Colorado Department of Transportation
Golden, CO

SUBMITTAL MANUAL - SECTION 613

RTD Enclosures

For project:

Eisenhower/Johnson Memorial Tunnel 480V Motor Control Center Replacement

Owner: CDOT/Atkins Global

Contact:	Justin Ulrich
Contact Info:	
Project Number:	NHPP 0703-435

Engineer: WSP USA

Contact:	David Moeller, PE
Contact Info:	(720) 482-3618
Project Number:	

Electrical Contractor: Casey Industrial

Contact:	Aaron Saunders
Contact Info:	
Project Number:	

Contractor: Rexel Inc.

Contact:	Kathy Riley
Contact Info:	(303) 629-3145
Project Number:	

Prepared by: Huffman Engineering Inc.

Contact:	Sean Creager
Contact Info:	112 Inverness Circle East, Suite E Englewood, CO 80112
Project Number:	CMS203

Submittal Information		
Facility / Building / Area	Eisenhower/Johnson Memorial Tunnel	
General Contents / Description	RTD Enclosures	
Panel No. / Equipment No. / Etc.	East and West Fan RTD Enclosures	
Submittal Number	**613-004-A**	
Volume	**1 of 1**	
Specification Section(s)	613 – RTD Enclosures	
Submittal Type	☐Product Data	
	☐Informational	☐Interim O&M Manual
		☒Final O&M Manual

Revision History:	
REVA	07MAY2020
REVB	09SEP2021 – Final O&M

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RTD Enclosures
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STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	RELAY CONTACT, NORMALLY CLOSED
	RELAY CONTACT, NORMALLY OPEN
	LIMIT SWITCH, NORMALLY CLOSED
	LIMIT SWITCH, NORMALLY CLOSED, HELD OPEN
	LIMIT SWITCH, NORMALLY OPEN
	LIMIT SWITCH, NORMALLY OPEN, HELD CLOSED
	PRESSURE SWITCH, NORMALLY CLOSED
	PRESSURE SWITCH, NORMALLY OPEN
	PUSHBUTTON, NORMALLY CLOSED
	PUSHBUTTON, NORMALLY OPEN
	PUSHBUTTON, NORMALLY CLOSED, HELD OPEN
	MUSHROOM HEAD PUSH BUTTON, NORMALLY CLOSED
	MUSHROOM HEAD PUSH BUTTON, NORMALLY OPEN
	2 POSITION SELECTOR SWITCH, CLOSED
	2 POSITION SELECTOR SWITCH, OPEN
	TEMPERATURE SWITCH, NORMALLY CLOSED
	TEMPERATURE SWITCH, NORMALLY OPEN
	TIMER CONTACT, NORMALLY CLOSED, TIMED OPEN
	TIMER CONTACT, NORMALLY CLOSED, TIMED OPEN, SHOWN OPEN
	TIMER CONTACT, NORMALLY OPEN, TIMED CLOSED
	TIMER CONTACT, NORMALLY OPEN, TIMED CLOSED, SHOWN CLOSED
	FLOW SWITCH, NORMALLY CLOSED
	FLOW SWITCH, NORMALLY OPEN
	PROXIMITY SWITCH, NORMALLY OPEN
	LEVEL SWITCH, NORMALLY CLOSED
	LEVEL SWITCH, NORMALLY OPEN
	RELAY COIL
	SOLENOID VALVE
R	PILOT LIGHT (R=RED, A=AMBER, B=BLUE, G=GREEN)
	NODE
	TERMINAL BLOCK
	KNIFE TERMINAL BLOCK
	TERMINAL BLOCK, FUSED

ELECTRICAL SYMBOLS CONTINUED

SYMBOL	DESCRIPTION
	GROUND
M	MOTOR
	ALARM HORN
	MOTOR STARTER COIL
	FIELD WIRING
	INTERNAL PANEL WIRING
	CAPACITOR
	MOTION DETECTOR

NOTE:
THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT ON THE PLANS.

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
A	AMPERE, AMBER
AC	ALTERNATING CURRENT
AWG	AMERICAN WIRE GAUGE
BRN	BROWN
BLU	BLUE
BLK	BLACK
C	CONTACTOR
CB	CIRCUIT BREAKER
CR	CONTROL RELAY
DC	DIRECT CURRENT
DIV	DIVISION
ES	EMERGENCY STOP
ESR	EMERGENCY STOP RELAY
F, FU	FUSE
FB	FUSE BLOCK
GRN	GREEN
GND	GROUND
GFR	GROUND FAULT RELAY
H	HORN
HP	HORSEPOWER
IPT	CURRENT TO PRESSURE TRANSDUCER
J-BOX	JUNCTION BOX
KVA	KILOVOLT AMPS
LS	LIMIT SWITCH
LT FLEX	LIQUID TIGHT FLEX CONDUIT
M	MOTOR
MC	MOTOR CONTACTOR
MCC	MOTOR CONTROL CENTER
MCR	MASTER CONTROL RELAY
MHPB	MUSHROOM HEAD PUSHBUTTON
MS	MOTOR STARTER
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OL	OVERLOAD RELAY
ORN	ORANGE
P	POLE
PB	PUSHBUTTON SWITCH
PS	PRESSURE SWITCH, POWER SUPPLY
PT	PRESSURE TRANSMITTER
PIT	PRESSURE TO CURRENT TRANSDUCER
RTD	RESISTIVE TEMPERATURE DETECTOR
REV	REVERSE
SR	SAFETY RELAY
SS	SELECTOR SWITCH
SV	SOLENOID VALVE
TB	TERMINAL BLOCK
TC	THERMOCOUPLE
TDR	TIME DELAY RELAY
V	VOLTAGE
VA	VOLT AMPS
VFD	VARIABLE FREQUENCY DRIVE
VIO	VIOLET
W	WATT
WHT	WHITE
XFMR	TRANSFORMER
YEL	YELLOW
Ø	PHASE

FUSE SCHEDULE

FUSE#	QTY	FUSE TYPE	SIZE	MFGR	PART#	DESCRIPTION
FB1	1	CLASS CC	20A	MERSEN	ATDR20	RTD ENCLOSURE POWER
FB2	1	1/4"x1-1/4"	10A	BUSSMAN	AGC-10-RP	CHASSIS PS
FB3	1	1/4"x1-1/4"	2A	BUSSMAN	AGC-2-RP	PANEL LIGHT

LABEL DEFINITIONS

WIRE NUMBERS

E01A20A01
- LINE NUMBER ON THE DRAWING (01, 02, ETC.)
- WIRE POSITION ON THE LINE (A, B, ETC.)
- DRAWING NUMBER (E01A30, E01A40, ETC.)

THREE LINE WIRE NUMBERS

280-L100A
- WIRE POSITION
- A TWO DIGIT NUMBER
- PHASE
- A LETTER FOR SEPARATION
- VOLTAGE

CROSS REFERENCES

(E01A20:01)
- RAIL NUMBER
- DRAWING NUMBER

DRAWING NUMBERS

AA000-E01A20
- THESE TWO CHARACTERS INDICATE THE TYPE OF DRAWING
- LETTER INDICATES IF THIS IS THE ORIGINAL PROJECT OR SUBSEQUENT BUT ESSENTIALLY IDENTICAL PROJECT
- PANEL DESIGNATION WITHIN THE PROJECT. 00=DRAWINGS FOR PROJECT, BUT NOT PANEL SPECIFIC, 01=FIRST PANEL, 02=SECOND PANEL, ETC.
- DESIGNATES THE DRAWING AS ELECTRICAL
- PROJECT NUMBER

PANEL DRAWING INDEX

DESCRIPTION	DWG #
EAST RTD ENCLOSURE - INDEX SHEET	CMS203-E43A00
EAST RTD ENCLOSURE - BACK PANEL LAYOUT	CMS203-E43A01
EAST RTD ENCLOSURE - FRONT PANEL LAYOUT	CMS203-E43A02
EAST RTD ENCLOSURE - TERMINAL BLOCK LAYOUTS	CMS203-E43A03
EAST RTD ENCLOSURE - BILL OF MATERIAL	CMS203-E43A04
EAST RTD ENCLOSURE - CONTROL POWER DISTRIBUTION	CMS203-E43A16
EAST RTD ENCLOSURE - RTD INPUTS	CMS203-E43A40
EAST RTD ENCLOSURE - RTD INPUTS	CMS203-E43A40
EAST RTD ENCLOSURE - RTD INPUTS	CMS203-E43A40
EAST RTD ENCLOSURE - RTD INPUTS	CMS203-E43A40
EAST RTD ENCLOSURE - RTD INPUTS	CMS203-E43A40
EAST RTD ENCLOSURE - RTD INPUTS	CMS203-E43A40
EAST RTD ENCLOSURE - RTD INPUTS	CMS203-E43A40

WIRE COLOR CODE

COLOR	DESCRIPTION
BLACK	ALL UNGROUNDED CIRCUIT CONDUCTORS OPERATING AT A VOLTAGE GREATER THAN 120VAC
WHITE OR GREY	GROUNDED AC CURRENT CARRYING CONTROL CIRCUIT CONDUCTOR
GREEN OR GREEN/YELLOW	GROUNDING CONDUCTOR
BLUE	UNGROUNDED DC CONTROL CIRCUITS
WHITE/BLUE STRIPE	DC COMMON CONTROL CIRCUIT CONDUCTOR
ORANGE	UNGROUNDED CONTROL CIRCUITS OR OTHER WIRING THAT MAY BE ENERGIZED WHEN MAIN DISCONNECT IS OFF
WHITE/ORANGE STRIPE	GROUNDED AC CONTROL CIRCUIT CURRENT CARRYING CONDUCTOR THAT REMAINS ENERGIZED WHEN THE MAIN DISCONNECT IS IN THE OFF POSITION
RED	UNGROUNDED CIRCUIT CONDUCTORS OPERATING AT 120VAC
VARIES	ANALOG INPUT, 2 COND. (SHIELDED)
VARIES	ANALOG OUTPUT, 2 COND. (SHIELDED)

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - INDEX SHEET

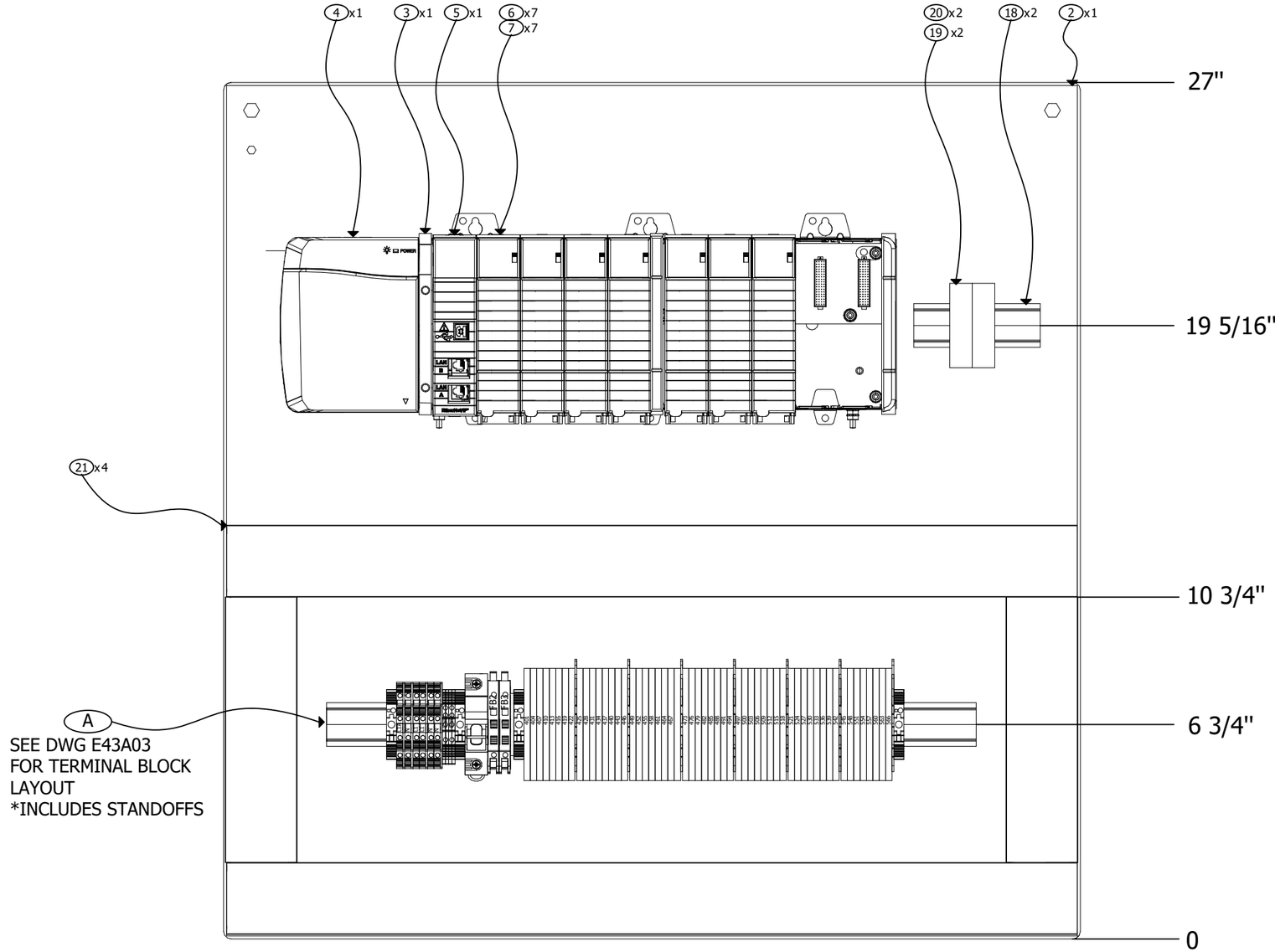
PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
2.1	07/07/20	ekilgore	FUSE CHANGE

HUFFMAN ENGINEERING INC.
5301 NORTH 57TH STREET
LINCOLN, NEBRASKA 68507
(402) 464-6823
112 INVERNESS CIRCLE EAST, SUITE E
ENGLEWOOD, COLORADO 80112
(303) 376-6280

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS
3.0	09/04/20	ekilgore	SHIPPED FOR ONSITE INSTALLATION
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
1.0	05/07/20	ekilgore	SUBMITTED FOR CUSTOMER APPROVAL
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A00



STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - BACK PANEL LAYOUT

PROJECT # CMS203 | SCALE 1:8 | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
2.1	09/04/20	ekilgore	SHOP REDLINES
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
0.1	05/08/20	ekilgore	DESIGN CHANGES

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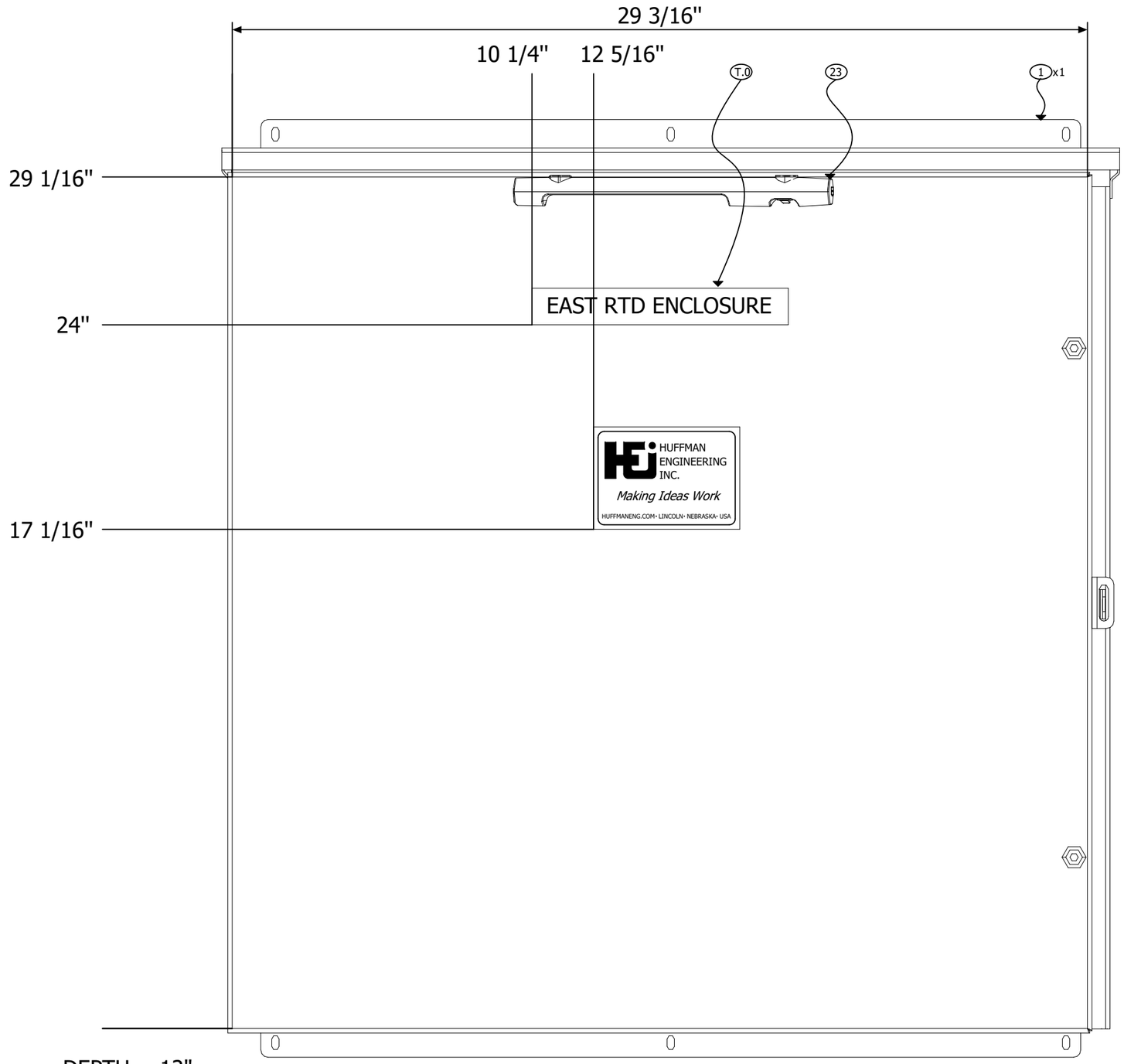
ENGLEWOOD, COLORADO 80112
(303) 376-6280

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS
3.0	09/04/20	ekilgore	SHIPPED FOR ONSITE INSTALLATION
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
1.0	05/07/20	ekilgore	SUBMITTED FOR CUSTOMER APPROVAL
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A01

CUSTOM BUILT BY	HUFFMAN ENGINEERING INC.			5301 North 57th Street Lincoln, NE 68507 402-464-6823		
PROJECT #	CMS203			DATE	MAY 2020	
PANEL #	EAST RTD ENCLOSURE					
INTERRUPT RATING	200kA			TOTAL FLA	20	
LARGEST MTR FLA	N/A			SCCR	10kA	
VOLTS	120	HZ. 60	PHASE 1	ENCL TYP	3R	
ELECT DWG INDEX #	CMS203-E43A00					

LEGEND PLATE SCHEDULE				
ITEM NO.	FIRST LINE	LEGEND PLATE COLOR	TEXT COLOR	TEXT HEIGHT
T.0	EAST RTD ENCLOSURE	BLACK	WHITE	1/2"



STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - FRONT PANEL LAYOUT

PROJECT # CMS203 | SCALE 1:10 | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
2.1	09/04/20	ekilgore	SHOP REDLINES
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
0.1	05/07/20	ekilgore	DESIGN CHANGES

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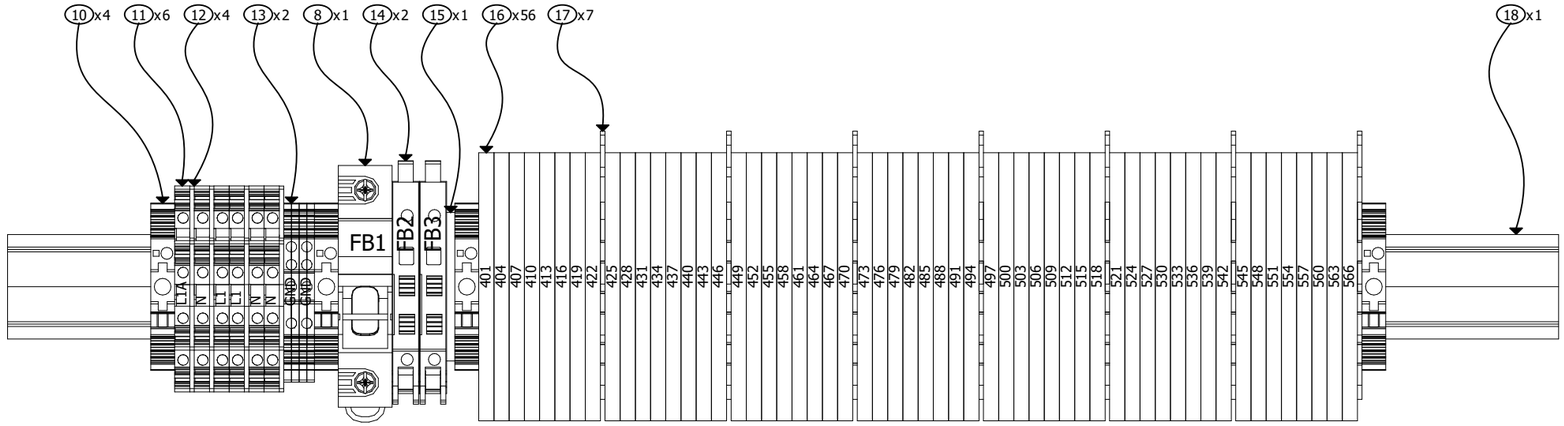
(303) 376-6280

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS
3.0	09/04/20	ekilgore	SHIPPED FOR ONSITE INSTALLATION
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
1.0	05/07/20	ekilgore	SUBMITTED FOR CUSTOMER APPROVAL
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A02

A



ITEM #	DESCRIPTION	TORQUE
1492-JD3C	TERMINAL BLOCK, 1P, 2 TIER	4.5-7.1 LB. IN.
1492-JG3	TERMINAL BLOCK, 2 TIER, GROUNDING	7.1 LB. IN.
1492-H4	FUSE TERMINAL BLOCK WITH INDICATION	7.1 LB. IN.
1492-WTF3	3 TIER TERMINAL BLOCK	4.2-4.6 LB. IN.

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - TERMINAL BLOCK LAYOUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS
2.1	07/07/20	ekilgore	TORQUE SCHEDULE

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(303) 376-6280

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS
3.0	09/04/20	ekilgore	SHIPPED FOR ONSITE INSTALLATION
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
1.0	05/07/20	ekilgore	SUBMITTED FOR CUSTOMER APPROVAL
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A03

ITEM #	QTY	MANUFACTURER	MANUFACTURERS P/N	DESCRIPTION
1	1	HOFFMAN	A30R3012HCR	30"X30"X12" NEMA 3R ENCLOSURE
2	1	HOFFMAN	A30P30	30"X30" BACKPANEL
3	1	ALLEN-BRADLEY	1756-A10	CONTROLLOGIX CHASSIS 10-SLOT
4	1	ALLEN-BRADLEY	1756-PA72	CONTROLLOGIX 85-265VAC, 10A POWER SUPPLY
5	1	ALLEN-BRADLEY	1756-EN2TR	CONTROLLOGIX HIGH CAPACITY DUAL PORT ETHERNET/IP MODULE
6	7	ALLEN-BRADLEY	1756-IRT8I	RTD/OHMS/THERMOCOUPLE INPUT MODULE, 8 CH.
7	7	ALLEN-BRADLEY	1756-TBCH	CONTROLLOGIX MODULE TERMINAL BLOCK
8	1	ALLEN-BRADLEY	1492-FB1C30-L	CLASS CC FUSE HOLDER, 1P, WITH INDICATION
9	1	MERSEN	ATDR20	20A FUSE, CLASS CC FUSE
10	4	ALLEN-BRADLEY	1492-EAJ35	TERMINAL BLOCK END ANCHOR
11	6	ALLEN-BRADLEY	1492-JD3C	TERMINAL BLOCK, 1P, 2 TIER
12	4	ALLEN-BRADLEY	1492-EBJD3	TERMINAL BLOCK, 2 TIER, GRAY, END BARRIER
13	2	ALLEN-BRADLEY	1492-JG3	TERMINAL BLOCK, 2 TIER, GROUNDING
14	2	ALLEN-BRADLEY	1492-H4	FUSE TERMINAL BLOCK WITH INDICATION
15	1	ALLEN-BRADLEY	1492-N37	FUSE TERMINAL BLOCK END BARRIER
16	56	ALLEN-BRADLEY	1492-WTF3	3 TIER TERMINAL BLOCK
17	7	ALLEN-BRADLEY	1492-EBTF3	3 TIER TERMINAL BLOCK END BARRIER
18	2	ENTRELEC	101 598.26	DIN MOUNTING RAIL
19	2	SIGNAMAX	KI-DIN-RMM-SL	DIN RAIL KEYSTONE JACK HOUSING
20	2	SIGNAMAX	KJ458MT-C6C-GY	CAT 6 KEYSTONE JACK
21	4	PANDUIT	F2X3LG6	NARROW SLOTTED WIRING DUCT, PVC
22	4	PANDUIT	C2LG6	2" WIRING DUCT COVER
23	1	HOFFMAN	LEDA1S35	ENCLOSURE LIGHT, 120V, LED

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - BILL OF MATERIAL

PROJECT # CMS203 | SCALE | ENG:E. KILGORE

REV	DATE	NAME	REMARKS

HUFFMAN ENGINEERING INC.
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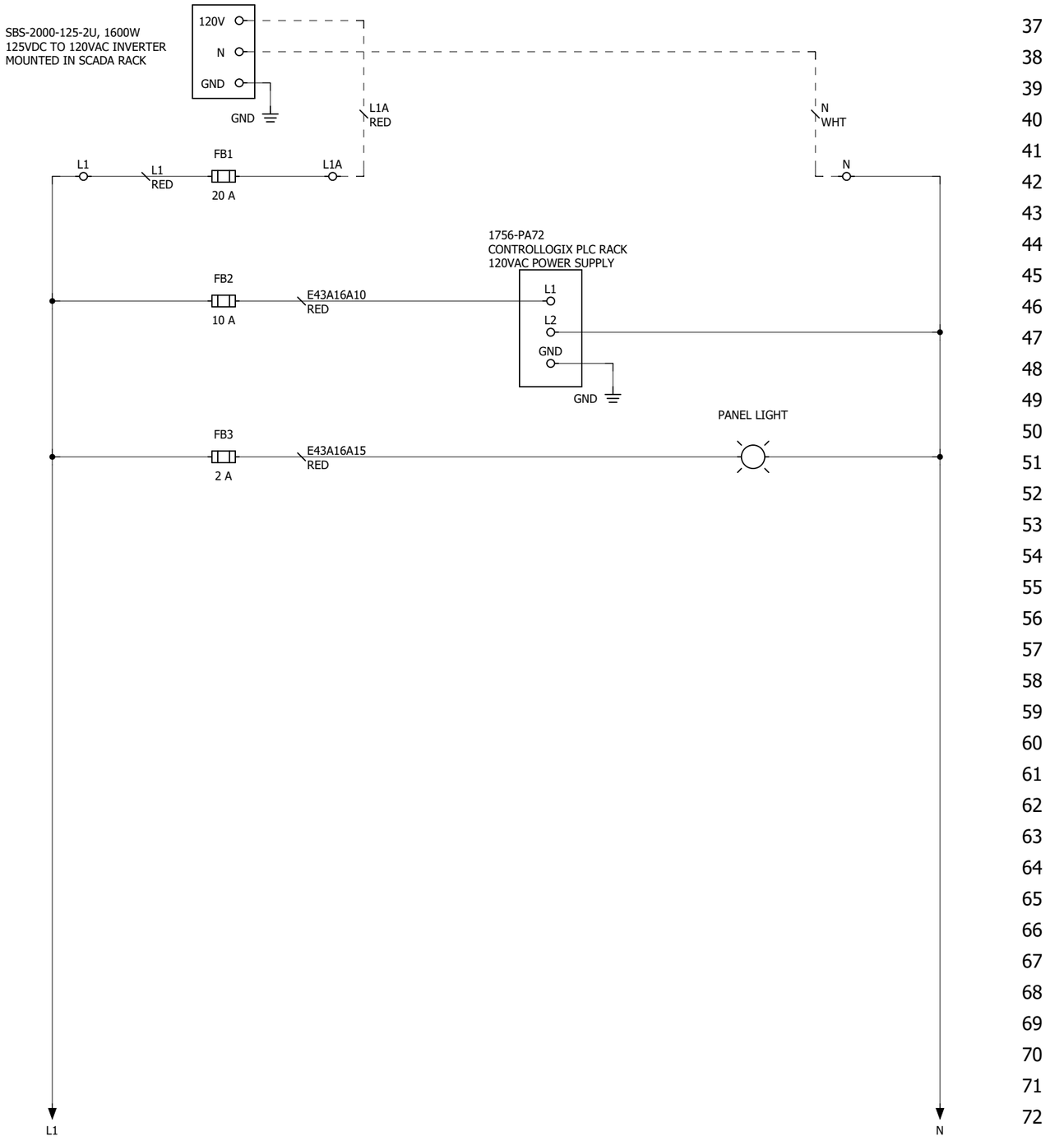
LINCOLN, NEBRASKA 68507
(402) 464-6823
112 INVERNESS CIRCLE EAST, SUITE E
ENGLEWOOD, COLORADO 80112
(303) 376-6280

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS
3.0	09/04/20	ekilgore	SHIPPED FOR ONSITE INSTALLATION
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
1.0	05/07/20	ekilgore	SUBMITTED FOR CUSTOMER APPROVAL
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A04



STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - CONTROL POWER DISTRIBUTION

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS

HUFFMAN ENGINEERING INC.
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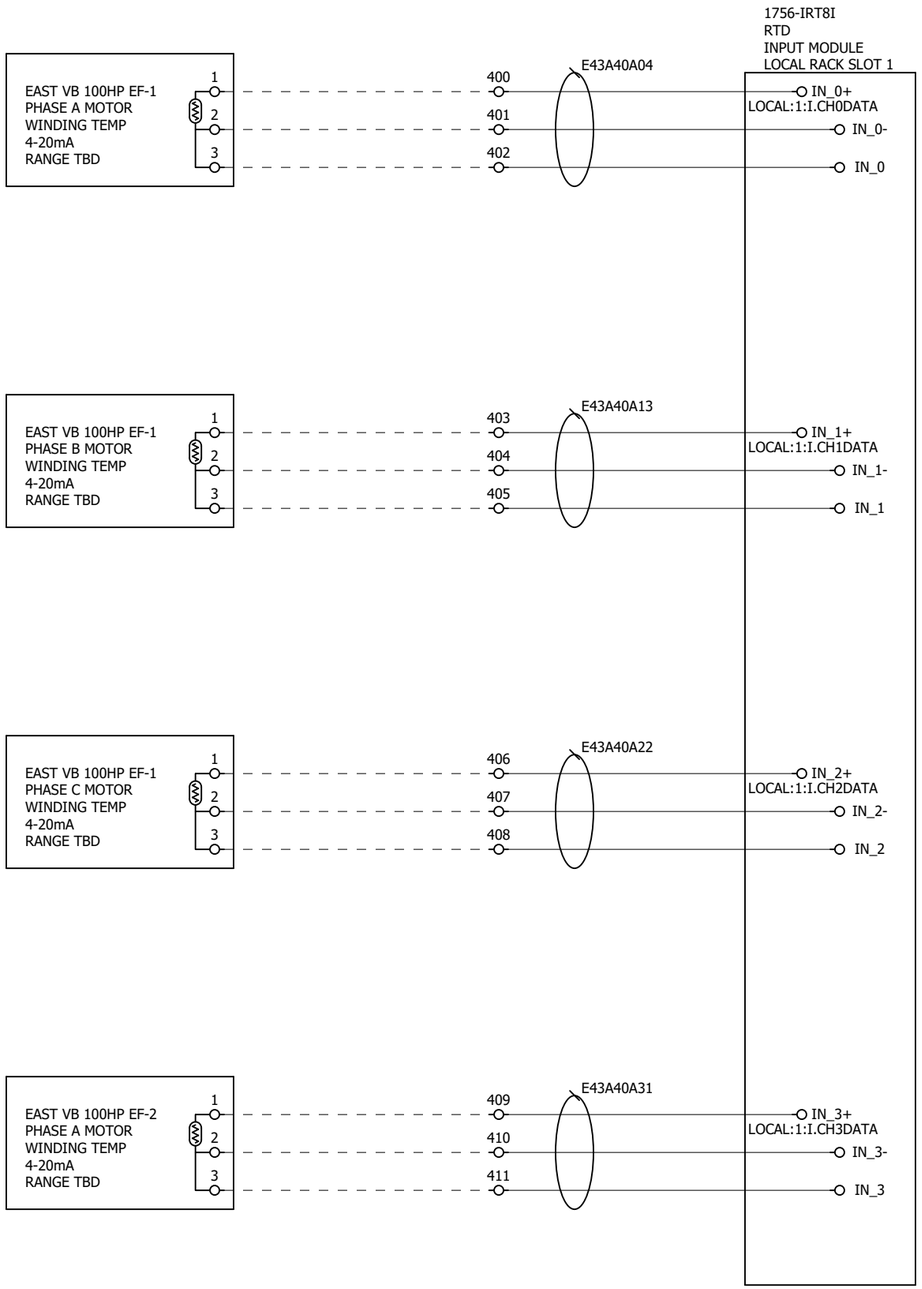
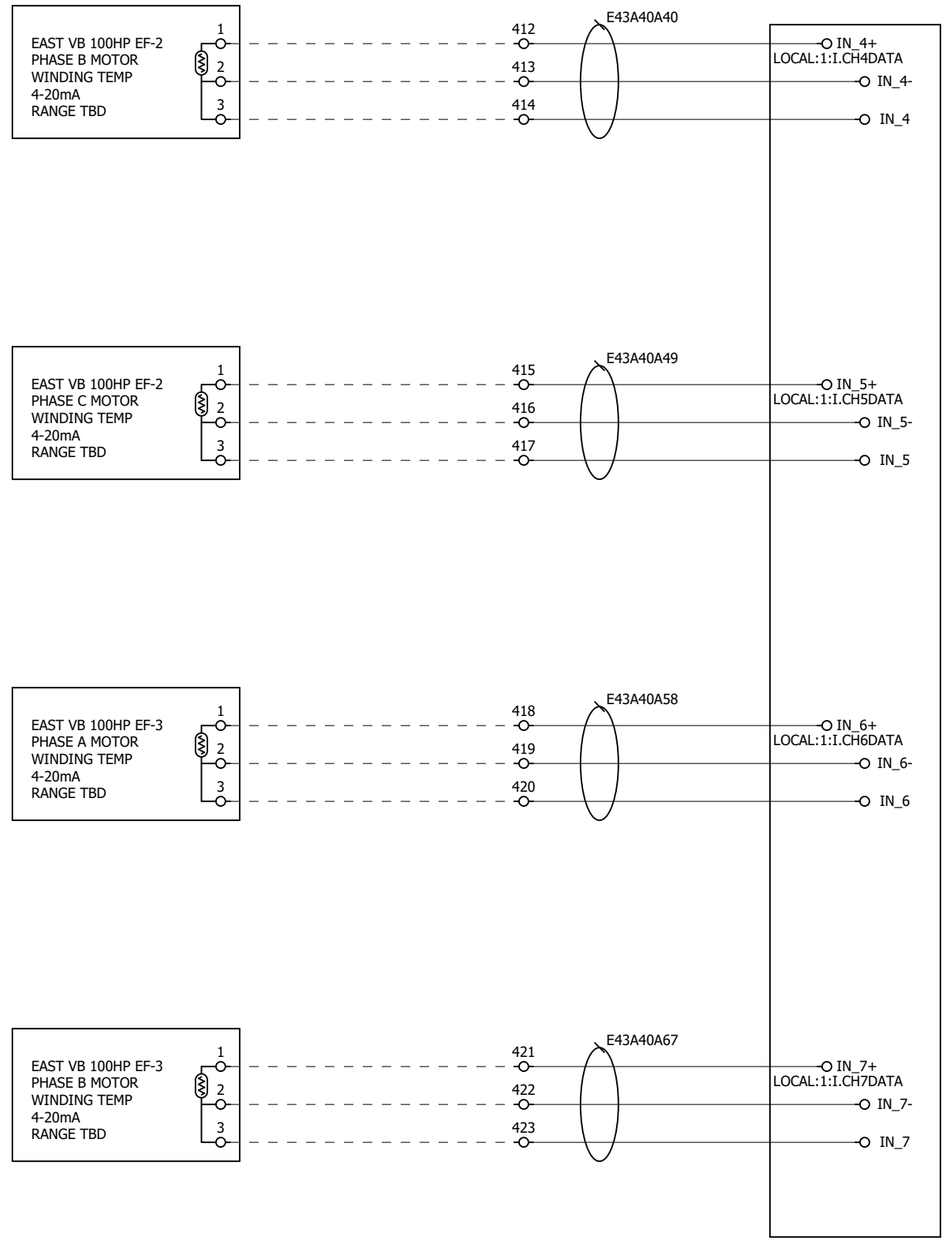
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A16





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
2.1	08/04/20	ekilgore	SHOP REDLINES

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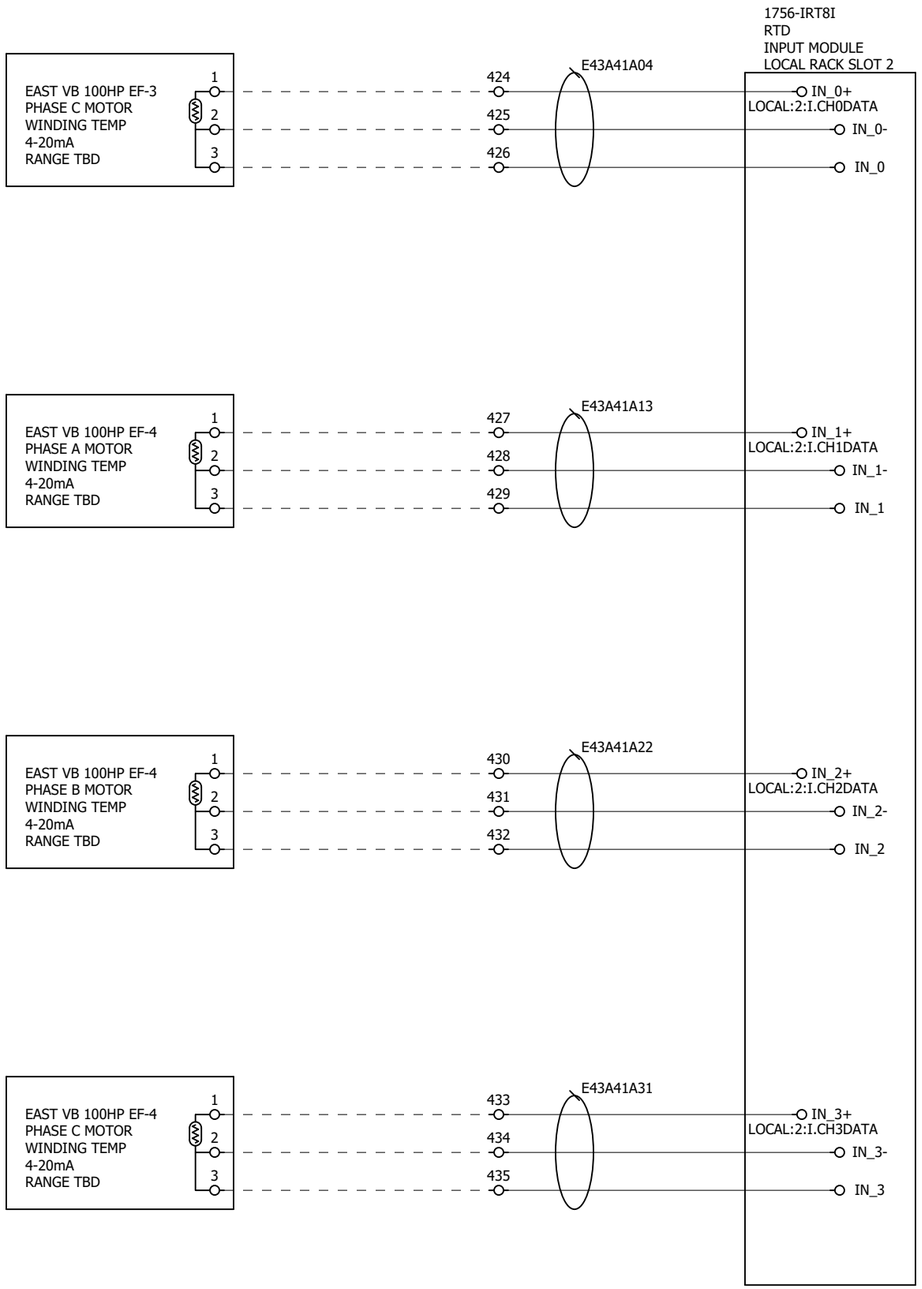
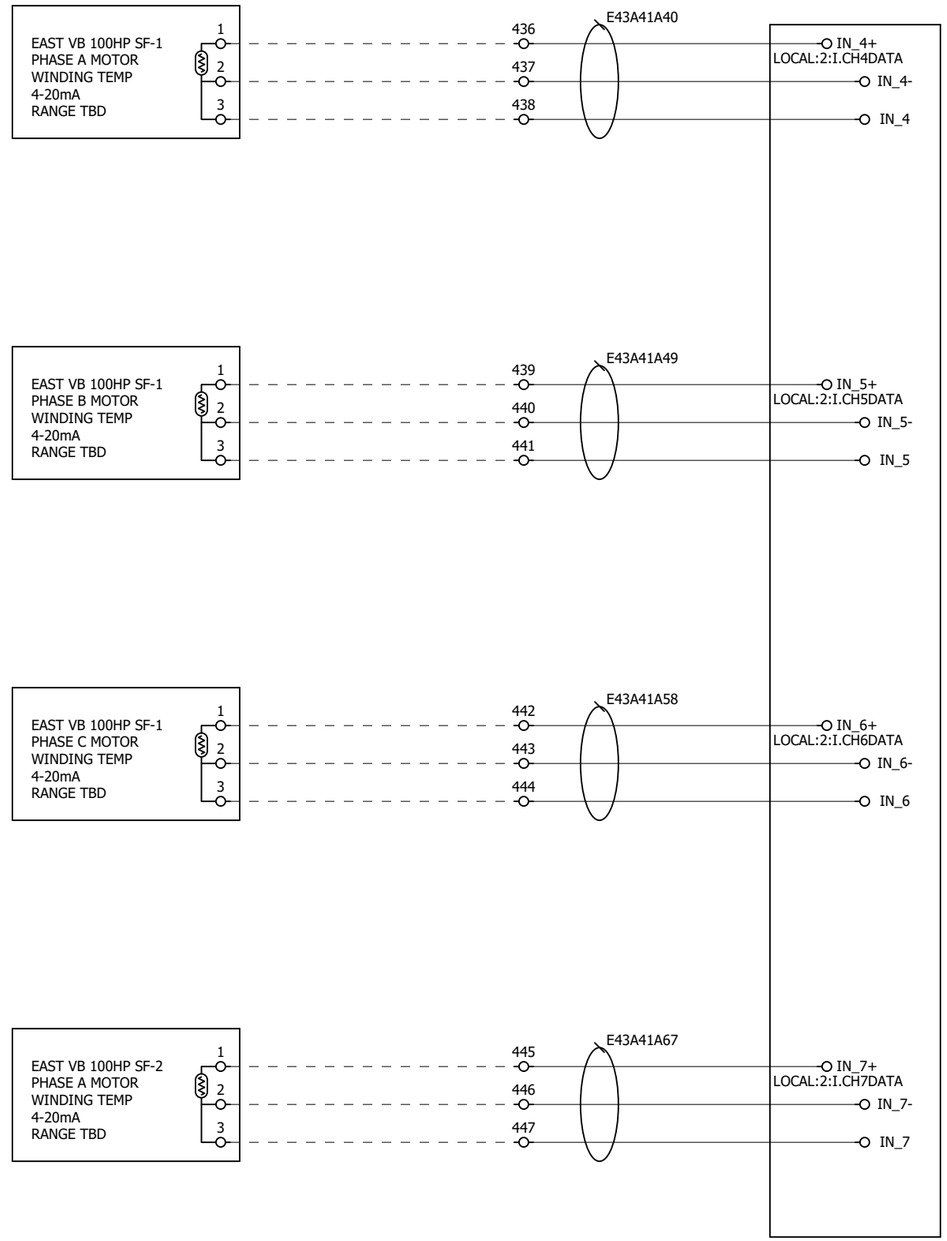
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A40





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
2.1	08/04/20	ekilgore	SHOP REDLINES

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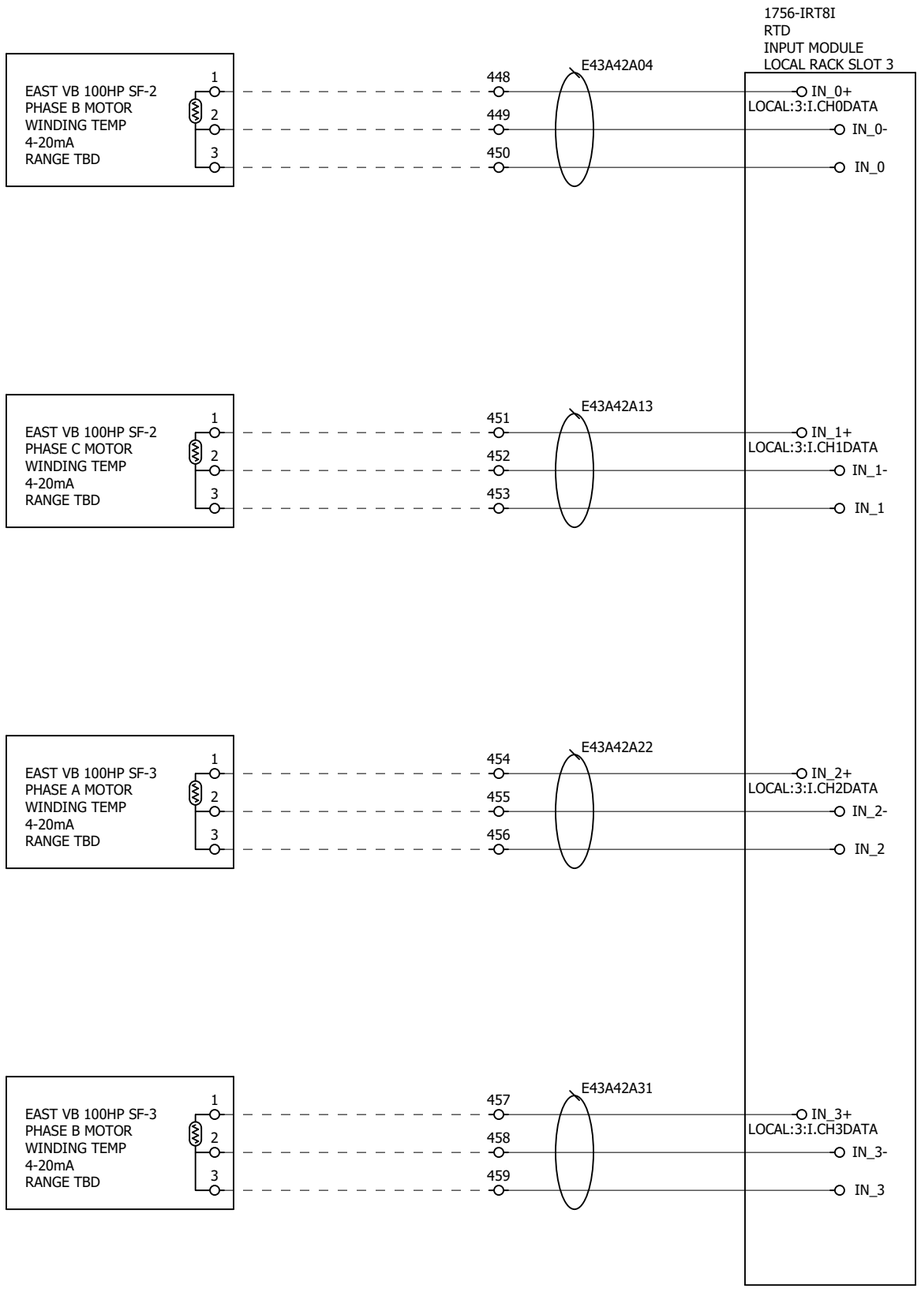
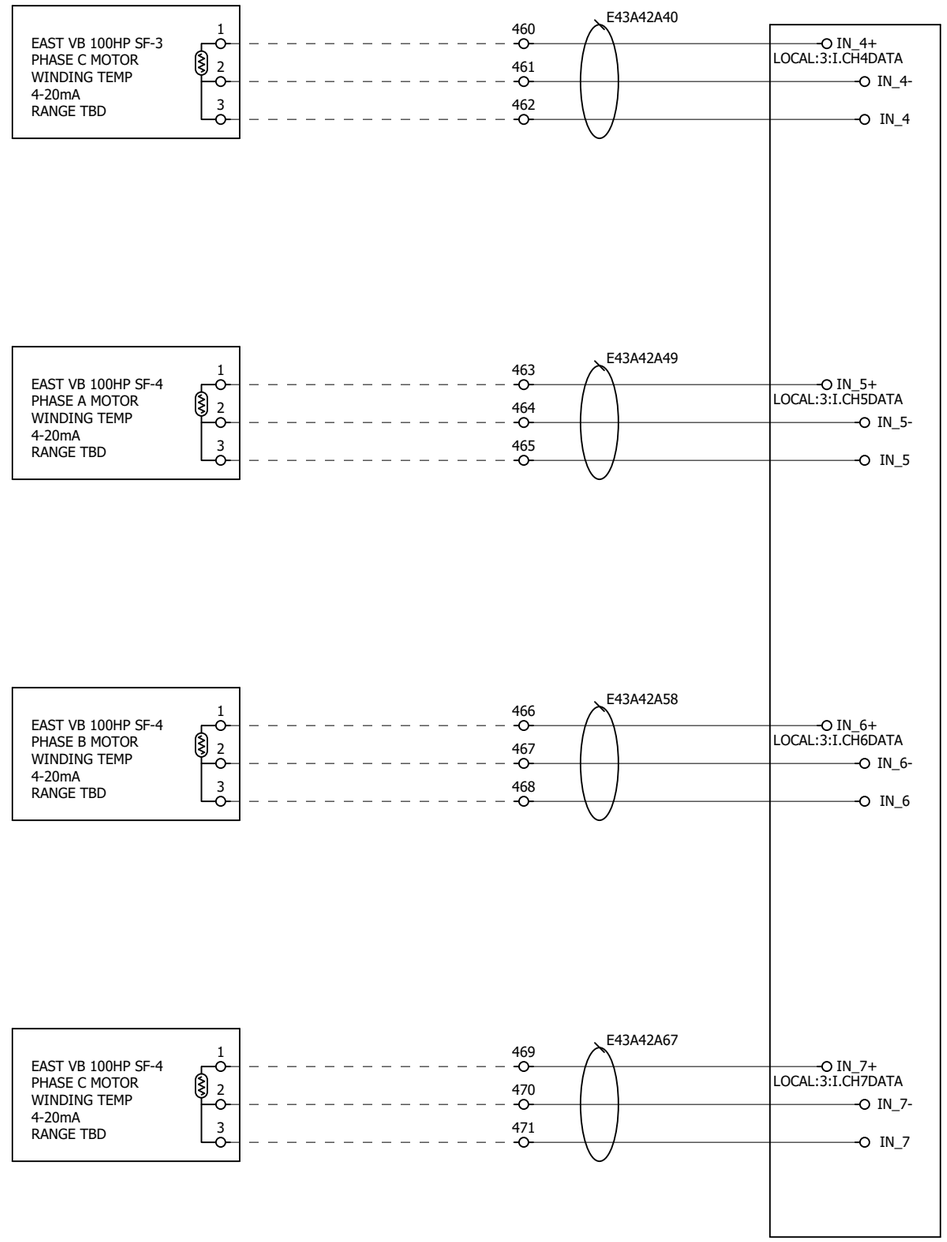
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A41





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - RTD INPUTS

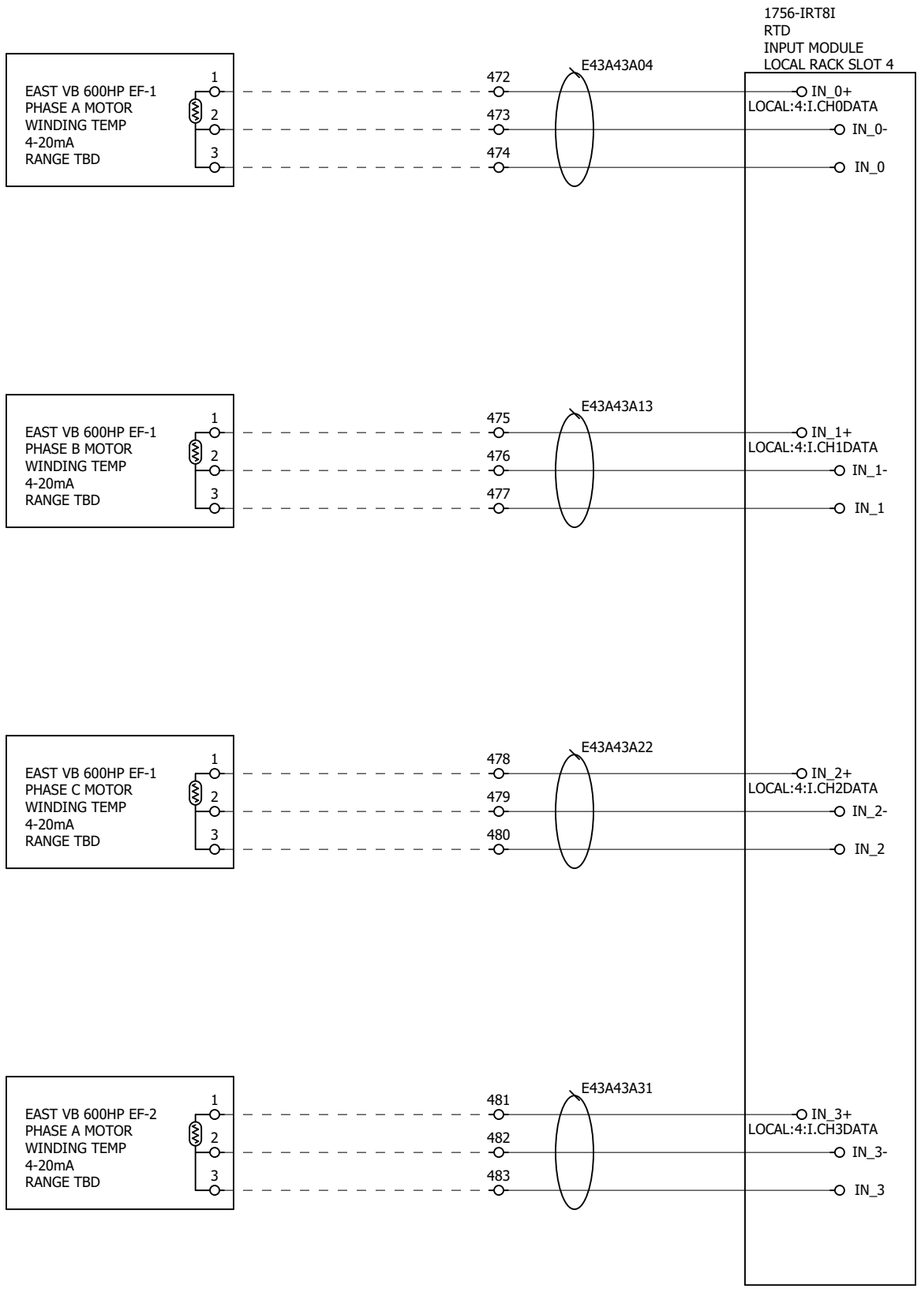
PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

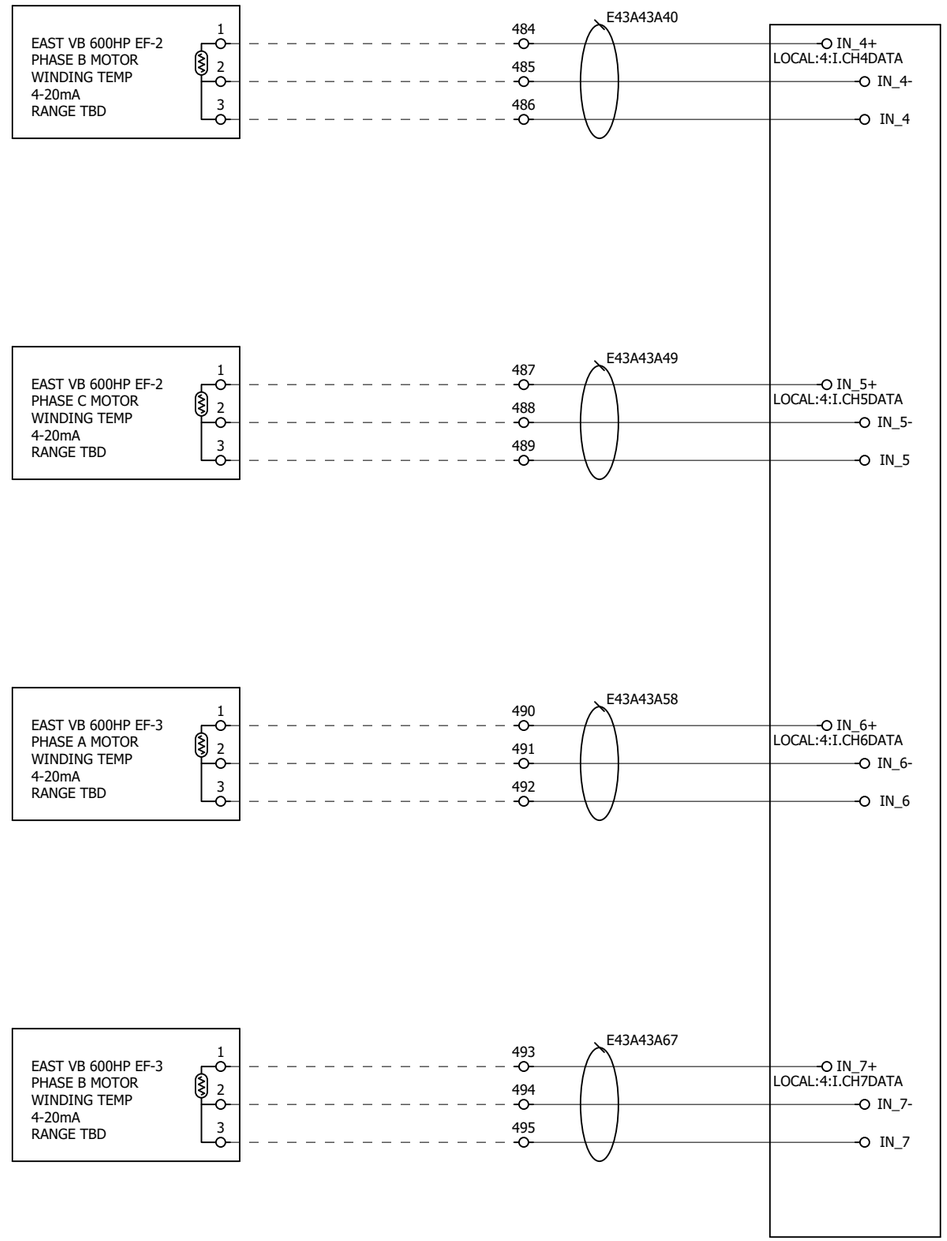
REV	DATE	NAME	REMARKS
2.1	08/04/20	ekilgore	SHOP REDLINES

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS
3.0	09/04/20	ekilgore	SHIPPED FOR ONSITE INSTALLATION
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
1.0	05/07/20	ekilgore	SUBMITTED FOR CUSTOMER APPROVAL
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A42

HUFFMAN ENGINEERING INC.
5301 NORTH 57TH STREET
LINCOLN, NEBRASKA 68507
(402) 464-6823
112 INVERNESS CIRCLE EAST, SUITE E
ENGLEWOOD, COLORADO 80112
(303) 376-6280





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
2.1	08/04/20	ekilgore	SHOP REDLINES

HUFFMAN ENGINEERING INC.
5301 NORTH 57TH STREET
LINCOLN, NEBRASKA 68507
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2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
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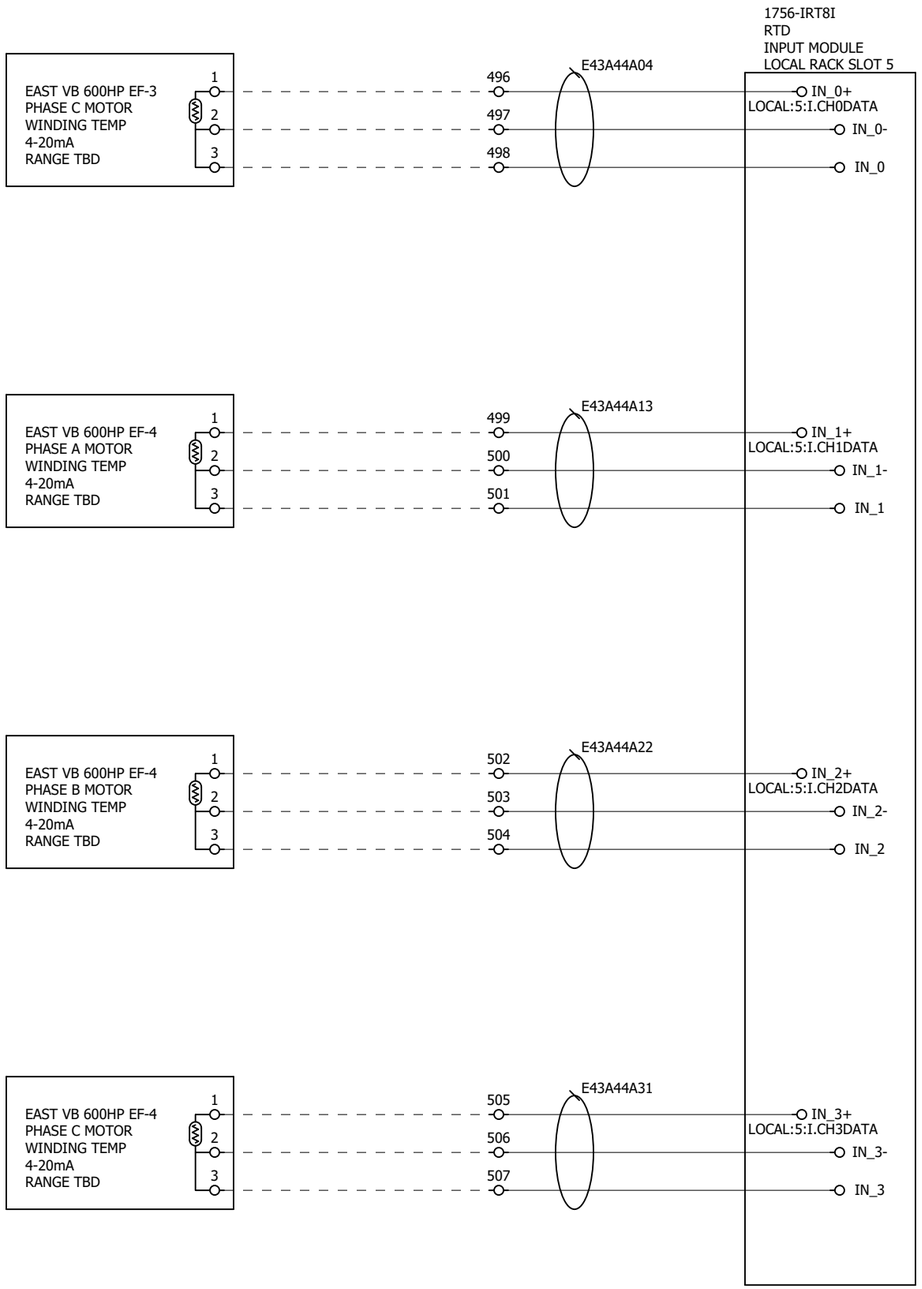
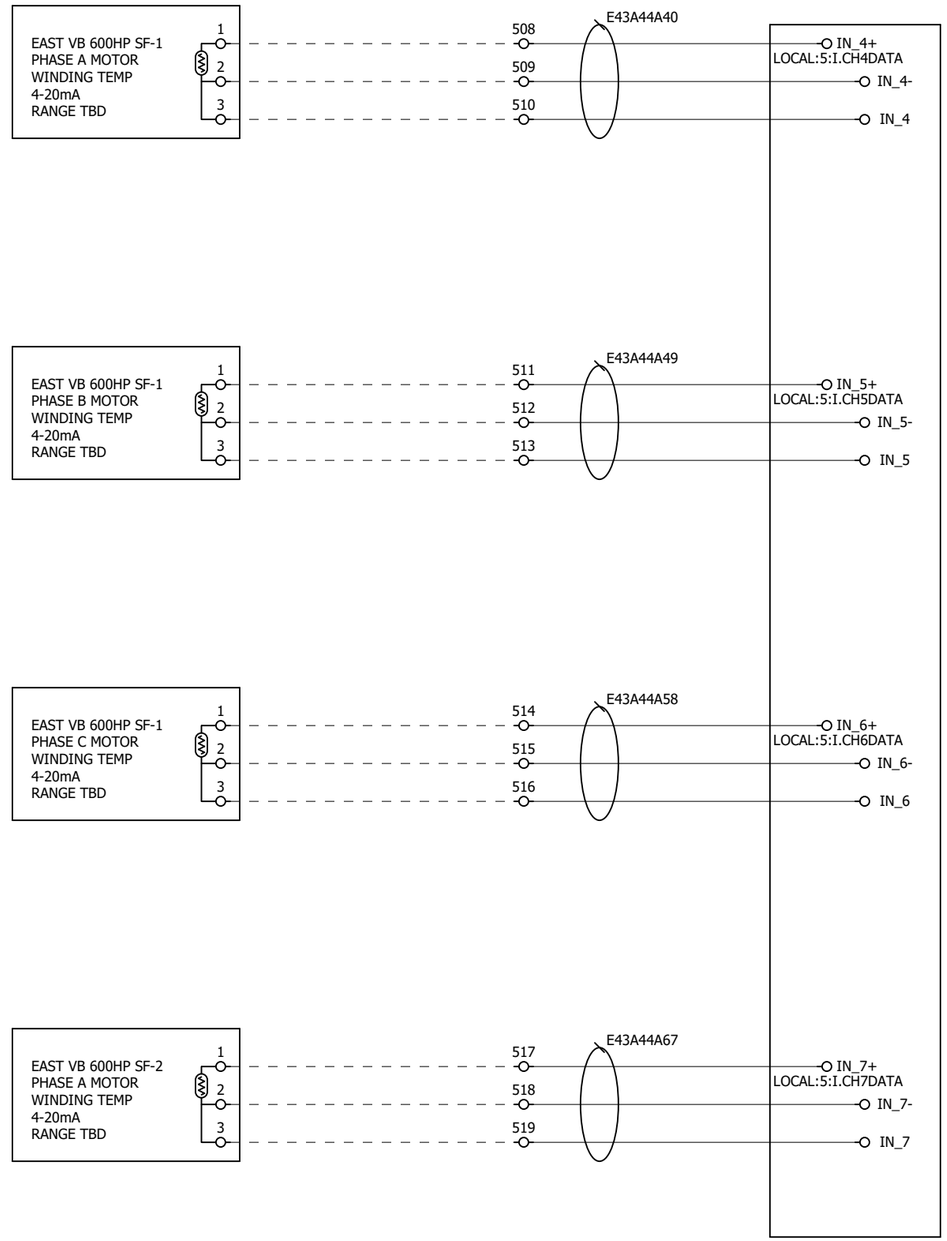
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A43





