

INGERSOLL-RAND®

AIR COMPRESSORS

HMD SERIES AIR DRYERS
MODELS 18 THROUGH 385

OPERATORS/
INSTRUCTION MANUAL
REPLACEMENT PARTS

CAUTION:

For HMD Models 84 Through 385 ONLY

1. Remove Dryer Chambers And Protective Padding.
2. Inspect Desiccant Cores For Shipping Damage Prior To Start-Up.
3. Torque Chamber Bolts To 40-50 Ft-Lbs.

Before installation or starting the dryer for the first time, this manual should be studied carefully to obtain a clear knowledge of the unit and of the duties to be performed while operating and maintaining the unit.

RETAIN THIS MANUAL WITH UNIT.

This Technical manual contains IMPORTANT SAFETY DATA and should be kept with the air dryer at all times.

INGERSOLL-RAND COMPANY DRYER WARRANTY

Warranty

Ingersoll-Rand warrants that this product shall, when properly installed, operated, applied and maintained in accordance with procedures and recommendations outlined in owner's manuals published by Ingersoll-Rand, be free from defect in materials and workmanship for a period of one year from the date of installation, or eighteen (18) months from the date of shipment from the factory, whichever occurs first, provided such defect is discovered and brought to Ingersoll-Rand's attention within the aforesaid warranty period.

During the warranty period, Ingersoll-Rand will repair or replace any product or part determined by Ingersoll-Rand to be defective within such warranty period, provided such defect occurred in normal service and not as a result of misuse, abuse, neglect or accident. Repair or replacement shall be made at the factory or the installation site, as elected by Ingersoll-Rand. Any service performed on the product by anyone other than Ingersoll-Rand, must first be authorized by Ingersoll-Rand. Unauthorized service voids the warranty, and any resulting charge or subsequent claim will not be paid by Ingersoll-Rand.

Ingersoll-Rand products repaired or replaced under warranty shall be warranted for the unexpired portion of the warranty applying to the original product.

THE LIMITED WARRANTY AND LIMITED REMEDY PROVIDED HEREIN ARE IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY OR REMEDY, INCLUDING ANY IMPLIED WARRANTY OR MERCHANTABILITY AND WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. INGERSOLL-RAND MAKES NO WARRANTY, EXPRESS OR IMPLIED, OF ANY NATURE WHATSOEVER WITH RESPECT TO THIS PRODUCT OR THE USE THEREOF EXCEPT AS IS SPECIFICALLY SET FORTH HEREIN. INGERSOLL-RAND SHALL IN NO EVENT BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PENAL DAMAGES, OR FOR ANY OTHER DAMAGES EXCEPT AS PROVIDED IN THIS LIMITED REMEDY. IN ANY EVENT, INGERSOLL-RAND'S MAXIMUM MONETARY LIABILITY HEREUNDER SHALL BE LIMITED TO THE PURCHASE PRICE PAID FOR THAT PART OF THE PRODUCT WHICH IS FOUND TO BE DEFECTIVE WITHIN THE WARRANTY PERIOD.

This unit was purchased from

Ingersoll-Rand Company reserves the right to make changes or add improvements without notices and without incurring any obligation to make such changes or add such improvements to products sold previously.

No. of units on order: _____

Customer Order No.: _____

Ingersoll-Rand Co. Order No.: _____

For ready reference:

Record the serial number and model number of your unit here.

Serial Number: _____

Model Number: _____

A WORD TO
GAS PURIFICATION SYSTEM
OWNERS

This manual has been prepared to acquaint you with the installation, operation and maintenance of your Air or Gas Dryer, and to provide important safety information. We urge you to read this data carefully. Follow the recommendations to help assure the highest performance, safe and trouble-free operation of your system.

When it comes to Service, remember that your local Ingersoll Rand Distributor knows your equipment and is interested in your complete satisfaction. Please contact the Distributor when you need parts or service assistance.

We thank you for choosing our product and want to assure you of our continuing dedication to provide the highest air purification equipment reliability and performance available anywhere in the world.

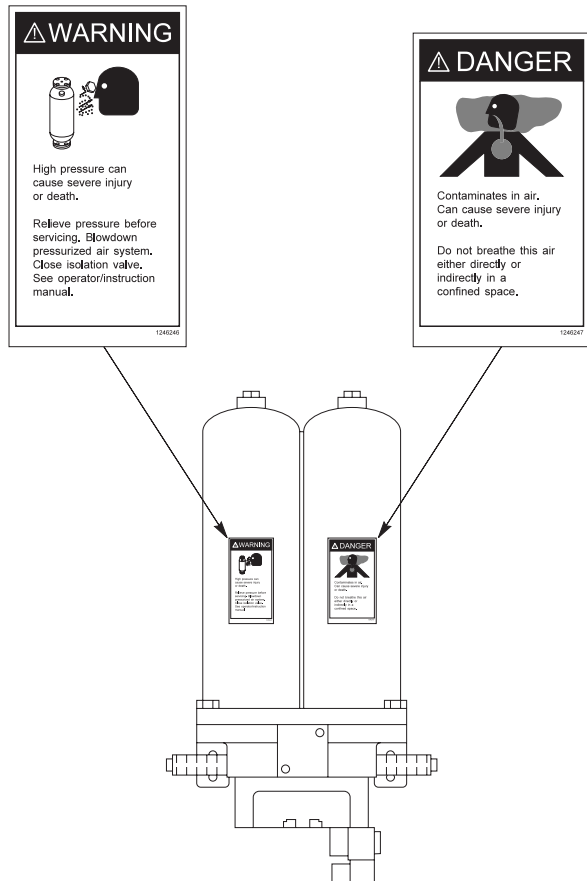
Ingersoll Rand

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DECALS

This section contains representative examples of decals which are applied to the unit. If for some reason a decal is defaced, parts are replaced or painted over we recommend that you obtain a replacement.



FOREWORD

CAUTION: This manual is designed to serve as the installation, operation and maintenance guide for your dryer. The contents of this manual should be carefully read BEFORE attempting any phase of installation, operation or maintenance. Failure to follow the operating and maintenance procedures of the instruction manual could result in personal injury or property damage.

To facilitate maintenance, "RECOMMENDED SPARE PARTS" for your specific dryer model are available. Failure to maintain recommended spare parts and filter cartridges may result in EXPENSIVE and unnecessary downtime for which the manufacturer cannot be responsible. To request a quotation of, or place an order for, recommended or emergency spare parts, please contact your local distributor.

A DRYER SPECIFICATION PLATE has been permanently attached to the dryer. When requesting information, service, ordering of spare parts, etc., please reference all information supplied on the SPECIFICATION PLATE.

All information, specifications and illustrations within this manual are those in effect at the time of printing. The manufacturer reserves the right to change or make improvements without notice and without incurring any obligation to make changes or add improvements to products previously sold.

GENERAL INFORMATION DRYING

This fully automatic, heatless type dryer alternately cycles the compressed, process gas flow through two desiccant charged vessels where the gas's entrained, vaporous moisture content is adsorbed. One desiccant vessel is always on-line in a DRYING CYCLE throughout normal dryer operation. The opposite, off-line vessel is in a regeneration cycle for removal of the previously adsorbed moisture content.

PREFILTER ASSEMBLY

As the first line of defense against oil/water contaminants, a Coalescing Prefilter with an automatic drain is recommended.

Offered as a highly recommended option, the Coalescing Prefilter Assembly removes oil and water aerosols, as well as dirt and pipe scale from the gas stream BEFORE the gas enters the dryer. Oil and liquids collected by the assembly's filter cartridge(s) fall to the housing sump which must be periodically drained. The coalescing prefilter cartridge features:

1. Lowest saturated pressure drop available.
2. Superior efficiency.
3. Effective coalescence of water moisture and filtration of particulate solids.
4. A design integrity that resists damage caused by gas surges or back flow.

AUTOMATIC DRAIN VALVES

As previously stated, the accumulated water and oil mixture collected by a prefilter must be periodically drained from the prefilter housing sump. An Automatic Drain Valve is a recommended and reliable means of removing collected moisture, oil and sludge from coalescing prefilter housings and other components requiring periodic draining.

We have reliable and economical Automatic Drain valves available for removing liquids and sludge from:

- Coalescing Filters
- Separators
- Receivers
- Aftercoolers

Consult your local Ingersoll Rand Distributor or Air Center for specific information concerning these and other fine products.

DRYER SPECIFICATIONS

Type:	Desiccant Heatless
Design pressure:	150 PSIG.
Operating pressure:	60 PSIG Minimum 150 PSIG Maximum
Design temperature:	120°F
Operating temperature:	30°F Minimum 120°F Maximum
Pressure Dew point Reduction @ 100 PSIG:	Minimum of 75°-80°F
Differential Pressure @ 100 PSIG. and 100°F	2 to 6 PSIG
Desiccant:	Activated alumina in the form of Immobilized cores.
Control:	Fully automatic solid state electric or pneumatic fixed cycle (1 minute NEMA)
Voltage:	12VDC, 24VDC 120 volt, 50/60 Hz, 1 ph power. (standard) 240 volt, 50/60 Hz, 1 ph power

