5ESS® SWITCHING EQUIPMENT
FUSE/FILTER PANEL 4
CIRCUIT

CHANGES

B. Changes in Apparatus

B.1 Removed

R5.0 KS-20289, L6C, 2610
Resistor, App. Fig. 1.

CR9 549A
Diode, App. Fig. 1.

Removed	Replaced By
ED-5D521-30,G1 App. Fig. 1	ED-5D521-30,G2B App. Fig. 1

D. Description of Changes

D.1 To reduce cost, the resistor (R5) and LED (CR9) have been removed on Sheet C1.

D.2 The alarm board has been changed from A Group 1 to A Group 2B on Sheets B2 and C1.

F. Changes in Description of Operation or Changes in CD Sections

F.1 Remove the reference to the illumination of light-emitting diode page, and Page 2.

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DEPT 55535-TPG-JCB

5ESS™ SWITCHING EQUIPMENT

FUSE/FILTER PANEL 4 CIRCUIT

CHANGES

B. Changes in Apparatus

B.1 No changes in apparatus. The drawing was corrected to bring it into agreement with all manufactured product, and to make minor corrections.

D. Description of Changes

D.1 Corrected the RTN designations on sheet B1.

D.2 Corrected the pin assignments on sheets B2, D5, and G2.

D.3 Added sheet note on sheet D2.

D.4 Corrected drawing on Sheet D5.

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DEPT 55613-RCK-JCB

5ESS™ SWITCHING EQUIPMENT

FUSE/FILTER PANEL 4 CIRCUIT

TABLE OF CONTENTS PAGE

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 This circuit provides fusing for all equipment units that are located in the same ESS™ bay as the fuse/filter panel. This circuit provides an electrical alarm signal and a visual indicator whenever any fuse operates. It also has a test capability feature to ensure that the alarm circuitry is functioning.

2. GENERAL DESCRIPTION OF OPERATION

2.01 The nominal power input to the fuse panel is -48 volts, with the return (RTN) isolated from frame ground in the equipment cabinet. Each fuse/filter panel has four circuits that are each fed from a 20-amp fuse in the power distributing cabinet or from the power plant. Circuit 0 feeds 8 low current fuse positions, each equipped with a 70 type fuse. Circuits 1, 2, and 3 are equipped the same as circuit 0. The total load fuse capability of the unit therefore is 32 low current fuses. Operation of any type 70 fuse sends out an electrical alarm signal. Those alarms generated when fuses operate are sent to the plug-in circuit pack (ED-5D521-30,G1) where they are combined to illuminate a light-emitting diode and to send from the fuse panel an electrical signal to indicate that a fuse in that panel has operated.

2.02 A typical installation is two fuse panels per equipment bay with distribution to all equipment loads in that bay. Power is never sent to other equipment bays from the bay in which the fuse panel is located. Available load fuse positions are assigned to satisfy reliability service group requirements and load balance goals between the 0, 1, 2, and 3 buses. Considerable flexibility exists as to how this unit can be powered; typically all four circuits are powered from the same bus, i.e., either A or B. (The A buses feed 0 circuits, and the B buses feed 1 circuits.) Or circuits 0 and 1 can be powered from the A (or 0) bus, and circuits 2 and 3 powered from the B (1) bus. The equipment arrangement in the cabinet can require either one unit or two side-by-side units. The most common arrangement is two units.

For 0 (or A) bus installations, the feeders are numbered consecutively through both units from the left (viewed from the front) as -48V00, -48V01, -48V02, -48V03, -48V04, -48V05, -48V06, and 48V07, using as many as are required. Similarly, for 1 (or B) bus installations, the feeders are numbered consecutively through both units from the left (viewed from the front) as -48V10, -48V11, -48V12, -48V13, -48V14, -48V15, -48V16 and -48V17, using as many as are required. Stamping lists to accomplish this are described in Equipment Note 206.

SECTION II - DETAILED DESCRIPTION

1. CIRCUIT AND PHYSICAL ARRANGEMENT

1.01 The physical construction of the fuse/filter panel 4 unit consists of three 23A fuse blocks at the lower level of the unit. These are fed from circuits 0, 1, and 2 respectively from the left as viewed from the front. Each block has 8 low current 70 type fuses. The upper level of the unit is equipped on the right (as viewed from the front) with another 23A fuse block, and is powered from circuit 3. The circuit 0 fuses have one fuse alarm; the circuit 1 fuses have one fuse alarm; the circuit 2 fuses have one fuse alarm; and the circuit 3 fuses have one fuse alarm. A fuse alarm circuit pack (ED-5D521-30, G1,A) is provided in the upper level of the unit. Any fuse alarm coming into the alarm pack lights the red FA LED on the front of the pack, and sends out an electrical fuse alarm via the small rear terminal strip.

1.02 To receive the push-on receptacles for the load power wiring, the rear panel of each fuse/filter unit is arranged with two large tab-type terminal strips. A small terminal strip is provided for pluggable connectors for fuse alarms and also for the TEL, SP, TTY A, and TTY B functions. This terminal strip has pairs of terminals made common in its printed wiring pattern, such that two connectors plugged into it, side-by-side, have identical signals present. These carry alarm and jack module mults down the line-up. To collect fuse alarm circuits, as required, the terminal strip can also have wire jumper strapping. Only one set of straps need be installed for each pair of connectors because of the terminals being made common in the wiring pattern.

