User's
Manual

YEWSERIES 80

Model SPBD
(Style E)
Standby Manual Station

IM 1B4D5-02E

YOKOGAWA ◆
Yokogawa Electric Corporation

IM 1B4D5-02E
7th Edition

Notices

■ Regarding This User's Manual

(1) This manual should be passed on the end user. Keep at least one extra copy of the manual in a safe place.

(2) Read this manual carefully and fully understand how to operate this product before you start operation.

(3) This manual is intended to describe the functions of this product. Yokogawa Electric Corporation (hereinafter simply referred to as Yokogawa) does not guarantee that the functions will suit a particular purpose of the user.

(4) Under absolutely no circumstances may the contents of this manual in part or in whole be transcribed or copied without permission.

(5) The contents of this manual are subject to change without prior notice.

(6) Every effort has been made to ensure accuracy in the preparation of this manual. Should any error or omissions come to your attention however, please contact your nearest Yokogawa representative or our sales office.

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(1) In order to protect the product and the system controlled by it against damage and ensure its safe use, make certain that all of the instructions and precautions relating to safety contained in this manual are strictly adhered to. Yokogawa does not guarantee safety if products are not handled according to these instructions.

(2) Be sure to use the spare parts approved by Yokogawa when replacing parts or consumables.

(3) Modification of the product is strictly prohibited.

(4) Reverse engineering such as the disassembly or decompilation of software is strictly prohibited.

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(2) Yokogawa assumes no liability to any party for any loss or damage, direct or indirect, caused by the user or any unpredictable defect of the product.

2004.05.01-00

CONTENTS

1. INTRODUCTION.

1-1. Inspection.

This instrument was thoroughly tested at the factory before shipment. However, when you receive this instrument:

- Inspect for visible damage.
- Confirm that the model and suffix codes shown on the shipping documents, and also on the nameplate on the top of the instrument, are the same as on your order sheet.
- Confirm that all accessories (see Section 2-2) are present.

If you have any questions about this instrument please contact either your nearest Yokogawa Sales/Service Office or Yokogawa Electric Corporation, Tokyo, Japan.

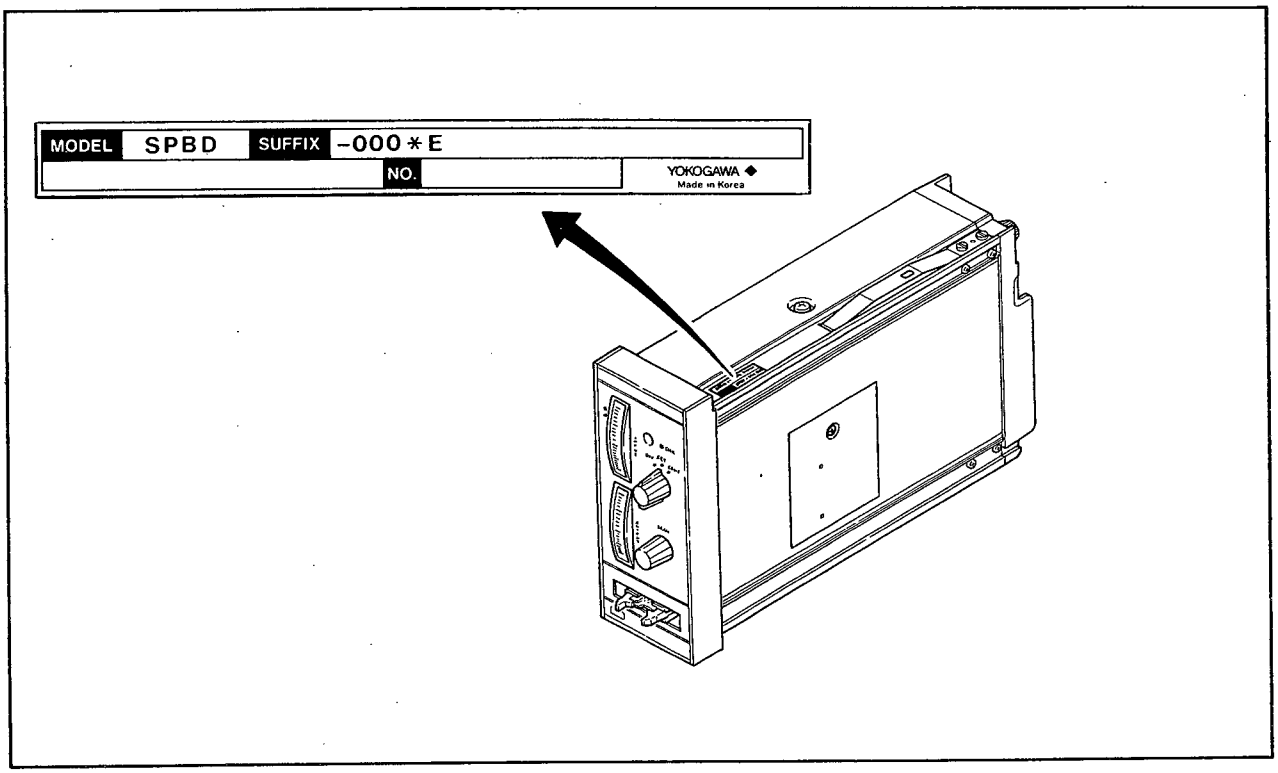


Figure 1-1. Nameplate.

2. GENERAL.

The SPBD Standby Station is used for maintenance service on YEWSERIES 80 controllers or another controllers while they are operating. This station is connected to the lower front of a panel-mounted controller housing to drive a control valve actuator by turning the front panel control knob. Figure 2-1 shows an external view of this instrument.

2-1. Standard Specifications.

Input Signal: 1 to 5 V DC. (Process variable)
4 to 20 mA or 10 to 50 mA DC. (Manipulated variable)
Input Impedance: 1 MΩ.
Output Signal: 4 to 20 mA or 10 to 50 mA DC.
Load Resistance: 0 to 750 Ω (for 4 to 20 mA output); 0 to 300 Ω (for 10 to 50 mA output).
Input Indicator:
Indication Range: 0 to 100%.
Scale: 20 uniform graduations.
Accuracy: ±2.5% of span.
Control Signal Indicator:
Indication Range: 0 to 100%.
Scale: 20 uniform graduations.
Accuracy: ±2.5% of span.