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

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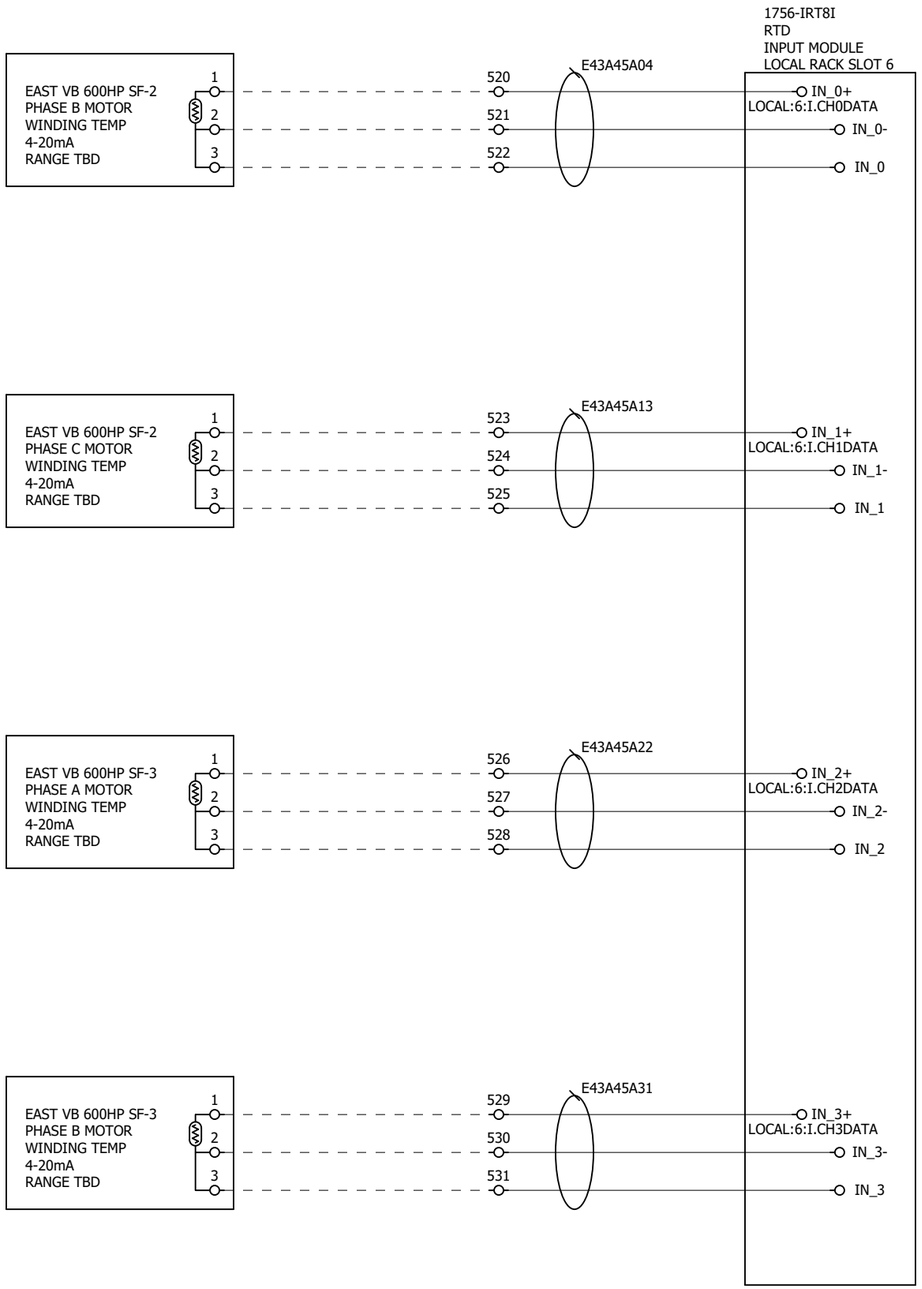
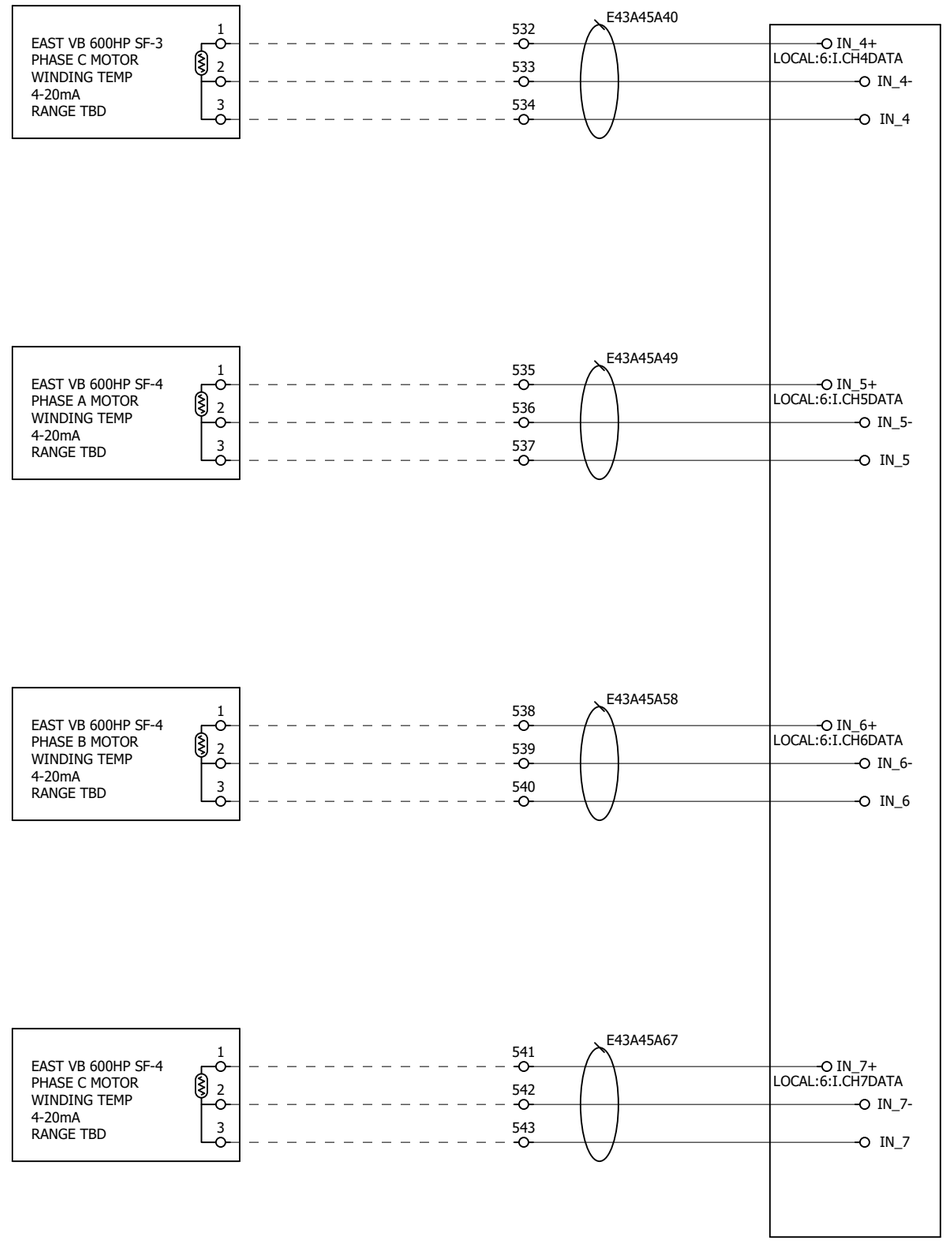
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A44





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

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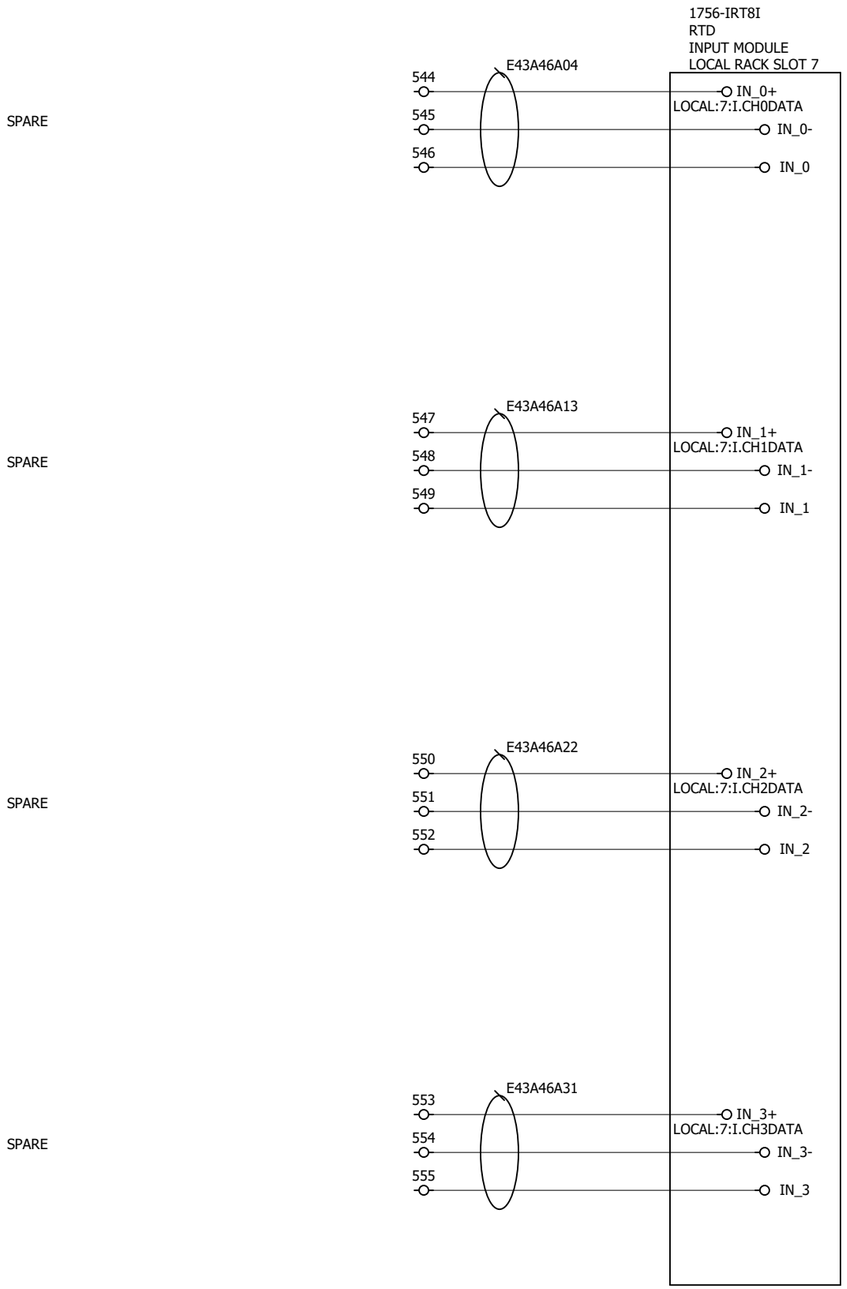
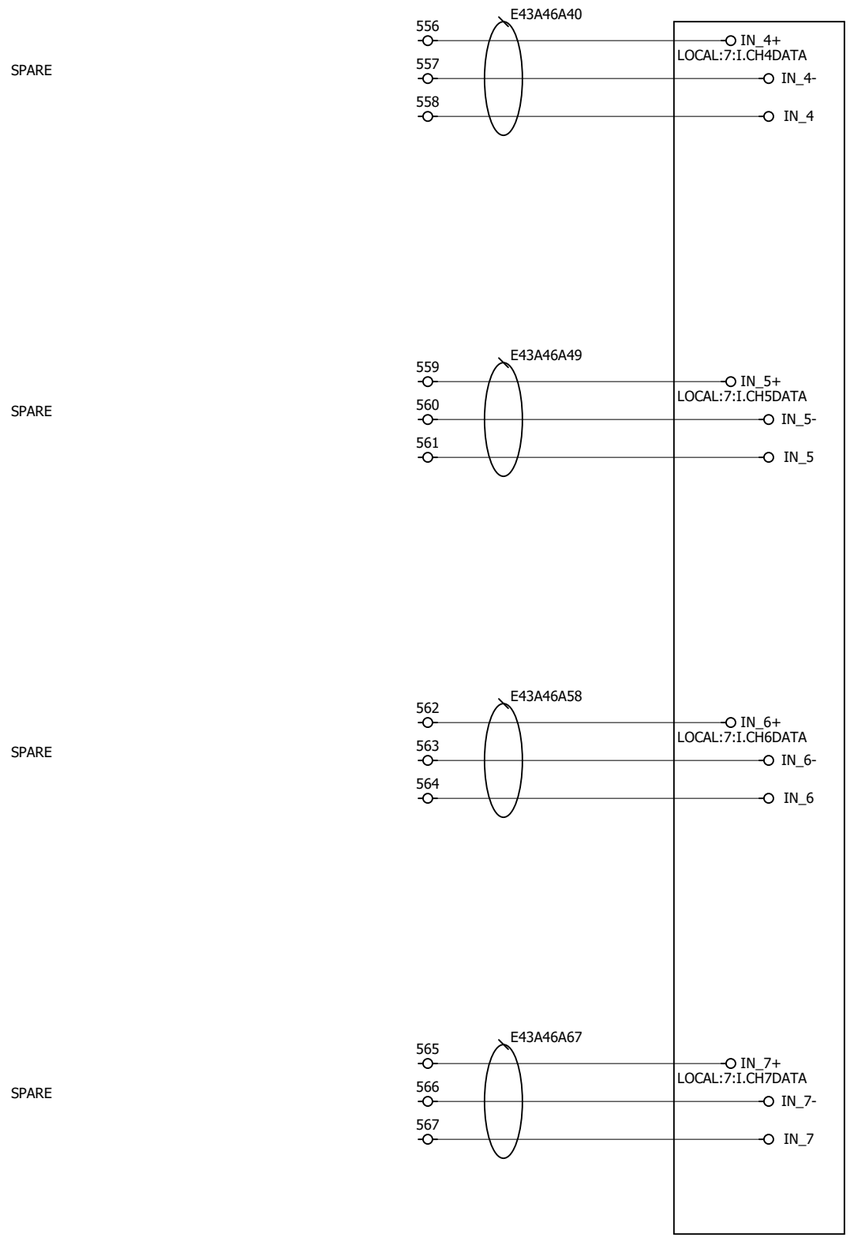
DWG # CMS203-E43A45





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

EAST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

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0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E43A46

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STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	RELAY CONTACT, NORMALLY CLOSED
	RELAY CONTACT, NORMALLY OPEN
	LIMIT SWITCH, NORMALLY CLOSED
	LIMIT SWITCH, NORMALLY CLOSED, HELD OPEN
	LIMIT SWITCH, NORMALLY OPEN
	LIMIT SWITCH, NORMALLY OPEN, HELD CLOSED
	PRESSURE SWITCH, NORMALLY CLOSED
	PRESSURE SWITCH, NORMALLY OPEN
	PUSHBUTTON, NORMALLY CLOSED
	PUSHBUTTON, NORMALLY OPEN
	PUSHBUTTON, NORMALLY CLOSED, HELD OPEN
	MUSHROOM HEAD PUSH BUTTON, NORMALLY CLOSED
	MUSHROOM HEAD PUSH BUTTON, NORMALLY OPEN
	2 POSITION SELECTOR SWITCH, CLOSED
	2 POSITION SELECTOR SWITCH, OPEN
	TEMPERATURE SWITCH, NORMALLY CLOSED
	TEMPERATURE SWITCH, NORMALLY OPEN
	TIMER CONTACT, NORMALLY CLOSED, TIMED OPEN
	TIMER CONTACT, NORMALLY CLOSED, TIMED OPEN, SHOWN OPEN
	TIMER CONTACT, NORMALLY OPEN, TIMED CLOSED
	TIMER CONTACT, NORMALLY OPEN, TIMED CLOSED, SHOWN CLOSED
	FLOW SWITCH, NORMALLY CLOSED
	FLOW SWITCH, NORMALLY OPEN
	PROXIMITY SWITCH, NORMALLY OPEN
	LEVEL SWITCH, NORMALLY CLOSED
	LEVEL SWITCH, NORMALLY OPEN
	RELAY COIL
	SOLENOID VALVE
R	PILOT LIGHT (R=RED, A=AMBER, B=BLUE, G=GREEN)
	NODE
	TERMINAL BLOCK
	KNIFE TERMINAL BLOCK
	TERMINAL BLOCK, FUSED

ELECTRICAL SYMBOLS CONTINUED

SYMBOL	DESCRIPTION
	GROUND
M	MOTOR
	ALARM HORN
	MOTOR STARTER COIL
	FIELD WIRING
	INTERNAL PANEL WIRING
	CAPACITOR
»	MOTION DETECTOR

NOTE:
THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT ON THE PLANS.

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
A	AMPERE, AMBER
AC	ALTERNATING CURRENT
AWG	AMERICAN WIRE GAUGE
BRN	BROWN
BLU	BLUE
BLK	BLACK
C	CONTACTOR
CB	CIRCUIT BREAKER
CR	CONTROL RELAY
DC	DIRECT CURRENT
DIV	DIVISION
ES	EMERGENCY STOP
ESR	EMERGENCY STOP RELAY
F, FU	FUSE
FB	FUSE BLOCK
GRN	GREEN
GND	GROUND
GFR	GROUND FAULT RELAY
H	HORN
HP	HORSEPOWER
IPT	CURRENT TO PRESSURE TRANSDUCER
J-BOX	JUNCTION BOX
KVA	KILOVOLT AMPS
LS	LIMIT SWITCH
LT FLEX	LIQUID TIGHT FLEX CONDUIT
M	MOTOR
MC	MOTOR CONTACTOR
MCC	MOTOR CONTROL CENTER
MCR	MASTER CONTROL RELAY
MHPB	MUSHROOM HEAD PUSHBUTTON
MS	MOTOR STARTER
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OL	OVERLOAD RELAY
ORN	ORANGE
P	POLE
PB	PUSHBUTTON SWITCH
PS	PRESSURE SWITCH, POWER SUPPLY
PT	PRESSURE TRANSMITTER
PIT	PRESSURE TO CURRENT TRANSDUCER
RTD	RESISTIVE TEMPERATURE DETECTOR
REV	REVERSE
SR	SAFETY RELAY
SS	SELECTOR SWITCH
SV	SOLENOID VALVE
TB	TERMINAL BLOCK
TC	THERMOCOUPLE
TDR	TIME DELAY RELAY
V	VOLTAGE
VA	VOLT AMPS
VFD	VARIABLE FREQUENCY DRIVE
VIO	VIOLET
W	WATT
WHT	WHITE
XFMR	TRANSFORMER
YEL	YELLOW
Ø	PHASE

FUSE SCHEDULE

FUSE#	QTY	FUSE TYPE	SIZE	MFGR	PART#	DESCRIPTION
FB1	1	CLASS CC	20A	MERSEN	ATDR20	RTD ENCLOSURE POWER
FB2	1	5x20mm	10A	LITTELFUSE	218-010	CHASSIS PS
FB3	1	5x20mm	2A	LITTELFUSE	218-002	PANEL LIGHT

LABEL DEFINITIONS

WIRE NUMBERS

E01A20A01
- LINE NUMBER ON THE DRAWING (01, 02, ETC.)
- WIRE POSITION ON THE LINE (A, B, ETC.)
- DRAWING NUMBER (E01A30, E01A40, ETC.)

THREE LINE WIRE NUMBERS

280-L100A
- WIRE POSITION
- A TWO DIGIT NUMBER
- PHASE
- A LETTER FOR SEPARATION
- VOLTAGE

CROSS REFERENCES

(E01A20:01)
- RAIL NUMBER
- DRAWING NUMBER

DRAWING NUMBERS

AA000-E01A20
- THESE TWO CHARACTERS INDICATE THE TYPE OF DRAWING
- LETTER INDICATES IF THIS IS THE ORIGINAL PROJECT OR SUBSEQUENT BUT ESSENTIALLY IDENTICAL PROJECT
- PANEL DESIGNATION WITHIN THE PROJECT. 00=DRAWINGS FOR PROJECT, BUT NOT PANEL SPECIFIC, 01=FIRST PANEL, 02=SECOND PANEL, ETC.
- DESIGNATES THE DRAWING AS ELECTRICAL
- PROJECT NUMBER

PANEL DRAWING INDEX

WIRE COLOR CODE

COLOR	DESCRIPTION
BLACK	ALL UNGROUNDED CIRCUIT CONDUCTORS OPERATING AT A VOLTAGE GREATER THAN 120VAC
WHITE OR GREY	GROUNDED AC CURRENT CARRYING CONTROL CIRCUIT CONDUCTOR
GREEN OR GREEN/YELLOW	GROUNDING CONDUCTOR
BLUE	UNGROUNDED DC CONTROL CIRCUITS
WHITE/BLUE STRIPE	DC COMMON CONTROL CIRCUIT CONDUCTOR
ORANGE	UNGROUNDED CONTROL CIRCUITS OR OTHER WIRING THAT MAY BE ENERGIZED WHEN MAIN DISCONNECT IS OFF
WHITE/ORANGE STRIPE	GROUNDED AC CONTROL CIRCUIT CURRENT CARRYING CONDUCTOR THAT REMAINS ENERGIZED WHEN THE MAIN DISCONNECT IS IN THE OFF POSITION
RED	UNGROUNDED CIRCUIT CONDUCTORS OPERATING AT 120VAC
VARIES	ANALOG INPUT, 2 COND. (SHIELDED)
VARIES	ANALOG OUTPUT, 2 COND. (SHIELDED)

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - INDEX SHEET

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
0.1	05/07/20	ekilgore	DESIGN CHANGES

HUFFMAN ENGINEERING INC.
5301 NORTH 57TH STREET
LINCOLN, NEBRASKA 68507
(402) 464-6823
112 INVERNESS CIRCLE EAST, SUITE E
ENGLEWOOD, COLORADO 80112
(303) 376-6280

REV	DATE	NAME	REMARKS
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3.0	09/04/20	ekilgore	SHIPPED FOR ONSITE INSTALLATION
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
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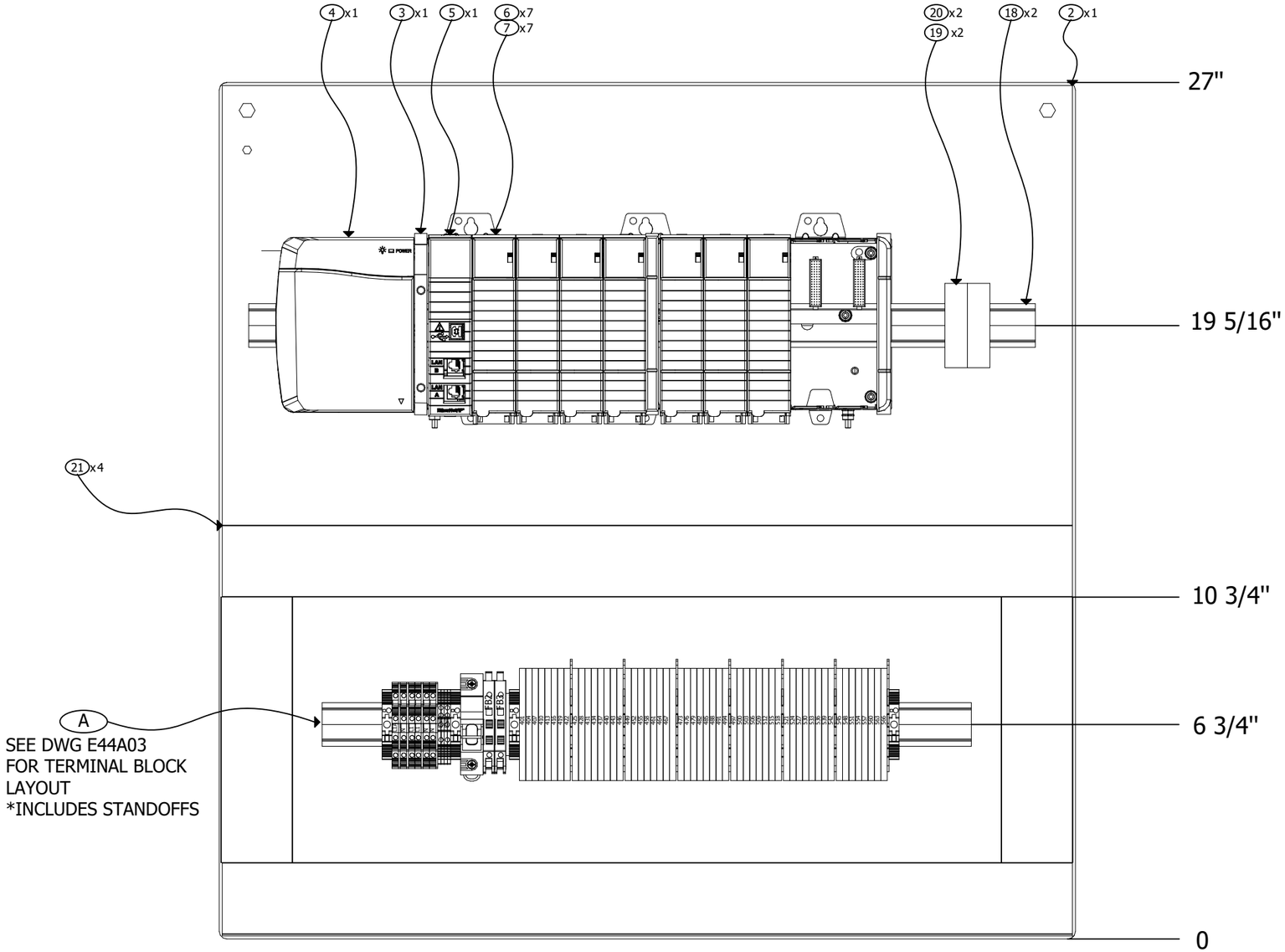
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A00



STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - BACK PANEL LAYOUT

PROJECT # CMS203 | SCALE 1:8 | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
0.1	05/07/20	ekilgore	DESIGN CHANGES

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DWG # CMS203-E44A01

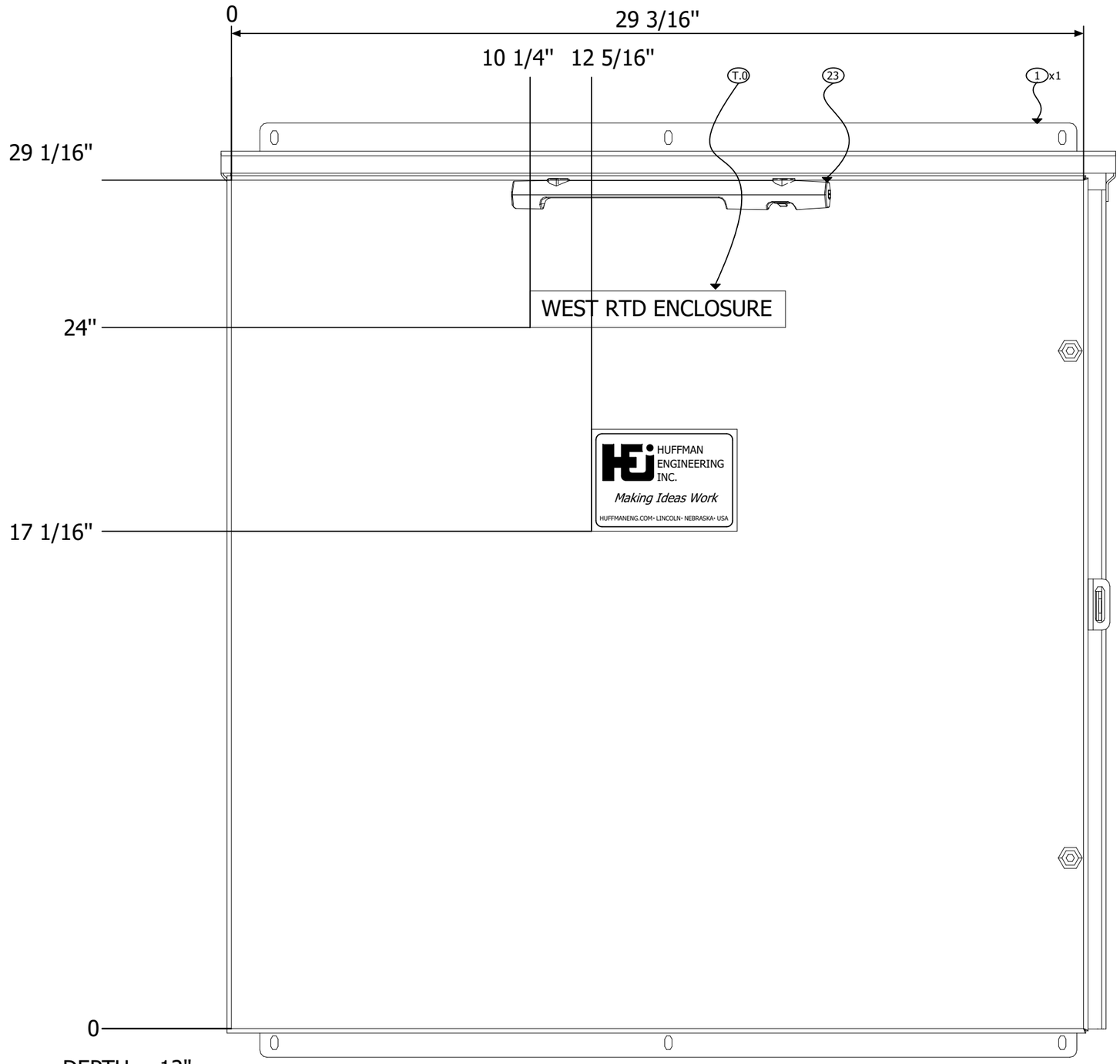
CUSTOM BUILT BY

HUFFMAN ENGINEERING INC.

5301 North 57th Street
Lincoln, NE 68507
402-464-6823

PROJECT #	CMS203			DATE	MAY 2020
PANEL #	WEST RTD ENCLOSURE				
INTERRUPT RATING	200kA			TOTAL FLA	20
LARGEST MTR FLA	N/A			SCCR	10kA
VOLTS	120	HZ. 60	PHASE 1	ENCL TYP	3R
ELECT DWG INDEX #	CMS203-E44A00				

LEGEND PLATE SCHEDULE				
ITEM NO.	FIRST LINE	LEGEND PLATE COLOR	TEXT COLOR	TEXT HEIGHT
T.0	WEST RTD ENCLOSURE	BLACK	WHITE	1/2"



STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - FRONT PANEL LAYOUT

PROJECT # CMS203 | SCALE 1:10 | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
0.2	05/07/20	ekilgore	DESIGN CHANGES
0.1	05/07/20	ekilgore	DESIGN CHANGES

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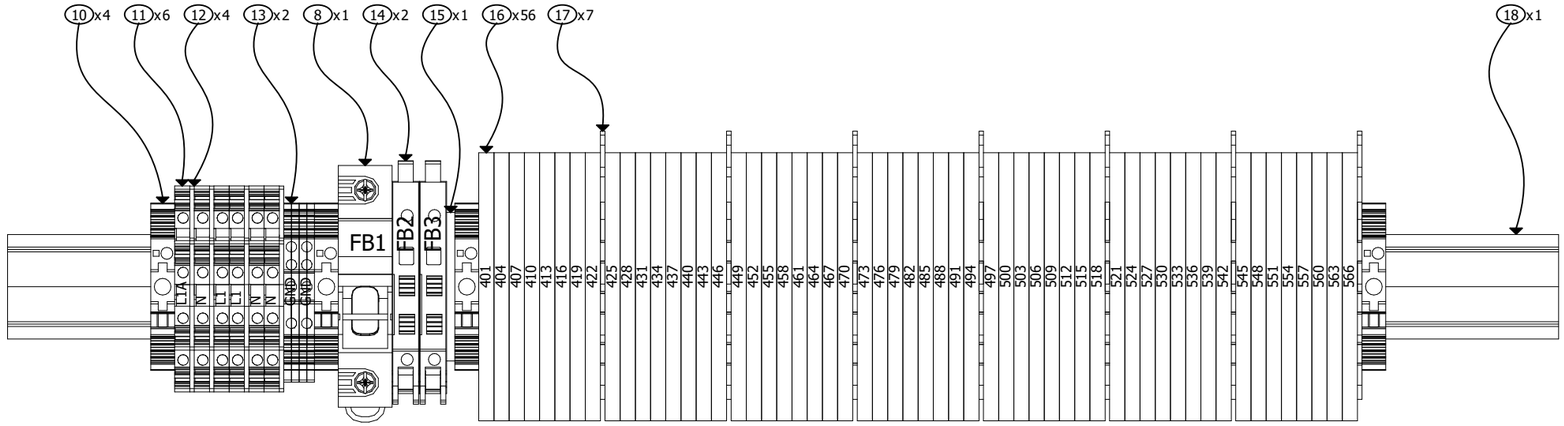
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A02

A



STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - TERMINAL BLOCK LAYOUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS

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DWG # CMS203-E44A03

ITEM #	QTY	MANUFACTURER	MANUFACTURERS P/N	DESCRIPTION
1	1	HOFFMAN	A30R3012HCR	30"X30"X12" NEMA 3R ENCLOSURE
2	1	HOFFMAN	A30P30	30"X30" BACKPANEL
3	1	ALLEN-BRADLEY	1756-A10	CONTROLLOGIX CHASSIS 10-SLOT
4	1	ALLEN-BRADLEY	1756-PA72	CONTROLLOGIX 85-265VAC, 10A POWER SUPPLY
5	1	ALLEN-BRADLEY	1756-EN2TR	CONTROLLOGIX HIGH CAPACITY DUAL PORT ETHERNET/IP MODULE
6	7	ALLEN-BRADLEY	1756-IRT8I	RTD/OHMS/THERMOCOUPLE INPUT MODULE, 8 CH.
7	7	ALLEN-BRADLEY	1756-TBCH	CONTROLLOGIX MODULE TERMINAL BLOCK
8	1	ALLEN-BRADLEY	1492-FB1C30-L	CLASS CC FUSE HOLDER, 1P, WITH INDICATION
9	1	MERSEN	ATDR20	20A FUSE, CLASS CC FUSE
10	4	ALLEN-BRADLEY	1492-EAJ35	TERMINAL BLOCK END ANCHOR
11	6	ALLEN-BRADLEY	1492-JD3C	TERMINAL BLOCK, 1P, 2 TIER
12	4	ALLEN-BRADLEY	1492-EBJD3	TERMINAL BLOCK, 2 TIER, GRAY, END BARRIER
13	2	ALLEN-BRADLEY	1492-JG3	TERMINAL BLOCK, 2 TIER, GROUNDING
14	2	ALLEN-BRADLEY	1492-H4	FUSE TERMINAL BLOCK WITH INDICATION
15	1	ALLEN-BRADLEY	1492-N37	FUSE TERMINAL BLOCK END BARRIER
16	56	ALLEN-BRADLEY	1492-WTF3	3 TIER TERMINAL BLOCK
17	7	ALLEN-BRADLEY	1492-EBTF3	3 TIER TERMINAL BLOCK END BARRIER
18	2	ENTRELEC	101 598.26	DIN MOUNTING RAIL
19	2	SIGNAMAX	KI-DIN-RMM-SL	DIN RAIL KEYSTONE JACK HOUSING
20	2	SIGNAMAX	KJ458MT-C6C-GY	CAT 6 KEYSTONE JACK
21	4	PANDUIT	F2X3LG6	NARROW SLOTTED WIRING DUCT, PVC
22	4	PANDUIT	C2LG6	2" WIRING DUCT COVER
23	1	HOFFMAN	LEDA1S35	ENCLOSURE LIGHT, 120V, LED

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - BILL OF MATERIAL

PROJECT # CMS203 | SCALE | ENG:E. KILGORE

REV	DATE	NAME	REMARKS

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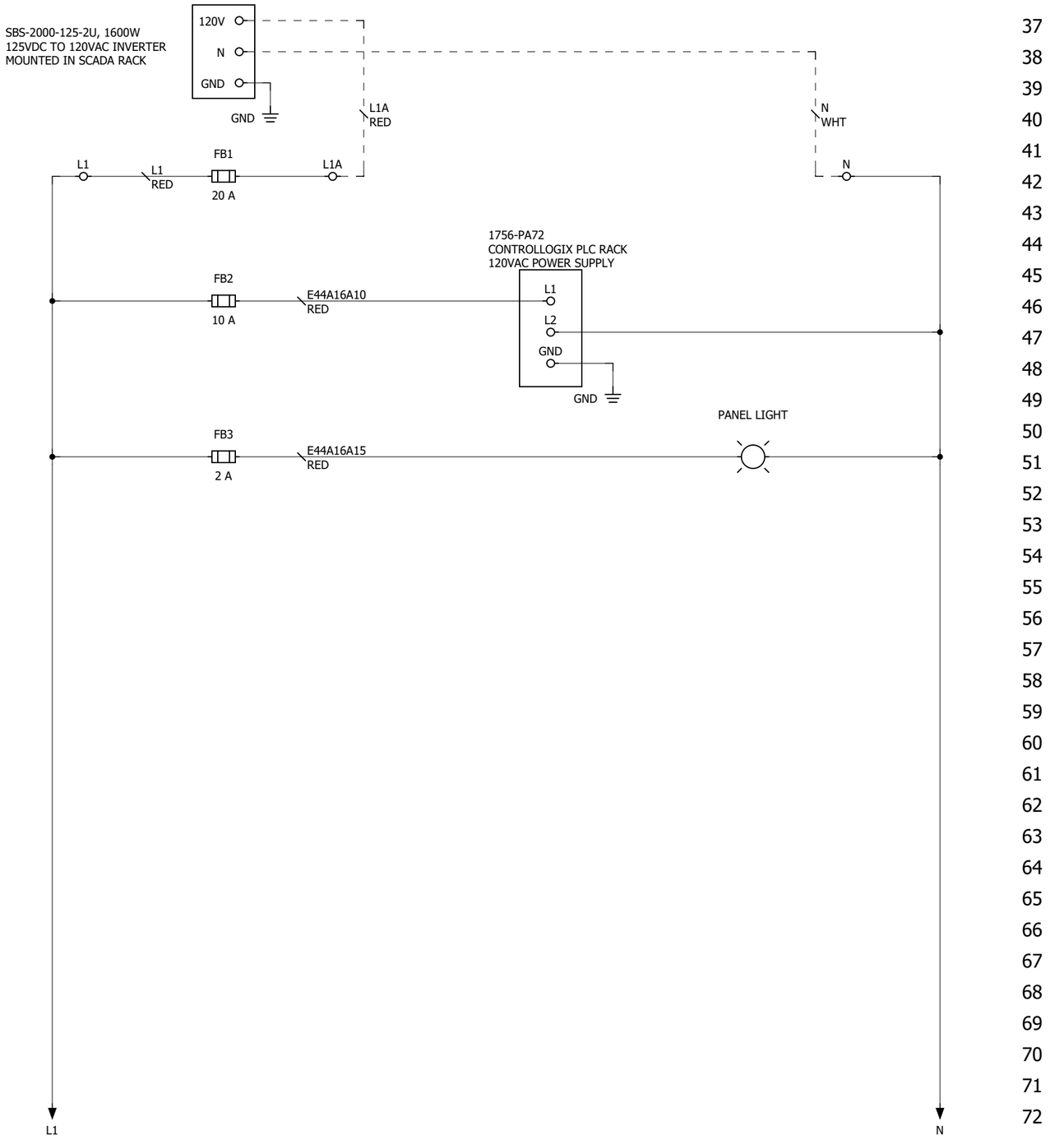
DWG # CMS203-E44A04



STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - CONTROL POWER DISTRIBUTION

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
0.1	05/07/20	ekilgore	DESIGN CHANGES

HUFFMAN ENGINEERING INC.
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2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
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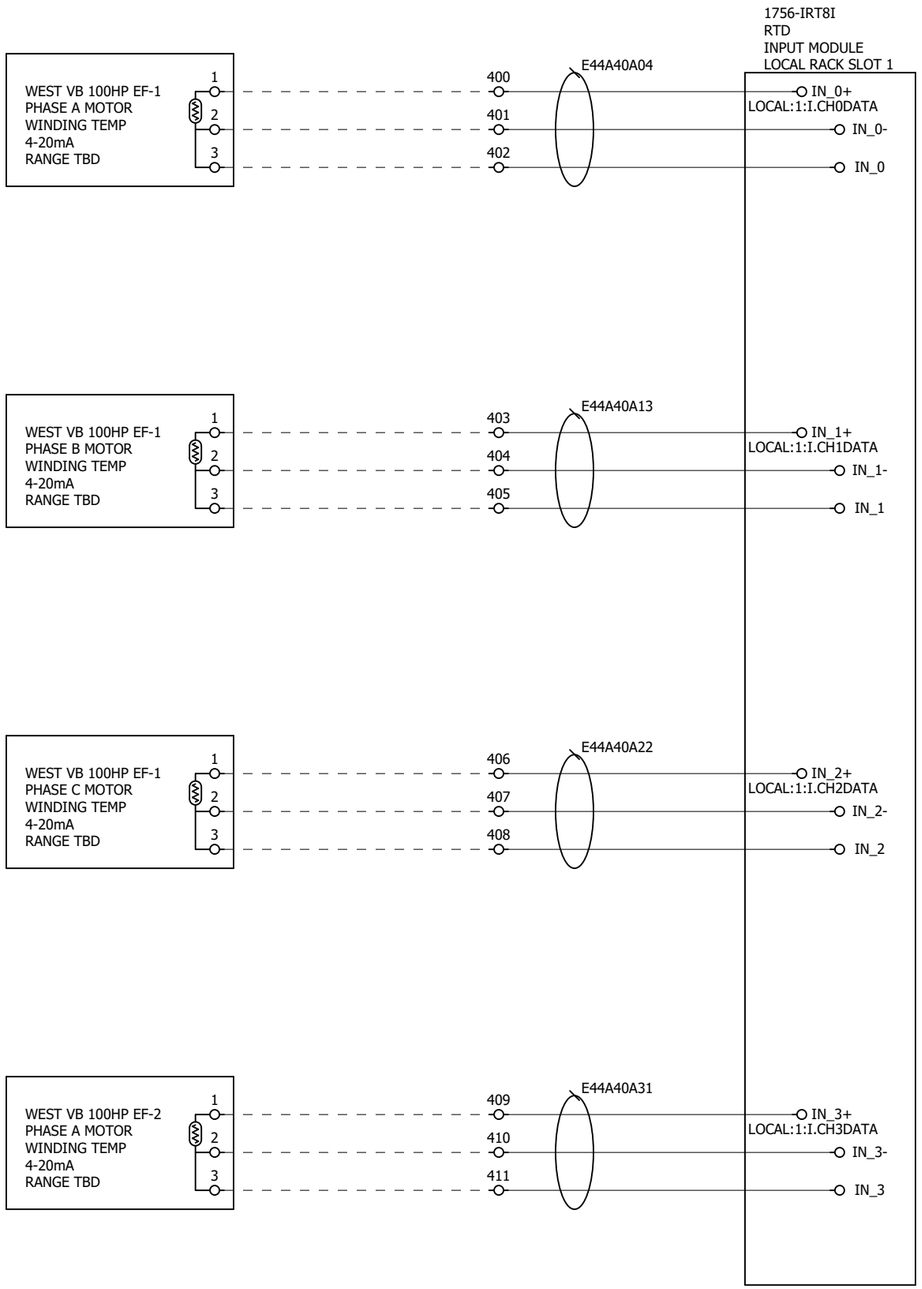
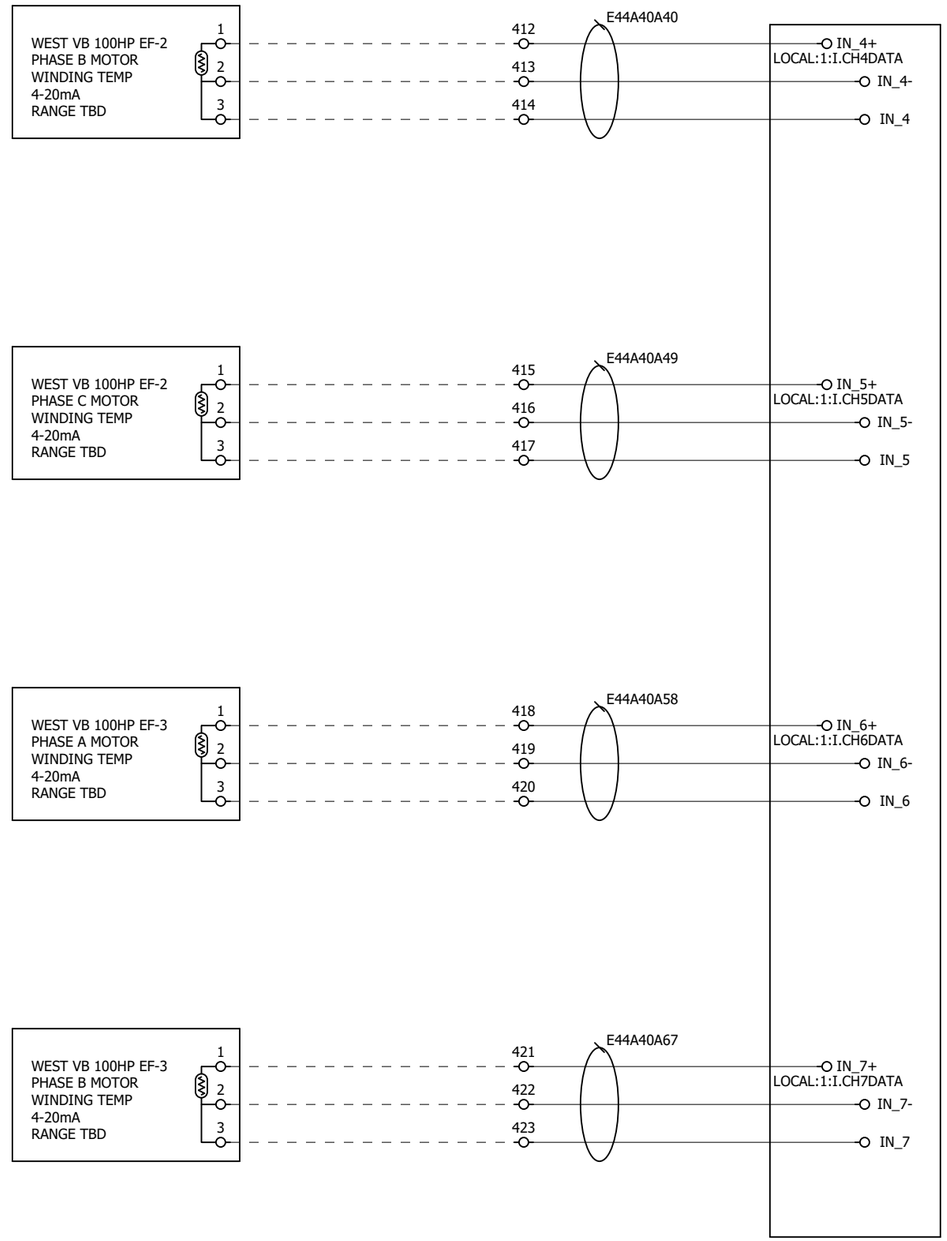
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A16





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - RTD INPUTS

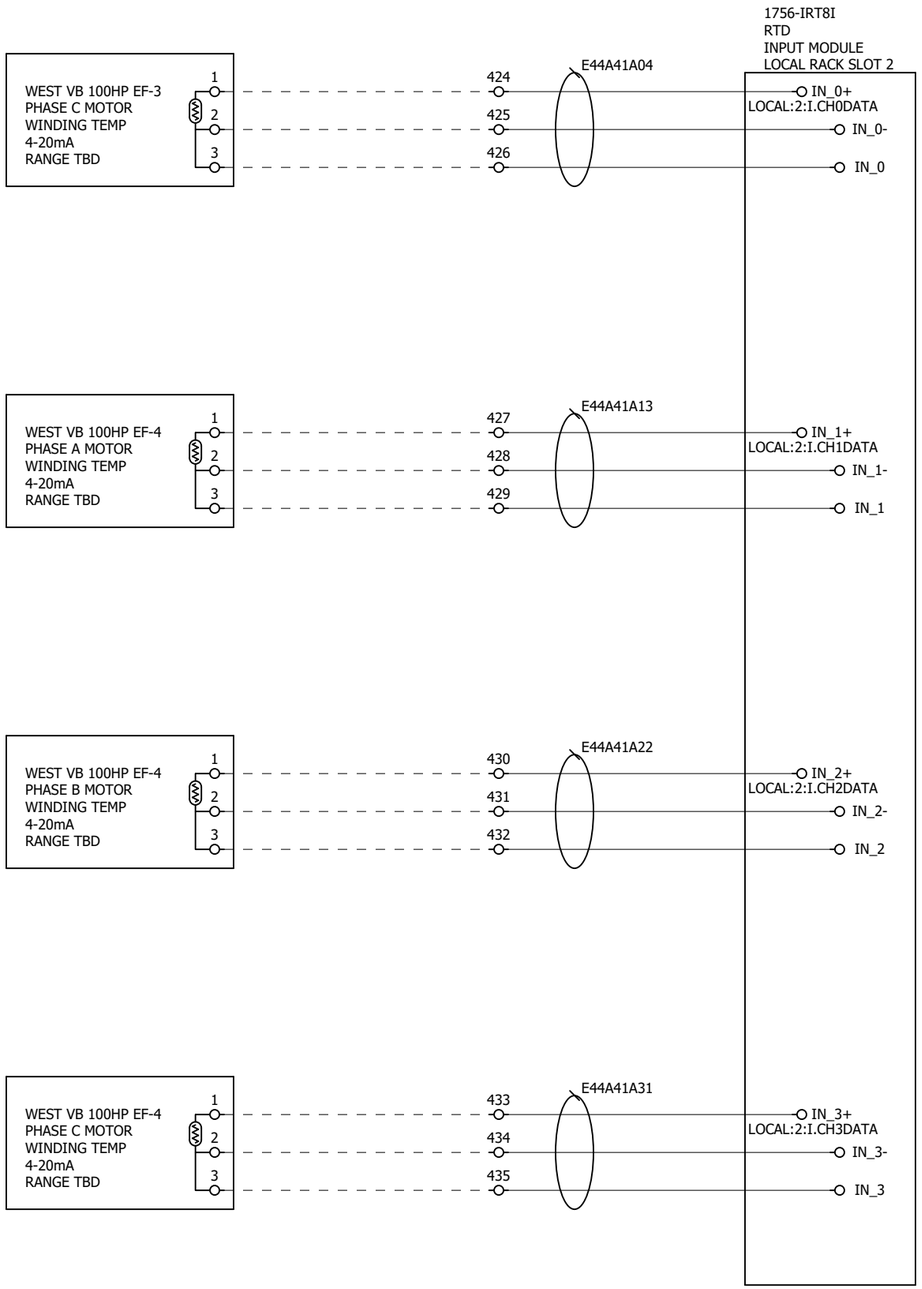
PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

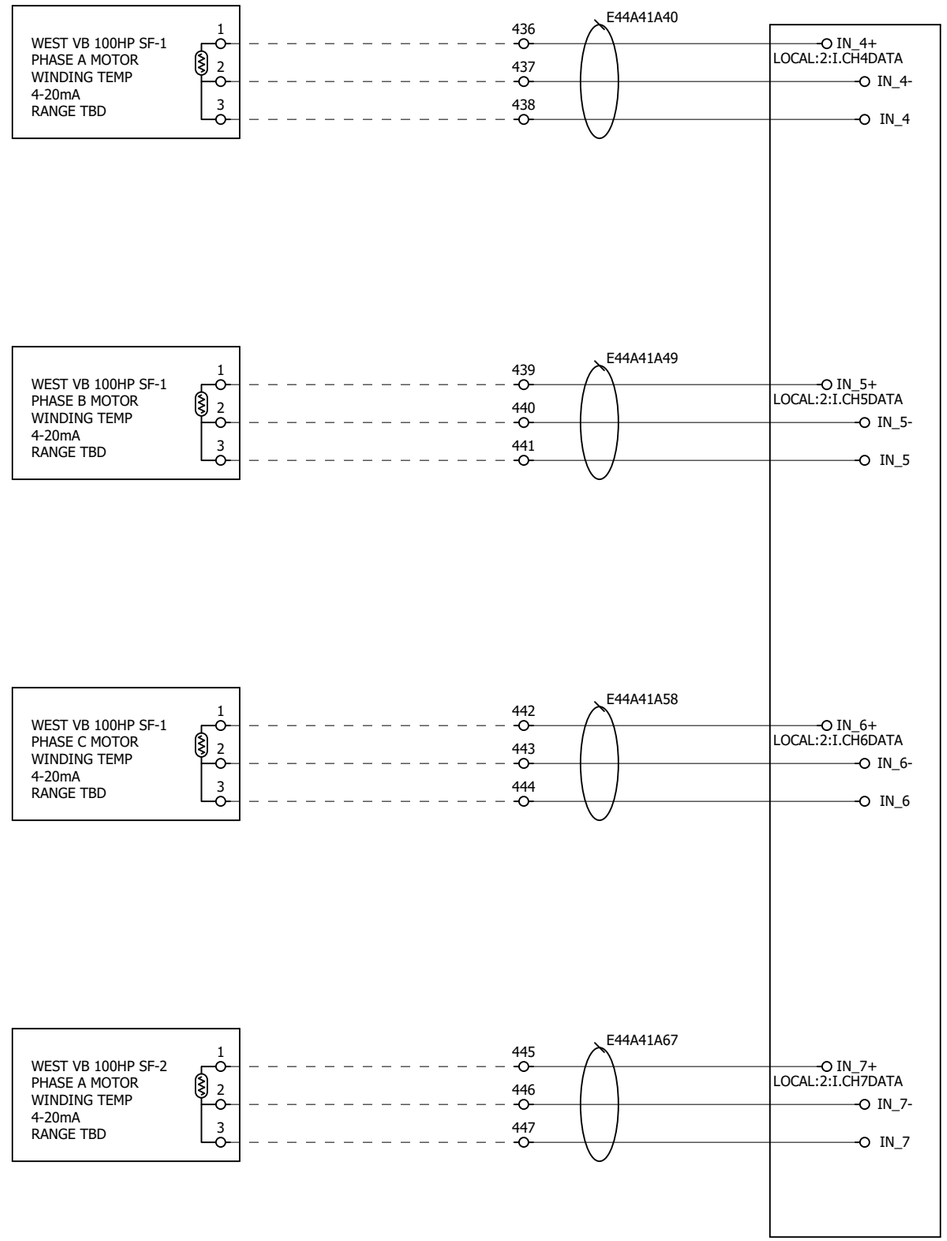
REV	DATE	NAME	REMARKS
2.1	08/04/20	ekilgore	SHOP REDLINES
0.1	05/07/20	ekilgore	DESIGN CHANGES

HUFFMAN ENGINEERING INC.
5301 NORTH 57TH STREET
LINCOLN, NEBRASKA 68507
(402) 464-6823
112 INVERNESS CIRCLE EAST, SUITE E
ENGLEWOOD, COLORADO 80112
(303) 376-6280

REV	DATE	NAME	REMARKS
4.0	09/09/21	ekilgore	AS-BUILTS
3.0	09/04/20	ekilgore	SHIPPED FOR ONSITE INSTALLATION
2.0	05/19/20	ekilgore	SUBMITTAL APPROVED. RELEASED FOR FABRICATION.
1.0	05/07/20	ekilgore	SUBMITTED FOR CUSTOMER APPROVAL
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A40





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - RTD INPUTS

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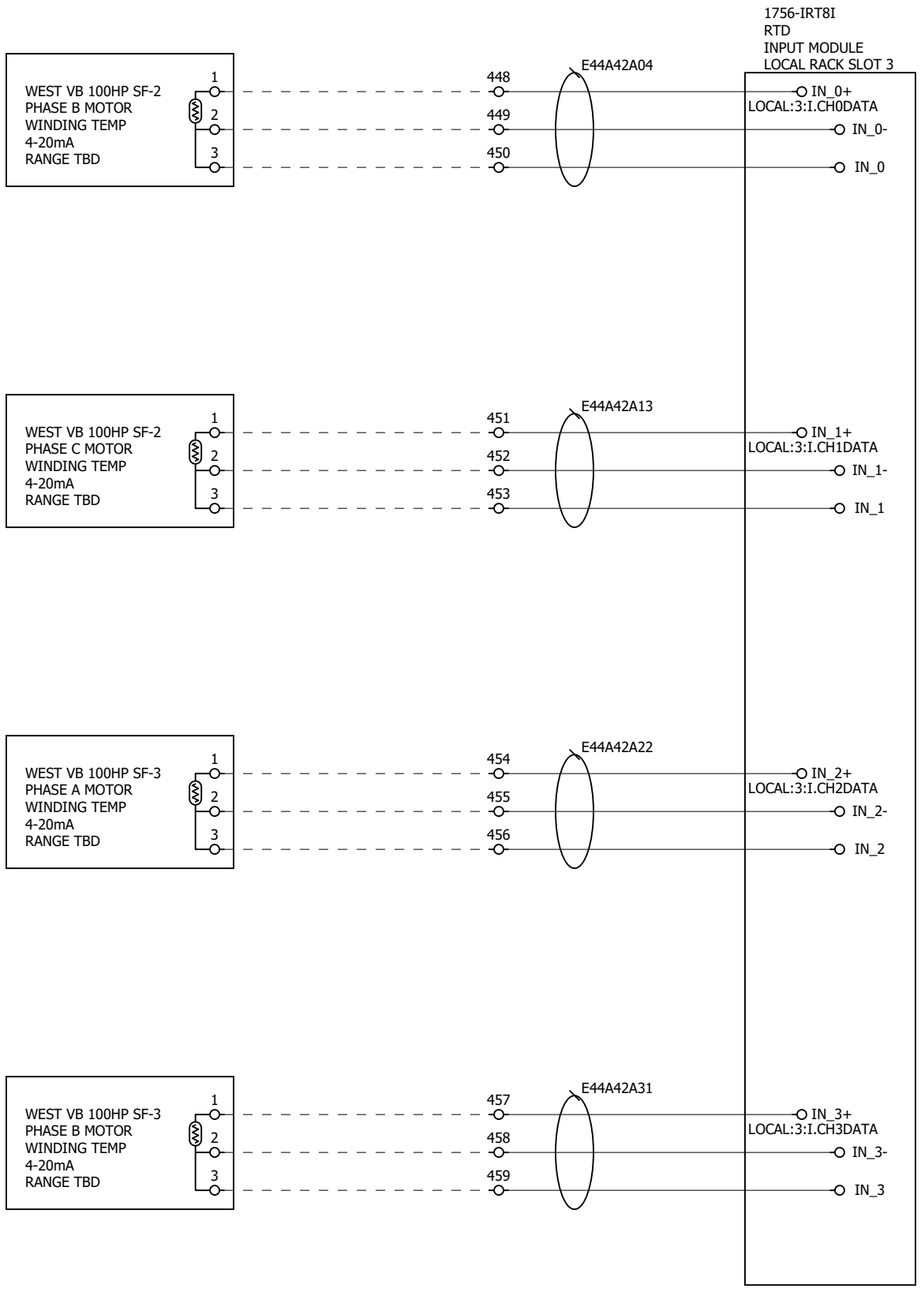
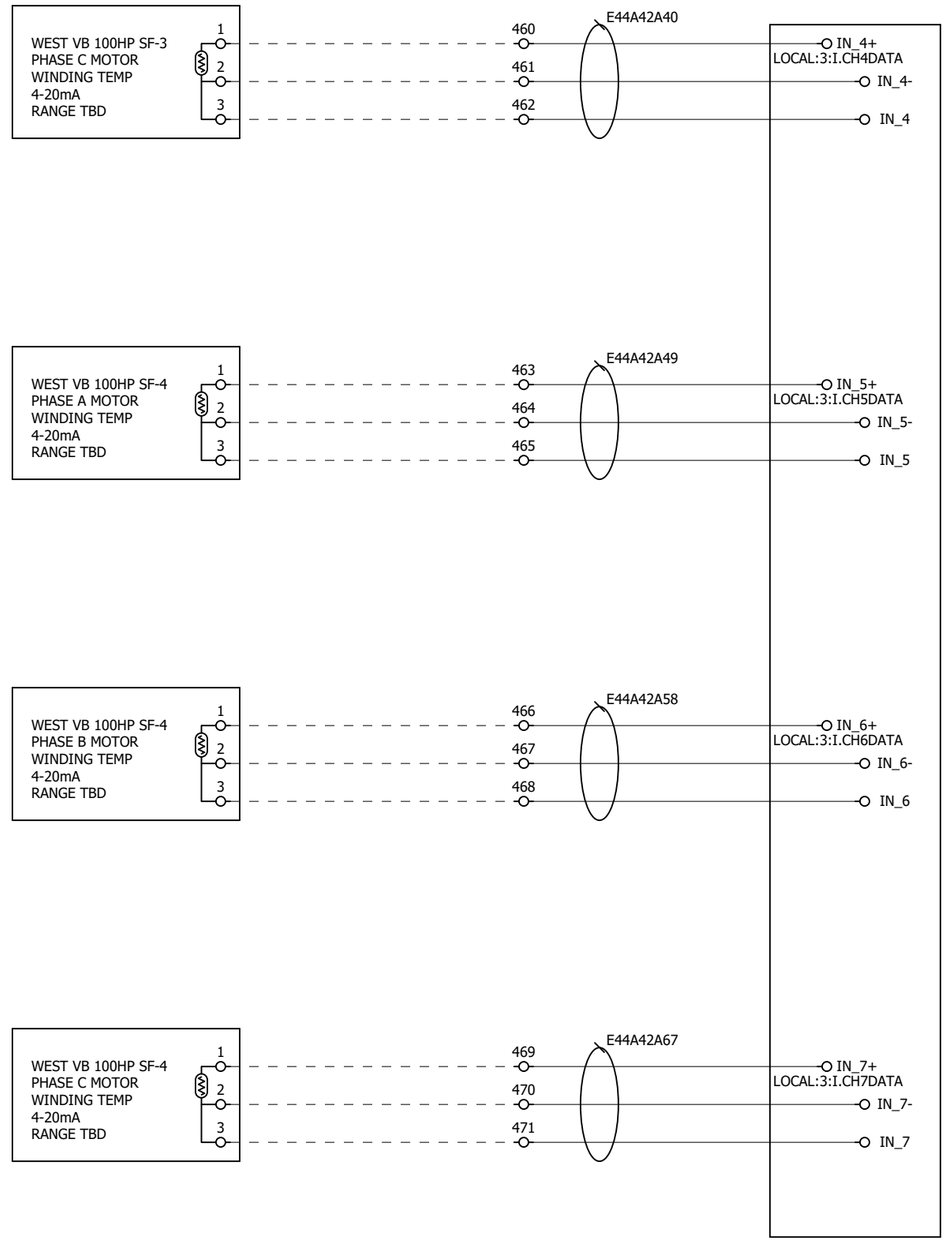
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A41