2. ALARMS

2.01 Circuit 0 has one fuse alarm available; circuit 1 has one fuse alarm available; and circuit 3 has one fuse alarm available. If separate alarms are not required, the alarm terminals at the alarm circuit pack can be connected, as required, on the small terminal strip at the back of the unit.

3. ALARM TESTING

3.01 Alarm testing is incorporated in 5ESS switch using circuits to ensure the proper functioning of both the fuse panel and the external wiring

to the circuit being used. The alarm test leads introduce a -48 volt test voltage into the beginning of the series circuit that makes up the interconnected alarm terminals. If all wiring is proper and intact, the test voltage reaches the alarm circuit packs and indicates an alarm condition, both visually (light-emitting diode) and through electrical manifestation. The maintenance circuit of the equipment being used expects this response, and it indicates improper operation if the correct input signal is not received from the fuse panel.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.01

Battery Symbol	Voltage Range
-48V	-42.75 to -52.5V

2. FUNCTIONAL DESIGNATIONS

2.01

Designation	Voltage	Bus	Meaning
-48V00	-48	A	A bus, First feeder, Circuit 0
-48V01	-48	A	A bus, Second feeder, Circuit 1
-48V02	-48	A	A bus, Third feeder, Circuit 2
-48V03	-48	A	A bus, Fourth feeder, Circuit 3
-48V04	-48	A	A bus Fifth feeder, Circuit 0
-48V05	-48	A	A bus Sixth feeder Circuit 1
-48V06	-48	A	A bus Seventh feeder Circuit 2
-48V07	-48	A	A bus Eighth feeder Circuit 3
-48V10	-48	B	B bus, First feeder, Circuit 0
-48V11	-48	B	B bus, Second feeder, Circuit 1
-48V12	-48	B	B bus, Third feeder, Circuit 2
-48V13	-48	B	B bus, Fourth feeder, Circuit 3
-48V14	-48	B	B bus Fifth feeder Circuit 0
-48V15	-48	B	B bus Sixth feeder Circuit 1
-48V16	-48	B	B bus Seventh feeder Circuit 2
-48V17	-48	B	B bus Eighth feeder Circuit 3
FA	-48		Fuse alarm
RTN00	-48	A	Return for A bus, First feeder, Circuit 0
RTN01	-48	A	Return for A bus, Second feeder, Circuit 1
RTN02	-48	A	Return for A bus, Third feeder, Circuit 2
RTN03	-48	A	Return for A bus, Fourth feeder, Circuit 3
RTN04	-48	A	Return for A bus, Fifth Feeder Circuit 0
RTN05	-48	A	Return for

Designation	Voltage	Bus	Meaning
			A bus, Sixth feeder Circuit 1
RTN06	-48	A	Return for A bus Circuit 2
RTN07	-48	A	Return for A bus Circuit 3
RTN10	-48	B	Return for B bus, First feeder, Circuit 0
RTN11	-48	B	Return for B bus, Second feeder, Circuit 1
RTN12	-48	B	Return for B bus, Third feeder, Circuit 2
RTN13	-48	B	Return for B bus, Fourth feeder, Circuit 3
RTN14	-48	B	Return for B bus, Fifth feeder, Circuit 0
RTN15	-48	B	Return for B bus, Sixth feeder, Circuit 1
RTN16	-48	B	Return for Seventh feeder Circuit 2
RTN17	-48	B	Return for Eighth feeder Circuit 3
FB01018	-48	-	Fuse block at EQL 01-018
10184B	-48	-	Fuse block at VEQL 01, HEQL 018, load fuse 4B
10184BR	-48	-	Fuse block at VEQL 01, HEQL 081, return for load fuse 4B
02-020,01	-48	-	Terminal strip at VEQL 02, HEQL 020, terminal 01 (Connection for 1018 4B)
01-044,201	-	-	Terminal strip at VEQL 01, HEQL 044, Column 2, Row 01 (Connection for fuse alarm FA)
CP0	-48	-	Fuse alarm circuit pack

3. FUNCTIONS

3.01 Provides equipment load fusing for up to 8 circuit 0 loads, up to 8 circuit 1 loads, up to 8 circuit 2 loads and up to 8 circuit 3 loads per fuse panel.

3.02 Provides visual and electrical fuse alarm indications for each bus.

3.03 Provides alarm circuit testing capability.

4. CONNECTING CIRCUITS

4.01 When this circuit is listed on a keysheet, the connecting information thereon is to be followed:

(a) Fuse/Filter Panel Unit J5D003BT-1.

(b) Appropriate 5ESS Cabinet Schematic Drawing.

(c) Appropriate 5ESS Equipment Unit Schematic Drawings.

5. MANUFACTURING TESTING REQUIREMENTS

5.01 None.

6. ALARM INFORMATION

6.01 Electrical alarm signal indications are sent to the control and display circuit pack SN 516 in equipment units as required. This pack relays the information to the processor frames over the optical fiber data link.

7. TAKING EQUIPMENT OUT OF SERVICE (TEOS)

7.01 Any group of 8 load fuses can be taken out of service by first powering down all equipment units using those fuses (in accordance with system operational guidelines). Then the appropriate power distributing cabinet fuse assigned to the feeder for the 8 fuses can be removed.

7.02 To power up a group of 8 load fuses, insert the feeder fuse at the power distributing cabinet; this is done only after properly using the charging circuit and tools at that cabinet. With the feeder energized, the equipment units are powered up individually through operation of the on pushbutton on the SN 516, as described in the appropriate system operational guidelines.

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