Babcock & Wilcox
Bailey Controls Company

Installation & Service Manual

4571K14-100

TYPE 714 SET STATION (FACTORY STYLE 2)

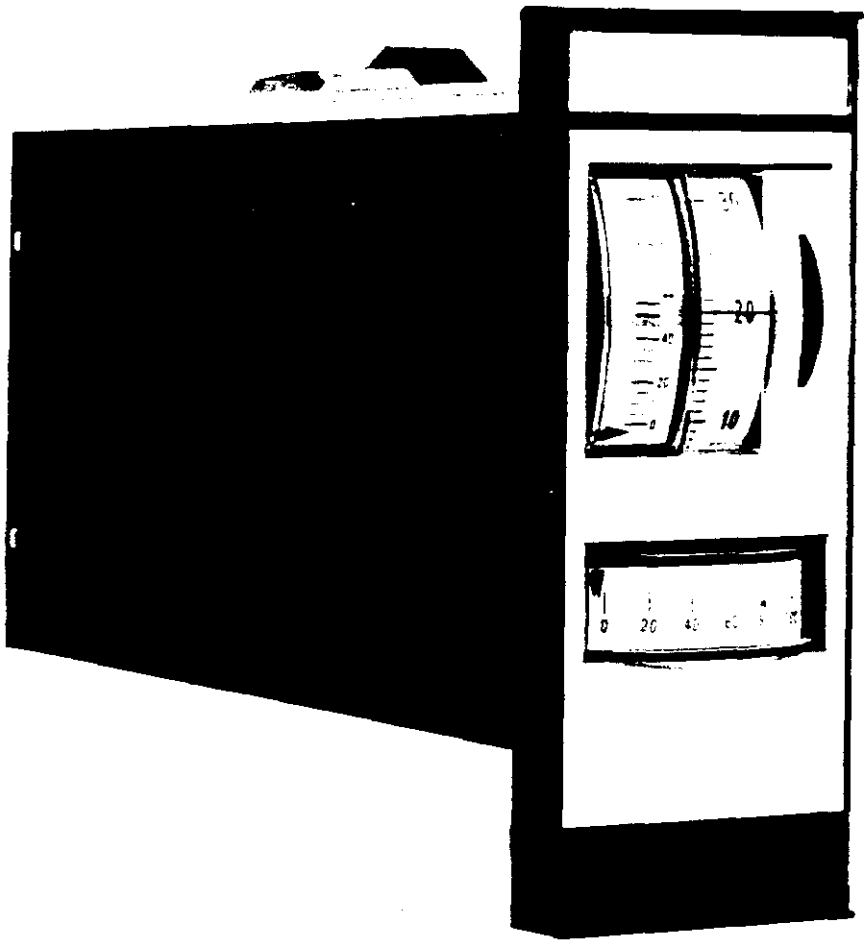


FIGURE 1 – Type 714 Set Station

FOREWORD

This publication provides installation, operation, service and parts information for standard models of the Type 714 Set Station. Information covering special station models is provided in separate publications identified as Difference Data Sheets. For information concerning installation of shelves, rack units and cables, refer to publication 4576K11-001.

BAILEY CONTROLS COMPANY • WICKLIFFE, OHIO 44092

Litho in U.S.A. 1178

WARNING

INSTRUCTION MANUALS

DO NOT INSTALL, MAINTAIN OR OPERATE THIS EQUIPMENT WITHOUT READING, UNDERSTANDING AND FOLLOWING PROPER **Babcock & Wilcox Bailey Controls Co. U.S.A.** INSTRUCTIONS AND MANUALS, OTHERWISE INJURY OR DAMAGE MAY RESULT.

AVERTISSEMENT

MANUELS D'OPERATION

NE PAS METTRE EN PLACE, RÉPARER OU FAIRE FONCTIONNER CE MATÉRIEL SANS AVOIR LU, COMPRIS ET SUIVI LES INSTRUCTIONS RÈGLEMENTAIRES DE **Babcock & Wilcox Bailey Controls Company, U.S.A.** TOUTE NÉGLIGENCE À CET ÉGARD POURRAIT ÊTRE UNE CAUSE D'ACCIDENT OU DE DÉFAILLANCE DU MATÉRIEL.

TABLE OF CONTENTS

Section I

Introduction

The Type 714 Set Station is used primarily in applications requiring a remote adjustable set point signal to be applied as a cascade input to a basic controller. The set station provides output signals of 1-5 V dc and 4-20 mA proportional to the setting of the set point scale. The voltage output is normally used as the set point cascade input to a controller, and the current output for manual control of a final control element.

The front panel of the standard set station contains a vertical set point. If desired, an optional vertical process variable meter and/or horizontal output meter may be supplied. Both the process variable and output meters have either 0-100 linear or 0-10 square root scales corresponding to a 1-5 V input and a 1-5 V and/or 4-20 mA output.

The station may be furnished with two optional indicating lights which are located behind a translucent legend plate. The lights may be operated in parallel or separately.

NOMENCLATURE

CATALOG NUMBER

(Digit	1	2	3	4	5	6	7	8	9	10	11)	Description
	7	1	4	0	•	•	•	A	A	•	2	Set station (manual loader)
					0							Standard (without PV meter)
					1							PV meter (0 to 100 linear)
					5							PV meter (0 to 10 square root)
						0						Standard (without output meter)
						2						Output meter (0 to 100 linear)
						3						Output meter (0 to 10 square root)
							A					Standard (without lights)
							B					Lights
										A		General purpose CSA Certified

WARNING

THIS DEVICE MUST NOT BE LOCATED IN A HAZARDOUS (CLASSIFIED) LOCATION (AS DEFINED BY CHAPTER 5 OF THE NATIONAL ELECTRICAL CODE, NFPA 70-1978, ANSI C1-1978 AND SECTION 18 OF THE CANADIAN ELECTRICAL CODE, PART I, CANADIAN STANDARDS ASSOCIATION STANDARD C22.1-1975.)

AVERTISSEMENT: CE DISPOSITIF NE DOIT PAS ETRE EMPLOYE EN ATMOSPHERE DANGEREUSE TELLE QUE DEFINIE AU CHAPITRE 5 DU NATIONAL ELECTRICAL CODE, NFPA 70-1978, ANSI C1-1978, ET DE LA SECTION 18 DU CODE CANADIEN DE L'ELECTRICITE, lere PARTIE, DE L'ASSOCIATION CANADIENNE DE NORMALISATION C22.1-1975.

Section II

Receiving, Handling, Storage, Shipment

RECEIVING

Immediately on receipt of the station, examine it for any damage which may have occurred in transit. Immediate examination is especially important if rough handling is evident. If damage is found, a damage claim should be filed immediately with the transportation company and the nearest Bailey sales office should be notified. The shipping container should be retained by the user to assist in evaluating the damage to the station or for storage and reshipment.

HANDLING

The station is an electronic unit, weighing approximately 3 pounds (1.36 kg). Observe normal precautions for electronic equipment during handling.

STORAGE

If the station is to be stored prior to use, repack it in its original packing material and container, if possible. Store in an area free of corrosive vapors and extremes in temperature.

SHIPMENT

To provide adequate protection for the station when shipping it from one location to another, or returning it to the factory, it should be packed in the original packing. If this packing is not available, float the station in a box large enough to permit four to five inches of wedging with shredded paper, rubberized hair or equivalent. Use a method of shipment which will insure that normal precautions for electronic equipment are observed.

Section III
Installation

GENERAL

Type 714 Set Stations are designed to be installed in Bailey Type 762 panel-mountable shelves. They are interconnected to other devices and/or to other components in a control system by means of Bailey Type 763 cables. For information concerning installation of shelves and cables, refer to Bailey publication 4576K11-001.

