



SUBMITTAL ID:

Project Owner:

Project Title:

Project Number:

Subject:

Manufacturer/Supplier:

Specification Section:

Submitted By:

SUBMITTAL DATA ☐ FOR APPROVAL ☐ REVIEWED ☐ REVIEWED AS NOTED ☐ REVISE AND RESUBMIT FOR GENERAL COMPLIANCE WITH CONTRACT DOCUMENTS. DATE _____ BY _____ WILDCAT CONSTRUCTION CO., INC.
--



***Submittals
For
City of Wichita
SS Improvements lift station #16***

General Contractor

Wildcat Construction

Engineer

PEC

Electrical Contractor

Atlas Electric, LLC

Pump controls and SCADA System

Electric Equipment

ATLAS ELECTRIC, L.L.C .
ELECTRICAL SUBMITTALS
 X APPROVED
 APPROVED AS NOTED
 RESUBMIT AS NOTED

BY Jeff Keys

DATE November, 15, 2024

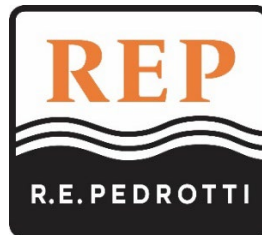
1607 N. Wabash, 67214 • Wichita, KS
(316) 858-1560 • Fax (316) 858-1564

SUBMITTAL FOR:
WICHITA, KS
Lift Station No. 16

ENGINEER:
PROFESSIONAL ENGINEERING CONSULTANTS
303 SOUTH TOPEKA
WICHITA, KS 67202
316-262-2691

CONTRACTED BY:
ATLAS ELECTRIC LLC
1607 N WABASH
WICHITA, KS 67214
316-858-1560

SUBMITTED BY:



R. E. PEDROTTI COMPANY, INC.
5855 BEVERLY AVE.
MISSION, KS 66202
913-677-3366

SUBMITTAL NUMBER

CONTROL PANELS

November 2024

TABLE OF CONTENTS

TAB	DESCRIPTION	MANUFACTURER
1	Lift Station Control Panel	KASA

Submittal No.: Control Panels

Customer: Atlas Electric

Reference: COW LIFT STATION 16

Item	Qty	Description
1.00	1	LIFT STATION 16 CONTROL PANEL
		Manufacturer:
		KASA
		REP Supplied Parts:
	<u>QTY</u>	<u>Part Number</u> <u>Description</u>
	1	TBUP474I-IA50-BB00 SCHNEIDER ELECTRIC SCADAPAK (20) DI (12) DO (12) AI (2) AO
	1	EA9-T7CL CMORE TOUCH PANEL, 7"
	1	2866763 PHOENIX CONTACT POWER SUPPLY 10A, 24 VDC
	1	2320270 PHOENIX CONTACT 24VDC UPS
	1	2320416 PHOENIX CONTACT BATTERY PACK
	1	APSQ-N135-SSC-HS-22-ENAA 4RF RADIO
	1	105TX RED LION ETHERNET SWITCH 5 PORTS, UNMANAGED
	1	SCATY-900 KATHREIN YAGI ANTENNA, 890-960 MHZ
	1	LMR-600 COAX ASSEMBLY TIMES COAX, 75', N(M) CONNECTORS
	1	POLIS-B50LN-C2 POLYPHASER SURGE PROTECTOR

R.E. PEDROTTI CO., INC.

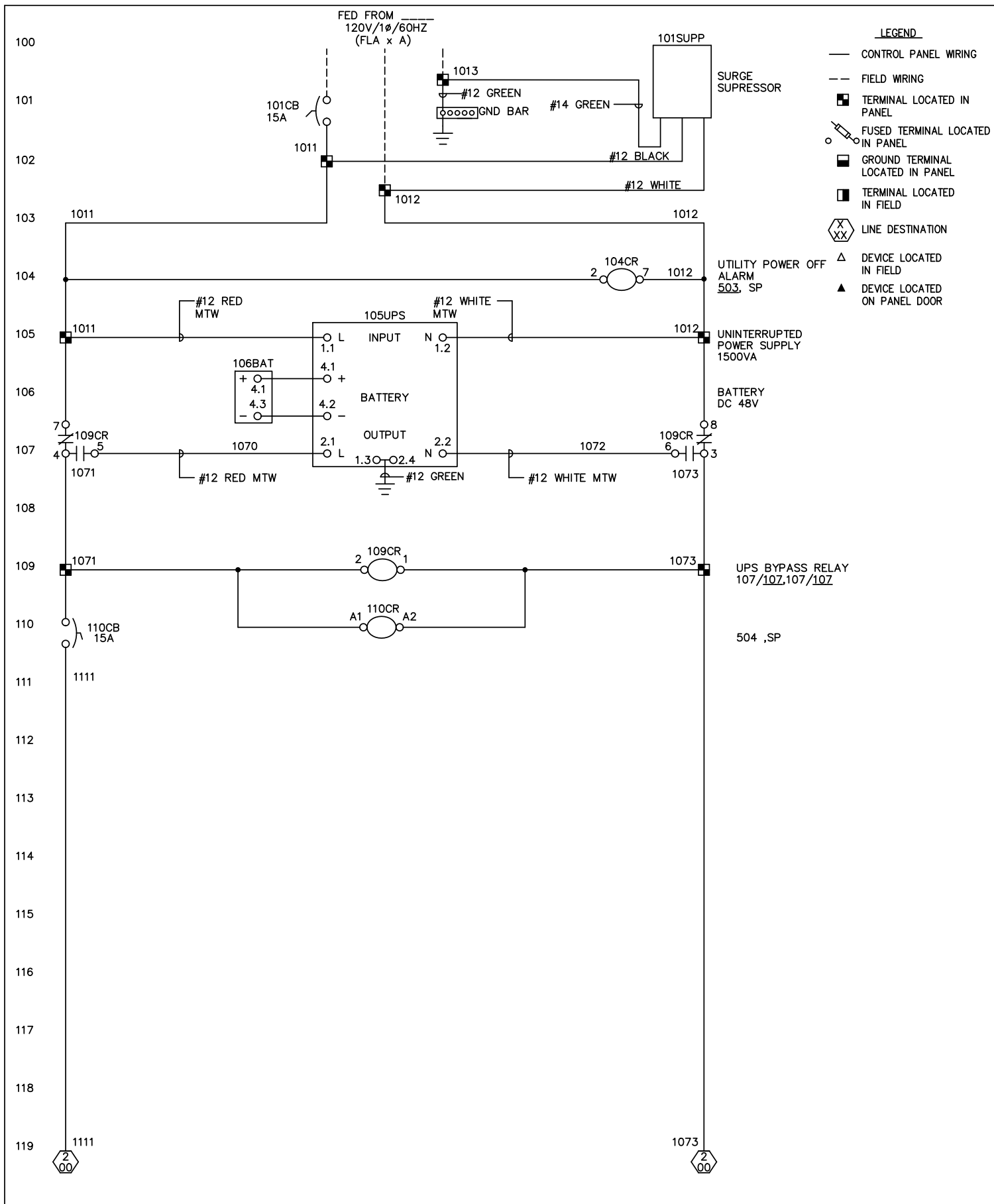
CITY OF WICHITA
LIFT STATION NO. 16
WICHITA, KS
KASA JOB #8902

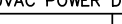
SHEET #	DRAWING #	DESCRIPTION
ID	LIFT-STA-16_ID	DRAWING INDEX
1	LIFT-STA-16_E01	120VAC POWER DISTRIBUTION
2	LIFT-STA-16_E02	120VAC/24VDC POWER DISTRIBUTION
3	LIFT-STA-16_E03	I/O SCHEMATICS - SCADAPACK 474 BASE MODULE
4	LIFT-STA-16_E04	I/O SCHEMATICS - BASE MODULE, DIGITAL INPUT
5	LIFT-STA-16_E05	I/O SCHEMATICS - BASE MODULE, DIGITAL INPUT CONT'D
6	LIFT-STA-16_E06	I/O SCHEMATICS - BASE MODULE, DIGITAL OUTPUT
7	LIFT-STA-16_E07	I/O SCHEMATICS - BASE MODULE, DIGITAL OUTPUT INTERPOSING RELAY
8	LIFT-STA-16_E08	I/O SCHEMATICS - BASE MODULE, ANALOG INPUT
9	LIFT-STA-16_E09	I/O SCHEMATICS - BASE MODULE, ANALOG INPUT CONT'D
10	LIFT-STA-16_E10	I/O SCHEMATICS - BASE MODULE, ANALOG OUTPUT
11	LIFT-STA-16_L01	EXTERIOR LAYOUT
12	LIFT-STA-16_L02	INTERIOR LAYOUT
13	LIFT-STA-16_L03	TERMINAL ROTATION
14	LIFT-STA-16_L04	DOOR DETAIL
15	LIFT-STA-16_BOM	BILL OF MATERIALS

REP

R.E. Pedrotti Co., Inc.
5855 BEVERLY AVE. SUITE A
MISSION, KS 66202
(913) 677-3366 FAX (913) 667-3460

NO	REVISIONS	DATE	BY	MISC.	DRAWING INDEX
1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	 INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401
-	-	-	-	SCALE	
-	-	-	-	DESIGNED	
-	-	-	-	DRAWN	
-	-	-	-	CHECKED	
-	-	-	-	APPROVED	
-	-	-	-	P.O. NO. 25661	
					R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS
SHEET OF	ID	JOB NO. 8902	DWG. NO. LIFT-STA-16_ID		



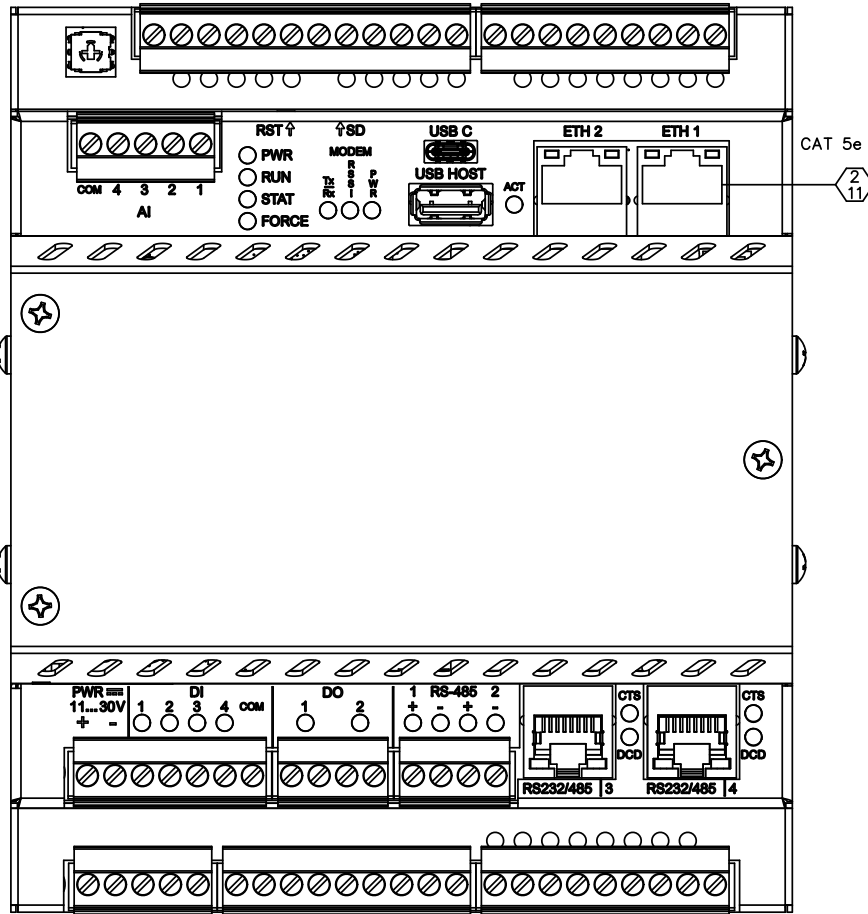
REP R.E. Pedrotti Co., Inc. 5655 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	120VAC POWER DISTRIBUTION				
	1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	 INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401	R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS	SHEET 1 OF 15	JOB NO. 8902	DWG. NO. LIFT-STA-16_E01
	-	-	-	-	SCALE					
	-	-	-	-	DESIGNED					
	-	-	-	-	DRAWN					
	-	-	-	-	CHECKED					
	-	-	-	-	APPROVED					
	-	-	-	-	P.O. NO. 25661					

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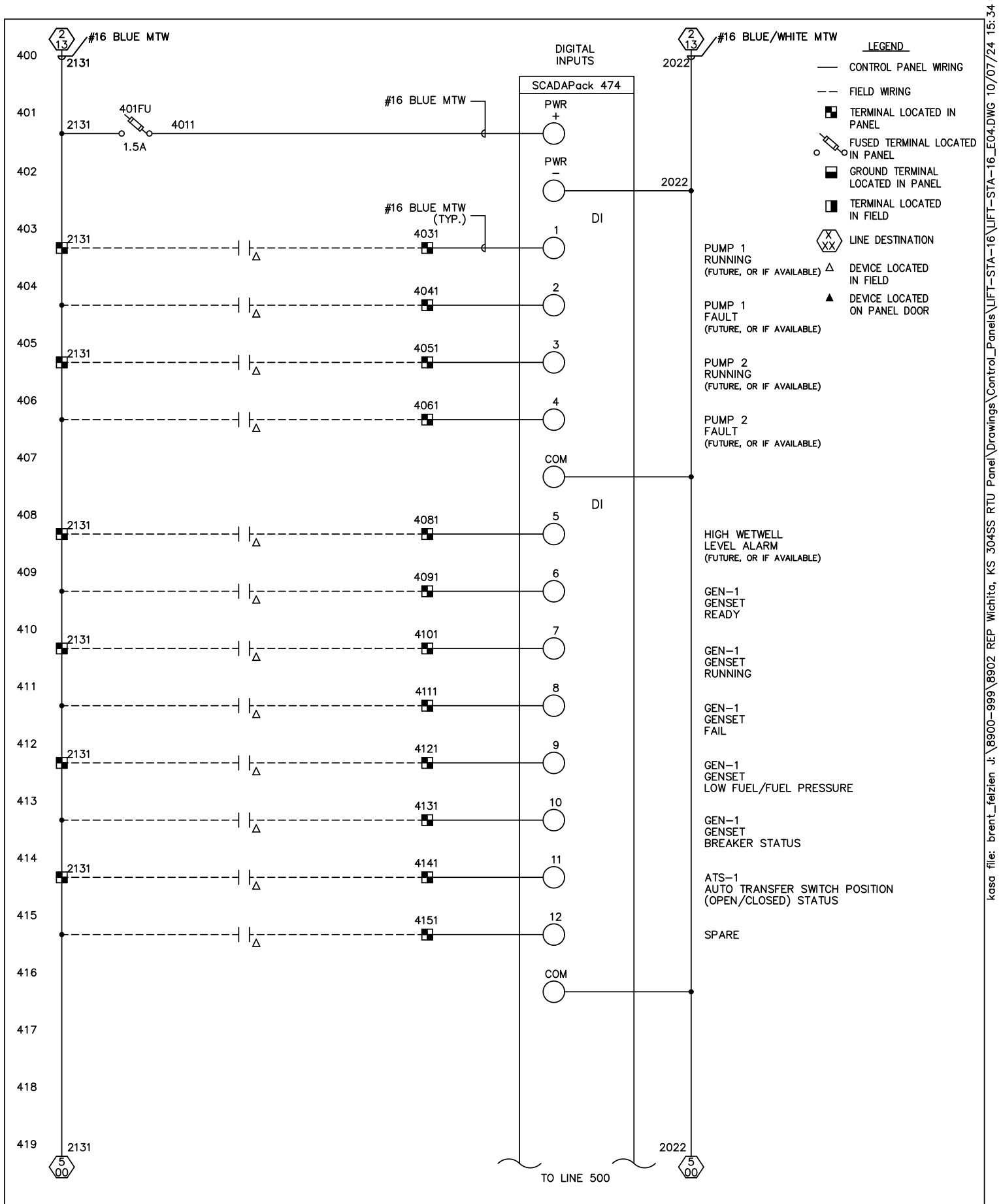
LEGEND

- CONTROL PANEL WIRING
- - - FIELD WIRING
- TERMINAL LOCATED IN PANEL
- FUSED TERMINAL LOCATED IN PANEL
- GROUND TERMINAL LOCATED IN PANEL
- TERMINAL LOCATED IN FIELD
- ⊗ LINE DESTINATION
- △ DEVICE LOCATED IN FIELD
- ▲ DEVICE LOCATED ON PANEL DOOR

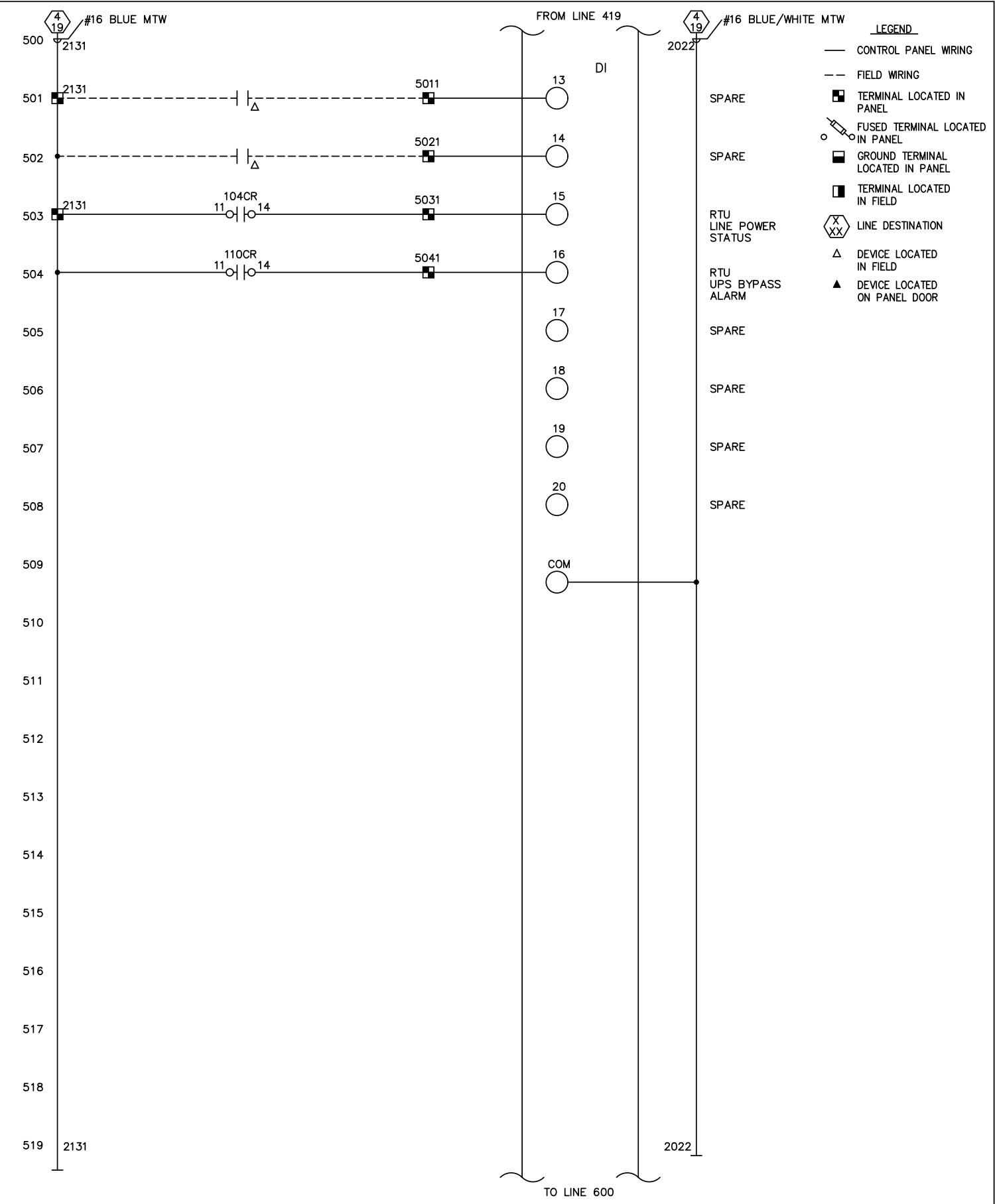
MODULE 0
SCADAPack 474 BASE



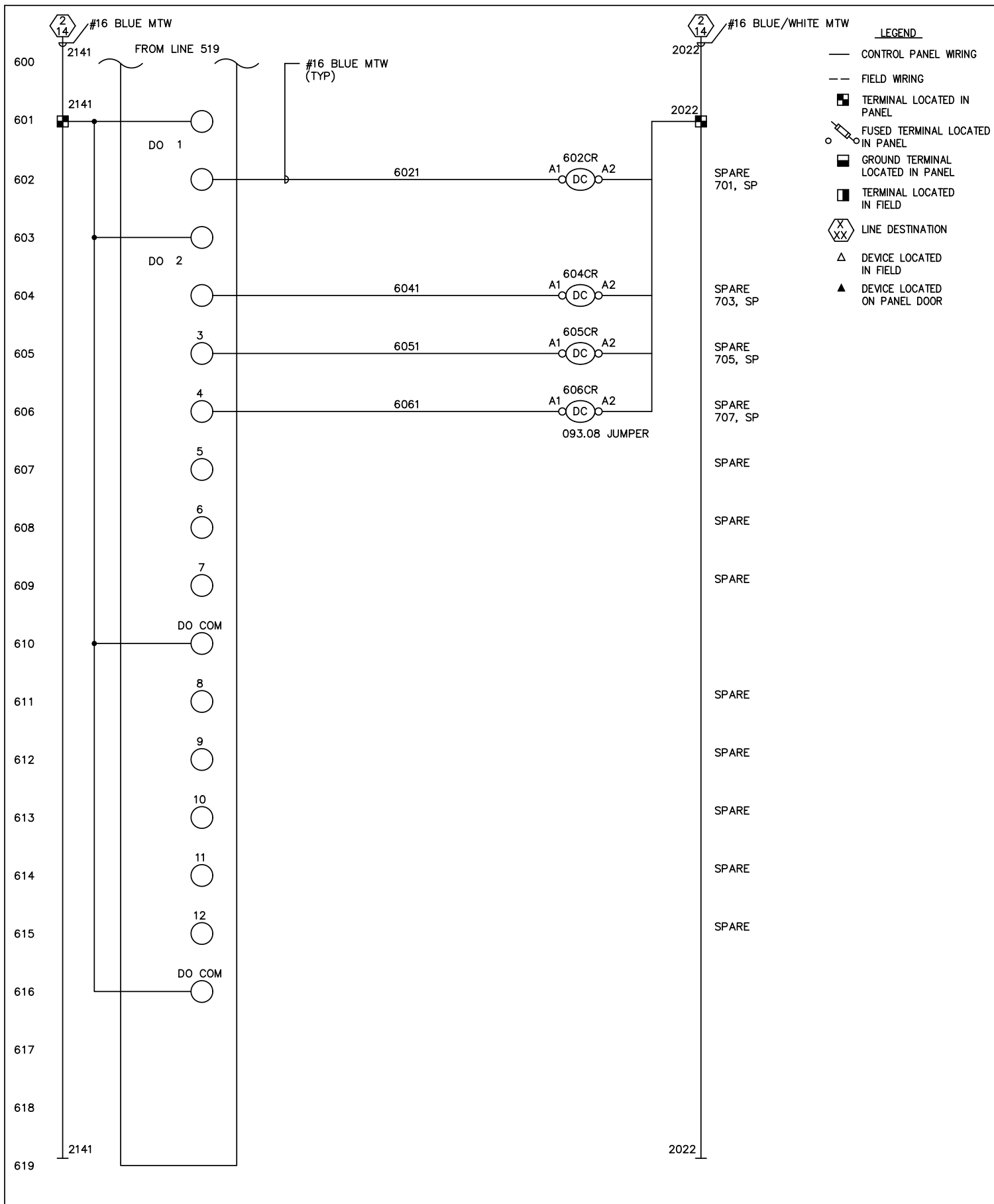
NO	REVISIONS	DATE	BY	MISC.	I/O SCHEMATICS - SCADAPACK 474 BASE MODULE
1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	l INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401 SHEET 3 OF 15 JOB NO. 8902 DWG. NO. LIFT-STA-16_E03
-	-	-	-	SCALE -	
-	-	-	-	DESIGNED BF	
-	-	-	-	DRAWN BF	
-	-	-	-	CHECKED -	
-	-	-	-	APPROVED -	
-	-	-	-	P.O. NO. 25661	
REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460 NO REVISIONS DATE BY MISC.					R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS



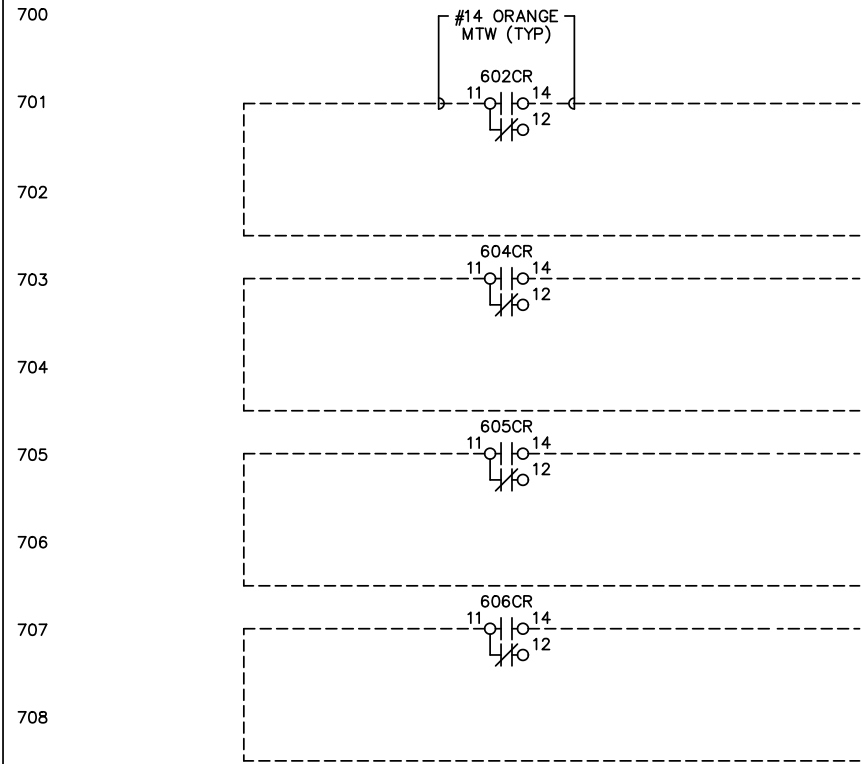
REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	I/O SCHEMATICS - BASE MODULE, DIGITAL INPUT		
	1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	kasa INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401		
	-	-	-	-	SCALE			
	-	-	-	-	DESIGNED			
	-	-	-	-	DRAWN			
	-	-	-	-	CHECKED			
	-	-	-	-	APPROVED			
	-	-	-	-	P.O. NO. 25661			
						R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS		
SHEET 4 OF 15		JOB NO. 8902		DWG. NO. LIFT-STA-16_E04				



REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	I/O SCHEMATICS - BASE MODULE, DIGITAL INPUT CONT'D		
	1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	kasa INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401	R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS	
	-	-	-	-	SCALE -			
	-	-	-	-	DESIGNED -			
	-	-	-	-	DRAWN -			
	-	-	-	-	CHECKED -			
	-	-	-	-	APPROVED -			
	-	-	-	-	P.O. NO. 25661			
	-	-	-	-	-			
						SHEET 5 OF 15	JOB NO. 8902	DWG. NO. LIFT-STA-16_E05

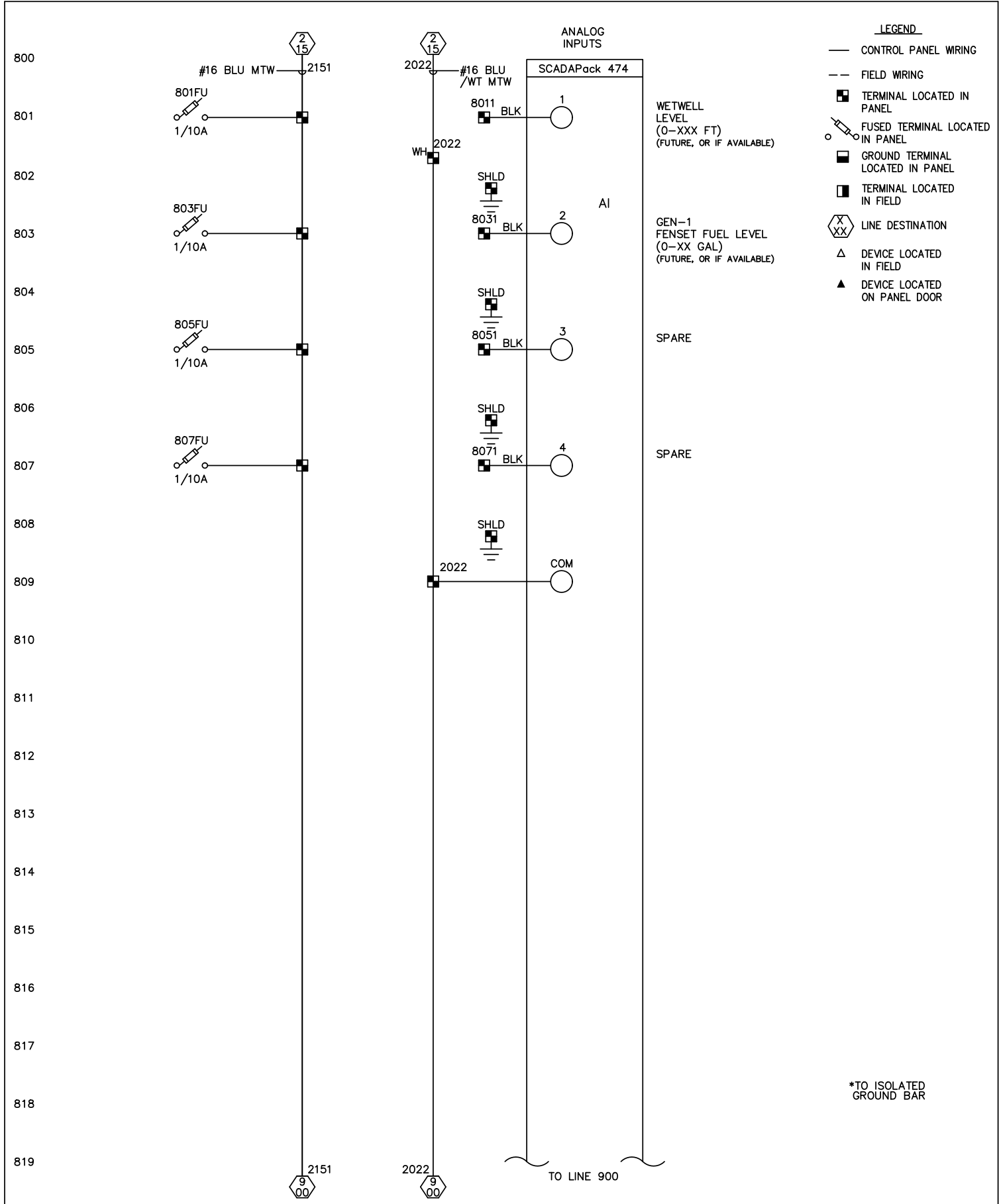


REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	I/O SCHEMATICS - BASE MODULE, DIGITAL OUTPUT		
	1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	kasa INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401	R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS	
	-	-	-	-	SCALE			
	-	-	-	-	DESIGNED			
	-	-	-	-	DRAWN			
	-	-	-	-	CHECKED			
	-	-	-	-	APPROVED			
	-	-	-	-	P.O. NO. 25661			
	-	-	-	-	-			
						SHEET 6 OF 15	JOB NO. 8902	DWG. NO. LIFT-STA-16_E06

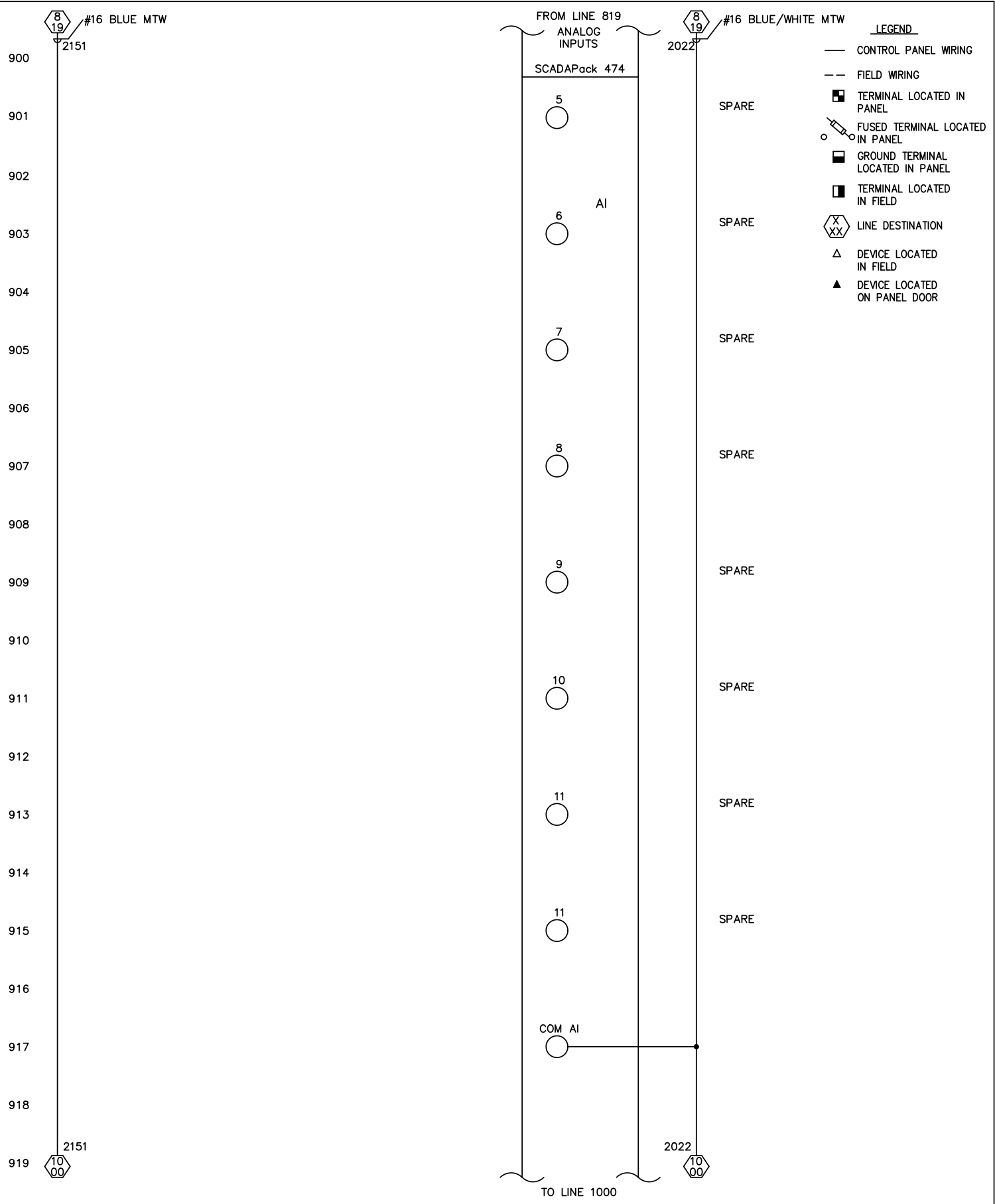


- LEGEND**
- CONTROL PANEL WIRING
 - - - FIELD WIRING
 - TERMINAL LOCATED IN PANEL
 - FUSED TERMINAL LOCATED IN PANEL
 - GROUND TERMINAL LOCATED IN PANEL
 - TERMINAL LOCATED IN FIELD
 - ⬡ LINE DESTINATION
 - △ DEVICE LOCATED IN FIELD
 - ▲ DEVICE LOCATED ON PANEL DOOR

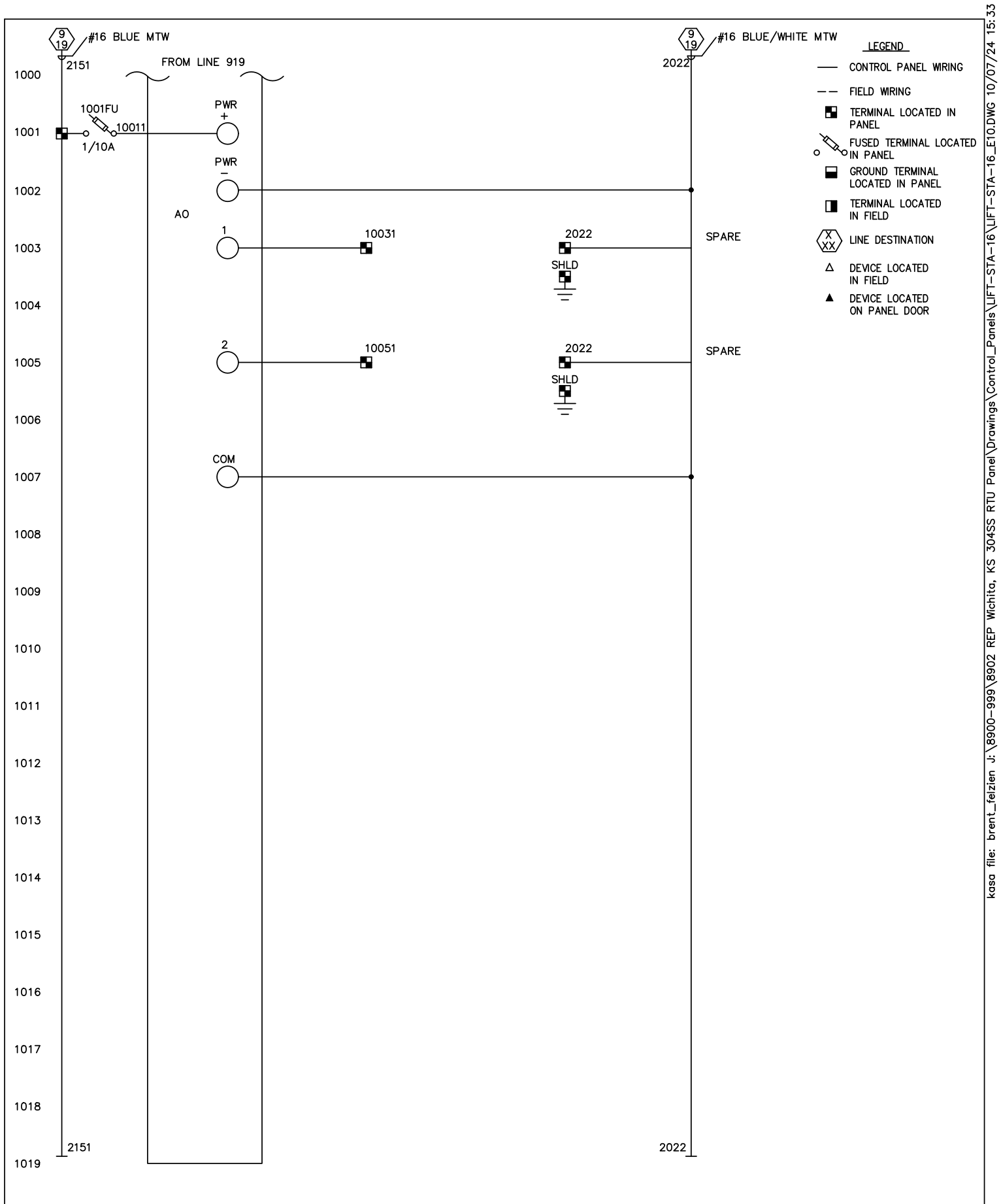
REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	I/O SCHEMATICS - DIGITAL OUTPUT INTERPOSING RELAYS		
	1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	kasa INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401	R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS	
	-	-	-	-	SCALE -			
	-	-	-	-	DESIGNED -			
	-	-	-	-	DRAWN -			
	-	-	-	-	CHECKED -			
	-	-	-	-	APPROVED -			
	-	-	-	-	P.O. NO. 25661			
	-	-	-	-	-			
						SHEET 7 OF 15	JOB NO. 8902	DWG. NO. LIFT-STA-16_E07



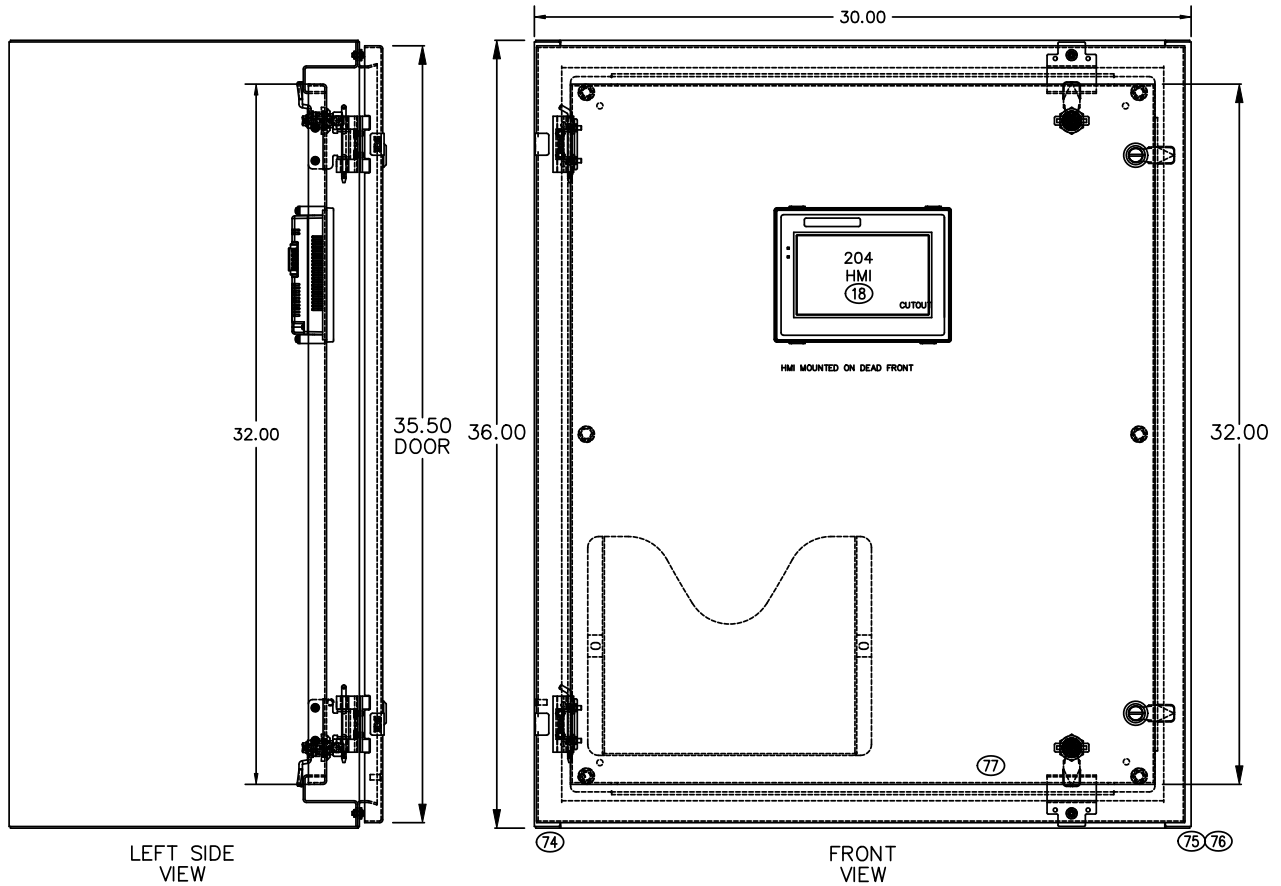
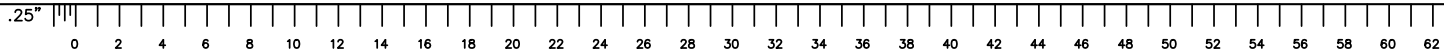
REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	I/O SCHEMATICS - BASE MODULE, ANALOG INPUT		
	1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	kasa INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401		
	-	-	-	-	SCALE			
	-	-	-	-	DESIGNED			
	-	-	-	-	DRAWN			
	-	-	-	-	CHECKED			
	-	-	-	-	APPROVED			
	-	-	-	-	P.O. NO. 25661			
						SHEET 8 OF 15	JOB NO. 8902	DWG. NO. LIFT-STA-16_E08
						R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS		



REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	I/O SCHEMATICS - BASE MODULE, ANALOG INPUT CONT		
	1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	 INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401		
	-	-	-	-	SCALE			
	-	-	-	-	DESIGNED			
	-	-	-	-	DRAWN			
	-	-	-	-	CHECKED			
	-	-	-	-	APPROVED			
	-	-	-	-	P.O. NO. 25661			
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						R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS		
						SHEET 9 OF 15	JOB NO. 8902	DWG. NO. LIFT-STA-16_E09



REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	I/O SCHEMATICS - BASE MODULE, ANALOG OUTPUT		
	1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	kasa INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401	R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS	
	-	-	-	-	SCALE			
	-	-	-	-	DESIGNED			
	-	-	-	-	DRAWN			
	-	-	-	-	CHECKED			
	-	-	-	-	APPROVED			
	-	-	-	-	P.O. NO. 25661			
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						SHEET 10 OF 15	JOB NO. 8902	DWG. NO. LIFT-STA-16_E10

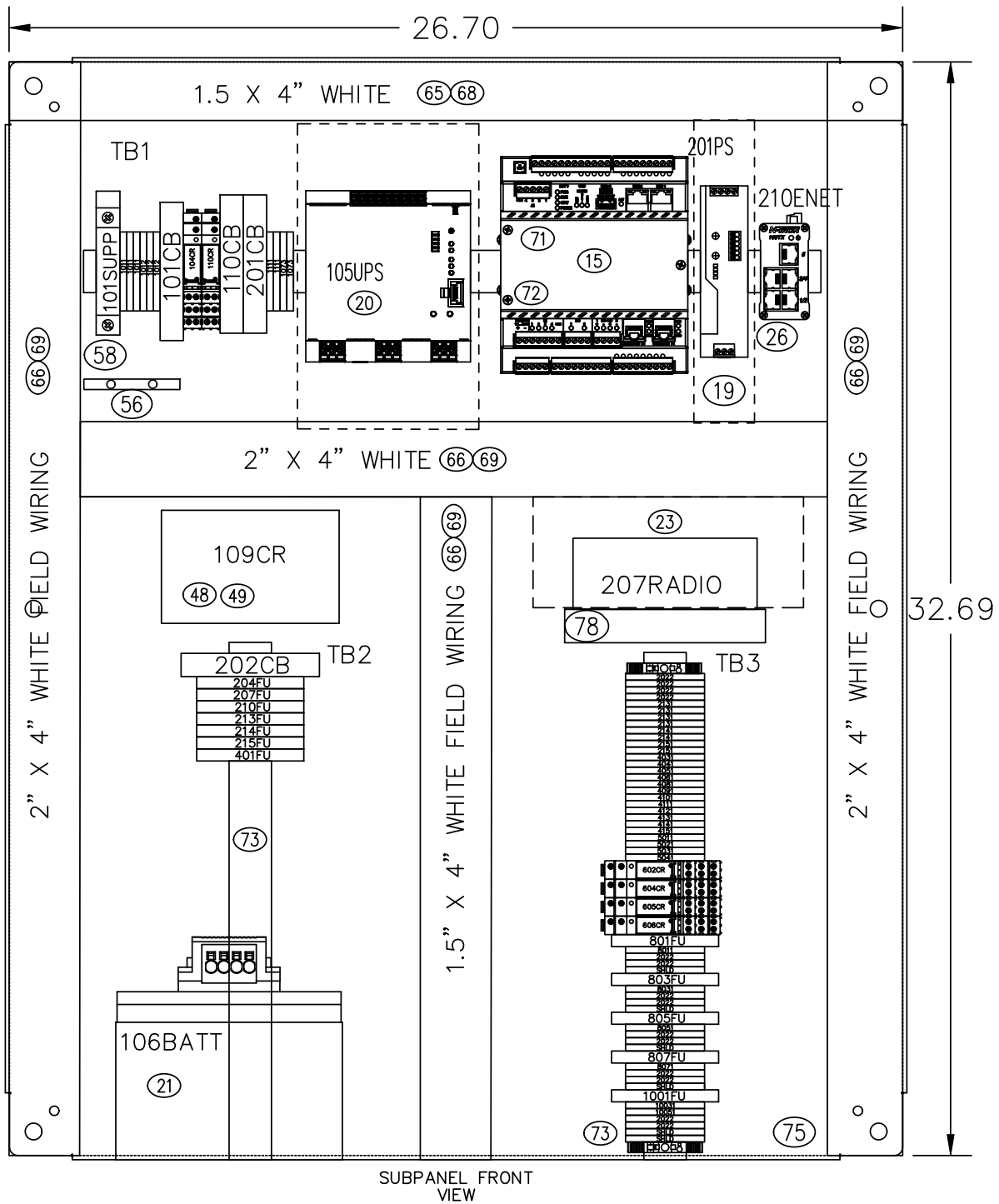


EXTERIOR LAYOUT

SCALE: 1/5" = 1"
ENCLOSURE: SCE-36EL3016SSLP
DEAD FRONT: SCE-DF36EL30LP
36"Hx30"Wx16"D
TYPE 4X

- SHOP NOTES:
1. Print five (5) extra wire labels for every terminal that receives field wiring, for use by the install electrical contractor, and ship the labels inside the control panel.
 2. Install all terminals and quantities as shown in the schematics. Include all hot and neutral terminals as shown. Follow terminal strip rotation sheet if applicable.
 3. Package all spare parts listed in the Bill of Materials Spare Parts column in zip-lock bags and place inside the enclosure for shipment.
 4. Save all customer supplied equipment (PLC and computer component) boxes and ship these inside or with the enclosure. If the boxes will not fit in the panel crate, see the Project Manager for instructions.
 5. Wire duct will have 40% spare capacity.
 6. Install minimum 10 spare terminals on DIN rail.

REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	EXTERIOR LAYOUT		
	1	SUBMITTAL	10/9/24	-	DATE 10/7/24	kasa INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401	R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS	SHEET 11 OF 15 JOB NO. 8902 DWG. NO. LIFT-STA-16_L01
	-	-	-	-	SCALE			
	-	-	-	-	DESIGNED			
	-	-	-	-	DRAWN			
	-	-	-	-	CHECKED			
	-	-	-	-	APPROVED			
	-	-	-	-	P.O. NO. 25661			
	-	-	-	-	-			



INTERIOR LAYOUT

SHOP NOTES:

- Print five (5) extra wire labels for every terminal that receives field wiring, for use by the install electrical contractor, and ship the labels inside the control panel.
- Install all terminals and quantities as shown in the schematics. Include all hot and neutral terminals as shown. Follow terminal strip rotation sheet if applicable.
- Save all customer supplied equipment (PLC and computer component)

- boxes and ship these inside or with the enclosure. If the boxes will not fit in the panel crate, see the Project Manager for instructions.
- Wire duct will have 40% spare capacity.
- Include 6' wire leads, labeled on both ends, and wire nuts on the open end for all internal panel wiring to field-installed panel devices.

REP

R.E. Pedrotti Co., Inc.
5855 BEVERLY AVE. SUITE A
MISSION, KS 66202
(913) 677-3366 FAX (913) 667-3460

NO	REVISIONS	DATE	BY	MISC.
1	SUBMITTAL	10/9/24	BF	DATE 10/7/24
-	-	-	-	SCALE -
-	-	-	-	DESIGNED -
-	-	-	-	DRAWN -
-	-	-	-	CHECKED -
-	-	-	-	APPROVED -
-	-	-	-	P.O. NO. 25661

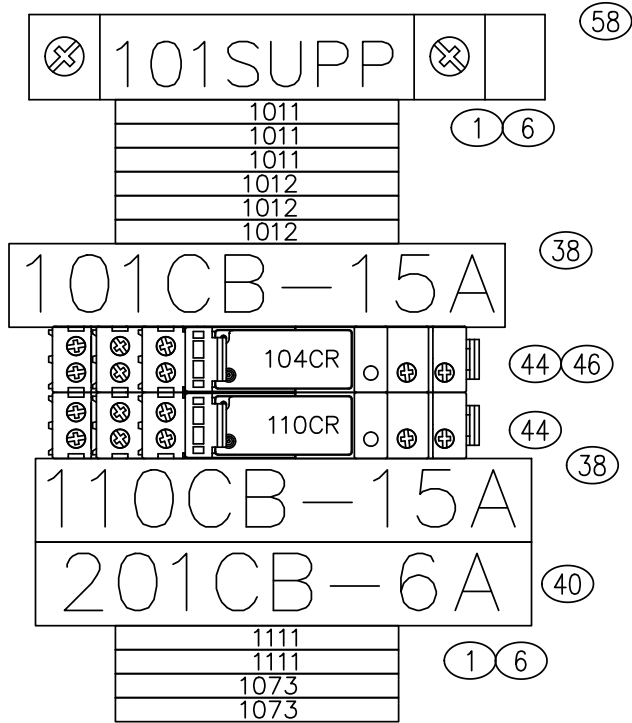
kasa
INDUSTRIAL CONTROLS, INC.
PHONE 785-825-7181
418 East Ave. B
Salina, Ks. 67401

R.E. PEDROTTI CO., INC.
CITY OF WICHITA
LIFT STATION NO. 16
WICHITA, KS

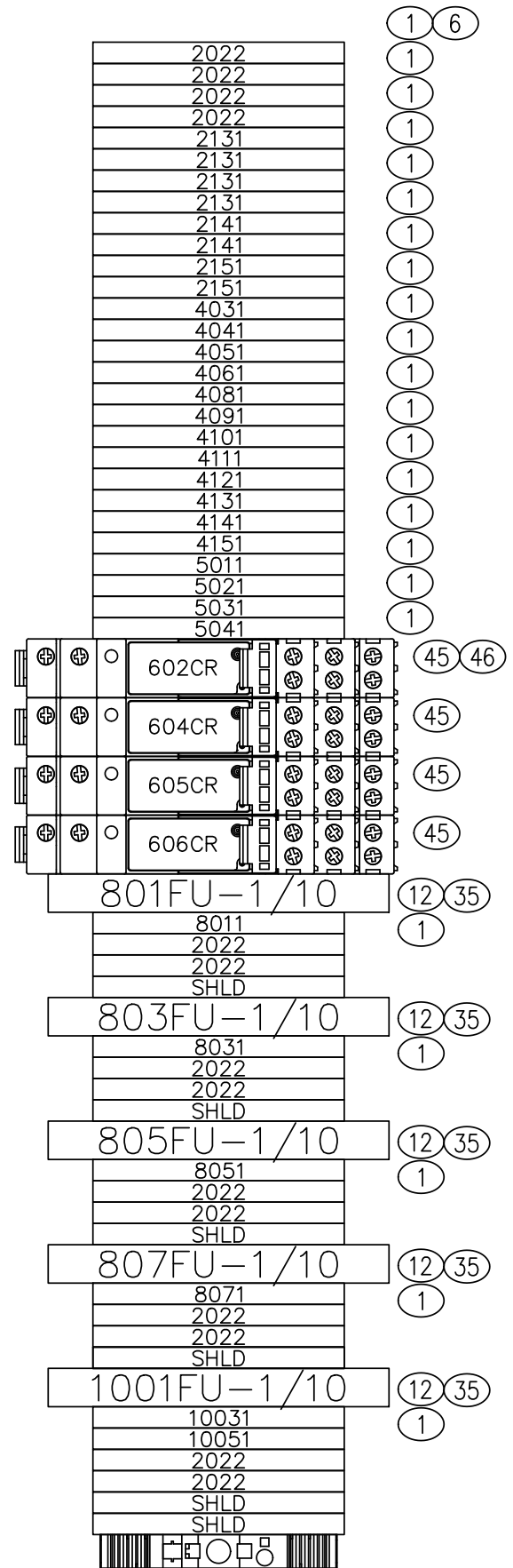
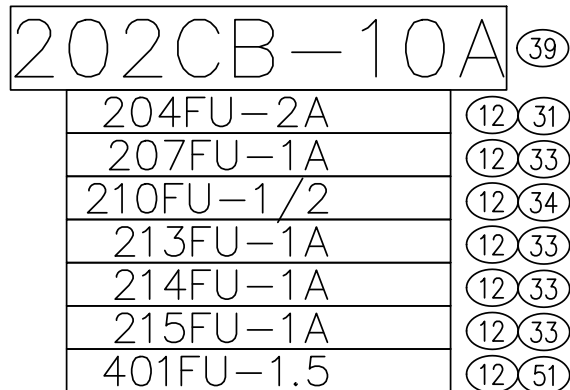
SHEET 12 OF 15 JOB NO. 8902 DWG. NO. LIFT-STA-16_L02

TB1

TB3



TB2

**REP**

R.E. Pedrotti Co., Inc.
5855 BEVERLY AVE. SUITE A
MISSION, KS 66202
(913) 677-3366 FAX (913) 667-3460

NO	REVISIONS	DATE	BY	MISC.
1	SUBMITTAL	10/9/24	BF	10/7/24
-	-	-	-	SCALE
-	-	-	-	DESIGNED
-	-	-	-	DRAWN
-	-	-	-	CHECKED
-	-	-	-	APPROVED
-	-	-	-	P.O. NO. 25661

TERMINAL ROTATION

kasa
INDUSTRIAL CONTROLS, INC.
PHONE 785-825-7181
418 East Ave. B
Salina, Ks. 67401

R.E. PEDROTTI CO., INC.
CITY OF WICHITA
LIFT STATION NO. 16
WICHITA, KS

SHEET 13 OF 15 JOB NO. 8902 DWG. NO. LIFT-STA-16_L03

Kasa Industrial Controls Inc. Salina, Kansas 67401 785-825-7181						
Volts	Amps	Hz	Phase	Motor FLA	SCCR	OCPD
120VAC	7.9	60Hz	1	N/A	10,000	15A
-	-	-	-	-	-	-
Enclosure Type			Job No.		Dwg No.	
4X			8902		LIFT-STA-16_ID	

TAG 1
2" X 5.25"
WHITE W/BLACK LETTERING

LIFT-STA-16
120V 1Ø
FED FROM ____
CIRCUITS ____

TAG 3
2" X 4"
WHITE W/BLACK LETTERING

USE HUBS & FITTINGS SUITABLE FOR
TYPE 4X ENCLOSURES ONLY

TAG 4
1" X 6"
BLACK W/WHITE LETTERING

CAUTION!
THE ORANGE WIRE IN
THIS ENCLOSURE IS NOT
DE-ENERGIZED BY THE
DISCONNECT

TAG 2
3" X 5"
YELLOW W/BLACK LETTERING

WARNING!
RISK OF ELECTRIC SHOCK- UPS EQUIPMENT OUTPUTS
REMAIN LIVE WITH MAIN DISCONNECT IN OFF POSITION

TAG 5
2" X 8"
RED W/WHITE LETTERING

NAMEPLATE DETAIL

REP R.E. Pedrotti Co., Inc. 5855 BEVERLY AVE. SUITE A MISSION, KS 66202 (913) 677-3366 FAX (913) 667-3460	NO	REVISIONS	DATE	BY	MISC.	DOOR DETAIL			
	1	SUBMITTAL	10/9/24	BF	DATE 10/7/24	kasa  INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, Ks. 67401	R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS		
	-	-	-	-	SCALE				
	-	-	-	-	DESIGNED				
	-	-	-	-	DRAWN				
	-	-	-	-	CHECKED				
	-	-	-	-	APPROVED				
	-	-	-	-	P.O. NO. 25661				
	-	-	-	-	-				
						SHEET 14 OF 15	JOB NO. 8902	DWG. NO. LIFT-STA-16_L04	

BILL OF MATERIALS

ITEM	QTY	SPARE	MANUFACTURER	PART NO.	DESCRIPTION
1	60	-	ALLEN BRADLEY	1492-J3	TERMINAL, IEC, 600V, 25A, 30-12AWG, 5.1MM, GRAY
2	-	-	-	-	-
3	1	-	ALLEN BRADLEY	1492-M5X12	TERMINAL, IEC, MARKER CARD, BLANK, 144 LBLs, J3 (5.1MM) TERMINALS
4	-	-	ALLEN BRADLEY	1492-M5X8	TERMINAL, IEC, MARKER CARD, BLANK, 144 LBLs
5	8	-	ALLEN BRADLEY	1492-EBJ3	TERMINAL, END BARRIER, FOR SCREW TYPE TB, 0.06 X 1.31 X 2.36 IN, GRAY
6	6	-	ALLEN BRADLEY	1492-EAJ35	TERMINAL, END ANCHOR, FOR NORMAL DUTY DIN RAIL, 0.31 X 2.20 X 1.85 IN, GRAY
7	9	-	ALLEN BRADLEY	1492-CJJ5-10	TERMINAL, CENTER JUMPER, SCREW TYPE, 5 MM CENTER TO CENTER, 10 POLE, GRAY
8	-	-	-	-	-
9	-	-	-	-	-
10	6	-	ALLEN BRADLEY	1492-N37	TERMINAL, NEMA, END BARRIER FOR FUSED TERMINAL
11	-	-	ALLEN BRADLEY	1492-H4	TERMINAL, IEC, FUSE HOLDER, 120VAC, 300V, 12A, 30-12AWG, NEON INDICATING LIGHT
12	12	-	ALLEN BRADLEY	1492-H5	TERMINAL, IEC, FUSE HOLDER, 24VDC, 300V, 12A, 30-12AWG, LED INDICATING LIGHT
13	-	-	-	-	-
14	-	-	-	-	-
* 15	1	-	SCHNEIDER ELECTRIC	TBUP474I-IA50-BB00	SCADAPACK 474, BASE MODULE WITH 20DI/12DO/12AI/2AO
16	-	-	-	-	-
17	-	-	-	-	-
&* 18	1	-	AUTOMATION DIRECT	EA9-T7CL	TOUCH PANEL 7in COLOR TFT 800x600 SVGA ETHERNET & USB EA9 C-MORE SERIES
* 19	1	-	PHOENIX CONTACT	2866763	POWER SUPPLY, 10A, 120V INPUT, 24VDC OUTPUT, QUINT POWER
* 20	1	-	PHOENIX CONTACT	2320270	UPS 500VA
* 21	1	-	PHOENIX CONTACT	2320416	UPS BATTERY PACK
22	-	-	-	-	-
* 23	1	-	4RF RADIO	APSQ-N135-SSC-HD-22-EN	AA RADIO
24	-	-	-	-	-
25	-	-	-	-	-
* 26	1	-	RED LION	105TX	ETHERNET SWITCH, 5 PORT, UNMANAGED, 24 VDC
27	-	-	-	-	-
28	-	-	-	-	-
29	-	-	-	-	-
30	-	-	-	-	-
31	1	-	BUSSMANN	MDL-2-R	FUSE, 250V, 2A, 1/4 x 1 1/4, TIME DELAY
32	-	-	-	-	-
33	4	-	BUSSMANN	MDL-1-R	FUSE, 250V, 1A, 1/4 x 1 1/4, TIME DELAY
34	1	-	BUSSMANN	MDL-1/2-R	FUSE, 250V, 1/2A, 1/4 x 1 1/4, TIME DELAY
35	5	-	BUSSMANN	MDL-1/10-R	FUSE, 250V, 1/10A, 1/4 x 1 1/4, TIME DELAY
36	-	-	-	-	-
37	-	-	-	-	-
38	2	-	ABB	SU201M-C15	CIRCUIT BREAKER, 1P, 15A, 240VAC/48VDC, 10KA, TRIP CURVE C, UL 489
39	1	-	ABB	SU201M-C10	CIRCUIT BREAKER, 1P, 10A, 240VAC/48VDC, 10KA, TRIP CURVE C, UL 489
40	1	-	ABB	SU201M-C6	CIRCUIT BREAKER, 1P, 6A, 240VAC/48VDC, 10KA, TRIP CURVE C, UL 489
41	-	-	-	-	-
42	-	-	-	-	-
43	-	-	-	-	-
44	2	-	FINDER	38.51.0.120.0060	RELAY, SPDT TERMINAL STYLE, BASE & COIL, 120VAC, 6A, 6.2MM WIDE
45	4	-	FINDER	38.51.0.024.0060	RELAY, SPDT TERMINAL STYLE, BASE & COIL, 24VDC/VAC, 6A, 6.2MM WIDE
46	1	-	FINDER	093.20	20 - WAY JUMPER, 38 SERIES, SCREW TERMINAL VERSION, 10A-250V, BLUE
47	-	-	-	-	-
48	1	-	POTTER & BRUMFIELD	PRD-11AY0-120	POWER CONTACT, DPDT, 120VAC COIL, 20A
49	1	-	POTTER & BRUMFIELD	35D013	COVER, DUST PRD SERIES
50	-	-	-	-	-
51	1	-	BUSSMANN	AGC-1-1/2-R	FUSE, 250V, 1.5A, 1/4 x 1 1/4, TIME DELAY
52	-	-	-	-	-
53	-	-	-	-	-
54	-	-	-	-	-
55	-	-	-	-	-
56	1	-	SQUARE D	PK7GTA	GROUND BAR, 7 HOLE, 14-4AWG
57	-	-	-	-	-
58	1	-	EMERSON	237120NS15KAWLN0	SURGE SUPPRESSOR, 120 VAC SINGLE PHASE SURGE SUPPRESSOR UL LISTED
59	-	-	-	-	-
60	-	-	-	-	-
61	-	-	-	-	-
62	3	-	MONOPRICE	3430	CABLE, ENET PATCH CABLE, CAT6, RJ45, 550MHZ, UTP, 24AWG STRANDED, 5FT, ORANGE
63	-	-	-	-	-
64	-	-	-	-	-
65	A/R	-	PANDUIT	C1.5WH6	WHITE WIRE DUCT COVER, 1.5", WHITE, 6FT
66	A/R	-	PANDUIT	C2WH6	WHITE WIRE DUCT COVER, 2", WHITE, 6FT
67	-	-	-	-	-
68	A/R	-	PANDUIT	G1.5x4WH6-A	1.5" X 4" WIRE DUCT, ADHESIVE BACK, WHITE, SLOT TYPE, 6FT
69	A/R	-	PANDUIT	G2x4WH6-A	2" X 4" WIRE DUCT, ADHESIVE BACK, WHITE, SLOT TYPE, 6FT
70	-	-	-	-	-
71	A/R	-	IDEC	BNL-5	DIN RAIL END ANCHOR, METAL
72	A/R	-	E-RAIL	ER35P	TRACK, MOUNTING, DIN STYLE, 6FT LENGTH
73	A/R	-	ALLEN BRADLEY	1492-DR6	TERMINAL, DIN RAIL, RAISED, ALUMINUM, 35 MM X 7.5 MM X 57.4MM, 1M LONG
74	1	-	SAGINAW	SCE-ELMFK4	ENCLOSURE, FOOT KIT MOUNTING FEET
75	1	-	SAGINAW	SCE-36P30	ENCLOSURE, SUBPANEL, 30IN X 24IN
76	1	-	SAGINAW	SCE-36EL3016SSLP	ENCLOSURE, 36IN H X 30IN W 16IN D TYPE 4X STAINLESS STEEL
77	1	-	SAGINAW	SCE-DF36EL30LP	ENCLOSURE, DEAD FRONT
78	1	-	CUSTOM	KIC-60226	SHELF, 6"x6"
79	-	-	-	-	-
80	-	-	-	-	-

* = SUPPLIED R.E. PEDROTTI CO., INC.

‡ = SUPPLIED BY OWNER

& = FIELD INSTALLED

REP
R.E. Pedrotti Co., Inc.
5855 BEVERLY AVE. SUITE A
MISSION, KS 66202
(913) 677-3366 FAX (913) 667-3460

NO	REVISIONS	DATE	BY	MISC.
1	SUBMITTAL	10/9/24	BF	10/7/24
-	-	-	-	SCALE
-	-	-	-	DESIGNED
-	-	-	-	DRAWN
-	-	-	-	CHECKED
-	-	-	-	APPROVED
-	-	-	-	P.O. NO. 25661

BILL OF MATERIALS  INDUSTRIAL CONTROLS, INC. PHONE 785-825-7181 418 East Ave. B Salina, KS. 67401		R.E. PEDROTTI CO., INC. CITY OF WICHITA LIFT STATION NO. 16 WICHITA, KS
SHEET 15 OF 15	JOB NO. 8902	DWG. NO. LIFT-STA-16_BOM

SCADAPack 470i | 474i

Remote Smart RTU and Controller with
Integrated Edge Platform



Product at a glance

The SCADAPack™ 470i and 474i combine the SCADAPack x70 Smart RTU platform with a Linux-based application processor. Having cybersecurity at their core, they provide the full functionality of a Smart RTU, an edge controller, and an embedded Linux computer; all in one rugged industrial device.

The SCADAPack 470i and 474i are configured using RemoteConnect, include a web server, and are designed for solution development by users employing the large ecosystem of tools, forums, and libraries available for rapid development on embedded Linux devices. Tools such as Node-RED® can be used to support communications protocols such as MQTT®, Sparkplug® B, and OPC® UA. A software development kit is available to support C/C++ development and containers can be used for development in languages such as Python™.

Industrial-hardened hardware supports operating temperatures of -40...70 °C (-40...158 °F), has robust vibration ratings, and cULus Class I, Division 2 and ATEX/IECEX Zone 2 hazardous area certifications. The SCADAPack x70 uses components that will be available in the long term, making them the remote IoT edge platform of choice for many years to come.

Green Premium™ ecolabel
product – Sustainable
performance, by design

SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Product Highlights:

Edge Solutions

- Use Linux as a rapid development environment for solutions using higher level programming languages such as C/C++ or Python, providing a low-power open computing platform and Smart RTU in a single box
- Employ USB devices with Linux driver support such as cameras, microphones, WiFi dongles and more, to extend the capability of the RTU
- Provide toolless user interfaces for operators to monitor and control sites by developing secure custom web applications to oversee the RTU's operations
- Develop and deploy edge analytics solutions using Python
- Add ready-made solutions directly, or by using containers



Flexible Communications

- Employ open-standard telemetry protocols such as Modbus™, IEC 60870-5-104, and DNP3 level 4 Secure Authentication
- Bridge communications using DNP3 or IEC 60870-5-104 routing and Modbus Store and Forward
- Use tools such as Node-RED¹ to support IoT protocols such as OPC UA, MQTT, and Sparkplug B
- Included web server provides access to remote operation status using PC or mobile web browser
- Develop custom web applications
- Develop custom communication protocol drivers using the Linux rapid development environment

Powerful, Smart RTU

- Tagged (named) object databases allows I/O, configuration, logic, and application information to be communicated using open standard telemetry protocols such as Modbus, IEC 60870-5-104, and DNP3 and exchanged with Linux applications and IoT protocols
- Create IEC 61131-3 logic, with 5-language support, and password protection using EcoStruxure Control Expert
- Leverage experience and personnel training across remote (RTU) and in-plant (PLC) projects by sharing IEC 61131-3 logic between SCADAPack x70 RTUs and Modicon™ PLCs
- Update firmware, load/update logic, load configurations, and view diagnostics remotely or locally with RemoteConnect configuration software
- Available applications including the Realflo™ Oil, Gas, liquids, and CO₂ flow computer, and Realift™ pump off controller

Security at the Edge

- Control IP communications using included IP firewall and Network Address Translation (NAT) for RTU communications and Linux applications
- Ruggedized IP communications and RTU operations tested to comply with Achilles® Level 2 and Synopsys Defensics™
- Includes DNP3 Secure Authentication support
- Planned compliance with IEC 62443 SL1 industry cybersecurity standard
- Use tools such as Node-RED¹ to employ secure IoT protocols
- SDK and other features help to support secure development of Linux applications
- Password-protection for access to SCADAPack configuration

¹. Node-RED is a flow-based programming tool maintained and authored by the OpenJS Foundation & Contributors, and which can be used on a SCADAPack 470i and SCADAPack 474i.

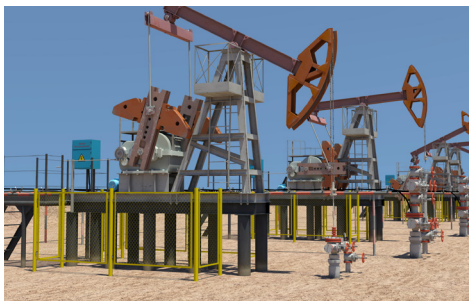
SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Product Highlights cont'd:

Rugged Hardware Optimized for Remote Deployment

- 11...30 Vdc Input Power with input voltage monitor
- Low power consumption
- Wide operating temperature -40...70 °C (-40...158 °F)
- G3 conformal-coated circuit boards
- Certified for use in hazardous locations (cULus Class I, Division 2 and ATEX/IECEX Zone 2)



Typical Applications

Oil and Gas

- Production automation and optimization
- Wellhead, pipeline, battery, and tank automation
- Leak detection/negative wave pressure calculation
- Protocol gateway (e.g. MQTT, Sparkplug B, OPC UA)
- Production and wellhead edge analytics



Water & Wastewater

- Web application monitoring and control of remote sites
- Potable Water Distribution Networks
- Wastewater Collection Networks
- Lift Stations
- Water wells
- Irrigation systems
- Leakage detection
- Potable water and wastewater analytics



Wind and Solar

- Substation control and monitoring
- Wind, solar, and radiation monitoring
- Meteorological analytics
- Device-positioning optimization

Configuring and Programming

RemoteConnect configuration software

RemoteConnect configuration software facilitates configuration, diagnostics, logic development, and device management:

- Locally through any of the communication ports (default: USB device port)
- Remotely through serial or TCP/IP networks and modems

Configuration

- Use descriptive naming of objects to enhance development, debugging, and translation to host systems
- Import or export configurations for templating and bulk editing externally in Microsoft® Excel
- Group, filter, and sort objects for easy editing and viewing with RemoteConnect configuration software object browsers

SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Linux Development

- SCADAPack 470i and 474i SDK supports the development of applications using C/C++
- Develop solutions in languages such as Python using Docker containers
- Deploy solutions directly to Linux using Docker containers
- Develop and debug on a Linux environment offline, in conjunction with live connection to SCADAPack 470i/474i Linux database, or online
- Leverage skills, training, and code by exploiting the large online ecosystem of libraries, forums, sample code to develop solutions quickly and easily with standard Linux and Raspberry PI®-style development environments

Logic Development (EcoStruxure Control Expert)

- Employ all five IEC 61131-3 languages
- Uses compiled run-time code for fast execution
- Import and export logic code segments for use in other SCADAPack projects or Modicon PLC projects
- Perform online debugging and logic modifications from the SCADAPack x70 Logic Editor
- Develop and write logic to a running system without interruption to the logic

Web Application Development

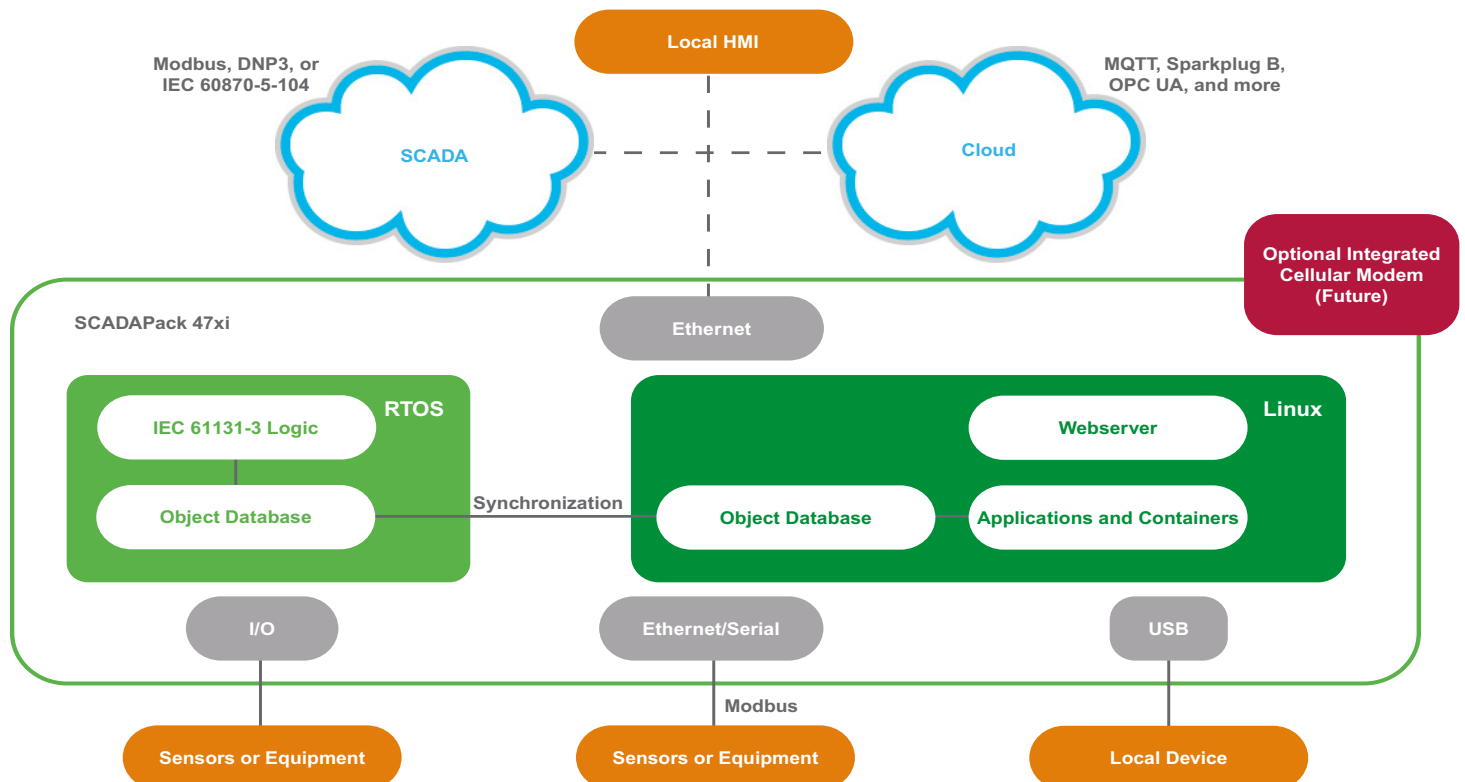
- Develop custom web applications using EcoStruxure™ RTU Operations Expert and Node-RED¹
- Develop custom web applications using included NGINX web server
- Create web applications using Role Based Access Control with LDAP support available in Ecostruxture RTU Operations Expert

Diagnostics

- View system information and status from object browsers within RemoteConnect configuration software
- View advanced diagnostics using the command line interface, including built-in protocol analyzers for DNP3, IEC 60870-5-104 and Modbus
- View system information and status from a web browser

Device Management

- Upgrade of SCADAPack and I/O expansion firmware
- Deploy custom device drivers and custom extensions using Linux application environment



SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Specifications

Architecture

Processors	RTU Real-time processor: • Dual ARM® Cortex® A7; 500M Hz, plus ARM Cortex M3 • 32-bit low power consumption CPU Linux Edge Application processor: • Dual ARM Cortex A7; 500 MHz, plus ARM Cortex M3 • 32-bit low power consumption CPU
Memory	RTU Real-time processor: • SRAM – 4 MB, battery backed static RAM • DDR3 RAM – 256 MB, dynamic RAM • NAND Flash – 256 MB, flash memory Linux Edge Application processor: • DDR3 RAM – 1 GB, dynamic RAM • NAND Flash – 1 GB, flash memory
File System Storage	RTU Real-time processor: • Approximately 70 MB user storage • Single-partition plug-in USB mass storage devices up to 32 GB FAT32 • Single-partition plug-in MicroSD card up to 32 GB mass storage Linux Edge Application processor: • Dual internal NAND Flash operating system image for robustness • Approximately 500 MB internal user application and storage • MicroSD card up to 1 TB mass storage • USB mass storage devices up to 1 TB
Data Capacity	RTU Real-time operating system: • Maximum DNP3 and IEC60870-5-104 events: 100,000² • Data Logging Capacity: • Up to 1 million datalog events in internal memory • Up to 250 million datalog events in external media • Database Capacity • Maximum number of database objects: Typically 15,000 • Maximum number of database objects linked with logic programming: Typically 6,000 • Maximum DNP3 Outstation devices³: Approximately 90 • Maximum DNP3 Outstation objects³: Approximately 15,000 across DNP3 Outstation devices • Maximum Modbus Server Devices when polled using the configurable Modbus Scanner: 150 • Maximum objects mapped from Modbus devices: 3,000 using Modbus scanner. Can be extended using IEC 61131-3 application.
Serial Ports: 1, 2	RS-485: 2-wire half-duplex operation maximum baud rate 115,200 bps
Serial Ports: 3, 4	• RS-232: Tx/D, Rx/D, CTS, RTS, DCD, DTR • RS-485: 2-wire half-duplex operation • Maximum baud rate 115,200 bps
Serial Protocols	DNP3 subset level 4 outstation with DNP3 client and peer-to-peer, Modbus RTU server/client. Custom protocols can be developed
Ethernet Ports: 1, 2, 3, 4	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100 Base-T), transformer-isolated, independent ports
IP Protocols	• DNP3 subset level 4 in TCP or in UDP outstation with DNP3 client and peer-to-peer capability • Modbus/TCP Server, Modbus/TCP Client • IEC 60870-5-104 controlled station • Secure SSH server, Secure HTTPS Web server, Telnet Server, FTP Server, NTP
USB Device Port	USB 2.0-compliant C-type receptacle
USB Host Ports	Port 1: USB 2.0-compliant A-type receptacle, supports USB mass storage devices up to 32 GB Ports 2, 3: USB 2.0-compliant A-type receptacle, available to Linux

2. Reduced if database objects exceed approximately 2,000 objects

3. Polled by the SCADAPack when it is operating as a DNP3 Controlling Station

SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Specifications – cont'd

General

Logic Control	RemoteConnect software (SCADAPack x70 Logic with five IEC 61131-3 languages)
I/O Terminations	3.3...0.08 mm ² (12...28 AWG), solid or stranded
Dimensions	- SCADAPack 470i: 142 mm W x 126 mm H x 68 mm D (5.6 in. x 4.9 in. x 2.7 in.) - SCADAPack 474i: 142 mm W x 167 mm H x 89 mm D (5.6 in. x 6.6 in. x 3.5 in.)
Packaging	- Corrosion-resistant zinc-plated steel base and stainless steel cover with black enamel paint - G3 conformal-coated circuit boards
Environment	-40...70 °C (-40...158 °F) operating temperature when the unit is mounted horizontally on a vertical surface -40...65 °C (-40...149 °F) operating temperature when the unit is mounted in any other position -40...85 °C (-40...185 °F) storage temperature 5...95% relative humidity, non-condensing - Pollution Degree 2, Installation Category I, Indoor use
Shock	IEC 61131-2 ½ sine, 15 ms, 15 g
Vibration	- IEC 61131-2 5...8.4 Hz: Amplitude controlled, 7.0 mm (0.28 in) peak-to-peak 8.4...150 Hz: Acceleration controlled, 1.0 g peak

Power Supply

Input voltage	- Rated Voltage 12...30 Vdc - Turn-on 10...11.5 Vdc - Turn-off 9...10 Vdc
Power requirements	4.8 W (SCADAPack 470i) 6 W (SCADAPack 474i)
Maximum power input to controller (excluding modem)	10.5 W

Certifications

Industrial Standards	Requirements specific to the SCADAPack functional characteristics, immunity, robustness, and safety: - IEC/EN 61131-2 - CAN/CSA 22.2 No. 61010-1-12 and CAN/CSA 22.2 No. 61010-2-201 - UL 61010-1 and UL 61010-2-201
CE Marking Compliance	- For the latest information regarding product compliance with European Directives for CE marking, refer to the EU Declaration of Conformity issued for your product at se.com - For the latest information regarding product compliance with RoHS, WEEE directives and REACH regulation, visit the Schneider Electric Check a Product portal at https://checkaproduct.se.com/
Installation in Classified Ex Area	- North America: Hazardous locations Class I, Division 2, groups A, B, C, and D, T4 and Class I, Zone 2, T4, -40 °C ≤ Tamb ≤ 70 °C (-40 °F ≤ Tamb ≤ 158 °F) and Class I, Zone 2, IIC T4 according to CSA C22.2 No. 213-17, UL 12.12.01 - ATEX, UKEX: Zone 2, II 3G, Ex ec nC IIC T4 Gc according to EN IEC 60079- 0, EN IEC 60079-7 and EN IEC 60079-15 - IECEx: Zone 2, Ex ec nC IIC T4 Gc according to IEC 60079- 0, IEC 60079-7 and IEC 60079-15
Specific Countries	- For Eurasian Economic Union: EAC  - For Australia and New Zealand: ACMA requirements for RCM marking - For United States: FCC Part 15 Subpart B Class A

SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Specifications – cont'd

Digital and Analog Inputs/Outputs

SCADAPack Smart RTU	Digital inputs 12...24 Vdc		Digital outputs		Pulse counter inputs (shared with DIs)		Analog inputs		Analog outputs
	DI 1...4	DI 5...20	DO 1...2	DO 3...12	DI 1...4	DI 5...12	AI 1...4	AI 5...12	AO 1...2
470i	4	-	2	-	4	-	4	-	-
474i	4	16	2	10	4	8	4	8	2

Digital Inputs	- DI 1...4 12...24 Vdc - DI 5...20 (SCADAPack 474i only) 12...24 Vdc								
Pulse Counter Inputs	- DI 1...4 - Max. 10 kHz (at 50% duty cycle) - Built-in turbine preamplifier⁴ for direct connection to turbine coils using short, shielded cable only. - DI 5...8 (SCADAPack 474i only) - Max. 1.5 kHz (at 50% duty cycle) - Shared with first 8 digital input channels on lower I/O board - DI 9...12 (SCADAPack 474i only) - Max. 150 Hz (at 50% duty cycle)								
Digital Outputs	- DO 1...2 - Form A, NO (Normally Open) relays, 2 A @ 30 Vdc, - DO 3...12 (SCADAPack 474i only) - Form A, NO relays, 2 A @ 30 Vdc								
Analog Inputs	- AI 1...4 0...20 mA, 4...20 mA, 0...5 Vdc, 1...5 Vdc, 12-bit resolution, unipolar, non-isolated, voltage/current selectable by software, - configurable for 30 mSec high speed update rate - AI 5...12 (SCADAPack 474i only) 0...20 mA, 4...20 mA, 0...5 Vdc, 1...5 Vdc, 24-bit resolution, single-ended, isolated from logic and chassis. - Filtering configuration 'none' results in fast sampling @100 mSec total for all 8 channels, '50/60Hz' filter configuration results in sampling at 500mSec for all 8 channels								
Analog Outputs	- AO 1...2 (SCADAPack 474i only) 0...20 mA, 4...20 mA (voltage output with external resistor), 12-bit resolution over 0...20 mA range, single-ended, isolated from logic and chassis								
Internal (System) Analog Inputs	- Input power supply voltage monitor, 36 Vdc full scale - Memory/RTC battery voltage monitor - Internal temperature monitor, measurement range -40...75 °C (-40...167 °F)								
Clock calendar	±15 seconds per month at -40...70 °C (-40...158 °F)								

Additional I/O

Supported Modules	5304, 5410, 5414, 5415, 5505, 5506, 5606, 5607, 6601, 6607 - When SCADAPack 47xi controller is used with 5000-series I/O Expansion modules, order one Inter Module Cable (IMC) adaptor cable (ref. TBUM297138), to adapt from 20 signal lines (used by SCADAPack x70 Smart RTUs) to 16 signal lines (used by 5000-series IO modules) - Maximum number of external expansion modules per unit: 15⁵								
I/O Expansion Limits ⁵	- Refer to the SCADAPack x70 Documentation Set > Hardware Manuals for further details. - Maximum intermodule cable length (not including the short cables that come with each module) is 1.82 m (75 in.)								

