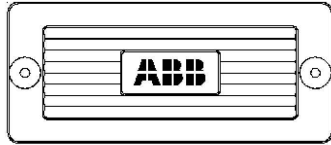
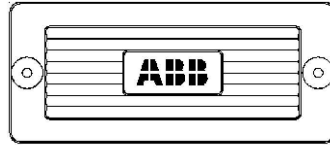


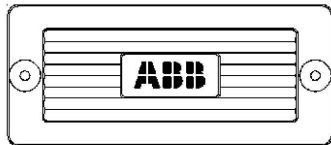
FT-1/TS1
Style No: 774B430G20
Code No: 171



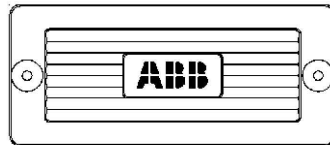
FT-1/TS2
Style No: 129A501G01
Code No: 001



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



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

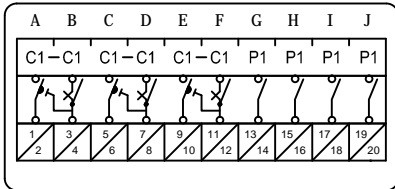


General Notes:

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_NAFBBAB3FFxxxAx1xx

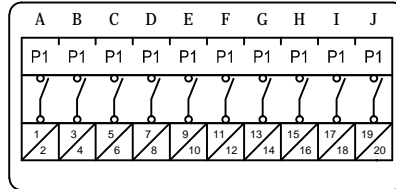
PHASE CURRENT ■ IA(1)
 PHASE CURRENT ■ IB(1)
 PHASE CURRENT ■ IC(1)
 RELAY POS. VDC
 RELAY NEG. VDC



FT-1/TS1

(CT (1) CURRENTS AND POWER SUPPLY)

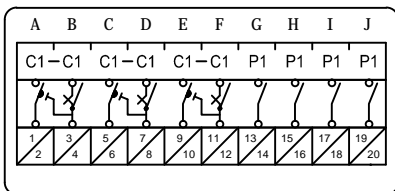
PHASE CURRENT ■ VA(1)
 PHASE CURRENT ■ VB(1)
 PHASE CURRENT ■ VC(1)
 52-1_EXE_CL/79-1_CLOSE_CB_(PO1)
 86_94-1_TRIP/52-1_EXE_OP(PO3)
 50BF-1_TRBU(SO1)
 86_94-1_TRIP(HSO1)
 CB1_POSITION_CLOSE(IN4)
 CB1_POSITION_OPEN(IN5)



FT-1/TS2

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

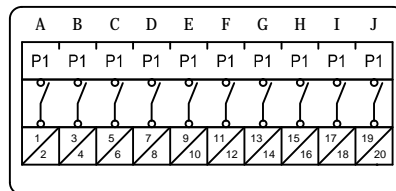
PHASE CURRENT ■ IA(2)
 PHASE CURRENT ■ IB(2)
 PHASE CURRENT ■ IC(2)
 SYNCH VOLTAGE ■ VS1
 SYNCH VOLTAGE ■ VS2



FT-1/TS3

(CT (2) CURRENTS AND LINE POTENTIALS)

