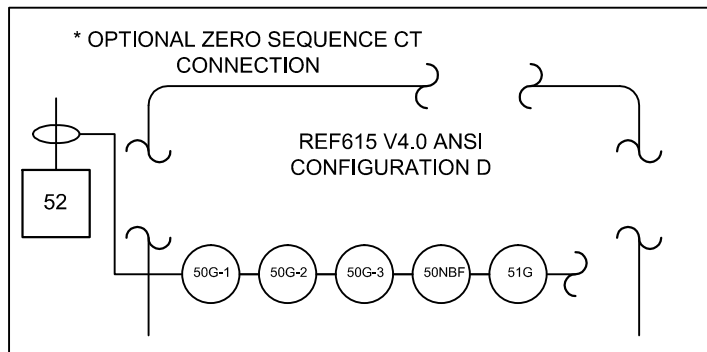
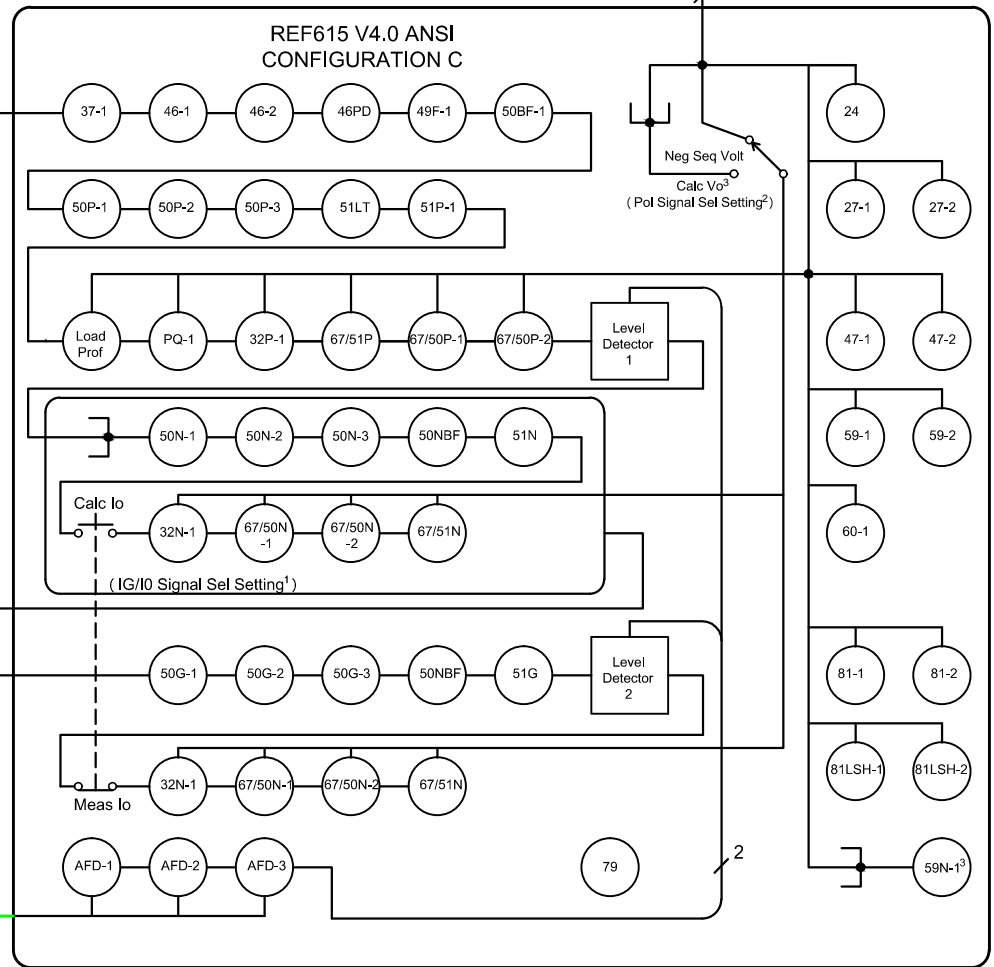
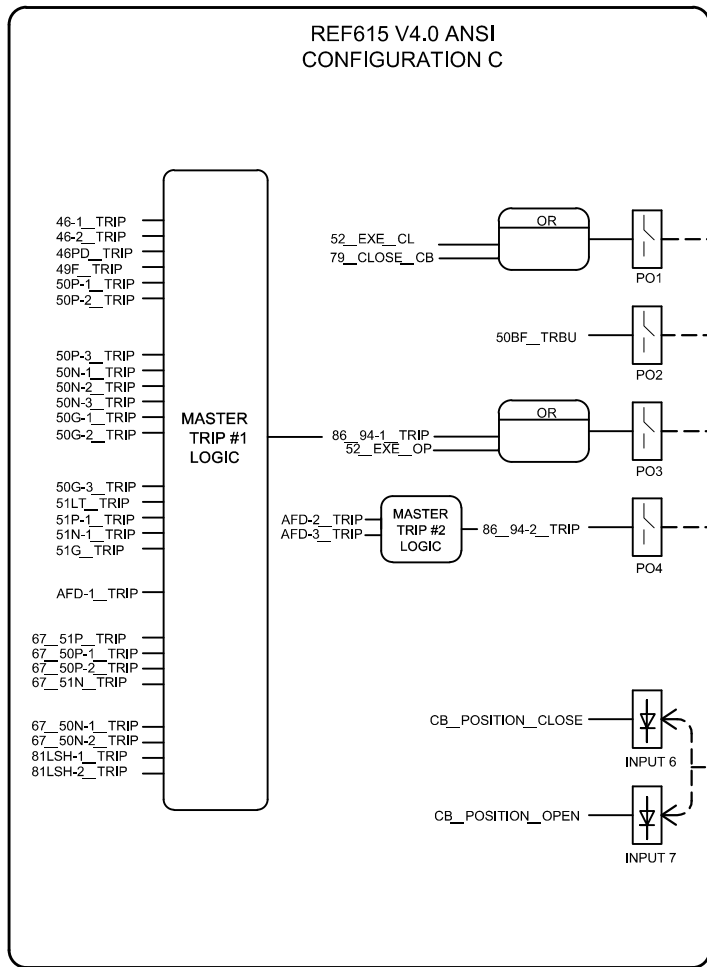


