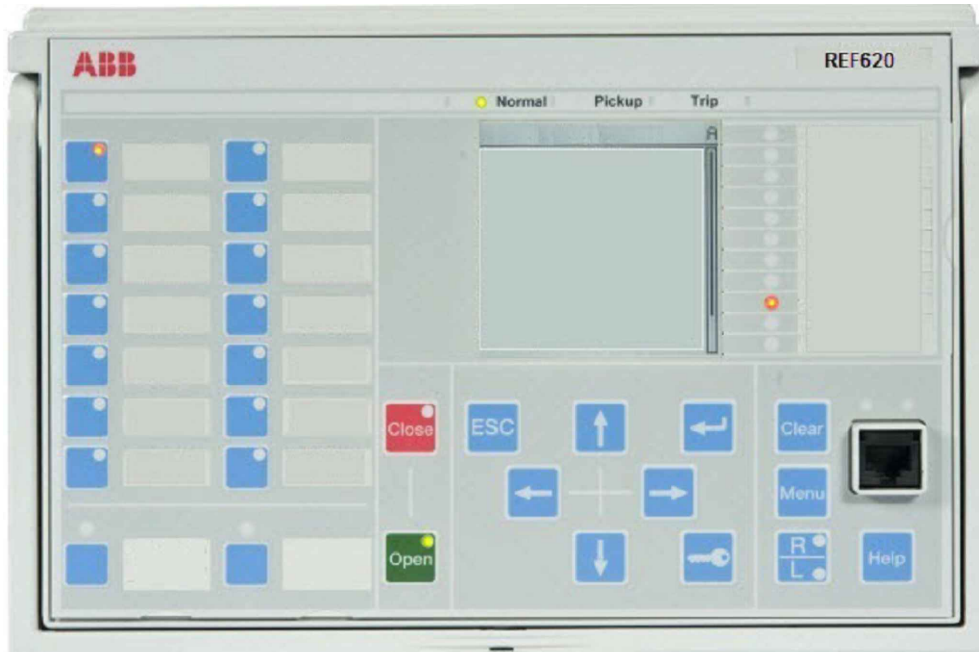


General Notes:

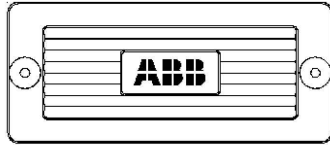
1. Latched pushbutton switch emulates drop down menu for "IG/10 signal Sel" parameter in PCM600. Switch position shown for recommended setting (Meas Io). Switch is typical for all connected functions. Position can be set individually for each function.
2. Rotary switch emulates drop down menu for "Pol Signal Sel" parameter setting in PCM600. Switch position shown for default setting (Calculated Vo).
3. "Pol Signal Sel" parameter setting Calc Vo, and 59N-1 functions not applicable for open delta connected VTs.
4. Default labels for programmable pushbuttons 13 and 14. Pushbuttons are shown latched and toggle to emulate flip-flop bus selection logic in PCM600 ACT (Application Configuration Tool). Relay defaults to Bus 1 selection when energized.



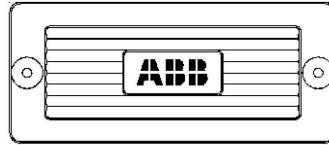
REF620_NAFCCAC3FFxxxAx1xx



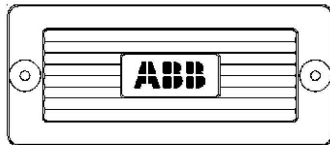
FT-1/TS1
Style No: 837A407G01
Code No: 083



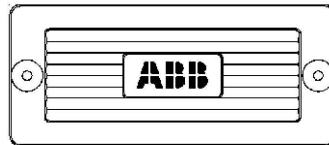
FT-1/TS2
Style No: 129A501G01
Code No: 001



FT-1/TS3
Style No: 774B430G20
Code No: 171



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

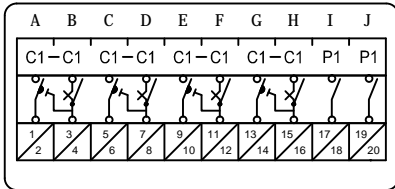


General Notes:

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 620 series ANSI Installation Manual for relay and cutout dimensions (Document ID: 1MAC457436-iB, Revision: A, Product version 2.0)

