

DANIEL MODEL 700B SERIES CONTROL VALVES

2-INCH, 3-INCH, 4-INCH, AND 6-INCH SIZES

OPERATING AND MAINTENANCE INSTRUCTIONS

**DANIEL MEASUREMENT AND CONTROL, INC.
AN EMERSON PROCESS MANAGEMENT COMPANY
HOUSTON, TEXAS**

**Part Number 3-9008-553
Revision D**

SEPTEMBER 2009



IMPORTANT INSTRUCTIONS

Daniel Measurement and Control, Inc. (Daniel) designs, manufactures and tests its products to meet many national and international standards. Because these instruments are sophisticated technical products, you must properly install, use and maintain them to ensure they continue to operate within their normal specifications. The following instructions must be adhered to and integrated into your safety program when installing, using and maintaining Daniel products.

- **Read all instructions prior to installing, operating and servicing the product.** If this instruction manual is not the correct manual, call 1-713-827-6314 (24-hour response number for both Service and Sales Support) and the requested manual will be provided. Save this instruction manual for future reference.
- If you do not understand any of the instructions, contact your Daniel representative for clarification.
- Follow all warnings, cautions and instructions marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation and maintenance of the product.
- Install your equipment as specified in the installation instructions of the appropriate instruction manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, use qualified personnel to install, operate, update, program and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by the manufacturer. Unauthorized parts and procedures can affect the product's performance and place the safe operation of your process at risk. Look-alike substitutions may result in fire, electrical hazards or improper operation.
- Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent personal injury.
- **ALWAYS READ AND FOLLOW THE DANIEL MODEL 700B SERIES CONTROL VALVES MANUAL AND ALL PRODUCT WARNINGS AND INSTRUCTIONS.**
- Use of this equipment for any purpose other than its intended purpose may result in property damage and/or serious personal injury or death.
- Before opening the flameproof enclosure in a flammable atmosphere, the electrical circuits must be interrupted.

This page intentionally left blank.

**DANIEL MEASUREMENT AND CONTROL, INC.
MODEL 700B SERIES CONTROL VALVES
OPERATING AND MAINTENANCE INSTRUCTIONS**

NOTICE

THE CONTENTS OF THIS PUBLICATION ARE PRESENTED FOR INFORMATIONAL PURPOSES ONLY, AND WHILE EVERY EFFORT HAS BEEN MADE TO ENSURE THEIR ACCURACY, THEY ARE NOT TO BE CONSTRUED AS WARRANTIES OR GUARANTEES, EXPRESSED OR IMPLIED, REGARDING THE PRODUCTS OR SERVICES DESCRIBED HEREIN OR THEIR USE OR APPLICABILITY. ALL SALES ARE GOVERNED BY DANIEL'S TERMS AND CONDITIONS, WHICH ARE AVAILABLE UPON REQUEST. WE RESERVE THE RIGHT TO MODIFY OR IMPROVE THE DESIGNS OR SPECIFICATIONS OF SUCH PRODUCTS AT ANY TIME.

DANIEL DOES NOT ASSUME RESPONSIBILITY FOR THE SELECTION, USE OR MAINTENANCE OF ANY PRODUCT. RESPONSIBILITY FOR PROPER SELECTION, USE AND MAINTENANCE OF ANY DANIEL PRODUCT REMAINS SOLELY WITH THE PURCHASER AND END-USER.

TO THE BEST OF DANIEL'S KNOWLEDGE THE INFORMATION HEREIN IS COMPLETE AND ACCURATE. DANIEL MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THIS MANUAL AND, IN NO EVENT, SHALL DANIEL BE LIABLE FOR ANY INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PRODUCTION, LOSS OF PROFITS, LOSS OF REVENUE OR USE AND COSTS INCURRED INCLUDING WITHOUT LIMITATION FOR CAPITAL, FUEL AND POWER, AND CLAIMS OF THIRD PARTIES.

PRODUCT NAMES USED HEREIN ARE FOR MANUFACTURER OR SUPPLIER IDENTIFICATION ONLY AND MAY BE TRADEMARKS/REGISTERED TRADEMARKS OF THESE COMPANIES.

DANIEL AND THE DANIEL LOGO ARE REGISTERED TRADEMARKS OF DANIEL INDUSTRIES, INC. THE EMERSON LOGO IS A TRADEMARK AND SERVICE MARK OF EMERSON ELECTRIC CO.

**COPYRIGHT © 2009
BY DANIEL MEASUREMENT AND CONTROL, INC.
HOUSTON, TEXAS, U.S.A.**

All rights reserved. No part of this work may be reproduced or copied in any form or by any means - graphic, electronic or mechanical - without first receiving the written permission of Daniel Measurement and Control, Inc., Houston, Texas, U.S.A.

WARRANTY

1. **LIMITED WARRANTY:** Subject to the limitations contained in Section 2 herein, Daniel Measurement & Control, Inc. ("Daniel") warrants that the licensed firmware embodied in the Goods will execute the programming instructions provided by Daniel, and that the Goods manufactured by Daniel will be free from defects in materials or workmanship under normal use and care and Services will be performed by trained personnel using proper equipment and instrumentation for the particular Service provided. The foregoing warranties will apply until the expiration of the applicable warranty period. Goods are warranted for twelve (12) months from the date of initial installation or eighteen (18) months from the date of shipment by Daniel, whichever period expires first. Consumables and Services are warranted for a period of 90 days from the date of shipment or completion of the Services. Products purchased by Daniel from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer. Buyer agrees that Daniel has no liability for Resale Products beyond making a reasonable commercial effort to arrange for procurement and shipping of the Resale Products. If Buyer discovers any warranty defects and notifies Daniel thereof in writing during the applicable warranty period, Daniel shall, at its option, correct any errors that are found by Daniel in the firmware or Services or repair or replace F.O.B. point of manufacture that portion of the Goods or firmware found by Daniel to be defective, or refund the purchase price of the defective portion of the Goods/Services. All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable power sources or environmental conditions, accident, misuse, improper installation, modification, repair, use of unauthorized replacement parts, storage or handling, or any other cause not the fault of Daniel are not covered by this limited warranty, and shall be at Buyer's expense. Daniel shall not be obligated to pay any costs or charges incurred by Buyer or any other party except as may be agreed upon in writing in advance by Daniel. All costs of dismantling, reinstallation and freight and the time and expenses of Daniel's personnel and representatives for site travel and diagnosis under this warranty clause shall be borne by Buyer unless accepted in writing by Daniel. Goods repaired and parts replaced by Daniel during the warranty period shall be in warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. This limited warranty is the only warranty made by Daniel and can be amended only in a writing signed by Daniel. THE WARRANTIES AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE. THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE OR ANY OTHER MATTER WITH RESPECT TO ANY OF THE GOODS OR SERVICES. **Buyer acknowledges and agrees that corrosion or erosion of materials is not covered by this warranty.**

