Vertical mounting styles with extra creepage distance

Surge Arrester IEEE Ratings V_r / V_{MCOV} (kV)	Style Number	Creepage Distance inches (mm)	Strike Distance inches (mm)	BIL 1.2/50 µs dry kV_{peak}	Weight (Mass) lbs (kg)	A max inches (mm)	Fig
3.0 / 2.55	Q003SB002A	23.6 (599)	11.6 (297)	175	22 (10)	18.36 (466)	1
4.0 / 3.40	Q004SB003A	23.6 (599)	11.6 (297)	175	22 (10)	18.36 (466)	1
5.0 / 4.25	Q005SB004A	23.6 (599)	11.6 (297)	175	22 (10)	18.36 (466)	1
6.0 / 5.10	Q006SB005A	23.6 (599)	11.6 (297)	175	22 (10)	18.36 (466)	1
7.0 / 5.95	Q007SB006A	23.6 (599)	11.6 (297)	175	22 (10)	18.36 (466)	1
8.0 / 6.80	Q008SB007A	23.6 (599)	11.6 (297)	175	22 (10)	18.36 (466)	1
9.0 / 7.65	Q009SB008B	23.6 (599)	11.6 (297)	175	22 (10)	18.36 (466)	1
10 / 8.40	Q010SB008B	23.6 (599)	11.6 (297)	175	22 (10)	18.36 (466)	1
12 / 10.2.	Q012SB010A	42 (1067)	17.6 (447)	250	33 (15)	24.27 (616)	1
15 / 12.7	Q015SB012A	42 (1067)	17.6 (447)	250	33 (15)	24.27 (616)	1
18 / 15.3	Q018SB015A	42 (1067)	17.6 (447)	250	33 (15)	24.27 (616)	1
21 / 17.0	Q021SB017B	42 (1067)	17.6 (447)	250	33 (15)	24.27 (616)	1
24 / 19.5	Q024SB019A	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
27 / 22.0	Q027SB022A	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
30 / 24.4	Q030SB024A	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
33 / 27.0	Q033SB027A	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
36 / 29.0	Q036SB029A	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
39 / 31.5	Q039SB031B	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
42 / 34.0	Q042SB034B	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
45 / 36.5	Q045SB037A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
48 / 39.0	Q048SB039A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
51 / 41.0	Q051SB041A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
54 / 42.0	Q054SB042A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
55 / 44.0	Q055SB044A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
60 / 48.0	Q060SB048A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
66 / 53.0	Q066SB053A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
72 / 57.0	Q072SB057A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
75 / 60.0	Q075SB060A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
78 / 63.0	Q078SB063A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
81 / 65.0	Q081SB065A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
84 / 68.0	Q084SB068A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
90 / 70.0	Q090SB070A	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
94 / 73.0	Q094SB073A	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
96 / 76.0	Q096SB076B	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
102 / 82.0	Q102SB082B	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
108 / 84.0	Q108SB084D	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
108 / 88.0	Q108SB088B	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
114 / 92.0	Q114SB092B	150.7 (3828)	50.0 (1269)	850	109 (50)	68.86 (1749)	4
120 / 98.0	Q120SB098D	150.7 (3828)	50.0 (1269)	850	109 (50)	68.86 (1749)	4
129 / 104	Q129SB104B	150.7 (3828)	50.0 (1269)	850	109 (50)	68.86 (1749)	4
132 / 106	Q132SB106D	150.7 (3828)	50.0 (1269)	850	109 (50)	68.86 (1749)	4
138 / 111	Q138SB111B	175.4 (4455)	57.8 (1469)	950	123 (56)	76.73 (1949)	4
144 / 115	Q144SB115C	175.4 (4455)	57.8 (1469)	950	123 (56)	76.73 (1949)	4
150 / 121	Q150SB121B	175.4 (4455)	57.8 (1469)	950	123 (56)	76.73 (1949)	4
168 / 131	Q168SB131C	200.1 (5082)	65.7 (1669)	1050	137 (63)	84.61 (2149)	4
172 / 140	Q172SB140C	200.1 (5082)	65.7 (1669)	1050	137 (63)	84.61 (2149)	4

Vertical mounting styles with extra extra creepage distance

Surge Arrester IEEE Ratings V_r / V_{MCOV} (kV)	Style Number	Creepage Distance inches (mm)	Strike Distance inches (mm)	BIL 1.2/50 µs dry kV_{peak}	Weight (Mass) lbs (kg)	A max inches (mm)	Fig
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6.0 / 5.10	Q006SC005A	42 (1067)	17.6 (447)	250	33 (15)	24.27 (616)	1
7.0 / 5.95	Q007SC006A	42 (1067)	17.6 (447)	250	33 (15)	24.27 (616)	1
8.0 / 6.80	Q008SC007A	42 (1067)	17.6 (447)	250	33 (15)	24.27 (616)	1
9.0 / 7.65	Q009SC008B	42 (1067)	17.6 (447)	250	33 (15)	24.27 (616)	1
10 / 8.40	Q010SC008B	42 (1067)	17.6 (447)	250	33 (15)	24.27 (616)	1
12 / 10.2.	Q012SC010A	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
15 / 12.7	Q015SC012A	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
18 / 15.3	Q018SC015A	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
21 / 17.0	Q021SC017B	66.7 (1694)	25.5 (647)	350	47 (22)	32.14 (816)	1
24 / 19.5	Q024SC019A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
27 / 22.0	Q027SC022A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
30 / 24.4	Q030SC024A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
33 / 27.0	Q033SC027A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
36 / 29.0	Q036SC029A	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
39 / 31.5	Q039SC031B	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
42 / 34.0	Q042SC034B	84 (2134)	35.7 (907)	500	62 (29)	42.38 (1076)	2
45 / 36.5	Q045SC037A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
48 / 39.0	Q048SC039A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
51 / 41.0	Q051SC041A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
54 / 42.0	Q054SC042A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
55 / 44.0	Q055SC044A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
60 / 48.0	Q060SC048A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
66 / 53.0	Q066SC053A	108.7 (2761)	43.6 (1107)	600	76 (35)	50.25 (1276)	2
72 / 57.0	Q072SC057A	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
75 / 60.0	Q075SC060A	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
78 / 63.0	Q078SC063A	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
81 / 65.0	Q081SC065A	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
84 / 68.0	Q084SC068A	133.4 (3388)	51.5 (1307)	700	90 (41)	58.12 (1476)	2
90 / 70.0	Q090SC070A	150.7 (3828)	50.0 (1269)	850	109 (50)	68.86 (1749)	4
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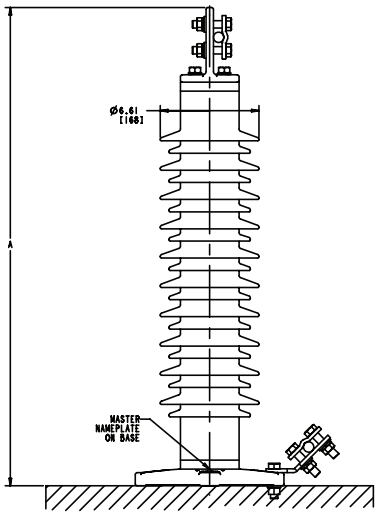
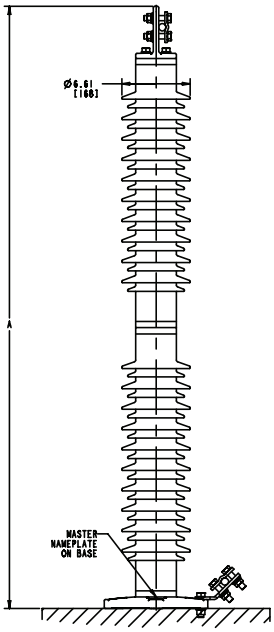
96 / 76.0	Q096SC076B	150.7 (3828)	50.0 (1269)	850	109 (50)	68.86 (1749)	4
102 / 82.0	Q102SC082B	150.7 (3828)	50.0 (1269)	850	109 (50)	68.86 (1749)	4
108 / 84.0	Q108SC084D	150.7 (3828)	50.0 (1269)	850	109 (50)	68.86 (1749)	4
108 / 88.0	Q108SC088B	150.7 (3828)	50.0 (1269)	850	109 (50)	68.86 (1749)	4
114 / 92.0	Q114SC092B	175.4 (4455)	57.8 (1469)	950	123 (56)	76.73 (1949)	4
120 / 98.0	Q120SC098D	175.4 (4455)	57.8 (1469)	950	123 (56)	76.73 (1949)	4
129 / 104	Q129SC104B	175.4 (4455)	57.8 (1469)	950	123 (56)	76.73 (1949)	4
132 / 106	Q132SC106D	175.4 (4455)	57.8 (1469)	950	123 (56)	76.73 (1949)	4
138 / 111	Q138SC111B	200.1 (5082)	65.7 (1669)	1050	137 (63)	86.41 (2149)	4
144 / 115	Q144SC115C	200.1 (5082)	65.7 (1669)	1050	137 (63)	86.41 (2149)	4
150 / 121	Q150SC121B	200.1 (5082)	65.7 (1669)	1050	137 (63)	86.41 (2149)	4

Figures

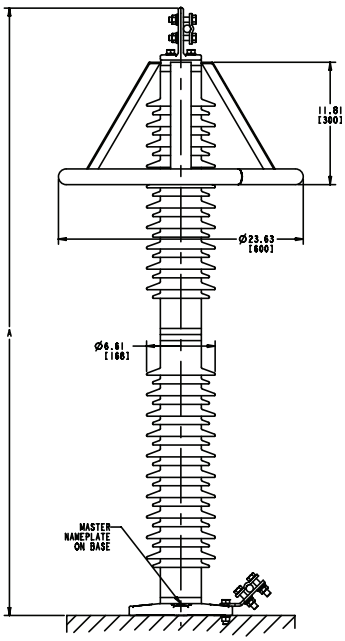
1 Single housing



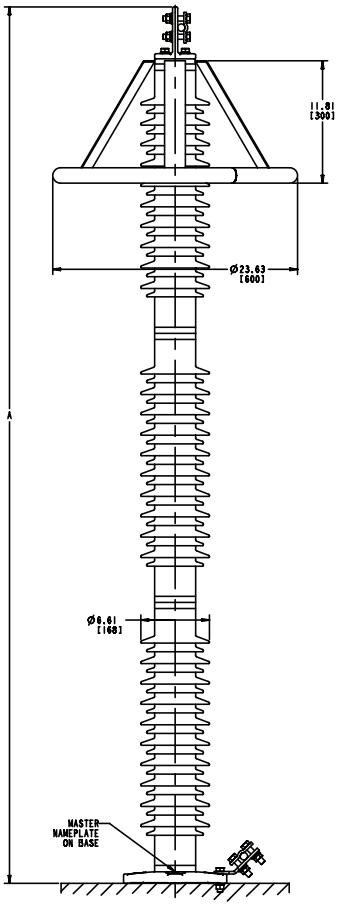
2 Double housing



3 Double housing with ring



4 Triple housing with ring



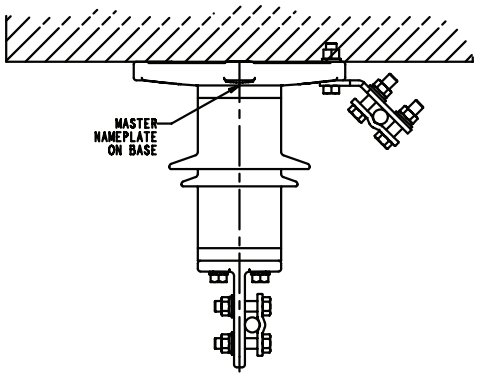
Optional mountings

Under-hung mounted styles

Available for all ratings. To select, add 'UH' to the end of the style number.

(Example: 5 kV Q015SA012AUH)

Single housing under-hung



Cubical mounted styles

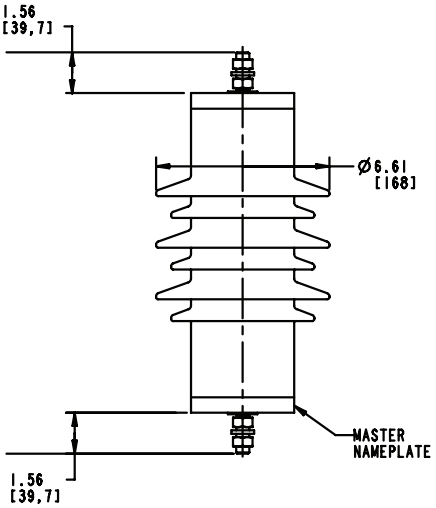
Available for rating 3 to 66 kV. To select, add 'SAA6' to the end of the style number.