FLOW RATES & ORIFICE SIZES

MODEL	OPERATING PRESSURE, FLOW RATES AND ORIFICE SIZE										
	PSIG---->	60	70	80	90	100	110	120	130	140	150
HMD18	ORIFICE	0.0730	0.0625	0.0550	0.0550	0.0465	0.0465	0.0390	0.0330	0.0330	0.0330
	INLET SCFM	18	18	18	18	18	18	18	18	18	18
	PURGE RATE	4.5	3.7	3.2	3.6	2.8	3.0	2.3	1.8	1.9	2.0
	OUTLET SCFM	13.5	14.3	14.8	14.4	15.2	15.0	15.7	16.2	16.1	16.0
HMD37	ORIFICE	0.0995	0.0860	0.0860	0.0730	0.0625	0.0625	0.0550	0.0550	0.0465	0.0465
	INLET SCFM	37	37	37	37	37	37	37	37	37	37
	PURGE RATE	8.3	7.1	7.9	6.3	5.0	5.5	4.6	4.9	3.8	4.0
	OUTLET SCFM	28.7	29.9	29.1	30.7	32.0	31.5	32.4	32.1	33.2	33.0
HMD84	ORIFICE	0.1495	0.1285	0.1285	0.1100	0.0935	0.0935	0.0785	0.0785	0.0670	0.0670
	INLET SCFM	84	84	84	84	84	84	84	84	84	84
	PURGE RATE	18.8	15.7	17.6	14.3	11.3	12.3	9.3	10.0	7.8	8.3
	OUTLET SCFM	65.2	68.3	66.4	69.7	72.7	71.7	74.7	74.0	76.2	75.7
HMD110	ORIFICE	0.1770	0.1495	0.1285	0.1285	0.1100	0.1100	0.0935	0.0935	0.0785	0.0785
	INLET SCFM	110	110	110	110	110	110	110	110	110	110
	PURGE RATE	26.3	21.3	17.6	19.5	15.6	17.0	13.3	14.2	10.7	11.4
	OUTLET SCFM	83.7	88.7	92.4	90.5	94.4	93.0	96.7	95.8	99.3	98.6
HMD138	ORIFICE	0.2090	0.1770	0.1495	0.1495	0.1285	0.1285	0.1100	0.1100	0.0935	0.0935
	INLET SCFM	138	138	138	138	138	138	138	138	138	138
	PURGE RATE	36.7	29.9	23.8	19.5	21.3	17.0	18.3	14.2	15.2	16.2
	OUTLET SCFM	101.3	108.1	114.2	118.5	116.7	121.0	119.7	123.8	122.8	121.8
HMD170	ORIFICE	0.2090	0.1770	0.1770	0.1495	0.1495	0.1285	0.1285	0.1100	0.1100	0.0935
	INLET SCFM	170	170	170	170	170	170	170	170	170	170
	PURGE RATE	36.7	29.9	33.4	26.3	28.9	23.2	25.0	19.7	21.1	16.2
	OUTLET SCFM	133.3	140.1	136.6	143.7	141.1	146.8	145.0	150.3	148.9	153.8
HMD230	ORIFICE	0.2500	0.2130	0.1820	0.1820	0.1540	0.1540	0.1285	0.1285	0.1285	0.1110
	INLET SCFM	230	230	230	230	230	230	230	230	230	230
	PURGE RATE	52.6	43.3	35.3	39.0	30.6	33.3	25.0	26.9	28.8	22.8
	OUTLET SCFM	177.4	186.7	194.7	191.0	199.4	196.7	205.0	203.1	201.2	207.2
HMD275	ORIFICE	0.2950	0.2500	0.2130	0.1820	0.1820	0.1540	0.1540	0.1540	0.1285	0.1285
	INLET SCFM	275	275	275	275	275	275	275	275	275	275
	PURGE RATE	73.2	59.6	48.4	39.0	42.8	33.3	36.0	38.6	28.8	30.6
	OUTLET SCFM	201.8	215.4	226.6	236.0	232.2	241.7	239.0	236.4	246.2	244.4
HMD385	ORIFICE	0.2950	0.2950	0.2500	0.2130	0.2130	0.1820	0.1820	0.1540	0.1540	0.1540
	INLET SCFM	385	385	385	385	385	385	385	385	385	385
	PURGE RATE	73.2	83.0	66.6	53.5	58.6	46.5	50.2	38.6	41.3	44.0
	OUTLET SCFM	311.8	302.0	318.4	331.5	326.4	338.5	334.8	346.4	343.7	341.0
FLOW RATES ARE IN SCFM (Ref 14.7 PSIA & 70°F)											

OPERATION OF YOUR DRYER AT REDUCED FLOW RATES

The Purge flow rates shown on the preceding page are the required purge flow rates for dryer operation at the specified inlet flow and pressure at 100°F. If you are operating your dryer at a reduced flow rate it may be possible to reduce the purge flow rate by reducing the orifice size.

The reduced size can be determined as follows:

- 1] Determine the actual inlet scfm to the dryer inlet.
- 2] Divide the actual inlet scfm by the design inlet scfm of the dryer.

- 3] If the ratio of the actual inlet scfm to the design inlet scfm is within the limits of A or B below, your orifice may be changed.

- A] 52% to 72% - The orifice may be reduced to the next smaller size
- B] 51% or less - The orifice may be reduced two sizes.

See the REPLACEMENT ORIFICES listed in the back of this book for color code, size and part number.

Note: For HMD Models 18 through 37, refer to page 16 for orifice installation location.

For HMD Models 84 through 385, refer to page 24 for orifice installation location.

*ATTENTION

Purge orifice selected for maximum flow rates and 100 PSIG. If your conditions are different, refer to chart on page 3 to determine correct orifice size. Your dryer is shipped with two (2) extra orifices for non-standard conditions.

INSTALLATION

PRE-INSTALLATION INSPECTION

Inspect the dryer on arrival for possible damage incurred during shipment. In the event that damage has occurred, immediately enter a claim with the carrier.

*ATTENTION: For HMD Models 84 through 385 ONLY.

1. Remove dryer chambers and protective padding.
2. Inspect desiccant cores for shipping damage prior to Start-Up.
3. Replace dryer chambers. Torque chamber bolts to 40 - 50 Ft-lbs.
4. Reconnect tubing and fittings removed for shipping (Refer to page 24).

All pressure vessels are factory-tested prior to shipment.

Vibration during shipment can cause fittings and fasteners to become loose. Check and tighten as necessary all such items when received, and at intervals thereafter as required for safety.

LOCATION AND MOUNTING

Locate the dryer in an area with adequate space for access to all components.

The dryer may be mounted, by means of mounting bolts through holes in the mounting bracket. Desiccant chambers should be facing up.

Connect dryer to system pipe work ensuring that connections are compatible with the aluminum alloy inlet and outlet ports. **Do not over tighten.**

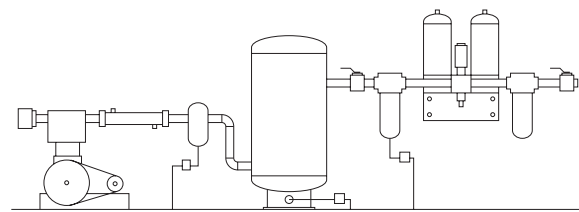
For safety during maintenance, bubble tight isolation valves should be fitted. A typical installation diagram has been included in this book for your convenience.

ELECTRICAL CONNECTION

All installations and connections must be in accordance with recognized electrical codes in effect. Local and municipal codes may also apply. Use approved load-rated components.

A fused disconnect switch or circuit breaker is not provided as standard equipment and therefore must be supplied by the customer.

TYPICAL INSTALLATION DIAGRAM



COMPRESSOR



COOLER



SEPARATOR



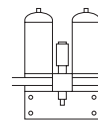
RECEIVER



ISOLATION
VALVE



PREFILTER
(RECOMMENDED)



DRYER



AFTERFILTER
(OPTIONAL)

FILTERS

A coalescing prefilter should be installed before the dryer to remove oil and water aerosols.

Under normal conditions the desiccant does not create dust, however, to ensure the dryer output remains free of particulates, a particulate afterfilter should be installed downstream of the dryer.

High performance filters and auto-drain valves are available from your local Ingersoll Rand Distributor or Air Center.

DETAILED OPERATING PROCEDURES

PRE-START-UP

1. Check that the purge orifice is correct for the flow and pressure. (See Flow Rates and Orifice Size Data)

Proper dryer function and economic use of energy depends upon the selection of the correct purge orifice.

To confirm that the purge orifice is correct, remove the check valve cover and note the color code of the poppet/orifice. If the poppet is not the correct code, replace it with the correct poppet/orifice available from your local Ingersoll Rand Distributor or Air Center.

2. Switch off dryer electric supply and remove the silencer. Clean the silencer with an air line, replace and switch on the power supply.

It is important that the silencer remain clean for most efficient operation.

INITIAL START-UP AND DESICCANT REGENERATION

1. Switch off electrical supply to the dryer.
2. CLOSE dryer isolation valves. (customer fitted)
3. Check compressed air supply is on.
4. OPEN dryer inlet isolation valve slowly. (customer fitted).
5. Switch on the electrical supply to the dryer. The controller will now begin to cycle the dryer.
6. Check that purge air is flowing from the exhaust silencer.

Important: An adequate and continuous purge air supply is essential during the regeneration phase.

7. Operate the dryer for two to three hours with the outlet isolation valve closed. (customer fitted)
8. During the conditioning run (see 7 above) test all joints to locate any leaks, using leak detector spray or a suitable alternative. Tighten or repair any leaks and retest.

Any small leaks on the dryer outlet side will cause a deterioration of the dew point.

CAUTION: Use of soap liquid may stain paint work.

9. On the completion of the conditioning run, slowly open the outlet isolation valve. The dryer will now be fully operational.

PROCEDURE TO SWITCH OFF YOUR DRYER

1. CLOSE the dryer outlet isolation valve (customer fitted).
2. SWITCH OFF the electrical supply to the dryer.
3. CLOSE the dryer inlet isolation valve (customer fitted).
4. Shut down the compressor if required.

WARNING: The dryer is now isolated at pressure. Warning notices must be prominently displayed.

WARNING: Before removing any dryer components and/or associated piping ensure that no residual pressure exists in the dryer. Failure to do so could result in damage to equipment and/or injury to personnel.

NORMAL START-UP

This procedure is to be followed when the dryer has been shut down for a short period during which time the desiccant has not been exposed to wet gas.

1. Start up the compressor if shut down.
2. Slowly OPEN the dryer inlet isolation valve (customer fitted).
3. SWITCH ON the electrical supply.
4. Slowly OPEN the dryer outlet isolation valve (customer fitted).
5. Check operation of the dryer.

MAINTENANCE SHUT-DOWN

1. CLOSE the dryer outlet isolation valve (customer fitted).
2. CLOSE the dryer inlet isolation valve (customer fitted).
3. Allow the dryer to continue to cycle until the purge exhaust fully depressurizes both chambers.
4. Switch off electrical power to the dryer and remove plug or fuse.

WARNING: Display prominent notices indicating that maintenance is being carried out.

MAINTENANCE

A compressed air dryer should give long and trouble free operation if the recommended preventative maintenance program is carried out.

