Temperature Control Panel Wiring Diagram

Model: ISPA-120-IP-15A

Shift Controls, Inc.

Installed Options:
- ☒ *TC Terminal Block*
- ☐ *Interlock Relay, RLY-1*
- ☒ *15A Power Cord*

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Temperature Control Panel Specifications	
Model Number	ISPA-120-IP-15A
Rated Voltage	120 VAC
Phases	Single
Power Controller	Zero Crossing SSR
Rated Frequency	60 Hz
SCCR	100 kA
Control Voltage	120 VAC
Maximum Fuse Size	20 Amps, Class CC, High Speed
Maximum Full Load Current	15 Amps, Resistive
Maximum Load	1800 W
Enclosure Type	Nema 4X
Operating Environment	0 - 35 deg C, 10-85% RH, Non-Condensing, Indoor Use Only

REV.	DATE	DRAWN BY	DESCRIPTION
A	03/14/16	B. KETTLER	FOR CONSTRUCTION

DRAWING TYPE: WIRING SCHEMATIC

DRAWING DESCRIPTION: CONTROL PANEL SPECIFICATIONS AND WIRE COLOR STANDARDS

DRAWING NUMBER: E-ISPA-120-IP-15A

SHEET NUMBER: SHEET i

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Fuse Replacement Voltage, Amperage, Class and Type Reference

FUSE REPLACEMENT NOTES:
1) Fuses are to be replaced with fuses of the same voltage rating, current rating, and fuse type.

Fuse Name	Description	Voltage Rating	Maximum Value	Fuse Type		Manufacturer Equivalent		
						Edison	Bussmann	Littelfuse
F1, F2	Main Power Branch Fusing	600	20 Amps	Class CC	Fast-Acting	HCLR	KTK-R	KLKR
F3	Control Circuit Supply Fusing	250	1 Amp	5x20mm	Fast-Acting	GMA	GMA	235

Main Branch Fuse Protection (F1) Ampacity Reference Table

FUSE SIZING NOTES:
1) The maximum resistive heater load is 15 Amps / 1800 Watts at 120 VAC 1-Phase.
2) Fuses are to be sized 125-160% of the heater full load.

Heater Full Load Rating		3A	3.5A	4A	5A	6A	8A	10A	12A	15A	17.5A	20A
Full Load Power, Watts	Minimum	225	263	300	375	450	600	750	900	1125	1313	1500
Full Load Power, Watts	Maximum	288	336	384	480	576	768	960	1152	1440	1680	1800
Full Load Current, Amps	Minimum	1.88	2.19	2.50	3.13	3.75	5.00	6.25	7.50	9.38	10.94	12.5
Full Load Current, Amps	Maximum	2.40	2.80	3.20	4.00	4.80	6.40	8.00	9.60	12.0	14.0	15

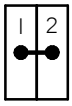
Standard Wire Colors	
120VAC, 1-Phase Power	Black (BK)
Neutral / Grounded AC	White (WH)
Gound Wires	Green (GN)
AC Control Power, 120VAC Ungrounded AC	Black (BK)
Thermocouple Cable	Type K - Yellow Cable, Type J - Black Cable
DC Signal wires	2-Conductor Cable
RS-485, Data	2-Conductor Cable

Customer Supplied Wire Size, Rating and Terminal Tightening Torque Reference

NOTES:
1) Conductor Sizing to be Determined by NEC and Local Codes
2) Control wiring (Terminals 93-98) to be Class II unless customer supplied circuits to Alarm 1 (Terminals 91, 92) are greater than 150 Volts. If customer supplied wiring is greater than 150 Volts, then all control wiring (Terminals 91-98) are to be Class I.