2. **LIMITATION OF REMEDY AND LIABILITY:** DANIEL SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE. THE REMEDIES OF BUYER SET FORTH IN THIS AGREEMENT ARE EXCLUSIVE. IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL DANIEL'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE TO BUYER OF THE SPECIFIC GOODS MANUFACTURED OR SERVICES PROVIDED BY DANIEL GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL DANIEL'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES. THE TERM "CONSEQUENTIAL DAMAGES" SHALL INCLUDE, BUT NOT BE LIMITED TO, LOSS OF ANTICIPATED PROFITS, REVENUE OR USE AND COSTS INCURRED INCLUDING WITHOUT LIMITATION FOR CAPITAL, FUEL AND POWER, AND CLAIMS OF BUYER'S CUSTOMERS.

TABLE OF CONTENTS

1.0 INTRODUCTION 1-1

2.0 THEORY OF OPERATION 2-1

3.0 SPECIFICATIONS 3-1

4.0 INSTALLATION AND MAINTENANCE 4-1

5.0 DISASSEMBLY AND REASSEMBLY 5-1

 5.1 Disassembly 5-1

 5.2 Reassembly 5-2

6.0 TROUBLESHOOTING 6-1

7.0 PARTS LIST 7-1

Figures

2-1	Theory of Operation	2-2
5-1	Using the Piston to Remove the Seat Ring from the Cylinder	5-2
5-2	Using the Piston to Insert the Seat Ring into the Cylinder	5-5
7-1	Assembly Illustration	7-5

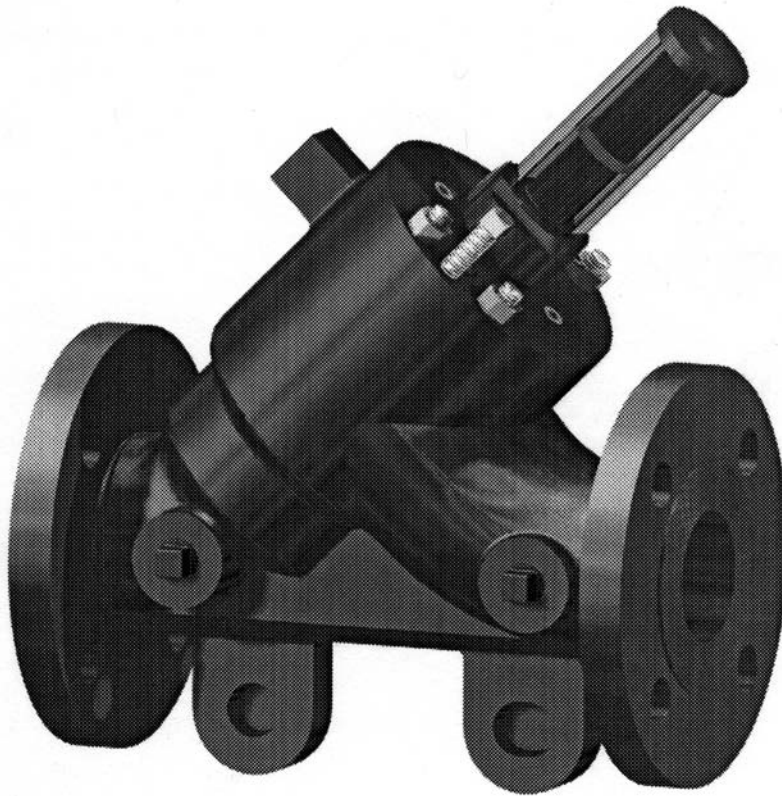
Tables

3-1	Maximum Working Pressure	3-3
6-1	Troubleshooting	6-1
7-1	Parts List	7-2

1.0 INTRODUCTION

The Model 700B Series Control Valve features a two-piece, aggressive products cylinder, characterized ports, and an optional visual indicator. Pilots and other optional accessories enable the valve to perform a variety of control functions such as regulating rate of flow, pressure relief, surge control, etc.

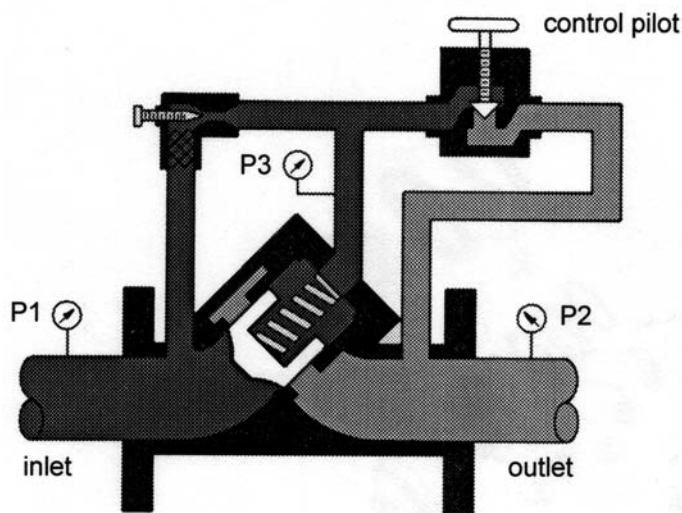
If you have questions or need information not contained in this manual, please contact your Daniel sales representative or the Daniel Measurement and Control service center nearest you.



This page intentionally left blank.

