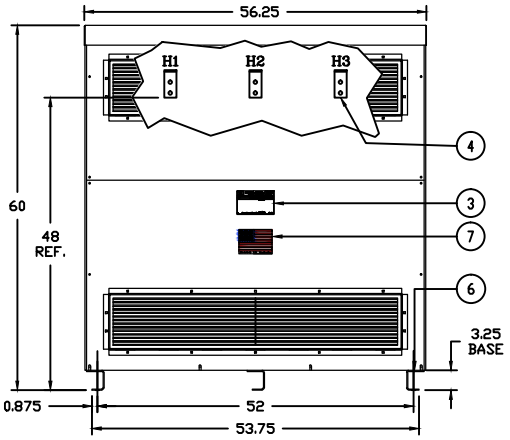
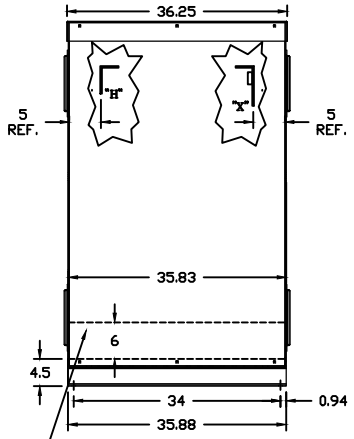
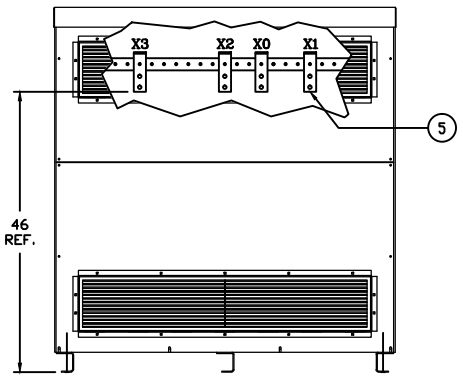
OLSUN
12,470 Volt to 480 Volt
Dry Type Transformers



FRONT VIEW

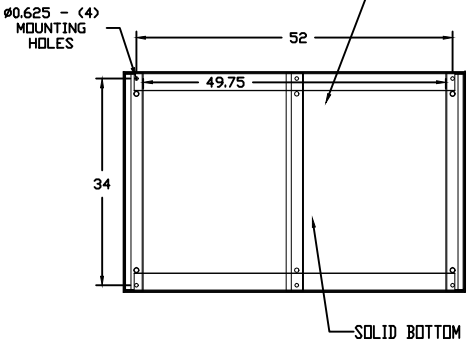


RIGHT SIDE VIEW

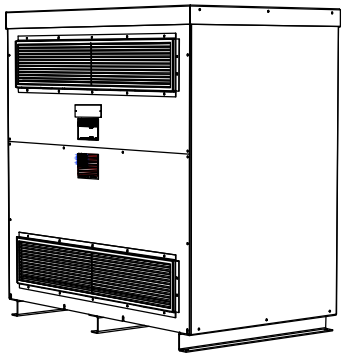


REAR VIEW

CONDUIT ACCESS TWO SIDES, AND BOTTOM. CUTOUTS BY OTHERS



PLAN VIEW (BASE DETAIL)



PERSPECTIVE VIEW

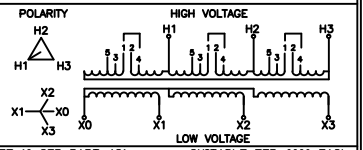
ITEM	DESCRIPTION
□	COPPER WOUND PRIMARY□ALUMINUM WOUND SECONDARY
□	□□□°C INSULATION
□	STAINLESS STEEL NAMEPLATE
□	H□ TERMINAL
□	L□ TERMINAL
□	□IBRATION PADS □NTERNAL□
□	MADE IN U.S.A.
	SPECIFICATIONS
A	NEMA □R MILD STEEL ENCLOSURE WITH BARBER COLEMAN □RILLES AND ANSI □□ □RAY POWDER COAT FINISH
B	DESI□N IMPEDANCE □ □.□□
C	□ACUUM PRESSURE IMPRE□NATION
D	D□□□ □ECTOR CONFI□URATION
E	COMPLIANT TO EFFICIENCY RE□UIREMENTS OF DOE □□ CFR PART □□□
F	UL□UL LISTED. UL FILE□E□□□□□
□	THERMOSTATICALLY CONTROLLED STRIP HEATERS □□□□ BY OTHERS□
H	DESI□NED AND BRACED FOR SEISMIC □ONE □NOT CERTIFIED□
□	SUITABLE FOR □□□□FASL

OLSUN Electrics
Engineered Transformer Solutions
www.olsun.com tel. 800.336.5786

DRY TYPE TRANSFORMER CLASS AA

KVA	112.5	3	PHASE	HERTZ	60	%IZ	°C RISE	150	
H.V.	12470△	60	KV BIL	AMPS	5.2	WGT.	2000	LBS.	
L.V.	480Y/277	10	KV BIL	AMPS	135.3	NO.	A74527		

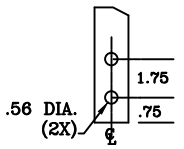
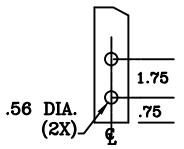
H.V. TAP	H.V. VOLTS
1-2	13094
2-3	12782
1-4	12470
3-4	12158
4-5	11847



COMPLIANT TO DOE 10 CFR PART 431 SUITABLE FOR 6000 FASL

DE-ENERGIZE TRANSFORMER BEFORE CHANGING TAPS

NAMEPLATE DRAWING

"H" TERMINAL DETAIL .25" X 1.5" COPPER	"X" TERMINAL DETAIL .25" X 1.5" ALUMINUM
	

REV.01 - ADJUSTED TERMINALS - 06/17/20 BJP

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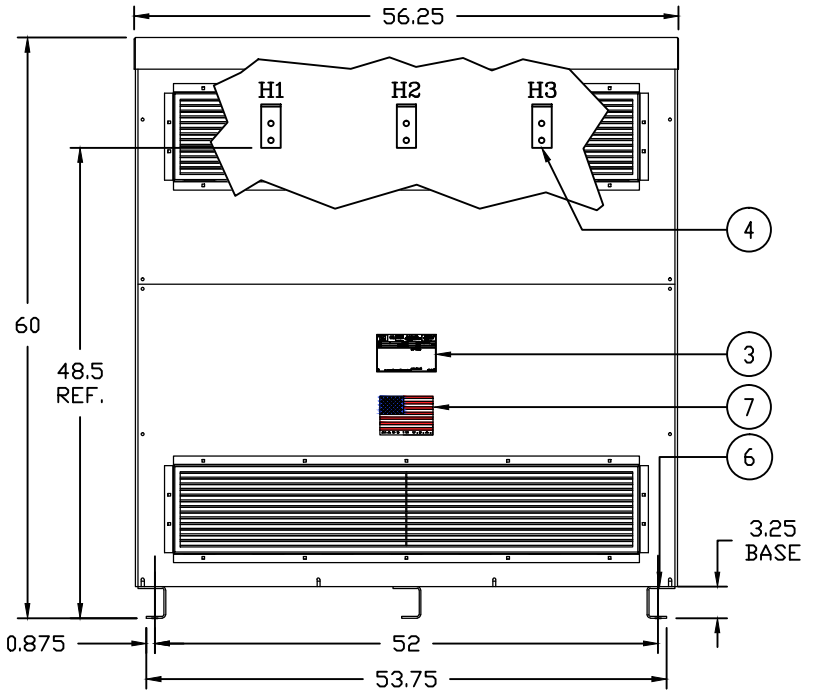
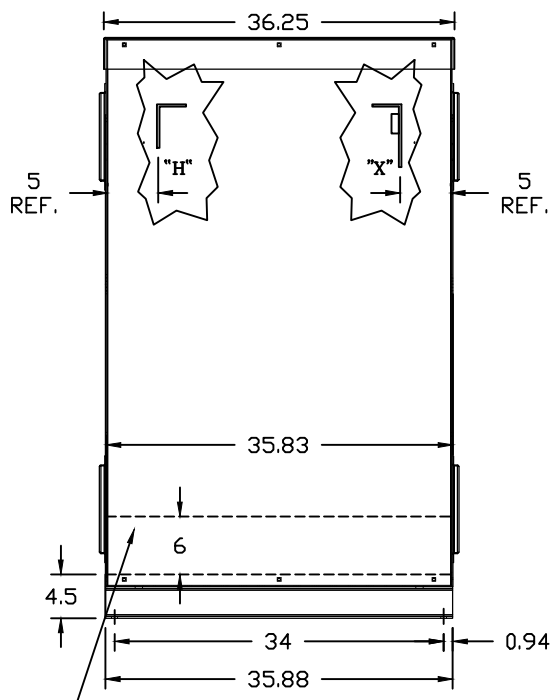
Engineered Transformer Solutions
RICHMOND, ILLINOIS
TEL. 800.336.5786
www.olsun.com

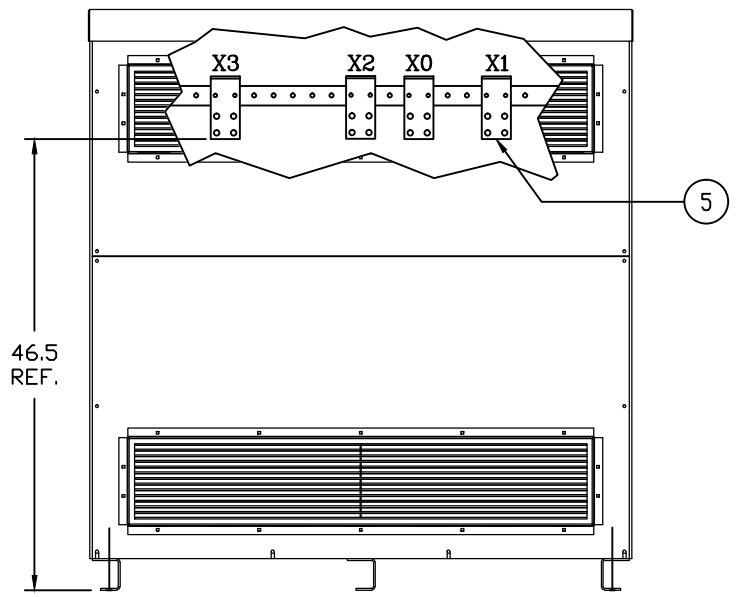
REVISIONS: 01	DRAWN BY: BJP
APPROVED BY: ANK	DATE: 04/07/2020
DIMENSIONS IN INCHES TOLERANCES: ONE DECIMAL: +/- .5" TWO DECIMAL: +/- 0.25" THREE DECIMAL: +/-0.125"	DRAWING TITLE: VENTILATED DISTRIBUTION TRANSFORMER DRAWING NUMBER: A74527-51938-AE



FRONT VIEW

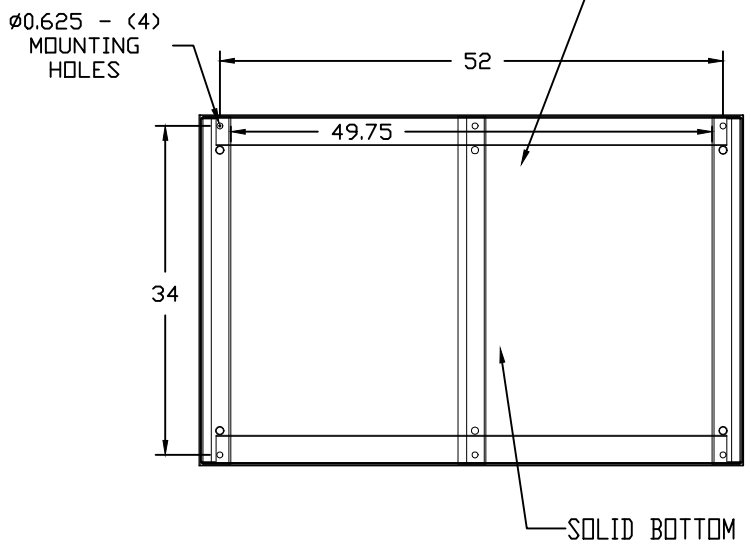


RIGHT SIDE VIEW



REAR VIEW

CONDUIT ACCESS
TWO SIDES, AND
BOTTOM. CUTOUTS
BY OTHERS



PLAN VIEW (BASE DETAIL)

PERSPECTIVE VIEW

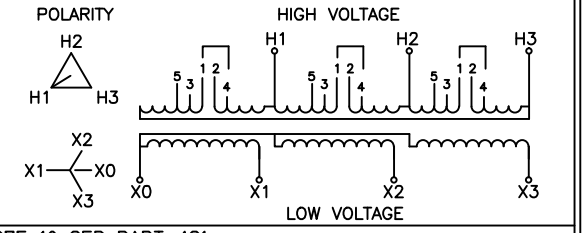
ITEM	DESCRIPTION
□	COPPER WOUND PRIMARY□ALUMINUM WOUND SECONDARY
□	□□□°C INSULATION
□	STAINLESS STEEL NAMEPLATE
□	H□ TERMINAL
□	L□ TERMINAL
□	□IBRATION PADS □INTERNAL□
□	MADE IN U.S.A.
	SPECIFICATIONS
A	NEMA □R MILD STEEL ENCLOSURE WITH BARBER COLEMAN □RILLES AND ANSI □□ □RAY POWDER COAT FINISH
B	DESI□N IMPEDANCE □ □.□ □
C	□ACUUM PRESSURE IMPRE□NATION
D	D□□□ □ECTOR CONFI□URATION
E	COMPLIANT TO EFFICIENCY RE□UIREMENTS OF DOE □□CFR PART □□□
F	UL□UL LISTED. UL FILE□E□□□□□
□	THERMOSTATICALLY CONTROLLED STRIP HEATERS □□□□ BY OTHERS□

OLSUN Electrics
Engineered Transformer Solutions
www.olsun.com tel. 800.336.5786

DRY TYPE
TRANSFORMER
CLASS AA

KVA	225	3	PHASE	HERTZ	60	%IZ		°C RISE	150
H.V.	12470△	60	KV BIL	AMPS	10.4	WGT.	2500		LBS.
L.V.	208Y/120	10	KV BIL	AMPS	625	NO.	A74528		

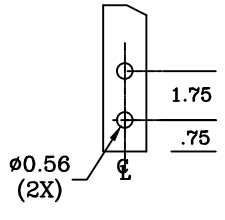
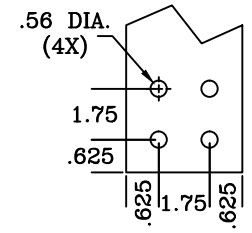
H.V. TAP	HV VOLTS
1–2	13094
2–3	12782
1–4	12470
3–4	12158
4–5	11847



COMPLIANT TO DOE 10 CFR PART 431

DE-ENERGIZE TRANSFORMER BEFORE CHANGING TAPS

NAMEPLATE DRAWING

"H" TERMINAL DETAIL .25" X 1.5" COPPER	"H" TERMINAL DETAIL .25" X 3.0" ALUMINUM
	

REV.01 - ADJUSTED TERMINALS - 06/17/20 BJP

OLSUN Electrics
Engineered Transformer Solutions

RICHMOND, ILLINOIS
TEL. 800.336.5786
www.olsun.com

REVISIONS: 01	THIS DOCUMENT IS THE PROPERTY OF OLSUN ELECTRICS CORPORATION AND MUST NOT BE COPIED, REPRODUCED OR DISCLOSED TO OTHERS WITHOUT THE EXPRESS WRITTEN CONSENT OF OLSUN ELECTRICS CORPORATION.	DRAWN BY: DS
APPROVED BY: ANK		DATE: 4/7/20
DIMENSIONS IN INCHES TOLERANCES: ONE DECIMAL: +/- .5" TWO DECIMAL: +/- 0.25" THREE DECIMAL: +/-0.125"	DRAWING TITLE:	VENTILATED DISTRIBUTION TRANSFORMER
	DRAWING NUMBER:	A74528-51939-AE

ABB
12,470 Volt to 4160 Volt
Outdoor Dry Type
Transformer

REV	DESCRIPTION	BY	DATE
-	----	--	--/--/--

CUSTOMER NAMEPLATE ITEMS: PACS1064:10

NAMEPLATE MATERIAL = 0.031 ALUMINUM

TAGGING:

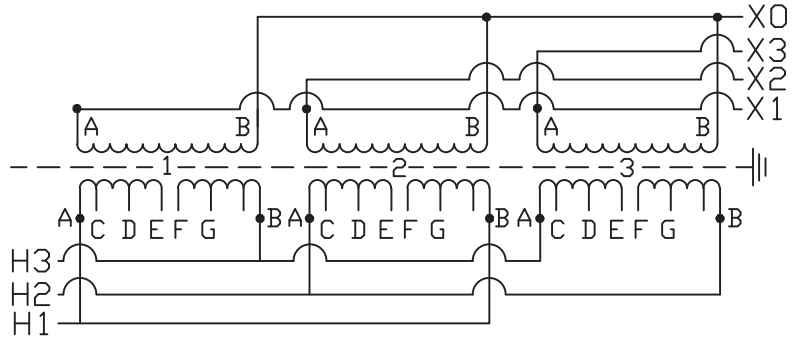
SER.NO.

DRY TYPE TRANSFORMER
PRIMARY UNIT SUBSTATION

LISTED 93D0

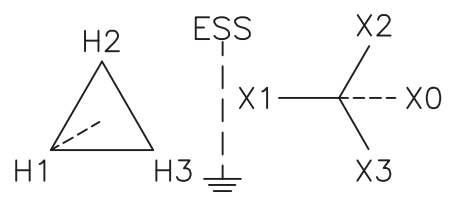
KVA....2500/3333 HV.....12470 kV BIL..60HV/30LV LV.....4160Y/2402 LV AMP.347/463 AVG./MAX.AMB. 30/40°C	CLASS. AA/FA TYPE..VPI PHASE.3 IMP..... HZ....60 DATE —	TEMP. RISE..150/150°C NEMA 3R ENCLOSURE INST. BOOK 1LUB000001-BLE	CONDUCTOR...AL/AL APROX.WT.(LBS/kg) C&C.. 13100/5943 TOTAL..16300/7394

Manufactured in Bland, Va.