REF615_HAFCCCAFFE1BCN1XE



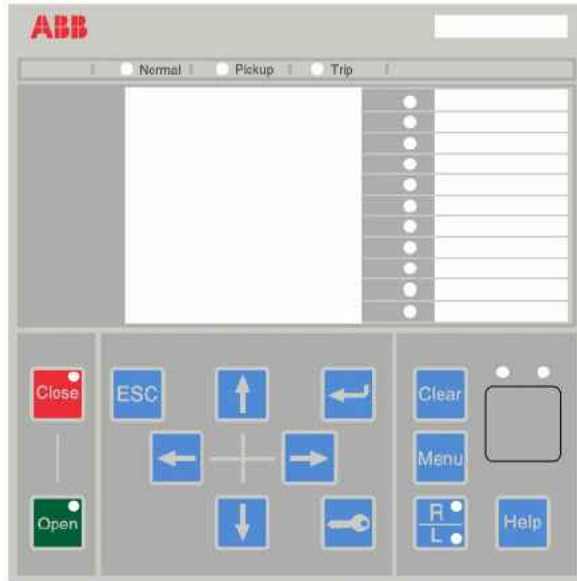
General Notes:

1. This drawing does not show all functions available in REF615 configuration C relay. The functions shown are for a distribution feeder application.
2. PCMG600 ACT (Application Configuration Tool) logic is shown in default state.