CONNECTIONS

External connections are made by means of either terminal board-terminated cables (Type 7631 cable, connector, and TB assembly) as shown in Figure 3-1 or extended cable-terminated cables (Type 7632 cable and connector assembly) as shown in Figure 3-2. Refer to Table 3-1 which shows external connections to the terminal board and color identification of cable conductors for connecting extended cables to customer-supplied remote terminals.

After external connections have been made, the station is connected into the system by plugging the terminal end of the station circuit board, which protrudes through the rear of the station chassis, into the mating cable connector. The station may then be inserted into the panel-mounted shelf by sliding the bottom rails over the guide rails in the shelf and at the same time depressing the spring latch on top of the station chassis.

TABLE 3-1

EXTERNAL CONNECTIONS

Terminal Number (Terminal Board-Terminated Cable Only)	Cable Conductor Color	External Connections	Notes
1	Green	Earth Ground	
2	Red	+24 V dc Supply	
3	Black	Supply Common	Connect to system signal common
4	White	Signal Common	Connect to system signal common
5	Orange	+ Process Input Signal 1-5 V dc	For optional process variable meter
6	Blue	Spare	
7	White/Black	Output Signal 1-5 V dc	Connect terminal 8 to 9 if current output not used. Load must exceed 0.25 meg.
8	Red/Black	Output Signal 4-20 mA (+)	Allowable load is 0-750 ohms Connect terminals 8 to 9 if current output not used.
9	Green/Black	Output Signal 4-20 mA (–)	
10	Orange/Black	Spare	
11	Blue/Black	Spare	
12	Black/White	Spare	
13	Red/White	Right Light * +24 V dc	For operation of lights from external source
14	Green/White	Left Light +24 V dc	
15	Blue/White	Spare	

*NOTE: When lights are to operate in parallel, connect +24 V dc to Terminal 13.

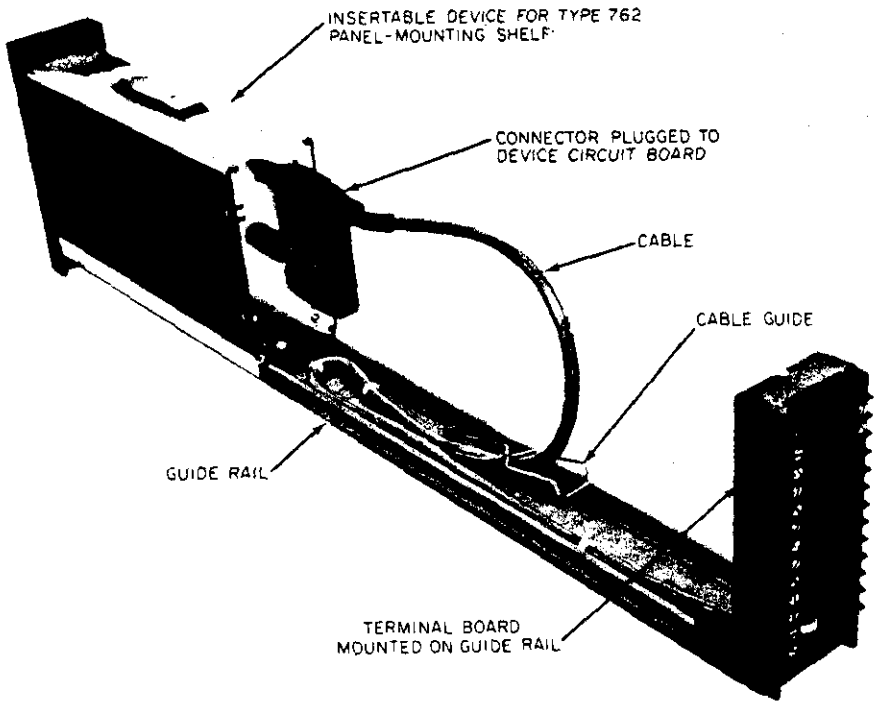


FIGURE 3-1 – Connections Using Type 7631 Cable, Connector and TB Assembly

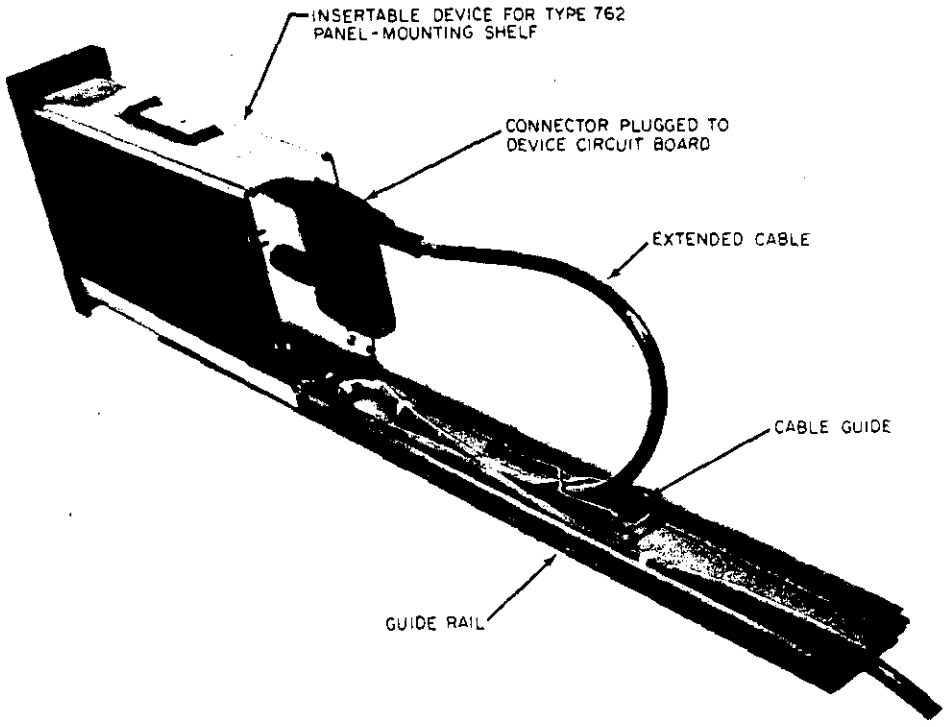
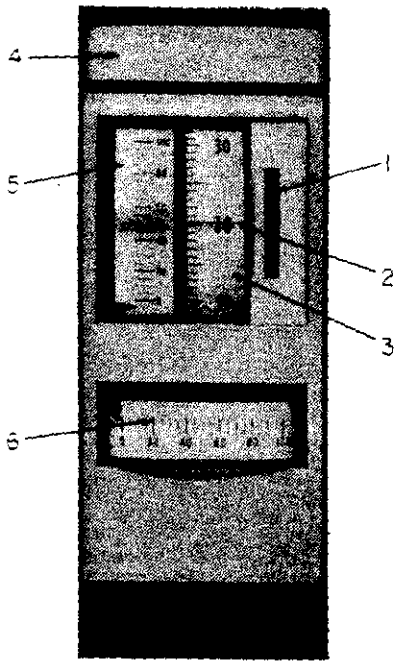