(Example: 15 kV Q015SA012ASAA6)

ABB	DATE	POLIM-S	U.S.A.
STYLE NO.		SERIAL NO.	
WEIGHT	MCOV kV	RATING	kV

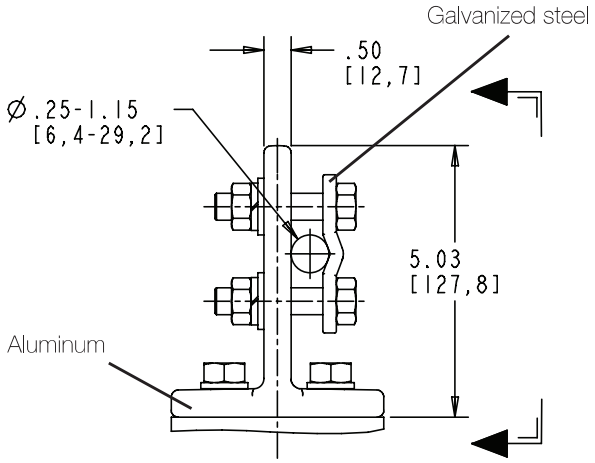
Nameplate for cubical mounted styles only.

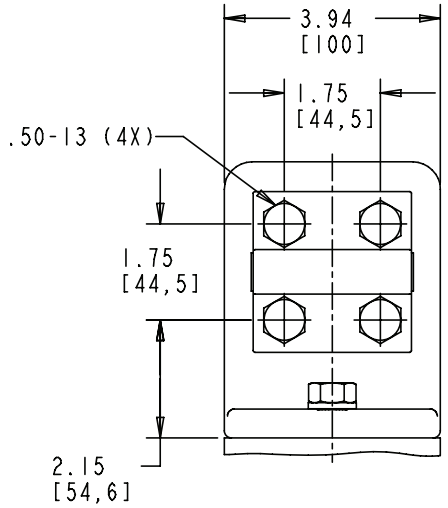
Single housing cubical



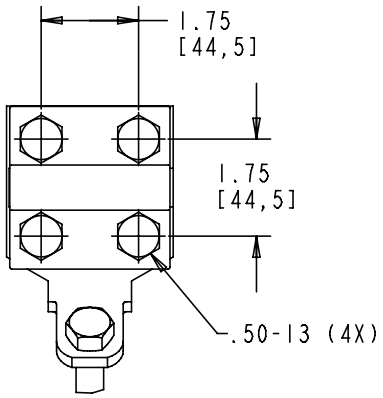
Standard hardware

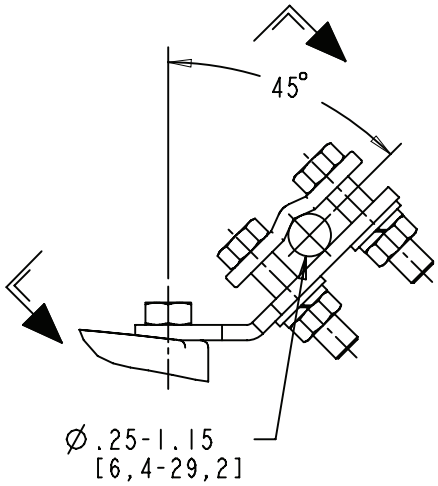
Line terminal
Aluminum / galvanized steel





Ground terminal
Galvanized steel





Note: Line and ground terminals can accommodate copper or aluminum cable size Number 2 to 1000 MCM / 0.25 to 1.15 in. diameter. Ground terminal can be located on any lug.

Phase-to-ground clearance

The phase-to-ground clearance in substations is usually based on the selected standard rated lightning and switching impulse withstand voltages. International standards, e.g. IEC 60071-2, recommend minimum clearances.

In general, the clearance between a grounded object and a surge arrester should be the same as the phase-to-ground clearance selected for other high voltage equipment in a substation. If it is not possible to use the normal phase-to-ground clearance in special applications of POLIM-S Surge Arresters, a smaller clearance may be chosen, considering the protective characteristics of the arrester. At system voltages 24 kV and below, the margin between the rated withstand voltage of the substation and the protective level of the surge arrester is large. Furthermore, distance effects by fast transients do not exist in the immediate vicinity of the surge arrester.

Thus, the recommended minimum phase-to-ground clearance for POLIM-S Surge Arresters, with regard to lightning and switching overvoltages are presented in Figure 1. These clearances are based on IEC 60071-2, Table VI, and on the protective characteristics of the surge arrester. They include safety margins and altitude correction.

The *Adjusted Protective Level* to be used in Figure 1, is defined as:

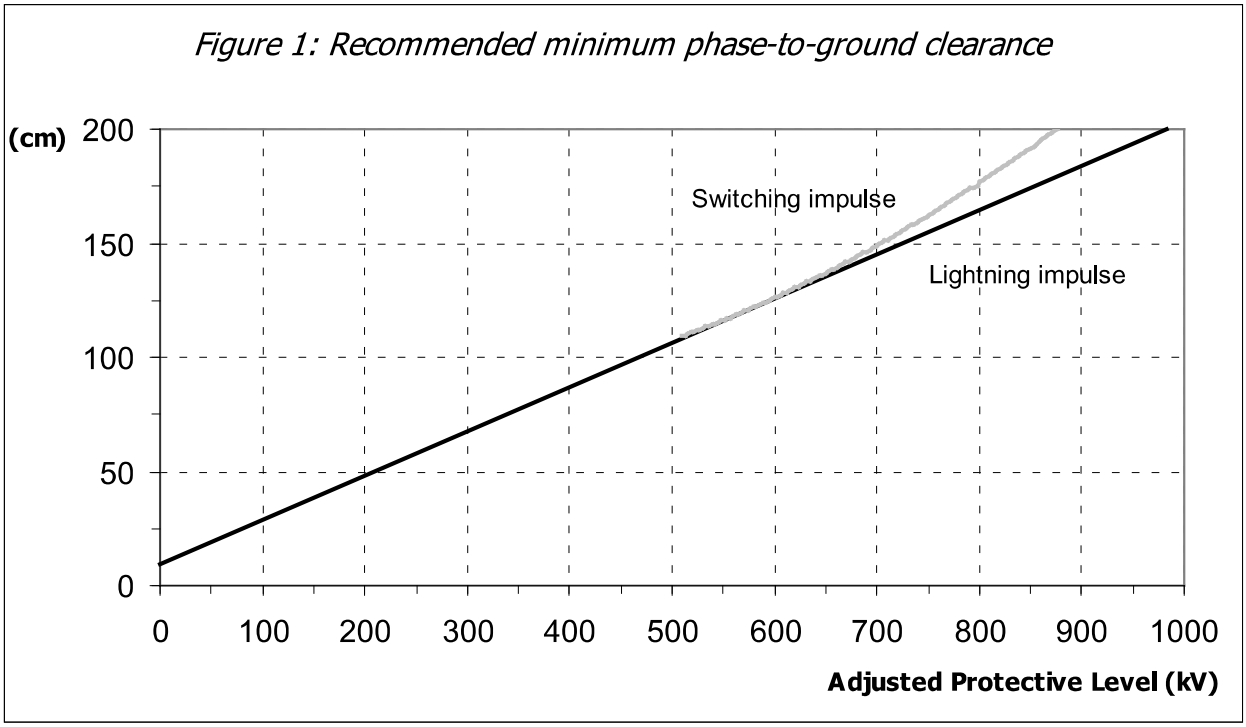
- *For lightning impulse:*
  $L_{pl} \times 1.15 \times e^{H/8150}$
- *For switching impulse:*
  $S_{pl} \times 1.10 \times e^{H/8150}$

H is the altitude in meters above sea level.

L_{pl} and S_{pl} are the lightning and switching impulse protective levels for the selected POLIM-S Surge Arresters at the respective coordinating currents.

The minimum clearance is determined either by lightning or switching impulse withstand, whichever renders a larger value.

Figure 1: Recommended minimum phase-to-ground clearance



Phase-to-phase clearance

The phase-to-phase clearance for high voltage equipment in a substation is normally based on the selected standard rated lightning and switching impulse phase-to-phase withstand voltages. International standards, e.g. IEC 60071-3 recommend minimum phase-to-phase clearances. Note that the normal election of surge arrester protective levels does not directly protect the phase-to-phase insulation.

In general, the clearance between surge arresters in adjacent phases should be the same as the phase-to-phase clearance selected for other high voltage equipment in the substation. If it is not possible to use the normal phase-to-phase clearance in a special application of POLIM-S Surge Arresters, the minimum clearance with regard to lightning overvoltages can be derived from Figure 2.

The clearances shown in Figure 2 are based on the assumption that one phase is subjected to a lightning overvoltage, while the voltage on the adjacent phase is at the peak of the maximum power frequency operating voltage (opposite polarity). Obviously, these clearances will also cover the case of lightning overvoltages of the same polarity appearing simultaneously on two or three phases.

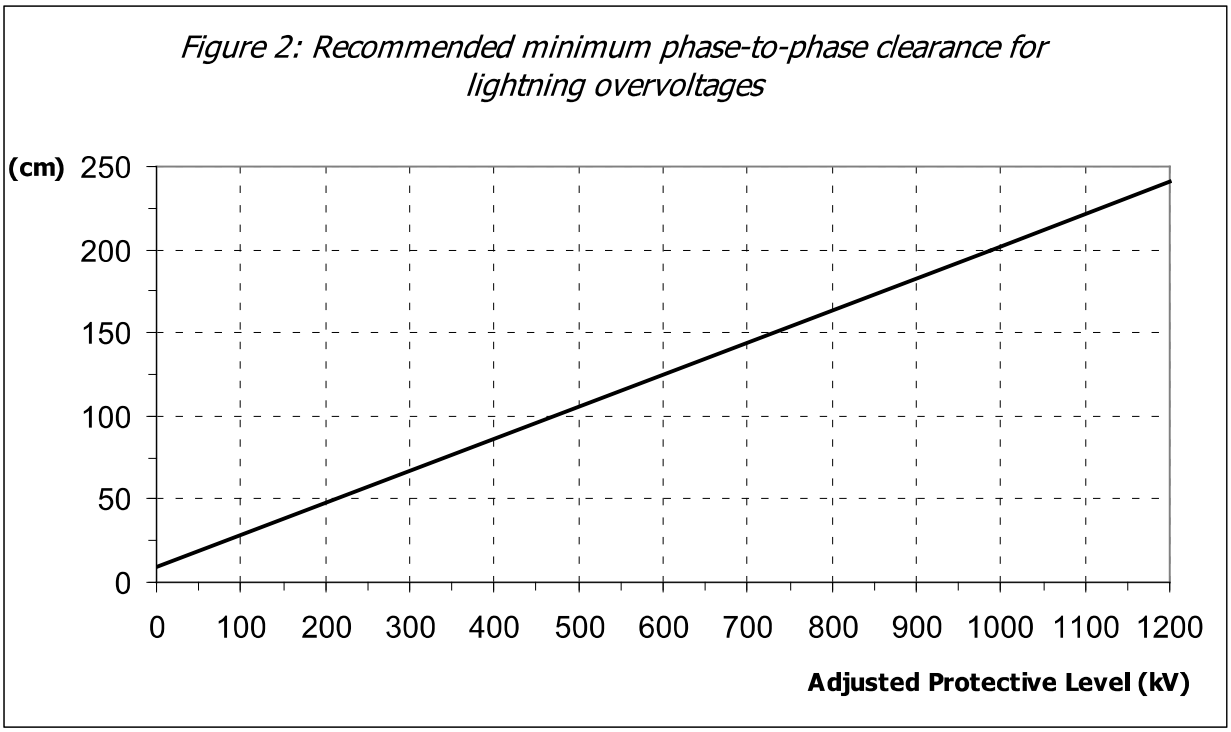
The *Adjusted Protective Level* shown in Figure 2 is based on the lightning protective characteristics of the selected POLIM-S Surge Arresters. It includes safety margin and altitude correction factors and is defined as:

$L_{pl} \times 1.15 \times e^{H/8150} + V_m \times \sqrt{2} / \sqrt{3}$

- V_m is the highest voltage for equipment according to IEC 60071-1, which is usually equal to the highest system voltage.
- L_{pl} is the lightning impulse protective level for the selected POLIM-S Surge Arrester.

The minimum phase-to-phase clearance for arresters with respect to switching overvoltages should always be based on the selected standard rated switching impulse phase-to-phase withstand voltage for the substation. Consequently, the clearances specified in IEC 60071-3, Table VI, are valid for most applications of arresters. If a special application requires a minimized phase spacing, the favorable electrode configuration established by the grading rings on POLIM-S Surge Arresters may permit a further reduction of the phase-to-phase clearance.