DE-ENERGIZE TRANSFORMER BEFORE CHANGING TAPS

HV AMPERES			CONN TAP EACH COIL
VOLTS	AA	FA	
13094	110	147	E-F
12782	113	150	D-F
12470	116	154	E-G
12158	119	158	D-G
11847	122	162	C-G

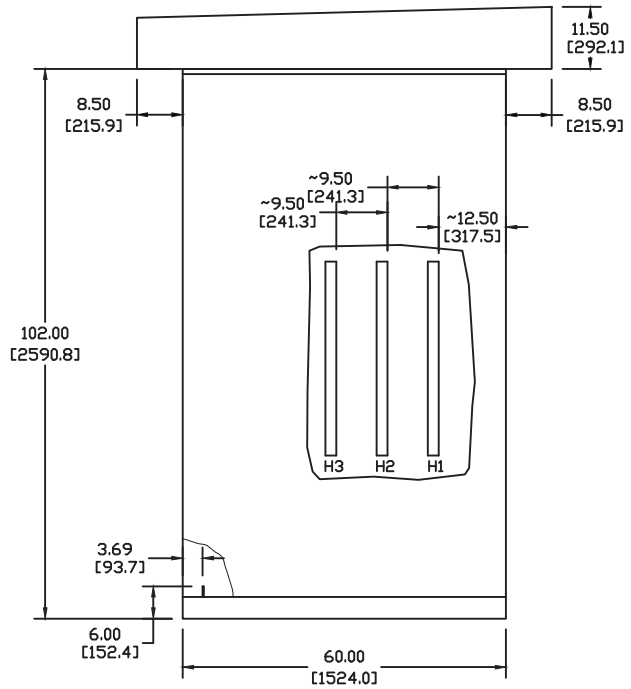


NOTES: RATED FOR OPERATION @ 5280' ASL

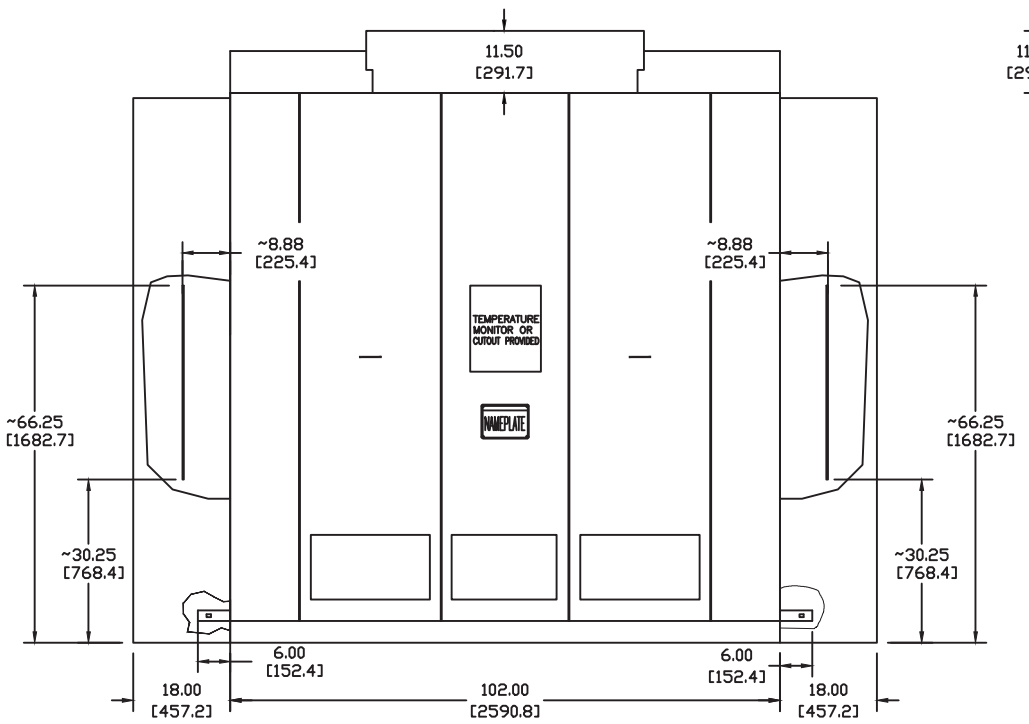
CUSTOMER NOTE: NAMEPLATE DRAWING IS FOR YOUR INFORMATION AND REVIEW. THE IMPEDANCE IS LEFT BLANK SINCE THE DRAWING IS SUBMITTED PRIOR TO MANUFACTURING. THE ACTUAL TESTED VALUE IS ENGRAVED ON THE METAL NAMEPLATE AT THE TIME OF SHIPMENT. THIS DRAWING IS NOT SUBSEQUENTLY REVISED TO ADD THE TESTED VALUE.

CUSTOMER NAME: ABB INC.	ABB Inc. Dry & Cast Technologies Bland Va.		SHEET 1 OF 1
PROJECT NAME: FERMI LAB			
PO.NO.: 1872-DM981893D			
	BY: PROG 4/14/2020	CHK/AP: KEHA 4/14/2020	
MAT`L #: TX14440	TITLE: NAMEPLATE	DWG#: 14440NP1	REV: 0

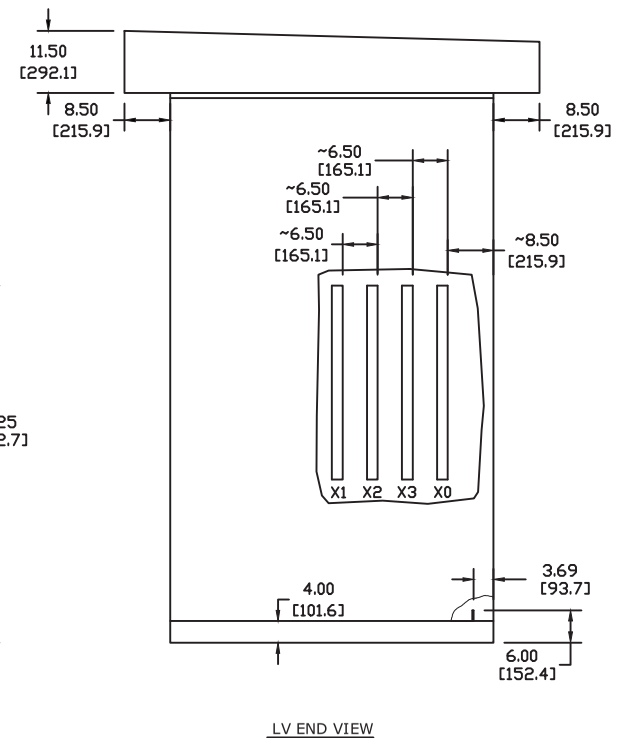
REV	DESCRIPTION	BY	DATE
-	----	--	--/--/--



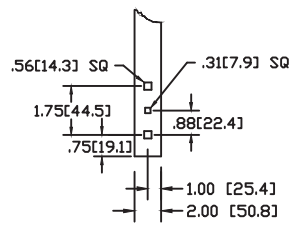
HV END VIEW



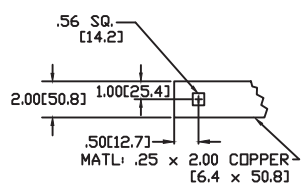
FRONT VIEW



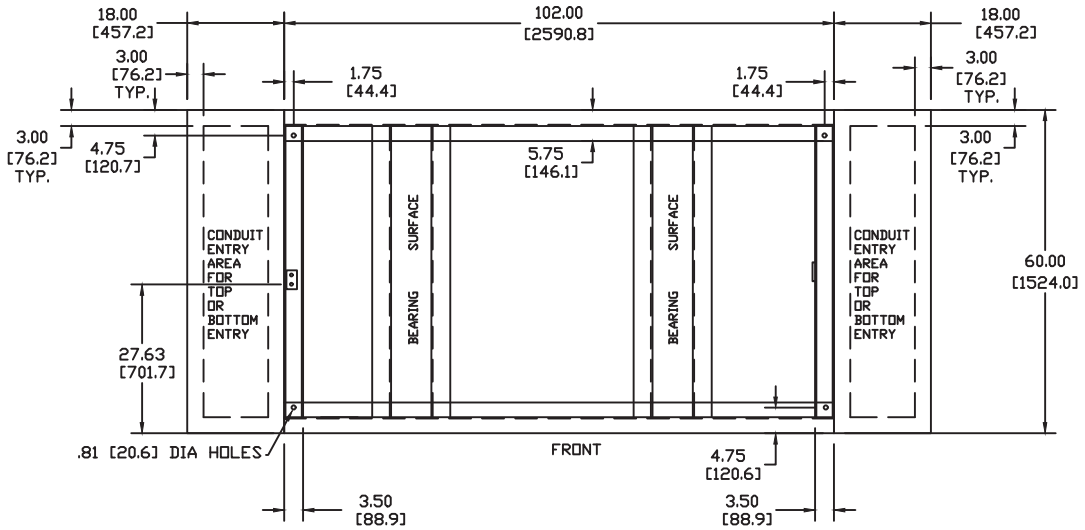
LV END VIEW



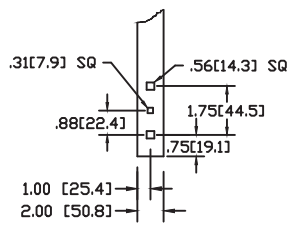
HV TERMINATION DETAIL



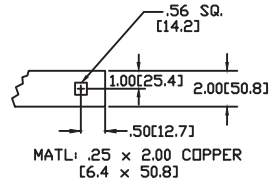
HV GROUND TERMINATION DETAIL



BASE DETAIL



LV TERMINATION DETAIL



LV GROUND TERMINATION DETAIL

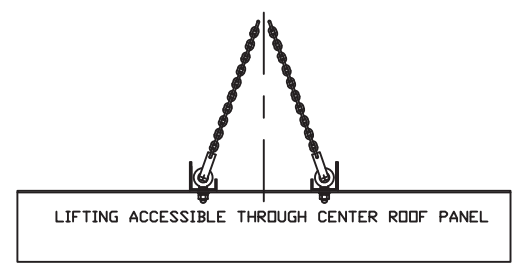
CHARACTERISTICS:
ENCLOSURE : NEMA 3R (OUTDOOR VENTILATED)
FINISH : ANSI 61 PAINT
PRODUCT TYPE : VPI
KVA : 2500/3333
HV : 12470 D
HV KVBIL : 60
LV : 4160Y/2402
LV KVBIL : 30
TAPS : 11847/12158/12470/12782/13094
IMPEDANCE : 5.75% STD ±7.5%
TEMPERATURE RISE : 150°C/150°C
COOLING CLASS : AA/FA
HERTZ : 60
PHASE : 3
PHASE RELATION : DYN1
HV WINDINGS: ALUMINUM
LV WINDINGS: ALUMINUM
SOUND LEVEL : 68DB
K-FACTOR : 1
APPROXIMATE WEIGHT : 16300LBS/7394KG

ACCESSORIES:
11 GAUGE BOTTOM PLATE
AIR TERMINAL CHAMBER REMOVABLE BOTTOM PANEL
COPPER GROUND BUS, .25" X 2.00"
HV TO LV ELECTROSTATIC SHIELD
QUALITROL 3-PHASE SERIES 118 ITM TEMPERATURE MONITOR
THERMOSTAT FOR SPACE HEATERS
UL LISTING
VPI, 2 CYCLE POLYESTER VARNISH

NOTES:
: ROOF IS DESIGNED FOR MAXIMUM 500 LBS LOAD
: MAINTAIN 12" MINIMUM FROM ANY VENTILATED SURFACE WHEN ENCLOSURE IS SUPPLIED.
: CUSTOMER MOUNTING HOLE PATTERNS ARE ± 1/16".
~ DENOTES AN APPROXIMATE DIMENSION OF ±3"
ALL OTHER MEASUREMENTS UNLESS OTHERWISE SPECIFIED ARE ±1/4"
: STAINLESS STEEL GROUND PADS WITH (2) .50-13 TAPPED HOLES ON 1.75 CENTERS
: DIMENSIONS IN INCHES [MM]

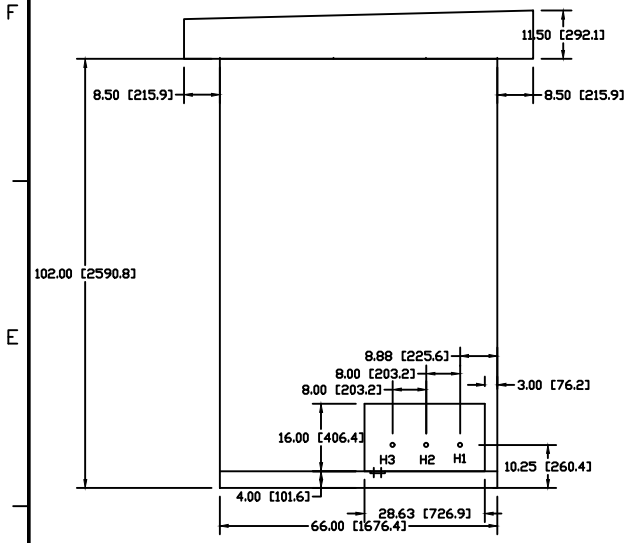
SALES ORDER/ITEM NO: PACS1064:10

TAGGING:

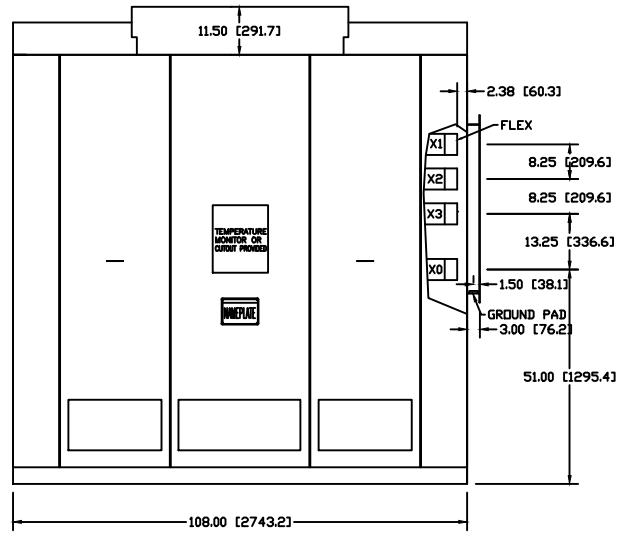


CUSTOMER NAME: ABB INC.	ABB Inc. Dry & Cast Technologies Bland Va.	SHEET 1 OF 1
PROJECT NAME: FERMI LAB		
PO.NO.: 1872-DM981893D	BY: PROG 4/14/2020	CHK/AP: KEHA 4/14/2020
MAT`L #: TX14440	TITLE: OUTLINE	DWG#: 14440OL1 REV: 0

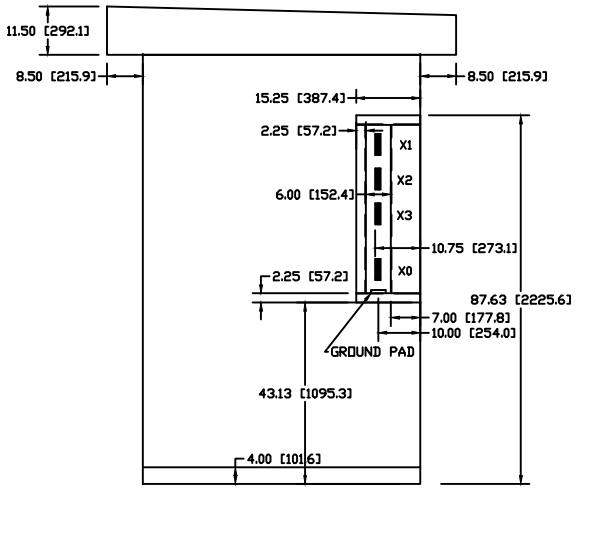
EATON
12,470 Volt to 480 Volt
Dry Type Outdoor
Transformer



HV END VIEW



FRONT VIEW



LV END VIEW

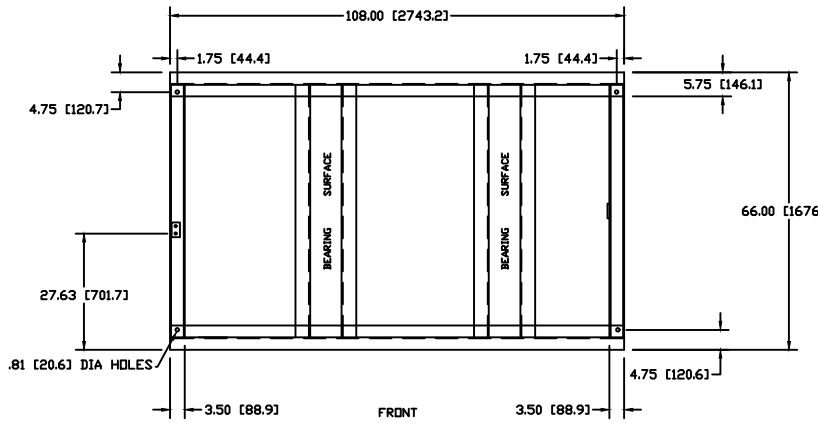
CHARACTERISTICS:
ENCLOSURE : NEMA 3R (OUTDOOR VENTILATED)
FINISH : ANSI 61 PAINT
PRODUCT TYPE : VPI
KVA : 2000
HV : 12470 D
HV KVBIL : 95
LV : 480Y/277
LV KVBIL : 10
TAPS : 11847/12158/12470/12782/13094
IMPEDANCE : 5.75% STD ±7.5%
TEMPERATURE RISE : 80°C
COOLING CLASS : AA/FFA
HERTZ : 60
PHASE : 3
PHASE RELATION : DYN1
HV WINDINGS: COPPER
LV WINDINGS: COPPER
SOUND LEVEL : 66DB
K-FACTOR : 1
APPROXIMATE WEIGHT : 17800LBS/8075KG