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

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0.1	05/07/20	ekilgore	DESIGN CHANGES

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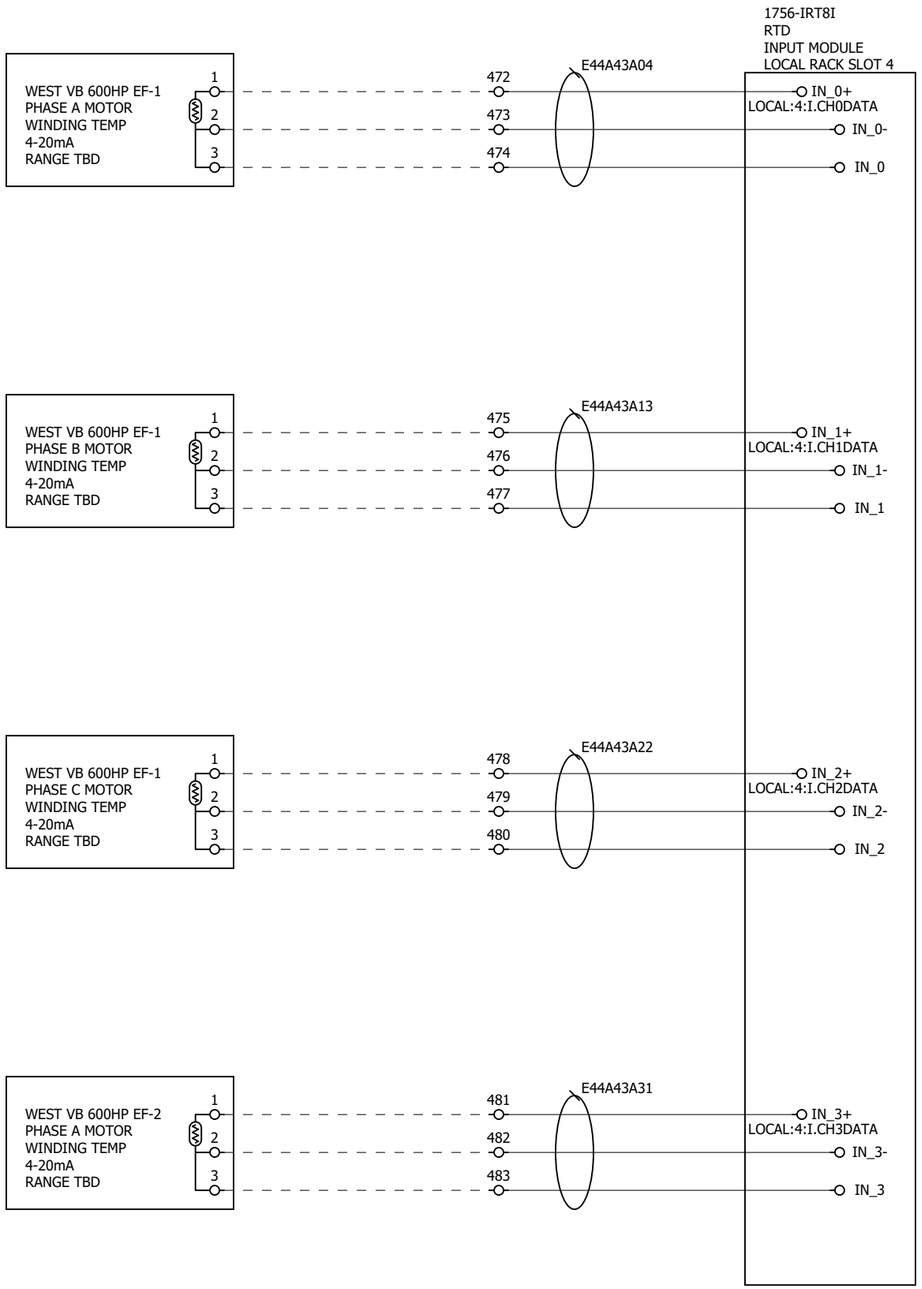
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A42



STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - RTD INPUTS

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0.1	05/07/20	ekilgore	DESIGN CHANGES

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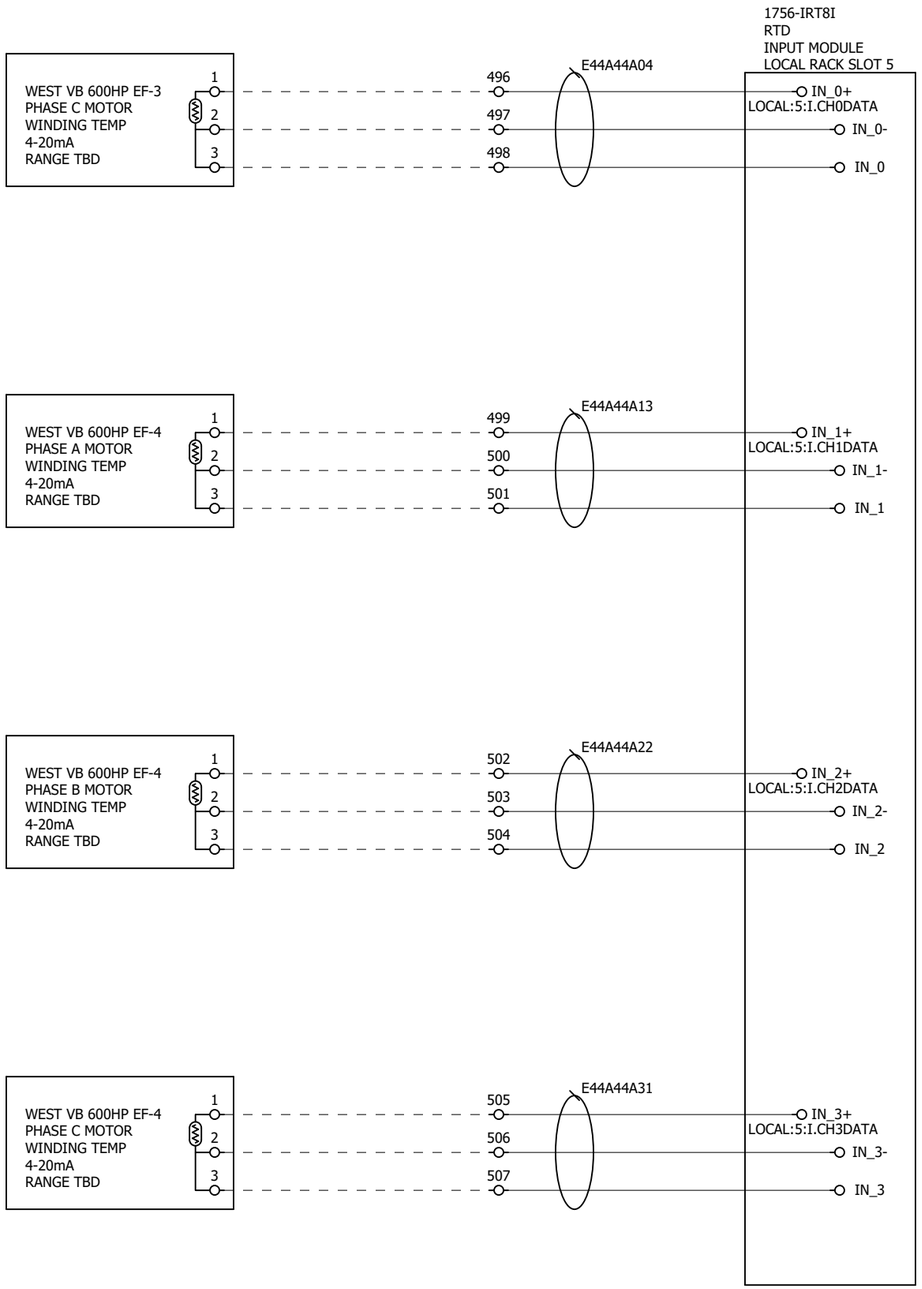
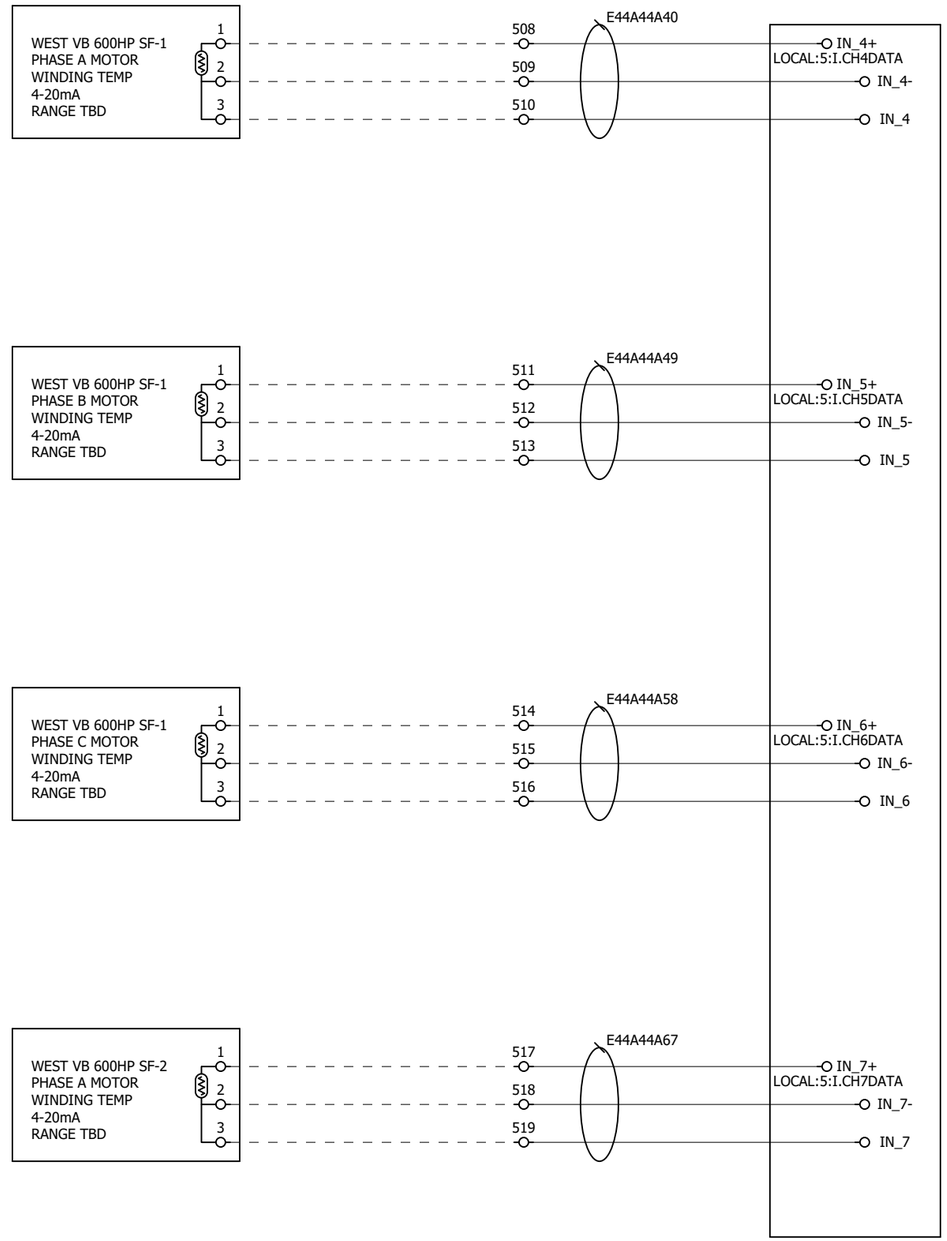
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A43





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
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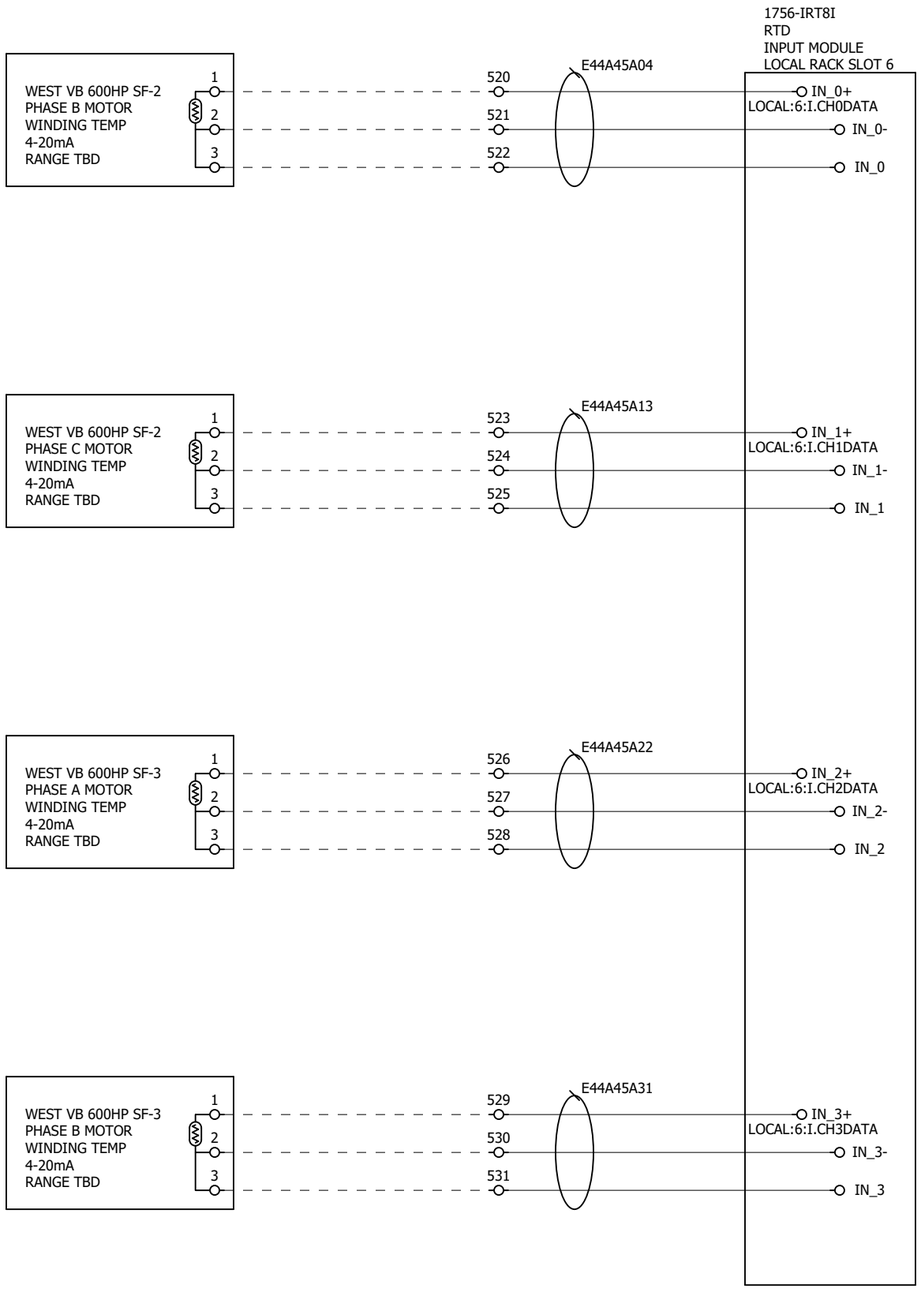
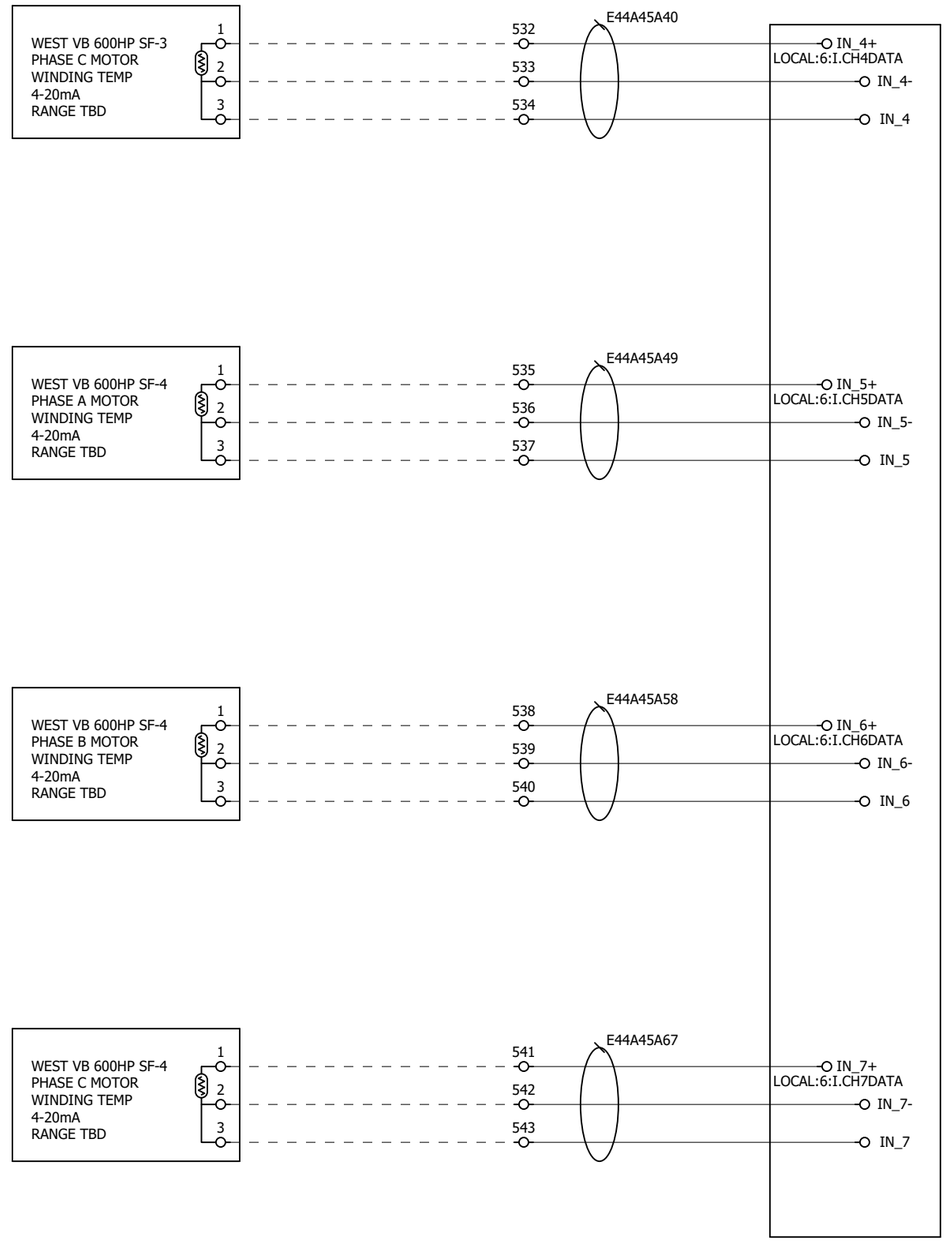
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A44





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
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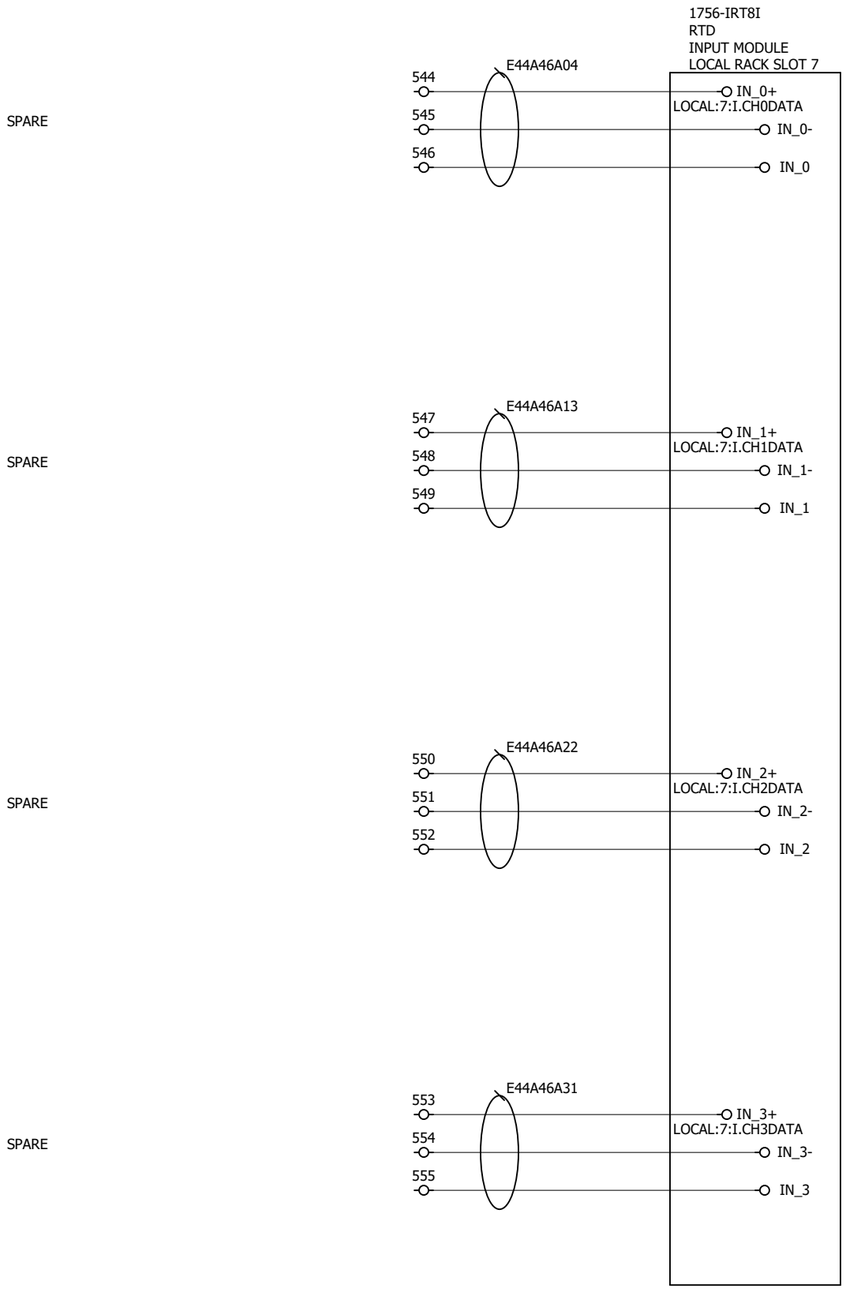
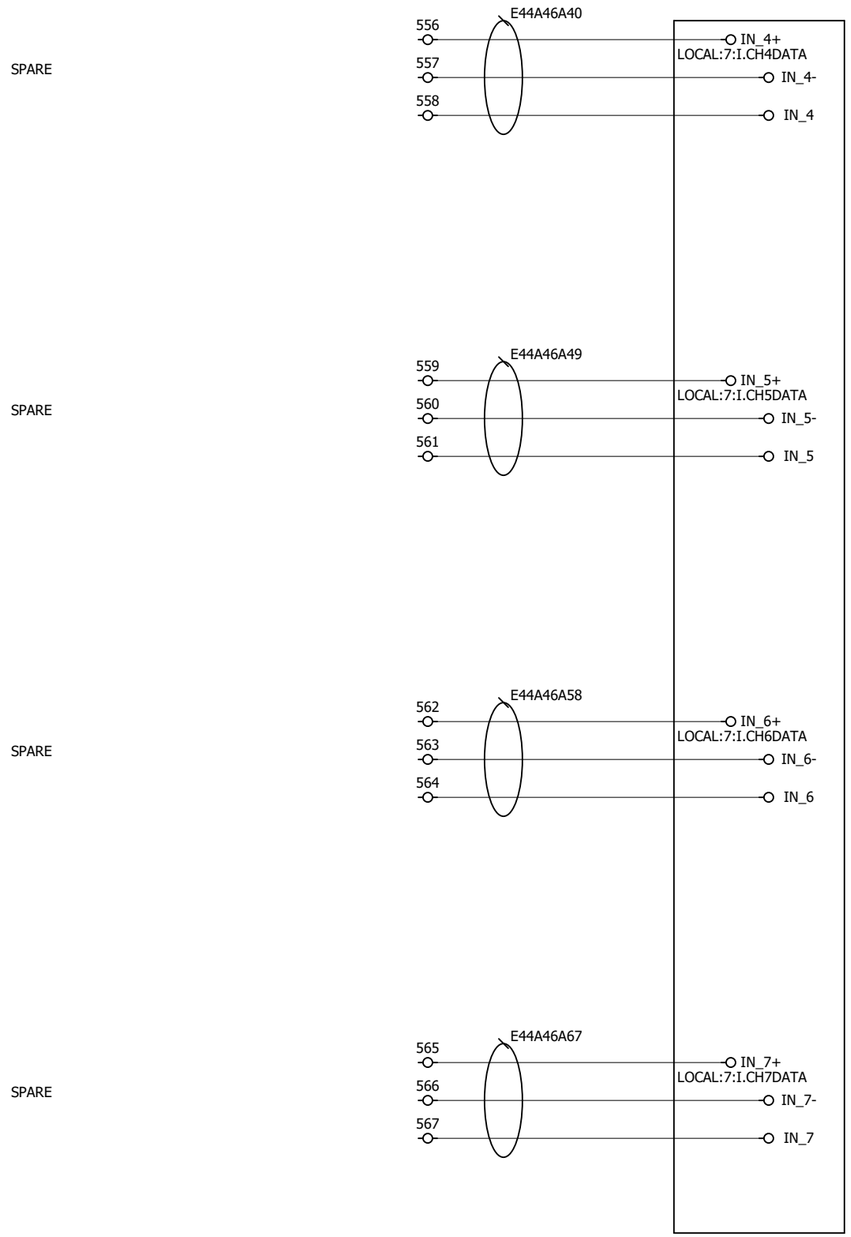
0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A45





STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
EISENHOWER/JOHNSON MEMORIAL TUNNEL 480V MCC REPLACEMENT

WEST RTD ENCLOSURE - RTD INPUTS

PROJECT # CMS203 | SCALE N/A | ENG:E. KILGORE

REV	DATE	NAME	REMARKS
2.1	08/04/20	ekilgore	SHOP REDLINES

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4.0	09/09/21	ekilgore	AS-BUILTS
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0.0	05/07/20	ekilgore	INITIAL

DWG # CMS203-E44A46

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HINGE-COVER, MEDIUM, TYPE 3R

APPLICATION

These enclosures have a size range of 16 x 12 x 6-in. to 60 x 36 x 12-in. and meet basic functionality requirements for applications that require protection from rain, sleet, snow or dripping water.

FEATURES

- Drip shield top and seam-free sides, front, and back protect from rain, snow, or sleet
- 16 gauge plated steel continuous hinge has stainless steel pin
- Cover fastened securely with captive plated steel screws
- Collar studs provided for mounting optional panels
- Hasp and staple provided for padlocking
- No gasketing or knockouts

SPECIFICATIONS

- 16 or 14 gauge galvanized steel

FINISH

ANSI 61 gray polyester powder paint finish inside and out over galvanized steel. Optional solid panels are white.

ACCESSORIES

See also Accessories.
Industrial Corrosion Inhibitors
Electric Heater
Grounding Device
Panels for Type 3R, 4, 4X, 12 and 13 Enclosures
Rack Mounting Angles - U Style (Type RA)
Touch-Up Paint
Steel and Stainless Steel Window Kits

BULLETIN: A3M

INDUSTRY STANDARDS

UL 50, 50E Listed; Type 3R; File No. E27567
cUL Listed per CSA C22.2 No 94; Type 3R File No. E27567

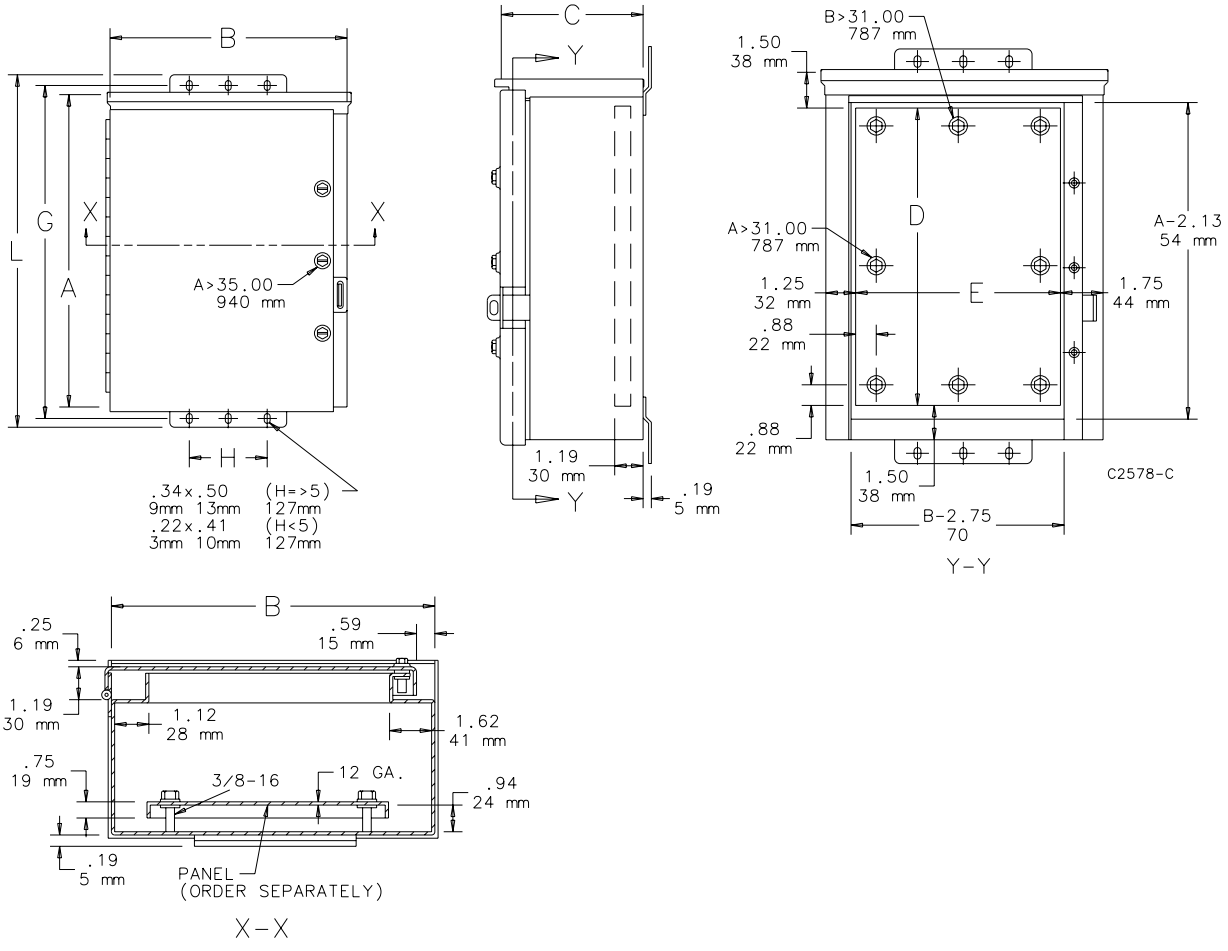
NEMA/EEMAC Type 3R
IEC 60529, IP32

Standard Product

Catalog Number	AxBxC in.	AxBxC mm	Panel Steel	Panel Perforated	Panel Aluminum	Panel Size D x E (in.)	Panel Size D x E (mm)	Mounting G x H (in.)	Mounting G x H (mm)	Overall L (in.)	Overall L (mm)
A16R126HCR	16.00 x 12.00 x 6.00	406 x 305 x 152	A16P12	A16P12PP	A16P12AL	13.00 x 9.00	330 x 229	17.00 x 3.00	432 x 76	18.00	457
A16R166HCR	16.00 x 16.00 x 6.00	406 x 406 x 152	A16P16	A16P16PP	A16P16AL	13.00 x 13.00	330 x 330	17.00 x 13.00	432 x 330	18.00	457
A18R186HCR	18.00 x 18.00 x 6.00	457 x 457 x 152	A18P18	A18P18PP	–	15.00 x 15.00	381 x 381	19.00 x 13.00	483 x 330	20.00	508
A20R166HCR	20.00 x 16.00 x 6.00	508 x 406 x 152	A20P16	A20P16PP	A20P16AL	17.00 x 13.00	432 x 330	21.00 x 13.00	533 x 330	22.00	559
A20R208HCR	20.00 x 20.00 x 8.00	508 x 508 x 203	A20P20	A20P20PP	A20P20AL	17.00 x 17.00	432 x 432	21.00 x 13.00	533 x 330	22.00	559
A24R208HCR	24.00 x 20.00 x 8.00	610 x 508 x 203	A24P20	A24P20PP	A24P20AL	21.00 x 17.00	533 x 432	25.00 x 13.00	635 x 330	26.00	660
A24R248HCR	24.00 x 24.00 x 8.00	610 x 610 x 203	A24P24	A24P24PP	A24P24AL	21.00 x 21.00	533 x 533	25.00 x 13.00	635 x 330	26.00	660
A30R248HCR	30.00 x 24.00 x 8.00	762 x 610 x 203	A30P24	A30P24PP	A30P24AL	27.00 x 21.00	686 x 533	31.00 x 13.00	787 x 330	32.00	813
A30R308HCR	30.00 x 30.00 x 8.00	762 x 762 x 203	A30P30	A30P30PP	–	27.00 x 27.00	686 x 686	31.00 x 27.00	787 x 686	32.00	813
A18R1810HCR	18.00 x 18.00 x 10.00	457 x 457 x 254	A18P18	A18P18PP	–	15.00 x 15.00	381 x 381	19.00 x 13.00	483 x 330	20.00	508
A24R2410HCR	24.00 x 24.00 x 10.00	610 x 610 x 254	A24P24	A24P24PP	A24P24AL	21.00 x 21.00	533 x 533	25.00 x 13.00	635 x 330	26.00	660
A30R2410HCR	30.00 x 24.00 x 10.00	762 x 610 x 254	A30P24	A30P24PP	A30P24AL	27.00 x 21.00	686 x 533	31.00 x 13.00	787 x 330	32.00	813
A36R3610HCR	36.00 x 36.00 x 10.00	914 x 914 x 254	A36P36	A36P36PP	–	33.00 x 33.00	838 x 838	37.00 x 30.00	940 x 762	38.00	965
A30R3012HCR	30.00 x 30.00 x 12.00	762 x 762 x 305	A30P30	A30P30PP	–	27.00 x 27.00	686 x 686	31.00 x 27.00	787 x 686	32.00	813
A36R2412HCR	36.00 x 24.00 x 12.00	914 x 610 x 305	A36P24	A36P24PP	A36P24AL	33.00 x 21.00	838 x 533	37.00 x 13.00	940 x 330	38.00	965
A36R3012HCR	36.00 x 30.00 x 12.00	914 x 762 x 305	A36P30	A36P30PP	–	33.00 x 27.00	838 x 686	37.00 x 27.00	940 x 686	38.00	965
A42R3012HCR	42.00 x 30.00 x 12.00	1067 x 762 x 305	A42P30	–	–	39.00 x 27.00	991 x 686	43.00 x 27.00	1092 x 686	44.00	1118
A36R3612HCR	36.00 x 36.00 x 12.00	914 x 914 x 305	A36P36	A36P36PP	–	33.00 x 33.00	838 x 838	37.00 x 27.00	940 x 686	38.00	965
A42R3612HCR	42.00 x 36.00 x 12.00	1067 x 914 x 305	A42P36	–	–	39.00 x 33.00	991 x 838	43.00 x 27.00	1092 x 686	44.00	1118
A48R3612HCR	48.00 x 36.00 x 12.00	1219 x 914 x 305	A48P36	–	A48P36AL	45.00 x 33.00	1143 x 838	49.00 x 27.00	1245 x 686	50.00	1270
A60R3612HCR	60.00 x 36.00 x 12.00	1524 x 914 x 305	A60P36	–	A60P36AL	57.00 x 33.00	1448 x 838	61.00 x 27.00	1549 x 686	62.00	1575
A30R3016HCR	30.00 x 30.00 x 16.00	762 x 762 x 406	A30P30	A30P30PP	–	27.00 x 27.00	686 x 686	31.00 x 27.00	787 x 686	32.00	813
A48R3616HCR	48.00 x 36.00 x 16.00	1219 x 914 x 406	A48P36	–	A48P36AL	45.00 X 33.00	1143 X 838	49.00 X 27.00	1245 X 686	50.00	1270

Purchase panels separately.

Panel edges are flanged when greater than 30 inches (762mm).


B
G
X
X
L
A
A>35.00
940 mm
H
.34x.50 (H=>5)
9mm 13mm 127mm
.22x.41 (H<5)
3mm 10mm 127mm
C
Y
1.19
30 mm
Y
.19
5 mm
B>31.00
787 mm
1.50
38 mm
D
A>31.00
787 mm
A-2.13
54 mm
1.25
32 mm
E
1.75
44 mm
.88
22 mm
.88
22 mm
1.50
38 mm
B-2.75
70
C2578-C
Y-Y
B
.25
6 mm
.59
15 mm
1.19
30 mm
1.12
28 mm
1.62
41 mm
.75
19 mm
3/8-16
12 GA.
.94
24 mm
.19
5 mm
PANEL
(ORDER SEPARATELY)
X-X

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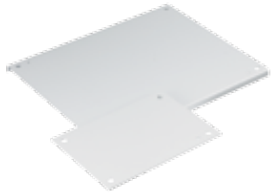
nVent | HOFFMAN

PANELS FOR TYPE 3R, 4, 4X, 12 AND 13 ENCLOSURES

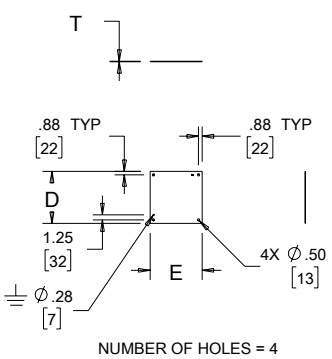


Steel panels are 11 or 12 gauge, finished with white polyester powder paint or a conductive, corrosion-resistant coating. Larger panels have flanges on two or four sides. Some larger steel panels are 11 gauge and include extra holes for panel lifting. Aluminum panels are 5052-H32 aluminum alloy. Larger panels have flanges on four sides. Aluminum panels are protected on one side with a plastic film. Stainless steel panels are Type 316 stainless steel. Panel mounting hardware is furnished with all enclosures which accept these panels.

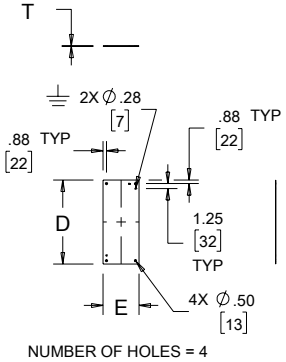
BULLETIN: PNLFS, PNLJ, PNLWM

Catalog Number	Material	Panel Size D x E (in.)	Panel Size D x E (mm)	Panel Gauge or Thickness	Edge Flanges	T (in.)	T (mm)	Number of Holes
A12P24	Painted steel	9.00 x 21.00	229 x 533	12 ga.	0	–	–	4
A12P24G	Conductive steel	9.00 x 21.00	229 x 533	12 ga.	0	–	–	4
A16P12	Painted steel	13.00 x 9.00	330 x 229	12 ga.	0	–	–	4
A16P12G	Conductive steel	13.00 x 9.00	330 x 229	12 ga.	0	–	–	4
A16P12SS6	Stainless Steel	13.00 x 9.00	330 x 229	12 ga.	0	–	–	4
A16P12AL	Aluminum	13.00 x 9.00	330 x 229	0.10 in./3 mm	0	–	–	4
A16P16	Painted steel	13.00 x 13.00	330 x 330	12 ga.	0	–	–	4
A16P16G	Conductive steel	13.00 x 13.00	330 x 330	12 ga.	0	–	–	4
A16P16SS6	Stainless Steel	13.00 x 13.00	330 x 330	12 ga.	0	–	–	4
A16P16AL	Aluminum	13.00 x 13.00	330 x 330	0.10 in./3 mm	0	–	–	4
A18P18	Painted steel	15.00 x 15.00	381 x 381	12 ga.	0	–	–	4
A18P18G	Conductive steel	15.00 x 15.00	381 x 381	12 ga.	0	–	–	4
A20P12	Painted steel	17.00 x 9.00	432 x 229	12 ga.	0	–	–	4
A20P12G	Conductive steel	17.00 x 9.00	432 x 229	12 ga.	0	–	–	4
A20P16	Painted steel	17.00 x 13.00	432 x 330	12 ga.	0	–	–	4
A20P16G	Conductive steel	17.00 x 13.00	432 x 330	12 ga.	0	–	–	4
A20P16SS6	Stainless Steel	17.00 x 13.00	432 x 330	12 ga.	0	–	–	4
A20P16AL	Aluminum	17.00 x 13.00	432 x 330	0.10 in./3 mm	0	–	–	4
A20P20	Painted steel	17.00 x 17.00	432 x 432	12 ga.	0	–	–	4
A20P20G	Conductive steel	17.00 x 17.00	432 x 432	12 ga.	0	–	–	4
A20P20SS6	Stainless steel	17.00 x 17.00	432 x 432	12 ga.	0	–	–	4
A20P20AL	Aluminum	17.00 x 17.00	432 x 432	0.10 in./3 mm	0	–	–	4
A24P16	Painted steel	21.00 x 13.00	533 x 330	12 ga.	0	–	–	4
A24P16G	Conductive steel	21.00 x 13.00	533 x 330	12 ga.	0	–	–	4
A24P16SS6	Stainless Steel	21.00 x 13.00	533 x 330	12 ga.	0	–	–	4
A24P20	Painted steel	21.00 x 17.00	533 x 432	12 ga.	2	0.75	19	4
A24P20G	Conductive steel	21.00 x 17.00	533 x 432	12 ga.	2	0.75	19	4
A24P20SS6	Stainless Steel	21.00 x 17.00	533 x 432	12 ga.	2	0.75	19	4
A24P20AL	Aluminum	21.00 x 17.00	533 x 432	0.10 in./3 mm	4	0.75	19	4
A24P24	Painted steel	21.00 x 21.00	533 x 533	12 ga.	2	0.75	19	4
A24P24G	Conductive steel	21.00 x 21.00	533 x 533	12 ga.	2	0.75	19	4
A24P24SS6	Stainless Steel	21.00 x 21.00	533 x 533	12 ga.	2	0.75	19	4
A24P24AL	Aluminum	21.00 x 21.00	533 x 533	0.10 in./3 mm	2	0.75	19	4
A30P16	Painted steel	27.00 x 13.00	686 x 330	12 ga.	2	0.75	19	4
A30P16G	Conductive steel	33.00 x 27.00	838 x 686	12 ga.	2	0.75	19	4
A30P20	Painted steel	27.00 x 17.00	686 x 432	12 ga.	2	0.75	19	4
A30P20G	Conductive steel	27.00 x 17.00	686 x 432	12 ga.	2	0.75	19	4
A30P20SS6	Stainless Steel	27.00 x 17.00	686 x 432	12 ga.	2	0.75	19	4
A30P24	Painted steel	27.00 x 21.00	686 x 533	12 ga.	2	0.75	19	4
A30P24G	Conductive steel	27.00 x 21.00	686 x 533	12 ga.	2	0.75	19	4
A30P24SS6	Stainless Steel	27.00 x 21.00	686 x 533	12 ga.	2	0.75	19	4
A30P24AL	Aluminum	27.00 x 21.00	686 x 533	0.10 in./3 mm	2	0.75	19	4
A30P30	Painted steel	27.00 x 27.00	686 x 686	12 ga.	4	0.75	19	4
A30P30G	Conductive steel	27.00 x 27.00	686 x 686	12 ga.	4	0.75	19	4
A30P30SS6	Stainless Steel	27.00 x 27.00	686 x 686	12 ga.	4	0.75	19	4
A36P16	Painted steel	33.00 X 13.00	838 X 330	12 ga.	2	0.75	19	4
A36P16G	Conductive steel	33.00 x 13.00	838 x 330	12 ga.	2	0.75	19	4
A36P24	Painted steel	33.00 x 21.00	838 x 533	12 ga.	2	0.75	19	6
A36P24G	Conductive steel	33.00 x 21.00	838 x 533	12 ga.	2	0.75	19	6
A36P24SS6	Stainless Steel	33.00 x 21.00	838 x 533	12 ga.	2	0.75	19	6
A36P24AL	Aluminum	33.00 x 21.00	838 x 533	0.10 in./3 mm	2	0.75	19	6
A36P30	Painted steel	33.00 x 27.00	838 x 686	12 ga.	4	0.75	19	6
A36P30G	Conductive steel	33.00 x 27.00	838 x 686	12 ga.	4	0.75	19	6
A36P30SS6	Stainless Steel	33.00 x 27.00	838 x 686	12 ga.	4	0.75	19	6
A36P30AL	Aluminum	33.00 x 27.00	838 x 686	0.10 in./3 mm	4	0.75	19	6
A36P36	Painted steel	33.00 x 33.00	838 x 838	12 ga.	4	0.75	19	8
A36P36G	Conductive steel	33.00 x 33.00	838 x 838	12 ga.	4	0.75	19	8
A36P36SS6	Stainless Steel	33.00 x 33.00	838 x 838	12 ga.	4	0.75	19	8
A40P24	Painted steel	37.00 x 21.00	940 x 533	12 ga.	4	0.75	19	6
A40P24G	Conductive steel	37.00 x 21.00	940 x 533	12 ga.	4	0.75	19	6
A40P30	Painted steel	37.00 x 29.00	940 x 737	12 ga.	4	0.75	19	4
A40P30G	Conductive steel	37.00 x 29.00	940 x 737	12 ga.	4	0.75	19	4
A42P24	Painted steel	39.00 x 21.00	991 x 533	12 ga.	2	0.75	19	6
A42P24G	Conductive steel	39.00 x 21.00	991 x 533	12 ga.	2	0.75	19	6
A42P30	Painted steel	39.00 x 27.00	991 x 686	12 ga.	4	0.75	19	6

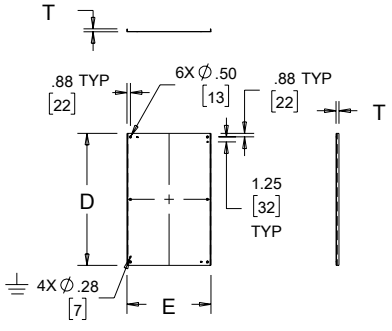
Catalog Number	Material	Panel Size D x E (in.)	Panel Size D x E (mm)	Panel Gauge or Thickness	Edge Flanges	T (in.)	T (mm)	Number of Holes
A42P30G	Conductive steel	39.00 x 27.00	991 x 686	12 ga.	4	0.75	19	6
A42P30SS6	Stainless Steel	39.00 x 27.00	991 x 686	12 ga.	4	0.75	19	6
A42P36	Painted steel	39.00 x 33.00	991 x 838	12 ga.	4	0.75	19	8
A42P36G	Conductive steel	39.00 x 33.00	991 x 838	12 ga.	4	0.75	19	8
A42P36SS6	Stainless Steel	39.00 x 33.00	991 x 838	12 ga.	4	0.75	19	8
A42P42	Painted steel	39.00 x 39.00	991 x 991	12 ga.	4	0.75	19	8
A42P42G	Conductive steel	39.00 x 39.00	991 x 991	12 ga.	4	0.75	19	8
A48P24	Painted steel	45.00 x 21.00	1143 x 533	12 ga.	2	0.75	19	6
A48P24G	Conductive steel	45.00 x 21.00	1143 x 533	12 ga.	2	0.75	19	6
A48P30	Painted steel	45.00 x 27.00	1143 x 686	12 ga.	4	0.75	19	6
A48P30G	Conductive steel	45.00 x 27.00	1143 x 686	12 ga.	4	0.75	19	6
A48P36	Painted steel	45.00 x 33.00	1143 x 838	12 ga.	4	0.75	19	8
A48P36G	Conductive steel	45.00 x 33.00	1143 x 838	12 ga.	4	0.75	19	8
A48P36SS6	Stainless Steel	45.00 x 33.00	1143 x 838	12 ga.	4	0.75	19	8
A48P36AL	Aluminum	45.00 x 33.00	1143 x 838	0.10 in./3 mm	4	0.75	19	8
A48P42	Painted steel	45.00 x 39.00	1143 x 991	12 ga.	4	0.75	19	8
A48P42G	Conductive steel	45.00 x 39.00	1143 x 991	12 ga.	4	0.75	19	8
A48P48	Painted steel	44.00 x 44.00	1118 x 1118	11 ga.	4	0.84	21	10
A48P48G	Conductive steel	44.00 x 44.00	1118 x 1118	11 ga.	4	0.84	21	10
A54P42	Painted steel	50.00 x 38.00	1270 x 965	11 ga.	4	0.84	21	10
A54P42G	Conductive steel	50.00 x 38.00	1270 x 965	11 ga.	4	0.84	21	10
A60P24	Painted steel	57.00 x 21.00	1448 x 533	12 ga.	4	0.75	19	6
A60P24G	Conductive steel	57.00 x 21.00	1448 x 533	12 ga.	4	0.75	19	6
A60P30	Painted steel	57.00 x 27.00	1448 x 686	12 ga.	4	0.75	19	6
A60P30G	Conductive steel	57.00 x 27.00	1448 x 686	12 ga.	4	0.75	19	6
A60P36	Painted steel	57.00 x 33.00	1448 x 838	12 ga.	4	0.75	19	8
A60P36G	Conductive steel	57.00 x 33.00	1448 x 838	12 ga.	4	0.75	19	8
A60P36SS6	Stainless Steel	57.00 x 33.00	1448 x 838	12 ga.	4	0.75	19	8
A60P36AL	Aluminum	57.00 x 33.00	1448 x 838	0.10 in./3 mm	4	0.75	19	8
A60BFP42	Painted steel	56.00 x 38.00	1422 x 965	11 ga.	4	0.84	21	10
A60BFP42G	Conductive steel	56.00 x 38.00	1422 x 965	11 ga.	4	0.84	21	10
A60P48	Painted steel	56.00 x 44.00	1422 x 1118	11 ga.	4	0.84	21	10
A60P48G	Conductive steel	56.00 x 44.00	1422 x 1118	11 ga.	4	0.84	21	10
A60P60	Painted steel	56.00 x 56.00	1422 x 1422	11 ga.	4	0.84	21	10
A60P60G	Conductive steel	56.00 x 56.00	1422 x 1422	11 ga.	4	0.84	21	10
A72P36	Painted steel	69.00 x 33.00	1753 x 838	12 ga.	4	0.75	19	8
A72P36G	Conductive steel	69.00 x 33.00	1753 x 838	12 ga.	4	0.75	19	8
A72P60	Painted steel	68.00 x 56.00	1727 x 1422	11 ga.	4	0.84	21	10
A72P60G	Conductive steel	68.00 x 56.00	1727 x 1422	11 ga.	4	0.84	21	10
A72P72	Painted steel	68.00 x 68.00	1727 x 1727	11 ga.	4	0.84	21	10
A72P72G	Conductive steel	68.00 x 68.00	1727 x 1727	11 ga.	4	0.84	21	10



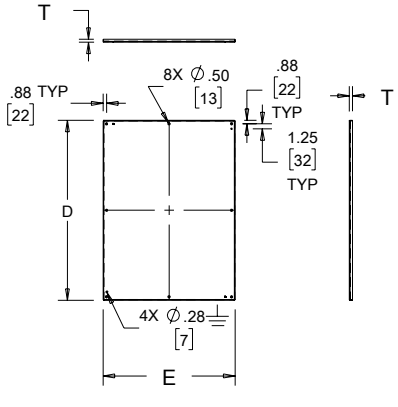
NUMBER OF HOLES = 4
A = < 24 in / 310 mm



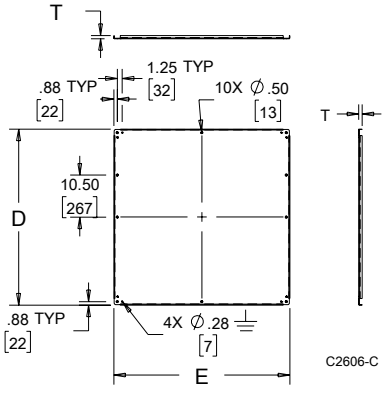
NUMBER OF HOLES = 4
A = ≥ 24 in / 310 mm



NUMBER OF HOLES = 6



NUMBER OF HOLES = 8



C2606-C

NUMBER OF HOLES = 10

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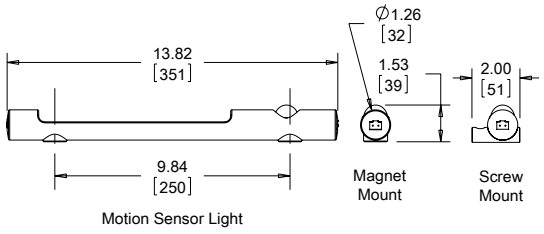
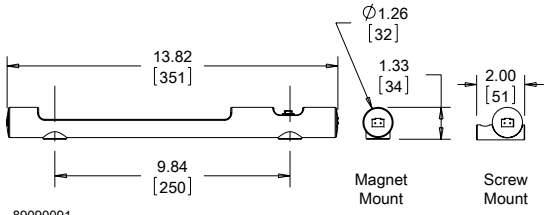
LED LIGHT KIT

LED light kits provide interior enclosure lighting. These light kits are ideal for remote and darkened enclosure applications. The light can be mechanically fastened with included hardware to maintain enclosure UL listing (up to Type 4X), or can be magnetically attached to flat steel surfaces. The lights have auto-sensing circuitry (AC voltage 90 VAC to 265 VAC and DC voltage 20 VDC to 60 VDC). LED lights are light-weight and in a small form factor while providing 400 LM of 6000-7000K light. Power consumption for all models is 5 watts.

BULLETIN: A80LT



Motion Sensor Light



89090091 On/Off Switch Light

Catalog Number	AxBxC in./mm	Weight (oz)	Weight (gm)	Mounting Style	Power Source	Activation	Voltage
LEDA1M35	1.34 x 1.26 x 13.82 34 x 32 x 351	4.8	135	Magnetic	AC	On/off switch	90 VAC-265 VAC
LEDA2M35	1.54 x 1.26 x 13.82 39 x 32 x 351	5.0	140	Magnetic	AC	IR Motion Sensor	90 VAC-265 VAC
LEDA1S35	1.42 x 2.05 x 13.82 36 x 52 x 351	4.8	135	Screw	AC	On/off switch	90 VAC-265 VAC
LEDA2S35	1.63 x 2.05 x 13.82 41 x 52 x 351	5.0	140	Screw	AC	IR Motion Sensor	90 VAC-265 VAC
LEDD1M35	1.34 x 1.26 x 13.82 34 x 32 x 351	4.8	135	Magnetic	DC	On/off switch	20 VDC-60 VDC
LEDD2M35	1.54 x 1.26 x 13.82 39 x 32 x 351	5.0	140	Magnetic	DC	IR Motion Sensor	20 VDC-60 VDC
LEDD1S35	1.42 x 2.05 x 13.82 36 x 52 x 351	4.8	135	Screw	DC	On/off switch	20 VDC-60 VDC
LEDD2S35	1.63 x 2.05 x 13.82 41 x 52 x 351	5.0	140	Screw	DC	IR Motion Sensor	20 VDC-60 VDC

LED LIGHT INPUT CONNECTOR/CABLE ASSEMBLY

The input connector/cable assembly is used to provide supply power to the LED light. Preassembled connector/cable assembly with 78.7-in. (2000 mm) long cable whip. Cables are constructed of 16 AWG copper wire.

BULLETIN: A80LT

Catalog Number	A in./mm	Power Source	Use with
LEDA20C	78.74 2000	AC	AC LED Lights
LEDD20C	78.74 2000	DC	DC LED Lights

LED LIGHT EXTENSION CONNECTOR/CABLE ASSEMBLY

The extension connector/cable assembly is used to connect adjacent LED lights (daisy chain). Up to 10 LED lights can be ganged or connected in series. Pre-assembled connector/cable assembly with 39.4-in. (1000 mm) long cable between input and output connectors. Cables are constructed of 16 AWG copper wire.

BULLETIN: A80LT

Catalog Number	A in./mm	Power Source	Use with
LEDA10E	39.37 1000	AC	AC LED Lights
LEDD10E	39.37 1000	DC	DC LED Lights

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Allen-Bradley

1756 ControlLogix Chassis Specifications

Catalog Numbers 1756-A4/B, 1756-A4K/B, 1756-A4/C, 1756-A4K/C, 1756-A7/B, 1756-A7K/B, 1756-A7/C, 1756-A7K/C, 1756-A10/B, 1756-A10K/B, 1756-A10/C, 1756-A10K/C, 1756-A13/B, 1756-A13K/B, 1756-A13/C, 1756-A13K/C, 1756-A17/B, 1756-A17K/B, 1756-A17/C, 1756-A17K/C, 1756-A4LXT/B, 1756-A5XT/B, 1756-A7LXT/B, 1756-A7XT/B, 1756-A7XT/C, 1756-A10XT/C

The ControlLogix® system is a modular system that requires a 1756 ControlLogix chassis. The chassis are designed for only horizontal back-panel mounting. Place any module into any slot. The backplane provides a high-speed communication path between modules.

AutoCAD product drawings are available at http://www.rockwellautomation.com/global/support/drawings.page.

Standard ControlLogix Chassis Specifications

The chassis backplane provides a high-speed communication path between modules and distributes power to each of the modules within the chassis.

Technical Specifications - ControlLogix Standard Chassis (Series B)

Attribute	1756-A4/B	1756-A7/B	1756-A10/B	1756-A13/B	1756-A17/B
Backplane current, chassis/slot max @ 1.2V DC	1.5 A/–				
Backplane current, chassis/slot max @ 3.3V DC	4 A/4 A				
Backplane current, chassis/slot max @ 5.1V DC	15 A/6 A				
Backplane current, chassis/slot max @ 24V DC	2.8 A/2.8 A				
Power dissipation, max	4 W	4.5 W	5 W	5.4 W	6 W
Isolation voltage	Determined by installed power supply and modules				
Slots	4	7	10	13	17
Mounting method	Only horizontal				
Cabinet size (HxWxD), min	50.8 x 50.8 x 20.3 cm (20 x 20 x 8 in.)	50.8 x 60.9 x 20.3 cm (20 x 24 x 8 in.)	50.8 x 76.2 x 20.3 cm (20 x 30 x 8 in.)	60.9 x 76.2 x 20.3 cm (24 x 30 x 8 in.)	76.2 x 91.4 x 20.3 cm (30 x 36 x 8 in.)
Weight, approx	0.75 kg (1.7 lb)	1.10 kg (2.4 lb)	1.45 kg (3.2 lb)	1.90 kg (4.2 lb)	2.20 kg (4.8 lb)
Location	Panel				
Wire size	Functional Earth Ground - 8.3 mm^2 (8 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater Protective Earth Ground - 2.1 mm^2 (14 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater				
North American temperature code	T5				
IEC temperature code	T4	T5			
Enclosure type rating	None (open-style)				

Technical Specifications - ControlLogix Standard Chassis (Series C)

Attribute	1756-A4/C	1756-A7/C	1756-A10/C	1756-A13/C	1756-A17/C
Backplane current, chassis/slot max @ 1.2V DC	1.5 A/–				
Backplane current, chassis/slot max @ 3.3V DC	4 A/4 A				
Backplane current, chassis/slot max @ 5.1V DC	15 A/6 A				
Backplane current, chassis/slot max @ 24V DC	2.8 A/2.8 A				
Power dissipation, max	4 W	4.5 W	5 W	5.4 W	6 W
Isolation voltage	Determined by installed power supply and modules				
Slots	4	7	10	13	17
Mounting method	Only horizontal				
Cabinet size (HxWxD), min	50.8 x 50.8 x 20.3 cm (20 x 20 x 8 in.)	50.8 x 60.9 x 20.3 cm (20 x 24 x 8 in.)	50.8 x 76.2 x 20.3 cm (20 x 30 x 8 in.)	60.9 x 76.2 x 20.3 cm (24 x 30 x 8 in.)	76.2 x 91.4 x 20.3 cm (30 x 36 x 8 in.)
Weight, approx	0.75 kg (1.7 lb)	1.10 kg (2.4 lb)	1.45 kg (3.2 lb)	1.90 kg (4.2 lb)	2.20 kg (4.8 lb)
Location	Panel				
Wire size	Functional earth ground - 8.3 mm^2 (8 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater Protective earth ground - 2.1 mm^2 (14 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater				
North American temperature code	T4				
IEC temperature code	T4				
Enclosure type rating	None (open-style)				

Environmental Specifications - ControlLogix Standard Chassis

Attribute	1756-A4/B, 1756-A7/B, 1756-A10/B, 1756-A13/B, 1756-A17/B	1756-A4/C, 1756-A7/C, 1756-A10/C, 1756-A13/C, 1756-A17/C
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)	-25…+60 °C (-13…+140 °F)
Temperature, surrounding air	60 °C (140 °F)	
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)	
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing	
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz	
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g	
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g	30 g
Emissions	IEC 61000-6-4	
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges	
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz	

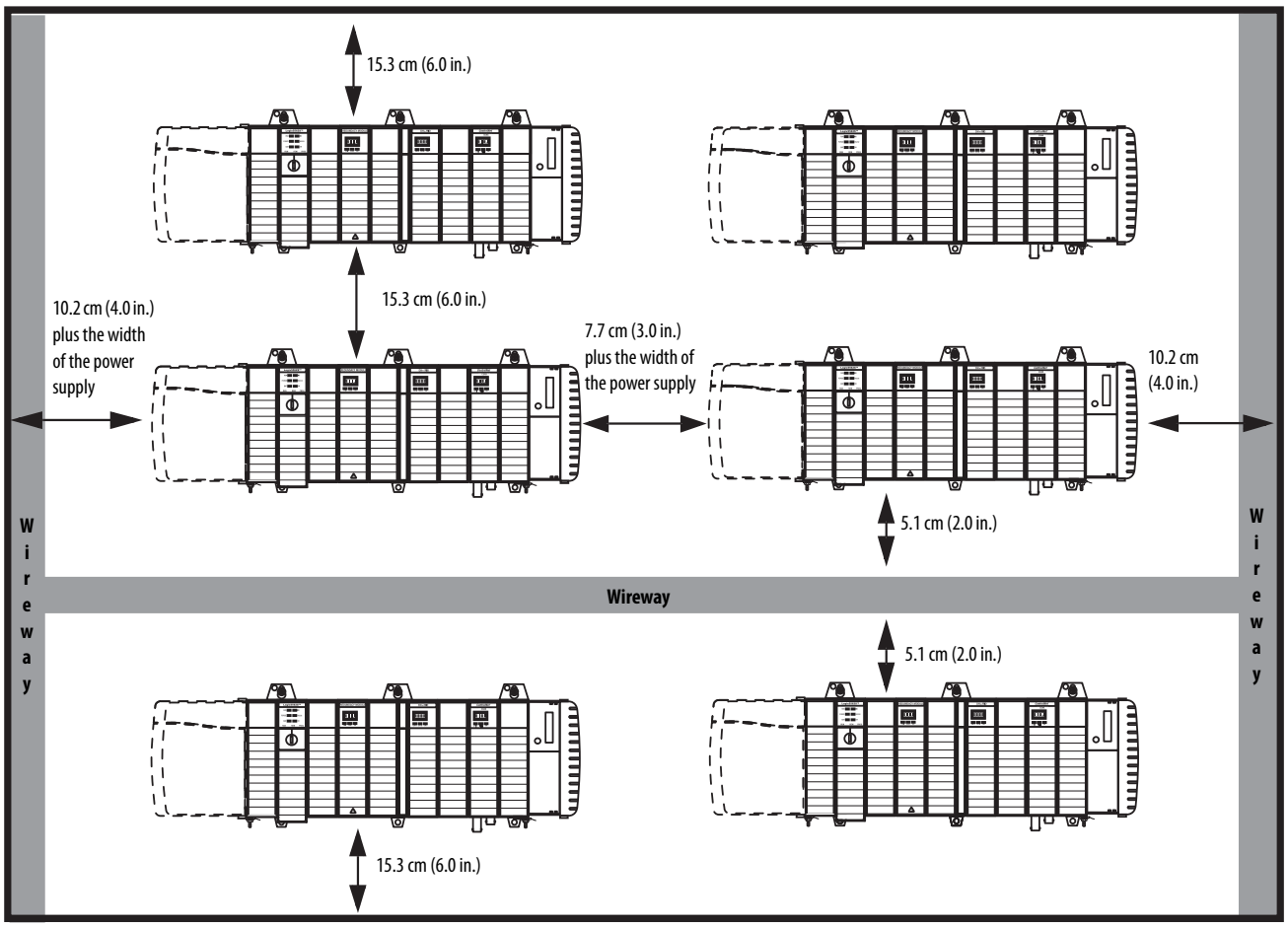
Certifications - ControlLogix Standard Chassis

Certification[(1)]	1756-A4/B	1756-A7/B, 1756-A10/B, 1756-A13/B, 1756-A17/B	1756-A4/C, 1756-A7/C, 1756-A10/C, 1756-A13/C, 1756-A17/C
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.		
CSA	CSA Certified Process Control Equipment. See CSA File 54689. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File 69960.		
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations.		
CE	European Union 2004/108/EC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)		
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions		
Ex	European Union 94/9/EC ATEX Directive, compliant with: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements • II 3 G Ex nA IIC T4 Gc X	European Union 94/9/EC ATEX Directive, compliant with: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements • II 3 G Ex nA IIC T5 Gc X	European Union 94/9/EC ATEX Directive, compliant with: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements • II 3 G Ex nA IIC T4 Gc • DEMKO13ATEX1325026X
IECEx	N/A		IECEx System, compliant with: • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • IEC 60079-0; General Requirements • II 3 G Ex nA IIC T4 Gc • IECExUL14.0008X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3		
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation		

(1) See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

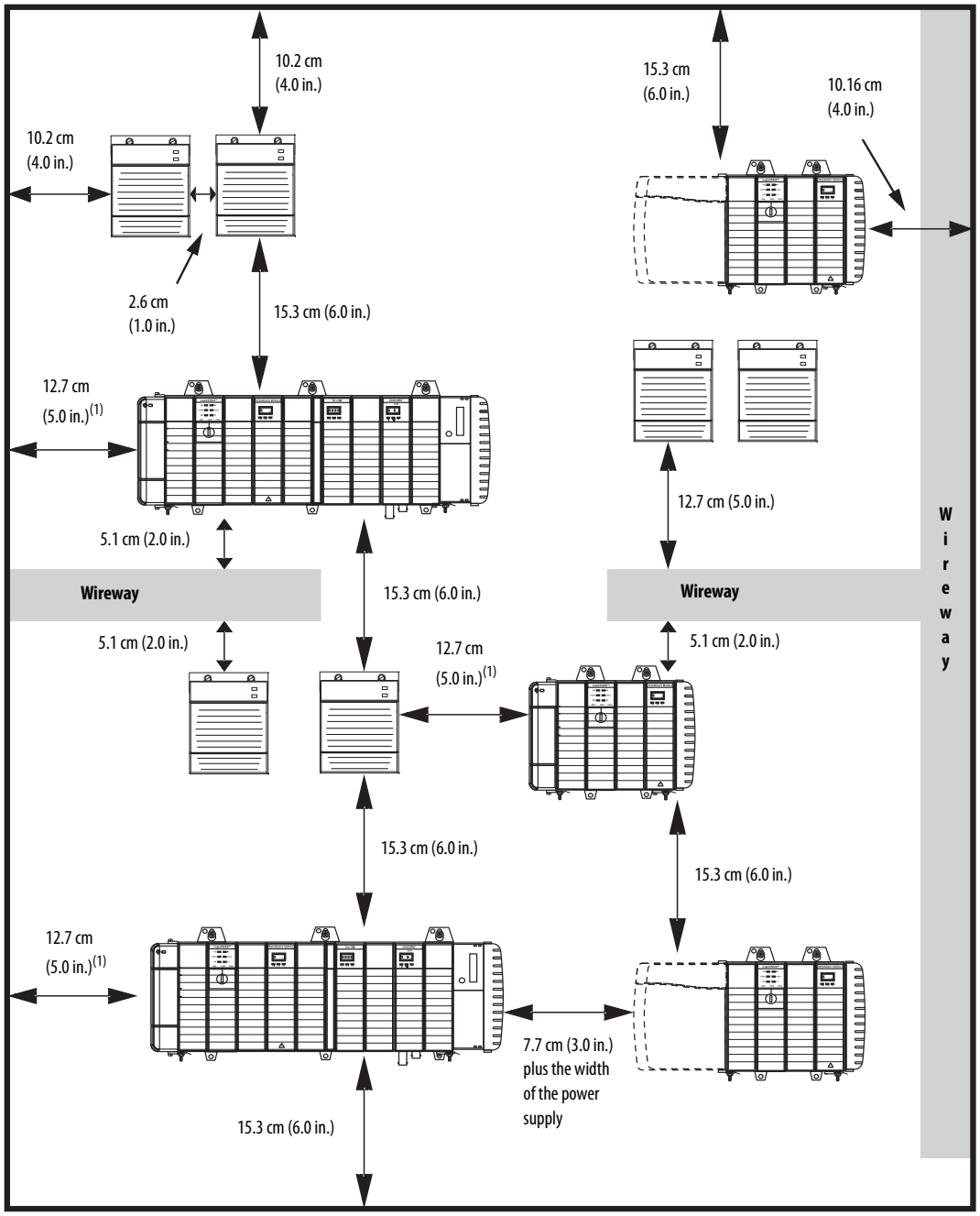
Spacing Requirements

When you mount a ControlLogix chassis with a standard power supply in an enclosure, follow these spacing requirements (series C chassis depicted).