Figure 2: Recommended minimum phase-to-phase clearance for lightning overvoltages



Contact us

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Phone: +1 (724) 696-1568
Fax: +1 (724) 696-1502

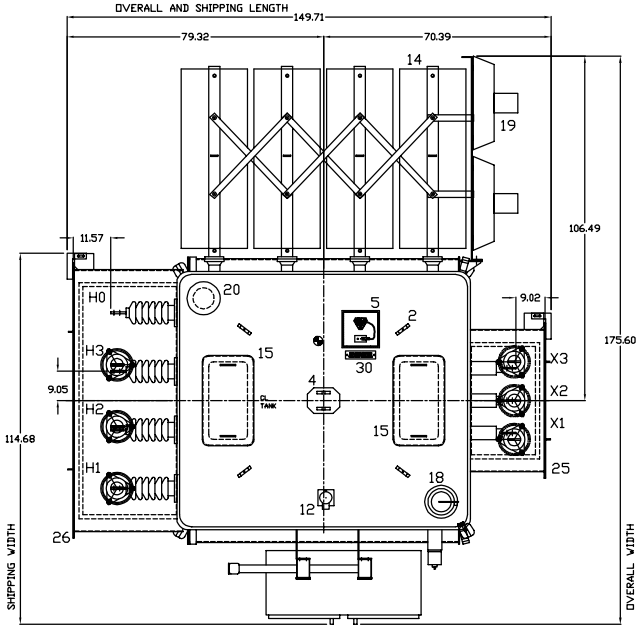
www.abb.us

Document Number 2GNM110077 /July 2011

Power and productivity
for a better world™

AS BUILT DRAWINGS

IT	CHANGE
2	CORRECTED WEIGHTS D. GUILL 3/3/15 M. CLARK 3/3/15
3	ADDED 46KV ARRESTERS TO HV. ADDED 18KV ARRESTERS TO LV. REVISED U PANEL & Y PANEL BRACING. REVISED TANK HEIGHT MAS: 113.75 NOW: 106.85 D. GUILL 9/25/15 M. CLARK 9/25/15
4	CHANGED HV ARRESTERS TO 42KV. ADDED "BLEEDER" TO ITEM 11 DISCRIPTION. D. GUILL 12/03/15 M. CLARK12/03/15
5	REVISED CONTROL CABINET REVISED COOLER FILL INFORMATION. D. GUILL 01/08/16 M. CLARK 01/08/16
6	REVISED OVERALL WIDTH DIMENSIONS ADDED SHIPPING WIDTH DIMENSIONS. D. GUILL 02/16/16 M. CLARK 02/16/16
7	ADDED SECOND FAN BOX. M. CLARK 03/14/16



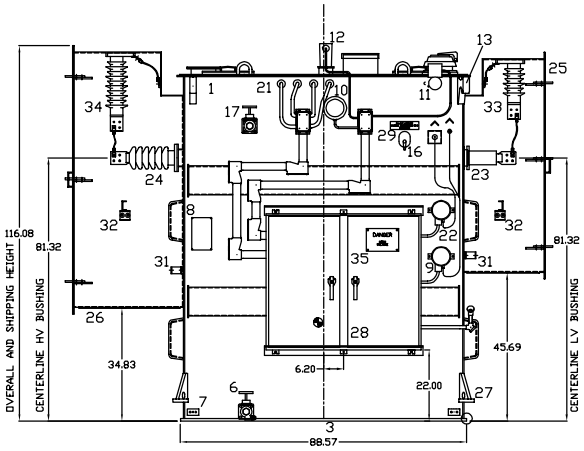
TANK BA IS UN COATED PLUS
2 INCHE P THE ES.

COVER H NON-S SURFACE

ALL EXT L H RE IS STAINLESS STEEL
WITH S NUTS.

ALL LEA IN UL/CSA RATED LIQUID-TIGHT
FLEXIBL UIT RATED -46C, TYPE HTUA.

AS BUILT DRAWINGS
Mar 21, 2016
ABB - South Boston, VA



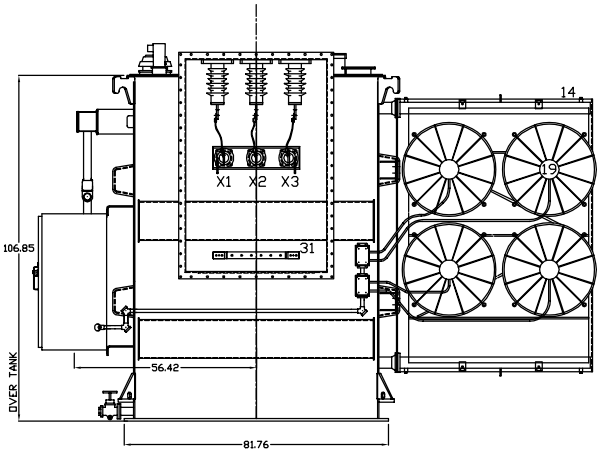


ABB INC.
SMALL POWER TRANSFORMERS
SOUTH BOSTON, VIRGINIA U.S.A.

APPROXIMATE NET WEIGHTS

CORE AND COILS	31737 LBS.
TANK AND FITTINGS	15455 LBS.
LIQUID - NATURAL ESTER FLUID - 2505 GAL.	19037 LBS.
TOTAL WEIGHT	66229 LBS.
APPROXIMATE TRANSFORMER SHIPPING WEIGHT	57884 LBS.
COOLER LIQUID TOTAL -- 238 GAL.	1809 LBS.
MAXIMUM COOLER ASSEMBLY WEIGHT EACH	1593 LBS.

(COOLER WEIGHTS ARE INCLUDED IN TANK AND FITTINGS WEIGHT)
(COOLER LIQUID WEIGHT IS INCLUDED IN LIQUID WEIGHT)

ITEM
1 SEALED TANK - BRACED FOR 15 PSI - COLOR ANSI 61
2 WELDED COVER WITH GASKET AND LIFTING LOOPS FOR LIFTING COVER ONLY.
3 BASE - DESIGNED FOR ROLLING PARALLEL TO CENTERLINES AND TYPICAL ANCHORING IS WELDED.
4 FALL ARREST MOUNTING BASE - FOR MANUFACTURING PURPOSES.
5 REMOVABLE EXTERNAL CORE GROUND LOCATED INSIDE ENCLOSURE.
6 2.0 DRAIN VALVE/LOWER FILTER PRESS WITH .38 SAMPLER.
7 STAINLESS STEEL GROUND PADS - 2 HOLE NEMA DRILLING - 8 TOTAL.
8 NAMEPLATE AND WARNING DECAL.
9 LIQUID TEMPERATURE GAUGE WITH ALARM CONTACTS.
10 MAGNETIC LIQUID LEVEL GAUGE WITH ALARM CONTACTS.
11 VACUUM PRESSURE GAUGE WITH ALARM CONTACT,AIR TEST (BLEEDER) AND SEALEDAIRE.
12 RAPID PRESSURE RISE RELAY.
13 LIFTING HOOK FOR LIFTING COMPLETE TRANSFORMER. THE TRANSFORMER IS DESIGNED FOR LIFTING WITH 4 VERTICAL SLINGS. THIS MAY REQUIRE THE USE OF A SPREADER OR LIFTING BEAM.
** 14 REMOVABLE 20.5" GALVANIZED RADIATORS - 4 TOTAL. FIELD FILLING INSTRUCTIONS - SEE DRAWING 8D12328 - CASE 2 - A = 218 B =1.00 C = 55.00
15 BOLTED MANHOLE - 24.00 X 12.00 OPENING, WITH NITRILE GASKET - 2 TOTAL.
16 DE-ENERGIZED TAP CHANGER - WITH .38 HOLE FOR PADLOCKING.
17 2.0 VALVE FOR UPPER FILTER PRESS CONNECTION.
18 RELIEF DEVICE WITH SEMAPHORE, OVER A 6.50 HANDHOLE.
** 19 AIR BLAST FAN ENCLOSED IN SAFETY CAGE - 04 TOTAL.
20 PROCESSING PORT FOR MANUFACTURING.
21 CURRENT TRANSFORMER FEED THROUGH - 4 TOTAL.
22 REMOTE HOT SPOT WINDING TEMPERATURE INDICATOR WITH ALARMS.
23 LV BUSHING STYLE 8D12973H01 10.00 CL TO CL - SEE DETAIL 23
24 HV BUSHING STYLE 8D12245H01 18.10 CL TO CL - SEE DETAIL 24
25 LV WELDED-ON ATC WITH NON-MAGNETIC ENTRANCE PLATE - SEE DETAIL 02
26 HV WELDED-ON ATC WITH NON-MAGNETIC ENTRANCE PLATE - PER DETAIL 03
27 JACKING PROVISIONS ON TANK FOR JACKING COMPLETE UNIT
28 NEMA 4 CONTROL CABINET.
29 TAP CHANGER WARNING TAG.
30 CORE GROUND WARNING TAG.
31 COPPER GROUND BAR - 2 TOTAL.
32 CABLE SUPPORTS- 2 TOTAL.
33 18KV STATION CLASS ARRESTERS, ABB STYLE# Q018SA015A - 3 TOTAL
34 42KV STATION CLASS ARRESTERS, ABB STYLE# Q042SA034B - 3 TOTAL
35 DANGER HIGH VOLTAGE SIGN.

** ITEMS ARE REMOVED FOR SHIPMENT

RENEWAL PARTS FOR OUTLINE
A SPARE SET OF ALL GASKETS AND
1 OF EACH STYLE BUSHING IS RECOMMENDED FOR STOCK.
FOR PRICES CONTACT YOUR FIELD SALES OFFICE

ORDER RENEWAL PARTS BY STYLE NUMBER AS FOLLOWS:
STYLE NUMBER = OUTLINE NUMBER - ITEM NUMBER - QUANTITY.
EXAMPLE: BS0013201-24-1.
FOR GASKETS ONLY PLACE A 'G' IN FRONT OF OUTLINE NUMBER
EXAMPLE: GBS0013201-24-1. (ONE GASKET)
EXAMPLE: GBS0013201 (ALL GASKETS)

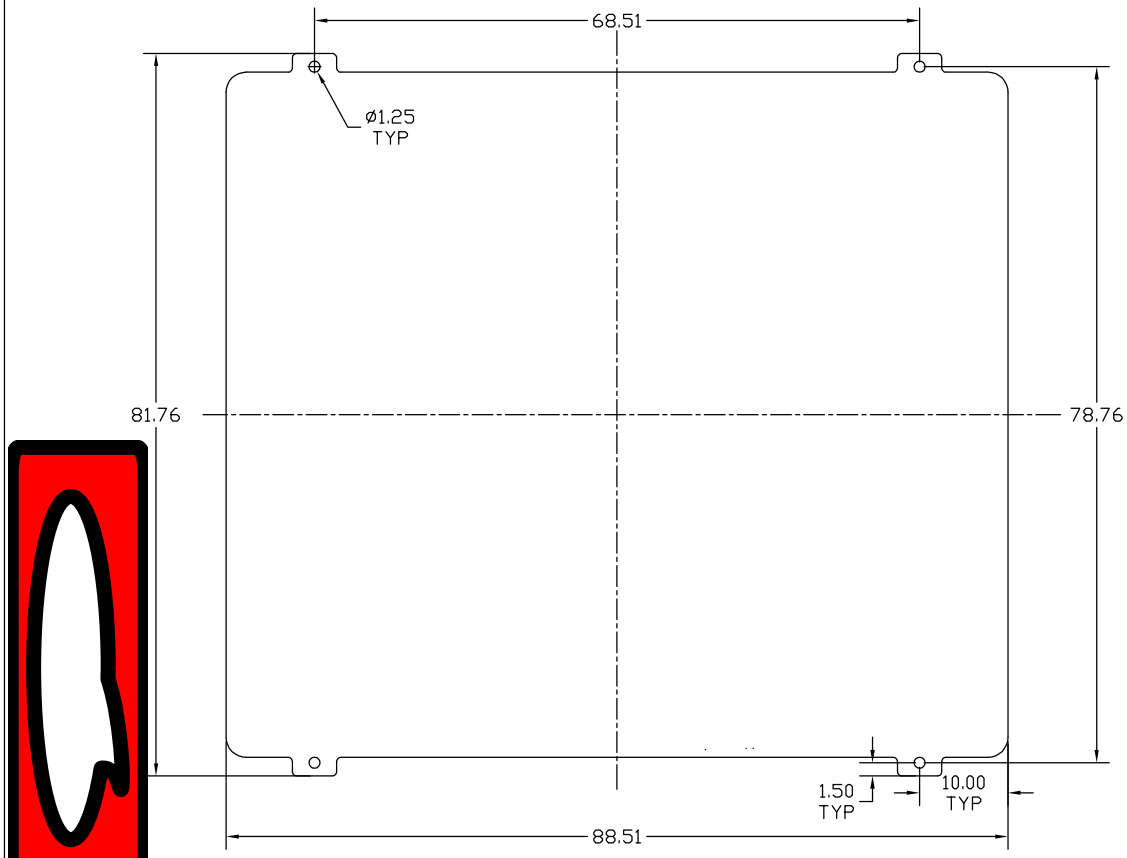
⊕ DESIGNATES CENTER OF GRAVITY COMPLETE		TEMP RISE	KNAN/KNAF KVA -
FROM GROUND IN FRONT VIEW	30.482	65° C	12000/20000
LEFT OF CENTERLINE TOP VIEW	1.677		
ABOVE CENTERLINE TOP VIEW	18.456		
DESIGN IMPEDANCE 6.500 %			

