Fermi potential tap designation
Toshiba potential tap designation
Toshiba connector designation

5000A Bus Bus A — West

1A0 (T11) J6-H P? — Vapor Cooled Lead
2A0 (T10) J3-H P? — Transition Lead
3A0 (T9) J7-G P? — Field Joint (V8) (V7)

TB1 R1A R1B R2B R2A R3A R3B TB-8
TB3 R20 R21 R22 R23 R24 R25 R26 TB-8
TB5 r1A00 r1A01 r2A00 r2A01 r2A02 r3A00 r3A01 TB-8

TP1A0
TP2A0
TP3A0

S1A P1A C209 WHT BLK P1B P1J
NC S1J
S1K P1K C210 WHT BLK P1C P1D
S1C
NC S1D

Vapor Lead A Voltage
Transition Lead A Voltage

Chimney Lead
3A1 (T9') J6-A P? 300/202* — (V4) (V3) Field Joint
4A0 (T8) J6-C P? 60/45*
J6-D P?
Solenoid Outer Coil
5A0 (T7) 30/29*
5A1 (T6) 30/29*
J6-E P?
5B0 (T5) 45/30* J6-F P? — Solenoid Inner Coil
J6-G P?
4B0 (T4) 60/45* — Field Joint (V2) (V1)
3B1 (T3') J6-B P? 300/202*

TB7 R4A R4B R5A R5B R6A R6B TB-11
TB9 R27 R28 R29 R30 R31 R32 R33 R34 R35 R36 TB-11
TB11 r3A10 r3A11 r3A12 r4A00 r4A01 r4A02 r4A03 r5A00 r5A01 r5A02 TB-11

TB8 R7A R7B R8A R8B R9A R9B R8O R81 R10A R10B TB-11
TB10 R37 R38 R39 R40 R41 R42 R43 R44 R45 R46 R47 TB-11
TB12 r5A10 r5A11 r5B00 r5B01 r4B00 r4B01 r4B02 r4B03 r3B10 r3B11 r3B12 TB-11

Patch panel at water cooled bus termination
for disconnecting to relocate solenoid

S2A P2A C100 S5A P5A S6A P6A WHT C200 BLK P6B
S2B P2B S5B P5B S6B
NC S2P P2P S5P P5P S6P P6P
S2C P2C C101 S5C P5C S6C P6C WHT C201 BLK P6E
S2E P2E S5E P5E S6E P6E
NC S2D P2D S5D P5D S6D P6D
S2R P2R C102 S5R P5R S6R P6R BLK C202 RED P6U
S2U P2U S5U P5U S6U P6W WHT P6Y
S2W P2W S5W P5W S6W
S2Y P2Y S5Y

Chimney Lead A Voltage
Outer Coil Voltage
Center Tap Bridge Imbalance Voltage

S2S P2S C103 S5S P5S S6S P6S BLK C203 RED P6H
S2H P2H S5H P5H S6H P6K WHT P6V
S2K P2K S5K P5K S6K
NC S2V P2V S5V P5V S6V P6F WHT C204 BLK P6L
S2F P2F C104 S5F P5F S6F
S2L P2L S5L P5L S6L P6J
NC S2J P2J C105 S5J P5J S6J P6M WHT C205 BLK P6N
S2M P2M S5M P5M S6M
S2N P2N S5N P5N S6N P6X
NC S2X P2X S5X P5X S6X

Quarter Tap Bridge Imbalance Voltage
Inner Coil Voltage
Chimney Lead B Voltage

S3A P3A WHT S4A P4A r3A11' TP3A1
S3B P3B C106 BLK S4B P4B r4A01' TP4A0
S3C P3C RED S4C P4C r5A01' TP5A0
S3H P3H GRN S4H P4H r5A11' TP5A1
S3D P3D WHT S4D P4D TP5B0
S3E P3E BLK S4E P4E r4B02' TP4B0
S3F P3F RED S4F P4F r3B12' TP3B1
S3G P3G C107 GRN S4G P4G

TP cable shield connected to connector shell

Transition Lead B Voltage
Vapor Lead B Voltage

To Quench Detector
Ptaps

Resistor box located near north connector on solenoid.
Solenoid connector J6 is a Burndy G6F 12-88 SNE

5000A Bus Bus B — East

1B0 (T1)
Transition Lead
2B0 (T2)
Vapor Cooled Lead

J7-P P? — Vapor and transition leads voltage tap safety resistors located near lead box
J2-H P?
J5-H P?

TB2 R11A R11B R12A R12B R13A R13B TB-8
TB4 R48 R49 R50 R51 R52 R53 R54 TB-8
TB6 r3B00 r3B01 r2B00 r2B01 r2B02 r1B00 r1B01 TB-8

TP3B0
TP2B0
TP1B0

S1H P1H C211 WHT BLK P1G
S1G
NC S1M P1M
S1F P1F C212 WHT BLK P1E
S1E
NC S1L P1L

Lead box connectors J2, J3, J5, J6 are Burndy G6F 12-88 SNE
J7 is Burndy G6F 18-22 SNE

Data Logger Connection Point

r1A01 J7A — Vapor Lead A T.P
r2A02 J7B
J7C — Trans Lead A T.P
r3A01 J7D
r3A11' J7E — Chimney Lead A T.P
r4A01' J7F
J7G — Outer Coil T.P
r5A11' J7J
r5A01' J7K — Inner Coil T.P
r4B02' J7M
J7N — Chimney Lead B T.P
r3B12' J7P
r3B01 J7R — Transition Lead B T.P
r2B02 J7c
J7b — Vapor Lead B T.P
r1B01 J7a