IMPORTANT The 1756-CPR2 cable has a bend radius of 12.7 cm (5.0 in.). The chassis must have a minimum clearance of 12.7 cm (5.0 in.) on the left side to route and connect the 1756-CPR2 cable. The redundant power supplies must have a minimum clearance of 12.7 cm (5.0 in.) below the supply to route and connect the 1756-CPR2 cable.

When you mount a ControlLogix chassis with a redundant power supply and a chassis adapter in an enclosure, follow these spacing requirements (series C chassis depicted).



(1) The measurements for systems that use 1756-CPR2D or 1756-CPR2U cables are 10.2 cm (4.0 in.).

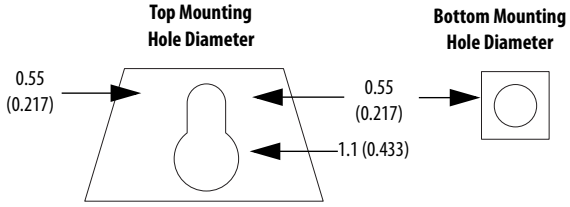
Series C chassis offer these features:

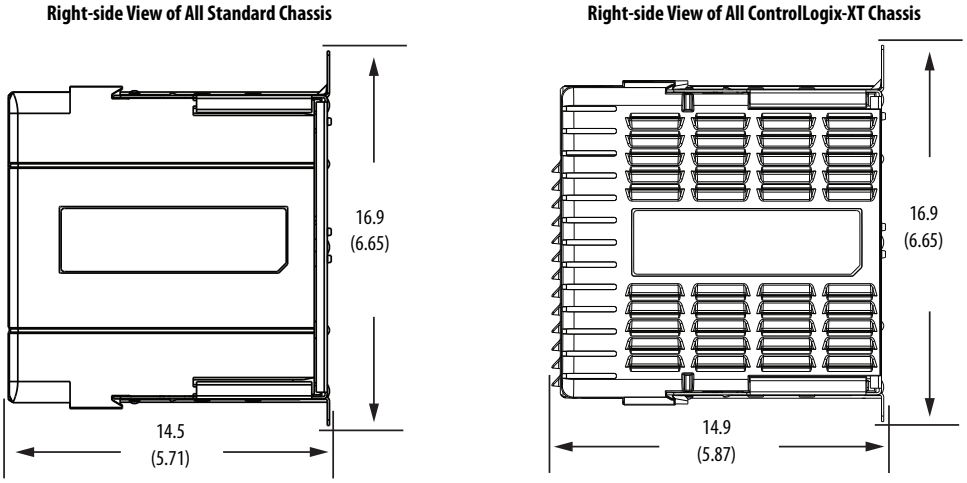
- Improved slot guidelines
- Improved ventilation
- Stronger mounting tabs
- Additional hole in mounting tab
- Additional ground screw

Series B ControlLogix Chassis with Standard and Slim Power Supply Mounting Dimensions

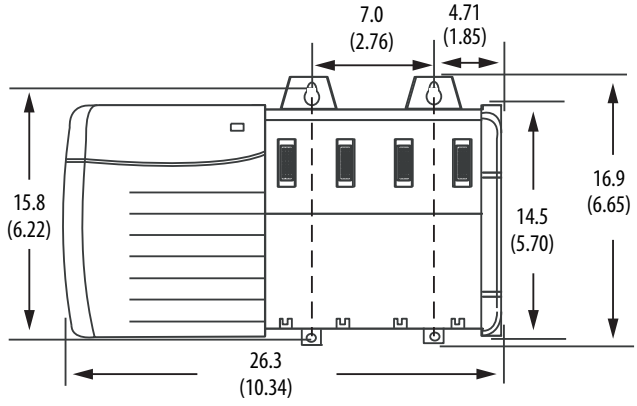
Dimensions are in cm (in.).

Chassis Common Dimensions

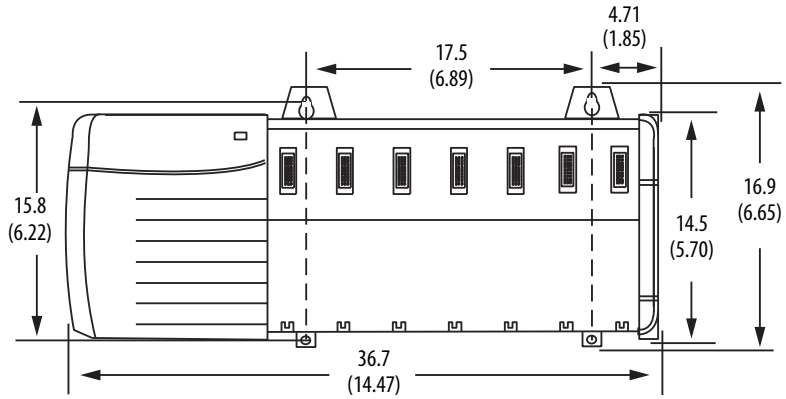




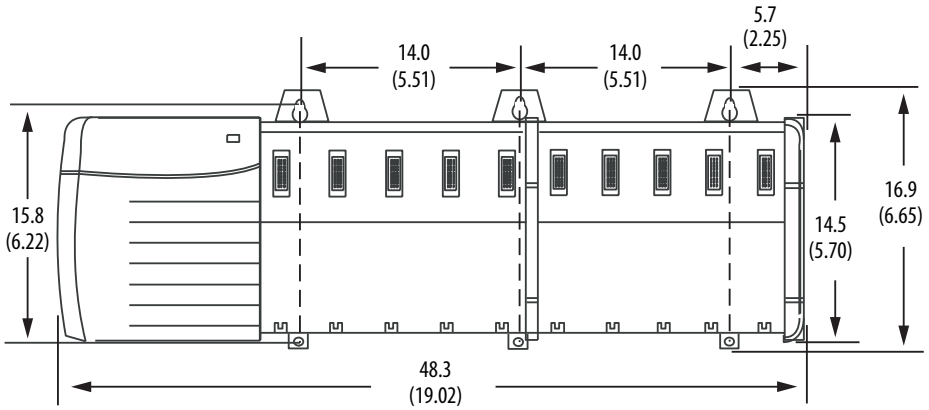
1756-A4/B Chassis and Power Supply



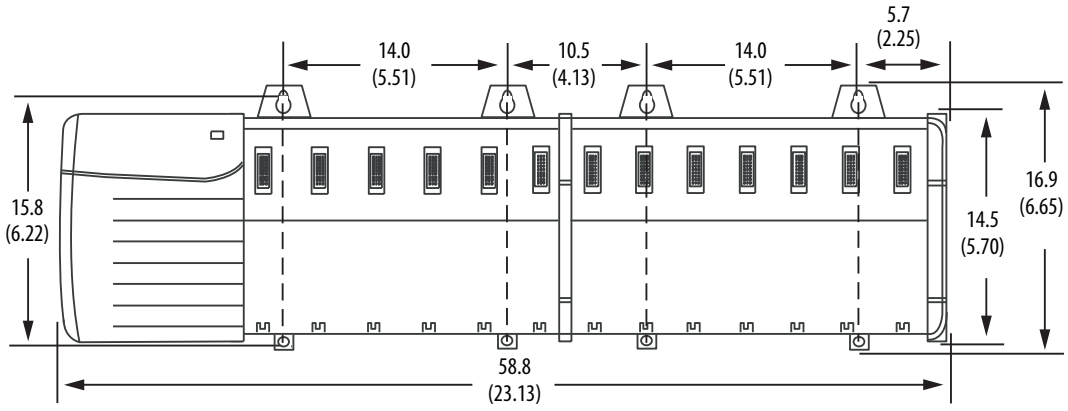
1756-A7/B Chassis and Power Supply



1756-A10/B Chassis and Power Supply



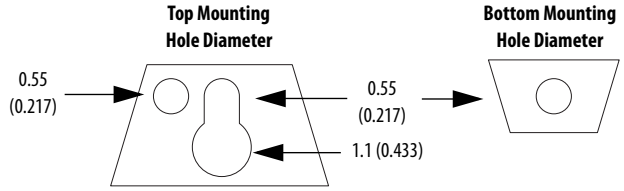
1756-A13/B Chassis and Power Supply



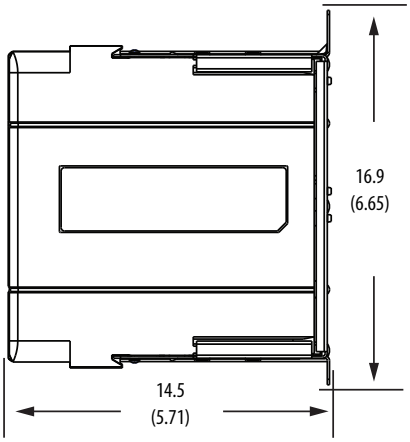
Series C ControlLogix Chassis with Standard and Slim Power Supply Mounting Dimensions

Dimensions are in cm (in.).

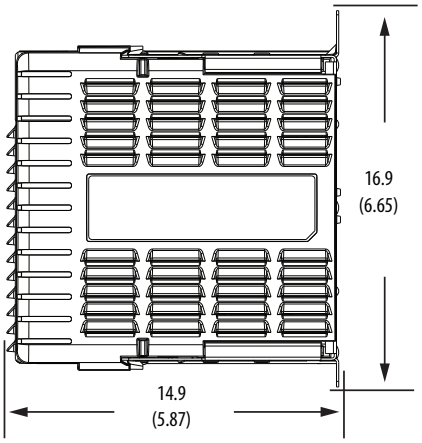
Chassis Common Dimensions



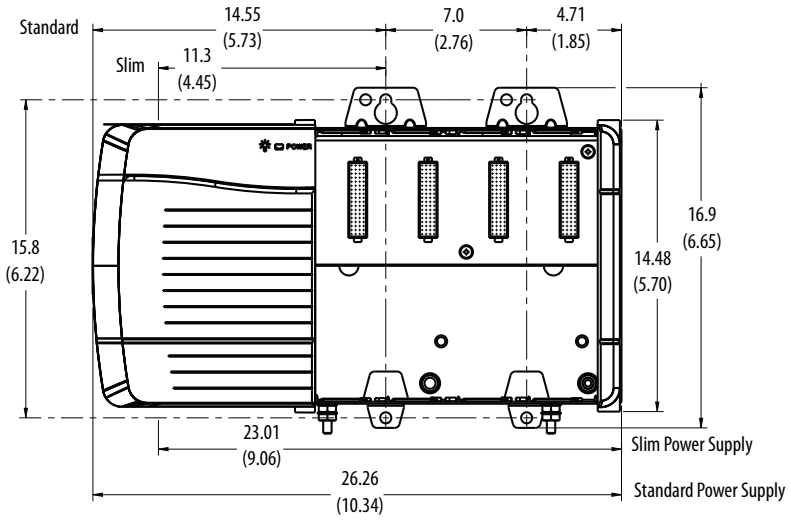
Right-side View of All Standard Chassis



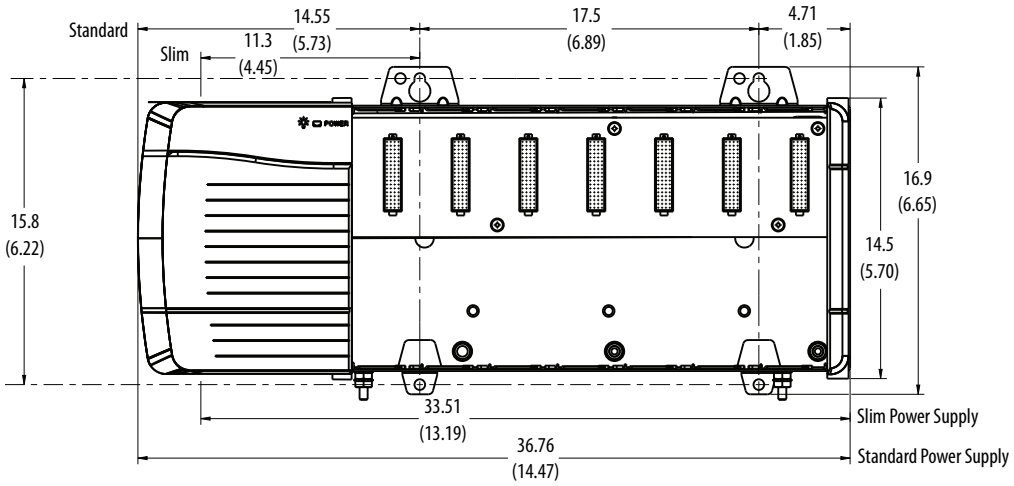
Right-side View of All ControlLogix-XT Chassis



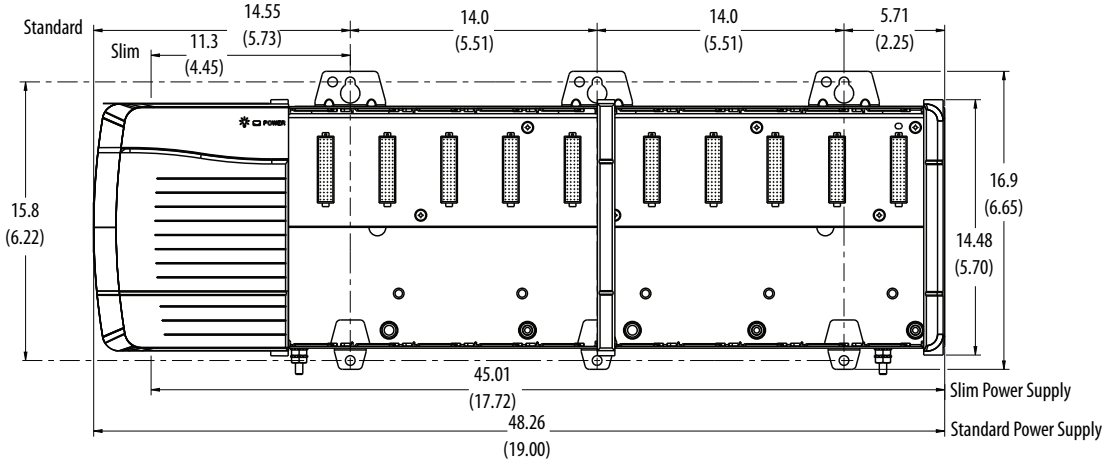
1756-A4/C Chassis and Power Supply



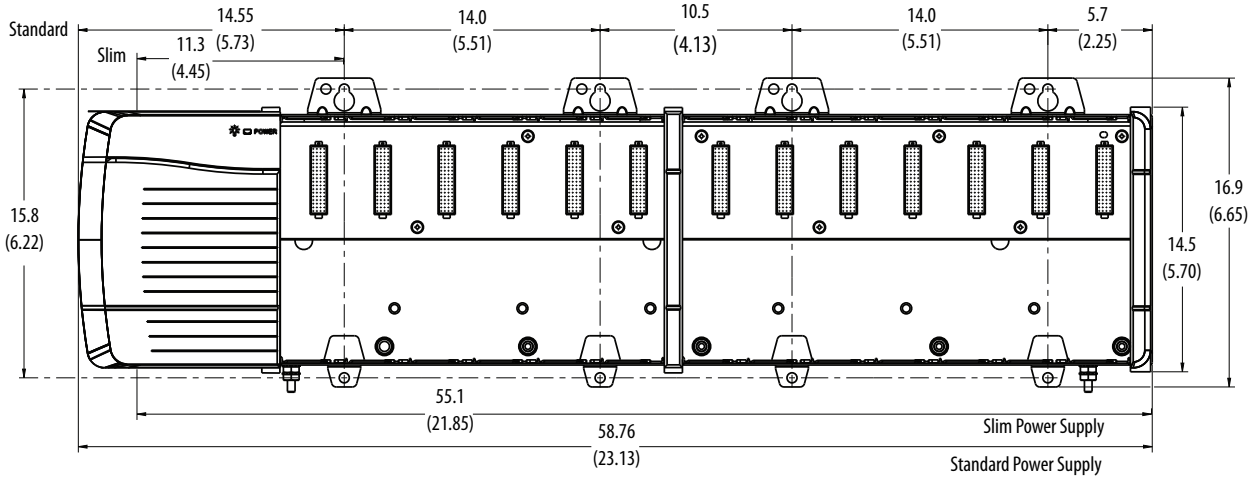
1756-A7/C Chassis and Power Supply



1756-A10/C Chassis and Power Supply



1756-A13/C Chassis and Power Supply



Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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Publication 1756-TD006F-EN-E - March 2017
Supersedes Publication 1756-TD006E-EN-E - October 2014

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Installation Instructions

Original Instructions

ControlLogix Chassis

Catalog Numbers 1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17, 1756-A4LXT, 1756-A5XT, 1756-A7LXT, 1756-A7XT, 1756-A10XT, 1756-A4K, 1756-A7K, 1756-A10K, 1756-A13K, 1756-A17K

Product Overview

The ControlLogix® system is a modular system that requires a 1756 ControlLogix chassis. The chassis are designed for only horizontal back-panel mounting. Place any module into any slot. The backplane provides a high-speed communication path between modules.

Summary of Changes

We added a 10-slot ControlLogix-XT® chassis, catalog number 1756-A10XT, to these installation instructions.

ATTENTION: Read this document and the documents listed in the Additional Resources section about installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

注意：在安装、配置、操作和维护本产品前，请阅读本文档以及 “ 其他资源 ” 部分列出的有关设备安装、配置和操作的相应文档。除了所有适用规范、法律和标准的相关要求之外，用户还必须熟悉安装和接线说明。

安装、调整、投运、使用、组装、拆卸和维护等各项操作必须由经过适当训练的专业人员按照适用的操作规范实施。

如果未按照制造商指定的方式使用该设备，则可能会损害设备提供的保护。

ATENCIÓN: Antes de instalar, configurar, poner en funcionamiento o realizar el mantenimiento de este producto, lea este documento y los documentos listados en la sección Recursos adicionales acerca de la instalación, configuración y operación de este equipo. Los usuarios deben familiarizarse con las instrucciones de instalación y cableado y con los requisitos de todos los códigos, leyes y estándares vigentes.

El personal debidamente capacitado debe realizar las actividades relacionadas a la instalación, ajustes, puesta en servicio, uso, ensamblaje, desensamblaje y mantenimiento de conformidad con el código de práctica aplicable.

Si este equipo se usa de una manera no especificada por el fabricante, la protección provista por el equipo puede resultar afectada.

ATENÇÃO: Leia este e os demais documentos sobre instalação, configuração e operação do equipamento que estão na seção Recursos adicionais antes de instalar, configurar, operar ou manter este produto. Os usuários devem se familiarizar com as instruções de instalação e fiação além das especificações para todos os códigos, leis e normas aplicáveis.

É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção sejam realizadas por pessoal qualificado e especializado, de acordo com o código de prática aplicável.

Caso este equipamento seja utilizado de maneira não estabelecida pelo fabricante, a proteção fornecida pelo equipamento pode ficar prejudicada.

ВНИМАНИЕ: Перед тем как устанавливать, настраивать, эксплуатировать или обслуживать данное оборудование, прочитайте этот документ и документы, перечисленные в разделе «Дополнительные ресурсы». В этих документах изложены сведения об установке, настройке и эксплуатации данного оборудования. Пользователи обязаны ознакомиться с инструкциями по установке и прокладке соединений, а также с требованиями всех применимых норм, законов и стандартов.

Все действия, включая установку, наладку, ввод в эксплуатацию, использование, сборку, разборку и техническое обслуживание, должны выполняться обученным персоналом в соответствии с применимыми нормами и правилами.

Если оборудование используется не предусмотренным производителем образом, защита оборудования может быть нарушена.

注意： 本製品を設置、構成、稼動または保守する前に、本書および本機器の設置、設定、操作についての参考資料の該当箇所に記載されている文書に目を通してください。ユーザは、すべての該当する条例、法律、規格の要件に加えて、設置および配線の手順に習熟している必要があります。

設置調整、運転の開始、使用、組立て、解体、保守を含む諸作業は、該当する実施規則に従って訓練を受けた適切な作業員が実行する必要があります。

本機器が製造メーカにより指定されていない方法で使用されている場合、機器により提供されている保護が損なわれる恐れがあります。

ACHTUNG: Lesen Sie dieses Dokument und die im Abschnitt „Weitere Informationen“aufgeführten Dokumente, die Informationen zu Installation, Konfiguration und Bedienung dieses Produkts enthalten, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder warten. Anwender müssen sich neben den Bestimmungen aller anwendbaren Vorschriften, Gesetze und Normen zusätzlich mit den Installations- und Verdrahtungsanweisungen vertraut machen.

Arbeiten im Rahmen der Installation, Anpassung, Inbetriebnahme, Verwendung, Montage, Demontage oder Instandhaltung dürfen nur durch ausreichend geschulte Mitarbeiter und in Übereinstimmung mit den anwendbaren Ausführungsvorschriften vorgenommen werden.

Wenn das Gerät in einer Weise verwendet wird, die vom Hersteller nicht vorgesehen ist, kann die Schutzfunktion beeinträchtigt sein.

ATTENTION : Lisez ce document et les documents listés dans la section Ressources complémentaires relatifs à l’installation, la configuration et le fonctionnement de cet équipement avant d’installer, configurer, utiliser ou entretenir ce produit. Les utilisateurs doivent se familiariser avec les instructions d’installation et de câblage en plus des exigences relatives aux codes, lois et normes en vigueur.

Les activités relatives à l’installation, le réglage, la mise en service, l’utilisation, l’assemblage, le démontage et l’entretien doivent être réalisées par des personnes formées selon le code de pratique en vigueur.

Si cet équipement est utilisé d’une façon qui n’a pas été définie par le fabricant, la protection fournie par l’équipement peut être compromise.

주의 : 본 제품 설치 , 설정 , 작동 또는 유지 보수하기 전에 본 문서를 포함하여 설치 , 설정 및 작동에 관한 참고 자료 섹션의 문서들을 반드시 읽고 숙지하십시오 . 사용자는 모든 관련 규정 , 법규 및 표준에서 요구하는 사항에 대해 반드시 설치 및 배선 지침을 숙지해야 합니다 .

설치 , 조정 , 가동 , 사용 , 조립 , 분해 , 유지보수 등 모든 작업은 관련 규정에 따라 적절한 교육을 받은 사용자를 통해서만 수행해야 합니다 .

본 장비를 제조사가 명시하지 않은 방법으로 사용하면 장비의 보호 기능이 손상될 수 있습니다 .

ATTENZIONE Prima di installare, configurare ed utilizzare il prodotto, o effettuare interventi di manutenzione su di esso, leggere il presente documento ed i documenti elencati nella sezione “Altre risorse”, riguardanti l’installazione, la configurazione ed il funzionamento dell’apparecchiatura. Gli utenti devono leggere e comprendere le istruzioni di installazione e cablaggio, oltre ai requisiti previsti dalle leggi, codici e standard applicabili.

Le attività come installazione, regolazioni, utilizzo, assemblaggio, disassemblaggio e manutenzione devono essere svolte da personale adeguatamente addestrato, nel rispetto delle procedure previste.

Qualora l’apparecchio venga utilizzato con modalità diverse da quanto previsto dal produttore, la sua funzione di protezione potrebbe venire compromessa.

DİKKAT: Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili İlave Kaynaklar bölümünde yer listelenmiş dokümanları okuyun. Kullanıcılar yürürlükteki tüm yönetmelikler, yasalar ve standartların gereksinimlerine ek olarak kurulum ve kablolama talimatlarını da öğrenmek zorundadır.

Kurulum, ayarlama, hizmete alma, kullanma, parçaları birleştirme, parçaları sökme ve bakım gibi aktiviteler sadece uygun eğitimleri almış kişiler tarafından yürürlükteki uygulama yönetmeliklerine uygun şekilde yapılabilir.

Bu ekipman üretici tarafından belirlenmiş amacın dışında kullanılırsa, ekipman tarafından sağlanan koruma bozulabilir.

注意事項：在安装、設定、操作或維護本產品前，請先閱讀此文件以及列於 「其他資源」章節中有關安装、設定與操作此設備的文件。使用者必須熟悉安裝和配線指示，並符合所有法規、法律和標準要求。

包括安装、調整、交付使用、使用、組装、拆卸和維護等動作都必須交由已經過適當訓練的人員進行，以符合適用的實作法規。

如果將設備用於非製造商指定的用途時，可能會造成設備所提供的保護功能受損。

POZOR: Než začnete instalovat, konfigurovat či provozovat tento výrobek nebo provádět jeho údržbu, přečtěte si tento dokument a dokumenty uvedené v části Dodatečné zdroje ohledně instalace, konfigurace a provozu tohoto zařízení. Uživatelé se musejí vedle požadavků všech relevantních vyhlášek, zákonů a norem nutně seznámit také s pokyny pro instalaci a elektrické zapojení.

Činnosti zahrnující instalaci, nastavení, uvedení do provozu, užívání, montáž, demontáž a údržbu musí vykonávat vhodně proškolený personál v souladu s příslušnými prováděcími předpisy.

Pokud se toto zařízení používá způsobem neodpovídajícím specifikaci výrobce, může být narušena ochrana, kterou toto zařízení poskytuje.

UWAGA: Przed instalacją, konfiguracją, użytkowaniem lub konserwacją tego produktu należy przeczytać niniejszy dokument oraz wszystkie dokumenty wymienione w sekcji Dodatkowe źródła omawiające instalację, konfigurację i procedury użytkowania tego urządzenia. Użytkownicy mają obowiązek zapoznać się z instrukcjami dotyczącymi instalacji oraz oprzewodowania, jak również z obowiązującymi kodeksami, prawem i normami.

Działania obejmujące instalację, regulację, przekazanie do użytkowania, użytkowanie, montaż, demontaż oraz konserwację muszą być wykonywane przez odpowiednio przeszkolony personel zgodnie z obowiązującym kodeksem postępowania.

Jeśli urządzenie jest użytkowane w sposób inny niż określony przez producenta, zabezpieczenie zapewniane przez urządzenie może zostać ograniczone.

OBS! Läs detta dokument samt dokumentet, som står listat i avsnittet Övriga resurser, om installation, konfigurering och drift av denna utrustning innan du installerar, konfigurerar eller börjar använda eller utföra underhållsarbete på produkten. Användare måste bekanta sig med instruktioner för installation och kabeldragning, förutom krav enligt gällande koder, lagar och standarder.

Åtgärder som installation, justering, service, användning, montering, demontering och underhållsarbete måste utföras av personal med lämplig utbildning enligt lämpligt bruk.

Om denna utrustning används på ett sätt som inte anges av tillverkaren kan det hända att utrustningens skyddsanordningar försätts ur funktion.

LET OP: Lees dit document en de documenten die genoemd worden in de paragraaf Aanvullende informatie over de installatie, configuratie en bediening van deze apparatuur voordat u dit product installeert, configureert, bedient of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradingsinstructies, naast de vereisten van alle toepasselijke regels, wetten en normen.

Activiteiten zoals het installeren, afstellen, in gebruik stellen, gebruiken, monteren, demonteren en het uitvoeren van onderhoud mogen uitsluitend worden uitgevoerd door hiervoor opgeleid personeel en in overeenstemming met de geldende praktijkregels.

Indien de apparatuur wordt gebruikt op een wijze die niet is gespecificeerd door de fabrikant, dan bestaat het gevaar dat de beveiliging van de apparatuur niet goed werkt.

Environment and Enclosure

ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment for indoor use. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements.
- NEMA Standard 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations:	**Informations sur l'utilisation de cet équipement en environnements dangereux:**
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local authority having jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation
WARNING **EXPLOSION HAZARD** • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must be changed only in an area known to be nonhazardous.	**AVERTISSMENT** **RISQUE D'EXPLOSION** • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

European Hazardous Location Approval

The following applies to products marked CE, Ex, II 3: Such modules:

- Are Equipment Group II, Equipment Category 3, and comply with the Essential Health and Safety Requirements relating to the design and construction of such equipment given in Annex II to Directive 94/9/EC. See the EC Declaration of Conformity at http://www.rockwellautomation.com/products/certification for details.
- The type of protection is "Ex nA IIC T4 Gc" according to EN 60079-15.
- Comply to Standards: EN 60079-0:2012+A11:2013, EN 60079-15:2010, reference certificate number DEMKO13ATEX1325026X.
- Are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification according to ATEX directive 1999/92/EC.

IEC Hazardous Location Approval

The following applies to products with IECEx certification: Such modules:

- Such modules are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification to IEC 60079-0.
- The type of protection is "Ex nA IIC T4 Gc" according to IEC 60079-15.
- Such modules comply to Standards IEC 60079-0:2011 6th Edition, IEC-60079-15:2010 4th Edition, reference IECEx certificate number IECExUL14.0008X.

Special Conditions for Safe Use

WARNING:

- This equipment is not resistant to sunlight or other sources of UV radiation.
- This equipment shall be mounted in an ATEX/IECEx Zone 2 certified enclosure with a minimum ingress protection rating of at least IP54 (as defined in EN/IEC 60529) and used in an environment of not more than Pollution Degree 2 (as defined in EN/IEC 60664-1) when applied in Zone 2 environments. The enclosure must be accessible only by the use of a tool.
- This equipment shall be used within its specified ratings defined by Rockwell Automation.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 140% of the rated voltage when applied in Zone 2 environments.
- The instructions in the user manual shall be observed.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.

Prevent Electrostatic Discharge

ATTENTION: This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

ATTENTION:

- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Installation, adjustments, putting into service, use, assembly, disassembly, and maintenance shall be carried out by suitably trained personnel in accordance with applicable code of practice. In case of malfunction or damage, no attempts at repair should be made. The module should be returned to the manufacturer for repair. Do not dismantle the module.
- This equipment is certified for use only within the surrounding air temperature range of -25…+60 °C (-13…+140 °F) for non-XT ControlLogix chassis. The 1756-A5XT/B, 1756-A7XT/B, 1756-A7XT/C, and 1756-A10XT chassis are certified for use only within the surrounding air temperature range of -25…+70 °C (-13…-158 °F). The equipment must not be used outside of this range.
- Use only a soft dry cloth to wipe down equipment. Do not use any cleaning agents.

Tools Required

When installing your chassis and power supplies, the following items are required:

- 3.18 mm (0.125 in.) slotted screwdriver
- 6.35 mm (0.25 in.) slotted or #2 Phillips-head screwdriver
- Torque screwdriver
- Needle-nose pliers
- Crimper
- Wire stripper
- Drill

Parts Required

These parts are not included with the chassis and must be ordered separately.

Parts Required Per Mounting Tab

Tab Position	With SEM Screws[1]	Without SEM Screws
Top	1 Phillips screw 1 flat washer 1 split-lock washer	N/A
Bottom	1 SEM screw	1 Phillips screw 1 star washer

(1) Phillips screw with attached star washer.

Total Parts Required Per Chassis

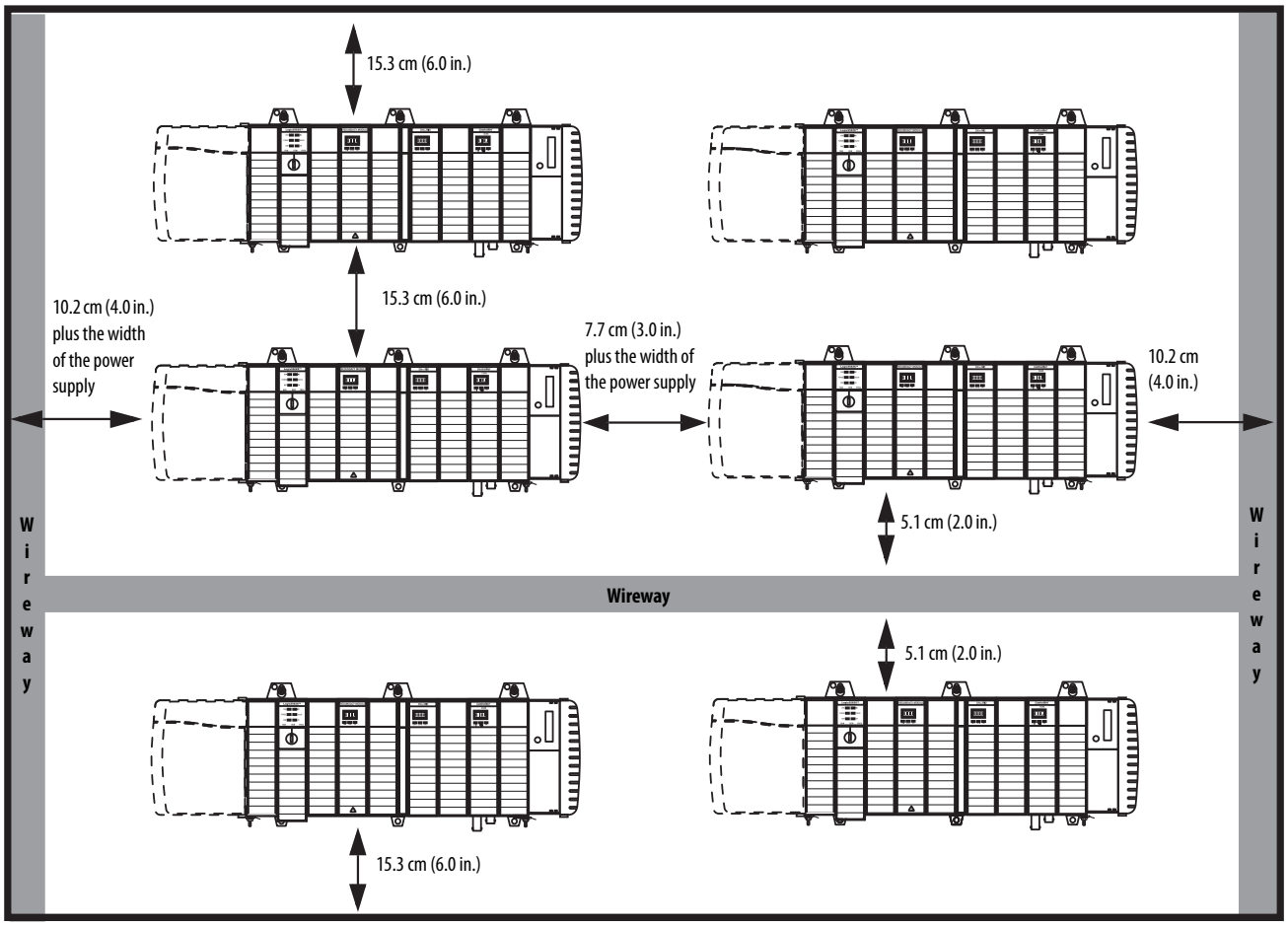
Chassis	Number of Mounting Tabs	Total Parts Required Per Chassis	
		With SEM Screws	Without SEM Screws
1756-A4/A, 1756-A4/B, 1756-A4/C, 1756-A7/A, 1756-A7/B, 1756-A7/C, 1756-A4LXT/B, 1756-A7LXT/B	2 top 2 bottom	• 2 Phillips screws • 2 flat washers • 2 split-lock washers • 2 SEM screws	• 4 Phillips screws • 2 flat washers • 2 split-lock washers • 2 star washers
1756-A10/A, 1756-A10/B, 1756-A10/C, 1756-A5XT/B, 1756-A7XT/B, 1756-A7XT/C	3 top 3 bottom	• 3 Phillips screws • 3 flat washers • 3 split-lock washers • 3 SEM screws	• 6 Phillips screws • 3 flat washers • 3 split-lock washers • 3 star washers
1756-A10XT/C, 1756-A13/A, 1756-A13/B, 1756-A13/C	4 top 4 bottom	• 4 Phillips screws • 4 flat washers • 4 split-lock washers • 4 SEM screws	• 8 Phillips screws • 4 flat washers • 4 split-lock washers • 4 star washers
1756-A17/A, 1756-A17/B, 1756-A17/C	5 top 5 bottom	• 5 Phillips screws • 5 flat washers • 5 split-lock washers • 5 SEM screws	• 10 Phillips screws • 5 flat washers • 5 split-lock washers • 5 star washers

Spacing Requirements for a System with a Non-redundant Power Supply

IMPORTANT Make sure that you meet the minimum spacing requirements specified.

Allow 15.3 cm (6.0 in.) between chassis and a heat source at the top or bottom of a chassis, and allow 5.1 cm (2.0 in.) between a wireway and the top or bottom of a chassis.

Chassis are intended to be mounted only horizontally. Do not mount vertically.



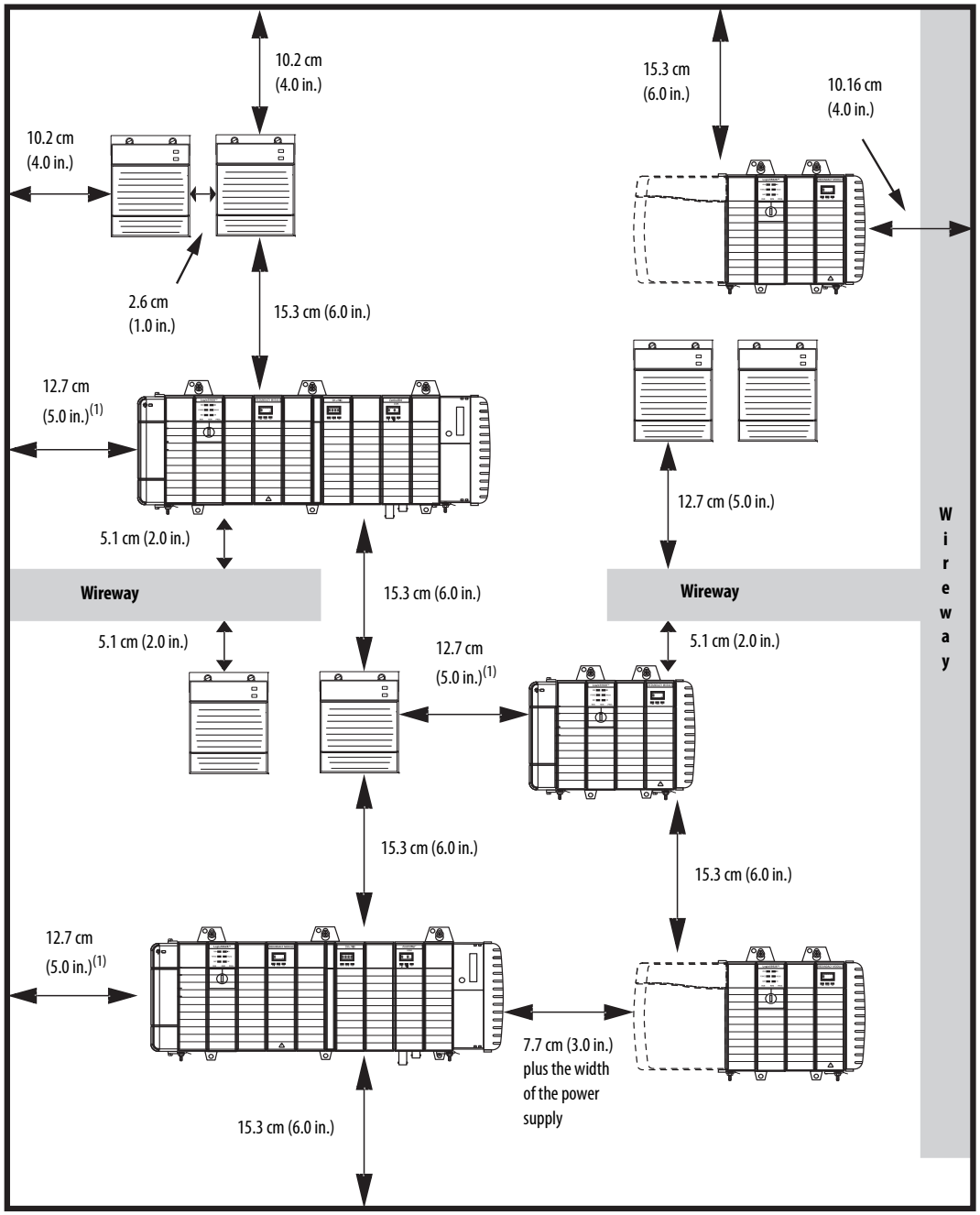
Spacing Requirements for a System with Redundant Power Supplies

IMPORTANT Make sure that you meet the minimum spacing requirements specified.

Chassis and redundant power supplies are intended to be mounted only horizontally. Do not mount vertically.

The 1756-CPR2 cable has a bend radius of 12.7 cm (5.0 in.). The chassis must have a minimum clearance of 12.7 cm (5.0 in.) on the left side to route and connect the 1756-CPR2 cable. The redundant power supplies must have a minimum clearance of 12.7 cm (5.0 in.) below the supply to route and connect the 1756-CPR2 cable.

The 1756-CPR2D and 1756-CPR2U cables have right-angle connectors. The chassis must have a minimum clearance of 10.16 cm (4.0 in.) on the left side to route and connect the 1756-CPR2D and 1756-CPR2U cables.

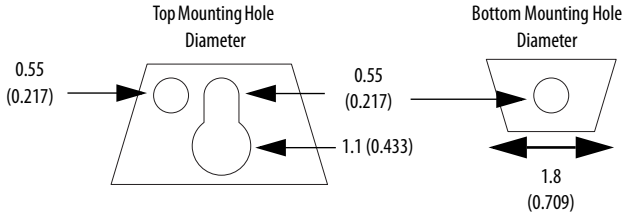


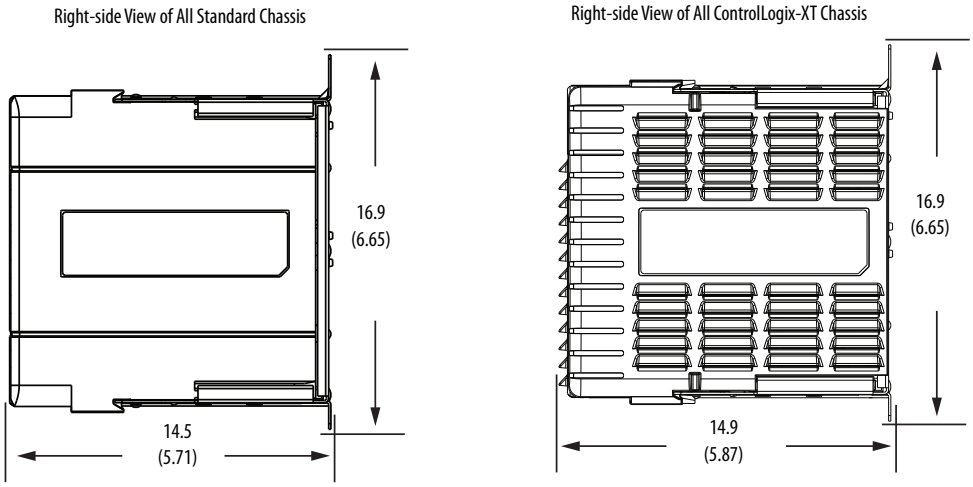
(1) The measurements for systems that use 1756-CPR2D or 1756-CPR2U cables are 10.2 cm (4.0 in.).

Mounting Dimensions

Dimensions are in cm (in.).

Chassis Common Dimensions

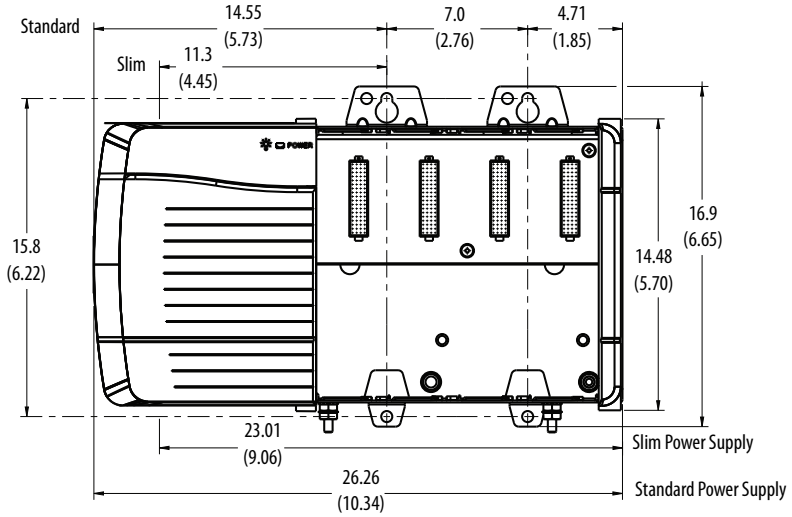




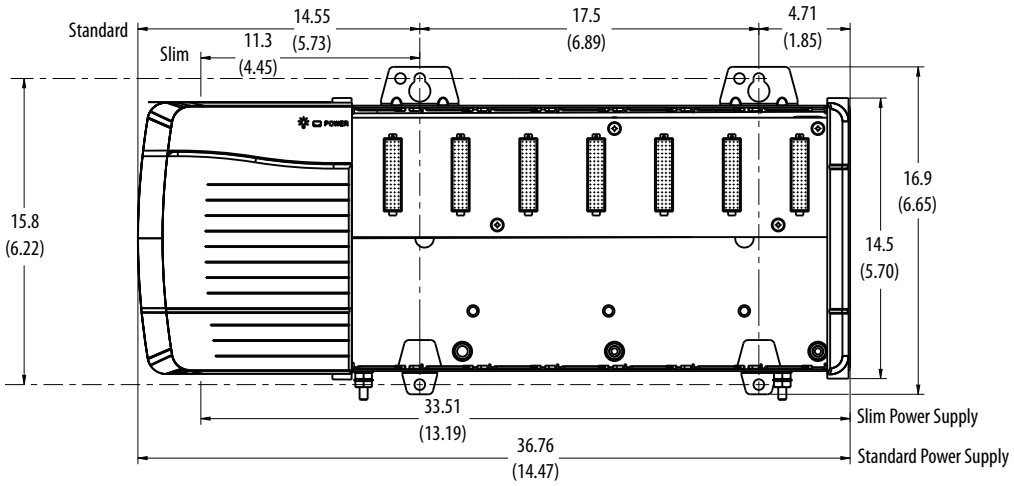
This section depicts Series C chassis, except where noted.

Standard refers to a standard power supply, and slim refers to a reduced-width power supply.

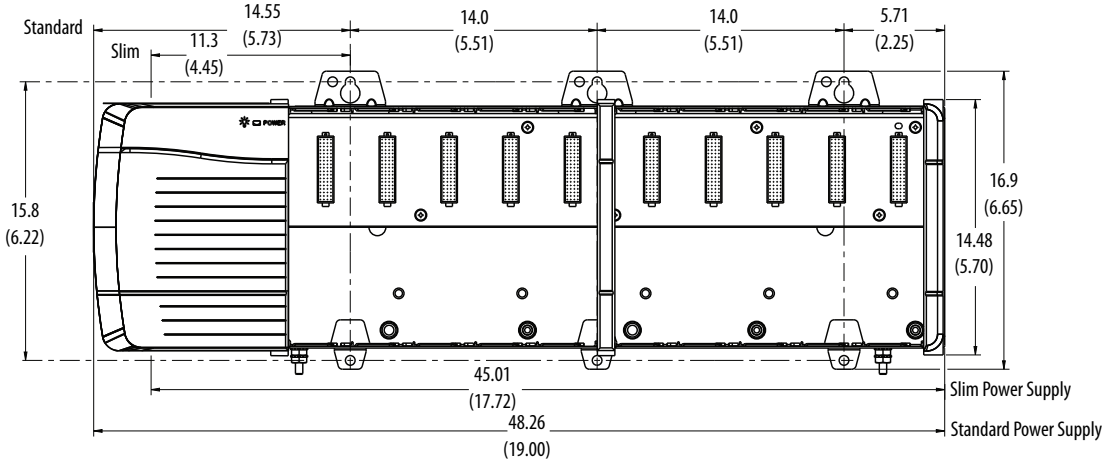
1756-A4 Chassis and Power Supply



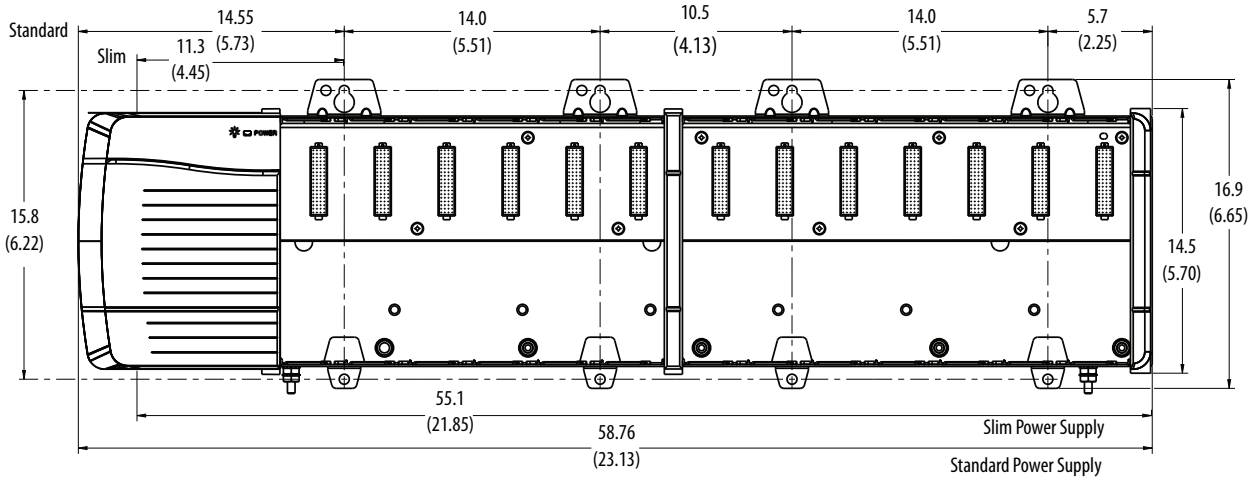
1756-A7 Chassis and Power Supply



1756-A10 Chassis and Power Supply



1756-A13 Chassis and Power Supply



Install the Chassis

After planning your system, use these instructions to install the chassis.

ATTENTION: Do not drill holes above an installed chassis. Metal chips from drilling can damage the backplane and cause intermittent operation.

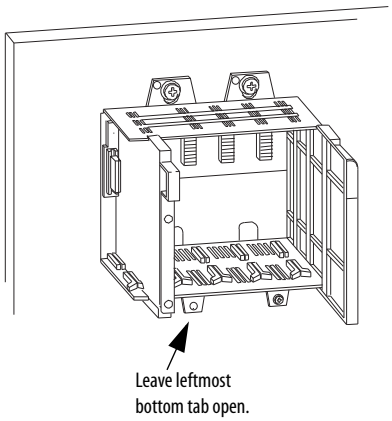
IMPORTANT Chassis are intended to be mounted only horizontally. Do not mount vertically.

1. Drill holes in the back panel of the enclosure for the chassis mounting tabs.
2. Scrape paint off the back panel for an electrical connection between the chassis and back panel.
3. Hold the chassis in place against the holes.

ATTENTION: If the chassis mounting tabs do not lay flat before the screws are tightened, use additional washers as shims so the chassis is not warped by tightening the screws.

Warping a chassis can damage the backplane and cause intermittent operation.

4. Install the hardware for the top mounting tabs and tighten. See Parts Required on page 5 for more information.
5. Install the remaining tab screws, but leave the leftmost bottom tab open for the functional ground.

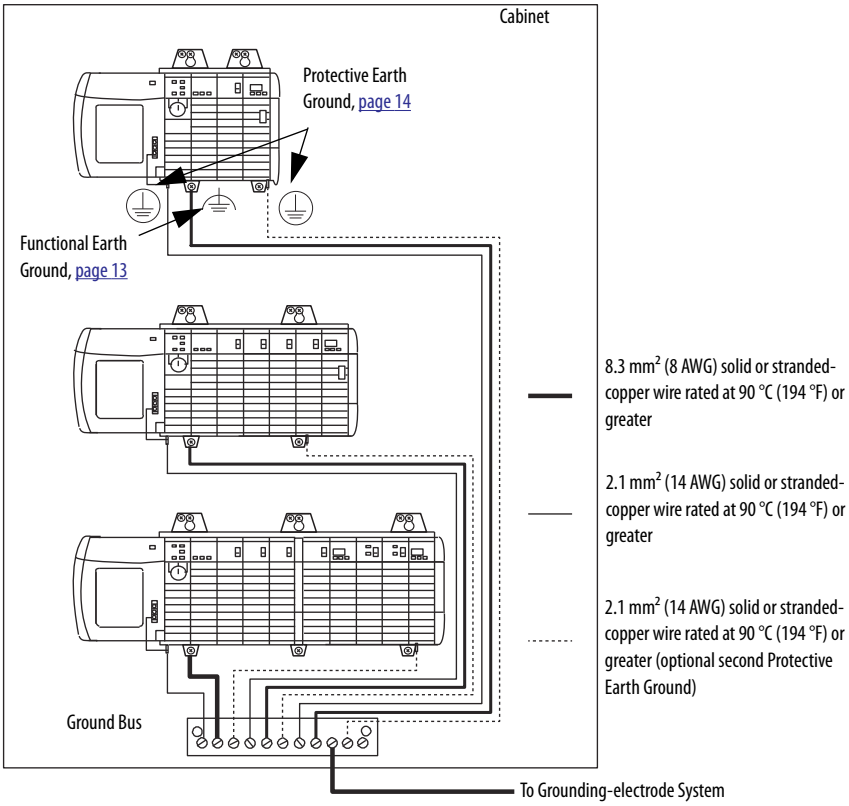


Ground the Chassis

The following figure shows an example grounding configuration. After you complete the grounding steps, your system looks similar to this figure.

TIP To minimize the resistance between the chassis and ground connection, keep wire lengths as short as possible.

Grounding Configuration Example



Use these guidelines when connecting the grounding:

- Use a steel enclosure to guard against electromagnetic interference (EMI).
- Install a bonding wire for electrical contact between the enclosure door and the enclosure; do not rely on the hinge.
- Make sure the enclosure-door viewing window is a laminated screen or a conductive optical substrate (to block EMI).

Install a Central Ground Bus

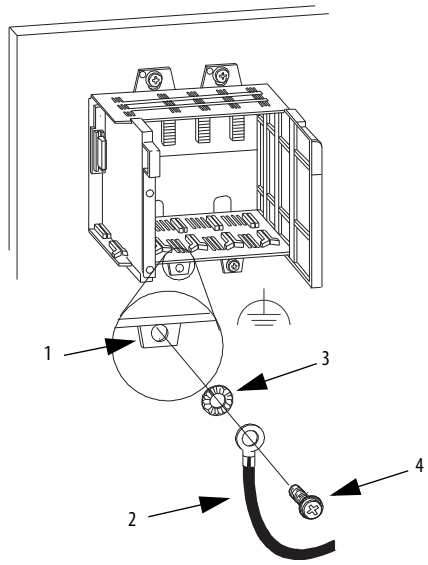
Each enclosure must contain a central ground bus. The ground bus is the common connection for each chassis within the enclosure and the enclosure itself. For more information on how to install a central ground bus, see the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Connect the Functional Earth Ground on the Chassis

Use 8.3 mm² (8 AWG) solid or stranded-copper wire rated at 90 °C (194 °F) or greater to connect the functional earth ground.

Connect the functional earth ground as shown in the following figure.

Functional Earth Ground Connection



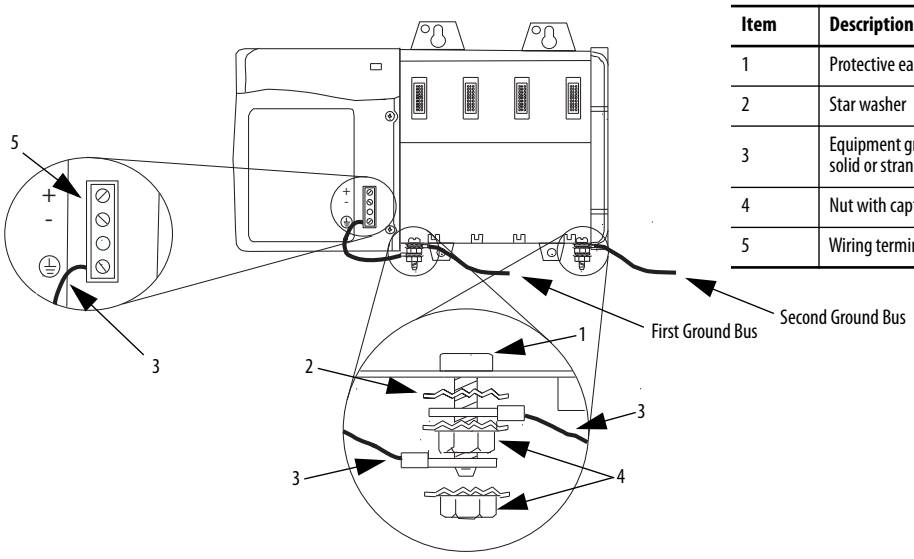
Item	Description
1	Chassis mounting tab
2	Equipment grounding conductor (ground lug with 8.3 mm² [8 AWG] solid or stranded-copper wire rated at 90 °C [194 °F] or greater)
3	M4 or M5 (#10 or #12) flat or star washer
4	M4 or M5 (#10 or #12) Phillips screw and flat or star washer (or SEM screw)

Connect the Protective Earth Ground

Use 2.1 mm² (14 AWG) solid or stranded-copper wire that is rated at 90 °C (194 °F) or greater to connect the protective earth ground. Tighten the nuts on the protective earth ground terminal stud to a torque of 16.27 N•m (12 lb•in).

Connect the functional earth ground as shown in the following figure.

Protective Earth Ground Connection



Item	Description
1	Protective earth-ground terminal stud
2	Star washer
3	Equipment grounding conductor (ground lug with 2.1 mm² [14 AWG] solid or stranded-copper wire rated at 90 °C [194 °F] or greater)
4	Nut with captive star washer
5	Wiring terminal block (bottom terminal is protective earth ground)

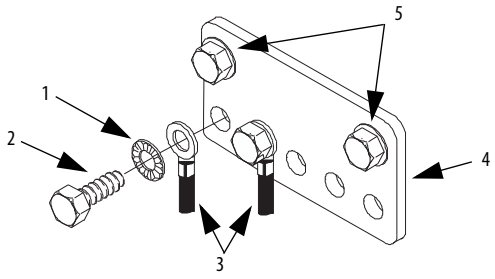
IMPORTANT If your application requires the use of the second protective earth-ground terminal stud, use the additional protective earth-ground terminal stud to connect the chassis to the ground bus. The Protective Earth Ground Connection figure depicts the connection of the second protective earth-ground terminal stud.

Connect the Grounding Conductors to the Ground Bus

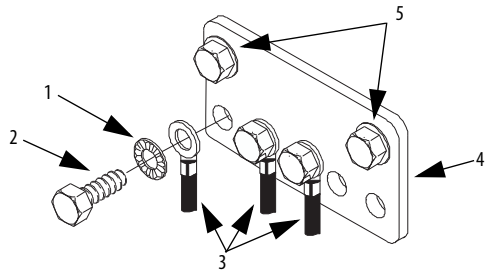
Connect the equipment grounding conductors (functional and protective earth ground) directly from each chassis to an individual bolt on the ground bus.