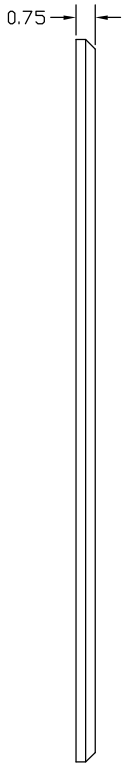
HV 150 KV BIL | LV 95 KV BIL

APPARATUS UNIT SUBSTATION TRANSFORMER CLASS KNAN/KNAF OUTDOOR
60 HERTZ 12000 KVA HV 34500Y/1992 LV 13800-DELTA 3 PH

DFTM M.Clark	01/29/15	WIRING DIAGRAM	ILUSBS0013201	MFR. ID	DRAWING NUMBER
CHKD D.Guill	01/29/15	NAME PLATE	ILUSBS0013201	ILUS	BS0013201
APPD		INSTRUCTION BOOK	PC-1002		
SMALL POWER TRANSFORMER			DIMENSIONS IN INCHES-SCALE NTS		

CHANGE





AS BUILT DRAWINGS
Mar 21, 2016
ABB - South Boston, VA

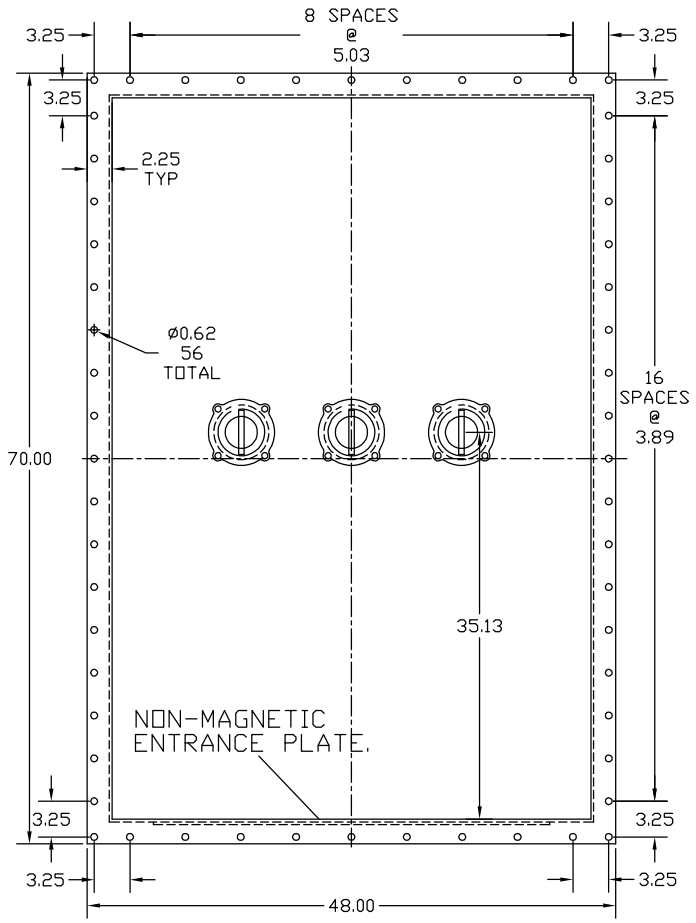
DETAIL NUMBER 01 - BASE
SHOP ORDER BS00132

ABB INC.
SOUTH BOSTON, VIRGINIA U.S.A.

DIMENSIONS IN INCHES - NTS

CHANGE

AS BUILT DRAWINGS
Mar 21, 2016
ABB - South Boston, VA



REMOVABLE FRONT
DETAIL NUMBER 02 - ACCESS PANEL
SHOP ORDER BS00132

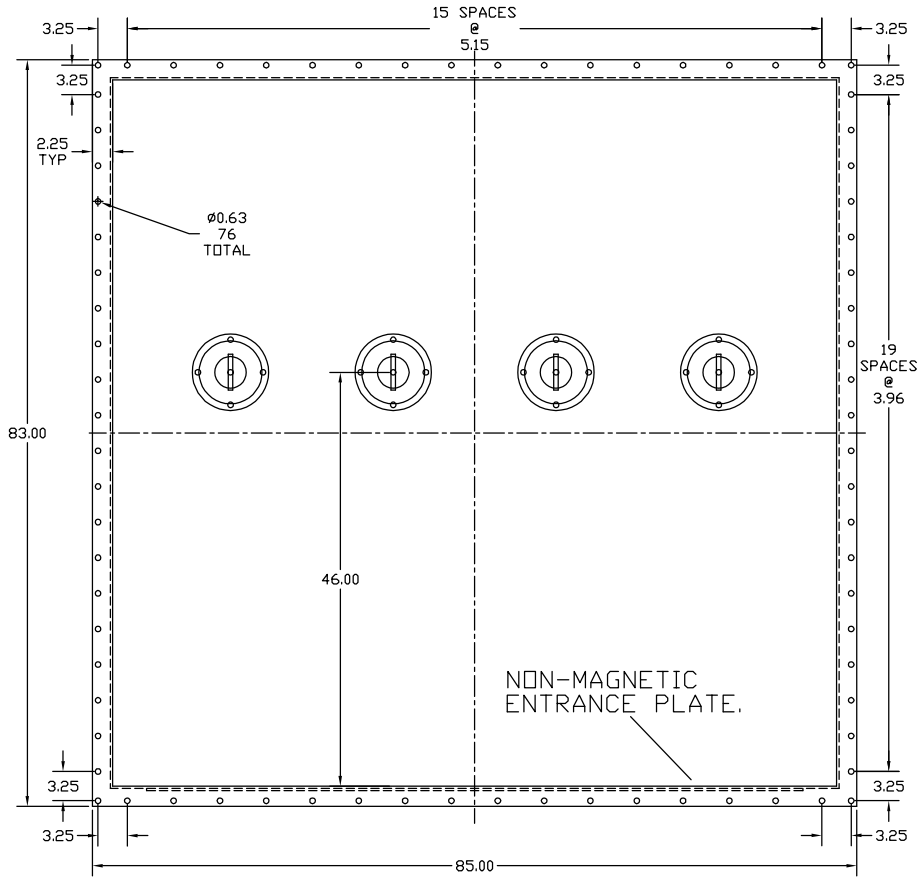
THROAT HAS 19.82 X 33.50 HANDHOLE

ABB INC.
SOUTH BOSTON, VIRGINIA U.S.A.

DIMENSIONS IN INCHES - NTS

CHANGE

AS BUILT DRAWINGS
Mar 21, 2016
ABB - South Boston, VA



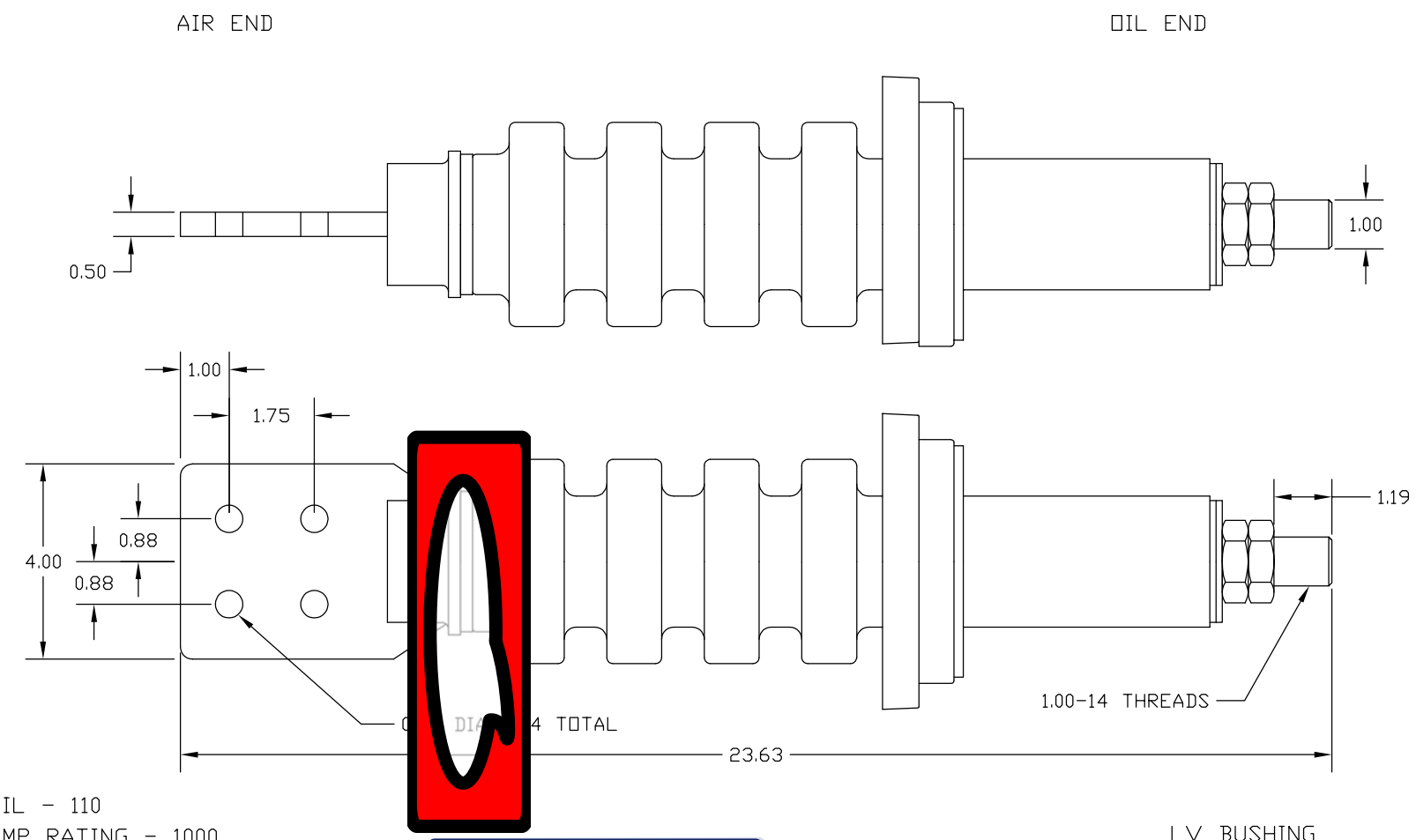
REMOVABLE FRONT
DETAIL NUMBER 03 - ACCESS PANEL
SHOP ORDER BS00132

THROAT HAS 28.82 X 70.50 HANDHOLE

ABB INC.
SOUTH BOSTON, VIRGINIA U.S.A.

DIMENSIONS IN INCHES - NTS

CHANGE



BIL - 110
AMP RATING - 1000
BUSHING MATERIAL - PORCELAIN
LEAD MATERIAL - COPPER
PART NUMBER - 8D12973H01

AS BUILT DRAWINGS
Mar 21, 2016
ABB - South Boston, VA

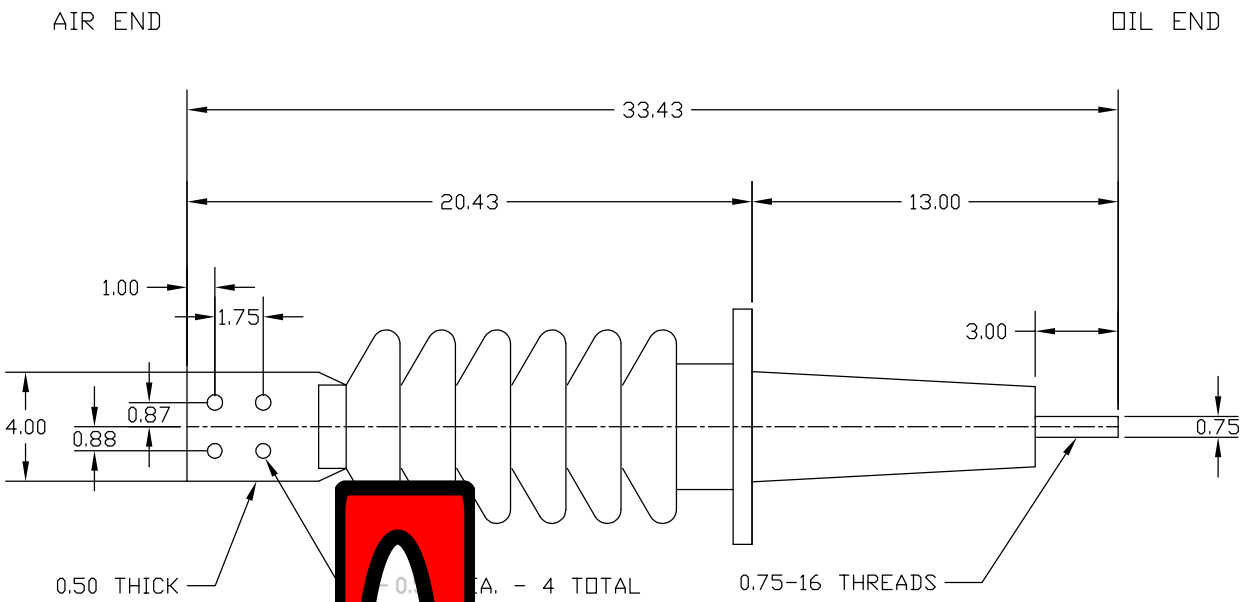
SHOP ORDER BS00132

LV BUSHING
DETAIL NUMBER 23

ABB INC.
SOUTH BOSTON, VIRGINIA U.S.A.