FIGURE 3-2 – Connections Using Type 7632 Extended Cable

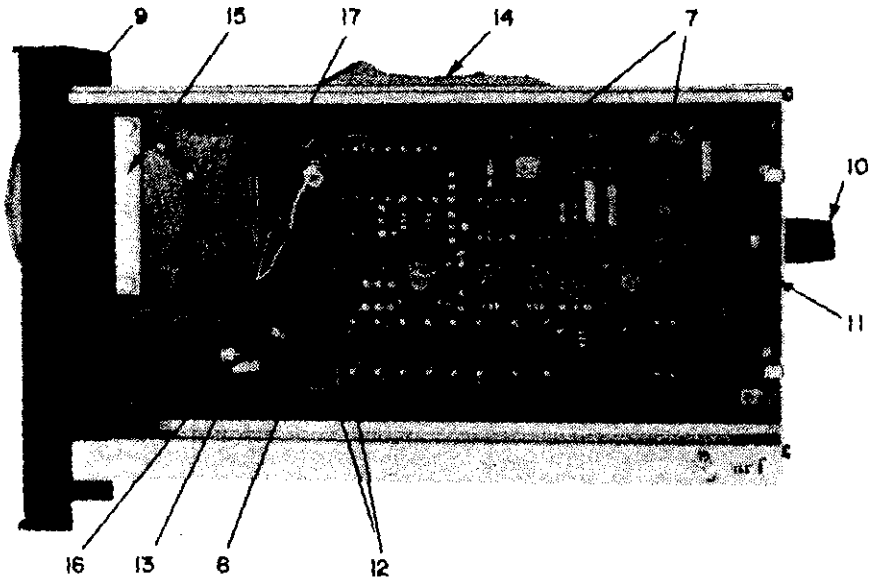
Section IV

Description

The controls, adjustments, meters and other parts required for operating and servicing the static identified in the front and side views shown in Figure 4-1.



Front View



Side View

LEGEND FOR FIGURE 4-1

1. Set Point Adjusting Thumbwheel
2. Set Point Index
3. Set Point Scale (and Drum)
4. Legend Plate – Translucent, with two optional lamps mounted behind legend
5. Process Variable Meter (Optional)
6. Output Meter (Optional).
7. Input and Output Test Jacks.
8. Green lead for parallel or separate lamp connectors.
9. Access Holes for Lamp, Filter, and Legend Replacement
10. Fuse Holder
11. Connector Contacts (Terminals)
12. Yellow and White Leads for Direct o Reverse Set Point Operation
13. Covers
14. Spring Latch
15. Clutch
16. Output Meter Mechanical Zero Adjustor
17. Input Meter Mechanical Zero Adjustor.

Section V

Initial Checks and Adjustments/Operation

INITIAL CHECKS

Unless otherwise specified by the customer, the station is shipped with the circuit board wired for the modes of operation which are specified as "Standard" in Table 5-1. Check to make sure that the circuit board wiring corresponds to the desired operating mode.

If it is desired to change the circuit board wiring in order to select a different mode of operation, refer to Table 5-1 for the specific lead changes to be made.

The plug-and-jack type lead connections can be disconnected and connected by hand. Make sure to disconnect and connect the lead jacks in a straight up-and-down manner. Do not apply sideways pressure or otherwise bend or twist the lead jacks.

CAUTION

CAUTION: Do not make wiring changes to the circuit board while this unit is connected to the process system. Disconnect this unit from the mounting unit or the cable connector or any other source of electrical power before making wiring changes.

ATTENTION: Ne pas modifier le cablage de la plaquette de circuit tant que l'appareil est raccorde au systeme de processus. Avant toute modification du cablage, il est essentiel de deconnecter cette unite de l'appareil sur lequel elle est montee ou de debrancher le connecteur de cables ou toute autre alimentation electrique.

TABLE 5-1

STATION OPERATING OPTIONS		
Mode of Operation	Description	Circuit Board Wiring
	INDICATING LIGHTS	
Parallel lights (Standard)	Lights operate in parallel from external source.	Green lead connected to J31.
Separate lights	Left and right lights operate separately from external source.	Green lead connected to J33.
	DIRECT/REVERSE SET POINT	
Direct set point operation (Standard)	Rotating set point scale from 0-100% causes increase in station output. (Output meter goes upscale.)	Yellow lead connected to J9. White lead connected to J13.
Reverse set point operation	Rotating set point scale from 0-100% causes decrease in station output. (Output meter goes downscale).	Yellow lead connected to J13. White lead connected J9.

NOTE: If lead changes are made to obtain reverse set point operation, the station set point must be recalibrated. Refer to Maintenance section for calibration procedures.

OPERATION

WARNING

THIS EQUIPMENT HAS BEEN DESIGNED TO AFFORD THE USER LIMITED RADIO FREQUENCY INTERFERENCE PROTECTION. REFER TO THE "SPECIFICATION" SECTION OF THIS INSTRUCTION FOR EFFECT ON PERFORMANCE AND PROTECTED FREQUENCY OR FREQUENCY BAND. CAUTION SHOULD BE EXERCISED WITH REGARD TO THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT IN THE AREA CAPABLE OF PRODUCING RADIO FREQUENCY INTERFERENCE BEYOND THOSE LEVELS AND FREQUENCIES SPECIFIED.

CE MATERIEL A ETE CONCU DE MANIERE A OFFRIR A SON UTILISATEUR UNE PROTECTION LIMITEE CONTRE LES FREQUENCES RADIOELECTRIQUES. PRIERE DE SE REFERER A LA SECTION "SPECIFICATIONS" DES PRESENTES INSTRUCTIONS POUR CE QUI CONCERNE L'EFFECT DE CES FREQUENCES SUR L'APTITUDE A LA FONCTION DE CE MATERIEL AINSI QUE LA FREQUENCE OU LA BANDE DE FREQUENCE POUR LAQUELLE EST PREVUE LA PROTECTION. L'EMPLOI D'EMETTEURS RADIOELECTRIQUES PORTATIFS SUSCEPTIBLES DE PROVOQUER DES PERTURBATIONS SUR DES FREQUENCES ET A UN NIVEAU DIFFERENTS DES SPECIFICATIONS DOIT ETRE EVITE A PROXIMITE DE CE MATERIEL.

MANUAL OPERATION

If the output of the station is being used for manual control of a valve or other final control element, adjust the station output by means of the set point scale to bring the valve or process to the desired value. The process variable can be measured on the process variable meter, if supplied.

When the station is wired for direct set point operation as specified in Table 5-1, rotating the set point scale from 0-100% will cause an increase in station output. If an output meter is supplied, this will be indicated by an increasing output meter indication. An increase in the station output will cause a direct operated valve to open and a reverse operated valve to close.

When the station is wired for reverse set point operation, rotating the set point scale from 0-100% will cause the output to decrease.

SET POINT OPERATION

If the output of the station is connected to the cascade input of a controller, set the set point scale to the desired controller set point value. Refer to the applicable controller instructions for operation of the controller.