The following recommended schedule is divided as follows:

1. Weekly procedure - check auto drain function.
(if fitted)
2. Quarterly procedure - clean auto drain and inspect filters. (if fitted)
3. Annual procedure - Purchase changeout kit from your local Ingersoll Rand Distributor or Air Center. Changeout all filter cartridges. (if fitted)

WARNING: Before removing any dryer component and/or associated piping ensure that no residual pressure exists in the dryer. Failure to do so could result in damage to equipment and/or injury to personnel.

FIELD SERVICE GUIDE

WARNING: Compressed air can be dangerous unless safety precautions are observed in the use of compressed air and compressed air equipment. Completely vent the internal air pressure to the atmosphere before disassembling any subassemblies or components and before doing any work on compressed air equipment. To vent internal air pressure, follow the maintenance shutdown instructions.

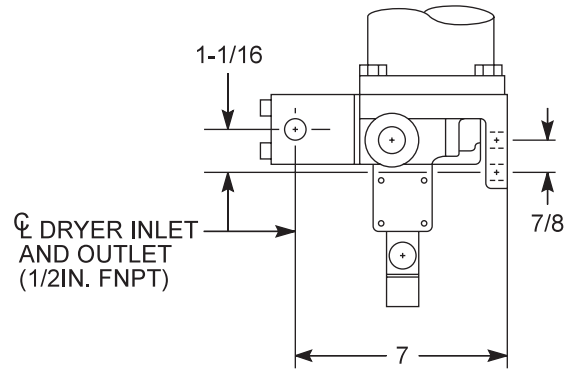
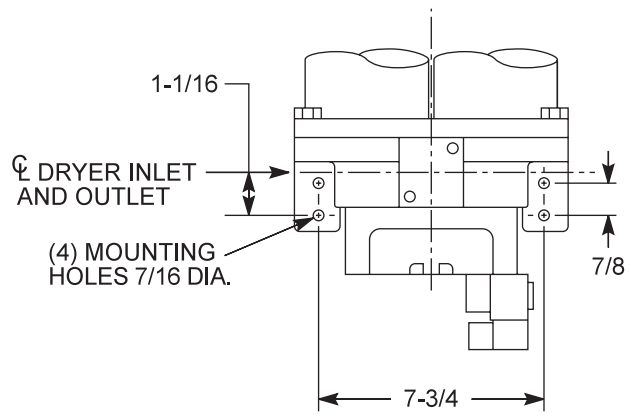
PROBLEM	POSSIBLE CAUSE	CHECKS AND REMEDY
<u>Dryer not cycling.</u>	<ol style="list-style-type: none"> 1. Power failure. 2. Solenoid valve failure. 3. Timer failure. 	<ol style="list-style-type: none"> 1. Check power supply and fuse. 2. Check and replace or repair solenoid valve. 3. Check and replace if defective.
<u>Dew point degradation.</u>	<ol style="list-style-type: none"> 1. Incorrect purge gas flow. 2. Inlet gas flow is too high for operating pressure. 3. Inlet gas temperature is above the dryer's design inlet working temperature. 4. Liquids entering the dryer inlet. 	<ol style="list-style-type: none"> 1a. Check purge orifice for blockage. Clean or replace as required. 1b. Check purge orifice for size. Replace if incorrect. 2. Reduce inlet flow rate and/or increase operating pressure. 3. Check the compressor aftercooler and cooling system. Adjust as necessary to bring the dryer inlet temperature to less than the maximum design working temperature. 4a. Check mounting position of the dryer. If mounted in an inverted or horizontal position, install a coalescing prefilter if one has not been previously installed. 4b. Check pipe lines prior to the dryer for low areas where liquids can collect. If areas where liquids can collect exist provide adequate drain valves. 4c. Isolate and depressurize the prefilter assembly. Inspect prefilter cartridges and end seals for loosening and/or damage. Tighten or replace as necessary. 4d. Check the compressor aftercooler for tube leakage if the aftercooler uses water as the cooling medium. 4e. Inspect the prefilter automatic drain valve or drain trap. Ensure that it is not clogged, and is draining properly. Repair or replace as necessary, if a problem is noted.

PROBLEM	POSSIBLE CAUSE	CHECKS AND REMEDY
<u>Dew point degradation.</u>	5. Desiccant core assembly is damaged, contaminated or coated with oil. The "beige" desiccant core may appear discolored and dirty if contamination has occurred. 6. Union or other piping/component leaks at dryer outlet manifold or downstream of dryer outlet.	5. Shutdown and depressurize the dryer. Inspect the desiccant cores and replace if broken, coated with oil or otherwise fouled. Inspect any existing prefilter if fouling is noted. If a prefilter has not been installed, it may be desirable to install one for longer desiccant core life. 6. Soap test the dryer outlet manifold and piping downstream of dryer. Repair all leaks noted.
<u>Excessive pressure drop across dryer higher than 6 PSIG.</u>	1. Fouled desiccant core assembly. 2. Excessive flow rate. 3. Pressure gauges are out of calibration or damaged.	1. Inspect and replace if the desiccant is fouled or discolored. 2. Reduce inlet flow rate as necessary. 3. Replace pressure gauges.
<u>Back pressure on a desiccant chamber during the regeneration cycle.</u> <u>(Chamber's pressure is above zero (0) PSIG.</u> NOTE: The presence of back pressure will result in insufficient regeneration followed by dew point degradation. An off-line chamber's pressure MUST be less than 3 psig throughout all regeneration cycles.	1. Excessive purge gas flow. 2. Dirty or fouled silencer.	1a. Check purge orifice for size. Replace if incorrect. 1b. Outlet check valve seat is worn, damaged or fouled (allowing leakage to enter regenerating chamber). Replace all worn or damaged components as noted. 1c. Switching valve is worn, damaged, or fouled (allowing slight pressure leakage to enter the regenerating chamber). Replace all worn or damaged components as noted. 2. Switch off power and remove silencer and clean using a compressed air line. Replace the silencer and switch on power supply.

DIMENSION AND CONNECTION DATA

MOUNTING BOLT PATTERN

Models HMD18 and HMD37



DIMENSION AND CONNECTION DATA – TIMER/SOLENOID OPERATION

Models HMD18 and HMD37

CLEARANCE REQUIRED TO
SERVICE CORE ASSEMBLY

MODEL	REF. DIM
18	7"
37	13"

MODEL	REF. DIM
18	8-5/8"
37	14-5/8"

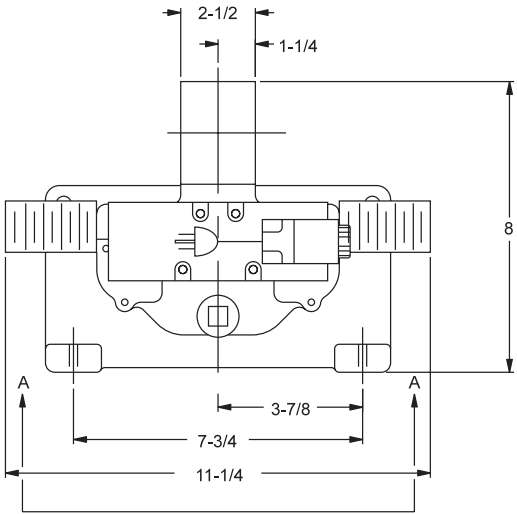
1/2 NPT
WET GAS INLET
(CUSTOMER CONNECTION)

1/2 NPT
DRY GAS OUTLET
(CUSTOMER CONNECTION)

1-1/4"

6-1/2" MAX.

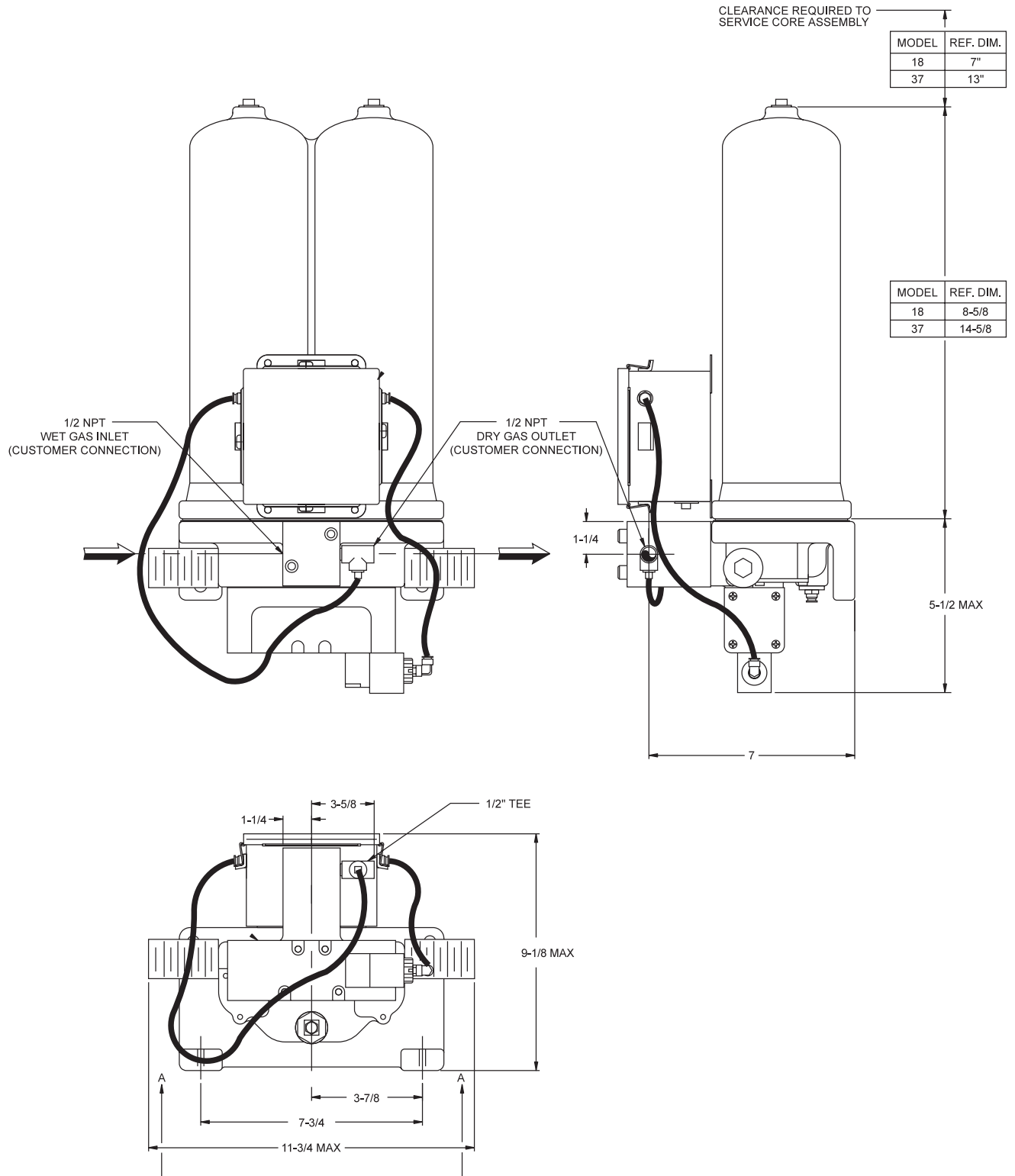
7"



NOTE: All dimensions are in inches and subject to change without notice.