REF620_NAFCCAC3FFxxxAx1xx

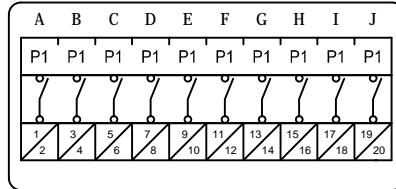
PHASE CURRENT
 ■ IA(1)
 PHASE CURRENT
 ■ IB(1)
 PHASE CURRENT
 ■ IC(1)
 GROUND CURRENT
 ■ IG
 RELAY POS. VDC
 RELAY NEG. VDC



FT-1/TS1

(CT (1) CURRENTS AND POWER SUPPLY)

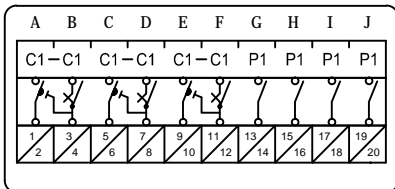
PHASE CURRENT ■VA(1)
 PHASE CURRENT ■VB(1)
 PHASE CURRENT ■VC(1)
 52-1_EXE_CL/79-1_CLOSE_CB_(PO1)
 86_94-1_TRIP/52-1_EXE_OP(PO3)
 50BF-1_TRBU(SO1)
 86_94-1_TRIP(HSO1)
 CB1_POSITION_CLOSE(IN4)
 CB1_POSITION_OPEN(IN5)



FT-1/TS2

(BUS 1 POTENTIALS AND CB 52-1 BINARY I/O)

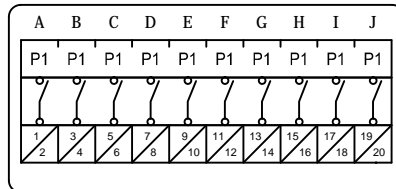
PHASE CURRENT
 ■ IA(2)
 PHASE CURRENT
 ■ IB(2)
 PHASE CURRENT
 ■ IC(2)
 AFD-3_TRIP(HSO3)
 SYNCH VOLTAGE ■VS



FT-1/TS3

(CT (2) CURRENTS AND LINE POTENTIAL)

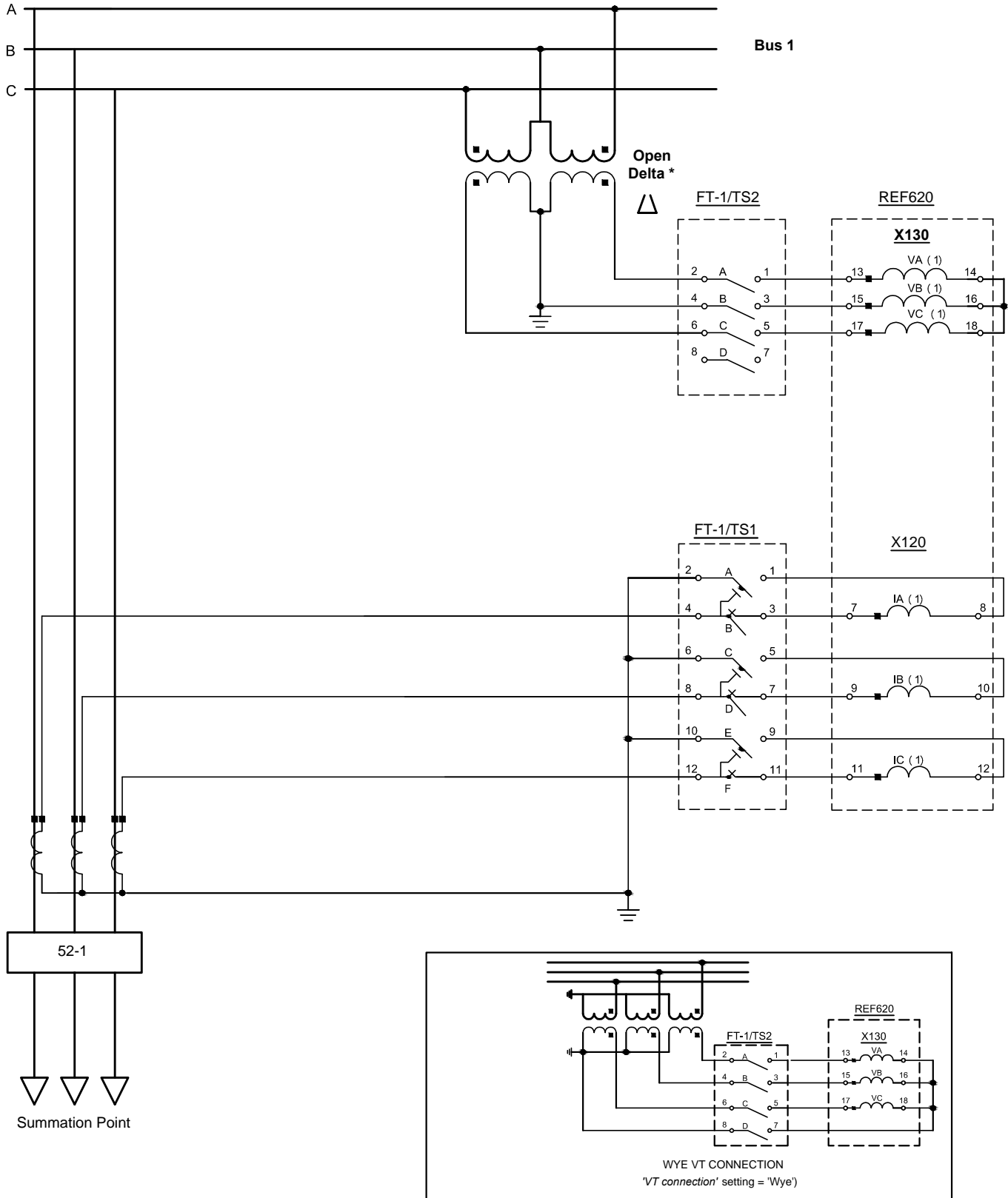
PHASE CURRENT ■VA(2)
 PHASE CURRENT ■VB(2)
 PHASE CURRENT ■VC(2)
 52-2_EXE_CL/79-2_CLOSE_CB_(PO2)
 86_94-2_TRIP/52-2_EXE_OP(PO4)
 50BF-2_TRBU(SO2)
 86_94-2_TRIP(HSO2)
 CB2_POSITION_CLOSE(IN2)
 CB2_POSITION_OPEN(IN3)