ACCESSORIES:
11 GAUGE BOTTOM PLATE
3 PHASE WINDING TEMPERATURE INDICATOR
COPPER GROUND BUS, .25" X 2.00"
DOE 2016 COMPLIANT
LOUVERED VENTILATION
THERMOSTAT FOR SPACE HEATERS
UL LISTING
VPI, 2 CYCLE POLYESTER VARNISH

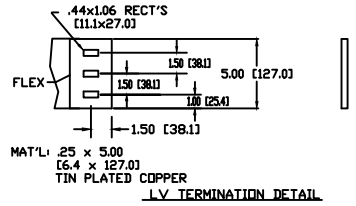
NOTES:
- ROOF IS DESIGNED FOR MAXIMUM 500 LBS LOAD
- MAINTAIN 12" MINIMUM FROM ANY VENTILATED SURFACE WHEN ENCLOSURE IS SUPPLIED.
- CUSTOMER MOUNTING HOLE PATTERNS ARE ± 1/16".
  ~ DENOTES AN APPROXIMATE DIMENSION OF ±3"
  ALL OTHER MEASUREMENTS UNLESS OTHERWISE SPECIFIED ARE ±1/4"
- STAINLESS STEEL GROUND PADS WITH (2) .50-13 TAPPED HOLES ON 1.75 CENTERS
- DIMENSIONS IN INCHES [MM]

HV CABLE LENGTHS
H1 - 36.00
H2 - 36.00
H3 - 36.00
CABLE SIZE - (1) - #2
INSTALLING CONTRACTOR TO CUT CABLE TO CORRECT LENGTH BEFORE ADDING LUGS

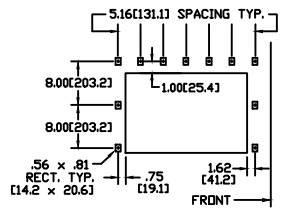
HV TERMINATION DETAIL



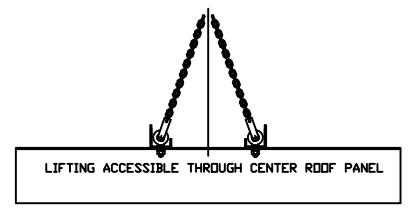
BASE DETAIL



LV TERMINATION DETAIL



HV CUTOUT DETAIL



REVISION			
01			

DFTR: PROG	DATE: 3/13/2020	EATON	
APPD: XXXX	DATE: 3/13/2020	TITLE	
S.O.: QT-19-0		TYPE: VENT	DESC: OUTLINE
FEDERAL ID NO.: 88725	PRODUCT CODE: DL	REVISION: 01	G.O.
DWG: QT-19-01567009-4	SHEET: 1 OF 01		

COEFTBL REV 02

SQUARE D
MEDIUM VOLTAGE
METAL ENCLOSED
SWITCHGEAR

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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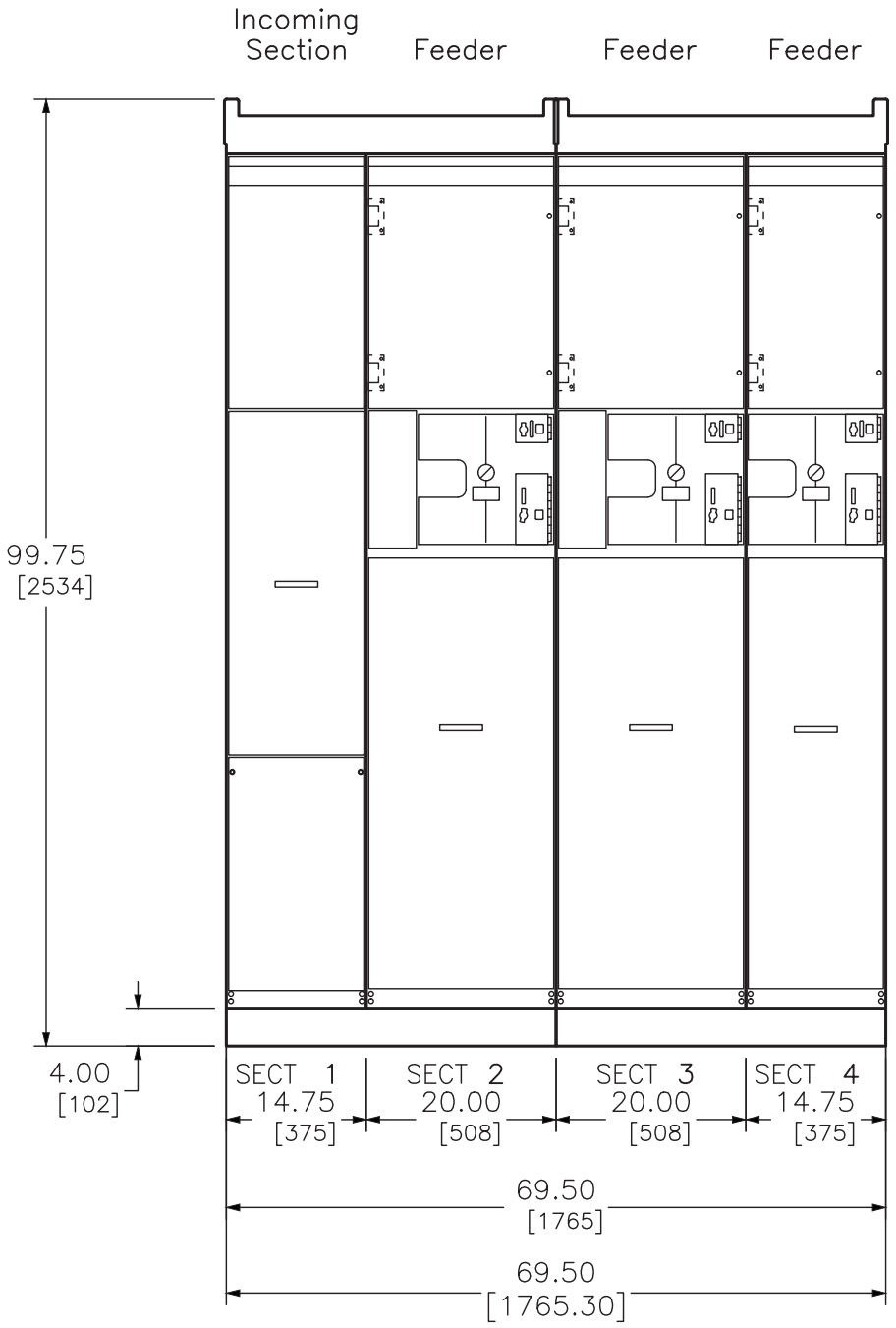

DUAL DIMENSIONS: INCHES
MILLIMETERS

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	ELEVATION
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# FQ-1605083-42568805-01	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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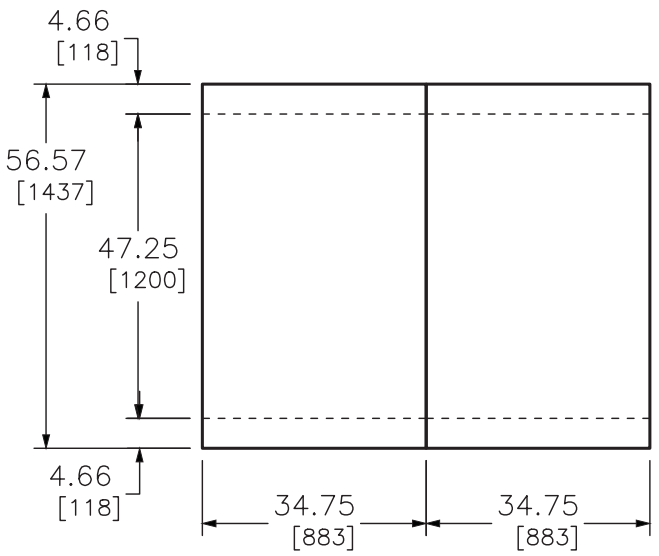

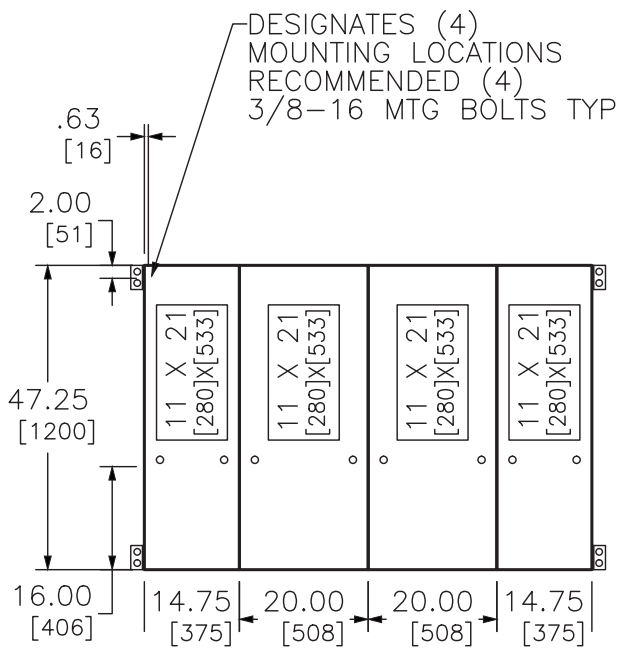

DUAL DIMENSIONS: INCHES
MILLIMETERS

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	TOP VIEW/FLOOR PLAN
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# FQ–1605083–42568805–02	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	-----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--	–	-----	--	--/--/--

GENERAL NOTES:

PRODUCT DESCRIPTION AND RATINGS:

POWER SYSTEM DATA:

12470 VOLTS, 3 PHASE, 3 WIRE WYE SOLIDLY GROUNDED
15.0 kV MAXIMUM VOLTAGE RATING
95 kV BIL, 60 HERTZ FREQUENCY
AC CONTROL POWER USER/CUSTOMER SUPPLIED

BUS SYSTEM DATA:

600A COPPER, TIN PLATED MAIN BUS
EPOXY BUS SUPPORTS
BARE COPPER GROUND BUS
40 kA Asym (25 kA Sym) MAIN BUS BRACING

ENCLOSURE DATA:

TYPE 3R OUTDOOR NON–WALKIN CONSTRUCTION
CATEGORY "A" ENCLOSURE
ANSI #61 FINISH
FRONT TYPE 3R REMOVED FOR CLARITY
FRONT AND REAR ACCESS IS AVAILABLE
PADLOCK PROVISIONS

HANDLING:

SWITCHGEAR SECTIONS ARE FURNISHED WITH LIFTING ANGLES AND ARE SHIPPED ON SKIDS.
ROLLERS OR FORKLIFT SHALL ONLY BE USED WITH SKID IN PLACE.
LINEUP WEIGHT 2585.00 LBS/1172.56 KG
Shipping Split – 1, 2585.00 LBS/1172.56 KG

CODE STANDARDS:

UL LABEL

PRODUCT INFORMATION:

#14 AWG, TYPE SIS CONTROL WIRING, UNLESS OTHERWISE SPECIFIED
#12 AWG, TYPE SIS CURRENT CIRCUIT WIRING
#12 AWG, TYPE SIS HEATER CONTROL WIRING

WIRE LABELING:

WIRES SHALL BE LABELED WITH DESTINATION MARKING (DESTINATION–ORIGIN).

TERMINATIONS:

LOW VOLTAGE WIRE TERMINATIONS (WHERE REQUIRED) SHALL BE UNINSULATED RING TYPE LUGS (STYLE 25009–XXXXX). TERMINAL BLOCKS ARE COMPRESSION SOLDERLESS BOX LUG (TYPE 9080 GR6), FUSE BLOCK (9080GF6).

INSTRUCTION BULLETIN:

OPTIONS/ACCESSORIES:

LIST OF MISC. ACCESSORIES:

STRIP HEATERS

LIST OF MISC. STRUCTURE OPTIONS:

4.0" BASE CHANNEL
FLOOR PLATES
UNDERCOAT BASE
GASKETING
TAMPER PROOF HARDWARE

LIST OF MISC. GENERAL OPTIONS:

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	GENERAL NOTES
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# FQ–1605083–42568805–03	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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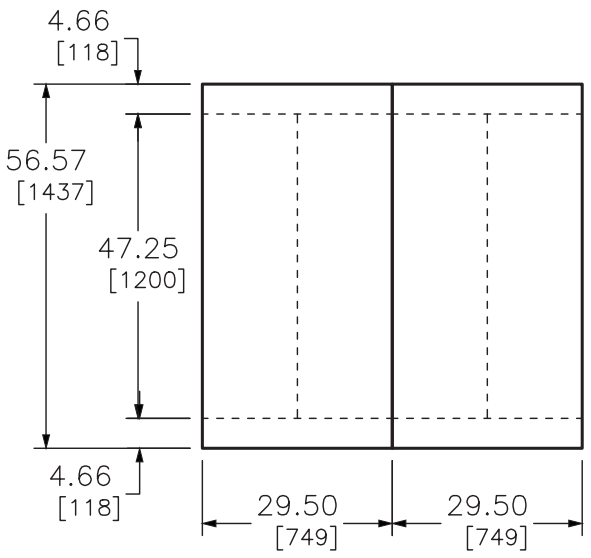
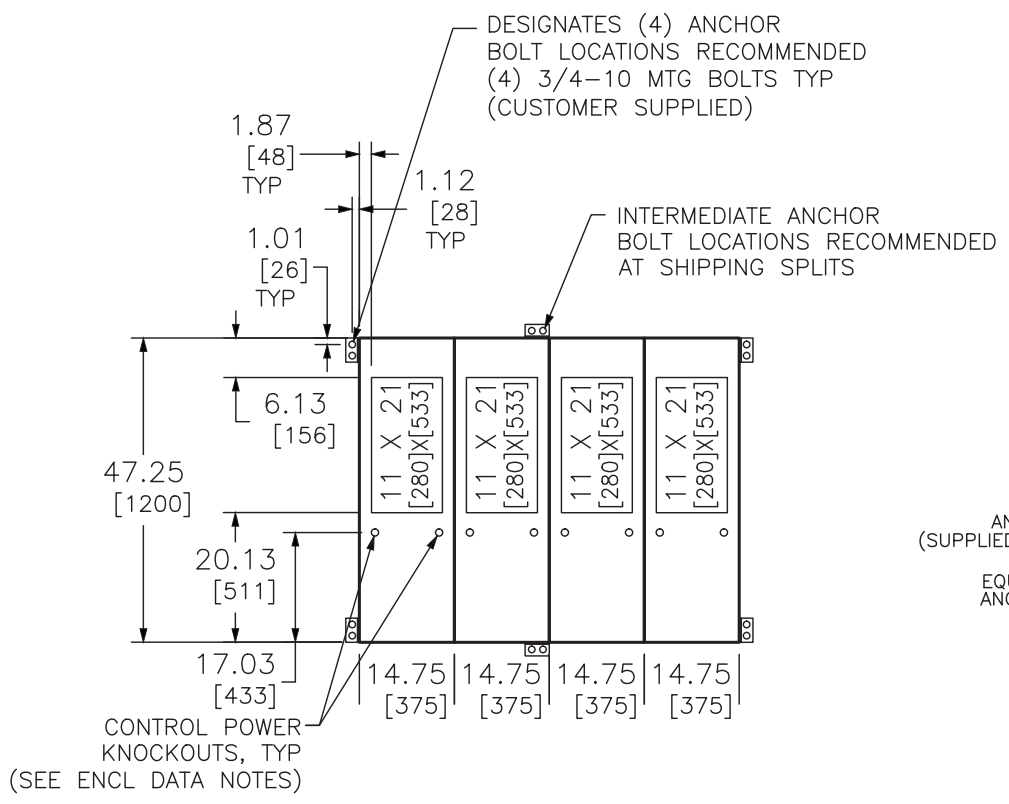
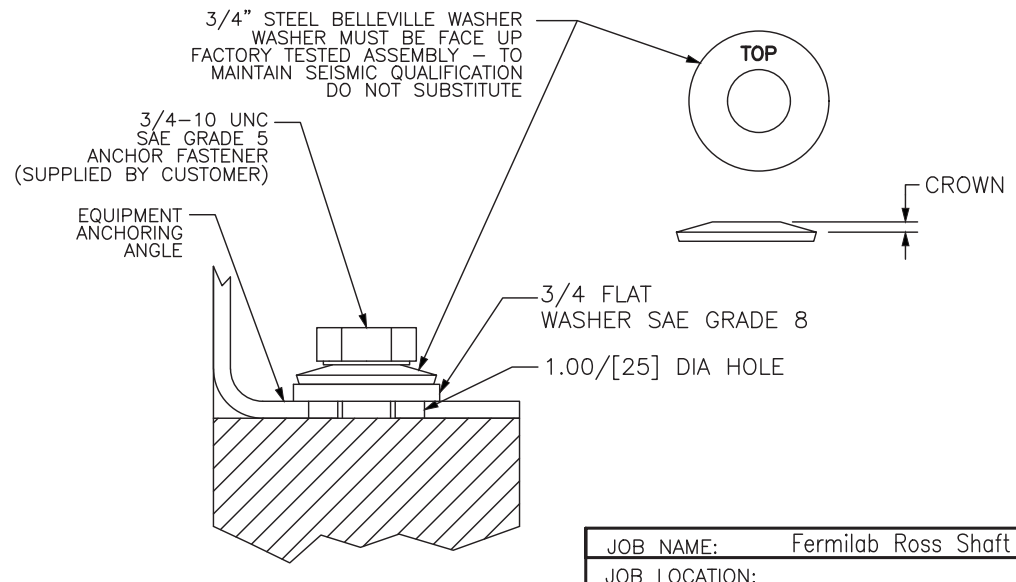






ANCHOR ASSEMBLY

SITE PREPARATION – SWITCHGEAR INSTALLATION

GOOD SITE PREPARATION IS NECESSARY TO ELIMINATE INSTALLATION PROBLEMS AND ENSURE PROPER SWITCHGEAR OPERATION. COMPARE THE SITE PLANS AND SPECIFICATIONS WITH THE SWITCHGEAR DRAWINGS TO BE SURE THERE ARE NO DISCREPANCIES. CHECK THE SITE TO ENSURE THAT THE EQUIPMENT WILL FIT PROPERLY.