DIMENSION AND CONNECTION DATA – PNEUMATIC OPERATION

Models HMD18 and HMD37

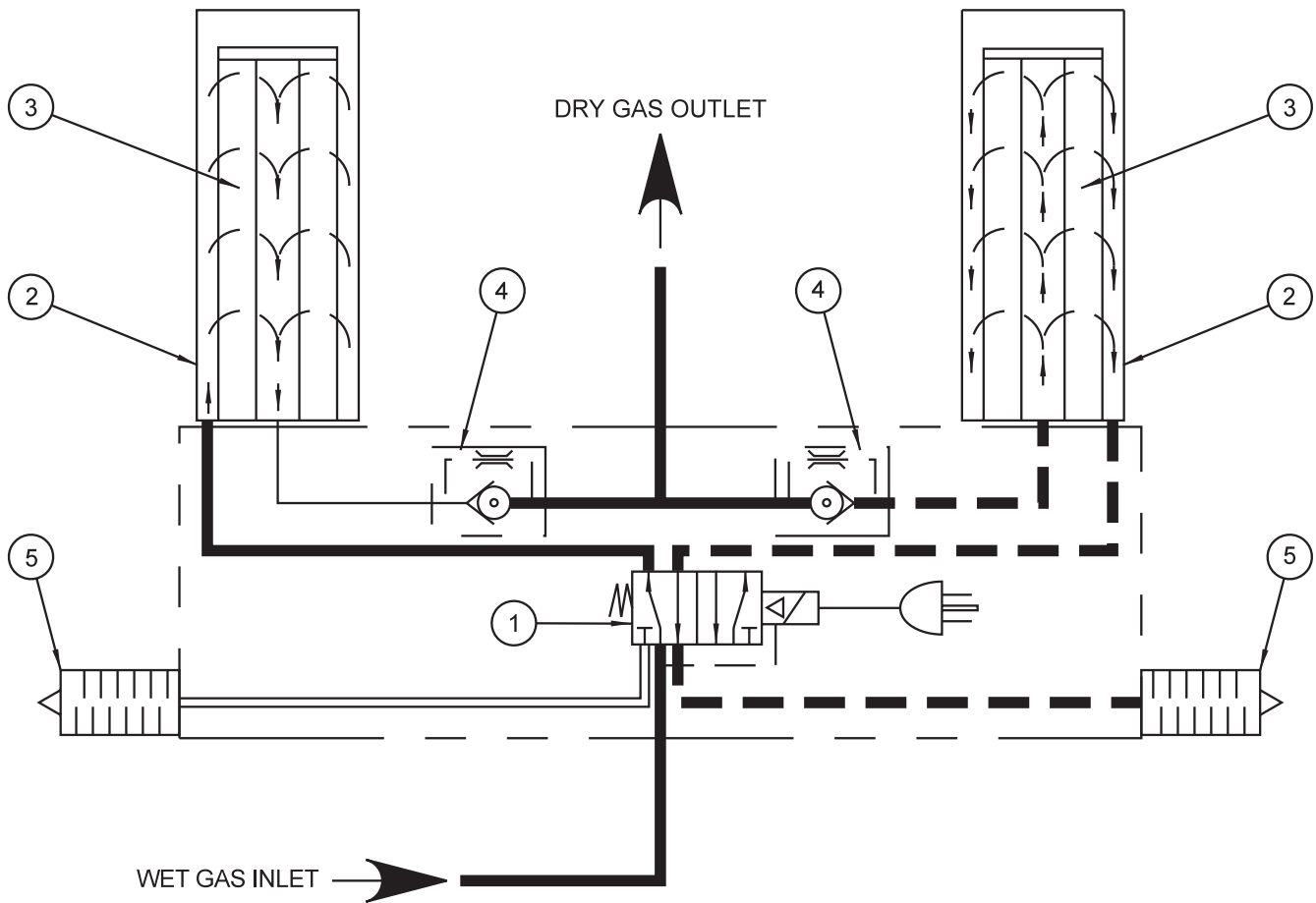


NOTE: All dimensions are in inches and subject to change without notice.

FLOW DIAGRAM – TIMER/SOLENOID OPERATION

Models HMD18 and HMD37

As shown the drying gas flow is in the left chamber and regenerating gas is in the right chamber.



LEGEND

1. Solenoid Switching Valve with Solid State Timer
2. Desiccant Chambers
3. Core Assembly
4. Outlet Check Valves
5. Purge Exhaust Silencers

NOTES

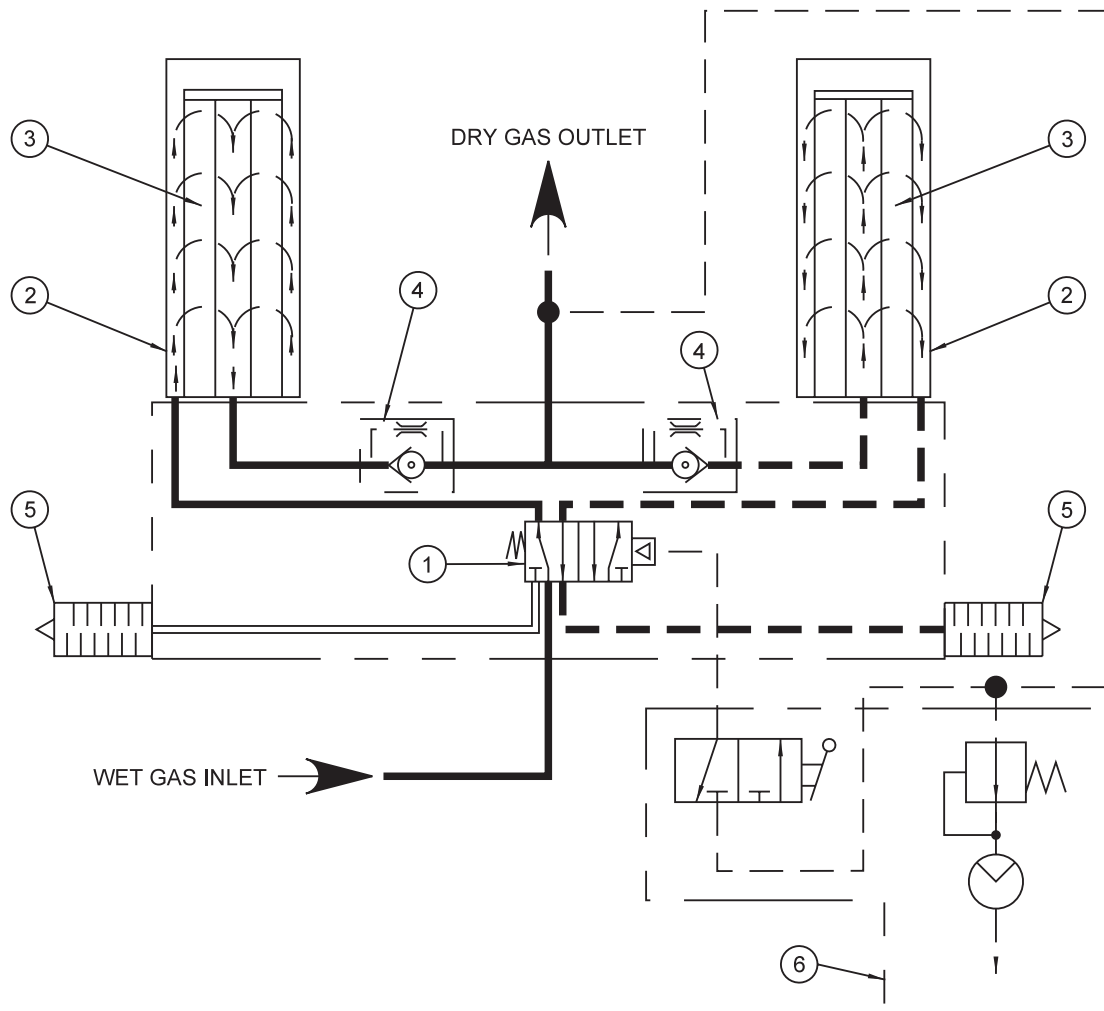
Process Gas Flow: 

Purge Gas Flow: 

FLOW DIAGRAM – PNEUMATIC OPERATION

Models HMD18 and HMD37

As shown the drying gas flow is in the left chamber and regenerating gas is in the right chamber.