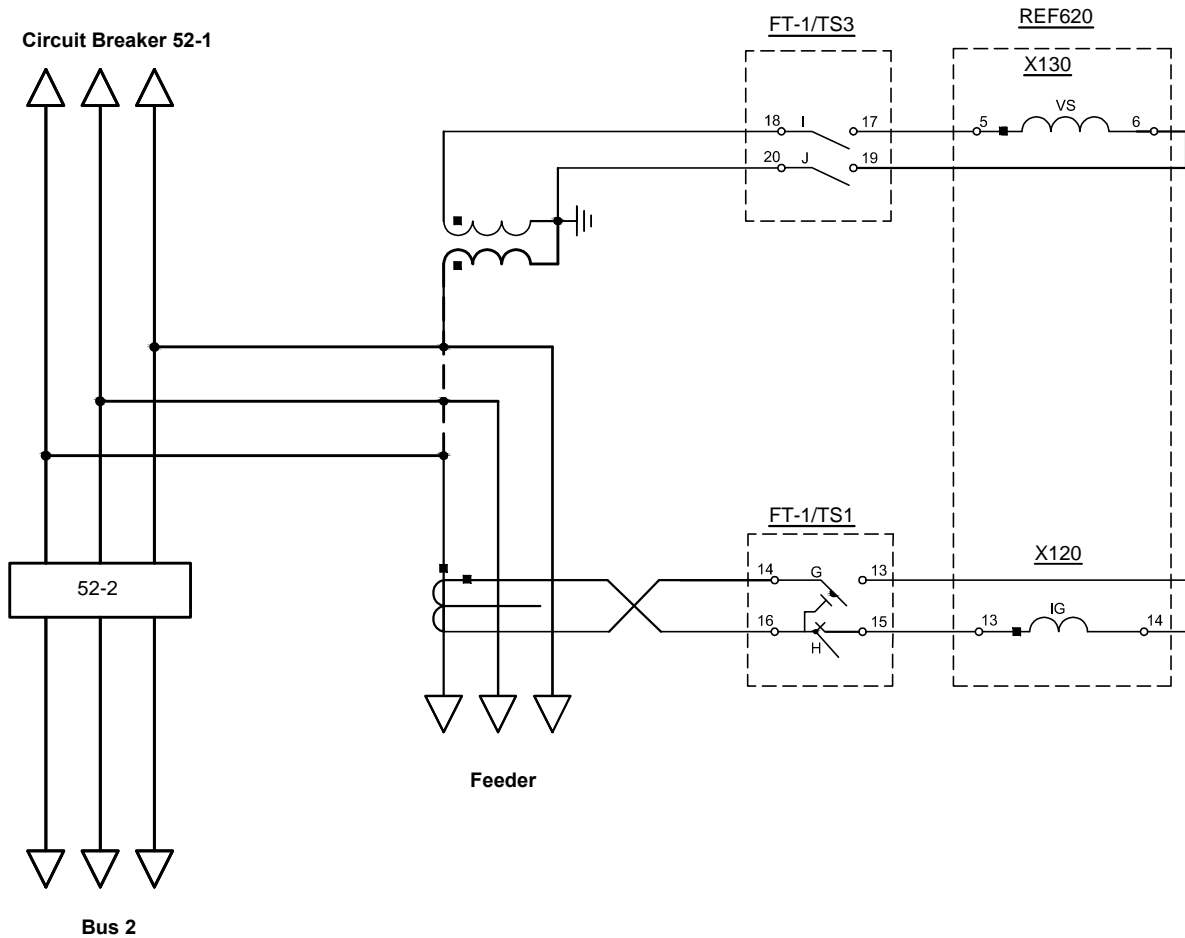
FT-1/TS4

(BUS 2 POTENTIALS AND CB 52-2 BINARY I/O)