THE FLOOR SHOULD BE FLAT AND LEVEL WITHIN 1/16 INCH/[2] PER FOOT/[305], OR A MAXIMUM OF 1/4 INCH/[6] WITHIN THE AREA OF THE SWITCHGEAR, TO PREVENT DISTORTION OF THE ENCLOSURES.

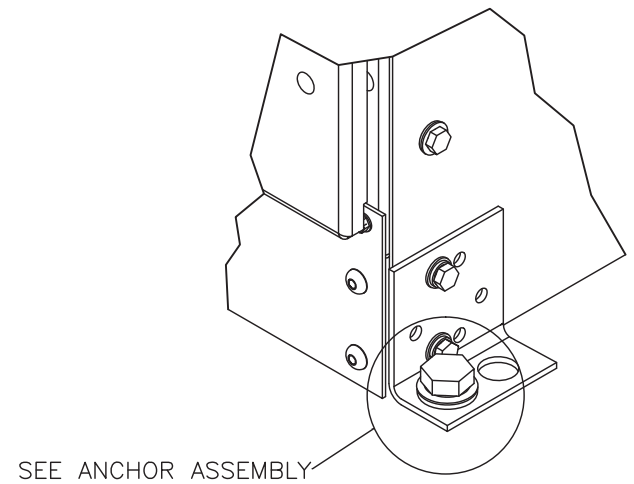
THE EQUIPMENT HAS BEEN DESIGNED FOR FRONT ACCESS. SCHNEIDER ELECTRIC RECOMMENDS THAT THE REAR OF INDOOR EQUIPMENT BE PLACED A MINIMUM OF 4–6 INCHES FROM THE WALL. ALLOW 5 FEET/[1524] OF CLEARANCE ON THE FRONT. HOWEVER, MINIMUM CLEARANCES MUST MEET ALL LOCAL AND NATIONAL REQUIREMENTS.

ON OUTDOOR SWITCHGEAR, 5 FEET/[1524] OF CLEARANCE (ON THE FRONT AND BACK ONLY) IS RECOMMENDED.

PROVIDE AREA VENTILATION AT ALL TIMES TO MAINTAIN THE AMBIENT TEMPERATURE AROUND THE EQUIPMENT BETWEEN –30°C AND +40°C DEGREES.

ADEQUATE LIGHTING AND CONVENIENCE OUTLETS SHOULD BE AVAILABLE NEAR THE SWITCHGEAR. ROUTE SEWER, WATER, AND STEAM LINES AWAY FROM THE EQUIPMENT. PROVIDE FLOOR DRAINS TO PREVENT WATER BUILDUP.

BOTTOM CABLE ENTRY: POWER CABLE ENTRY AREA, 11/[280] X 21/[533] AS SHOWN ON FLOOR PLAN. CONTROL POWER KNOCKOUTS, 1.13/[29] DIA, 2.39/[61] FROM CENTER OF KNOCKOUT TO OUTER SIDE OF CUBICLE, TYP. 2 PLACES.



MOUNTING DETAILS

DUAL DIMENSIONS: INCHES
MILLIMETERS

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	DETAIL VIEW
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# FQ-1605083-42568805-51	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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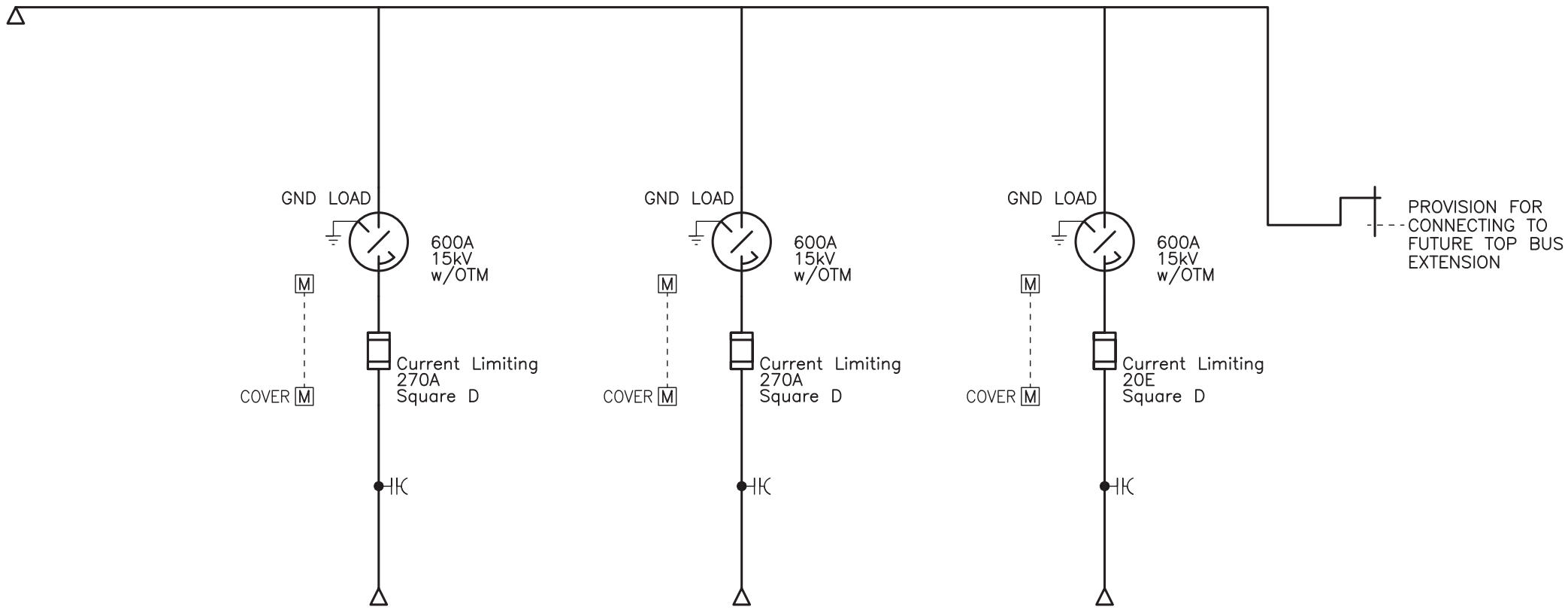
Incoming Section
C–UL LABEL

Feeder
C–UL LABEL

Feeder
C–UL LABEL

Feeder
C–UL LABEL

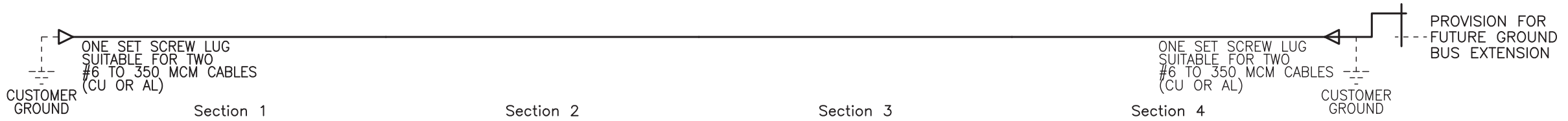


COMPRESSION LUGS
SUITABLE FOR ONE
1/0 AWG CABLE(S) /PH
BOTTOM INCOMING

COMPRESSION LUGS
SUITABLE FOR ONE
#4 AWG CABLE(S) /PH
BOTTOM OUTGOING

COMPRESSION LUGS
SUITABLE FOR ONE
#4 AWG CABLE(S) /PH
BOTTOM OUTGOING

COMPRESSION LUGS
SUITABLE FOR ONE
#4 AWG CABLE(S) /PH
BOTTOM OUTGOING



Section 1 | Section 2 | Section 3 | Section 4

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	ONE LINE DIAGRAM
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# 0Q–1605083–42568805–01	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
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HVL / CC™

LOAD CURRENT INTERRUPTER SWITCHGEAR

ORDER NO.	0	MANUF. DATE	

RATED MAX. VOLTAGE	kV	15.0
IMPULSE (BIL)	kV	95
POWER FREQ. WITHSTAND	kV	36
FREQUENCY	HZ	60
SW. CONT. CURR.	A SYM	600
MAIN BUS CONT. CURR.	A SYM	600
MOMENTARY CURR.	kA ASYM	40
SHORT TIME CURR.	kA SYM	25
TIME	SEC	2
FAULT CLOSE CURR.	kA ASYM	40

FUSE DATA

CAT. #	175GXQSJD150E
FUSE SIZE	270A
MAX. DIRECT ACTING TRIP FUSE SIZE	N/A
INTREGRATED SW & FUSE SHORT CIRCUIT CURRENT kA SYM	65
SF6 CONTENT g	238

MOTOR	N/A	CLOSE	N/A	TRIP	N/A

SQUARE D COMPANY
SMYRNA, TN USA

44044–185–01

Section 2

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver, CO	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	RATING NAMEPLATE
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# NQ–1605083–42568805–01	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
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HVL / CC™

LOAD CURRENT INTERRUPTER SWITCHGEAR

ORDER NO.	0	MANUF. DATE	

RATED MAX. VOLTAGE	kV	15.0
IMPULSE (BIL)	kV	95
POWER FREQ. WITHSTAND	kV	36
FREQUENCY	HZ	60
SW. CONT. CURR.	A SYM	600
MAIN BUS CONT. CURR.	A SYM	600
MOMENTARY CURR.	kA ASYM	40
SHORT TIME CURR.	kA SYM	25
TIME	SEC	2
FAULT CLOSE CURR.	kA ASYM	40

FUSE DATA

CAT. #	175GXQSJD150E
FUSE SIZE	270A
MAX. DIRECT ACTING TRIP FUSE SIZE	N/A
INTREGRATED SW & FUSE SHORT CIRCUIT CURRENT kA SYM	65
SF6 CONTENT g	238

MOTOR	N/A	CLOSE	N/A	TRIP	N/A

SQUARE D COMPANY
SMYRNA, TN USA

44044–185–01

Section 3

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	RATING NAMEPLATE
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# NQ–1605083–42568805–02	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
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HVL / CC™

LOAD CURRENT INTERRUPTER SWITCHGEAR

ORDER NO.	0	MANUF. DATE	

RATED MAX. VOLTAGE	kV	15.0
IMPULSE (BIL)	kV	95
POWER FREQ. WITHSTAND	kV	36
FREQUENCY	HZ	60
SW. CONT. CURR.	A SYM	600
MAIN BUS CONT. CURR.	A SYM	600
MOMENTARY CURR.	kA ASYM	40
SHORT TIME CURR.	kA SYM	25
TIME	SEC	2
FAULT CLOSE CURR.	kA ASYM	40

FUSE DATA

CAT. #	175GDMSJD20E
FUSE SIZE	20E
MAX. DIRECT ACTING TRIP FUSE SIZE	N/A
INTREGRATED SW & FUSE SHORT CIRCUIT CURRENT kA SYM	65
SF6 CONTENT g	238

MOTOR	N/A	CLOSE	N/A	TRIP	N/A

SQUARE D COMPANY
SMYRNA, TN USA

44044–185–01

Section 4

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver, CO	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	RATING NAMEPLATE
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# NQ–1605083–42568805–03	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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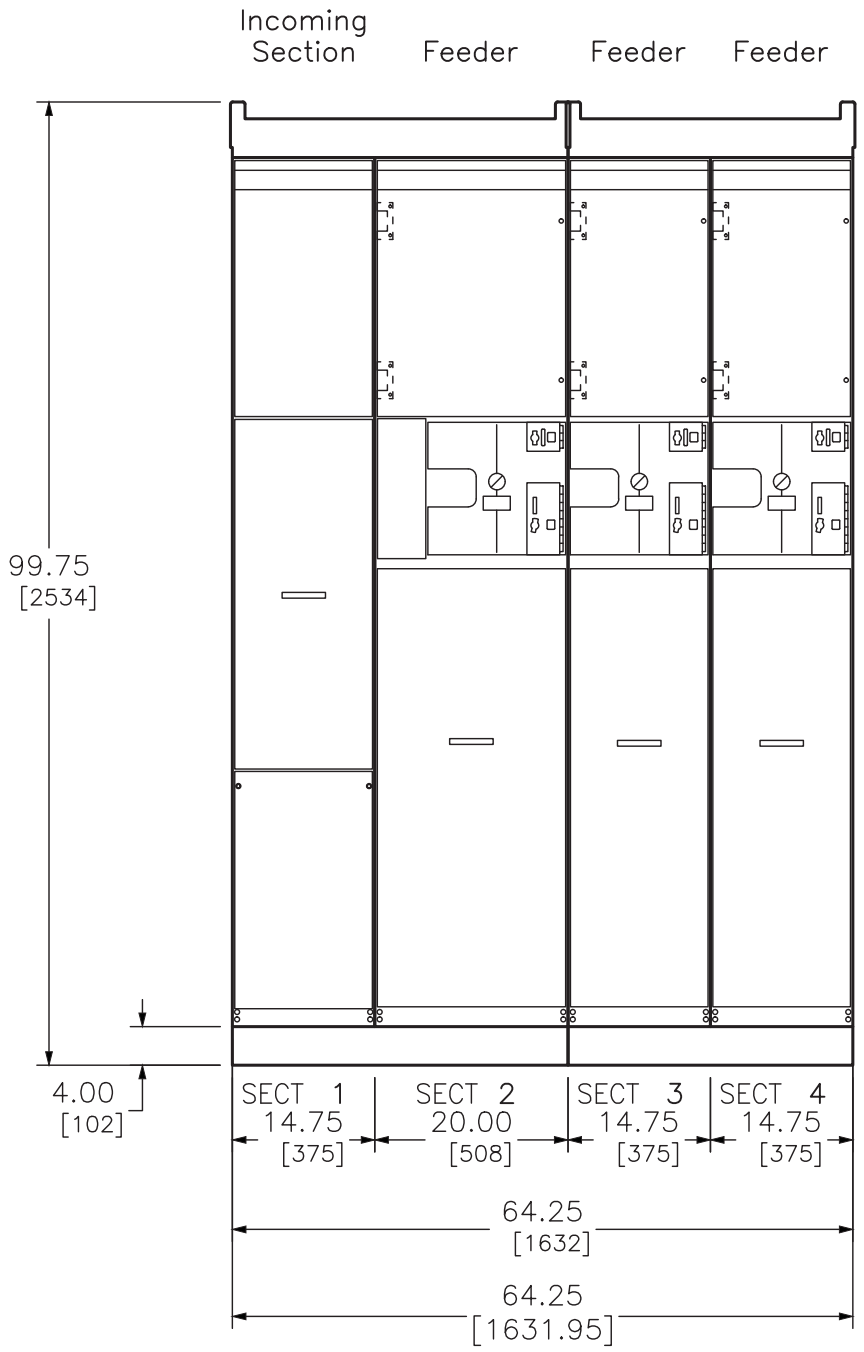

DUAL DIMENSIONS: INCHES
MILLIMETERS

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	ELEVATION
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# FQ-1605083-42568999-01	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	-----	--	--/--/--
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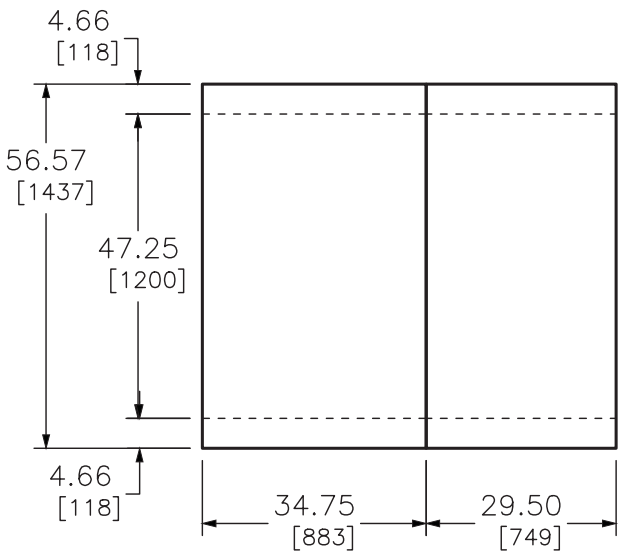

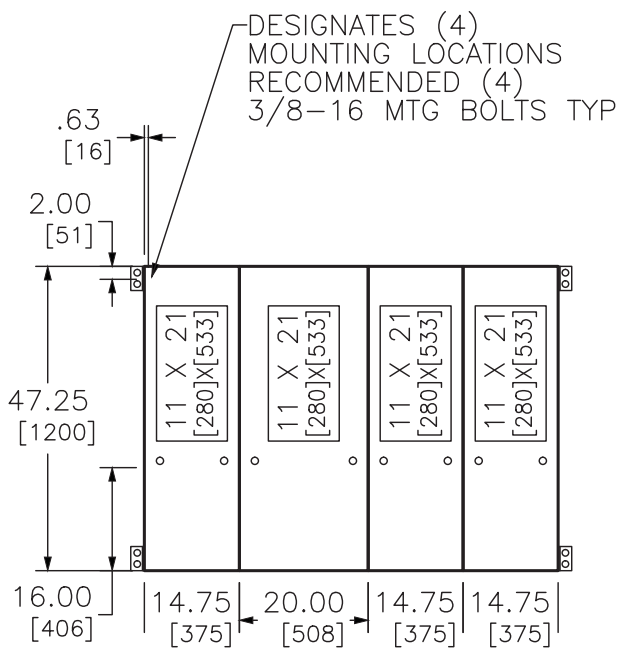

DUAL DIMENSIONS: INCHES
MILLIMETERS

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	TOP VIEW/FLOOR PLAN
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# FQ–1605083–42568999–02	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	-----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--	–	-----	--	--/--/--

GENERAL NOTES:

PRODUCT DESCRIPTION AND RATINGS:

POWER SYSTEM DATA:

12470 VOLTS, 3 PHASE, 3 WIRE WYE SOLIDLY GROUNDED
15.0 kV MAXIMUM VOLTAGE RATING
95 kV BIL, 60 HERTZ FREQUENCY
AC CONTROL POWER USER/CUSTOMER SUPPLIED

BUS SYSTEM DATA:

600A COPPER, TIN PLATED MAIN BUS
EPOXY BUS SUPPORTS
BARE COPPER GROUND BUS
40 kA Asym (25 kA Sym) MAIN BUS BRACING

ENCLOSURE DATA:

TYPE 3R OUTDOOR NON–WALKIN CONSTRUCTION
CATEGORY "A" ENCLOSURE
ANSI #61 FINISH
FRONT TYPE 3R REMOVED FOR CLARITY
FRONT AND REAR ACCESS IS AVAILABLE
PADLOCK PROVISIONS

HANDLING:

SWITCHGEAR SECTIONS ARE FURNISHED WITH LIFTING ANGLES AND ARE SHIPPED ON SKIDS.
ROLLERS OR FORKLIFT SHALL ONLY BE USED WITH SKID IN PLACE.
LINEUP WEIGHT 2545.00 LBS/1154.41 KG
Shipping Split – 1, 2545.00 LBS/1154.41 KG

CODE STANDARDS:

UL LABEL

PRODUCT INFORMATION:

#14 AWG, TYPE SIS CONTROL WIRING, UNLESS OTHERWISE SPECIFIED
#12 AWG, TYPE SIS CURRENT CIRCUIT WIRING
#12 AWG, TYPE SIS HEATER CONTROL WIRING

WIRE LABELING:

WIRES SHALL BE LABELED WITH DESTINATION MARKING (DESTINATION–ORIGIN).