LEGEND

1. Switching Valve
2. Desiccant Chambers
3. Core Assembly
4. Outlet Check Valves
5. Purge Exhaust Silencers
6. Cam Timer Air Motor and Regulator

NOTES

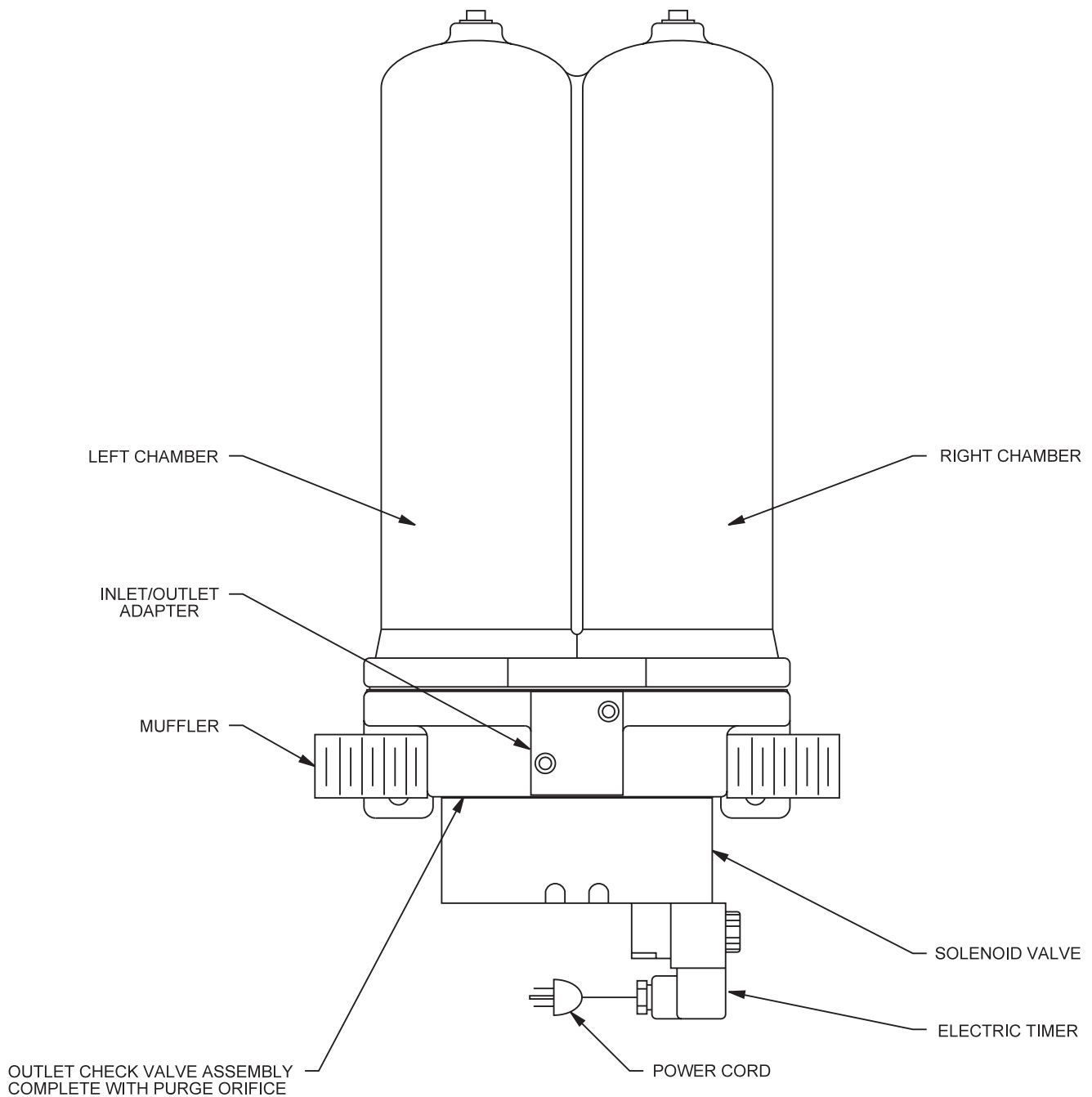
Process Gas Flow: 

Purge Gas Flow: 

Pilot Gas Flow: 

COMPONENT IDENTIFICATION DRAWING – TIMER/SOLENOID OPERATION

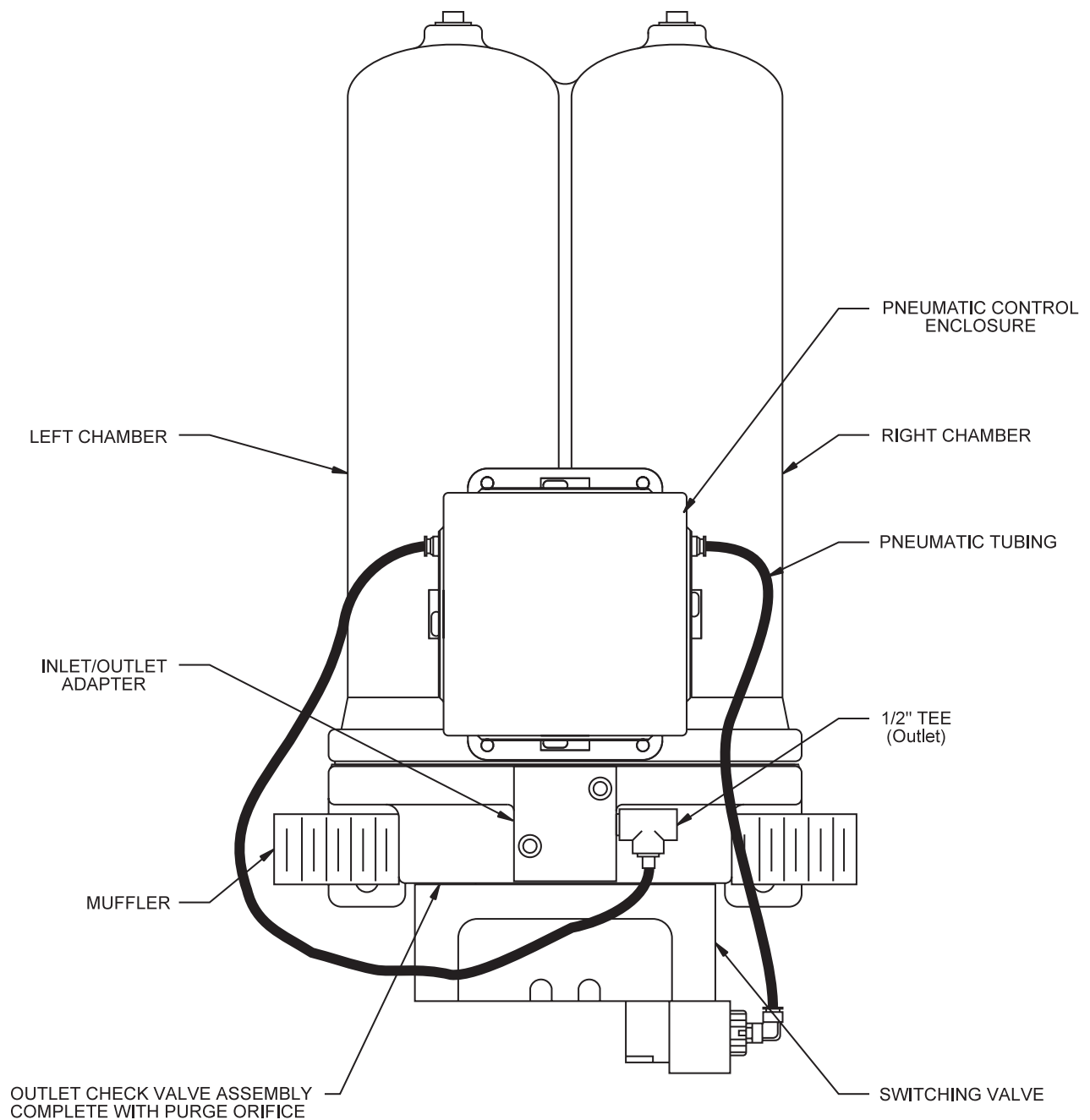
Models HMD18 and HMD37



NOTE: PURGE ORIFICE LOCATED ON TOP MANIFOLD. REMOVE SWITCHING VALVE AND ORIFICE COVER FOR ACCESS.

COMPONENT IDENTIFICATION DRAWING – PNEUMATIC OPERATION

Models HMD18 and HMD37

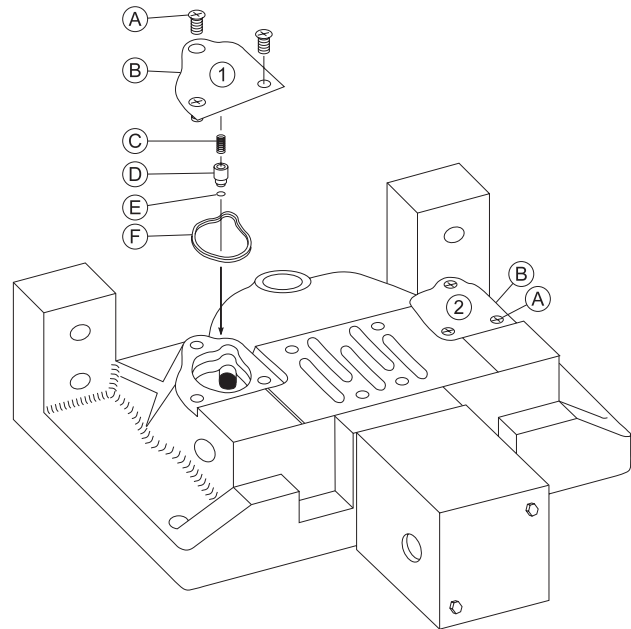


NOTE: PURGE ORIFICE LOCATED ON TOP MANIFOLD. REMOVE SWITCHING VALVE AND ORIFICE COVER FOR ACCESS.

INSTRUCTIONS FOR CHANGING PURGE ORIFICE

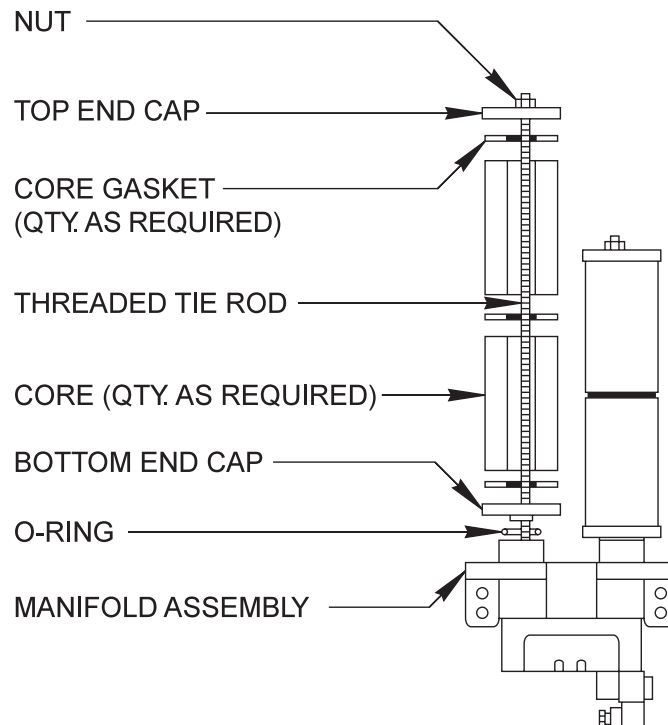
Models HMD18 and HMD37

1. Remove switching valve from manifold.
2. Remove screws [A] and cover [B] from manifold.
3. Remove and inspect spring [C] and orifice [D].
Replace if necessary.
4. Reassemble as shown.
5. Repeat operation with cover (2).
6. Reassemble solenoid valve onto manifold.