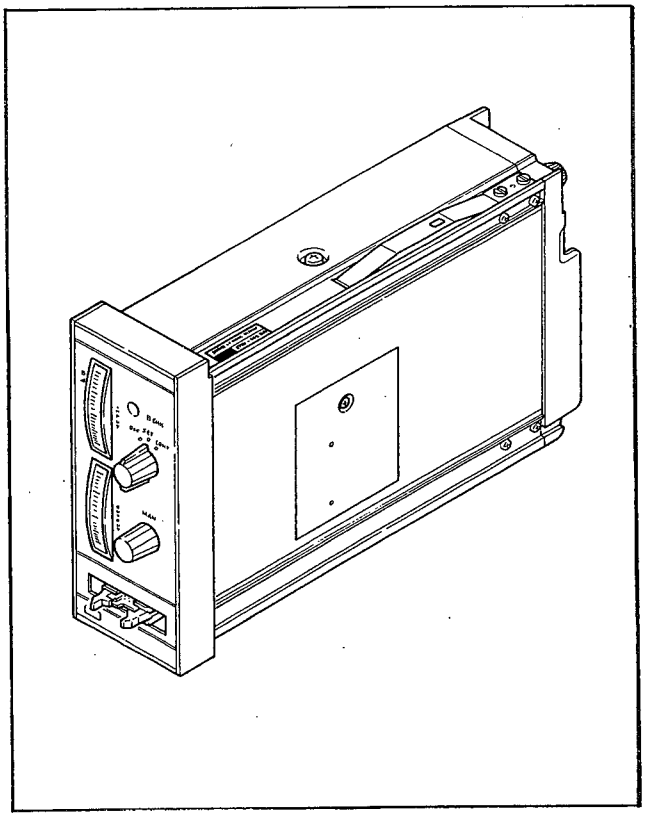


Figure 2-1. External View.

Internal Battery: Three IEC size 6F22 dry cells permit portable operation.

Output	Period of Battery Operation
20 mA DC	10 to 60 min.* (500 Ω load)
50 mA DC	5 to 30 min.* (for 200 Ω load)

* At operating temperature of 25°C.

Power Supply: Two versions, for "100 V" (standard) or "220 V" (option /A2). Both versions may use AC or DC, without change to the instrument:

Version	100 V	220 V
DC (polarity reversible)	20 to 130 V	120 to 340 V
AC (47 to 63 Hz)	80 to 138 V	138 to 264 V

Maximum Power Consumption:
60 mA with 24 V DC power supply.
5.4 VA with 100 V AC power supply.
8.4 VA with 220 V AC power supply.

2-2. Accessories.

1 A fuse, quantity one.
Note: The fuse (S9510VK) is the dedicated fuse, Do not use it for other products.

2-3. Model and Suffix Codes.

Model	Suffix Code	Description
SPBD	. . . . .	Standby Manual Station
	-000 . . .	Always 000
Style Code	-E	Style E
Options	/A2	220 V power supply version
	/NPE	Nameplate engraving

3. PRINCIPLES OF OPERATION.

Figure 3-1 shows a functional block diagram of the SPBD. A process variable (input) is fed to the SPBD through the housing connector, from where it passes through a high-input impedance (R_{IN}), an input filter with (R), (C), a buffer amplifier (U_1) and switches, and is then indicated by the input indicator pointer.

A manipulated output signal adjusted by the manual control knob is fed to transistor (Q_1) via buffer amplifier (U_2), and is supplied to a control valve actuator from the output terminals of the housing, passing through the output indicator and switch after it has been converted to voltage/current.

If a manipulated output signal of 10 to 50 mA DC is required, select the internal slide switch, referring to Chapter 5.

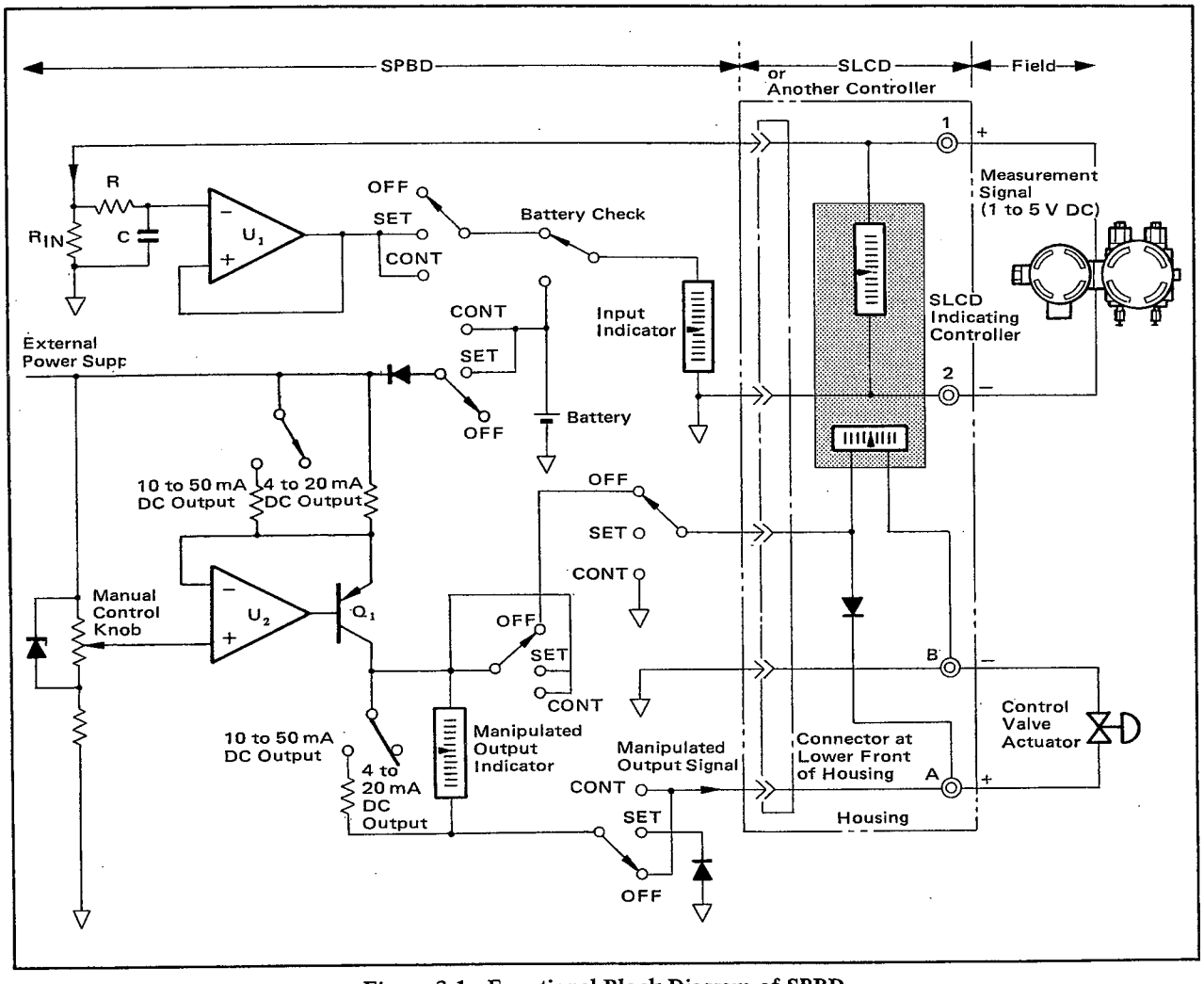


Figure 3-1. Functional Block Diagram of SPBD.