TERMINATIONS:

LOW VOLTAGE WIRE TERMINATIONS (WHERE REQUIRED) SHALL BE UNINSULATED RING TYPE LUGS (STYLE 25009–XXXXX). TERMINAL BLOCKS ARE COMPRESSION SOLDERLESS BOX LUG (TYPE 9080 GR6), FUSE BLOCK (9080GF6).

INSTRUCTION BULLETIN:

OPTIONS/ACCESSORIES:

LIST OF MISC. ACCESSORIES:

STRIP HEATERS

LIST OF MISC. STRUCTURE OPTIONS:

4.0" BASE CHANNEL
FLOOR PLATES
UNDERCOAT BASE
GASKETING
TAMPER PROOF HARDWARE

LIST OF MISC. GENERAL OPTIONS:

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	GENERAL NOTES
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# FQ–1605083–42568999–03	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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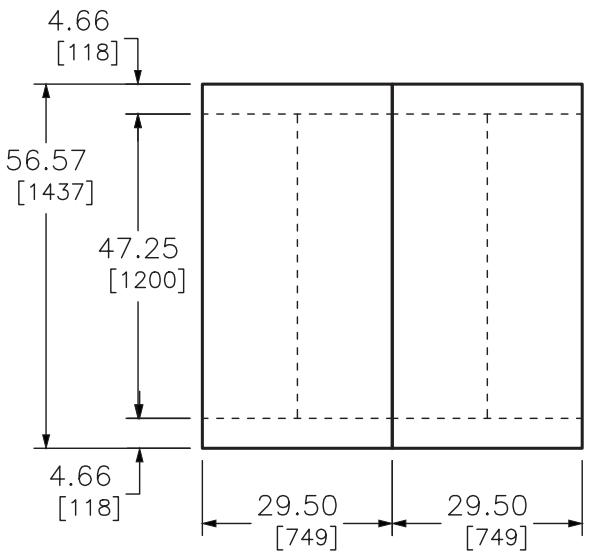

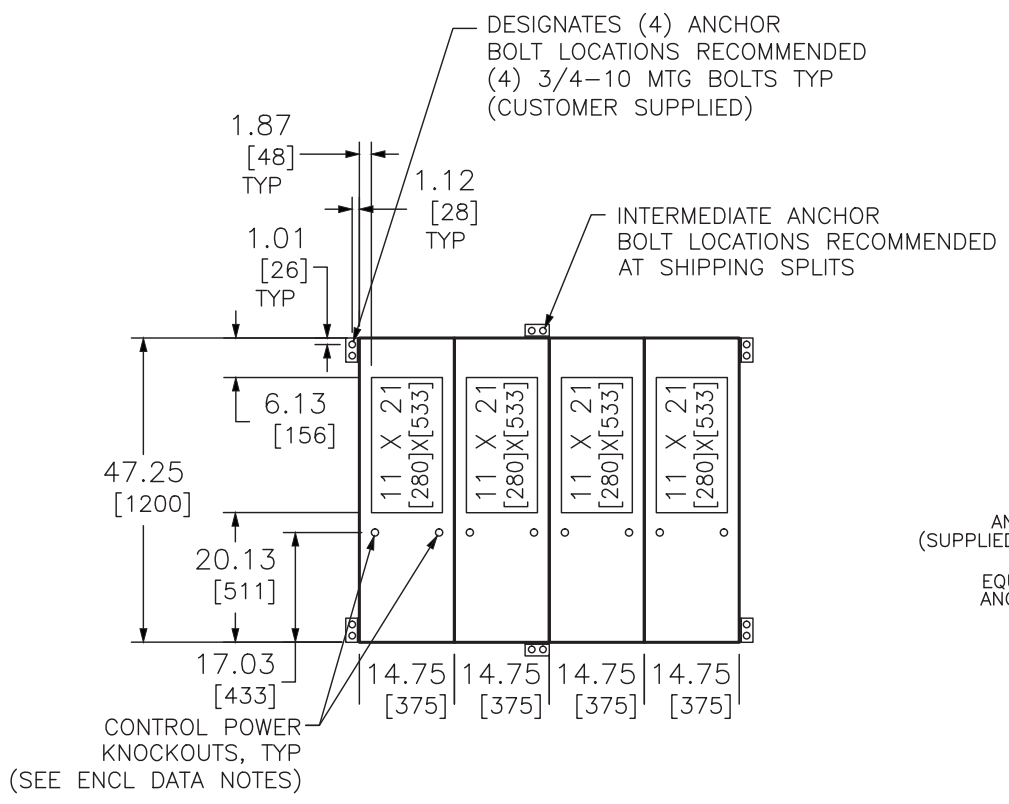

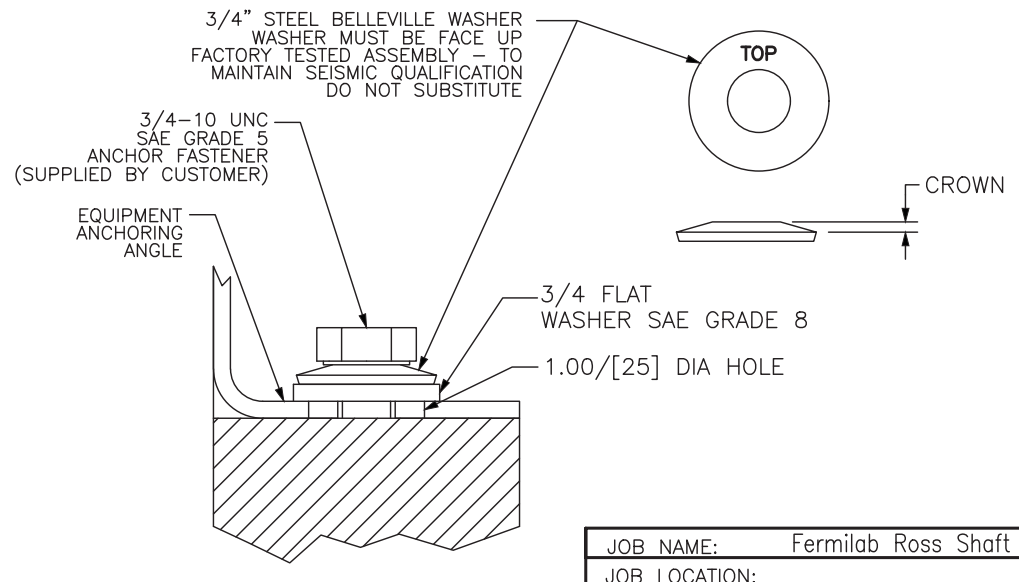

ANCHOR ASSEMBLY

SITE PREPARATION – SWITCHGEAR INSTALLATION

GOOD SITE PREPARATION IS NECESSARY TO ELIMINATE INSTALLATION PROBLEMS AND ENSURE PROPER SWITCHGEAR OPERATION. COMPARE THE SITE PLANS AND SPECIFICATIONS WITH THE SWITCHGEAR DRAWINGS TO BE SURE THERE ARE NO DISCREPANCIES. CHECK THE SITE TO ENSURE THAT THE EQUIPMENT WILL FIT PROPERLY.

THE FLOOR SHOULD BE FLAT AND LEVEL WITHIN 1/16 INCH/[2] PER FOOT/[305], OR A MAXIMUM OF 1/4 INCH/[6] WITHIN THE AREA OF THE SWITCHGEAR, TO PREVENT DISTORTION OF THE ENCLOSURES.

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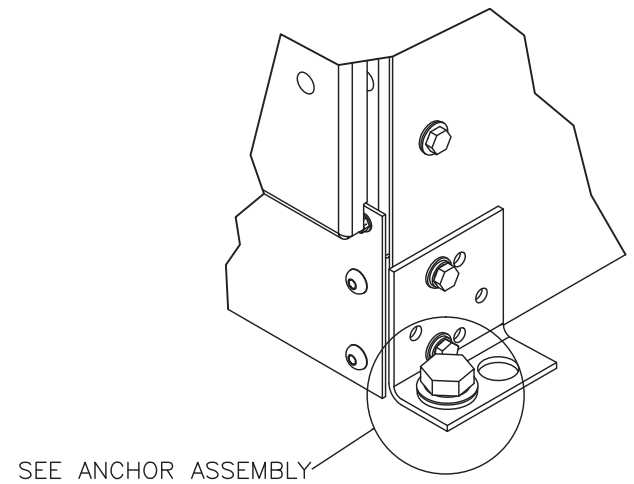
BOTTOM CABLE ENTRY: POWER CABLE ENTRY AREA, 11/[280] X 21/[533] AS SHOWN ON FLOOR PLAN. CONTROL POWER KNOCKOUTS, 1.13/[29] DIA, 2.39/[61] FROM CENTER OF KNOCKOUT TO OUTER SIDE OF CUBICLE, TYP. 2 PLACES.



MOUNTING DETAILS

DUAL DIMENSIONS: INCHES
MILLIMETERS

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	DETAIL VIEW
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# FQ-1605083-42568999-51	PG 1 OF 1 REV –

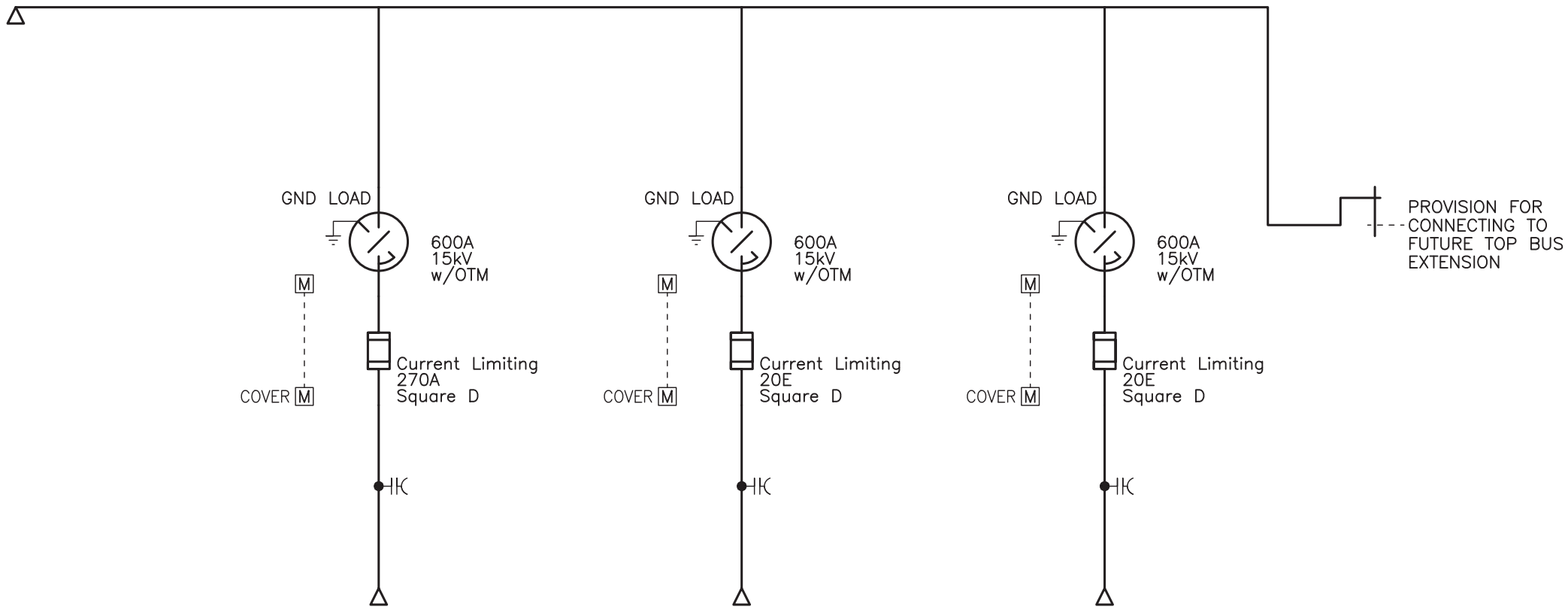
REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--	–	----	--	--/--/--

Incoming Section
C–UL LABEL

Feeder
C–UL LABEL

Feeder
C–UL LABEL

Feeder
C–UL LABEL



COMPRESSION LUGS
SUITABLE FOR ONE
1/0 AWG CABLE(S) /PH
BOTTOM INCOMING

COMPRESSION LUGS
SUITABLE FOR ONE
#4 AWG CABLE(S) /PH
BOTTOM OUTGOING

COMPRESSION LUGS
SUITABLE FOR ONE
#4 AWG CABLE(S) /PH
BOTTOM OUTGOING

COMPRESSION LUGS
SUITABLE FOR ONE
#4 AWG CABLE(S) /PH
BOTTOM OUTGOING

Section 1 | Section 2 | Section 3 | Section 4

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver – Ma	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	ONE LINE DIAGRAM
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# 0Q–1605083–42568999–01	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--

HVL / CC™

LOAD CURRENT INTERRUPTER SWITCHGEAR

ORDER NO.	0	MANUF. DATE	

RATED MAX. VOLTAGE	kV	15.0
IMPULSE (BIL)	kV	95
POWER FREQ. WITHSTAND	kV	36
FREQUENCY	HZ	60
SW. CONT. CURR.	A SYM	600
MAIN BUS CONT. CURR.	A SYM	600
MOMENTARY CURR.	kA ASYM	40
SHORT TIME CURR.	kA SYM	25
TIME	SEC	2
FAULT CLOSE CURR.	kA ASYM	40

FUSE DATA

CAT. #	175GXQSJD150E
FUSE SIZE	270A
MAX. DIRECT ACTING TRIP FUSE SIZE	N/A
INTREGRATED SW & FUSE SHORT CIRCUIT CURRENT kA SYM	65
SF6 CONTENT g	238

MOTOR	N/A	CLOSE	N/A	TRIP	N/A

SQUARE D COMPANY
SMYRNA, TN USA

44044–185–01

Section 2

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver, CO	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	RATING NAMEPLATE
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# NQ–1605083–42568999–01	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--

HVL / CC™

LOAD CURRENT INTERRUPTER SWITCHGEAR

ORDER NO.	0	MANUF. DATE	

RATED MAX. VOLTAGE	kV	15.0
IMPULSE (BIL)	kV	95
POWER FREQ. WITHSTAND	kV	36
FREQUENCY	HZ	60
SW. CONT. CURR.	A SYM	600
MAIN BUS CONT. CURR.	A SYM	600
MOMENTARY CURR.	kA ASYM	40
SHORT TIME CURR.	kA SYM	25
TIME	SEC	2
FAULT CLOSE CURR.	kA ASYM	40

FUSE DATA

CAT. #	175GDMSJD20E
FUSE SIZE	20E
MAX. DIRECT ACTING TRIP FUSE SIZE	N/A
INTREGRATED SW & FUSE SHORT CIRCUIT CURRENT kA SYM	65
SF6 CONTENT g	238

MOTOR	N/A	CLOSE	N/A	TRIP	N/A

SQUARE D COMPANY
SMYRNA, TN USA

44044–185–01

Section 3

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver, CO	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	RATING NAMEPLATE
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# NQ–1605083–42568999–02	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--

HVL / CC™

LOAD CURRENT INTERRUPTER SWITCHGEAR

ORDER NO.	0	MANUF. DATE	

RATED MAX. VOLTAGE	kV	15.0
IMPULSE (BIL)	kV	95
POWER FREQ. WITHSTAND	kV	36
FREQUENCY	HZ	60
SW. CONT. CURR.	A SYM	600
MAIN BUS CONT. CURR.	A SYM	600
MOMENTARY CURR.	kA ASYM	40
SHORT TIME CURR.	kA SYM	25
TIME	SEC	2
FAULT CLOSE CURR.	kA ASYM	40

FUSE DATA

CAT. #	175GDMSJD20E
FUSE SIZE	20E

MAX. DIRECT ACTING TRIP

FUSE SIZE	N/A

INTREGRATED SW & FUSE SHORT CIRCUIT CURRENT

kA SYM	65
SF6 CONTENT g	238

MOTOR	N/A	CLOSE	N/A	TRIP	N/A

SQUARE D COMPANY
SMYRNA, TN USA

44044–185–01

Section 4

JOB NAME:	Fermilab Ross Shaft Production Hoist – Denver, CO	EQUIPMENT DESIGNATION:	
JOB LOCATION:		EQUIPMENT TYPE:	METAL ENCLOSED SWITCHGEAR
DRAWN BY:	(Q2C)	DRAWING TYPE:	RATING NAMEPLATE
ENGR:			SQUARE D by Schneider Electric
DATE:	March 20 2020		
DRAWING STATUS:	QUOTE	DWG# NQ–1605083–42568999–03	PG 1 OF 1 REV –

EATON
MEDIUM VOLTAGE
METAL ENCLOSED
SWITCHGEAR

Medium Voltage Switches

Table of Contents

Detail Bill of Material

Project Name: **Negotiation No:**
General Order No: **Alternate No:** 0000

Item No.	Qty	Product	Description
	1	Medium Voltage Switches	Outdoor, 15kV Max, 12.47kV system, 3 wires, 800A, Silver-Plated Copper bus, 5 Structures

Qty	List of Materials
5	Outdoor Enclosure
5	Copper silver plated bus
5	800A Copper silver plated main bus
4	15kV Switch 600A, 61kA mom, 61kA fc
1	TransitionSection
3	Set of Current Limiting - E Rated, HLE 125 Amp max fuses
1	Set of Current Limiting - E Rated, HLE 250 Amp max fuses
4	Visual blown fuse indication
5	Rear door - 2 Handles
5	Bottom Plate
4	2 Sets of Ground bails
3	Steel cable support
1	Total Freight Price

Eaton Selling Policy 25-000 applies.