DIMENSIONS IN INCHES - NTS

CHANGE



BIL - 200
AMP RATING - 442
BUSHING MATERIAL - PORCELAIN
LEAD MATERIAL - COPPER
PART NUMBER - 8D12245H01

AS BUILT DRAWINGS
Mar 21, 2016
ABB - South Boston, VA

SHOP ORDER BS00132

HV BUSHING
DETAIL NUMBER 24

ABB INC.
SOUTH BOSTON, VIRGINIA U.S.A.

DIMENSIONS IN INCHES - NTS

WIEGMANN CONTROL CABINET - STAINLESS STEEL RATED NEMA 4X

42.00" H X 48.00" W X 20.00" D

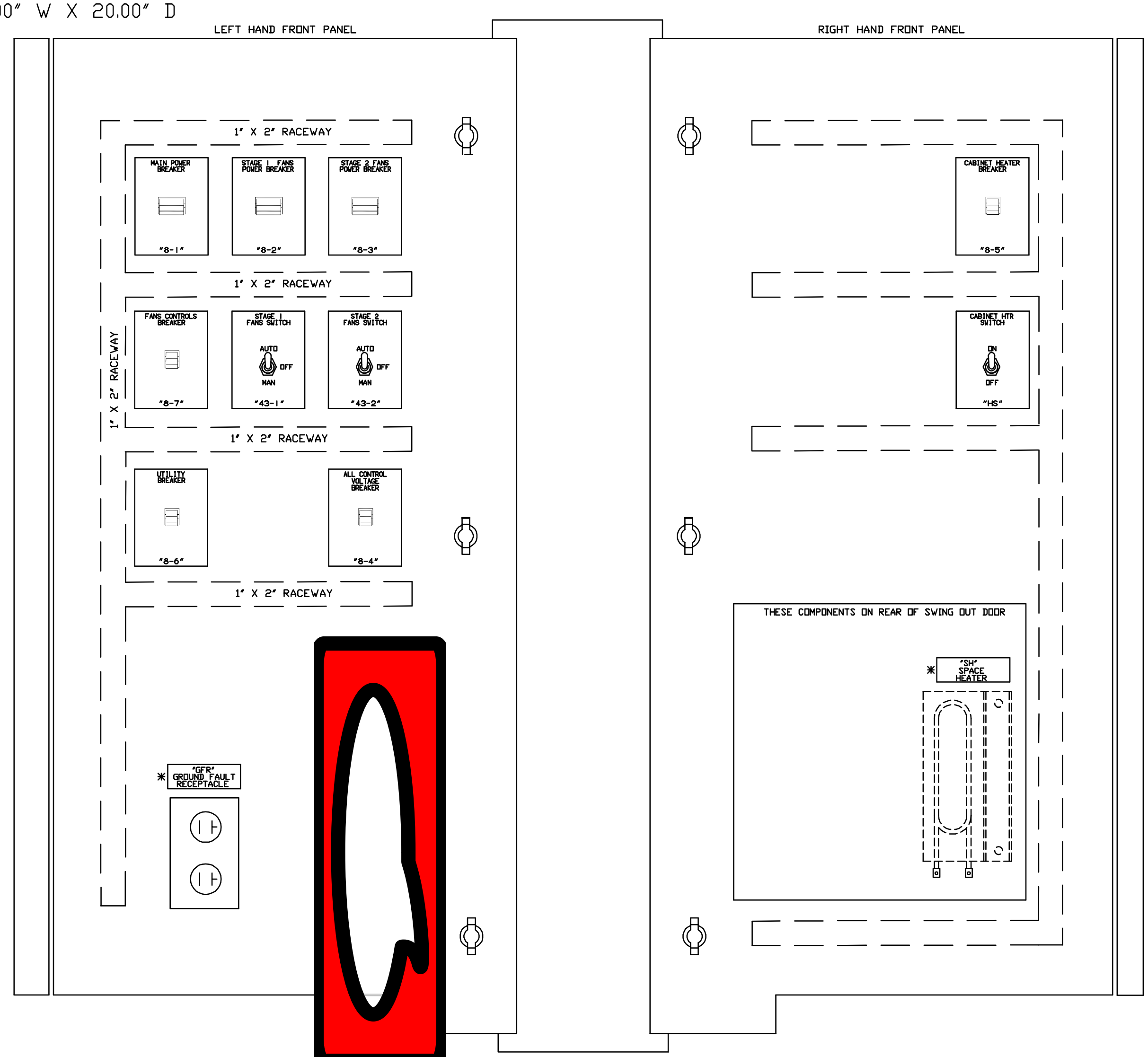


ABB INC.
SMALL POWER TRANSFORMERS
SOUTH BOSTON, VIRGINIA U.S.A.

NOTE: THIS WIRING DIAGRAM MUST NOT BE USED TO DETERMINE THE EXACT LOCATION OF APPARATUS, WIRES OR CABLES. ALL APPARATUS IS SHOWN IN DE-ENERGIZED POSITION. ALL ALARM CONTACTS SHOWN IN NORMAL OPERATING CONDITION.

THE MATERIAL SUPPLIED BY ABB INC. IS ACCORDING TO CONTRACT AND IS NOT MODIFIED BY ANYTHING SHOWN ON THIS DIAGRAM.

STAY PUT / SPRING RETURN	SWITCH CONTACT
NORMALLY OPEN / NORMALLY CLOSED	RELAY CONTACT
	OPERATING COIL
	DISCONNECT DEVICE
	OPERATING COIL
	CAPACITOR
	CIRCUIT BREAKER
	THERMAL ELEMENT

GRD	GROUND BAR
26Q	THERMOMETER 1 FAN CONTACT (STARTS FANS 60° C AUTOMATICALLY BY LIQUID TEMPERATURE) 2 AUXILLIARY CONTACT 65° C 3 ALARM CONTACT 90° C 4 TRIP CONTACT 105° C
71Q	LIQUID LEVEL GAUGE 1 ALARM CONTACT (LOW LEVEL)
49T	DIAL HOT SPOT THERMOMETER 1 FAN CONTACT 70° C - STAGE 1 2 FAN CONTACT 75° C - STAGE 2 3 ALARM CONTACT 112° C 4 TRIP CONTACT 117° C H HEATER
63	RAPID PRESSURE RISE RELAY DEVICE
63X	RAPID PRESSURE RISE RELAY PANEL
HS	HEATER SWITCH(ES)
T1	CABINET THERMOSTAT
SH	CABINET SPACE HEATER
LS	LIGHT SWITCH (DOOR ACTIVATED)
LT	LIGHT
GFR	GROUND FAULT RECEPTACLE - 120 VOLT AC - 15 AMP
88F	FAN MOTOR(S) 480 VAC ABSOLUTE, 3 PH, 60 HZ
43	AUTO-MANUAL SWITCH(ES)
4	FAN CONTACTOR(S)
8-1	MAIN CIRCUIT BREAKER 16A/480V/3P
8-2	MAIN CIRCUIT BREAKER 4A/480V/3P
8-3	MAIN CIRCUIT BREAKER 4A/480V/3P
8-4	MAIN CIRCUIT BREAKER 32A/120V/1P
8-5	MAIN CIRCUIT BREAKER 1A/120V/1P
8-6	MAIN CIRCUIT BREAKER 20A/120V/1P
8-7	MAIN CIRCUIT BREAKER 1A/120V/1P

- (A) THE EXACT NUMBER OF FANS IS 4
- (B) CUSTOMER SUPPLY - 480 VAC, 3 WIRE, 3 PH, 60 HZ
- (C) 125 VDC, CUSTOMER SUPPLY
- (D) CUSTOMER TO SET JUMPER BLOCK CONNECTION FOR SELECTED SUPPLY VOLTAGE - SEE TABLE 3 - SHIPPED IN 125 VOLTS DC CONNECTION
- (G) FANS SHUTDOWN CONTACT REMOVE JUMPER WHEN USING REMOTE DEVICE
- (H1) REMOTE START STAGE 1 - WILL BYPASS AUTO-OFF-MANUAL SWITCH CONTROLS
- (H2) REMOTE START STAGE 2 - WILL BYPASS AUTO-OFF-MANUAL SWITCH CONTROLS
- (I1) REMOTE STOP STAGE 1 - BYPASSES ALL OTHER FAN CONTROLS REMOVE JUMPER IF REMOTE DEVICE IS USED
- (I2) REMOTE STOP STAGE 2 - BYPASSES ALL OTHER FAN CONTROLS REMOVE JUMPER IF REMOTE DEVICE IS USED

* MICARTA TAGS — ALL DEVICES IN CONTROL CABINET MUST BE IDENTIFIED WITH MICARTA TAGS WHITE WITH 1/4" HIGH BLACK LETTERS

* FLEXIBLE METAL CONDUIT
* INSTRUMENT WIRE SIZE - #14 AWG EXCEPT WHEN INDICATED
* CONTROL POWER WIRE SIZE - #12 AWG EXCEPT WHEN INDICATED
* CURRENT TRANSFORMER WIRE SIZE - #10 AWG EXCEPT WHEN INDICATED
* ALL WIRING TO BE SIS TYPE.
* STATES TERMINAL BLOCKS
* RING TONGUE TYPE TERMINALS ONLY

SHEET 1 OF 5

IT	CHANGE
1	REVISED TO CORRECT LAYOUT AFTER CIRCUIT BREAKER STYLE CHANGE BREAKER AMPS ALSO REVISED 01/05/2015 M.VALLIA
2	REVISED TO CHANGE BREAKER DESIGNATION AS PER QN#200157870 01/31/2015 M.VALLIA
3	REVISED TO CHANGE RPRR VOLTAGE TO 48V AS PER QN#200189579 03/21/2016 M.VALLIA

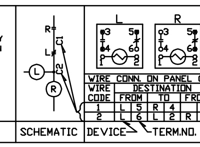
AS BUILT DRAWINGS
Mar 21, 2016
ABB - South Boston, VA

CUSTOMER ID

CHARTS OF THE WIRE CONNECTIONS FOR THE PHYSICAL LAYOUT OF THE PANEL COMPARTMENT, OR GENERAL AREA TO WHICH THEIR LISTINGS APPLY ARE SHOWN EITHER ADJOINING THESE AREAS OR ON DWG. LISTED AT THE RIGHT OF THIS EXPLANATION.

WIRE CODE NO'S. CORRESPOND TO THOSE APPEARING ON THE SCHEMATIC DIAGRAM. "X" PLACED AT THE DEVICE TERMINAL INDICATES UNUSED TERMINAL.

EXPLANATION



WIRE CODE	DESTINATION FROM	TO	FROM
1	L 5	R 4	
2	L 6	L 2	R 1

SCHEMATIC — DEVICE — TERM.NO.

ABB INC.
TRANSFORMER
WIRING DIAGRAM

DFTM	Michael D. Vallia	03/13/2015	MFR. ID: 1LUS
CHKD			DRAWING NUMBER: BS00132W1
APPD	Daniel Gull	03/13/2015	

SMALL POWER TRANSFORMER

ABB INC.
POWER TRANSFORMERS
SOUTH BOSTON, VIRGINIA U.S.A.

NOTE: ... NOT BE USED TO DETERMINE THE EXACT ... WIRES OR CABLES. ALL APPARATUS IS SHOWN IN ... ALL ALARM CONTACTS SHOWN IN NORMAL OPERATING ...

... ABB INC. IS ACCORDING TO ... IFIED BY ANYTHING SHOWN ON THIS DIAGRAM.