4. OPERATION.

4-1. Names of Components.

Figure 4-1 shows the component names of the SPBD.

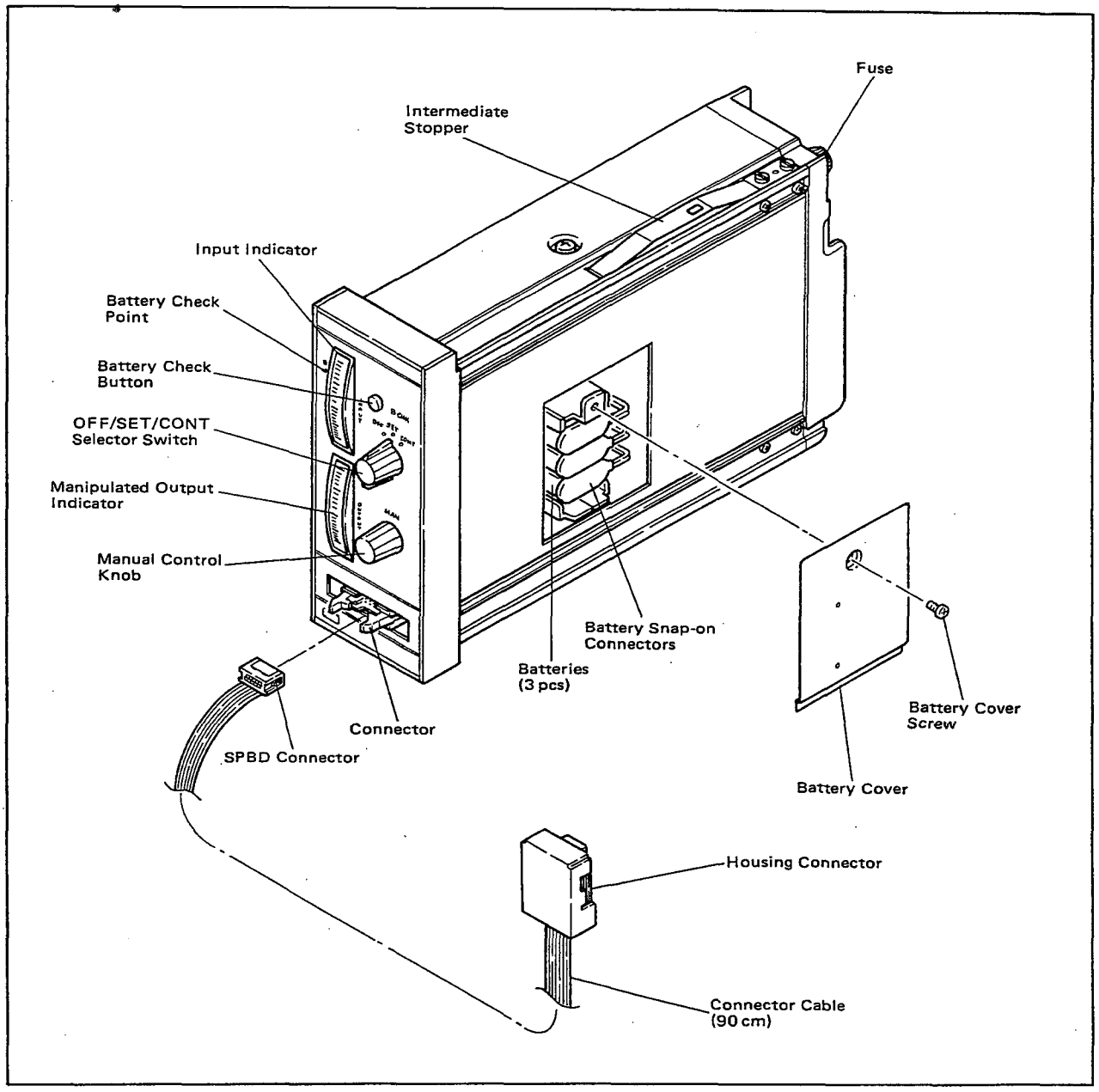
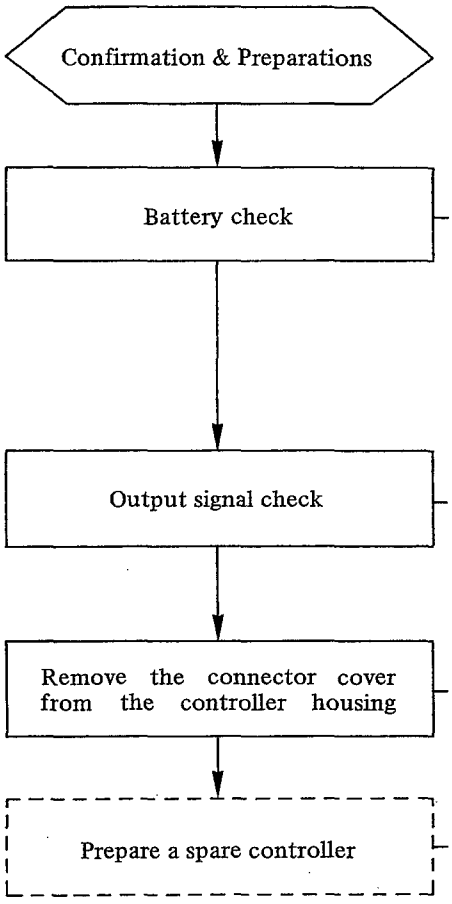


Figure 4-1. Names of Components.

4-2. Preparations for Operation.

4-2-1. Confirmation and Preparations Prior to Operation.

Before using this instrument, confirm and prepare the following items shown in the flow diagram.



- Check that the voltage of the built-in batteries is normal. For the battery check procedure, refer to Paragraph 4-2-2.
  If this instrument is used continuously for an extended period of time, connect the YEW-SERIES 80 housing power cord to the outlet and then, connect the housing connector to this unit. (See Figure 4-2).
- The manipulated output signal of this instrument is either 4 to 20 mA DC or 10 to 50 mA DC (set by the internal selector switch). Insure that the internal output selector switch is set to the desired output signal (for details, refer to Section 5-1).
- Remove the connector cover from the controller housing (see Figure 4-3). If the connector cover can not be removed easily, use tweezers or a jeweller's screwdriver.
- Prepare a spare controller (internal unit), if the existing controller requires replacement.
  If the control valve open/close marks, control action, control parameters, verious selector switch positions are known, set these factors in advance.
  To remove the SPBD and replace it with a controller, refer to Paragraph 4-3-1 and 4-3-2.

NOTE

When the SPBD is not used, set the front panel output selector switch to the OFF position.