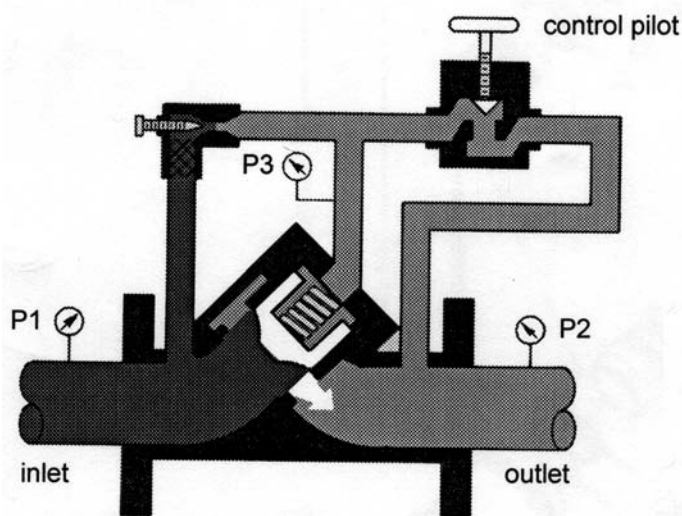
2.0 THEORY OF OPERATION

The Model 700B Series Control Valve operates on a balanced-piston principle. When pressures on both sides of the piston are equalized, a spring located on top of the piston acts as a differential force and closes the piston. When the pressure against the bottom of the piston exceeds the pressure plus the force of the spring exerted against the top of the piston, spring tension is overcome, and the valve opens. See Figure 2-1 for more information.



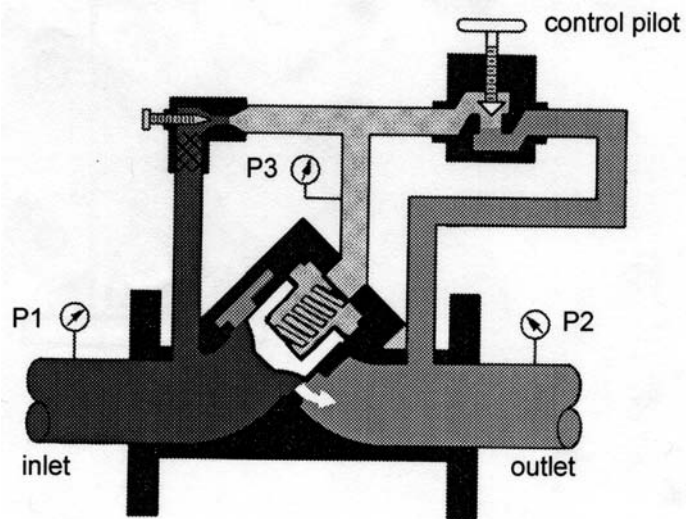
The control valve operates using the balanced piston principle, meaning the exposed area on the spring side (P3) of the piston and the bottom side (P1) of the piston are equal in area. The spring is the differential force that closes the piston when P1 and P3 pressures are equal.

P1 and P3 = inlet pressure
 P2 = outlet pressure



When the pressure against the bottom of the piston (P1) exceeds the pressure exerted against the top of the piston (P3), including the force of the spring, spring tension is overcome and the valve opens.

P1 = inlet pressure
 P2 and P3 = outlet pressure



Flow through the valve is adjusted using the control pilot, a variable orifice that regulates the pressure at P3 by controlling the flow through the outlet port. Adjusting P3 pressure will cause the piston to change positions, thus, regulating flow through the valve.

P1 = inlet pressure
P2 = outlet pressure
P3 = controlled pressure

Figure 2-1. Theory of Operation

3.0 SPECIFICATIONS



PERSONAL INJURY AND/OR EQUIPMENT DAMAGE

Do not exceed specifications listed below.

Failure to heed this warning could result in serious injury and/or damage to the equipment.

Pressure Class

150 lb., 300 lb., or 600 lb. ANSI steel
DIN PN 16, 40, 64, and 100

Maximum Safe Working Pressure

150 lb. ANSI steel body - 285 psi (1965 kPa)
300lb. ANSI steel body -740 psi (5100 kPa)
600 lb. ANSI steel body - 1480 psi (10,200 kPa)
DIN PN 16-16 bars
DIN PN 25 - 25 bars
DIN PN 40 - 10 bars
DIN PN 64 - 64 bars
DIN PN 100 - 100 bars

Safe Working Temperature Ranges

Standard: -20°F, -29°C to 150°F, 66°C
Optional: -20°F, -29°C to 250°F, 121°C

Size:

2-in., 3-in., 4-in., 6-in.

Materials of Construction**Main Valve Body**

steel, ASTM-A216-GR-WCB

Main Valve Cylinder

2-in. through 4-in. - stainless steel
6-in. - nickel coated steel

Main Valve Piston

stainless steel

Seat Ring

stainless steel

Seals:

Buna-N, EPR, Kalrez[®], Low-swell Nitrile, Neoprene, Viton[®]-A

Optional

Visual position indicator
Microswitch-type indicator
AP (aggressive products) option

Pressure/Temperature Ratings

The maximum working pressure for the Model 700B Series Control Valve is based on the temperature/pressure rating of the ANSI B16.5 flanges. The following table lists the maximum working pressure of ASTM A216 GR WCB at 100°, 150°, and 250°F. For maximum working pressures at intermediate temperatures, and for other materials, refer to ANSI B16.5.

* Viton[®] and Kalrez[®] are registered trademarks of E. I. du Pont de Nemours and Company.

Table 3-1. Maximum Working Pressure

Pressure/Temperature	ASTM A216 GR WCB
150# ANSI/-20 to 100°F	285 psig WP
150# ANSI/150°F	272 psig WP
150# ANSI/250°F	245 psig WP
300# ANSI/-20 to 100°F	740 psig WP
300# ANSI/150°F	707 psig WP
300# ANSI/250°F	665 psig WP
600# ANSI/-20 to 100°F	1480 psig WP
600# ANSI/150°F	1415 psig WP
600# ANSI/250°F	1332 psig WP
P/N 16/-29 to 66°C	16 bar WP
P/N 16/121°C	15.8 bar WP
P/N 16/-29 to 66°C	25 bar WP
P/N 25/121°C	24.7 bar WP
P/N 40/-29 to 66°C	40 bar WP
P/N 40/121°C	39.6 bar WP
P/N 63/-29 to 66°C	63 bar WP
P/N 63/121°C	62.4 bar WP
P/N 100/-29 to 66°C	100 bar WP
P/N 100/121°C	99 bar WP

This page intentionally left blank.