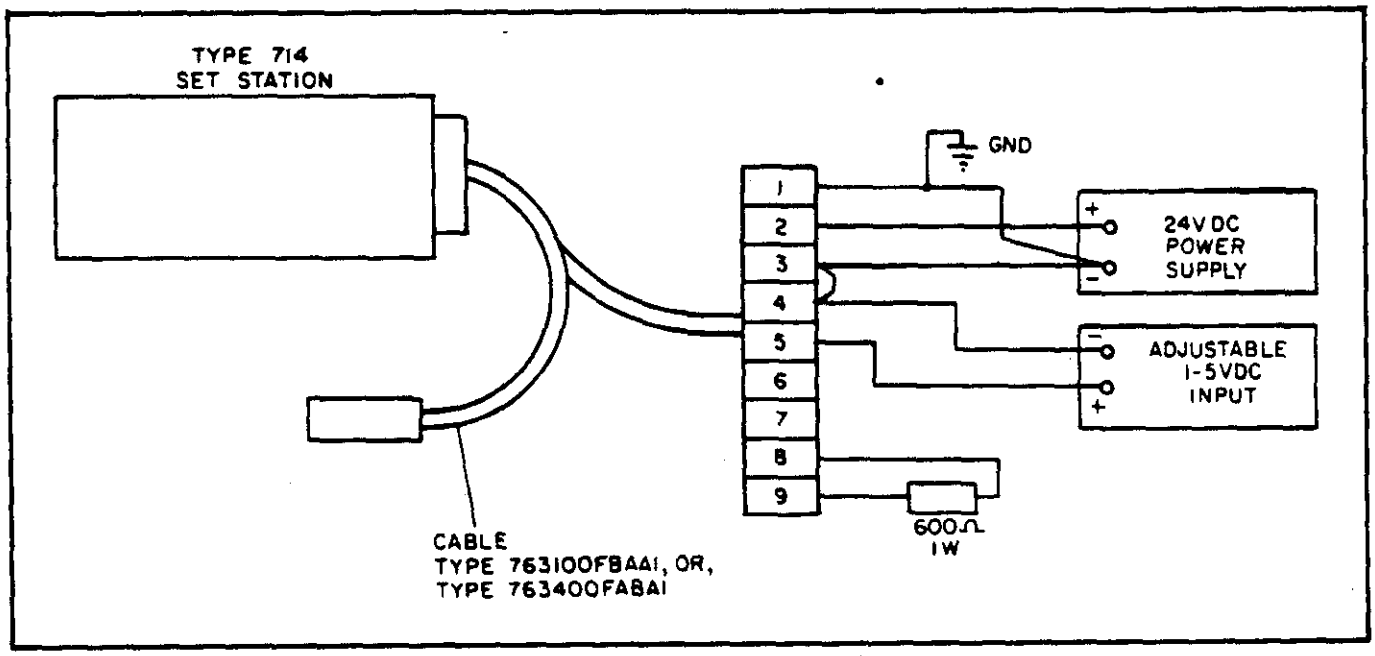


FIGURE 5-1 – Bench Test Set-Up for Operational Check

OPERATIONAL CHECK

The station does not require functional checks or calibration prior to placing into operation. However, if desired, the operation and calibration can be checked by the following procedures. If the station does not operate as specified, refer to the Troubleshooting and/or Calibration sections.

To perform the following operational check, the complete station should be removed from service and connected to the bench test set-up shown in Figure 5-1. A precision voltmeter with input resistance greater than 0.5 megohms is recommended for checking the station.

Before connecting the station to the bench test set-up, place set point connections and light connections in the standard positions. Refer to Table 5-1.

1. Connect voltmeter to terminal P1-7 (+) and COM (−).

2. Adjust set point scale to 0 and 100%. The corresponding output voltage should be 1 and 5 volts within .02 volt (±0.5% accuracy). Remove voltmeter from terminals.

3. If the station is provided with an optional process variable meter, set input voltage to 1, 3 and 5 volts. The corresponding meter indication should be 0, 50 and 100%.

Section VI

Principles of Operation

The station circuit is shown in schematic diagram Figure 6-1.

Set point slidewire R1 provides a 1-5 volt signal referenced to signal common. This signal is applied to one input of differential amplifier A4.

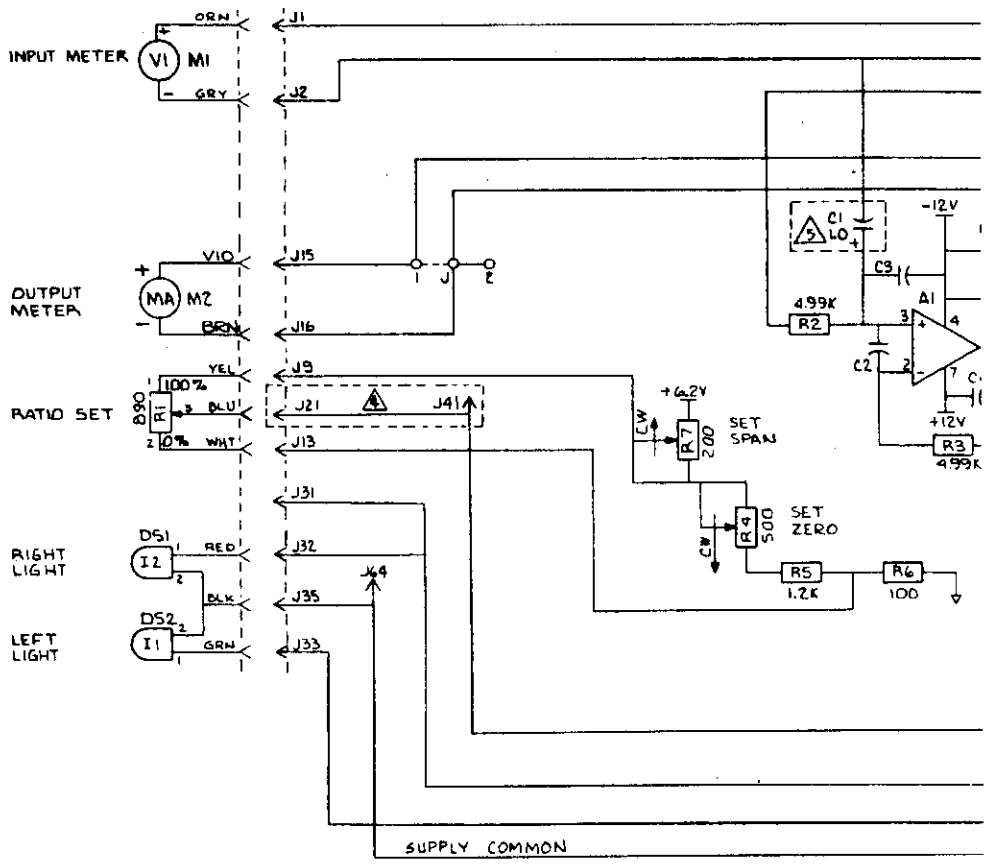
The inverting input to A4 (terminal 2) is connected to feedback resistor R42 and forces the voltage across R42 to be equal to the voltage output of slidewire R1.

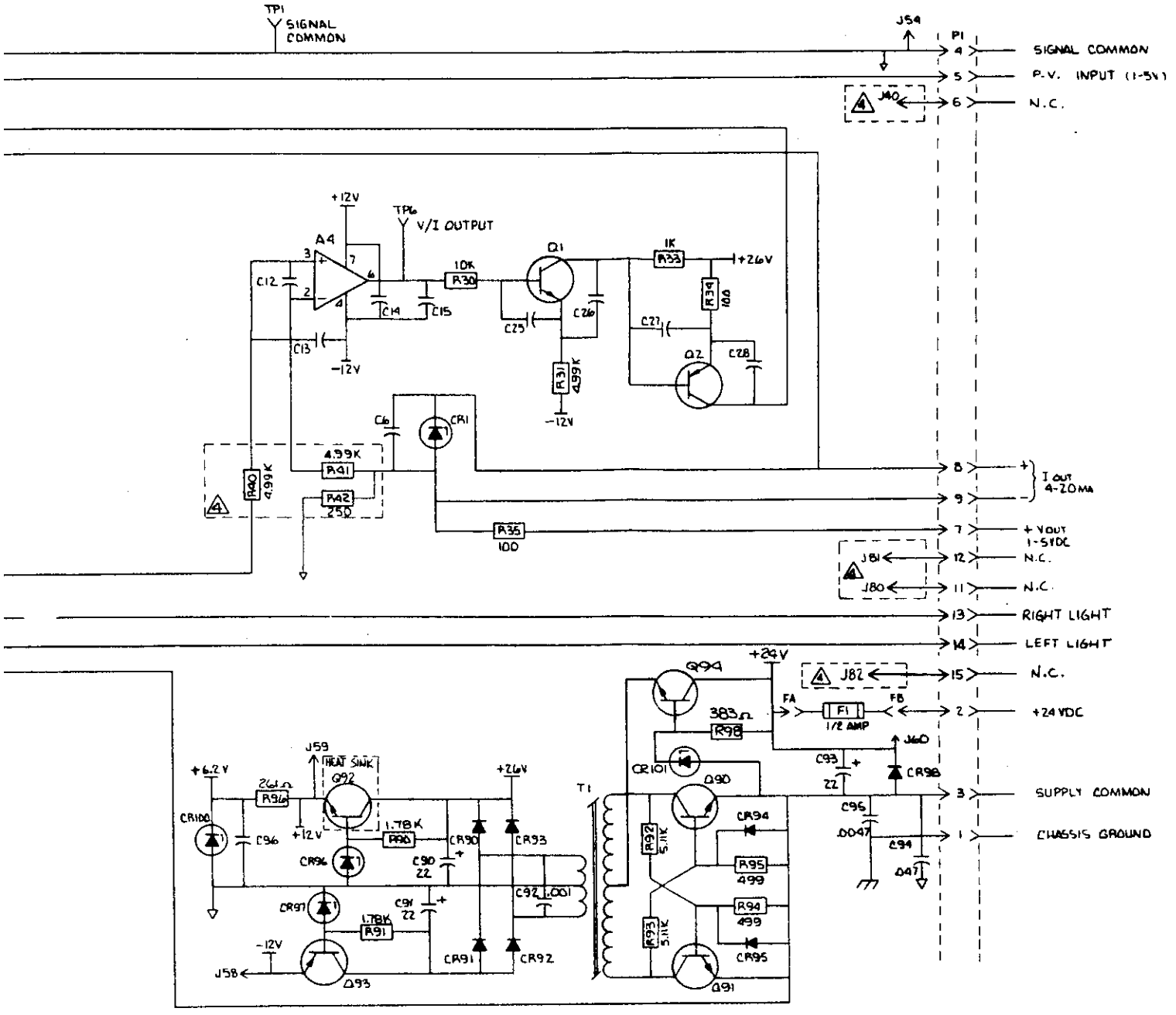
The output of amplifier A4 generates a current in transistor Q1 which controls the output current of 4-20 mA from transistor Q2. Maximum output current from Q2 is determined by the drop across resistor R33. The 4-20 mA output current flows through the load and feedback resistor R42 to signal common.