SWITCH CONTACT

RELAY CONTACT

OPERATING COIL

DISCONNECT DEVICE

OPERATING COIL

CAPACITOR

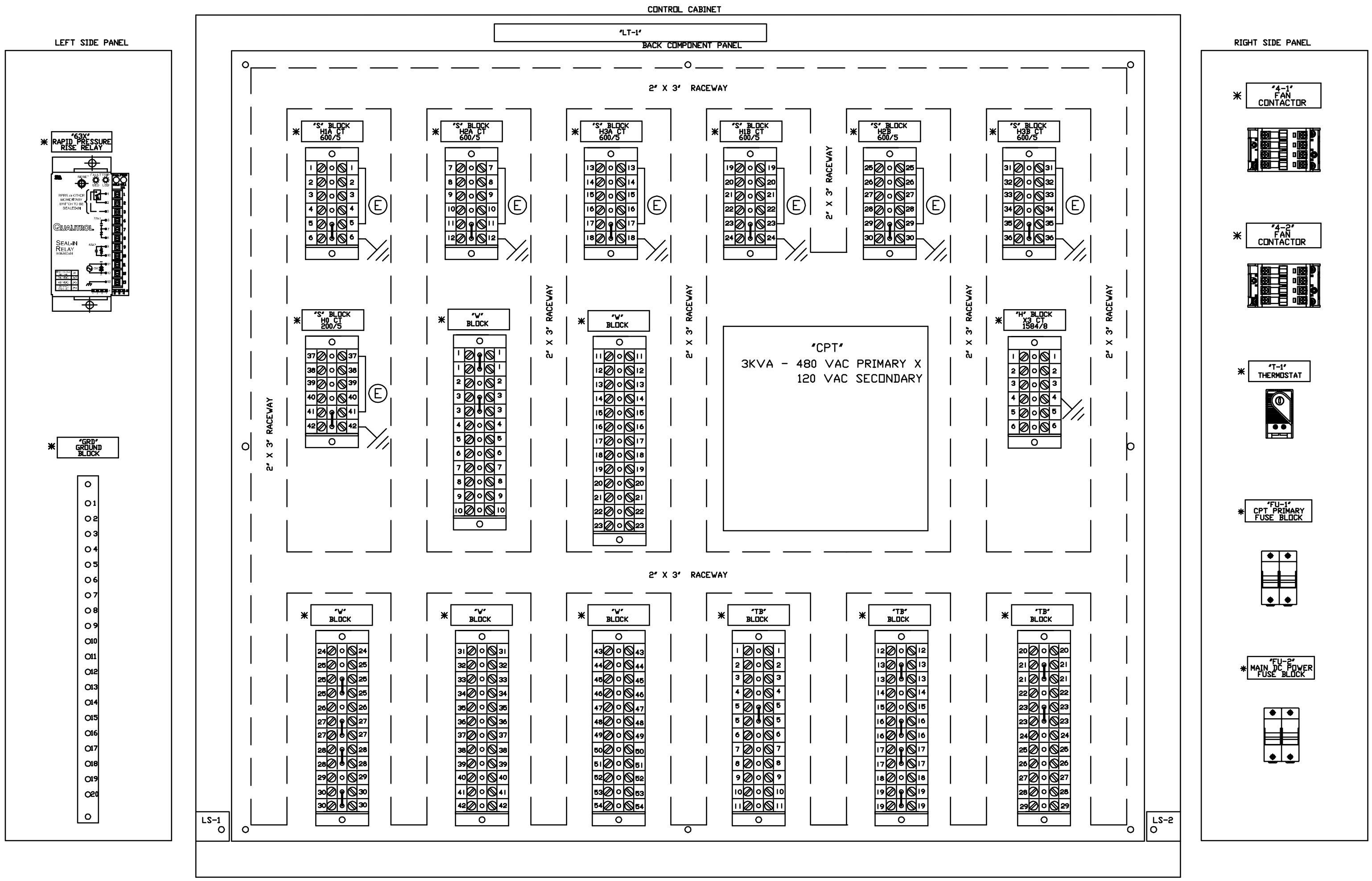
CIRCUIT BREAKER

THERMAL ELEMENT

AS BUILT DRAWINGS

Mar 21, 2016

ABB - South Boston, VA



LEFT SIDE PANEL
"63X" RAPID PRESSURE RISE RELAY
"GRD" GROUND BLOCK
CONTROL CABINET
"LT-1"
BACK COMPONENT PANEL
2" X 3" RACEWAY
"S" BLOCK H1A CT 600/5
"S" BLOCK H2A CT 600/5
"S" BLOCK H3A CT 600/5
"S" BLOCK H1B CT 600/5
"S" BLOCK H2B 600/5
"S" BLOCK H3B CT 600/5
"S" BLOCK H0 CT 200/5
"V" BLOCK
"H" BLOCK X3 CT 1584/8
"CPT"
3KVA - 480 VAC PRIMARY X
120 VAC SECONDARY
"TB" BLOCK
LS-1
LS-2
RIGHT SIDE PANEL
"4-1" FAN CONTACTOR
"4-2" FAN CONTACTOR
"T-1" THERMOSTAT
"FU-1" CPT PRIMARY FUSE BLOCK
"FU-2" MAIN DC POWER FUSE BLOCK

LAYOUT DRAWING
DRAWING NOT TO SCALE

SHEET 2 OF 5

IT	CHANGE
1	
2	REVISED TERMINALS TO MATCH SPEC. 01/16/2016 - M. VALLIA
3	REVISED TERMINALS & REMOVED JUMPERS NOT NEEDED 01/16/2016 - M. VALLIA

CUSTOMER ID

CHARTS OF THE WIRE CONNECTIONS FOR THE PHYSICAL LAYOUT OF THE PANEL COMPARTMENT, OR GENERAL AREA TO WHICH THEIR LISTINGS APPLY ARE SHOWN EITHER ADJOINING THESE AREAS OR ON DWG. LISTED AT THE RIGHT OF THIS EXPLANATION.

WIRE CODE NO'S. CORRESPOND TO THOSE APPEARING ON THE SCHEMATIC DIAGRAM. "X" PLACED AT THE DEVICE TERMINAL INDICATES UNUSED TERMINAL.

EXPLANATION

SCHEMATIC

WIRE CODE	WIRE CONN. ON PANEL C DESTINATION FROM	TO	FROM
1	L 5	R 4	
2	L 6	L 2	R 1

DEVICE — TERM.NO.

ABB INC.
TRANSFORMER
WIRING DIAGRAM

DFTM	Michael D. Vallia	03/13/2015	MFR. ID	DRAWING NUMBER
CHKD			1LUS	BS00132W2
APPD	Daniel Gull	03/13/2015		

SMALL POWER TRANSFORMER

WIRE CODE	DESTINATION FROM		TO		FROM		WIRE SIZE
W1	26Q(1)	RED	W	1			14
W3	26Q(1)	BLK	W	3			14
W4	26Q(2)	ORN	W	4			14
W6	26Q(2)	YEL	W	6			14
W7	26Q(3)	BLU/BLK	W	7			14
W8	26Q(3)	ORN/BLK	W	8			14
W9	26Q(3)	RED/BLK	W	9			14
W10	26Q(4)	BRN/BLK	W	10			14
W11	26Q(4)	BLK/RED	W	11			14
W12	26Q(4)	YEL/BLK	W	12			14
W13	71Q(1)	WHT	W	13			14
W14	71Q(1)	BLK	W	14			14
W15	71Q(1)	GRN	W	15			14
W16	63VP(V)	3	W	16			14
W17	63VP(V)	1	W	17			14
W18	63VP(V)	2	W	18			14
W19	63VP(P)	6	W	19			14
W20	63VP(P)	4	W	20			14
W21	63VP(P)	5	W	21			14
W25	49T(1)	RED	W	25			14
W26	49T(1)	BLU	W	26			14
W27	49T(1)	BLK	W	27			14
W28	49T(2)	YEL	W	28			14
W29	49T(2)	BRN	W	29			14
W30	49T(2)	ORN	W	30			14
W31	49T(3)	BLU/BLK	W	31			14
W32	49T(3)	ORN/BLK	W	32			14
W33	49T(3)	RED/BLK	W	33			14
W34	49T(4)	BRN/BLK	W	34			14
W35	49T(4)	BLK/RED	W	35			14
W36	49T(4)	YEL/BLK	W	36			14
H1	49TH	1	H	1			14
H4	49TH	6	H	4	GRD		14
W37	63	BLK	W	37	63X	1	14
W38	63	WHT	W	38	63X	2	14
W39	63	GRN	W	39	63X	3	14
TB28	FU-1	1	TB	28			12
TB29	FU-1	3	TB	29			12
J50	FU-1	2	63X	12			12
J51	FU-1	4	63X	11			12
GRD	GRD		63X	13			12 GRN
W40	W	40	63X	6			14
W41	W	41	63X	7			14
W42	W	42	63X	8			14
W43	W	43	63X	9			14
W44	W	44	63X	10			14

TABLE I

ALARM SWITCH RATINGS

CONTACT VOLTAGE	MAKE (ALL LOADS)	BREAK TYPE OF LOAD FOR N.O. AND N.C. CONTACTS (AMPS) RESISTANCE	●INDUCTIVE
115 AC	20	15.0	15.0
230 AC	20	15.0	15.0
24 DC	20	10.0	5.0
48 DC	20	1.5	0.75
125 DC	20	0.5	0.25
250 DC	20	0.25	0.125

● L/R LESS THAN 0.026, WHERE
L = INDUCTANCE IN HENRIES AND
R = RESISTANCE IN OHMS

AS BUILT DRAWINGS

Mar 21, 2016

ABB - South Boston, VA

TABLE II

63X-SEAL-IN RELAY CONTACT RATINGS

MAKE (ALL LOADS)	CARRY (ALL LOADS)	BREAK TYPE OF LOAD FOR N.O. AND N.C. CONTACTS (AMPS) RESISTANCE	●INDUCTIVE	CONTACT VOLTAGE
20	10	10.0	5.0	115 AC
20	10	5.0	2.5	230 AC
20	10	5.0	3.0	24 DC
20	10	2.0	1.0	48 DC
20	10	0.5	0.25	125 DC

● L/R LESS THAN 0.026, WHERE
L = INDUCTANCE IN HENRIES AND
R = RESISTANCE IN OHMS

ABB INC.
SMALL POWER TRANSFORMERS
SOUTH BOSTON, VIRGINIA U.S.A.

NOTE: THIS WIRING DIAGRAM MUST NOT BE USED TO DETERMINE THE EXACT LOCATION OF APPARATUS, WIRES OR CABLES. ALL APPARATUS IS SHOWN IN DE-ENERGIZED POSITION. ALL ALARM CONTACTS SHOWN IN NORMAL OPERATING CONDITION.

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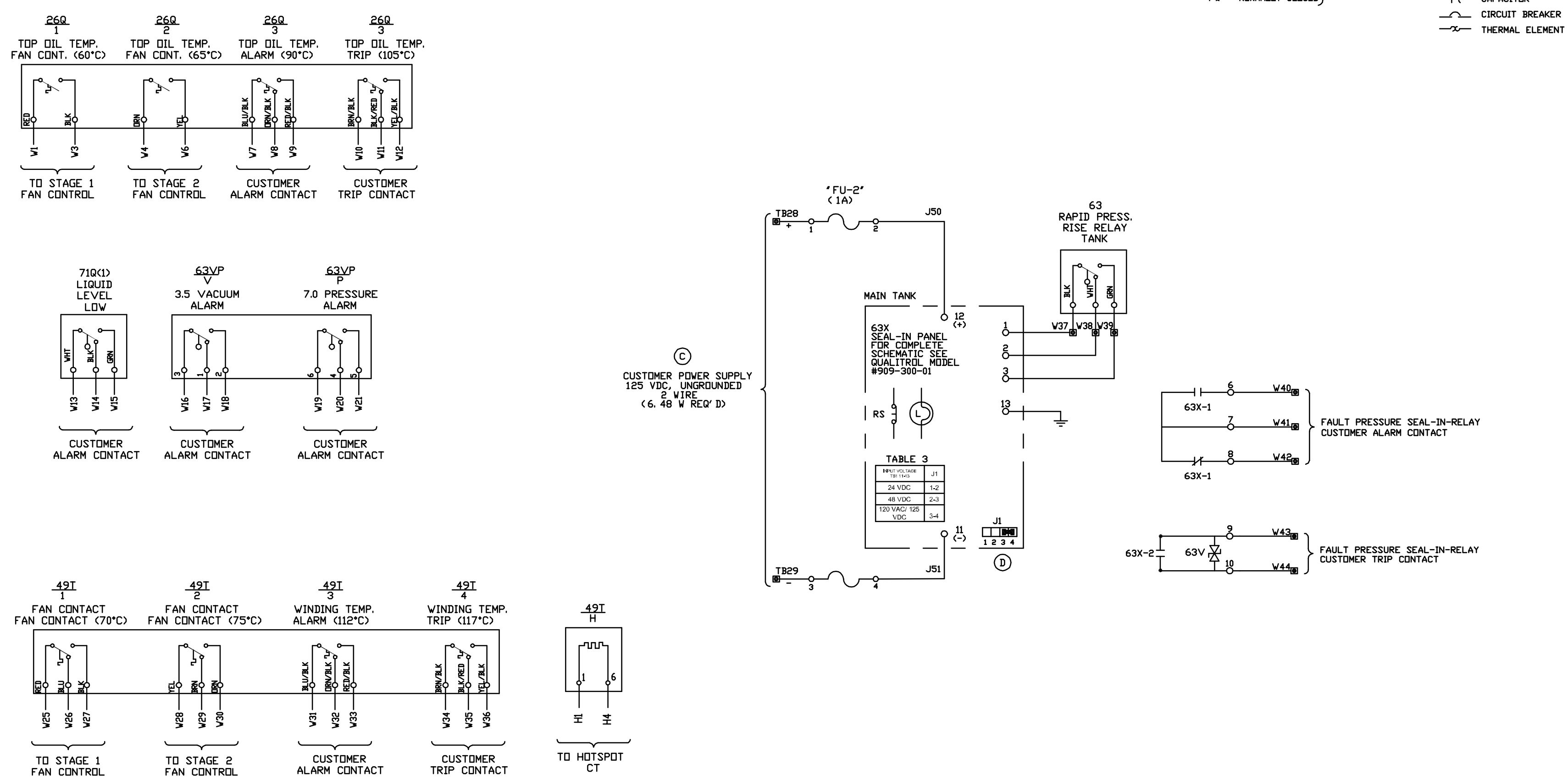
STAY PUT / SPRING RETURN — SWITCH CONTACT
NORMALLY OPEN / NORMALLY CLOSED — RELAY CONTACT
OPERATING COIL
DISCONNECT DEVICE
OPERATING COIL
CAPACITOR
CIRCUIT BREAKER
THERMAL ELEMENT