4.0 INSTALLATION AND MAINTENANCE

This valve was designed without corrosion allowance. The valve's metal parts should be periodically inspected for corrosion and erosion, and the seals and O-rings should be inspected for wear and chemical attack.

When installing this equipment, bolting must conform to the requirements of ASME B16.5 paragraph 5.3 and to the material requirements of ASME B16.5 Table 1B. Gaskets must conform to the requirements of ASME B16.20.

It is the customer's responsibility to ensure that piping or other attachments connected to the Product do not place adverse stresses on the Product.

The design of the Product has not been assessed for the effects of traffic, wind or earthquake loading.

It is the customer's responsibility to provide fire prevention measures and equipment per local regulations.

**PERSONAL INJURY OR DEATH AND/OR PROPERTY DAMAGE**

Use equipment for its intended purpose.

Use of this equipment for any purpose other than its intended purpose may result in property damage and/or serious personal injury or death.

This page intentionally left blank.

5.0 DISASSEMBLY AND REASSEMBLY

The following tools will be needed to disassemble and reassemble your control valve:

- socket wrench
- adjustable wrench
- T-handle or extended Allen wrench
- arbor press (may be needed for 4- and 6-inch valves)
- retaining ring pliers

Numbers in parentheses correspond with the item numbers in Table 7-1 and Figure 7-1.



PERSONAL INJURY AND/OR EQUIPMENT DAMAGE

Release all pressure from the system prior to maintenance work on the valve.

Disassembling or reassembling the valve without carefully following the instructions and without referring to the appropriate figures could result in serious injury and/or damage to the equipment.

5.1 DISASSEMBLY

Refer to Figure 7-1.

1. Remove the nuts (31) that secure the cylinder head (13) to the valve body.
2. Alternately tighten the jack-out screws (17) until the cylinder assembly is free to be lifted from the valve body.
3. Lift the cylinder assembly by the cylinder head (13), remove it from the valve body (32), and place it in a vertical position with the cylinder head on top.
4. Before completing step 5, place the cylinder assembly in an arbor press to hold the cylinder head in position to prevent the pressure from the spring from being released suddenly and causing damage or injury upon removing the screws.

5. Use an Allen wrench to remove the screws (16) that secure the cylinder head (13) to the cylinder (1), and then gradually release the arbor press to remove the cylinder head from the cylinder. If your valve has a *visual* position indicator, it is not necessary to remove the indicator housing (24) prior to removing the cylinder head.
6. Remove the valve spring (11), indicator stem (18), retaining ring (10), washer (9), and piston (4) from the cylinder (1). If your valve does not have a position indicator, you will only need to remove the valve spring (11) and the piston (4).
7. Turn the cylinder (1) over with the ports on top. Place the piston (4), nose end up, into the recess between the cylinder and the seat ring (3). Use the piston (4) to press the seat ring out of the cylinder. See Figure 5-1.

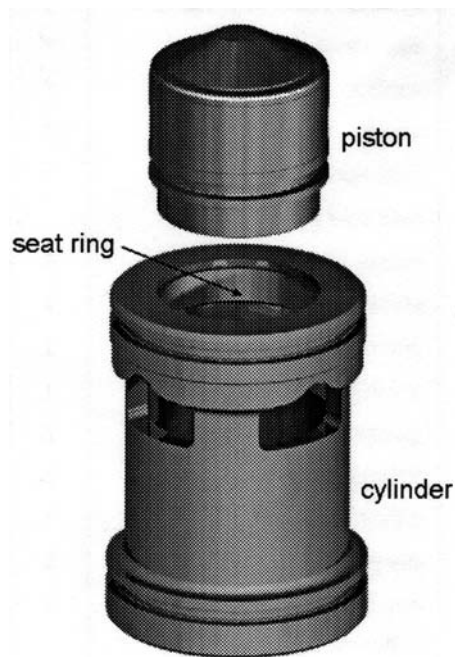


Figure 5-1. Using the Piston to Remove the Seat Ring from the Cylinder

5.2 REASSEMBLY

Refer to Figure 7-1.

1. Place the cylinder (1) in an upright position with the ports on top. Lubricate the inside of the cylinder wall with Mobil FM2 lubricant or an equivalent product.
2. Insert the O-ring (2) into the groove inside the top of the cylinder. This will require some effort.

For steps 3 through 5, refer to Figure 5-2.

3. Turn the cylinder over with the ports and O-ring (2) on the bottom.
4. Insert the seat ring (3) into the cylinder placing it on top of the O-ring.
5. Using the piston (4) as your tool, place it nose end down into the cylinder on top of the seat ring. Using a hammer handle or similar device, press down on the piston to force the seat ring in position against the lip in the cylinder.
6. Remove the piston from the cylinder.
7. With the piston in a vertical position, nose end down, place the O-ring (5) into the groove on the piston. (If the valve is a high-pressure model, the piston will require backup rings as well.)
8. Place the indicator stem retaining ring (8) into the counter bore of the piston. Place the washer (9) on top of the indicator stem retaining ring (8). Using retaining ring pliers, place the retaining ring (10) on top of the washer.
9. Place the piston into the cylinder, nose end down.
10. Insert the spring (11) into the piston.
11. Turn the jack-out screws (17) in the cylinder head (13) to their original position.
12. Place the O-ring (12) into the groove in the cylinder head (13).
13. Place the cylinder head (13) on top of the spring (11), and use an arbor press against the top of the cylinder head to press the spring into the cylinder.

14. Align the holes in the cylinder head with the mating holes in the cylinder, and insert the screws (16) into the holes in the cylinder head (13). Tighten the screws using an Allen wrench.
15. Remove the cylinder assembly from the arbor press.
16. Place the O-rings (7) into the grooves in the outside of the cylinder.
17. Place the gasket (30) on the valve body (32).
18. Holding the cylinder assembly by the cylinder head (13), place the cylinder assembly into the valve body (32), aligning the holes in the cylinder head with the mating studs in the valve body. Tighten the nuts (31) that secure the cylinder head to the valve body.