CORE ASSEMBLY

Models HMD18 and HMD37

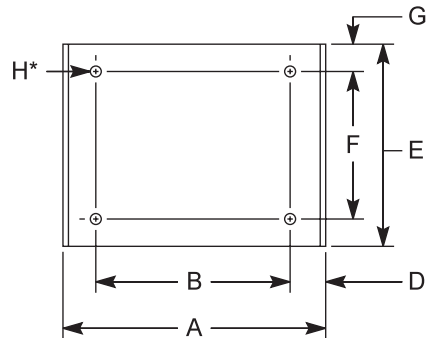


See Spare Parts and Accessories Table for Core Assembly Overhaul Kit part numbers.

DIMENSION AND CONNECTION DATA

Models HMD84 through HMD385

MOUNTING BOLT PATTERN



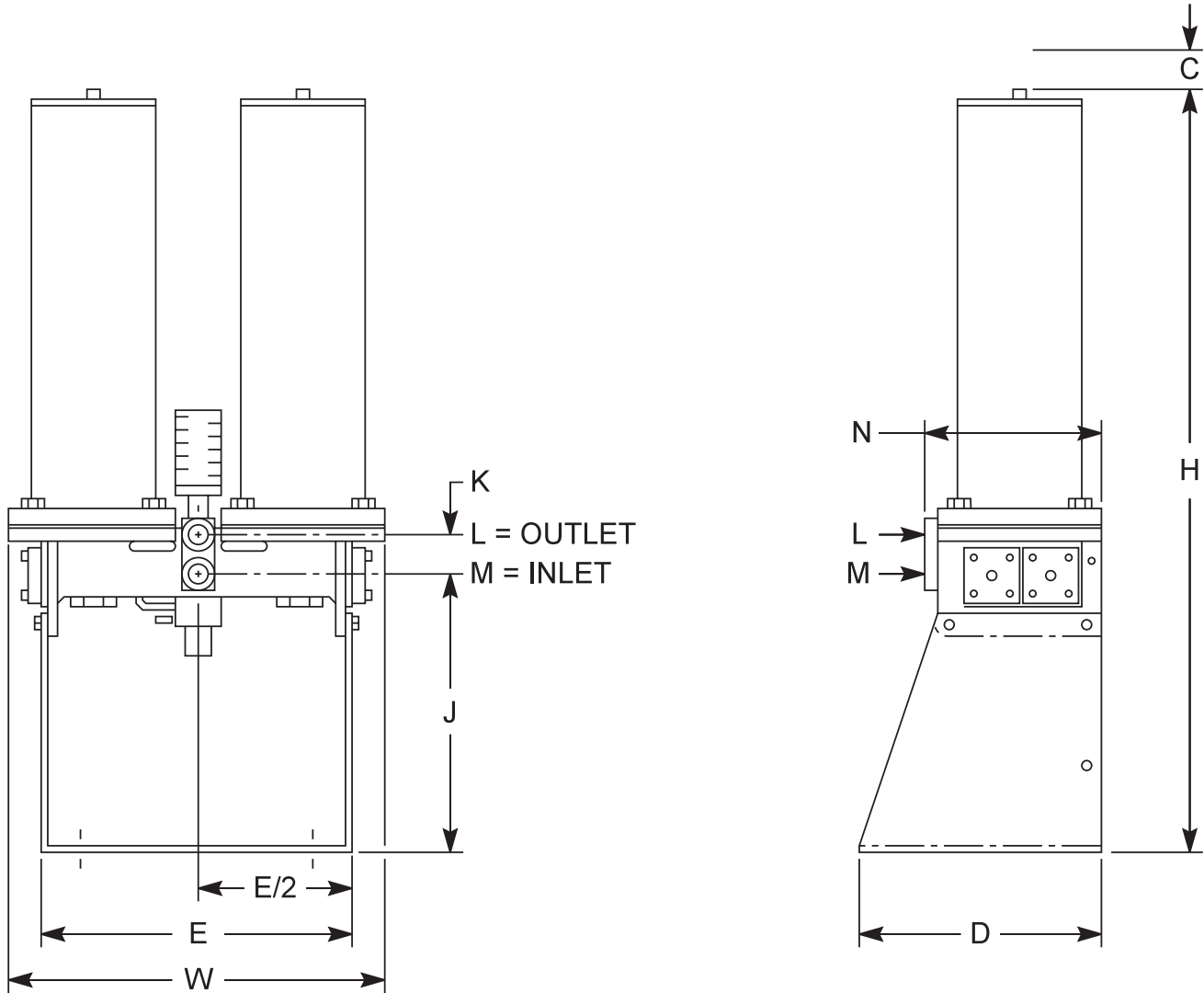
* Four (4) mounting bolt holes

Dimension	MODEL	
	HMD84 thru HMD170	HMD230 thru HMD385
A	16-3/16	18
B	11-15/16	13-3/4
D	2-1/8	2-1/8
E	10-1/2	12
F	8-1/2	7
G	1	2-1/2
H	13/32	1/2

NOTICE: All dimensions are nominal and subject to change without notice.

DIMENSION AND CONNECTION DATA

Models HMD84 through HMD170



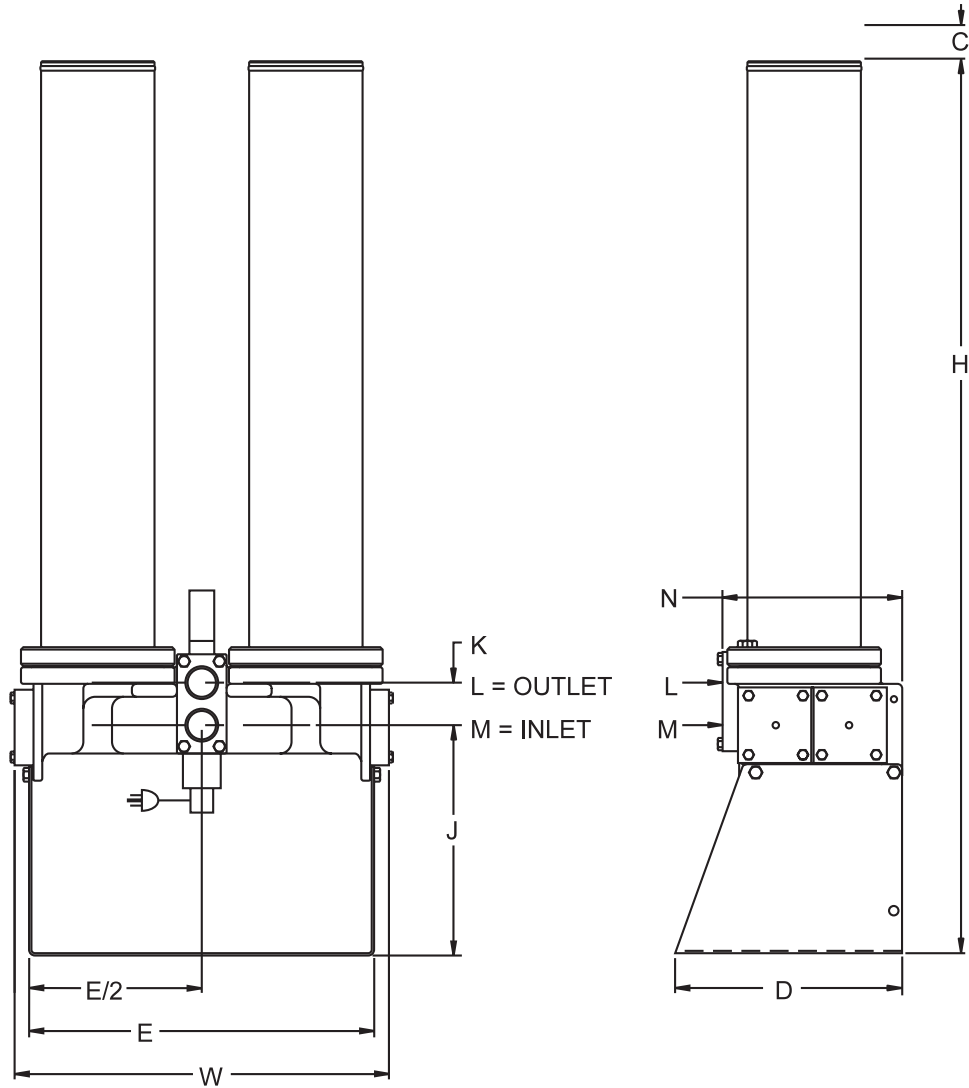
Model	H	W	D	C	E	J	K	OUTLET FNPT L	INLET FNPT M	N	GROSS WEIGHT POUNDS
HMD84	26.25	18.87	10.5	14	16.25	9.63	1.87	1	1	7.13	76
HMD110	30	18.87	10.5	18	16.25	9.63	1.87	1	1	7.13	80
HMD138	37	18.87	10.5	25	16.25	9.63	1.87	1	1	7.13	85
HMD170	37	18.87	10.5	25	16.25	9.63	1.87	1	1	7.13	90

C = Recommended clearance for service of drying media.

NOTE: All dimensions are in inches and subject to change without notice.