Terminal Number	Description	Wire					Tightening Torque	
		Conductor Material	Minimum Voltage Rating	Minimum Temp. Rating	Minimum Wire Size	Maximum Wire Size	Minimum	Maximum
91, 92	User Programable Alarm (Dry Contacts)	Copper	Class I	60 C	26AWG, 0.4mm See Note 1	10AWG, 2.5mm See Note 1	5.3 in*lb, 0.6 N*m	7.0 in*lb, 0.8 N*m
93, 94	Temp. Retransmit (4-20mA Sourcing)	Copper	Class II See Note 2	60 C	26AWG, 0.4mm See Note 1	10AWG, 2.5mm See Note 1	5.3 in*lb, 0.6 N*m	7.0 in*lb, 0.8 N*m
95, 96	RS-485 Modbus Communication	Copper	Class II See Note 2	60 C	26AWG, 0.4mm See Note 1	10AWG, 2.5mm See Note 1	5.3 in*lb, 0.6 N*m	7.0 in*lb, 0.8 N*m
97, 98	Thermocouple Input	TC Wire	Class II See Note 2	60 C	24AWG	14AWG Solid 16AWG Stranded	3.5 in*lb, 0.4 N*m	3.5 in*lb, 0.4 N*m
A1, A2	External Interlock (Option)	Copper	Class I	60 C	26AWG, 0.4mm See Note 1	14AWG, 1.6mm See Note 1	3.5 in*lb, 0.4 N*m	3.5 in*lb, 0.4 N*m

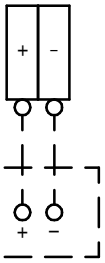
Wiring Schematic
Typical Symbols and Standards



Jumpered Terminal Blocks;
jumpers are shown connecting
center dots, terminal blocks are
numbered.

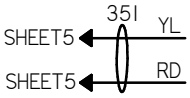
Grounded Terminal
Block - grounded to
DIN Rail and back panel

Fuse holder and
fuse,



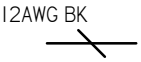
Customer field wiring
connection, at terminal block,
denoted by circles

Customer Supplied
Field Wiring

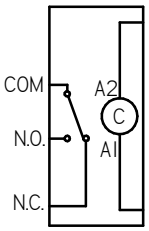


Multi-conductor cable labeled
with a single wire number.
Conductors labeled with wire
colors.

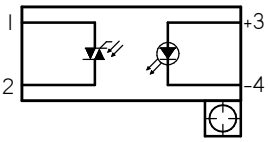
Customer supplied, field wiring



12 Gauge, Black Wire



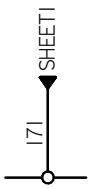
SPDT Mechanical Relay
Relay Coil marked as "C"
Switched contacts marked
as Common, Normally Open (N.O.)
and Normally Closed (N.C.).



Solid State Relay (SSR)
Right side terminals indicate
the signal side.
Left terminals show the normally
open, switched load side .

Ground Screw

A wire indicating its sheet destination.
The wire is marked with a 3-digit wire number,
indicating its source.
1st digit: SHEET, 2nd digit: ROW, 3rd digit: WIRE
In this example, the wire destination is SHEET 3
and is labeled wire 171. The source is
SHEET1, ROW7, and WIRE 1, within the row.



A wire indicating its sheet source.
The wire is arriving at a terminal is marked with a
3-digit wire number, indicating its source.
1st digit: SHEET, 2nd digit: ROW, 3rd digit: WIRE
In this example, the wire source is SHEET 1
and is labeled wire 171. The source is
SHEET 1, ROW 7, and WIRE 1, within the row.