If an optional process variable meter is provided, the 1-5 volt process variable signal is connected to it through buffer amplifier A1 and associated resistors.

A fused 24 V dc supply from an external source is regulated by series regulator transistor Q94 with reference diode CR101. The multivibrator consists of transistors Q90, Q91 and associated resistors which oscillate at a frequency of approximately 10K Hz. The square wave voltage induced in the secondary of T1 is rectified by full-wave rectifier bridge (CR90-CR93), filtered by capacitors C90 and C91, and regulated by series regulator transistors Q92 and Q93 with reference diodes CR96 and CR97, respectively, to produce +12 V dc and −12 V dc supplies.

Resistor R96 drops the 12 V dc to 6.2 V dc (with regulation by zener diode CR100) to supply the set point circuit.


INPUT METER
V1
M1
ORN
GRY
J1
J2
OUTPUT METER
MA
M2
VIO
BRN
J15
J16
RATIO SET
890
R1
100%
0%
YEL
BLU
WHT
J9
J21
J41
J13
RIGHT LIGHT
LEFT LIGHT
DS1
I2
DS2
I1
RED
BLK
GRN
J31
J32
J35
J33
J4
+6.2V
CW
R7
200
SET SPAN
R4
500
SET ZERO
R5
1.2K
R6
100
-12V
C1
10
C3
4.99K
R2
A1
C2
+12V
R3
4.99K
SUPPLY COMMON



NOTES:
1. UNLABELED CAPACITORS ARE 1000 pF.
2. UNLESS OTHERWISE SPECIFIED, CAPACITANCE VALUES IN MICROFARADS.

	TYPE UNIT	INCLUDES COMPONENTS
⑥	714 SET STATION	4 & 5

3049B11-023 REV. B

FIGURE 6-1 – Schematic Diagram of Set Static

Section VII

Maintenance and Troubleshooting

MAINTENANCE

SET POINT CLUTCH ADJUSTMENT

The set point adjusting thumbwheel (1, Figure 4-1) should have enough tension on it so that the set point scale can not be shifted by vibration or other accidental means. If the thumbwheel adjustment feels too loose or too tight, readjust clutch (15, Figure 4-1) by adjusting the two clutch screws by equal amounts until the desired thumbwheel tension is obtained.

LUBRICATION

Lubrication of the station is limited to the clutch (15, Figure 4-1) and is only required if stickiness is experienced when adjusting the set point.

To lubricate the clutch, apply a very small amount of Plastilube No. 3 lubricant to the set point gear in the area where the clutch pads bear against the gear.

LIGHT FILTERS, LEGEND PLATE AND LAMP REPLACEMENT

To change filters, legend plates or lamps, proceed as follows:

1. Insert small-head screwdriver through two access holes (9, Figure 4-1) at rear of front frame to push out legend and lamp-holder assembly (4, Figure 4-1).

a. To replace a legend plate, slide plate out of legend and lampholder assembly and replace by sliding back into assembly. Make sure that legend plate does not extend beyond edge of holder.

b. To change filters, insert desired filters for both left and right lights by sliding into slot behind legend plate.

c. To replace lamps, snap used lamp out of lamp holder and replace. Make sure that lamp holder is centered in legend holder.

2. Insert legend and lamp holder assembly into station front frame and press to lock into frame.

REPLACING SET POINT SCALE DRUM

1. Rotate thumbwheel until set point scale is indexed at 0 scale position.

2. Disconnect process variable meter leads (if used) by removing grey lead from jack J2 and orange lead from jack J1.

3. Remove process variable meter retaining screws and pull meter or dummy meter out through front of station. (See Figure 7-1).

4. Loosen two screws holding the set point drum, which are located on either side of drum hub. (See Figure 7-2.) Rotate drum enough to lift it out through key-hole-slotted holes in drum core, and remove drum from side of station opposite to circuit board. (See Figure 7-3.)

5. Install new drum on two screws from which old drum was removed in step 4. Make sure that scale is indexed at 0 scale position as in step 1 since it is possible to install drum incorrectly by one-half turn. Tighten drum retaining screws.

6. Re-insert process variable meter or dummy meter and install retaining screws removed in step 3.

7. Reconnect process variable meter leads (grey lead to J2 and orange lead to J1).

DISASSEMBLY OF STATION

The following procedures cover complete disassembly of the station for purposes of parts replacement.

Removal of Circuit Board

1. Remove back cover and front cover (13, Figure 4-1) by freeing them from tabs on backplate and sliding them out of rails.

2. Disconnect all leads from jacks on circuit board.

3. Disassemble backplate from top and bottom rails and circuit board by removing 6 screws on back of backplate. Slide circuit board out of rails, being careful not to damage any of circuit board components.

Disassembly of Station Front End (Refer to Figure 7-4)

1. Remove process variable meter (1) (if supplied) by removing screws (2). Pull meter out through front of station.

2. To remove set point scale drum (3), refer to previous section.

3. To remove output meter (4) and memory pointer (5) (if supplied), remove screws (6), and pull meter and pointer out through front of station.

4. To remove set point assembly (7), remove screws (8) and bend left side of front frame out slightly to release locking stud. Remove set point assembly from rear of station.

5. To reassemble, follow reverse order of disassembly. Refer to schematic diagram, Figure 6-1 to connect proper leads to circuit board jacks.

CALIBRATION

In general, the following calibration procedures should be carried out following replacement of any major components, or whenever it is suspected that the station is not functioning properly. Calibration is also required when changing from direct set point operation to reverse set point operation and vice versa. (Refer to Table 5-1.). To perform the following calibration procedures, the complete station should be removed from service and connected to the bench test set-up shown in Figure 5-1. A precision voltmeter with input resistance greater than 0.5 megohm is recommended for calibrating the station.