Notes:

1. Latched pushbutton switch emulates drop down menu for "IG/IO signal Sel" parameter in PCMG600. Switch position shown for recommended setting (Meas Io). Switch is typical for all connected functions. Position can be set individually for each function.
2. Rotary Switch emulates drop down menu for "Pol Signal Sel" parameter setting in PCMG600. Switch position shown for default setting (Neg Seq Volt). Switch is typical for all connected functions. Position can be set individually for each function.
3. "Pol Signal Sel" parameter setting "Calc Vo", and 59N-1 functions not applicable for open delta connected VTs.

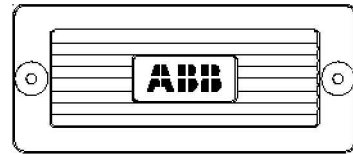
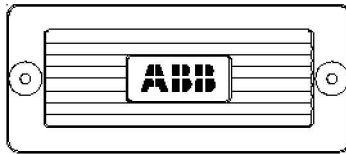
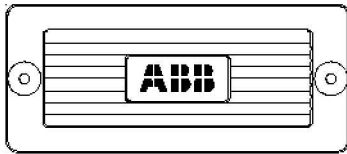
REF615_HAFCCCAFFE1BCN1XE



FT-1/TS1
Style No: 837A407G01
Code No: 083

Style No: 129A501G01
Code No: 001

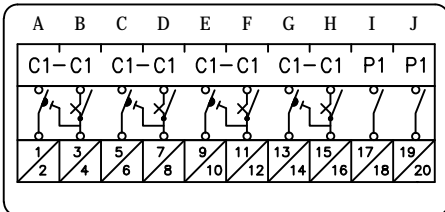
FT-1/TS3
Style No: 129A501G01
Code No: 001



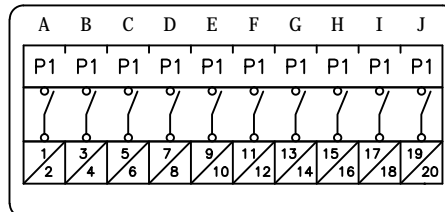
PHASE CURRENT ■ (IA)
PHASE CURRENT ■ (IB)
PHASE CURRENT ■ (IC)
GROUND CURRENT ■ (IG)

PHASE VOLTAGE ■ (VA)
PHASE CURRENT ■ (VB)
PHASE CURRENT ■ (VC)

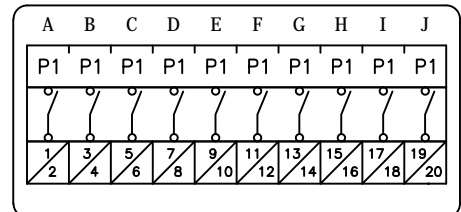
RELAY POS.VDC
RELAY NEG.VDC
52_EXE_CL/79_CLOSE_CB (PO1)
50BF_TRBU (PO2)
86_94-1_TRIP/62_EXE_OP (PO3)
86_94-2_TRIP (PO4)
GROUND_BLOCKING (IN5)
CB_POSITION_CLOSE (IN6)
CB_POSITION_OPEN (IN7)
EXTERNAL_AR_BLOCKING (IN8)



(CURRENTS)