26Q 1 TOP OIL TEMP. FAN CONT. (60°C)
26Q 2 TOP OIL TEMP. FAN CONT. (65°C)
26Q 3 TOP OIL TEMP. ALARM (90°C)
26Q 3 TOP OIL TEMP. TRIP (105°C)
RED BLK ORN YEL BLU/BLK ORN/BLK RED/BLK BRN/BLK BLK/RED YEL/BLK
V1 V3 V4 V6 V7 V8 V9 V10 V11 V12
TO STAGE 1 FAN CONTROL
TO STAGE 2 FAN CONTROL
CUSTOMER ALARM CONTACT
CUSTOMER TRIP CONTACT
71Q(1) LIQUID LEVEL LOW
63VP V 3.5 VACUUM ALARM
63VP P 7.0 PRESSURE ALARM
WHT BLK GRN
V13 V14 V15 V16 V17 V18 V19 V20 V21
CUSTOMER ALARM CONTACT
CUSTOMER ALARM CONTACT
CUSTOMER ALARM CONTACT
49T 1 FAN CONTACT FAN CONTACT (70°C)
49T 2 FAN CONTACT FAN CONTACT (75°C)
49T 3 WINDING TEMP. ALARM (112°C)
49T 4 WINDING TEMP. TRIP (117°C)
49T H
RED BLU BLK YEL BRN ORN BLU/BLK ORN/BLK RED/BLK BRN/BLK BLK/RED YEL/BLK
V25 V26 V27 V28 V29 V30 V31 V32 V33 V34 V35 V36 H1 H4
TO STAGE 1 FAN CONTROL
TO STAGE 2 FAN CONTROL
CUSTOMER ALARM CONTACT
CUSTOMER TRIP CONTACT
TO HOTSPOT CT
'FU-2' (1A)
TB28 +
J50
TB29 -
J51
C
CUSTOMER POWER SUPPLY 125 VDC, UNGROUNDED 2 WIRE (6. 48 W REQ'D)
MAIN TANK
63X SEAL-IN PANEL FOR COMPLETE SCHEMATIC SEE QUALITROL MODEL #909-300-01
12 (+)
11 (-)
RS
TABLE 3
24 VDC 1-2
48 VDC 2-3
120 VAC/ 125 VDC 3-4
J1
D
63 RAPID PRESS. RISE RELAY TANK
BLK WHT GRN
V37 V38 V39
63X-1
63X-1
V40 V41 V42
FAULT PRESSURE SEAL-IN-RELAY CUSTOMER ALARM CONTACT
63X-2
63V
V43 V44
FAULT PRESSURE SEAL-IN-RELAY CUSTOMER TRIP CONTACT

SHEET 3 OF 5

1	CHANGE — IT
2	REVISED TERMINALS TO MATCH SPEC. AND GAUGE DESIG. 01/16/2016 - M. VALLIA — IT
3	REVISED AS PER CUSTOMER MARKUPS /ALSO FAN CIRC. FOR FUNCTIONALITY. QN# 200189579 QN# 200189594 02/06/2016 - M. VALLIA — IT

CUSTOMER ID

CHARTS OF THE WIRE CONNECTIONS FOR THE PHYSICAL LAYOUT OF THE PANEL COMPARTMENT, OR GENERAL AREA TO WHICH THEIR LISTINGS APPLY ARE SHOWN EITHER ADJOINING THESE AREAS OR ON DWG. LISTED AT THE RIGHT OF THIS EXPLANATION.

WIRE CODE NO'S. CORRESPOND TO THOSE APPEARING ON THE SCHEMATIC DIAGRAM. "X" PLACED AT THE DEVICE TERMINAL INDICATES UNUSED TERMINAL.

EXPLANATION

SCHEMATIC

WIRE CONN. ON PANEL C

WIRE CODE	DESTINATION FROM		TO		FROM	
1	L	5	R	4		
2	L	6	L	2	R	1

DEVICE — TERM.NO.

ABB INC.
TRANSFORMER
WIRING DIAGRAM

DFTM Michael D. Vallia	03/13/2015	MFR. ID 1LUS	DRAWING NUMBER BS00132W3
CHKD			
APPD Daniel Gulll	03/13/2015		

SMALL POWER TRANSFORMER

WIRE CODE	DESTINATION FROM		TO		FROM		WIRE SIZE
S1	M	1	S	1			10
S2	M	2	S	2			10
S3	M	3	S	3			10
S4	M	4	S	4			10
S5	M	5	S	5			10
S7	M	6	S	7			10
S8	M	7	S	8			10
S9	M	8	S	9			10
S10	M	9	S	10			10
S11	M	10	S	11			10
S13	N	1	S	13			10
S14	N	2	S	14			10
S15	N	3	S	15			10
S16	N	4	S	16			10
S17	N	5	S	17			10
S19	N	6	S	19			10
S20	N	7	S	20			10
S21	N	8	S	21			10
S22	N	9	S	22			10
S23	N	10	S	23			10
S25	P	1	S	25			10
S26	P	2	S	26			10
S27	P	3	S	27			10
S28	P	4	S	28			10
S29	P	5	S	29			10
S31	P	6	S	31			10
S32	P	7	S	32			10
S33	P	8	S	33			10
S34	P	9	S	34			10
S35	P	10	S	35			10
S37	Q	1	S	37			10
S41	Q	5	S	41			10
H1	Q	6	H	1			10
H2	Q	7	H	2			10
H3	Q	8	H	3			10
H4	Q	9	H	4			10
H5	Q	10	H	5			10

LOCATION TANK WALL — JUNC BLK M 1-10

LOCATION TANK WALL — JUNC BLK N 1-10

LOCATION TANK WALL — JUNC BLK P 1-10

LOCATION TANK WALL — JUNC BLK Q 1-10

600/5 M.R.C.T. ACCURACY CLASS C 200	
NOMINAL RATIO	LEADS ON
50 TO 5	X2 - X3
100 TO 5	X1 - X2
150 TO 5	X1 - X3
200 TO 5	X4 - X5
250 TO 5	X3 - X4
300 TO 5	X2 - X4
400 TO 5	X1 - X4
450 TO 5	X3 - X5
500 TO 5	X2 - X5
600 TO 5	X1 - X5

1584/8 M.R.C.T. HOT SPOT C.T.	
NOMINAL RATIO	LEADS ON
104 TO 8	X1 - X2
216 TO 8	X3 - X4
240 TO 8	X4 - X5
456 TO 8	X3 - X5
1024 TO 8	X2 - X3
1128 TO 8	X1 - X3
1240 TO 8	X2 - X4
1344 TO 8	X1 - X4
1480 TO 8	X2 - X5
1584 TO 8	X1 - X5

200/5 S.R.C.T. ACCURACY CLASS C200	
NOMINAL RATIO	LEADS ON
200 TO 5	X1 - X2

ABB INC.
SMALL POWER TRANSFORMERS
SOUTH BOSTON, VIRGINIA U.S.A.

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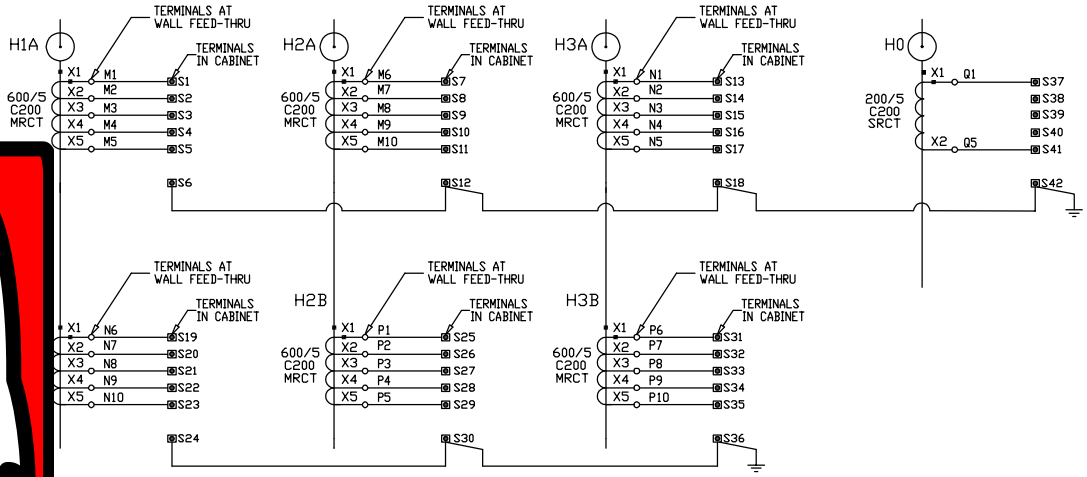
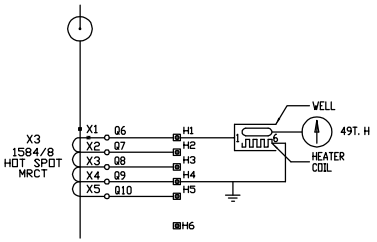
SWITCH CONTACT: STAY PUT, SPRING RETURN
RELAY CONTACT: NORMALLY OPEN, NORMALLY CLOSED

OPERATING COIL
DISCONNECT DEVICE
OPERATING COIL
CAPACITOR
CIRCUIT BREAKER
THERMAL ELEMENT





AS BUILT DRAWINGS
Mar 21, 2016
ABB - South Boston, VA

SHEET 4 OF 5

1	IT	CHANGE
2	IT	REVISED DESTINATION AS PER CUSTOMER MARKUPS ON# 20015787/0 07/30/2015 - M. VALLIA

CUSTOMER ID

CHARTS OF THE WIRE CONNECTIONS FOR THE PHYSICAL LAYOUT OF THE PANEL COMPARTMENT, OR GENERAL AREA TO WHICH THEIR LISTINGS APPLY ARE SHOWN EITHER ADJOINING THESE AREAS OR ON DVG. LISTED AT THE RIGHT OF THIS EXPLANATION.

WIRE CODE NO'S. CORRESPOND TO THOSE APPEARING ON THE SCHEMATIC DIAGRAM. "X" PLACED AT THE DEVICE TERMINAL INDICATES UNUSED TERMINAL.

EXPLANATION

SCHEMATIC | DEVICE | TERM.NO.

WIRE CONN. ON PANEL C

WIRE CODE	DESTINATION FROM	TO	FROM
1	L 5	R 4	
2	L 6	L 2	R 1

ABB INC.
TRANSFORMER
WIRING DIAGRAM

DFTM Michael D. Vallia 03/13/2015
CHKD
APPD Daniel Gull 03/13/2015

MFR. ID: 1LUS
DRAWING NUMBER: BS00132W4

SMALL POWER TRANSFORMER

WIRE CODE	DESTINATION FROM		TO		FROM		WIRE SIZE
TB1	TB	1	8-1	1			12
TB2	TB	2	8-1	3			12
TB3	TB	3	8-1	5			12
J60	8-1	2	8-2	1	8-3	1	12
J61	8-1	4	8-2	3	8-3	3	12
J62	8-1	6	8-2	5	8-3	5	12
J63	8-1	2	FU-1	1			12
J64	8-1	4	FU-1	3			12
J65	FU-1	2	CPT	H1			12
J66	FU-1	4	CPT	H4			12
J72	8-2	2	4-1	L1			12
J73	8-2	4	4-1	L2			12
J74	8-2	6	4-1	L3			12
J75	8-3	2	4-2	L1			12
J76	8-3	4	4-2	L2			12
J77	8-3	6	4-2	L3			12
TB7	4-1	T1	TB	7	SB	1	12
TB8	4-1	T2	TB	8	SB	2	12
TB9	4-1	T3	TB	9	SB	3	12
TB10	4-2	T1	TB	10	SB	5	12
TB11	4-2	T2	TB	11	SB	6	12
TB12	4-2	T3	TB	12	SB	7	12
J67	CPT	X1	8-4	1			12
J68	CPT	X2	TB	4			12 GND
TB4	TB	4	SH	2	TB	5	12
TB5	GFR	N	TB	5	TB	13	12
TB13	LT-1	2	TB	13	4-1	A2	12
TB14	4-2	A2	TB	14	4-1	A2	12
J69	8-4	2	8-5	1	8-6	1	12
J70	8-6	1	8-7	1			12
J78	8-5	2	HS	1			12
J79	HS	3	T1	1			12
SH	T1	2	SH	1			12
J80	GFR	L	8-6	2	LS	1	12
J82	LS-2	1	LS-1	1			12
J81	LS-2	3	LS-1	3	LT1	1	12
J91	CPT	H2	CPT	H3			12
J90	8-7	2	TB	15	TB	16	12
TB18	TB	19	TB	18			12
TB20	TB	19	TB	20	4-1	A1	12
W1	TB	16	W	1	TB	21	12
W28	TB	21	W	28	W	4	12
W4	W	4	43-2	1			12
TB16	TB	16	TB	17	W	25	12
W25	W	25	43-1	1			12
W27	43-1	3	W	27	W	3	12
W30	43-2	3	W	30	W	6	12
TB23	TB	22	TB	23	43-2	2	12
TB24	TB	23	TB	24	4-2	A1	12

AS BUILT DRAWINGS
Mar 21, 2016
ABB - South Boston, VA

ABB INC.
SMALL POWER TRANSFORMERS
SOUTH BOSTON, VIRGINIA U.S.A.