REV.	DATE	DRAWN BY	DESCRIPTION
A	03/14/16	B. KETTLER	FOR CONSTRUCTION

DRAWING TYPE
WIRING SCHEMATIC

DRAWING DESCRIPTION
TYPICAL SYMBOLS, STANDARDS and
WIRE LABELING CONVENTIONS

DRAWING NUMBER
E-ISPA-120-IP-15A

SHEET NUMBER
SHEET iv

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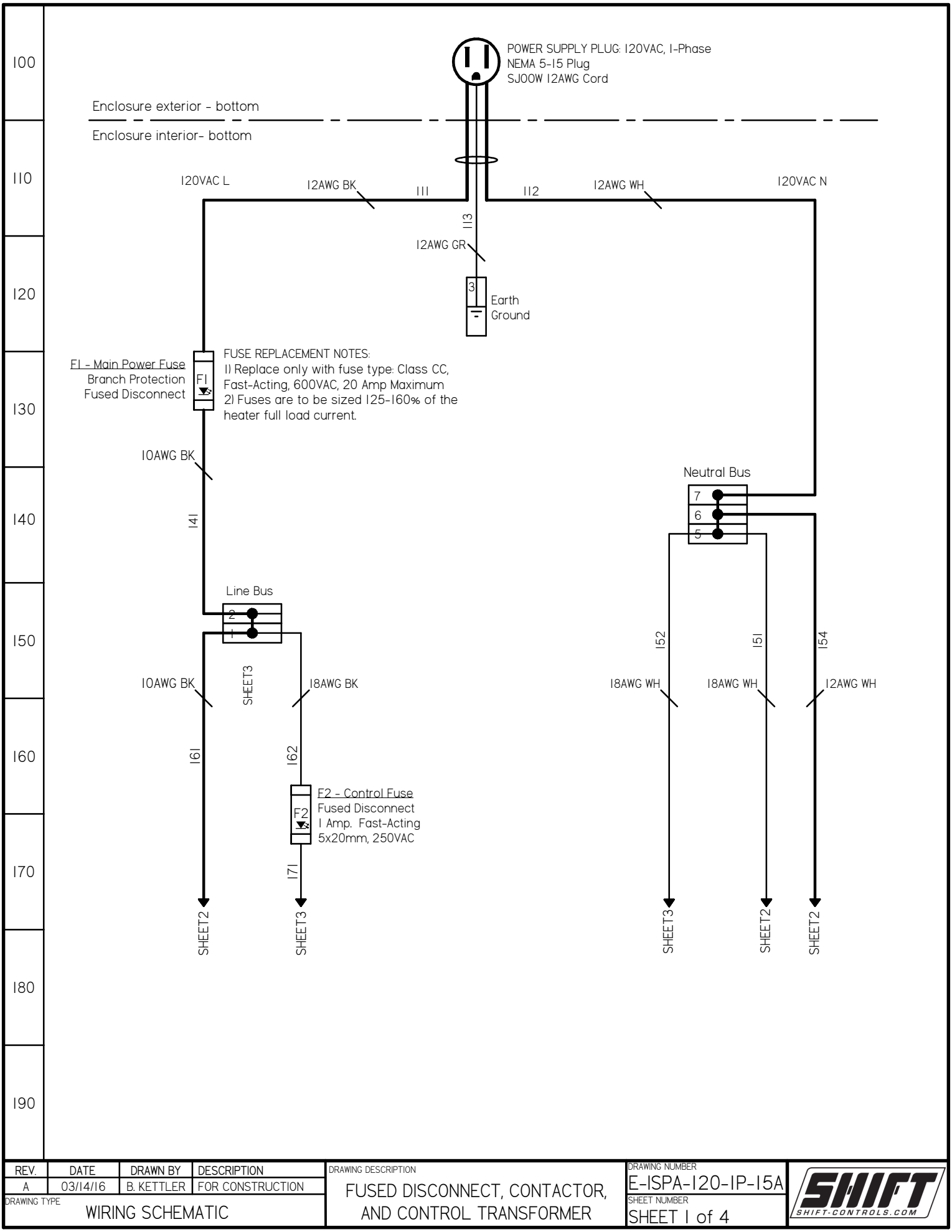

