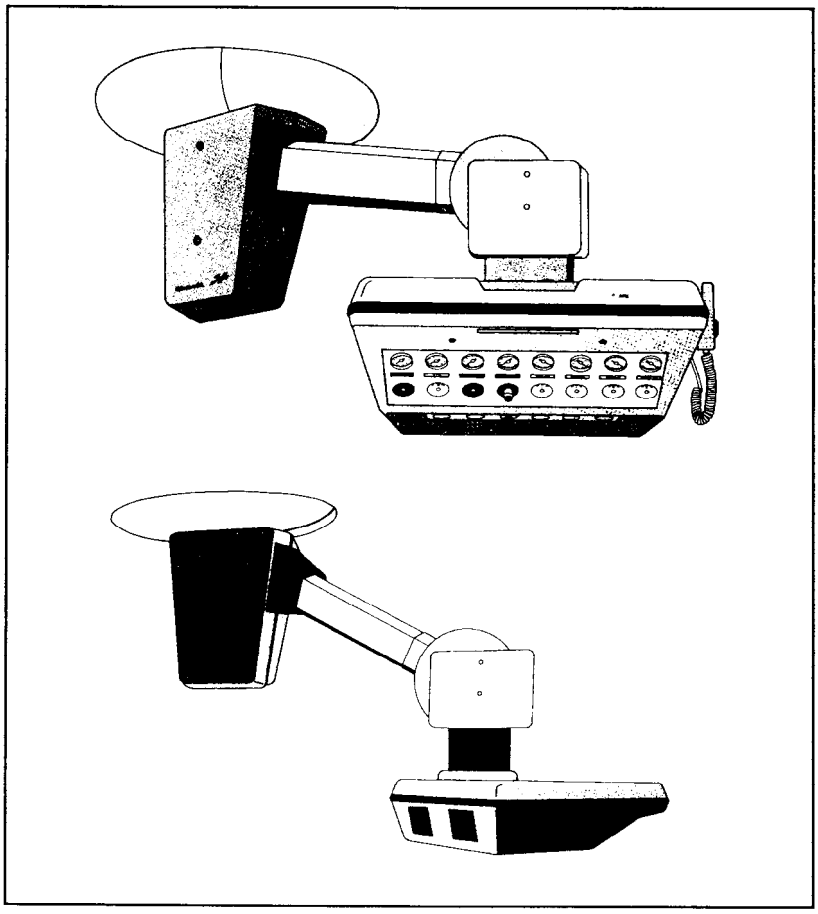
Multi-Service Pendant

OPERATION & MAINTENANCE MANUAL



MEDÆS

MEDICAL ARCHITECTURAL & ENGINEERED SYSTEMS

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User Responsibility

This Product will perform in conformity with the description thereof contained in this operation manual and accompanying labels and/or inserts, when assembled, operated, maintained, and repaired in accordance with the instructions provided. This Product must be checked periodically. A defective Product should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, MEDÆS recommends that a telephonic or written request for service be made to the MEDÆS Service Center. This Product or any of its parts should not be repaired other than in accordance with written instructions provided by MEDÆS, or altered without the prior written approval of MEDÆS' Safety Department. The user of this Product shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, improper repair, damage, or alteration by anyone other than MEDÆS.

Technical Competence

The procedures described in this manual should be performed by trained and authorized personnel only. Maintenance should be undertaken only by competent individuals who have a general knowledge of and experience with devices of this nature.

Genuine replacement parts manufactured or sold by MEDÆS must be used for all repairs.

Read completely through each step in every procedure before starting the procedure; any exceptions may result in a failure to properly and safely complete the attempted procedure.

Cross Connection Prevention

Do not use this device unless checked for cross connection per National Fire Protection Agency (NFPA) 99.

Certification in accordance with the NFPA 99 helps assure pipeline safety and patient protection. MEDÆS offers this service after installation. Please contact the MEDÆS Service Center for information.

PRECAUTIONS

Warnings

Prior to using the outlet after initial installation, make certain the correct gas is piped to each outlet. Test the piping system in accordance with NFPA 99 to ensure patient protection.

Turn off gas to the Pendant at the appropriate zone valve box before performing maintenance or repair.

This device has more than one electrical connection to the source of supply. To reduce the risk of electric shock, disconnect all such connections before servicing or turn off the circuit breaker at the power source to the device.

Prior to using the check unit after the initial installation or service involving the removal of the keying disc or the unit itself, make certain the correct gas has been piped to each check unit. Test piping system in accordance with NFPA 99 to ensure patient protection.

Before performing maintenance or service on any electrical parts, turn off the circuit breaker from the power source to the Multi-Service Pendant.

Before replacing the run capacitor, discharge any residual charge. Do this either by waiting a few minutes after turning the circuit breaker off or by pressing the handheld controller rocker switch to move the Pendant head up and then down.

Cautions

Do not cut RS232 cable during installation. If cable is cut, replace it. Do not attempt to repair it. Field repair voids warranty on RS232 option.

Do not wrap or coil the RS232 cable around anything (e.g., all thread rod) during installation of cable. It may cause EMI or RFI interference which can degrade signal performance.

Each electric outlet box should have a separate 20 amp circuit per NEC guidelines.

Do not rotate arm more than 350 degrees when stops are removed. Doing so could cause hoses to kink and restrict gas supply.

Tighten DISS connectors only enough to prevent leakage. Excessive tightening may cause damage to the check unit. Leakage is detected by a hissing sound.

Maintenance or repairs should be undertaken only by competent individuals who have a general knowledge of and experience with devices of this nature.

Before turning the zone valve to the Off position, obtain permission from appropriate hospital personnel. The gas may be in use and alarms may be triggered.

Do not use harsh chemicals to clean the outlets.

Do not use oil or grease on or around the outlets. Use only lubricants approved for oxygen service, such as Krytox-6PL205.*

When testing an outlet for correct operation, do not allow the piston in the check valve to snap back into position. The shoulder on the piston can break, causing leakage.

Before performing any maintenance or repair, remove all loose items from the shelf on the Pendant head.

**Krytox-6PL205 is a registered trademark of E.I. DuPont DeNemours and Company.*

INTRODUCTION

This manual contains operation and maintenance procedures to ensure proper and safe use of the MEDÆS Multi-Service Pendant*. Service procedures are contained in a separate service supplement.

Read the entire manual before using the Pendant. Pay special attention to the warnings and cautions which appear throughout this manual and are summarized in the Precautions section.

Read the User Responsibility statement - it lists what is required of the operator to maintain a safe and accurate device. Read the Limited Warranty Policy - it lists MEDÆS' responsibility in case of a functional defect.

The wiring of all installed option kits must be done by persons qualified in the installation of the chosen equipment. MEDÆS assumes no responsibility for the operation, maintenance, or warranty of options installed by persons other than MEDÆS' factory personnel or Authorized Service Representatives.

**Patent Pending.*

2/DESCRIPTION

2.1 General Information

The MEDÆS Multi-Service Pendant is designed to provide convenient, adjustable positioning of medical gas, electrical, and specialty services. The arm suspends a self-leveling, rotatable head with a shelf which may support monitors, infusion pumps, computer terminals, and other medical devices. The Pendant accommodates ceiling heights between 8'6" and 11".

The head can contain up to 14 gas outlets, including passive evacuation, in any combination. Line pressure monitoring gauges are supplied for the first eight services, excluding passive evacuation. The side and back panels of the head contain six option windows which allow the selection of any mix of option kits including straight-blade electrical receptacles, twist-lock electrical receptacles, patient ground receptacles, 5-pin monitor receptacles, gas mass spectrometer inlet terminals, water (hypothermia) outlet, RS232 computer I/O, and telephone service connection. See Figure 1.

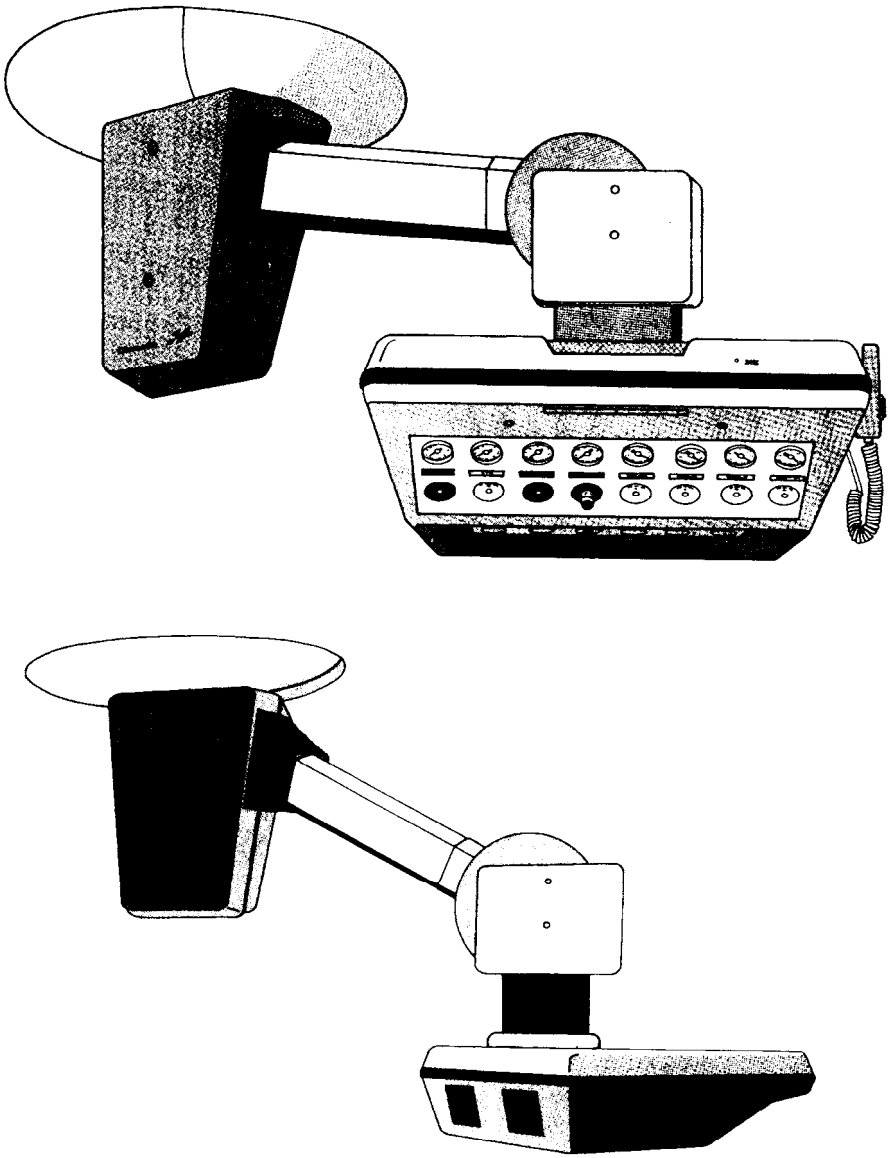


Figure 1
Multi-Service Pendant

2/DESCRIPTION

2.2 Specifications

Power Requirements	115 VAC/20 amp circuits (15 amp circuits in Canada) recommended
Weight	Variable (dependent on options installed) - Not to exceed 250 lbs
Motor	1/8 HP linear motion actuator 115 VAC at 1700 RPM limit
Full Load Amperage (Motor)	Less than 4 amperes
Electrical	Up to 3 independent 20 amp circuits plus low current monitoring circuits
Conduit	Liquidtite UL 3/8"
Wiring	#10 AWG for ground connections #12 AWG for 115 VAC supply and return
Structural Load Requirements	150 lbs (68 kg) horizontal 500 lbs (186 kg) vertical 2500 ft lbs moment
Shrouds	High impact plastic Flame spread rating UL94V-0
Castings	319 T51 aluminum alloy
Grounding	Each independent casting individually grounded to copper bus bar
Reach	37" (94 cm) from ceiling pivot to head pivot 57" (144 cm) Total - Fully raised position
Vertical Range	20" (50 cm) maximum
Horizontal Range	330 degree maximum head swing 350 degree maximum arm swing
Gas Delivery Ratings	Flow rates vary with pipeline network All outlets except DISS III Nitrogen 50 psig maximum DISS III Nitrogen 200 psig maximum
Vacuum Ratings	30 In Hg maximum

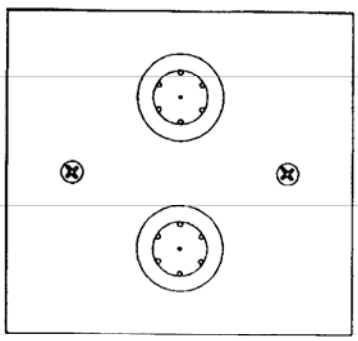


Figure 2
Hansen Water Connection (Stock No. 6811-7110-0300)

2.3 Available Gases and Kits

Front Body Stock Numbers

	Diamond III (Quick Connect)	DISS (Threaded)
Oxygen	6811-7110-000	6811-7110-021
Nitrous Oxide	6811-7110-001	6811-7110-022
Nitrogen	N/A	6811-7110-020
Air	6811-7110-003	6811-7110-019
Carbon Dioxide	6811-7110-004	6811-7110-025
Vacuum	6811-7110-002	6811-7110-023
Evacuation	6811-7110-005	6811-7110-024

Back Body Stock Numbers

(Same for Diamond and DISS)

Oxygen	6811-7110-006
Nitrogen	6811-7110-007
Nitrous Oxide	6811-7110-008
Air	6811-7110-009
Vacuum	6811-7110-010
Evacuation	6811-7110-011
Carbon Dioxide	6811-7110-012

Passive Evac (19 mm Connection)
1 per Pendant 6811-7110-038

2.4 Options

MEDÆS offers jacks and receptacles as options on the Multi-Service Pendant. With the exception of 5 Pin Monitoring and Gas Mass Spectrometer, all kits are prewired to connect with the appropriate interface above the ceiling during installation of the finished Pendant. The wiring of Gas Mass Spectrometer and 5-Pin Monitoring jacks from the jack to the ceiling interface must be done by others qualified in the installation of that equipment.