DIMENSION AND CONNECTION DATA

Models HMD230 through HMD385



Model	H	W	D	C	E	J	K	OUTLET FNPT	INLET FNPT	N	GROSS WEIGHT POUNDS
HMD230	47.5	19.87	12	6	18	12.19	2.25	1.5	1.5	9.5	112
HMD275	54.75	19.87	12	6	18	12.19	2.25	1.5	1.5	9.5	124
HMD385	69	19.87	12	6	18	12.19	2.25	1.5	1.5	9.5	142

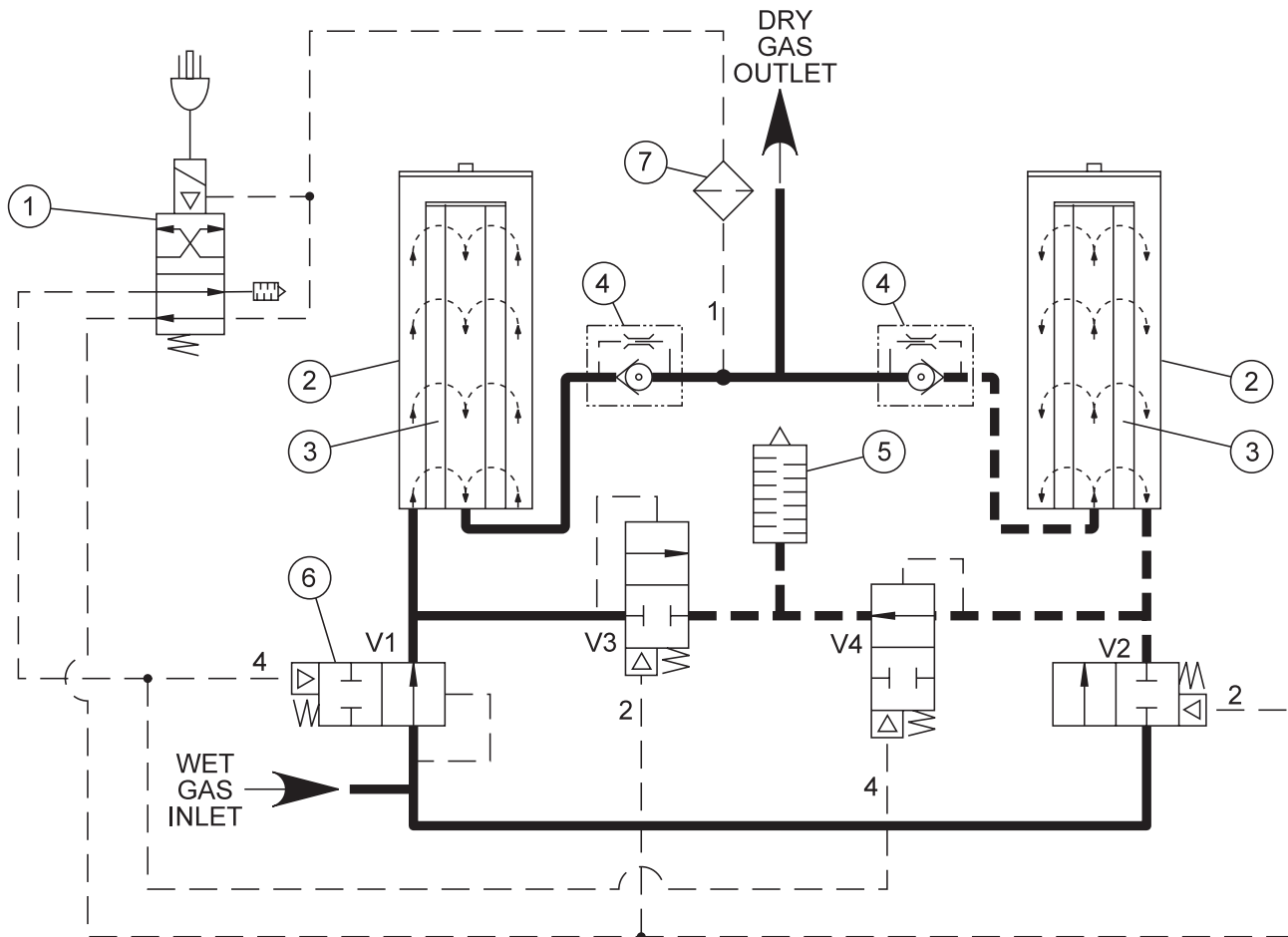
C = Recommended clearance for service of drying media.

NOTE: All dimensions are in inches and subject to change without notice.

FLOW DIAGRAM – TIMER/SOLENOID OPERATION

Models HMD84 through HMD385

As shown, the drying gas flow is in the left chamber and the regenerating gas flow is in the right chamber.



LEGEND

1. Solenoid Switching Valve with Solid State Timer
2. Desiccant Chambers
3. Core Assembly
4. Purge and Outlet Check Valves
5. Purge Dump Exhaust Silencer
6. Inlet and Purge Exhaust Valves [V1 thru V4]
7. Filter

NOTES

Process Gas Flow:

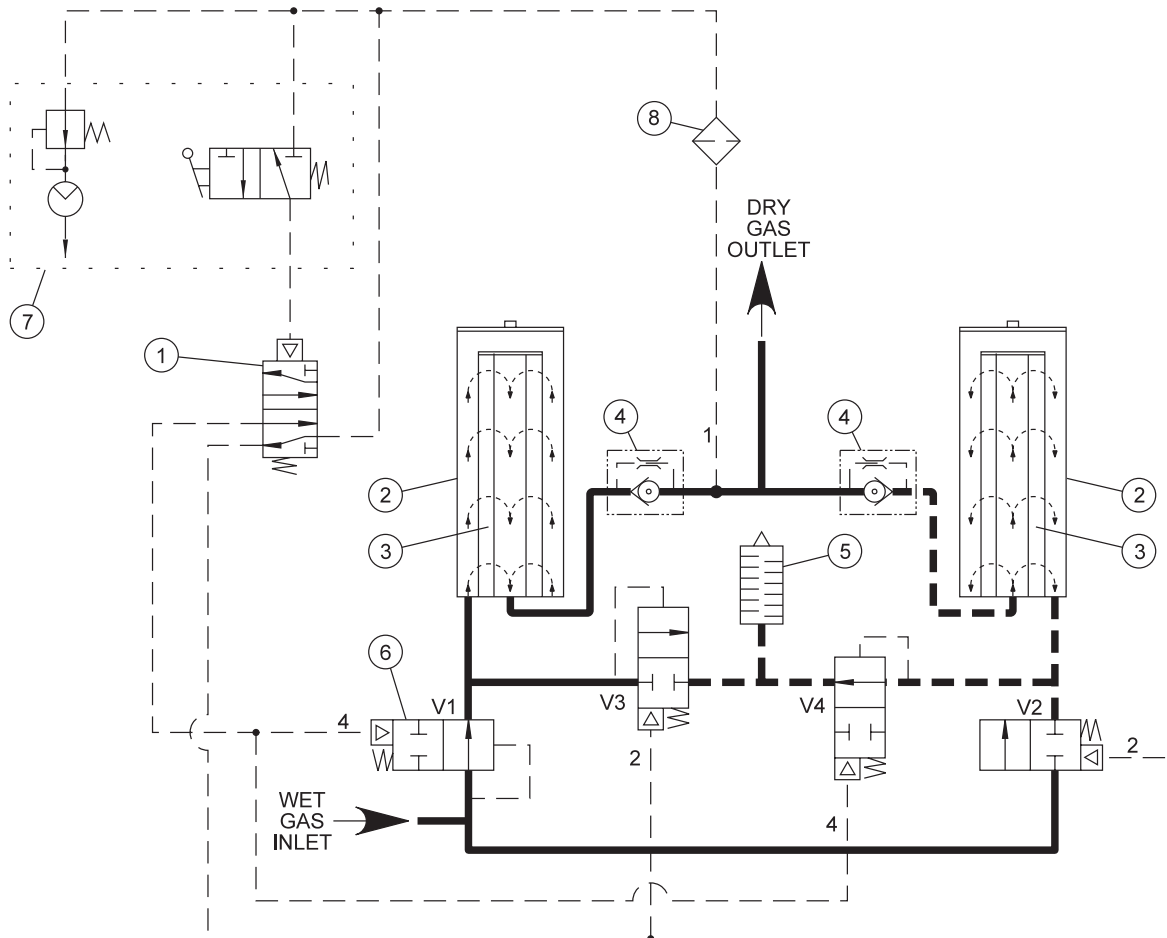
Purge Gas Flow:

Pilot Gas Flow:

FLOW DIAGRAM – PNEUMATIC OPERATION

Models HMD84 through HMD385

As shown, the drying gas flow is in the left chamber and the regenerating gas flow is in the right chamber.



LEGEND

1. Switching Valve
2. Desiccant Chambers
3. Core Assembly
4. Purge and Outlet Check Valves
5. Purge Dump Exhaust Silencer
6. Inlet and Purge Exhaust Valves [V1 thru V4]
7. Cam Timer Air Motor and Regulator
8. Filter