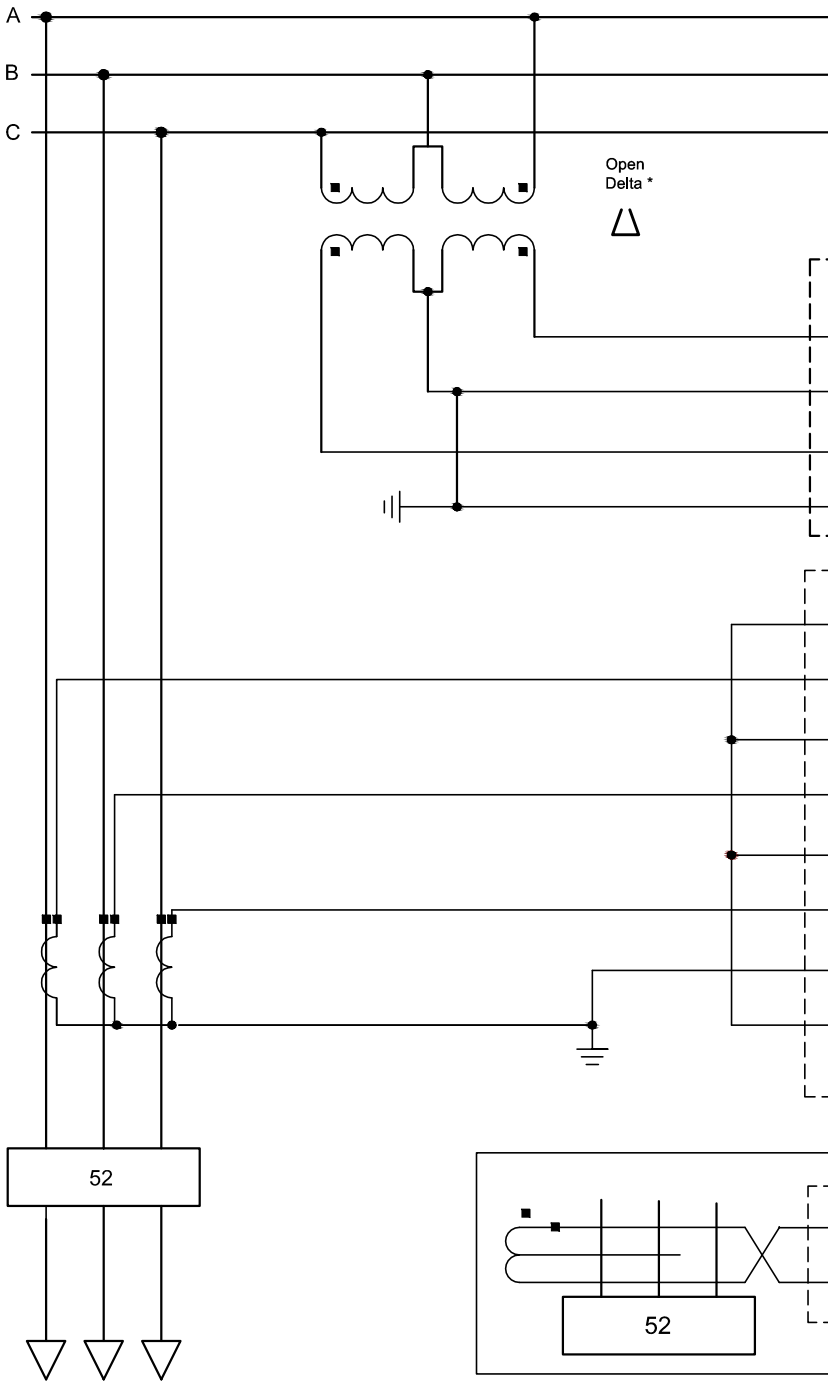
(POTENTIALS)



(POWER SUPPLY AND BINARY I/O)

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: MACCO51065-MB, Revision: D, Product version 4.0)