Option	Stock Number
Water (Hansen Connection)	6811-7110-035
Gas Mass Spectrometer	6811-7110-036
RS232	6811 -7110-034
Monitoring (5-Pin Receptacle)	6811-7110-031
Telephone Jack	6811-7110-037
Straight Blade Electrical Receptacle	6811-7110-032
Twist Lock Electrical Receptacle	6811-7110-033
Ground Receptacle	6811-7110-030
Blank	6811-7110-028

2.5 Water (Hansen Connection)

Two Hansen type connectors with appropriate tubing for the piping of water. This connection may be used with a hypothermia blanket controller, a heart lung machine, or other devices requiring water. See figure 2.

2.6 Gas Mass Spectrometer

Two SARA* connectors are provided for use with a central mass spectrometer gas analysis system. See Figure 3.

**SARA is a registered trademark of P.P.G. Systems.*

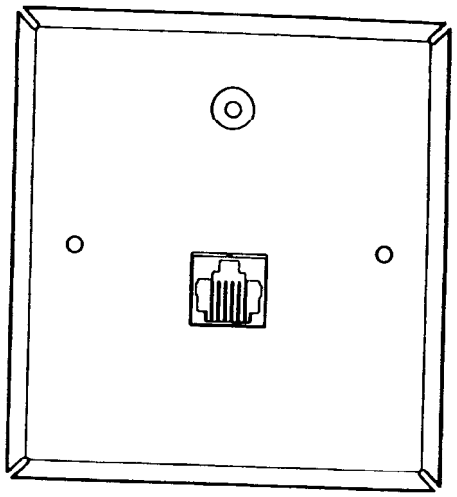


Figure 3
Gas Mass Spectrometer (Stock No. 6811-7110-036)

2.7 RS232

CAUTION: Do not cut RS232 cable during installation. If cable is cut, replace it. Do not attempt to repair it. Field repair voids warranty on RS232 option.

CAUTION: Do not wrap or coil the RS232 cable around anything (e.g., all thread rod) during installation of cable. It may cause EMI or RFI interference which can degrade signal performance.

Two RS232 connections (1 male, 1 female) are provided for use with computer or other RS232 compatible monitoring equipment. See Figure 4.

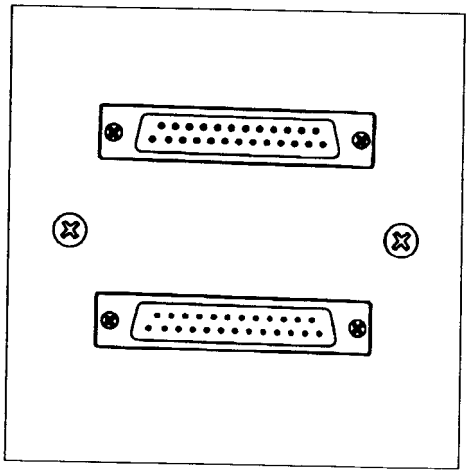


Figure 4
RS232 Computer I/O (Stock No. 6811-7110-034)

2.8 Monitoring (5-Pin Receptacle)

Six Amphenol 5-pin receptacles are provided for use with monitoring systems. This kit is not wired. It must be wired by others to match user equipment. See Figure 5.

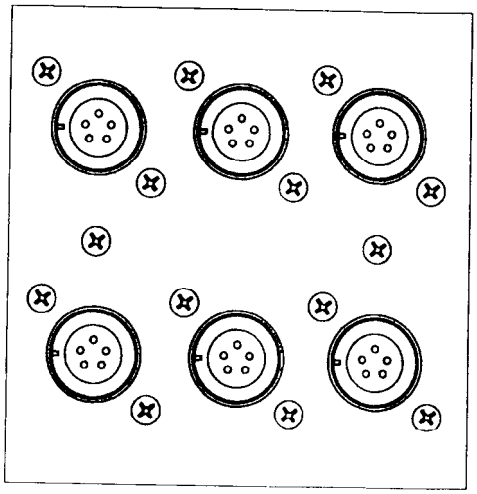


Figure 5
Monitoring 5 Pin Receptacle (Stock No. 6811-7110-031)

2.9 Telephone Jack

One standard 6-contact telephone jack. See Figure 6.

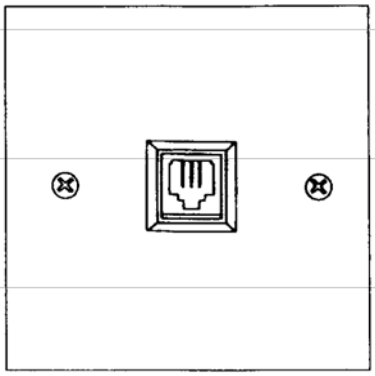


Figure 6
Telephone Jack (Stock No. 6811-7110-037)

2.10 Electrical Receptacles

CAUTION: Each electric outlet box should have a separate 20 amp circuit (15 amp circuit in Canada) per NEC guidelines.

The Multi-Service Pendant may house straight blade and twist lock electrical receptacles. When electrical service is needed, insert a mating plug into the receptacle. See Figures 7 and 8.

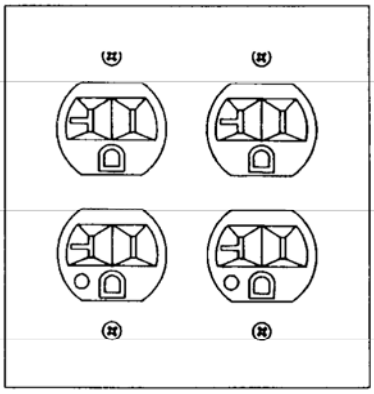


Figure 7
Straight Blade Electrical Receptacle
(Stock No. 6811-7110-039)

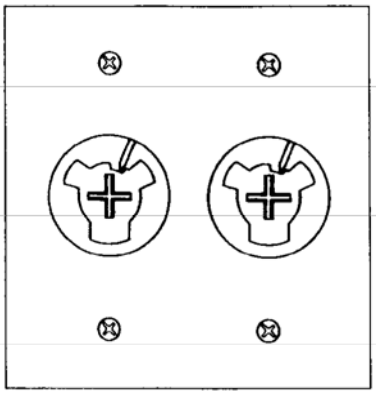


Figure 8
Twist Lock Electrical Receptacle
(Stock No. 6811-7110-033)

2.11 Ground Receptacle

Two duplex receptacles are provided that accept jacks connected to hospital equipment such as metal beds which may transmit static electricity. The receptacles ground medical equipment that comes in contact with the patient. See Figure 9.

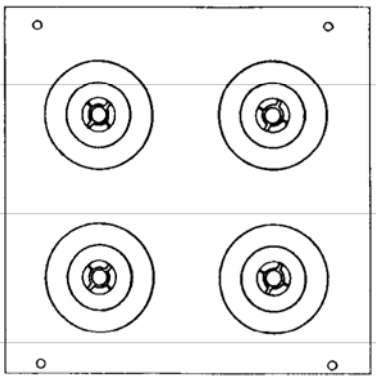


Figure 9
Patient Ground
(Stock No. 6811-7110-030)

2.12 Blank

Plate covers one or more unused option window(s) in the Pendant head.

3.1 Adjustments

Unlocking the Pendant head is the only mandatory adjustment during initial installation. All other limits have been preset at the factory. Optional adjustments are included here.

3.2 Adjusting Vertical Motion

(If less than 20" range of motion is desired.)
See Figure 10.

Limiting Downward Range

1. Remove acorn nuts on both sides of motor assembly shrouds.
2. Remove motor assembly shrouds.
   Note: Rubber U.P.I. boot is now free and moves easily.
3. Slide rubber U.P.I. boot down the length of the horizontal arm.
4. Using handheld controller, lower Pendant to new desired stop position.
5. Loosen 2 screws attaching lower limit switch bracket to the upper pivot housing to allow free rotation of lower limit switch bracket assembly. Do not completely remove screws. See Figure 11.
6. Rotate lower limit switch assembly counterclockwise until switch is depressed by horizontal arm.
7. Retighten lower limit switch bracket assembly. Raise Pendant a few inches. Lower Pendant to verify new desired stop position. Adjust as necessary.
8. Reposition rubber U.P.I. boot.
9. Replace motor assembly shrouds.
10. Retighten acorn nuts on either side of motor assembly shrouds.

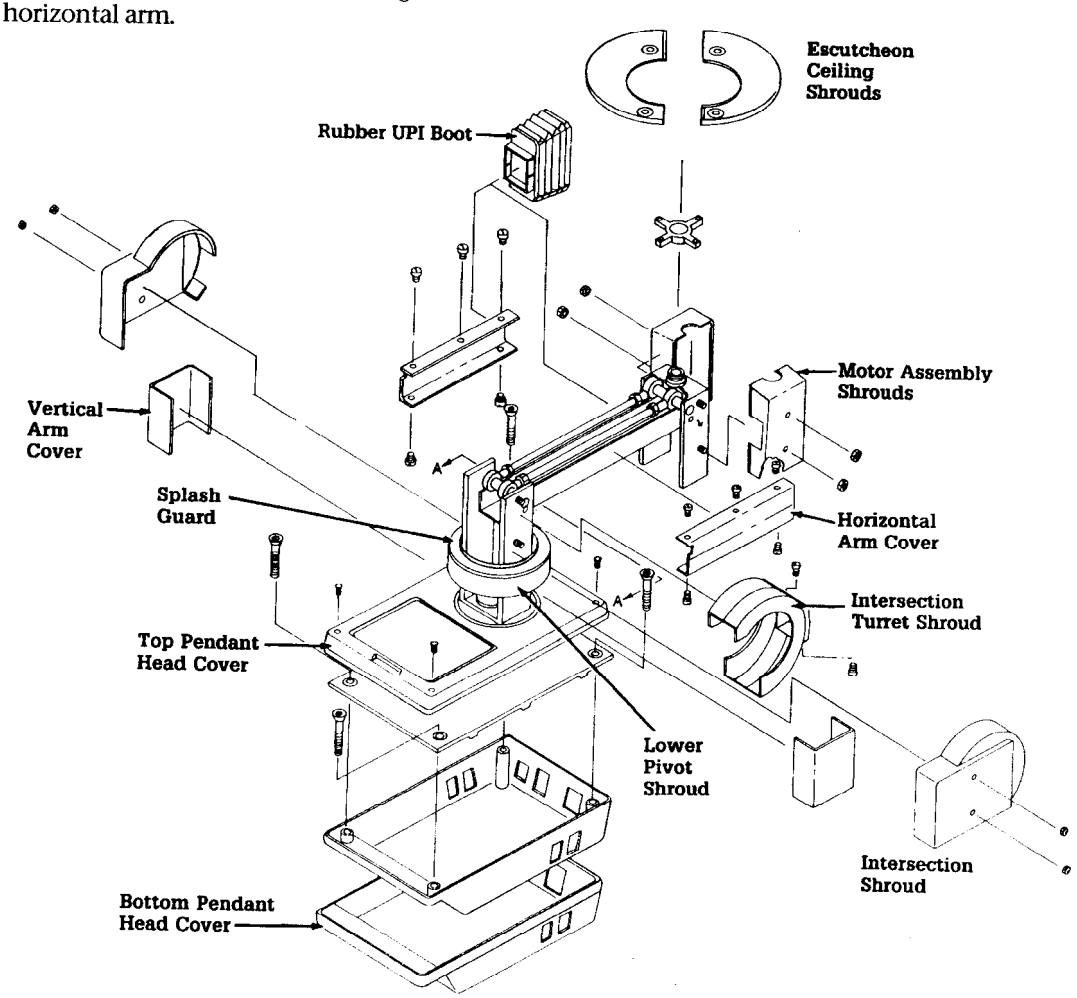


Figure 10
Adjusting the Vertical Motion on the Multi-Service Pendant

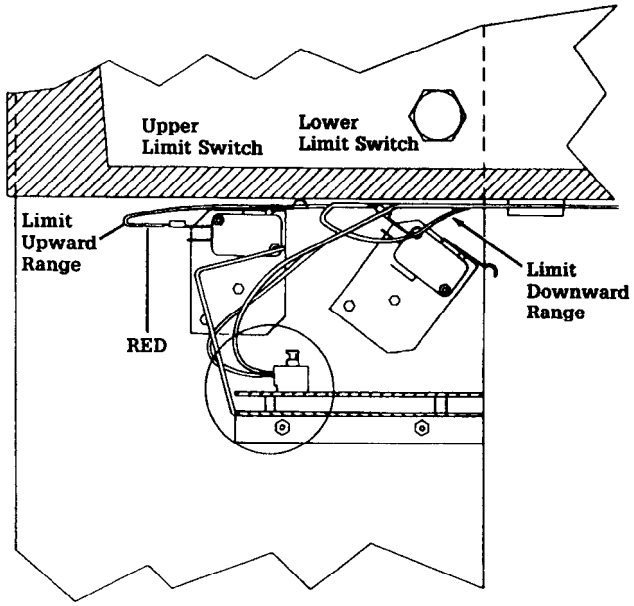


Figure 11
Limiting the Range of Motion on the Multi-Service Pendant

Limiting Upward Range

1. Remove acorn nuts on both sides of motor assembly shrouds.
2. Remove motor assembly shrouds.
   Note: Rubber U.P.I. boot is now free and moves easily.
3. Slide rubber U.P.I. boot down the length of the horizontal arm.
4. Using handheld controller, raise Pendant to desired position.
5. Loosen 2 screws attaching upper limit switch bracket to the upper pivot housing to allow free rotation of upper limit switch bracket assembly. Do not completely remove screws. See Figure 11.
6. Rotate upper limit switch assembly counterclockwise until switch is depressed by horizontal arm.
7. Retighten upper limit switch bracket assembly. Lower Pendant a few inches. Raise Pendant to verify new desired stop position. Adjust as necessary.
8. Reposition rubber U.P.I. boot.
9. Replace motor assembly shrouds.
10. Retighten acorn nuts on either side of motor assembly shrouds.