4. Applies to inputs 1 and 2 only. Cabling 10 ft (3 m) maximum in low noise environments

5. Additional power supply modules (model 6103) may be required for additional bus power, depending on how many expansion modules are included on the bus.

SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Model Code

TBUP474I-IA50-BB03S is an example of a SCADAPack 474i part number using the model codes below

Code	Select: Hardware platform
TBUP470I	SCADAPack 470i, 32-bit controller, Dual Core
TBUP474I	SCADAPack 474i, 32-bit controller, Dual Core, with additional I/O

Code	Select: Firmware platform
I	SCADAPack x70i RemoteConnect with IEC 61131-3 programming software, Linux Application Processor included

Code	Select: SCADA Security
A	Standard security features (including DNP3 Secure Authentication)

Code	Select: Protocol Option
5	DNP3 Serial/IP client/outstation/peer-to-peer, Modbus RTU/TCP client/server, TCP/IP

Code	Select: License Option
0	Standard DNP3 features, includes DNP3 Data Concentrator Controlling Station License

Code	Select: Analog Inputs /Outputs
A	P470i: 4 Analog Inputs, selectable as 0...20 mA, 4...20 mA, 0...5 Vdc, 1...5 Vdc
B	P474i: adds 8 Analog Inputs, selectable as 0...20 mA, 4...20 mA, 0...5 Vdc, 1...5 Vdc, and 2 Analog Outputs, selectable as 0...20 or 4...20 mA (voltage output with external resistor)

Code	Select: Digital Inputs/Outputs
A	P470i: 4 Digital Inputs (12...24 Vdc), 2 Digital Outputs Form A, NO (Normally Open) relays
B	P474i: adds 16 Digital Inputs (12...24 Vdc) and 10 Digital Outputs Form A NO relays

SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Model Code cont'd

TBUP474I-IA50-BB03S is an example of a SCADAPack 474i part number using the model codes below

Code	Future Option
0	None

Code	Select: Realflo Flow Computer - Flow Run License Options
0	None
3	3 Runs - any combination of gas, liquid or water totaling 3 runs
6	6 Runs - any combination of gas, liquid or water totaling 6 runs
T	10 Runs - any combination of gas, liquid or water totaling 10 runs
V	20 Runs - any combination of gas, liquid or water totaling 20 runs ⁶

Code	Select: Certifications
S	- FCC 47 CFR Part 15, Subpart B; ICES-003; CE and RCM markings, cULus Hazardous Location Class I, Division 2, Groups A, B, C and D, T4; and Class I, Zone 2, IIC - ATEX: EU Directive 2014/34/EU in defined atmosphere Zone 2 ATEX II 3G, Ex ec nC IIC T4 Gc according to EN IEC 60079-0, EN IEC 60079-7 and EN IEC 60079-15 - For Eurasian Economic Union: EAC

Accessories

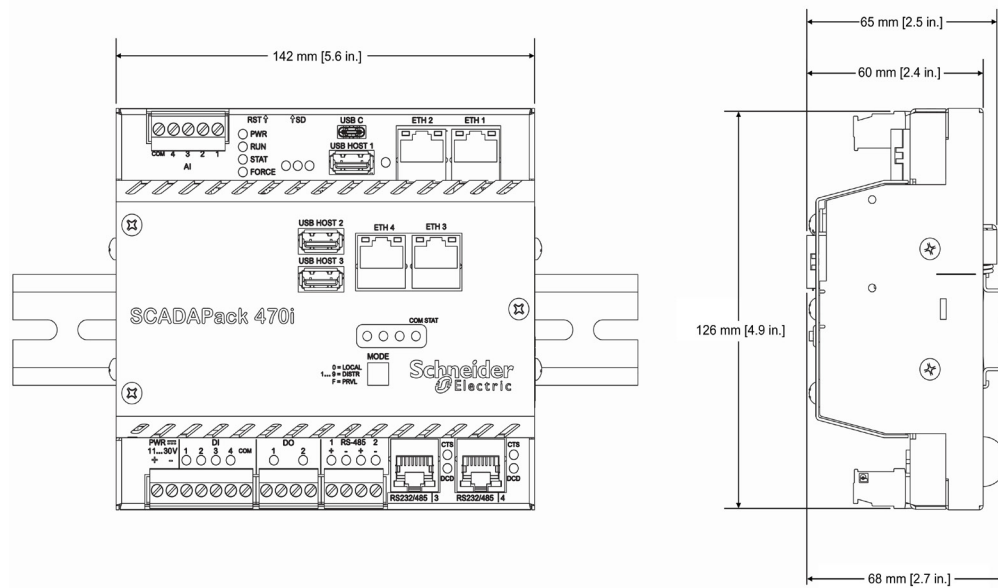
Part Number	Description
TBUM297310	SCADAPack 47x Connector Kit - five complete sets of spare connectors for SCADAPack 470i and 474i RTUs, and 6607 I/O expansion module
TBUM297147	SCADAPack Rod Pump Controller, Factory
TBUM297148	SCADAPack Rod Pump Controller, Field Upgrade

⁶ Gas transmission option is a standard feature of all SCADAPack x70 Smart RTUs with an active flow run license

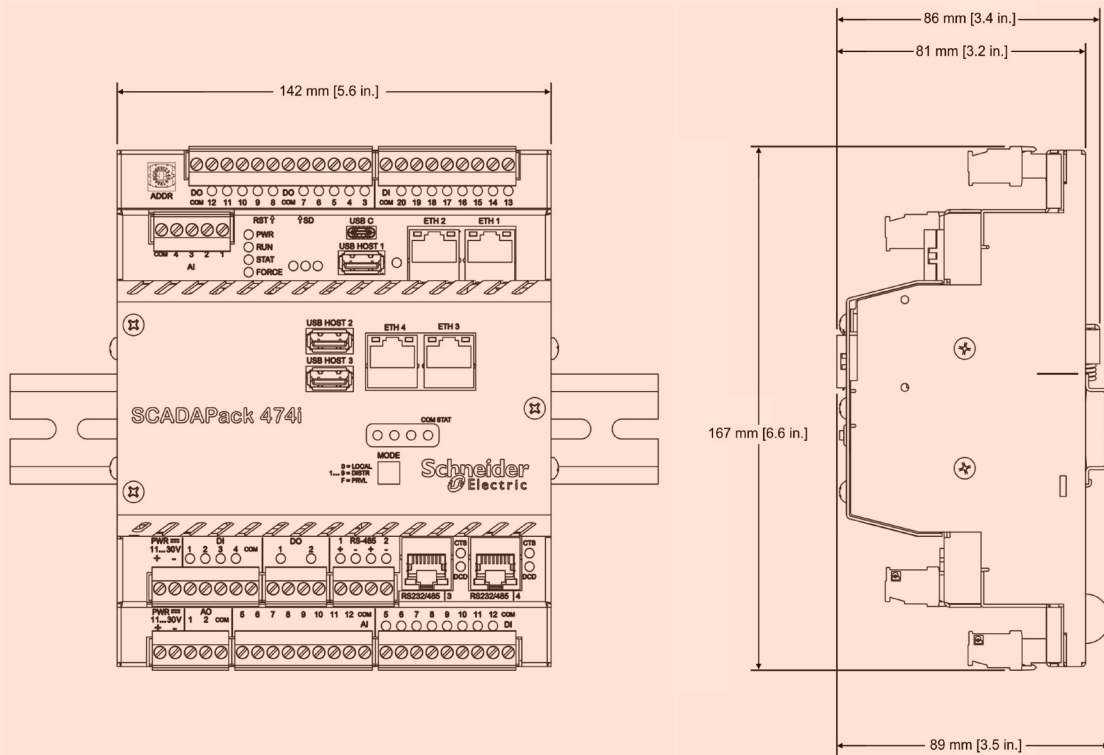
SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Dimensions - SCADAPack 470i



Dimensions - SCADAPack 474i



SCADAPack 470i | 474i

Remote Smart RTU and Controller with Integrated Edge Platform

Terminal Adaptors



Optional terminal adaptors provide the possibility for drop-in wiring replacement of existing SCADAPack P1, or SCADAPack P4 RTUs. This approach can save substantial time and costs when upgrading existing panels to SCADAPack 474i.

The terminal adaptors provide pin headers that accept the older style 'gray' plug-in terminal blocks. The adaptors position the terminal headers to approximately the same physical position as they are on the existing SCADAPacks. If panel space allows, and the wiring scheme is compatible with the terminal adaptors, the SCADAPack 474i can be placed into the existing panel, and existing wiring to the lower I/O board can be plugged onto the terminal adaptors without removing the wires from the terminal blocks.

For further details on the TBUM297915 terminal adaptor kit, refer to its data sheet (TBULM08038-10).

Refer to the SCADAPack x70 Documentation Set for further details.

Disclaimer:

The information provided in this document contains general descriptions and/or technical characteristics of the performance of the described products or services. For detailed specification, performance and instruction of use, refer to corresponding Catalogs and user guides if available.

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Life Is On

Schneider
Electric

Part Number: TBULM08030-07 v05

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Schneider Electric's commitment to deliver products with best-in-class environmental performance.



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- Circularity instructions



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Green Premium promises compliance with the latest regulations, transparency on environmental impacts as well as circular and low-CO₂ products.

CO₂ and P&L impact through... Resource Performance

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Cost of ownership optimization through... Circular Performance

We're helping our customers optimize the total cost of ownership of their assets. To do this, we provide IoT-enabled solutions, as well as upgrade, repair, retrofit, and remanufacture services.

Peace of mind through... Well-being Performance

Green Premium products are RoHS and REACH-compliant. We're going beyond regulatory compliance with step-by-step substitution of certain materials and substances from our products.

Improved sales through... Differentiation

Green Premium delivers strong value propositions through third-party labels and services. By collaborating with third-party organizations we can support our customers in meeting their sustainability goals such as green building certifications.

*PEP: Product Environmental Profile (i.e. Environmental Product Declaration)

C-more Selection Guide & Specifications

Model	6" TFT color w/ base features		6" TFT color w/ full features		7" TFT color w/ base features		7" TFT color w/ full features	
Specification	6" TFT color w/ base features		6" TFT color w/ full features		7" TFT color w/ base features		7" TFT color w/ full features	
Part Number	EA9-T6CL-R		EA9-T6CL		EA9-T7CL-R		EA9-T7CL	
Display Actual Size and Type	5.7" TFT color				7.0" TFT color			
Display Viewing Area	4.54" x 3.40" [115.2 mm x 86.4 mm]				6.00" x 3.60" [152.4 mm x 91.4 mm]			
Weight	1.56 lb [710g]		1.59 lb [720g]		1.46 lb [660g]		1.48 lb [670g]	
Screen Pixel	320 x 240 (QVGA)				800 x 480 (WVGA)			
Display Brightness	280 nits (typ)				350 nits (typ)			
LCD Panel Dot Pitch	0.18 mm x 0.18 mm				0.190 mm x 0.190 mm			
Color Scale	65,536 colors							
Backlight Average Lifetime*	50,000 hours @ 25°C							
Touch Panel Type**	Four-wire analog resistive, single touch							
Project Memory	26MB				43MB			
Number of Screens	Up to 999 screens – limited by project memory							
Realtime Clock	Realtime clock built into panel, backed up for 30 days at 25°C							
Calendar – Month / Day / Year	Yes - monthly deviation 60sec (Reference)							
Serial Port 1	15-pin D-sub female – RS232C, RS-422/485							
Serial Port 2	N/A		3-wire terminal block – RS-485		N/A		3-wire terminal block – RS-485	
Serial Port 3	N/A		RJ-12 modular jack – RS-232C		N/A		RJ-12 modular jack – RS-232C	
USB Port – Type B	USB 2.0 High speed (480 Mbps) Type B – Download/Program – Max. cable length 15-feet							
USB Port – Type A	USB 2.0 High speed (480 Mbps) Type A – for USB device options – Max. cable length 15-feet – Bus Power – Less than 200mA at 5VDC							
Ethernet Port	N/A		10/100 Base-T, auto MDI/MDI-X					
Ethernet Port - Expansion Module	N/A		EA-ECOM		N/A		EA-ECOM	
Audio Line Out	N/A		3.5 mm mini jack – requires amplifier and speaker(s)		N/A		3.5 mm mini jack – requires amplifier and speaker(s)	
Mic In (Future)	N/A		3.5 mm mini jack		N/A		3.5 mm mini jack	
SD Card Slot	1 slot supports max 2GB (SD,) max 32GB (SDHC)							
HDMI Video Out	N/A							
HDMI Supported Resolution	N/A							
Supply Power	10.2-26.4 VDC Class 2 or SELV (Safety Extra-Low Voltage) Circuit or Limited Energy Circuit (LEC), or use the AC/DC Power Adapter, EA-AC, to power the touch panel from a 100-240 VAC, 50/60 Hz power source. Reverse Polarity Protected							
Power Consumption	16.0 W 1.30 A @ 12VDC 0.66 A @ 24VDC							
Internal Fuse (non-replaceable)	4.0 A							
Altitude	Up to 2000m (6562ft)							
Operating Temperature	0 to 50°C (32 to 122°F) Maximum surrounding air temperature rating: 50°C (122°F) IEC 60068-2-14 (Test Nb, Thermal Shock)							
Storage Temperature	–20 to +60°C (–4 to +140°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)							
Humidity	5-95% RH (non-condensing)							
Environment	For use in Pollution Degree 2 environment, no corrosive gases permitted							
Noise Immunity	(EN61131-2), EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Serge), EN61000-4-6 (Conducted) EN61000-4-8 (Power frequency magnetic field immunity) (Local Test) RFI, (145MHz, 440Mhz 10W @ 10cm), Impulse 1000V @ 1µs pulse							
Withstand Voltage	1000VAC, 1min. (FG to Power supply)							
Insulation Resistance	> 10M ohm @ 500VDC (FG to Power supply)							
Vibration	IEC60068-2-6 (Test Fc)							
Shock	IEC60068-2-27 (Test Ea)							
Emission	EN55011 Class A (Radiated RF emission)							
Enclosure	NEMA 250 type 4/4X indoor use only UL50 type 4X indoor use only IP-65 indoor use only (When mounted correctly)				NEMA 250 type 4/4X indoor use only UL50 type 4X indoor use only IP-65 (not tested by UL) (When mounted correctly)			
Agency Approvals	UL508, E157382, Class 1, Div 2, Groups A, B, C CE (EN61131-2), RoHS (2011/65/EU) CUL Canadian C22.2				UL61010, E157382 CE (EN61131-2), RoHS (2011/65/EU) CUL Canadian C22.2			
NOTES:	<i>*The backlight average lifetime is defined as the average usage time it takes before the brightness becomes 50% of the initial brightness. The lifetime of the backlight depends on the ambient temperature. The lifetime will decrease under low or high temperature usage.</i> <i>**The touchscreen is designed to respond to a single touch. If it is touched at multiple points at the same time, an unexpected object may be activated.</i>							

C-more 7" TFT Color Touch Panel - Full Model

EA9-T7CL

C-more EA9 series touch screen interface panel, 7-inch color TFT (7.0 inch viewable screen), 64K colors, 800 x 480 pixel WVGA screen resolution, 800MHz CPU, 12-24 VDC powered, NEMA 4/4X, IP65 (when mounted correctly; for indoor use only)(not tested by UL), non-replaceable LED backlight. Includes (3) serial ports, USB 2.0 Type A and B ports and Ethernet port; supports SD memory card. Compatible with [EA9-PGMSW](#) programming software version 6.3 or later.

Features

- 7.0" diagonal color TFT (Thin Film Transistor) LCD display with 64K colors
- 800 x 480 pixel resolution
- 350 NITS display brightness
- 50,000 hour average backlight half-life
- Analog resistive (1024 X 1024) touch screen allowing unlimited touch areas
- USB port B (program/download) and USB port A (USB device options)
- Ethernet 10/100 Base-T port (program/download & PLC communication)
- Expansion Module Support
- Use [EA-ECOM](#) for second Ethernet Port
- Remote Internet access
- Serial PLC interface (RS-232/422/485)
- One built-in SD memory card slot
- 12-24 VDC powered, 110VAC power adapter (optional)
- Audio Line Out, stereo - requires amplifier and speaker(s)
- 43MB project memory
- Data logging
- 0 to 50°C [32 to 122°F] operating temperature range
- NEMA 4/4X, IP65(not tested by UL) when mounted correctly, indoor use only
- Slim design saves panel space
- UL, cUL & CE agency approvals
- 2-year warranty from date of purchase



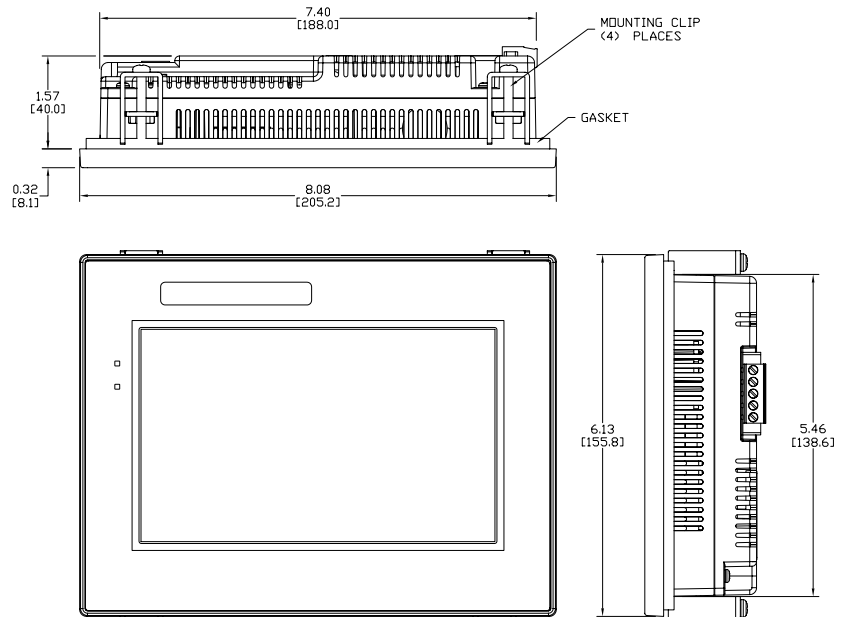
Function	Available
Ethernet	Yes
USB	Yes
SD Card	Yes
Audio Out	Yes
HDMI Video Out	No
Expansion Module	Yes



\$794.00

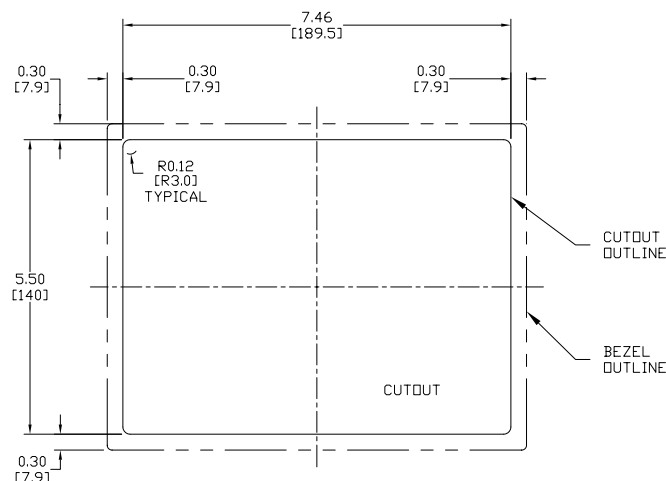
Dimensions

Units: inches [mm]

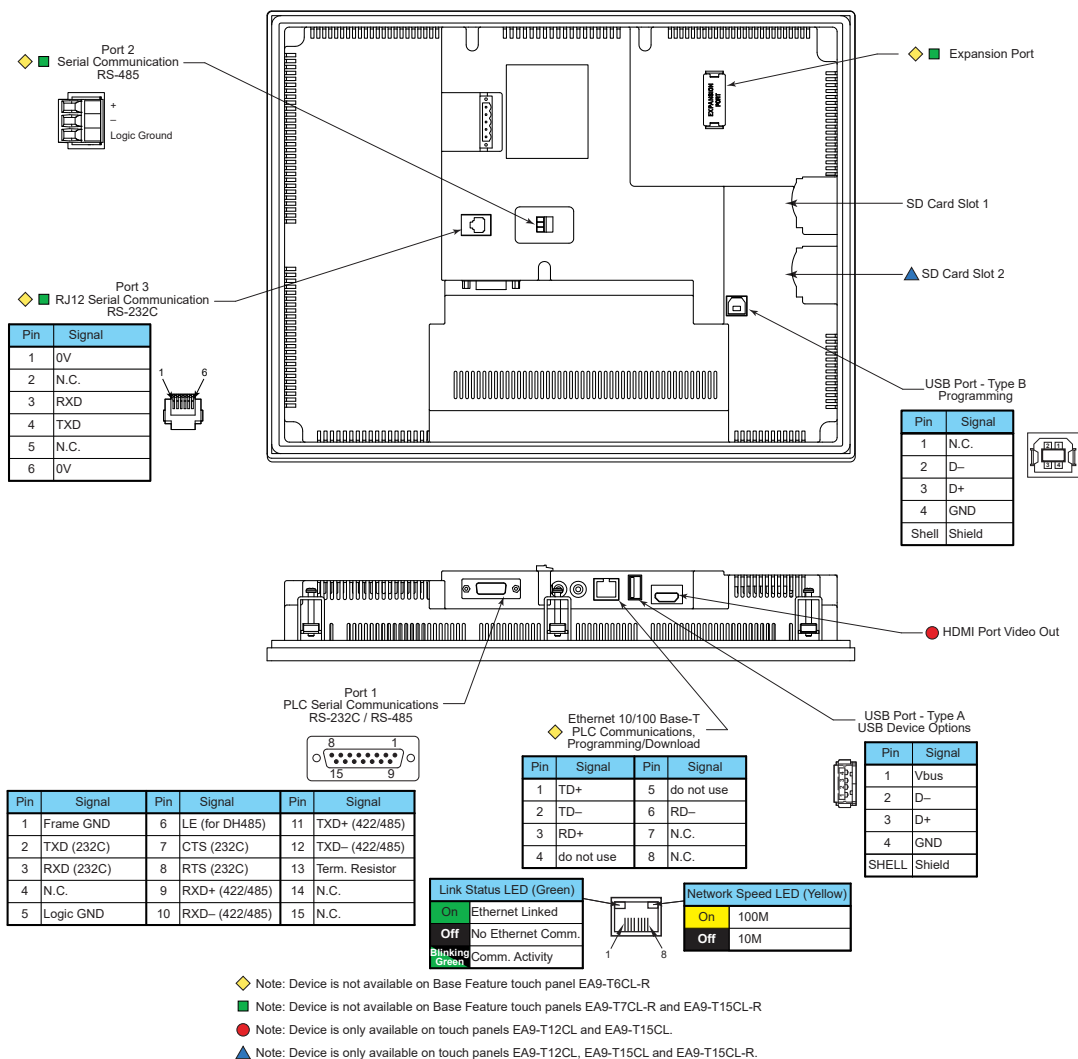


See our website www.AutomationDirect.com for complete engineering drawings.

Mounting Cutout



C-more Communication Ports



Ethernet Port

The Ethernet port has several uses:

- Download program to panel
- Communicate to PLCs/PCs
- Send e-mail
- Access FTP server
- Act as a Web server
- Remote Internet access

The Ethernet port has an RJ-45 8-wire modular connector with green and yellow LEDs.

- The yellow LED indicates network speed – off for a 10 Mbps connection and illuminated for a 100 Mbps connection.
- The green LED indicates link status and illuminates when a link is established.

Note: EA6-T6CL-R does not include an Ethernet port, and does not have these capabilities.

Expansion Port

The expansion port supports the EA-ECOM module to provide a second Ethernet Port for all full featured models.

USB Port B

Program **C-more** via the USB programming port. It's fast and easy, with no baud rate settings, parity, or stop bits to worry about. We stock standard USB cables for your convenience. USB Port B can be used to upload or download projects to and from a PC.

USB Port A

The Universal Serial Bus (USB) Port A is a standard feature on all models and can be used to connect various USB HID (Human Input Device) devices to the panel, such as the following:

- USB flash drives ([USB-FLASH](#))
- USB keyboards
- USB barcode scanners
- USB card scanners

C-more can log data to the USB flash drive as well as load projects to the panel from the pen drive. You can also back up project files and panel firmware.

Sound Interface (Audio Line Out)

When attached to an amplifier and speaker(s), **C-more** can play warning sounds or pre-recorded messages such as: "conveyor is jammed". **C-more** supports WAV type files. The output is stereo.

Serial Port

Port 1 - Connect to your serial controller network via Port 1. Port 1 is a 15-pin port that supports RS-232 or RS-422/485.

Port 2 - Connect your RS-485 network via Port 2. Port 2 is provided with a 3-wire removable terminal block.

Port 3 - Connect to your RS-232C device via Port 3. Port 3 is an RJ12 connection.

HDMI Video Out

EA9-T12CL and EA9-T15CL include an HDMI Type A port to provide video output to a projector or remote monitor.

C-more Computer Programming Connections

Using the **C-more** Programming Software [EA9-PGMSW](#) for project development, the HMI can be connected to a PC (personal computer) in one of several ways:

- Connect a USB Programming Cable such as (USB-CBL-AB15) from a USB port type A on the PC to the USB type B programming port on the **C-more** HMI. The USB connection is for direct connection only and does not support USB hubs.
- Connect the **C-more** HMI to a PC with a Cat5 Ethernet cable via an Ethernet switch. Multiple **C-more** HMIs can be programmed in this configuration.

Following are the minimum system requirements for running **C-more** Programming Software, p/n [EA9-PGMSW](#), on a PC:

- USB or Ethernet connection to HMI (cables sold separately).
- Windows operating system - see automationdirect.com for specific operating system requirements.



NOTE: Regarding Ethernet access to a C-more HMI.

If you intend to take advantage of the methods of remote access to the HMI, including the web server, PC remote access, FTP, iPhone or iPad app, you need to consider the security exposure in order to minimize the risks to your process and your C-more HMI.

Security measures may include password protection, changing the ports exposed on your network, including a VPN in your network, and other methods. Security should always be carefully evaluated for each installation.

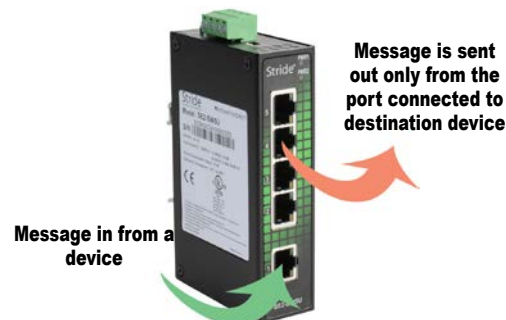
USB Programming Cable



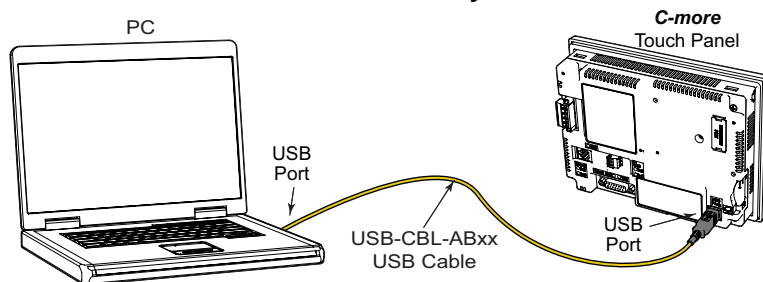
Part No. USB-CBL-ABxx

USB Programming Cables		
Part Number	Length	Price
USB-CBL-AB3	3 feet	\$12.00
USB-CBL-AB6	6 feet	\$16.00
USB-CBL-AB10	10 feet	\$36.50
USB-CBL-AB15	15 feet	\$42.50

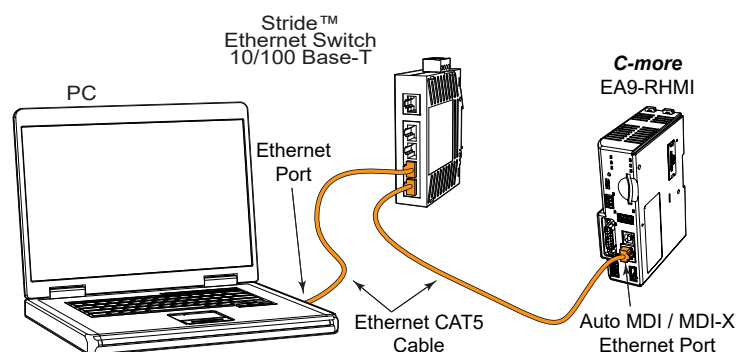
Stride® Ethernet Switch



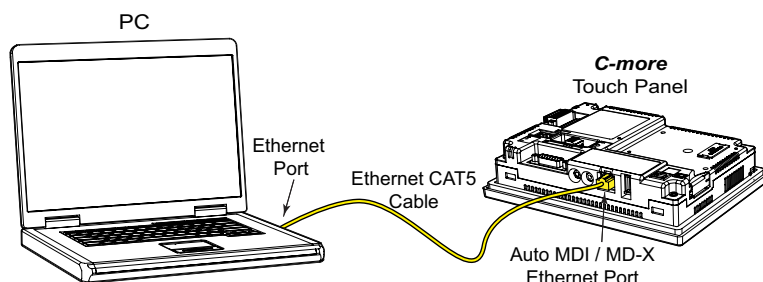
USB Connectivity



Ethernet Connectivity via a Hub or Switch



Ethernet Direct Connection



QUINT-PS/1AC/24DC/10 - Power supply unit



2866763

<https://www.phoenixcontact.com/us/products/2866763>

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Primary-switched power supply unit QUINT POWER, Screw connection, DIN rail mounting, SFB Technology (Selective Fuse Breaking), input: 1-phase, output: 24 V DC / 10 A

Product description

QUINT POWER power supplies with maximum functionality

QUINT POWER circuit breakers magnetically and therefore quickly trip at six times the nominal current, for selective and therefore cost-effective system protection. The high level of system availability is additionally ensured, thanks to preventive function monitoring, as it reports critical operating states before errors occur.

Reliable starting of heavy loads takes place via the static power reserve POWER BOOST. Thanks to the adjustable voltage, all ranges between 5 V DC ... 56 V DC are covered.

Your advantages

- Reliable starting of difficult loads with the static POWER BOOST power reserve with up to 1.5 times the nominal current permanently
- Fast tripping of standard circuit breakers with dynamic power reserve SFB (selective fuse breaking) technology with up to 6 times the nominal current for 12 ms
- For superior system availability
- Preventive function monitoring

Commercial data

Item number	2866763
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM11
Product key	CMPQ13
Catalog page	Page 159 (C-6-2015)
GTIN	4046356113793
Weight per piece (including packing)	1,508 g
Weight per piece (excluding packing)	1,145 g
Customs tariff number	85044095
Country of origin	TH

QUINT-PS/1AC/24DC/10 - Power supply unit



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Technical data

Input data

AC operation

Nominal input voltage range	100 V AC ... 240 V AC -15 % / +10 %
Input voltage range	85 V AC ... 264 V AC
Derating $I_{\text{Stat. Boost}}$	< 100 V AC (1 %/V)
Input voltage range DC	110 V DC ... 350 V DC (typ. 90 V DC (UL 508: ≤ 300 V DC))
Electric strength, max.	300 V AC
Typical national grid voltage	120 V AC
	230 V AC
Voltage type of supply voltage	AC
Inrush current	< 15 A
Inrush current integral (I^2t)	< 1.5 A ² s
Inrush current limitation	15 A
AC frequency range	45 Hz ... 65 Hz
Frequency range DC	0 Hz
Mains buffering time	> 36 ms (120 V AC)
	> 36 ms (230 V AC)
Current consumption	4 A (100 V AC)
	1.7 A (240 V AC)
Nominal power consumption	302 VA
Protective circuit	Transient surge protection; Varistor, gas-filled surge arrester
Power factor (cos phi)	0.85
Typical response time	< 0.15 s
Input fuse	10 A (slow-blow, internal)
Permissible backup fuse	B10 B16 AC:
Permissible DC backup fuse	DC: Connect a suitable fuse upstream
Recommended breaker for input protection	10 A ... 20 A (Characteristics B, C, D, K)
Discharge current to PE	< 3.5 mA

DC operation

Nominal input voltage range	110 V DC ... 250 V DC -10 % ... +40 % (UL 508: ≤ 300 V DC)
Input voltage range	110 V DC ... 350 V DC
Derating $I_{\text{Stat. Boost}}$	< 110 V DC (1 %/V)
Current consumption	3.4 A (110 V DC)
	1.5 A (250 V DC)

Output data

Efficiency	typ. 92 % (120 V AC)
	typ. 93.2 % (230 V AC)
Output characteristic	U/I
Nominal output voltage	24 V DC ± 1 %

QUINT-PS/1AC/24DC/10 - Power supply unit



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Setting range of the output voltage (U_{Set})	18 V DC ... 29.5 V DC (> 24 V DC, constant capacity restricted)
Nominal output current (I_N)	10 A
POWER BOOST (I_{Boost})	15 A (-25 °C ... 40 °C permanent, $U_{OUT} = 24$ V DC)
Static Boost ($I_{Stat.Boost}$)	15 A
Selective Fuse Breaking (I_{SFB})	60 A (12 ms)
Magnetic circuit breaker tripping	B2 / B4 / B6 / C2 / C4
Derating	60 °C ... 70 °C (2.5 %/K)
Feedback voltage resistance	≤ 35 V DC
Protection against overvoltage at the output (OVP)	≤ 35 V DC
Control deviation	< 1 % (change in load, static 10 % ... 90 %)
	< 2 % (change in load, dynamic 10 % ... 90 %)
	< 0.1 % (change in input voltage ± 10 %)
Residual ripple	< 50 mV _{PP} (with nominal values)
Short-circuit-proof	yes
Output power	240 W
	360 W
Maximum no-load power dissipation	9.1 W
Power loss nominal load max.	22 W
Rise time	< 0.05 s (U_{OUT} (10 % ... 90 %))
Connection in parallel	yes, for redundancy and increased capacity
Connection in series	yes

Signal: DC OK active

Output description	$U_{OUT} > 0.9 \times U_N$: High signal
Switching voltage range	18 V DC ... 24 V DC
Maximum inrush current	≤ 20 mA (short-circuit-proof)
Continuous load current	≤ 20 mA

Signal: DC OK floating

Output description	Relay contact, $U_{OUT} > 0.9 \times U_N$: Contact closed
Maximum switching voltage	30 V AC
	24 V DC
Maximum inrush current	0.5 A
	1 A
Continuous load current	≤ 1 A

Signal: POWER BOOST, active

Output description	$I_{OUT} < I_N$: High signal
Switching voltage range	18 V DC ... 24 V DC
Output voltage	+ 24 V DC
Maximum inrush current	20 mA (short-circuit-proof)
Continuous load current	≤ 20 mA

Connection data

Input

QUINT-PS/1AC/24DC/10 - Power supply unit



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Connection method	Screw connection
Conductor cross section, rigid min.	0.2 mm ²
Conductor cross section, rigid max.	2.5 mm ²
Conductor cross section flexible min.	0.2 mm ²
Conductor cross section flexible max.	2.5 mm ²
Conductor cross section AWG min.	16
Conductor cross section AWG max.	12
Stripping length	7 mm
Screw thread	M3
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

Output

Connection method	Screw connection
Conductor cross section, rigid min.	0.2 mm ²
Conductor cross section, rigid max.	2.5 mm ²
Conductor cross section flexible min.	0.2 mm ²
Conductor cross section flexible max.	2.5 mm ²
Conductor cross section AWG min.	16
Conductor cross section AWG max.	12
Stripping length	7 mm
Screw thread	M3
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

Signal

Connection method	Screw connection
Conductor cross section, rigid min.	0.2 mm ²
Conductor cross section, rigid max.	2.5 mm ²
Conductor cross section flexible min.	0.2 mm ²
Conductor cross section flexible max.	2.5 mm ²
Conductor cross section AWG min.	16
Conductor cross section AWG max.	12
Screw thread	M3
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

Signaling

Types of signaling	LED
	Active switching output
	Relay contact

Signal output: DC OK active

Status display	$U_{OUT} > 0.9 \times U_N$: "DC OK" LED green
Note on status display	$U_{OUT} < 0.9 \times U_N$: Flashing "DC OK" LED

QUINT-PS/1AC/24DC/10 - Power supply unit



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	$I_{OUT} < I_N$: LED ON
Signal output: DC OK floating	
Status display	$U_{OUT} > 0.9 \times U_N$: "DC OK" LED green
Note on status display	$U_{OUT} < 0.9 \times U_N$: Flashing "DC OK" LED
Signal output: POWER BOOST, active	
Status display	$I_{OUT} > I_N$: LED "BOOST" yellow

Electrical properties

Number of phases	1.00
Insulation voltage input/output	4 kV AC (type test)
	2 kV AC (routine test)
Insulation voltage output / PE	500 V DC (routine test)
Insulation voltage input / PE	3.5 kV AC (type test)
	2 kV AC (routine test)

Product properties

Product type	Power supply
Product family	QUINT POWER
MTBF (IEC 61709, SN 29500)	> 940000 h (25 °C)
	> 530000 h (40 °C)
	> 230000 h (60 °C)

Data management status

Article revision	09
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Insulation characteristics

Protection class	I
Degree of pollution	2

Dimensions

Width	60 mm
Height	130 mm
Depth	125 mm

Installation dimensions

Installation distance right/left	5 mm / 5 mm
Installation distance top/bottom	50 mm / 50 mm

Alternative assembly

Width	122 mm
Height	130 mm
Depth	63 mm

Mounting

Mounting type	DIN rail mounting
---------------	-------------------

QUINT-PS/1AC/24DC/10 - Power supply unit



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Assembly note	alignable: $P_N \geq 50\%$, 5 mm horizontally, 15 mm next to active components, 50 mm vertically alignable: $P_N < 50\%$, 0 mm horizontally, 40 mm vertically top, 20 mm vertically bottom
Mounting position	horizontal DIN rail NS 35, EN 60715
With protective coating	no

Material specifications

Housing material	Metal
Hood version	Galvanized sheet steel, free from chrome (VI)
Side element version	Aluminum

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Ambient temperature (start-up type tested)	-40 °C
Maximum altitude	≤ 5000 m (> 2000 m, observe derating)
Climatic class	3K3 (in acc. with EN 60721)
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, non-condensing)
Shock	18 ms, 30g, in each space direction (according to IEC 60068-2-27)
Vibration (operation)	< 15 Hz, amplitude ±2.5 mm (according to IEC 60068-2-6) 15 Hz ... 150 Hz, 2.3g, 90 min.
Temp code	T4 (-25 ... +60 °C)

Standards and regulations

Rail applications	EN 50121-4
	EN 50121-3-2
HART FSK Physical Layer Test Specification Compliance	Output voltage U_{Out} compliant
Standard – Limitation of mains harmonic currents	EN 61000-3-2
Standard - Electrical safety	IEC 61010-2-201 (SELV)
Standard - Equipment safety	BG (design tested)
Standard - Approval for medical use	IEC 60601-1, 2 x MOOP
Standard – Safety extra-low voltage	IEC 61010-1 (SELV)
	IEC 61010-2-201 (PELV)
Standard - Safe isolation	IEC 61010-2-201
Standard - safety for equipment for measurement, control, and laboratory use	IEC 61010-1
Approval - requirement of the semiconductor industry with regard to mains voltage dips	SEMI F47-0706 Compliance Certificate
DeviceNet approval	DeviceNet™ Power Supply Conformance Tested

Overvoltage category

EN 61010-1	II (≤ 5000 m)
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QUINT-PS/1AC/24DC/10 - Power supply unit



2866763

<https://www.phoenixcontact.com/us/products/2866763>

Approvals

CSA	CAN/CSA-C22.2 No. 60950-1-07
	CSA-C22.2 No. 107.1-01
Shipbuilding approval	DNV GL (EMC B), ABS, LR, RINA, NK, BV
SIQ	BG (type approved)
UL approvals	UL Listed UL 508
	UL/C-UL Recognized UL 60950-1
	UL 121201 & CSA C22.2 No. 213-17 Class I, Division 2, Groups A, B, C, D T4 (Hazardous Location)
DeviceNet approval	DeviceNet™ Power Supply Conformance Tested

EMC data

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Low Voltage Directive	Conformance with Low Voltage Directive 2014/35/EC
EMC requirements for noise emission	EN 61000-6-3
	EN 61000-6-4
EMC requirements for noise immunity	EN 61000-6-1
	EN 61000-6-2

Electrostatic discharge

Standards/regulations	EN 61000-4-2
-----------------------	--------------

Electrostatic discharge

Contact discharge	8 kV (Test Level 4)
Discharge in air	15 kV (Test Level 4)
Comments	Criterion A

Electromagnetic HF field

Standards/regulations	EN 61000-4-3
-----------------------	--------------

Electromagnetic HF field

Frequency range	80 MHz ... 1 GHz
Test field strength	20 V/m (Test Level 3)
Frequency range	1 GHz ... 2 GHz
Test field strength	10 V/m (Test Level 3)
Frequency range	2 GHz ... 3 GHz
Test field strength	10 V/m (Test Level 3)
Comments	Criterion A

Fast transients (burst)

Standards/regulations	EN 61000-4-4
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Fast transients (burst)

Input	4 kV (Test Level 4 - asymmetrical)
Output	2 kV (Test Level 3 - asymmetrical)
Signal	2 kV (Test Level 4 - asymmetrical)

QUINT-PS/1AC/24DC/10 - Power supply unit



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Comments	Criterion A
Surge voltage load (surge)	
Standards/regulations	EN 61000-4-5
Surge voltage load (surge)	
Input	1 kV (Test Level 2 - symmetrical)
	2 kV (Test Level 3 - asymmetrical)
Output	0.5 kV (Test Level 1 - symmetrical)
	0.5 kV (Test Level 1 - asymmetrical)
Signal	1 kV (Test Level 2 - asymmetrical)
Comments	Criterion B
Conducted interference	
Standards/regulations	EN 61000-4-6
Conducted interference	
I/O/S	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V (Test Level 3)
Emitted interference	
Standards/regulations	EN 61000-6-3
Radio interference voltage in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential
Emitted radio interference in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential
Criteria	
Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

QUINT-PS/1AC/24DC/10 - Power supply unit

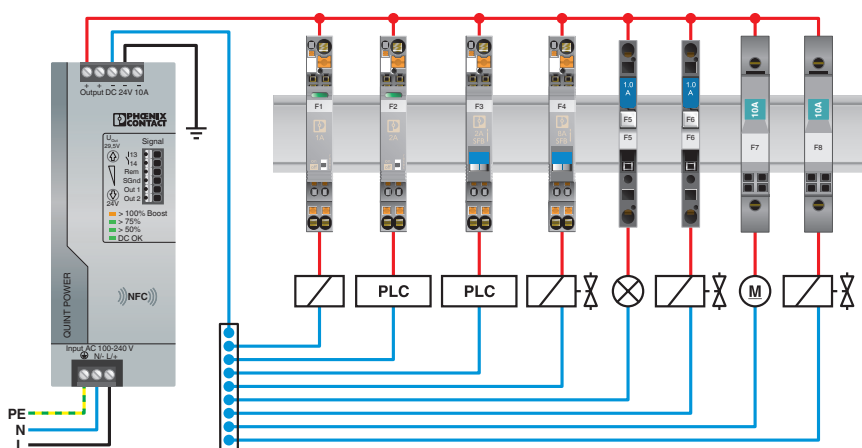


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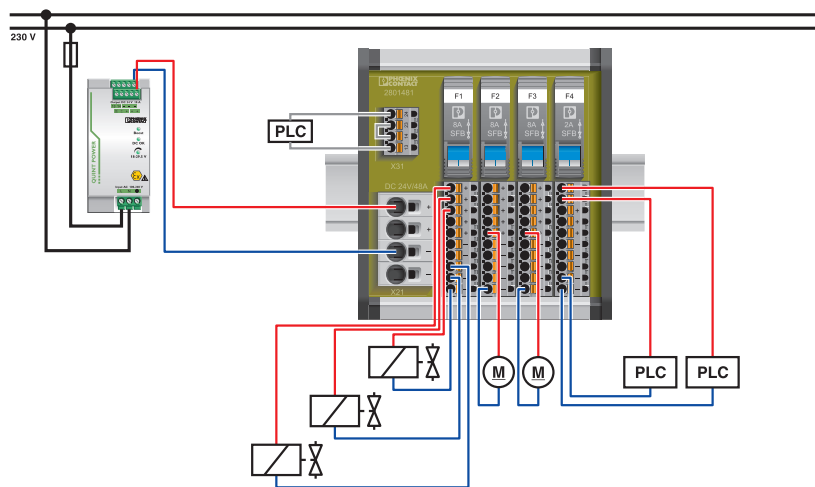
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Drawings

Application drawing



Application drawing



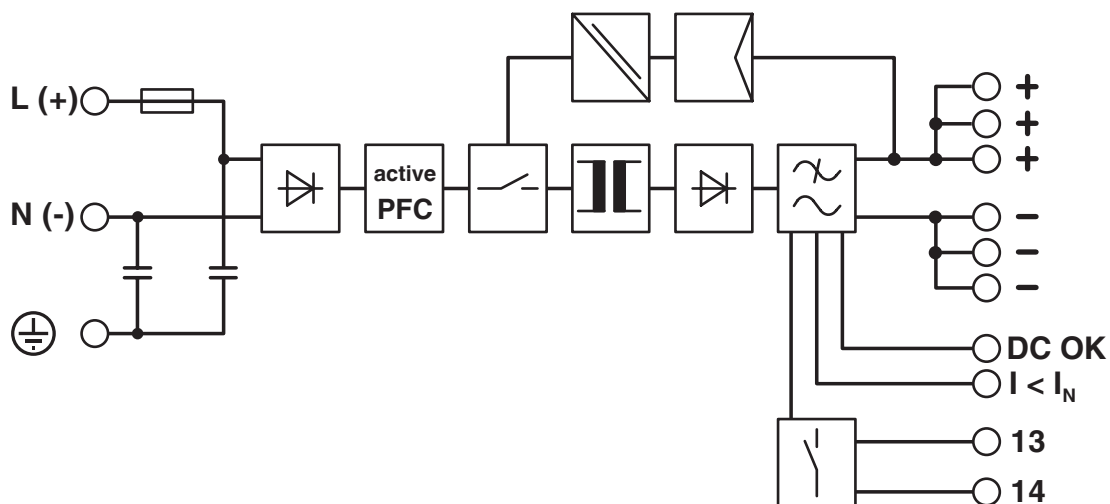
QUINT-PS/1AC/24DC/10 - Power supply unit



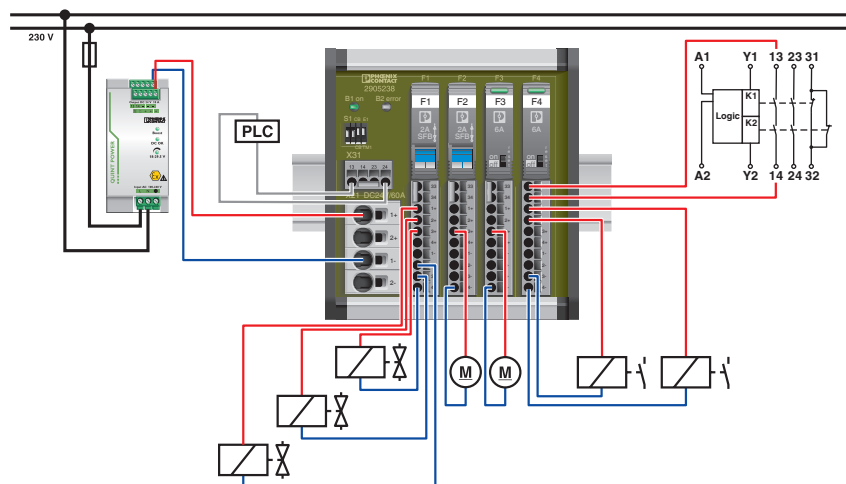
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Block diagram



Application drawing



QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply



2320270

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Uninterruptible power supply with IQ technology 1AC/1AC/500 VA. For 120 V AC/230 V AC applications. Provides information regarding the charging state, remaining runtime, and service life of your rechargeable battery module at all times and thereby increases system availability.