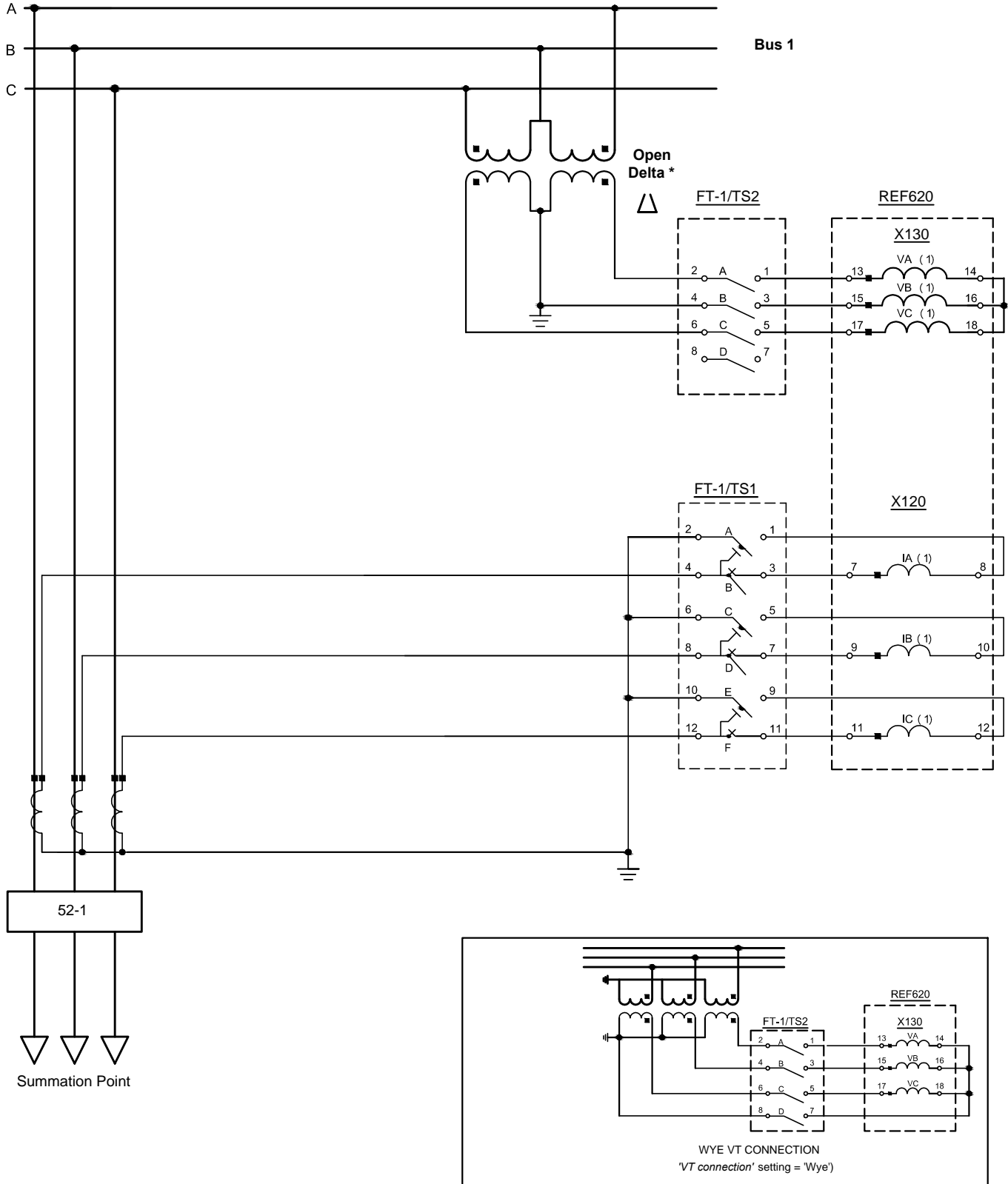
PHASE CURRENT ■ VA(2)
 PHASE CURRENT ■ VB(2)
 PHASE CURRENT ■ VC(2)
 52-2_EXE_CL/79-2_CLOSE_CB_(PO2)
 86_94-1_TRIP/52-2_EXE_OP(PO4)
 50BF-2_TRBU(SO2)
 86_94-2_TRIP(HSO2)
 CB2_POSITION_CLOSE(IN2)
 CB2_POSITION_OPEN(IN3)