3.3 Adjusting Ceiling Interface Rotation Distance

(If less than 350 Degree rotation is desired.)
See Figure 10.

CAUTION: Do not rotate arm more than 350 degrees when stops are removed. Doing so could cause hoses to kink and restrict gas supply.

Clockwise

1. Remove the four (4) acorn nuts attaching the two halves of the escutcheon ceiling shroud and remove the ceiling shroud.
2. Locate extra shoulder bolt supplied.
3. Rotate arm clockwise to desired stop point.
4. Install shoulder bolt in 3/8" - 16 horizontal hole closest to the desired stop location. Holes are located at 30 degree increments. See Figure 12.
5. Re-attach the escutcheon ceiling shroud.

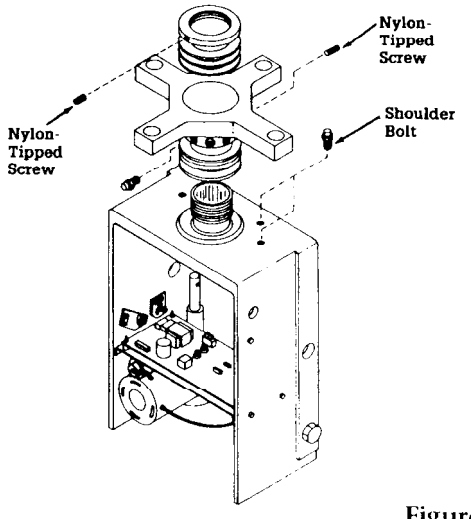


Figure 12
Adjusting the Clockwise Ceiling Interface Rotation Distance

Counterclockwise
Same procedure as the previous one except rotate arm counterclockwise.

Note: If this adjustment does not allow desired positioning, vertical stop may be adjusted also at 15 degree increments allowing infinite adjustment.

3.4 Adjusting Arm Rotation Resistance

See Figure 10 on page 6.

1. Remove four (4) acorn nuts attaching the two halves of the escutcheon ceiling shroud and remove the ceiling shroud.
2. Locate two (2) nylon-tipped set screws opposite each other on the sides of ceiling interface. See Figure 12.
3. Turn screws clockwise using Allen wrench to increase force needed to turn head. Turn screws counterclockwise to decrease force needed to turn head. Both screws must be adjusted equally.
4. Check new rotation resistance and readjust if necessary.
   Note: If rotation of arm is set too loosely, Pendant arm may not hold desired position due to drag forces created by internal hoses and conduit. If this occurs, adjust nylon-tipped set screws until Pendant holds desired position.
5. Replace the escutcheon ceiling shrouds and acorn nuts.

3.5 Adjusting Head Rotation Distance

(If less than 330 degree rotation is desired.)
See Figures 13 and 14.

Counterclockwise
1. Remove acorn nuts on either side of intersection shrouds and screws on shroud seams. Remove intersection shrouds.
2. If applicable, remove screws from vertical arm shrouds below intersection shrouds. Pull vertical arm shrouds free of rubber splash guard. Slide splash guard up the lower pivot interface.
3. Slide lower pivot shroud (ring) up to reveal shoulder bolts.
4. Rotate head counterclockwise until desired stop position is obtained.
5. Remove shoulder bolt closest to hard stop. See Figure 14.
6. Re-install shoulder bolt in hole closest to desired stop location.
7. Replace shrouds and splash guard.

Clockwise
Follow same procedure except rotate head clockwise.

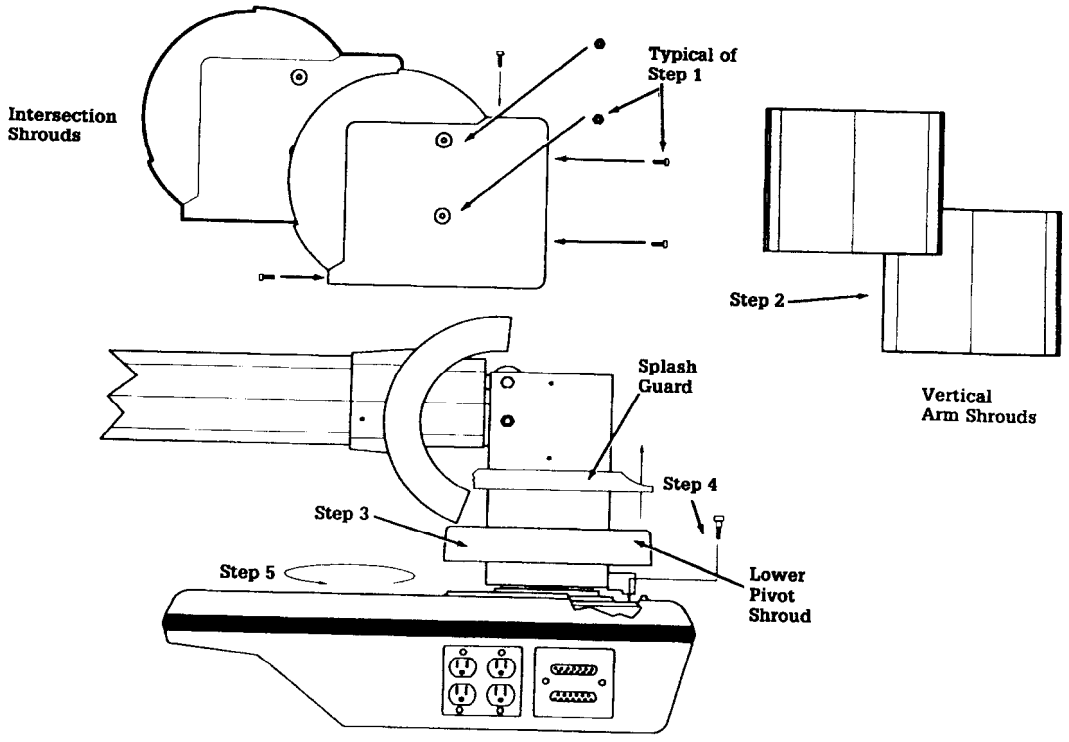


Figure 13
Adjusting Head Rotation Distance and Resistance

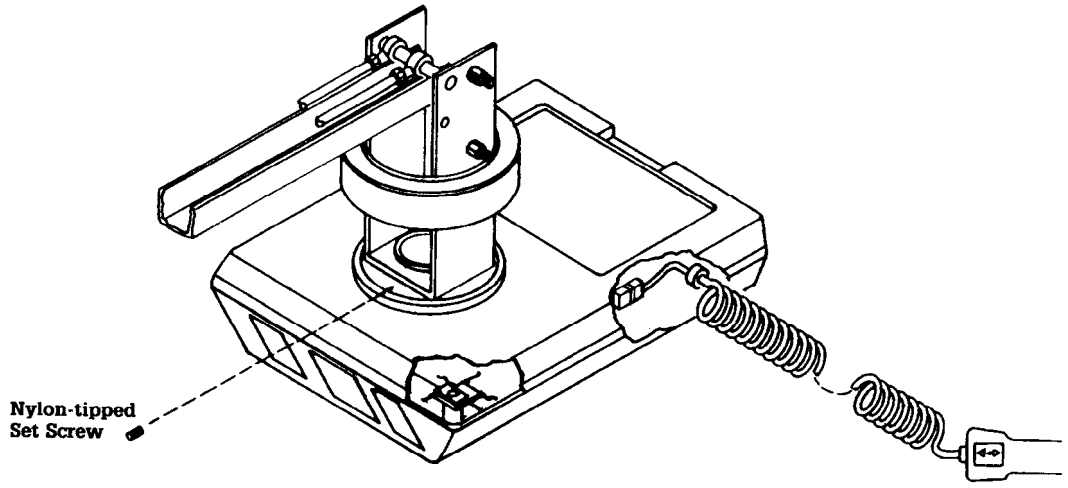


Figure 14
Adjusting Head Rotation Resistance

3.6 Adjusting Head Rotation Resistance

See Figures 13 and 14.

1. Remove acorn nuts on either side of intersection shrouds and screws on shroud seams. Remove intersection shrouds.
2. If applicable, remove screws from vertical arm shrouds below intersection shrouds. Pull vertical arm shrouds free of rubber splash guard. Slide splash guard up the lower pivot interface.
3. Slide lower pivot shroud (ring) up.
4. Locate nylon-tipped set screw 180 degrees opposite hard stop. See Figure 14.
5. Turn screw clockwise using Allen wrench to increase force needed to turn head. Turn screw counterclockwise to decrease force needed to turn head.

Note: If rotation of head is set too loosely, Pendant head may not hold desired position due to drag forces created by internal hoses and conduit. If this occurs, adjust nylon-tipped set screw until Pendant holds desired position.

6. Replace the splash guard, vertical arm shrouds and intersection shrouds.

3.7 Startup

Functional Check
Check voltage and current at electrical receptacles.

Note: Option kits must also be verified as functioning properly before Pendant is put in service. These kits may require connection and verification by other qualified service personnel.

Gas Certification
Certification of gas outlets must be completed by qualified service personnel. Gas services must remain turned off at the zone valve box until gas services in the Pendant have been certified.

When outlets and accessories have been certified by appropriate personnel, power and gas connections can be made to the Pendant, and it can be operated.

3.8 Vertical Movement

Vertical movement of the Pendant is initiated by a handheld control switch (optional wall switch also available) which activates an induction motor-driven linear motion actuator. It moves through all or part of a 20" (50 cm) range with adjustable limits. See Section 3.2 for adjustments.

3.9 Horizontal Movement

Horizontal movement of the Pendant arm and head is accomplished manually with a handle in the front of the Pendant head to allow precise positioning and optimal control.

The arm rotates up to 350 degrees adjustable in 15 degree increments. Refer to Section 3.3 for adjustments. Friction brakes allow adjustment of arm rotation force. See Section 3.4 for adjustments.

The head rotates up to 330 degrees, adjustable in 15 degree increments. See Section 3.5 for adjustments. Friction brakes allow adjustment of arm rotation force. See Section 3.6 for adjustments.

3.10 Theory of Operation: Diamond III Outlets

1. Secondary check is pushed against rubber bushing spring to form a gas-tight seal when front body assembly is not attached. See Figure 15.

   Note: Bronze spring is used for pressurized gases. Stainless steel spring is used for vacuum and evacuation. The stainless steel spring is stronger than the bronze spring to hold the secondary check against rubber bushing.

2. When front and back bodies are attached, the front body cylinder is inserted into the rubber bushing of the back body. See Figure 16.

3. When the front body assembly is attached, the front body cylinder forces the secondary check back against the spring. Seal between secondary check and rubber bushing is broken.

4. A seal then is made between the front body cylinder and check o-ring. Gas flow is stopped here until appropriate adapter is inserted. See Figure 17.

5. When Diamond III adapter is inserted, lock-in spring holds adapter in place.

6. Adapter nose pushes piston back, breaking seal between front body cylinder and o-ring to allow gas flow from outlet.

7. O-ring forms gas-tight seal around the nose of Diamond III adapter when the adapter is inserted. Gas is forced to go through the adapter without leaking around the nose. See Figure 18.