Process Variable Meter Calibration.

1. Set input voltage to precisely 3 volts. Process variable meter should indicate 50%.

2. If it does not, adjust by means of mechanical zero adjustor on back of meter.

Output Meter Calibration

1. Connect voltmeter to test jack TP1 (−) and terminal P1-7.

2. Adjust set point for output voltage of precisely 3 volts. Output meter should indicate 50%. If it does not, adjust by means of mechanical zero adjustor on back of output meter.

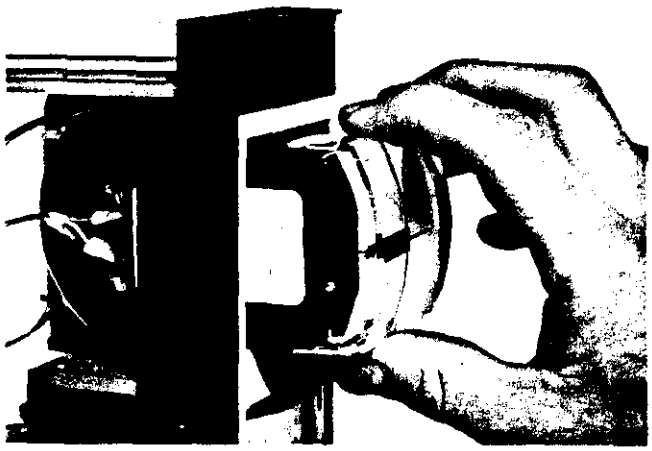


FIGURE 7-1 – Removing Process Variable Meter

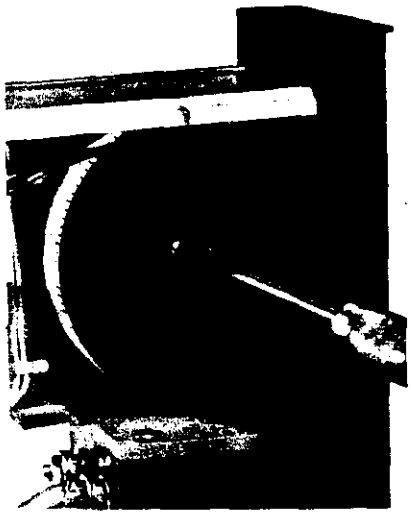


FIGURE 7-2 – Disassembling Drum from Set Point Assembly

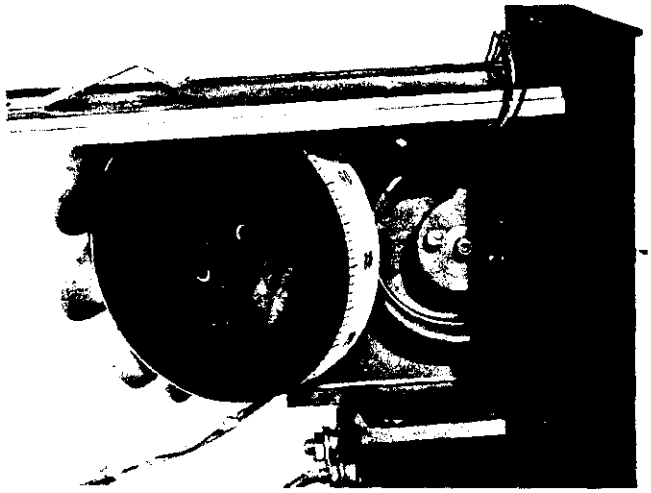
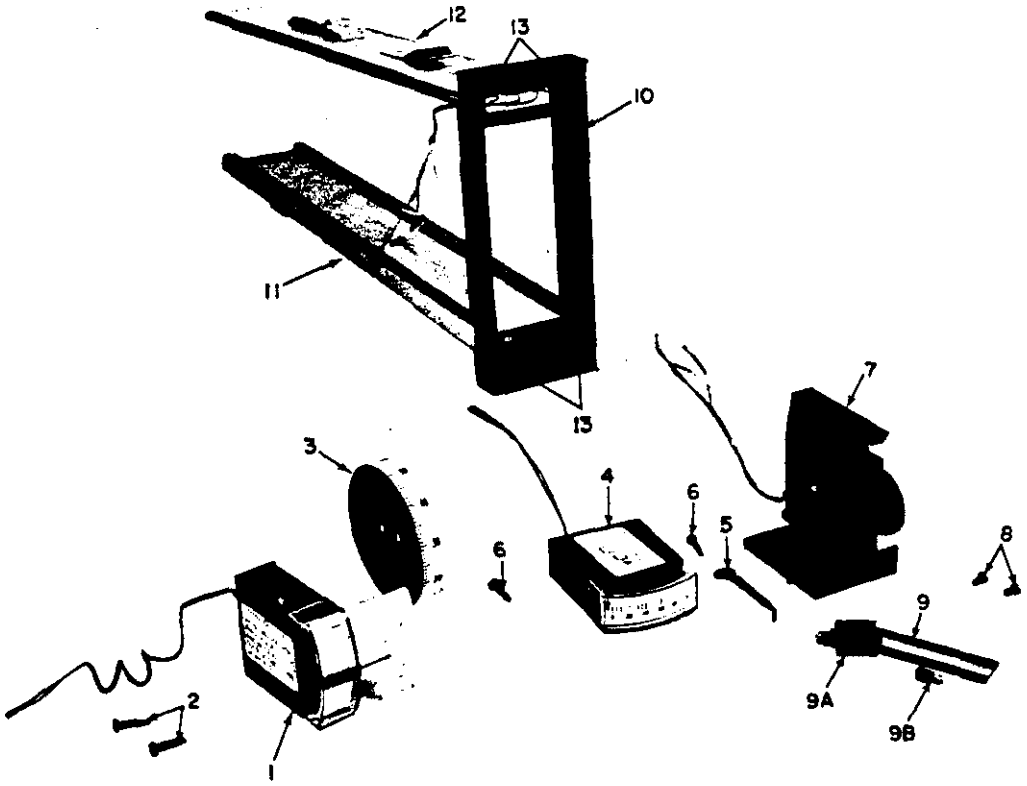


FIGURE 7-3 – Removing Drum



1. Process Variable Meter
2. Screws
3. Set Point Scale Drum
4. Output Meter
5. Memory Pointer
6. Screws
7. Set Point Assembly
8. Screws
9. Legend Holder
9A. Light Holder
9B. Lamp
10. Frame
11. Bottom Rail
12. Top Rail
13. Screws

FIGURE 7-4 – Station Front End Disassembled

Set Point Calibration

1. Connect voltmeter to test jack TP1 (–) and terminal P1-7.

2. Adjust set point scale to 100% (or to 0% if wired for reverse set point operation). Adjust Span potentiometer R7 for output voltage of 5 volts.

3. Adjust set point scale to 0% (or 100% if wired for reverse set point operation). Adjust Zero potentiometer R4 for output voltage of 1 volt.

4. Repeat steps 2 and 3 until both voltages are within limits of ±0.008 volt.

TROUBLESHOOTING

GENERAL

In the event of station malfunction or failure to meet calibration specifications, the complete station should be removed from service and connected to a bench test set-up as shown in Figure 5-1. A high resistance voltmeter (> .5 megohms) and an ohmmeter are recommended for making tests. When troubleshooting the station, refer to schematic diagram, Figure 6-1.

TROUBLESHOOTING PROCEDURES

Power Supply

1. Check voltage across capacitor C93. Voltage must be 24 V dc ±2 V dc. If voltage is zero, check fuse F1 and replace, if necessary. If voltage is not within limits (especially if too low), adjust bench supply.