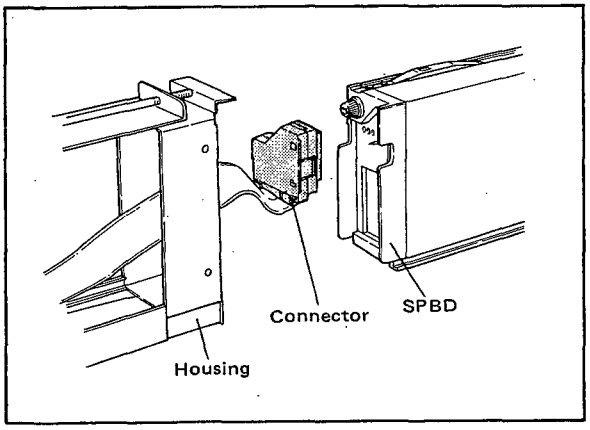


Figure 4-2.

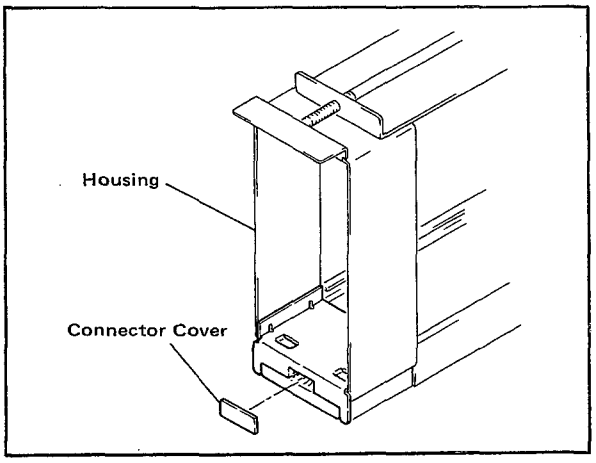


Figure 4-3.

4-2-2. Battery Check.

The voltage of the built-in batteries can be checked on the input indicator by pressing the battery check button (B CHK) on the front panel. If the input pointer indicates above the battery check mark B, the batteries are normal. If the pointer indicates below this mark, replace the batteries. Refer to Chapter 5 for the battery replacement procedure.

The battery can be checked without respect to the selector switch positions (OFF, SET, or CONT) and while the control valve positioner is manually operated.

4-2-3. Battery Replacement Interval.

Battery Used:

S-006P (JIS) 3 pcs.
6F22 (IEC) 3 pcs.

Replace all three built-in batteries at the same time by referring to the following recommended replacement intervals.

[Continuous operation time]

New Batteries:

Approximately 60 min. (20 mA output).
Approximately 30 min. (50 mA output).

When the batteries are normal (the pointer indicates the battery check mark when the B CHK button is pressed):

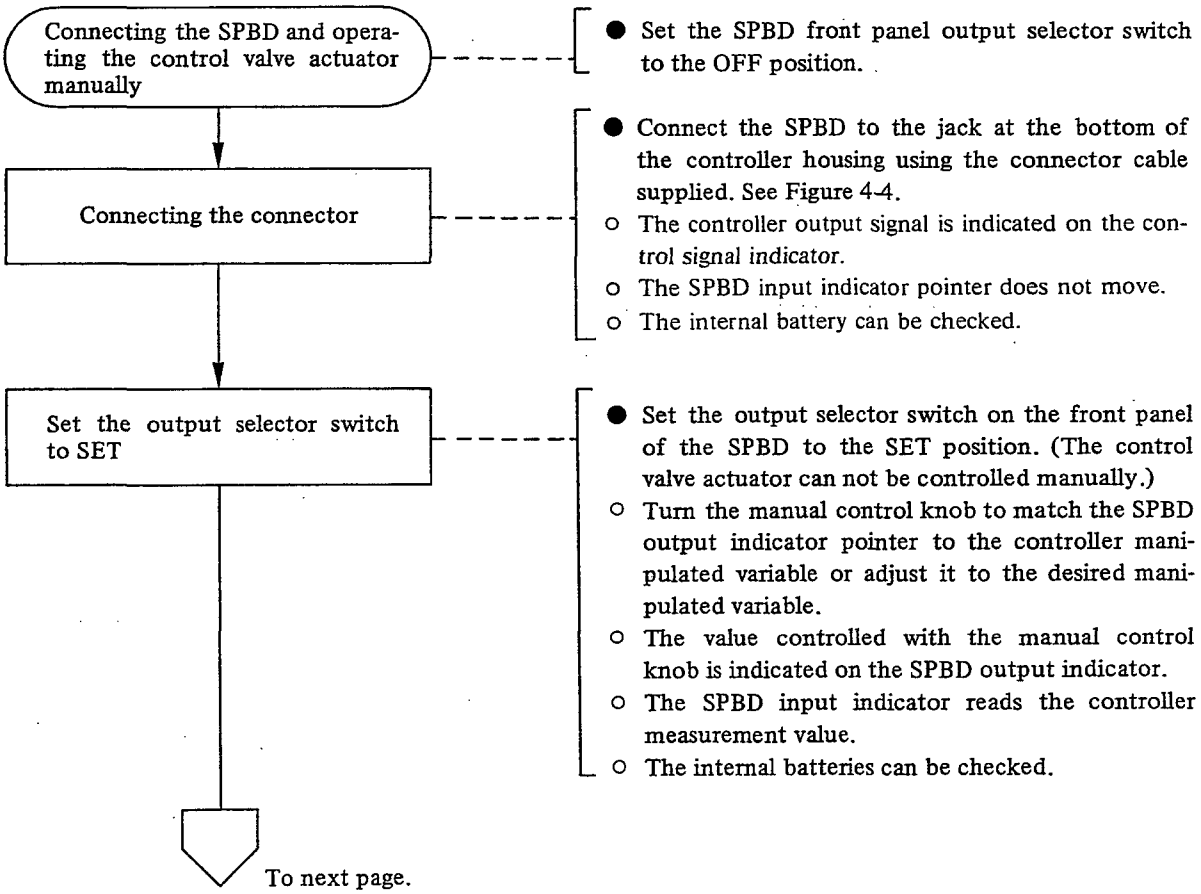
Approximately 10 min. (20 mA output).
Approximately 5 min. (50 mA output).