Ground Bus Connection

First Protective Earth Ground



Second Protective Earth Ground



Item	Description
1	Protective earth-ground terminal stud
2	Star washer
3	Equipment grounding conductor (ground lug with 2.1 mm^2 [14 AWG] solid or stranded-copper wire rated at 90 °C [194 °F] or greater)
4	Nut with captive star washer
5	Wiring terminal block (bottom terminal is protective earth ground)

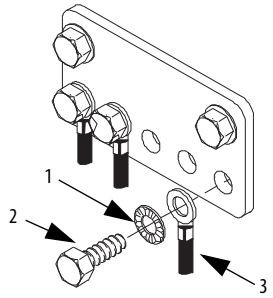
Connect Ground Bus to Grounding-electrode System

Use a grounding-electrode conductor to connect the ground bus to the grounding-electrode system.

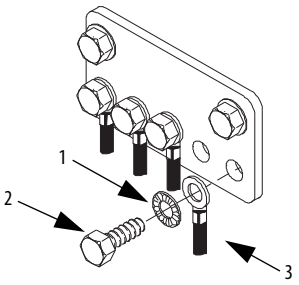
At minimum, use 8.3 mm^2 (8 AWG) solid or stranded-copper wire that is rated at 90 °C (194 °F) or greater for the grounding-electrode conductor to guard against EMI. The National Electrical Code specifies safety requirements for the grounding-electrode conductor.

Grounding-electrode System Connection

First Protective Earth Ground



Second Protective Earth Ground



Item	Description
1	Flat or star washer
2	Bolt
3	Equipment grounding conductor (ground lug with minimum 8.3 mm^2 [8 AWG] solid or stranded-copper wire rated at 90 °C [194 °F] or greater)

Specifications

Standard ControlLogix Chassis Specifications (Series B)

Attribute	1756-A4/B	1756-A7/B	1756-A10/B	1756-A13/B	1756-A17/B
Backplane current, chassis/slot max @ 1.2V DC	1.5 A/–				
Backplane current, chassis/slot max @ 3.3V DC	4A/4A				
Backplane current, chassis/slot max @ 5.1V DC	15 A/6 A				
Backplane current, chassis/slot max @ 24V DC	2.8 A/2.8 A				
Isolation voltage	Determined by installed power supply and modules				
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (0…140 °F)				
Temperature, surrounding air, max	60 °C (140 °F)				
Enclosure type rating	None (open-style)				
Slots	4	7	10	13	17
Wire size	Functional Earth Ground: 8.3 mm^2 (8 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater Protective Earth Ground: 2.1 mm^2 (14 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater				
North American temperature code	T5				
IECEx temperature code	T4	T5			

Standard ControlLogix Chassis Specifications (Series C)

Attribute	1756-A4/C	1756-A7/C	1756-A10/C	1756-A13/C	1756-A17/C
Backplane current, chassis/slot max @ 1.2V DC	1.5 A/–				
Backplane current, chassis/slot max @ 3.3V DC	4A/4A				
Backplane current, chassis/slot max @ 5.1V DC	15 A/6 A				
Backplane current, chassis/slot max @ 24V DC	2.8 A/2.8 A				
Isolation voltage	Determined by installed power supply and modules				
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-25…+60 °C (-13…+140 °F)				
Temperature, surrounding air, max	60 °C (140 °F)				
Enclosure type rating	None (open-style)				
Slots	4	7	10	13	17
Wire size	Functional Earth Ground: 8.3 mm^2 (8 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater Protective Earth Ground: 2.1 mm^2 (14 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater				
North American temperature code	T4				
IECEx temperature code	T4				

ControlLogix-XT Chassis Specifications

Attribute	1756-A4LXT/B	1756-A7LXT/B	1756-A5XT/B	1756-A7XT/B	1756-A7XT/C	1756-A10XT/C
Backplane current, chassis/slot max @ 1.2V DC	1.5 A/–					
Backplane current, chassis/slot max @ 3.3V DC	4 A/4 A					
Backplane current, chassis/slot max @ 5.1V DC	10 A/6 A				15 A/6 A	
Backplane current, chassis/slot max @ 24V DC	2 A/2 A				2.8 A/2.8 A	
Isolation voltage	Determined by installed power supply and modules					
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-25…+60 °C (-13…+140 °F)		-25…+70 °C (-13…+158 °F)			
Temperature, surrounding air, max	60 °C (140 °F)		70 °C (158 °F)			
Enclosure type rating	None (open-style)					
Slots	4	7	4	7	7	10
Wire size	Functional Earth Ground: 8.3 mm^2 (8 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater Protective Earth Ground: 2.1 mm^2 (14 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater					
North American temperature code	T5			T4A	T4	
IECEx temperature code	T5		T4			

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
ControlLogix Chassis Specifications Technical Data, publication 1756-TD006	Provides technical specifications for ControlLogix chassis.
ControlLogix Power Supplies Specifications Technical Data, publication 1756-TD005	Provides technical specifications for ControlLogix power supplies.
ControlLogix Power Supply Installation Instructions, publication 1756-IN619	Provides information on how to install ControlLogix standard power supplies.
ControlLogix Redundant Power Supply Installation Instructions, publication 1756-IN620	Provides information on how to install ControlLogix redundant power supplies.
ControlLogix System User Manual, publication 1756-UM001	Provides instructions for installation and use of ControlLogix Systems, application design, and other general information for these systems.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/rockwellautomation/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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Supersedes Publication 1756-IN621A-EN-P - May 2016
PN-417161

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Allen-Bradley

1756 ControlLogix Power Supplies Specifications

Product	Catalog Number
Standard Power Supplies	1756-PA72, 1756-PA72K, 1756-PA75, 1756-PA75K, 1756-PB72, 1756-PB72K,1756-PB75, 1756-PB75K,1756-PC75, 1756-PH75
Standard Slim Power Supplies	1756-PA50, 1756-PA50K, 1756-PB50, 1756-PB50K
ControlLogix-XT Power Supplies	1756-PAXT, 1756-PBXT
ControlLogix-XT Slim Power Supplies	1756-PA30XT, 1756-PB30XT
Redundant Power Supplies	1756-PA75R, 1756-PA75RK,1756-PB75R, 1756-PB75RK
Redundant Power Supplies Chassis Adapter	1756-PSCA2, 1756-PSCA2K
ControlLogix-XT Redundant Power Supplies	1756-PAXTR, 1756-PBXTR
ControlLogix-XT Redundant Power Supplies Chassis Adapter	1756-PSCA2XT
Redundant Power Supply Power Cable	1756-CPR2, 1756-CPR2D, 1756-CPR2U

ControlLogix® power supplies are used with the 1756 chassis to provide 1.2V, 3.3V, 5V, and 24V DC power directly to the chassis backplane. Standard, Slim, ControlLogix-XT™, and redundant power supplies are available.

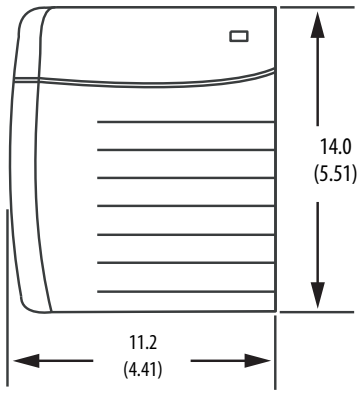
Summary of Changes

This manual contains updated torque requirements on pages 3, 5, 9, 13, and 15.

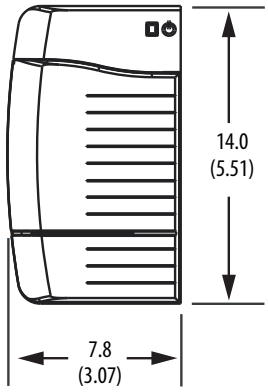
Standard AC Power Supplies

Mounting Dimensions

1756-PA72, 1756-PA72K, 1756-PA75, 1756-PA72K



1756-PA50, 1756-PA50K



Dimensions are in cm (in.).

Technical Specifications - Standard AC Power Supplies

Attribute	1756-PA50, 1756-PA50K	1756-PA72/C, 1756-PA72K/C	1756-PA75/B, 1756-PA75K/B
Input voltage range[1]	85…265V AC		
Input voltage, nom	120V/240V AC		
Input frequency range	47…63 Hz		
Input power, max	81 W/91VA @ 50 °C (122 °F) 68 W/77VA @ 60 °C (140 °F)	100VA/100 W	
Output power, max	60 W @ 0…+50 °C (+32…+122 °F)[3] 50 W @ 0…+60 °C (+32…+140 °F)[4]	75 W @ 0…+60 °C (+32…+140 °F)[6]	
Inrush current, max	20 A		
Hold up time[2]	4 cycles @85...265V AC, 50/60 Hz, 60 W 5 cycles @85...265V AC, 50/60 Hz, 50 W	5 cycles @ 85V AC, 50/60 Hz 6 cycles @ 120V AC, 50/60 Hz 6 cycles @ 200V AC, 50/60 Hz 6 cycles @ 240V AC, 50/60 Hz	2 cycles @ 85V AC, 60 Hz 6 cycles @ 120V AC, 60 Hz 20 cycles @ 220V AC, 60 Hz
Current capacity @ 1.2V DC	1.5 A		
Current capacity @ 3.3V DC	2 A	4 A	
Current capacity @ 5.1V DC	8 A @ 50 °C (122 °F) 6 A @ 60 °C (140 °F)	10 A	13 A
Current capacity @ 24V DC	2.5 A @ 50 °C (122 °F) 2.0 A @ 60 °C (140 °F)	2.8 A	
Isolation voltage	250V (continuous), Reinforced Insulation Type, Power Input to Backplane Type tested @ 3150V DC for 60 s	250V (continuous), Reinforced Insulation Type, Power Input to Backplane Type tested at 3500V DC for 60 s	
Weight, approx	0.77 kg (1.7 lb)	0.95 kg (2.10 lb)	
Dimensions (HxWxD), approx	14.0 x 7.8 x 14.5 cm (5.51 x 3.07 x 5.71 in.)	14.0 x 11.2 x 14.5 cm (5.51 x 4.41 x 5.71 in.)	
Module location	Left side of 1756 chassis		
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17		
Chassis compatibility	Series A Series B Series C		Series B Series C
Wire size	2.5 mm^2 (14 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max		

Technical Specifications - Standard AC Power Supplies

Attribute	1756-PA50, 1756-PA50K	1756-PA72/C, 1756-PA72K/C	1756-PA75/B, 1756-PA75K/B
Wire category	1 - on power ports[5]		
Conductor screw torque	0.565 N•m (5 lb•in)		
North American temperature code	T4		
Enclosure type rating	None (open-style)		

(1) UL certification for 120/240V AC, 50/60 Hz nominal. Rockwell Automation specified 85…265V AC, 47…63 Hz.
(2) The hold up time is the time between input voltage removal and DC power failure.
(3) The combination of all output power (5.1V backplane, 24V backplane, 3.3V backplane, and 1.2V backplane) cannot exceed 60 W @ 50 °C (122 °F) maximum temperature.
(4) The combination of all output power (5.1V backplane, 24V backplane, 3.3V backplane, and 1.2V backplane) cannot exceed 50 W @ 60 °C (140 °F) maximum temperature.
(5) Use this conductor category information to plan conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(6) The combination of all output power (5.1V backplane, 24V backplane, 3.3V backplane, and 1.2V backplane) cannot exceed 75 W.

Environmental Specifications - Standard AC Power Supplies

Attribute	1756-PA50, 1756-PA50K	1756-PA72/C, 1756-PA72K/C, 1756-PA75/B, 1756-PA75K/B
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)	
Temperature, surrounding air, max	60 °C (140 °F)	
Temperature, non-operating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)	
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing	
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz	
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g	
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g[1]	
Emissions	IEC 61000-6-4	
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges	
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz	
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on power ports	
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports	
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz	
Voltage variation IEC 61000-4-11	30% dips for 1 period at 0° and 180° on AC supply ports 60% dips for 5 and 50 periods on AC supply ports ±10% fluctuations for 15 min on AC supply ports >95% interruptions for 250 periods on AC supply ports	
Damped oscillatory wave immunity IEC 61000-4-18	±2.5 kV line-line (DM) and ±2.5 kV line-earth (CM) on power ports	–

(1) Series C chassis have a maximum nonoperating shock value of 30 g. If you select a Series C chassis for use with your power supply, you are limited to a maximum nonoperating shock value of 30 g.

Certifications - Standard AC Power Supplies

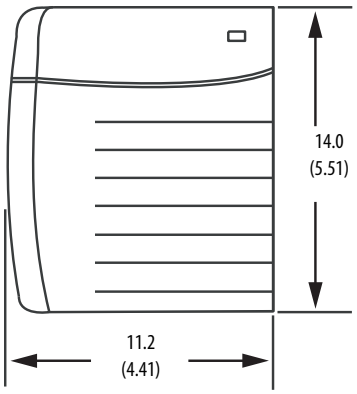
Certification[1]	1756-PA50, 1756-PA50K	1756-PA72/C, 1756-PA72K/C	1756-PA75/B, 1756-PA75K/B
UL	–	UL Listed Industrial Control Equipment. See UL File E65584.	
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.	–	
CSA	–	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.	
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations		
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: • EN 61010-2-201; Control Equipment Safety Requirements	European Union 2014/30/EU EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: • EN 61131-2; Programmable Controllers (Clause 11)	
RCM	Australian Radiocommunications Act, compliant with: • EN 61000-6-4; Industrial Emissions		
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3		
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation		

(1) See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

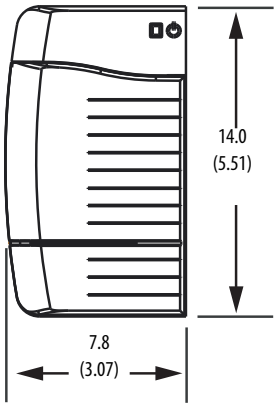
Standard DC Power Supplies

Mounting Dimensions

1756-PB72, 1756-PB72K, 1756-PB75, 1756-PB75K, 1756-PC75, 1756-PH75



1756-PB50, 1756-PB50K



Dimensions are in cm (in.).

Technical Specifications - Standard DC Power Supplies

Attribute	1756-PB50, 1756-PB50K	1756-PB72/C, 1756-PB72K/C	1756-PB75/B, 1756-PB75K/B	1756-PC75/B	1756-PH75/B
Input voltage range	18…32V DC[2]			30…60V DC[5]	90…143V DC[6]
Input voltage, nom	24V DC			48V DC	125V DC
Input power, max	85 W @ 50 °C (122 °F) 70 W @ 60 °C (140 °F)	95 W			

Power Load and Transformer Sizing

The following graphs show the input power requirements for slim and standard power supplies, given the power that they are providing to the modules in the chassis.

Follow these steps to determine the power requirements for your chassis.

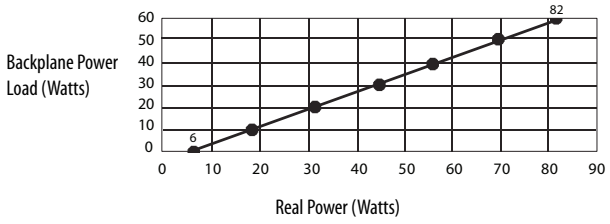
1. Calculate the Backplane Power load by adding the power draw (in watts) for all planned modules.

   For module power draws, refer to the module specification tables in the ControlLogix Selection Guide, publication 1756-SG001.
2. Locate the Backplane Power load on the vertical (y) axis of the graph and determine the corresponding Real Power (input-power) rating on the horizontal (x) axis.

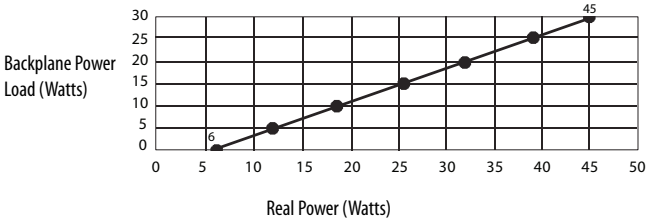
   The Real Power value is the amount of power that is consumed by the power supply.

Slim Power Supply Power Requirements

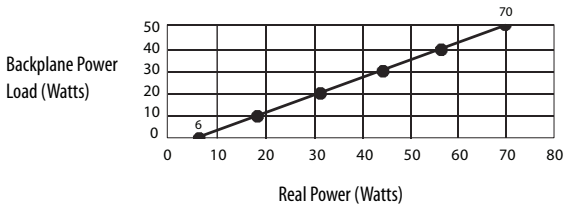
1756-PA50, 1756-PA50K @ 50 °C (AC)



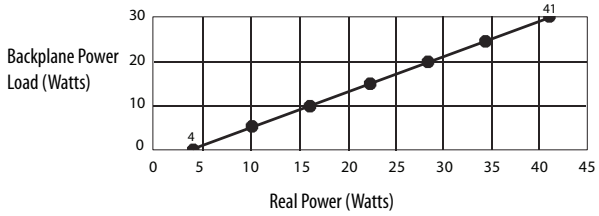
1756-PA30XT (AC)



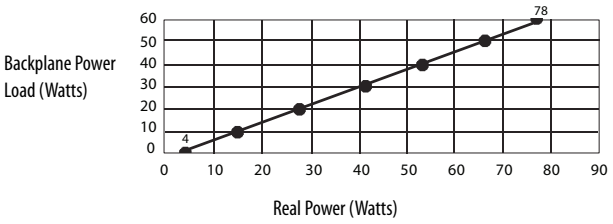
1756-PA50, 1756-PA50K @ 60 °C (AC)



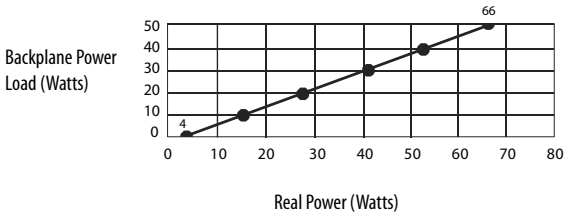
1756-PB30XT (DC)



1756-PB50, 1756-PB50K @ 50 °C (DC)



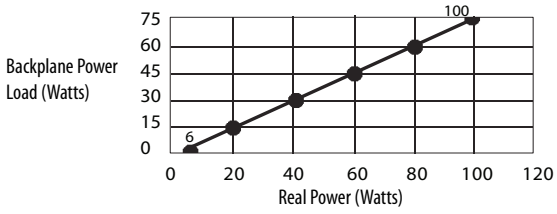
1756-PB50, 1756-PB50K @ 60 °C (DC)



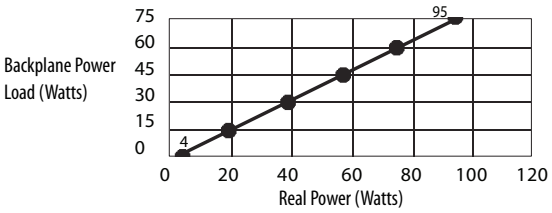
Apparent Power (Watts) = Transformer Load (VA) = Real Power (Watts)

Standard Power Supply Power Requirements

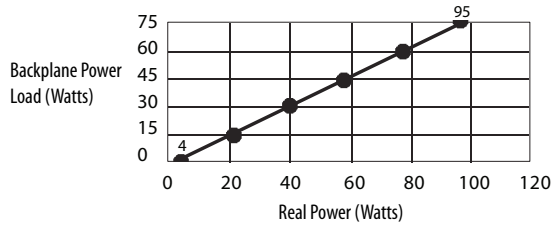
1756-PA72/C, 1756-PA72K/C, 1756-PA75/B (AC), 1756-PA75K/B (AC)



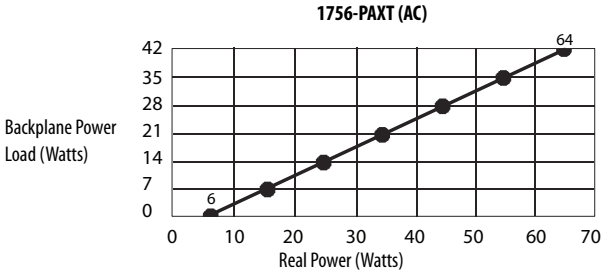
1756-PB72/C, 1756-PB72K/C, 1756-PB75/B (AC), 1756-PB75K/B (DC)



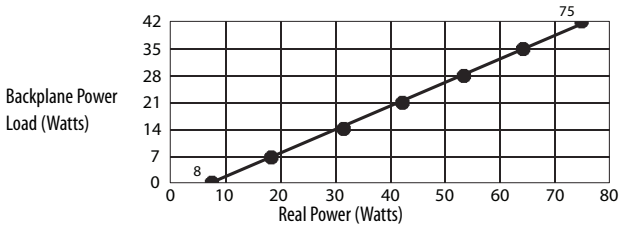
1756-PH75/B, 1756-PC75/B (DC)



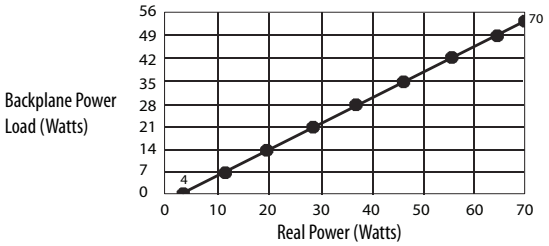
1756-PAXT (AC)



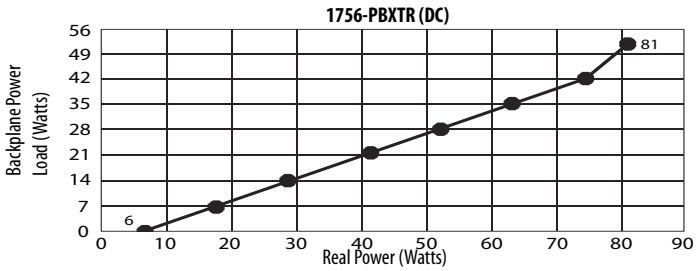
1756-PAXTR (AC)



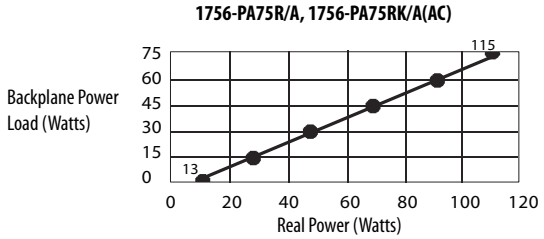
1756-PBXT (DC)



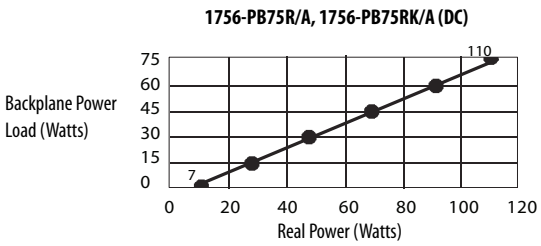
1756-PBXTR (DC)



1756-PA75R/A, 1756-PA75RK/A(AC)



1756-PB75R/A, 1756-PB75RK/A (DC)



Apparent Power (Watts) = Transformer Load (VA) = Real Power (Watts)

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
ControlLogix Chassis Specifications Technical Data, publication 1756-TD006	Provides technical specifications for ControlLogix chassis.
ControlLogix Selection Guide, publication 1756-SG001	Provides overview of the ControlLogix system and its products.
ControlLogix Power Supply Installation Instructions, publication 1756-IN619	Provides information on how to install ControlLogix standard power supplies.
ControlLogix Redundant Power Supply Installation Instructions, publication 1756-IN620	Provides information on how to install ControlLogix redundant power supplies.
ControlLogix Chassis Installation Instructions, publication 1756-IN621	Provides information on how to install ControlLogix chassis.
ControlLogix System User Manual, publication 1756-UM001	Provides information on how to install, configure, program, and use ControlLogix systems.
Industrial Automation Wiring and Grounding Guidelines, publication 1770.4.1	Provides general guidelines for installing a Rockwell Automation® industrial system.
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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Publication 1756-TD005I-EN-E - October 2018
Supersedes Publication 1756-TD005H-EN-E - November 2017

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Installation Instructions

Original Instructions

ControlLogix Power Supply

Catalog Numbers 1756-PA30XT, 1756-PA50, 1756-PA50K, 1756-PA72, 1756-PA72K, 1756-PA75, 1756-PA75K, 1756-PB30XT, 1756-PB50, 1756-PB50K, 1756-PB72, 1756-PB72K, 1756-PB75, 1756-PB75K, 1756-PC75, 1756-PH75, 1756-PH75K, 1756-PAXT, 1756-PBXT

ControlLogix® power supplies are used with the 1756 chassis to provide 1.2V, 3.3V, 5V, and 24V DC power directly to the chassis backplane. Standard, ControlLogix-XT™, and slim (reduced width) power supplies are available.

The catalog number of the conformal coated product includes the designation 'K' in the last position before the series identifier.

Power Supply and Chassis Compatibility

Your chassis series determines the power supply that you can use. This table lists the chassis that can be installed with each power supply.

Power Supply Cat. No.	Chassis Cat. No.
1756-PA72/C, 1756-PA72K	1756-A4/A, 1756-A7/A, 1756-A10/A, 1756-A13/A, 1756-A17/A, 1756-A4/B, 1756-A7/B, 1756-A10/B, 1756-A13/B, 1756-A17/B, 1756-A4/C, 1756-A7/C, 1756-A10/C, 1756-A13/C, 1756-A17/C
1756-PB72/C, 1756-PB72K	
1756-PA50, 1756-PA50K	
1756-PB50, 1756-PB50K	
1756-PA75/B, 1756-PA75K	1756-A4/B, 1756-A7/B, 1756-A10/B, 1756-A13/B, 1756-A17/B, 1756-A4/C, 1756-A7/C, 1756-A10/C, 1756-A13/C, 1756-A17/C
1756-PB75/B, 1756-PB75K	
1756-PC75/B	
1756-PH75/B, 1756-PH75K	
1756-PBXT	1756-A4LXT/B, 1756-A5XT/B, 1756-A7LXT/B, 1756-A7XT/B, 1756-A7XT/C, 1756-A10XT/C
1756-PAXT	
1756-PA30XT	
1756-PB30XT	

ATTENTION: Read this document and the documents listed in the Additional Resources section about installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

注意：在安装、配置、操作和维护本产品前，请阅读本文档以及 “ 其他资源 ” 部分列出的有关设备安装、配置和操作的相应文档。除了所有适用规范、法律和标准的相关要求之外，用户还必须熟悉安装和接线说明。

安装、调整、投运、使用、组装、拆卸和维护等各项操作必须由经过适当训练的专业人员按照适用的操作规范实施。

如果未按照制造商指定的方式使用该设备，则可能会损害设备提供的保护。

ATENCIÓN: Antes de instalar, configurar, poner en funcionamiento o realizar el mantenimiento de este producto, lea este documento y los documentos listados en la sección Recursos adicionales acerca de la instalación, configuración y operación de este equipo. Los usuarios deben familiarizarse con las instrucciones de instalación y cableado y con los requisitos de todos los códigos, leyes y estándares vigentes.

El personal debidamente capacitado debe realizar las actividades relacionadas a la instalación, ajustes, puesta en servicio, uso, ensamblaje, desensamblaje y mantenimiento de conformidad con el código de práctica aplicable.

Si este equipo se usa de una manera no especificada por el fabricante, la protección provista por el equipo puede resultar afectada.

ATENÇÃO: Leia este e os demais documentos sobre instalação, configuração e operação do equipamento que estão na seção Recursos adicionais antes de instalar, configurar, operar ou manter este produto. Os usuários devem se familiarizar com as instruções de instalação e fiação além das especificações para todos os códigos, leis e normas aplicáveis.

É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção sejam realizadas por pessoal qualificado e especializado, de acordo com o código de prática aplicável.

Caso este equipamento seja utilizado de maneira não estabelecida pelo fabricante, a proteção fornecida pelo equipamento pode ficar prejudicada.

ВНИМАНИЕ: Перед тем как устанавливать, настраивать, эксплуатировать или обслуживать данное оборудование, прочитайте этот документ и документы, перечисленные в разделе «Дополнительные ресурсы». В этих документах изложены сведения об установке, настройке и эксплуатации данного оборудования. Пользователи обязаны ознакомиться с инструкциями по установке и прокладке соединений, а также с требованиями всех применимых норм, законов и стандартов.

Все действия, включая установку, наладку, ввод в эксплуатацию, использование, сборку, разборку и техническое обслуживание, должны выполняться обученным персоналом в соответствии с применимыми нормами и правилами.

Если оборудование используется не предусмотренным производителем образом, защита оборудования может быть нарушена.

注意：本製品を設置、構成、稼動または保守する前に、本書および本機器の設置、設定、操作についての参考資料の該当箇所に記載されている文書に目を通してください。ユーザは、すべての該当する条例、法律、規格の要件に加えて、設置および配線の手順に習熟している必要があります。

設置調整、運転の開始、使用、組立て、解体、保守を含む諸作業は、該当する実施規則に従って訓練を受けた適切な作業員が実行する必要があります。

本機器が製造メーカにより指定されていない方法で使用されている場合、機器により提供されている保護が損なわれる恐れがあります。

ACHTUNG: Lesen Sie dieses Dokument und die im Abschnitt „Weitere Informationen“aufgeführten Dokumente, die Informationen zu Installation, Konfiguration und Bedienung dieses Produkts enthalten, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder warten. Anwender müssen sich neben den Bestimmungen aller anwendbaren Vorschriften, Gesetze und Normen zusätzlich mit den Installations- und Verdrahtungsanweisungen vertraut machen.

Arbeiten im Rahmen der Installation, Anpassung, Inbetriebnahme, Verwendung, Montage, Demontage oder Instandhaltung dürfen nur durch ausreichend geschulte Mitarbeiter und in Übereinstimmung mit den anwendbaren Ausführungsvorschriften vorgenommen werden.

Wenn das Gerät in einer Weise verwendet wird, die vom Hersteller nicht vorgesehen ist, kann die Schutzfunktion beeinträchtigt sein.

ATTENTION : Lisez ce document et les documents listés dans la section Ressources complémentaires relatifs à l’installation, la configuration et le fonctionnement de cet équipement avant d’installer, configurer, utiliser ou entretenir ce produit. Les utilisateurs doivent se familiariser avec les instructions d’installation et de câblage en plus des exigences relatives aux codes, lois et normes en vigueur.

Les activités relatives à l’installation, le réglage, la mise en service, l’utilisation, l’assemblage, le démontage et l’entretien doivent être réalisées par des personnes formées selon le code de pratique en vigueur.

Si cet équipement est utilisé d’une façon qui n’a pas été définie par le fabricant, la protection fournie par l’équipement peut être compromise.

주의 : 본 제품 설치 , 설정 , 작동 또는 유지 보수하기 전에 본 문서를 포함하여 설치 , 설정 및 작동에 관한 참고 자료 섹션의 문서들을 반드시 읽고 숙지하십시오 . 사용자는 모든 관련 규정 , 법규 및 표준에서 요구하는 사항에 대해 반드시 설치 및 배선 지침을 숙지해야 합니다 .

설치 , 조정 , 가동 , 사용 , 조립 , 분해 , 유지보수 등 모든 작업은 관련 규정에 따라 적절한 교육을 받은 사용자를 통해서만 수행해야 합니다 .

본 장비를 제조사가 명시하지 않은 방법으로 사용하면 장비의 보호 기능이 손상될 수 있습니다 .

ATTENZIONE Prima di installare, configurare ed utilizzare il prodotto, o effettuare interventi di manutenzione su di esso, leggere il presente documento ed i documenti elencati nella sezione “Altre risorse”, riguardanti l’installazione, la configurazione ed il funzionamento dell’apparecchiatura. Gli utenti devono leggere e comprendere le istruzioni di installazione e cablaggio, oltre ai requisiti previsti dalle leggi, codici e standard applicabili.

Le attività come installazione, regolazioni, utilizzo, assemblaggio, disassemblaggio e manutenzione devono essere svolte da personale adeguatamente addestrato, nel rispetto delle procedure previste.

Qualora l’apparecchio venga utilizzato con modalità diverse da quanto previsto dal produttore, la sua funzione di protezione potrebbe venire compromessa.

DİKKAT: Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili İlave Kaynaklar bölümünde yer listelenmiş dokümanları okuyun. Kullanıcılar yürürlükteki tüm yönetmelikler, yasalar ve standartların gereksinimlerine ek olarak kurulum ve kablolama talimatlarını da öğrenmek zorundadır.

Kurulum, ayarlama, hizmete alma, kullanma, parçaları birleştirme, parçaları sökme ve bakım gibi aktiviteler sadece uygun eğitimleri almış kişiler tarafından yürürlükteki uygulama yönetmeliklerine uygun şekilde yapılabilir.

Bu ekipman üretici tarafından belirlenmiş amacın dışında kullanılırsa, ekipman tarafından sağlanan koruma bozulabilir.

注意事項：在安装、設定、操作或維護本產品前，請先閱讀此文件以及列於 「其他資源」章節中有關安装、設定與操作此設備的文件。使用者必須熟悉安裝和配線指示，並符合所有法規、法律和標準要求。

包括安装、調整、交付使用、使用、組装、拆卸和維護等動作都必須交由已經過適當訓練的人員進行，以符合適用的實作法規。

如果將設備用於非製造商指定的用途時，可能會造成設備所提供的保護功能受損。

POZOR: Než začnete instalovat, konfigurovat či provozovat tento výrobek nebo provádět jeho údržbu, přečtěte si tento dokument a dokumenty uvedené v části Dodatečné zdroje ohledně instalace, konfigurace a provozu tohoto zařízení. Uživatelé se musejí vedle požadavků všech relevantních vyhlášek, zákonů a norem nutně seznámit také s pokyny pro instalaci a elektrické zapojení.

Činnosti zahrnující instalaci, nastavení, uvedení do provozu, užívání, montáž, demontáž a údržbu musí vykonávat vhodně proškolený personál v souladu s příslušnými prováděcími předpisy.

Pokud se toto zařízení používá způsobem neodpovídajícím specifikaci výrobce, může být narušena ochrana, kterou toto zařízení poskytuje.

UWAGA: Przed instalacją, konfiguracją, użytkowaniem lub konserwacją tego produktu należy przeczytać niniejszy dokument oraz wszystkie dokumenty wymienione w sekcji Dodatkowe źródła omawiające instalację, konfigurację i procedury użytkowania tego urządzenia. Użytkownicy mają obowiązek zapoznać się z instrukcjami dotyczącymi instalacji oraz oprzewodowania, jak również z obowiązującymi kodeksami, prawem i normami.

Działania obejmujące instalację, regulację, przekazanie do użytkowania, użytkowanie, montaż, demontaż oraz konserwację muszą być wykonywane przez odpowiednio przeszkolony personel zgodnie z obowiązującym kodeksem postępowania.

Jeśli urządzenie jest użytkowane w sposób inny niż określony przez producenta, zabezpieczenie zapewniane przez urządzenie może zostać ograniczone.

OBS! Läs detta dokument samt dokumentet, som står listat i avsnittet Övriga resurser, om installation, konfigurering och drift av denna utrustning innan du installerar, konfigurerar eller börjar använda eller utföra underhållsarbete på produkten. Användare måste bekanta sig med instruktioner för installation och kabeldragning, förutom krav enligt gällande koder, lagar och standarder.

Åtgärder som installation, justering, service, användning, montering, demontering och underhållsarbete måste utföras av personal med lämplig utbildning enligt lämpligt bruk.

Om denna utrustning används på ett sätt som inte anges av tillverkaren kan det hända att utrustningens skyddsanordningar försätts ur funktion.

LET OP: Lees dit document en de documenten die genoemd worden in de paragraaf Aanvullende informatie over de installatie, configuratie en bediening van deze apparatuur voordat u dit product installeert, configureert, bediend of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradingsinstructies, naast de vereisten van alle toepasselijke regels, wetten en normen.

Activiteiten zoals het installeren, afstellen, in gebruik stellen, gebruiken, monteren, demonteren en het uitvoeren van onderhoud mogen uitsluitend worden uitgevoerd door hiervoor opgeleid personeel en in overeenstemming met de geldende praktijkregels.

Indien de apparatuur wordt gebruikt op een wijze die niet is gespecificeerd door de fabrikant, dan bestaat het gevaar dat de beveiliging van de apparatuur niet goed werkt.

Environment and Enclosure

ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in EN/IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment for indoor use. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements.
- NEMA Standard 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosures.

Prevent Electrostatic Discharge

ATTENTION: This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

IMPORTANT **ControlLogix-XT system components are rated for extreme environmental conditions only when used properly with other Logix-XT system components. The use of ControlLogix-XT components with standard ControlLogix system components nullifies extreme-environment ratings.**

If a ControlLogix-XT module is used with standard ControlLogix products, the ControlLogix-XT module can withstand only the environments specified for the standard ControlLogix version of the module. For example, if a 1756-L63XT controller is used in a standard 1756-A10 chassis, the ControlLogix-XT controller can withstand only the environment specified for the standard 1756-L63 controller.

The ControlLogix-XT system components are designed to meet the same and greater operational and environmental requirements as traditional ControlLogix products.

When a ControlLogix-XT component is used as a replacement for a traditional ControlLogix component, the functional and environmental requirements of the traditional ControlLogix component apply, with the exception of the power output ratings.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations.	Informations sur l'utilisation de cet équipement en environnements dangereux.
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.
WARNING: EXPLOSION HAZARD • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must be changed only in an area known to be nonhazardous.	**AVERTISSMENT: RISQUE D'EXPLOSION** • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

European Hazardous Location Approval

The following applies to products marked CE, Ex, II 3:

- Such modules are Equipment Group II, Equipment Category 3, and comply with the Essential Health and Safety Requirements relating to the design and construction of such equipment given in Annex II to Directive 94/9/EC. See the EC Declaration of Conformity at rok.auto/certifications for details. The type of protection for 1756-PB50, 1756-PB72, 1756-PB75, 1756-PBXT, and 1756-PB30XT is "Ex nA IIC T4 Gc" according to EN 60079-15.
- Such modules may have catalog numbers followed by a "K" to indicate a conformal coating option.
- Such modules are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification according to ATEX directive 1999/92/EC.
- The 1756-PB50, 1756-PB72, 1756-PB75, 1756-PBXT, and 1756-PB30XT comply to Standards EN 60079-0:2012+A11:2013, EN 60079-15:2010, reference ATEX certificate number DEMKO13ATEX1325026X.

IEC Hazardous Location Approval

The following applies to products with IECEx certification:

- Such modules are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification to IEC 60079-0.
- Such modules may have catalog numbers followed by a "K" to indicate a conformal coating option.
- The type of protection for 1756-PB50, 1756-PB72, 1756-PB75, 1756-PBXT, and 1756-PB30XT, is "Ex nA IIC T4 Gc" according to IEC 60079-15.
- The 1756-PB50, 1756-PB72, 1756-PB75, 1756-PBXT, and 1756-PB30XT comply to Standards IEC 60079-0:2011, IEC 60079-15:2010, reference IECEx certificate number IECExUL14.0008X.

ATEX and IECEx Hazardous Location Conformity

Model	Protection Type	ATEX Certificate	IECEx Certificate
1756-PA50, 1756-PA50K	None	—	—
1756-PA72, 1756-PA72K	None	—	—
1756-PA75, 1756-PA75K	None	—	—
1756-PB50, 1756-PB50K	Ex nA IIC T4 Gc	DEMKO13ATEX1325026X	IECEx UL 14.0008X
1756-PB72, 1756-PB72K	Ex nA IIC T4 Gc	DEMKO13ATEX1325026X	IECEx UL 14.0008X
1756-PB75, 1756-PB75K	Ex nA IIC T4 Gc	DEMKO13ATEX1325026X	IECEx UL 14.0008X
1756-PC75	None	—	—
1756-PH75, 1756-PH75K	None	—	—
1756-PAXT	None	—	—
1756-PBXT	Ex nA IIC T4 Gc	DEMKO13ATEX1325026X	IECEx UL 14.0008X
1756-PA30XT	None	—	—
1756-PB30XT	Ex nA IIC T4 Gc	DEMKO13ATEX1325026X	IECEx UL 14.0008X

Waste Electrical and Electronic Equipment (WEEE)

At the end of its life, this equipment should be collected separately from any unsorted municipal waste.

Special Conditions for Safe Use

WARNING:

- This equipment shall be mounted in an ATEX/IECEx Zone 2-certified enclosure with a minimum ingress protection rating of at least IP54 (as defined in EN/IEC 60529) and used in an environment of not more than Pollution Degree 2 (as defined in EN/IEC 60664-1) when applied in Zone 2 environments. The enclosure must be accessible only by the use of a tool.
- This equipment shall be used within its specified ratings defined by Rockwell Automation.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 140% of the rated voltage when applied in Zone 2 environments.
- This equipment must be used only with ATEX/IECEx certified Rockwell Automation backplanes.
- Instructions in the user manual shall be observed.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- Devices shall be used in an environment of not more than Pollution Degree 2.

Summary of Changes

We updated the torque requirement on pages 7 and 10 for these power supplies.

Tools Required

When installing the standard or ControlLogix-XT versions of your 1756 chassis and power supplies, the following items are required:

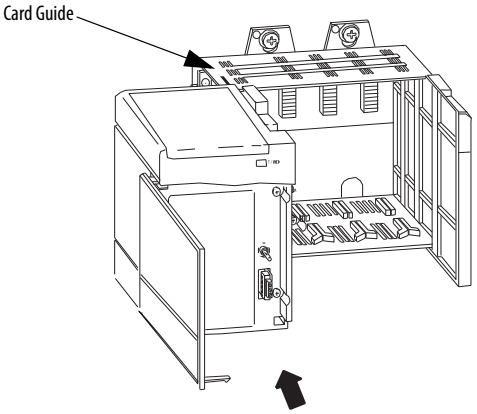
- 3.18 mm (0.125 in.) slotted screwdriver
- 6.35 mm (0.25 in.) slotted or #2 Phillips screwdriver
- Torque screwdriver
- Needle-nose pliers
- Crimper
- Wire stripper
- Drill

ATTENTION: If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

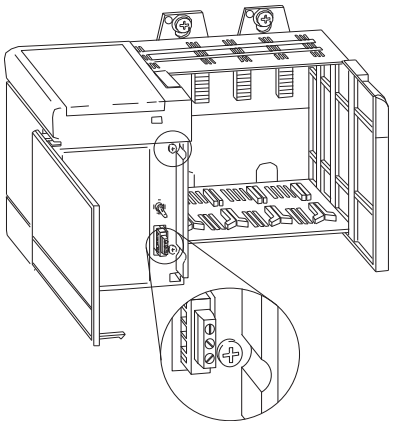
ATTENTION: Make sure the chassis is mounted and all panel fabrication is complete before you remove the protective label. This label protects the power supply from metal shavings falling inside the power supply and damaging it during operation.

Install the Power Supply

1. Make sure that the chassis is installed and grounded correctly.
2. Align the power-supply circuit board with the card guides on the left side of the chassis.
3. Slide the power supply back until it is flush with the front of the chassis.



4. Tighten the top and bottom screws to fasten the power supply to the chassis.



Connect the Power

WARNING: EXPLOSION HAZARD
If you connect or disconnect wiring while the field-side power is on, an electric arc can occur. This can cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

ATTENTION: Do not wire more than one conductor on any single terminal.

Use 15 A time-delay type fuse in all ungrounded power connections.

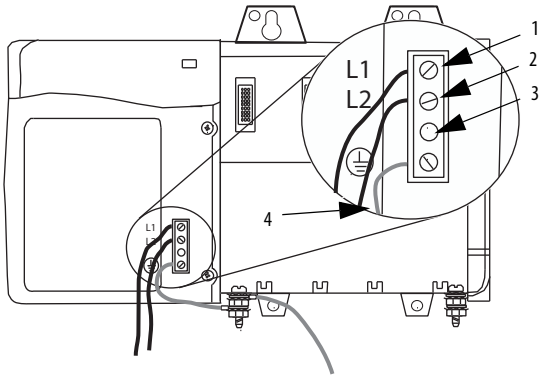
Use 2.5 mm2(14 AWG) solid or stranded-copper wire that is rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation maximum to connect power. Tighten the terminals to a torque of 0.565 N•m (5 lb•in).

Connect the power as shown in the figure.

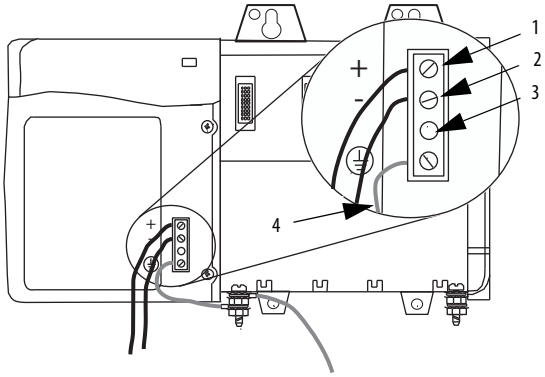
IMPORTANT The voltage input connections of the power supplies are auto-sensing.

You do **not** use a jumper, for example, a 120/240V AC jumper, when connecting external power to the power supply, as shown in the following figure.

AC Power Supplies



DC Power Supplies



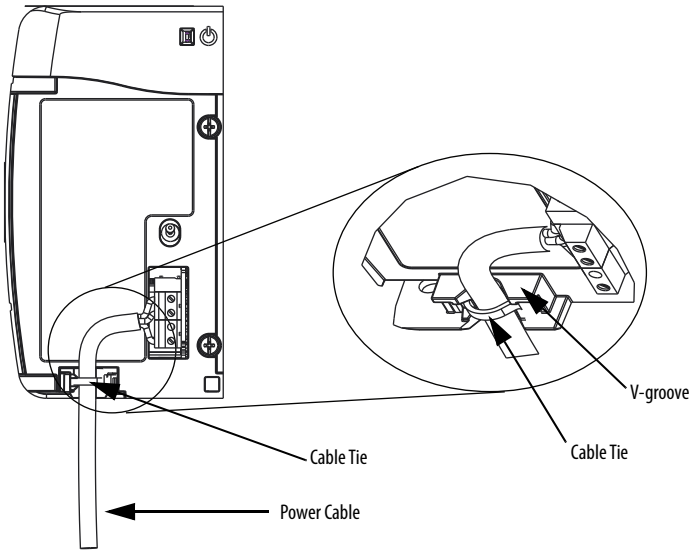
Item	Description, AC Power Supplies	Description, DC Power Supplies
1	L1 (high side of line power)	DC+ (positive supply)
2	L2 (low side of line power)	DC- (negative supply return)
3	This terminal is not used and is capped to prevent use.	
4	Protective Earth. Attach to chassis ground lug or ground bus. See the ControlLogix Chassis Installation Instructions, publication 1756-IN621, for details.	

Optional Power Cable Connection

The 1756-PA50, 1756-PA50K, 1756-PB50, 1756-PB50K, 1756-PA30XT, and 1756-PB30XT power supplies offer an optional cable retention mechanism.

Install the optional cable retention mechanism per the following procedure.

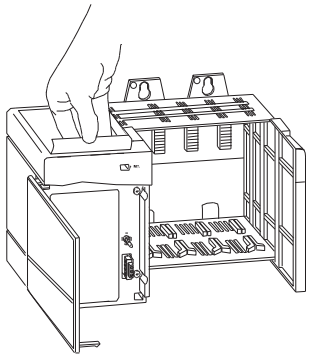
1. Align the power cable in the v-groove at the front of the power supply.
2. Feed a cable tie through the retainer on the v-groove.
3. To secure the power cable, tighten the cable tie.
4. Trim any excess cable tie length as appropriate.



Remove the Protective Label

ATTENTION: Make sure the chassis is mounted and all panel fabrication is complete before you remove the protective label. This label protects the power supply from metal shavings falling inside the power supply and damaging it during operation.

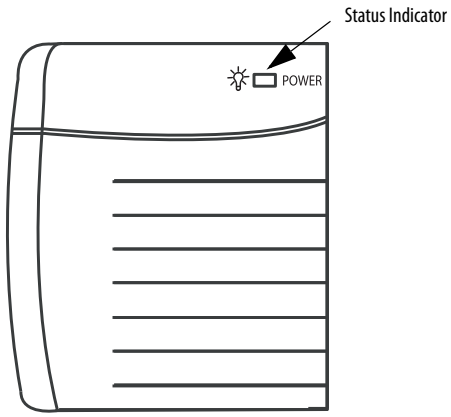
Remove the protective label from the top of the power supply.



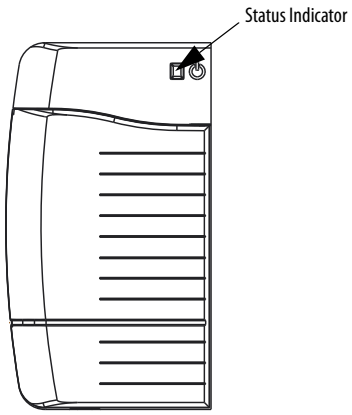
Troubleshoot the Power Supply

All ControlLogix power supplies have a green status indicator that remains ON during normal operation.

Standard Power Supply



Slim Power Supply



If the indicator turns OFF during operation, take these steps to troubleshoot the power supply.

1. Verify that the line voltage is within the specified range.
2. If the indicator remains OFF, turn off the power.
3. Loosen the screws that secure the power supply to the chassis.

   See step 4 on page 6 for the location of the screws on the power supply.
4. Slide the power supply out so that the rear connector is disconnected.
5. Turn on the power.
6. Follow these steps if the indicator does the following:
   - Turns ON:
     a. Verify that the Backplane Power Load of the system is within the output rating of the power supply.
     b. Turn off the power.
     c. Reinstall the power supply in the chassis.
     d. Turn on the power.
   - Remains OFF: Contact your local Allen-Bradley distributor.

Specifications

Attribute	1756-PA72, 1756-PA72K	1756-PA75, 1756-PA75K	1756-PB72, 1756-PB72K	1756-PB75, 1756-PB75K	1756-PC75	1756-PH75, 1756-PH75K
Voltage and current ratings Input	120/240V AC, 50/60 Hz, 100VA, 100 W	120/240V AC, 50/60 Hz, 100VA, 100 W	24V DC, 95 W	24V DC, 95 W	48V DC, 95 W	125V DC, 95 W
Output (current capacity)	2.8 A, 24V DC; 10.0 A, 5.1V DC; 4.0 A, 3.3V DC; 1.5 A, 1.2V DC; 75 W max, 20 A inrush max	2.8 A, 24V DC; 13.0 A, 5.1V DC; 4.0 A, 3.3V DC; 1.5 A, 1.2V DC; 75 W max, 20 A inrush max	2.8 A, 24V DC; 10.0 A, 5.1V DC; 4.0 A, 3.3V DC; 1.5A, 1.2V DC; 75 W max, 30 A inrush max	2.8 A, 24V DC; 13.0 A, 5.1V DC; 4.0 A, 3.3V DC; 1.5 A, 1.2V DC; 75 W max, 30 A inrush max	2.8 A, 24V DC; 13.0 A, 5.1V DC; 4.0 A, 3.3V DC; 1.5 A, 1.2V DC; 75 W max, 30 A inrush max	2.8 A, 24V DC; 13.0 A, 5.1V DC; 4.0 A, 3.3V DC; 1.5 A, 1.2V DC; 75 W max, 30 A inrush max
Isolation voltage	250V (continuous), Reinforced Insulation Type, Power Input to Backplane					
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < 140 °F)					
Temperature, surrounding air, max	60 °C (140 °F)					
Enclosure type rating	None (open-style)					
Torque	0.565 N•m (5 lb•in)					
Dimensions (HxWxD), approx	14.0 x 11.2 x 14.5 cm (5.51 x 4.41 x 5.71 in.)					
Wire size	2.5 mm^2 (14 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max					
North American temperature code	T4					
ATEX temperature code	-		T4		-	
IECEx temperature code	-		T4		-	

Attribute	1756-PA50, 1756-PA50K	1756-PB50, 1756-PB50K
Voltage and current ratings Input	120/240V AC, 50/60 Hz, 81 W (90VA), 50 °C (122 °F), 68 W (77VA), 60 °C (140 °F)	24V DC; 50 °C (122 °F), 85 W; 60 °C (140 °F), 70 W
Output (current capacity)	2.5 A, 24V DC; 8.0 A, 5.1V DC; 2.0 A, 3.3V DC; 1.5 A, 1.2V DC; 50 °C (122 °F), 60 W max; 60 °C (140 °F), 50 W max; 20 A inrush max	2.5 A, 24V DC; 8.0 A, 5.1V DC; 2.0 A, 3.3V DC; 1.5 A, 1.2V DC; 50 °C (122 °F), 60 W max; 60 °C (140 °F), 50 W max; 20 A inrush max
Isolation voltage	250V (continuous), Reinforced Insulation Type, Power Input to Backplane	
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)	
Temperature, surrounding air, max	60 °C (140 °F)	
Enclosure type rating	None (open-style)	
Torque	0.565 N•m (5 lb•in)	
Dimensions (HxWxD), approx	14.0 x 7.8 x 14.5 cm (5.51 x 3.07 x 5.71 in.)	
Wire size	2.5 mm^2 (14 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max	
North American temperature code	T4	
ATEX temperature code	-	T4
IECEx temperature code	-	T4

Attribute	1756-PAXT	1756-PBXT	1756-PA30XT	1756-PB30XT
Voltage and current ratings Input	120/240V AC, 50/60 Hz, 82VA, 64 W	18…32V DC, 70 W	120/240V AC, 50/60 Hz, 50 W (60VA), 70 °C (158 °F)	24V DC, 50W 70 °C (158 °F)
Output (current capacity)	1.75 A, 24V DC, 8.0 A, 5.1V DC, 4.0 A, 3.3V DC, 1.5 A, 1.2V DC, 42 W max, 20 A inrush max	2.1 A, 24V DC, 10.0 A, 5.1V DC, 4.0 A, 3.3V DC, 1.5 A, 1.2V DC, 52 W max, 30 A inrush max	1.25 A, 24V DC; 6.0 A, 5.1V DC; 2.0 A, 3.3V DC; 1.5 A, 1.2V DC; 30 W max, 20 A inrush max	1.25 A, 24V DC; 6.0 A, 5.1V DC; 2.0 A, 3.3V DC; 1.5 A, 1.2V DC; 30 W max, 20 A inrush max
Isolation voltage	250V (continuous), Reinforced Insulation Type, Power Input to Backplane			
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-25 °C < Ta < +70 °C (-13 °F < Ta < +158 °F)			
Temperature, surrounding air, max	70 °C (158 °F)			
Enclosure type rating	None (open-style)			
Torque	0.565 N•m (5 lb•in)			
Dimensions (HxWxD), approx	14.0 x 11.2 x 14.5 cm (5.51 x 4.41 x 5.71 in.)		14.0 x 7.8 x 14.5 cm (5.51 x 3.07 x 5.71 in.)	
Wire size	2.5 mm^2 (14 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max			
North American temperature code	T4	T4A	T4	
ATEX temperature code	-	T4	-	T4
IECEx temperature code	-	T4	-	T4

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
1756 ControlLogix Specifications Technical Data, publication 1756-TD006	Provides technical specifications for ControlLogix chassis.
1756 ControlLogix Power Supplies Specifications Technical Data, publication 1756-TD005	Provides technical specifications for ControlLogix power supplies.
ControlLogix Chassis Installation Instructions, publication 1756-IN621	Provides information on how to install ControlLogix chassis.
ControlLogix System User Manual, publication 1756-UM001	Provides instructions for installation and use of ControlLogix Systems, application design, and other general information for these systems.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/rockwellautomation/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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1756 ControlLogix Communication Modules Specifications

Standard ControlLogix Catalog Numbers: 1756-CN2, 1756-CN2R, 1756-CNB, 1756-CNBR, 1756-DNB, 1756-DHRIO, 1756-DH485, 1756-EN2F, 1756-EN2T, 1756-EN2TP, 1756-EN2TR, 1756-EN2TSC, 1756-EN3TR, 1756-EN4TR, 1756-ENBT, 1756-EWEB, 1756-RIO, 1756-SYNCH, 1756-TIME

ControlLogix 1756 Communication Module Conformal Coated Catalog Numbers: 1756-CN2RK, 1756-EN2FK, 1756-EN2TK, 1756-EN2TPK, 1756-EN2TRK, 1756-EN4TRK, 1756-ENBTK, 1756-TIMEK

ControlLogix-XT Catalog Numbers: 1756-CN2RXT, 1756-DHRIOXT, 1756-EN2TPXT, 1756-EN2TXT, 1756-EN2TRXT, 1756-EN4TRXT

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
EtherNet/IP Modules Installation Instructions, publication ENET-IN002	Provides information on installing EtherNet/IP™ modules.
EtherNet/IP Secure Communication User Manual, publication ENET-UM003	Provides information on system architecture, configuring secure communication, and diagnostics.
ControlNet Modules Installation Instructions, publication CNET-IN005	Provides instructions for installing ControlNet® modules.
ControlLogix System User Manual, publication 1756-UM001	Provides information on system architecture, configuring secure communication, and diagnostics.
ControlLogix Time Synchronization Module - Series B User Manual, publication 1756-UM542	Describes the functionality, installation, configuration, and operation of the 1756-TIME module.
DeviceNet Network Configuration User Manual, publication DNET-UM004	Provides information on system architecture, configuring communication, and diagnostics.
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to use EtherNet/IP communication modules in Logix 5000™ control systems
ControlLogix DH-485 Communication Module User Manual, publication 1756-UM532	Provides information on system architecture, configuring communication, and diagnostics.
ControlLogix Data Highway Plus-Remote I/O Communication Interface Module User Manual, publication 1756-UM514	Provides information about programming, messaging, applying, and connecting the module.
ControlLogix SynchLink Module User Manual, publication 1756-UM521	Provides information about topologies, configurations, planning, and installing a Synchlink™ module.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Summary of Changes

This table contains the changes made in this revision.

Topic	Page
Catalog Numbers 1756-EN4TR, 1756-EN4TRK, and 1756-EN4TRXT added.	Throughout

Available Communication Modules

Network	Cat. No.	Description	Page
EtherNet/IP	1756-EN2F	EtherNet/IP bridge, fiber, 256 Logix connections	7
	1756-EN2T	EtherNet/IP bridge, copper, 256 Logix connections	7
	1756-EN2TSC	EtherNet/IP secure communication module	7
	1756-EN2TR, 1756-EN2TRK	EtherNet/IP bridge, embedded switch, copper Supports as many as 8 axis of motion	7
	1756-EN3TR	EtherNet/IP bridge, embedded switch, copper Supports as many as 128 axis of motion	7
	1756-EN2TP, 1756-EN2PK, 1756-EN2PXT	EtherNet/IP bridge with Parallel Redundancy Protocol Supports as many as 8 axis of motion	7
	1756-ENBT	EtherNet/IP bridge, copper, 128 Logix connections	7
	1756-EWEB	Ethernet web server, 128 Logix connections, Class 3 messaging only	7
	1756-EN2TXT	ControlLogix-XT™, EtherNet/IP bridge, copper, 256 Logix connections	7
	1756-EN2TRXT	ControlLogix-XT EtherNet/IP bridge module with embedded switch	7
	1756-EN4TR, 1756-EN4TRK, 1756-EN2TRXT	ControlLogix® EtherNet/IP with CIP Security™	7
	1756-EN4TRXT	ControlLogix-XT EtherNet/IP with CIP Security	7
ControlNet	1756-CN2/B, 1756-CN2/C, 1756-CN2R/B, 1756-CN2R/C, 1756-CN2RK	ControlNet bridge, 128 Logix connections(1)	15
	1756-CNB, 1756-CNBR	ControlNet bridge, 64 connections; recommend using only 40…48 Logix connections for I/O	15
	1756-CN2RXT	ControlLogix-XT, ControlNet bridge, 128 Logix connections(1)	19
DeviceNet®	1756-DNB/E	DeviceNet bridge	23
Data Highway Plus™	1756-DHRIO	Data Highway Plus/Remote I/O module	27
	1756-DHRIOXT	ControlLogix-XT, Data Highway Plus/Remote I/O module	29
Remote I/O	1756-DHRIO	Data Highway Plus/Remote I/O module	27
	1756-RIO/B	Remote I/O module	27
	1756-DHRIOXT	ControlLogix-XT, Data Highway Plus/Remote I/O module	29
DH-485 module	1756-DH485	DH-485 module	32
SynchLink	1756-SYNCH	SynchLink fiber-optic communication link	34
Time Synchronization	1756-TIME	Time synchronization on different interfaces by using Global Positioning System (GPS) technology	36

(1) 128 connections are available for standard use. An additional three connections are reserved for redundant control.

Communication Connections

A ControlLogix system uses connections to establish communication links between devices. The types of connections include the following:

- Controller-to-local I/O modules or local communication modules
- Controller-to-remote I/O or remote communication modules
- Controller-to-remote I/O (rack-optimized) modules
- Produced and consumed tags
- Messages
- Controller access with the Studio 5000™ environment
- Controller access with RSLinx® software for HMI or other applications

You indirectly determine the number of connections the controller uses by configuring the controller to communicate with other devices in the system. The limit of connections ultimately resides in the communication module you use for the connection. If a message path routes through a communication module, the connection that is related to the message also counts towards the connection limit of that communication module.

EtherNet/IP Network

The Ethernet Industrial (EtherNet/IP) network protocol is an open industrial-networking standard that supports both real-time I/O messaging and message exchange. The EtherNet/IP network uses off-the-shelf Ethernet communication chips and physical media.

If you need to	Select this interface
Control I/O modules and drives Act as an adapter for I/O on remote EtherNet/IP links Communicate with other EtherNet/IP devices (messages and HMI) Bridge EtherNet/IP links to route messages to devices on other networks	1756-EN2F, 1756-EN2FK 1756-EN2T, 1756-EN2TK, 1756-EN2TXT 1756-EN2TP, 1756-EN2TPK, 1756-EN2TPXT 1756-EN2TR, 1756-EN2TRK, 1756-EN2TRXT 1756-ENBT, 1756-ENBTK
Support device level ring (DLR) and linear topologies	1756-EN2TR, 1756-EN2TRK 1756-EN3TR, 1756-EN3TRK
Support for Parallel Redundancy Protocol	1756-EN2TP, 1756-EN2TPK 1756-EN2TPXT
Provide control in environments where temperatures range from -25…70 °C (-13…158 °F)	1756-EN2TPXT 1756-EN2TRXT 1756-EN2TXT 1756-EN4TRXT
Secure access to a control system from within the plant network	1756-EN2TSC 1756-EN4TR, 1756-EN4TRK
Use an Internet browser to remotely access tags in a ControlLogix controller Communicate with other EtherNet/IP or generic Ethernet devices (messaging only; no I/O control) Bridge EtherNet/IP links to route messages to devices on other networks	1756-EWEB, 1756-EWEBK web server

EtherNet/IP Network Specifications

Table 1 - ControlLogix EtherNet/IP Connections Specifications(1)

Cat. No.	Connections		CIP Unconnected Messages (backplane + Ethernet)
	TCP	CIP(2)	
1756-ENBT	64	128	64 + 64
1756-EN2F	128	256	128 + 128
1756-EN2T	128	256	128 + 128
1756-EN2TXT	128	256	128 + 128
1756-EN2TP	128	256	128 + 128
1756-EN2TPXT	128	256	128 + 128
1756-EN2TR	128	256	128 + 128
1756-EN2TRXT	128	256	128 + 128
1756-EN2TSC	128	256	128 + 128
1756-EN3TR	128	256	128 + 128
1756-EN4TR	512	1000 I/O 528 (3)	256+256
1756-EN4TRXT	512	1000 I/O 528 (3)	256+256
1756-EWEB	64	128	128 + 128

(1) Includes the K conformal coating catalog numbers.

(2) CIP™ connections can be used for all explicit or all implicit applications. For example, a 1756-ENBT module has a total of 128 CIP connections that can be used for any combination of connections.

(3) There are 1000 CIP I/O connections and 528 CIP messaging connections.

Table 2 - ControlLogix EtherNet/IP Data Specifications(1)

Cat. No.	Produced/Consumed Tags		Socket Services	SNMP Support (password required)	Duplicate IP Detection (starting revision)
	Number of Multicast Tags, Max(2)	Unicast Available in RSLogix 5000 Software			
1756-ENBT	32	Version 16.03.00 or later	No	Yes	Revision 3.3
1756-EN2F	32	Version 16.03.00 or later	Yes	Yes	Revision 1.*x*
1756-EN2T	32	Version 16.03.00 or later	Yes	Yes	Revision 1.*x*
1756-EN2TXT	32	Version 16.03.00 or later	Yes	Yes	Revision 1.*x*
1756-EN2TP	32	Version 24.00.00 or later	Yes	Yes	Revision 10.x
1756-EN2TR	32	Version 17.01.02 or later	Yes	Yes	Revision 1.*x*
1756-EN2TRXT	32	Version 20.01.00 or later	Yes	Yes	Revision 1.*x*
1756-EN2TSC	32	Version 20.01.00 or later	No	Yes	Revision 1.*x*
1756-EN3TR	32	Version 18.02.00 or later	Yes	Yes	Revision 3.*x*
1756-EN4TR	32	Version 24.00.00 or later	Yes	Yes	Revision 2.001
1756-EN4TRXT	32	Version 24.00.00 or later	Yes	Yes	Revision 2.001
1756-EWEB	N/A	N/A	Yes	Yes	Revision 2.2

(1) Includes the K conformal coating catalog numbers.