2. Check internal components for an unusual temperature rise. Faulty components can load down power supply.

3. Check voltage between emitter of transistor Q94 and supply common. Voltage should be 21.5 V dc ±10%. If not, check zener diode CR101 first. This should be 22 V ±1.1 volts. Replace if necessary. Also check Q94 and resistor R98.

4. Check voltage wave form across transistor Q90 and Q91 (collector to emitter) with oscilloscope. Wave form must be square with amplitude of approximately 22 volts and frequency of approximately 12K Hz. If not, check Q90, and Q91 (probable fault would be a short between collector and emitter). Also check diodes CR94 and CR99 and resistors R92 through R95.

5. Check voltage across C90. Voltage should be 26 V dc ±2 V dc. If not, check diodes CR90 through CR93.

6. Check voltage from emitter of Q92 to signal common. Voltage should be +12 V dc ±1 V dc. If not, check voltage across CR96 first. Voltage should be +12 V dc ±.6 V dc. If not, check CR96, Q92 and R90.

7. Check voltage from emitter of Q93 to signal common. Voltage should be −12 V dc ±1 V dc. If not, check voltage across CR97 first. Voltage should be −12 V dc ±.6 V dc. If not, check CR97, Q93 and R91.

8. Check voltage across CR100. Voltage should be 6.2 V ±.4 V dc. If not, check CR100 and R96.

Signal Circuit

1. If voltages are within limits, adjust set point to 50% and measure voltage at J41 to signal common. It should be 3 volts. If not, check continuity through J9, J13 and J21. If continuity is zero or infinite, replace set point slidewire R1.

2. Measure voltage at TP6. It should be approximately 2 volts. If not, check for feedback voltage of 3 volts from R42. If feedback voltage is correct, check for defective amplifier A4. If output of A4 is within 2 or 3 volts of the 12 volt supply, this can indicate an open load connection or defective transistors Q1 or Q2. To check Q1 or Q2, measure forward base emitter drop which should be approximately 0.7 volts.

3. If optional process variable meter does not accurately indicate process variable input, check continuity through J1 and J2. If continuity checks out, apply input voltage of 1-5 volts and check for 1-5 volts across J1 and J2. If correct voltage is obtained, check for defective process variable meter. If voltage is not correct, amplifier A1 is probably defective and should be replaced.

Section VIII

Specifications

Input:	
Signals	250 K Ohms
Resistance	1-5 V dc
Output:	
Signals	Current: 4-20 mA dc Voltage: 1-5 V dc
Allowable Load	Current: 0-750 ohms Voltage: > 250K ohms
Accuracy (at 24 V dc and 80°F (27°C):	Output vs. scale setting 0.5% of span
Power Supply Requirements:	0.2 amps @ 24 V dc ±2 V.
Design Conditions:	
Supply Voltage	Reference: 24 V dc Normal: 22 to 26 V dc Operative Limits: 20 to 28 V dc
Ambient Temperature	Normal Operating Range: 40°F (4°C) to 120°F (49°C). Operative Limits: 20°F (–7°C) to 140°F (60°C) Storage Temperature: –70°F (–57°C) to 180°F (82°C)
Operating Influences:	
Supply Voltage (±2 V dc from 24 V dc)	±0.2%
Ambient Temperature (±40°F from 80°F)	±0.5%
RFI Protection:	150 MHz Band - (147 to 160 MHz) Field Strength - 15 V/m (radiated), ±1% effect on accuracy when tested to proposed SAMA PMC33.1

Physical Aspects:	
Size	2-3/4" W x 7-1/4" H x 11-1/2" D (69.9 mm x 184.2 mm x 292.1 mm)
Weight	Net 3 lbs. (1.7 Kg); Shipping 6 lbs. (2.7 Kg.).
Mounting	On Type 762 panel-mountable shelf. Refer to Product Specification E98-762. Requires one unit of space.
Cable	15 conductor cable
Legend	A white translucent legend plate is standard. Lettering capacity is one or two lines of .16-inch characters. Each line has a maximum of 19 character spaces.
Electrical Classification	Canadian Standards Association (CSA) Certified for use in ordinary (non-hazardous) locations
Options:	Process Variable Meter with Amplifier: Meter-amplifier rating is a 1-5 volts. Input impedance is 250K ohms. Meter scale 0-100, linear or 0-10, square root. Accuracy is ±3% of full scale. Output Meter: Calibrated 0-100 linear, accuracy is ±3% of full scale. Indicating Lights: Two 24 V dc white lights are located behind the legend plate. Either light may be colored red, amber, green or blue by easily changed filters provided with the option. Lights may be operated separately or in parallel. Lights are jumpered for operation in parallel when the station is shipped.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Section IX

Service and Renewal Parts

SERVICE

The Bailey Controls Company is ready to assist in the use and repair of its products. Requests for sales and/or application services should be made to the nearest sales office.

Requests for installation, repair, overhaul and/or maintenance contract services should be made to the nearest sales office.

REPLACEMENT PARTS AND ORDERING INSTRUCTIONS

If the user is to make repairs at his own facilities, replacement parts should be ordered through a Bailey sales office. It is requested that the following information be provided to expedite the handling of parts orders.

1. Part description, Bailey catalog number or part number, and quantity.

2. Model and serial (if applicable) number(s) and rating of component for which the part has been ordered.

3. Bailey publication number and reference used in identifying the part.

It is recommended that standard parts be purchased from local supply houses. If standard parts are ordered from the Bailey Controls Company, it is requested that the Bailey catalog number (provided in the part number column of the Renewal Parts section) be provided in addition to the commercial description of the part (listed in the description column of the Renewal Parts section).

Parts which do not have a commercial description provided in the description column of the Renewal Parts section must be ordered from the nearest Bailey sales office.

Priced recommended spare parts lists on standard components may be obtained through the nearest sales office.

TRAINING

The Bailey Controls Company has available for in-plant training of customer personnel a modern training facility equipped to provide service and repair instructions. Additional information on specific component coverage and available schedules may be obtained from a Bailey sales office.

TECHNICAL DOCUMENTATION

Additional copies of this publication must be obtained through the nearest sales office. Copies, over and above those provided at no charge with the original purchase, are available at a minimum charge to the customer.

Requirements for technical documentation to specific preparation specifications must be negotiated for price and delivery through the nearest Bailey sales office.

RENEWAL PARTS

This parts list describes replaceable parts for the Type 714 Set Station. It is not to be taken as the authority for the procedure of assembly or disassembly of the equipment. Instead, it is intended for use in requisitioning, storing, issuing and identifying parts.

DETAILED PARTS LIST

The parts list has associated illustrations to portray instrument assembly parts and their relation to one another.

In most cases the listings are arranged in five columns: Fig. & Index. No., Part No., Reference Designation, Description, and Units Per Assy.

Fig. & Index No. Column

This column keys a part to an illustration and the applicable index number.

Part No. Column

This column lists the Bailey part number.

Reference Designation Column

This column is a listing of all reference designations (wiring diagram symbols) which have been assigned to the instrument components.

Description Column

This column contains the following information:

a. A brief commercial description of the part.

1. Tolerances on electronic parts are plus or minus unless otherwise stated.

2. Capacitor working voltages are given in wvdc unless otherwise stated.

Units Per Assembly Column

1. The quantities listed in this column indicate the total quantity of the listed part required per unit or the quantity of the part bearing the listed reference designation.