REV.	DATE	DRAWN BY	DESCRIPTION
A	03/14/16	B. KETTLER	FOR CONSTRUCTION

DRAWING TYPE
WIRING SCHEMATIC

DRAWING DESCRIPTION
FUSED DISCONNECT, CONTACTOR, AND CONTROL TRANSFORMER

DRAWING NUMBER
E-ISPA-120-1P-15A

SHEET NUMBER
SHEET 1 of 4

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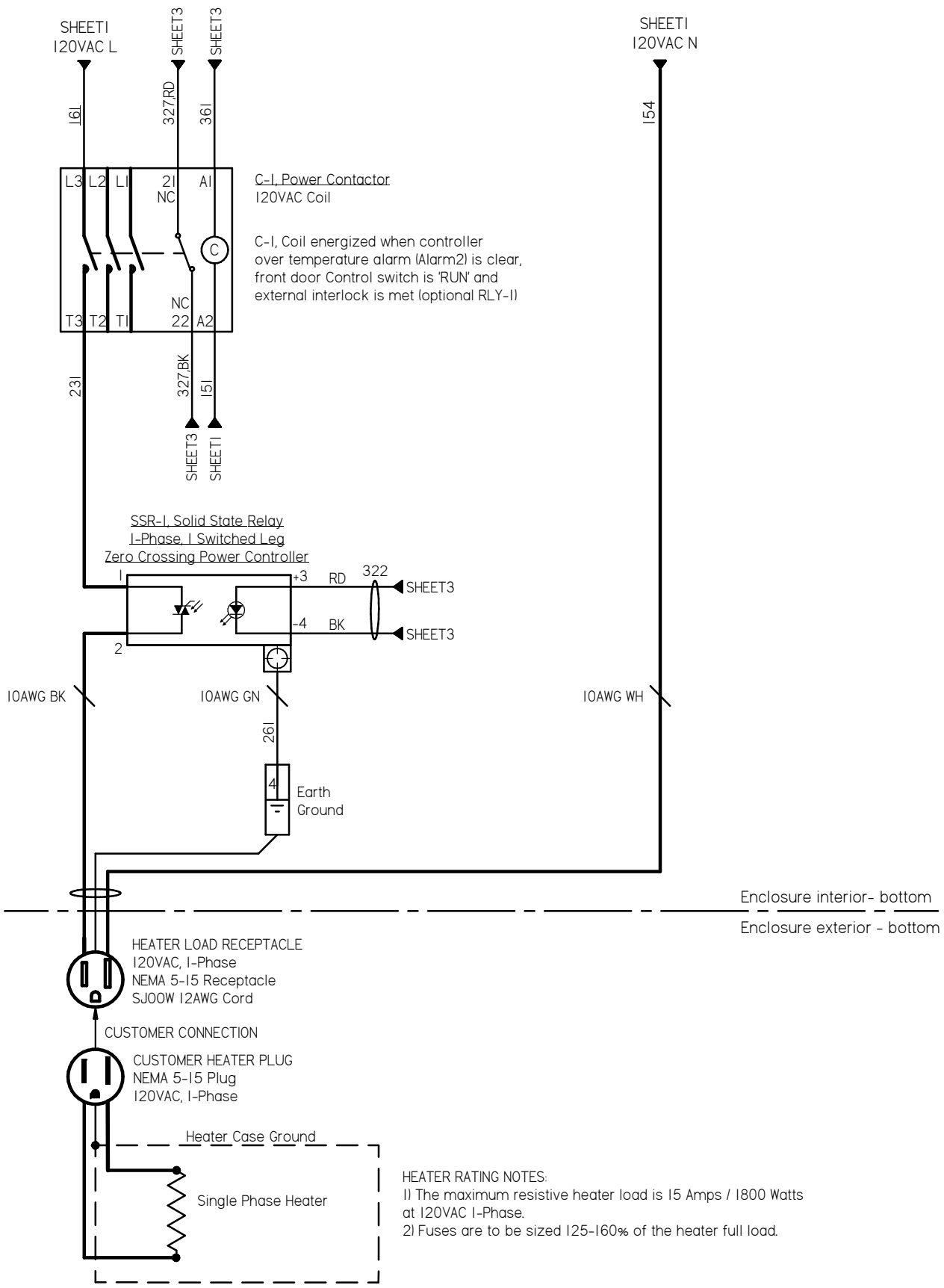