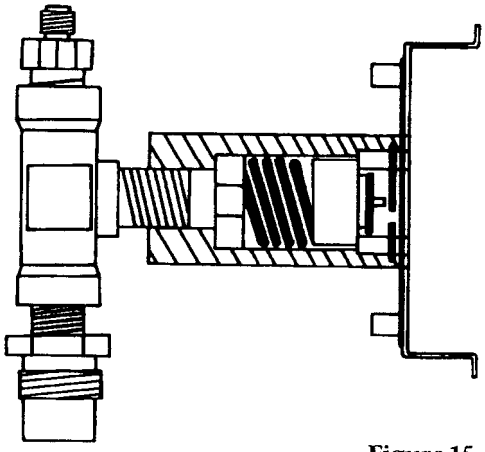


Figure 15
Diamond III Back Body Assembly

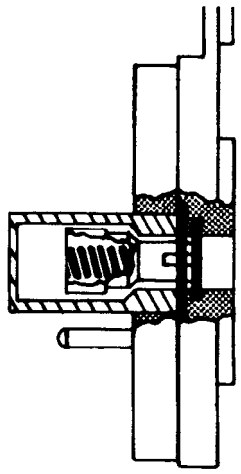


Figure 16
Diamond III Front Body Assembly

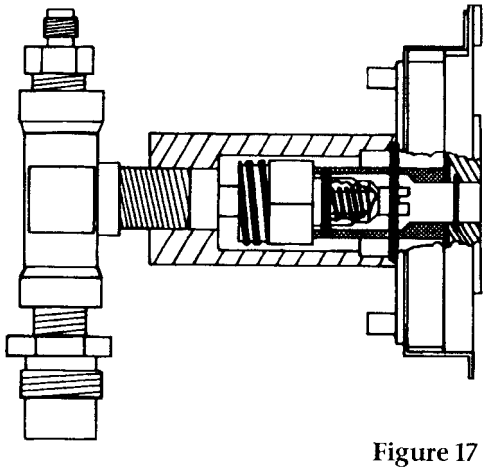


Figure 17
Diamond III Front Body Attached to Back Body Assembly

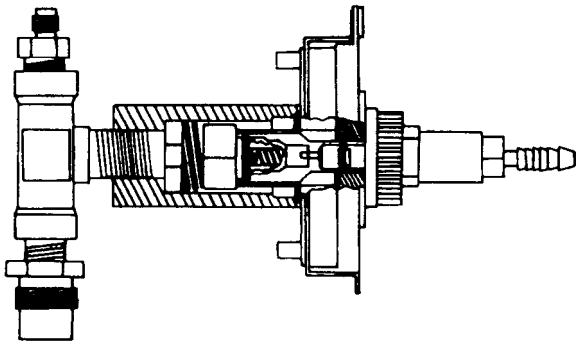


Figure 18
Diamond III Front Body Assembly Attached to Back Body Assembly with Diamond III Adapter Inserted

3.11 Diamond III Outlets – Operation

WARNING: Prior to using the outlet after initial installation, make certain the correct gas is piped to each outlet. Test the piping system in accordance with NFPA 99 to ensure patient protection.

When gas service is needed, attach the appropriate hose or equipment with Diamond III adapter to the outlet by pushing the nose of the adapter into the outlet until the lugs of the adapter seat into the detents of the outlet keying disc. A positive locking click will signal a complete engagement of the adapter.

To remove the adapter, turn the knurled, color-coded ring of the adapter clockwise 90 degrees and pull the adapter out.

3.12 Theory of Operation: DISS III Outlets

1. Secondary check is pushed against rubber bushing spring to form a gas-tight seal when front body assembly is not attached. See Figure 19.

   Note: Bronze spring is used for pressurized gases. Stainless steel spring is used for vacuum and evacuation. The stainless steel spring is stronger than the bronze spring to hold the secondary check against rubber bushing.

2. When the front body assembly is attached, the front body cylinder forces the secondary check backward against the spring. Seal between secondary check and rubber bushing is broken. See Figure 20.

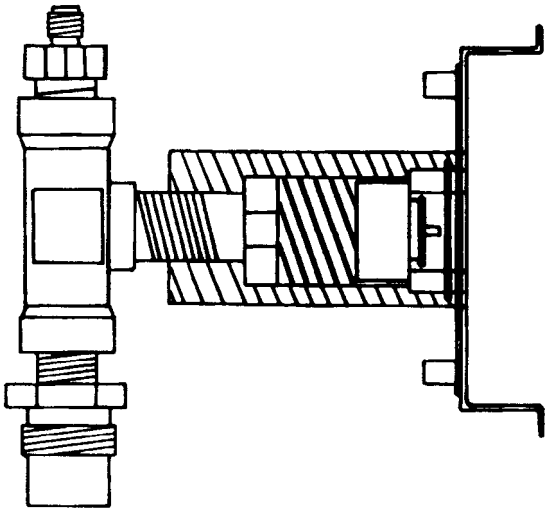


Figure 19
DISS III Back Body Assembly

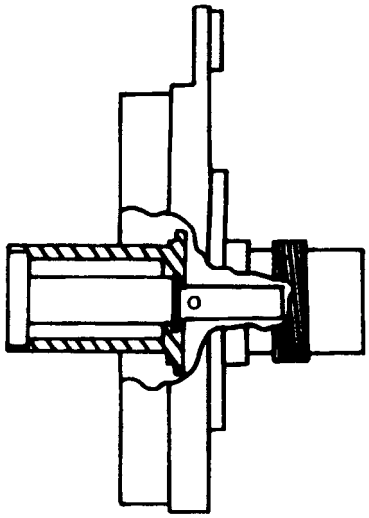


Figure 20
DISS III Front Body Assembly

3. Gas-tight seal is formed between small o-ring on piston and front body. See Figure 21.

4. DISS adapter attached.

5. When DISS adapter is attached, piston is pushed back and seal between o-ring on piston and the front body is broken to allow gas flow. Piston also pushes secondary check further back to allow better gas flow. See Figure 22.

WARNING: Prior to using the outlet after initial installation, make certain the correct gas is piped to each outlet. Test the piping system in accordance with NFPA 99 to ensure patient protection.

3.13 DISS III Outlets - Operation

When gas service is needed, attach the appropriate hose or equipment to the check unit and tighten the nut fingertight so that no hissing is heard. It may be necessary to tighten the nut slightly with a wrench if finger tightening does not prevent leakage.

CAUTION: Tighten DISS connectors only enough to prevent leakage. Excessive tightening may cause damage to the check unit. Leakage is detected by a hissing sound.

To remove the adapter, simply turn the nut counter clockwise until the nut can be removed. Get nut started with a wrench if necessary.

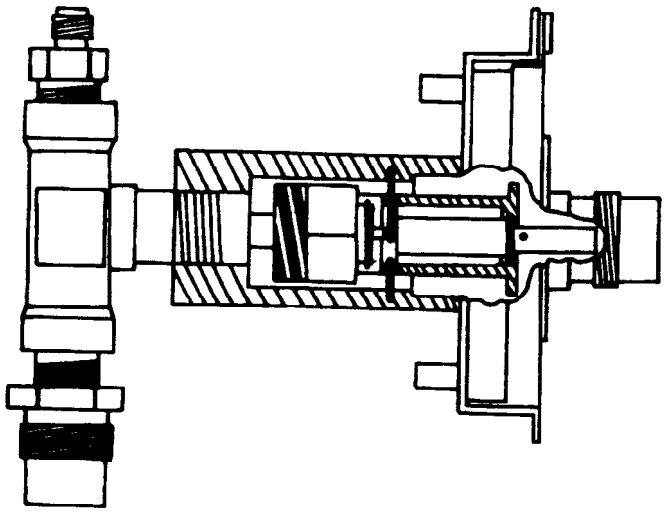


Figure 21
DISS III Front Body Assembly Attached to Back Body Assembly

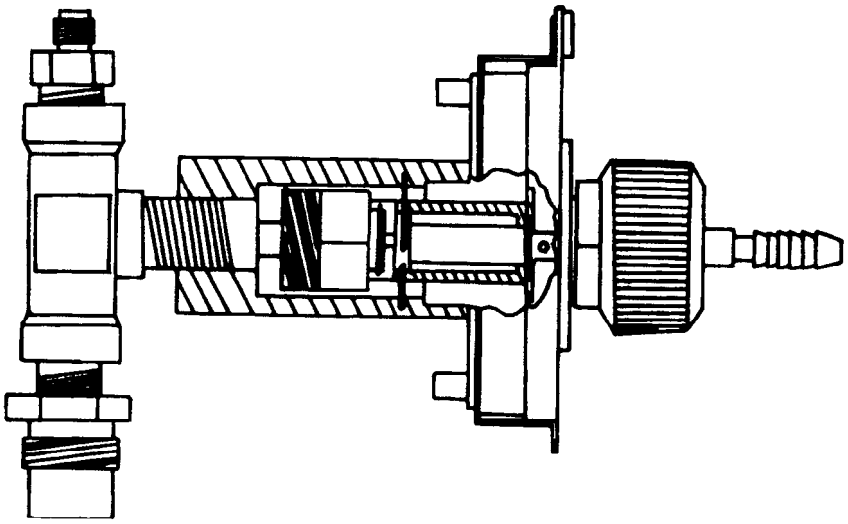


Figure 22
DISS II Front Body Assembly Attached to Back Body Assembly with DISS III Adapter Connected

4/MAINTENANCE

4.1 Repair Policy

CAUTION: Maintenance and repair should be undertaken only by competent individuals who have a general knowledge of and experience with devices of this nature.

A unit which is not functioning properly should not be used until all necessary repairs have been made and the unit has been tested to ascertain that it is functioning in accordance with the manufacturer's published specifications.

To ensure full reliability, it is recommended that all repairs be performed by an authorized MEDÆS Service Representative. However, if this cannot be done, replacement of those parts designated in this manual may be undertaken by a competent individual having general experience in the repair of devices of this nature.

Replace damaged parts with components manufactured or sold by MEDÆS. Then test the unit to ascertain that it complies with the manufacturer's specifications.

Contact the MEDÆS Service Center for service assistance. If you send the unit to the MEDÆS Service Center, package it securely in the original shipping container, if possible, and ship it prepaid. Enclose a letter with the unit describing in detail any difficulties experienced and the repairs felt necessary. In all cases, other than where MEDÆS' warranty is applicable, repairs will be made at MEDÆS' current list price for the replacement part(s) plus a reasonable labor charge.

The procedures described in the following sections of this manual are to be performed by trained and authorized personnel only. The maintenance procedures in the following sections should be undertaken only by competent individuals who have a general knowledge of and experience with devices of this nature. No repairs or maintenance should be at tempted by anyone not having such qualifications. Where advised to contact MEDÆS Service, call 800-511-2333.

Genuine replacement parts manufactured or sold by MEDÆS must be used for all repairs to this product.

CAUTION: Before turning the zone valve to the Off position, obtain permission from appropriate hospital personnel. The gas may be in use and alarms may be triggered.

WARNING: Turn off gas to the Pendant at the appropriate zone valve box before performing maintenance or repair.

WARNING: This device has more than one electrical connection to the source of supply. To reduce the risk of electric shock, disconnect all such connections before servicing or turn off the circuit breaker at the power source to the device.

4.2 Cleaning

The shrouds, the anodized aluminum cover plates, and plastic portion of the outlets should be cleaned with a mild soap and warm water solution.

CAUTION: Do not use harsh chemicals to clean the outlets.

CAUTION: Do not use oil or grease on or around the outlets. Use only lubricants approved for oxygen service, such as Krytox-6PL205.*

**Krytox-6PL205 is a registered trademark of DuPont DeNemours and Company.*

4.3 Preventive Maintenance — General

The following checks should be performed annually or whenever the Pendant is being returned from service.

1. Inspect the roughing-in assembly to ensure it is level and firmly anchored to the structural support. Inspect ceiling interface to ensure it is level. Check for corroded or loose nuts and rods. Inspect all gas hoses and electrical connections for twisting and wear. Tighten or replace parts as necessary. Refer to Section 4.4.
2. Inspect the Pendant arm and head stops and friction brakes for wear and tightness. Adjust or replace as necessary. Refer to Section 4.5.
3. Check that upper and lower limit switches are operational. Adjust if necessary. Refer to Section 3.2.

4.4 Inspect Roughing-in Assembly and Ceiling Interface

CAUTION: Before turning the zone valve to the Off position, obtain permission from appropriate hospital personnel. The gas may be in use and alarms may be triggered.

WARNING: Turn off gas to the Pendant at the appropriate zone valve box before performing maintenance or repair.

WARNING: This device has more than one electrical connection to the source of supply. To reduce the risk of electric shock, disconnect all such connections before servicing or turn off the circuit breaker at the power source to the device.

1. Remove four nuts at base of escutcheon ceiling shroud and remove both halves of ceiling shroud exposing the rough-in.
2. Ensure that rough-in is level and firmly anchored to structural support. Tighten any loose nuts. Replace any corroded nuts or rods.
3. Ensure that the ceiling interface is level and firmly anchored to the structural support. Tighten any loose nuts. Replace any corroded nuts or rods.

4. Ensure gas connections are tight. Inspect gas hoses for twisting, kinks, and wear. Tighten, repair or replace parts as necessary.
5. Ensure electrical connections are tight. Inspect electrical cables for twisting and wear. Tighten, repair or replace parts as necessary.
6. Reattach escutcheon ceiling shroud halves.
7. Reconnect electric and gas service to the Pendant.

4.5 Inspect Stops and Friction Brakes

See Section 3.4 for arm adjustment and Section 3.6 for head adjustment.

1. If tightening the nylon-tipped set screws does not increase resistance, remove the set screws.
2. Examine each set screw for wear and replace as necessary.

4.6 Preventive Maintenance — Diamond Check Units

WARNING: Prior to using the check unit after the initial installation or service involving the removal of the keying disc or the unit itself, make certain the correct gas has been piped to each check unit. Test piping system in accordance with NFPA 99 to ensure patient protection.

To ensure that gas outlets are working properly, make the following checks annually or whenever the Pendant is being returned for service.

CAUTION: When testing an outlet for correct operation, do not allow the piston in the check valve to snap back into position. The shoulder on the piston can break, causing leakage.

4.7 Primary Check

Insert an appropriate Diamond III adapter into the check unit until a positive click signals the complete engagement of the adapter. Listen for leaks around the keying disc. If a leak is detected, the o-ring and/or piston in the front of the check unit will have to be replaced. See Section 5 for repairs.

4.8 Adapter Retention

Insert the appropriate Diamond III adapter into the check unit until a positive click signals the complete engagement. Firmly pull on the adapter. If it can be removed without turning the knurled ring, the adapter locking spring will have to be replaced. See Section 5 for repairs.

4.9 Piston Operation

Insert the appropriate Diamond III adapter into the check unit until a positive click signals the complete engagement. Remove the adapter by turning the knurled ring. Check to see that the piston returns to its original position. If the piston does not return to its original position, the return spring must be replaced. See Section 5 for repairs.