REF620_NAFCCAC3FFxxxAx1xx

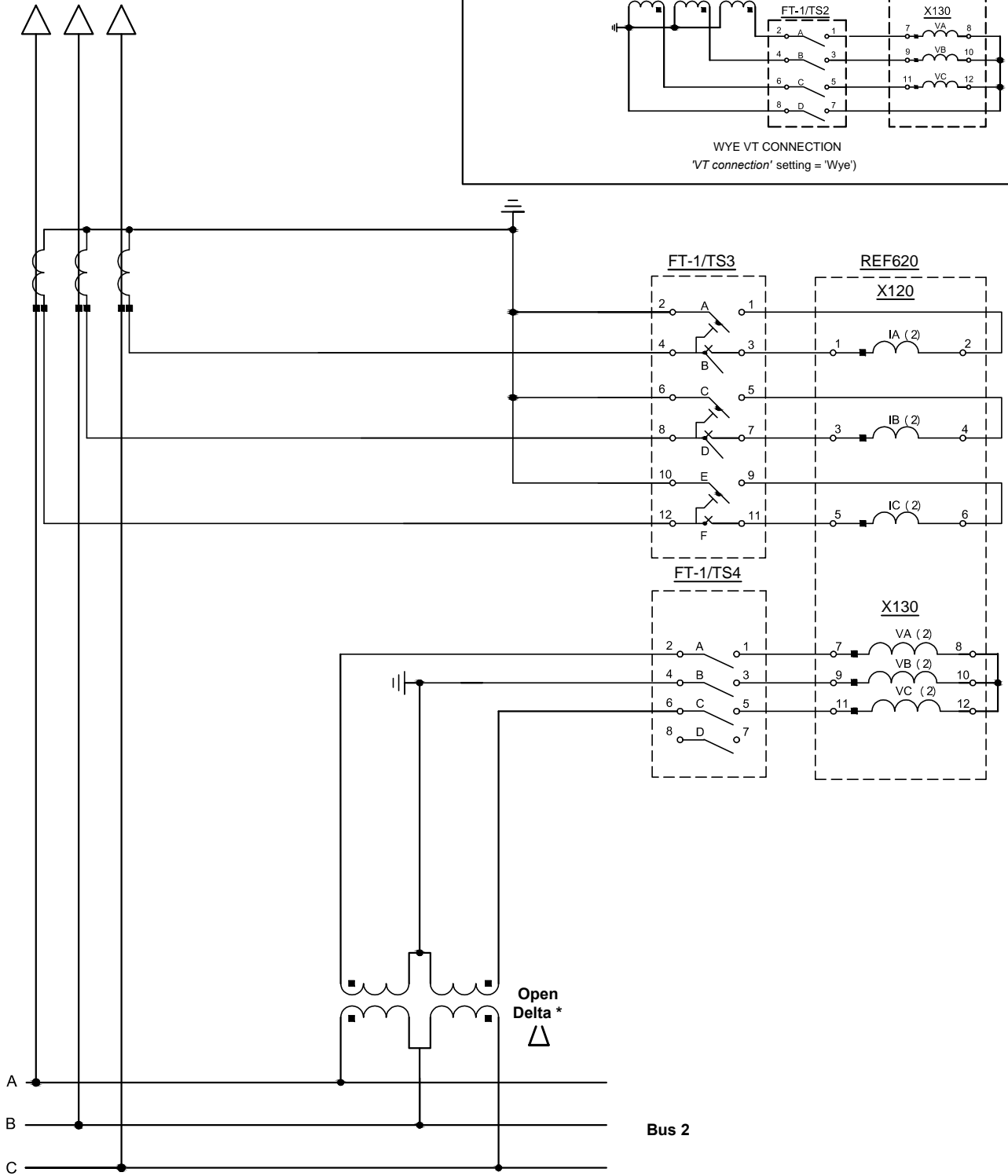
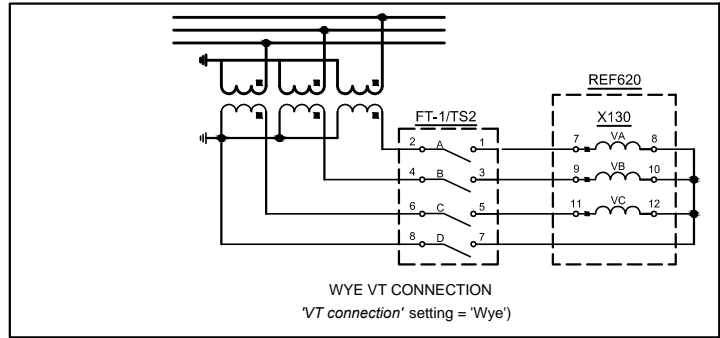