NOTE: THIS WIRING DIAGRAM MUST NOT BE USED TO DETERMINE THE EXACT LOCATION OF APPARATUS, WIRES OR CABLES. ALL APPARATUS IS SHOWN IN DE-ENERGIZED POSITION. ALL ALARM CONTACTS SHOWN IN NORMAL OPERATING CONDITION.

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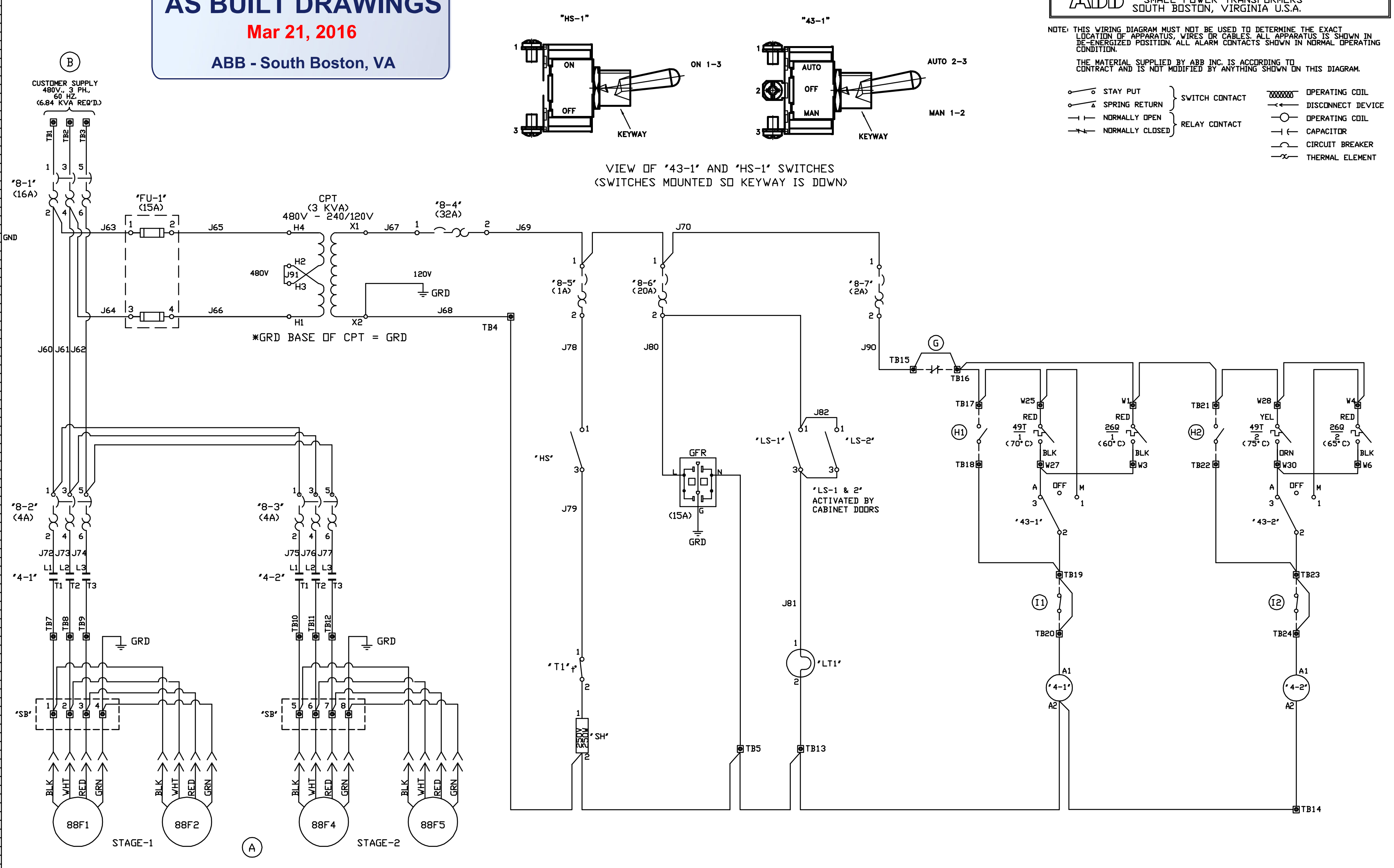


SHEET 5 OF 5

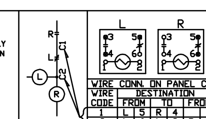
1	CHANGE	IT		
2	REVISED DESTINATION TO MATCH DRWG AS PER CUSTOMER MARKUPS QN# 200157870 07/31/2015 - M. VALLIA	IT		
3	REVISED TERMINALS TO MATCH SPEC. 01/16/2016 - M. VALLIA	IT		
4	REVISED CPT SECNDRY CONNECTIONS 02/06/2016 - M. VALLIA	IT		
5	REVISED AS PER CUSTOMER MARKUPS ALSO FAN CIRC. FOR FUNCTIONALITY QN# 200189579 QN# 200189594 02/06/2016 - M. VALLIA	IT		

CUSTOMER ID

CHARTS OF THE WIRE CONNECTIONS FOR THE PHYSICAL LAYOUT OF THE PANEL COMPARTMENT, OR GENERAL AREA TO WHICH THEIR LISTINGS APPLY ARE SHOWN EITHER ADJOINING THESE AREAS OR ON DWG. LISTED AT THE RIGHT OF THIS EXPLANATION.

WIRE CODE NO'S. CORRESPOND TO THOSE APPEARING ON THE SCHEMATIC DIAGRAM. "X" PLACED AT THE DEVICE TERMINAL INDICATES UNUSED TERMINAL.

EXPLANATION



WIRE CONN. ON PANEL C

WIRE CODE	DESTINATION FROM		TO		FROM	
1	L	5	R	4		
2	L	6	L	2	R	1

DEVICE — TERM.NO.

ABB INC.
TRANSFORMER
WIRING DIAGRAM

DFTM Michael D. Vallia	03/13/2015	MFR. ID 1LUS	DRAWING NUMBER BS00132W5
CHKD			
APPD Daniel Gull	03/13/2015		

SMALL POWER TRANSFORMER

CUSTOMER NOTE: N.P. DWG. IS FOR YOUR INFO & REVIEW. THE IMPEDANCE, MANUFACTURE DATE, AND ABB SERIAL NUMBER ARE LEFT BLANK SINCE DRAWING IS SUBMITTED PRIOR TO MANUFACTURING. THE ACTUAL VALUES ARE ENGRAVED ON THE NAMEPLATE AT TIME OF SHIPMENT. THIS DRAWING IS NOT SUBSEQUENTLY REVISED TO ADD TESTED VALUES.

SMALL POWER TRANSFORMERS
SOUTH BOSTON, VA.

LISTED E221827 LIQUID-FILLED DISTRIBUTION XFMR 99UF

VOLTS		THREE PHASE	FULL LOAD KVA	
HV	34500Y/19920	NATURAL ESTER FLUID INSULATED	12000	KNAN
LV	13800	UNIT SUBSTATION TRANSFORMER	16000	KNAF
60 HERTZ		CLASS KNAN/KNAF/KNAF INSULDUR INSULATION	20000	KNAF
			65	°C RISE
			GALLONS LIQUID	2505

INSTRUCTION BOOK: PC-1002 | MFR ID: 1LUS | SERIAL: BS00132 -#### | MANUFACTURE DATE: ##/##

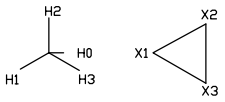
FULL WAVE IMPULSE TEST LEVEL: H.V. 150 KV., L.V. 95 KV.

IMPEDANCE: IMP_VAL1 % AT 12000 KVA 34500 TO 13800 VOLTS.

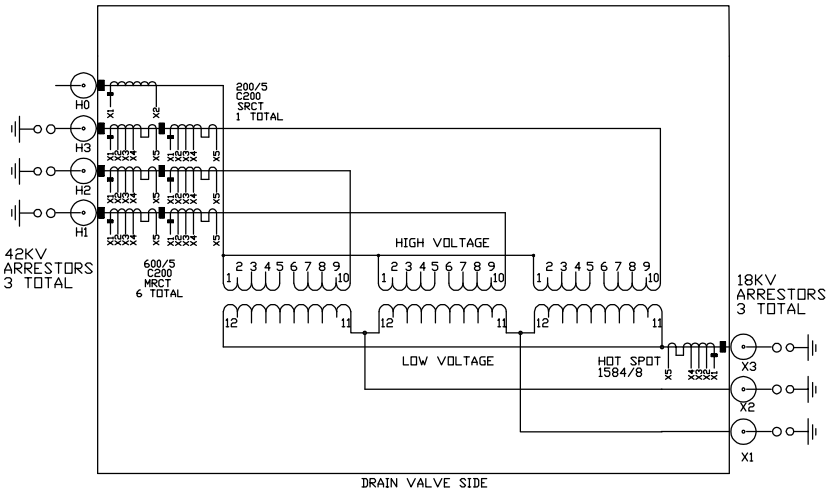
APPROX. WEIGHT IN LBS. CORE AND COILS: 31737 | CASE: 15455 | LIQUID: 19037 | TOTAL: 66229

MADE IN U.S.A. ABB INC. 1LUSBS00132N1

YND1



CONNECTIONS				
WINDING	VOLTS	20000 KVA AMPERES	TAP CHANGER POS.	TAP CHANGER CONNECTS
HIGH VOLTAGE WYE COPPER	37950	304.2	1	5 TO 6
	37090	311.3	2	4 TO 6
	36230	318.7	3	4 TO 7
	35360	326.5	4	3 TO 7
	34500	334.7	5	3 TO 8
	33640	343.3	6	2 TO 8
	32780	352.3	7	2 TO 9
LOW VOLTAGE DELTA COPPER	13800	836.8		



THE OPERATING PRESSURE IS LIMITED BY THE SEALEDAIRE FLUID PRESERVATION SYSTEM, UNLESS REMOVED TO 6.5 LBS. PER SQUARE INCH POSITIVE AND 6.5 LBS. PER SQUARE INCH NEGATIVE.
THE TRANSFORMER TANK IS DESIGNED TO WITHSTAND A POSITIVE OR NEGATIVE PRESSURE OF 15 LBS. PER SQUARE INCH.
THE 25°C LIQUID LEVEL IS 11.11 INCHES BELOW HIGHEST MANHOLE FLANGE.
LIQUID LEVEL CHANGES .57 INCH FOR EACH 10°C CHANGE IN AVERAGE LIQUID TEMPERATURE.
THE TRANSFORMER MUST NOT BE ENERGIZED FROM ANY VOLTAGE SOURCE WHEN TAP CHANGER IS OPERATED.
SUITABLE FOR OPERATION AT OR BELOW 3300 FEET ALTITUDE AT NAMEPLATE RATING.
AT THE TIME OF SHIPMENT THIS UNIT CONTAINED LESS THAN 1 PPM OF PCBS.

MFR. ID	SHOP ORDER
1LUS	BS00132
MFR. ID	DRAWING #
1LUS	BS00132N1

5/16 INCH HOLES FOR 190-32 X 3/16 SCREW
SIZE 6.25 INCHES X 10.0 INCHES AREA 62.5 SQUARE INCHES
DISTANCE BETWEEN CENTERS OF HOLES ON LONG EDGE 9 19/32 INCH ± 1/64 ON SHORT EDGE 5 27/32 INCH ± 1/64

Mar 21, 2016

	1	2		
		ADDED TAP RANGE TO +4, -2 @ 2.5% UPDATED LV ARRESTER TO 42 KV		
N.P.DRAFT.				
DRAFT.				
ENGINEER	D.Gulli	D.Gulli		
DATE	01/07/15	04/27/15		