(2) Each controller can send a maximum of 32 produced tags to one single consuming controller. If these same tags are sent to multiple consumers, the maximum number is 31.

Table 3 - ControlLogix EtherNet/IP Packet Rates Specifications(1)

Cat. No.	Firmware Revision	RSLogix 5000 Software Version	RSLinx Software Version	Packet Rate Capacity (packets/second)(3)		Support for Extended Environment(4)	Integrated Motion on the EtherNet/IP Network Axes
				I/O	HMI/MSG		
1756-ENBT	Any	8.02.00 or later	2.30 or later	5000	900	No	N/A
1756-EN2F	2.*x*	15.02.00 or later	2.51 or later	10,000	2000	No	N/A
	3.6 or later	18.02.00 or later(2)		25,000			Up to 4 axes supported(5)
							Up to 8 axes supported(5)
1756-EN2T	2.*x* or earlier	15.02.00 or later	2.51 or later	10,000	2000	No	N/A
	3.6 or later	18.02.00 or later(2)		25,000(5)			Up to 8 axes supported(5)
1756-EN2TXT	2.*x*	15.02.00 or later	2.51 or later	10,000	2000	Yes	N/A
	3.6 or later	18.02.00 or later(2)		25,000(5)			Up to 8 axes supported(5)
1756-EN2TP	2.*x*	17.01.02 or later	2.55 or later	10,000	2000	No	N/A
	10.x or later	18.02.00 or later(2)	2.56 or later	25,000(5)			Up to 8 axes supported(5)
1756-EN2TPXT	10.x or later	20.01.00 or later	2.56 or later	25,000(5)	2000	Yes	N/A
1756-EN2TR	2.*x*	17.01.02 or later	2.55 or later	10,000	2000	No	N/A
	3.6 or later	18.02.00 or later(2)	2.56 or later	25,000(5)			Up to 8 axes supported(5)
1756-EN2TRXT	5.028 or later	20.01.00 or later	2.56 or later	25,000(5)	2000	Yes	N/A
1756-EN2TSC	5.028 or later	20.01.00 or later	2.56 or later	25,000(5)	• 1800 without encryption • 930 with encryption	No	N/A
1756-EN3TR	3.6 or later	18.02.00 or later(2)	2.56 or later	25,000(5)	2000	No	Up to 128 axes supported(5)
1756-EN4TR	Any	24.00.00 or later	4.10 or later	• 50,000 without CIP Security • 25,000 with integrity • 15,000 with integrity and confidentiality	• 3,700 without CIP Security • 2,700 with integrity • 1,700 with integrity and confidentiality	No	Up to 256 axes supported(5)
1756-EN4TRXT	Any	24.00.00 or later	4.10 or later	• 50,000 without CIP Security • 25,000 with integrity • 15,000 with integrity and confidentiality	• 3,700 without CIP Security • 2,700 with integrity • 1,700 with integrity and confidentiality	Yes	Up to 256 axes supported(5)

(1) Includes the K conformal coating catalog numbers.

(2) This version is required to use CIP Sync™ technology, Integrated Motion on the EtherNet/IP Network, or Exact Match keying.

(3) I/O numbers are maximums; they assume no HMI/MSG. HMI/MSG numbers are maximums, they assume no I/O. Packet rates vary depending on packet size. For more details, see Troubleshoot EtherNet/IP Application Technique, publication ENET-AT003, and the EDS file for a specific catalog number.

(4) Module operates in a broad temperature spectrum, -20…70 °C (-4…158 °F), and meets ANSI/ISA-S71.04-1985 Class G1, G2 and G3, as well as cULus, Class 1 Div 2, C-Tick, CE, ATEX Zone 2 and SIL 2 requirements for increased protection against salts, corrosives, moisture/condensation, humidity, and fungal growth.

(5) This value assumes the use of a 1756-L7*x* ControlLogix controller. For a 1756-L6*x* ControlLogix controller, see ControlLogix Controllers User Manual, publication 1756-UM001.

Table 4 - Technical Specifications - 1756 EtherNet/IP Modules(1)

Attribute	1756-EN2F/B 1756-EN2F/C	1756-EN2T/D, 1756-EN2TSC/B, 1756-EN2TP/A	1756-EN2TR/C, 1756-EN3TR/B	1756-EN4TR/A	1756-ENBT/A	1756-EWEB/B
EtherNet/IP communication rate	10/100 Mbps			10/100 Mbps 1 Gbps	10/100 Mbps	
Current draw @ 5.1V DC	1.2 A	1A			700 mA	
Current draw @ 24V DC	3 mA	—			3 mA	
Voltage and current ratings	5.1 V DC, 1.2A	—		5.1 V DC, 1.2A	—	
Power dissipation	6.2 W	5.1 W		6.12 W	3.7 W	
Thermal dissipation	21.28 BTU/hr	17.4 BTU/hr		20.9BTU/Hr	12.6 BTU/hr	
Isolation voltage	30V (continuous), Basic Insulation Type, USB to Backplane Type tested at980V AC for 60 s	30V (continuous), Basic Insulation Type, Ethernet to Backplane, USB to Backplane, and USB to Ethernet(4) Type tested at 980V AC for 60 s		30V (continuous), Basic Insulation Type, Ethernet to Backplane, USB to Backplane, and USB to Ethernet Type tested at 860V AC for 60 s	30V (continuous), basic insulation type, Ethernet network to backplane Type tested @ 707V DC for 60 s	
Slot width	1					
Module location	Chassis-based, any slot					
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17					
Power supply, standard	1756-PA72, 1756-PA75, 1756-PB72, 1756-PB75, 1756-PC75, 1756-PH75					
Power supply, redundant	1756-PA75R, 1756-PB75R, 1756-PSCA2					
Ethernet port	1 Ethernet fiber	1 Ethernet RJ45 Category 5	2 Ethernet RJ45 Category 5	Category 5E	1 Ethernet RJ45 Category 5	
Ethernet cable	Multimode fiber, LC connector	802.3 compliant shielded or unshielded twisted pair				
USB port(2)	USB 1.1, full speed (12 Mbps)				—	
Wiring category(3)	3 - on USB ports	2 - on Ethernet ports 3 - on USB ports			2 - on Ethernet ports	2 - on Ethernet ports
North American temp code	T4A					
ATEX temp code	T4					
IECEx temp code	T4					
Enclosure type rating	None (open-style)					
Transmitter launch power at Beginning of Life (BOL), min Allow -1 dB at End of Life (EOL)	-19 dBm into 62.5/125 µm fiber, N/A = 0.275 -22.5 dBm into 50/125 µm fiber, N/A = 0.20	—				

(1) Includes the K conformal coating catalog numbers.

(2) The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.

(3) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

(4) Applies only to these modules/series: 1756-EN2T/D,1756-EN2TSC/B, 1756-EN2TR/C,1756-EN3TR/B.

Table 5 - Environmental Specifications - 1756 EtherNet/IP Modules[1]

Attribute	1756-EN2F/B 1756-EN2F/C	1756-EN2T/D, 1756-EN2TSC/B, 1756-EN2TP/A	1756-EN2TR/C, 1756-EN3TR/B	1756-EN4TR/A	1756-ENBT/A, 1756-EWEB/B
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold) IEC 60068-2-2 (Test Bd, Operating Dry Heat) IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < 60 °C (32 °F < Ta < 140 °F)			For Series C Chassis: • 0 ≤ Ta ≤ +60 °C (+32 ≤ Ta ≤ +140 °F) For Series B Chassis: • 0 ≤ Ta ≤ +50 °C (+32 ≤ Ta ≤ +122 °F)	0 °C < Ta < 60 °C (32 °F < Ta < 140 °F)
Temperature, surrounding air, max	60 °C (140 °F)			For Series C Chassis: • 60 °C (140 °F) For Series B Chassis: • 50 °C (122°F)	60 °C (140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold) IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat) IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40 °C< Ta < 85 °C (-40 °F < Ta < 185 °F)				
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged damp heat)	5…95% noncondensing				
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz				
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g				
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g	30 g[2]	30 g[2]	30g	50 g
Emission CISPR 11 (IEC 61000-6-4)	Class A				
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges				
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz 3V/m with 1 kHz sine-wave 80% AM from 2700…6000 MHz			10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	—	±3 kV at 5 kHz on Ethernet ports[2]		±3 kV at 5 kHz on Ethernet ports	±2 kV at 5 kHz on Ethernet ports
Surge transient immunity IEC 61000-4-5	—	±2 kV line-earth (CM) on Ethernet ports			
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz				

(1) Includes the K conformal coating catalog numbers.

(2) Applies only to these modules/series: 1756-EN2T/D,1756-EN2TSC/B, 1756-EN2TR/C,1756-EN3TR/B.

Table 6 - Certifications - 1756 EtherNet/IP Modules(1)

Certification(2)	1756-EN2T/D 1756-EN2TP/A	1756-EN2F/B 1756-EN2F/C	1756-EN2TSC/B	1756-EN2TR/C, 1756-EN3TR/B	1756-ENBT/A	1756-EWEB/B	1756-EN4TR/A
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.						UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.		—			CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.	—
CE	European Union 2004/108/IEC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)						
RCM	Australian Radiocommunications Act, compliant with EN 61000-6-4; Industrial Emissions						
ATEX	European Union 94/9/EC ATEX Directive, compliant with the following: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X DEMKO13ATEX1325026X (1756-EN2T/C only)						European Union 2014/34/EU ATEX Directive, compliant with the following: EN IEC 60079-0 General Requirements; EN 60079-7 Explosive Atmospheres, Protection "e"; II 3 G Ex ec IIC T4 Gc DEMKO18ATEX2139X
FM	**All modules except 1756-EN2TSC:** FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations						
IECEx	—	IECEx System, compliant with: IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" IEC 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc IECEx UL 14.0008X	—		IECEx System, compliant with: IEC 60079-0; General Requirements IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" IEC 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc IECEx UL 14.0008X	—	IECEx System, compliant with the Standards IEC 60079-0, Edition 7 General Requirements, and 60079-7, Edition 5.1, Explosive Atmospheres, Protection "e"; II 3 G Ex ec IIC T4 Gc IECExUL 18.0130X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3						
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation						
EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications						

(1) Includes the K conformal coating catalog numbers.

(2) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Table 7 - Technical Specifications - 1756 EtherNet/IP-XT Modules

Attribute	1756-EN2TXT/D, 1756-EN2TRXT/C, 1756-EN2TPXT/A	1756-EN4TRXT/A
EtherNet/IP communication rate	10/100 Mbps	10/100 Mbps 1 Gbps
Logix communication connections	256	1000 I/O 528 (1)
TCP communication connections	128	512
Current draw @ 5.1V DC	1 A	1.2 A
Power dissipation	5.1 W 17.4BTU/Hr	6.12 W 20.9BTU/Hr
Thermal dissipation	17.4 BTU/hr	20.9BTU/Hr
Isolation voltage	30V (continuous), Basic Insulation Type, Ethernet to Backplane, USB to Backplane, and USB to Ethernet	
Slot width	1	
Module location	Chassis-based, any slot	
Chassis	1756-A4LXT, 1756-A5XT, 1756-A7XT, 1756-A7LXT	1756-A4LXT/C, 1756-A5XT/C, 1756-A7XT/C, 1756-A7LXT/C
Power supply, standard	1756-PAXT, 1756-PBXT	
Power supply, redundant	1756-PAXTR, 1756-PBXTR	
Ethernet port	2 Ethernet RJ45 Category 5	
Ethernet cable	802.3 compliant shielded or unshielded twisted pair	
USB port(2)	USB 1.1, full speed (12 Mbps)	
Wiring category (3)	2 - on Ethernet ports 3 - on USB ports	
North American temperature code	T4A	
ATEX temperature code	T4	
IECEx temperature code	T4	
Enclosure type rating	None (open-style)	

(1) There are 1000 CIP I/O connections and 528 CIP messaging connections.

(2) The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.

(3) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Table 8 - Environmental Specifications - 1756 EtherNet/IP-XT Module

Attribute	1756-EN2TXT/D, 1756-EN2TRXT/C	1756-EN4TRXT/A
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold) IEC 60068-2-2 (Test Bd, Operating Dry Heat) IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-25 ≤Ta ≤ +70 °C (-13 ≤ Ta ≤ +158 °F)	
Temperature, surrounding air, max	70 °C (158 °F)	
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat) IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…85 °C (-40…185 °F)	
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged damp heat)	5…95% noncondensing	

Table 8 - Environmental Specifications - 1756 EtherNet/IP-XT Module (Continued)

Attribute	1756-EN2TXT/D, 1756-EN2TRXT/C	1756-EN4TRXT/A
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz	
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g	
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g	
Emissions CISPR 11 (IEC 61000-6-4)	Class A	
ESD immunity IEC 61000-4-2	6 kV contact discharges 8k V air discharges	
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz 3V/m with 1 kHz sine-wave 80% AM from 2700…6000 MHz	
EFT/B immunity IEC 61000-4-4	±3 kV at 5 kHz on Ethernet ports(1)	
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on Ethernet ports	
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz	

(1) Applies only to these modules/series: 1756-EN2TXT/D, 1756-EN2TRXT/C 1756-EN4TXT.

Table 9 - Certifications - 1756 EtherNet/IP-XT Module

Certification(1)	1756-EN2TXT/D, 1756-EN2TRXT/C	1756-EN4TRXT/A
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.	
CE	European Union 2004/108/IEC EMC Directive, compliant with the following: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)	
RCM	Australian Radiocommunications Act, compliant with EN 61000-6-4; Industrial Emissions	
Ex	European Union 94/9/EC ATEX Directive, compliant with the following: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X	European Union 2014/34/EU ATEX Directive, compliant with the following: • EN 60079-7; Explosive Atmospheres, Protection "e" • EN 60079-0; General Requirements II 3 G Ex ec IIC T4 Gc
FM	—	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3	
EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications	

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

EtherNet/IP Module Diagrams

Figure 1 - 1756-EN2T

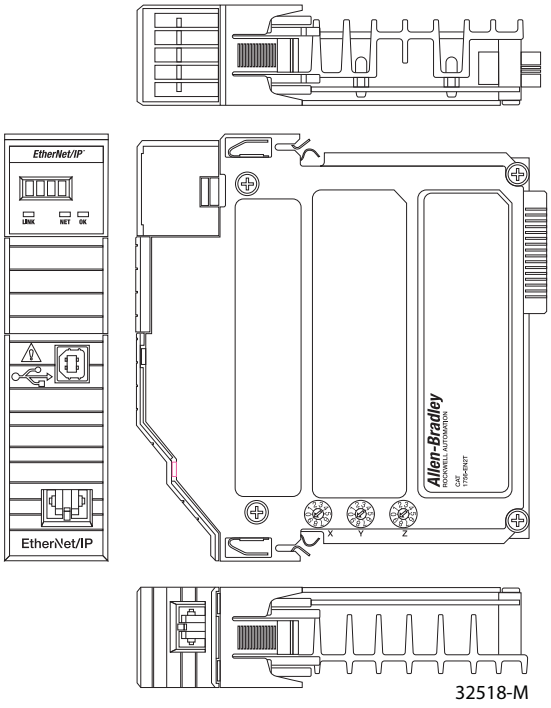


Figure 2 - 1756-EN2TP

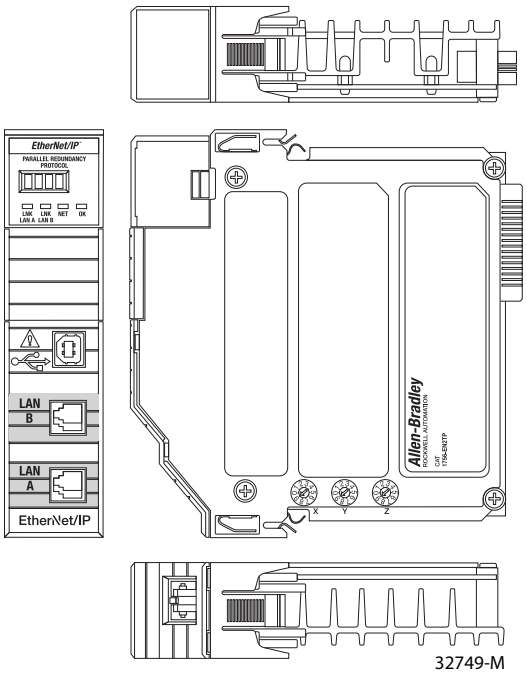


Figure 3 - 1756-EN2TR, 1756-EN3TR

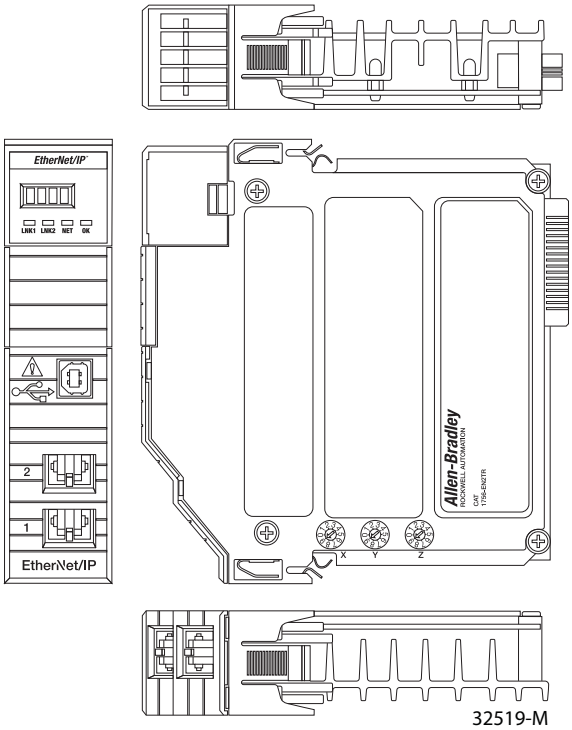


Figure 4 - 1756-EN2F

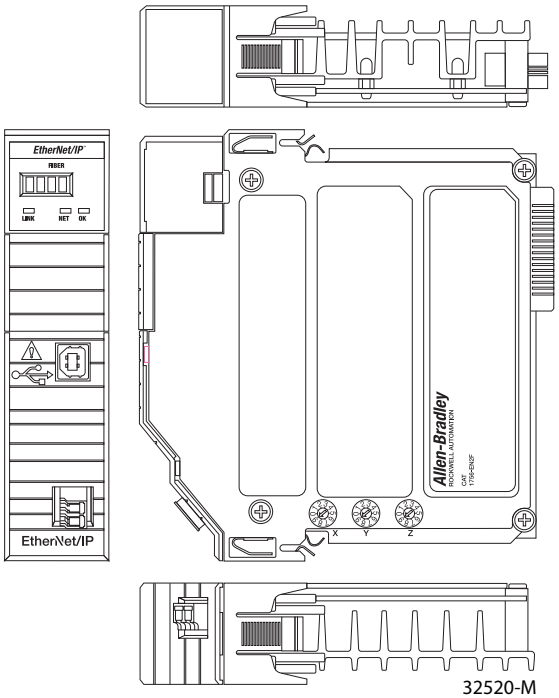
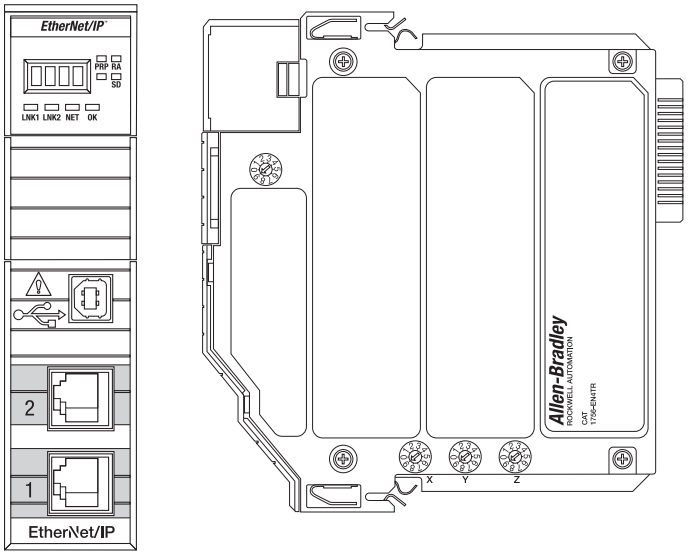


Figure 5 - 1756-EN4TR



Accessories—Ethernet Network

Cat. No.	Description	Specifications
1585J-M8PBJM-*x*	Ethernet RJ45 patchcord *x* = 2 (2 m), 5 (5 m), or 10 (10 m)	8-conductor, teal riser PVC cable (flex-rated cable also available)
1585J-M8CC-H	RJ45 insulation displacement connector (IDC)	0.128…0.325 mm^2 (26…22 AWG), Cat. 6, IDC, no tool required
1585J-M8CC-C	RJ45 crimp connector with boot, qty = 50 pieces	0.128…0.205 mm^2 (26…24 AWG), Cat. 5e, requires crimp tool for assembly
1585A-JCRIMP	Crimp tool	—
9300-RADES	Remote access dial-in kit	56 Kbps modem connection to devices on an Ethernet network

Stratix Switches

To effectively manage real-time control and information flow throughout the manufacturing and IT enterprise, Rockwell Automation offers a full portfolio of industrial Ethernet switches and media, including a line of Stratix® switches integrated with Cisco® technology. The Stratix line of switches includes modular managed, fixed managed, and unmanaged switches.

For detailed specifications for Stratix switches, see Stratix Ethernet Switch Specifications Technical Data, publication 1783-TD001.

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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Installation Instructions

Original Instructions

1756 EtherNet/IP Communication Modules

Catalog Numbers 1756-EN2T, 1756-EN2TP, 1756-EN2TPK, 1756-EN2TPXT, 1756-EN2TR, 1756-EN2TRK, 1756-EN2TRXT, 1756-EN2TSC, 1756-EN2TXT, 1756-EN3TR, 1756-EN3TRK, 1756-EN4TR, 1756-EN4TRK, 1756-EN4TRXT

ATTENTION: Read this document and the documents listed in the Additional Resources section about installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

注意：在安装、配置、操作和维护本产品前，请阅读本文档以及 “ 其他资源 ” 部分列出的有关设备安装、配置和操作的相应文档。除了所有适用规范、法律和标准的相关要求之外，用户还必须熟悉安装和接线说明。

安装、调整、投运、使用、组装、拆卸和维护等各项操作必须由经过适当训练的专业人员按照适用的操作规范实施。

如果未按照制造商指定的方式使用该设备，则可能会损害设备提供的保护。

ATENCIÓN: Antes de instalar, configurar, poner en funcionamiento o realizar el mantenimiento de este producto, lea este documento y los documentos listados en la sección Recursos adicionales acerca de la instalación, configuración y operación de este equipo. Los usuarios deben familiarizarse con las instrucciones de instalación y cableado y con los requisitos de todos los códigos, leyes y estándares vigentes.

El personal debidamente capacitado debe realizar las actividades relacionadas a la instalación, ajustes, puesta en servicio, uso, ensamblaje, desensamblaje y mantenimiento de conformidad con el código de práctica aplicable.

Si este equipo se usa de una manera no especificada por el fabricante, la protección provista por el equipo puede resultar afectada.

ATENÇÃO: Leia este e os demais documentos sobre instalação, configuração e operação do equipamento que estão na seção Recursos adicionais antes de instalar, configurar, operar ou manter este produto. Os usuários devem se familiarizar com as instruções de instalação e fiação além das especificações para todos os códigos, leis e normas aplicáveis.

É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção sejam realizadas por pessoal qualificado e especializado, de acordo com o código de prática aplicável.

Caso este equipamento seja utilizado de maneira não estabelecida pelo fabricante, a proteção fornecida pelo equipamento pode ficar prejudicada.

ВНИМАНИЕ: Перед тем как устанавливать, настраивать, эксплуатировать или обслуживать данное оборудование, прочитайте этот документ и документы, перечисленные в разделе «Дополнительные ресурсы». В этих документах изложены сведения об установке, настройке и эксплуатации данного оборудования. Пользователи обязаны ознакомиться с инструкциями по установке и прокладке соединений, а также с требованиями всех применимых норм, законов и стандартов.

Все действия, включая установку, наладку, ввод в эксплуатацию, использование, сборку, разборку и техническое обслуживание, должны выполняться обученным персоналом в соответствии с применимыми нормами и правилами.

Если оборудование используется не предусмотренным производителем образом, защита оборудования может быть нарушена.

注意：本製品を設置、構成、稼動または保守する前に、本書および本機器の設置、設定、操作についての参考資料の該当箇所に記載されている文書に目を通してください。ユーザは、すべての該当する条例、法律、規格の要件に加えて、設置および配線の手順に習熟している必要があります。

設置調整、運転の開始、使用、組立て、解体、保守を含む諸作業は、該当する実施規則に従って訓練を受けた適切な作業員が実行する必要があります。

本機器が製造メーカにより指定されていない方法で使用されている場合、機器により提供されている保護が損なわれる恐れがあります。

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Aktivitäten wie Installation, Einstellung, Inbetriebnahme, Verwendung, Montage, Demontage und Instandsetzung müssen durch ausreichend geschultes Personal in Übereinstimmung mit den geltenden Durchführungsvorschriften ausgeführt werden.

Wenn diese Ausrüstung in einer Weise verwendet wird, die nicht vom Hersteller angegeben wurde, kann der von der Ausrüstung bereitgestellte Schutz beeinträchtigt sein..

ATTENTION : Lisez ce document et les documents listés dans la section Ressources complémentaires relatifs à l’installation, la configuration et le fonctionnement de cet équipement avant d’installer, configurer, utiliser ou entretenir ce produit. Les utilisateurs doivent se familiariser avec les instructions d’installation et de câblage en plus des exigences relatives aux codes, lois et normes en vigueur.

Les activités relatives à l’installation, le réglage, la mise en service, l’utilisation, l’assemblage, le démontage et l’entretien doivent être réalisées par des personnes formées selon le code de pratique en vigueur.

Si cet équipement est utilisé d’une façon qui n’a pas été définie par le fabricant, la protection fournie par l’équipement peut être compromise.

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본 장비를 제조사가 명시하지 않은 방법으로 사용하면 장비의 보호 기능이 손상될 수 있습니다 .

ATTENZIONE Prima di installare, configurare ed utilizzare il prodotto, o effettuare interventi di manutenzione su di esso, leggere il presente documento ed i documenti elencati nella sezione “Altre risorse”, riguardanti l’installazione, la configurazione ed il funzionamento dell’apparecchiatura. Gli utenti devono leggere e comprendere le istruzioni di installazione e cablaggio, oltre ai requisiti previsti dalle leggi, codici e standard applicabili.

Le attività come installazione, regolazioni, utilizzo, assemblaggio, disassemblaggio e manutenzione devono essere svolte da personale adeguatamente addestrato, nel rispetto delle procedure previste.

Qualora l’apparecchio venga utilizzato con modalità diverse da quanto previsto dal produttore, la sua funzione di protezione potrebbe venire compromessa.

DİKKAT: Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili İlave Kaynaklar bölümünde yer listelenmiş dokümanları okuyun. Kullanıcılar yürürlükteki tüm yönetmelikler, yasalar ve standartların gereksinimlerine ek olarak kurulum ve kablolama talimatlarını da öğrenmek zorundadır.

Kurulum, ayarlama, hizmete alma, kullanma, parçaları birleştirme, parçaları sökme ve bakım gibi aktiviteler sadece uygun eğitimleri almış kişiler tarafından yürürlükteki uygulama yönetmeliklerine uygun şekilde yapılabilir.

Bu ekipman üretici tarafından belirlenmiş amacın dışında kullanılırsa, ekipman tarafından sağlanan koruma bozulabilir.

注意事項：在安裝、設定、操作或維護本產品前，請先閱讀此文件以及列於 「其他資源」章節中有關安裝、設定與操作此設備的文件。使用者必須熟悉安裝和配線指示，並符合所有法規、法律和標準要求。

包括安裝、調整、交付使用、使用、組裝、拆卸和維護等動作都必須交由已經過適當訓練的人員進行，以符合適用的實作法規。

如果將設備用於非製造商指定的用途時，可能會造成設備所提供的保護功能受損。

POZOR: Než začnete instalovat, konfigurovat či provozovat tento výrobek nebo provádět jeho údržbu, přečtěte si tento dokument a dokumenty uvedené v části Dodatečné zdroje ohledně instalace, konfigurace a provozu tohoto zařízení. Uživatelé se musejí vedle požadavků všech relevantních vyhlášek, zákonů a norem nutně seznámit také s pokyny pro instalaci a elektrické zapojení.

Činnosti zahrnující instalaci, nastavení, uvedení do provozu, užívání, montáž, demontáž a údržbu musí vykonávat vhodně proškolený personál v souladu s příslušnými prováděcími předpisy.

Pokud se toto zařízení používá způsobem neodpovídajícím specifikaci výrobce, může být narušena ochrana, kterou toto zařízení poskytuje.

UWAGA: Przed instalacją, konfiguracją, użytkowaniem lub konserwacją tego produktu należy przeczytać niniejszy dokument oraz wszystkie dokumenty wymienione w sekcji Dodatkowe źródła omawiające instalację, konfigurację i procedury użytkowania tego urządzenia. Użytkownicy mają obowiązek zapoznać się z instrukcjami dotyczącymi instalacji oraz oprzewodowania, jak również z obowiązującymi kodeksami, prawem i normami.

Działania obejmujące instalację, regulację, przekazanie do użytkowania, użytkowanie, montaż, demontaż oraz konserwację muszą być wykonywane przez odpowiednio przeszkolony personel zgodnie z obowiązującym kodeksem postępowania.

Jeśli urządzenie jest użytkowane w sposób inny niż określony przez producenta, zabezpieczenie zapewniane przez urządzenie może zostać ograniczone.

OBS! Läs detta dokument samt dokumentet, som står listat i avsnittet Övriga resurser, om installation, konfigurering och drift av denna utrustning innan du installerar, konfigurerar eller börjar använda eller utföra underhållsarbete på produkten. Användare måste bekanta sig med instruktioner för installation och kabeldragning, förutom krav enligt gällande koder, lagar och standarder.

Åtgärder som installation, justering, service, användning, montering, demontering och underhållsarbete måste utföras av personal med lämplig utbildning enligt lämpligt bruk.

Om denna utrustning används på ett sätt som inte anges av tillverkaren kan det hända att utrustningens skyddsanordningar försätts ur funktion.

LET OP: Lees dit document en de documenten die genoemd worden in de paragraaf Aanvullende informatie over de installatie, configuratie en bediening van deze apparatuur voordat u dit product installeert, configureert, bediend of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradingsinstructies, naast de vereisten van alle toepasselijke regels, wetten en normen.

Activiteiten zoals het installeren, afstellen, in gebruik stellen, gebruiken, monteren, demonteren en het uitvoeren van onderhoud mogen uitsluitend worden uitgevoerd door hiervoor opgeleid personeel en in overeenstemming met de geldende praktijkregels.

Indien de apparatuur wordt gebruikt op een wijze die niet is gespecificeerd door de fabrikant, dan bestaat het gevaar dat de beveiliging van de apparatuur niet goed werkt.

ATTENTION:
- Read this document and the documents listed in the Additional Resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards
- Installation, adjustments, putting into service, use, assembly, disassembly, and maintenance shall be carried out by suitably trained personnel in accordance with applicable code of practice. In case of malfunction or damage, no attempts at repair should be made. The module should be returned to the manufacturer for repair. Do not dismantle the module.
- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- This equipment is certified for use only within the surrounding air temperature range of 0…60 °(32…140 °F) [1756-EN2T, 1756-EN2TP, 1756-EN2TPK, 1756-EN2TR, 1756-EN2TSC, 1756-EN3TR, 1756-EN4TR (Series C Chassis only), 1756-EN4TRK (Series C Chassis only)], 0…50 °C (32…122 °F) [1756-EN4TR (Series B Chassis), 1756-EN4TRK (Series B Chassis)], or -25…+70 °C (-13…+158 °F) [1756-EN2TXT, 1756-EN2TRXT, 1756-EN2TPXT, 1756-EN4TRXT]. The equipment must not be used outside of this range.
- Use only a soft dry anti-static cloth to wipe down equipment. Do not use any cleaning agents.
- The USB port is intended for temporary local programming purposes only and not intended for permanent connection.
- The USB cable is not to exceed 3.0 m (9.84 ft) and must not contain hubs.

IMPORTANT Any illustrations, charts, sample programs, and layout examples that are shown in this publication are intended solely for the purposes of example. Since there are many variables and requirements that are associated with any particular installation, Rockwell Automation does not assume responsibility or liability for actual use based on the examples that are shown in this publication.

Environment and Enclosure

ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC/EN 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment for indoor use. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if non-metallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain more information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:
- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for more installation requirements.
- NEMA Standard 250 and IEC/EN 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations:

Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local authority having jurisdiction at the time of installation.

WARNING: EXPLOSION HAZARD
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Substitution of components may impair suitability for Class I, Division 2.
- If this product contains batteries, they must be changed only in an area known to be nonhazardous.

Informations sur l'utilisation de cet équipement en environnements dangereux:

Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation

AVERTISSEMENT: RISQUE D'EXPLOSION
- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.
- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit.
- La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2.
- S'assurer que l'environnement est classé non dangereux avant de changer les piles.

European Hazardous Location Approval

The following applies to products marked CE, Ex, II 3 G.
- Such modules are Equipment Group II, Equipment Category 3, and comply with the Essential Health and Safety Requirements relating to the design and construction of such equipment given in Annex II to Directive 2014/34/EU. See the EC Declaration of Conformity at http://www.rockwellautomation.com/products/certification for details.
- The type of protection for the 1756-EN2T, 1756-EN2TP, 1756-EN2TPXT, 1756-EN2TR, 1756-EN2TRXT, 1756-EN2TSC, 1756-EN2TXT, and 1756-EN3TR is "Ex nA IIC T4 Gc" according to EN 60079-15.
- The type of protection for the 1756-EN4TR, 1756-EN4TRK, and1756-EN4TRXT is "Ex ec IIC T4 Gc" according to EN 60079-0 and EN 60079-7.
- The modules 1756-EN2T, 1756-EN2TP, 1756-EN2TPXT, 1756-EN2TR, 1756-EN2TRXT, 1756-EN2TSC, 1756-EN2TXT, and 1756-EN3TR comply to standards: EN 60079-0:2012+A11:2013, EN 60079-15:2010, reference certificate number DEMK013ATEX1325026X.
- The modules 1756-EN4TR, 1756-EN4TRK, and 1756-EN4TRXT comply to standards: EN IEC 60079-0:2018, EN 60079-7:2015+A1:2018, reference certificate number DEMK018ATEX2139X.
- Such modules may have catalog numbers followed by a "K" to indicate conformal coating option.
- Such modules are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification according to ATEX directive 2014/34/EU.

WARNING: Special Conditions for Safe Use:
- This equipment is not resistant to sunlight or other sources of UV radiation.
- This equipment shall be used within its specified ratings defined by Rockwell Automation.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 140% of the peak rated voltage when applied in Zone 2 environments.
- The instructions in the user manual shall be observed.
- This equipment must be used only with ATEX/IECEx certified Rockwell Automation backplanes.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.
- For the 1756-EN4TR, 1756-EN4TRK, and 1756-EN4TRXT:
  - The equipment shall only be used in an area of at least pollution degree 2, as defined in IEC/EN 60664-1.
  - The equipment shall be installed in an enclosure with tool removable door or cover that provides a degree of protection not less than IP 54 in accordance with IEC/EN 60079-0.

At the end of its life, this equipment should be collected separately from any unsorted municipal waste.

IEC Hazardous Location Approval

The following applies to products with IECEx certification:
- Such modules are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification to IEC 60079-0.
- The type of protection for catalog numbers 1756-EN2T, 1756-EN2TP, 1756-EN2TR, 1756-EN2TPXT, 1756-EN2TRXT, 1756-EN2TSC, 1756-EN2TXT, and 1756-EN3TR is "Ex nA IIC T4 Gc" according to IEC 60079-15.
- The type of protection for catalog numbers 1756-EN4TR, 1756-EN4TRK, and 1756-EN4TRXT is "Ex ec IIC T4 Gc" according to IEC 60079-0 and IEC 60079-7.
- Such modules may have catalog numbers followed by a "K" to indicate the conformal coating option.
- The modules 1756-EN2T, 1756-EN2TP, 1756-EN2TR, 1756-EN2TPXT, 1756-EN2TRXT, 1756-EN2TSC, 1756-EN2TXT, and 1756-EN3TR comply to Standards IEC 60079-0:2011, IEC 60079-15:2010, reference IECEx certificate number IECExUL14.0008X.
- The modules 756-EN4TR, 1756-EN4TRK, and 1756-EN4TRXT comply to Standards IEC 60079-0, Edition 7, and IEC 60079-7, Edition 5.1, reference IECEx certificate number IECExUL18.0130X.

Prevent Electrostatic Discharge

ATTENTION:
- This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:
- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

Removal and Insertion Under Power (RIUP)

WARNING: When you insert or remove the module while backplane power is on, an electric arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electric arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

Multi-point Network Communication

WARNING: If you connect or disconnect the communication cable with power applied to this module or any device on the network, an electric arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

Install the Module

You can install or remove a module while chassis power is applied.

WARNING: When you insert or remove the module while backplane power is on, an electric arc can occur. The insertion or removal of the module while the backplane power is on can cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electric arcs can cause excessive wear to contacts on both the module and its mating connector. Worn contacts can create electrical resistance that can affect module operation.

For equipment with multi-point network communication connections.

WARNING: If you connect or disconnect the communication cable with power that is applied to this module or any device on the network, an electric arc can occur. This connection or disconnection of the module with applied power can cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

ATTENTION: If you are using the 1756-EN4TR or 1756-EN4TRK above 50 °C(122 °F), it must be installed in a Series C chassis.

ATTENTION: In order to operate over its full rated temperature range, the 1756-EN4TRXT must be used with a Series C XT Chassis.

Follow these steps to install the module.

1. Set the network IP address on a module.

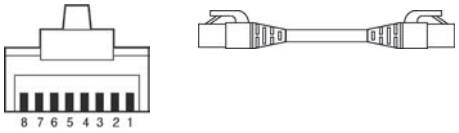
   For more information about how to configure an EtherNet/IP network, see the EtherNet/IP Network Configuration User Manual, publication ENET-UM001.

   Depending on the 1756 EtherNet/IP communication module, you can use some or all of these tools to set the network Internet Protocol (IP) address:

   - Rotary switches
   - Bootstrap Protocol (BOOTP)/Dynamic Host Configuration Protocol (DHCP) server
   - RSLinx® Classic software
   - The Studio 5000® environment

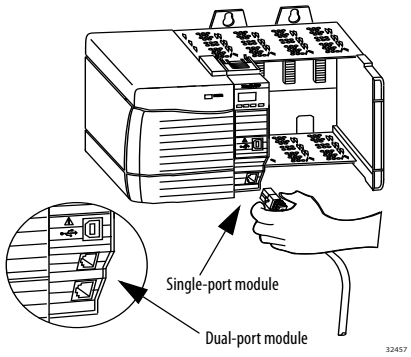
   The module uses these tools sequentially to set the IP address.
2. Determine module slot location.
3. Install the module.
   a. Align the circuit board with top and bottom guides in the chassis.
   b. Slide the module into the chassis.

   Make sure that the module backplane connector properly connects to the chassis backplane. The module is properly installed when it is flush with the power supply or other installed modules.
4. Connect the module to an EtherNet/IP network via an RJ45 connection.



Connector Number	Color	1585J 8-pin Cables with Support for 10/100/1000 Mbps	1585J 8-pin Cables with Support for 10/100 Mbps	1585J 4-pin Cables with Support for 10/100 Mbps
1	White/Orange	BI_DA+	TxData +	
2	Orange	BI_DA-	TxData -	
3	White/Green	BI_DB+	Recv Data +	
4	Blue	BI_DC+	Unused	N/A
5	White/Blue	BI_DC-	Unused	N/A
6	Green	BI_DB-	Recv Data -	
7	White/Brown	BI_DD+	Unused	N/A
8	Brown	BI_DD-	Unused	N/A

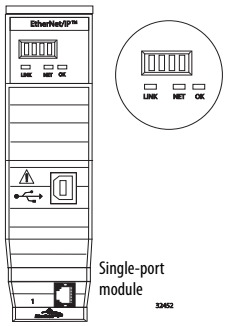
5. Attach the cable with the RJ45 connector to the Ethernet port on the module as shown.

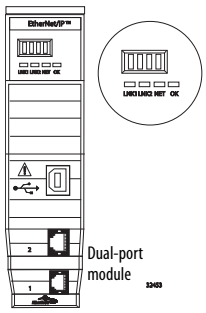


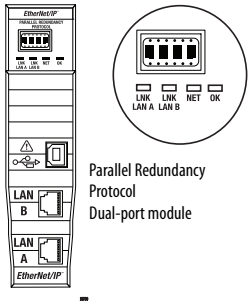
6. Download the Add-on Profile from the Product Compatibility and Download website at http://www.ab.com.
7. Connect to the module via the USB port (if the module is equipped with a USB port).
8. Download the firmware from the Product Compatibility and Download website at http://www.ab.com.
9. Apply chassis power and check status indicators.

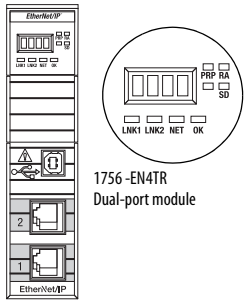
Status Indicators

These 1756 EtherNet/IP communication modules use the same status indicators. This graphic shows the front of the module for these modules (Extended-temperature modules not shown.)









For more information on the status indicators, see the EtherNet/IP Modules Installation Instructions, publication ENET-IN002.

Network Connectors and Cable

This product includes a USB port.

WARNING: The USB ports are intended only for temporary use and must not be connected or disconnected unless the area is nonhazardous. Do not use the USB port in hazardous locations.

The USB cable is not to exceed 3.0 m (9.84 ft) and must not contain hubs.

Modules	Ports	Requirements
EtherNet/IP	Copper Ethernet	Connector/cable: RJ45 connector according to IEC 60603-7, 2 or 4 pair Category 5e minimum cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 11801-3. Connector/cable: For 1756-EN4TR, 1756-EN4TRK, and 1756-EN4TRXT, RJ45 connector according to IEC 60603-7, 4 pair Category 5e minimum cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 11801-3.

Specifications

Attribute	1756-EN2T, 1756-EN2TK, 1756-EN2TP, 1756-EN2TPK, 1756-EN2TR, 1756-EN2TRK, 1756-EN2TSC, 1756-EN3TR, 1756-EN3TRK	1756-EN4TR, 1756-EN4TRK	1756-EN2TXT, 1756-EN2TRXT, 1756-EN2TPXT	1756-EN4TRXT
Voltage and current ratings	5.1V DC, 1 A	5.1V DC, 1.2 A	5.1V DC, 1 A	5.1V DC, 1.2 A
Temperature, operating • IEC 60068-2-1(Test Ad, Operating Cold) • IEC 60068-2-2 (Test Bd, Operating Dry Heat) • IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 ≤ Ta ≤ +60 °C (+32 ≤ Ta ≤ +140 °F)	For Series C Chassis: • 0 ≤ Ta ≤ +60 °C (+32 ≤ Ta ≤ +140 °F) For Series B Chassis: • 0 ≤ Ta ≤ +50 °C (+32 ≤ Ta ≤ +122 °F)	-25 ≤Ta ≤ +70 °C (-13 ≤ Ta ≤ +158 °F)	
Temperature, surrounding air	60 °C (140 °F)	For Series C Chassis: • 60 °C (140 °F) For Series B Chassis: • 50 °C (122°F)	70 °C (158 °F)	
Enclosure type rating	None (open-style)			
Isolation voltage	30V (continuous), Basic Insulation Type, Ethernet to Backplane, USB to Backplane, and USB to Ethernet, Type tested at 860V AC for 60 s			
Wire size	Ethernet connections: RJ45 connector according to IEC 60603-7, 2 or 4 pair Category 5e minimum cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 11801-3.	Ethernet connections: RJ45 connector according to IEC 60603-7, 4 pair Category 5e minimum cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 11801-3.	Ethernet connections: RJ45 connector according to IEC 60603-7, 2 or 4 pair Category 5e minimum cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 11801-3.	Ethernet connections: RJ45 connector according to IEC 60603-7, 4 pair Category 5e minimum cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 11801-3.
North American temp code	T4A			
ATEX temp code	T4			
IECEx temp code	T4			

Additional Resources

These resources contain information about related products from Rockwell Automation.

Resource	Description
EtherNet/IP Modules Installation Instructions, publication ENET-IN002	Provides details on how to install and configure EtherNet/IP communication modules.
Ethernet Design Considerations Reference Manual, publication ENET-RM002	Provides details about how to use EtherNet/IP communication modules with Logix 5000™ controllers and communicate with other devices on the EtherNet/IP network.
EtherNet/IP Secure Communication User Manual, publication ENET-UM003	Provides information on system architecture, configuring secure communication, and diagnostics.
EtherNet/IP Network Configuration User Manual, publication ENET-UM001	Describes how you can use EtherNet/IP communication modules with your Logix 5000 controller and communicate with various devices on the Ethernet network.
EtherNet/IP Embedded Switch Technology Application Guide, publication ENET-AP005	Provides details about how to install, configure, and maintain linear and Device Level Ring (DLR) networks by using Rockwell Automation EtherNet/IP devices that are equipped with embedded switch technology.
EtherNet/IP Media Planning and Installation Manual This manual is available from the Open DeviceNet Vendor Association (ODVA) at http://www.odva.org	Provides details about how to use the required media components and provides information on how to plan for, install, verify, troubleshoot, and certify your EtherNet/IP network.

You can view or download Rockwell Automation publications at http://www.rockwellautomation.com/literature/.
To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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User Manual

Original Instructions

Allen-Bradley

EtherNet/IP Network Devices

Allen-Bradley • Rockwell Software

Rockwell Automation

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
	**ARC FLASH HAZARD:** Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

Table of Contents

Send Email

Chapter 5

This manual describes how to use EtherNet/IP communication modules in Logix 5000™ control systems.

Make sure that you are familiar with the following:

- Use of a controller in a Logix 5000 control system, including these following controllers:
  - CompactLogix™ 5380 controllers
  - Compact GuardLogix® 5380 controllers
  - CompactLogix 5480 controller
  - ControlLogix® 5580 controllers
  - GuardLogix® 5580 controllers
- Use of an EtherNet/IP network
- Use of various software applications from Rockwell Automation

Additional Resources

These documents contain more information concerning related products from Rockwell Automation.

Table 1 - Additional Resources

Resource	Description
EtherNet/IP Media Planning and Installation Manual	Describes how to use the required media components and how to plan for, install, verify, troubleshoot, and certify your EtherNet/IP network. This manual is available from the Open DeviceNet Vendor Association (ODVA) at: http://www.odva.org.
Ethernet Design Considerations Reference Manual, publication ENET-RM002	Describes basic Ethernet concepts:
EtherNet/IP Socket Interface Application Technique, publication ENET-AT002	Describes the socket interface that you can use to program MSG instructions to communicate between a Logix 5000™ controller and Ethernet devices. In this case, the interface is used because the Ethernet devices that do not support the EtherNet/IP application protocol. Such devices include barcode scanners, RFID readers, or other standard Ethernet devices.
EtherNet/IP Embedded Switch Technology Application Guide, publication ENET-AP005	Describes how to install, configure, and maintain linear and Device Level Ring (DLR) networks by using Rockwell Automation® EtherNet/IP devices that are equipped with embedded switch technology.
EtherNet/IP Parallel Redundancy Protocol Application Technique, publication ENET-AT006	Describes how you can configure a Parallel Redundancy Protocol (PRP) network with the 1756-EN2TP EtherNet/IP communication module and a Stratix® 5400 or 5410 switch.
Integrated Architecture and CIP Sync Configuration Application Technique, publication IA-AT003	Provides information on CIP Sync and the IEEE 1588-2008 Precision Time Protocol.
Integrated Motion on the EtherNet/IP Network Reference Manual, publication MOTION-RM003	Reference descriptions of the AXIS_CIP_DRIVE attributes and the Studio 5000 Logix Designer® application Control Modes and Methods
Electronic Keying in Logix 5000 Control Systems Application Technique, publication LOGIX-AT001	Describes how to use electronic keying in Logix 5000 control system applications.

Table 1 - Additional Resources

Resource	Description
Network Technology webpage, http://www.rockwellautomation.com/rockwellautomation/products-technologies/network-technology/overview.page?	Provides information on reference architectures and white papers on networking.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation® industrial system.
Product Certifications website, http://www.rockwellautomation.com/rockwellautomation/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

EtherNet/IP Features in Allen-Bradley Network Devices

EtherNet/IP networks offer a comprehensive suite of messages and services for many automation applications. This open network standard uses standard Ethernet communication products to support real-time I/O messaging, information exchange, and general messaging. Other features to all EtherNet/IP network devices include the following:

- Support for messaging, produced/consumed tags, and distributed I/O
- DNS addressing
- Internet Group Management Protocol (IGMP) snooping (enabled by default) and querier (disabled by default)
- Port configuration and diagnostics
- Email server

EtherNet/IP networks also support CIP Safety applications. Such support makes the simultaneous transmission of safety and standard control data and diagnostics information over a common network possible.

EtherNet/IP Device-Specific Features

EtherNet/IP network devices can provide the following functionality. See the user manual for your device for details.

- Support for the following communication rates:
  - 10 Mbps
  - 100 Mbps
  - 1 Gbps

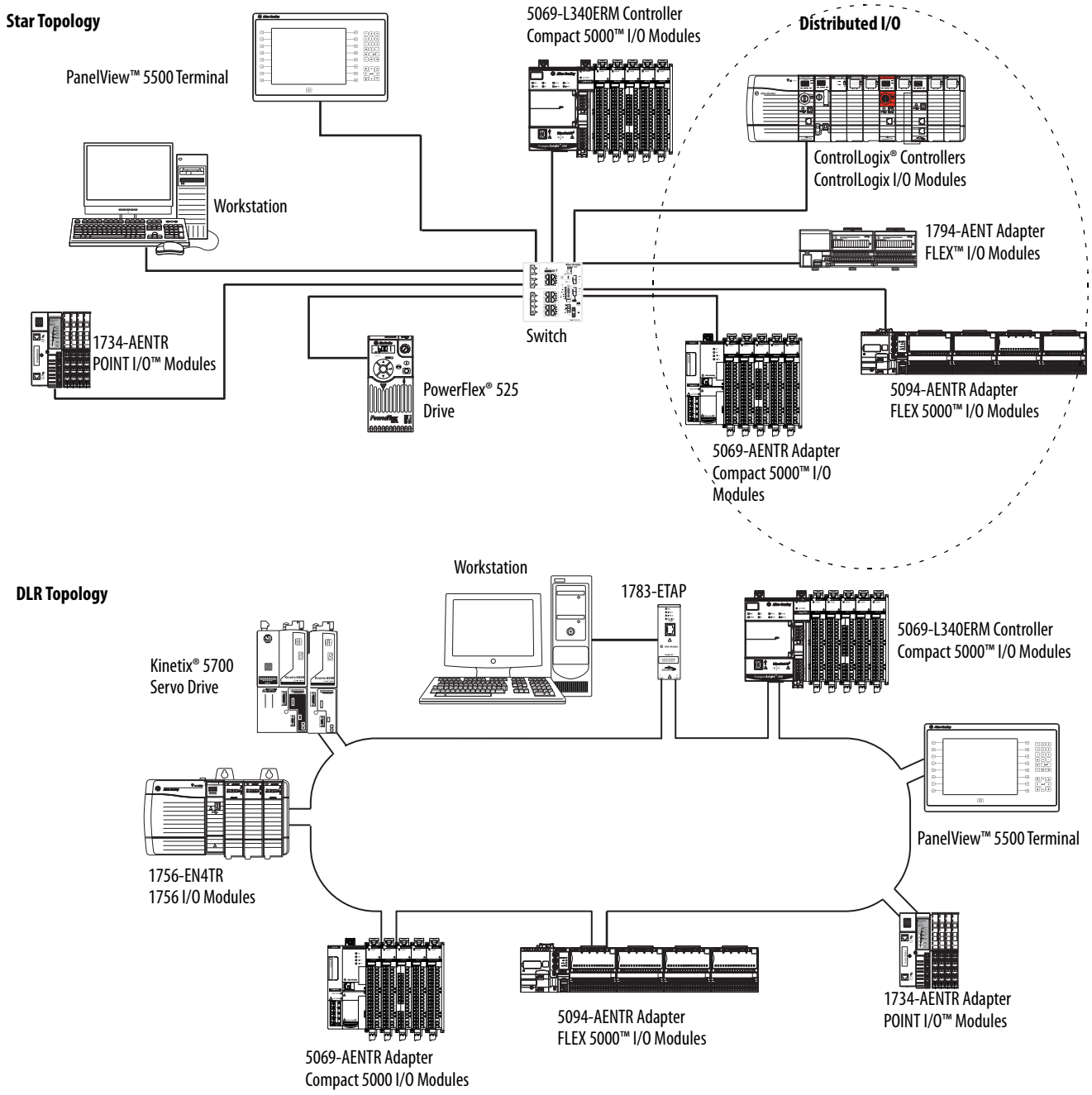
IMPORTANT
- When a device uses the 1 Gbps network communication rate, it supports only full-duplex mode.
- When a device uses the 10 Mbps or 100 Mbps network communication rate, it supports full-duplex and half-duplex mode.

- Linear network
- Device Level Ring protocol
- Option to operate as a Ring supervisor on a DLR network
- Parallel Redundancy Protocol
- Duplicate IP address detection
- Socket interface
- Email client

Figure 1 shows how Rockwell Automation® EtherNet/IP network devices fit into a control system. In this example, the following can occur over the EtherNet/IP network:

- Controllers produce and consume tags
- Controllers initiate MSG instructions that send and receive data
- Control of I/O modules
- Use of Integrated Motion over an EtherNet/IP network
- Workstations configure devices, and upload or download projects to the controllers

Figure 1 - EtherNet/IP Network Devices in a Control System



Duplicate IP Address Detection

Duplicate IP address detection verifies that an IP address does not match any other device IP address on the network when you perform either of these tasks:

- Connect the device to a EtherNet/IP network.
- Change the IP address on the device.

If the IP address matches that of another device on the network, the EtherNet/IP port on the device transitions to conflict mode. In conflict mode, these conditions exist:

- OK status indicator blinks red.
- Network (NET) status indicator is solid red.
- If the device has a text display, the following message scrolls across the 4-character display:

  <IP_address_of_this_device> Duplicate IP - <MAC_address_of_duplicate_node_detected>

  For example: 10.88.60.196 Duplicate IP - 00:00:BC:02:34:B4

Duplicate IP Address Resolution

This table describes how to resolve duplicate IP addresses.

Duplicate IP Address Detection Conditions	Resolution Process
• Both devices support duplicate IP address detection • Second device is added to the network after the first device is operating on the network	1. The device that began operation first uses the IP address and continues to operate without interruption. 2. The device that begins operation second detects the duplication and enters Conflict mode.
• Both devices support duplicate IP address detection • Both devices were powered up at approximately the same time	Both EtherNet/IP devices enter Conflict mode. To resolve this conflict, follow these steps: a. Assign a new IP address to one of the devices. b. Cycle power to the other device or disconnect and reconnect all Ethernet cables from the other device.
One device supports duplicate IP address detection and a second device does not	1. Regardless of which device obtained the IP address first, the device that does not support IP address detection uses the IP address and continues to operate without interruption. 2. The device that supports duplicate IP address detection detects the duplication and enters Conflict mode.

DNS Addressing

To qualify the device address further, use DNS addressing to specify a host name for a device. When you specify a host name for the device, you also specify a domain name and DNS servers. DNS addressing makes it possible to create similar network structures and IP address sequences under different domains.

DNS addressing is necessary only if you refer to the device by host name, such as in path descriptions in MSG instructions.

To use DNS addressing, follow these steps.

1. Assign a host name to the device.

   A network administrator can assign a host name. Valid host names must be IEC-1131-3 compliant.

2. Configure the device IP address:

   In the DNS server, the host name must match the IP address of the device.

IMPORTANT Make sure the DNS enable bit is set.

- If you use Logix Designer application, version 28 or later, to configure your device, the enable bit is set and DNS addressing is successful.
- If you use RSLinx® Classic software, version 2.41.00 or later, to configure your device, the enable bit is cleared and DNS addressing fails.

3. In the Logix Designer application, add the device to the I/O.

IMPORTANT	If a child device resides in the same domain as its parent device, type the host name. If the domain name of the child device differs from its parent device, type the host name and the domain name (host.domain)

IMPORTANT	You can also use DNS addressing in a device profile in the I/O configuration tree or in a message path. If the domain name of the destination device differs from the source device, use a fully qualified DNS name (hostname.domainname). For example, to send a message from AEN2TR1.location1.companyA to AEN2TR1.location2.company, the host names match, but the domains differ. Without the entry of a fully qualified DNS name, the device adds the default domain name to the specified host name.

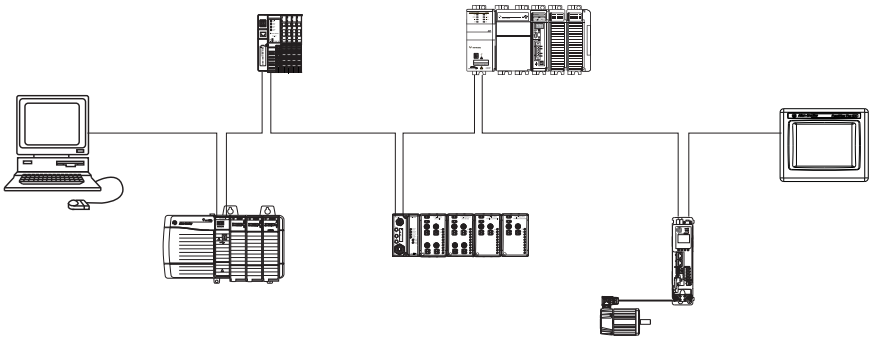
Socket Interface

Some EtherNet/IP devices support the use of a CIP Generic MSG instruction to request socket services. For more information, see EtherNet/IP Socket Interface Application Technique, ENET-AT002.

Linear Network

A linear network is a collection of devices that are daisy-chained together. The EtherNet/IP embedded switch technology lets you implement this topology at the device level. No additional switches are required.

Figure 2 - Example Linear Network



The following are advantages of a linear network.

- Simple installation
- Reduced wiring and installation costs
- No special software configuration required
- Improved CIP Sync application performance on linear networks

The primary disadvantage of a linear network is that any break of the cable disconnects all devices downstream from the break from the rest of the network.

Device Level Ring

Device Level Ring (DLR) is an EtherNet/IP protocol that is defined by the Open DeviceNet® Vendors' Association (ODVA). DLR provides a means to detect, manage, and recover from single faults in a ring-based network.

A DLR network includes the following types of ring nodes.

Node	Description
Ring supervisor	A ring supervisor provides these functions: • Manages traffic on the DLR network • Collects diagnostic information for the network A DLR network requires at least one node to be configured as ring supervisor. **IMPORTANT:** By default, the supervisor function is disabled on supervisor-capable devices, so they are ready to participate on a linear or star network or as a ring node on a DLR network. In a DLR network, you must configure at least one of the supervisor-capable devices as the ring supervisor before physically connecting the ring. If you do not, the DLR network does not work.
Ring participants	Ring participants provide these functions: • Process data that is transmitted over the network. • Pass on the data to the next node on the network. • Report fault locations to the active ring supervisor. When a fault occurs on the DLR network, ring participants reconfigure themselves and relearn the network topology.
Redundant gateways (optional)	Redundant gateways are multiple switches that are connected to one DLR network and also connected together through the rest of the network. Redundant gateways provide DLR network resiliency to the rest of the network.

Depending on their firmware capabilities, both devices and switches can operate as supervisors or ring nodes on a DLR network. Only switches can operate as redundant gateways.

For more information about DLR, see the EtherNet/IP Device Level Ring Application Technique, publication ENET-AT007.

Parallel Redundancy Protocol

Parallel Redundancy Protocol (PRP) is defined in international standard IEC 62439-3 and provides high-availability in Ethernet networks. PRP technology creates seamless redundancy by sending duplicate frames to two independent network infrastructures, which are known as LAN A and LAN B.

A PRP network includes the following components.

Component	Description
LAN A and LAN B	Redundant, active Ethernet networks that operate in parallel.
Double attached node (DAN)	An end device with PRP technology that connects to both LAN A and LAN B.
Single attached node (SAN)	An end device without PRP technology that connects to either LAN A or LAN B. A SAN does not have PRP redundancy.
Redundancy box (RedBox)	A switch with PRP technology that connects devices without PRP technology to both LAN A and LAN B.
Virtual double attached node (VDAN)	An end device without PRP technology that connects to both LAN A and LAN B through a RedBox. A VDAN has PRP redundancy and appears to other nodes in the network as a DAN.
Infrastructure switch	A switch that connects to either LAN A or LAN B and is not configured as a RedBox.

For more information about PRP topologies and configuration guidelines, see the EtherNet/IP Parallel Redundancy Protocol Application Technique, publication ENET-AT006.

EtherNet/IP Network Specifications

Table 2 - EtherNet/IP Network Specifications

Cat. No.	Connections		CIP Unconnected Messages (backplane + Ethernet)	Ethernet Node Count, Max	Packet Rate Capacity (packets/second)(5)		SNMP Support (password required)
	TCP	CIP			I/O	HMI and MSG	
1734-AENT, 1734-AENTR	32	20	32	—	5000	900	No
1738-AENT, 1738-AENTR	32	20	32	—	5000	900	No
1756-ENBT	64	128(3)	64 + 64	—	5000	900	Yes
1756-EN2F, 1756-EN2T, 1756-EN2TXT, 1756-EN2TR, 1756-EN2TRXT	128	256(3)	128 + 128	—	**IMPORTANT**: Packet rates for ControlLogix EtherNet/IP communication modules depend on series and firmware revision.	2000	Yes
1756-EN2TSC	128	256(3)	128 + 128	—		930 with encryption 1800 without encryption	Yes
1756-EN3TR	128	256(3)	128 + 128	—		2000	Yes
1756-EN4TR, 1756-EN4TRXT	512	1000 I/O 528 (4)	256+256	—	• 50,000 without CIP Security • 25,000 with integrity • 15,000 with integrity and confidentiality	• 3,700 without CIP Security • 2,700 with integrity • 1,700 with integrity and confidentiality	Yes
1756-EWEB	64	128(3)	128 + 128	—	—	900	Yes
1756-L81E	512	—	—	100	—	—	—
1756-L82E	512	—	—	175	—	—	—

Table 2 - EtherNet/IP Network Specifications (continued) (continued)

Cat. No.	Connections		CIP Unconnected Messages (backplane + Ethernet)	Ethernet Node Count, Max	Packet Rate Capacity (packets/second)[5]		SNMP Support (password required)
	TCP	CIP			I/O	HMI and MSG	
1756-L83E	512	—	—	250	—	—	—
1756-L84E	512	—	—	250	—	—	—
1756-L85E	512	—	—	300	—	—	—
1768-ENBT	32[1] 64[2]	64[3] 128	32 + 32	—	5000	960	Yes
1769-L3*x*E	64	32[3]	32 + 32	—	4000	760	Yes
1769-L16ER-BB1B, 1769-L18ER-BB1B, 1769-L18ERM-BB1B	120	256	256	4	6000 @ 500 bytes/packet	400 messages/s @ 20% comm. timeslice	Yes
1769-L24ER-QB1B, 1769-L24ER-QBFC1B	120	256	256	8	6000 @ 500 bytes/packet		Yes
1769-L27ERM-QBFC1B	120	256	256	16	6000 @ 500 bytes/packet		Yes
1769-L30ER, 1769-L30ERM, 1769-L30ER-NSE	120	256	256	16	6000 @ 500 bytes/packet		Yes
1769-L33ER, 1769-L33ERM	120	256	256	32	6000 @ 500 bytes/packet		Yes
1769-L36ERM	120	256	256	48	6000 @ 500 bytes/packet		Yes
1783-ETAP, 1783-ETAP1F, 1783-ETAP2F	64	—	—	—	—	900	No
1794-AENT	64	64	—	—	9500	—	Yes
5069-AENRT	32	16 (messaging)	16	—	100000	500	Yes
5069-AEN2TR		256 (messaging)	32	—	100000	2000	Yes
5094-AENTR, 5094-AENTRXT, 5094-AEN2TR, 5094-AEN2TRXT	32	16 (messaging)	16	—	100000	500	Yes
5069-L306ER, 5069-L306ERM	512	—	256	16	128000	2000	Yes
5069-L310ER, 5069-L310ER-NSE, 5069-L310ERM	512	—	256	24	128000	2000	Yes
5069-L320ER, 5069-L320ERM	512	—	256	40	128000	2000	Yes
5069-L330ER, 5069-L330ERM	512	—	256	60	128000	2000	Yes
5069-L340ER, 5069-L340ERM	512	—	256	90	128000	2000	Yes
5069-L350ERM	512	—	256	120	128000	2000	Yes
5069-L380ERM	512	—	256	150	128000	2000	Yes
5069-L3100ERM	512	—	256	180	128000	2000	Yes
9300-ENA	—	—	—	—	—	—	—

(1) The 1768-ENBT communication module supports 32 TCP connections with firmware revision 1.