NOTICE

The following steps apply to valves with position indicators. If your valve does not have a position indicator, you have finished reassembling your valve.

If your valve has a visual position indicator:

19. Place the valve in a vertical position with the cylinder head up. Place the indicator stem (18) into the center hole in the cylinder head (13), and press it into the retaining ring (8) in the piston. You may have to wiggle the indicator stem a little to get it into position. When the indicator stem is in position, *you will not be able to pull it out.*
20. Place the magnets (19) onto the indicator stem (18), and retain the magnets by placing the retaining ring (20) on the indicator stem.
21. Coat the threads of the indicator adapter (21) with pipe sealant, and place the indicator adapter over the indicator stem (18), and screw it into the cylinder head (13). The connection for the tubing should face upwards.
22. Place the ring magnet (23) on the indicator adapter.
23. Place the indicator housing (24) over the indicator adapter, and secure it with the indicator top (25) and screw (26).

If your valve has a microswitch-type position indicator:

24. Place the valve in a vertical position with the head up. Place the indicator stem (18) into the center hole in the cylinder head (13), and press it into the retaining ring (8) in the piston. You may have to wiggle the indicator stem a little to get it into position. When the indicator stem is in position, *you will not be able to pull it out.*
25. Install the indicator adaptor (21) on the cylinder head (13) by turning the indicator guard clockwise. Next, install the O-ring (43) on the upper bearing (41).
26. Install the indicator guard (44) on the indicator adaptor (21) and secure it with the lockwashers (45) and screws (46). Replace the two jack-out screws (17).

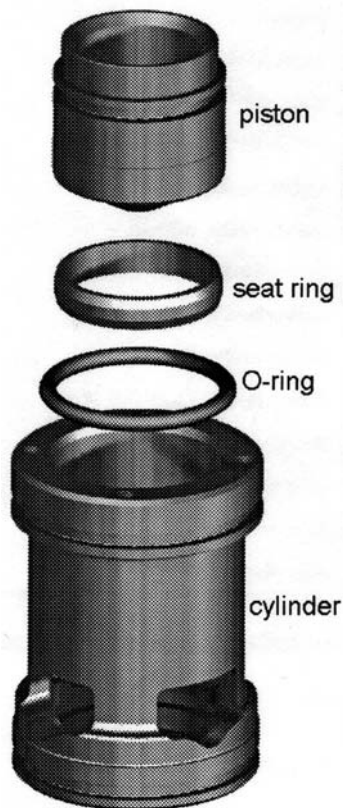


Figure 5-2. Using the Piston to Insert the Seat Ring into the Cylinder

This page intentionally left blank.

6.0 TROUBLESHOOTING

Table 6-1 provides information for identifying and correcting operational problems you may experience with your control valve. Please keep in mind this information is not exhaustive and that system abnormalities may result from causes other than valve error. This information is provided to assist in general field repairs.

Table 6-1. Troubleshooting

Condition	Probable Cause	Correction
Valve will not open	Upstream valve is closed.	Open valve.
	Pump is not operating.	Start pump and check for cavitation.
	Downstream valve is closed.	Open valve. (Check coupler on bottom loading units and internal valve in truck.)
	Insufficient pressure.	Check pump. Check bypass and strainer in line.
	Clogged strainer.	Clean strainer.
	Swollen O-rings.	Disassemble valve and replace O-rings. Check compatibility of O-rings with product.
	Pilot malfunction.	Consult pilot manual.
Valve opens too slowly	Valve inlet pressure below normal.	Check strainer and pump for obstruction.
	Swollen O-rings.	Disassemble valve and replace O-rings. Check compatibility of O-rings with product.
	Pilot malfunction.	Consult pilot manual.
Valve will not close off tightly	Bent indicator stem.	Replace indicator
	Foreign material lodged in main valve piston seat.	Disassemble valve and inspect piston.
	Swollen O-rings	Disassemble valve and replace O-rings. Check compatibility of O-rings with product.
	Piston or seat O-ring cut or defective.	Disassemble valve and replace, if necessary.
	Pilot malfunction.	Consult pilot manual.

This page intentionally left blank.

7.0 PARTS LIST

Table 7-1 lists the replacement parts for 2- through 6-inch Model 700B Series Control Valves. The item numbers in the parts list (Table 7-1) correspond with the sequence numbers in Figure 7-1, with the exception of items A and B which are not illustrated.

When ordering replacement parts you must furnish the following information:

- Valve serial number
- Part number, if available
- Part description
- Quantity required.

To order replacement parts, contact your Daniel sales representative.

DANIEL MODEL 700B SERIES CONTROL VALVES

Table 7-1. Parts List

Item	Description	Qty	2-inch	3-inch	4-inch	6-inch
1	cylinder	1	520471-690	530471-690	540471-69	560471-590
2	O-ring, Buna-N	1	1500399	152100	152080	1500407
	O-ring, EPR	1	1500399-005	152100-005	152080-005	1500407-005
	O-ring, Kalrez [®]	1	1500399-075	152100-075	152080-075	1500407-075
	O-ring, low-swell Nitrile	1	1500399-120	152100-120	152080-120	1500407-120
	O-ring, Neoprene	1	1500399-116	152100-116	152080-116	1500407-116
	O-ring, Viton [®] -A	1	1500399-022	152100-022	152080-022	1500407-022
3	seat ring	1	520026-690	530026-690	540026-690	560026-690
4	piston, standard	1	520024-690	530024-690	540024-690	560024-690
	piston, AP option	1	520024-693	530024-693	540024-693	560024-693
	piston, high-pressure	1	526024-690	536024-690	546024-690	566024-690
5	O-ring, Buna-N	1	152073	152075	152078	157002
	O-ring, EPR	1	152073-005	152075-005	152078-005	157002-005
	O-ring, Kalrez [®]	1	152073-075	152075-075	152078-075	157002-075
	O-ring, low-swell Nitrile	1	152073-120	152075-120	152078-120	157002-120
	O-ring, Neoprene	1	152073-116	152075-116	152078-116	157002-116
	O-ring, Viton [®] -A	1	152073-022	152075-022	152078-022	157002-022
6	backup ring	2	157187	157186	157188	157185
7	O-ring, Buna-N	2	157000	152095	152094	152079
	O-ring, EPR	2	157000-005	152095-005	152094-005	152079-005
	O-ring, Kalrez [®]	2	157000-075	152095-075	152094-075	152079-075
	O-ring, low-swell Nitrile	2	157000-120	152095-120	152094-120	152079-120
	O-ring, Neoprene	2	157000-116	152095-116	152094-116	152079-116
	O-ring, Viton [®] -A	2	157000-022	152095-022	152094-022	152079-022
8	retaining ring	1	1500408	1500408	1500408	1500408
9	washer	1	540032	540032	540032	540032
10	retaining ring	1	156488	156488	156488	156488
11	spring, light (blue)	1	520031	530031	540031	560031
	spring, medium (bronze)	1	520029	530029	540029	560029
	spring, heavy (green)	1	520059	530059	540059	560059
12	O-ring, Buna-N	1	157029	159575	157032	159576
	O-ring, EPR	1	157029-005	159575-005	157032-005	159576-005
	O-ring, Kalrez [®]	1	157029-075	159575-075	157032-075	159576-075
	O-ring, low-swell Nitrile	1	157029-120	159575-120	157032-120	159576-120
	O-ring, Neoprene	1	157029-116	159575-116	157032-116	159576-116
	O-ring, Viton [®] -A	1	157029-022	159575-022	157032-022	159576-022
13	cylinder head, standard	1	520056-510M	530056-510 M	540056-510 M	560056-510 M
	cylinder head, hi-pressure	1	526056-510M	536056-510 M	546056-510 M	566056-510 M
16	screw		151066 (4)	151012 (6)	151012 (6)	151012 (8)