REV.	DATE	DRAWN BY	DESCRIPTION
A	03/14/16	B. KETTLER	FOR CONSTRUCTION

DRAWING TYPE: WIRING SCHEMATIC

DRAWING DESCRIPTION: POWER CONTROLLER AND ENCLOSURE COOLING

DRAWING NUMBER: E-ISPA-120-1P-15A

SHEET NUMBER: SHEET 2 OF 4

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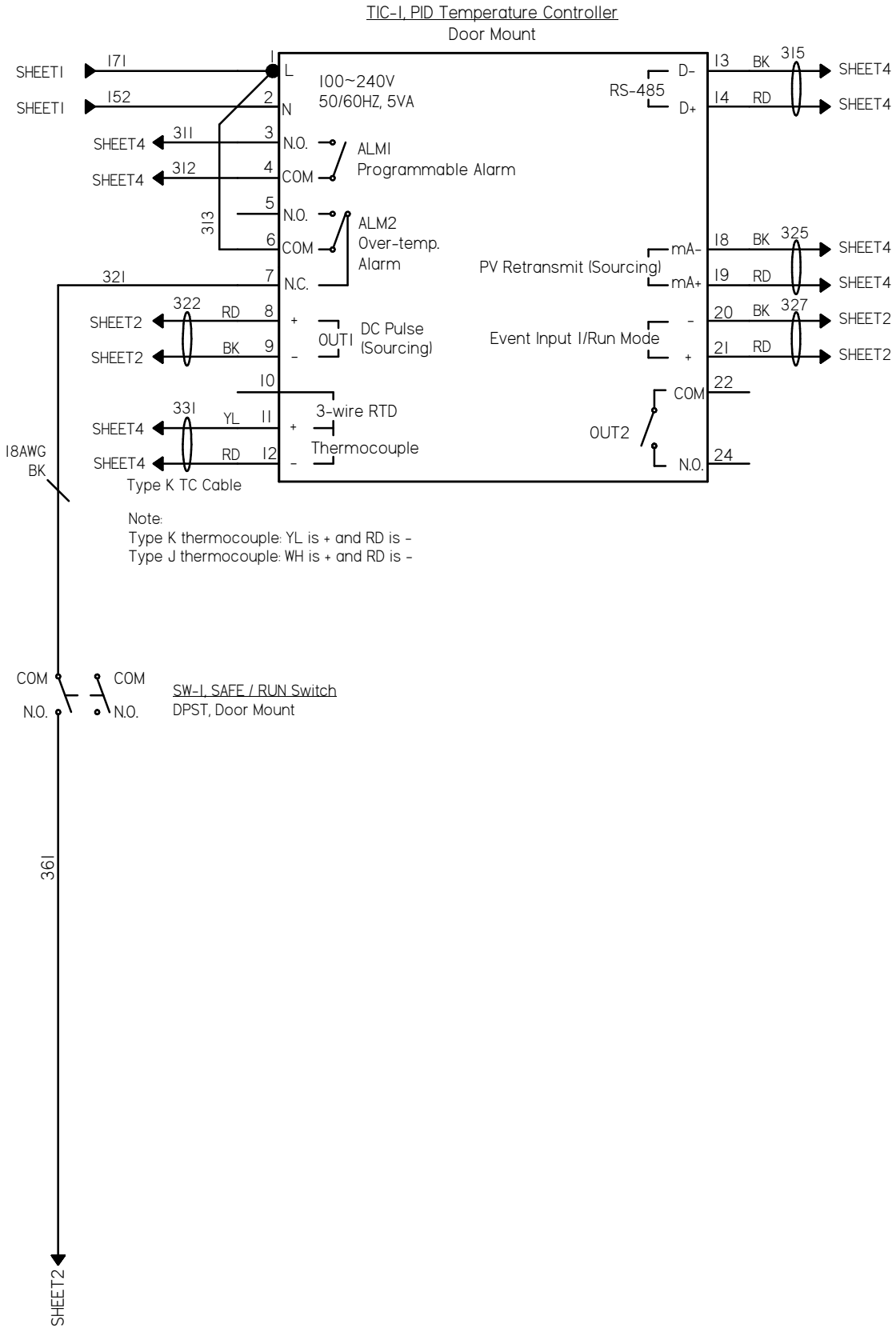

