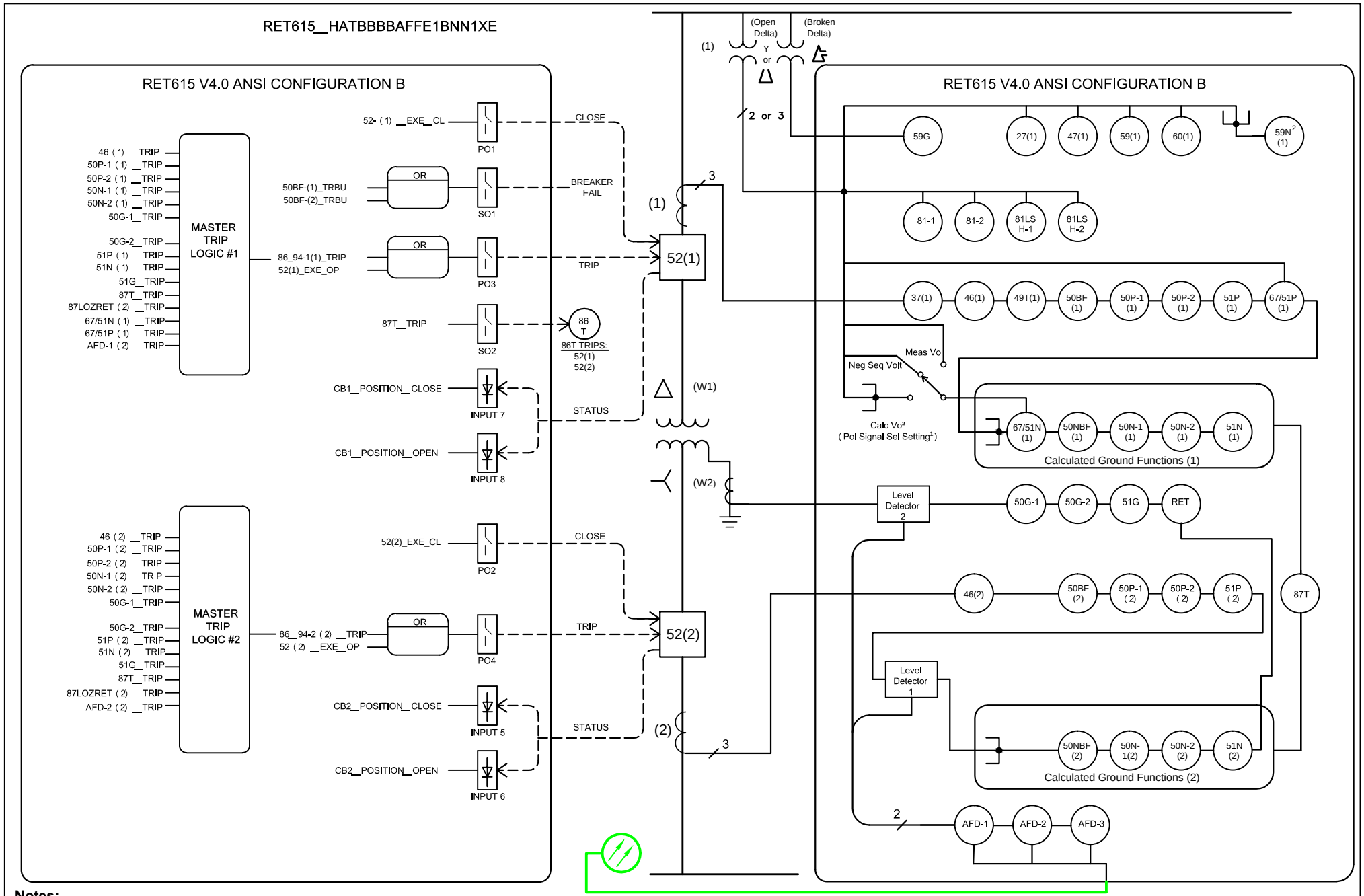


Notes:

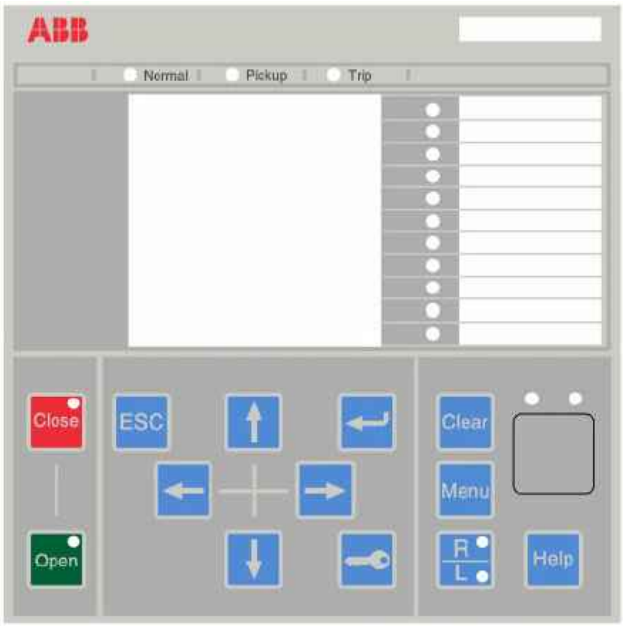
1. Rotary Switch emulates drop down menu for "Pol Signal Sel" parameter setting in PCM600. Switch position shown for default setting (Neg Seq Volt). Switch is typical for all connected functions. Position can be set individually for each function.
2. "Pol Signal Sel" parameter setting "Calc Vo", and 59N(1)functions not applicable for open delta connected VTs.

General Notes:

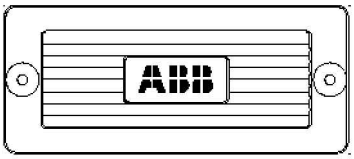
PCM600 ACT (Application Configuration Tool) logic is shown in default state with exception of 86T lockout relay trip (contact SO2).

TITLE: **SINGLE LINE DIAGRAM (TYPICAL)**	SOFTWARE TYPE: AUTOCAD 2011		SIZE A	DWG. NO. **1MAC206896-DR**	REV. **B**
RELAY ORDER CODE: **HATBBBBAFFE1BNN1XE**	ABB Protective Relays and Switches, Coral Springs Fl, U.S.A.		SCALE:	SHEET 1 OF 8	

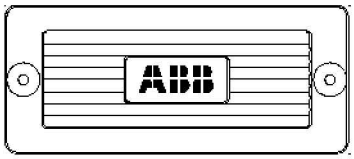
RET615_HATBBBBAFFE1BNN1XE



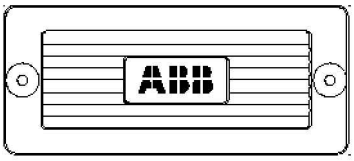
FT-1/TS1
Style No: 774B430G20
CODE No: 171



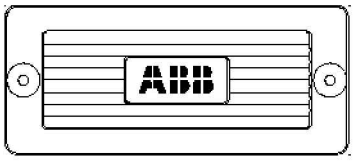
FT-1/TS2
Style No: 129A501G01
Code No: 001



FT-1/TS3
Style No: 837A407G01
CODE No: 083



FT-1/TS4
Style No: 129A501G01
Code No: 001

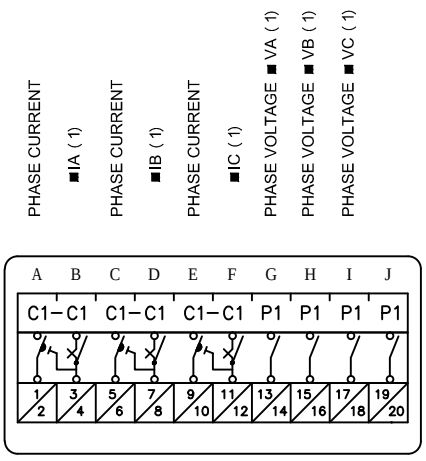


General Notes:

1. Style and code numbers for FT-1 switches provide black covers and handles, screw terminals and standard depth. Poles selection follows arrangement shown in this drawing set. For custom designs, different selection options can be made by using FT-1 configurator at ft1switch.com
2. Refer to 615 series ANSI Installation Manual for relay and cutout dimensions (Document ID: 1MACCO51065-MB, Revision: D, Product version 4.0)

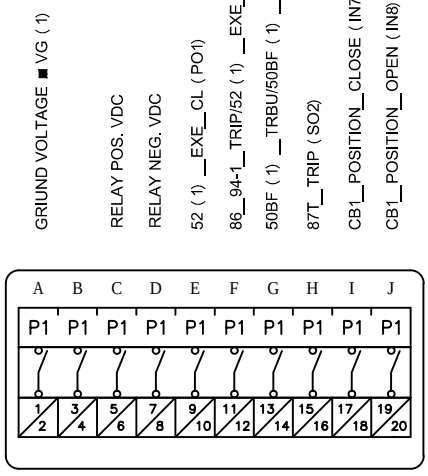
TITLE: **FRONT PANEL ELEVATION**	SOFTWARE TYPE: AUTOCAD 2011		SIZE A	DWG. NO. **1MAC206896-DR**	REV. **B**	ABB
RELAY ORDER CODE: **HATBBBBAFFE1BNN1XE**	ABB Protective Relays and Switches, Coral Springs Fl, U.S.A.		SCALE:	SHEET 2 OF 8		

RET615_HATBBBBAFFE1BNN1XE



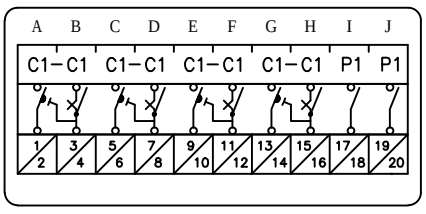
FT-1/TS1

(BREAKER 1 CURRENTS AND BUS 1 PHASE POTENTIALS)



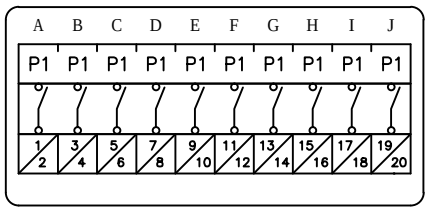
FT-1/TS2

(BUS 1 GROUND POTENTIAL, POWER SUPPLY AND BREAKER 1 BINARY I/O)



FT-1/TS3

(BREAKER 2 CURRENTS AND TRANSFORMER NEUTRAL CURRENT)