DANIEL MODEL 700B SERIES CONTROL VALVES

SEP 2009

Item	Description	Qty	2-inch	3-inch	4-inch	6-inch
17	jack-out screws	2	150691	150695	150695	150695
18	indicator stem	1	520183-690	530183-690	540183-690	560183-690
	visual, 150 & 300 lb.	1	520183-690	530183-690	540183-690	566183-690
	visual, 600 lb.	1	520183-691	530183-691	540183-691	560183-691
	microswitch, 150 & 300 lb.	1	530183-691	530183-691	540183-691	566183-691
	microswitch, 600lb	1	530183-691	530183-691	540183-691	566183-691
19	magnet	2	1500410	1500410	1500410	1500410
20	retaining ring	1	153946	153946	153946	153946
21	indicator adapter	1	540081-690M	540081-690M	540081-690M	540081-690M
22	cap plug	1	154769	154769	154769	154769
23	ring magnet	1	1500409	1500409	1500409	1500409
24	indicator housing	1	540082-690	540082-690	540082-690	540082-690
25	indicator top	1	540084-690	540084-690	540084-690	540084-690
26	screw	1	151469	151469	151469	151469
27	bal-seal	2	159775	159714	159715	159716
28	piston seal retainer	2	520027-690	-	-	-
29	external retaining ring	2	156576	-	-	-
31	nuts, 150 and 300 lb. nuts, 600 lb.		151546 M (4)	151547M (4)	151547M (6)	151553M (8)
			151546 M (4)	151547M (8)	151547M (8)	151553M (8)
32	valve body, 150 lb.	1	521001M	531001M	541001M	561001M
	valve body, 300 lb.	1	523001M	533001M	543001M	563001M
	valve body, 600 lb.	1	526001M	536001M	546001M	566001M
	valve body, DIN PN 16	1	521001-016M	531001-016M	541001-016M	561001-016M
	valve body, DIN PN 40	1	523001-040M	533001-040M	543001-040M	563001-040M
	valve body, DIN PN 64	1	526001-064M	536001-064M	546001-064M	566001-064M
	valve body, DIN PN 100	1	526001-100M	536001-100M	546001-100M	566001-100M
33	studs, 150 and 300 lb. studs, 600 lb.		151309M (4)	151305M (4)	151305M (6)	151347M (8)
			151451M (4)	151451M (8)	151454M (8)	151450M (8)
34	pipe plug	2	154721	154721	154721	154721
38	cap plug	1	154774	154774	154774	154774

DANIEL MODEL 700B SERIES CONTROL VALVES

Item	Description	Qty	2-inch	3-inch	4-inch	6-inch
39	O-ring, Buna-N	1	157012	157012	157012	157012
	O-ring, EPR	1	157012-005	157012-005	157012-005	157012-005
	O-ring, Kalrez®	1	157012-075	157012-075	157012-075	157012-075
	O-ring, low-swell Nitrile	1	157012-120	157012-120	157012-120	157012-120
	O-ring, Neoprene	1	157012-116	157012-116	157012-116	157012-116
	O-ring, Viton® -A	1	157012-022	157012-022	157012-022	157012-022
40	seal retainer	1	540188-500	540188-500	540188-500	540188-500
41	O-ring, Buna-N	1	152096	152096	152096	152096
	O-ring, EPR	1	152096-005	152096-005	152096-005	152096-005
	O-ring, Kalrez®	1	152096-075	152096-075	152096-075	152096-075
	O-ring, low-swell Nitrile	1	152096-120	152096-120	152096-120	152096-120
	O-ring, Neoprene	1	152096-116	152096-116	152096-116	152096-116
	O-ring, Viton® -A	1	152096-022	152096-022	152096-022	152096-022
42	backup ring	2	157172	157172	157172	157172
43	upper bearing	1	540189-500	540189-500	540189-500	540189-500
44	indicator guard	1	540082-400	540082-400	540082-400	540082-400
45	lock washer	2	152119	152119	152119	152119
46	screws	2	150727	150727	150727	150727
47	indicator adapter	1	540081-500M	540081-500M	540081-500M	540081-500M
48	cap plug	1	154774	154774	154774	154774
A	cylinder assy 150 and 300 lb. without indicator	1	520075-690	530075-690	540075-690	560075-690
	with visual indicator	1	520575-690	530575-690	540575-690	560575-690
	with standard indicator	1	520175-690	530175-690	540175-690	560175-690
	cylinder assy, 600 lb. without indicator	1	526080-690	536080-690	546080-690	566080-690
	with visual indicator	1	526580-690	536580-690	546580-690	566580-690
	with standard indicator	1	526180-690	536180-690	546180-690	566180-690
B	O-ring kit, Viton®	1	W521055-492	W531055-402	W541055-402	W561055-492
	O-ring kit, AP	1	W521015-396	W531015-306	W541015-306	W561015-396

NOTICE

Quantity indicated in parentheses beside part number.