Product description

The UPS module for 120 V AC/230 V AC delivers a pure sine curve at the output. For 400 W/500 VA of power, only one energy storage is required, the power supply is already integrated.

Your advantages

- Optimum use of the buffer time and preventive monitoring of the energy storage
- Can be used worldwide
- Maximum efficiency
- Comprehensive signaling and parameterization
- Simplified startup

Commercial data

Item number	2320270
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM20
Product key	CMUQ15
Catalog page	Page 330 (C-4-2019)
GTIN	4046356560078
Weight per piece (including packing)	2,510 g
Weight per piece (excluding packing)	2,244 g
Customs tariff number	85371091
Country of origin	DE

QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply



2320270

<https://www.phoenixcontact.com/us/products/2320270>

Technical data

Input data

AC operation

Input voltage	240 V AC
	100 V AC
	120 V AC -20 % / +15 %
	230 V AC -20 % / +15 %
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range	184 V AC ... 264 V AC
	96 V AC ... 138 V AC
	96 V AC ... 264 V AC
Input voltage range AC	196 V AC ... 264 V AC
	102 V AC ... 138 V AC
	96 V AC ... 264 V AC
Voltage type of supply voltage	AC
Nominal frequency	50 Hz ... 60 Hz
	50 Hz ... 60 Hz
AC frequency range	45 Hz ... 65 Hz
Buffer period	1 h (38 AH)
Current consumption	2.2 A (230 V AC)
	0.18 A (230 V AC)
	0.8 A (230 V AC)
	3.7 A (230 V AC)
	4.3 A (120 V AC)
	0.35 A (120 V AC)
	1.3 A (120 V AC)
	6.8 A (120 V AC)
Fixed backup threshold	Configurable, 10% deviation from nominal input voltage set by default
Variable connect threshold	Can be configured using UPS-CONF software
Power factor (cos phi)	0.8
Device mains fuse	10 A
Permissible backup fuse	B16 230 V AC
	20 A 120 V AC, Listed breaker

Digital Control Low-Active (configurable)

Battery-operated start 120 V AC Default	Plug-in bridge (output +24 V DC, 30 mA to input A1)
Battery-operated start 230 V AC Default	Plug-in bridge (output +24 V DC, 30 mA to input A2)

Output data

Classification according to IEC 62040-3	VFD-SS-311
	> 98 % (Mains operation)

QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply



2320270

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Efficiency	> 98 % (120 V AC)
	> 86 % (Battery operation)
Nominal output voltage	120 V AC
	230 V AC
Output voltage range	96 V AC ... 144 V AC
	184 V AC ... 264 V AC
Form of output voltage	Pure sine
Nominal output current (I_N)	4.3 A (120 V AC, -25 °C ... 50 °C)
	2.2 A (230 V AC, -25 °C ... 40 °C)
Output current limit	5.2 A (120 V AC)
	2.7 A (230 V AC)
POWER BOOST (I_{Boost})	5.2 A (120 V AC, -25 °C ... 40 °C)
	2.7 A (230 V AC, -25 °C ... 40 °C)
Bridging time	3600 s
Derating	> 50 °C ... 70 °C (2.5 %/K)
UPS connection in parallel	no
UPS connection in series	no
Output power	516 W
Apparent power	500 VA
Nominal power	400 W
Crest factor	2.8
Switch-over time	< 10 ms
Connection in parallel	no
Connection in series	no

Mains operation

Nominal output voltage	120 V AC
	230 V AC
Output voltage range	102 V AC ... 138 V AC
	196 V AC ... 264 V AC
Nominal output current (I_N)	4.3 A (120 V AC)
	2.2 A (230 V AC)
POWER BOOST (I_{Boost})	5.2 A
	2.7 A
Permissible backup fuse	AC: 1 x circuit breaker - recommended fuse

Battery operation

Nominal output voltage	120 V AC
	230 V AC
Nominal output current (I_N)	2.2 A (230 V AC)
	4.3 A (120 V AC)
POWER BOOST (I_{Boost})	2.7 A (230 V AC)
	5.2 A (120 V AC)
Permissible backup fuse	25 A in parallel operation of 3.5 AH and 60 WH
	50 A in parallel operation of 7.2 AH, 12 AH, and 38 AH

QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply



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Buffer period	10 min (400 W / 7,2 Ah)
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Signal: Alarm

Maximum switching voltage	≤ 30 V DC
Output voltage	24 V (SELV)
Continuous load current	≤ 30 mA

Signal: Battery mode

Maximum switching voltage	≤ 30 V DC
Output voltage	24 V (SELV)
Continuous load current	≤ 30 mA

Signal: POWER BOOST

Maximum switching voltage	≤ 30 V DC
Output voltage	24 V (SELV)
Continuous load current	≤ 30 mA

Energy storage

Nominal voltage U_N	24 V DC
End-of-charge voltage	25 V DC ... 30 V DC (temperature compensated)
Charging current	2 A
Nominal capacity range	3.4 Ah ... 114 Ah (3x 38 Ah)
Battery presence check/time interval	1 min
Battery presence check (cyclic)	60 s
Energy storage device connection in parallel	yes, 3 (observe line protection)
Energy storage device connection in series	no
IQ technology	Yes
Temperature compensation	42 mV/K (preset)
Temperature compensation (preset)	-42 mV/K
Permissible backup fuse	50 A
Network management	Yes

Connection data

Input

Connection method	Screw connection
Conductor cross section, rigid min.	1.5 mm ²
Conductor cross section, rigid max.	6 mm ²
Conductor cross section flexible min.	1.5 mm ²
Conductor cross section flexible max.	4 mm ²
Conductor cross section AWG min.	18
Conductor cross section AWG max.	10
Stripping length	8 mm
Screw thread	M4
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply



2320270

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Output

Connection method	Screw connection
Conductor cross section, rigid min.	1.5 mm ²
Conductor cross section, rigid max.	6 mm ²
Conductor cross section flexible min.	1.5 mm ²
Conductor cross section flexible max.	4 mm ²
Conductor cross section AWG min.	18
Conductor cross section AWG max.	10
Stripping length	8 mm
Screw thread	M4
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

Signal

Connection method	Screw connection
Conductor cross section, rigid min.	0.2 mm ²
Conductor cross section, rigid max.	2.5 mm ²
Conductor cross section flexible min.	0.2 mm ²
Conductor cross section flexible max.	2.5 mm ²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	10
Stripping length	8 mm
Screw thread	M4
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

Interfaces

Interface	IFS (Interface system data port)
	MINI-USB type B

Signaling

Types of signaling	LED
	Active switching outputs
	Interface/software

Signal output: Status indicator 120 V AC

Signalization designation	AC mode of operation
Status display	LED
Note on status display	static on

Signal output: Status indicator 230 V AC

Signalization designation	AC mode of operation
Status display	LED
Color	green
Note on status display	static on

QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply



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Signal output: Transistor output, active

Signalization designation	Alarm
Status display	LED
Color	red
Note on status display	static on

Signal output: Transistor output, active

Signalization designation	Battery mode
Status display	LED
Color	yellow
Note on status display	static on

Signal output: Transistor output, active

Signalization designation	POWER BOOST
Status display	LED
Color	yellow
Note on status display	static on

Signal output

Signalization designation	Battery charge
Status display	Bar graph
Color	red/green

Electrical properties

Insulation voltage input, output / housing	1.5 kV AC
	2.1 kV DC

Product properties

Product type	AC UPS
Product family	QUINT AC UPS
IQ technology	Yes
MTBF (IEC 61709, SN 29500)	> 240513 h (40 °C)

Data management status

Article revision	07
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Insulation characteristics

Protection class	I
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Life expectancy (electrolytic capacitors)

Time	184982 h
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Dimensions

Width	125 mm
Height	130 mm
Depth	125 mm

QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply



2320270

<https://www.phoenixcontact.com/us/products/2320270>

Installation dimensions

Installation distance right/left	5 mm / 5 mm
Installation distance top/bottom	50 mm / 50 mm

Mounting

Mounting type	DIN rail mounting
Assembly note	alignable: $P_N \geq 50\%$, 5 mm horizontally, 15 mm next to active components, 50 mm vertically alignable: $P_N < 50\%$, 0 mm horizontally, 40 mm vertically top, 20 mm vertically bottom
Mounting position	horizontal DIN rail NS 35, EN 60715

Material specifications

Housing material	Metal
Housing material	Steel sheet, zinc-plated
Type of housing	Aluminum (AlMg3)
Hood version	Galvanized sheet steel, free from chrome (VI)
Side element version	Aluminum

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 70 °C (> 50 °C Derating: 2.5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Ambient temperature (start-up type tested)	-40 °C
Climatic class	3K3 (in acc. with EN 60721)
Max. permissible relative humidity (operation)	≤ 95 % (25 °C, non-condensing)
Shock	18 ms, 30g, in each space direction (according to IEC 60068-2-27)
Vibration (operation)	< 15 Hz, amplitude ±2.5 mm (according to IEC 60068-2-6) 15 Hz ... 150 Hz, 2.3g $t_v = 90$ min.

Standards and regulations

Rail applications	EN 50121-4
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Standards

Standard uninterruptible power supply systems	EN 62040-1
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Uninterruptible power supply systems

Standard designation	Uninterruptible power supply systems
Standards/specifications	EN 62040-1

Approvals

UL

Identification	UL/C-UL Recognized UL 1778
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QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply



2320270

<https://www.phoenixcontact.com/us/products/2320270>

EMC data

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Low Voltage Directive	Conformance with Low Voltage Directive 2014/35/EC
Interference emission	Noise emission in accordance with EN 62040-2
Noise immunity	Immunity in accordance with EN 62040-2

Electrostatic discharge

Standards/regulations	EN 61000-4-2
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Electrostatic discharge

Contact discharge	8 kV (Test Level 4)
Discharge in air	15 kV (Test Level 4)
Comments	Criterion A

Electromagnetic HF field

Standards/regulations	EN 61000-4-3
-----------------------	--------------

Electromagnetic HF field

Frequency range	80 MHz ... 3 GHz
Test field strength	10 V/m
Frequency range	1 GHz ... 3 GHz
Test field strength	10 V/m
Frequency range	2 GHz ... 3 GHz
Test field strength	3 V/m
Comments	Criterion A

Fast transients (burst)

Standards/regulations	EN 61000-4-4
-----------------------	--------------

Fast transients (burst)

Input	2 kV (Test Level 3 - asymmetrical)
Output	2 kV (Test Level 3 - asymmetrical)
Signal	2 kV (Test Level 4 - asymmetrical)
Comments	Criterion A

Surge voltage load (surge)

Standards/regulations	EN 61000-4-5
-----------------------	--------------

Surge voltage load (surge)

Input	1 kV (Test Level 2 - symmetrical)
	2 kV (Test Level 3 - asymmetrical)
Output	0.5 kV (Test Level 1 - symmetrical)
	0.5 kV (Test Level 1 - asymmetrical)
Comments	Criterion B

Conducted interference

Standards/regulations	EN 61000-4-6
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QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply



2320270

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Conducted interference

I/O/S	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V (Test Level 3)

Emitted interference

Radio interference voltage	EN 62040-2 (Class C1)
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Criteria

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

QUINT-UPS/ 1AC/ 1AC/500VA - Uninterruptible power supply

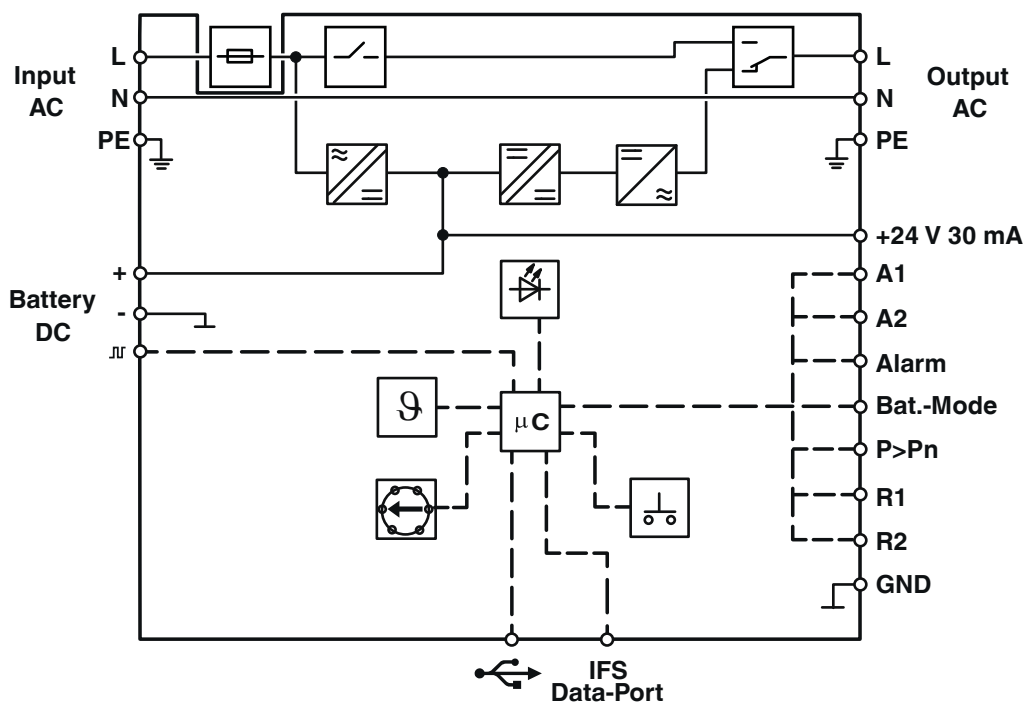


2320270

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Drawings

Block diagram



Block diagram

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UPS-BAT/VRLA-WTR/24DC/13AH - Battery module



2320416

<https://www.phoenixcontact.com/us/products/2320416>

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Battery module, lead AGM, VRLA technology, 24 V DC, 13 Ah, tool-free battery replacement, automatic detection, and communication with QUINT UPS-IQ

Product description

For continuous monitoring and intelligent management, there is constant communication with the QUINT UPS. Thanks to automatic detection of the battery module and tool-free switching during operation, quick installation is possible. The battery modules for QUINT UPS with IQ Technology leave the warehouse fully charged.

Your advantages

- Maximum buffer times at extreme temperatures
- Pure lead AGM technology (Absorbent Glass Mat)

Commercial data

Item number	2320416
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM24
Product key	CMUEW3
Catalog page	Page 338 (C-4-2019)
GTIN	4046356707701
Weight per piece (including packing)	10,025 g
Weight per piece (excluding packing)	10,000 g
Customs tariff number	85072080
Country of origin	US

Technical data

Notes

General

Note on the battery	This product contains a battery with a limited shelf life that must be charged every few months. The product packaging indicates when the battery must be started up or recharged. The general shelf life can be found in the energy storage devices area under "Latest startup".
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Input data

Input voltage	24 V DC
Buffer period	50 min (10 A) 10 min (40 A)

Output data

Nominal output voltage	24 V DC
Output current $I_{\max}$	45 A
Output fuse	2x 25 A ATOF 32V
Connection in parallel	15
Connection in series	no

Battery operation

Nominal output voltage	24 V DC
Nominal output current (I_N)	45 A

Energy storage

End-of-charge voltage	27.6 V (20 °C)
Charging current	5.2 A
Nominal capacity	13 Ah
Latest startup date (battery only)	12 Months (0 °C ... 20 °C)
Latest startup (battery only) - range	9 Months ... 12 Months (20 °C ... 30 °C) 6 Months ... 9 Months (30 °C ... 40 °C)
Battery technology	VRLA-WTR
Memory medium	Pure lead AGM
Accumulator type	Genesis G13EPX
Number of cells	2
Size designation	Block
Battery pack	yes
IQ technology	Yes
Temperature sensor	yes
Suitable for fast charging	yes
Approved according to	UL Style 3321150 °C 600 V AC 750 V DC

Product properties

UPS-BAT/VRLA-WTR/24DC/13AH - Battery module



2320416

<https://www.phoenixcontact.com/us/products/2320416>

Product type	Battery module
Product family	Battery module
Application	for QUINT4 DC-UPS, QUINT4 AC-UPS, and QUINT-UPS
Disposal	Used batteries must not be thrown away with household waste, they should instead be disposed of in accordance with applicable national regulations.
IQ technology	Yes

Data management status

Article revision	09
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Insulation characteristics

Protection class	III
Degree of pollution	2

Dimensions

Width	172 mm
Height	177 mm
Depth	178 mm

Installation dimensions

Installation distance right/left	0 mm / 0 mm
Installation distance top/bottom	50 mm / 50 mm

Mounting

Mounting position	Horizontally, on a mounting panel
-------------------	-----------------------------------

Material specifications

Housing material	Plastic
Housing material	Metal

Cable/line

Battery connecting cable: A+/-

Cable cross section	6 mm ²
Cable length	340 mm
Color	red/black

Battery connecting cable: B+/-

Cable cross section	6 mm ²
Cable length	110 mm
Color	red/black

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 60 °C

UPS-BAT/VRLA-WTR/24DC/13AH - Battery module



2320416

<https://www.phoenixcontact.com/us/products/2320416>

Ambient temperature (storage/transport)	-40 °C ... 60 °C
Max. permissible relative humidity (operation)	≤ 95 %
Shock	18 ms, 30g, in each space direction (according to IEC 60068-2-27)
Vibration (operation)	< 15 Hz, amplitude ±2,5 mm, 15 Hz ... 150 Hz, according to IEC 60068-2-6
	15 Hz ... 150 Hz, 2.3g, 90 min.

Standards and regulations

Standard - Electrical safety	EN 62368-1/VDE 0868-1
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Approvals

Shipbuilding approval	DNV GL (EMC A), ABS
UL approvals	UL/C-UL listed UL 508
	UL/C-UL Recognized UL 60950-1

Ex data

Suited for EX-applications	no
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UPS-BAT/VRLA-WTR/24DC/13AH - Battery module



2320416
https://www.phoenixcontact.com/us/products/2320416

Drawings

Graphic

Load Current	Buffertime																
	Minutes										Hours						
	1	2	3	5	10	20	30	40	45	50	1	2	3	5	8	10	15
15 W																	
35 W																2x	
55 W															2x		
90 W														2x			
125 W													2x	2x			
180 W													2x				
275 W												2x					
400 W											2x						

2320416 UPS-BAT/VRLA-WTR/24DC/13AH

2320429 UPS-BAT/VRLA-WTR/24DC/26AH

2x: In this case, two battery modules of the same capacity are required. The data is based on an ambient temperature of +25 °C at the start of use.

VRLA-WTR battery buffer times for QUINT AC UPS 500 VA

Graphic

Load Current	Buffertime																			
	Minutes														Hours					
	1	2	3	4	5	8	10	15	20	25	30	40	50	1	1.5	2	3	4	6	9
100 W	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x
200 W	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x		
300 W	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x			
400 W	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x				
500 W	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x					
600 W	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x					
700 W	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x						
800 W	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x						
900 W	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x	2x							

2320416 UPS-BAT/VRLA-WTR/24DC/13AH

2320429 UPS-BAT/VRLA-WTR/24DC/26AH

2x: There are always two battery modules of the same capacity are required . The data is based on an ambient temperature of +25 °C at the start of use.

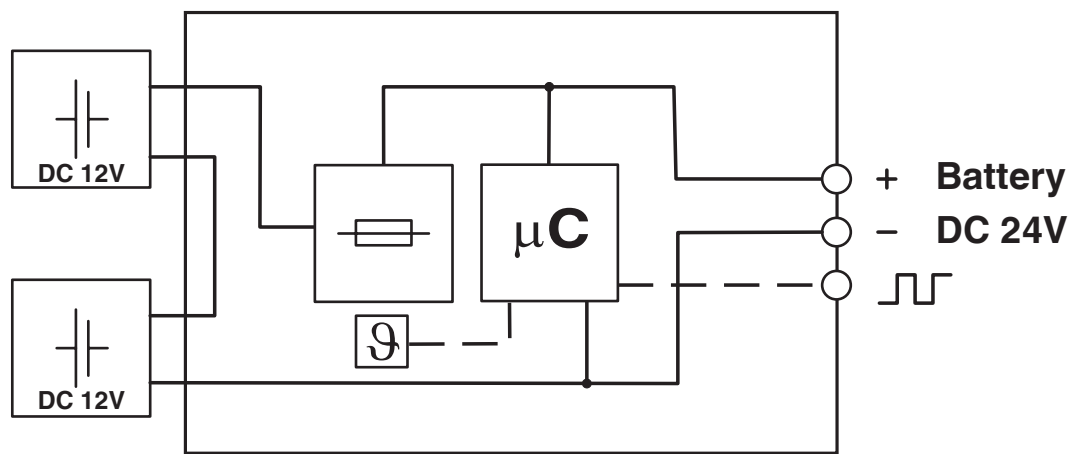
VRLA-WTR battery buffer time for QUINT AC UPS 1 kVA

UPS-BAT/VRLA-WTR/24DC/13AH - Battery module

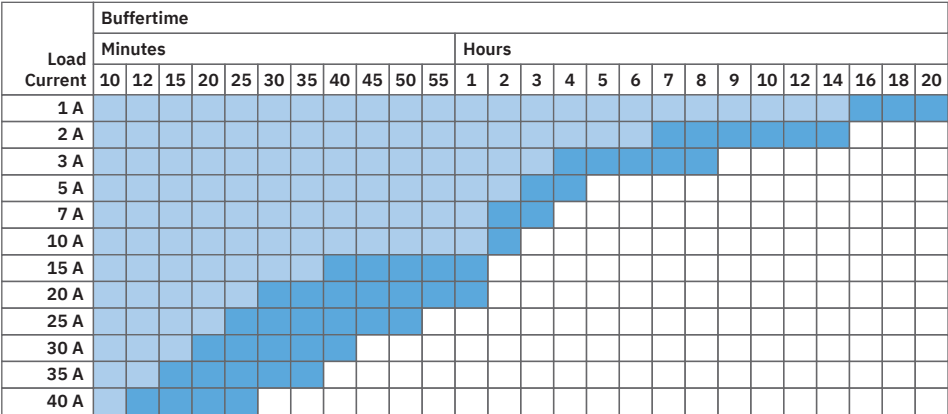


2320416
<https://www.phoenixcontact.com/us/products/2320416>

Block diagram



Graphic



The data is based on an ambient temperature of +25 °C at the start of use.

■ 2320416 UPS-BAT/VRLA-WTR/24DC/13AH ■ 2320429 UPS-BAT/VRLA-WTR/24DC/26AH

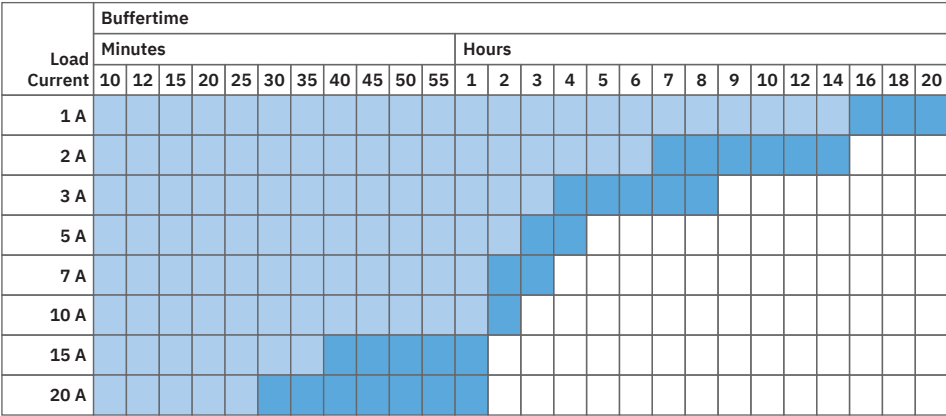
VRLA-WTR battery buffer times for QUINT DC UPS

UPS-BAT/VRLA-WTR/24DC/13AH - Battery module



2320416
<https://www.phoenixcontact.com/us/products/2320416>

Graphic



The data is based on an ambient temperature of +25 °C at the start of use.

Light Blue 2320416 UPS-BAT/VRLA-WTR/24DC/13AH Dark Blue 2320429 UPS-BAT/VRLA-WTR/24DC/26AH

VRLA-WTR battery buffer times for TRIO DC UPS

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105TX Industrial Ethernet Switch

N-Tron Networking Series



►►► Unmanaged Industrial Ethernet Switch

The *N-TRON® 105TX* is a low cost unmanaged five port Industrial Ethernet Switch. It is housed in a hardened, metal, DIN-Rail enclosure, and is designed for use in mission critical data acquisition, control, and Ethernet I/O applications.

PRODUCT FEATURES

- Compact, Space Saving Package
- Full IEEE 802.3 Compliance
- American Bureau of Shipping (ABS) Type Approval
- EN50155 for Railway applications
- Five 10/100BaseTX RJ-45 Ports
- Unmanaged Operation
- Extended Environmental Specifications
 - -40°C to 80°C Operating Temperature
 - >2M Hours MTBF
- Supports Full/Half Duplex Operation
- Up to 1.0Gbs Maximum Throughput
- MDIX Auto Sensing Cable
- Auto Sensing Speed and Flow Control
- Full Wire Speed Communications
- Store-and-forward Technology
- Redundant Power Inputs (10-30 VDC)
- LED Link/Activity Status Indication
- Hardened Metal DIN-Rail Enclosure

PRODUCT OVERVIEW

The *105TX* Industrial Network Switch is designed to solve the most demanding industrial communication requirements while providing high throughput and minimum downtime.

The *105TX* provides five RJ-45 auto sensing 10/100BaseTX ports. All ports are full/half duplex capable, using "state of the art" Ethernet switching technology. The *105TX* auto-negotiates the speed and flow control capabilities of the five TX port connections, and configures itself automatically.

Since the *105TX* is auto sensing, there will be no need to make extensive wiring changes if upgrades are made to host computers, plant systems, or Ethernet I/O modules. The switching fabric simply scales up or down automatically to match specific network environments.



The *105TX* supports up to 2,000 MAC addresses, enabling these products to support extremely sophisticated and complex network architectures.

The is an ideal candidate for upgrading existing hubs and repeaters to increase bandwidth and determinism by virtually eliminating network collisions. The *N-TRON 105TX* combines affordability and the plug & play simplicity of the unmanaged hub.

The *105TX* can simplify plant wiring by eliminating the need to bring data acquisition and control network connections back to a climate controlled environment. The *105TX* has extended operating environmental specifications to meet the harsh needs of the industrial environment. For cost savings and convenience it can be DIN-Rail mounted alongside Ethernet I/O or other Industrial Equipment.

To increase reliability the *105TX* provides dual redundant power inputs. LED's are provided to display the link status and activity of each port.

105TX SPECIFICATIONS

Case Dimensions

Height:	2.9"	(7.3cm)
Width:	1.5"	(3.8 cm)
Depth:	3.6"	(9 cm)
Weight:	0.6 lbs.	(0.28 kg)
DIN-Rail:	35mm	

Electrical

Input Voltage:	10-30 VDC
Steady Input Current:	215mA@24V
Inrush:	7.8Amp/0.7ms@24V

Environmental

Operating Temperature:	-40°C to 80°C
Storage Temperature:	-40°C to 85°C
Operating Humidity:	10% to 95% (Non Condensing)
Operating Altitude:	0 to 10,000 ft.

Shock and Vibration (bulkhead mounted)

Shock:	200g @ 10ms
Vibration/Seismic:	50g, 5-200Hz, Triaxial

Reliability

MTBF:	>2 Million Hours
-------	------------------

Network Media

10BaseT:	>Cat3 Cable
100BaseTX:	>Cat5 Cable

Connectors

10/100BaseTX:	Five (5) RJ-45 TX Copper Ports
---------------	-----------------------------------

Recommended Wiring Clearance

Front:	2" (5.08 cm)
Top:	1" (2.54 cm)

BENEFITS

Industrial Network Switch

- Compact Size / Small Footprint
- Extended Environmental Specifications
- Hardened Metal DIN-Rail Enclosure
- High Performance
- High MTBF >2M Hours
- ESD Protection Diodes on RJ-45 Ports
- Surge Protection Diodes on Power Inputs

Ease of Use

- Plug & Play Operation
- Auto Sensing 10/100BaseTX
- Auto Negotiation Full/Half Duplex
- MDIX Auto Cable Sensing
- Unmanaged Operation

Increased Performance

- Full Wire Speed Capable
- Full Duplex Capable
- Eliminates Network Collisions
- Increases Network Determinism

Regulatory Approvals

*FCC Title 47 Part 15 Class A; ICES-003- Class A
CE: EN61000-6-2,4; EN61000-4-2,3,4,5,6; EN5501
UL Listed (US and Canada) per ANSI/ISA-12.12.01-20
Class I, Div 2, Groups A,B,C,D,T4A
GOST-R Certified
ABS Type Approval for Shipboard Applications
DNV-GL Type Approval Certification
EN50155 for Railway Applications
RoHS Compliant*

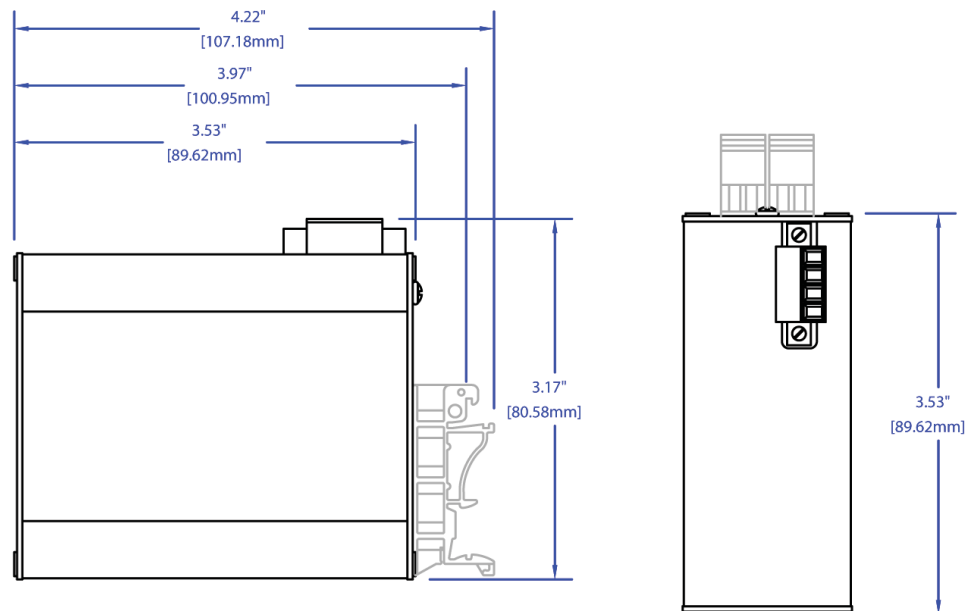
Designed to comply with:
*IEEE 1613 for Electric Utility Substations
NEMA TS1/TS2 for Traffic Control Equipment*

Ordering Information

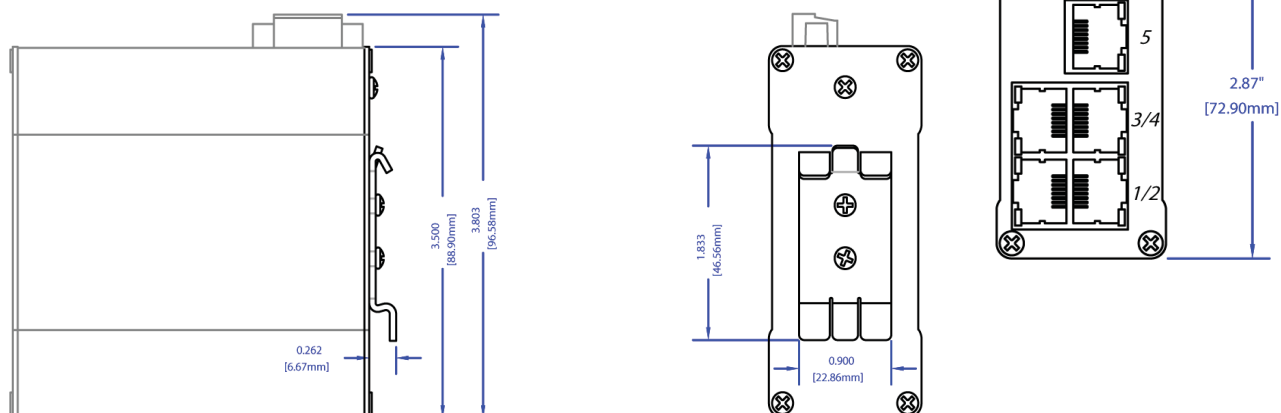
105TX	Five 10/100BaseTX Ports
NTPS-24-1.3	DIN-Rail Power Supply 24V@1.3 Amp
100-MDR-1	Metal Din Rail Option*

* MDR option must be specified with switch order - not field upgradable

105TX with Standard DIN rail Mount



Optional 100-MDR-2 Metal DIN Rail Mount



Delivering
1.15 Mbit/s
256 QAM

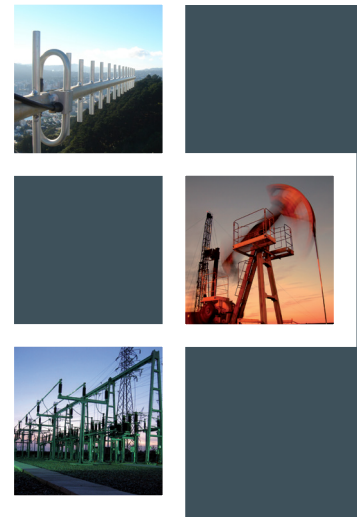
Aprisa SR+

SMART, SECURE POINT-TO-MULTIPOINT RADIO



Smart, secure, industry-leading speed licensed point-to-multipoint SCADA communications for industrial monitoring and control for the electricity, water, oil and gas industries – now with 256 QAM

- **High capacity:** to meet the growing number of data-intensive applications in the SCADA environment, the Aprisa SR+ provides data rates of up to 576 kbit/s half duplex / 1,152 kbit/s full duplex in 100 kHz licensed channels.
- **Secure:** with its defense in depth approach, including AES encryption, authentication, address filtering and user access control including RADIUS, the Aprisa SR+ protects against vulnerabilities and malicious attacks.
- **Future-proof:** the Aprisa SR+ supports dual serial and dual Ethernet ports in a single, compact form factor, designed to cryptographically secure legacy serial, protect existing device investment, and enable new applications. Old and new application protocols can be run side by side.
- **Advanced L2 / L3 capabilities:** selectable L2 bridge, L3 router, or advanced gateway router combination L2/L3 modes with VLAN, QoS, NAT, and filtering attributes to maximize capacity in constrained bandwidth and prioritize mission critical traffic while meeting tough security and IP network policy imperatives.
- **Adaptable:** the Aprisa SR+ integrates into a range of network topologies, with each unit configurable as a master station, repeater or remote station; connect multiple RTUs / PLCs to a single radio.
- **Flexible interfaces:** the data interfaces can be configured for serial or Ethernet operation; a range of options are supported, including two serial and two Ethernet, one serial and three Ethernet, or four Ethernet ports. Support for NMEA GPS receiver option.
- **Link efficiency:** Adaptive Coding and Modulation (ACM) and forward error correction maintains the integrity of the wireless connection while an effective channel access scheme and IP routing ensures efficient transfer of data across the Aprisa SR+ network. Automatic Transmit Power Control maintains the minimum transmit power required for effective communications enhancing both frequency reuse and power savings. Advanced payload and Ethernet / IP / TCP / UDP header compression.
- **Reliable and robust:** the Aprisa SR+ requires no manual component tuning and maintains its performance over a wide temperature range using full specification industrially rated components and shared Aprisa family heritage.
- **Easily managed:** an easy to use GUI supports local element management via HTTPS and remote element management over the air and SNMP support allows network-wide monitoring and control via a variety of supported third party network management systems.