4.10 Troubleshooting

Use the following tables to assist in diagnosing maintenance and repair needs. Different systems within the Pendant are covered in different tables.

Table 1. Pendant Movement

Symptom	Probable Cause	Solution	Reference Section
Pendant will not move vertically	Main power source not connected to Pendant	Connect main power source to Pendant	4.4
	Limit switches out of adjustment	Adjust limit switches	3.2
	Autostop contacts out of adjustment (Red LED stays on.)	Contact MEDÆS Service	4.1
	Handheld controller damaged	Replace handheld controller	5.5
	Run capacitor damaged	Replace run capacitor	5.6
	Motor Control Board damaged	Replace Motor Control Board	5.7
	Actuator assembly damaged	Contact MEDÆS Service	4.1
Pendant arm drifts out of horizontal position	Ceiling interface not level	Level ceiling interface	4.4
	Rough-in not level	Level rough-in	4.4
Pendant arm drifts out of horizontal position. Rough-in and ceiling interface are level	Friction brakes at ceiling interface adjusted too loosely	Tighten friction brakes	3.4
Pendant head drifts out of horizontal position	Friction brakes at head adjusted too loosely	Tighten friction brakes	3.6

Pendant arm does not have full vertical travel	Limit switches out of adjustment	Adjust limit switches	3.2
Pendant arm does not have desired rotation	Arm stops need adjustment	Adjust arm stops	3.3
Pendant head does not have desired rotation	Head stops need adjustment	Adjust head stops	3.5

Table 2. Pendant Outlets

Symptom	Probable Cause	Solution	Reference Section
Audible hissing at outlet front body	Front body o-ring leaking	Replace front body o-ring	5.2
Audible hissing at outlet back body	Back body o-ring and/or bushing leaking	Replace back body o-ring and bushing	5.3
Outlet adapter can be removed without turning knurled ring on Diamond outlet	Worn adapter locking spring	Replace adapter locking spring	5.2
Outlet piston does not return to its original position when adapter is removed	Worn return spring (Item 7, Figure 29)	Replace return spring	5.2
Secondary check piston does not return after being depressed	Worn spring (Item 2, Figures 27 and 29)	Replace spring	5.3
No pressure reading at outlet gauge	Gas not supplied to rough-in	Check that zone valve is open	
	Gas connection disconnected between gas supply and gauge	Check all gas connections between rough-in and gauge	4.4
	Hose leak between gas supply and gauge	Leak test hoses. Replace as necessary	4.4
	Damaged gauge	Replace gauge	5.4

Table 3. Electrical Options

Symptom	Probable Cause	Solution	Reference Section
Equipment does not function when plugged into Pendant electrical receptacle	No voltage at receptacle due to open circuit breaker	Check circuit breaker and reset	4.4
	Power supply not connected at Pendant rough-in	Check and connect power to rough-in if necessary	4.4
Circuit breaker opens immediately after being reset	Bad connection or bad wire between rough-in and electrical receptacle	Check connections and wires for short. Replace or repair as necessary	4.4

5.1 Removing the Front or Bottom Outlet Cover

Before any service can be performed on an outlet, it must first be freed from the Pendant unit and the aluminum cover plate. Refer back to this section.

1. Remove the bottom head shroud by removing the 8-32 AVSAFE tamper-proof screw located in each corner of the bottom shroud. (No. 8 AVSAFE driver required, stock no. 6812-9020-001.)
2. Remove the six 6-32 AVSAFE tamper-proof screws securing aluminum cover plate to Pendant head with appropriate wrench. (No. 6 AVSAFE driver required, stock no. 6812-9020-000.) Support the cover plate while removing AVSAFE screws. Coverplate with outlets attached will come free of Pendant head.
3. Remove two Phillips head screws from cover plate directly above and below outlet to be serviced. Outlet will come free of coverplate.
4. Remove gas fitting(s) from outlet back body.
5. If outlet is connected directly to a gauge, disconnect adapter at rear of gauge.
6. Remove outlet from Pendant head and service as required.
7. Reverse procedures to re-attach cover plate and bottom shroud.

5.2 Diamond III/DISS III Outlets: Front Body

(See Section 5.1 for removal of aluminum cover plate.)

The Diamond III/DISS III outlets can be disassembled for servicing and replacement of parts as illustrated in Section 6, Illustrated Parts List.

Note: The gas supply need not be turned off when removing the front body. The secondary check valve and bushing in the back body prevent flow from the outlet.

The adapter locking spring on the Diamond III front body housing, and the front body o-ring can be replaced by dismantling the housing as follows (see detail in Section 6, Illustrated Parts List):

1. Loosen the two front body screws.
2. Carefully remove the front body assembly from the back body assembly.
3. Using needle-nose pliers, crush the inside flange of the brass eyelets and remove them from the assembly.
4. Remove and replace all worn or damaged parts.
5. New brass eyelets must be used when reassembling the front body assembly. Insert the eyelets and flare the rear of each with a 60 degree tapered punch.
6. Re-attach cover plate.

5.3 Diamond III/DISS III Outlets: Back Body

(See Section 5.1 for removal of aluminum cover plate.)

(See detail in Section 6, Illustrated Parts List.)

WARNING: Be certain the gas supply is shut off before disassembling the back body.

1. Lift the inside (1D) lock spring from the rear housing with a small screwdriver.
2. Carefully work the rubber bushing from the back body with a screwdriver.
3. Remove the secondary check and the spring.
4. Replace components as necessary and reassemble the outlet. See Section 6, Illustrated Parts List.
5. Re-attach front body and cover plate.

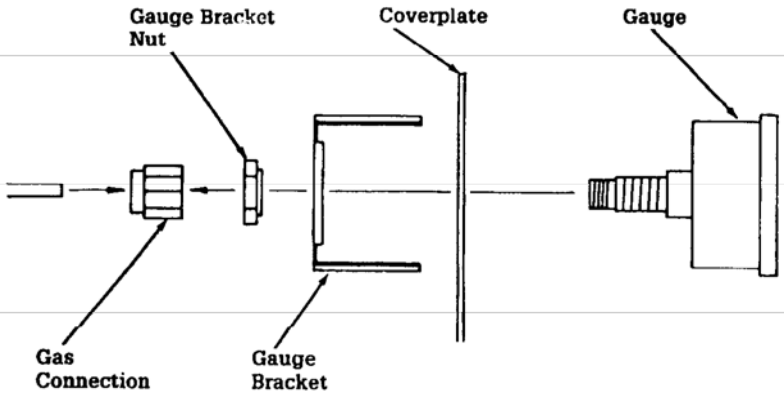


Figure 23
Replacing the Gauge

5.4 Replacing A Gauge

(See Section 5.1 for removal of aluminum cover plate)

(See Figure 23.)

1. Disconnect fitting at rear of gauge.
2. Support gauge while removing gauge bracket nut which holds gauge bracket to cover plate.
3. Gauge is now free from cover plate.
4. Install new gauge.
5. Fasten gauge to cover plate with gauge bracket and gauge bracket nut.
6. Wrap gauge fitting with Teflon* tape and fasten gauge fitting to outlet.
7. Replace cover plate.

**Teflon is a registered Trademark of the DuPont DeNemours Company.*

5.5 Replacing the Handheld Controller

WARNING: Before performing maintenance or service on any electrical parts, turn off the circuit breaker from the power source to the Multi-Service Pendant.

CAUTION: Before performing any maintenance or repair, remove all loose items from the shelf on the Pendant head.

See Figure 10 on page 6 and Figure 24 below.

1. Remove acorn nuts on either side of the intersection shrouds and screws on shroud seams. Remove intersection shrouds.
2. If applicable, remove screws from vertical arm shrouds below intersection shrouds. Pull vertical arm shrouds free of rubber splash guard. Slide splash guard up the lower pivot interface.
3. Slide lower pivot shroud (ring) up to reveal shoulder bolts.
4. Remove the four 8-32 Avsafe screws holding the top pendant head cover in place. (No. 8 Avsafe driver is required.)
5. Slide the top pendant head cover up the lower pivot interface.
6. Look between the two metal castings to locate the male-female connector for the handheld controller cord.
7. Disconnect the handheld controller cord connector.
8. Cut off the male half of the connector from the old retractile cord and pull the cord through the strain relief in the side of the shroud.
9. Snap the strain relief out of the hole in the shroud.
10. Feed the new cord through the strain relief and the hole in the shroud. Snap the strain relief back into the hole in the shroud.
11. Insert the pins of the new controller cord into the male half of the connector. Make sure you match like-colored wires from the male half of the connector to the female half of the connector. (The connector halves are keyed so they can be joined in only one orientation.)
12. Connect the two halves of the connector together.
13. Slide the top pendant head cover back down the lower pivot interface.
14. Re-attach the top pendant head cover.
15. Re-attach the lower pivot shroud, the splash guard, the vertical arm shrouds, and the intersection shrouds.

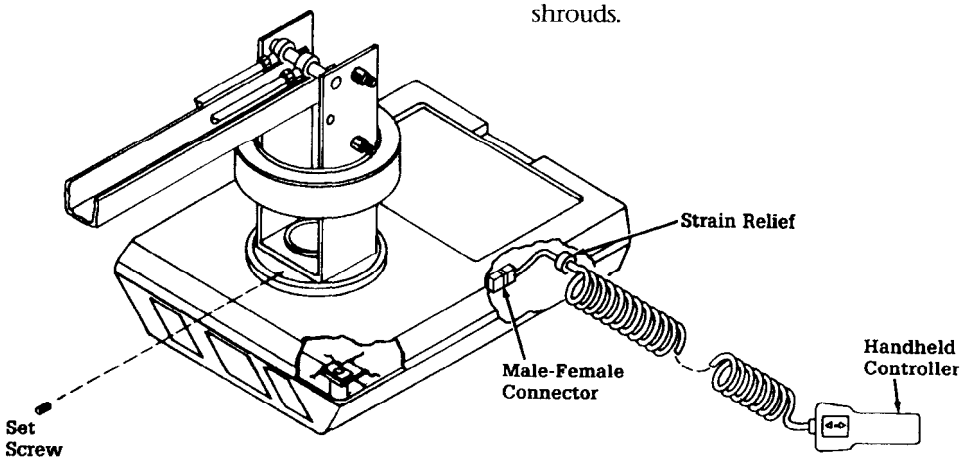


Figure 24
Replacing the Handheld Controller

5.6 Replacing the Run Capacitor

WARNING: Before performing maintenance or service on any electrical parts, turn off the circuit breaker from the power source to the Multi-Service Pendant.

WARNING: Before replacing the run capacitor, discharge any residual charge. Do this either by waiting a few minutes after turning the circuit breaker off or by pressing the hand-held controller rocker switch to move the Pendant head up and then down.

CAUTION: Before performing any maintenance or repair, remove all loose items from the shelf on the Pendant head.

See Figures 10 and 25.

1. Remove two (2) acorn nuts on each side of motor assembly shrouds.
2. Remove motor assembly shrouds.
   Note: Rubber U.P.I. boot is now free and moves easily.
3. Slide rubber U.P.I. boot down length of horizontal arm.
4. Loosen the two screws holding the run capacitor damp to the upper pivot interface.
5. Slide the run capacitor toward the horizontal arm and remove it from the run capacitor clamp.
6. Slide the protective rubber terminal boot up the wires and out of the way.
7. Disconnect the wires from the run capacitor, noting the wiring configuration.
8. Attach the wires to the new run capacitor in the same configuration the old wires were connected in.
9. Slide the protective rubber boot back over the terminal corrections.
10. Slide the new run capacitor into the run capacitor clamp.
11. Tighten the two screws holding the run capacitor clamp to the upper pivot interface.
12. Replace U.P.I. boot, motor assembly shrouds, and acorn nuts.

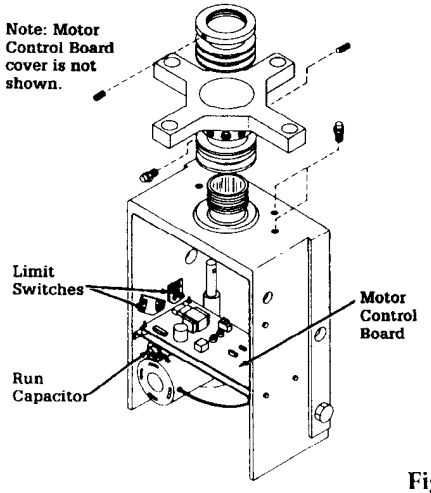


Figure 25
Replacing the Run Capcitor

5.7 Replacing the Motor Control Board

WARNING: Before performing maintenance or service on any electrical parts, turn off the circuit breaker from the power source to the Multi-Service Pendant.

CAUTION: Before performing any maintenance or repair, remove all loose items from the shelf on the Pendant head.

See Figures 10 and 25.

1. Remove two (2) acorn nuts on each side of motor assembly shrouds.
2. Remove motor assembly shrouds.
   Note: Rubber U.P.I. boot is now free and moves easily.
3. Slide rubber U.P.I. boot down length of horizontal arm.
4. Remove Motor Control Board cover by removing two (2) 4-40 screws at the front of the cover and slide the cover forward and free of the upper pivot interface.
5. Remove the motor control board by gently depressing the retaining snap on the printed circuit board mounting stud at each corner of the board and, at the same time, lifting the corner of the board. Repeat this action for each of the snap-on studs until the board is free.
6. Slide the motor control board toward the horizontal arm until all of the wire connections can be reached.
7. Disconnect the wires from the motor control board, noting the wiring configuration.
8. Remove the old motor control board.
9. Position the new motor control board in order to connect the wires to the appropriate terminals on the new motor control board. See Figure 26.
10. Slide the motor control board back into the upper pivot interface until the holes in the board are aligned with the snap-on studs.
11. Attach the motor control board by gently pressing each corner down until it snaps onto the corresponding stud.
12. Replace U.P.I. boot, motor assembly shrouds, and acorn nuts.