REF615_HAFCCCAFFE1BCN1XE

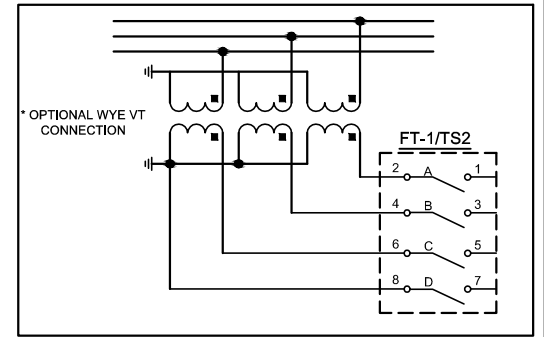
Open Delta *

FT-1/TS2

REF615

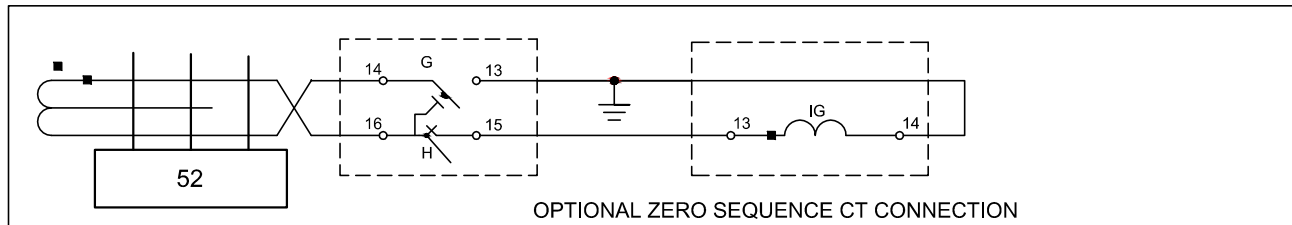
FT-1/TS1

X120



* OPTIONAL WYE VT CONNECTION

FT-1/TS2



OPTIONAL ZERO SEQUENCE CT CONNECTION

TITLE: AC SCHEMATIC (TYPICAL)

RELAY ORDER CODE: HAFCCCAFFE1BCN1XE

SOFTWARE TYPE:

AUTOCAD 2011

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ABB Protective Relays and Switches, Coral Springs FL, U.S.A.

SIZE DWG. NO.

A

1MAC108889-DR

REV.