All orders must be released for manufacture within 90 days of date of order entry. If approval drawings are required, drawings must be returned approved for release within 60 days of mailing. If drawings are not returned accordingly, and/or if shipment is delayed for any reason, the price of the order will increase by 1.0% per month or fraction there of for the time the shipment is delayed.

General Information

Switchgear Design Type

Design Type:	MVS

Switchgear Rating

Voltage Class:	15
System Voltage:	12.47
Symm Short Circuit:	40
BIL:	95 KV
Number of Wires:	3
System Ground	Solid
3rd Party Cert:	NA

Bus Specifications

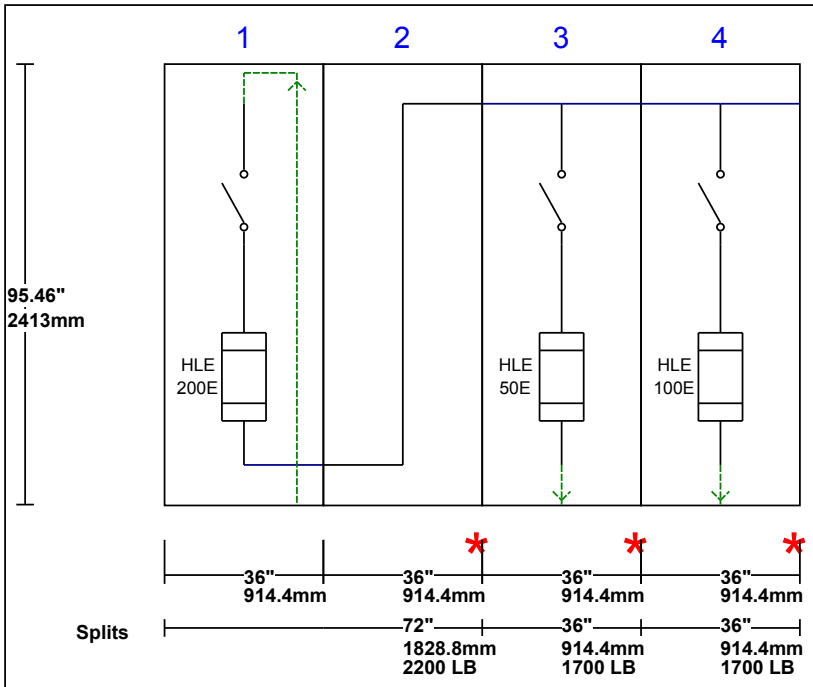
Bus Material:	Silver-Plated Copper
Ground Bus Material:	Cu
Bus Bracing, kA RMS Sym:	40
Main Bus Amps:	800
Bus Support Ins:	Polyester Finned

Enclosure Info:

:	Outdoor
Int. Color:	ANSI-61 Light Gray
Ext. Color:	ANSI-61 Light Gray

Structure Modifications

Modification	Str #s
Blown Fuse Indication	1,3,4
Bot. Enclosing Plate	1,2,3,4
Sw Wdw; Acrylic Plasti	1,2,3,4
Rear Doors	1,2,3,4
Rear	1,2,3,4
Ground Bails	1,3,4
Service Entrance	1,2,3,4
Drive Rod; Glass Poly	1,3,4
Gnd Lug; Clamp Lugs	1,3,4
Gnd Size; #6-350mcn	1,3,4
Gnd Qty	1,3,4
Heaters	1,3,4



Structure		1	2	3	4
Depth		55.25	55.25	55.25	55.25
Switch Rating		600		600	600
Momentary Rating		61		61	61
NP Integ. Rating		40	40	40	40
FUSE OR VCB	Class	Current Limiting-E		Current Limiting-E	Current Limiting-E
	Type	HLE		HLE	HLE
	Amps	200E		50E	100E
	Spare	None		None	None
CABLE IN	Size	500mcm			
	#/PH	2			
	Term Type	None			
CABLE OUT	Size			1/0	2/0
	#/PH			1	1
	Term Type	None		None	None
(Qty) CT Ratio					
(Qty) VT Ratio					
CPT Rating (kVA)					
SURGE ARREST	KV				
	TYPE				
KEY INTER-LOCK inter-changes	QTY				
	SCHEME				
	LO				
	LD				
	LC				

PREPARED BY	DATE 5/9/2019	**Eaton**	Greenwood, SC
APPROVED BY	DATE	JOB NAME	
		DESIGNATION	
VERSION 7.3.10.0		TYPE Medium Voltage Switches	DRAWING TYPE Customer Appr.

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
MPG40211X9K1-0000	0	A			1 of 3

General Information

Switchgear Design Type

Design Type:	MVS

Switchgear Rating

Voltage Class:	15
System Voltage:	12.47
Symm Short Circuit:	40
BIL:	95 KV
Number of Wires:	3
System Ground	Solid
3rd Party Cert:	NA

Bus Specifications

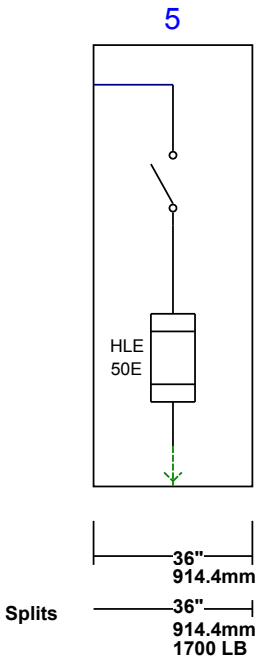
Bus Material:	Silver-Plated Copper
Ground Bus Material:	Cu
Bus Bracing, kA RMS Sym:	40
Main Bus Amps:	800
Bus Support Ins:	Polyester Finned

Enclosure Info:

:	Outdoor
Int. Color:	ANSI-61 Light Gray
Ext. Color:	ANSI-61 Light Gray

Structure Modifications

Modification	Str #s
Blown Fuse Indication	5
Bot. Enclosing Plate	5
Sw Wdw; Acrylic Plasti	5
Rear Doors	5
Rear	5
Ground Bails	5
Service Entrance	5
Drive Rod; Glass Poly	5
Gnd Lug; Clamp Lugs	5
Gnd Size; #6-350mcn	5
Gnd Qty	5
Heaters	5

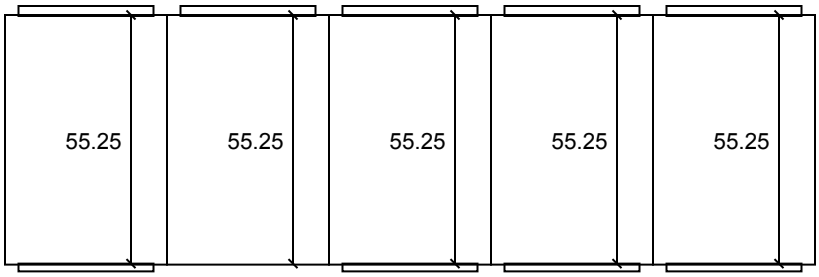


Structure		5			
Depth		55.25			
Switch Rating		600			
Momentary Rating		61			
NP Integ. Rating		40			
FUSE OR VCB	Class	Current Limiting-E			
	Type	HLE			
	Amps	50E			
	Spare	None			
CABLE IN	Size				
	#/PH				
	Term Type				
CABLE OUT	Size	1/0			
	#/PH	1			
	Term Type	None			
(Qty) CT Ratio					
(Qty) VT Ratio					
CPT Rating (kVA)					
SURGE ARREST	KV				
	TYPE				
KEY INTER-LOCK inter-changes	QTY				
	SCHEME				
	LO				
	LD				
	LC				

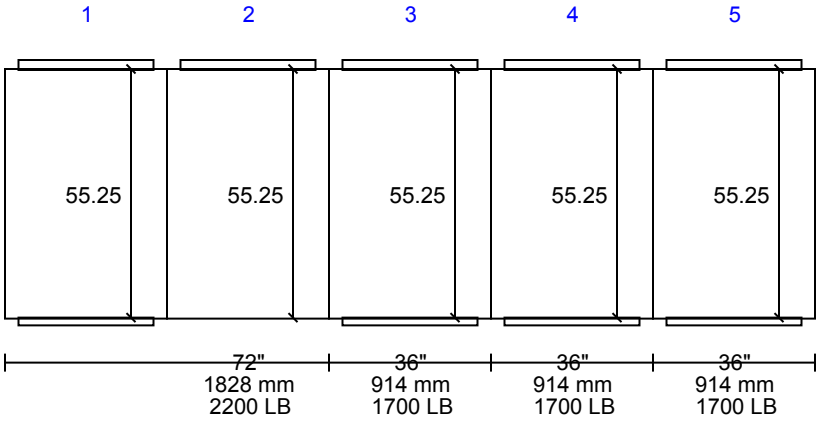
PREPARED BY	DATE 5/9/2019	**Eaton**	Greenwood, SC
APPROVED BY	DATE	JOB NAME	
		DESIGNATION	
VERSION 7.3.10.0		TYPE Medium Voltage Switches	DRAWING TYPE Customer Appr.

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
MPG40211X9K1-0000	0	A			2 of 3

Roof Plan
Rear



Floor Plan
Rear



	PREPARED BY	DATE 5/9/2019	**Eaton**	Greenwood, SC	
	APPROVED BY	DATE	JOB NAME		
			DESIGNATION		
	VERSION 7.3.10.0		TYPE Medium Voltage Switches	DRAWING TYPE Customer Appr.	
NEG-ALT Number MPG40211X9K1-0000	REVISION 0	DWG SIZE A	G.O.	ITEM	SHEET 3 of 3

Detail Bill of Material

Project Name: **Negotiation No:**

General Order No: **Alternate No:** R000

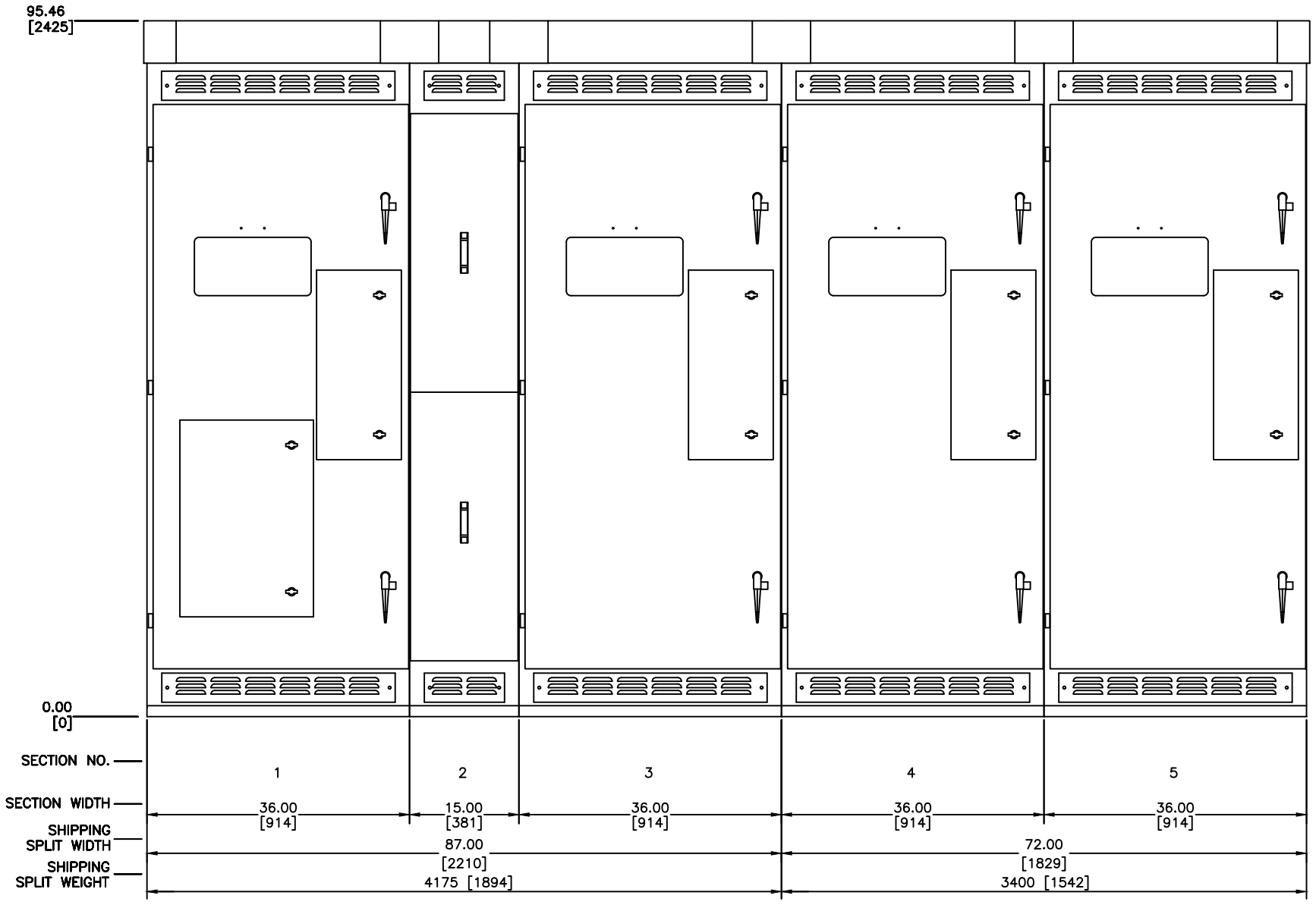
Item No.	Qty	Product	Description
001	1	EESS SAT	

Designation Startup

Qty	List of Materials
1	EESS Office: Denver, CO
1	Jobsite: , Lead, South Dakota 57754
1	Drive Time: 5.72 Hours
1	Weekly Site Schedule: 8 hr Days, 5 Days per Week
1	MVS 5/15 kV Lineups
1	800 A Bus
4	Space Heaters
0	Key Interlock
0	Key Interlock w electrical contacts
5	MVS Structures
4	12.47 kV Switch
4	200E HLE Fuses
1	IQ260
2	2 - 100/1 VTs
0	Addressable Relay
0	IT Relay Single Phase
0	Watthour Meter w Demand Register
0	Watthour Meter w Pulse Indicator
0	Cable Fault Indicator

Eaton Selling Policy 25-000 applies.

All orders must be released for manufacture within 90 days of date of order entry. If approval drawings are required, drawings must be returned approved for release within 60 days of mailing. If drawings are not returned accordingly, and/or if shipment is delayed for any reason, the price of the order will increase by 1.0% per month or fraction thereof for the time the shipment is delayed.