The Aprisa SR+ in brief

- 135–175, 215–240, 400–520, 757–758 and 787–788, 896–902 and 928–960 MHz
- RS-232 and IEEE 802.3 with multiple port options
- Software selectable 12.5 kHz, 15 kHz, 25 kHz, 30 kHz, 50 kHz, and 100 kHz channel sizes (frequency band dependent)
- Full and half duplex operation, single or dual frequency (point-to-point option)
- Data rates of up to 576 kbit/s half duplex / 1,152 kbit/s full duplex
- 256, 192 or 128 bit AES encryption
- AES-CCM to NIST SP 800-38C
- Adaptive Coding and Modulation: QPSK to 256 QAM
- Automatic Transmit Power Control: reduces interference in large networks, improves power savings
- Advanced forward error correction
- Ethernet and IP / TCP / UDP header compression (ROHC) and payload compression
- Software selectable dual / single antenna port operation
- Transparent to all common SCADA protocols
- Dedicated alarm port and optional USB connected GPS receiver
- Protected station option
- Power optimized option
- Layer 2 bridge (VLAN aware), layer 3 router, and advanced gateway router combination L2/L3 modes
- VLAN tagging and Q-in-Q
- Flexible QoS priority enforcement – by port or traffic type, VLAN, PCP/DSCP, rule including 5MAC/DMAC, IP address and IP protocol, and EtherType
- L2 / L3 / L4 filtering
- MEMS accelerometer motion sensing anti-tamper option
- IEEE 1613 and IEC 61850-3 substation protection
- 30 kV ESD antenna protection
- Class 1, Division 2 for hazardous protection
- –40 to +70 °C operational temperature without fans
- 210 mm (W) x 130 mm (D) x 41.5 mm (H)
- FCC and IC standards compliant

Aprisa SR+ applications

- Electricity grid: distribution automation control and protection in MV / HV distribution / transmission
- Smart grid, DA, DFA, DER, cap bank control
- Oil & Gas: production metering, lift pump automation
- AMI / AMR: high density data concentrator backhaul
- Renewables: wind farm, tidal, hydro automation
- Water and wastewater: flow, level, pressure modulation automation and pump status

SYSTEM SPECIFICATION

GENERAL						
NETWORK TOPOLOGY		Point-To-MultiPoint (PTMP), Master, Remote, Repeater Point-To-Point (PTP) FD see 'Aprisa SR+ PTP Datasheet'				
NETWORK INTEGRATION		Serial and Ethernet (router or bridge mode)				
PROTOCOLS						
ETHERNET		IEEE 802.3, 802.1d/q/p				
SERIAL		Legacy RS-232 transport, Mirrored Bits ®, SLIP and Terminal Server support				
WIRELESS		Proprietary				
SCADA		Transparent to all common SCADA protocols such as Modbus, IEC 60870-5-101/104, DNP3 or similar				
RADIO	FREQ BAND	TUNING RANGE	TUNE STEP			
FREQUENCY RANGE	135 MHz	135 – 175 MHz	0.625 kHz			
	220 MHz	215 – 240 MHz	0.625 kHz			
	400 MHz	400 – 470 MHz	6.25 kHz			
	(Note 4) 450 MHz	450 – 520 MHz	6.25 kHz			
	(Note 4) 700 MHz	757 – 758 & 787 – 788 MHz	6.25 kHz			
(Note 5) 896 MHz	896 – 902 MHz	6.25 kHz				
(Note 5) 928 MHz	928 – 960 MHz	6.25 kHz				
CHANNEL SIZE		12.5 kHz, 15 kHz, 25 kHz, 30 kHz, 50 kHz and 100 kHz software selectable				
DUPLEX		Single frequency half-duplex Dual frequency half-duplex Dual frequency full-duplex				
FREQUENCY STABILITY		± 0.5 ppm				
FREQUENCY AGING		< 1 ppm / annum				
TRANSMITTER						
MAX PEAK ENVELOPE POWER (PEP)		10.0 W (+40 dBm)				
AVERAGE POWER OUTPUT		256 QAM 0.01 – 2.0 W (+10 to +33 dBm, in 1 dB steps) 64 QAM 0.01 – 2.5 W (+10 to +34 dBm, in 1 dB steps) 16 QAM 0.01 – 3.2 W (+10 to +35 dBm, in 1 dB steps) QPSK 0.01 – 5.0 W (+10 to +37 dBm, in 1 dB steps)				
		(Note 2) 4-CPFSK 0.01 – 10.0 W (+10 to +40 dBm, in 1 dB steps)				
ADJACENT CHANNEL POWER		< –60 dBc				
TRANSIENT ADJACENT CHANNEL POWER		< –60 dBc				
SPURIOUS EMISSIONS		< –37 dBm				
ATTACK TIME		< 1.5 ms				
RELEASE TIME		< 0.5 ms				
DATA TURNAROUND TIME		< 2 ms				
EMISSION DESIGNATORS		see https://4rf.com/emission-designators				
RECEIVER		12.5 kHz	25 kHz	50 kHz	100 kHz	
SENSITIVITY (BER < 10 ⁻⁶)	min coded	256 QAM	–95 dBm	–91 dBm	–88 dBm	–85 dBm
	max coded	64 QAM	–103 dBm	–99 dBm	–96 dBm	–93 dBm
	max coded	16 QAM	–110 dBm	–107 dBm	–104 dBm	–101 dBm
	max coded	QPSK	–115 dBm	–112 dBm	–109 dBm	–106 dBm
	min coded	4-CPFSK	–113 dBm	–110 dBm	–107 dBm	–104 dBm
ADJACENT CHANNEL SELECTIVITY		> –47 dBm > –37 dBm > –37 dBm > –37 dBm				
		(Note 1)	[> 48 dB]	[> 58 dB]	[> 58 dB]	[> 58 dB]
CO-CHANNEL REJECTION max coded QPSK		> –10 dB				
CO-CHANNEL REJECTION min coded 256 QAM		> –26 dB				
INTERMODULATION RESPONSE REJECTION		> –35 dBm [> 60 dB ^{Note 1}]				
BLOCKING OR DESENSITISATION		> –17 dBm [> 78 dB ^{Note 1}]				
SPURIOUS RESPONSE REJECTION		> –32 dBm [> 63 dB ^{Note 1}]				
MODEM	12.5 kHz ^(Note 3)	15 kHz	25 kHz	30 kHz	50 kHz	100 kHz
GROSS DATA RATE						
BANDS	220, 400, 450, 700, 896, 928	135 220	220, 400, 450, 896, 928, 700	135	135, 220, 400, 896, 928, 700	700, 896, 928
256 QAM	72 kbit/s 80 kbit/s	72 kbit/s 80 kbit/s	128 kbit/s 160 kbit/s	128 kbit/s	288 kbit/s 320 kbit/s	576 kbit/s
64 QAM	54 kbit/s 60 kbit/s	54 kbit/s 60 kbit/s	96 kbit/s 120 kbit/s	96 kbit/s	216 kbit/s 240 kbit/s	432 kbit/s
16 QAM	36 kbit/s 40 kbit/s	36 kbit/s 40 kbit/s	64 kbit/s 80 kbit/s	64 kbit/s	144 kbit/s 160 kbit/s	288 kbit/s
QPSK	18 kbit/s 20 kbit/s	18 kbit/s 20 kbit/s	32 kbit/s 40 kbit/s	32 kbit/s	72 kbit/s 80 kbit/s	144 kbit/s
4-CPFSK	9.6 kbit/s 9.6 kbit/s	9.6 kbit/s 9.6 kbit/s	19.2 kbit/s 19.2 kbit/s	19.2 kbit/s	38.4 kbit/s 38.4 kbit/s	76.8 kbit/s
FORWARD ERROR CORRECTION		Variable Reed Solomon plus convolutional code				
ADAPTIVE BURST SUPPORT		Adaptive Coding and Modulation				

SECURITY			
DATA ENCRYPTION		256, 192 or 128 bit AES	
DATA AUTHENTICATION		CCM	
CRYPTOGRAPHIC PROTECTION		FIPS 140-2	
IPSEC		Transparent	
INTERFACES			
ETHERNET PORTS		RJ45 10/100Base-T auto-neg MDI/MDIX	
SERIAL PORTS		RJ45 RS-232 Additional RS-232 / RS-485 port via USB converter (option)	
GPS RECEIVER		Support for optional USB connected GPS receiver	
MANAGEMENT		1 x USB micro type B (device port) 1 x USB standard type A (host port)	
ANTENNA		2 x TNC 50 ohm female Software selectable single or dual port operation	
ALARM I/O		1 x RJ45 Alarm I/O interface 2 x inputs + 2 x outputs	
LEDs		Status: OK, MODE, AUX, TX, RX Diagnostics: RSSI, traffic port status	
TEST BUTTON		Toggles LEDs between diagnostics / status	
PRODUCT OPTIONS (specified at order)			
DATA PORT CONFIGURATION OPTIONS		2 x Ethernet ports + 2 serial ports 3 x Ethernet ports + 1 serial port 4 x Ethernet ports	
DUPLEX OPTIONS		Half Duplex or Full Duplex	
PROTECTED STATION OPTION		Providing hot-swappable / hot-standby redundant hardware switching	
POWER			
INPUT VOLTAGE		Radio	10 – 30 VDC negative earth
		Protected Station	10 – 60 VDC floating
RECEIVE	All bands	< 3 W (217 mA at 13.8 VDC) in active receive state < 2 W (145 mA at 13.8 VDC) in idle receive state < 0.5 W (36 mA at 13.8 VDC) in sleep mode	
TRANSMIT	135 and 220 MHz	< 26 W (1884 mA at 13.8 VDC)	
	400, 450, 700, 896, 928 MHz	< 28 W (2028 mA at 13.8 VDC)	
MECHANICAL			
DIMENSIONS	Radio	210 mm (W) x 130 mm (D) x 41.5 mm (H) 8.27" (W) x 5.12" (D) x 1.63" (H)	
	Protected Station	434 mm (W) x 372 mm (D) x 88.9 mm (H) 2 RU 17.1" (W) 14.6" (D) 3.5" (H)	
WEIGHT	Radio	1.25 kg (2.81 lbs)	
	Protected Station	10.0 kg (22 lbs) (includes the 2 radios)	
MOUNTING		Wall, Rack or DIN rail (radio only)	
ENVIRONMENTAL			
OPERATING TEMPERATURE		–40 to +70 °C (–40 to +158 °F)	
HUMIDITY		Maximum 95 % non-condensing	
MANAGEMENT & DIAGNOSTICS			
LOCAL ELEMENT		SSH and HTTP/S web servers with full control / diagnostics Partial diagnostics via LEDs and test button Software upgrade from PC or USB flash drive	
REMOTE ELEMENT		SSH and HTTP/S over-the-air remote element management with control / diagnostics Network software upgrade over-the-air	
NETWORK		SNMPv2 and SNMPv3 security support for integration with external network management systems	
OVER THE AIR		Low overhead SuperVisor Extended Network Management (EXM)	
COMPLIANCE			
RF		FCC CFR47 Part 24 / 27 / 80 / 90 / 95 / 101 IC RSS 119 / RSS 134	
	BAND	FCC ID:	IC:
	135	UIPSQ135M150	6772A-SQ135M150
	220	UIPSQ215M141	6772A-SQ215M141
	400	UIPSQ400M1311	6772A-SQ400M1311
	450	UIPSQ450M140	N/A
	700	UIPSQ757M160	N/A
	896	UIPSQ896M141	6772A-SQ896M141
	928	UIPSQ928M141	6772A-SQ928M141
EMC		FCC CFR47 Part 15, EN 301 489-5, ICES-003	
SAFETY		UL / EN 60950, Class 1 division 2 for hazardous locations	
ENVIRONMENTAL		ETS 300 019 Class 3.4, IEEE 1613 Class 2 IEC 61850-3, Ingress Protection IP51	

Notes:

- The receiver figures are shown in typical fixed interference dBm values and dB values [in brackets] relative to the sensitivity. Relative values are given for QPSK modulation and max coded FEC. Refer to the Aprisa SR+ User Manual for a complete list of modulation and coding levels.
- Please consult 4RF for availability.
- The gross data rate for the 12.5 kHz channel size varies with regulatory compliance.
- The 450 MHz and 700 MHz bands are only available for FCC.
- The receive tuning range is specified. The transmit tuning range is 896 - 960 MHz.

ABOUT 4RF

Operating in more than 150 countries, 4RF provides radio communications equipment for critical infrastructure applications. Customers include utilities, oil and gas companies, transport companies, telecommunications operators, international aid organisations, public safety, military and security organisations. 4RF point-to-point and point-to-multipoint products are optimized for performance in harsh climates and difficult terrain, supporting IP, legacy analogue, serial data applications.

Made in USA from local and imported parts.

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For more information please contact
EMAIL sales@4rf.com
URL www.4rf.com

Version 3.1.0

The Scala TY-900 is a rugged broadband yagi antenna fabricated of aluminum rod and extruded pipe, anodized for maximum reliability and corrosion resistance. The hardware and fastenings are stainless steel. The internal balun, coax feed and connector are sealed in a foam potting system to prevent moisture penetration and assure long service life in severe environmental conditions. The heavy aluminum mounting casting allows installation for V or H polarization.

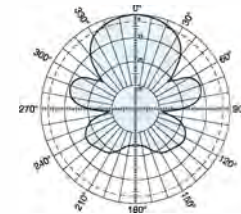
- The TY-900 is specifically designed for professional fixed-station applications in the 890–960 MHz band.



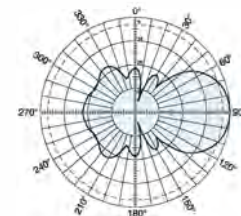
(Shown vertically polarized)

Specifications	
Frequency range	890–960 MHz
Gain	10 dBd (12.15 dBi)
Impedance	50 ohms
VSWR	<1.5:1 maximum (1.35:1 typical)
Polarization	Horizontal or vertical
Front-to-back ratio	>20 dB
Maximum input power	100 watts (at 50°C)
H-plane beamwidth	48 degrees (half-power)
E-plane beamwidth	40 degrees (half-power)
Connector	N female
Weight	3 lb (1.4 kg)
Dimensions	23 x 6.8 inches (584 x 173 mm)
Wind load at 93 mph (150 kph)	
Front / Side	3 lbf / 4 lbf (11 N / 17 N)
Wind survival rating*	150 mph (241 kph)
Shipping dimensions	28 x 10 x 4.5 inches (maximum) (711 x 254 x 114 mm)
Shipping weight	5 lb (2.3 kg)
Mounting	For masts of 1.25 to 2.375 inch (32 to 60 mm) OD.

* Mechanical design is based on environmental conditions as stipulated in TIA-222-G-2 (December 2009) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. Contact Kathrein Broadcast USA for further details.

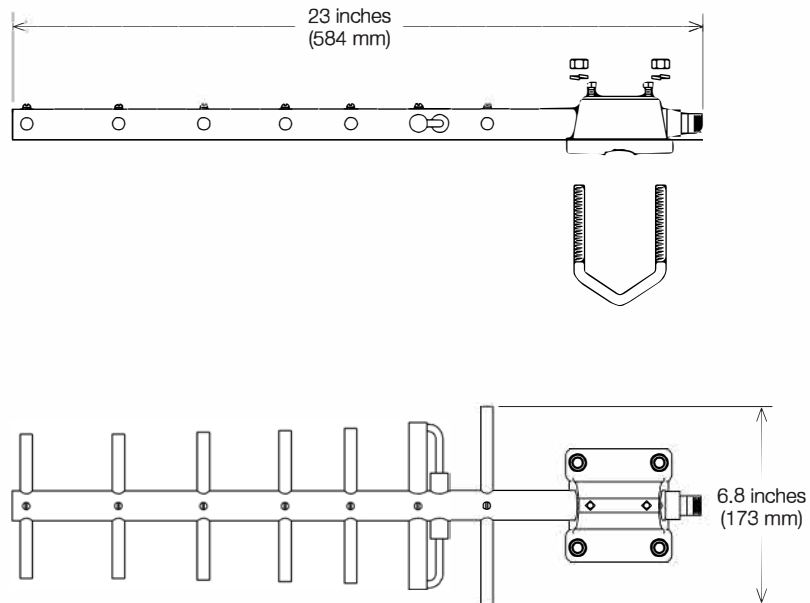


H-plane
Horizontal pattern — V-polarization
Vertical pattern — H-polarization



E-plane
Horizontal pattern — H-polarization
Vertical pattern — V-polarization

TY-900
Yagi Antenna
890-960 MHz

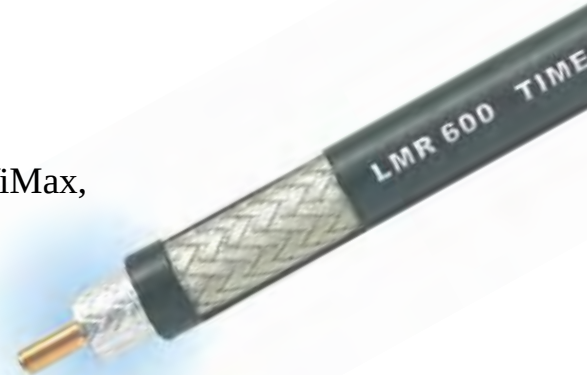


30022 subject to alteration

LMR®-600 Flexible Low Loss Communications Coax

Ideal for...

- Jumper Assemblies in Wireless Communications Systems
- Short Antenna Feeder runs
- Any application (e.g. WLL, GPS, LMR, WLAN, WISP, WiMax, SCADA, Mobile Antennas) requiring an easily routed, low loss RF cable



- **LMR®** standard is a UV Resistant Polyethylene jacketed cable designed for 20-year service outdoor use. The bending and handling characteristics are significantly better than air-dielectric and corrugated hard-line cables.
- **LMR®-DB** is identical to standard LMR plus has the advantage of being watertight. The addition of waterproofing compound in and around the foil/braid insures continuous reliable service should the jacket be inadvertently damaged during installation or in the future.
- **LMR®-FR** is a non-halogen (non-toxic), low smoke, fire retardant cable designed for in-building runs that can be routed anywhere except air handling plenums. LMR-FR is UL/NEC & CSA rated 'CMR' and 'FT4' respectively, meets FAA FAR25 requirements and is MSHA-P for mining applications.
- **LMR®-FR-PVC** is a general-purpose indoor cable and has a UL/NEC & CSA rating of 'CMR' and 'FT4' respectively. It is less expensive than LMR-FR, however it emits toxic fumes (HCL) and greater smoke density when burned.
- **LMR®-PVC** is designed for low loss general-purpose applications and is somewhat more flexible than the standard polyethylene jacketed LMR.
- **LMR®-PVC-W** is a white-jacketed version of LMR-PVC for marine and other applications where color compatibility is desired.

- **Flexibility** and bendability are hallmarks of the LMR-600 cable design. The flexible outer conductor enables the tightest bend radius available for any cable of similar size and performance.
- **Low Loss** is another hallmark feature of LMR-600.

Size for size LMR has the lowest loss of any flexible cable and comparable loss to semirigid hard-line cables.

- **RF Shielding** is 50 dB greater than typical single shielded coax (40 dB). The multi-ply bonded foil outer conductor is rated conservatively at > 90 dB (i.e. >180 dB between two adjacent cables).
- **Weatherability:** LMR-600 cables designed for outdoor exposure incorporate the best materials for UV resistance and have life expectancy in excess of 20 years.
- **Connectors:** A wide variety of connectors are available for LMR-600 cable, including all common interface types, reverse polarity, and a choice of solder or non-solder center pins. Most LMR connectors employ crimp outer attachment using standard hex crimp sizes.
- **Cable Assemblies:** All LMR-600 cable types are available as pre-terminated cable assemblies. Refer to the section on FlexTech for further details.

Part Description				Stock
Part Number	Application	Jacket Color		Code
LMR-600	Outdoor	PE	Black	54003
LMR-600-DB	Outdoor/Watertight	PE	Black	54093
LMR-600-FR	Indoor/Outdoor Riser CMR	FRPE	Black	54032
LMR-600-FR-PVC	Indoor/Outdoor Riser CMR	FRPVC	Black	54074
LMR-600-PVC	General Purpose	PVC	Black	54219
LMR-600-PVC-W	General Purpose	PVC	White	54206

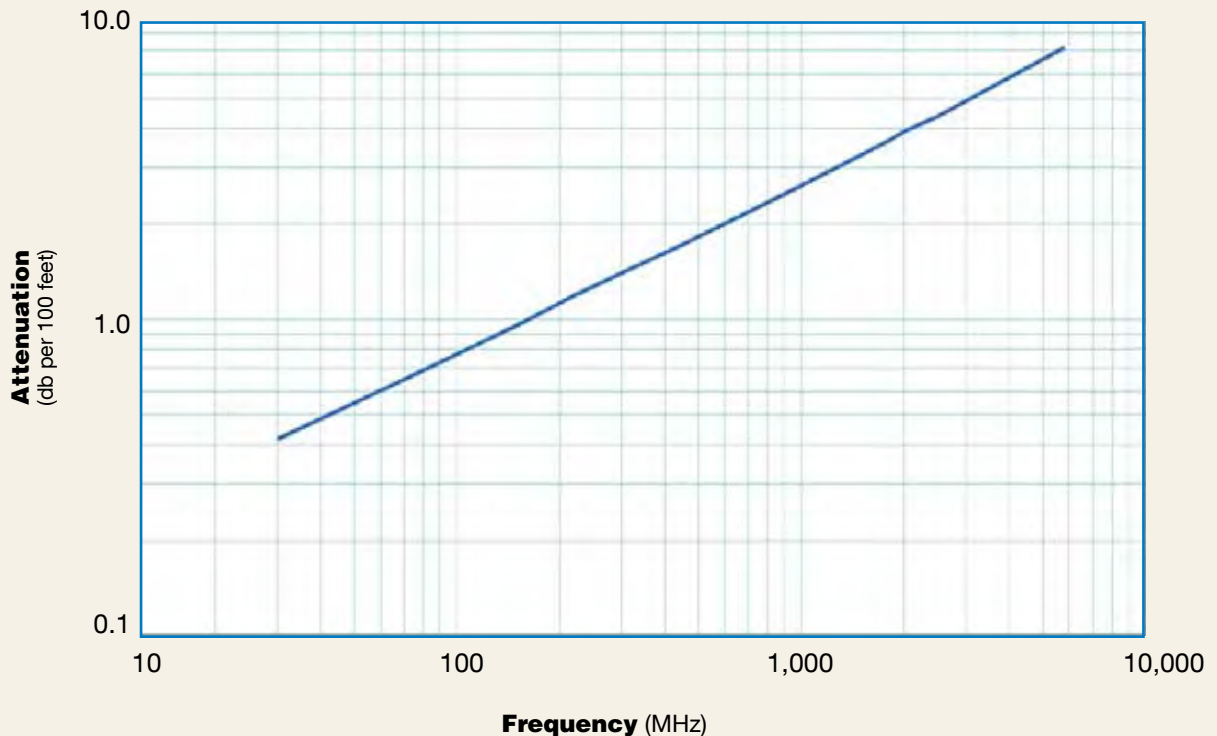
Construction Specifications			
Description	Material	In.	(mm)
Inner Conductor	Solid BCCA	0.176	(4.47)
Dielectric	Foam PE	0.455	(11.56)
Outer Conductor	Aluminum Tape	0.461	(11.71)
Overall Braid	Tinned Copper	0.490	(12.45)
Jacket	(see table above)	0.590	(14.99)

Mechanical Specifications			
Performance Property	Units	US	(metric)
Bend Radius: installation	in. (mm)	1.50	(38.1)
Bend Radius: repeated	in. (mm)	6.0	(152.4)
Bending Moment	ft-lb (N-m)	2.75	(3.73)
Weight	lb/ft (kg/m)	0.131	(0.20)
Tensile Strength	lb (kg)	350	(158.9)
Flat Plate Crush	lb/in. (kg/mm)	60	(1.07)

Environmental Specifications			
Performance Property	°F	°C	
Installation Temperature Range	-40/+185	-40/+85	
Storage Temperature Range	-94/+185	-70/+85	
Operating Temperature Range	-40/+185	-40/+85	

Electrical Specifications			
Performance Property	Units	US	(metric)
Velocity of Propagation	%	87	
Dielectric Constant	NA	1.32	
Time Delay	nS/ft (nS/m)	1.17	(3.83)
Impedance	ohms	50	
Capacitance	pF/ft (pF/m)	23.4	(76.6)
Inductance	uH/ft (uH/m)	0.058	(0.19)
Shielding Effectiveness	dB	>90	
DC Resistance			
Inner Conductor	ohms/1000ft (/km)	0.53	(1.7)
Outer Conductor	ohms/1000ft (/km)	1.2	(3.9)
Voltage Withstand	Volts DC	4000	
Jacket Spark	Volts RMS	8000	
Peak Power	kW	40	

Attenuation vs. Frequency (typical)



Frequency (MHz)	30	50	150	220	450	900	1500	1800	2000	2500	5800
Attenuation dB/100 ft	0.4	0.5	1.0	1.2	1.7	2.5	3.3	3.7	3.9	4.4	7.3
Attenuation dB/100 m	1.4	1.8	3.2	3.9	5.6	8.2	10.9	12.1	12.8	14.5	23.8
Avg. Power kW	5.51	4.24	2.41	1.97	1.35	0.93	0.70	0.63	0.59	0.52	0.32

Calculate Attenuation =

$(0.075550) \cdot \sqrt{\text{FMHz}} + (0.000260) \cdot \text{FMHz}$ (interactive calculator available at http://www.timesmicrowave.com/cable_calculators)

Attenuation:

VSWR=1.0; Ambient = +25°C (77°F)

Power:

VSWR=1.0; Ambient = +40°C; Inner Conductor = 100°C (212°F); Sea Level; dry air; atmospheric pressure; no solar loading

LMR®-600 Flexible Low Loss Communications Coax



Connectors

Interface	Description	Part Number	Stock Code	VSWR**	Coupling Freq. (GHz)	Nut	Inner Contact Attach	Outer Contact Attach	Finish* /Pin	Length in (mm)	Width in (mm)	Weight lb (g)
1. 7/8 EIA	Flange	EZ-600-78EIA	3190-1373	<1.25:1	(2.5)	NA	Spring Finger	Clamp	S/S	2.3 (58)	2.60 (66.0)	0.873 (396.0)
2. 7-16 DIN Female	Straight Jack	TC-600-716FC	3190-375	<1.25:1	(2.5)	NA	Solder	Clamp	S/S	1.1 (28)	1.00 (25.4)	0.249 (112.9)
3. 7-16 DIN	Straight Plug	EZ-600-716M-X	3190-2643	<1.30:1	(6)	Hex	Spring Finger	Crimp	A/S	1.6 (42)	1.38 (35.0)	0.209 (94.80)
4. 7-16 DIN	Straight Plug	TC-600-716M-X	3190-2642	<1.30:1	(6)	Hex	Solder	Crimp	A/S	1.6 (40)	1.38 (35.0)	0.191 (86.6)
5. 7-16 DIN	Straight Plug	TC-600-716MC	3190-502	<1.25:1	(2.5)	Hex	Solder	Clamp	S/S	2.0 (51)	1.30 (33.0)	0.347 (157.4)
6. 7/16 Male	Right Angle	EZ-600-716M-RA-X	3190-2546	<1.35:1	(6)	Hex	Spring Finger	Crimp	A/G	1.6 (40)	1.38 (35.0)	0.462 (210.0)
7. 7-16 DIN	Right Angle	TC-600-716M-RA-D	3190-2599	<1.35:1	(6)	Hex	Solder	Crimp	A/S	1.7 (44)	2.00 (50.9)	0.362 (164.2)
8. 7-16 DIN	Straight Jack	EZ-600-716F	3190-2447	<1.25:1	(6)	Hex	Spring Finger	Crimp	A/G	1.8 (45)	1.32 (33.6)	0.158 (71.7)
9. HN Male	Straight Plug	TC-600-HNMC	3190-1429	<1.25:1	(<1)	Knurl	Solder	Clamp	S/g	2.3 (59.2)	0.88 (22.4)	0.25 (113)
10. LC Male	Straight Plug	TC-600-LCM	3190-1406	<1.25:1	(<1)	Hex	Solder	Clamp	N/S	3.1 (78.0)	1.62 (41.1)	1.20 (544)
11. N Female	Straight Jack	TC-600-NF-X	3190-2816	<1.30:1	(6)	NA	Solder	Crimp	A/G	1.7 (43)	0.69 (17.6)	0.076 (34.6)
12. N Female	Straight Jack	EZ-600-NF-X	3190-2817	<1.30:1	(6)	NA	Spring Finger	Crimp	A/G	1.7 (43)	0.69 (17.6)	0.090 (40.6)
13. N Female	Bulkhead Jack	EZ-600-NF-BH	3190-616	<1.25:1	(2.5)	NA	Spring Finger	Crimp	S/G	2.4 (61)	0.88 (22.4)	0.195 (88.5)
14. N Female	Bulkhead Jack	TC-600-NF-BH	3190-589	<1.25:1	(2.5)	NA	Solder	Crimp	S/G	2.4 (61)	0.88 (22.4)	0.195 (88.5)
15. N Female	Bulkhead Jack	TC-600-NFC-BH	3190-466	<1.25:1	(2.5)	NA	Solder	Clamp	S/G	2.2 (56)	0.94 (23.9)	0.214 (97.1)
16. N Male	Straight Plug	EZ-600-NMK	3190-669	<1.25:1	(2.5)	Knurl	Spring Finger	Crimp	S/G	2.1 (53)	0.92 (23.4)	0.164 (74.4)
17. N Male	Straight Plug	EZ-600-NMC-2-D	3190-2641	<1.25:1	(6)	Hex/Knurl	Spring Finger	Clamp	A/G	2.1 (53)	0.92 (23.4)	0.202 (91.6)
18. N Male	Straight Plug	TC-600-NMC	3190-357	<1.25:1	(2.5)	Hex	Solder	Clamp	S/G	2.1 (53)	0.92 (23.4)	0.208 (93.4)
19. N Male	Straight Plug	EZ-600-NMH-X	3190-2627	<1.25:1	(8)	Hex/Knurl	Spring Finger	Crimp	A/G	2.1 (53)	0.92 (23.4)	0.164 (74.4)
20. N Male	Straight Plug	TC-600-NMH-X	3190-2628	<1.25:1	(8)	Hex/Knurl	Spring Finger	Crimp	A/G	2.1 (53)	0.92 (23.4)	0.166 (75.3)
21. N Male	Right Angle	EZ-600-NMH-RA-X	3190-2639	<1.35:1	(6)	Hex	Spring Finger	Crimp	A/G	2.0 (50)	1.42 (36.0)	0.224 (101.7)
22. N Male	Right Angle	TC-600-NMH-RA-D	3190-2427	<1.35:1	(6)	Hex	Solder	Crimp	A/G	1.8 (46.5)	1.62 (41.2)	0.185 (84.3)
23. N Male	Straight Plug	TC-600-NMH-75-50	3190-1610	<1.35:1	(6)	Hex	Solder	Crimp	N/G	2.1 (52.8)	0.91 (23.1)	0.130 (59.0)
24. QDS Male	Straight Plug	TC-600-QDSM	3190-825	<1.25:1	(<1)	Knurl	Solder	Clamp	A/G	2.2 (55.6)	1.00 (25.4)	0.25 (113)
25. TNC Male	Straight Plug	TC-600-TM-X	3190-2530	<1.25:1	(6)	Hex/Knurl	Solder	Crimp	A/G	2.3 (57.6)	0.75 (19.0)	0.100 (45.6)
26. TNC Male	Straight Plug	EZ-600-TM-X	3190-2531	<1.25:1	(6)	Hex/Knurl	Spring Finger	Crimp	A/G	2.3 (57.6)	0.75 (19.0)	0.100 (45.6)
27. TNC Male	Reverse Polarity	TC-600-TM-RP	3190-796	<1.25:1	(2.5)	Knurl	Spring Finger	Crimp	A/G	2.2 (56)	0.87 (22.0)	0.112 (50.8)
28. TNC Male	Reverse Polarity	TC-600-TM-RP	3190-1064	<1.25:1	(6)	Knurl	Solder	Crimp	N/G	2.1 (53.3)	0.68 (17.3)	0.112 (50.8)
29. TNC Male	Right Angle	TC-600-TM-RA-D	3190-2707	<1.35:1	(6)	Hex/Knurl	Solder	Crimp	A/G	1.6 (41)	1.75 (44.5)	0.164 (74.3)
30. TNC Female	Reverse Polarity	EZ-600-TF-RP	3190-797	<1.25:1	(2.5)	NA	Spring Finger	Crimp	A/G	2.3 (58)	0.87 (22.0)	0.100 (45.4)
31. TNC	Reverse Polarity	TC-600-TF-RP	3190-1065	<1.35:1	(6)	Knurl	Solder	Crimp	N/G	2.2 (55.8)	0.68 (17.3)	0.100 (45.4)
32. UHF Male	Straight Plug	EZ-600-UM	3190-615	<1.25:1	(2.5)	Knurl	Spring Finger	Crimp	S/G	1.7 (43)	0.88 (22.4)	0.164 (74.4)
33. UHF Male	Straight Plug	TC-600-UMC	3190-213	<1.25:1	(2.5)	Knurl	Solder	Clamp	S/G	1.7 (43)	0.88 (22.4)	0.198 (89.8)

Finish metals: N=Nickel, S=Silver, G=Gold, SS=Stainless Steel, A=Alloy **VSWR spec based on 3 foot cable with a connector pair *Available in bulk pack



Install Tools

Type	Part Number	Stock Code	Description
Crimp Tool	HX-4	3190-200	Crimp Handle
Crimp Dies	Y1720	3190-203	.610" Hex Dies
Crimp Rings	CR-600	3190-831	Crimp Rings for TC/EZ-600 connectors (pkg of 10)
Strip Tool	CST-600	3192-052	Combination prep tool for LMR-600 crimp and clamp style connectors
Replacement Blades	RB-456	3190-421	Replacement Blades for Strip Tools
Deburr Tool	DBT-U	3192-001	Removes center conductor rough edges
Midspan Strip Tool	GST-600A	3190-1051	For ground strap attachment
Wrench	WR-600	3190-1435	15/16" Box Wrench (2 required for EZ-600-NMC-2)
Cutting Tool	CCT-01	3190-1544	Cable end flush cut tool
Replacement Blade	RB-01	3190-1609	Replacement blade for cutting tool
Replacement Blade Kit	RB-CST	3192-086	Replacement blade kit for all CST strip tools
Tool Kit	TK-600EZ	3190-1602	Tool kit for LMR crimp/clamp connectors (includes CCT-01, CST-600, HX-4, Y1720, Tool Pouch)



Hardware Accessories

Type	Part Number	Stock Code	Description
Ground Kit	GK-S600TT	GK-S600TT	Standard Grounding Kit (each)
Hoisting Grip	HG-600T	HG-600T	Split/Laced Type (each)
Cold Shrink	CS-A600T	CS-A600T	Cable to Antenna Junction (each)
Cold Shrink	CS-60120T	CS-60120T	LMR-600 to -1200 Junction (each)
Cold Shrink	CS-60170T	CS-60170T	LMR-600 to -1700 Junction (each)
Hanger Blocks	CB-600T	CB-600T	Dual Cable Support Block (kit of 10)
Standard Entry			
Port Cushion	SC-600T-3	SC-600T-3	Three cables (each)
Snap-In Hangers	SH-U600T	SH-U600T	Snap-In Hangers (Kit of 10)
Hanger Block Supporting Hardware			Complete Range of Supporting Hardware & Adapters Available

COAXIAL RF SURGE PROTECTION

IS-B50 Series

The IS-B50 Series of DC block surge arrestors are designed to protect against lightning events and are ideal for HF, UHF and VHF radios. The IS-B50 family of RF protectors can be used for general radio use with frequency ranges between 1.5 MHz to 1000 MHz.



FEATURES

- Broad frequency ranges from 1.5 MHz to 1000 MHz
- Connectors: N-Type and UHF
- High power versions capable to 3kW
- Industry leading surge rating of 20kA
- Nuclear EMP versions available with N-Type connectors
- Flexible bulkhead and bracket mounting options

STANDARDS

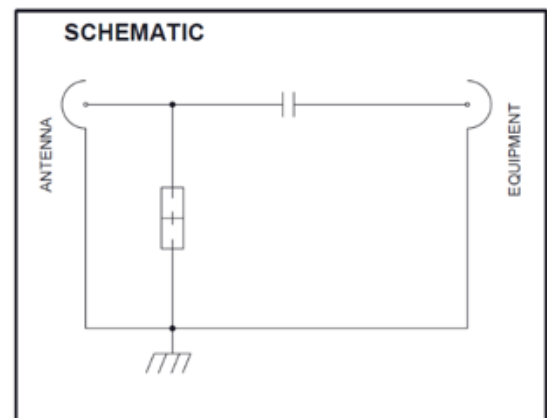
- CE Compliant
- RoHS Compliant

GENERAL SPECIFICATIONS

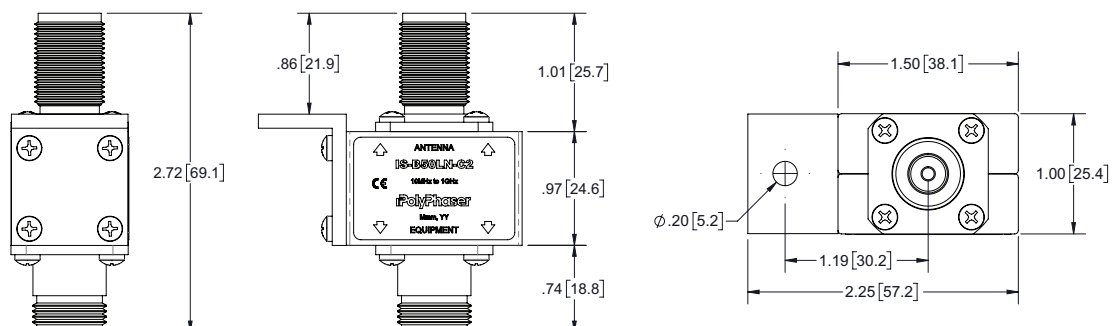
Insertion Loss	≤0.1dB
VSWR	≤1.2:1 or Better Over Frequency Range
Return Loss	<20dB
Max Surge	20 kA 8/20μs Waveform
Weathering Kit Available	Part Number: WK-1

PATENTED LIGHTNING ARRESTOR TECHNOLOGY

The IS-B50 product family is based on PolyPhaser's market establishing surge protection technology. This engineered surge suppressor has been the cornerstone for ham radio operators, land mobile communications and remote industrial monitoring. The IS-B50 is approved by major OEMs for use in critical applications such as emergency response, SCADA and public safety communications.



DIMENSIONS



AVAILABLE IS-B50 PART NUMBERS

Part Number	Frequency Range	Connector	Mounting Configuration	RF Power**	Let-Through Energy
IS-B50HN-C0	1.5MHz - 700MHz	N-Type	Bulkhead/Bracket	Up to 1.5kW	≤20μJ
IS-B50HN-C0-MA	1.5MHz - 700MHz	N-Type	Bulkhead/Bracket	Up to 1.5kW	≤20μJ
IS-B50HN-C1-ME	1.5MHz - 700MHz	N-Type	Bulkhead/Bracket	Up to 500W	≤20μJ
IS-B50HN-C2	125MHz - 1GHz	N-Type	Bulkhead/Bracket	Up to 500W	≤800μJ
IS-B50HN-C2-MA	125MHz - 1GHz	N-Type	Bulkhead/Bracket	Up to 500W	≤800μJ
IS-B50HN-C2-ME	125MHz - 1GHz	N-Type	Bulkhead/Bracket	Up to 500W	≤800μJ
IS-B50HU-C0	1.5MHz - 700MHz	UHF	Bulkhead/Bracket	Up to 3kW	≤20mJ
IS-B50LN-C2	1.5MHz - 700MHz	N-Type	Bulkhead/Bracket	Up to 1.5kW	≤10mJ
IS-B50LN-C2-MA	1.5MHz - 700MHz	N-Type	Bulkhead/Bracket	Up to 1.5kW	≤10mJ
IS-B50LN-C2-ME	1.5MHz - 700MHz	N-Type	Bulkhead/Bracket	Up to 1.5kW	≤10mJ
IS-B50LU-C0	125MHz - 1GHz	UHF	Bulkhead/Bracket	Up to 2kW	≤220μJ
IS-B50LU-C0-MA	125MHz - 1GHz	UHF	Bulkhead/Bracket	Up to 2kW	≤220μJ
IS-B50LU-C1-ME	125MHz - 1GHz	UHF	Bulkhead/Bracket	Up to 375W	≤220μJ
IS-NEMP-C0	1.5MHz - 700MHz	N-Type	Bulkhead/Bracket	–	–
IS-NEMP-C0-MA	1.5MHz - 700MHz	N-Type	Bulkhead/Bracket	–	–
IS-NEMP-C1-ME	50MHz - 700MHz	N-Type	Bulkhead/Bracket	Up to 200W	≤313μJ
IS-NEMP-C2	125MHz - 1GHz	N-Type	Bulkhead/Bracket	Up to 200W	≤250μJ
IS-NEMP-C2-MA	125MHz - 1GHz	N-Type	Bulkhead/Bracket	Up to 200W	≤250μJ
IS-NEMP-C2-ME	125MHz - 1GHz	N-Type	Bulkhead/Bracket	Up to 200W	≤250μJ

• MA for Male Surge (Antenna) Connector

• ME for Male Protected (Equipment) Connector

**Power depends on frequency being used – see individual product specifications for details



1492 Terminal Block Accessories

[1492-CJJ5-10](#)

1492 Terminal Block Accessories Plug-In Center Jumper , 5 mm Center to Center , 10 Pole , Gray ,

Product Details

ACCESSORY ITEMS	
Accessories	Jumpers



DIN Mounting Rail

[1492-DR6](#)



Representative Rendering, Not The Actual Product

DIN Mounting Rail, Aluminum, 35mm x 7.5mm x 57.4mm Raised DIN Rail, 1 Meter (Pkg. Qty. 2)

Product Details

IMPORTANT INFORMATION	
Please Note:	Warning:
DIN MOUNTING RAIL DATA	
DIN Rail	1492-DR6: Aluminum Raised DIN Rail (35mm x 7.5mm x 57.4mm high x 1 meter long)

Supporting Documentation and Downloads

- [DIN Mounting Rail Photo](#)



1492 Terminal Block Accessories

[1492-EAJ35](#)

1492 Terminal Block Accessories End Anchor, End Anchor

Product Details

ACCESSORY ITEMS	
Accessories	End Anchors And End Retainers



1492 Terminal Block Accessories

[1492-EBJ3](#)

1492 Terminal Block Accessories End Barrier , Grey (Standard), Qty. 50

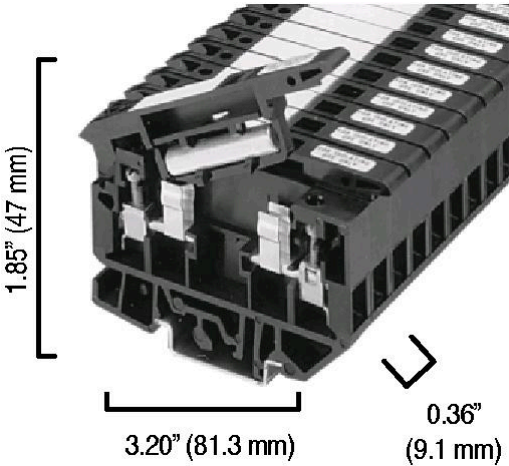
Product Details

ACCESSORY ITEMS	
Accessories	End Barriers, Partition Plates, and Terminal Covers



1492-H Finger-Safe Terminal Blocks

[1492-H4](#)



Representative Rendering, Not The Actual Product

1492-H Finger-Safe Terminal Blocks, H-Block,Single Circuit Fuse Block, Code 4,Neon Blown Fuse Indicator, #30 - #10 AWG, Black (Standard),No Bulk Pack (Single Block)

Product Details

BASE DATA	
Electrical Standards	UL
Type of Device	Finger-Safe Terminal Block
Base Block Type	Single Circuit Fuse Block
DETAIL DATA	
Features	Neon Blown Fuse Indicator
Wire Range	#30 - #10 AWG
Color	Black (Standard)
Bulk Pack	No Bulk Pack (Single Block)

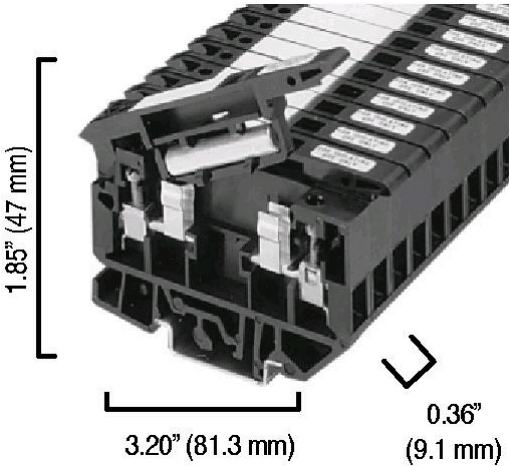
Supporting Documentation and Downloads

- [Terminal Block Photo](#)
- [Terminal Block Photo \(3/4 View\)](#)
- [Specifications](#)
- [Short Circuit Ratings Data Sheet](#)



1492-H Finger-Safe Terminal Blocks

[1492-H5](#)



Representative Rendering, Not The Actual Product

1492-H Finger-Safe Terminal Blocks, H-Block,Single Circuit Fuse Block, Code 5,LED Blown Fuse Indicator, #30 - #10 AWG, Black (Standard),No Bulk Pack (Single Block)

Product Details

BASE DATA	
Electrical Standards	UL
Type of Device	Finger-Safe Terminal Block
Base Block Type	Single Circuit Fuse Block
DETAIL DATA	
Features	LED Blown Fuse Indicator
Wire Range	#30 - #10 AWG
Color	Black (Standard)
Bulk Pack	No Bulk Pack (Single Block)

Supporting Documentation and Downloads

- [Terminal Block Photo](#)
- [Terminal Block Photo \(3/4 View\)](#)
- [Specifications](#)
- [Short Circuit Ratings Data Sheet](#)



1492 IEC Screw Terminal Blocks

[1492-J3](#)

1492-J IEC Terminal Block, One-Circuit Feed-Through Block, 2.5 mm (# 24 AWG - # 12 AWG), Standard Feedthrough, Gray (Standard),

Product Details

BLOCK STYLE	
Base Block Style	Standard Feed-Through Blocks
BASE DATA	
Base Block Type	One-Circuit Feed-Through Block
DETAIL DATA	
Features	Standard Feedthrough
Maximum Wire Size & Rating	UL: 30-12 AWG (25A @600V AC/DC) CSA: 26-12 AWG (20A @600V AC/DC) IEC: 2.5mm ² (24A @800V AC/DC) EEx e II: 2.5mm ² /20-14 AWG (21A @ 550V AC/DC)
Color	Gray (Standard)

Supporting Documentation and Downloads

- [Specifications](#)
- [Wire Size \[AWG\] Table](#)
- [Short Circuit Ratings Data Sheet](#)



1492 Terminal Block Accessories

[1492-M5X12](#)

1492 Terminal Block Accessories Snap-In Individual Marker Card5 mm x 12 mmNo Text

Product Details

ACCESSORY ITEMS	
Accessories	Marking Cards & Adhesive Labels



1492 Terminal Block Accessories

[1492-N37](#)

1492 Terminal Block Accessories End Barrier , Grey (Standard)

Product Details

ACCESSORY ITEMS	
Accessories	End Barriers, Partition Plates, and Terminal Covers

S(U)200 series — SU200M, SU200MR, and S200UDC

UL 489 series



Description

The SU200M, SU200MR and S200UDC miniature circuit breakers offer a compact solution for protection requirements. The SU200 series devices are current-limiting according to UL 489 and DIN rail mounted.