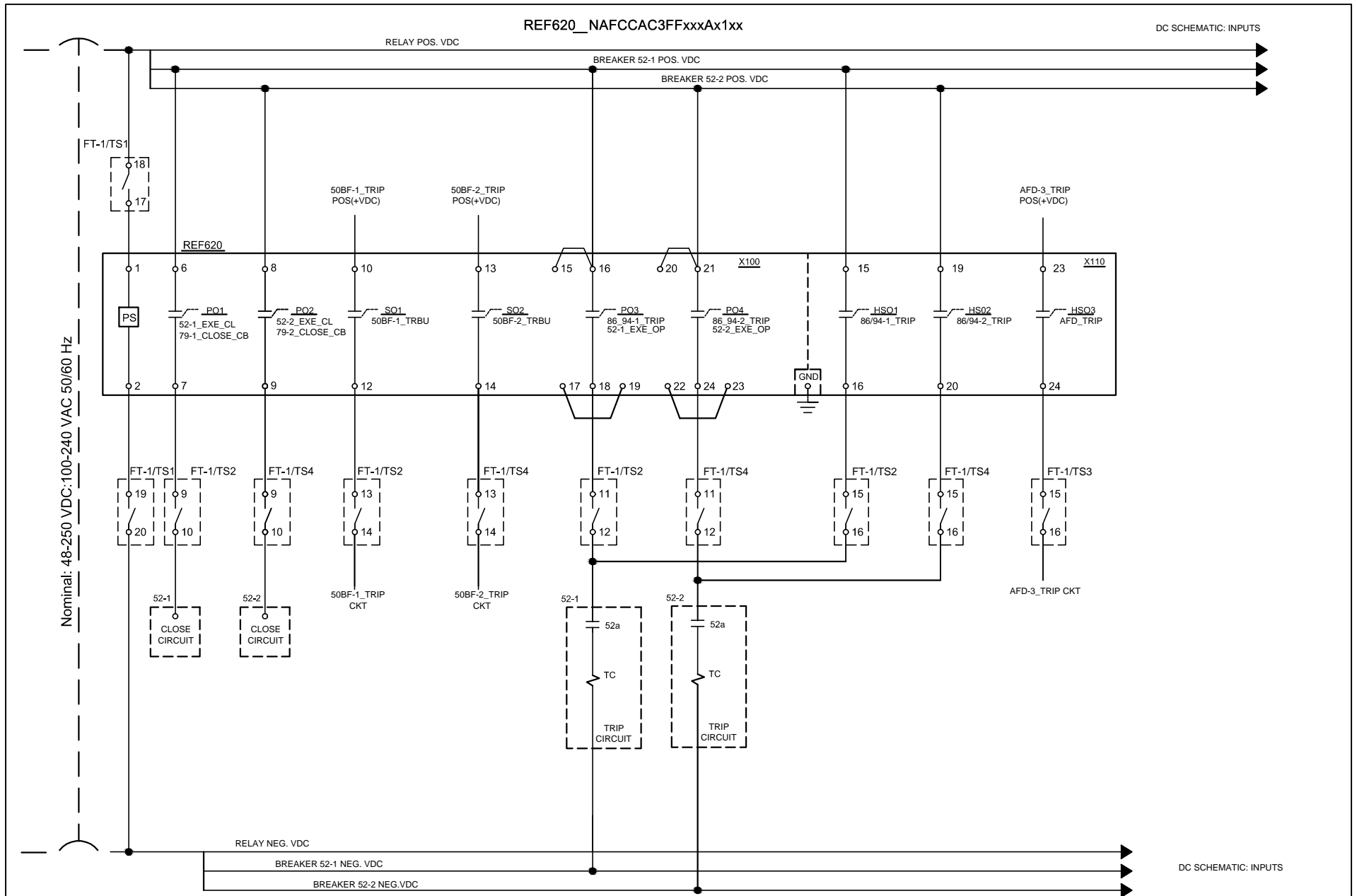
* For relay voltage connections shown set Analog input Voltage 'VT connection' setting to Wye' for metering to work correctly. Refer to application manual for alternate connections to relay for open delta connections using 'Delta' VT connection setting.