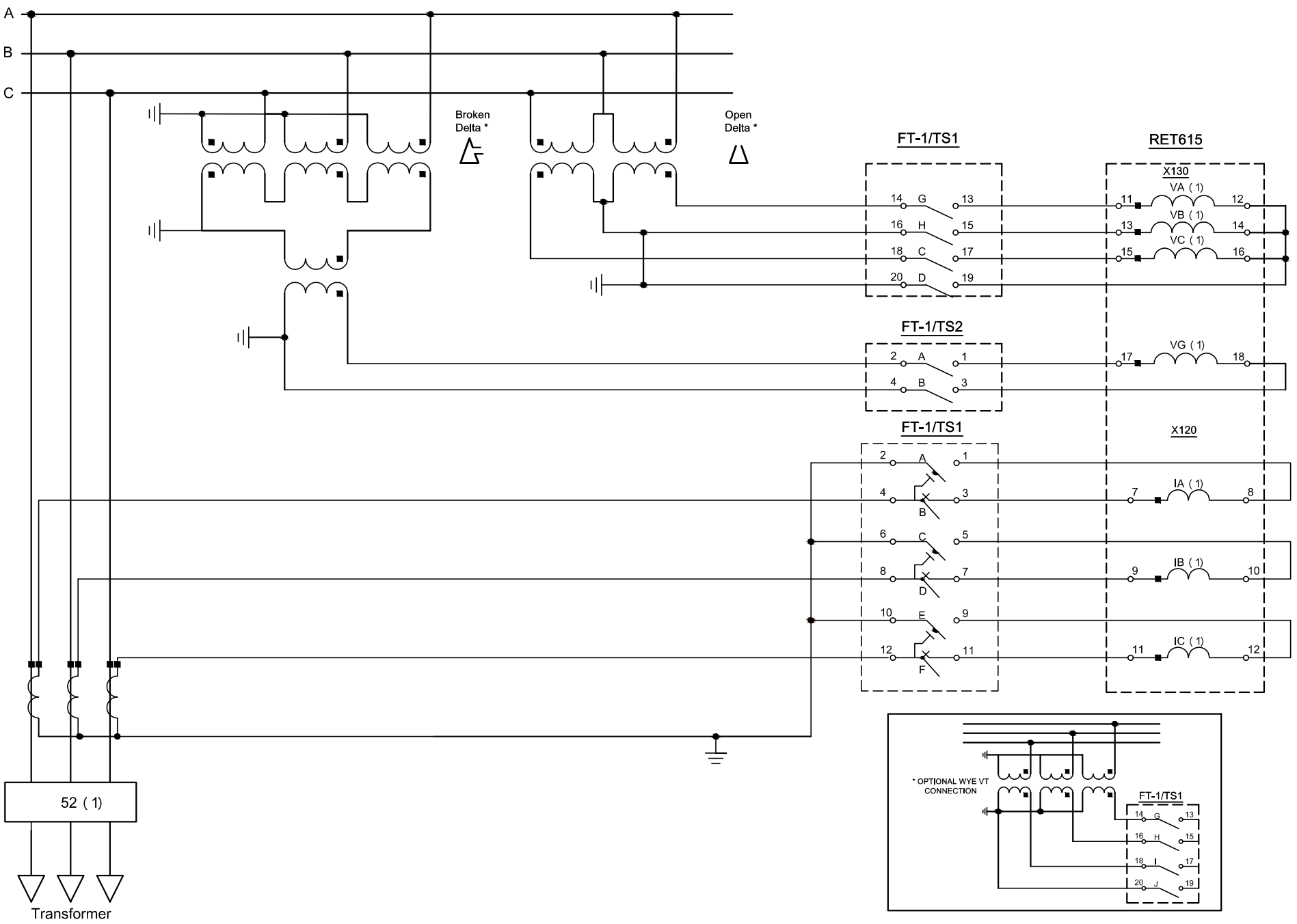


FT-1/TS4

(BREAKER 2 BINARY I/O)

TITLE: **FRONT PANEL ELEVATION**	SOFTWARE TYPE: AUTOCAD 2011		SIZE A	DWG. NO. **1MAC206896-DR**	REV. **B**
RELAY ORDER CODE: **HATBBBBAFFE1BNN1XE**	ABB Protective Relays and Switches, Coral Springs Fl, U.S.A.		SCALE:	SHEET 3 OF 8	