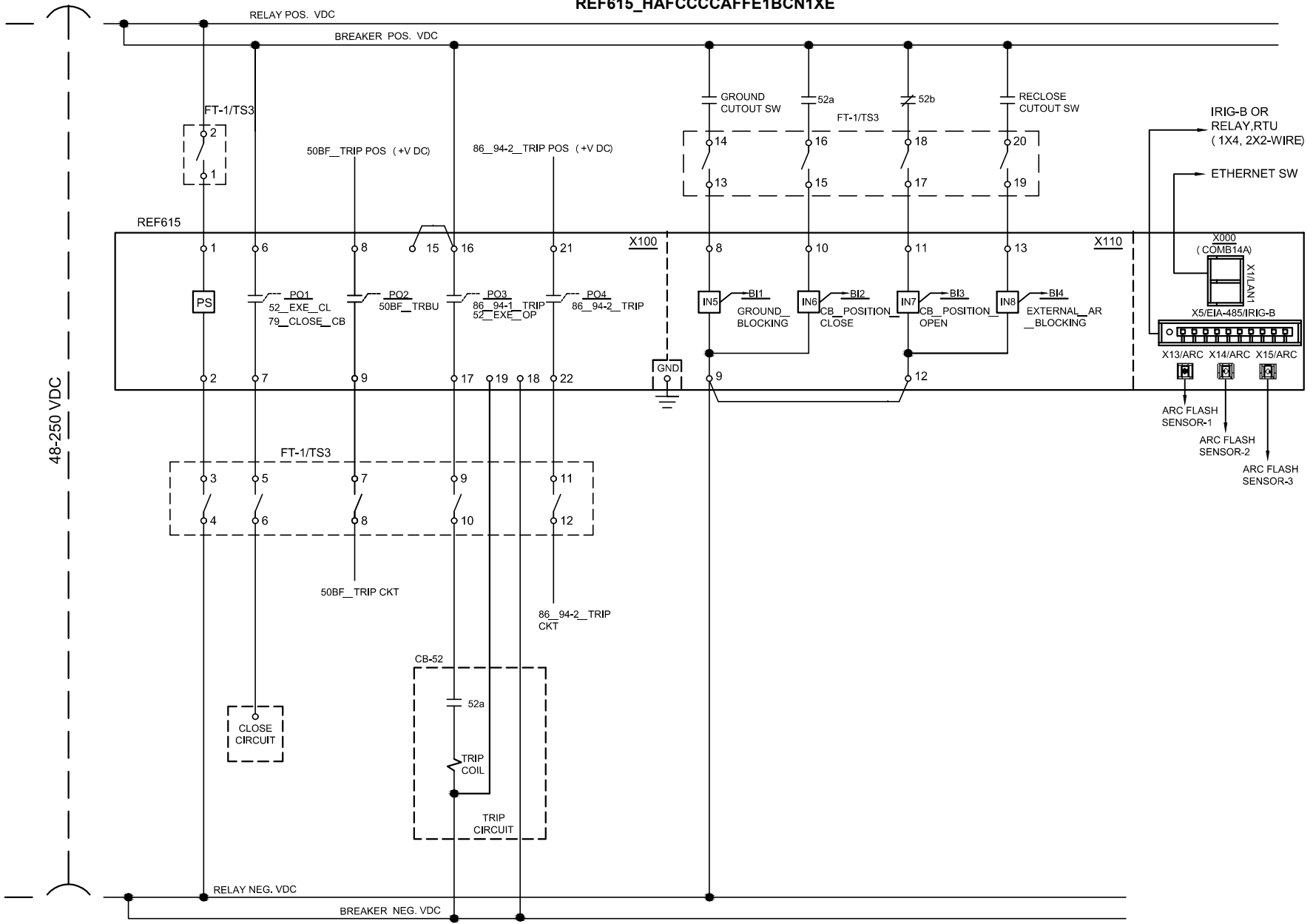
B

ABB

SCALE:

SHEET 3 OF 5

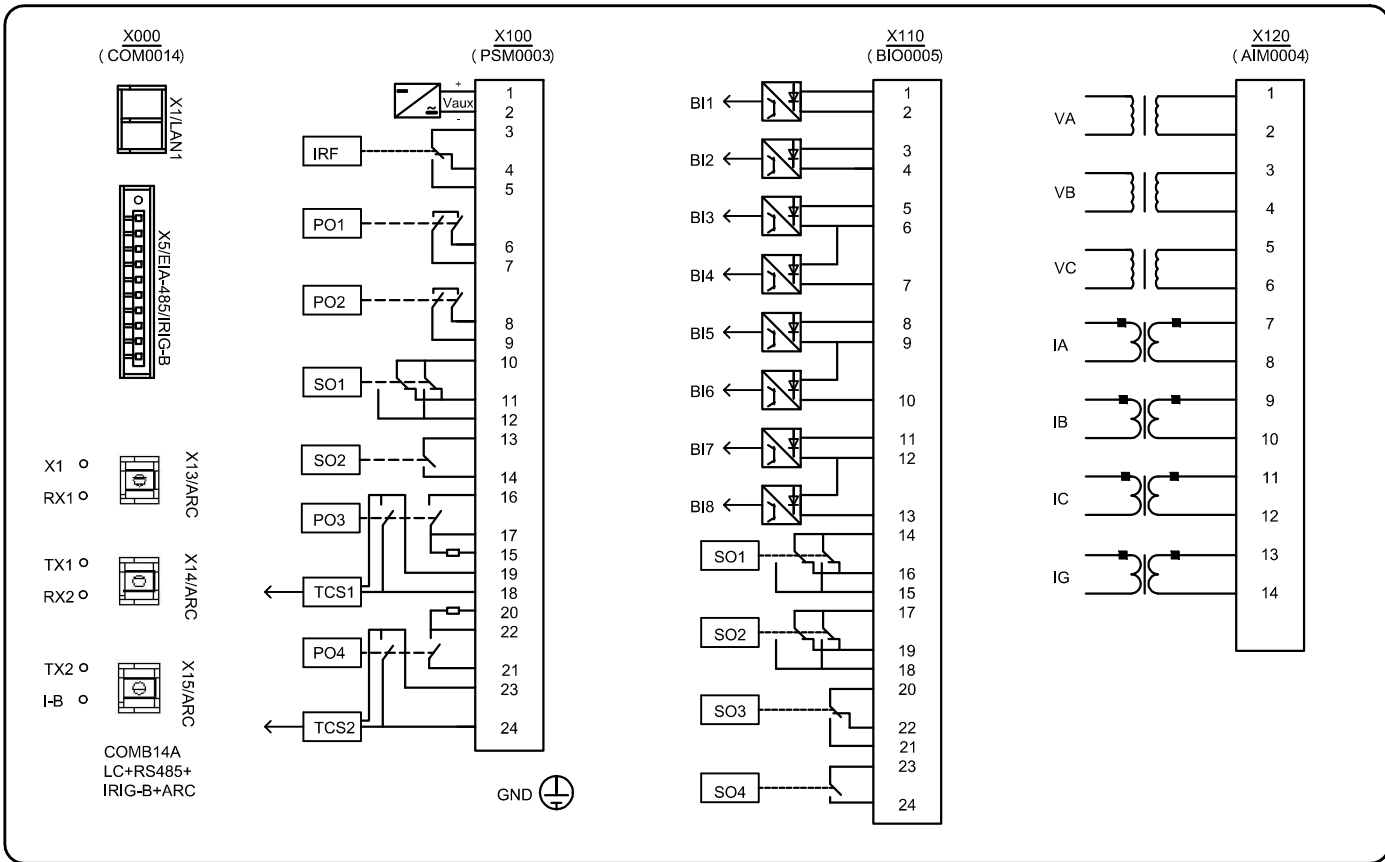
REF615_HAFCCCAFFE1BCN1XE



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.

REF615_HAFCCCAFFE1BCN1XE



RR
REF615

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

X100-1: SS1
X100-2: SS3
X100-3:
X100-4:
X100-5:
X100-6:
X100-7: SS5
X100-8:
X100-9: SS7
X100-10:
X100-11:
X100-12:
X100-13:
X100-14:
X100-15: X100-16
X100-16: X100-15
X100-17: SS9,
X100-18:
X100-19:
X100-20:
X100-21:
X100-22: SS11
X100-23:
X100-24:

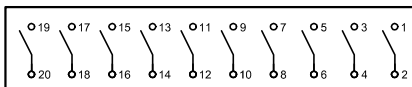
X110-1:
X110-2:
X110-3:
X110-4:
X110-5:
X110-6:
X110-7:
X110-8: SS13
X110-9: X110-12
X110-10: SS15
X110-11: SS17
X110-12: X110-9
X110-13: SS19
X110-14:
X110-15:
X110-16:
X110-17:
X110-18:
X110-19:
X110-20:
X110-21:
X110-22:
X110-23:
X110-24:

X120-1: TT1
X120-2: X120-4
X120-3: TT3
X120-4: X120-2, X120-6
X120-5: TT5
X120-6: X120-4, TT7
X120-7: UU3
X120-8: UU1
X120-9: UU7
X120-10: UU5
X120-11: UU11
X120-12: UU9
X120-13: UU15
X120-14: UU13

GND:

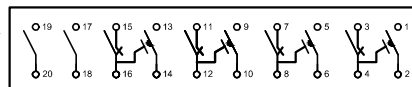
RR_X110-13
RR_X110-11
RR_X110-10
RR_X110-8
RR_X100-22
RR_X100-17
RR_X100-9
RR_X100-7
RR_X100-2
RR_X100-1

SS
FT-1/
TS3



RR_X120-6
RR_X120-5
RR_X120-3
RR_X120-1

TT
FT-1/
TS2



RR_X120-13
RR_X120-14
RR_X120-11
RR_X120-12
RR_X120-9
RR_X120-10
RR_X120-7
RR_X120-8

UU10
UU6, UU16
UU10
UU6

UU
FT-1/
TS1