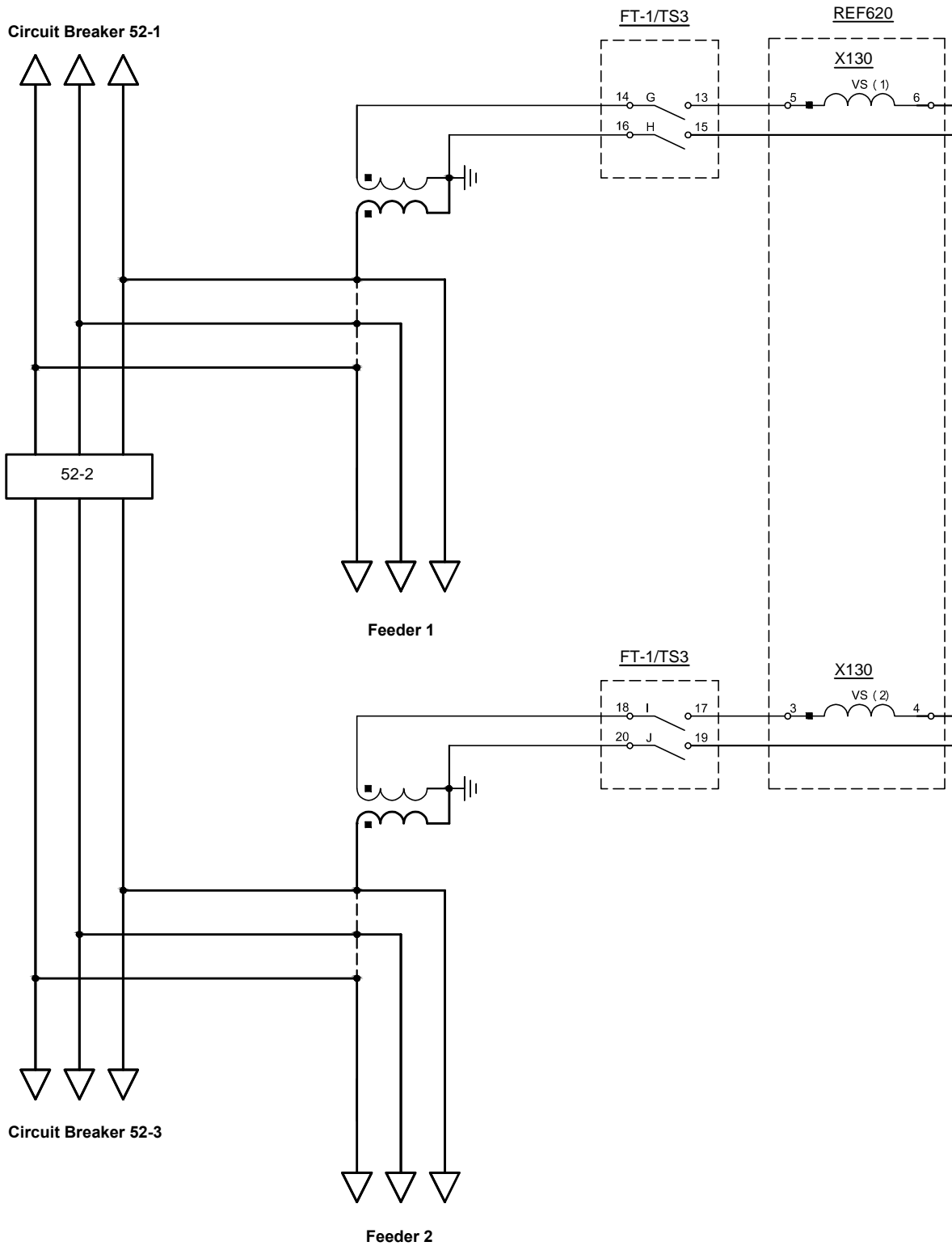
FT-1/TS4

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

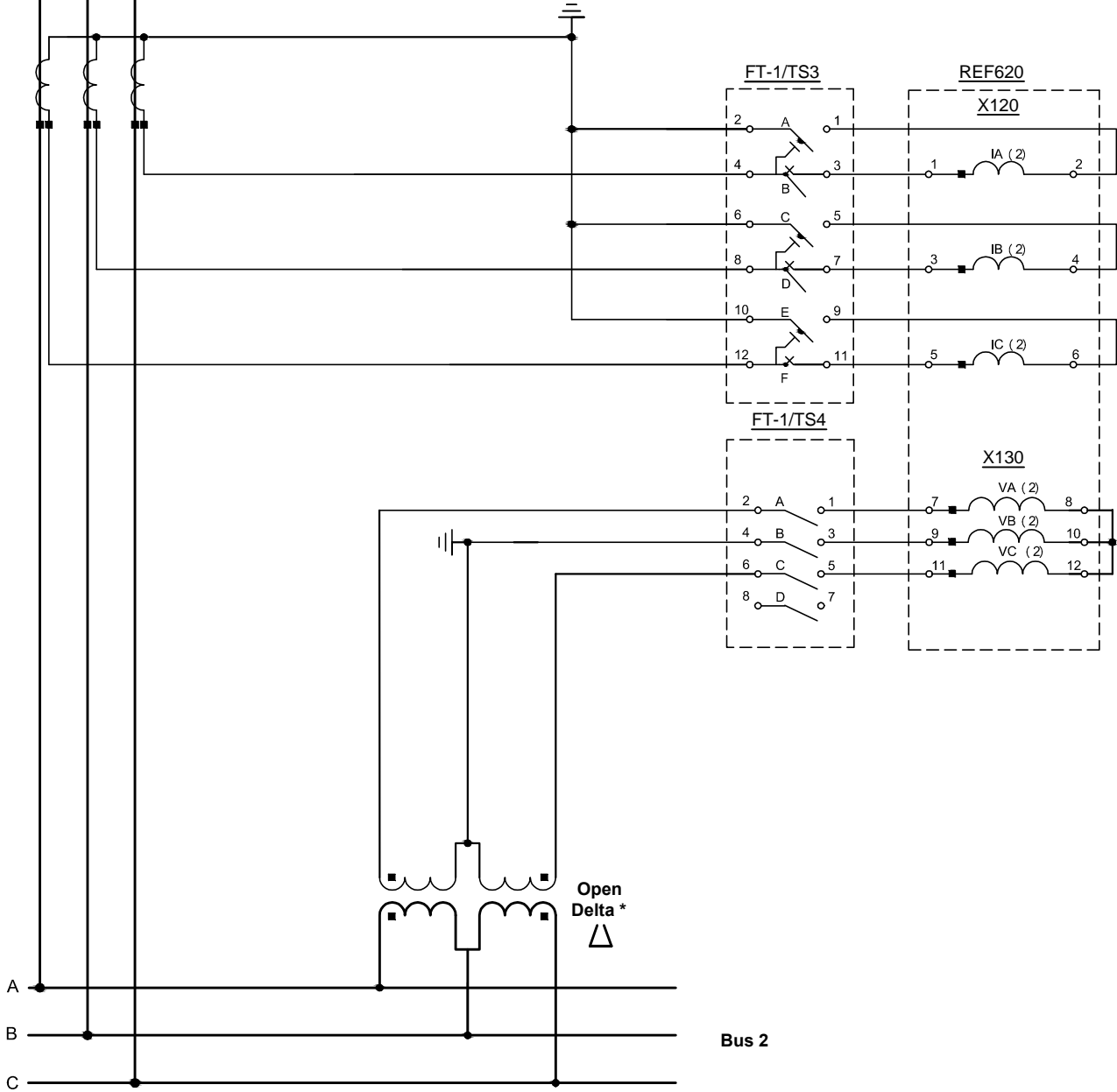
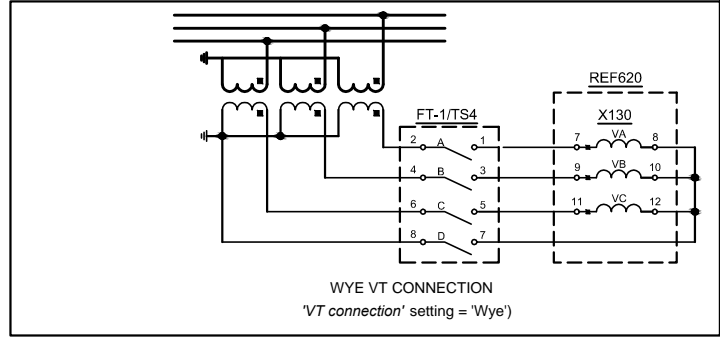
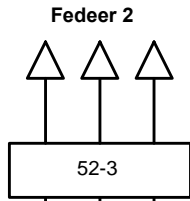
REF620_NAFBBAB3FFxxxAx1xx



* 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.