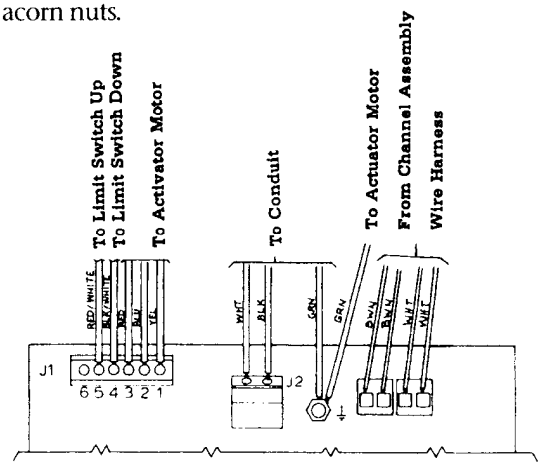
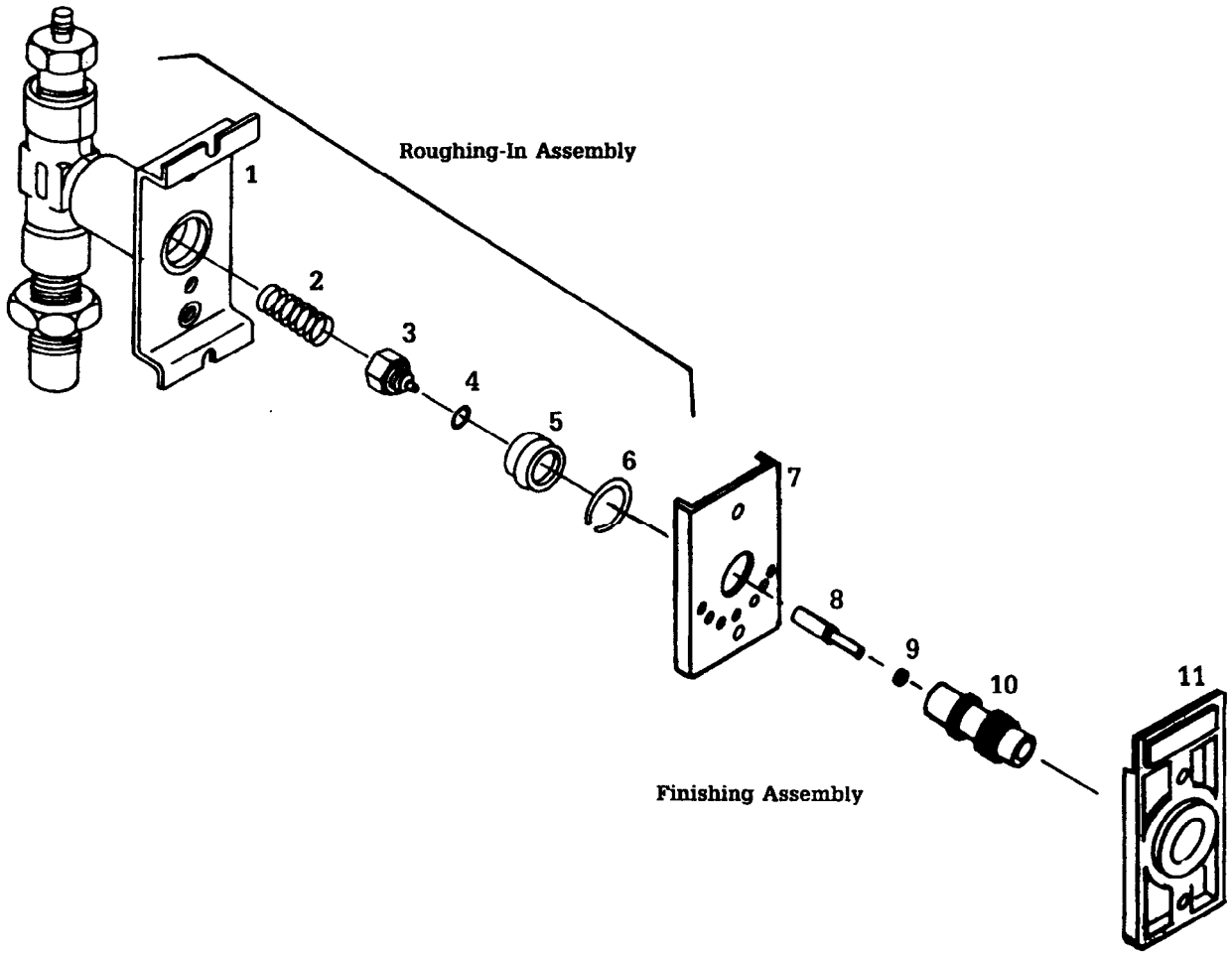
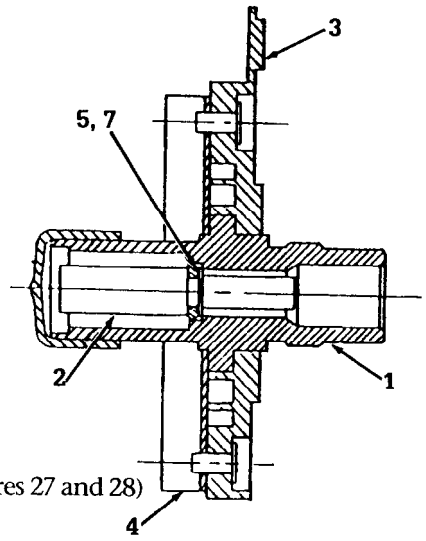


Figure 26
Wiring Diagram for the Motor Control Board

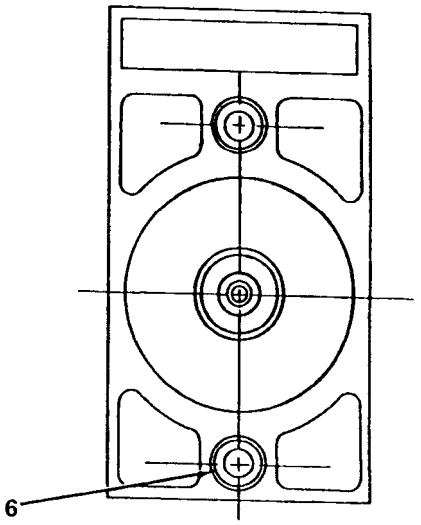


1. Back Body
2. Spring
3. Secondary Check
4. O-ring
5. Rubber Bushing
6. Ring, 1" Spirolox
7. Front Body Plate
8. Piston
9. O-ring
10. Front Body Cylinder
11. Keying Disc

Figure 27
DISS III Outlet



(See Figures 27 and 28)



DISS III - AIR

Part Name	Stock Number
1. Front Body, DISS - AIR -INT Outlet (1)	221-3964-535
2. Piston, INT DISS Outlet ($N_2$0,AIR,CO_2) (1)	221-3950-500
3. Keying Disc, INT DISS - AIR - Yellow (1)	221-3957-600
4. Plate, Front Body Pendant Outlets (1)	6811-2540-007
5. Lubricant, Vac Kote 37951M (AR)	220-0091-300
6. Eyelet, Rolled Flange .177 O.D. x .287 LG BRS (2)	203-5632-300
7. O-Ring, .187 I.D. x .312 O.D. x .062W (1)	210-0591-300

DISS III- Nitrogen

Part Name	Stock Number
1. Front Body, DISS - N_2 -INT Outlet (1)	221-3966-535
2. Piston, INT DISS Outlet ($N_2$0, AIR, CO_2, N_2) (1)	221-3950-500
3. Keying Disc, INT DISS - N_2 - Black (1)	221-3958-600
4. Plate, Front Body Pendant Outlets (1)	6811-2540-007
5. Lubricant, Vac Kote 37951M (AR)	220-0091-300
6. Eyelet, Rolled Flange .177 O.D. x .287 LG BRS (2)	203-5632-300
7. O-Ring, .187 I.D. x .312 O.D. x .062W (1)	210-0591-300

DISS III - Oxygen

Part Name	Stock Number
1. Front Body, DISS - 0_2 -INT Outlet (1)	221-3961-535
2. Piston, INT DISS Outlet (0_2) (1)	221-3951-500
3. Keying Disc, INT DISS - 0_2 - Green (1)	221-3925-600
4. Plate, Front Body Pendant Outlets (1)	6811-2540-007
5. Lubricant, Vac Kote 37951M (AR)	220-0091-300
6. Eyelet, Rolled Flange .177 O.D. x .287 LG BRS (2)	203-5632-300
7. O-Ring, .187 I.D. x .312 O.D. x .062W (1)	210-0591-300

DISS III - Nitrous Oxide

Part Name	Stock Number
1. Front Body, DISS - $N_2$0 -INT Outlet (1)	221-3962-535
2. Piston, INT DISS Outlet ($N_2$0,AIR,CO_2,N_2) (1)	221-3950-500
3. Keying Disc, INT DISS - $N_2$0 - Blue (1)	221-3926-600
4. Plate, Front Body Pendant Outlets (1)	6811-2540-007
5. Lubricant, Vac Kote 37951M (AR)	220-0091-300
6. Eyelet, Rolled Flange .177 O.D. x .287 LG BRS (2)	203-5632-300
7. O-Ring, .187 I.D. x .312 O.D. x .062W (1)	210-0687-300

DISS III - Carbon Dioxide

Part Name	Stock Number
1. Front Body, DISS - $C0_2$ -INT Outlet (1)	221-3965-535
2. Piston, INT DISS Outlet ($N_2$0,AIR,CO_2,N_2) (1)	221-3950-500
3. Keying Disc, INT DISS - $C0_2$ - Gray (1)	221-3929-600
4. Plate, Front Body Pendant Outlets (1)	6811-2540-007
5. Lubricant, Vac Kote 37951M (AR)	220-0091-300
6. Eyelet, Rolled Flange .177 O.D. x .287 LG BRS (2)	203-5632-300
7. O-Ring, .187 I.D. x .312 O.D. x .062W (1)	210-0591-300

DISS III - Vacuum

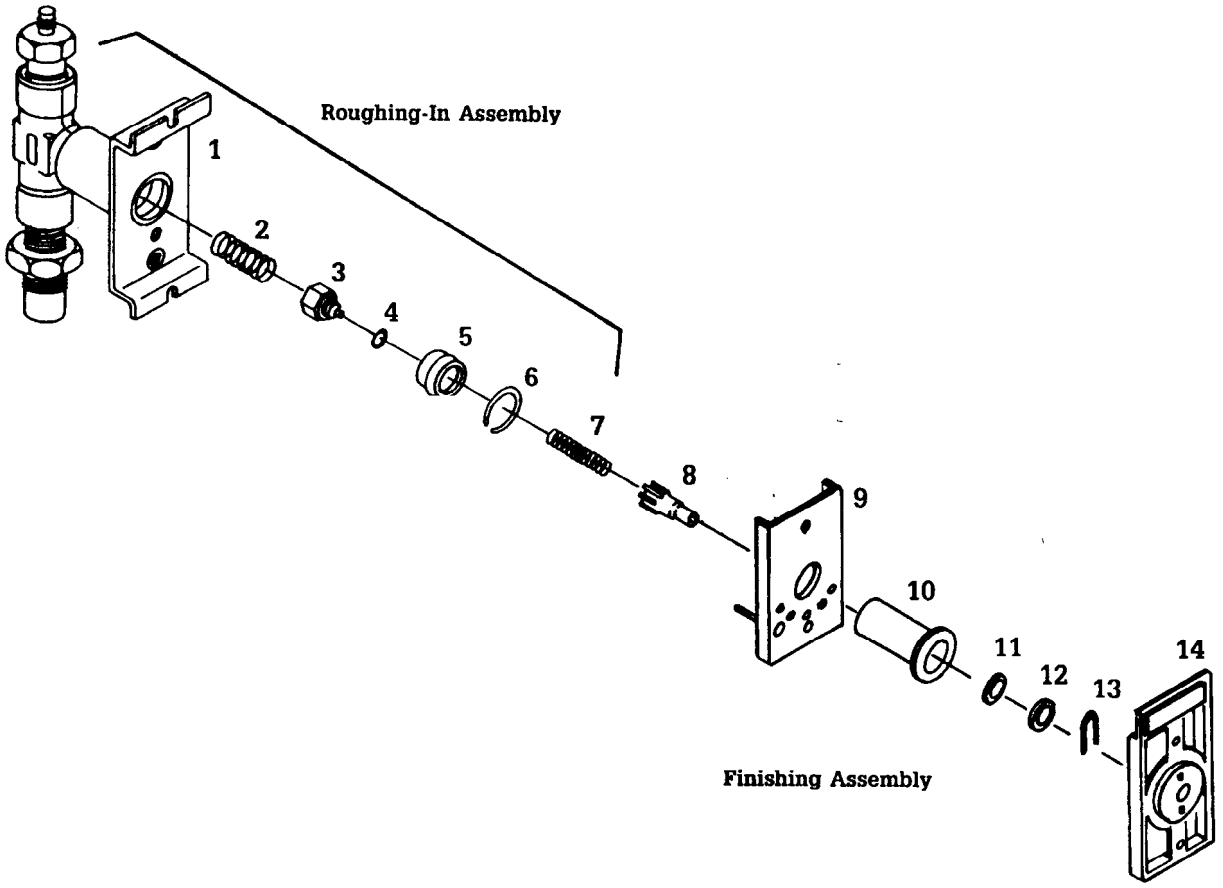
Part Name	Stock Number
1. Front Body, DISS - VAC -INT Outlet (1)	221-3963-535
2. Piston, INT DISS Outlet (VAC & EVAC) (1)	221-3952-500
3. Keying Disc, INT DISS - VAC - White (1)	221-3927-600
4. Plate, Front Body Pendant Outlets (1)	6811-2540-007
5. Lubricant, Vac Kote 37951M (AR)	220-0091-300
6. Eyelet, Rolled Flange .177 O.D. x .287 LG BRS (2)	203-5632-300
7. O-Ring, .250 I.D. x .375 O.D. x 062W (1)	210-0687-300