RTD's all to PLC

Located in Rm511 on clamp connection to water cooled bus
RTD13 + Red, RTD13 - Red, RTD13 + Blk, RTD13 - — ER0180 ER0181 ER0182 — RTD13
Located in Rm511 on clamp connection to water cooled bus
RTD14 + Red, RTD14 - Red, RTD14 + Blk, RTD14 - — ER0183 ER0184 ER0185 — RTD14

Box located on control dewar platform
see also temperature permit sheet
for klixon assignments on TB1 in same box

Located at solenoid on connection to vapor cooled lead
RTD15 + Red, RTD15 - Red, RTD15 + Blk, RTD15 - — ER0186 ER0187 ER0188 — RTD15
Located at solenoid on connection to vapor cooled lead
RTD16 + Red, RTD16 - Red, RTD16 + Blk, RTD16 - — ER0189 ER0190 ER0191 — RTD16

TB2 A B C D E F TB-9
MS3120E10-3P

These leads attach to the solenoid chimney lead field joint voltage taps. They are used to manually monitor voltage drops during commissioning. They are not used by the quench detector system. The Toshiba connector is located near the lead box and is shared by the transition and vapor lead voltage taps. Implicit connections go to solenoid shown above.

V1 J7-N P? V1
V2 J7-F P? V2
V3 J7-M P? V3
V4 J7-E P? V4
V5 J7-L P? V5
V6 J7-D P? V6
V7 J7-K P? V7
V8 J7-C P? V8

TB13 R60 R61 R62 R63 R64 R65 R66 R67 TB-9
TB14 TB-9

Chimney Lead Field Joint
Test Points and external connector
(Not used in Quench Detection System)

TPV1 1-BLK J7d — Lower Field Joint Chimney Lead A T.P
TPV2 1-RED J7g
TPV3 2-BLK J7U — Lower Field Joint Chimney Lead B T.P
TPV4 2-RED J7V
TPV5 1-GRN J7Z — Upper Field Joint Chimeny Lead B T.P
TPV6 1-WHT J7L
TPV7 2-GRN J7W — Upper Field Joint Chimeny Lead A T.P
TPV8 2-WHT J7X

Notes:

1) Voltage taps 1A0, 2A0, 3A0, 1B0, 2B0, 3B0, and V1-8 are terminated in connectors J2,3,5,6,7 and routed to safety resistor box near lead box.
2) Voltage taps 3A1, 4A0, 5A0, 5A1, 5B0, 4B0 and 3B1 are terminated in connector J6 and routed to safety resistor box near solenoid vessel.
3) R1-R13 are 200 ohm, 3W, 1%, Dale RS-2B
4) R20-R54 are 10K ohm, 10W, 1%, Dale RS-10
5) R60-R67 are 10K ohm, 5W, 1%, Dale RS-5
6) R80-R81 - 301K ohm 1/2W, 1%, Dale RN65C.
Note: R80-81 are used to balance the voltage drops on the source resistance (100 Ohms plus the lead resistance) before the 10K limiter resistor
There is a voltage drop on the source resistance from the current paths through the 100 to 1 dividers and the bridge resistors
7) S1 is Burndy GOB 14-92 SNE
8) S2, S5, S6 is Burndy GOB 18-22 SNE
9) S3 is Burndy GOB 12-88 SNE
10) S4 is Burndy GOB 12-88 PNE
11) S5 is Burndy GOB 18-22 PNE
12) J7 is Burndy GOB 20-30 SNE
13) TB1-TB6 are 8 contact terminal block, Cinch 8-140
14) TB7-TB12 are 11 contact terminal block, Cinch 11-140
15) TB13, TB14 are 9 contact terminal block, Cinch 9-140
16) Terminal blocks and resistors mounted on 3/32" G-10 base plate
17) All internl wiring #AGW20 TFE insulated
18) External test points mounted on 3/32" G-10 plate with minimum of 0.75" creepage path between each other and ground through 1 Meg 1W resistor with a parallel 1000pf 3kV capacitor
19) * Is used to denote resistance of SS leads used for voltage taps. Numbers are warm/cold resistance in Ohms.

Signal nomenclature:

1) Solenoid signals are labeled 1A0, 2A0, 3A0, 3A1 etc.
2) Signals are isolated from the solenoid with 100 ohm resistors and then multiple connections are made such that up to four connections to each signal are present.
3) Each occurance of the signal is then protected by a 10K ohm resistor and routed to the Burndy connector.
4) A small "r" is prefixed to each signal name after its protection resistor to designate "resistor protected".
5) A number (0-3) is postfixed to each signal to identify each particular signal as it is routed to its destination in the quench detector.
6) Test points are routed through isolation and protection resistors also; but are labeled to directly identify the corresponding solenoid signal. For example: TP1A0 is connected to solenoid signal 1A0 through a 10K protection resistor and a 100 ohm isolation resistor.
19) * Is used to denote resistance of SS leads used for voltage taps. Numbers are warm/cold resistance in Ohms.

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Electronics Group

Solenoid Energization, Controls & Interlocks

Solenoid (PTaps & Protection Resistors)

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