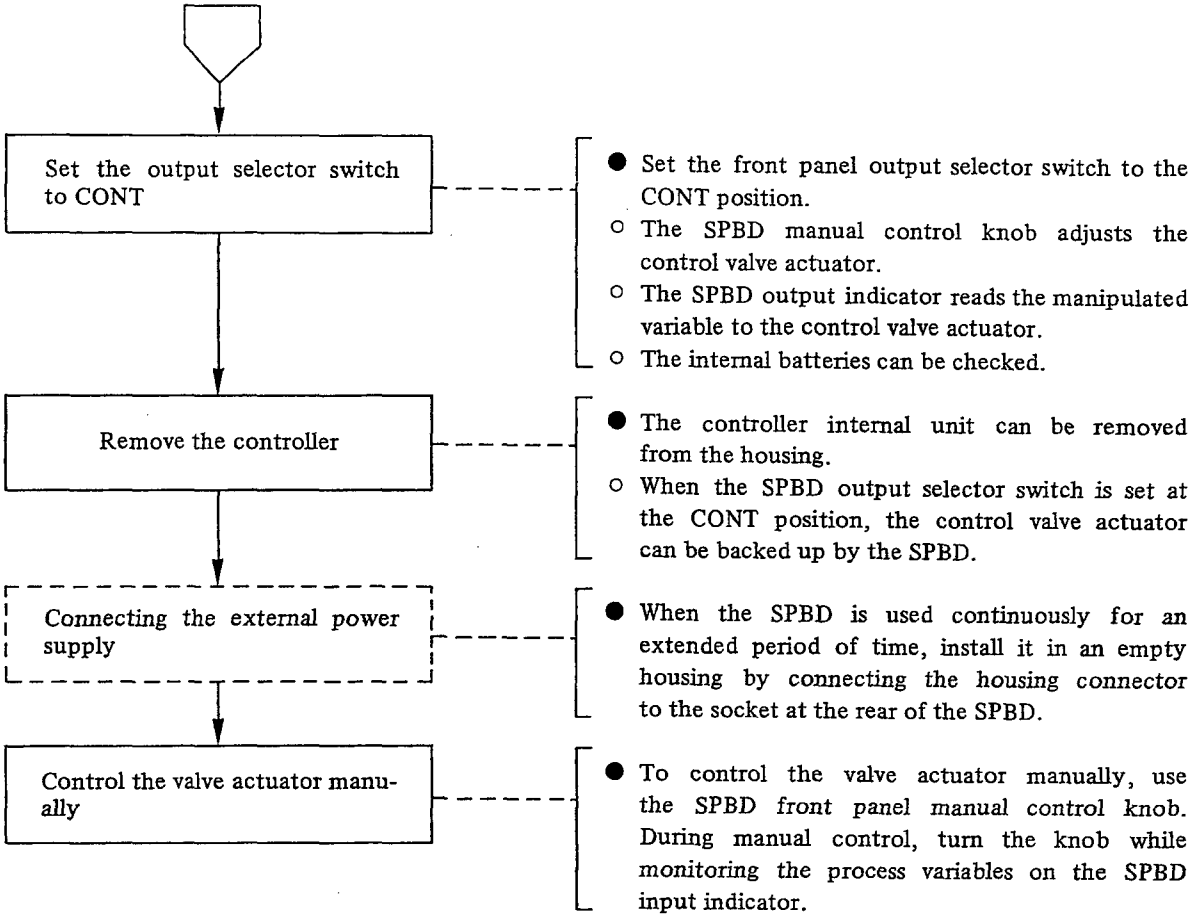
Replace the batteries once a year, even if they are not used. If the SPBD is used for an extended period, supply the power from the housing to avoid discharging the battery.

4-3. Normal Operation.

4-3-1. Connecting the SPBD and Manual Control by SPBD.

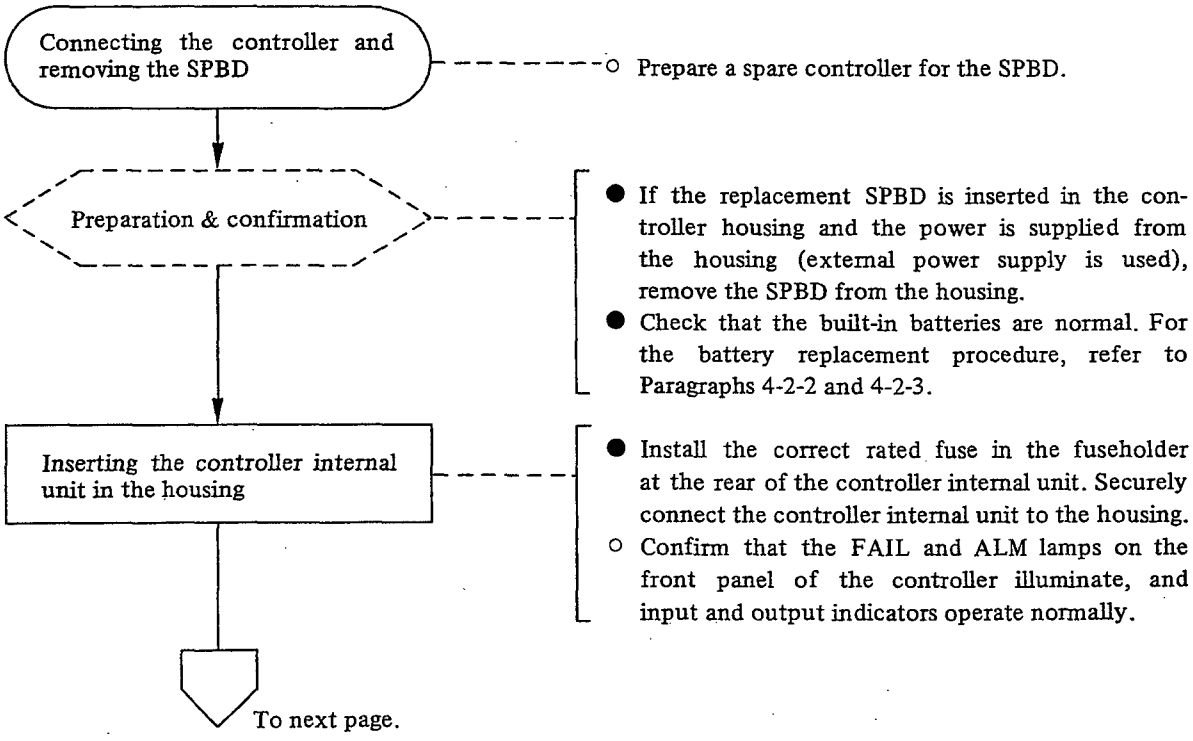
Observe the procedures in the flowcharts to back up a controller and to control a valve actuator manually with the SPBD. Use the SPBD which has been checked as Paragraph 4-2-1, confirmation and preparation prior to operation.