DISS III - Evacuation

Part Name	Stock Number
1. Front Body, DISS - EVAC -INT Outlet (1)	221-3967-535
2. Piston, INT DISS Outlet (VAC & EVAC) (1)	221-3952-500
3. Keying Disc, INT DISS - EVAC - White (1)	221-3931-600
4. Plate, Front Body Pendant Outlets (1)	6811-2540-007
5. Lubricant, Vac Kote 37951M (AR)	220-0091-300
6. Eyelet, Rolled Flange .177 O.D. x .287 LG BRS (2)	203-5632-300
7. O-Ring, .250 I.D. x .375 O.D. x 062W (1)	210-0687-300

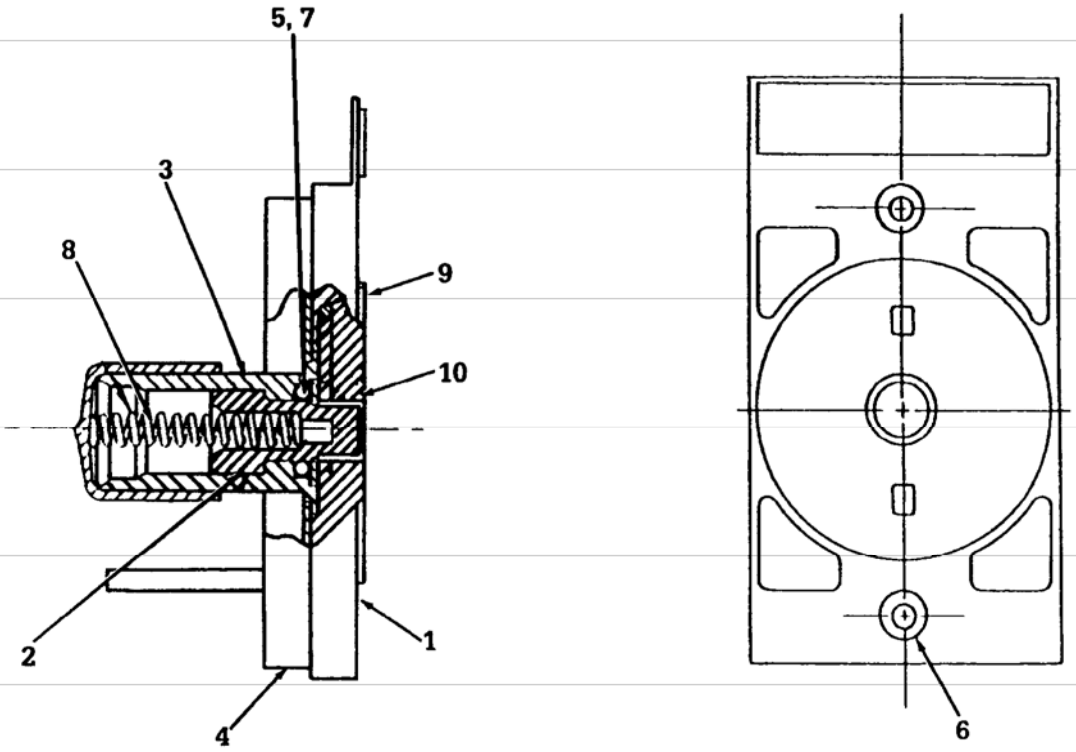
Figure 28
DISS III Front Body

6/ILLUSTRATED PARTS LIST



1. Back Body
2. Spring
3. Secondary Check
4. O-ring
5. Rubber Bushing
6. Ring, 1" Spirolox
7. Spring
8. Piston
9. Front Body Plate
10. Front Body Cylinder
11. O-ring Washer
12. Washer
13. Lock-in Adapter Spring
14. Keying Disc

Figure 29
Diamond III Outlet



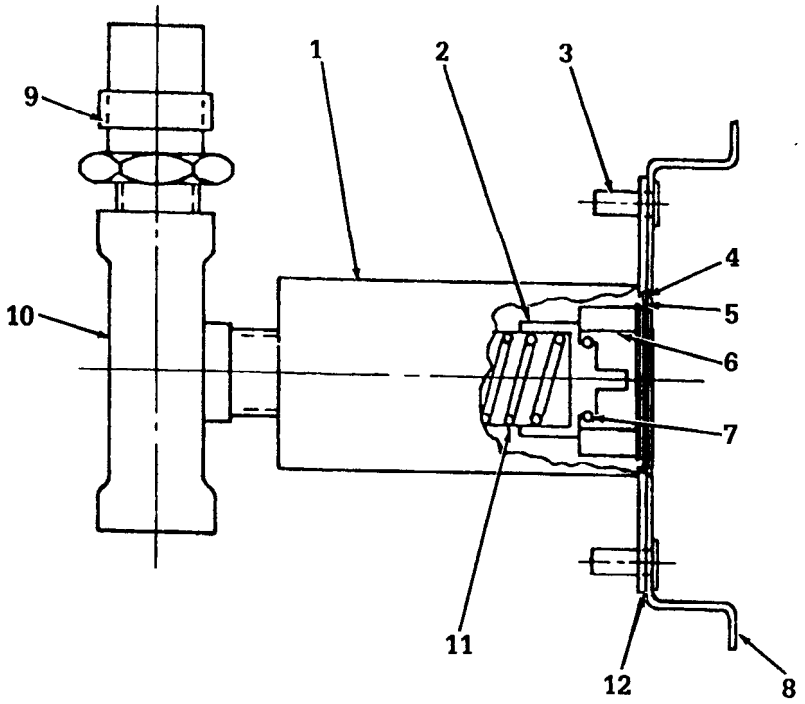
(See Figures 29 and 30)

Part Name	Stock Number
1. Gas Specific (See below: Keying Disc)	
2. Piston DIA INT Outlet (1)	221-3945-100
3. Body, Front DIA (1)	221-3960-500
4. Plate, Front Body (1)	6811-2540-007
5. Lubricant, Vac Kote 37951M (AR)	220-0091-300
6. Eyelet, Rolled Flange .177 O.D. x .287 LG BRS (2)	203-5632-300
7. O-Ring, .375 I.D x .562 O.D. x .094W (1)	210-0664-300
8. Spring, Compression .210 O.D. x 1.375L x .018 PH BR 2 CL (1)	203-3115-300
9. Spring Adapter (1)	203-5069-300
10. Washer, .622 O.D. x .380 I.D. (1)	402-1130-300

Gas Specific Part
1. Keying Disc

Gas	Stock Number
Air (1)	221-1508-600
Oxygen (1)	221-1500-600
Nitrous Oxide (1)	221-1501-600
Carbon Dioxide (1)	221-1509-600
Vacuum (1)	221-1502-600
Evacuation (1)	221-1507-600

Figure 30
Diamond III Front Body



Part Number		Stock Number
1.	Back Body (1)	6811-2560-028
2.	Check, SEC INT Outlet (1)	221-3970-500
3.	Rivnut (1)	145-3324-210
4.	Ring, Spirolox 1.125 Shaft (1)	203-5218-300
5.	Ring, Spirolox 1.00 Housing (1)	203-5212-300
6.	Bushing, Back Body (1)	221-3974-300
7.	O-Ring, .375 I.D. x .562 O.D. (1)	210-0598-300
8.	Gas Specific (See below: Bracket, Back Body)	
9.	Gas Specific (see below: Adapter 1/4 NPT)	
10.	Branch, T 1/4 NPT (1)	6812-2060-006
11.	Spring, 1.75 LG x .60 O.D. x .42 (1)	203-3508-300
12.	Bracket, Back Body (1)	6811-2540-020
13.	Lubricant, Vac Kote 37951IM (AR)	0220-0091-300

Gas Specific Parts

8. Bracket, Back Body

Gas	Stock Number
Air (1)	6811-2540-003
Nitrogen (1)	6811-2540-004
Oxygen (1)	6811-2540-000
Nitrous Oxide (1)	6811-2540-001
Carbon Dioxide (1)	6811-2540-006
Vacuum (1)	6811-2540-002
Evacuation (1)	6811-2540-005

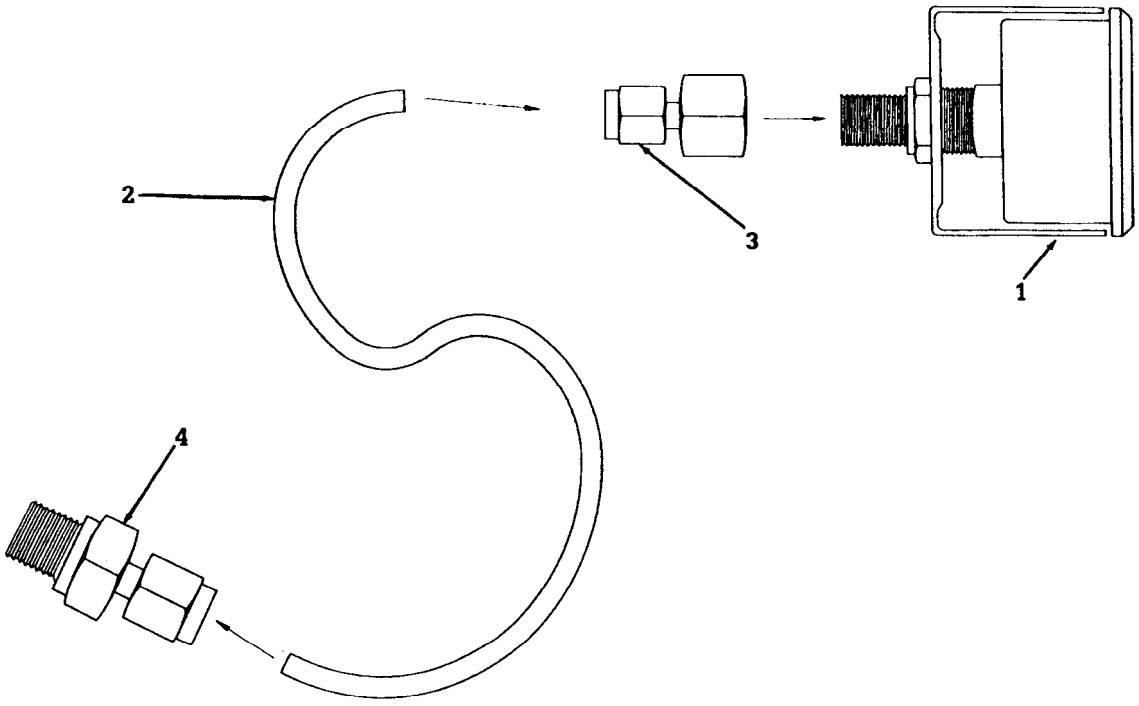
9. Adapter, 1/4 NPT

Air (2)	6812-2060-000
Nitrogen (2)	6812-2060-001
Oxygen (2)	204-7928-300
Nitrous Oxide (2)	6812-2060-002
Carbon Dioxide (2)	6812-2060-003
Vacuum (2)	6812-2060-004
Evacuation (2)	6812-2060-005

10. Labels

Air (1)	0405-9840-300
Nitrogen (1)	0405-9841-300
Oxygen (1)	0405-9925-300
Nitrous Oxide (1)	0405-9926-300
Carbon Dioxide (1)	0205-5425-300
Vacuum (1)	0405-9927-300
Evacuation (1)	0405-9914-300

Figure 31
Diamond and DISS Back Body



0-100 PSI Gauge Kit 6811-7110-074

Part Name	Stock Number
1. Gauge, 0-100 PSI 1 1/2" Panel Mount (1)	6812-2070-001
2. Tubing, 1/8" OD Nylon, Black (.9 ft)	6812-2140-000
3. Adapter, 1/4" FNPT - 1/8" Tube (1)	6812-2060-008
4. Adapter, 1/4" MNPT - 1/8" Tube (1)	6812-2060-007

0-300 PSI Gauge Kit 6811-7110-075

Part Name	Stock Number
1. Gauge, 0-300 PSI 1 1/2" Panel Mount (1)	6812-2070-002
2. Tubing, 1/8" OD Nylon, Black (.9 ft)	6812-2140-000
3. Adapter, 1/4" FNPT - 1/8" Tube (1)	6812-2060-008
4. Adapter, 1/4" MNPT - 1/8" Tube (1)	6812-2060-007

0-30" HG Gauge Kit 6811-7110-076

Part Name	Stock Number
1. Gauge, 0-30" HG 1 1/2" Panel Mount (1)	6812-2070-000
2. Tubing, 1/8" OD Nylon, Black (.9 ft)	6812-2140-000
3. Adapter, 1/4" FNPT - 1/8" Tube (1)	6812-2060-008
4. Adapter, 1/4" MNPT - 1/8" Tube (1)	6812-2060-007