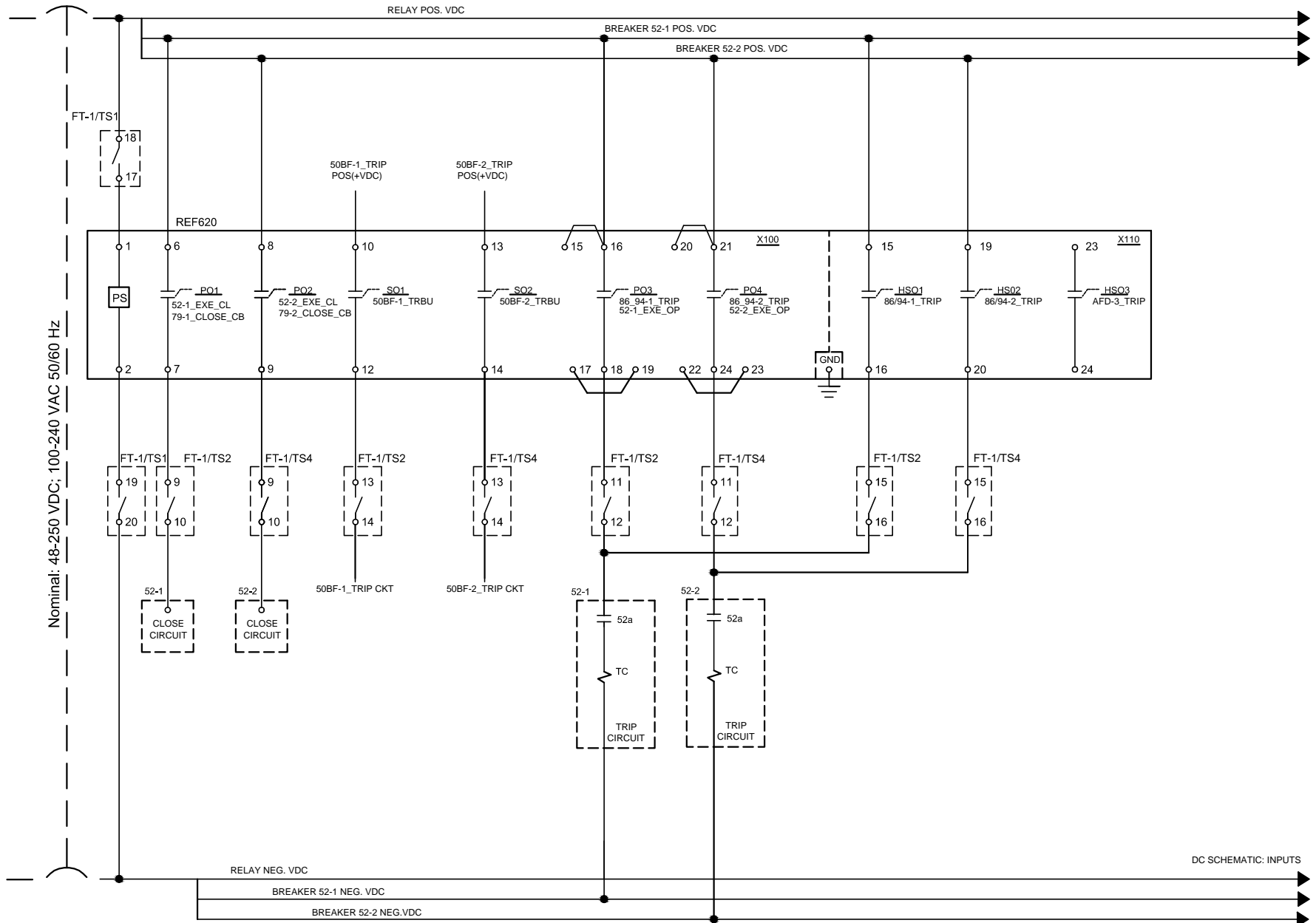


REF620_NAFBBAB3FFxxxNx1xx



REF620_NAFBBAB3FFxxxNx1xx

DC SCHEMATIC: INPUTS



Nominal: 48-250 VDC; 100-240 VAC 50/60 Hz

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.

TITLE: DC SCHEMATIC - OUTPUTS, PS (TYPICAL)