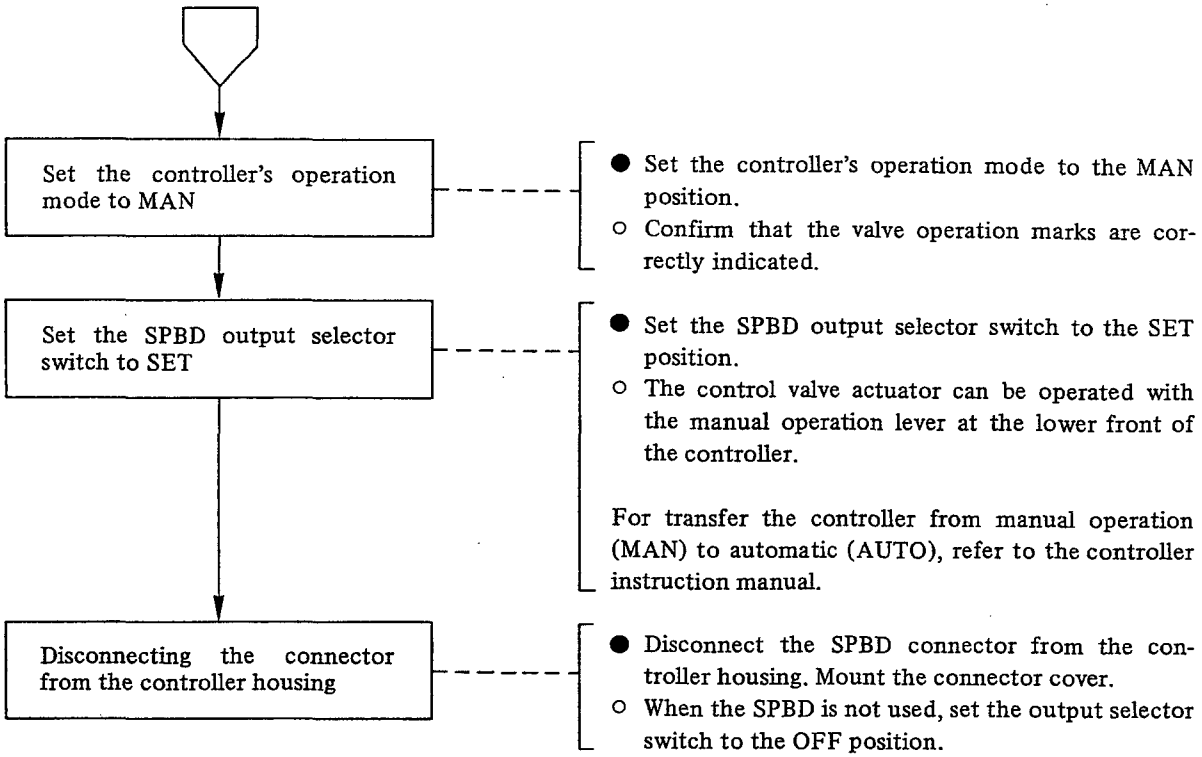




4-3-2. Restoration of the Controller and SPBD Removal.

When the controller is restored and manual operation with the SPBD is not required, restore the manual control loop controller, and remove the SPBD as per the flowchart.





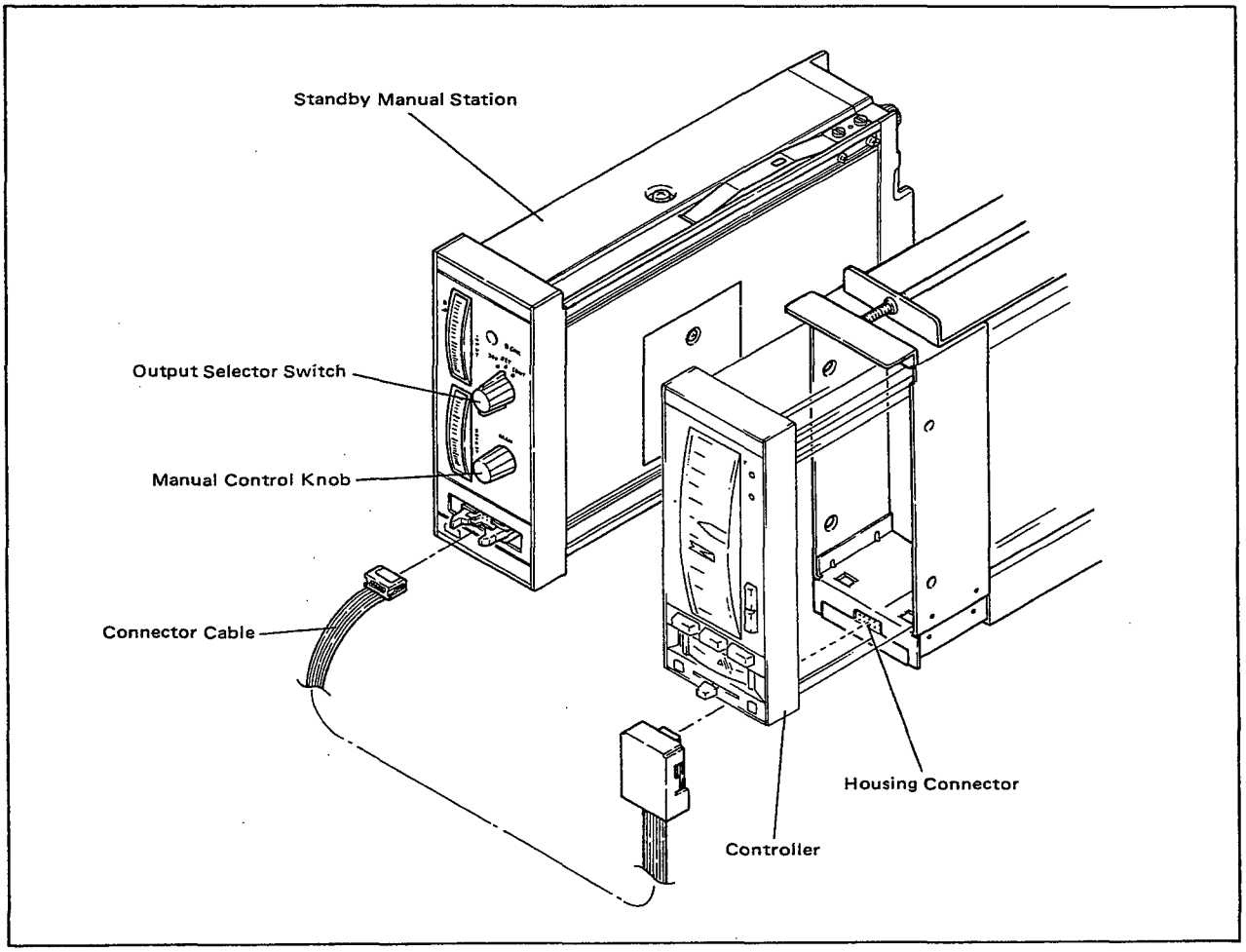


Figure 4-4. Connecting to the Controller Housing Connector.

5. MAINTENANCE.

5-1. Output Current Selector Switch.

The manipulated output current (4 to 20 mA DC or 10 to 50 mA DC) to operate valve actuators can be selected by the slide switch on the main card. Remove the battery cover on the right side of the SPBD to set the slide switch to the desired range. (See Figure 5-1).

5-2. Parts Replacement.

(1) Battery replacement.
Remove the battery cover on the right side of the SPBD. (See Figure 5-1). Detach the snap-on battery connectors before replacing the batteries.
Battery: IEC Type 6F22, or JIS Type S-006P (9 V), 3 pcs.