FRONT VIEW

GENERAL INFORMATION

SYSTEM DETAILS:

VOLTAGE CLASS:	15 KV
LINE TO LINE VOLTAGE:	12470 V
BASIC IMPULSE LEVEL:	95 KV
SYSTEM GROUND:	SOLID
PHASE – WIRE:	3 PHASE, 3 WIRE
SYMMETRICAL SHORT CIRCUIT RATING:	25 KA

ENCLOSURE DETAILS:

ENCLOSURE:	OUTDOOR
DUST RESISTANT:	N
TAMPER RESISTANT:	N
DRIP RESISTANT:	N
MIMIC BUS:	NONE
MIMIC BUS COLOR:	NONE
EXTERIOR COLOR:	ANSI-61 LIGHT GRAY
INTERIOR COLOR:	ANSI-61 LIGHT GRAY

BUS DETAILS:

MATERIAL:	SILVER-PLATED COPPER
MAIN BUS AMPS:	800
BUS SUPPORT INSULATION:	POLYESTER FINNED
BUS INSULATION:	NONE

CODES AND STANDARDS:

CERTIFICATION:	NA
SEISMIC:	NONE

WIRING & CONTROL DETAILS:

CONTROL POWER:	120VAC REMOTE
WIRE TYPE:	SIS VW-1
WIRE SIZE (GENERAL):	#14 MIN
WIRE SIZE (GROUND):	#14 MIN
WIRE SIZE (CT'S):	#10 MIN
WIRE COLOR (GENERAL):	GRAY
WIRE COLOR (GROUND):	GREEN
WIRE COLOR (CT'S):	GRAY
TERMINALS (GENERAL):	SPADE
TERMINALS (CT'S):	INSULATED RING
WIRE MARKERS:	ADHESIVE WRAP-AROUND
TERMINAL BLOCKS (GENERAL):	TBAT3
TERMINAL BLOCKS (CT'S):	KUSC SERIES
WIRE LABELING:	WIRE ID

MISCELLANEOUS DETAILS:

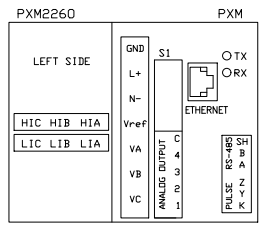
–

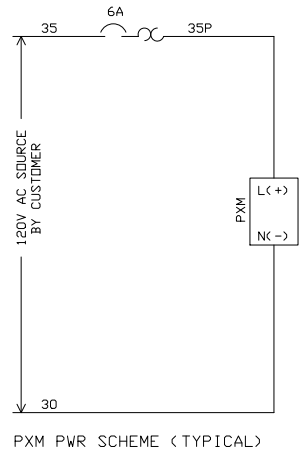
GENERAL NOTES

1. ALL DOOR HANDLES AND MANUALLY OPERATED SWITCHES HAVE PROVISIONS FOR PADLOCKING
2. DOOR CANNOT BE OPENED WHEN INTERRUPTER SWITCH IS CLOSED AND INTERRUPTER SWITCH CANNOT BE CLOSED WHEN DOOR IS OPENED
3. ENCLOSURE MATERIAL: IN ACCORDANCE WITH IEEE C37.20.3
4. 16" X 8" [406 X 204] SHATTERPROOF VIEWING WINDOW IN FRONT OF SWITCH
5. 120V, 250W SPACE HEATER IN OUTDOOR UNITS
6. "DANGER HAZARDOUS VOLTAGE" SIGN ON ALL DOORS
7. ALL DIMENSIONS SHOWN IN INCHES [MM]. ALL WEIGHTS SHOWN IN LBS [KG].

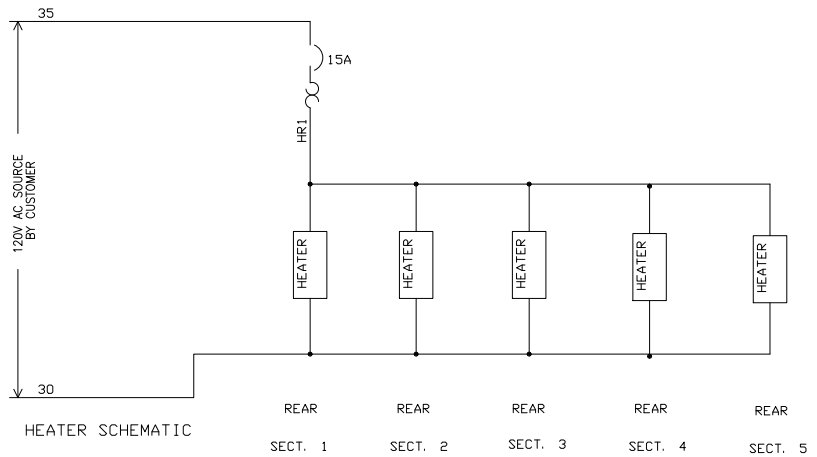
DFTR: KRISTEN DUNCAN	DATE: 12/02/2019	THE INFORMATION ON THIS DOCUMENT WAS CREATED BY EATON CORPORATION. IT WAS DISCLOSED IN CONFIDENCE AND IS ONLY TO BE USED FOR THE PURPOSE IN WHICH IT WAS SUPPLIED.	EATON
APPD: AMOL Y MAGAR	DATE: 12/02/2019	TITLE:	
PRODUCT CODE: 3321	S.O.: G19G14S	TYPE: MEDIUM VOLTAGE SWITCH	OUTLINES
CAGE CODE: 341756454	REVISION: 1	G.O.: SDN1050726-002	DWG: G19G14S-0 / SHEET: 001

COEFtBL_R6

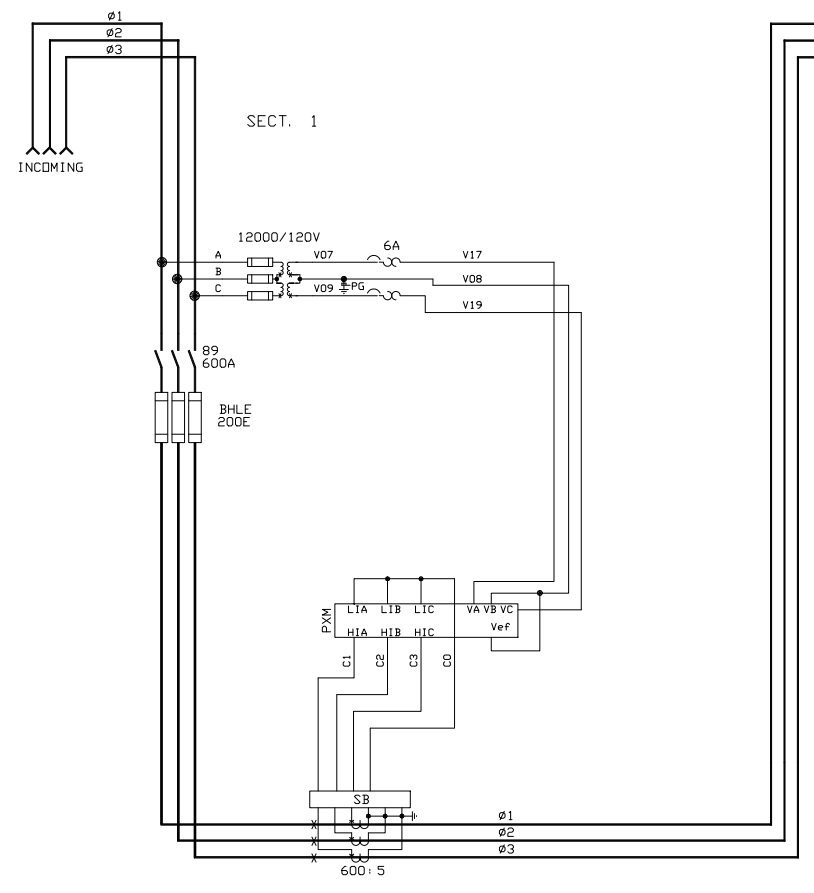


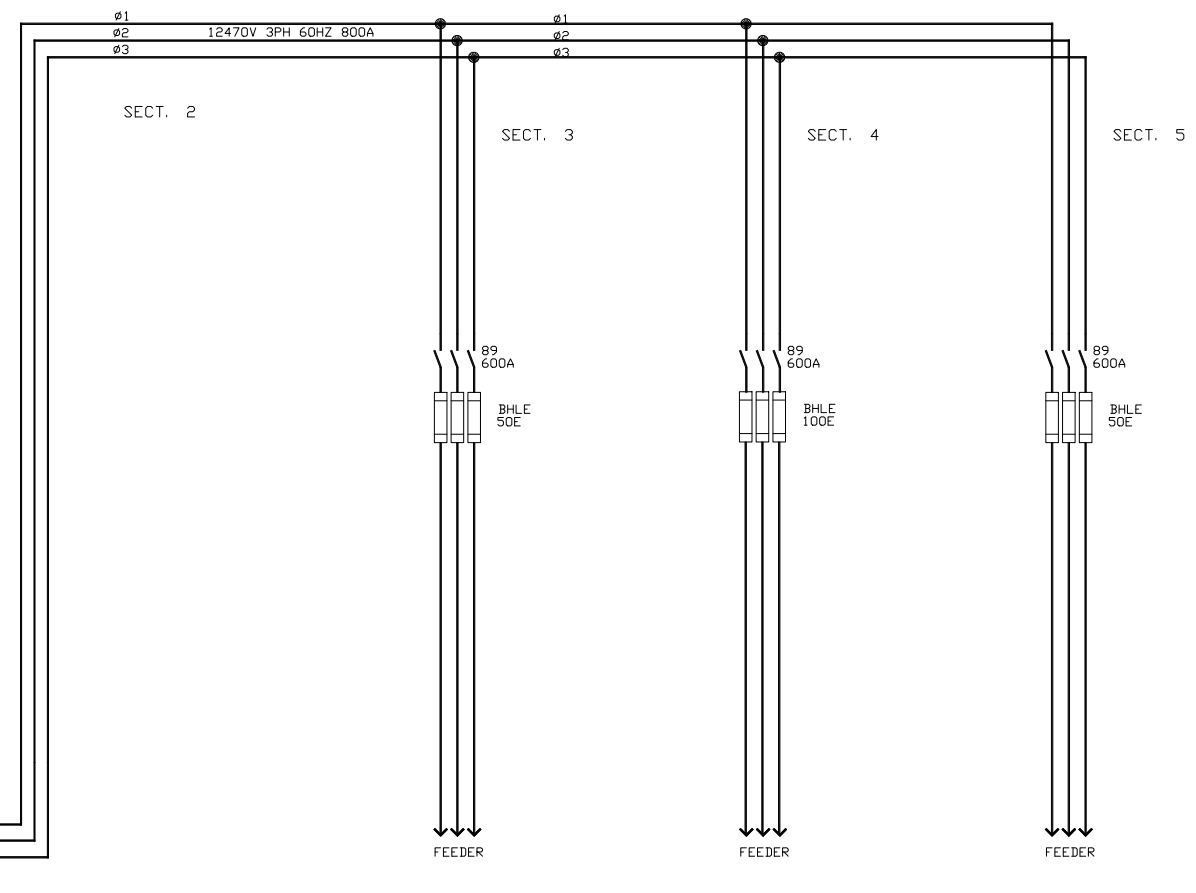


PXM PWR SCHEME (TYPICAL)



HEATER SCHEMATIC





A	1		PHASOR ROTATION 1-2-3	ENG DEPT REF	DFTR Harold Jackson	DATE 12/09/2019	THE INFORMATION ON THIS DOCUMENT WAS CREATED BY EATON CORPORATION. IT WAS DISCLOSED IN CONFIDENCE AND IS ONLY TO BE USED FOR THE PURPOSE IN WHICH IT WAS SUPPLIED. EATON		
	G19G14S-E	REVISION			APPD Amol Magar	DATE 12/09/2019	TITLE		
					APPD Pineda	DATE	TYPE MEDIUM VOLTAGE SWITCH 2	Elect. master/schemes/3-line	
					FEDERAL ID NO 341756464	PRODUCT CODE 3328	REVISION 1	DWG SIZE D	G.O. SDN1050726-002	DWG G19G14S-E	SHEET 1 OF 1

Medium Voltage Switches

Technical Documents

MVS Load Interrupter Switchgear

General Description

Eaton's MVS Load Interrupter Switchgear is an integrated assembly of switches, bus and fuses that are coordinated electrically and mechanically for medium voltage circuit protection. All major components are manufactured by Eaton, establishing one source of responsibility for the equipment's performance and ensuring high standards in quality, coordination, reliability and service.

A complete line of Eaton switches and fuses is available, as follows:

- 5, 15, 27 and 38 kV voltage classes
- 600A continuous and load interrupting ratings, all voltage classes, 1200A continuous and load interrupting for 5 and 15 kV classes
- 350A continuous and load interrupting ratings for 5 kV and 15 kV classes for capacitive circuits
- Non-fused or fused with current limiting or boric acid-type fuses
- Manual or motor operated
- Indoor or outdoor non-walk-in enclosures
- Single switches and transformer primary switches
- Duplex loadbreak switch arrangements for selection of alternate feeds
- Two-position, manual no-load selector switches for selection of alternate feeds (5 and 15 kV only)
- Lineups with main bus
- Standard arrangements with automatic transfer control systems, two sources feeding one load or two sources feeding two loads on a split bus with tie switch

Standard design configurations for:

- NEMA® pads for cable lugs
- Surge arresters
- Instrument transformers
- Control power transformers
- IQ electronic metering
- Eaton's PowerNet™ accessing devices such as addressable relays and PONI cards
- Other auxiliary equipment

Outdoor Duplex with Customer Metering

Application Description

Eaton's Load Interrupter Type MVS metal-enclosed switchgear provides safe, reliable switching and fault protection for medium voltage circuits rated from 2.4–38 kV. The MVS switch is ideal for applications where high duty cycle operation is not needed.

MVS switchgear has the advantage of low initial cost inherent in switch designs while offering the characteristics most vital to safety and coordination.

The MVS switch's quick-make, quick-break mechanism provides full-load current interrupting capability while fuses provide accurate, permanently calibrated short circuit detecting and interrupting capabilities. Visibility of actual blade position improves safety by giving positive assurance of circuit de-energization.

Standard MVS switchgear meets or exceeds the following industry standards:

- ANSI/IEEE® C37.20.3
- ANSI/IEEE C37.20.4
- ANSI C37.22
- ANSI C37.57
- ANSI C37.58
- NEMA SG5
- NEMA SG6
- CSA® 22.2 No. 31-04 (5/15 kV ratings only)
- EEMAC G8-3.3
- UL® listed (5/15 kV ratings only)
- CSA/US listable (5–38 kV)

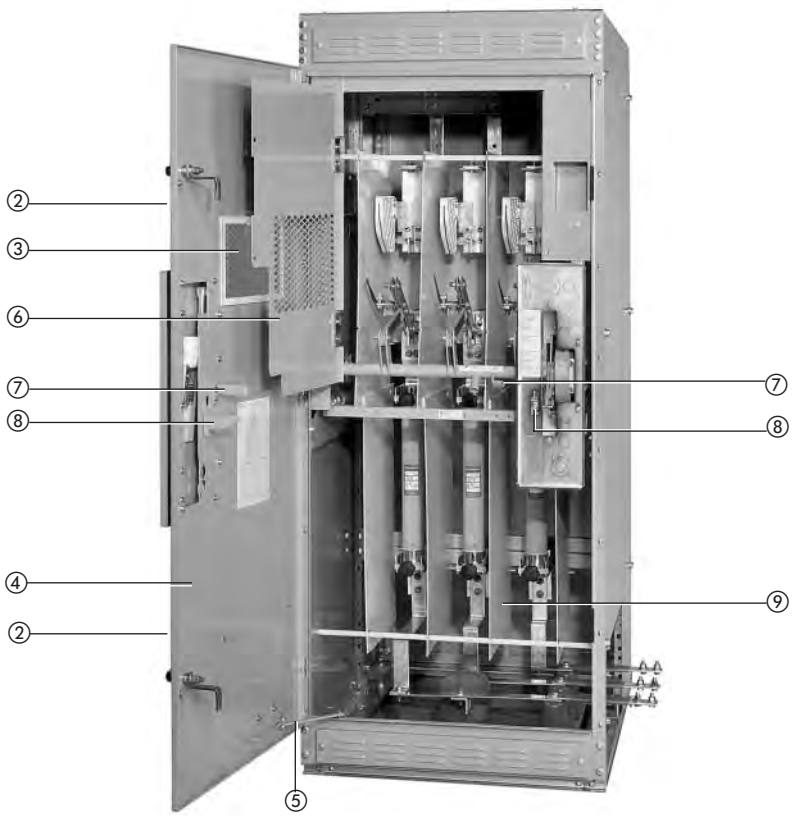
5 and 15 kV MVS switchgear assemblies are available as listed products with **Underwriters Laboratories** and **Canadian Standards Association** for most options. In addition, 27 and 38 kV MVS switchgear assemblies are available with CSA/US listing to U.S. standards with a limited number of options.

Load interrupter switches should not be used to interrupt load currents above their interrupting rating of 600 or 1200A, as they are not designed nor tested for interrupting fault currents on electrical systems. Optional fuses can be provided for phase overcurrent protection. For ground fault current tripping, see MSB and MEB switchgear **Tab 7**. Refer to **Page 8.0-13**, **Table 8.0-6** for applicable fuse ratings.

Seismic Qualification

Refer to **Tab 1** for information on seismic qualification for this and other Eaton products.

Construction



Typical Switch with Front Door Open

① **Switch Mechanism**
Quick-make, quick-break stored energy operation.

The opening and closing of the switch blades is done by the operating spring. An operator's actions only charge and release the operating spring.

The switch blades cannot be teased to any intermediate positions. During the closing operation, full clearance between blades and stationary contacts is maintained until the switch mechanism goes over toggle.

The switch mechanism has only metal-to-metal linkage—no chains or cables are used.

Arc interruption takes place between copper-tungsten tipped auxiliary (flicker) blade and arcing contacts with a DE-ION® arc chute; no arcing takes place between the main blades and the stationary contacts to prolong the life of the main blades.

Blow-out forces cannot be transmitted to the operating handle.

② **Provisions for Padlocking Door**
Handle not visible in the photo.

③ **Inspection Window**
A large 8.00-inch x 16.00-inch (203.2 x 406.4 mm) gasketed, rectangular, high impact viewing window permits full view of the position of all three switch blades through the closed door.

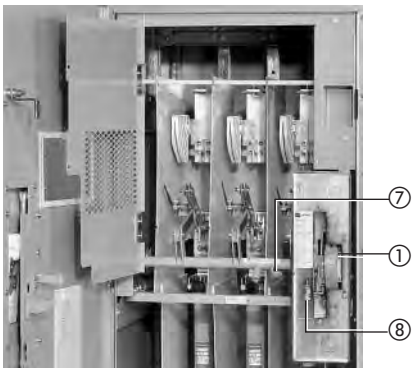
④ **Full Height Main Door**
The door has a return flange and two rotary latch-type handles to provide latching members held in shear. It closes over a projecting frame.