Figure 32
Outlet Gauge Parts

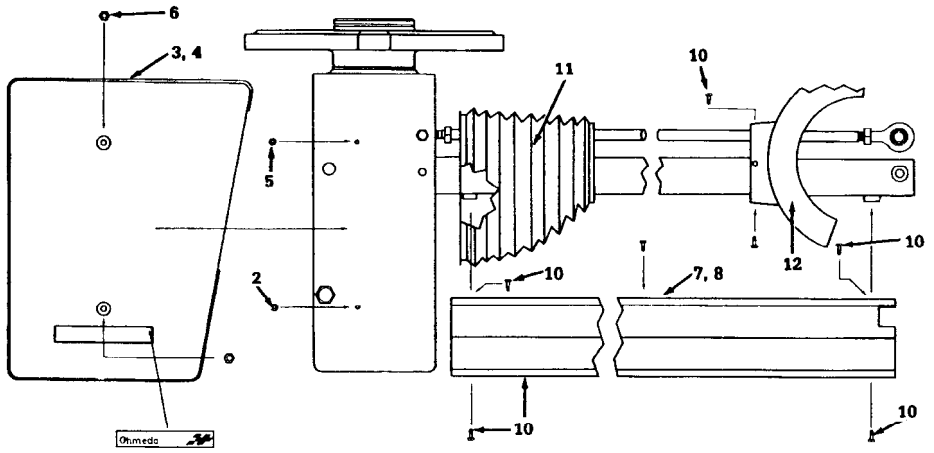


Figure 33
Upper Shrouds

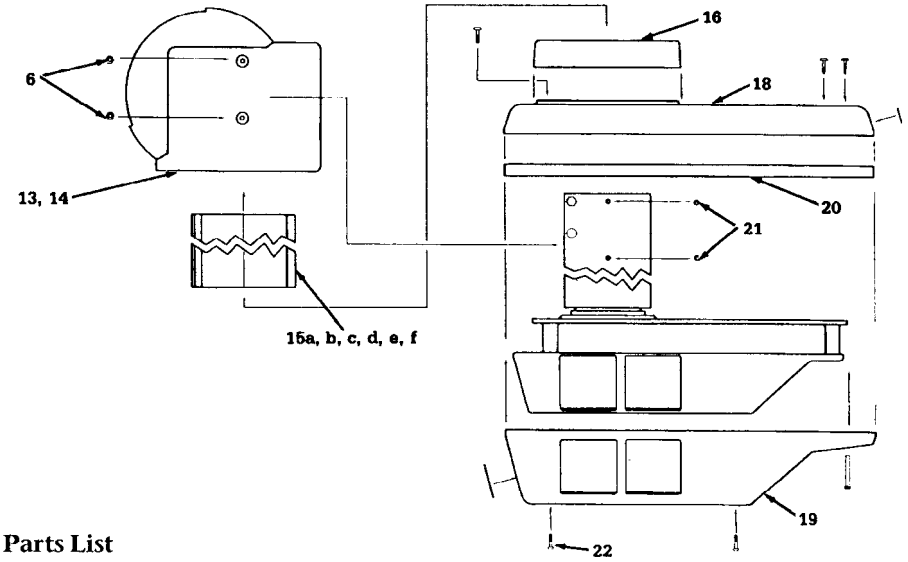


Figure 34
Lower Shrouds

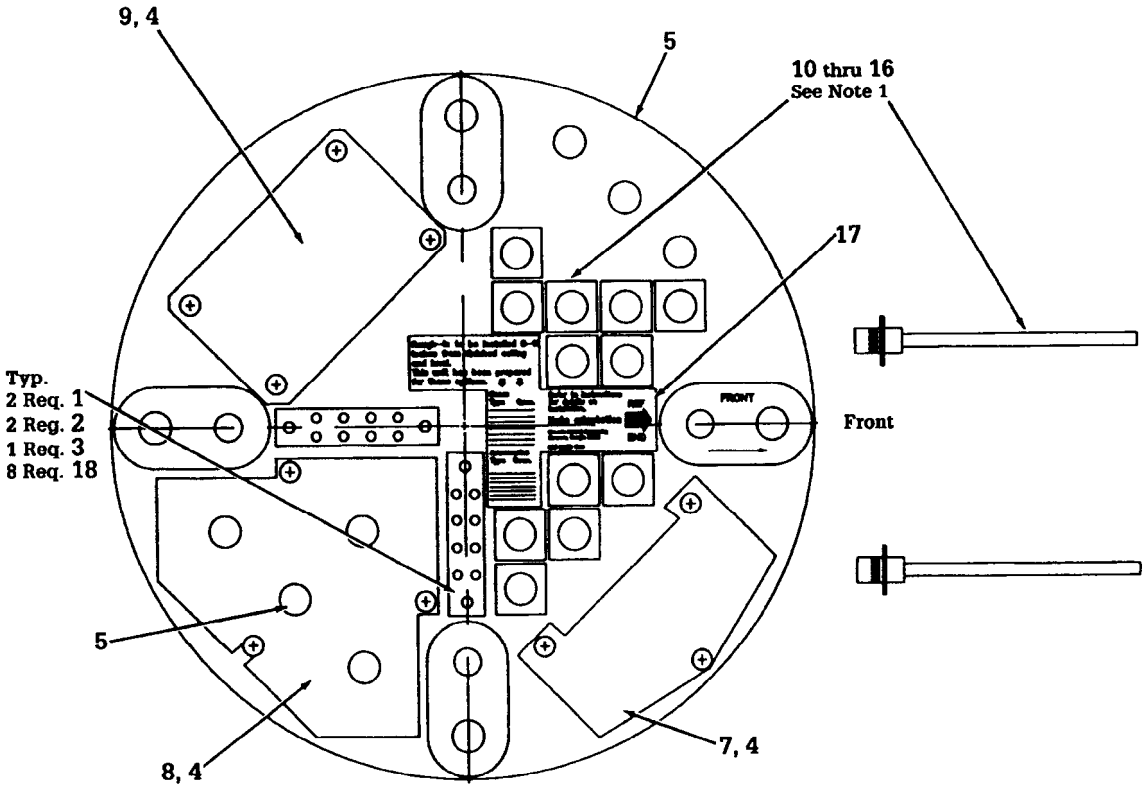
Shrouds Parts List

(See Figures 33 and 34)

Part Name	Stock Number
1. Shroud, Escutcheon Ceiling (2)	6811-2510-004
2. Standoff, 10-32 x 5/8" (2)	6812-2020-008
3. Shroud, Motor Assembly Right (1)	6811-2510-007
4. Shroud, Motor Assembly Left (1)	6811-2510-008
5. Standoff, 10-32 x 1 1/8" (6)	6812-2020-011
6. Nut, Acorn 10-32 (12)	6812-2010-004
7. Cover, Horizontal Arm Right (1)	6811-2510-002
8. Cover, Horizontal Arm Left (1)	6811-2510-003
9. Screw, 8-32 x 3/4" (4)	6812-2000-010
10. Screw, 6-19 x .500 OL TORQ PLT60 (19)	6812-2000-032
11. Boot, Pendant U.P.I. (1)	6811-2520-002
12. Intersection Section Turret (1)	6811-2510-018
13. Shroud, Intersection Right (1)	6811-2510-005
14. Shroud, intersection Left (1)	6811-2510-006
15a. *Cover, Vertical Arm 8'- 6" (2)	6811-2510-011
15b. *Cover, Vertical Arm 9'- 0" (2)	6811-2510-012
15c. *Cover, Vertical Arm 9'- 6" (2)	6811-2510-013
15d. *Cover, Vertical Arm 10'- 0" (2)	6811-2510-014
15e. *Cover, Vertical Arm 10'- 6" (2)	6811-2510-015
15f. *Cover, Vertical Arm 11'- 0" (2)	6811-2510-016
16. Splash Guard LPI (1)	6811-2520-003
17. Shroud, Lower Pivot (1)	6811-2510-010
18. Cover, Top Pendant Head (1)	6811-2510-000
19. Cover, Bottom Pendant Head (1)	6811-2510-001
20. Pendant, Trim Extruded Rubber (1)	6811-7110-114
21. Standoff, 10-32 x 1.500" (4)	6812-2020-009
22. Screw, AVDEL 8-32 (8)	6812-2000-023

** Each Pendant contains one set of Vertical Arm Covers depending on ceiling height.*

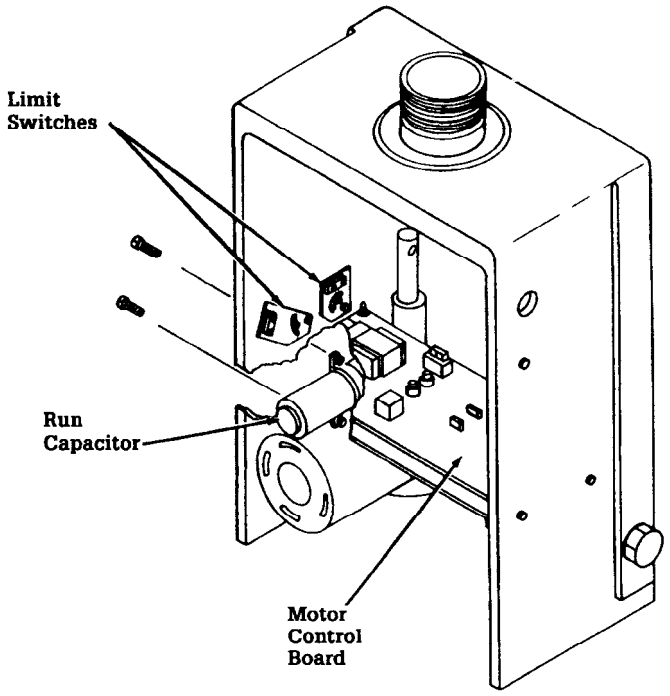
Fastex Rivet 6812-2030-005
plastic



Part Name	Stock Number
1. Washer, #10 Internal Lock (4)	.0144-1110-131
2. Screw, 10-32 x .750 PH Pan Hd SS (4)	6812-2000-029
3. Bus Bar, Pendant (1)	6811-2560-027
4. Screw, 1/4-20 x .500 PH Pan Hd SS (10)	6812-2000-037
5. Plug Button .875 Nl CR (7)	0216-2603-335
6. Rough-In Housing (1)	6811-2500-005
7. Plate RI, Option Cover (1)	6811-2540-024
8. Plate RI, A-C Interface (1)	6811-2540-023
9. Plate RI, Mount, Blank (1)	6811-2540-022
10. R-I Gas Kit, Carbon Dioxide (SO)*	0221-4785-875
11. R-I Gas Kit, Evacuation (SO)*	0221-4785-874
12. R-I Gas Kit, Air (SO)*	0221-4785-873
13. R-I Gas Kit, Vacuum (SO)*	0221-4785-872
14. R-I Gas Kit, Nitrous Oxide (SO)*	0221-4785-871
15. R-I Gas Kit, Oxygen (SO)*	0221-4785-870
16. R-I Gas Kit, DISS, Nitrogen (SO)*	0221-4782-870
17. Label, Pendant Rough-In (1)	6811-0100-001
18. Screw, 8-32 x 5/8" PH Pan Grn Hd (16)	6812-2000-017

* *Sales Order: varies according to customer specifications.*

Figure 35
Rough-In Assembly



Part Name	Stock Number
1. Limit Switch Sub-Assembly (1)	6811-7110-123
2. Motor Control Board (1)	6811-7110-026
3. Run Capacitor (1)	6811-3320-001

Figure 36
Electronic Parts

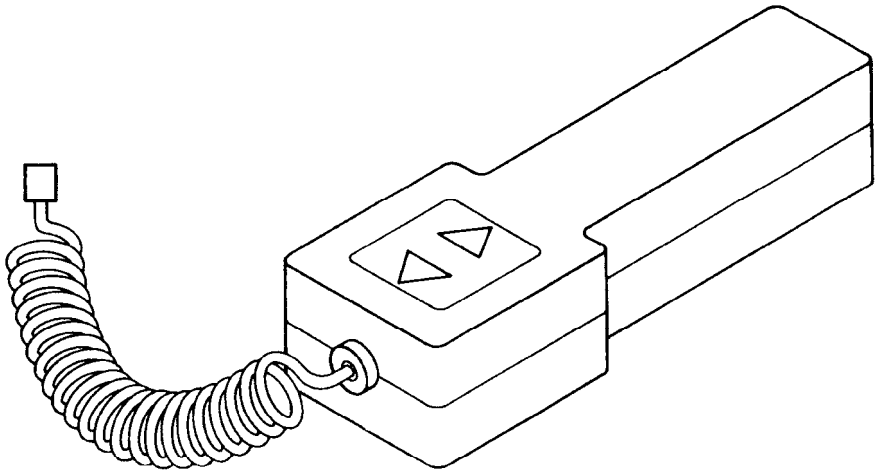


Figure 37
Handheld Controller (Stock No. 6811-7110-018)

NOTES

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Limited Warranty Policy

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Bare MedPlus or Reliisys Compressors and Bare MedPlus Vacuum Pumps supplied as a part of an air or vacuum plant will be warranted for a period of two and a half years (30 Months) from the date of startup, or three years (36 Months) from the date of shipment, whichever ends first, provided that startup is performed by MEDÆS (or Ohmeda) Service Representatives and the recommended OH 500 series oil is used in the vacuum pumps. All other components supplied as a part of the Medical Air or Vacuum Plant will be covered according to the standard MEDÆS Limited Warranty as stated above.

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Multi-Service Pendant/OM. Rev. 09/95
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