SOFTWARE TYPE:
AUTOCAD 2014

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SIZE DWG. NO.
A

1MAC503972-DR

REV.
A



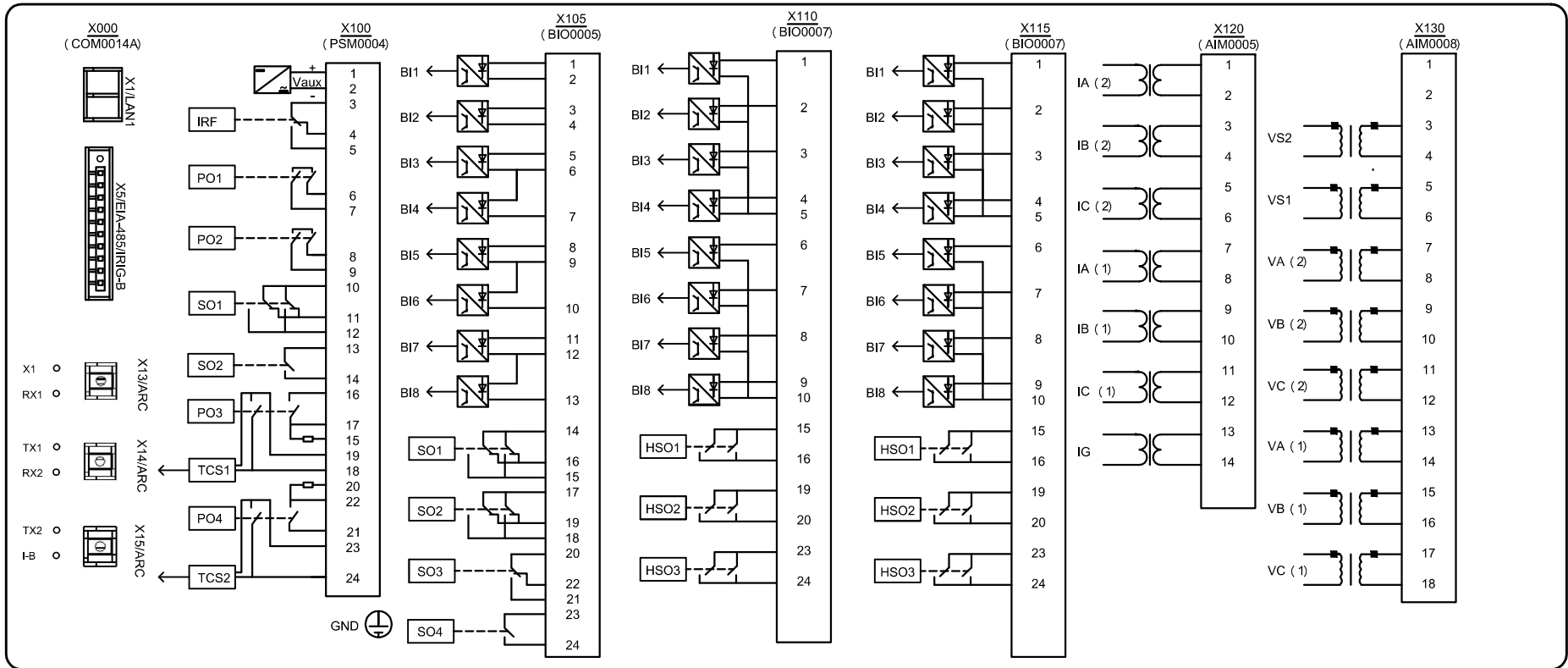
RELAY ORDER CODE: NATBBAB3FFxxxAx1xx

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

SCALE:

SHEET 7 OF 10

REF620_NAFBBAB3FFxxxAx1xx



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:
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:

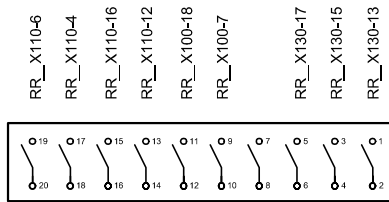
X115-1:
X115-2:
X115-3:
X115-4:
X115-5:
X115-6:
X115-7:
X115-8:
X115-9:
X115-10:
X115-11:
X115-12:
X115-13:
X115-14:
X115-15:
X115-16:
X115-17:
X115-18:
X115-19:
X115-20:
X115-21:
X115-22:
X115-23:
X115-24:

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:
X120-14:

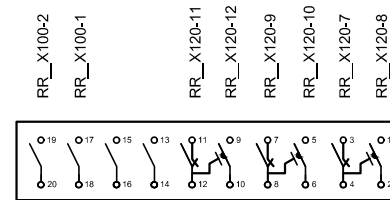
X130-1:
X130-2:
X130-3: VV17
X130-4: VV19
X130-5: VV13
X130-6: VV15
X130-7: UU1
X130-8: X130-10
X130-9: UU3
X130-10: X130-8, X130-12
X130-11: UU5
X130-12: X130-10
X130-13: SS1
X130-14: X130-16
X130-15: SS3
X130-16: X130-14, X130-18
X130-17: SS5
X130-18: X130-16

GND:

REF620_NAFBBAB3FFxxxAx1xx

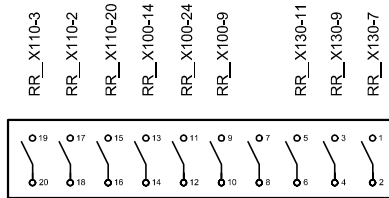


SS
FT-1/TS2

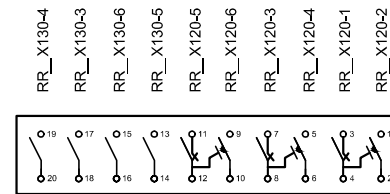


TT
FT-1/TS1

TT6
TT2, TT10
TT6



UU
FT-1/TS4



VV
FT-1/TS3

VV6
VV2, VV10
VV6