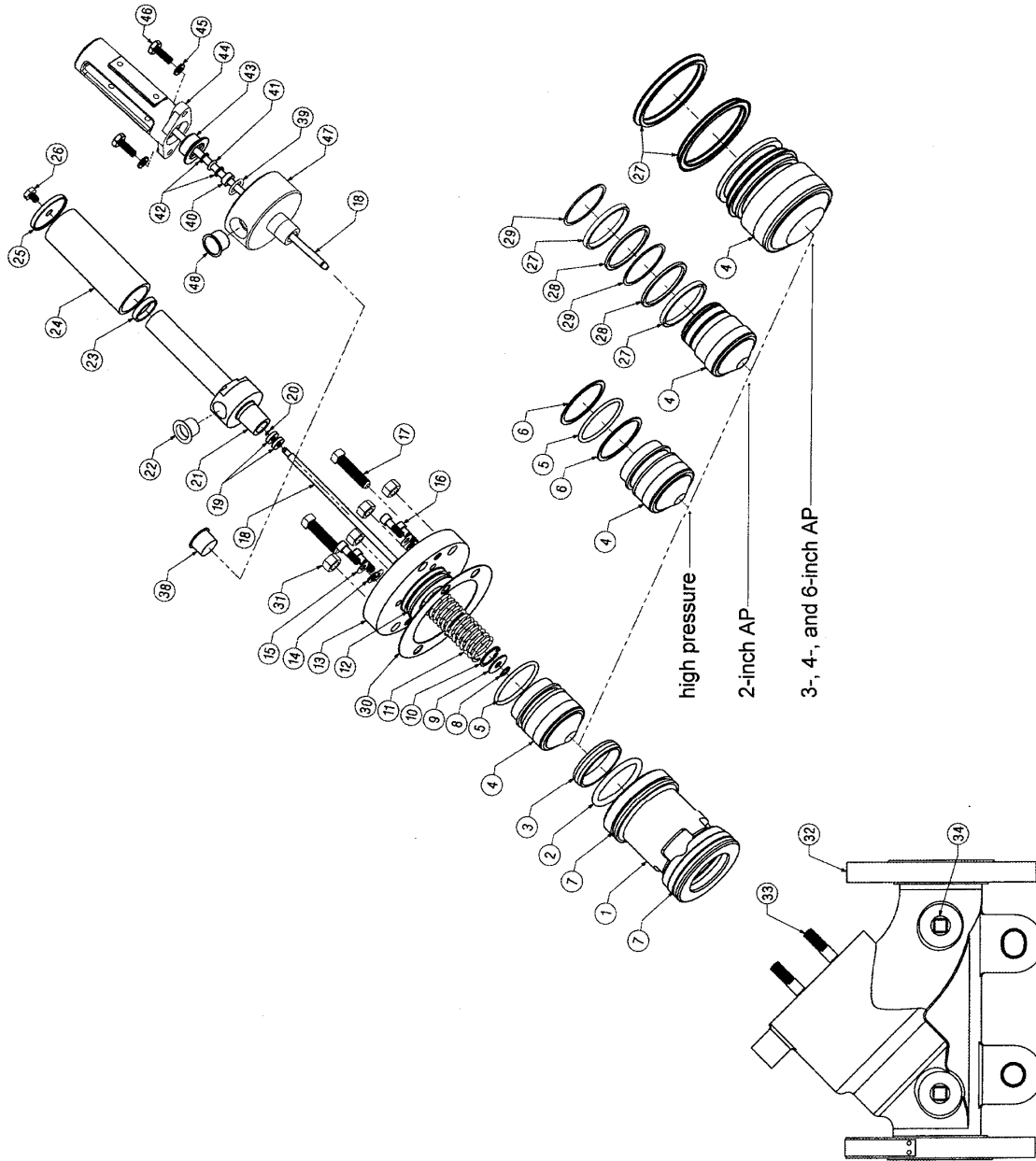


Figure 7-1. Assembly Illustration

This page intentionally left blank.

DANIEL MEASUREMENT AND CONTROL, INC.
RETURN POLICY FOR WARRANTY
AND NON-WARRANTY MATERIAL

Use the following procedure for returning equipment to the Daniel factory in the United States.

Step 1 Obtaining a RMA Number

A Return Material Authorization (RMA) number must be obtained prior to returning any equipment for any reason.

To obtain a RMA number, call the Customer Service Department at 713-827-5033 between 8:00 a.m. and 5:00 p.m. (Central Standard Time), Monday through Friday, except holidays or email daniel.support@emersonprocess.com.

NOTICE

No product returns will be accepted without a RMA number and will be returned at the customer's expense.

For warranty consideration, the product must be returned to Daniel within twelve (12) months of the date of original shipment or within eighteen (18) months of the date of original shipment of the product to destinations outside the United States. The Purchaser must prepay any shipping charges.

In addition, the Purchaser is responsible for insuring any product shipped for return, and assumes the risk of loss of the product during shipment.

- The following information is required at the time the RMA is issued:
- Customer name
- Contact name
- Billing address
- Contact Phone # and email address
- Daniel SO #, PO #, or Invoice #
- Item(s) to be returned
- Reason for return
- End user and final destination address
- Consignee's complete name, address, contact name and phone number

- A RMA number is required for each original order. (Example: Two fittings purchased on two separate orders now being returned require two RMA numbers.)

For product returns from locations outside the United States, Daniel Customer Service personnel will provide additional shipping requirements.

Step 2 Cleaning and Decontamination

Prior to shipment, thoroughly clean and decontaminate all equipment removing all foreign substances. This includes all substances used for cleaning the equipment. The cleaning and decontamination requirement applies to any part exposed to process fluids or cleaning substances.

Shipping equipment that has not been decontaminated may be in violation of U.S. Department of Transportation (DOT) regulations. For your reference, the requirements for packaging and labeling hazardous substances are listed in DOT regulations 49 CFR 172, 178, and 179.