SU200M, SU200MR and S200UDC MCBs come in up to three trip curves to provide maximum circuit protection.

For the worldwide market, the breakers carry UL, CSA, IEC, CE and many other agency approvals and certifications.

Features

- UL current limiting
- Fast breaking time (2.3–2.5 ms)
- Bus connection system
- Wide range of accessories
- Available with variable depth handle mechanism
- CE certified and marked
- DIN rail mounting
- Finger-safe terminals
- Multi-function terminals
- Suitable for reverse feed (except for S200UDC)
- UL 489 listed branch circuit protective device, UL File #E212323

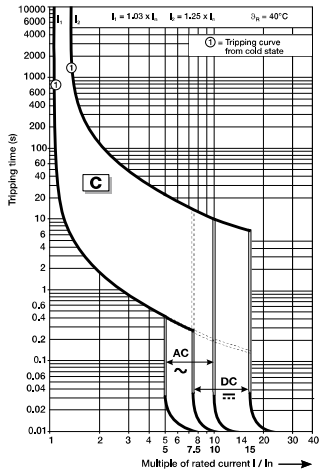
	SU200M	SU200MR	S200UDC
Amperage	0.2–63 A	0.2–63 A	1–63 A
Voltage	up to 277/Y480 V AC 48/96 V DC	up to 277/480 V AC	60/125 V DC
Trip curves	Z, C, K	K	Z, K
Interrupt rating	10 kA	10 kA	14 kA
Auxiliary contacts	Yes	Yes	Yes
Bell alarm	Yes	Yes	Yes
Shunt trip	Yes	Yes	Yes
Busbar	Yes	Yes	Yes

SU200M-C

Branch circuit protection — UL 489, CSA 22.2 No. 5

Rated current				Rated current			
Number of poles		I_n A	Cat. no.	Number of pole		I_n A	Cat. no.
	1	0.5	SU201M-C0.5	3		0.5	SU203M-C0.5
		1	SU201M-C1			1	SU203M-C1
		1.6	SU201M-C1.6			1.6	SU203M-C1.6
		2	SU201M-C2			2	SU203M-C2
		3	SU201M-C3			3	SU203M-C3
		4	SU201M-C4			4	SU203M-C4
		5	SU201M-C5			5	SU203M-C5
		6	SU201M-C6			6	SU203M-C6
		7	SU201M-C7			7	SU203M-C7
		8	SU201M-C8			8	SU203M-C8
		10	SU201M-C10			10	SU203M-C10
		13	SU201M-C13			13	SU203M-C13
		15	SU201M-C15			15	SU203M-C15
		16	SU201M-C16			16	SU203M-C16
		20	SU201M-C20			20	SU203M-C20
		25	SU201M-C25			25	SU203M-C25
		30	SU201M-C30			30	SU203M-C30
		32	SU201M-C32			32	SU203M-C32
		35	SU201M-C35			35	SU203M-C35
		40	SU201M-C40			40	SU203M-C40
		50	SU201M-C50			50	SU203M-C50
		60	SU201M-C60			60	SU203M-C60
		63	SU201M-C63			63	SU203M-C63
	2	0.5	SU202M-C0.5	4		0.5	SU204M-C0.5
		1	SU202M-C1			1	SU204M-C1
		1.6	SU202M-C1.6			1.6	SU204M-C1.6
		2	SU202M-C2			2	SU204M-C2
		3	SU202M-C3			3	SU204M-C3
		4	SU202M-C4			4	SU204M-C4
		5	SU202M-C5			5	SU204M-C5
		6	SU202M-C6			6	SU204M-C6
		7	SU202M-C7			7	SU204M-C7
		8	SU202M-C8			8	SU204M-C8
		10	SU202M-C10			10	SU204M-C10
		13	SU202M-C13			13	SU204M-C13
		15	SU202M-C15			15	SU204M-C15
		16	SU202M-C16			16	SU204M-C16
		20	SU202M-C20			20	SU204M-C20
		25	SU202M-C25			25	SU204M-C25
		30	SU202M-C30			30	SU204M-C30
		32	SU202M-C32			32	SU204M-C32
		35	SU202M-C35			35	SU204M-C35
		40	SU202M-C40			40	SU204M-C40
		50	SU202M-C50			50	SU204M-C50
		60	SU202M-C60			60	SU204M-C60
		63	SU202M-C63			63	SU204M-C63

Diagram



Technical specifications

SU200M, SU200MR and S200UDC — UL 489, CSA 22.2 No. 5

Technical specifications

	SU200M	SU200MR	S200UDC
Specifications	UL 489, C 22.2 No. 5, IEC 60947-2	UL 489, C 22.2 No. 5, IEC 60947-2	UL 489, VDE 0660
UL file number	E 212323, UL current limiting	E 212323, UL current limiting	E212323
Number of poles	1, 2, 3, 4	1, 2, 3, 4	1, 2
Trip curves	C, K, Z	K	Z, K
Rated current	Up to 63 A	Up to 63 A	Up to 63 A
Rated voltage	277/Y480 V AC up to 40 A (Z and C trip curves) 277/Y480 V AC up to 35 A (K trip curve) 240 V AC up to 63 A (all trip curves) 48/96 V DC up to 63 A (1/2-pole, all trip curves)	277/Y480 V AC (up to 35 A) 240 V AC up to 63 A	60/125 V DC (1/2-pole)
Short circuit interrupt rating	10 kA	10 kA	14 kA
Calibration temperature	40 °C	40 °C	25 °C
Mounting position	Any	Any	Any
Protection degree	IP 20	IP 20	IP 20 with accessory
Mounting	35 mm DIN rail	35 mm DIN rail	35 mm DIN rail
Terminal screw tightening torque	25 in. lbs (2.8 Nm)	25 in. lbs (2.8 Nm)	25 in. lbs (2.8 Nm)
Cable size	4–16 AWG	4–16 AWG	4–16 AWG
Ambient temperature	-25 °C to 55 °C (-13 °F to 131 °F)	-25 °C to 55 °C (-13 °F to 131 °F)	-25 °C to 55 °C (-13 °F to 131 °F)
Shock resistance (IEC60068-2-27)	25 g - 2 shocks - 13 ms	25 g - 2 shocks - 13 ms	25 g - 2 shocks - 13 ms
Service life, mechanical	20,000 operations	20,000 operations	20,000 operations

Auxiliary contact S2C-H6RU and S2C-S6RU

Rated current	10
Rated voltage AC/DC	24
Contact	1 pole double throw
Connection capacity	18–14 AWG (0.75–2.5 mm ²)
Tightening torque	11 in. lbs (1.2 Nm)
Shock resistance acc. to DIN IEC 68-2-6	5 g, 20 frequency cycles 5...150...5 Hz at 24 V AC/DC, 5 mA auto-reclosing < 10 ms
Mechanical service life	10,000 operations

Shunt trip

		S2C-A1U	S2C-A2U
Rated voltage	V AC	12–60	110–415
	V DC	12–60	110–250
Maximum release duration	ms	<10	<10
Minimum release voltage	V AC	7	55
	V DC	10	80
Consumption on release	VA AC	40–200	55–210
	VA DC	40–200	55–110
Coil resistance	V	3.7	225
Terminals	AWG/mm ²	18–6/0.75–16	18–6/0.75–16
Tightening torque	in. lbs./Nm	18/2	18/2

Technical specifications

SU200M, SU200MR and S200UDC — UL 489, CSA 22.2 No. 5

Internal resistance and power loss per pole

Internal resistance per pole in mV, power loss per pole in W.

SU200M

Rated current I_n A	C, K characteristics		Z characteristics	
	Internal resistance per pole R_i mΩ	Power loss P_v W	Internal resistance per pole R_i mΩ	Power loss P_v W
0.2	42500	1.7	-	-
0.3	18889	1.7	-	-
0.5	5600	1.4	9000	2.3
0.75	2489	1.4	-	-
1	1400	1.4	2200	2.2
1.6	703	1.8	1000	2.6
2	450	1.8	650	2.6
3	178	1.6	250	2.3
4	113	1.8	140	2.2
5	50	1.3	100	2.5
6	56	2.0	70	2.5
8	23	1.5	28	1.8
10	21	2.1	21	2.1
13	14	2.3	17	2.9
15	11	2.4	13	2.9
16	9.8	2.5	10	2.6
20	6.3	2.5	6.5	2.6
25	5.1	3.2	5.1	3.2
30	3.9	3.5	3.9	3.5
32	3.6	3.7	3.6	3.7
35	3.3	4.1	3.3	4.1
40	2.8	4.5	2.8	4.5
50	1.8	4.5	1.8	4.5
60	1.4	4.9	1.4	4.9
63	1.4	5.4	1.4	5.4

SU200MR

Rated current A	Internal resistance per pole mΩ	Power loss per pole W
0.2	25300	1.01
0.3	13700	1.23
0.5	4740	1.19
0.75	2067	1.16
1	127	.27
1.5	610	1.56
2	442	1.77
3	140	1.26
4	109	1.75
5	50	1.26
6	54	1.94
8	22	1.41
10	18.2	1.82
13	14.8	2.50
15	8.1	1.83
16	11.1	2.83
20	8.5	3.40
25	5.5	3.43
30	3.8	3.39
32	4.6	4.70
35	3.9	4.76
40	2.8	4.40
50	1.7	4.25
60	1.7	6.18
63	1.9	7.56

Technical specifications

SU200M, SU200MR and S200UDC — UL 489, CSA 22.2 No. 5

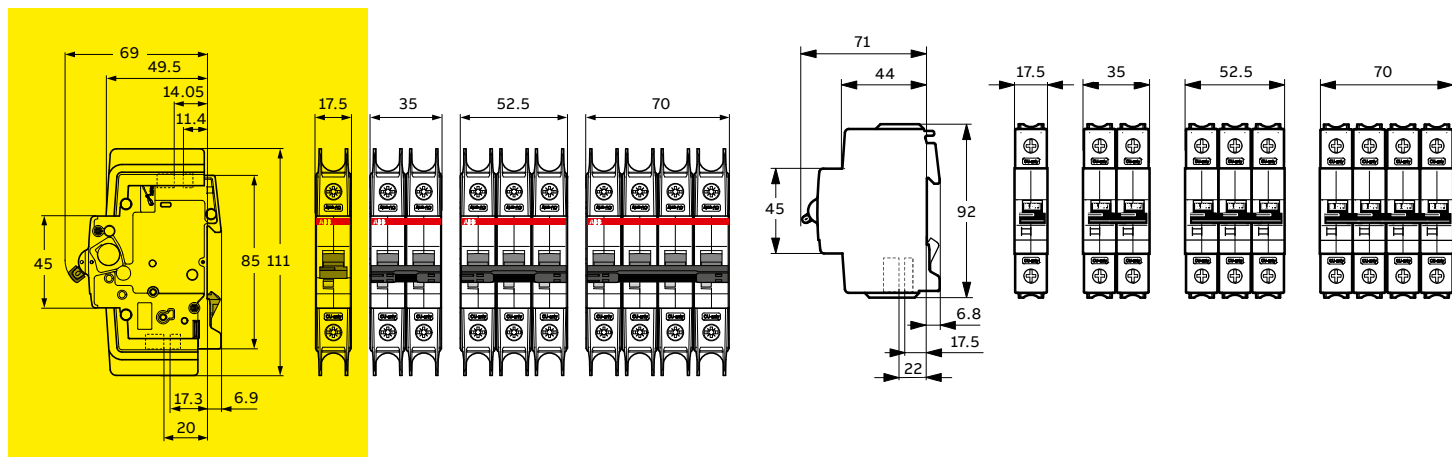
Temperature derating for SU200M and SU200MR

Standard	Rated current	Maximum operating current at ambient temperature T											
	A	- 40 °C	- 30 °C	- 20 °C	- 10 °C	0 °C	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C
UL 489	0.2 ¹⁾	0.27	0.26	0.25	0.24	0.23	0.22	0.22	0.21	0.20	0.19	0.19	0.18
	0.3 ¹⁾	0.40	0.39	0.37	0.36	0.35	0.33	0.32	0.31	0.30	0.29	0.28	0.27
	0.5	0.67	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.5	0.48	0.46	0.45
	0.75 ¹⁾	1.00	0.97	0.93	0.90	0.87	0.84	0.81	0.78	0.75	0.72	0.70	0.67
	1	1.34	1.29	1.24	1.20	1.16	1.12	1.08	1.04	1	0.96	0.93	0.89
	1.6	1.74	1.68	1.62	1.56	1.50	1.45	1.40	1.35	1.3	1.25	1.21	1.16
	2	2.67	2.58	2.49	2.40	2.31	2.23	2.15	2.07	2	1.93	1.85	1.79
	3	4.01	3.87	3.73	3.60	3.47	3.35	3.23	3.11	3	2.89	2.78	2.68
	4	5.35	5.16	4.97	4.80	4.63	4.46	4.30	4.15	4	3.85	3.71	3.57
	5	6.69	6.45	6.22	6.00	5.78	5.58	5.38	5.19	5	4.82	4.64	4.47
	6	8.02	7.74	7.46	7.20	6.94	6.69	6.45	6.22	6	5.78	5.56	5.36
	8	10.70	10.32	9.95	9.59	9.25	8.92	8.60	8.30	8	7.70	7.42	7.14
	10	13.37	12.90	12.44	11.99	11.56	11.15	10.75	10.37	10	9.63	9.27	8.93
	13	17.38	16.76	16.17	15.59	15.03	14.50	13.98	13.48	13	12.52	12.06	11.61
	15	20.06	19.34	18.65	17.99	17.35	16.73	16.13	15.56	15	14.45	13.91	13.40
	16	21.40	20.63	19.90	19.19	18.50	17.84	17.21	16.59	16	15.41	14.84	14.29
	20	26.75	25.79	24.87	23.98	23.13	22.30	21.51	20.74	20	19.26	18.55	17.86
	25	33.43	32.24	31.09	29.98	28.91	27.88	26.88	25.93	25	24.08	23.18	22.33
	30	40.12	38.69	37.31	35.98	34.69	33.45	32.26	31.11	30	28.89	27.82	26.79
	32	42.79	41.27	39.79	38.37	37.01	35.69	34.41	33.18	32	30.82	29.68	28.58
	35	46.81	45.14	43.53	41.97	40.47	39.03	37.64	36.30	35	33.71	32.46	31.26
	40	53.49	51.58	49.74	47.97	46.26	44.61	43.01	41.48	40	38.52	37.09	35.72
	50	66.87	64.48	62.18	59.96	57.82	55.76	53.77	51.85	50	48.15	46.37	44.65
	60	80.24	77.38	74.61	71.95	69.39	66.91	64.52	62.22	60	57.78	55.64	53.58
	63	84.25	81.24	78.35	75.55	72.85	70.25	67.75	65.33	63	60.67	58.42	56.26

¹⁾ Current ratings 0.2, 0.3 and 0.75 A available with K characteristic only.

SU200M, SU200MR and S200UDC — UL 489, CSA 22.2 No. 5

S200UDC

[illegible]

S2C-A..U



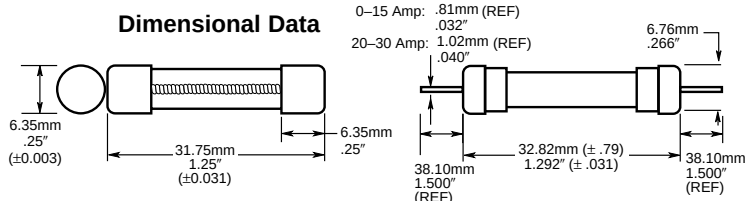
All dimensions shown are in mm.

Time-Delay Glass Fuses

For 1/4" x 1-1/4" (6.3mm x 32mm)

MDL

MDL-V



Catalog Symbol: MDL

1/4" x 1-1/4" (3AG)

Characteristics: Time-Delay

Agency Approvals*: UL/CSA 248-4

Construction: Glass Tube,
Albaloy Plated Brass Endcaps

Packaging & Ordering Information:

Package Code Blank 5 in BK/ 100 in	MDL Product Symbol	V Lead Blank -no lead V-Axial lead	(See Table) Rated Current
---	---------------------------------	--	-------------------------------------

Weight = .93 lbs/100

Time-Current Characteristics:

Rated Current	Percent of Rating		
	110%	135%	200%
0-30	4 hrs. (min)	60 min. (max)	120 sec. (max)

CE CE logo denotes compliance with European Union Low Voltage Directive (50-1000 VAC, 75-1500 VDC). Refer to BIF document #8002 or contact Bussmann Application Engineering at 314-527-1270 for more information.

Electrical Characteristics

Rated Current ⁵	Rated Voltage		Interrupting Rating ¹		Pre-arcing I ² t (A ² sec)		Typical Total Clearing ³ I ² t (A ² sec)		Typical Voltage Drop ² Volts at 100% Rated Current	Agency* Approvals
	AC (Max.)	DC ⁶ (Max.)	AC	DC ⁶	AC	DC ⁶	AC	DC ⁶		
1/16	250V	250V	35A	35A	.21	.02	.51	3.59	5.56	UL, CSA, U.L.
1/10	250V	250V	35A	35A	.04	.60	.11	1.31	2.02	UL, CSA, U.L.
1/8	250V	250V	35A	35A	.05	.06	.06	.06	1.68	UL, CSA, U.L.
3/16	250V	250V	35A	35A	.08		.52		1.12	UL, CSA, U.L.
2/10	250V	250V	35A	35A	.08		.68		1.00	UL, CSA, U.L.
1/4	250V	250V	35A	35A	.43	.44	.96	.45	1.02	UL, CSA, U.L.
3/10	250V	250V	35A	35A	.41	.43	1.13	.66	1.48	UL, CSA, U.L.
3/8	250V	250V	35A	35A	.72	.83	1.86	2.00	.85	UL, CSA, U.L.
1/2	250V	250V	35A	35A	1.48	2.02	2.52	2.14	1.26	UL, CSA, U.L.
3/4	250V	250V	35A	35A	3.75	4.25	5.11	4.62	1.01	UL, CSA, U.L.
1	250V	250V	35A	35A	10.24	9.80	12.65	10.25	.98	UL, CSA, U.L.
1 1/4	250V	250V	100A	100A	10.70		21.40		.77	UL, CSA, U.L.
1 1/2	250V	250V	100A	100A	10.10		30.90		.74	UL, CSA, U.L.
2	250V	250V	100A	100A	60.60		70.70		.50	UL, CSA, U.L.
2 1/4	250V	250V	100A	100A	55.40		78.20		.27	UL, CSA, U.L.
2 1/2	250V	250V	100A	100A	63.50		77.10		.42	UL, CSA, U.L.
3	250V	250V	100A	100A	43.10	30.27	68.60	76.09	.35	UL, CSA, U.L.
4	250V	32V	200A	1000A	161.30		203.30		.20	UL, CSA, U.L.
5	250V	32V	200A	1000A	311.30		374.00		.10	UL, CSA, U.L.
6	250V	32V	200A	1000A	368.30		427.50		.17	UL, CSA, U.L.
7	250V	32V	200A	1000A	457.50		507.60		.15	UL, CSA, U.L.
8	250V	250V	200A	200A	280.00	422.00	455.20	531.00	.12	UL, CSA, U.L.
9	32V	32V	1000A	1000A	568.00		685.00		.14	UL, CSA, U.L.
10	32V	32V	1000A	1000A	671.00		874.00		.12	UL, CSA, U.L.
15	32V	32V	1000A	1000A	1931.00		2296.00		.14	UL, CSA, U.L.
20	32V	32V	1000A	1000A	5652.00		5992.00		.05	UL, CSA, U.L.
25	32V	32V	1000A	1000A	15356.00		15789.00		.07	UL, CSA, U.L.
30	32V	32V	1000A	1000A	28033.00		28499.00		.07	UL, CSA, U.L.

*Approvals: UL Listed, Std. 248-14, Guide JDYX, File E19180; CSA Certification Class 1422-01, File 53787; U.L. Recognized, Guide #JDYX2, File E19180.

1. Interrupting ratings were measured at 70% - 80% power factor on AC, and at a time constant described in UL 198L.

2. Voltage drop was measured at 25°C±3°C ambient temperature at rated current.

3. I²t was measured at listed interrupting rating and rated voltage.

4. Interrupting rating for MDL 1/16-8A @ 125 VAC is 10000A. Interrupting rating listed corresponds to maximum rated voltage.

5. Other available sizes include 1/100, 1/32, 15/100, 175/100, 4/10, 6/10, 7/10, 8/10, 1-2/10, 1-6/10, 1-8/10, 2-8/10, 3-2/10, 3-1/2, 6-1/4, 7-1/2 and 12.

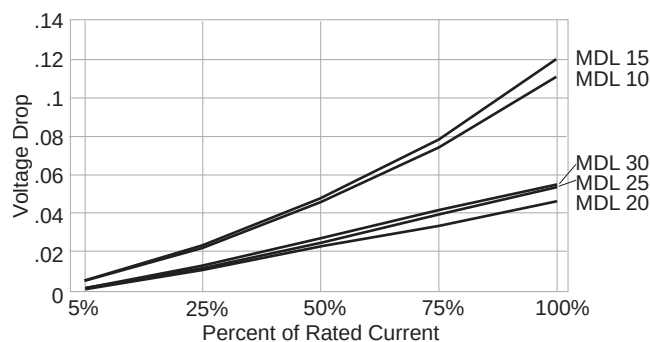
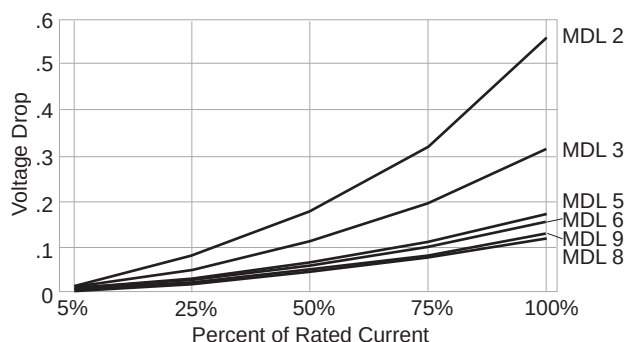
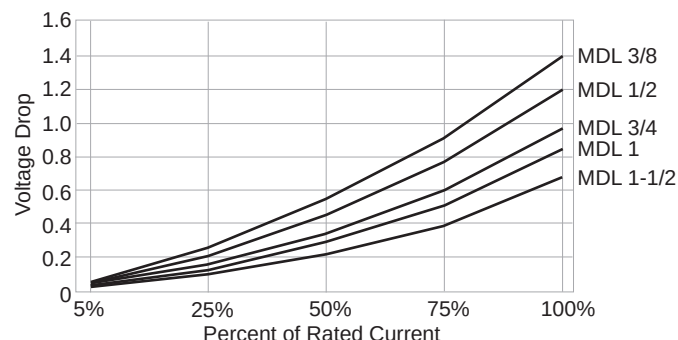
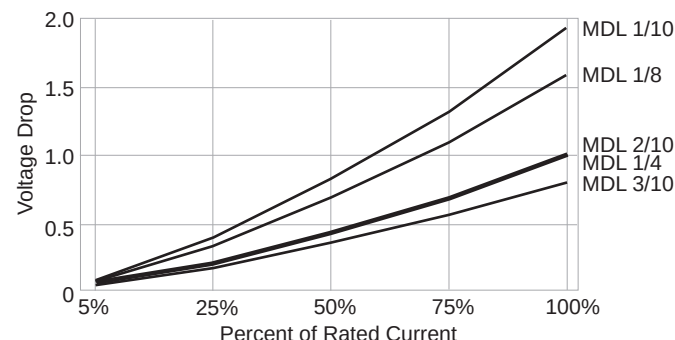
6. 1-10A, UL Recognized: 125 VDC and 500 AIC. Other DC ratings are self-certified.

Time-Delay Glass Fuses

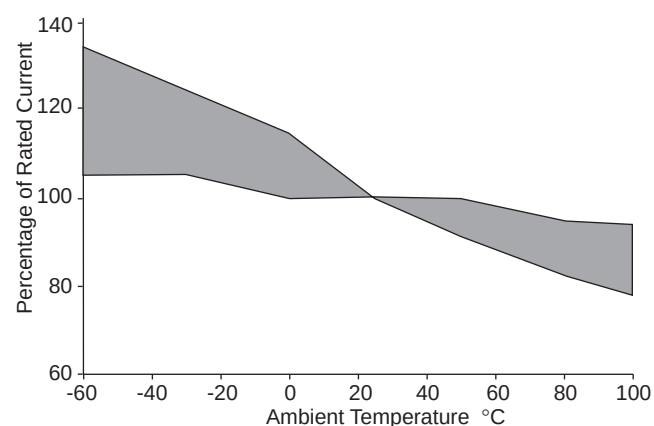
For 1/4" x 1-1/4" (6.3mm x 32mm)

MDL
MDL-V

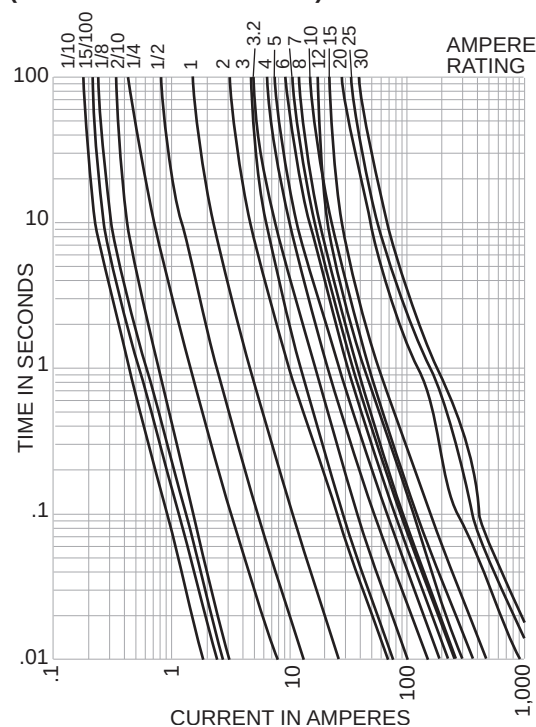
1.0 Typical Voltage Drop (At 25° C Ambient Temperature)



2.0 Ambient Temperature Effect Chart (Derating Curve)



Time-Current Characteristic Curves—Average Melt (Full Size Curves Available)



This bulletin is intended to clearly present comprehensive product data and provide technical information that will help the end user with design applications. Bussmann reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Bussmann also reserves the right to change or update, without notice, any technical information contained in this bulletin. Once a product has been selected, it should be tested by the user in all possible applications.

Eaton AGDN12010R

Catalog Number: AGDN12010R

Eaton DIN Rail Surge, 120 Vac rating, single phase, remote contacts

General specifications



Product Name
Eaton AEGIS DIN rail surge

Catalog Number
AGDN12010R

UPC
786689652630

Product Length/Depth
4.3 in

Product Height
2.7 in

Product Width
0.71 in

Product Weight
0.29 lb

Resources

Brochures

[AEGIS series line filters and surge protectors](#)

[Eaton surge protective devices overview brochure](#)

[Eaton surge protection capabilities overview brochure](#)

Specifications and datasheets

[Eaton Specification Sheet - AGDN12010R](#)

Technical data sheets

[Eaton AEGIS series technical data](#)



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Dublin 4, Ireland
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PowerSure™ FAS-120AC

120 VAC Medium Duty (Parallel) AC-Hardware

■ Surge Protection
For Business-Critical Continuity™

The PowerSure FAS-120AC surge suppressor is designed to protect AC distribution panel circuits or 120V power supplies feeding sensitive electronic equipment. Electrically, the unit incorporates MOV and thermal fusing technology. The PowerSure FAS-120AC is designed to be installed in parallel on standard single phase 120 VAC (L,N,G) circuits.



General Technical Specifications

Operating Voltage	120 VAC
Total Peak Surge Current	15.5 kA (8 x 20 μ s)
Short Circuit Current Rating	5kAIC
Location Type	Type 2
I-Nominal	3kA
UL 1449 VPR Rating	700V (L-N, L-G), 900V (N-G)
Operating Current	NA, Parallel
Operating Frequency	47-63 Hz
EMI Attenuation (100 kHz to 100 MHz)	>25 dB
SPD Technology	Metal Oxide Varistors (MOVs)
Modes of Protection	Line-to-Neutral, Line-to-Ground, Neutral-to-Ground
Status Indication	Power On & MOV Functional
Connection Type	#14 Wire Leads, 12" Long
Operating Temperature	-40°C to +85°C
Dimensions (Inches)	2.5H x 1.5W x 3.0L
Weight	4.2 oz
Certifications	ANSI/UL1449 Third Edition

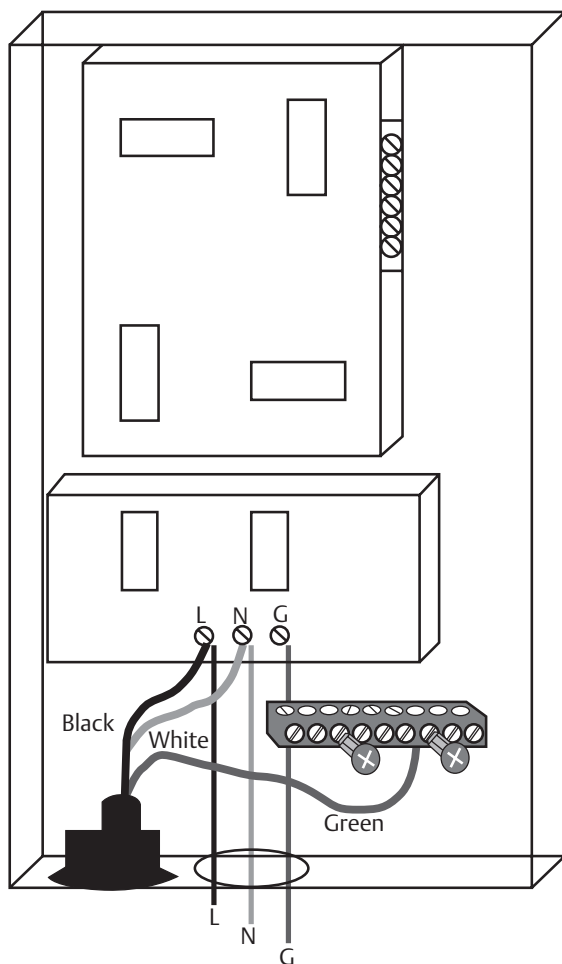
Features

- LED indicator
- Fast response time
- Thermal fuse
- L-G, L-N & N-G protection
- Compact size
- Liquid tight conduit fitting
- ANSI/UL 1449 Third Edition
- 5 year warranty



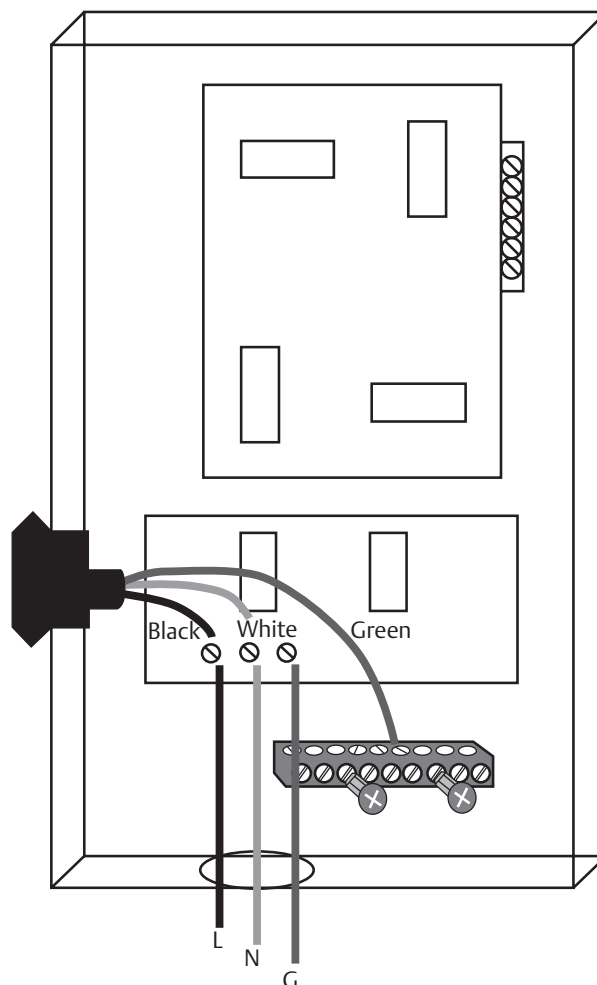
Installation

Mounting Inside Fire/Security Panel



A ground bus can be installed in cabinet to provide a single point ground.

Mounting Outside (closed nipple 3/4") Fire/Security Panel



Installation can be close-nipple up to a distribution panel/circuit or hardwired in parallel up to power supply input terminal screws. Be sure to dress leads as short as possible.

Emerson Network Power.
The global leader in enabling
Business-Critical Continuity™.

■ AC Power
■ Connectivity
■ DC Power

■ Embedded Computing
■ Embedded Power
■ Monitoring

■ Outside Plant
■ Power Switching & Control
■ Precision Cooling

■ Racks and Integrated Cabinets
■ Services
■ **Surge Protection**

Emerson Network Power Contact information

Headquarters

Surge Protection
100 Emerson Parkway
Binghamton, New York 13905
T: (607) 721-8840
T: (800) 288-6169
F: (607) 722-8713
E: contactsurge@emerson.com

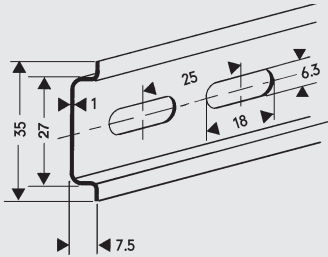
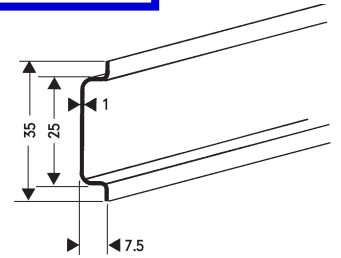
www.emersonnetworkpower.com





Part numbers 111.013 and ER-35P are equivalent per Daniel Baker with E-RAIL LLC.

~~111.011 2 Meter 35 x 7.5 MM Standard DIN Rail~~

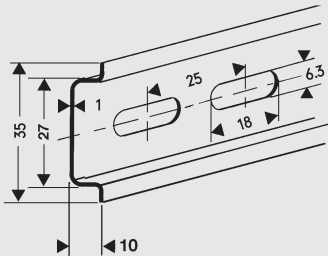
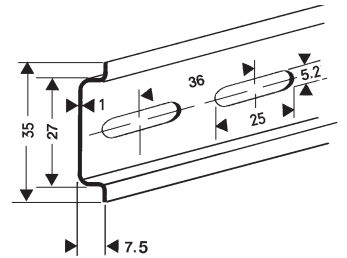


~~111.103 1 Meter 35 x 7.5 MM Slotted DIN Rail~~

111.013 2 Meter 35 x 7.5 MM Slotted DIN Rail

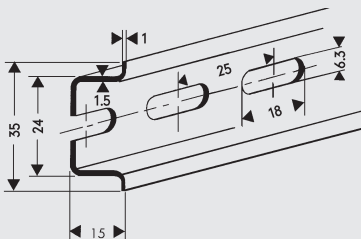
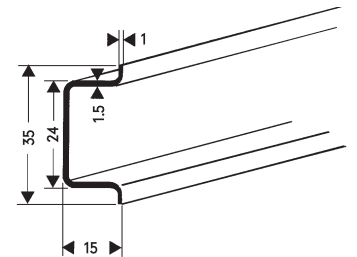
~~111.037 2 Meter 35 x 7.5 MM Stainless Steel~~

~~111.023 2 Meter 35 x 7.5 MM Slotted DIN Rail~~



~~111.232 2 Meter 35 x 10 MM Slotted DIN Rail~~

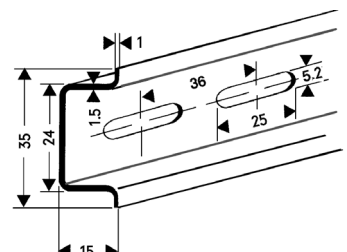
~~111.021 2 Meter 35 x 15 MM Standard DIN Rail~~



~~111.142 1 Meter 35 x 15 MM Slotted DIN Rail~~

~~111.025 2 Meter 35 x 15 MM Slotted DIN Rail~~

~~111.243 2 Meter 35 x 15 MM Slotted DIN Rail~~



SPECIAL CUT RAIL AVAILABLE UPON REQUEST



finder®

SWITCH TO THE FUTURE

38
SERIES

Relay interface modules 0.1 - 2 - 3 - 5 - 6 - 8 - 16 A



Bottling plant



Packaging machines



Control panels



Traffic light controls



Vending machines



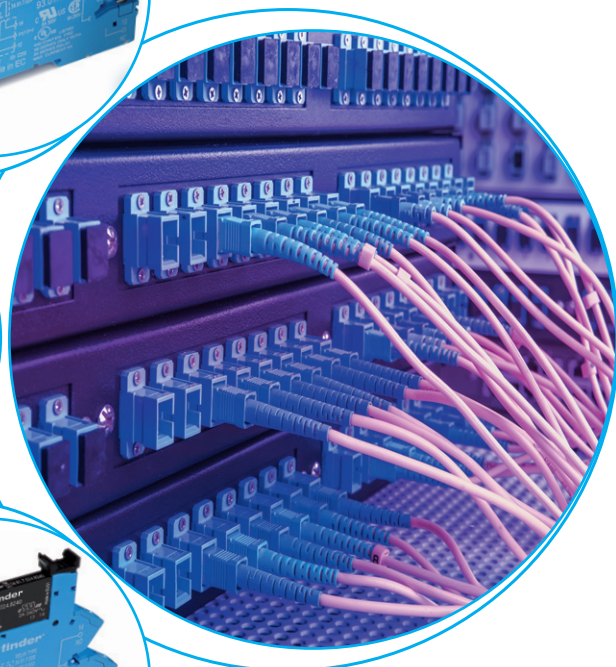
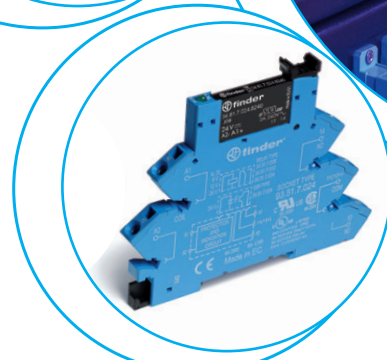
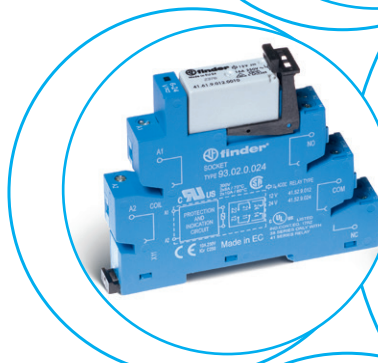
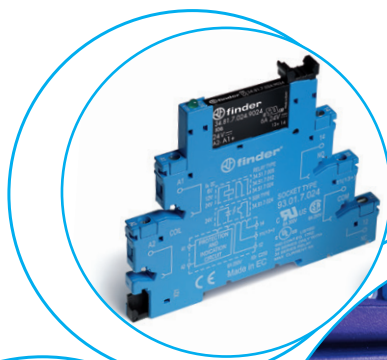
Programmable controllers

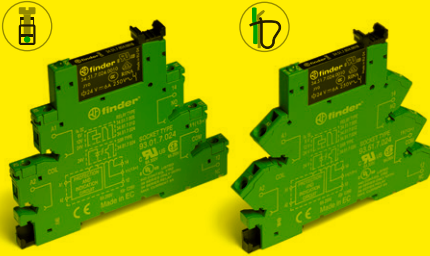
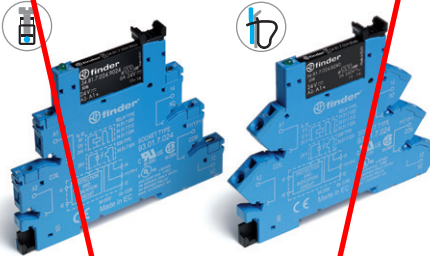
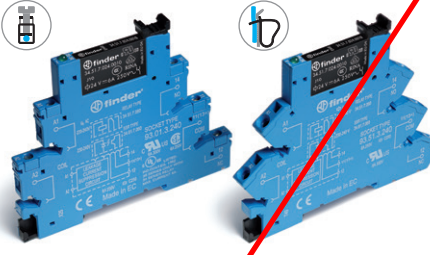
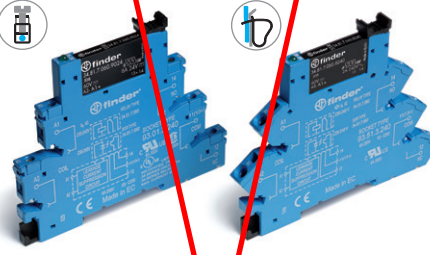
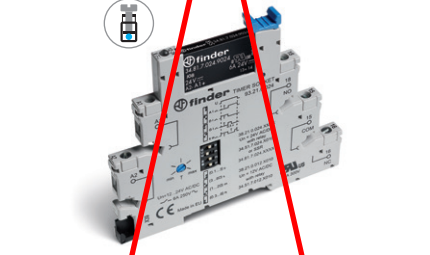
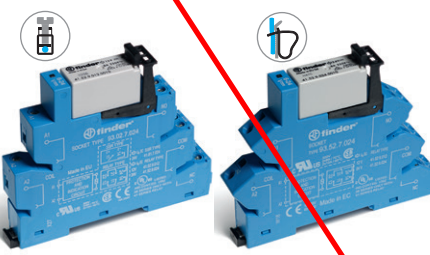
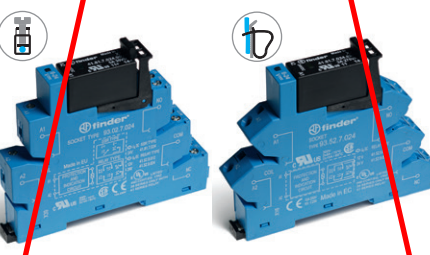


Panels for electrical distribution



Labelling machines



Common features - Instant ejection of relay by plastic retaining clip - Integral coil indication and protection circuit 35 mm rail (EN 60715) mounting	EMR Electromechanical Relays	SSR Solid State Relays
6.2 mm wide - EMR - DC, AC or AC/DC coil versions - SSR - DC or AC/DC input versions - Screw and Screwless terminal options	38.51/38.61  1 CO - 6 A/250 V AC Page 1	38.81/38.91  - Single solid state output: Options 0.1 A/48 V DC, 6 A/24 V DC, 2 A/240 V AC - Silent, high speed switching - Long electrical life Page 2
6.2 mm wide - Special coil/input leakage current suppression types - EMR - AC or AC/DC coil versions - SSR - AC or AC/DC input versions - Screw and Screwless terminal options	38.51.3... - 38.61.3...  1 CO - 6 A/250 V AC Page 1	38.81.3... - 38.91.3...  - Single solid state output: Options 0.1 A/48 V DC, 6 A/24 V DC, 2 A/240 V AC - Silent, high speed switching - Long electrical life Page 2
6.2 mm wide - Timed Interface module 4 functions & 4 time scales 0.1 s...6 h - EMR - AC/DC (12 or 24 V) supply versions - SSR - AC/DC (24 V) supply - Screw terminals	38.21  1 CO - 6 A/250 V AC Page 3	38.21...9024-8240  - Single solid state output: Options 6 A/24 V DC, 2 A/240 V AC - Silent, high speed switching - Long electrical life Page 3
14 mm wide 2 pole 8 A or 1 pole 16 A - EMR - DC or AC/DC coil versions - SSR - DC input versions - Screw and Screwless terminal options	38.01/38.52/38.11/38.62  1 CO - 16 A/250 V AC 2 CO - 8 A/250 V AC Page 4	38.31/38.41  - Single solid state output: Options 5 A/24 V DC, 3 A/240 V AC - Silent, high speed switching - Long electrical life Page 5

1 Pole - 6 A electromechanical relay interface modules, 6.2 mm wide.
Ideal interface for PLC and electronic systems

- Sensitive DC coil or AC/DC coil versions
- Integral coil indication and protection circuit
- Instant ejection of relay using plastic retaining clip
- UL Listing (certain relay/socket combinations)
- 35 mm rail (EN 60715) mounting

 38.51/38.51.3
Screw terminal

 38.61/38.61.3
Screwless terminal


* Special version for max ambient temperature +70 °C.

