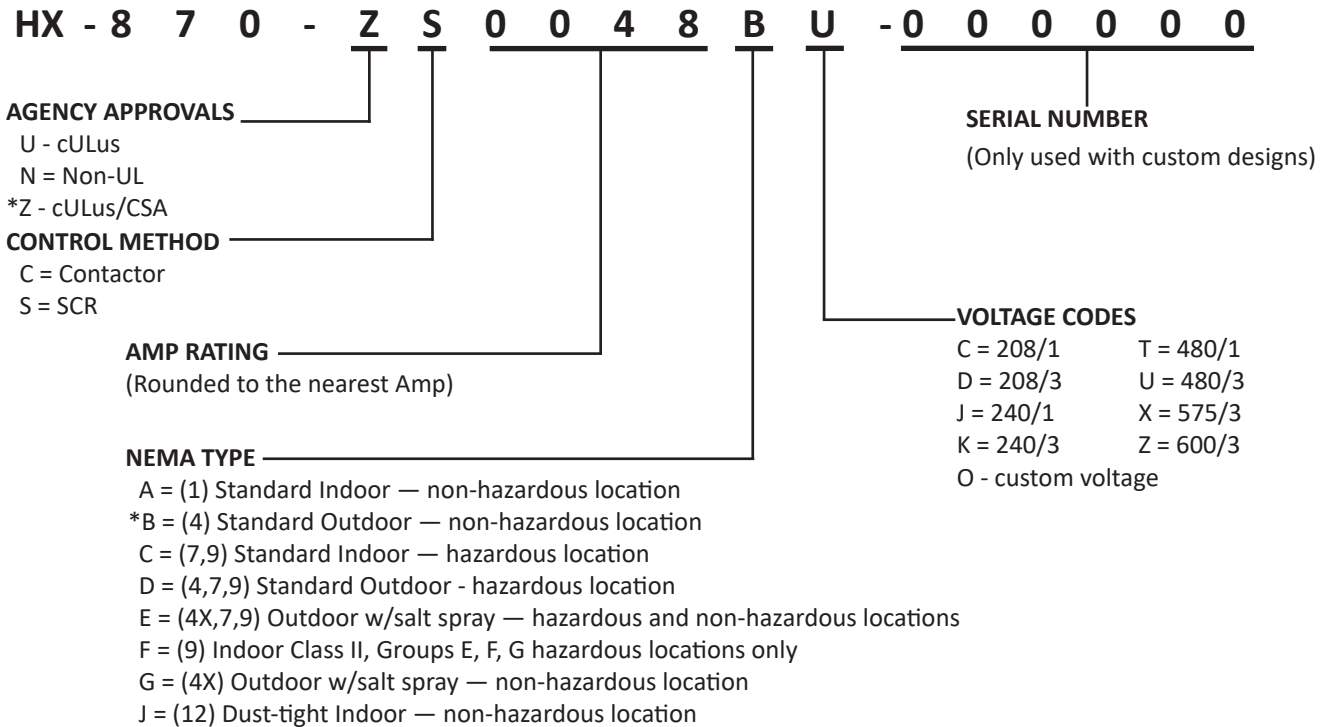- ☐ **Special Ratings** – 100 KA interupting amp rating.

(1) Agency listed for UL Type 4 or 4X only
(2) Agency listing for purged panels is cULus only (not CSA)

870 Series SCR Control Panel

ORDERING INFORMATION
Build your catalog number

HX - 8 7 0 - Z S 0 0 4 8 B U - 0 0 0 0 0 0

AGENCY APPROVALS
  U - cULus
  N = Non-UL
  *Z - cULus/CSA

CONTROL METHOD
  C = Contactor
  S = SCR

AMP RATING
  (Rounded to the nearest Amp)

NEMA TYPE
  A = (1) Standard Indoor — non-hazardous location
  *B = (4) Standard Outdoor — non-hazardous location
  C = (7,9) Standard Indoor — hazardous location
  D = (4,7,9) Standard Outdoor - hazardous location
  E = (4X,7,9) Outdoor w/salt spray — hazardous and non-hazardous locations
  F = (9) Indoor Class II, Groups E, F, G hazardous locations only
  G = (4X) Outdoor w/salt spray — non-hazardous location
  J = (12) Dust-tight Indoor — non-hazardous location

SERIAL NUMBER
(Only used with custom designs)

VOLTAGE CODES
  C = 208/1   T = 480/1
  D = 208/3   U = 480/3
  J = 240/1   X = 575/3
  K = 240/3   Z = 600/3
  O - custom voltage

*Standard Catalog Construction

CATALOG SCR CONTROL PANELS

Max KW 240/3	Max KW 480/3	No. of Circuits	Amps Per Circuit	Catalog Number with Maximum Amps		Dimensions (Inches)			Estimated Weight (lbs)
				240V/3PH	480V/3PH	Height	Width	Depth	
19	39	1	48	870-ZS0048BK	870-ZS0048BU	24	**24	8	90
39	79	2	48	870-ZS0096BK	870-ZS0096BU	30	**30	8	140
59	119	3	48	870-ZS0144BK	870-ZS0144BU	36	**30	8	165
79	159	4	48	870-ZS0192BK	870-ZS0192BU	42	**30	8	185
99	199	5	48	870-ZS0240BK	870-ZS0240BU	48	**36	8	275
119	239	6	48	870-ZS0288BK	870-ZS0288BU	48	**36	8	280
139	279	7	48	870-ZS0336BK	870-ZS0336BU	60	**36	12	360
159	319	8	48	870-ZS0384BK	870-ZS0384BU	60	**36	12	365
179	359	9	48	870-ZS0432BK	870-ZS0432BU	*60	**48	12	645
199	399	10	48	870-ZS0480BK	870-ZS0480BU	*60	**48	12	650
219	438	11	48	870-ZS0528BK	870-ZS0528BU	*60	**60	12	745
239	478	12	48	870-ZS0576BK	870-ZS0576BU	*60	**60	12	750

*These panels have double doors and 12" high floor stands.
** Additional 9" clearance required for externally mounted heat sinks which may be mounted on one of both sides of the enclosure.