REV.	DATE	DRAWN BY	DESCRIPTION
A	03/14/16	B. KETTLER	FOR CONSTRUCTION

DRAWING TYPE: WIRING SCHEMATIC

DRAWING DESCRIPTION: TEMPERATURE CONTROLLER

DRAWING NUMBER: E-ISPA-120-IP-15A

SHEET NUMBER: SHEET 3 OF 4

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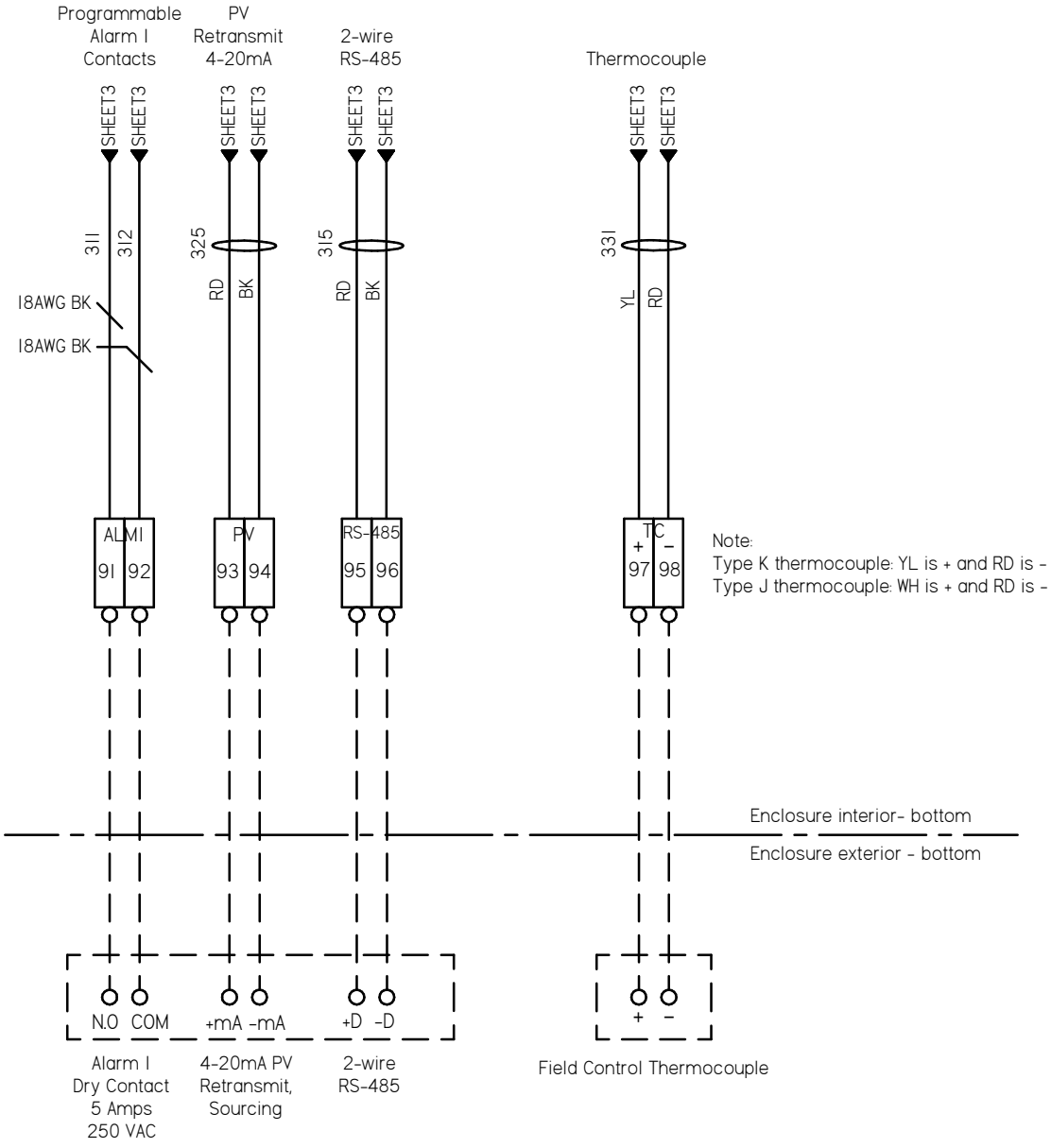
FIELD CONTROL TERMINALS (91-96)
#26 - #10 AWG (0.4-2.5 mm)
Use Minimum 60°C Copper Wire Only,
Terminal Torque: 5.4-7.0 Lb.-in. (0.6-0.8 N-m)

FIELD THERMOCOUPLE TERMINALS (97-98)
#24 - #14 AWG (0.5-1.6 mm)
Use Thermocouple Extension Wire Only,
Terminal Torque: 3.5 Lb.-in. (0.4 N-m)



CUSTOMER SUPPLIED FIELD WIRING
Use conduit hubs with a Nema 4X/12 rating.
Locate conduit entry on bottom of enclosure,
below terminal blocks 91-98.

NOTES:
1) Conductor Sizing to be Determined by NEC and Local Codes
2) Control wiring (Terminals 93-98) to be Class II unless customer supplied circuits to Alarm 1 (Terminals 91, 92) or optional Interlock (Terminals A1, A2) are greater than 150 Volts. If customer supplied wiring is greater than 150 Volts, then all control wiring (Terminals 91-98) are to be Class I.

REV.	DATE	DRAWN BY	DESCRIPTION
A	03/14/16	B. KETTLER	FOR CONSTRUCTION

DRAWING TYPE: WIRING SCHEMATIC

DRAWING DESCRIPTION: CONTROL FIELD CONNECTIONS

DRAWING NUMBER: E-ISPA-120-IP-15A

SHEET NUMBER: SHEET 4 OF 4

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