(2) The 1768-ENBT communication module supports 64 TCP connections with firmware revision 2 or later.

(3) CIP connections can be used for all explicit or all implicit applications. For example, a 1756-ENBT module has a total of 128 CIP connections that can be used for any combination of connections.

(4) There are 1000 CIP I/O connections and 528 CIP messaging connections.
(5) Total packet rate capacity = I/O Produced Tag, max + HMI/MSG, max. Packet rates vary depending on packet size. For more detailed specifications, see the EDS file for a specific catalog number.

Reserve 10% of the bandwidth (packets/second) of the network device for Explicit Messaging.

Time Synchronization

In certain situations, the I/O modules can synchronize with the adapter before the adapter synchronizes with the system Grandmaster clock. This synchronization occurrence leads to a time difference between the I/O and the Grandmaster clock until the adapter synchronizes with the Grandmaster clock.

In your logic, verify that the adapter is synchronized with the Grandmaster clock (CIPSyncValid) before you initiate time stamp requests or scheduled outputs from your I/O modules. A system with intermediate devices, such as network bridges and switches, can require that you insert a delay until the time stabilizes in the system.

For information on how to verify that the adapter is synchronized to a Grandmaster clock, see CIP Sync Diagnostics in the Integrated Architecture and CIP Sync Configuration Application Technique, publication IA-AT003. This publication also includes information on Time Sync Object Attributes.

Configure a Workstation to Operate on an EtherNet/IP Network

Before you can connect to the device via an Ethernet cable, you must install an EtherNet/IP driver on your workstation.

A communication driver is required to complete these tasks:

- Upload and download Logix Designer application projects to Logix 5000™ controllers over an EtherNet/IP network
- Collect controller data for electronic operator interfaces, for example, PanelView™ Plus terminals, and visualization software, for example, FactoryTalk® View software
- Update device firmware
- Set or change the IP address.
- Configure the device

Remember the following when you use the RSLinx® Classic software communication drivers:

- EtherNet/IP driver:
  - Supports runtime communications
  - Requires that the workstation is properly connected to the EtherNet/IP network
  - Supports communications over longer distances when compared to the USB driver
- Ethernet devices driver:
  - Requires that you configure the IP addresses to which the software browses and, therefore, the devices with which the device communicates
- USB driver:
  - Convenient method to connect to an unconfigured device and configure the Ethernet port
  - Convenient method to connect to a device when the Ethernet port configuration is unknown
  - Convenient method to update the device firmware
  - Not intended for runtime connections; it is a temporary-use only connection with a limited cabling distance

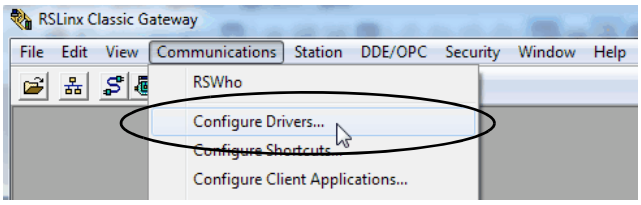
Configure the Ethernet Communication Driver in RSLinx Classic Software

Before you add an Ethernet driver, confirm that these conditions exist:

- The workstation is properly connected to the EtherNet/IP network.
- The workstation IP address and other network parameters are configured correctly.

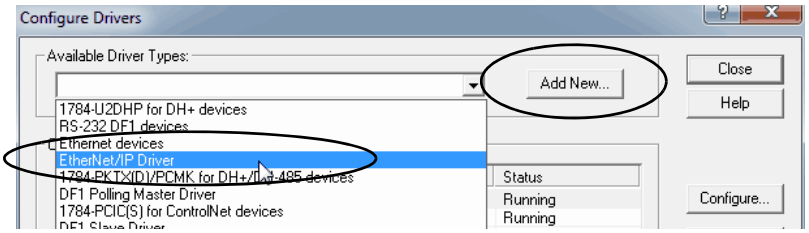
To configure the EtherNet/IP driver, follow these steps.

1. From the Communications menu, choose Configure Drivers.



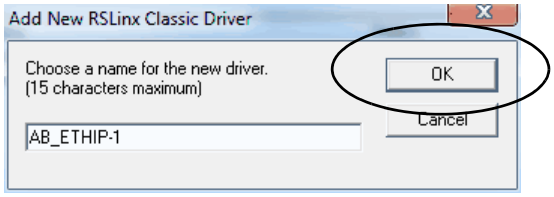
   The Configure Drivers dialog box appears.

2. From the Available Driver Types pull-down menu, choose EtherNet/IP Driver.
3. Click Add New.



   The Add New RSLinx® Driver dialog box appears.

4. Type a name for the new driver and click OK.

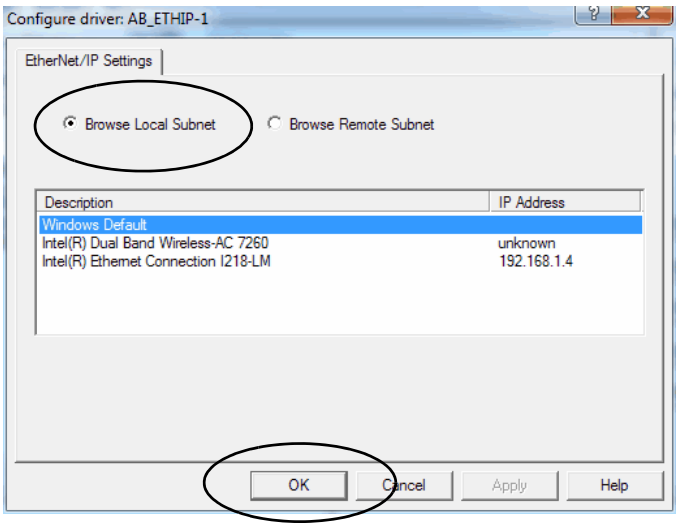


The Configure driver dialog box appears.

5. Click Browse Local Subnet.

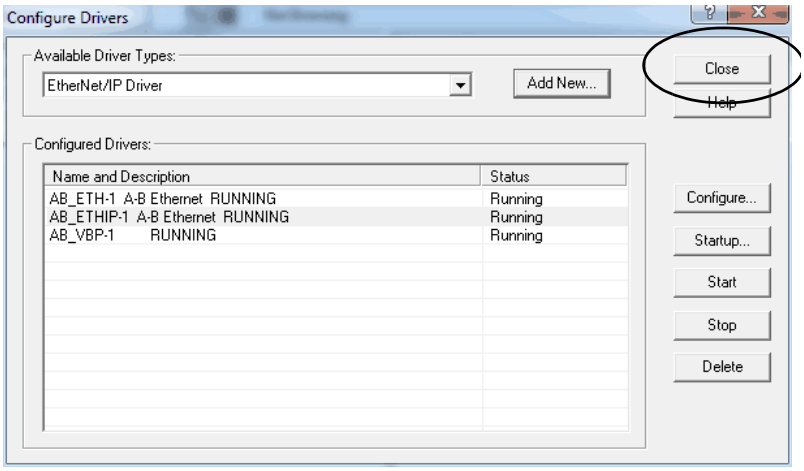
   TIP To view devices on another subnet or VLAN from the workstation running RSLinx Classic software, click Browse Remote Subnet.

6. Select the desired driver, and click OK.



The new driver is available on the Configure Drivers dialog box.

7. Click Close.



Configure the USB Communication Driver in RSLinx Classic Software

In RSLinx Classic software, version 3.80.00 or later, a USB driver automatically appears in the software when you connect the USB cable from your workstation to the controller.

The USB driver can take a moment to appear in RSLinx Classic software.

IMPORTANT EtherNet/IP drivers remain visible in RSLinx Classic software after they are configured regardless of whether they are in use or not.

A USB driver appears in RSLinx Classic software only when a USB cable is connected between the workstation and the controller.

Once the cable is disconnected, the driver disappears from RSLinx Classic software.

ATTENTION: The USB port is intended for temporary, local programming purposes only and is not intended for permanent connection. The USB cable is not to exceed 3.0 m (9.84 ft) and must not contain hubs.

WARNING: Do not use the USB port in hazardous locations.

IMPORTANT Do not simultaneously load firmware for multiple devices through a USB port. If you do, one or more of the firmware loads can fail in the middle of the loading process.

If you use the RSLinx Classic software, version 3.80.00 or later, and a USB driver does not appear automatically, complete the following steps.

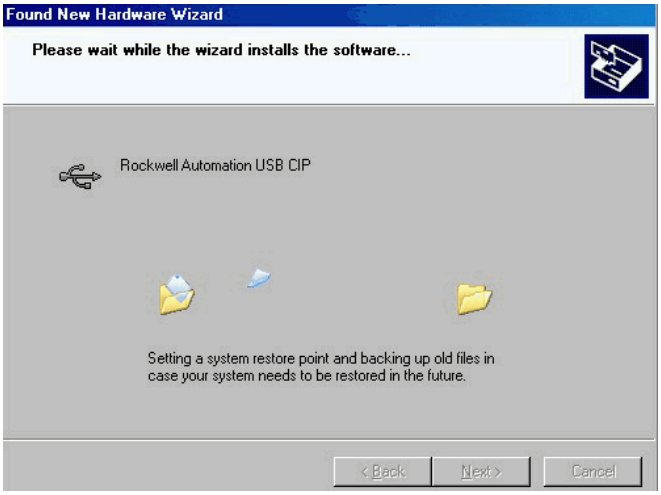
1. Connect one end of the USB cable to your workstation, and the other end to the USB port on the device.

   The RSLinx Found New Hardware Wizard dialog box appears.
2. Click Install the software automatically (recommended).

3. Click Next.

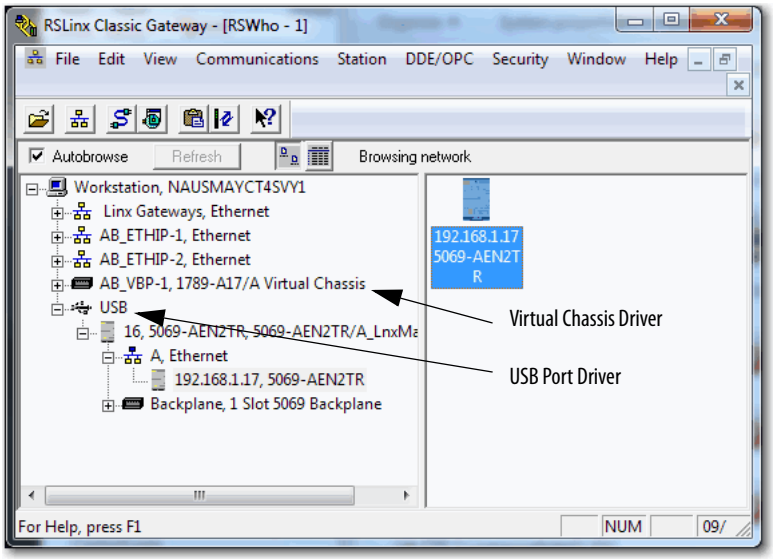
These dialog boxes appear consecutively.

4. Click Finish.



5. In RSLinx Classic software, from the Communications menu, click RSWho.

   The RSLinx Workstation organizer appears, and your device appears under two different drivers, a virtual chassis and the USB port.



Notes:

Set an IP Address

Set the IP Address with the BOOTP/DHCP Utility

The BOOTP/DHCP tool is a standalone server that you can use to set an IP address. The BOOTP/DHCP tool sets an IP address and other Transport Control Protocol (TCP) parameters.

You can use the BOOTP/DHCP tool to set the IP address when the device powers up in the out-of-box state. That is, the rotary switches are not set to a valid IP address, and the device is DHCP enabled.

Access the BOOTP/DHCP tool from one of these locations:

- Programs > Rockwell Software > BOOTP-DHCP Tool > BOOTP-DHCP Tool
- Tools directory on the Studio 5000® environment installation CD

IMPORTANT Before you start the BOOTP/DHCP tool, remember the following:

- Make sure that you have the hardware (MAC) address of the device.

  The hardware address is on a sticker on the side of the device and has a format similar to the following:

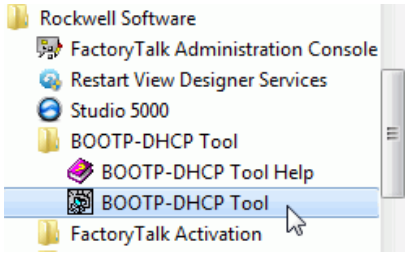
  00-00-BC-14-55-35

- Make sure that the workstation that you use to set the IP address has only one connection to the EtherNet/IP network on which the device resides.

  The BOOTP/DHCP tool can fail to work if your workstation has multiple connections to the EtherNet/IP network.

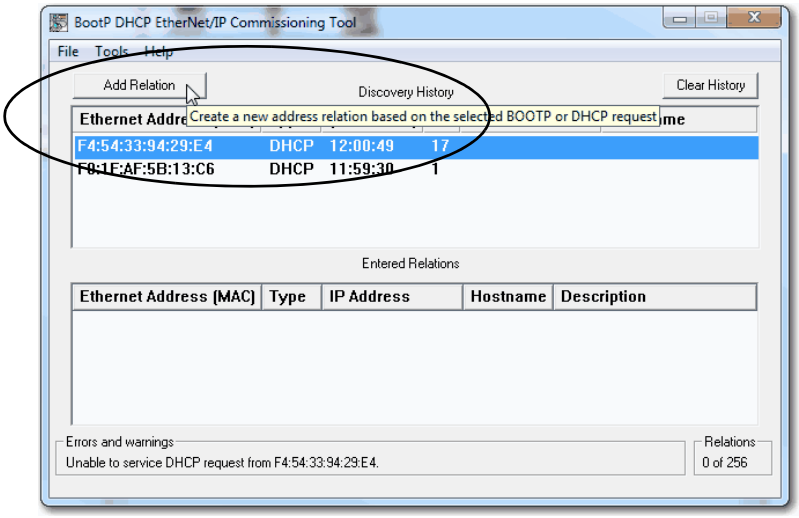
To set the IP address with BOOTP/DHCP tool, complete the following steps.

1. Confirm that the device is connected to the network.
2. Start the BOOTP-DHCP tool.



The MAC ID of the device appears in the Request History window.

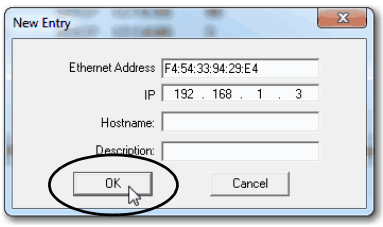
3. Select the appropriate device and click Add to Relation List.



The New Entry dialog box appears.

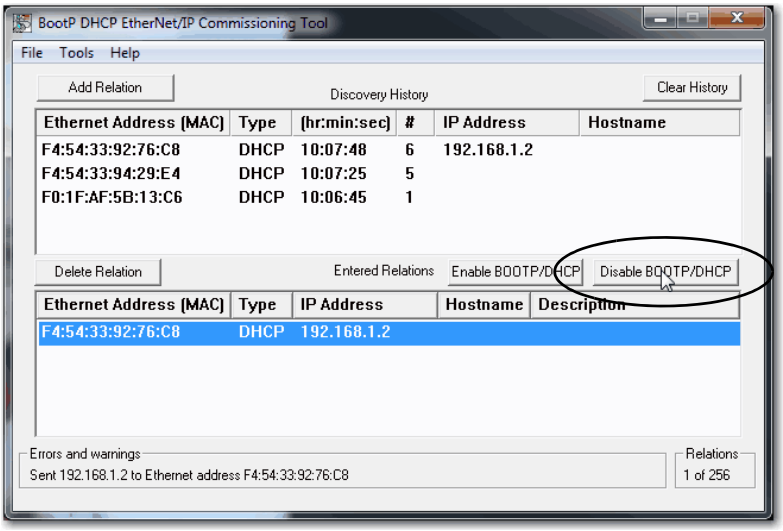
4. Type an IP address, Hostname, and Description for the device.

   Hostname and Description are optional.



5. Click OK.
6. To assign this configuration on the device, wait for the device to appear in the Relation List panel and select it.

7. Click Disable BOOTP/DHCP.



The device now uses the assigned configuration and does not issue BOOTP or DHCP requests after power is cycled on the controller.

IMPORTANT Remember the following:

- If you do not click Disable BOOTP/DHCP, on future power cycles, the current IP configuration is cleared and the controller sends DHCP requests again.
- If you click Disable BOOTP/DHCP and it does not disable BOOTP/DHCP, you can use RSLinx® Classic software to disable BOOTP/DHCP.

For more information on how to use RSLinx Classic software to disable BOOTP/DHCP, see page 28.

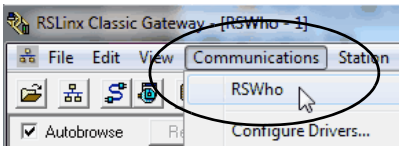
Disable BOOTP/DHCP with RSLinx Classic Software

To disable BOOTP/DHCP in RSLinx Classic software, complete the following steps.

1. Start RSLinx Classic software.

   After several seconds, an RSWho dialog box appears.

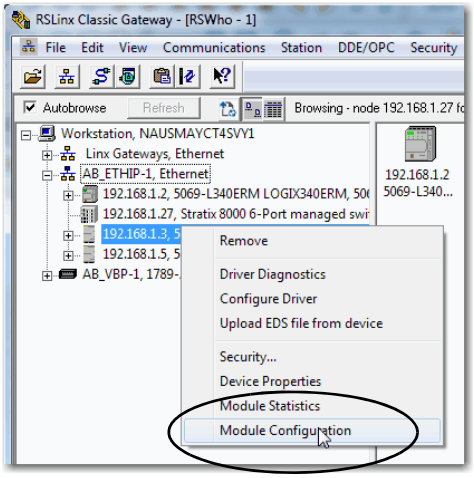
2. If no RSWho dialog box appears, from the Communications pull-down menu, choose RSWho.



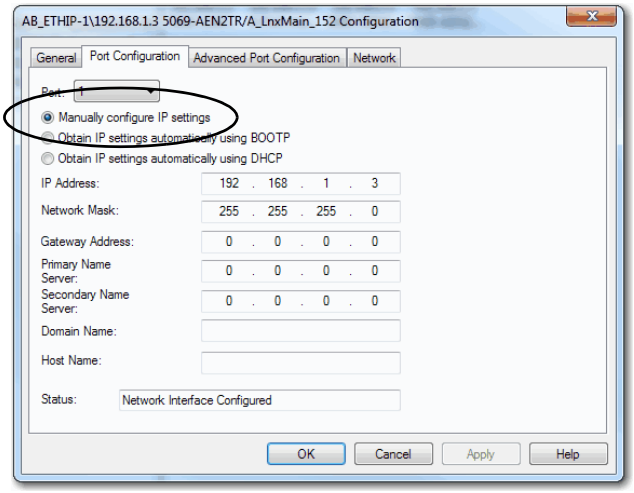
3. Navigate to the device.

   You can access the device via the USB or an EtherNet/IP driver.

4. Right-click on the device and choose Module Configuration.



5. Click the Port Configuration tab.
6. Click Manually configure IP settings.



7. Click OK.

DHCP Considerations

If the device is DHCP-enabled in the out-of-box condition, you can use a DHCP server to set the IP address.

The DHCP server automatically assigns IP addresses to client stations logging on to a TCP/IP network. DHCP is based on BOOTP and maintains some backward compatibility.

ATTENTION: You can use a DHCP server that is always configured to assign the same IP address to specific devices when they appear on the EtherNet/IP network and request an IP address.

If your system does not use a DHCP server that assigns the same IP address for specific devices, we **strongly recommend** that you assign the device a fixed IP address. Do not set the IP address dynamically. That is, do not use the Obtain IP settings automatically by using DHCP.

When a device uses Obtain IP settings automatically by using DHCP, the IP address for that device is cleared with each power cycle. If the same IP address is not automatically assigned to the device when it requests a new IP address, the device can be assigned another IP address than what was used before cycling power.

The use of a new IP address can result in such issues as a Duplicate IP address condition or configuration faults because the IP address differs from what is stored in a Logix Designer application project.

Failure to observe this precaution can result in unintended machine motion or loss of process control.

Set the IP Address with RSLinx Classic Software

To use RSLinx Classic software to set the IP address for the **first time**, after it powers up in the out-of-box state, you must connect to the device via the USB port.

If the device does not have a USB port, you cannot use RSLinx Classic software to set the IP address for the first time the device powers up in the out-of-box state.

IMPORTANT You can use RSLinx Classic software to configure the device, including to change the IP address after it has been set.

To change the IP address by using the RSLinx Classic software, the rotary switches on the device must be set to positions that are valid for DHCP address configuration (000...254).

You must access the device by browsing to it via an EtherNet/IP driver.

For more information on how to configure a device with RSLinx Classic software, see page 32.

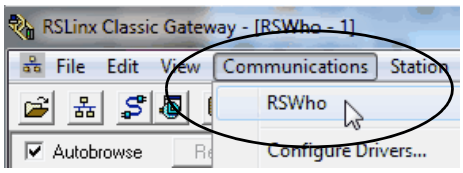
WARNING: Do not use the USB port in hazardous locations.

ATTENTION: The USB port is intended for temporary local programming purposes only and not intended for permanent connection. The USB cable is not to exceed 3.0 m (9.84 ft) and must not contain hubs.

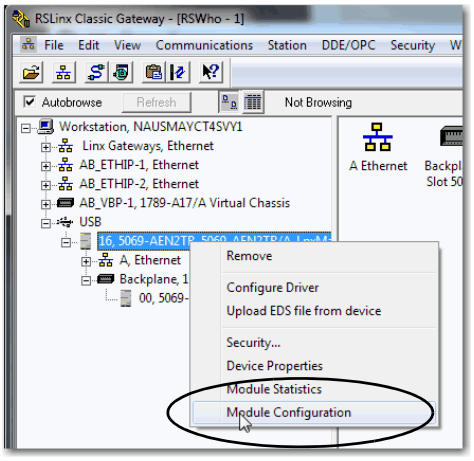
Complete these steps to set the IP address with RSLinx Classic software when the device is in the out-of-box state.

1. Confirm that your computer is connected to the device via a USB cable.
2. Start the RSLinx Classic software.

   After several seconds, an RSWho dialog box appears.
3. If the RSWho dialog box does not appear, from the Communications pull-down menu, choose RSWho.

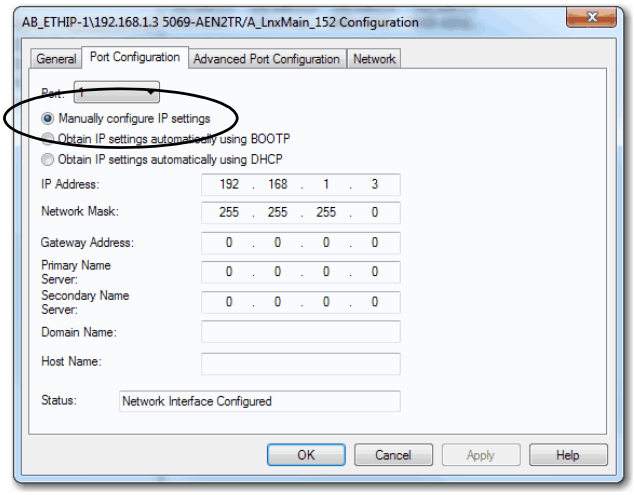


4. Right-click the device and choose Module Configuration.



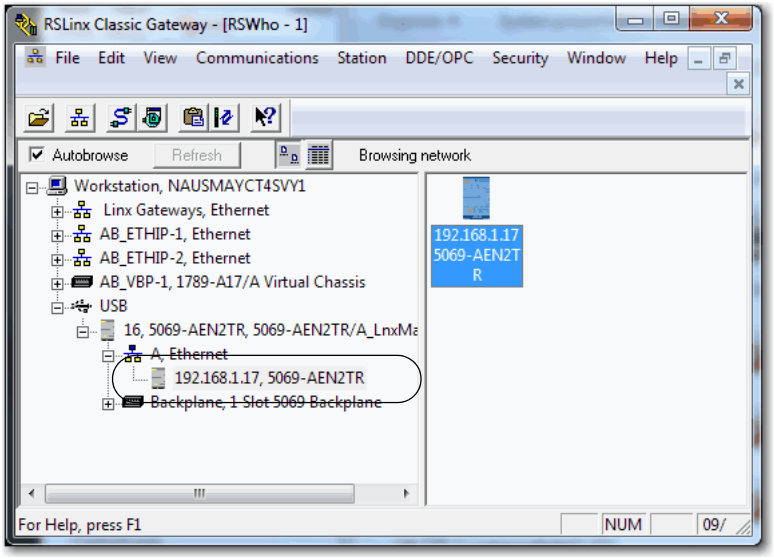
The Module Configuration dialog box appears.

5. Click the Port Configuration tab.
6. Click Manually configure IP settings and set the port configuration parameters.



7. Click OK.
8. Open the USB branch on the menu tree.

The device shows the IP address.



Configure Port Settings with RSLinx Classic Software

You can use RSLinx Classic software to configure a subset of the parameters available on the device.

Complete the following steps.

1. Right-click the device and then click Module Configuration.
2. Click the Advanced Port Configuration tab.

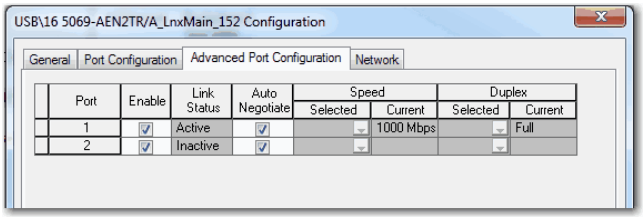
IMPORTANT Consider the following when you configure the port settings:

- When the device uses the 1 Gbps network communication rate, it supports only full-duplex mode.
- When the device uses the 10 Mbps or 100 Mbps network communication rate, it supports full-duplex and half-duplex mode.
- The speed and duplex settings for the devices on the same Ethernet network must be the same to avoid transmission errors.
- Fixed speed and full-duplex settings offer better reliability than autonegotiate settings and are recommended for some applications.
- If the device is connected to an unmanaged switch, leave Auto-negotiate checked or the device fails.
- If you force the port speed and duplex with a managed switch, the corresponding port of the managed switch must be forced to the same settings or the device fails.
- If you connect a manually configured device to an autonegotiate device (duplex mismatch), a high rate of transmission errors can occur.
- To disable a port, clear the Enable checkbox.

  You cannot disable both ports on a 5069-AENTR or FLEX 5000 EtherNet/IP adapter simultaneously in RSLinx Classic software. We recommend that before you disable a port, you confirm that the port is not in use.
- If you disable a port in RSLinx Classic software and the port is being used for network communication, the communication is interrupted.

  In this case, if the other Ethernet port is enabled, we recommend that you moved the Ethernet cable from the disabled port and connect it to the enabled port.

  After you re-enable the port that was unintentionally disabled, you can change the cable connection back to the first port



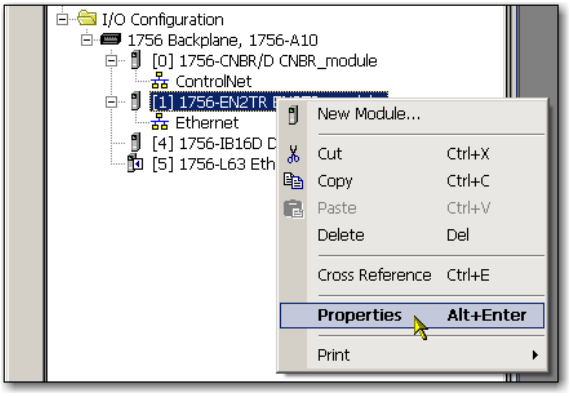
Task	Action
Let the device automatically set the port speed and duplex settings.	Leave the Auto-negotiate enabled.
Manually configure the port speed and duplex settings.	Follow these steps. 1. Clear the Auto-negotiate port speed and duplex checkbox. 2. From the Current Port Speed pull-down menu, choose a port speed. 3. From the Current Duplex pull-down menu, choose full-duplex.

3. On the Module Configuration dialog box, click OK.

Set the IP Address with Studio 5000 Logix Designer Application

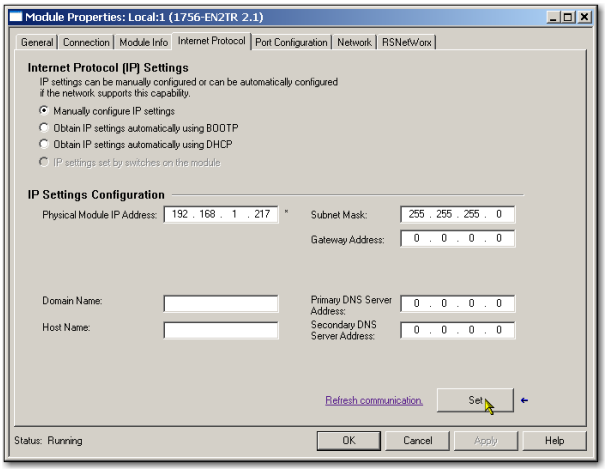
To use the Logix Designer application to set the IP address of the device, follow these steps.

1. In the Controller Organizer, right-click the device and choose Properties.



   The Module Properties dialog box appears.

2. Click the Port Configuration tab.



3. In the IP address field, type the IP address.
4. In the other fields, type the other network parameters, if needed.

   IMPORTANT The fields that appear vary from one device to another.

5. Click Set.
6. Click OK.

Reset the IP Address to Factory Default Value

You can reset the IP address of the device to its factory default value with the following methods:

- If the device has rotary switches, set the switches to 888 and cycle power.
- If the device does not have rotary switches, use an MSG instruction to the reset the IP address.

Notes:

Configure the Device

After installing a device and setting the IP address, add the device to the Controller Organizer in a programming software project. This addition establishes I/O control.

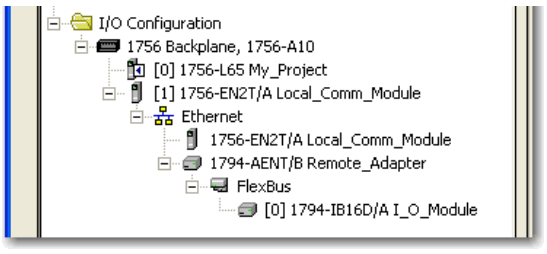
You must download that project to the host controller before operation can begin. When the controller begins operation, it establishes a connection with the device. The configuration of the device determines its behavior.

Add the Device to the Controller Organizer

To build the I/O configuration for a typical I/O network, follow these steps.

1. Add the device.
2. Add the remote device for distributed I/O.
3. Add the I/O modules.

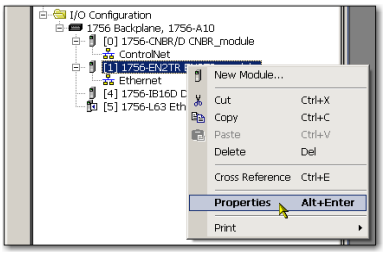
This graphic shows the I/O configuration of the consumer controller after distributed I/O modules are added.



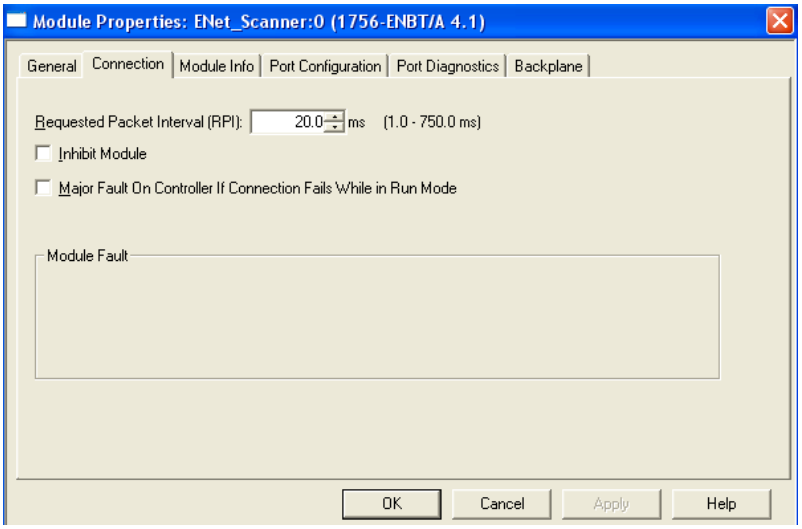
Configure EtherNet/IP Communication

To configure the device, follow these steps.

1. Make sure that the device is installed, started, and connected to the controller.
2. In the Controller Organizer, right-click the device and choose Properties.



The Module Properties dialog box appears.



3. Make configuration selections on the individual tabs.
4. Click OK.

Produced and Consumed Data

Logix controllers can produce (broadcast) and consume (receive) system-shared tags that are sent and received via the device. Produced and consumed tags each require connections.

Tag Type	Required Connections
Produced	The local controller (producing) must have one connection for the produced tag and the first consumer and one more connection for each additional consumer (heartbeat). The produced tag requires two connections. As you increase the number of controllers that can consume a produced tag, you also reduce the number of connections the controller has available for other operations. Example operations include communication and I/O.
Consumed	Each consumed tag requires one connection for the controller that is consuming the tag. **IMPORTANT**: When you configure a consumed tag, you must add a remote device to the programming software project for the producing controller to configure the consuming controller. The default Comm Format when adding a remote device to the project is rack-optimized. Change the Comm Format to None when adding the remote device.

All EtherNet/IP devices support as many as 32 produced multicast connections. Each tag that passes through an EtherNet/IP device uses one connection. Due to this feature, the number of available connections limits the total number of tags that can be produced or consumed. If the device uses all of its connections for I/O and other devices, no connections remain for produced and consumed tags.

IMPORTANT Depending on whether it is producing or consuming a tag, a Logix 5000™ controller uses its connections differently.

For more information, see Logix 5000 Controllers Produced and Consumed Tags Programming Manual, publication 1756-PM011.

Message Instructions

Messages transfer data to other devices, such as other controllers or operator interfaces. Each message uses one connection, regardless of how many devices are in the message path. To conserve connections, you can configure one message to read from or write to multiple devices.

For more information on programming MSG instruction, see the Logix 5000™ Controller General Instructions Reference Manual, publication 1756-RM003.

Notes:

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

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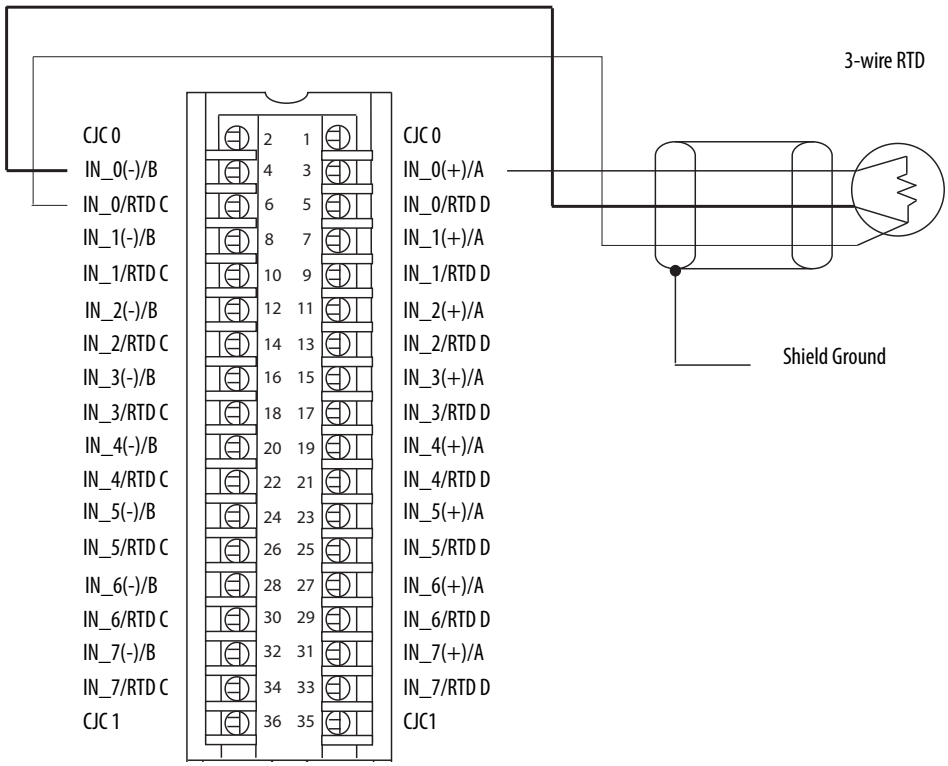
1756-IRT8I, 1756-IRT8IK

ControlLogix isolated RTD/Thermocouple analog input module.

1756-IRT8I, 1756-IRT8IK Module Wiring Diagram - 3-wire RTD Input

IMPORTANT: Remember the following:

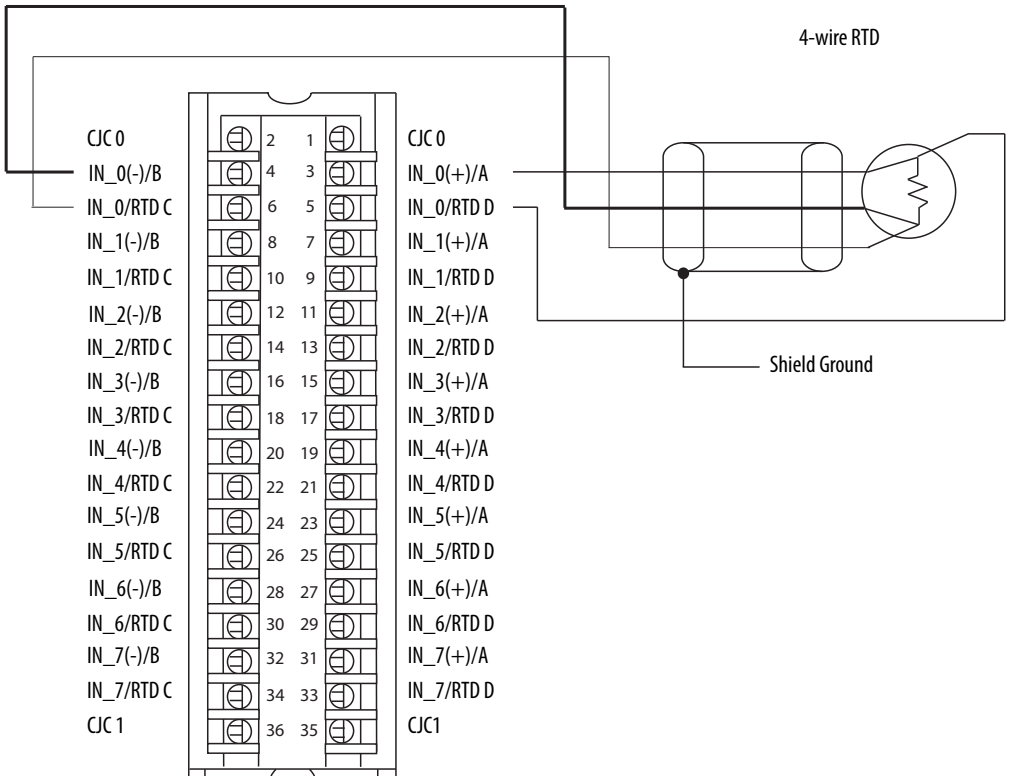
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Terminals 1, 2, 35, and 36 are not used in RTD applications.
- For 2-wire resistor applications including calibration, make sure IN_x(-)/B and IN_x/RTD C are shorted together.



1756-IRT8I, 1756-IRT8IK Module Wiring Diagram - 4-wire RTD Input

IMPORTANT: Remember the following:

- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Terminals 1, 2, 35, and 36 are not used in RTD applications.



1756-IRT8I, 1756-IRT8IK Module Wiring Diagram - Thermocouple Input

IMPORTANT: Remember the following:

- Connect the white end of the CJC sensor to the even-numbered terminal. Connect the orange end of the CJC sensor to the odd-numbered terminals.

For CJC 0:

– White end - Connected to terminal number 2

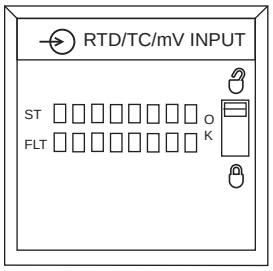
– Orange end - Connected to terminal number 1

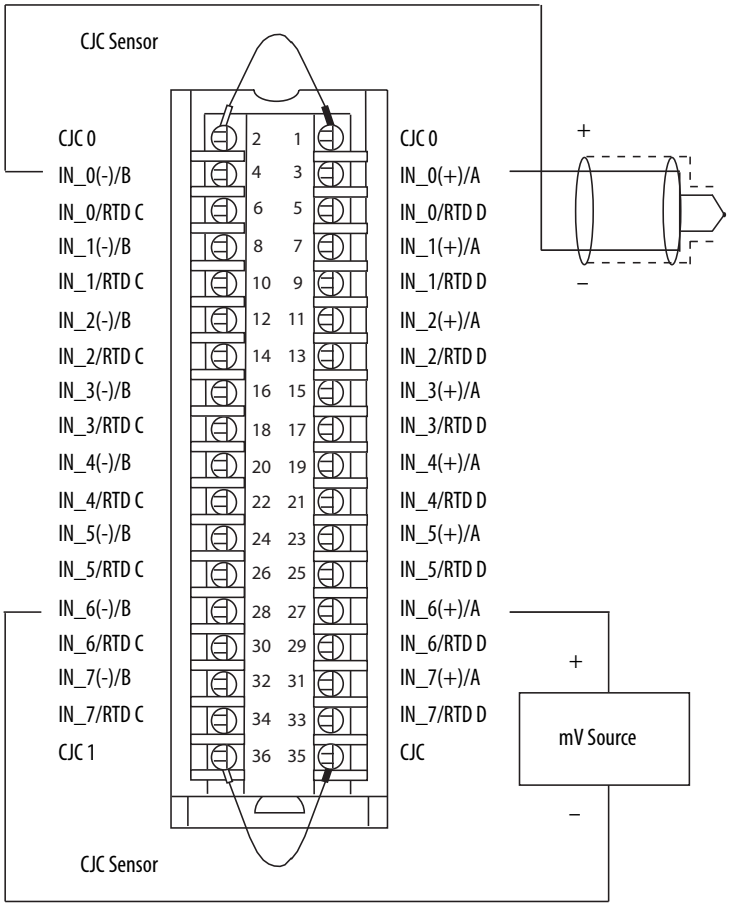
For CJC 1:

–White end - Connected to terminal number 36

–Orange end - Connected to terminal number 35

- CJC sensors do not come with the module. You must order the sensors, product catalog number 1756-CJC, separately.
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.





Technical Specifications - 1756-IRT8I, 1756-IRT8IK

Attribute	1756-IRT8I, 1756-IRT8IK
Inputs	Eight isolated channels - Any combination of RTD or Thermocouple mode Two CJC sensors for Thermocouple use. The CJC sensors, product catalog number 1756-CJC, do not come with the module. You must order the sensors separately.
Input range	1…500 Ω 2…1000 Ω 4…2000 Ω 8…4000 Ω -100…100 mV
Resolution	24 bits 0…510 Ω: 0.06 mΩ/count 0…1020 Ω: 0.12 mΩ/count 0…2040 Ω: 0.25 mΩ/count 0…4080 Ω: 0.50 mΩ/count -101…101 mV: 0.01 µV/count
RTD sensors supported	100, 200, 500, 1000 Ω Platinum, alpha=385 100, 200, 500, 1000 Ω Platinum, alpha=3916 120 Ω Nickel, alpha=672 100, 120, 200, 500 Ω Nickel, alpha=618 10 Ω Copper, alpha=427

Technical Specifications - 1756-IRT8I, 1756-IRT8IK

Attribute	1756-IRT8I, 1756-IRT8IK
Thermocouple types	B, C, D, E, J, K, N, R, S, T, TXK/XK (L)
Thermocouple linearization	ITS-90
Current draw @ 5.1V	200 mA
Current draw @ 24V	150 mA
Total backplane power	4.6 W
Voltage and current ratings	Backplane: 5.1V DC, 200 mA, 24V DC,150 mA Input: 1-4000 Ohms, +/-100 mV, Thermocouple; B,C,E,J,K,R,S,T,N,D,L
Power dissipation	4.6 W (15.7 BTU/hr) max
Thermal dissipation	15.7 BTU/hr
RTD excitation current	600 µA
Input impedance, approx	1 GΩ
Open circuit detection time	• Thermocouple input and 3-wire RTD input = 2 s • 4-wire RTD input = 5 s **IMPORTANT**: **No Open Circuit Detection** when wires are simultaneously disconnected from the IN_*x*/RTD C and IN_*x*/RTD D terminals on same channel; where *x* represents the channel number.
Overvoltage protection, max	±30V DC
Normal mode noise rejection	75 dB at 60 Hz(2)
Common mode noise rejection	125 dB @ 60 Hz 1000 Ω differential 120 dB @ 50 Hz 1000 Ω differential 160 dB @ 600V 100 Ω differential
Channel bandwidth	Notch filter configuration dependent See publication 1756-UM540 for possible values.
Settling time	Notch filter configuration dependent See publication 1756-UM540 for possible values.
Calibrated accuracy @ 25 °C	0.05%
Module error over full temperature range	0.1%
Local CJC sensor accuracy	± 0.3 °C
Remote CJC sensor, accuracy	± 0.3 °C
Module input scan time, min	1 ms
Data format	IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), reinforced insulation type, inputs to backplane. 250V (continuous), basic insulation type, input to input.
RTD sensor types/temperature range (Each sensor type in a cell supports all temperature ranges in the corresponding column to the right.)	
100 Ω PT 385 20 Ω PT 385 500 Ω PT 385 1000 Ω PT 385	-200…+870 °C (-328…+1598 °F) 73…1143 °K 132…2058 °R
100 Ω PT 3916 20 Ω PT 3916 500 Ω PT 3916 1000 Ω PT 3916	-200…+630 °C (-328…+1166 °F) 73…903 °K 132…1626 °R

Technical Specifications - 1756-IRT8I, 1756-IRT8IK

Attribute	1756-IRT8I, 1756-IRT8IK
10 Ω CU 427	-200…+260 °C (-328…+500 °F) 73…533 °K 132…960 °R
120 Ω NI 672	-80…+320 °C (-112…+608 °F) 193…593 °K 348…1068 °R
100 Ω NI 618 120 Ω NI 618 200 Ω NI 618 500 Ω NI 618	-60…+250 °C (-76…+482 °F) 213…523 °K 384…942 °R
Thermocouple type/temperature range	
Thermocouple Type B	21…1820 °C (68…3308 °F) 293…2093 °K 528…3768 °R
Thermocouple Type C	0…2320 °C (32…4208 °F) 273…2593 °K 492…4668 °R
Thermocouple Type D	0…2320 °C (32…4208 °F) 273…2593 °K 492…4668 °R
Thermocouple Type E	-270…+1000 °C (-454…+1832 °F) 3…1273 °K 6…2292 °R
Thermocouple Type J	-210…+1200 °C (-346…+2192 °F) 63…1473 °K 114…2652 °R
Thermocouple Type K	-270…+1372 °C (-454…+2502 °F) 3…1645 °K 6…2961 °R
Thermocouple Type N	-270…+1300 °C (-454…+2372 °F) 3…1573 °K 6…2832 °R
Thermocouple Type R	-50…+1768 °C (-58…+3215 °F) 223…2041 °K 402…3674 °R
Thermocouple Type S	-50…+1768 °C (-58…+3215 °F) 223…2041 °K 402…3674 °R
Thermocouple Type T	-270…+400 °C (-454…+752 °F) 3…673 °K 6…1212 °R
Thermocouple Type TXK/XK (L)	-200…+800 °C (-328…+1472 °F) 73…1073 °K 132…1932 °R
Thermocouple type/resolution, nom	
Type C, R	~0.03 °C (~0.05 °F)
Type B, S	~0.04 °C (~0.07 °F)

Technical Specifications - 1756-IRT8I, 1756-IRT8IK

Attribute	1756-IRT8I, 1756-IRT8IK
Type E, J, K, N, T, TXK/XK (L)	~0.01 °C (~0.02 °F)
Type D	~0.02 °C (~0.04 °F)
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Wire category(1)	2 - on signal ports
Enclosure type	None (open-style)
North American temperature code	T4A
ATEX temperature code	T4
IECEx temperature code	T4

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

(2) Notch filter dependent.

Environmental Specifications - 1756-IRT8I, 1756-IRT8IK

Attribute	1756-IRT8I, 1756-IRT8IK
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test N/A, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test dB, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz

Environmental Specifications - 1756-IRT8I, 1756-IRT8IK

Attribute	1756-IRT8I, 1756-IRT8IK
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-IRT8I, 1756-IRT8IK

Certification (when product is marked)(1)	1756-IRT8I, 1756-IRT8IK
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements • II 3 G Ex nA IIC T4 Gc • DEMKO13ATEX1325026X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 14.0008X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) See the Product Certification link at rok.auto/certifications for Declarations of Conformity, Certificates, and other certification details.

1756 Removable Terminal Blocks

Removable terminal blocks (RTBs) provide a flexible interconnection between your plant wiring and 1756 I/O modules. The RTB plugs into the front of the I/O module. The type of module determines which RTB you need. You can choose screw-clamp or spring-clamp RTBs.

RTBs are not shipped with I/O modules. You must order them separately. The standard housing on the front of the wiring arm is not deep enough for 2.5 mm^2 (14 AWG) wiring. If you plan to use 2.5 mm^2 (14 AWG) wiring, also order the extended housing.

ATTENTION: If separate power sources are used, do not exceed the specified isolation voltage: referring to the specifications for each individual module on the preceding pages.

WARNING: Do not use the 1756-TBNHS, 1756-TBSHS, 1756-TBCHS, 1756-TBS6HS safety RTBs, and the 1756-TBES Extended-depth terminal block housing ,on non-safety I/O modules.

RTB Specifications - 1756-TBNH, 1756-TBNHS, 1756-TBSH, 1756-TBSHS, 1756-TBCH, 1756-TBCHS, 1756-TBS6H, 1756-TBS6HS, 1756-TBE, 1756-TBES

Attribute	1756-TBNH, 1756-TBNHS	1756-TBSH, 1756-TBSHS	1756-TBCH, 1756-TBCHS	1756-TBS6H, 1756-TBS6HS	1756-TBE, 1756-TBES
Description	20-position NEMA screw-clamp removable block	20-pin spring-clamp removable terminal block with standard housing	36-pin cage-clamp removable terminal block with standard housing	36-pin spring-clamp removable terminal block with standard housing	Extended depth terminal block housing
Screw torque	1.36 N•m (12 lb•in)	–	0.5 N•m (4.4 lb•in)	–	–
Wire size(1)	0.33…2.1 mm^2 (22…14 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Do not wire more than two conductors on any single terminal.	0.33…2.1 mm^2 (22…14 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Do not wire multiple conductors on any single terminal.	Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Double wire connection: 0.33…1.3 mm^2 (22…16 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Do not wire more than two conductors on any single terminal.	0.33…2.1 mm^2 (22…14 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Do not wire multiple conductors on any single terminal.	
Screwdriver width	8 mm (5/16 in.) Max	–	3.2 mm (1/8 in.)	–	–

(1) Maximum wire size requires extended housing, catalog number 1756-TBE.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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Publication 1756-TD002M-EN-E - December 2019
Supersedes Publication 1756-TD002L-EN-E - June 2019

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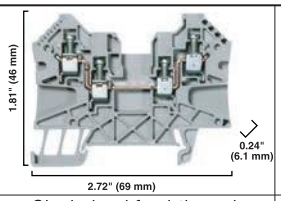
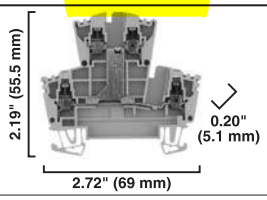
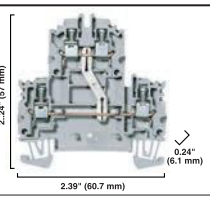
	1492-J4Q			1492-JD3C				1492-JD4C			
Dimensions are not intended to be used for manufacturing purposes. **Note:** Height dimension is measured from top of rail to top of terminal block.											
Specifications	*Single-level feed-through terminal block with 2 connection points on each side*			*Two-level feed-through terminal block with commoning bar*				*Two-level feed-through terminal block with commoning bar*			
Certifications		CSA	IEC		CSA	IEC	ATEX		CSA	IEC	ATEX
Voltage Rating	600V AC/DC		500V AC/DC	600V AC/DC	300V AC/DC	400V AC/DC	275V AC/DC	600V AC/DC	300V AC/DC	400V AC/DC	550V AC/DC
Maximum Current	30 A		32 A	20 A	10 A	24 A	21 A	35 A	30 A	32 A	28 A
Wire Range (Rated Cross Section)	#30…10 AWG		0.5…4 mm²	#22…12 AWG	#26…12 AWG	2.5 mm²	2.5 mm² (20…14 AWG)	#26…10 AWG		0.5…4 mm²	4 mm² (20…12 AWG)
Wire Strip Length	0.39 in. (10 mm)			0.39 in. (10 mm)				0.28 in. (7 mm)			
Recommended Tightening Torque	6.2 lb•in (0.7 N•m)			4.5…7.1 lb•in (0.5…0.8 N•m)				4.5 lb•in (0.5 N•m)			
Density	49 pcs/ft (163 pcs/m)			59 pcs/ft (196 pcs/m)				49 pcs/ft (163 pcs/m)			
Housing Temperature Range	-58…+248 °F (-50…+120 °C)			-58…+248 °F (-50…+120 °C)				-58…+248 °F (-50…+120 °C)			
Short-Circuit Current Rating (SCCR)	See page 12-42										
Terminal Blocks	**Cat. No.**		**Pkg Qty.**	**Cat. No.**			**Pkg Qty.**	**Cat. No.**			**Pkg Qty.**
Color: Grey	**1492-J4Q**		50	1492-JD3C			100	**1492-JD4C**			100
Accessories	**Cat. No.**		**Pkg Qty.**	**Cat. No.**			**Pkg Qty.**	**Cat. No.**			**Pkg Qty.**
Mounting Rails: 1 m Symmetrical DIN (Steel)	**199-DR1**		10	**199-DR1**			10	**199-DR1**			10
1 m Symmetrical DIN (Aluminum)	**1492-DR5**		10	**1492-DR5**			10	**1492-DR5**			10
1 m Hi-Rise Sym. DIN (Aluminum)	**1492-DR6**		2	**1492-DR6**			2	**1492-DR6**			2
1 m Angled Hi-Rise Sym. DIN (Steel)	**1492-DR7**		2	**1492-DR7**			2	**1492-DR7**			2
End Barriers Grey	**1492-EBJ4Q**		50	**1492-EBJD3**			20	**1492-EBJD4**			20
Blue	—		—	**1492-EBJD3-B**			20	—			—
Yellow	**1492-EBJ4Q-Y**		50	**1492-EBJD3-Y**			20	—			—
End Anchors and Retainers: Screwless End Retainer	**1492-ERL35**		20	**1492-ERL35**			20	—			—
DIN Rail — Normal Duty	**1492-EAJ35**		100	**1492-EAJ35**			100	—			—
DIN Rail — Heavy Duty	**1492-EAHJ35**		50	**1492-EAHJ35**			50	**1492-EAHJ35**			50
Jumpers:* Screw Center Jumper — 41-pole	—		—	—			—	—			—
Screw Center Jumper — 10-pole	—		—	**1492-CJJ5-10**			20	—			—
Screw Center Jumper — 4-pole	—		—	**1492-CJJ5-4**			50	—			—
Screw Center Jumper — 3-pole	—		—	**1492-CJJ5-3**			50	—			—
Screw Center Jumper — 2-pole	—		—	**1492-CJJ5-2**			50	—			—
Plug-in Center Jumper — 41-Pole	**1492-CJLJ6-41**		10	—			—	**1492-CJLJ6-41**			10
Plug-in Center Jumper — 5-, 6-, 7-, 8-, 9-, 10-Pole	**1492-CJLJ6-10**		20	—			—	**1492-CJLJ6-10**			20
Plug-in Center Jumper — 2-, 3-, 4-Pole	**1492-CJLJ6-2**, -3, -4		60	—			—	**1492-CJLJ6-2**, -3, -4			60
Insulated Side Jumper — 24-Pole	—		—	**1492-SJ5A-24**			50	—			—
Insulated Side Jumper — 10-Pole	—		—	**1492-SJ5A-10**			50	—			—
Screw Type Jumper Notching Tool	—		—	**1492-T1**			1	—			—
Other Accessories: Partition Plate	—		—	**1492-PPJD3**			20	**1492-PPJD3**			20
Test Plug Socket	—		—	**1492-TPS23**			20	—			—
Test Plug	—		—	**1492-TP23**			20	—			—
Test Plug (Stackable)	—		—	—			—	—			—
Marking Systems: Snap-in marker card	**1492-MR6X12** (120/card)		5	**1492-M5X8** (144/card)			5	**1492-MR6X8** (120/card)			5
	1492-M6X12 (120/card)		5	**1492-M5X5** (200/card)			5	**1492-M6X5** (200/card)			5

* Use of center jumpers may affect spacings, requiring derating of terminal blocks; see page 12-83 for details.