** Maximum ambient temperature limitations apply in the case of adjacent mounting of modules, where the coil is energised with a duty cycle of $\geq 50\%$ or where the ON time exceeds 1 hour:

+55 °C: applies to groups limited to 2 adjacent modules and where each group is separated by an air gap ≥ 6.2 mm.

+30 °C: applies to a group of more than 2 adjacent modules.

For outline drawing see page 13

Contact specification

Contact configuration

1 CO (SPDT)

 Rated current/
Maximum peak current

A

6/10

 Rated voltage/
Maximum switching voltage

V AC

250/400

Rated load AC1

VA

1500

Rated load AC15 (230 V AC)

VA

300

Single phase motor rating (230 V AC)

kW

0.185

Breaking capacity DC1: 30/110/220 V

A

6/0.2/0.12

Minimum switching load

mW (V/mA)

500 (12/10)

Standard contact material

AgNi

Coil specification

 Nominal voltage (U_N)

V AC/DC

12 - 24 - 48 - 60 - (110...125) - (220...240)**

V AC

(230...240)*

V DC

6 - 12 - 24 - 48 - 60 (non polarized)

Rated power AC/DC

VA (50 Hz)/W

See page 9

Operating range

AC/DC

 (0.8...1.1) U_N

AC

(184...264)V

DC

 (0.8...1.2) U_N

Holding voltage

AC/DC

 0.6 U_N / 0.6 U_N

Must drop-out voltage

AC/DC

 0.1 U_N / 0.05 U_N
Technical data

Mechanical life AC/DC

cycles

 10 · 10⁶

Electrical life at rated load AC1

cycles

 60 · 10³

Operate/release time

ms

5/6

 Insulation between coil and contacts (1.2/50 μ s)

kV

6 (8 mm)

Dielectric strength between open contacts

V AC

1000

 Ambient temperature range ($U_N \leq 60$ V / > 60 V) °C

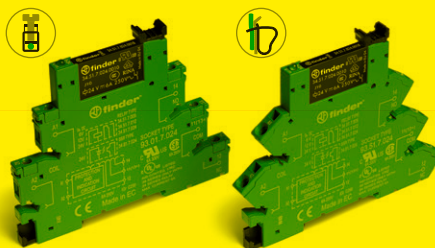
-40...+70 / -40...+55

Protection category

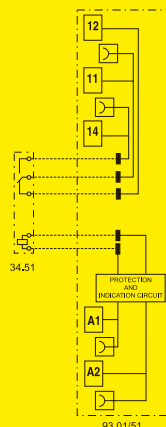
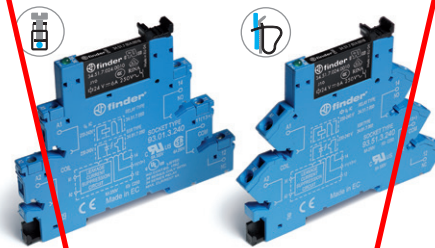
IP 20

Approvals relay (according to type)

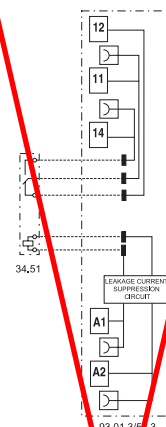
CE ENEC EAC RINA cULus

38.51/61


- 1 pole electromechanical relay
- Screw terminal and screwless terminal
- 35 mm rail (EN 60715) mounting


38.51.3/38.61.3


- Leakage current suppression
- 1 pole electromechanical relay
- Screw terminal and screwless terminal
- 35 mm rail (EN 60715) mounting



Ordering information

Electromechanical relay - 1 or 2 Pole

Example: 38 series screw terminal relay interface module, 1 CO (SPDT), sensitive 12 V DC coil.

B

3 8 . 5 **1 . 7 . 0 1 2 . 0** **A** **B** **C** **D**

Series

Type

- ~~0 = Electromechanical 16 A relay, with screw terminal~~
- ~~1 = Electromechanical 16 A relay, with screwless terminal~~
- ~~2 = Timer multifunction (AI, DI, GI, SW), with screw terminal~~
- 5 = Electromechanical relay, with screw terminal**
- ~~6 = Electromechanical relay, with screwless terminal~~

No. of poles

1 = 1 pole, 6 or 16 A~~2 = 2 pole, 8 A~~

Coil version

0 = AC (50/60 Hz)/DC~~5 = Leakage current suppression for (110...125)V AC/DC - (230...240)V AC~~~~7 = Sensitive DC (6, 12, 24, 48, 60)V only~~~~8 = AC (50/60 Hz)~~

Coil voltage

See coil specifications

D: Special versions**0 = Standard****C: Options**~~5 = Standard DC~~**6 = Standard AC or AC/DC****B: Contact circuit****0 = CO (nPDT)****A: Contact material****0 = AgNi Standard**~~4 = AgSnO₂~~~~5 = AgNi / Au~~

Selecting features and options: only combinations in the same row are possible.

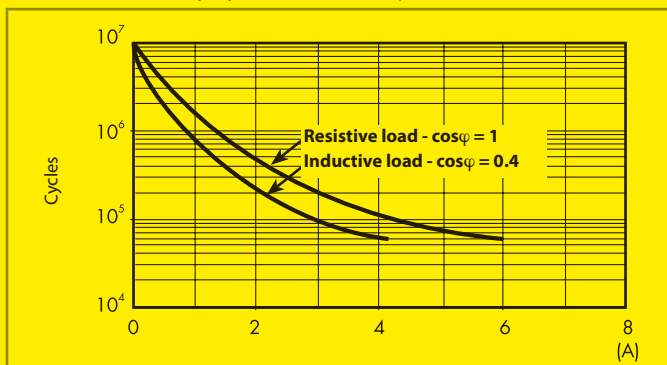
Type	Coil version	A	B	C	D
38.01/11	7	0 - 4	0	5	0
38.01/11	0 - 8	0 - 4	5	6	0
38.51/61	7	0 - 4 - 5	0	5	0
38.51/61	0 - 3 - 8	0 - 4 - 5	0	6	0
38.52/62	7	0 - 5	0	5	0
38.52/62	0 - 8	0 - 5	5	6	0
38.21	0	0	0	6	0

Technical data - 1 & 2 Pole Electromechanical Relays

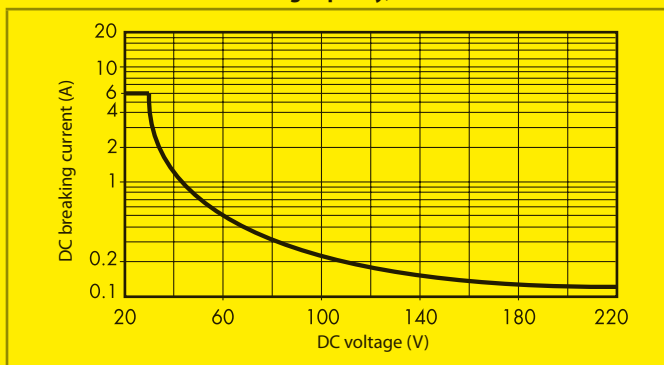
Insulation						
Insulation according to EN 61810-1	insulation rated voltage	V	250	400		
	rated impulse withstand voltage	kV	4	4		
	pollution degree		3	2		
	overvoltage category		III	III		
Insulation between coil and contacts (1.2/50 μs)		kV	6 (8 mm)			
Dielectric strength between open contacts		V AC	1000			
Insulation between coil terminals						
Rated impulse voltage (surge) differential mode (according to EN 61000-4-5)		kV(1.2/50 μs)	2			
Other data			1 Pole 6 A	1 Pole 16 A - 2 Pole 8 A		
Bounce time: NO/NC		ms	1/6	2/5		
Vibration resistance (10...55)Hz: NO/NC		g	10/5	15/2		
Power lost to the environment	without contact current	W	0.2 (12 V) - 0.9 (240 V)	0.5 (24 V) - 0.9 (240 V)		
	with rated current	W	0.5 (12 V) - 1.5 (240 V)	1.3 (24 V) - 1.7 (240 V)		
Terminals			38.21 / 38.51	38.61		
Wire strip length		mm	10	10		
 Screw torque		Nm	0.5	—		
Max. wire size		solid cable	stranded cable	solid cable	stranded cable	
		mm²	1 x 2.5 / 2 x 1.5	1 x 2.5 / 2 x 1.5	1 x 2.5	1 x 2.5
		AWG	1 x 14 / 2 x 16	1 x 14 / 2 x 16	1 x 14	1 x 14
		38.01 / 38.52			38.11 / 38.62	
Wire strip length		mm	10	10		
 Screw torque		Nm	0.5	—		
Max. wire size		solid cable	stranded cable	solid cable	stranded cable	
		mm²	1 x 2.5 / 2 x 1.5	1 x 2.5 / 2 x 1.5	1 x 2.5	1 x 2.5
		AWG	1 x 14 / 2 x 16	1 x 14 / 2 x 16	1 x 14	1 x 14

Contact specification - 1 & 2 Pole Electromagnetic Relays

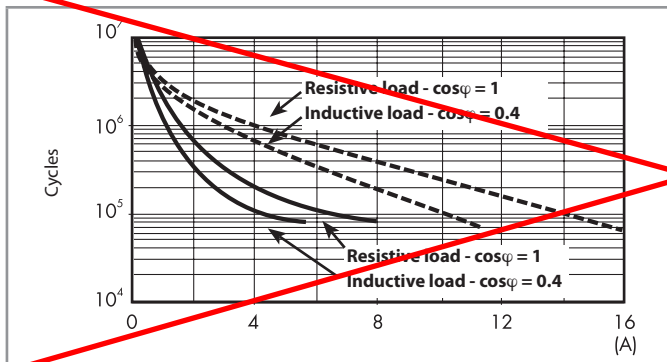
F 38 - Electrical life (AC) v contact current, 1 Pole 6 A



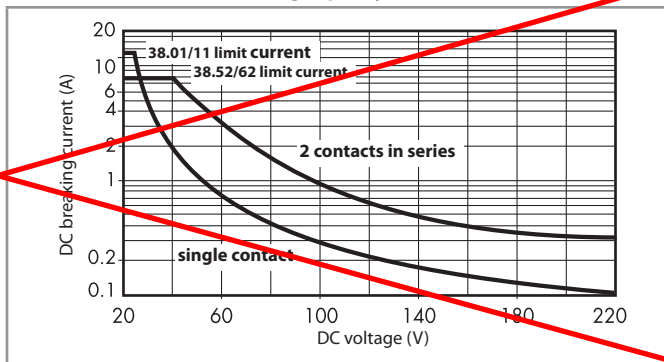
H 38 - Maximum DC1 breaking capacity, 1 Pole 6 A



F 38 - Electrical life (AC) v contact current, 1 Pole 16 A and 2 Pole 8 A



H 38 - Maximum DC1 breaking capacity, 1 Pole 16 A and 2 Pole 8 A



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of $\geq 60 \cdot 10^3$ (1 Pole) or $\geq 80 \cdot 10^3$ (2 Pole) can be expected.
- In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load. Note: the release time for the load will be increased.

Coil specifications - 1 Pole 6 A Electromechanical Relay

Coil data sensitive DC, 1 Pole

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
V		U_{min} V	U_{max} V	mA	W
6	7.006	4.8	7.2	35	0.2
12	7.012	9.6	14.4	15.2	0.2
24	7.024	19.2	28.8	7.6	0.3
48	7.048	38.4	57.6	3.8	0.3
60	7.060	48	72	3.1	0.4

Coil data AC/DC, 1 Pole

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
V		U_{min} V	U_{max} V	mA	VA/W
12	0.012	9.6	13.2	16	0.2/0.2
24	0.024	19.2	26.4	12	0.3/0.2
48	0.048	38.4	52.8	6.9	0.3/0.3
60	0.060	48	66	7	0.5/0.5
110...125	0.125	88	138	5(*)	0.6/0.6(*)
220...240	0.240	176	264	4(*)	1/0.9(*)

(*) Rated coil consumption and power consumption values relate to $U_N = 125$ and 240 V.

Coil data AC, 1 Pole (indicated for max ambient temperature +70 °C)

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
V		U_{min} V	U_{max} V	mA	VA/W
(230...240) AC	8.240	184	264	3	0.7/0.3

Coil data, leakage current suppression types, 1 Pole

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
V		U_{min} V	U_{max} V	mA	VA/W
(110...125) AC/DC	3.125	94	138	8(*)	1/1(*)
(230...240) AC	3.240	184	264	7(*)	1.7/0.5(*)

(*) Rated coil consumption and power consumption values relate to $U_N = 125$ and 240 V.

The 38 Series interface modules (supply version 3) have built-in leakage current suppression to address industry concerns of the contacts not dropping-out when there is residual current in the circuit; at (110...125)V AC and (230...240)V AC.

This problem can occur, for example, when connecting the interface modules to PLCs with triac outputs or when connecting via relatively long cables.

Coil specifications - 1 Pole 16 A and 2 Pole 8 A Electromechanical Relay

Coil data sensitive DC, 1 Pole 16 A and 2 Pole 8 A

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
V		U_{min} V	U_{max} V	mA	W
12	7.012	9.6	14.4	41	0.5
24	7.024	19.2	28.8	19.5	0.5
60	7.060	48	72	8	0.5

Coil data AC/DC, 1 Pole 16 A and 2 Pole 8 A

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
V		U_{min} V	U_{max} V	mA	W
24	0.024	19.2	26.4	20	0.5/0.5
60	0.060	48	66	7.1	0.5/0.5
110...125	0.125	88	138	4.6	0.6/0.6
220...240	0.240	184	264	3.8	0.9/0.9

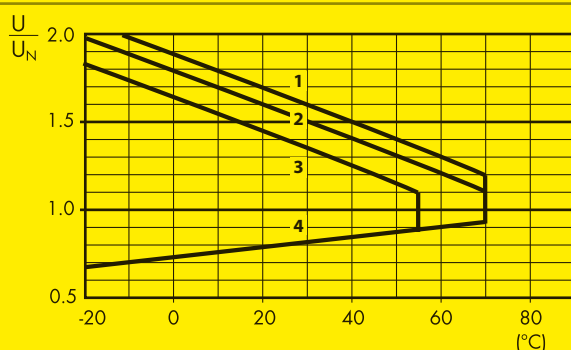
Coil data AC, 1 Pole 16 A and 2 Pole 8 A

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
V		U_{min} V	U_{max} V	mA	VA/W
230...240	8.230	184	264	5.3	1.2/0.6

Coil specification - 1 & 2 Pole Electromagnetic Relays

R 38 - DC coil operating range v ambient temperature

1 Pole and 2 Pole



- 1 - Max. permitted coil voltage at nominal load (DC coil).
- 2 - Max. permitted coil voltage at nominal load (AC/DC coils $U \leq 60$ V).
- 3 - Max. permitted coil voltage at nominal load (AC/DC coils $U > 60$ V).
- 4 - Min pick-up voltage with coil at ambient temperature.

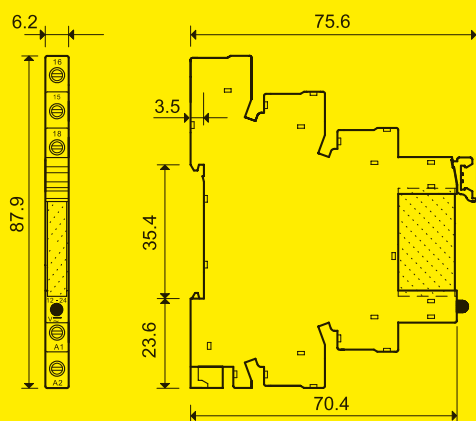
Outline drawings

Types 38.21

38.51 / 38.51.3

38.81 / 38.81.3

Screw terminal

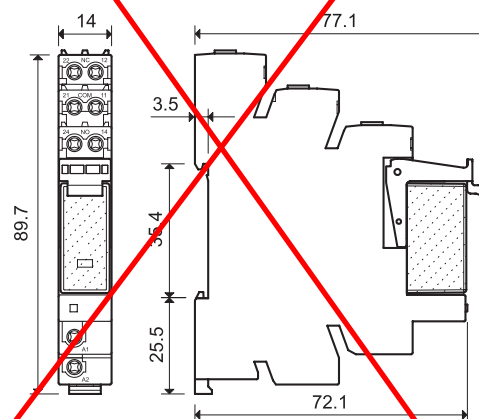


Types 38.01

38.31

38.52

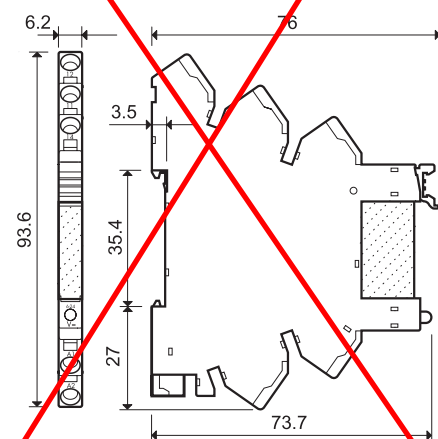
Screw terminal



Types 38.61 / 38.61.3

38.91 / 38.91.3

Screwless terminal

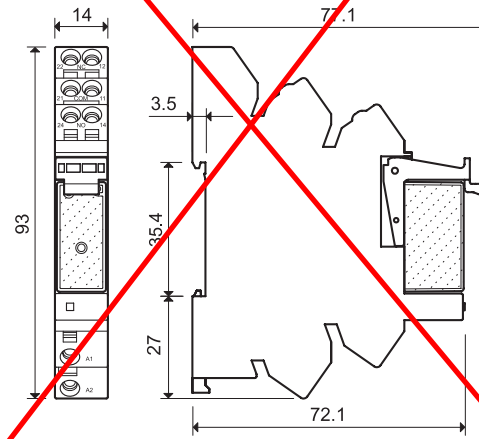


Types 38.11

38.41

38.62

Screwless terminal



Electromechanical Relay & Socket Combinations

Screw terminal - 1 Pole relay 6 A

Interface Module Code	Coil voltage	Relay	Socket
38.51.0.012.0060	12 V AC/DC	34.51.7.012.0010	93.01.0.024
38.51.0.024.0060	24 V AC/DC	34.51.7.024.0010	93.01.0.024
38.51.0.048.0060	48 V AC/DC	34.51.7.048.0010	93.01.0.060
38.51.0.060.0060	60 V AC/DC	34.51.7.060.0010	93.01.0.060
38.51.0.125.0060	(110...125)V AC/DC	34.51.7.060.0010	93.01.0.125
38.51.0.240.0060	(220...240)V AC/DC	34.51.7.060.0010	93.01.0.240
38.51.3.125.0060	(110...125)V AC/DC	34.51.7.060.0010	93.01.3.125
38.51.3.240.0060	(220...240)V AC	34.51.7.060.0010	93.01.3.240
38.51.7.006.0050	6 V DC	34.51.7.005.0010	93.01.7.024
38.51.7.012.0050	12 V DC	34.51.7.012.0010	93.01.7.024
38.51.7.024.0050	24 V DC	34.51.7.024.0010	93.01.7.024
38.51.7.048.0050	48 V DC	34.51.7.048.0010	93.01.7.060
38.51.7.060.0050	60 V DC	34.51.7.060.0010	93.01.7.060
38.51.8.240.0060	(230...240)V AC	34.51.7.060.0010	93.01.8.240

Screwless terminal - 1 Pole relay 6 A

Interface Module Code	Coil voltage	Relay	Socket
38.61.0.012.0060	12 V AC/DC	34.51.7.012.0010	93.51.0.024
38.61.0.024.0060	24 V AC/DC	34.51.7.024.0010	93.51.0.024
38.61.0.125.0060	(110...125)V AC/DC	34.51.7.060.0010	93.51.0.125
38.61.0.240.0060	(220...240)V AC/DC	34.51.7.060.0010	93.51.0.240
38.61.3.125.0060	(110...125)V AC/DC	34.51.7.060.0010	93.51.3.125
38.61.3.240.0060	(230...240)V AC	34.51.7.060.0010	93.51.3.240
38.61.7.012.0050	12 V DC	34.51.7.012.0010	93.51.7.024
38.61.7.024.0050	24 V DC	34.51.7.024.0010	93.51.7.024
38.61.8.240.0060	(230...240)V AC	34.51.7.060.0010	93.51.8.240

Screw terminal - 1 Pole relay 16 A

Interface Module Code	Coil voltage	Relay	Socket
38.01.7.012.0050	12 V DC	41.61.9.012.0010	93.02.7.024
38.01.7.024.0050	24 V DC	41.61.9.024.0010	93.02.7.024
38.01.7.060.0050	60 V DC	41.61.9.060.0010	93.02.7.060
38.01.0.024.0060	24 V AC/DC	41.61.9.024.0010	93.02.0.024
38.01.0.060.0060	60 V AC/DC	41.61.9.060.0010	93.02.0.060
38.01.0.125.0060	125 V AC/DC	41.61.9.110.0010	93.02.0.125
38.01.0.240.0060	240 V AC/DC	41.61.9.110.0010	93.02.0.240
38.01.8.230.0060	230 V AC	41.61.9.110.0010	93.02.8.230

Screwless terminal - 1 Pole relay 16 A

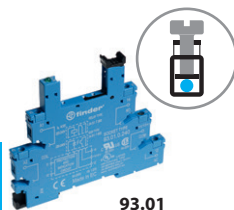
Interface Module Code	Coil voltage	Relay	Socket
38.11.7.012.0050	12 V DC	41.61.9.012.0010	93.52.7.024
38.11.7.024.0050	24 V DC	41.61.9.024.0010	93.52.7.024
38.11.7.060.0050	60 V DC	41.61.9.060.0010	93.52.7.060
38.11.0.024.0060	24 V AC/DC	41.61.9.024.0010	93.52.0.024
38.11.0.060.0060	60 V AC/DC	41.61.9.060.0010	93.52.0.060
38.11.0.125.0060	125 V AC/DC	41.61.9.110.0010	93.52.0.125
38.11.0.240.0060	240 V AC/DC	41.61.9.110.0010	93.52.0.240
38.11.8.230.0060	230 V AC	41.61.9.110.0010	93.52.8.230

Screw terminal - 2 Pole relay 8 A

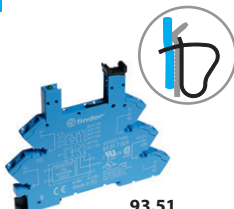
Interface Module Code	Coil voltage	Relay	Socket
38.52.0.024.0060	24 V AC/DC	41.52.9.024.0010	93.02.0.024
38.52.0.060.0060	60 V AC/DC	41.52.9.060.0010	93.02.0.060
38.52.0.125.0060	(110...125)V AC/DC	41.52.9.110.0010	93.02.0.125
38.52.0.240.0060	(220...240)V AC/DC	41.52.9.110.0010	93.02.0.240
38.52.7.012.0050	12 V DC	41.52.9.012.0010	93.02.7.024
38.52.7.024.0050	24 V DC	41.52.9.024.0010	93.02.7.024
38.52.7.060.0050	60 V DC	41.52.9.060.0010	93.02.7.060
38.52.8.230.0060	(230...240)V AC	41.52.9.110.0010	93.02.8.230

Screwless terminal - 2 Pole relay 8 A

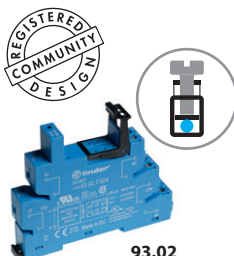
Interface Module Code	Coil voltage	Relay	Socket
38.62.0.024.0060	24 V AC/DC	41.52.9.024.0010	93.52.0.024
38.62.0.060.0060	60 V AC/DC	41.52.9.060.0010	93.52.0.060
38.62.0.125.0060	(110...125)V AC/DC	41.52.9.110.0010	93.52.0.125
38.62.0.240.0060	(220...240)V AC/DC	41.52.9.110.0010	93.52.0.240
38.62.7.012.0050	12 V DC	41.52.9.012.0010	93.52.7.024
38.62.7.024.0050	24 V DC	41.52.9.024.0010	93.52.7.024
38.62.7.060.0050	60 V DC	41.52.9.060.0010	93.52.7.060
38.62.8.230.0060	(230...240)V AC	41.52.9.110.0010	93.52.8.230



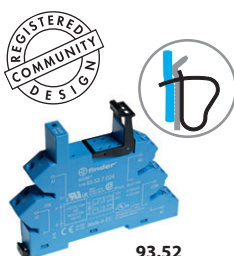
93.01



93.51



93.02



93.52

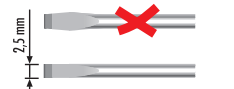
Approvals

(according to type):



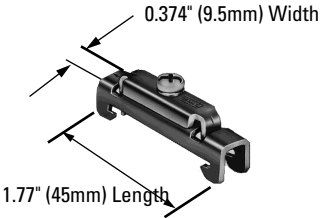
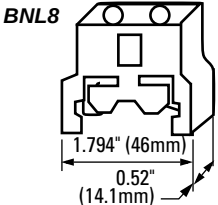
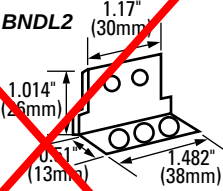
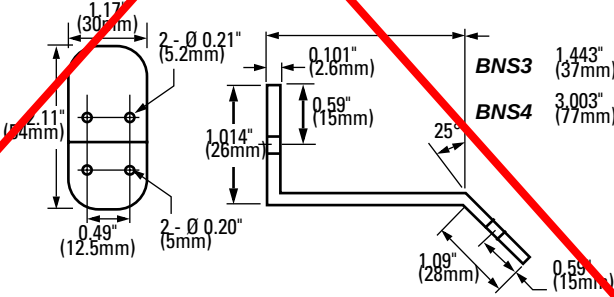
CUL US

Certain relay/socket combinations



Dimensions: Accessories, continued

Dimensions: DIN Rail Stops and Stand-Offs

Part No.	Dimensions
BNL-5	 0.374" (9.5mm) Width 1.77" (45mm) Length
BNL-8	
BNL-8	 1.794" (46mm) 0.52" (14.1mm)
BNDL2	 1.17" (30mm) 1.014" (26mm) 0.51" (13mm) 1.482" (38mm)
BNS3	 1.17" (30mm) 2 - Ø 0.21" (5.2mm) 0.101" (2.6mm) 0.59" (15mm) 1.014" (26mm) 0.49" (12.5mm) 2 - Ø 0.20" (5mm) 1.443" (37mm) 3.003" (77mm) 1.09" (28mm) 0.59" (15mm)
BNS4	

CAT6 24AWG UTP

Ethernet Patch Cable



For more information or to order, please contact **Monoprice Sales Representative** or sales@monoprice.com

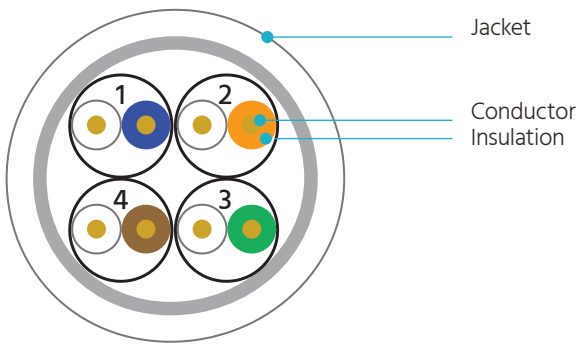
Construction

Conductor	24AWG
Material:	BC
Nom. OD:	7/0.2±0.008mm
Insulation:	PE
Nominal Thickness:	0.18mm Min: 0.02mm
Nom. OD:	0.97±0.05mm
Jacket	PVC
Nominal Thickness:	0.67mm Min: 0.05mm
Nom. OD:	5.8±0.3mm

Electrical Characteristics

Conductor Resistance@20 °C ≤ 87.6 Ohms/km

	LOSS	NEXT	RL	ACR-N	ACR-F	PS NEXT	PS ACR-N	PS ACR-F
MHz	dB	dB	dB	dB	dB	dB	dB	dB
1	3.0	65	19	62	63.3	62	59	60.3
4	4.0	63	19	59	51.2	60.5	56.5	48.2
8	5.7	58	19	52.2	45.2	55.6	49.9	42.2
10	6.3	56.6	19	50.2	43.3	54	47.7	40.3
16	8.0	53.2	18	45.2	39.2	50.6	42.6	36.2
20	9.0	51.6	17.5	42.6	37.2	49	39.9	34.2
25	10.1	50	17	39.9	35.3	47.3	37.2	32.3
31.25	11.4	48.4	16.5	37	33.4	45.7	34.3	30.4
62.5	16.5	43.4	14	26.9	27.3	40.6	24.1	24.3
100	21.3	39.9	12	18.6	23.3	37.1	15.8	20.3
200	31.5	34.8	9	3.3	17.2	31.9	0.3	14.2
250	35.9	33.1	8	-2.8	15.3	30.2	-5.8	12.3



Mechanical Characteristics

Storage Temperature Range 0 °C to 45 °C

Installation Temperature Range 0 °C to 75 °C

Maximum Pulling Force 100 lbs.

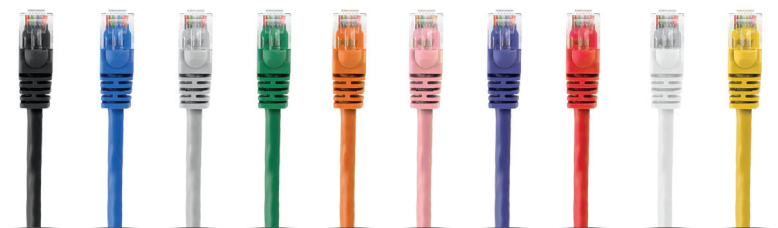
Wire Connection

Pair 1 White + Blue	Pair 3 White + Green
Pair 2 White + Orange	Pair 4 White + Brown



Ratings/Certifications

UL, RoHS, REACH

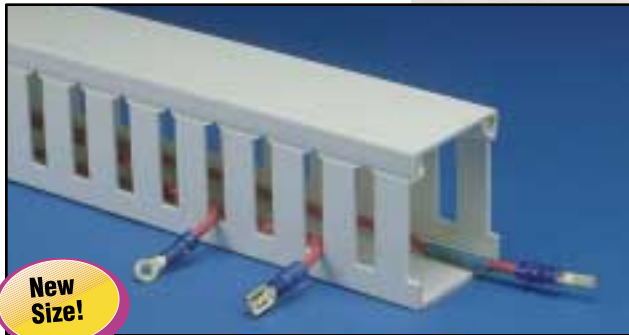


Colors: Black, Blue, Gray, Green, Orange, Pink, Purple, Red, White, and Yellow

Lengths: 0.5, 1, 2, 3, 5, 7, 10, 14, 20, 25, 30, 50, 75, and 100 feet

Jacket Marking: MONOPRICE TYPE CM 24AWG 4PR 75°C (UL) E467139 ANSI/TIA-568-C.2 CAT.6 UTP 250MHz RoHS COMPLIANCE

PANDUCT® Type G — Slotted Wall Wiring Duct



Type G Slotted Wall Wiring Duct

- Made of rigid PVC (*See pg. 41* for material specifications)
- Rated for continuous use temperatures up to 50°C (122°F)
- U.L. Flammability Rating: V-0
- Available in a variety of colors as a standard part
- Provided with standard mounting holes (*See page 35* for dimensions)
- Available with adhesive backing* (*See page 25* for details)

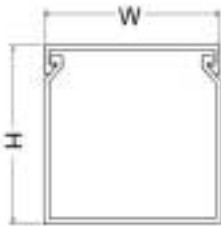


Type G— Wiring Duct Standard Colors:

LG	DG	WH
Light Gray	Dark Gray	White

BL	IB
Black	Intrinsic Blue

Colors shown are approximate.



Duct Part Number	Duct External Dimensions		Cover Part Number	Duct Std. Ctn. Qty.	Cover Std. Ctn. Qty.	Std. Lgth.
	WxH In.	WxH (mm)				
G.5X.5LG6	0.69 x .56	(17.5) x (14.2)	C.5LG6	120 ft.	120 ft.	6 ft.
G.5X1LG6	0.69 x 1.09	(17.5) x (27.1)		120 ft.	120 ft.	
G.5X4LG6	0.69 x 4.10	(17.5) x (104.0)		120 ft.	120 ft.	
G.75X.75LG6	0.94 x 0.83	(23.9) x (21.0)	C.75LG6	120 ft.	120 ft.	6 ft.
G.75X1LG6	0.94 x 1.09	(23.9) x (27.1)		120 ft.	120 ft.	
G.75X1.5LG6	0.94 x 1.58	(23.9) x (40.0)		120 ft.	120 ft.	
G.75X2LG6	0.94 x 2.09	(23.9) x (53.0)		120 ft.	120 ft.	
G.1X1LG6	1.25 x 1.09	(31.8) x (27.1)	C.1LG6	120 ft.	120 ft.	6 ft.
G.1X1.5LG6	1.25 x 1.58	(31.8) x (40.0)		120 ft.	120 ft.	
G.1X2LG6	1.25 x 2.09	(31.8) x (53.0)		120 ft.	120 ft.	
G.1X3LG6	1.25 x 3.12	(31.8) x (78.6)		120 ft.	120 ft.	
G.1X4LG6	1.25 x 4.10	(31.8) x (104.0)		60 ft.	120 ft.	
G.1.5X1LG6	1.75 x 1.09	(44.3) x (27.1)	C.1.5LG6	120 ft.	120 ft.	6 ft.
G.1.5X1.5LG6	1.75 x 1.58	(44.3) x (40.0)		120 ft.	120 ft.	
G.1.5X2LG6	1.75 x 2.09	(44.3) x (53.0)		120 ft.	120 ft.	
G.1.5X3LG6	1.75 x 3.12	(44.3) x (78.6)		120 ft.	120 ft.	
G.1.5X4LG6	1.75 x 4.10	(44.3) x (104.0)		60 ft.	120 ft.	
G.2X1LG6	2.25 x 1.09	(57.2) x (27.1)	C2WH6	120 ft.	120 ft.	6 ft.
G.2X1.5LG6	2.25 x 1.58	(57.2) x (40.0)		120 ft.	120 ft.	
G.2X2LG6	2.25 x 2.09	(57.2) x (53.0)		120 ft.	120 ft.	
G.2X3LG6	2.25 x 3.12	(57.2) x (78.6)		60 ft.	120 ft.	
G2X4WH6	2.25 x 4.10	(57.2) x (104.0)		60 ft.	120 ft.	
G.2X5LG6	2.25 x 5.11	(57.2) x (129.7)		60 ft.	120 ft.	
G.2.5X3LG6	2.75 x 3.12	(69.9) x (78.6)	C.2.5LG6	60 ft.	120 ft.	6 ft.
G.3X1LG6	3.25 x 1.09	(82.6) x (27.1)	C.3WH6	120 ft.	120 ft.	
G.3X2LG6	3.25 x 2.09	(82.6) x (53.0)		120 ft.	120 ft.	6 ft.
G.3X3LG6	3.25 x 3.12	(82.6) x (78.6)		60 ft.	120 ft.	
G.3X4WH6	3.25 x 4.10	(82.6) x (104.0)		60 ft.	120 ft.	
G.3X5LG6	3.25 x 5.11	(82.6) x (129.7)		60 ft.	120 ft.	
G.4X1.5LG6	4.25 x 1.58	(108.0) x (40.0)	C.4WH6	60 ft.	120 ft.	6 ft.
G.4X2LG6	4.25 x 2.09	(108.0) x (53.0)		60 ft.	120 ft.	
G.4X3LG6	4.25 x 3.12	(108.0) x (78.6)		60 ft.	120 ft.	
G.4X4WH6	4.25 x 4.10	(108.0) x (104.0)		60 ft.	120 ft.	
G.4X5LG6	4.25 x 5.11	(108.0) x (129.7)		60 ft.	120 ft.	
G.6X1LG6	6.25 x 1.09	(158.8) x (27.1)	C.6LG6	60 ft.	120 ft.	6 ft.

*Adhesive tape is not CSA Certified.

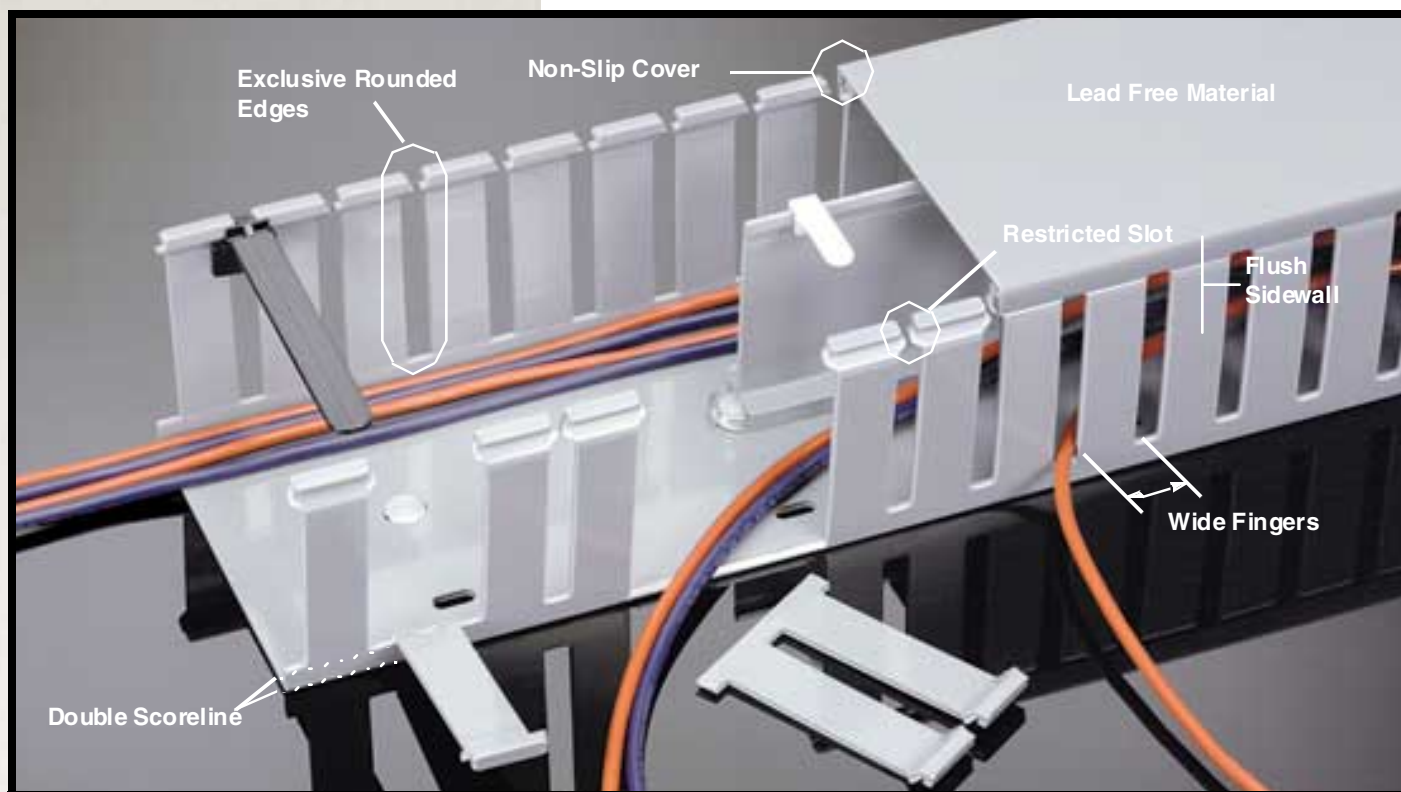
See page 35 for complete listing of dimensions. ✓ = New Size

Part Number Nomenclature —

G	.5	X	.5	LG	6
↑	↑		↑	↑	↑
type/style	nominal width (in)		nominal height (in)	color	length (ft)

Ordering Information:

- Order number of feet required in multiples of 6 ft or Std. Carton quantities.
- To order with pressure-sensitive adhesive mounting tape applied, add -A to Part Number.
- Part Number shown for Light Gray LG. For other color availability see chart, *page 43*.



Type G Slotted Wall Wiring Duct

Choose from **35** sizes of *PANDUIT*® Type G Wiring Duct; from **0.5" x 0.5"** up to **6" x 4"**. Used for general purpose control panel wiring and to route and protect wiring in communication closets. The non-slip cover conceals all wiring and is easy to install. The duct and cover form a flush sidewall providing increased capacity and improved aesthetics.

Accessories

Duct Cutting Tool	26
Duct Finger Cutting Tool	26
Duct Notching Tool	27
Nylon Rivet Installation Tool	27
Divider Walls	28
Wire Retainers	29-30
Mounting Bracket	33
Labeling	34

Features & Benefits

Wide Fingers

- Provide added support
- Same slot and finger width as Type E Duct

Cover Flush with Base

- Provides greater wire capacity
- Improves aesthetics

Restricted Slot Design

- Retains wire in slot
- Speeds installation
 - Simply deflect finger for fast, easy wire installation or removal

Optional Divider Walls

- Can create multiple channels within duct to separate wiring

Exclusive Rounded Edges Along Entire Slot

- Protect wires and hands from abrasion

Non-Slip Cover Design

- Incorporates integral high friction lining to inhibit cover movement

Easy Cover Removal

- Changes to wiring can be made quickly & easily

Double Scorelines

- Upper Scoreline:
 - Fingers break off leaving a smooth edge, without the use of a tool
- Lower Scoreline:
 - Fingers and sidewall break off flush with base for junctions. (Use DNT-100 Tool to cut side wall)

Bar Coded Part Number Label with QC Number

- Allows for automated inventory control systems
- Quick identification of loose piece wiring duct
- Complete quality traceability

Optional Pressure-Sensitive Adhesive Mounting Tape is Available

PANDUIT® Adhesive Backed Wiring Duct



Adhesive Backing For Wiring Duct

For Most Wiring Duct Types and Sizes

Adhesive backing is available option for most types and sizes of PANDUIT® Wiring Duct and Raceway. The adhesive backing is factory applied and ready for use. Simply peel off the tape's protective liner and mount the duct to a clean, dry, grease-free surface.

Features & Benefits

As a PERMANENT MOUNTING METHOD

Eliminates the drilling and tapping of holes, labor and time required to install separate mounting devices.

As a TEMPORARY MOUNTING METHOD

Holds duct in place to free installer's hands to further secure duct with screws, rivets, etc.

- Recommended installation temperature is 70°F (21°C)
- UL Recognized service temperature is 32°F (0°C) to 140°F (60°C)
- Optimum recommended dwell time for acrylic adhesive is 8 hours
- Recommended tape load is 1/2 lb. per square inch of tape area

Factory Applied Tape —

To order any PANDUIT Wiring Duct or Raceway with pressure-sensitive adhesive mounting tape factory applied add -A to the Duct/Raceway part number.