REF620_NAFCCAC3FFxxxAx1xx

Circuit Breaker 52-2



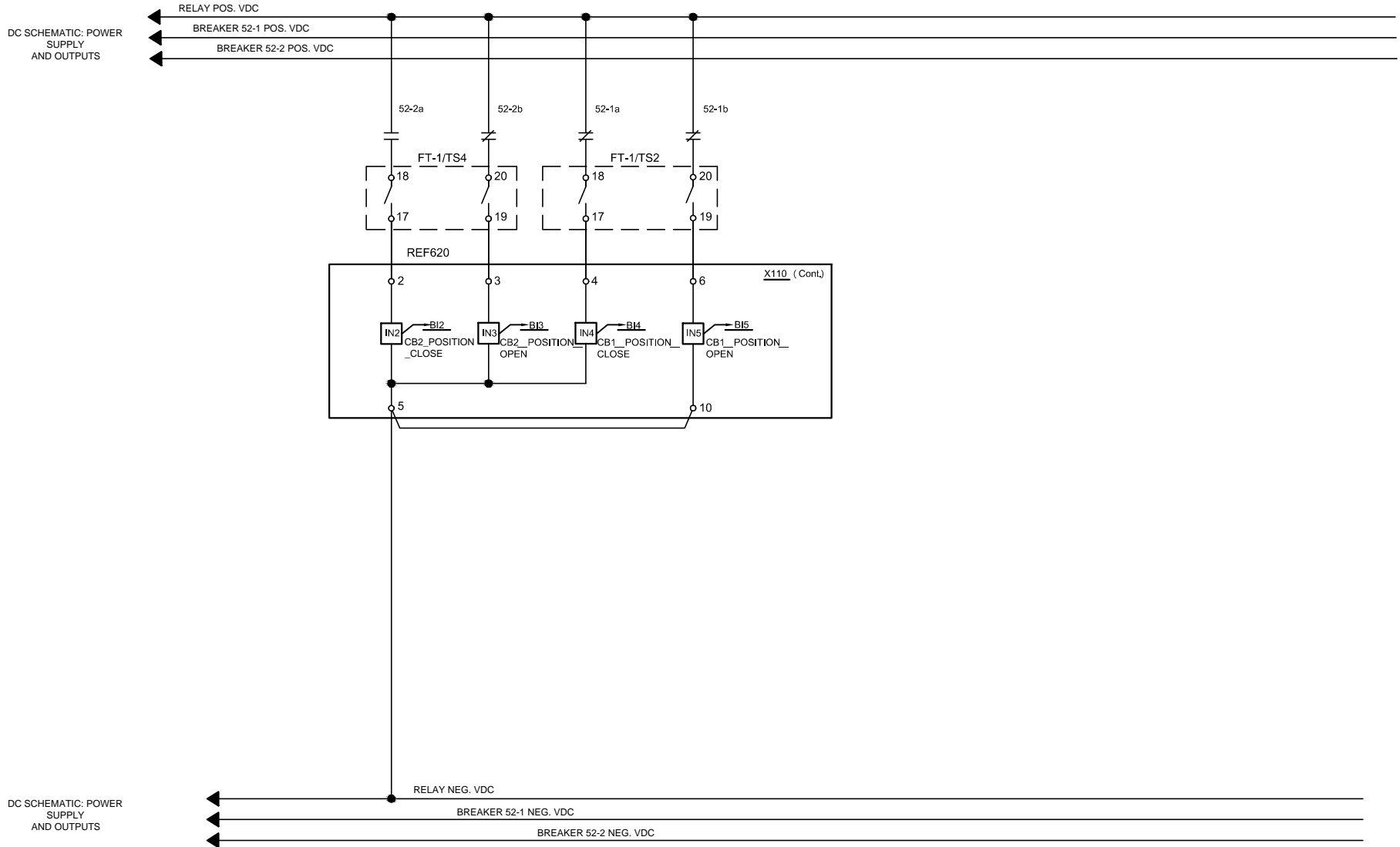


General Notes:

1. 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.

2. Connections are for Trip Circuit Supervision without an external resistor. For this application the Trip Circuit Monitoring function is blocked when the circuit breaker is open. Refer to technical manual for connections with an external resistor to monitor trip coil when breaker is open or closed.

REF620_NAFCCAC3FFxxxAx1xx



TITLE: DC SCHEMATIC-INPUTS (TYPICAL)

RELAY ORDER CODE: NAFCCAC3FFxxxAx1xx

SOFTWARE TYPE:

AUTOCAD 2014

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SIZE DWG. NO.

A

1MAC501029-DR

REV.