12

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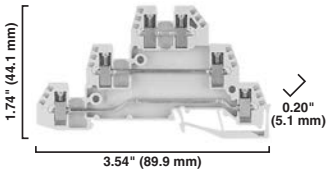
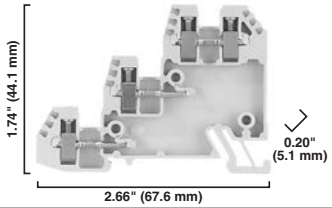
	1492-WTF3…			1492-WTS3…		
Dimensions are not intended to be used for manufacturing purposes. **Note:** Height dimension is measured from top of rail to top of terminal block.						
Specifications	*Three-circuit terminal block.*			*Three-level sensor block.*		
Certifications		CSA	IEC		CSA	IEC
Voltage Rating	300V AC/DC		250V AC/DC	300V AC/DC		250V AC/DC
Maximum Current	10 A		24 A	10 A		24 A
Wire Range (Rated Cross Section)	#26…14 AWG		0.5…2.5mm²	#26…14 AWG		0.5…2.5 mm²
Recommended Tightening Torque	4.2…4.6 lb•in (0.5 N•m)			4.2…4.6 lb•in (0.5 N•m)		
Density	60 pcs/ft (197 pcs/m)			60 pcs/ft (197 pcs/m)		
Housing Temperature Range	-40…+195 °F (-40…+90 °C)			-40…+195 °F (-40…+90 °C)		
Indicator Type WTF3/WTS3	No indicator			No indicator		
WTF3LP/WTS3LP	Red LED for PNP devices (10…50V)			Red LED for PNP devices (10…50V)		
WTF3LN/WTS3LN	Red LED for NPN devices (10…50V)			Red LED for NPN devices (10…50V)		
Leakage Current WTF3/WTS3	—			—		
WTF3LP/WTS3LP	2.69 mA @ 50V			2.69 mA @ 50V		
WTF3LN/WTS3LN	2.69 mA @ 50V			2.69 mA @ 50V		
Wire Strip Length	0.31 in. (8 mm)			0.31 in. (8 mm)		
Short-Circuit Current Rating	See page 12-42					

Terminal Blocks		**Cat. No.**	**Pkg Qty.**	**Cat. No.**	**Pkg Qty.**
Color:	Grey	**1492-WTF3**	50	**1492-WTS3**	50
	Blue	—	—	**1492-WTS3-B**	50
Grey for PNP devices		**1492-WTF3LP**	50	**1492-WTS3LP**	50
Grey for NPN devices		1492-WTF3LN	50	**1492-WTS3LN**	50

Accessories		**Cat. No.**	**Pkg Qty.**	**Cat. No.**	**Pkg Qty.**
Mounting Rails: 1 m Symmetrical DIN (Steel)		**199-DR1**	10	**199-DR1**	10
1 m Symmetrical DIN (Aluminum)		**1492-DR5**	10	**1492-DR5**	10
1 m Hi-Rise Sym. DIN (Aluminum)		**1492-DR6**	2	**1492-DR6**	2
1 m Angled Hi-Rise Sym. DIN (Steel)		**1492-DR7**	2	**1492-DR7**	2
End Barrier		**1492-EBTF3**	50	**1492-EBTS3**	50
End Anchors and Retainers: Screwless End Retainer		**1492-ERL35**	20	**1492-ERL35**	20
DIN Rail — Normal Duty		**1492-EAJ35**	100	**1492-EAJ35**	100
DIN Rail — Heavy Duty		**1492-EAHJ35**	50	**1492-EAHJ35**	50
Jumpers: Center Jumper — 50-pole		**1492-CJT5-50**	5	**1492-CJT5-50**	5
Center Jumper — 10-pole		**1492-CJT5-10**	10	**1492-CJT5-10**	10
Center Jumper — 3-pole		1492-CJT5-3	10	1492-CJT5-3	10
Center Jumper — 2-pole		**1492-CJT5-2**	10	**1492-CJT5-2**	10
Center Jumper Link		**1492-CJL5**	10	**1492-CJL5**	10
Center Jumper Cover — Red		**1492-CJCR5**	10	**1492-CJCR5**	10
Center Jumper Cover — Blue		**1492-CJCB5**	10	**1492-CJCB5**	10
Side — 20-pole Insulated Red		**1492-SJT5-20-R**	10	**1492-SJT5-20-R**	10
Side — 20-pole Insulated Blue		**1492-SJT5-20-B**	10	**1492-SJT5-20-B**	10
Other Accessories: Partition Plate		**1492-PPTS3**	50	**1492-PPTS3**	50
Test Plug Adapter		**1492-TA285**	10	**1492-TA285**	10
Electrical Warning Plate	4-Pole	1492-EWP5-4	10	1492-EWP5-4	10
	1-Pole	1492-EWP5	10	1492-EWP5	10
Marking Systems: Snap-in Marker Card		**1492-MS5X9** (80/card)	5	**1492-MS5X9** (80/card)	5

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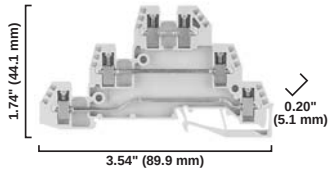
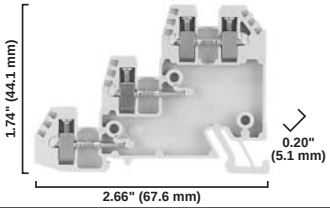
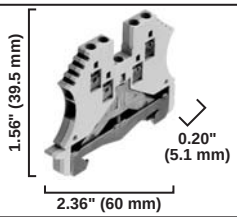
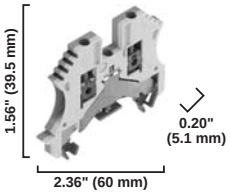
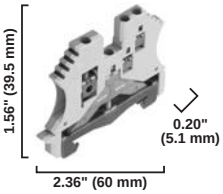
	1492-WTF3…			1492-WTS3…		
Dimensions are not intended to be used for manufacturing purposes. **Note:** Height dimension is measured from top of rail to top of terminal block.						
Specifications	*Three-circuit terminal block.*			*Three-level sensor block.*		
Certifications		**CSA**	**IEC**		**CSA**	**IEC**
Voltage Rating	300V AC/DC		250V AC/DC	300V AC/DC		250V AC/DC
Maximum Current	10 A		24 A	10 A		24 A
Wire Range (Rated Cross Section)	#26…14 AWG		0.5…2.5mm^2	#26…14 AWG		0.5…2.5 mm^2
Recommended Tightening Torque	4.2…4.6 lb•in (0.5 N•m)			4.2…4.6 lb•in (0.5 N•m)		
Density	60 pcs/ft (197 pcs/m)			60 pcs/ft (197 pcs/m)		
Housing Temperature Range	-40…+195 °F (-40…+90 °C)			-40…+195 °F (-40…+90 °C)		
Indicator Type WTF3/WTS3	No indicator			No indicator		
WTF3LP/WTS3LP	Red LED for PNP devices (10…50V)			Red LED for PNP devices (10…50V)		
WTF3LN/WTS3LN	Red LED for NPN devices (10…50V)			Red LED for NPN devices (10…50V)		
Leakage Current WTF3/WTS3	—			—		
WTF3LP/WTS3LP	2.69 mA @ 50V			2.69 mA @ 50V		
WTF3LN/WTS3LN	2.69 mA @ 50V			2.69 mA @ 50V		
Wire Strip Length	0.31 in. (8 mm)			0.31 in. (8 mm)		

	1492-JG2Q			1492-JG3				1492-JG3TW			
Dimensions are not intended to be used for manufacturing purposes. **Note:** Height dimension is measured from top of rail to top of terminal block.											
Specifications	*Feed-through grounding terminal block with 2 connection points on each side*			*Feed-through grounding terminal block*				*Feed-through grounding terminal block with 3 connection points, 2 on one side*			
Certifications		**CSA**	**IEC**		**CSA**	**IEC**	**ATEX**		**CSA**	**IEC**	**ATEX**
Voltage Rating	—	—	—	—	—	—	—	—	—	—	—
Maximum Current	Grounding			Grounding				Grounding			
Wire Range (Rated Cross Section)	#22…14 AWG		1.5 mm^2	#22…12 AWG		2.5 mm^2	2.5 mm^2 (#20…14 AWG)	Single Side: #22…12 AWG		2.5 mm^2	2.5 mm^2 (#20…14 AWG)
								Twin Side: #26…12 AWG		1.5 mm^2	1.5 mm^2 (#20…16 AWG)
Wire Strip Length	0.28 in. (7 mm)			0.39 in. (10 mm)				Single Side: 0.39 in. (10 mm) Twin Side: 0.28 in. (7 mm)			
Recommended Tightening Torque	5.0 lb•in (0.6 N•m)			7.1 lb•in (0.8 N•m)				Single Side: 7.1 lb•in (0.8 N•m)			
Mounting Torque — Center Screw	3.5…5.3 lb•in (0.4…0.6 N•m)			3.5…6.2 lb•in (0.4…0.6 N•m)				Twin Side: 4.5 lb•in (0.5 N•m)			
Density	59 pcs/ft (196 pcs/m)			59 pcs/ft (196 pcs/m)				59 pcs/ft (196 pcs/m)			
Housing Temperature Range	-58…+248 °F (-50…+120 °C)			-58…+248 °F (-50…+120 °C)				-58…+248 °F (-50…+120 °C)			

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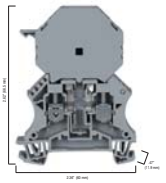
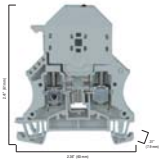
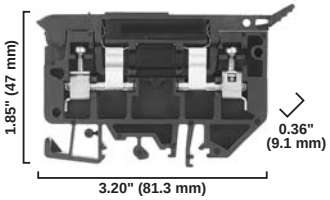
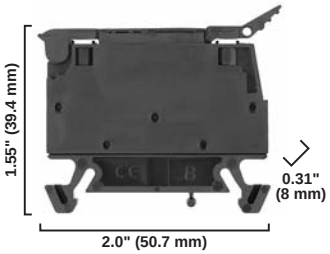
Fuse Blocks

		1492-J6FB1...			1492-J6FB2...		
Dimensions are not intended to be used for manufacturing purposes. **Note:** Height dimension is measured from top of rail to top of terminal block.							
Specifications		*Single-circuit fuse block with or without blown fuse indication*			*Single-circuit fuse block with or without blown fuse indication*		
Certifications		UL	**CSA**	**IEC**	UL	**CSA**	**IEC**
Voltage Rating	J6FB1/J6FB2	600V AC/DC		500V AC/DC	600V AC/DC		500V AC/DC
	J6FB124/J6FB224	10…36V AC/DC			10…36V AC/DC		
	J6FB148/J6FB248	30…70V AC/DC			30…70V AC/DC		
	J6FB1120/J6FB2120	60…150V AC/DC			60…150V AC/DC		
	J6FB1250/J6FB2250	100…250V AC/DC			100…250V AC/DC		
Maximum Current		10 A	16 A	6.3 A	10 A	10 A	6.3 A
Wire Range (Rated Cross Section)		#22…8 AWG	#20…8 AWG	6 mm^2	#22…8 AWG	#20…8 AWG	6 mm^2
Wire Strip Length		0.47 in. (12 mm)			0.47 in. (12 mm)		
Recommended Tightening Torque		10.6 lb•in (1.2 N•m)			14.2 lb•in (1.6 N•m)		
Density		25 pcs/ft (84 pcs/m)			38 pcs/ft (126 pcs/m)		
Housing Temperature Range		-58…+248 °F (-50…+120 °C)			-58…+248 °F (-50…+120 °C)		
Leakage Current		≤ 0.5 mA at Nominal Voltage			≤ 0.5 mA at Nominal Voltage		
Fuse Size (not supplied)		1/4 x 1-1/4 in.			5 x 20 mm		

		1492-H...			1492-WFB4...		
Dimensions are not intended to be used for manufacturing purposes. **Note:** Height dimension is measured from top of rail to top of terminal block.							
Specifications		*Single-circuit fusible terminal block with or without fuse indication.*			*Single-circuit fuse block with or without fuse indication.*		
Certifications		cULus	**CSA**	**IEC**	cULus	**CSA**	**IEC**
Voltage Rating	H6/WFB4	300V AC/DC		500V AC/DC	300V AC/DC		500V AC/DC
	H5/WFB424	10…57V AC/DC			10…57V AC/DC		
	H4/WFB4250	100…300V AC			85…264V AC		
Maximum Current		15 A			15 A		15 A ★
Wire Range (Rated Cross Section)		#30…12 AWG		0.5… 4 mm^2	#30…12 AWG		0.5…4 mm^2
Wire Strip Length		0.38 in. (9.7 mm)			0.31 in. (8 mm)		
Recommended Tightening Torque		7.1 lb•in (0.8 N•m)			2.65…5.3 lb•in (0.3…0.6 N•m)		
Density		33 pcs/ft (109pcs /m)			38 pcs/ft (125 pcs/m)		
Housing Temperature Range		-40…+195 °F (-40…+90 °C)			-40…+195 °F (-40…+90 °C)		
Indicator Type							
H6/WFB4		Non-Indicating			Non-Indicating		
H5/WFB424		Red LED			Red LED		
H4/WFB4250		Neon			Neon		
Leakage Current							
H6/WFB4		—			—		
H5/WFB424		2 mA @ 24V			2 mA @ 24V		
H4/WFB4250		2 mA @ 300V			2 mA @ 300V		
Fuse Size (Not Supplied)		1/4 x 1-1/4 in.			5 x 20 mm		

Short-Circuit Current Ratings
Fuse Ratings

Cat. No.	Wire Range Cu [AWG]		Overcurrent Protection Fuse Required Class/Max. Current Rating [A]						Maximum Voltage [V]	SCCR, RMS SYM [A]
	Line	Load	J	T	RK1	RK5	G	CC		
1492-J3	14…12	14…12	30	30	—	—	30	30	600	100,000
1492-J3P										
1492-JD3SS										
1492-JD3										
1492-JD3C										
1492-JG3TW										
1492-JDG3C										
1492-JG3										
1492-J3F	14…12	14…12	30	30	—	—	30	30	300	100,000
1492-J3TW										
1492-JC3										
1492-JDC3										
1492-JKD3										
1492-JD3FB										
1492-JD3F										
1492-JDG3FB										
1492-JD3PSSTP										
1492-JD3PTP										
1492-JDG3P										
1492-JDG3PSS										
1492-JDG3PSSTP										
1492-JDG3PTP										
1492-JDG3										
1492-JD3PSS										
1492-JD3P										
1492-J4	14…10	14…10	60	60	30	—	60	30	600	100,000
1492-JG4										
1492-JKD4										
1492-J4TW										
1492-J4Q										
1492-JG4TW										
1492-JG4Q										
1492-JKD4TW										
1492-JKD4Q										
1492-JKD4TP										
1492-JD4C										
1492-JD4										
1492-JKD4QTP										
1492-JKD4TWTP										
1492-JSD4	14…10	14…10	60	60	30	—	60	30	300	100,000
1492-JKD4										
1492-J4CTB										
1492-J6	14…8	14…8	100	100	60	30	60	30	600	100,000
1492-JG6										
1492-J10	14…6	14…6	100	100	60	30	60	30	600	100,000
1492-JG10										
1492-J16	14…4	14…4	100	100	60	30	60	30	600	100,000
1492-JG16										
1492-J16ND										
1492-J35	12…1/0	12…1/0	200	200	100	30	60	30	600	100,000
1492-JG35										
1492-J50	6…1/0	6…1/0	200	200	100	30	60	30	600	100,000
1492-JG50										
1492-J70	1/0...3/0	1/0...3/0	400	400	200	100	60	30	600	100,000
1492-JG70										
1492-J120	4…4/0	4…4/0	400	400	200	100	60	30	600	100,000
1492-JG120										

Overcurrent Ratings

Cat. No.	Wire Range Cu [AWG] (Line and Load)	Overcurrent Protection Device Required	Max. Current [A]	SCCR, RMS Sym A 480Y/277V	SCCR, RMS Sym. A 600Y/347V
1492-J3	14…12	140M-D8E-__	16	65,000	30,000
1492-JG3TW		140M-C2E-B10		65,000	30,000
1492-J3P		140M-C2E-B16		65,000	30,000
1492-J3		140M-C2E-B25		65,000	30,000
1492-JD3		140M-C2E-B40		65,000	25,000
1492-JD3C		140M-C2E-B63		65,000	★
1492-JD3SS		140M-C2E-A__		65,000	30,000
1492-JDG3C		140M-C2E-C10		65,000	★
1492-JG3		140MC2E-C16		30,000	★
1492-J4	14…10	140M-F8E-__	32	65,000	30,000
1492-JG4		140M-D8E-C10		65,000	30,000
1492-J4TW		140M-D8E-C16		65,000	30,000
1492-J4Q		140M-D8E-C20		65,000	★
1492-JG4TW		140M-D8E-C25		30,000	★
1492-JG4Q		140M-D8E-B__		65,000	30,000
1492-JKD4TW		140M-C2E-B10		65,000	30,000
1492-JKD4Q		140M-C2E-B16		65,000	30,000
1492-JKD4TP		140M-C2E-B25		65,000	30,000
1492-JD4C		140M-C2E-B40		65,000	25,000
1492-JD4		140M-C2E-B63		65,000	★
1492-JKD4QTP		140M-C2E-C10		65,000	★
1492-JKD4TWTP		140M-C2E-C16		30,000	★
		140M-C2E-A__		65,000	30,000
1492-J6	14…8	140M-F8E-__	32	65,000	30,000
1492-JG6		140M-D8E-C10		65,000	30,000
		140M-D8E-C16		65,000	30,000
		140M-D8E-C20		65,000	★
		140M-D8E-C25		30,000	★
		140M-D8E-B__		65,000	30,000
		140M-C2E-B10		65,000	30,000
		140M-C2E-B16		65,000	30,000
		140M-C2E-B25		65,000	30,000
		140M-C2E-B40		65,000	25,000
		140M-C2E-B63		65,000	★
		140M-C2E-C10		65,000	★
		140M-C2E-C16		30,000	★
		140M-C2E-A__		65,000	30,000

★ Bulletin 140M does not have ratings at this voltage.

Cat. No.	Wire Range Cu [AWG] (Line and Load)	Overcurrent Protection Device Required	Max. Current [A]	SCCR, RMS Sym A 480Y/277V	SCCR, RMS Sym. A 300V+
1492-J3TW	14…12	140M-D8E-__	16	65,000	30,000
1492-JC3		140M-C2E-B10		65,000	30,000
1492-JDC3		140M-C2E-B16		65,000	30,000
1492-J3F		140M-C2E-B25		65,000	30,000
1492-JD3F		140M-C2E-B40		65,000	25,000
1492-JKD3		140M-C2E-B63		65,000	★
1492-JD3FB		140M-C2E-A__		65,000	30,000
1492-JDG3FB		140M-C2E-C10		65,000	★
1492-JD3PSSTP		140MC2E-C16		30,000	★
1492-JD3PTP					
1492-JDG3P					
1492-JDG3PSS					
1492-JDG3PSSTP					
1492-JDG3PTP					
1492-JDG3					
1492-JD3P					
1492-JD3PSS					
1492-JKD4	14…10	140M-F8E-__	32	65,000	30,000
1492-JSD4		140M-D8E-C10		65,000	30,000
1492-J4CTB		140M-D8E-C16		65,000	30,000
		140M-D8E-C20		65,000	★
		140M-D8E-C25		30,000	★
		140M-D8E-B__		65,000	30,000
		140M-C2E-B10		65,000	30,000
		140M-C2E-B16		65,000	30,000
		140M-C2E-B25		65,000	30,000
		140M-C2E-B40		65,000	25,000
		140M-C2E-B63		65,000	★
		140M-C2E-C10		65,000	★
		140M-C2E-C16		30,000	★
		140M-C2E-A__		65,000	30,000

Cat. No.	Wire Range Cu [AWG] (Line and Load)	Overcurrent Protection Device Required	Max. Current [A]	SCCR, RMS Sym A 480V+	SCCR, RMS Sym. A 600Y 347V+
1492-J10	14…10	140M-H8P-__	50	50,000	30,000
1492-JG10					
1492-J16	14…4	140M-H8P-__	100	30,000	30,000
1492-JG16					
1492-J16ND					
1492-J35	12…2	140M-H8P-__	100	50,000	30,000
1492-JG35					
1492-J50	2…1/0	140M-H8P-__	150	65,000	30,000
1492-JG50					

Cat. No.	Wire Range Cu [AWG] (Line and Load)	Overcurrent Protection Device Required	Max. Current [A]	SCCR, RMS Sym A 480V+	SCCR, RMS Sym. A 600V+
1492-J70	4…1/0	140U-J0X3	175	65,000	★
	1/0	140U-J0X3		★	30,000
1492-J120	2…3/0	140U-J0X3	228	65,000	30,000

★ Bulletin 140M does not have ratings at this voltage.
+ Voltage terminal block was tested at for respective SCCR

Allen-Bradley spring-clamp terminal blocks generally have been designed to meet the requirements of one or more regulatory bodies. Most products have also been tested per additional standards. The following is a listing of some of the regulatory bodies and standards which apply to Allen-Bradley spring-clamp terminal block products. See the particular product description for information on specific certifications and ratings.

(Underwriters Laboratories) — Allen-Bradley spring-clamp terminal blocks with one of these ratings have been tested by Underwriters Laboratories and meet the requirements of one or more of the following United States Standards:

- UL 486E — Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
- UL 1059 — Standard for Terminal Blocks

Reference UL file E40735

(Underwriters Laboratories) — Allen-Bradley spring-clamp terminal blocks with this rating have been tested by Underwriters Laboratories and meet the requirements of one or more of the following Canadian Standards:

- CSA 22.2 No. 158 — Terminal Blocks

Reference UL file E40735

(Canadian Standards Association) — Allen-Bradley spring-clamp terminal blocks with this rating have been tested by the Canadian Standards Association and meet the requirements of the following Canadian Standard:

- CSA 22.2 No. 158 — Terminal Blocks

Reference CSA files 677896

Allen-Bradley spring-clamp terminal blocks listed in this catalog meet the requirements of the Low Voltage Directive put forth by the European Union. Devices have been tested and comply with one or more of the following European Norms:

- EN 60947-1 — Low Voltage Switchgear and Controlgear: General Rules
- EN 60947-7-1 — Low Voltage Switchgear and Controlgear: Terminal Blocks for Copper Conductors
- EN 60947-7-2 — Low Voltage Switchgear and Controlgear: Protective Conductor Terminal Blocks for Copper Conductors
- EN 60947-7-3 — Low Voltage Switchgear and Controlgear: Safety Requirements for Fuse Terminal Blocks

ATEX — Devices listed in this catalog with “ATEX” ratings meet the following European Norms per DEMKO or KEMA, Approval Certification Bodies for the European Union:

- EN 60079-0 — Electrical Apparatus for Potentially Explosive Atmospheres — General Requirements
- EN 60079-7 — Electrical Apparatus for Potentially Explosive Atmospheres — Increased Safety “e”

Contact your local Allen-Bradley distributor for a copy of the certificate.

Ex e II — Bulletin 1492-L terminal blocks in this catalog meet the following Canadian Standards per Underwriters Laboratories:

- CAN/CSA E60079-7 — Electrical Apparatus for Explosive Atmospheres — Part 0 — General Requirements
- CAN/CSA E60079-0 — Electrical Apparatus for Explosive Atmospheres — Part 7 — Increased Safety “e”

These products are suitable for Class I, Zone 1 Hazardous Locations. Reference UL file E187022. Contact your local Allen-Bradley distributor for more information.

AEx e II — Allen-Bradley spring-clamp terminal blocks with an “AEx e II” rating meet the following United States Standard per Underwriters Laboratories:

- UL 2279 — Standard for Electrical Equipment for Use in Class I, Zone 0, 1, and 2 Hazardous (Classified) Locations

These products are suitable for Class I, Zone 1 Hazardous Locations. Reference UL file E187022. Contact your local Allen-Bradley distributor for more information.

Lloyd’s Register — Bulletin 1492-L terminal blocks in this catalog have been certified for use in marine, off-shore, and industrial installations per the following standard:

- Lloyd’s Register Test Specification No. 1:1996

Contact your local Allen-Bradley distributor for a copy of the certificate.

The Allen-Bradley Line of Spring-Clamp Terminal Blocks…

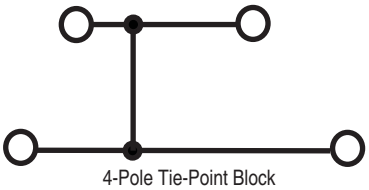
The Bulletin 1492-L line of internationally approved spring-clamp IEC-style terminal blocks offers a variety of products that can make any application:

- Fast — Reduces wiring time by more than 50%
- Practical — Requires only a flat-head screwdriver for easy installation. Maintenance-free, no need to retighten
- Reliable — Secure contact is durable under extreme conditions such as high-vibration applications

Products Available in the 1492-L Spring-Clamp Line

- **Feed-Through Blocks**, accommodating wire sizes from #30…#2 AWG (0.2…35 mm^2)
- **Grounding Blocks** for grounding a given circuit to the DIN Rail
- **Multi-Circuit Blocks** for doubling circuit wiring density
- **Isolation Blocks** for circuit isolation during testing and troubleshooting
- **Plug-In Style Terminal Blocks** accommodating component plugs, fuse plugs, and disconnect plugs
- **Sensor Blocks** for coordination of three-wire sensor groups with or without ground terminations
- **Electrical Component Blocks** which allow for the insertion of fixed components into control circuits. Components include diodes and surge suppression circuits

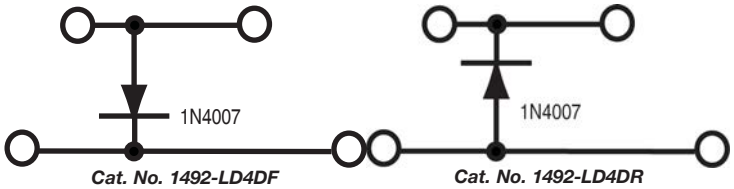
Tie-Point Block (Cat. Nos. 1492-LD2C, LD3C, LD4C)



4-Pole Tie-Point Block

Diode Block (Cat. Nos. 1492-LD4DF, 1492-LD4DR)

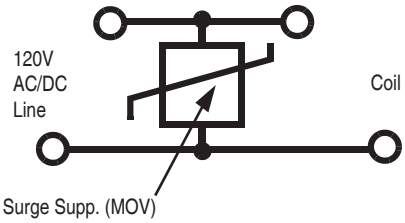
Uses a 1N4007 diode between the upper and lower levels for insertion into a control circuit. This block is useful in low voltage DC control circuits for directioning and suppression.



Cat. No. 1492-LD4DF *Cat. No. 1492-LD4DR*

Surge Suppression Block (Cat. No. 1492-LD4SS)

Provides a convenient means of incorporating transient suppression for relays, contactors and solenoids into a control system.



- **Test Blocks** for allowing a bank of pluggable terminal strips to be easily connected for test purposes
- A wide variety of snap-in markers are available for individual or group circuit identification
- A broad offering of accessories such as screwless end retainers, electrical warning plates, end barriers, protective stops and test plugs to provide exactly what the application requires
- Operating instructions (printed on an adhesive label), for fixing inside a panel
- **Mini-blocks** available in rail-mount or panel-mount configurations

Materials and Design Features

The 1492-L line is specially designed for safety, installation ease, and ruggedness. Features include:

- Tin-plated terminals and stainless steel spring clamps for resistance to corrosion and vibration
- Spring clamp design to minimize stress relaxation and maintain contact force, even under vibration
- Top wire entry for ease of installation
- Circuit testing with standard 2 mm diameter test probe or stackable test plugs on most spring-clamp blocks
- Insulation stops to ensure electrical connection when using smaller gauge wires
- Markers that are visible after terminal blocks are wired
- Multiple marking options
- Common profiles to minimize stocking of accessories
- Self-extinguishing, polymide 6.6 housing materials with a flammability rating UL 94-V0 (1492-R terminal blocks have a UL 94-V2 flammability rating)
- Screwless center jumpers to simplify jumpering terminals together

Note: To ensure proper wire termination, these blocks are designed to accept only **one** wire per terminal.

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End Barriers

End barriers are required to provide the necessary insulation for the last terminal block in a group.

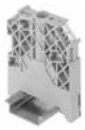
Dimensions Width x Length x Height	For Use With	Color	Pkg Qty.	Cat. No.
0.08 x 1.14 x 2.03 in. (2 x 28.9 x 51.5 mm)	1492-L2, LG2	Grey	50	**1492-EBL2**
		Blue	50	**1492-EBL2-B**
		Yellow	50	**1492-EBL2-Y**
0.08 x 1.14 x 2.48 in. (2 x 28.9 x 63 mm)	1492-L2T, LG2T	Grey	50	**1492-EBL2T**
		Blue	50	1492-EBL2T-B
		Yellow	50	**1492-EBL2T-Y**
0.08 x 1.14 x 2.95 in. (2 x 28.9 x 75 mm)	1492-L2Q, LG2Q	Grey	50	**1492-EBL2Q**
		Blue	50	**1492-EBL2Q-B**
		Yellow	50	1492-EBL2Q-Y
0.08 x 1.15 x 2.34 in. (2 x 29.1 x 59.5 mm)	1492-L3, LG3, LKD3, L3P	Grey	50	**1492-EBL3**
		Blue	50	**1492-EBL3-B**
		Yellow	50	**1492-EBL3-Y**
0.08 x 1.20 x 2.54 in. (2 x 30.6 x 64.5 mm)	1492-L3T, LG3T	Grey	50	**1492-EBL3T**
		Blue	50	**1492-EBL3T-B**
		Yellow	50	**1492-EBL3T-Y**
0.08 x 1.20 x 3.11 in. (2 x 30.6 x 79 mm)	1492-L3Q, L3QS, LG3Q	Grey	50	**1492-EBL3Q**
		Blue	50	**1492-EBL3Q-B**
		Yellow	50	**1492-EBL3Q-Y**
0.10 x 1.06 x 2.8 in. (2.5 x 27 x 71 mm)	1492-L31P, 1492-LG31P	Yellow	50	1492-EBL31P-Y
	1492-L3T1P, 1492-LG3T1P	Grey	50	1492-EBL3T1P
		Yellow	50	1492-EBL3T1P-Y
0.08 x 1.20 x 3.11 in. (2 x 30.6 x 79 mm)	1492-L3Q2P	Grey	50	1492-EBL3Q2P
0.10 x 1.76 x 3.17 in. (2.5 X 44.7 x 80.5)	1492-LD32P	Grey	50	1492-EBLD32P
0.08 x 1.37 x 2.44 in. (2 x 34.85 x 62 mm)	1492-L4, LG4	Grey	50	**1492-EBL4**
		Blue	50	**1492-EBL4-B**
		Yellow	50	**1492-EBL4-Y**
0.08 x 1.37 x 3.31 in. (2 x 34.85 x 84 mm)	1492-L4T, LG4T	Grey	50	**1492-EBL4T**
		Blue	50	1492-EBL4T-B
		Yellow	50	1492-EBL4T-Y
0.08 x 1.37 x 4.13 in. (2 x 34.85 x 105 mm)	1492-L4Q, LG4Q	Grey	50	**1492-EBL4Q**
		Blue	50	1492-EBL4Q-B
		Yellow	50	**1492-EBL4Q-Y**
0.08 x 1.45 x 2.56 in. (2 x 36.95 x 65 mm)	1492-L6, LG6	Grey	50	**1492-EBL6**
		Blue	50	1492-EBL6-B
		Yellow	50	**1492-EBL6-Y**
0.08 x 1.45 x 3.54 in. (2 x 36.95 x 90 mm)	1492-L6T, LG6T	Grey	50	**1492-EBL6T**
		Blue	50	1492-EBL6T-B
		Yellow	50	**1492-EBL6T-Y**
0.12 x 1.67 x 2.89 in. (3 x 42.5 x 73.5 mm)	1492-L10, LG10	Grey	20	**1492-EBL10**
		Blue	20	1492-EBL10-B
		Yellow	20	**1492-EBL10-Y**
0.12 x 1.71 x 3.25 in. (3 x 43.5 x 82.5 mm)	1492-L16, LG16	Grey	20	**1492-EBL16**
		Blue	20	1492-EBL16-B
		Yellow	20	**1492-EBL16-Y**
—	1492-LAFB6	Black	50	**1492-EBLAFB6**
0.08 x 1.65 x 2.95 in. (2 x 41.9 x 75 mm)	1492-LD2, LDG2, LD2C, LDG2C	Grey	50	**1492-EBLD2**
		Blue	20	1492-EBLD2-B
		Yellow	20	1492-EBLD2-Y
0.08 x 1.87 x 2.85 in. (2 x 47.5 x 72.5 mm)	1492-LD3, LD3C, LDG3, LDG3C	Grey	20	**1492-EBLD3**
		Blue	20	1492-EBLD3-B
		Yellow	20	**1492-EBLD3-Y**
0.08 x 2.05 x 2.99 in. (2 x 52 x 76 mm)	1492-LD4, LD4C, LDG4, LDG4C, LD4DF, LD4DR, LD4RB…, LD4SS	Grey	20	**1492-EBLD4**
		Blue	20	**1492-EBLD4-B**
		Yellow	20	1492-EBLD4-Y

End Barriers

Dimensions Width x Length x Height	For Use With	Color	Pkg Qty.	Cat. No.
0.20 x 0.94 x 1.31 in. (5.1 x 23.8 x 33.3 mm)	1492-LMP3, LMP3Q	Grey	50	**1492-EBLMP3**
		Blue	50	1492-EBLMP3-B
0.20 x 0.94 x 1.31 in. (5.1 x 23.8 x 33.3 mm)	1492-LM3, LM3Q, LMG3, LMP3E, LMP3QE	Grey	50	**1492-EBLM3**
0.06 x 0.97 x 1.38 in. (1.5 x 24.65 x 35 mm)	1492-LMJ3, LMJG3	Grey	50	**1492-EBLMJ3**
		Blue	50	1492-EBLMJ3-B
		Yellow	50	1492-EBLMJ3-Y
0.06 x 2.32 x 4.35 in. (1.5 x 59 x 110.5 mm)	1492-LTF3	Grey	20	**1492-EBLTF3**
0.06 x 2.69 x 1.77 in. (5 x 68.5 x 45 mm)	1492-LS2-3, LS2-3L, LSG2-3		50	**1492-EBLS2-3**
0.20 x 3.2 x 1.77 in. (5 x 81.5 x 45 mm)	1492-LS2-4, LS2-4L, LSG2-4		50	**1492-EBLS2-4**
0.06 x 1.81 x 3.74 in. (1.5 x 46 x 95 mm)	1492-LDAG3, LDG3P		20	**1492-EBLDAG3**
0.10 x 1.04 x 1.81 in. (2.5 x 26.4 x 46 mm)	1492-LC3		20	**1492-EBLC3**
0.10 x 1.65 x 2.72 in. (2.5 x 41.85 x 69 mm)	1492-LDC3		20	1492-EBLDC3
—	1492-LDG3ND, LD3N, LDG3N	Grey	20	**1492-BSPJLD3N**
—	1492-LDG3ND, LD3N, LDG3N	Blue	20	1492-BSPJLD3N-B

End Anchor/End Retainers

End anchors and end retainers mount at both ends of a group of terminal blocks to add rigidity to the terminal assembly and prevent sliding along the rails.

Photo	Dimensions Width x Length x Height	Tightening Torque	Markers	For Use With	Color	Pkg Qty.	Cat. No.
	0.31 x 2.20 x 1.85 in. (8 x 56 x 47 mm)	4.4 lb•in (0.5 N•m)	1492-M7X12 1492-M8X5	199-DR1, 199-DR2, 1492-DR4, 1492-DR5, 1492-DR6, 1492-DR7, 1492-DR8, 1492-DR9	Grey	100	**1492-EAJ35**
	0.48 x 2.20 x 2.48 in. (12.2 x 56 x 63 mm)	4.4 lb•in (0.5 N•m)	1492-M7X12 1492-M5X5	199-DR1, 199-DR2, 1492-DR4, 1492-DR5, 1492-DR6, 1492-DR7, 1492-DR8, 1492-DR9	Grey	50	**1492-EAHJ35**
	0.31 x 1.06 x 1.06 in. (8 x 27 x 27 mm)	3.5 lb•in (0.9 N•m)	1492-M5X5	1492-DR3	Grey	50	**1492-EAJ15**
	0.24 x 2.19 x 1.63 in. (6 x 55.6 x 41.5 mm)	—	1492-M5X10 1492-M5X5	199-DR1, 199-DR2, 1492-DR4, 1492-DR5, 1492-DR6, 1492-DR7, 1492-DR8, 1492-DR9	Grey	20	**1492-ERL35**
	0.20 x 0.96 x 0.75 in. (5 x 24.5 x 19 mm)	—	1492-M5X10 1492-M5X5	1492-DR3	Grey	20	**1492-ERL15**

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Publication 1492-TD015A-EN-P - August 2014

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CONTROL CIRCUIT AND LOAD PROTECTION DEVICES

TECHNICAL DATA

Rockwell Automation has Short Circuit Current Ratings on the list of products below per the specific UL Standard and Category Code.

BULLETIN 1489
BULLETIN 1492-CB
BULLETIN 1492-FB
BULLETIN 1492-GH
BULLETIN 1492-GS
BULLETIN 1492-MC
BULLETIN 1492-SP

These ratings are included in the UL acceptance file of the device and summarized on the UL Certification site per the Category Code for the specific product.

SHORT CIRCUIT CURRENT RATINGS

Per the requirements of the 2005 National Electric Code (NEC) and UL508A (effective April 25, 2006), many electrical panels must be rated for their Short Circuit Withstand Rating. Analyzing the SCCR of individual components, and the associated branch and feeder overcurrent devices is a method of determining the SCCR of an electrical assembly.

UL Standard 508A permits these devices to have a SCCR without any additional testing.

Device	SCCR
Circuit Breaker	5 kA
Circuit Breaker With GFCI	5 kA
Fuse Holder	10 kA
Supplementary Protector	200 A

The Allen-Bradley products far exceed those ratings (see page 2).

UL489 CIRCUIT BREAKERS – CAT. CODE DIVQ

UL 508 MANUAL MOTOR STARTERS – CAT. CODE NLRV

UL 1077 SUPPLEMENTARY PROTECTORS – CAT. CODE QVNU2

UL512 FUSE HOLDERS – CAT. CODE IZLT

STANDARD PRODUCT

Rockwell Automation has tested a number of the 1492-PD Power Terminal blocks to determine their SCCR related to the new testing requirements. These are the standard Power Terminal Blocks that have been used in Industrial Control Panels.

The new ratings for these blocks permit their continued use in panels where the higher SCCR ratings are required.

HIGH FAULT SCCR RATINGS – UP TO 200,000 A
CERTIFIED TO UL REQUIREMENTS
STANDARD PRODUCTS

Bulletin Number	Notes	UL508A Category Code	UL File Number	Poles	Current Rating	Max Voltage	SCCR	Application code/notes
1489	Circuit Breaker	DIVQ	E197878	1 pole	0.5 - 25(a) A	277 VAC	10 kA	----
					30 - 40 A	240 VAC		
				2, 3 pole	0.5 - 25(a) A	480Y/277 VAC		
					30 - 40 A	240 VAC		
1492-CB	When used as UL508 Manual Motor Controller	NLRV	E14841	1 pole	0.5 - 52A	277 VAC	5 kA	----
				2, 3 pole		480Y/277 VAC		
	Supplementary Protector	QVNU2	E65138	1, 2, 3 pole 1 + N pole 3 + N pole	0.5 - 50 A	125 VAC	10 kA	U2
						240 VAC	5 kA	U2
						480Y/277 VAC	3 kA	U2
						480Y/277 VAC	5 kA	U1
1492-FB	Fuse holder	IZLT	E34648	1, 2, 3 pole	0.1 - 30 A	1492-FB	200 kA (*)	Type CC & J (*) Interrupt rating of fuse
					35 - 60 A			Type J (*) Interrupt rating of fuse
					0.1 - 30 A		(*)	Type M (*) Interrupt rating of fuse
1492-GH	Supplementary Protector	QVNU2	E65138	1 pole	0.2 - 15 A	250 VAC	1 kA	U1
1492-GS	Supplementary Protector	QVNU2	E65138	1 pole	0.2 - 16 A	277 VAC	5 kA	C1
					20 - 25 A		3 kA	C1
					0.2 - 5 A		400 A	U1
					6 - 25 A		800 A	U1
				2, 3 pole	0.2 - 16 A	480Y/277 VAC	5 kA	C1
					20 - 25 A		3 kA	C1
					0.2 - 5 A		400 A	U1
					6 - 25 A		500 A	U1
1492-MC	Circuit Breaker	DIVQ	E197878	1, 2 pole	10 - 60 A	120/240 VAC	10 kA	1492-MCAAnnn
					70 - 100 A			1492-MCBAnnn
				2 pole	15 - 30 A	240 VAC		1492-MCAA2Hnn
					40 - 100 A			1492-MCBA2Hnn
				3 pole	15 - 30 A	240 VAC		1492-MCAA3nn
					40 - 100 A			1492-MCBA3nn
				1 pole	15 - 100 A	120 VAC	65 kA	1492-MCCA1nn
						277 VAC	14 kA	
				2 pole		240 VAC	65 kA	1492-MCCA2nn
						480Y/277 VAC	14 kA	
	Circuit Breaker with Ground Fault GFCI and GFEP			1 pole	15 - 50 A	120VAC	10 kA	1492-MCGA1nn 1492-MCEA1nn
				2 pole	15 - 50 A	120/240 VAC		1492-MCGA2nn 1492-MCEA2nn
1492-SP	Supplementary Protector	QVNU2	E65138	1 pole 1 + N pole	0.5 - 35 A	277 VAC	10 kA	U2 - B or C trip
					40 - 63 A		5 kA	U2 - B or C trip
					0.5 - 40 A		5 kA	U2 - D trip
				2, 3 pole 3 + N pole	0.5 - 35 A	480Y/277 VAC	10 kA	U2 - B or C trip
					40 - 63 A		5 kA	U2 - B or C trip
					0.5 - 40 A		5 kA	U2 - D trip

(a) Indicates 25 A @ 480Y/277 available November 2006

C1 Indicates that the short-circuit test was conducted with series overcurrent protection that is no greater than 400% of Supplementary Protector or 15 A whichever is greater. Indicates that a recalibration and dielectric test was not conducted as part of the short-circuit test.

U1 Indicates that the short-circuit test was conducted without series overcurrent protection. Indicates that a recalibration and dielectric test was not conducted as part of the short-circuit test.

U2 Indicates that the short-circuit test was conducted without series overcurrent protection. Indicates that a recalibration and dielectric test was conducted as part of the short-circuit test.

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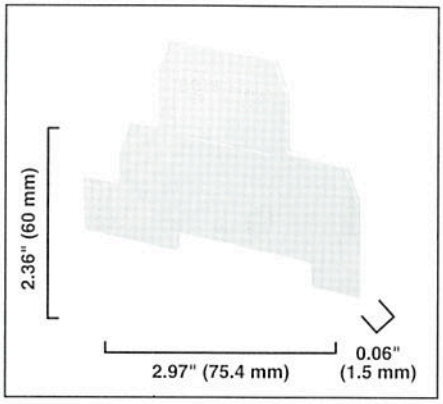
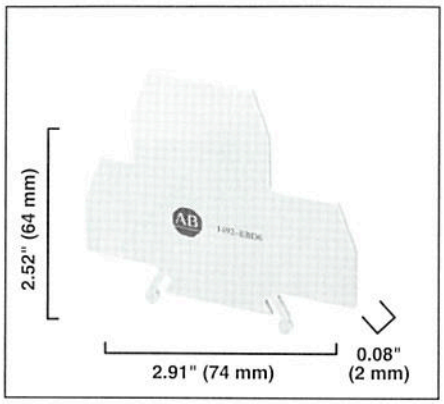
IEC, Continued

1492-EBD4P



1492-EBD6



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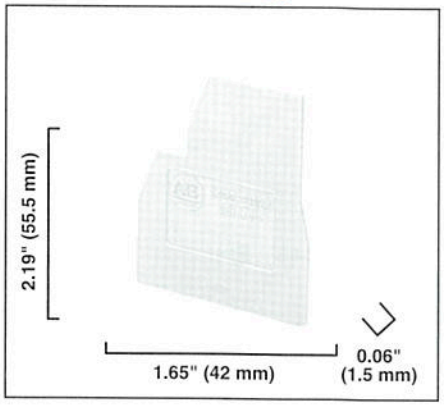
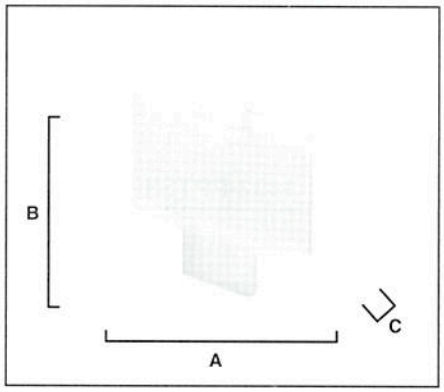


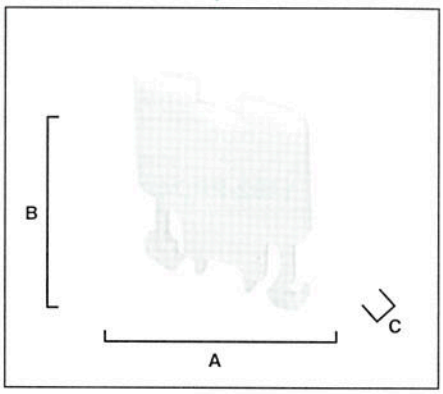
NEMA/EEMAC

1492-NM16, 1492-NM16BL, 1492-NM16GL, 1492-NM36



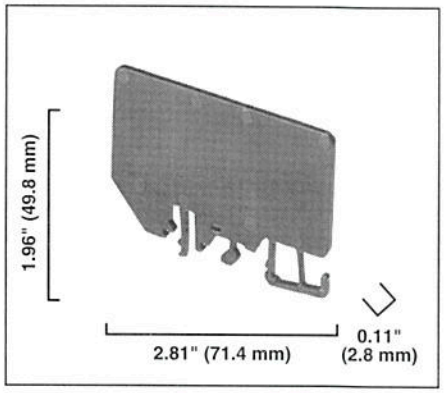
Cat. No.	A	B	C
1492-NM16	1.50" (38.1 mm)	1.39" (35.3 mm)	0.07" (1.78 mm)
1492-NM16BL	1.50" (38.1 mm)	1.39" (35.3 mm)	0.07" (1.78 mm)
1492-NM16GL	1.50" (38.1 mm)	1.39" (35.3 mm)	0.07" (1.78 mm)
1492-NM36	1.56" (39.6 mm)	1.45" (36.8 mm)	0.07" (1.78 mm)

1492-N16, 1492-N17, 1492-N18, 1492-N36

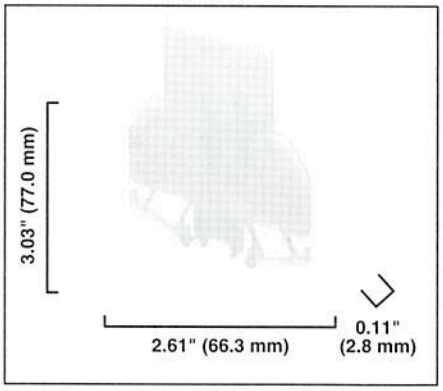


Cat. No.	A	B	C
1492-N16	1.50" (38.1 mm)	1.78" (45.2 mm)	0.11" (2.8 mm)
1492-N17	1.75" (44.5 mm)	2" (50.8 mm)	0.14" (3.6 mm)
1492-N18	1.25" (31.8 mm)	1.13" (28.7 mm)	0.11" (2.8 mm)
1492-N36	1.56" (39.6 mm)	1.68" (42.5 mm)	0.11" (2.8 mm)

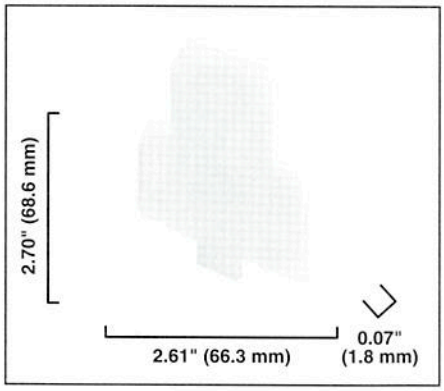
1492-N37



1492-N40



1492-NM40



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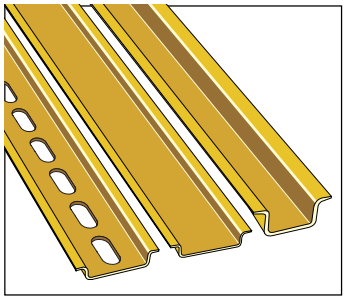
Mounting rails
Symmetrical - DIN 3



These rails are often used as grounding bars. The current carrying capacity of these rails and the copper wire sizes required to carry that current are given below.

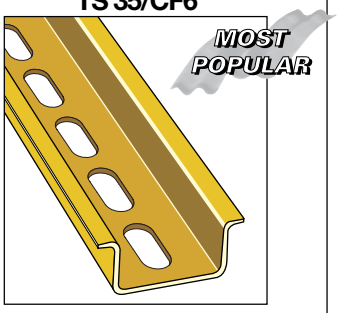
RAIL CURRENT CARRYING CAPACITY

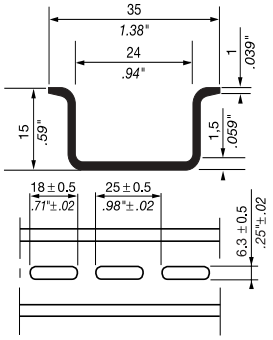
Rail	Material	Current (A)	Wire size AWG	Wire size mm²
TS 35/CF6	Steel	125	4	25
TS 35/C1	Steel	143	2	35
TS 35/C	Steel	125	4	25
TS 35/C ALU	Aluminum	265	000	95
High rail 90°	Steel	65	8	10
High rail 30°	Steel	65	8	10

All rails are in compliance with EN 50022 standard (DIN 46277-3 - NFC 63015) DIN 3.

Tolerances are ± unless otherwise noted.

TS 35/CF6





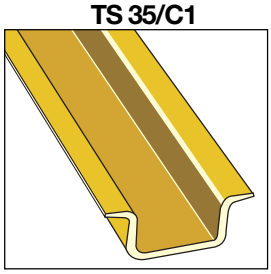
Type	P/N
PR5 (TS 35/CF6)	**0101 598.26**

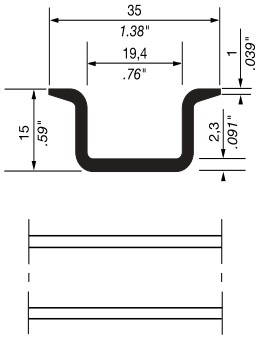
Zinc bichromate plated steel, prepunched length 2 m 6'6" (78") approx. The length and prepunched cut out dimensions are approximate.

Type	P/N
PR5 (TS 35/CF6)	**0101 509.05**

Length 1 m 3'3" (39") approx.

TS 35/C1





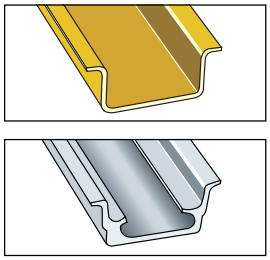
Type	P/N
PR4 (TS 35/C1)	**0168 500.12**

Zinc bichromate plated steel. Length 2 m 6'6" (78") approx.

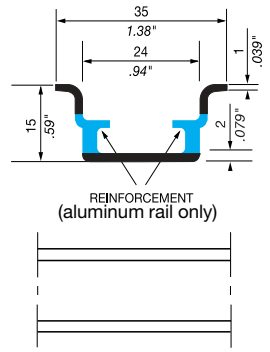
Type	P/N
PR4 (TS 35/C1)	**0101 517.14**

Length 1 m 3'3" (39") approx.

TS 35/C



TS 35/C ALU



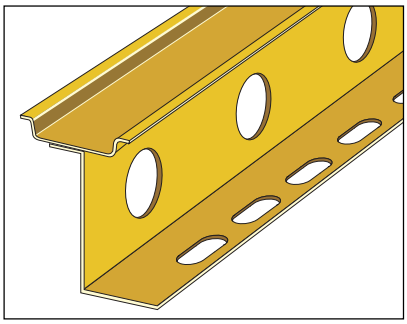
Type	P/N
PR5 (TS 35/C)	

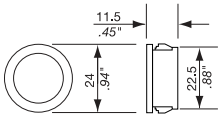
Zinc bichromate plated steel.
Length 2 m 6'6" (78") approx. **0168 700.22**
Length 1 m 3'3" (39") approx. **0101 515.12**

Type	P/N
PR5.A2 (TS 35/C ALU)	

Reinforced aluminum.
Length 2 m 6'6" (78") approx. **0101 502.26**
Length 1 m 3'3" (39") approx. **0101 899.24**

TS 35, High Rail 90°

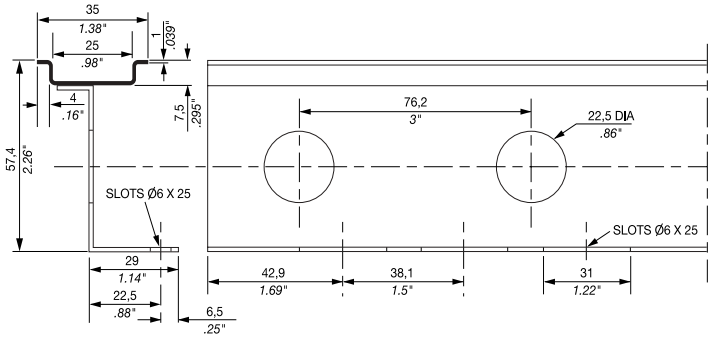




Insert for rail knockout:

Open grommet, black	**0106 064.26**
Closed blind plug, black	**0106 083.12**

Sold in North America only.



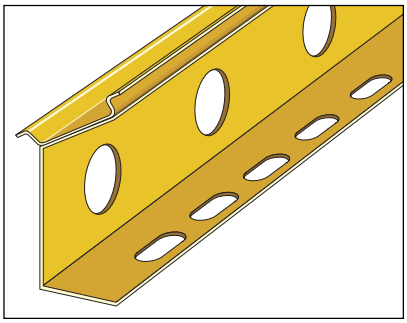
Type	P/N
PR3.Z2 HR90	**0101 571.02**

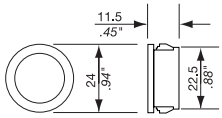
Zinc bichromate plated steel, prepunched length 2 m 6'6" (78") approx. The length and prepunched cut out dimensions are approximate.

Type	P/N
PR3.Z2 HR90	**0101 570.01**

Zinc bichromate plated steel. Length 1 m 3'3" (39") approx.

TS 35, High Rail 30°

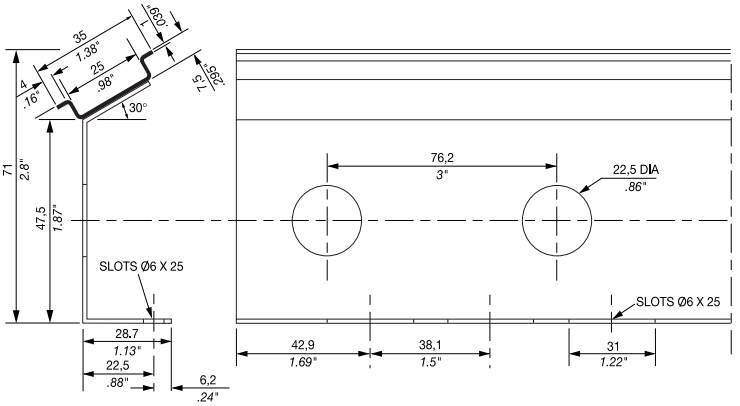




Insert for rail knockout:

Open grommet, black	**0106 064.26**
Closed blind plug, black	**0106 083.12**

Sold in North America only.



Type	P/N
PR3.Z2 HR30	**0101 875.23**

Zinc bichromate plated steel, prepunched length 2 m 6'6" (78") approx. The length and prepunched cut out dimensions are approximate.

Type	P/N
PR3.Z2 HR30	**0101 874.22**

Zinc bichromate plated steel. Length 1 m 3'3" (39") approx.

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PF

ATDR

Time Delay/Class CC

UL/CSA LISTED POWER FUSES

THE BEST PROTECTION FOR TODAY'S SMALL MOTORS

Amp-Trap 2000® ATDR small-dimension fuses can provide IEC Type 2 No Damage protection to your facility's increasingly sensitive branch circuit components and small motors – minimizing the risk of fault-related damage. ATDR Class CC fuses deliver the best time-delay characteristics in their class with excellent cycling ability for small motor loads.

FEATURES/BENEFITS:

- Time-delay for motor starting inrush currents without nuisance opening
- Highly current-limiting for low peak let-thru current
- Improved cycling ability for frequent motor starts/stops without nuisance fuse opening
- Rejection-style design prevents replacement errors (when used with recommended fuse blocks)
- High-visibility orange label ensures instant brand recognition, simplifies replacement
- Metal-embossed date and catalog number for traceability and lasting identification
- Fiberglass body provides dimensional stability in harsh industrial settings
- High-grade silica filler ensures fast arc quenching and optimum current-limitation

RATINGS:

Volts: 600VAC, 300VDC

Amps: 1/4 to 30A

IR: 200kA I.R. AC, 100kA I.R. DC

APPLICATIONS:

- Small motors
- Contactors
- Lighting, heating & general loads
- Branch circuit protection

Note: See motor fuse applications tables for more information

APPROVALS:

- UL listed to standard 248-4 File E2137
- CSA certified to standard C22.2 No. 248.4
- DC listed to UL standard 248

Mersen
Expertise, our source of energy

HIGHLIGHTS:

- Time-delay
- Best choice for small motor protection
- Highly current-limiting
- AC & DC rated

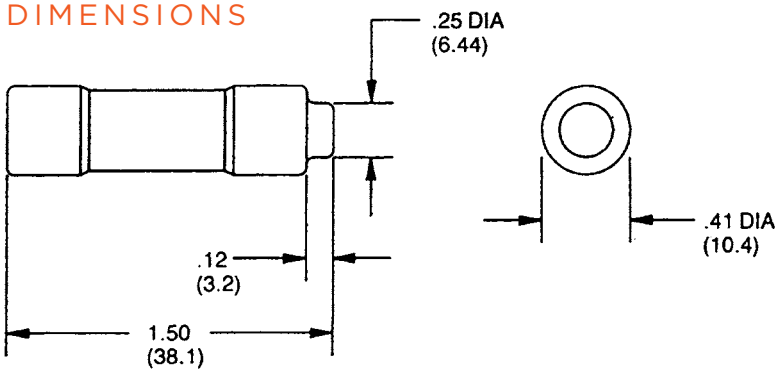
CATALOG NUMBERS (AMPS)

ATDR1/4	ATDR1-1/2	ATDR3	ATDR6	ATDR12
ATDR1/2	ATDR1-6/10	ATDR3-2/10	ATDR6-1/4	ATDR15
ATDR8/10	ATDR1-8/10	ATDR3-1/2	ATDR7	ATDR17-1/2
ATDR1	ATDR2	ATDR4	ATDR7-1/2	ATDR20
ATDR1-1/8	ATDR2-1/4	ATDR4-1/2	ATDR8	ATDR25
ATDR1-1/4	ATDR2-1/2	ATDR5	ATDR9	ATDR30
ATDR1-4/10	ATDR2-8/10	ATDR5-6/10	ATDR10	

RECOMMENDED FUSE BLOCKS FOR CLASS CC FUSES

Number of Poles	Catalog Numbers			
	UltraSafe™ Indicating Fuse Holder	Screw Connector w/ Double Quick Connects	Pressure Plate Connector w/ Double Quick Connects	Copper Box Connector
ADDER		30310R	30320R	30350R
1	USCC1I	30311R	30321R	30351R
2	USCC2I	30312R	30322R	30352R
3	USCC3I	30313R	30323R	30353R
3	USFMCCI			

DIMENSIONS



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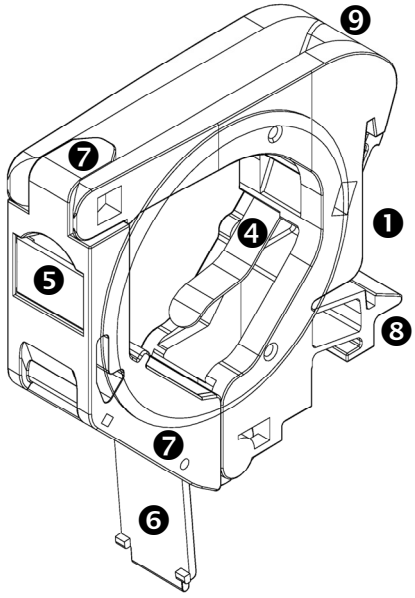
Keystone Industrial DIN-Rail Mounting Module

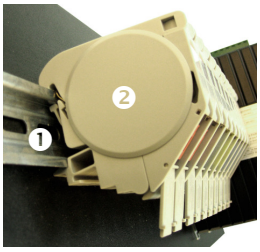
Signamax Keystone Industrial DIN-Rail Mounting Modules afford an opportunity to combine advantages of regular keystone jack design and transmission performance with simplicity and usability of industrial DIN-rail mounting systems.

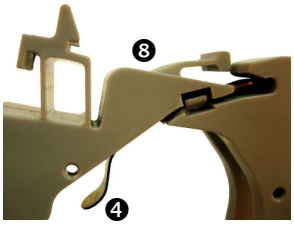
State-of-the-art module's design provides all kinds of features usually found in office work area solutions, – universal labeling, protection covers, "front access," "gravity compensation" for patch cords along with such important for the industrial applications aspects as toolless mounting and replacement of connector modules, quick access to any part of the assembly. Additionally, modules allow installing screened jacks without any extra efforts, parts, and tools.

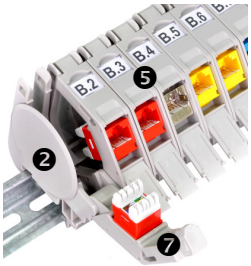
KEY FEATURES

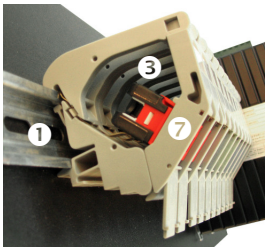
- Designed for standard 35-mm wide DIN rails ❶
- Side lids ❷ are removable facilitating installation of several modules in one continuous row ❸
- Accommodates all Signamax keystone jacks up to 17 mm (0.67 in) wide
- Bronze alloy spring ❹ serves two purposes – secure retention of all keystone jack types, and grounding contact and path for screened jacks
- Clear plastic labeling window ❺
- Front hinged hatch ❻ protects keystone jack from damage and contamination when it is not used
- Swinging cassette with latching mechanism ❼ allows quick and easy installation and removal of the keystone jack
- Installation does not require special tools or threaded fastening – the module snaps-on the DIN rail ❽
- Cable entry points are equipped with noses ❾ supporting required cable bend radii and protecting cables from deformation
- Equipment or patch cord connection angle provides for cord stress compensation caused by the cord's weight

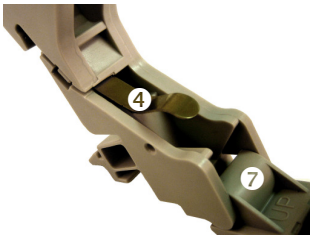


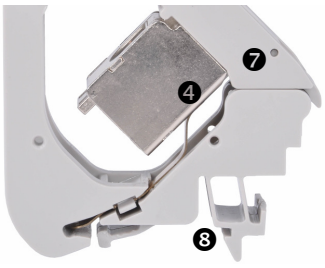












SPECIFICATIONS

Keystone Industrial DIN-Rail Mounting Module

ORDERING INFORMATION

Keystone Industrial DIN-Rail Mounting Modules

Part Number	Description
KI-DIN-RMM-SL	Keystone Industrial DIN-Rail Mounting Module, 2 Side Lids
KI-DIN-RMM	Keystone Industrial DIN-Rail Mounting Module, w/o Side Lids

Standard color is Gray

SPECIFICATIONS

- **CONSTRUCTION**
  Housing: high impact thermoplastic, UL94V-0 fire retardant
  Jack spring wire: bronze alloy
- **MECHANICAL**
  DIN rail: 35 mm (1.378 in)
  Keystone module width: 17 mm (0.669 in) max
- **MOUNTING DIMENSIONS**:
  KI-DIN-RMM-SL:
  D 67.5 mm H 70.5 mm W 21.0 mm
  D 2.66 in H 2.78 in W 0.83 in
  KI-DIN-RMM:
  D 67.50 mm H 70.50 mm W 18.0 mm
  D 2.66 in H 2.78 in W 0.71 in
- **ENVIRONMENTAL CONDITIONS**
  Storage: -40°C – +70°C (-40°F – +158°F)
  Operation: -10°C – +60°C (+14°F – +140°F)
  RH (operation): max non-condensing 93%
- **COMPATIBILITY**
  Signamax MT-series unscreened keystone jacks
  Signamax TL-series screened keystone jacks
  Signamax KRJ45/xS unscreened feed-thru couplers

RELATED PRODUCTS

Product/Product Group	Spec Sheet #	
Voice-Grade Unscreened High-Density MT-Series Keystone Jack	PSS.KJ126MT-C3U	(B-OCT-11)
Category 5e Unscreened High-Density MT-Series Keystone Jack	PSS.KJ458MT-C5E	(B-OCT-11)
Category 5e Screened Toolless Keystone Jack	PSS.KJS458TL-C5E	(A-JUN-10)
Category 6 Unscreened High-Density MT-Series Keystone Jack	PSS.KJ458MT-C6C	(B-OCT-11)
Category 6 Screened Toolless Keystone Jack	PSS.KJS458TL-C6C	(A-JUN-10)
Category 6A Unscreened High-Density MT-Series Keystone Jack	PSS.KJ458MT-C6AC	(A-JUL-10)
Category 6A Screened Toolless Keystone Jack	PSS.KJS458TL-C6AC	(A-JUL-10)
Category 6 Keystone Feed-Thru Couplers	PSS.C6SL-KFTC	(A-OCT-08)

SPECIFICATIONS

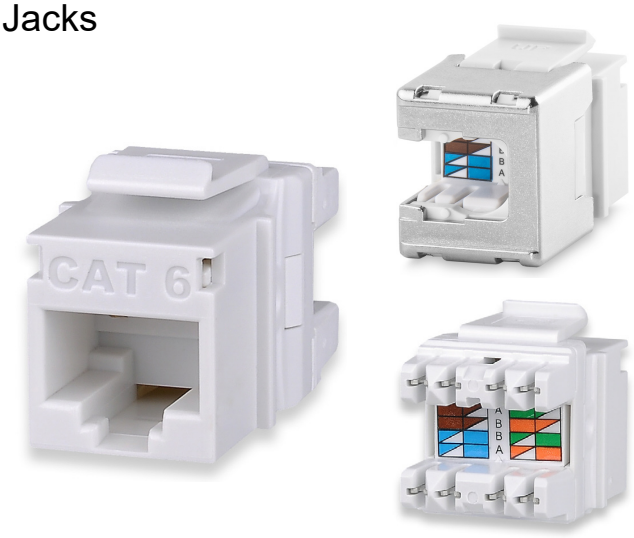
SIGNAMAX
Connectivity Solutions

Product Specifications

Category 6 MT-Series Unscreened Keystone Jacks

KEY FEATURES

- Exceeds TIA-568-C.2 component performance specifications
- Supports TIA-568-C.2 category 6 100 meter channel performance
- Slim profile for the highest density applications
- Improved wire retention and ease of termination with rear 110 type contacts
- Easy-to-read T568A/B wiring scheme color-coded label
- Compatible with Signamax screened snap-in patch panels and work area faceplates
- Circuit identification icons, dust covers, and 110 protection caps included in kit



The Signamax Category 6 Unscreened MT-Series Keystone Jacks have been designed to meet the need for today's high-bandwidth applications. These connectors are slim in profile for the highest density applications and have the ability to mount either color-coded icons for service identification or dust covers to protect unused jacks from dust and other contaminants.

The contact design provides enhanced plug-to-jack connection integrity, protects against damage caused by insertion of 4- or 6-position plugs. Special design features allow these jacks to be terminated with a standard 110 single-position tool or with the Signamax four-pair tool, and are rated for a minimum of 750 plug insertions providing for the highest level of system reliability.

ORDERING INFORMATION

PART NO.	DESCRIPTION
KJ458MT-C6C	Category 6 MT-Series Keystone Jack, T568A/B Wiring, Light Ivory
KJ458MT25-C6C	Category 6 MT-Series Keystone Jack, T568A/B Wiring, Light Ivory, 25-Pack

For other colors add the following to P/N: -WH -YE -OR -RD -BU -GN -GY -BK

SPECIFICATIONS

TRANSMISSION PERFORMANCE
ANSI/TIA-568-C.2: meets or exceeds category 6 (1–250 MHz) component specifications

TRANSMISSION MEDIA
Unscreened twisted pair (U/UTP)

JACK TYPE
8p8c (8-position, 8-contact) "RJ45" style

WIRING SCHEME (See Figure 1)
ANSI/TIA-568-C.2: T568A & T568B
ISO/IEC 11801 2nd Ed.: 8-position pin/pair assignment (1-2/3-6/4-5/7-8)

WIRE GAUGE
22 to 24 AWG (0.644 to 0.511 mm)

ELECTRICAL
Insulation Resistance: Min 500 MOhm @ 100 V_{dc}
Dielectric Withstanding Voltage:
1,000 $V_{dc/ac}$ peak contact-to-contact @ 60 Hz for 1 min
Spring Wire Contact Resistance: Max 20 mOhm
IDC Contact Resistance: Max 2.5 mOhm
Current Rating: See Figure 2

CONSTRUCTION
Housing: High impact thermoplastic, UL94V-0 fire retardant
Jack Spring Wire: Phosphor bronze alloy plated with 50 µin of gold over 70 to 100 µin of nickel
IDC: 110 type, phosphor bronze alloy with 100 µin 100% tin alloy

MECHANICAL
Total Contact Force: Min 800 g for 8 wire leads
Retention: 50 N (11 lbf) for 60 ± 5 s
Mating Cycle Life: Min 750 cycles

FOOTPRINT
Standard keystone footprint

MOUNTING DIMENSIONS:
1.18" D x 0.67" W x 0.76" H (30.0 mm x 16.9 mm x 19.3 mm)

ENVIRONMENTAL CONDITIONS
Operating Temperature: 14 °F to 140 °F (-10 °C to 60 °C)
Storage Temperature: -40 °F to 158 °F (-40 °C to 70 °C)
Operating RH: 93% Max (non-condensing)

COMPLIANCE
ANSI/TIA-568-C.2, IEC 60603-7, FCC Part 68 Subpart F, UL 94V-0

APPLICATIONS
X.21, V.11, S0, ISDN, CSMA/CD 10BASE-T, 100BASE-TX, 100BASE-T4, 100BASE-T2, 1000BASE-T, 10GBASE-T, TR 4/16/100, 100BASE-VG, ATM LAN 25/51/155, TP-PMD

WARRANTY
5 - Year Limited Component

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Figure 1: Wiring Schemes

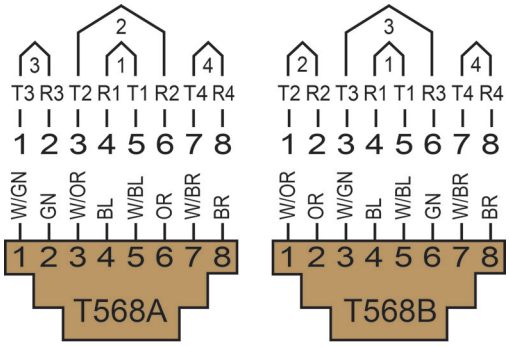
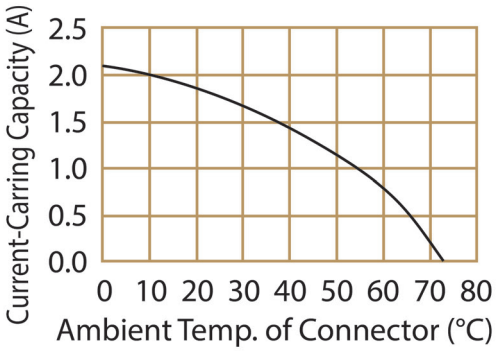


Figure 2: Current Rating



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