⑤ **Foot-Operated Door Stop**

⑥ **Grounded Metal Safety Barrier**
Prevents inadvertent contact with any live part, yet allows full-view inspection of the switch blade position.

⑦ **Door Interlock**
Prevents the door of the enclosure from being opened when the switch is closed.

⑧ **Switch Interlock**
Prevents inadvertent closure of the switch if the door of the enclosure is open.



Switch with Hinged Screen Barrier Open

⑨ **High Quality Insulation**
Bus and switch insulators, switch drive rod barriers between phases, and barriers between outer phases and the housing, are of high strength, non-hygroscopic, track-resistant glass polyester as standard. Optional switch, fuse and main bus epoxy insulation system is available.

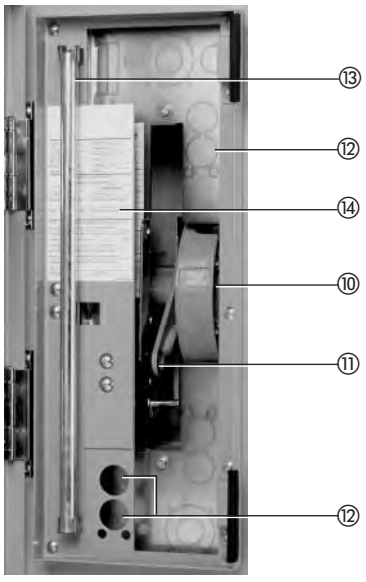
⑩ **Red-Green Switch Position Indicators**

⑪ **Provisions for Padlocking Switch Open or Closed**

⑫ **Provisions for Door and Switch Key Interlocks**

⑬ **The Operating Handle**
It is conveniently located behind a small access door giving the structure a smooth homogeneous appearance and discourages casual contact by unauthorized personnel.

⑭ **Switchgear Assembly Rating Nameplate**



Switch Operating Compartment Door Open

Switch Mechanism

The quick-make, quick-break mechanism uses a heavy-duty coil spring that provides powerful opening and closing action. To close the switch, the handle is inserted into the spring charging cam, then rotated upward through an angle of 120 degrees. This action charges the operating spring, and as the mechanism is forced past toggle, the stored energy of the spring is released and transferred to the main shaft that snaps the switch closed.

As a result of the over-toggle action, the blades are moved independently of the operator. It is impossible to tease the switch into any intermediate position.

To open the switch, the handle is inserted into the spring charging cam and rotated downward through 120 degrees resulting in charging of the operating spring, then releasing its stored energy in similar sequence.

Quick-Break DE-ION Arc Interruption

With the switch closed, both main and auxiliary (flicker) blades are closed, and all of the current flows through the main blades. The flicker blades are in the closed position in the arc chutes, but are past the arcing contacts and thus carry no current.

As the main blades open, current is transferred momentarily to the flicker blades, which are held in the arc chutes by high pressure contact fingers. There is no arcing at the main blades.

When the main blades reach a predetermined angle of opening, a stop post on the main blades prevents further angular movement between the main and flicker blades. This starts the flicker blades out of the high pressure contacts in the arc chutes and as contacts are broken, the flicker blades are snapped into position by their torsion springs.

The heat of the arc, meanwhile, releases a blast of de-ionizing gas from the gas-generating material of the arc chute. This combination of quick-break and DE-ION action quickly extinguishes the arc and the circuit is safely de-energized.

A non-fused switch has the ability to close and latch four times when rated 40 kA fault close, and one time when rated 61 kA fault close, and continue to carry rated current thus adding a large margin of integrity to the electrical system.

The 5/15 kV switch designs have also demonstrated the ability to surpass the number of ANSI C37.22 required loadbreak current operations by no less than 200%.

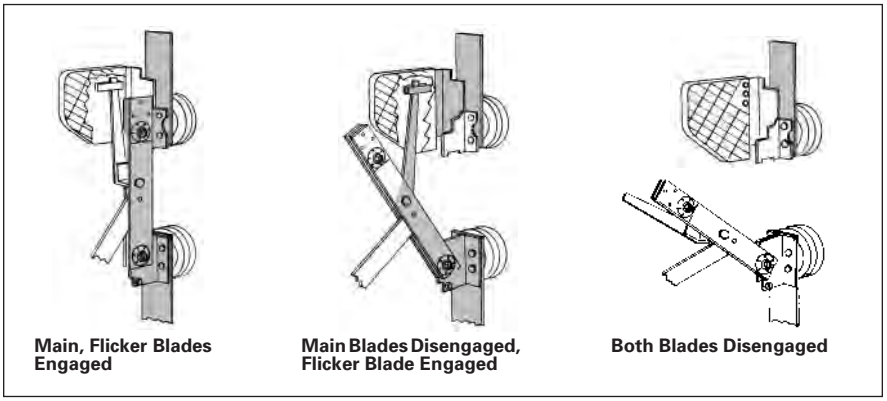
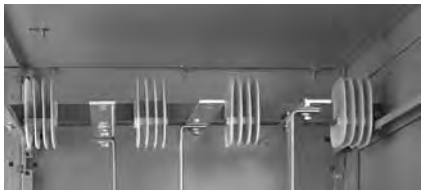


Figure 8.0-1. Switch Operation

Bus Insulation System

All bus runs are supported using a high strength and high creep, finned support providing in excess of 12.00 inches (304.8 mm) for 5/15 kV and 24.00 inches (609.6 mm) for 27/38 kV, of creep distance between phases and ground. The molded high track-resistant fins are constructed as standard of Aramid nylon or optional Cycloaliphatic epoxy.

- Significantly superior bus bracing than standoff type A20 insulators
- Significantly increased creep distance phase-to-phase and phase-to-ground
- Improved endurance from fault incidents
- Minimizes bus system failures due to tracking
- Eliminates additional ground planes in the switchgear for bus supporting systems



Bus Support

Technical Data

Test Data

All Eaton's MVS switch ratings have been thoroughly tested in recognized high power laboratories with certified inspectors from both UL and CSA organizations. Tests were performed to substantiate all published ratings in accordance with ANSI, IEEE, CSA and NEMA standards.

The testing program included tests of:

- Basic impulse levels
- Momentary withstand
- Short-time withstand
- Fault closing
- Load interrupting at various loads, various power factors
- Mechanical life tests
- Temperature rise test

These tests verified not only the performance of the switch and integrated switch-fuse assembly, but also the suitability of the enclosure venting, rigidity and bus spacing.

The mechanical life test subjected the MVS switch to a number of no load cycles greater than the requirements tabulated in ANSI C37.22 standards. There were no moving or current carrying part failures as a result.

The Fault Close and Load Interrupting test demonstrated significant improved performance above ANSI/IEEE standards. See **Tables 8.0-3** and **8.0-4** for results.

Table 8.0-1. Switch Ratings (Non-Fused)

Rated Maximum kV	Impulse Withstand kV	Cont. and Load-Break Amperes	Fault-Close & Momentary Amperes kA rms Asym. (10 Cycles)	Rated Short-Time Current (2 sec.) kA rms Sym.
4.76	60	600	40	25
4.76	60	600	61	38
4.76	60	1200	40	25
4.76	60	1200	61	38
15	95	600	40	25
15	95	600	61	38
15	95	1200	40	25
15	95	1200	61	38
27	125	600	40	25
27	125	600	64	40
38	150	600	40	25

Table 8.0-2. Switchgear Assembly Ratings

Rated Maximum Volts kV	Rated BIL kV	Rated Main Bus Current Amperes	Rated Momentary Current kA rms Asym.	Rated Short-Time Current (2 sec.) kA rms Sym.
4.76	60	600–1200	40	25
4.76	60	600–1200	61	38
4.76	60	600–1200	80	50
4.76	60	1200	101	63
4.76	60	2000	61	38
4.76	60	2000	80	50
4.76	60	2000	101	63
15	95	600–1200	40	25
15	95	600–1200	61	38
15	95	600–1200	80	50
15	95	1200	101	63
27	125	600–1200	40	25
27	125	600–1200	64	40
38	150	600–1200	40	25

Table 8.0-3. MVS Switch Duty Cycle for Full Load Operations

Rated Maximum kV	Switch Load Interrupting Ampere Rating	ANSI Required Number of Load Interrupting Operations	Eaton MVS Switch Number of UL Tested Load Break Operations
4.76	600	50	60
4.76	1200	20	50
15	600	30	60
15	1200	10	50
27	600	10	10
38	600	5	5

Table 8.0-4. MVS Switch Duty Cycle for Fault Close Operations—Non-Fused

Rated Maximum kV	Switch Fault Close Ampere Rating	ANSI Required Number of Fault Close Operations	Eaton MVS Switch Number of UL Tested Fault Close Operations
5 and 15	40	1	4
5 and 15	61	1	1
27	40	1	1
27	61	1	1
38	40	1	1

Table 8.0-5. Mini-MVS Ratings, rms Values

Description	Unfused	Fused
Input voltage, maximum	4.76 kV	4.76 kV
Impulse withstand voltage (BIL)	60 kV	60 kV
Low frequency voltage	19 kV	19 kV
Frequency	60 Hz	60 Hz
Continuous current, maximum	200A	200A
Load current interrupting rating ①	200A	200A
Magnetizing interrupting current	4A	4A
Short-time current symmetrical for 2 seconds	12.5 kA	②
Momentary current, asymmetrical	20 kA	101 kA
Fault close current, asymmetrical	20 kA	101 kA

① 100% to 80% power factor lagging.

② Not applicable for fused units.

Table 8.0-6. Primary Fuses, Standard Ratings and Fused Switch Fault Close Rating

Type Fuse	Switchgear Rated Maximum Voltage, kV	Fuse Rated Continuous Current Range, Amperes	Rated Interrupting Capacity kA Symmetrical ①	Fused Switch Fault-Close Rating, kA Asymmetrical rms ①
RBA-200	4.76	10–200	19	26.5
RBA-400	4.76	10–200	25	40
RBA-400	4.76	0.5–400	37.5	60
RBA-800	4.76	0.5–400	25	40
RBA-800	4.76	0.5–720	37.5	60
BHLE	4.76	10–450	63	101 ②
CLE600/750	4.76	600–750	40	64
RBA-200	15	10–200	14.4	23
RBA-400	15	0.5–400	25	40
RBA-400	15	0.5–400	29.4	47
RBA-800	15	0.5–720	25	40
RBA-800	15	0.5–720	29.4	47
HRBA-400	14.4	0.5–400	34.8	55.7
HRBA-800	14.4	0.5–720	34.8	55.7
BHLE	15	10–250	63	101 ②
BHCL	15	300	63	101 ②
RBA-200	25.8	10–200	10.5	16.8
RBA-400	25.8	0.5–300	21	33.6
RBA-800	25.8	0.5–540	21	33.6
Cooper NX	27	0.5–100	35	56
RBA-200	38	10–200	6.9	11
RBA-400	38	0.5–300	16.8	26.8
RBA-800	38	0.5–540	16.8	26.8
GE EJO-1	38	20–80	12.5	20
Cooper NX	38	20–100	35	56 ③

① When RBA expulsion fuses are used, and two ratings appear, the lower rating applies when the lower-rated switch (15 kV, 40 kA fault close, 25 kA short-time current) versus the higher rating that applies when the higher-rated switch (15 kV, 61 kA fault close, 38 kA short-time) is used.

② UL and CSA listed integrated rating with an Eaton BHLE or BHCL fuse.

③ UL and CSA listed integrated rating with Cooper NX fuse.

Note: For additional fuse data, refer to fuse documents in **Tab 9**.

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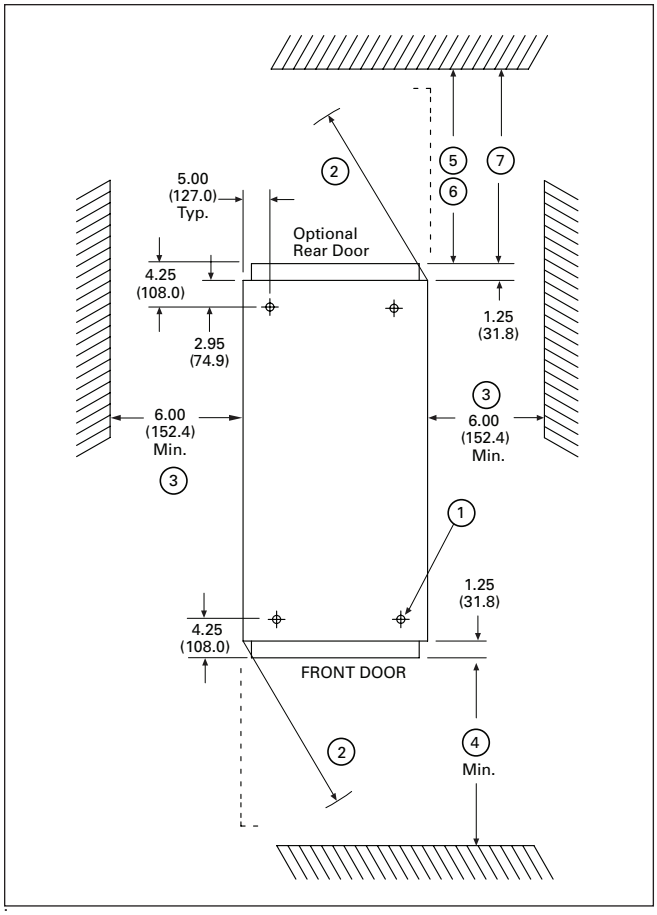

Figure 8.0-25. Typical Anchor Plan—5–15 kV Indoor or Outdoor

① Locations for tie-down 0.65 (16.5) diameter holes in four places. Customer provided bolts for anchoring should be 0.50–13 min. SAE Grade 5 (M12 x 1.75 CL 10.9) and tightened to 75 ft-lbs. (101.7 Nm).

② Door swing equals unit width at 90°.

③ The standard minimum clearances on side. 24.00 inches (609.6 mm) may need to be added for passage from front to rear. The authority having jurisdiction may require a larger distance.

④ Minimum clearances in front is the width of the widest vertical section plus 1.00 inch (25.4 mm). The authority having jurisdiction may require a larger distance.

⑤ The standard minimum recommended distance is 30.00 inches (762.0 mm) for assemblies requiring rear access for installation and maintenance. The authority having jurisdiction may require a larger distance.

⑥ For MVS only. If the application is specifically provided by contract as not requiring rear access as stated in 5, then the minimum recommended distance is 6.00 inches (152.4 mm).

⑦ If optional rear door is supplied, the minimum is the width of the widest vertical section plus 1.00 inch (25.4 mm). The authority having jurisdiction may require a larger distance.

⑧ Finished foundation's surface shall be level within 0.06 inch (1.5 mm) in 36.00 inches (914.4 mm) left-to-right, front-to-back and diagonally, as measured by a laser level.

Table 8.0-17. Approximate Weights in Lbs. (kg)

Switch Description	Indoor	Outdoor
5 or 15 kV Class		
Non-fused switch Fuses (3), add Indoor transition	1500 (681) 200 (91) 300 (136)	1800 (817) 200 (91) —
Outdoor throat	—	500 (227)

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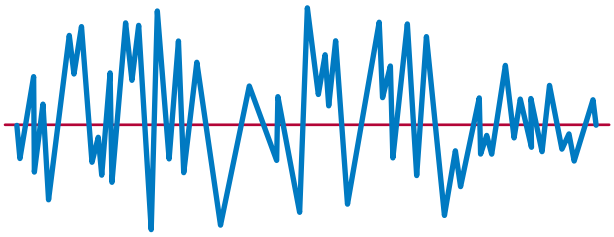
Dimensions in Inches (mm).
Not to be used for construction purposes unless approved.

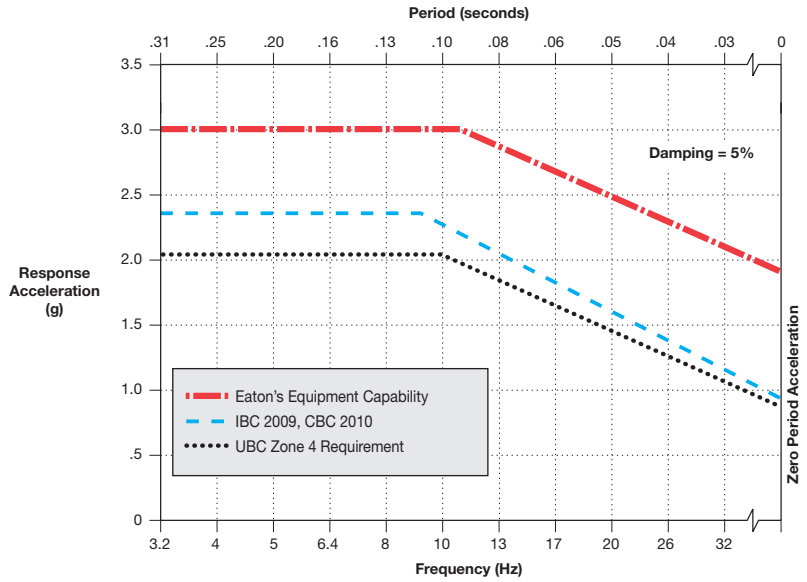
Seismic qualified



Eaton Corporation's equipment identified below was tested for seismic withstand capability and tested in accordance with the combined requirements specified in the International Building Code, the California Building Code, and the Uniform Building Code.

As required by the codes, the equipment demonstrated its ability to function after the seismic tests. The seismic capability of the equipment exceeds the worst-case required levels, as illustrated in the figure below.

Metal-Enclosed Medium Voltage Switchgear— Type MVS/MSB/MEB



The frequency sweep tests revealed that the lowest equipment natural frequency is:

4.8 Hz

Drawing Number
69A1003H01

Mostafa A. Ahmed
Westinghouse Electric Company, LLC

3RD PARTY TEST ENGINEER IN CHARGE

TESTED BY
Wyle Laboratories
September 2000 – 47065-1

For interpretation of testing data, refer to Eaton Publication SA12501SE

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