Terms and Symbols

1. Following is a listing of abbreviations and symbols used in this parts list.

A	- Amp	PRCKT BD	- Printed-Circuit Board
ASSY	- Assembly		
BKDN	- Breakdown	PWR	- Power
CAP	- Capacitor	RES	- Resistor
COMP	- Composition	SI	- Silicon
K	- One Thousand Ohms	SOC	- Socket
LG	- Long	TANT	- Tantalum
MFD	- Microfarad	TRM	- Trim

MMFD	- Micro Microfarad	V	- Volts
MW	- Milliwatts	W	- Watts
NHA	- Next Higher Assembly	W/	- With
		W/O	- Without
OPER	- Operating	WW	- Wire Wound
POT	- Potentiometer	STL	- Steel

FIG. & INDEX NO.	PART NO.	REF. DES.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY
7-4	5721K85G703		PLATE, FRONT (W/ OUTPUT METER)	1
	5721K85G709		PLATE, FRONT (W/O OUTPUT METER)	1
-1	4615K91P002		METER, PROCESS VARIABLE (0-100 LINEAR)	1
-1	4615K91P003		METER, PROCESS VARIABLE (0-10 SQUARE ROOT)	1
-1	4615K91P004		METER, DUMMY (ATTACHING PARTS)	1
-2	NGJAT13 010		SCREW, SLOTTED PAN HD, STL PARKERIZED, NO. 6-70 BY 5/8 LG.	2
-3	3285K60G- - -		DRUM	1
-4	4615K91P005		METER, OUTPUT (0-100 LINEAR)	1
-4	4615K91P006		METER, OUTPUT (0-10 SQUARE ROOT)	1
-5	5779K61P001		POINTER (ATTACHING PARTS)	1
-6	NCJAT13 010		SCREW, SLOTTED PAN HD, STL, PARKERIZED, NO. 6-20 BY 5/8 LG.	2
-7	6625K62G700		ASSY, SET POINT (ATTACHING PARTS)	1
-8	NBZAT13 004		SCREW, MACH, PAN HD, PARKERIZED, NO. 6-32 BY 1/4 LG.	2
-9	4223K68G700		HOLDER, LEGEND (W/O LIGHTS)	1
-9	4223K68G701		HOLDER, LEGEND (W/LIGHTS)	1
-9A	4215K62P002		HOLDER, LIGHT	1
-9B	4868K33P001		LAMP	2
	3578K10G700		ASSY, FILTER (INCLUDES RED, AMBER, GREEN, BLUE)	1
	5676K69P000		PLATE, LEGEND (BLANK)*	1
FRONT HOUSING AND RAILS 7-4				
-10	3730K61G700		ASSY, FRAME (W/O LIGHTS)	1
-10	3730K61G701		ASSY, FRAME (W/LIGHTS) (ATTACHING PARTS)	1
-11	5974K23P004		RAIL, BOTTOM	1
-12	5975K61G701		RAIL, TOP (ATTACHING PARTS)	1
-13	NDLAT13 014		SCREW, SELF-TAPPING TYPE A, STL, PARKERIZED, NO. 6-18 BY 7/8 LG.	4
	5698K68P001		PLATE, BACK (ATTACHING PARTS)	1
	NDFAL12 012		SCREW, SELF-TAPPING, TYPE A PARKERIZED, NO. 6-20 BY 3/4 LG	4

* IF FACTORY LEGEND DESIRED, REFER TO NEAREST BAILEY SALES OFFICE

FIG. & INDEX NO.	PART NO.	REF. DES.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY
	1694K87P001		BRACKET	2
	NBZAL13 004		SCREW, SLOTTED PAN HD, STL, CRONAK PLATE, NO. 6-32 BY 1/4 LG.	4
4-1				
-10	4223K69G700		HOLDER, FUSE	1
	3744K11P028		FUSE, .5A AGC 1/2	1
-13	2820K68P004		COVER, FRONT AND REAR	2
6-1	1612B30G000X		PRINTED CIRCUIT BOARD	
	1081K94P0006	A1	OP. AMPLIFIER 741C	1
		A4	SAME AS A1	1
	2106K92P0029	C1	CAPACITOR, 1.0 MFD, 35 V, 10%, SLD. TANT.	1
	2092B02P1210	C2	CAPACITOR, 1000pFD, 50 V, CERAMIC	1
		C3	SAME AS C2	1
		C4	SAME AS C2	1
		C5	SAME AS C2	1
		C6	SAME AS C2	1
		C12	SAME AS C2	1
		C13	SAME AS C2	1
		C14	SAME AS C2	1
		C15	SAME AS C2	1
		C25	SAME AS C2	1
		C26	SAME AS C2	1
		C27	SAME AS C2	1
		C28	SAME AS C2	1
	2106K92P0060	C90	CAPACITOR, 22 MFD, 35 V, 10%, SLD. TANT.	1
		C91	SAME AS C90	1
	2092K90P0100	C92	CAPACITOR, .001 MFD, 1 KV, 10%, CERAMIC	1
		C93	SAME AS C90	1
	2108K97P0102	C94	CAPACITOR, .047 MFD, 50 V, 10%, FILM	1
	2092K90P0010	C95	CAPACITOR, .0047 MFD, 1 KV, CERAMIC	1
		C96	SAME AS C2	1
	6707K10P0187	CR1	DIODE, IN4746A	1
	6705K90P0010	CR90	DIODE, IN645	1
		CR91	SAME AS CR90	1
		CR92	SAME AS CR90	1
		CR93	SAME AS CR90	1
	6705K90P0002	CR94	DIODE, IN457	1
		CR95	SAME AS CR94	1
	6707K10P0185	CR96	DIODE, IN4742A	1
		CR97	SAME AS CR96	1
	6776K10P0073	CR98	DIODE, IN5059	1
	6707K10P0186	CR100	DIODE, IN825	1
	6707K10P0198	CR101	DIODE, IN4748A	1
	6147K33P0368	R2	RESISTOR, 4.99 K, 1%, 1/4 W, FILM	1
		R3	SAME AS R2	1
	5845K71P0023	R4	POT., 500, 5%, WR WD	1
	6148K67P0194	R5	RESISTOR, 1.2 K, .1%, .3 W, WR WD	1
	6148K60P0076	R6	RESISTOR, 100, .1%, .3 W, WR WD	1

FIG. & INDEX NO.	PART NO.	REF. DES.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY
6-1	5845K71P0010	R7	POT., 200, 5%, WR WD	1
	6147K33P0401	R30	RESISTOR, 10 K, 1%, 1/4 W, FILM	1
		R31	SAME AS R2	1
	6147K33P0301	R33	RESISTOR, 1 K, 1%, 1/4 W, FILM	1
	6147K33P0201	R34	RESISTOR, 100, 1%, 1/4 W, FILM	1
		R35	SAME AS R34	1
		R40	SAME AS R2	1
		R41	SAME AS R2	1
	6146K15P0277	R42	RESISTOR, 250, .1%, 2.5 W, WR WD	1
	6147K29P0325	R90	RESISTOR, 1.78 K, 1%, 1/2 W, FILM	1
		R91	SAME AS R90	1
	6147K29P0369	R92	RESISTOR, 5.11 K, 1%, 1/2 W, FILM	1
		R93	SAME AS R92	1
	6147K33P0268	R94	RESISTOR, 499, 1%, 1/4W, FILM	1
		R95	SAME AS R94	1
	6147K29P0241	R96	RESISTOR, 261, 1%, 1/2 W, FILM	1
	6147K29P0257	R98	RESISTOR, 383, 1%, 1/2 W, FILM	1
	6854K90P0052	Q1	TRANSISTOR, 2N3417	1
	6856K93P0006	Q2	TRANSISTOR, D41D5, PNP	1
	6856K93P0008	Q90	TRANSISTOR, D40D8, NPN	1
		Q91	SAME AS Q90	1
	6856K93P0009	Q92	TRANSISTOR, D42C8, NPN	1
		Q93	SAME AS Q2	1
	6856K93P0020	Q94	TRANSISTOR, T1P33, NPN	1
	8615K64G0701	T1	TRANSFORMER	1
	5535B01P0001		IC PAD	2
	7640K68P0001		HEAT SINK	1
	1705B02P0001		BRKT, MTG.	4