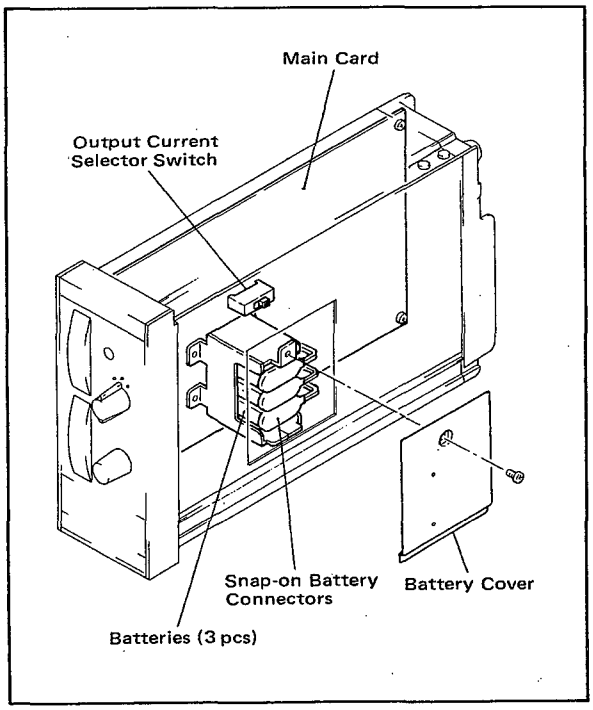


Figure 5-1. Output Current Selector Switch.

(2) Nameplate replacement.
Open the top lid to replace the nameplate as shown in Figure 5-2.

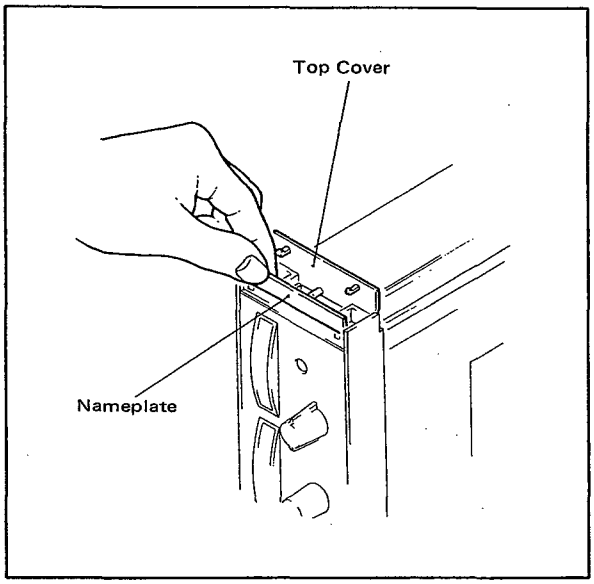


Figure 5-2. Replacing the Nameplate.

(3) Fuse replacement.
Unscrew the fuseholder cap from the rear panel of the SPBD and replace the cartridge fuse. (See Figure 5-3).
Fuse rating: 1 A
Part Number: S9510VK
After replacing the fuse, secure the fuseholder cap.

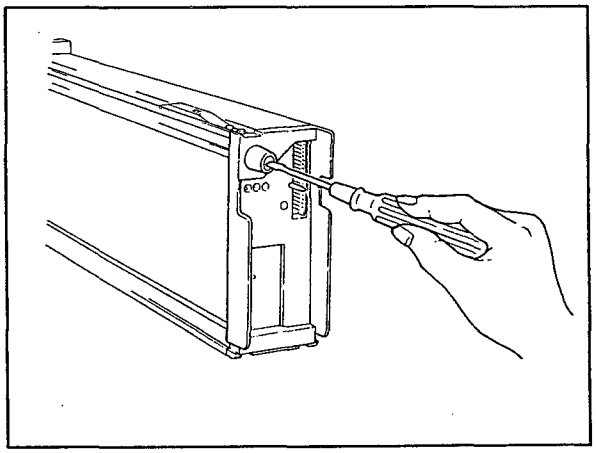


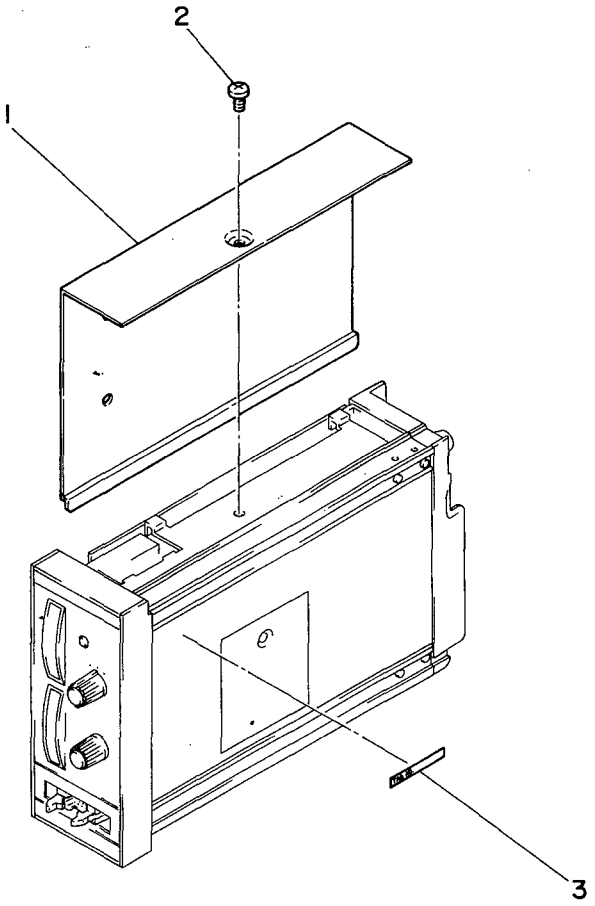
Figure 5-3. Replacing the Fuse.

Note: Use the dedicated fuse (S9510VK). Do not use a fuse for other products.