If you suspect that a part has been contaminated, the part must be completely drained and flushed to remove contaminants.



MAY CAUSE DEATH OR SERIOUS INJURY TO PERSONNEL

Contents may be under pressure or materials may be hazardous

Follow appropriate handling instructions for accessing pressurized equipment. Avoid contact with hazardous materials or contaminated units and parts. Failure to do so may result in death or serious injury.

Decontamination/Cleaning Statement

A blank Decontamination/Cleaning Statement is provided on the “Returned Material Authorization Repair Form for Used Equipment”.

- A Decontamination/Cleaning Statement is required for each returned part.
- Fully complete each form and include a signature. If the decontamination statement is incomplete, the customer may be charged for decontamination and cleaning.

If the equipment has been exposed to a known hazardous substance with any characteristic that can be identified in the Code of Federal Regulations, 40 CFR 261.20 through 261.24, the chemical abstracts number and hazardous waste number/hazard code must be stated in the space provided on the form.

Two (2) copies of each Decontamination/Cleaning Statement must be provided:

- One (1) copy must be attached to the outside of the package.
- One (1) copy must be included inside the package.

Step 3 Material Safety Data Sheets (MSDS)

Provide a Material Safety Data Sheet (MSDS) with the returned equipment for each substance that has come in contact with the equipment being returned, including substances used for decontamination and cleaning.

A MSDS sheet is required by law to be available to people exposed to specific hazardous substances, with one exception: if the equipment has only been exposed to food-grade substances or potable water, or other substances for which an MSDS is not applicable, the Decontamination/Cleaning Statement form alone is acceptable.

Two (2) copies of each MSDS must be provided:

- One (1) copy must be attached to the outside of the package.
- One (1) copy must be provided inside the package.

Step 4 Packaging

Shipping a Device With Possible Contamination

To meet DOT requirements for identifying hazardous substances, ship only one device per package.

Shipping a Device Without Any Potential Contamination

Devices being returned may be shipped together in one package, if there is no potential of foreign substance contamination.

Step 5 Shipping

Before returning used equipment:

- Mark each package clearly with a RMA number.
- Include a Decontamination/Cleaning Statement inside the package.
- Attach a duplicate Decontamination/Cleaning statement to the outside of the package.
- Include a MSDS for each substance that has come in contact with the equipment inside the package.
- Attach a duplicate MSDS to the outside of the package.

NOTICE

No product returns will be accepted without a RMA number and will be returned at the customer's expense.

For warranty consideration, the product must be returned to Daniel within twelve (12) months of the date of original shipment or within eighteen (18) months of the date of original shipment of the product to destinations outside the United States. The Purchaser must prepay any shipping charges.

Ship all * mechanical equipment to the following address:

Daniel Measurement and Control, Inc.
Attn: Service Dept.
5650 Brittmoore Rd.
Houston, TX 77041
Ref: RMA# _____

*Mechanical equipment includes: Orifice Fittings, Parts, Plates, Seal Rings, Turbine Meters, Control Valves, Provers, Strainers, Meter Tubes, Ultrasonic Meters, Flow Conditioners, etc.

Ship all * electronic equipment to the following address:

Daniel Measurement and Control, Inc.
Attn: Service Dept.
11100 Brittmoore Park Drive
Houston, TX 77041
Ref: RMA# _____

*Electronic equipment includes: Gas Chromatographs, Petrocount Presets, Danload Preset, Ultrasonic Meter Electronics (CPU boards, transducers, etc.), 2403 Totalizer, MRT 97 Indicator, Preamps, Pick Up Coils, Prover Interface Boards, and the following Flow Computer Models: 2230, 2239, 2270, 2460, 2470, S100, 2100, and 3000.

Daniel Measurement and Control, Inc.

Returned Material Authorization

Repair Form for Used Equipment Including Decontamination/Cleaning Statement

1. Return Material Authorization (RMA) Number _____
2. Equipment to be returned:
Model Number _____ Serial Number _____
3. Reason for return: _____

Decontamination/Cleaning Fluids Process

A. List each substance in which the equipment was exposed. Attach additional documents if necessary.

Common Name	CAS# if available	Used for Hazardous Waste (20 CFR 261)	EPA Waste Code if used for hazardous waste
		[] Yes [] No	
		[] Yes [] No	
		[] Yes [] No	
		[] Yes [] No	
		[] Yes [] No	
		[] Yes [] No	

B. Circle any hazards and/or process fluid types that apply:

Infectious	Radioactive	Explosive	Pyrophoric	Poison Gas	
Cyanides	Sulfides	Corrosive	Oxidizer	Flammable	Poison
Carcinogen	Peroxide	Reactive-Air	Reactive-Water	Reactive-Other (list)	
Other hazard category (list):					

C. Describe decontamination/cleaning process. Include MSDS description for substances used in decontamination and cleaning processes. Attach additional documents if necessary.

Shipping Requirements

Failure to comply with this procedure will result in the shipment being refused.

4. Write the RMA number on the shipping package.
5. Inside the package include one copy of this document and all required Material Safety Data Sheets (MSDS)
6. Outside of the package attach one copy of this document and all required Material Safety Data Sheets (MSDS).

THIS EQUIPMENT, BEING RETURNED "FOR REPAIR," HAS BEEN COMPLETELY DECONTAMINATED AND CLEANED. ALL FOREIGN SUBSTANCES HAVE BEEN DOCUMENTED ABOVE AND MSDS SHEETS ARE ATTACHED.

By:

(Signature)

(Print name)

Title:

Date:

Company:

Phone:

Fax:

The sales and service offices of Daniel Measurement and Control are located throughout the United States and in major countries overseas.
Please contact Daniel Measurement Services at
11100 Brittmoore Park Drive, Houston, Texas 77041, or phone (713) 827-6314
for the location of the sales or service office nearest you.
Daniel Measurement Services offers both on-call and contract
maintenance service designed to provide single-source
responsibility for all Daniel products.

Daniel Measurement and Control, Inc., and Daniel Measurement Services, Inc.
Divisions of Emerson Process Management reserves the right to make changes to any of its products or services
at any time without prior notification in order to improve that product or service and to supply
the best product or service possible.
www.emersonprocess.com/daniel

DANIEL®


EMERSON™
Process Management