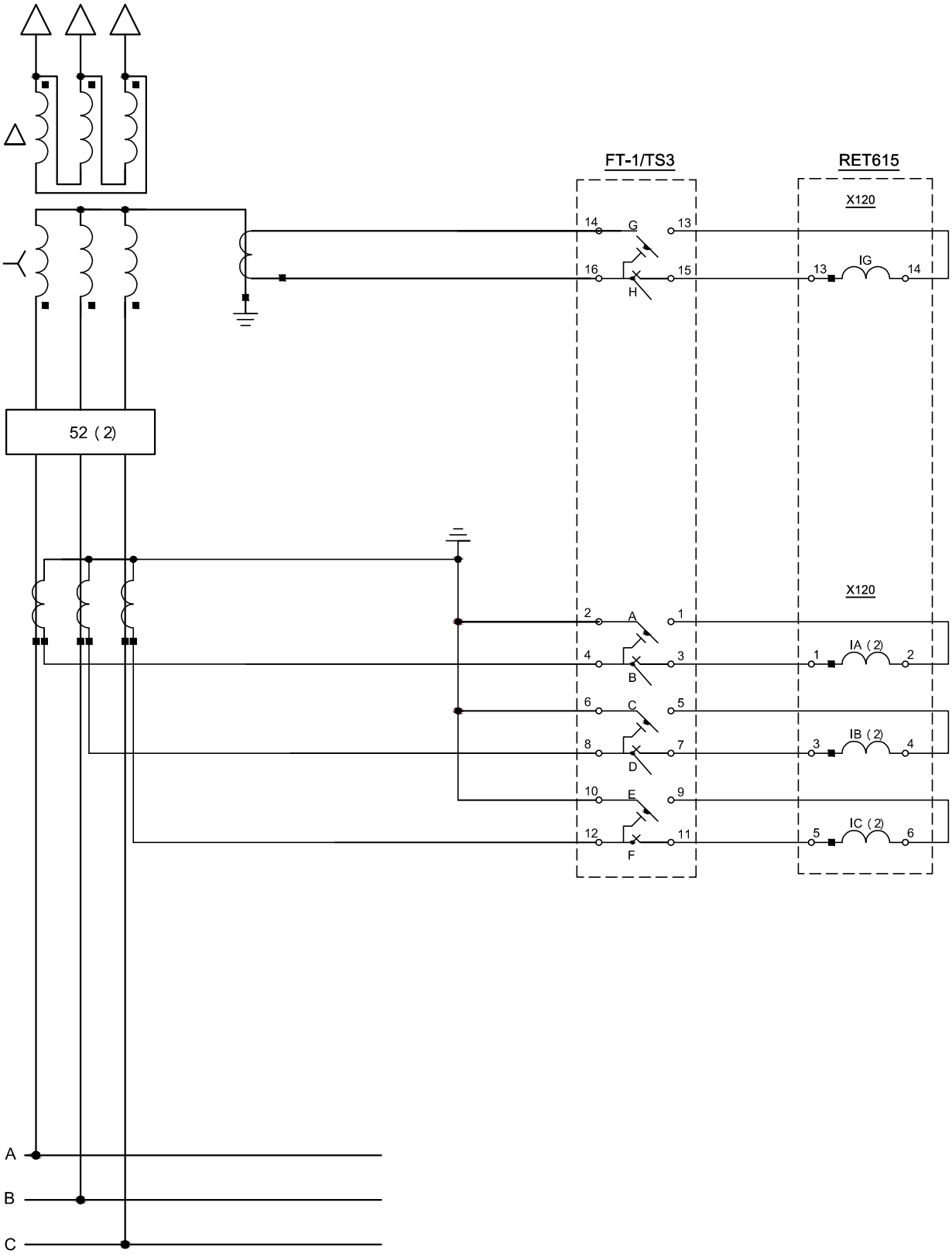
RET615_HATBBBBAFFE1BCN1XE



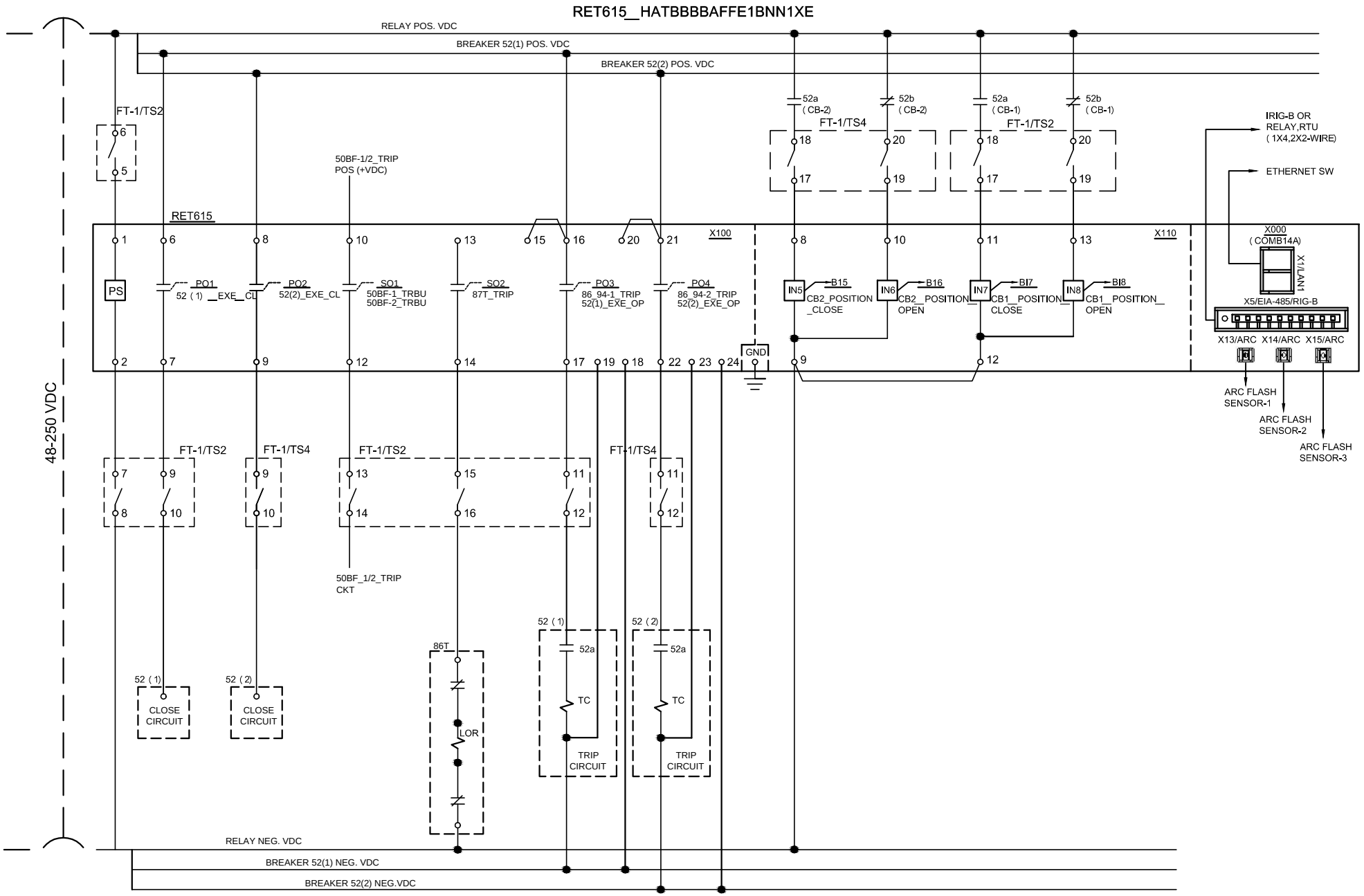
TITLE: **AC SCHEMATIC (TYPICAL)**	SOFTWARE TYPE: AUTOCAD 2011	© Copyright 2014 ABB All rights reserved	SIZE A	DWG. NO. 1MAC206896-DR	REV. B
RELAY ORDER CODE: **HATBBBBAFFE1BNN1XE**	ABB Protective Relays and Switches, Coral Springs Fl, U.S.A.			SCALE:	SHEET 4 OF 8

RET615_HATBBBBAFFE1BNN1XE

Circuit Breaker 52 (1)



TITLE: **AC SCHEMATIC (TYPICAL)**	SOFTWARE TYPE: AUTOCAD 2011	© Copyright 2014 ABB All rights reserved	SIZE A	DWG. NO. **1MAC206896-DR**	REV. **B**	ABB
RELAY ORDER CODE: **HATBBBBAFFE1BNN1XE**	ABB Protective Relays and Switches, Coral Springs Fl, U.S.A.			SCALE:	SHEET 5 OF 8	