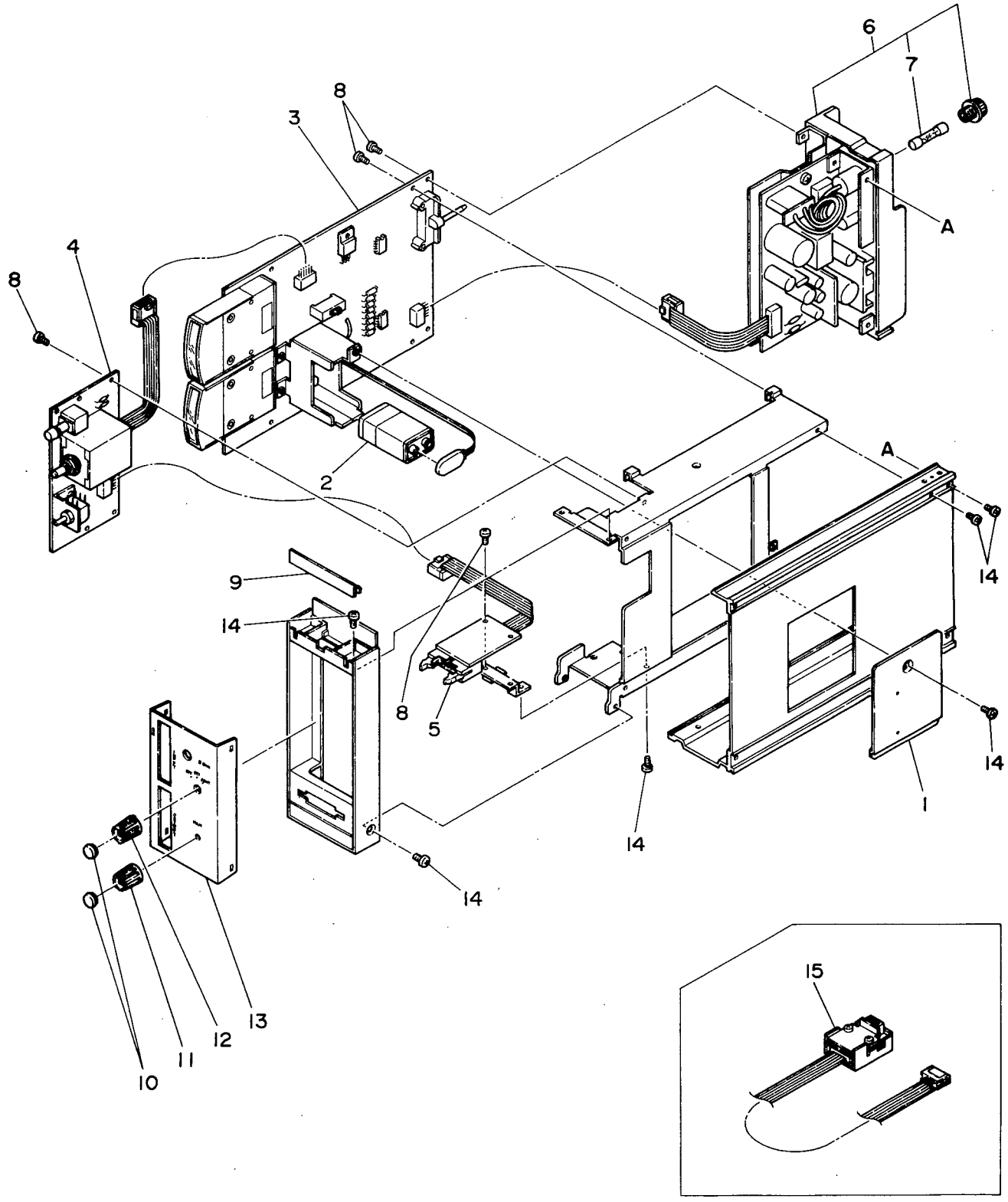
Customer Maintenance Parts List

Model SPBD (Style E) Standby Manual Station

YEWSERIES 80



Item	Part No.	Qty	Description
1	E9712HB	1	Cover
2	Y9405LB	1	B. H. Screw, M4 x 5
3	Y9021NP	1	Tag No. Label (blank)


6
7
8
3
A
4
8
2
A
14
9
14
8
5
14
1
14
14
15
13
12
11
10

Item	Part No.	Qty	Description
1	E9712HC	1	Bracket Assembly
2	A9006ED	3	Battery
—	E9712HF	1	Control Assembly (*items 3 through 8*)
3	E9716RL	1	Main Board Assembly
4	E9716RN	1	Set Board Assembly
5	E9716RD	1	Connection Card
6	E9716YA	1	Power Supply Unit (for 100 V Version)
	E9716YR	1	Power Supply Unit (for 220 V Version)
7	S9510VK	1	Fuse — "1A"
8	Y9306JB	11	Pan H. Screw, M3 x 6
9	E9711FG	1	Plate
10	A9005KU	2	Cap
11	A9082KU	1	Knob
12	A9051KU	1	Knob
13	E9712HK	1	Bracket
14	Y9306JB	12	Pan H. Screw, M3 x 6
15	E9712JJ	1	Cable Assembly

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Yokogawa Electric Corporation

YOKOGAWA ELECTRIC CORPORATION
Network Solutions Business Div.
2-9-32, Nakacho, Musashino-shi, Tokyo, 180-8750 JAPAN
Phone: +81-422-52-7179 Facsimile: +81-422-52-6793
Sales Branch Offices
Tokyo, Nagoya, Osaka, Hiroshima, Fukuoka

YOKOGAWA CORPORATION OF AMERICA
Headquaters
2 Dart Road, Newnan, GA. 30265-1094 U.S.A.
Phone: +1-770-253-7000 Facsimile: +1-770-251-0928
Sales Branch Offices / Texas, Chicago, Detroit, San Jose

YOKOGAWA EUROPE B. V.
Headquaters
Databankweg 20, 3821 AL Amersfoort THE NETHERLANDS
Phone: +31-334-64-1611 Facsimile: +31-334-64-1610
Sales Branch Offices / Houten (The Netherlands), Wien (Austria), Zaventem (Belgium), Ratingen (Germany), Madrid (Spain), Bratislava (Slovakia), Runcorn (United Kingdom), Milano (Italy), Velizy villacoublay(France), Johannesburg(Republic of South Africa)

YOKOGAWA AMERICA DO SUL S.A.
Headquarters & Plant
Praca Acapulco, 31-Santo Amaro, Sao Paulo/SP, BRAZIL CEP-04675-190
Phone: +55-11-5681-2400 Facsimile: +55-11-5681-4434

YOKOGAWA ENGINEERING ASIA PTE. LTD.
Head office
5 Bedok South Road, Singapore 469270 SINGAPORE
Phone: +65-6241-9933 Facsimile: +65-6241-2606

YOKOGAWA ELECTRIC KOREA CO., LTD.
Seoul Sales office
395-70, Shindaebang-dong, Dongjak-gu, Seoul,156-010, KOREA
Phone: +82-2-3284-3000 Facsimile: +82-2-3284-3019

YOKOGAWA TAIWAN CORPORATION
Head office
17F, No.39, Sec. 1, Chung Hwa Road Taipei, 100 TAIWAN
Phone: +886-2-2314-9166 Facsimile: +886-2-2314-9918

YOKOGAWA AUSTRALIA PTY. LTD.
Head office
Centrecourt D1, 25-27 Paul Street North, North Ryde, N. S. W. 2113, AUSTRALIA
Phone: +61-2-9805-0699 Facsimile: +61-2-9888-1844

YOKOGAWA INDIA LTD.
Head office
40/4 Lavelle Road, Bangalore, 560 001, INDIA
Phone: +91-80-227-1513 Facsimile: +91-80-227-4270

LTD. YOKOGAWA ELECTRIC
Grokholskiy per. 13, Build. 2, 4th Floor, 129010, Moscow, RUSSIA FEDERATION
Phone: +7-095-737-7868 Facsimile: +7-095-737-7869