G	2	X	1	LG	6	-A
↑	↑	↑	↑	↑	↑	↑
type/style	nominal width (in)	nominal height (in)	color	length (ft)	factory applied adhesive tape	

Specifications for Factory Applied Tape:

Duct Size WxH	Rows of Tape	Tape			
		Width		Thickness	
		In.	(mm)	In.	(mm)
.5X.5 thru 1.5X4	1	.50	(12.7)	.0313	(.8)
2X1 thru 3X3	2	.50	(12.7)	.0313	(.8)
2X4 thru 2X5	2	.75	(19.1)	.0313	(.8)
4X1.5 thru 4X3	2	.50	(12.7)	.0313	(.8)
4X4 thru 6X4	2	.75	(19.1)	.0313	(.8)

To Order Tape Separately:

Duct Size WxH	Tape Part Number	Roll Length		Std. Package Qty.	Std. Carton Qty.
		Yds.	(m)		
.5X.5 thru 1.5X4	P32W2A2-50-7	7.0	(6.4)	1 Roll	100 Rolls
	P32W2A2-50-72	72.0	(65.5)	1 Roll	9 Rolls
2X1 thru 3X3	P32W2A2-50-7	7.0	(6.4)	1 Roll	100 Rolls
	P32W2A2-50-72	72.0	(65.5)	1 Roll	9 Rolls
3X4 thru 3X5	P32W2A2-75-7	7.0	(6.4)	1 Roll	60 Rolls
	P32W2A2-75-72	72.0	(65.5)	1 Roll	7 Rolls
4X1.5 thru 4X3	P32W2A2-50-7	7.0	(6.4)	1 Roll	100 Rolls
	P32W2A2-50-72	72.0	(65.5)	1 Roll	9 Rolls
4X4 thru 6X4	P32W2A2-75-7	7.0	(6.4)	1 Roll	60 Rolls
	P32W2A2-75-72	72.0	(65.5)	1 Roll	7 Rolls

Ordering Information:

For Factory Applied Tape:

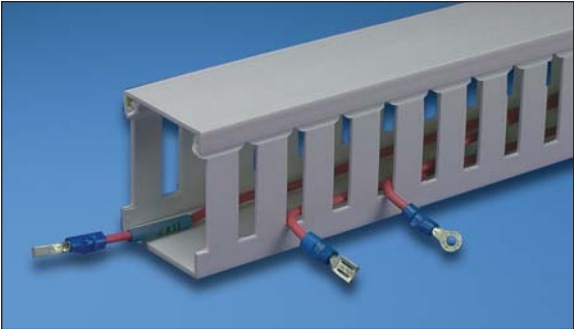
- Add -A to the Duct or Raceway Part Number (Not available for Type D)

To Order Tape Separately:

- Order number of rolls required from the table at right

Wiring Duct *Control Panel*

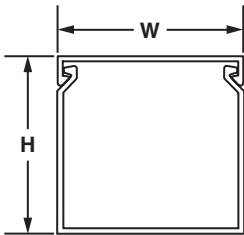
PANDUCT® Type G — Wide Slot Wiring Duct



- Wide slot/finger design provides greater sidewall rigidity and can be used with a wide range of wire bundle sizes
- Made of rigid PVC
- UL Recognized continuous use temperature: 50°C (122°F)
- UL94 Flammability Rating of V-0
- Provided with mounting holes
- Conforms with NFPA 79-2002 section 14.3.1 requirement for flame retardant material



- nonmetallic, non-flame propagating CDS
- medium impact resistance
- 331 temperature classification
- cover removal without tools



Reference	Page(s)
Color Availability	F14
Adhesive Tape	E12 , E13
Dimensions	F2
Wirefill Guide	F8
Material Specifications	F13
Tools & Accessories	D11 , D12 , Section E
Installation Tips	F15

Part Number	Duct Size W x H		Cover Part Number	Duct Std. Ctn. Qty.	Cover Std. Ctn. Qty.	Length (ft)
	In.	mm				
G.5X.5LG6	.69 x .60	17.5 x 15.2	C.5LG6	120	120	6
G.5X1LG6	.69 x 1.06	17.5 x 26.9		120		
G.5X2LG6	.69 x 2.03	17.5 x 51.6		120		
G.5X4LG6	.69 x 4.10	17.5 x 104.1		60		
G.75X.75LG6	.93 x .82	23.6 x 20.8	C.75LG6	120	120	6
G.75X1LG6	.93 x 1.06	23.6 x 26.9		120		
G.75X1.5LG6	.93 x 1.57	23.6 x 39.9		120		
G.75X2LG6	.93 x 2.03	23.6 x 51.6		120		
G1X1LG6	1.26 x 1.12	32.0 x 28.4	C1LG6	120	120	6
G1X1.5LG6	1.26 x 1.62	32.0 x 41.1		120		
G1X2LG6	1.26 x 2.12	32.0 x 53.8		120		
G1X3LG6	1.26 x 3.12	32.0 x 79.2		120		
G1X4LG6	1.26 x 4.10	32.0 x 104.1	C1.5LG6	60	120	6
G1.5X1LG6	1.75 x 1.12	44.5 x 28.4		120		
G1.5X1.5LG6	1.75 x 1.62	44.5 x 41.1		120		
G1.5X2LG6	1.75 x 2.12	44.5 x 53.8		120		
G1.5X3LG6	1.75 x 3.12	44.5 x 79.2	C2LG6	120	120	6
G1.5X4LG6	1.75 x 4.10	44.5 x 104.1		60		
G2X1LG6	2.25 x 1.12	57.2 x 28.4		120		
G2X1.5LG6	2.25 x 1.62	57.2 x 41.1		120		
G2X2LG6	2.25 x 2.12	57.2 x 53.8	C2.5LG6	120	120	6
G2X3LG6	2.25 x 3.12	57.2 x 79.2		60		
G2X4LG6	2.25 x 4.10	57.2 x 104.1		60		
G2X5LG6	2.25 x 5.10	57.2 x 129.5		60		
G2.5X3LG6	2.75 x 3.12	69.9 x 79.2	C3LG6	120	120	6
G3X1LG6	3.25 x 1.12	82.6 x 28.4		120		
G3X2LG6	3.25 x 2.12	82.6 x 53.8		120		
G3X3LG6	3.25 x 3.12	82.6 x 79.2		60		
G3X4LG6	3.25 x 4.10	82.6 x 104.1	C4LG6	60	120	6
G3X5LG6	3.25 x 5.10	82.6 x 129.5		60		
G4X1.5LG6	4.25 x 1.62	108.0 x 41.1		120		
G4X2LG6	4.25 x 2.12	108.0 x 53.8		60		
G4X3LG6	4.25 x 3.12	108.0 x 79.2	C6LG6	60	120	6
G4X4LG6	4.25 x 4.10	108.0 x 104.1		60		
G4X5LG6	4.25 x 5.10	108.0 x 129.5		60		
G6X4LG6	6.25 x 4.15	158.8 x 105.4		60		

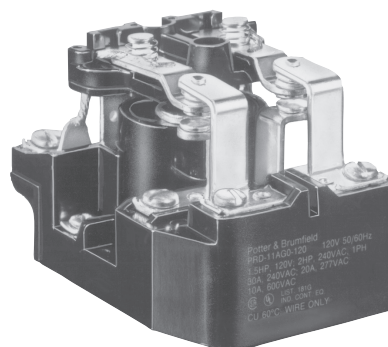
Part Number shown for LG (Light Gray). For other color availability see Color Selection Guide, [page F14](#).

Use WH for white

PRD Series Power Relay

- Contact ratings to 50A
- Magnetic blowouts available for switching DC loads
- Contact arrangement up to 2 form C (2CO)
- 1 form C auxiliary switch available
- UL class B insulation

Typical applications
Industrial controls, lighting.



Approvals

UL E22575; CSA LR15734; VDE Reg.Nr.C144
Models with all screw terminals are UL Listed. Others are UL Recognized.
Technical data of approved types on request.

Contact Data

Contact arrangement	1 and 2 form A (NO); 1 and 2 form C (CO); 1 form X (NO-DM)
Rated voltage	600VAC, 125VDC
Rated current	50A
Contact material	Ag, AgCdO, W
Min. recommended contact load	1A, 12VDC or 12VAC
Initial contact resistance	75mΩ max.
Initial voltage drop	75mV
Frequency of operation	7200 ops/hr
Operate/releases time max.	40/20ms
Bounce time max.	10ms

Contact ratings

Type	Load	Cycles
UL 508¹⁾		
Models with screws or quick connects for main terminals		
Code Y, Ag, 1 pole		
	25A, 277VAC	100x10 ³
	1HP, 120VAC	100x10 ³
	2HP, 250VAC	100x10 ³
	10A, 600VAC	100x10 ³
	7A, 50VDC, resistive	100x10 ³
Code Y, Ag, 2 pole		
	25A, 240VAC	100x10 ³
	20A, 277VAC	100x10 ³
	1HP, 120VAC	100x10 ³
	2HP, 250VAC	100x10 ³
	7A, 50VDC, resistive	100x10 ³
	10A, 600VAC	100x10 ³
Code G, AgCdO, 1 pole		
	30A, 277VAC, resistive	100x10 ³
	1.5HP, 120VAC	100x10 ³
	2HP, 250VAC	100x10 ³
	10A, 600VAC	100x10 ³
Code G, AgCdO, 2 pole		
	30A, 240VAC	100x10 ³
	20A, 277VAC	100x10 ³
	1.5HP, 120VAC	100x10 ³
	2HP, 250VAC	100x10 ³
	10A, 600VAC	100x10 ³

1) Any PRD relay deviating electrically or physically from the standard models in the table is not UL or CSA listed. All horsepower ratings are for single phase motors..

Contact ratings (continued)

Type	Load	Cycles
UL 508¹⁾		
Models with screws or quick connects for main terminals		
Code F, AgCdO, 1 pole		
	50A, 240VAC, general purpose ²⁾	20x10 ³
	30A, 277VAC, resistive	100x10 ³
	1.5HP, 120VAC	100x10 ³
	2HP, 250VAC	100x10 ³
	10A, 600VAC	100x10 ³
Code F, AgCdO, 2 pole		
	50A, 240VAC, general purpose ²⁾	20x10 ³
	30A, 240VAC	100x10 ³
	20A, 277VAC	100x10 ³
	1.5HP, 120VAC	100x10 ³
	2HP, 250VAC	100x10 ³
	10A, 600VAC	100x10 ³
Code H, Ag with magnetic blowout, 1 or 2 pole		
	20A, 125VDC	100x10 ³
	1/3HP, 125VDC	100x10 ³
Code J, AgCdO with magnetic blowout, 1 or 2 pole		
	20A, 125VDC	100x10 ³
	1/3HP, 125VDC	100x10 ³
Code N, W stationary with AgCdO movable, 1 or 2 pole		
	25A, 250VAC	100x10 ³
	1HP, 125VAC	100x10 ³
	2HP, 250VAC	100x10 ³

UL 508¹⁾

Models with box lugs for main terminals

Code P, Ag, 1 form X		
	50A, 277VAC, general purpose	100x10 ³
	30A, 277VAC, ballast	6x10 ³
	15A, 277VAC, tungsten	6x10 ³
	102LRA, 17FLA, 240VAC	30x10 ³
	120LRA, 20FLA, 120VAC	30x10 ³
	1.5HP, 120VAC	30x10 ³
	3HP, 240VAC	30x10 ³

Factory ratings

Models with box lugs for main terminals

Code R, Ag with magnetic blowout, 1 form X		
	60A, 28VDC, resistive	100x10 ³
	30A, 125VDC	100x10 ³

Mechanical endurance DC Coil, 1x10⁶ ops.; AC Coil 5x10⁵ ops.

Auxiliary Snap-Action Switch Contact Data

Contact arrangement	1 form C (CO)
Rating	5A, 120VAC, 60Hz., 25°C
Contact material	Ag

PRD Series Power Relay (Continued)

Coil Data

Coil voltage range	6 to 110VDC 6 to 480VAC
--------------------	----------------------------

Coil insulation system according UL	Class B
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Coil versions, DC coil

Coil code	Rated voltage VDC	Operate voltage VDC	Release voltage VDC	Coil resistance $\Omega \pm 10\%$	Rated coil power W
6	6	4.5	0.6	18	2
12	12	9	1.2	71	2
24	24	18	2.4	288	2
48	48	36	4.8	1150	2
110	110	82.5	11	6050	2

All figures are given for coil without preenergization, at ambient temperature +23°C.
Other coil voltages on request.

Coil versions, AC coil

Coil code	Rated voltage VAC	Operate voltage VAC	Release voltage VAC	Coil resistance $\Omega \pm 15\%$	Rated coil power VA
6	6	5.1	0.6	0.86	9.8
12	12	10.2	1.2	3.2	9.8
24	24	20.4	2.4	12	9.8
120	120	102	12	290	9.8
240	240	204	24	1200	9.8
480	480	408	48	4500	9.8

All figures are given for coil without preenergization, at ambient temperature +23°C.
Other coil voltages on request.

Insulation Data

Initial dielectric strength	
between open contacts	2000V _{rms}
between contact and coil	2000V _{rms}
between adjacent contacts	2000V _{rms}
Initial insulation resistance	
between insulated elements	100M Ω

Other Data

Material compliance: EU RoHS/ELV, China RoHS, REACH, Halogen content
refer to the Product Compliance Support Center at
www.te.com/customersupport/rohssupportcenter

Ambient temperature

AC coil: -55°C to 45°C

DC coil: -55°C to 80°C

Category of environmental protection

IEC 61810

RT0 - open relay

Terminal type Screw, Quick connects, Box lugs

Weight 284g

Packaging/unit tray/20 pcs., box/40pcs.

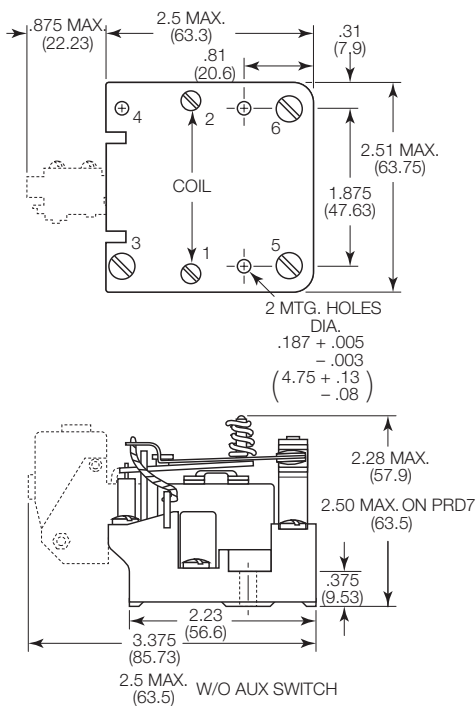
Accessories

Product Code Description

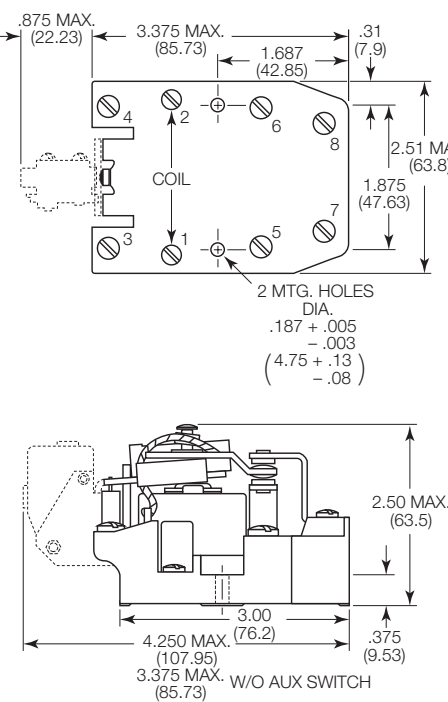
35D013 Metal dust cover

Dimensions

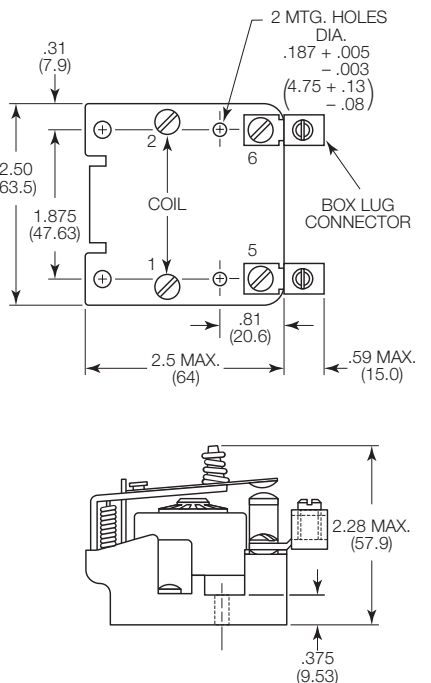
PRD/PRDA 1, 3, 5 and 7



PRD/PRDA 11



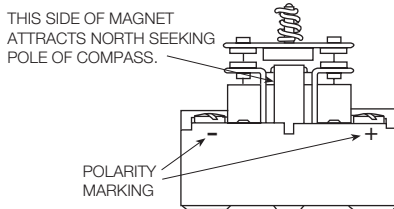
PRD-3_P and R



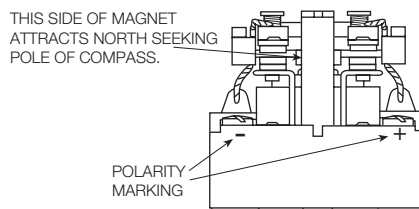
PRD Series Power Relay (Continued)

Terminal assignment for models with magnetic blowout

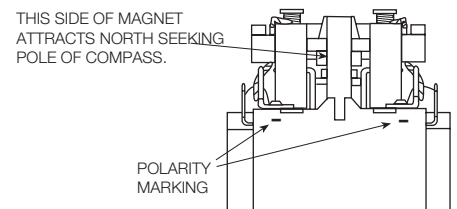
PRD3 with blowout



PRD7 with blowout



PRD 11 with blowout



Product code structure

Typical product code

PRD -7 A Y 0 -120

Type

- PRD** Open relay
PRDA Open relay with aux. 1 form C (CO) snap-action switch

Main contact arrangement

- | | |
|--|-----------------------------|
| 1 1 form A (1 NO) | 3 1 form X (1 NO-DM) |
| 5 1 form C (1 CO) | 7 2 form A (2 NO) |
| 7V 2 form A (2 NO) with 3mm contact gap ¹⁾ | 11 2 form C (2 CO) |

¹⁾ Code 7V is only available as a UL Recognized model, not UL Listed

Coil input

- | | |
|----------------------|-------------|
| A AC, 50/60Hz | D DC |
|----------------------|-------------|

Main contact material and type

- Y** .312" (7.92mm) dia. Ag [25A max. rating]
G .312" (7.92mm) dia. AgCdO [30A max. rating]
F .312" (7.92mm) dia. AgCdO [50A max. rating] ²⁾
H Ag with magnetic blowout [20A DC max. rating] ³⁾
J AgCdO with magnetic blowout [20A DC max. rating]
N W stationary & AgCdO movable [25A max. rating] ⁴⁾
P Ag [50A max. rating] ⁵⁾
R Ag with magnetic blow out [50A max. rating] ⁵⁾

²⁾ Available with Main contact arrangement code 1, 5, 7 or 11 only, and Termination code 0 or A only.

³⁾ Available with Main contact arrangement code 3, 7 or 11 only

⁴⁾ Available with Main contact arrangement code 1, 5, 7 or 11 only.

⁵⁾ Available with Main contact arrangement code 3 only, and Termination code 4 only.

Termination

PRD types only

- 0** #8-32 screw term. for main contacts, #6-32 screw term. for coil.
1 .250" (6.35mm) QC for main contacts and coil
3 #8-32 screw term. for main contacts, .250" (6.35mm) QC for coil.
4 Box lug term. which accept #6 - #14 wire for main contacts, #6-32 screw term. for coil. ⁶⁾

⁶⁾ Available with Main contact arrangement code 3 only, and Main contact material code P or R only.

PRDA (with aux. switch) types only

- A** #8-32 screw term. for main contacts, #6-32 screw term. for coil, screw term. for aux. switch
B .250" (6.35mm) QC for main contacts, coil and aux. switch
L Twin .250" (6.35mm) QC for main contacts, .250" (6.35mm) QC for coil and aux. switch

Coil voltage

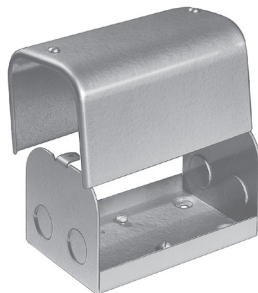
Coil code: please refer to coil versions table

PRD Series Power Relay (Continued)

Product Code	Arrangement	Material	Coil	Terminals	Part Number
PRD-3AY0-120	1 form X, 1 NO-DM	Ag	120VAC	Screw	7-1393127-9
PRD-3AG0-120		AgCdO, 30A			6-1393127-9
PRD-3AJ0-120		AgCdO, mag blowout			7-1393127-4
PRD-3AJ3-24			24VAC	Screw / QC	7-1393127-5
PRD-3DH0-24		Ag, mag blowout	24VDC	Screw	8-1393127-6
PRD-3DY0-12		Ag	12VDC		9-1393127-5
PRD-3DY0-24			24VDC		9-1393127-6
PRD-3DY0-110			110VDC		9-1393127-4
PRD-5AY0-24	1 form C, 1 CO		24VAC		1393128-6
PRD-5AY0-120			120VAC		1393128-5
PRD-5AY1-120				QC	1-1393128-1
PRD-5AY0-240			240VAC	Screw	1393128-7
PRD-5DF0-12		AgCdO, 50A	12VDC		2-1423100-4
PRD-5DY0-12		Ag			1-1393128-6
PRD-5DY0-24			24VDC		1-1393128-7
PRD-7AG0-120	2 form A, 2 NO	AgCdO, 30A	120VAC		9-1393129-5
PRD-7AY0-24		Ag	24VAC		1393130-9
PRD-7AY0-120			120VAC		1393130-7
PRD-7AY0-240			240VAC		1-1393130-0
PRD-7AY3-120			120VAC	Screw / QC	1-1393130-2
PRD-7DG0-24		AgCdO, 30A	24VDC	Screw	1-1393130-6
PRD-7DH0-48		Ag, mag blowout	48VAC		2-1393130-1
PRD-7DY0-12		Ag	12VDC		2-1393130-8
PRD-7DY0-24			24VDC		2-1393130-9
PRD-11AF0-240	2 form C, 2 CO	AgCdO, 50A	240VAC		3-1423100-0
PRD-11AG0-24		AgCdO, 30A	24VAC		1-1393127-1
PRD-11AG0-120			120VAC		1393127-9
PRD-11AG0-240			240VAC		1-1393127-2
PRD-11AH0-120		Ag, mag blowout	120VAC		1-1393127-6
PRD-11AY0-24		Ag	24VAC		2-1393127-9
PRD-11AY0-120			120VAC		2-1393127-6
PRD-11AY0-240			240VAC		3-1393127-0
PRD-11AY0-480			480VAC		3-1393127-1
PRD-11DF0-12		AgCdO, 50A	12VDC		2-1423100-2
PRD-11DF0-110			110VDC		2-1423100-9
PRD-11DG0-12		AgCdO, 30A	12VDC		3-1393127-5
PRD-11DG0-24			24VDC		3-1393127-8
PRD-11DH0-12		Ag, mag blowout	12VDC		4-1393127-7
PRD-11DH0-24			24VDC		4-1393127-9
PRD-11DH0-48			48VDC		5-1393127-0
PRD-11DH0-110			110 VDC		4-1393127-6
PRD-11DJ0-24		AgCdO, mag blowout	24 VDC		5-1393127-5
PRD-11DY0-12		Ag	12 VDC		6-1393127-1
PRD-11DY0-24			24 VDC		6-1393127-2
PRD-11DY0-48			48 VAC		6-1393127-3
PRD-11DY0-110			110 VDC		6-1393127-0
PRDA-11AGA-120		AgCdO, 30A	120 VAC		7-1393131-4
PRDA-11AYA-120					7-1393131-9

PRD accessory

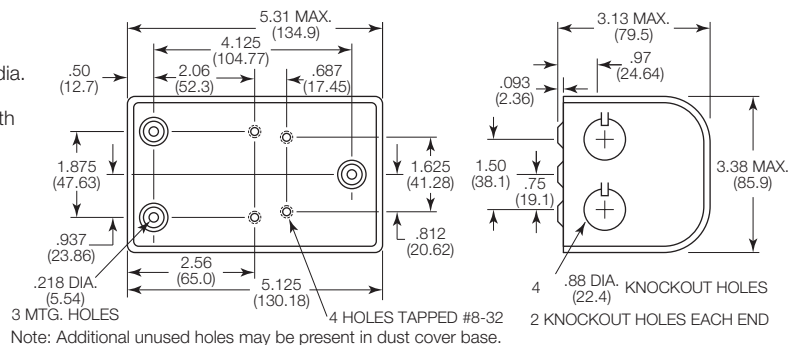
Product Code	Description	Part Number
35D013	Metal dust cover enclosure	5-1393158-2



35D013 Dust Cover

PRD dust cover has a steel base with knockouts for 0.5" (12.7mm) dia. conduit and a cover fitted with two screws. Fits PRD relays, except with auxiliary contacts. Finished in gray baked enamel.

Mounting:
Three No. 10 holes on 1.875" (47.63mm) x 4.125" (104.77mm) centers.





Saginaw Control and Engineering
 95 Midland Road Saginaw, MI 48638-5770
 (800) 234-6871 - Fax: (989) 799-4524
 SCE@SaginawControl.com

SCE-36EL3016SSLP



Product Specifications:

Part Number: SCE-36EL3016SSLP

Description: S.S. EL Enclosure

Height: 36.00"

Width: 30.00"

Depth: 16.00"

Price Code: S5

List Price: \$2,096.44

Catalog Page: 272

Est. Ship Weight: 141.33 lbs

Construction

- * 0.075 In. stainless steel Type 304.
- * Seams continuously welded and ground smooth.
- * Flange trough collar around all sides of door opening.
- * Pour in place oil & water resistant gasket
- * Collar studs 3/8-16 provided for mounting optional panels.
- * Stainless steel concealed hinges.
- * Removable and interchangeable doors.
- * Black quarter turn latches.
- * Latches are opened or closed with a screwdriver (optional tamper-resistant inserts are available).
- * Mounting holes in back of enclosure.
- * Mounting hardware, sealing washer and hole plug included.
- * Removable print pocket furnished if height and width of enclosure is greater than 12 inches.
- * Ground studs on door and body.

Application

Designed to house electrical and electronic controls, instruments and components in areas which may be regularly hosed down or are in very wet conditions. Provides protection from dust, dirt, oil, and water. For outdoor application a drip shield and drain vent is recommended.

For details about the design, performance expectations, applications and design suggestions - See Design Considerations
www.saginawcontrol.com/instman/considerations.pdf

Options

Optional mounting feet available. Door hardware available.

Finish

#4 brushed finish on all exterior surfaces. Optional sub-panels are powder coated white.

Industry Standards - (IS6)

- * NEMA Type 3R, 4, 4X, 12 and Type 13
- * UL Listed Type 3R, 4, 4X and 12
- * CSA Type 4, 4X and 12
- * IEC 60529
- * IP 66

Notes

Special Instructions apply for IS3, IS4 and IS6 to maintain the environmental rating of Type 3R for these parts. Instructions are located on the enclosure door. Drip shield is required on IS3, drip shield is recommended on IS4 and IS6. Drain holes are required on all.

Optional Accessories

- SCE-36P30 Subpanel, Bent
- SCE-36P30GALV Subpanel, Bent Galvanized
- SCE-BVK Breather Vent
- SCE-DF36EL30LP Panel, Dead Front (Wall Mount)
- SCE-DS30SS Shield, S.S. Drip
- SCE-ELFM30WSS S.S. EL Flush Mount Frame
- SCE-ELFM36HSS S.S. EL Flush Mount Frame
- SCE-ELMFK4 Foot Kit, EL Mounting (4pc.)
- SCE-ELMFK4SS6-OS Foot Kit, S.S. EL Mounting (4pc.)
- SCE-ELSP3 KIT, Swing-Out Panel (20 High & Up)
- SCE-RD36EL30SS Door, Replacement

Similar Part Numbers

- SCE-24EL2006SSLPS.S. EL Enclosure
- SCE-24EL2008SSLPS.S. EL Enclosure
- SCE-24EL2010SSLPS.S. EL Enclosure
- SCE-24EL2012SSLPS.S. EL Enclosure
- SCE-24EL2408SSLPS.S. EL Enclosure
- SCE-24EL2410SSLPS.S. EL Enclosure
- SCE-24EL2412SSLPS.S. EL Enclosure
- SCE-24EL2416SSLPS.S. EL Enclosure
- SCE-24EL3008SSLPS.S. EL Enclosure
- SCE-24EL3010SSLPS.S. EL Enclosure

Installation Information

- * Mounting Foot Kit for Enviroline Enclosures
- * EL Flush Mount Frame
- * Drip Shield Kit Assembly
- * Dead Front Wall Mount Installation Instructions. EL-LP
- * Swing Panel Assembly for Enviroline Enclosures
- * Dead Front Wall Mount < 20 In Height Installation Instructions. EL-LP
- * Swing Panel ELSP3 for Encl. Height > 16
- * Swing Panel ELSP for Encl. Height <= 16
- * Sealing Washer Specifications
- * Service Parts Wall Mount Enclosures
- * Dead Front Wall Mount < 20 In Height Installation Instructions. EL-LP REV. 2
- * Dead Front Wall Mount Installation Instructions. EL-LP REV. 2



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SCE-36P30

Product Specifications:



Part Number: SCE-36P30
Description: Subpanel, Bent
Height: 33.00"
Width: 27.00"
Depth: 0.88"
Price Code: P3
List Price: \$112.69
Catalog Page: 440
Est. Ship Weight: 34.00 lbs

Finish

Powder Coated White.

Industry Standards - (IS17)

- ⚙ NEMA Not Applicable
- ⚙ UL Not Applicable
- ⚙ CSA N/A

Similar Part Numbers

SCE-24P20Subpanel, Bent
SCE-24P24Subpanel, Bent
SCE-24P24PCSubpanel, Flat
SCE-30P20Subpanel, Bent
SCE-30P24Subpanel, Bent
SCE-30P30Subpanel, Bent
SCE-36P24Subpanel, Bent
SCE-36P36Subpanel, Bent
SCE-40P24Subpanel, Bent
SCE-42P24Subpanel, Bent

Installation Information

- ⚙ Sub-Plate Layout & Grounding for 10-32



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 (800) 234-6871 - Fax: (989) 799-4524
 SCE@SaginawControl.com

SCE-DF36EL30LP

Product Specifications:



Part Number: SCE-DF36EL30LP

Description: Panel, Dead Front (Wall Mount)

Height: 32.00"

Width: 26.63"

Depth: 2.00"

Price Code: P2

List Price: \$154.81

Catalog Page: 450

Est. Ship Weight: 22.25 lbs

Construction

- ✦ 0.075 In. Carbon Steel.

Application

Designed for use in Wall Mount Enclosures with SCE concealed hinges.

Dead front panels are designed as a fixed depth panel to be mounted directly behind the existing hinged door. This allows space to mount: gauges, meters and push buttons directly behind the front door making them easily visible when mounting them through the main door is not an option. Dead front panels also provide a barrier against incidental contact with live components during routine monitoring or maintenance of equipment.

Dead front panels are installed by mounting hinges back to back with the existing door hinge of the enclosure and only adding two additional holes on the latching side of the enclosure to mount the latch brackets. Dead Front panels include quarter turn wing knobs for easy entry to the interior and mounting hardware to maintain the environmental rating of the enclosure.

Finish

Powder coated white inside and out.

Industry Standards - (IS17)

- ✦ NEMA Not Applicable
- ✦ UL Not Applicable
- ✦ CSA N/A

Notes

Cutout will need to be added for clearance of Defeater and defeater hook when use in Flange mount disconnect enclosure

Optional Accessories

SCE-115259 Extension, 2 inch Dead Front

Similar Part Numbers

SCE-DF24EL20LPPanel, Dead Front (Wall Mount)
 SCE-DF24EL24LPPanel, Dead Front (Wall Mount)
 SCE-DF30EL20LPPanel, Dead Front (Wall Mount)
 SCE-DF30EL24LPPanel, Dead Front (Wall Mount)
 SCE-DF30EL30LPPanel, Dead Front (Wall Mount)
 SCE-DF36EL20LPPanel, Dead Front (Wall Mount)
 SCE-DF36EL24LPPanel, Dead Front (Wall Mount)
 SCE-DF36EL36LPPanel, Dead Front (Wall Mount)
 SCE-DF42EL21LPPanel, Dead Front (Wall Mount)
 SCE-DF42EL24LPPanel, Dead Front (Wall Mount)

Installation Information

- ✦ Dead Front Wall Mount Installation Instructions. EL-LP
- ✦ Dead Front Wall Mount < 20 In Height Installation Instructions. EL-LP
- ✦ Dead Front Wall Mount With 3 Point Latching Hardware. EL-LPPL
- ✦ Dead Front Wall Mount < 20 In Height Installation Instructions. EL-LP REV. 2
- ✦ Dead Front Wall Mount Installation Instructions. EL-LP REV. 2
- ✦ Dead Front Wall Mount Installation Instructions. H-LP REV. 2
- ✦ Dead Front Wall Mount Installation Instructions. XEL-LP REV. 2
- ✦ Dead Front Wall Mount With 3 Point Latching Hardware. EL-LPPL REV. 2



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SCE-ELMFK4

Product Specifications:

Part Number: SCE-ELMFK4

Description: Foot Kit, EL Mounting (4pc.)

Height: 5.00"

Width: 3.00"

Depth: 1.25"

Price Code: P2

List Price: \$20.43

Catalog Page: 435

Est. Ship Weight: 2.00 lbs



Application

Made for use with all SCE Enviroline enclosures and two-door wall-mount enclosures. Chemical and Corrosion resistant Polyamide material rated for type 3, 3R, 4, 4X and 12. Available in kits of four or six, and with plated steel fastener or stainless steel fasteners to maintain type 3, 3R, 4, 4X and 12 rating of your enclosure.

Industry Standards - (IS17)

- ⚙ NEMA Not Applicable
- ⚙ UL Not Applicable
- ⚙ CSA N/A

Similar Part Numbers

SCE-ELMFK4-25Foot Kit, EL Mounting (4pc.) - Bulk

SCE-ELMFK4-50Kit, EL Mounting Foot - Bulk

SCE-ELMFK6Foot Kit, EL Mounting (6pc.)

Installation Information

- ⚙ Mounting Foot Kit for Enviroline Enclosures
- ⚙ Mounting Foot Kit for WFLP Enclosures

PK7GTA

LOAD CENTER EQUIPMENT GROUND BAR ASSY



by Schneider Electric

Product availability: Stock - Normally stocked in distribution facility
Price*: 11.70 USD

Main

Commercial Status	Commercialised
Range of product	QO
Product or component type	Load Center Grounding Bar Assembly

Ordering and shipping details

Category	00102 - QO LC ACCESSORIES
Discount Schedule	DE3A
GTIN	00785901026372
Nbr. of units in pkg.	1
Package weight(Lbs)	0.08
Product availability	Stock - Normally stocked in distribution facility
Returnability	Y
Country of origin	US

Offer Sustainability

Sustainable offer status	Not Green Premium product
RoHS	Compliant - since 0844 - Schneider Electric declaration of conformity
REACH	Reference not containing SVHC above the threshold

Contractual warranty

Period	18 months
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Customer Atlas Electric	Date 10/3/2024
Address 1607 N Wabash Ave. Wichita, KS 67214-1447	Job Ref COW Lift Station No. 16
Attention Jeff Keys	PO 2024071
	Our SO # N/A

We are enclosing herewith 1 copies of cuts/drawings. Please complete section below marked "To Be Completed By Customer" and return this form with approved cuts to the Sender noted below.

Type	Catalog Number or Drawing Number and Date	Manufacturer	Approximate Lead Time in Weeks
Gear	Q-5194144	Square D	10

To Be Completed By Graybar	To Be Completed By Customer
☒ For Approval	☐ Approved
☐ For Record Only	☐ Disapproved
☒ Please return <u>1</u> copies of approved cuts.	☐ To be revised and resubmitted for final approval
	☐ Approved as noted

- PLEASE NOTE THE APPROXIMATE LEAD TIMES INDICATED ABOVE. WE ASK THAT YOU ALLOW AT LEAST THAT AMOUNT OF TIME AFTER THE RETURN OF YOUR APPROVED CUTS. THIS SUBMITTAL REPRESENTS OUR INTERPRETATION OF THE PROJECTED PLANS AND SPECIFICATIONS AS THEY RELATE TO THE EQUIPMENT COVERED.
- VOLTAGES ARE SHOWN FOR FLUORESCENT AND H.I.D. EQUIPMENT. IF VOLTAGE REQUIREMENTS ARE OTHER THAN INDICATED, THE SUBMITTAL SHOULD BE APPROVED AS NOTED, AND THE CORRECT VOLTAGE SHOWN. IF NO VOLTAGE IS SHOWN, IT IS OUR INTENT TO FURNISH 120 VOLT.
- PLASTER FRAMES AND OTHER AUXILIARY EQUIPMENT SUCH AS STEMS, CHAIN HANGERS, SPECIAL FUSING, ETC., ARE NOT INCLUDED EXCEPT WHEN SPECIFICALLY INDICATED, OR WHEN FURNISHED AS AN INTEGRAL PART OF THE EQUIPMENT AS DESCRIBED BY CATALOG NUMBER.
- SPECIAL FINISHES SHOULD BE NOTED, IF NOT SPECIFICALLY INDICATED. EVERY EFFORT HAS BEEN MADE TO SUBMIT THE CORRECT FIXTURE FOR THE CEILING REQUIRED. FINAL DETERMINATION IS THE RESPONSIBILITY OF THE CONTRACTOR.
- WE ASSUME THE RESPONSIBILITY FOR FURNISHING MATERIAL ONLY AS SUBMITTED. ANY DEVIATION MUST BE NOTED ON THE COPIES RETURNED.

Remarks: We are providing one (1) set of electronic submittals for approval.

Sender	Gregg Ratzlaff
	% Graybar Electric Company, Inc.
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	WICHITA, KS 67213

Proposal Name: LIFT STATION NO. 16

Quote Name: LIFT STATION NO. 16

Proposal #: P-240723-4629681

Quote #: Q-5194144

Addendum #: 0

Sales Representative: Steve Vossman

Prepared For:

Distributor: GRAYBAR ELECT CO 5818836

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Through Addenda Number: 0

Sales Representative: Steve Vossman

Conditions of Sale

Except as otherwise provided below, this Quotation is subject to Coordinated Project Terms. See <https://www.schneider-electric.us/en/download/document/0100PL0043>

Notwithstanding any provision to the contrary in the referenced Coordinated Project Terms or any other documentation provided in connection with this proposal, this quote is valid for 30 days. Quoted lead times are approximate and subject to change.

Schneider Electric reserves the right to amend, withdraw or otherwise alter this submission without penalty or charge as a result of any event beyond its control arising from or due to the current Covid-19 epidemic or events subsequent to this epidemic / pandemic including changes in laws, regulations, by laws or direction from a competent authority.

TABLE OF CONTENTS

Panelboards

Circuit Breakers

Surge Protection Devices

This Section Contains Products: Panelboards

Seq #	Qty	Product Description
3	1	Designation : MDP

Product Details:

1-NQ430L2C-PNLBD INT NQ 225A MLO 30 CKT 3P CU

Consisting of

208Y/120V 3Ph 4W 60Hz SCCR: 50kA

Feeders Series Rated w/ JG Circuit Breaker

Main Lug Only: 225A

Incoming Conductors: 1 - #6 - 350 kcmil

AL Ground Bar

Bus: 225A Rated Copper: Silver/Tin Plated

30 Circuit Interior

Type 3R/5/12Box: 32H x 20W x 6.5D

Incoming: Bottom Trim w/ Box

Box Cat No: MH32WP

Ref. Drawing: PBA711

Feeders:

1 - 110A/3P QOB-VH

21 - 20A/1P QOB

Optional Features:

Standard Panel (Box Ahead),Standard Solid

Neutral,Standard Ground Bar

Branch User Placement

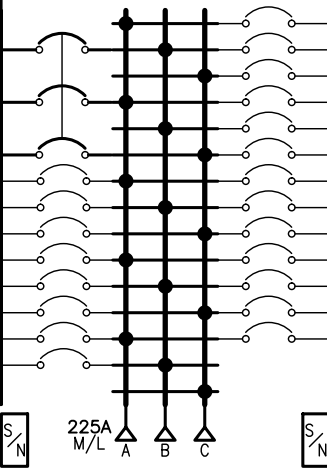
1-PK27GTA-LOAD CENTER EQUIPMENT GROUND BAR ASSY

1-QOB3110VH-MINIATURE CIRCUIT BREAKER 240V 110A

21-QOB120-MINIATURE CIRCUIT BREAKER 120/240V 20A

1-MH32WP-PANELBOARD ENCL/BOX TYPE 3R/12 32H 20W

REV	DESCRIPTION	BY	DATE	--	----	--	---/---/---
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CKT NO	ACCESSORIES	TYPE	RATING AMP/P		RATING AMP/P	TYPE	ACCESSORIES	CKT NO
1		QOB-VH	110/3		20 / 1	QOB		2
3					20 / 1	QOB		4
5					20 / 1	QOB		6
7					20 / 1	QOB		8
9					20 / 1	QOB		10
11					20 / 1	QOB		12
13		QOB	20 / 1		20 / 1	QOB		14
15		QOB	20 / 1		20 / 1	QOB		16
17		QOB	20 / 1		20 / 1	QOB		18
19		QOB	20 / 1		20 / 1	QOB		20
21		QOB	20 / 1		20 / 1	QOB		22
23		QOB	20 / 1		20 / 1	QOB		24
25		QOB	20 / 1		20 / 1	QOB		26
27		QOB	20 / 1				BLANK	28
29	BLANK						BLANK	30

PHYSICAL DATA

ENCLOSURE Type 3R/5/12
FRONT CAT#: Trim w/Box
BOX CAT#: MH32WP

DIMENSIONS:
32''(813mm)Hx20''(508mm)Wx6.5''(165mm)D

WIRE BENDING SPACE:
TOP - 5''(127)mm
BOTTOM - 9.26''(236)mm
SIDE - 6.13''(156)mm

PBA: 711

BUSSING: 225A RATED COPPER BUS
Silver/Tin Plated

OPTIONAL FEATURES:
BRANCH USER PLACEMENT
ALUMINUM SOLID NEUTRAL
ALUMINUM GROUND BAR

ELECTRICAL DATA

SYSTEM: 208Y/120V 3Ph 4W 60Hz
System Ampacity: 225A
50kA SYMS. SCCR
Series Rated w/ JG

MAIN: MAIN LUGS : 225A
Bottom FEED
INCOMING CONDUCTORS(S) PER NEC, CEC, NOM:
Wire Bending Space:
Phase Lugs:1 - #6 - 350 kcmil

-----BRANCH SUMMATION-----
1 - 110A/3P QOB-VH 21 - 20A/1P QOB

JOB NAME:	LIFT STATION NO 16	EQUIPMENT DESIGNATION:	MDP
JOB LOCATION:		EQUIPMENT TYPE:	NQ (Circuit Breaker Type) PANEL 1 OF 1
DRAWN BY:	(Q2C)	DRAWING TYPE:	ONE LINE DIAGRAM
ENGR:			
DATE:	October 03 2024	by Schneider Electric	
DRAWING STATUS:	QUOTE	DWG#	0Q-5194144-153624369-01
		PG 1	OF 1
		REV	--

This Section Contains Products: Circuit Breakers

Seq #	Qty	Product Description
1	1	Designation : MAIN Product Details: 1-JGL36200-MOLDED CASE CIRCUIT BREAKER 600V 200A JGL36200 UL/CSA Rated PowerPact J Frame Termination: Lugs Line/Load Side 200 Amp Capacity 3 Pole Device 600 Vac Rated 80% Rated - Standard rated Interrupting Rating 65kA @ 240Vac/35kA @ 480Vac/18kA @ 600Vac Revision - 7/23/2024 - (S20240709/S20240709) 7/23/2024 8:08:05 PM Source -Selector 1-J250R-CIRCUIT BREAKER ENCLOSURE 1-SN400LA-NEUTRAL ASSEMBLY INSULATED GROUNDABLE 1-PKOGTJ250-J ENCLOSURE EQUIPMENT GROUND ASSEMBLY

This Section Contains Products: Surge Protection Devices

Seq #	Qty	Product Description
2	1	Designation : LIGHTNING SURGE ARRESTOR Product Details: SDSA2040-SPD T1 SDSA 40KA 120/208V 3P4W

Seq #	Qty	Product Description
4	1	Designation : MDP, EXTERNAL SPD Product Details: SDSA2040-SPD T1 SDSA 40KA 120/208V 3P4W