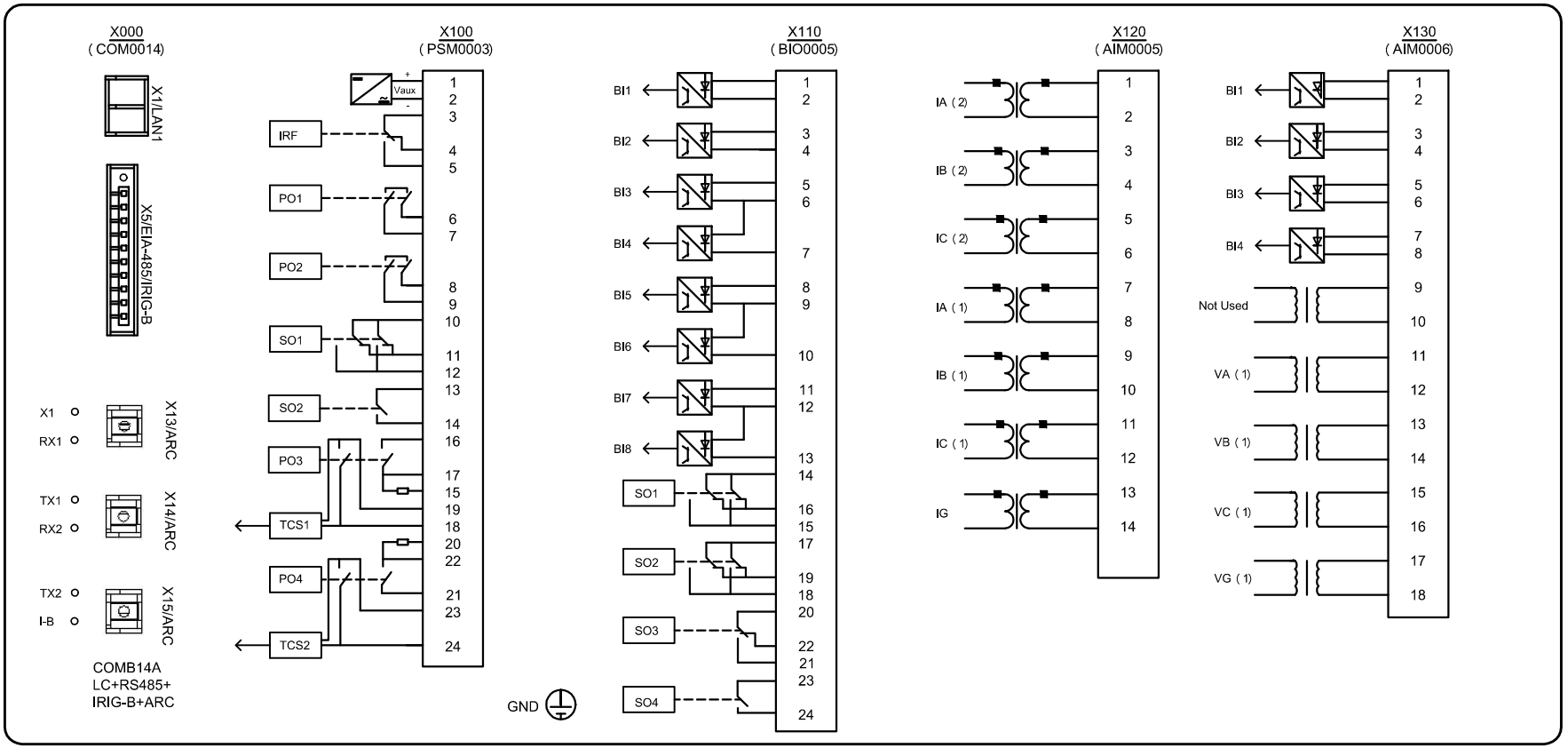


General Notes:

Binary I/O shown is from default PCM600 Application Configuration Tool (ACT).
Connections shown are typical though more connections may be needed for specific application.

TITLE: **DC SCHEMATIC (TYPICAL)**	SOFTWARE TYPE: AUTOCAD 2011	© Copyright 2014 ABB All rights reserved	SIZE A	DWG. NO. **1MAC206896-DR**	REV. **B**
RELAY ORDER CODE: **HATBBBBAFFE1BNN1XE**	ABB Protective Relays and Switches, Coral Springs Fl, U.S.A.		SCALE:	SHEET 6 OF 8	

RET615_HATBBBBAFFE1BNN1XE



RR
RET615

X000-X1:
X000-X5:
X000-X13:
X000-X14:
X000-X15:

X100-1: SS5
X100-2: SS7
X100-3:
X100-4:
X100-5:
X100-6:
X100-7: SS9
X100-8:
X100-9: UU9
X100-10:
X100-11:
X100-12: SS13
X100-13:
X100-14: SS15
X100-15: X100-16
X100-16: X100-15
X100-17: SS11
X100-18:
X100-19:
X100-20: X100-21
X100-21: X100-20
X100-22: UU11
X100-23:
X100-24:

X110-1:
X110-2:
X110-3:
X110-4:
X110-5:
X110-6:
X110-7:
X110-8: UU17
X110-9: X110-12
X110-10: UU19
X110-11: SS17
X110-12: X110-9
X110-13: SS19
X110-14:
X110-15:
X110-16:
X110-17:
X110-18:
X110-19:
X110-20:
X110-21:
X110-22:
X110-23:
X110-24:

X120-1: VV3
X120-2: VV1
X120-3: VV7
X120-4: VV5
X120-5: VV11
X120-6: VV9
X120-7: TT3
X120-8: TT1
X120-9: TT7
X120-10: TT5
X120-11: TT11
X120-12: TT9
X120-13: VV15
X120-14: VV13

X130-1:
X130-2:
X130-3:
X130-4:
X130-5:
X130-6:
X130-7:
X130-8:
X130-9:
X130-10:
X130-11: TT13
X130-12: X130-14
X130-13: TT15
X130-14: X130-12, X130-16
X130-15: TT17
X130-16: X130-14, TT19
X130-17: SS1
X130-18: SS3

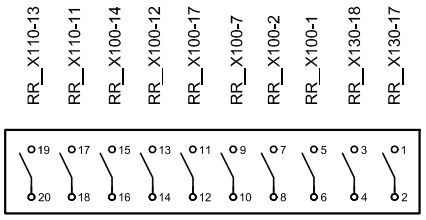
GND:

TITLE: **CONNECTION DIAGRAM**
RELAY ORDER CODE: **HATBBBBAFFE1BNN1XE**

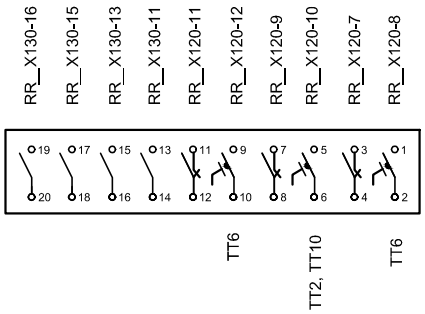
SOFTWARE TYPE: AUTOCAD 2011

ABB Protective Relays and Switches, Coral Springs FI, U.S.A.
SIZE A
DWG. NO. 1MAC206896-DR
REV. B
SCALE:
SHEET 7 OF 8

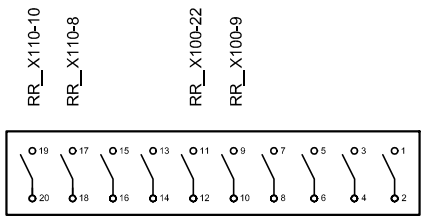
RET615_HATBBBBAFFE1BNN1XE



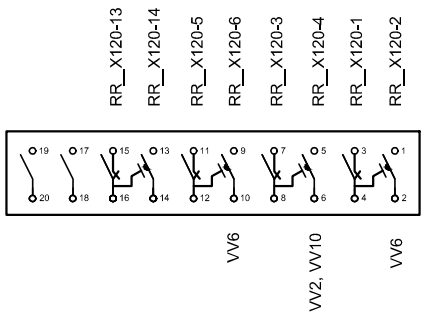
SS
FT-1/TS2



TT
FT-1/TS1



UU
FT-1/TS4



VV
FT-1/TS3

TITLE: **CONNECTION DIAGRAM**	SOFTWARE TYPE: AUTOCAD 2011	© Copyright 2014 ABB All rights reserved	SIZE A	DWG. NO. **1MAC206896-DR**	REV. **B**	ABB
RELAY ORDER CODE: **HATBBBBAFFE1BNN1XE**	ABB Protective Relays and Switches, Coral Springs FI, U.S.A.			SCALE:	SHEET 8 OF 8	