A

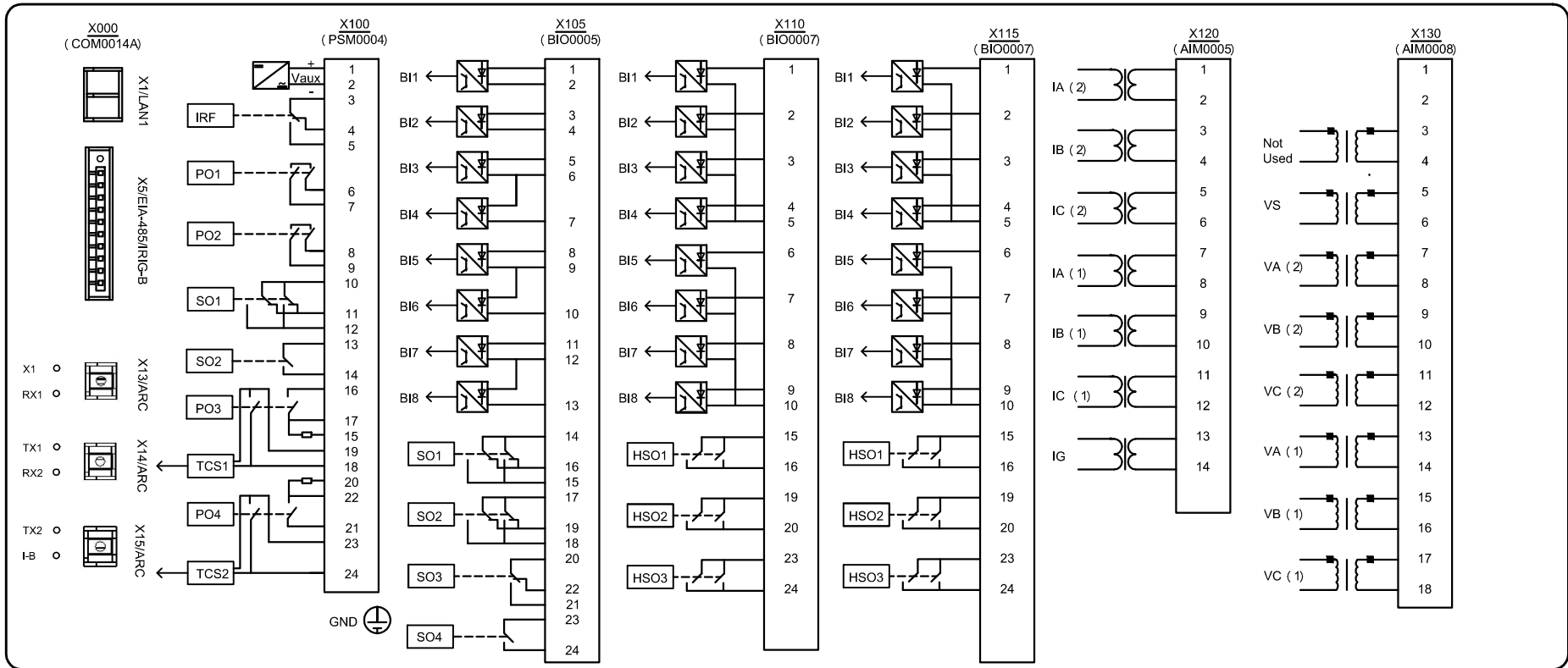


ABB Protective Relays and Switches, Coral Springs FL, U.S.A.

SCALE:

SHEET 8 OF 10

REF620_NAFCCAC3FFxxxAx1xx



RR
REF620

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

X100-1: TT17
X100-2: TT19
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: UU13
X100-15: X100-16
X100-16: X100-15
X100-17: X100-19
X100-18: SS11
X100-19: X100-17
X100-20: X100-21
X100-21: X100-20
X100-22: X100-23
X100-23: X100-22
X100-24: UU11

X105-1:
X105-2:
X105-3:
X105-4:
X105-5:
X105-6:
X105-7:
X105-8:
X105-9:
X105-10:
X105-11:
X105-12:
X105-13:
X105-14:
X105-15:
X105-16:
X105-17:
X105-18:
X105-19:
X105-20: X100-21
X105-21:
X105-22:
X105-23:
X105-24:

X110-1:
X110-2: UU17
X110-3: UU19
X110-4: SS17
X110-5: X110-10
X110-6: SS19
X110-7:
X110-8:
X110-9:
X110-10: X110-5
X110-11:
X110-12:
X110-13:
X110-14:
X110-15:
X110-16: SS15
X110-17:
X110-18:
X110-19:
X110-20: UU15
X110-21:
X110-22:
X110-23:
X110-24: VV15

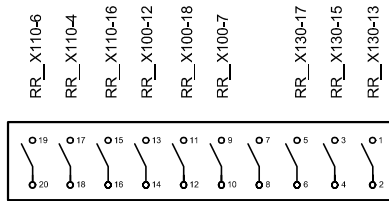
X115-1:
X115-2:
X115-3:
X115-4:
X115-5:
X115-6:
X115-7:
X115-8:
X115-9:
X115-10:
X115-11:
X115-12:
X115-13:
X115-14:
X115-15:
X115-16:
X115-17:
X115-18:
X115-19:
X115-20:
X115-21:
X115-22:
X115-23:
X115-24:

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: TT15
X120-14: TT13

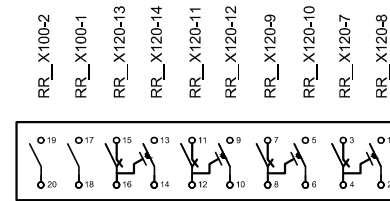
X130-1:
X130-2:
X130-3:
X130-4:
X130-5: VV17
X130-6: VV19
X130-7: UU1
X130-8: X130-10
X130-9: UU3
X130-10: X130-8, X130-12
X130-11: UU5
X130-12: X130-10
X130-13: SS1
X130-14: X130-16
X130-15: SS3
X130-16: X130-14, X130-18
X130-17: SS5
X130-18: X130-16

GND:

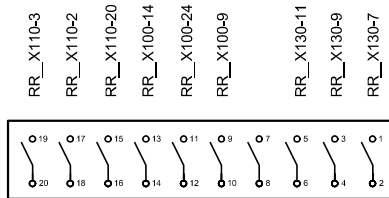
REF620_NAFCCAC3FFxxxAx1xx



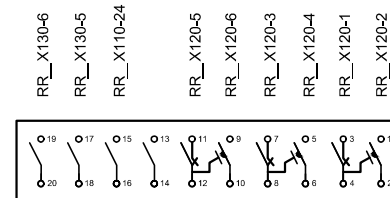
$\frac{SS}{FT-1/TS2}$



$\frac{TT}{FT-1/TS1}$



$\frac{UU}{FT-1/TS4}$



$\frac{VV}{FT-1/TS3}$