NOTES

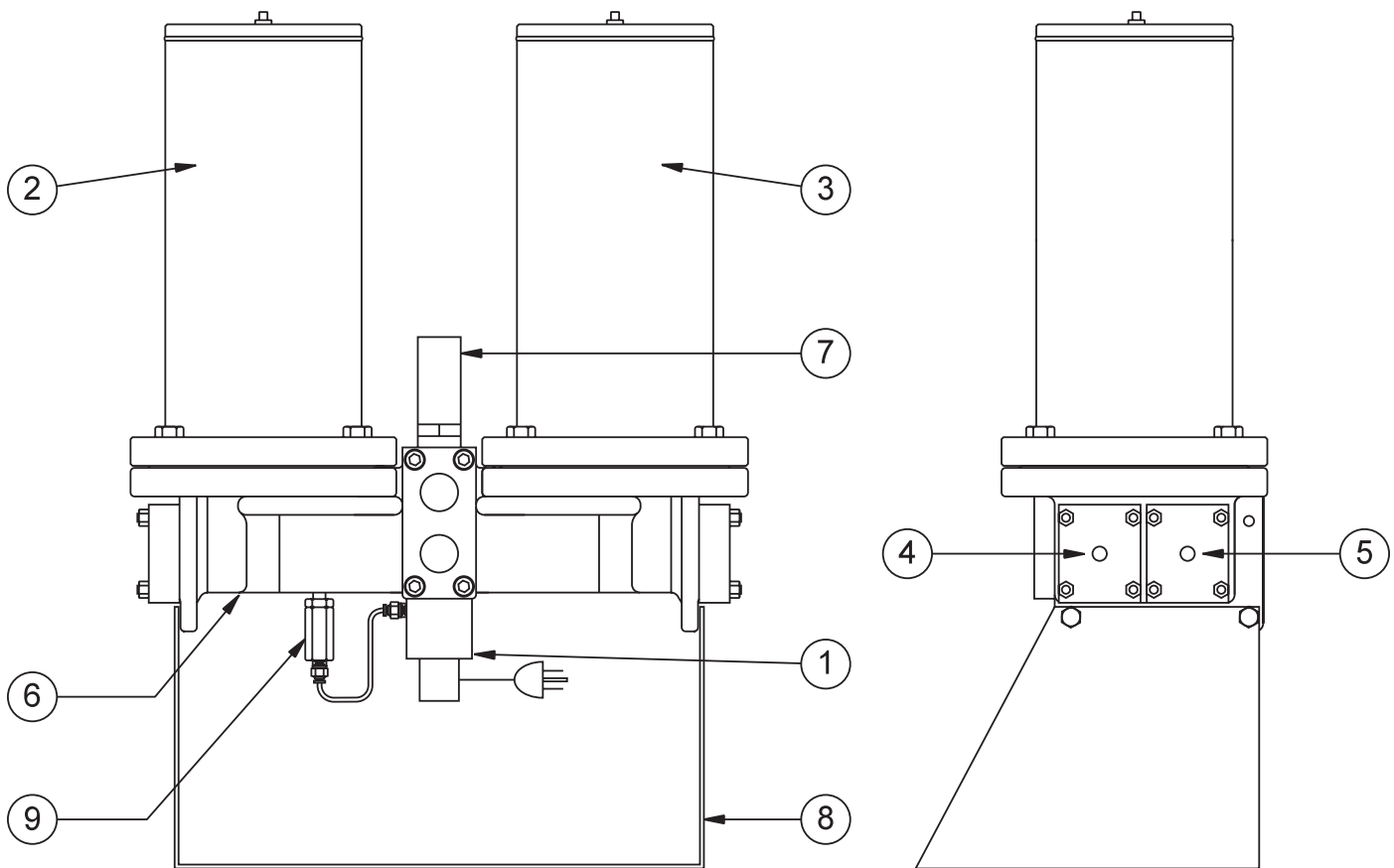
Process Gas Flow: 

Purge Gas Flow: 

Pilot Gas Flow: 

COMPONENT IDENTIFICATION DRAWING – TIMER/SOLENOID OPERATION

Models HMD84 through HMD385



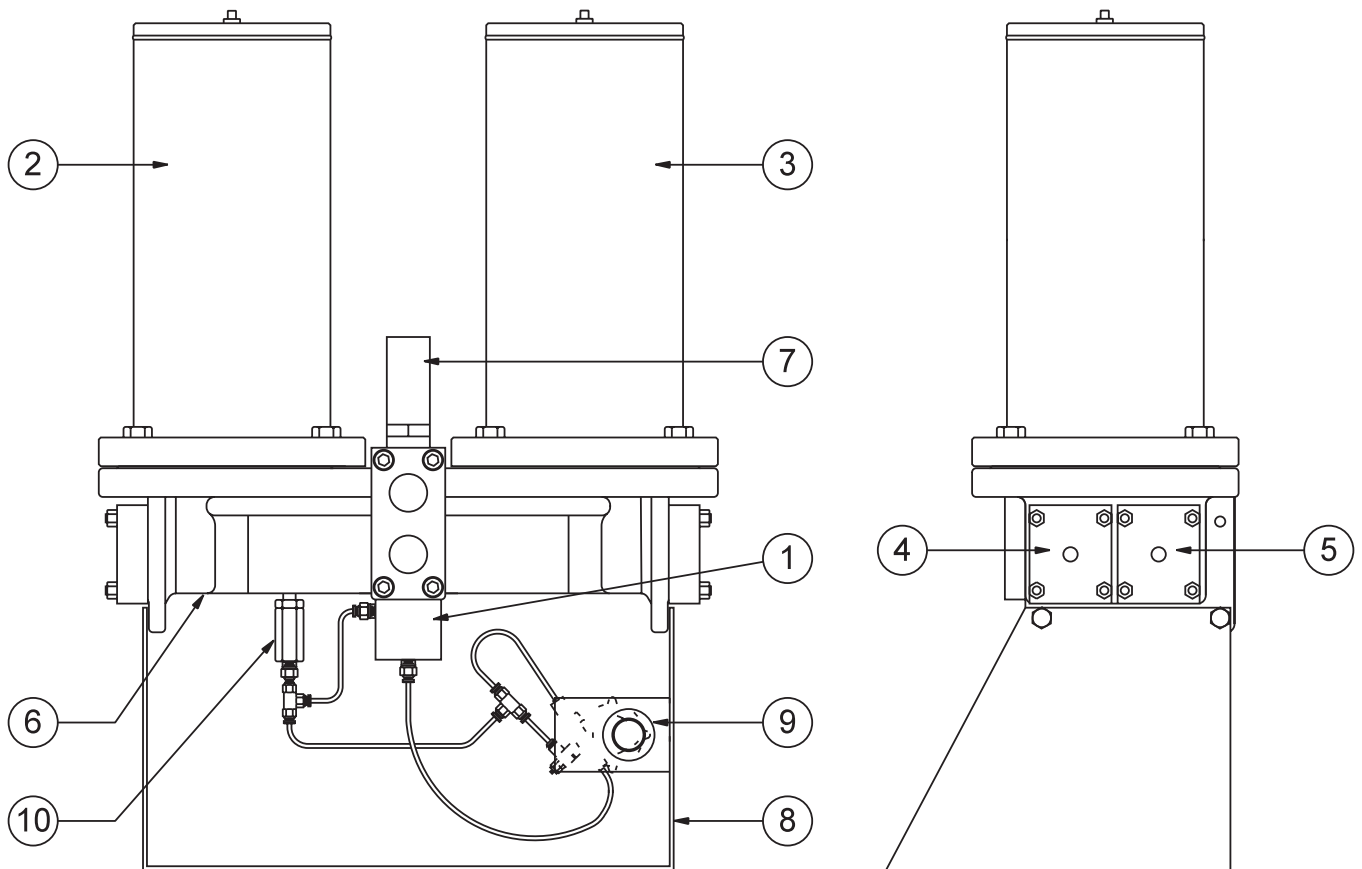
LEGEND

1. Pilot Gas Solenoid Valve with Solid State Timer and Pilot Gas Silencer.
2. Left Desiccant Chamber.
3. Right Desiccant Chamber
4. Inlet Switching Valve
V1 Left Chamber
V2 Right Chamber (shown)
5. Purge Exhaust Valve
V3 Left Chamber
V4 Right Chamber (shown)
6. Outlet Check Valve Assembly Complete With Purge Orifice
(Left and Right Closure shown)
7. Purge Exhaust Silencer
8. Mounting Bracket shown in position for floor or bench mounting. Rotate base 90° to rear for wall mounting.
9. Filter

Note: Remove Item #6 to access Purge Orifice.

COMPONENT IDENTIFICATION DRAWING – PNEUMATIC OPERATION

Models HMD84 through HMD385



LEGEND

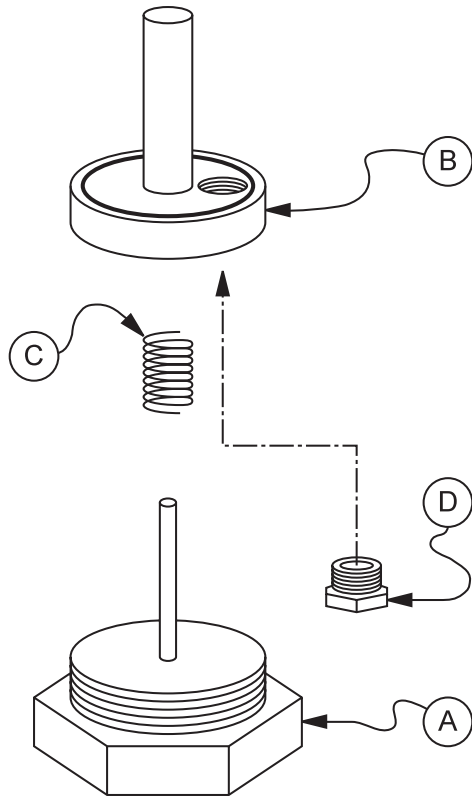
1. Pilot Gas Operated Valve
2. Left Desiccant Chamber.
3. Right Desiccant Chamber
4. Inlet Switching Valve
V1 Left Chamber
V2 Right Chamber (shown)
5. Purge Exhaust Valve
V3 Left Chamber
V4 Right Chamber (shown)
6. Outlet Check Valve Assembly Complete With Purge Orifice
(Left and Right Closure shown)
7. Purge Exhaust Silencer
8. Mounting Bracket shown in position for floor or bench
mounting. Rotate base 90° to rear for wall mounting.
9. Pneumatic Timer
10. Filter

Note: Remove Item #6 to access Purge Orifice.

INSTRUCTIONS FOR CHANGING PURGE ORIFICE

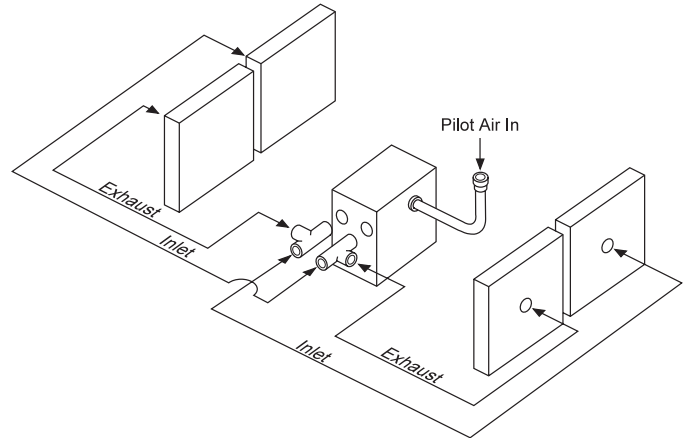
Models HMD84 through HMD385

1. Remove outlet check valve assembly [A].
(Refer to item 6 of component identification drawing)
2. Remove poppet [B].
3. Unscrew orifice [D], inspect and replace.
4. Reassemble as shown.
5. Repeat operation for other purge orifice.



TUBING CONNECTIONS

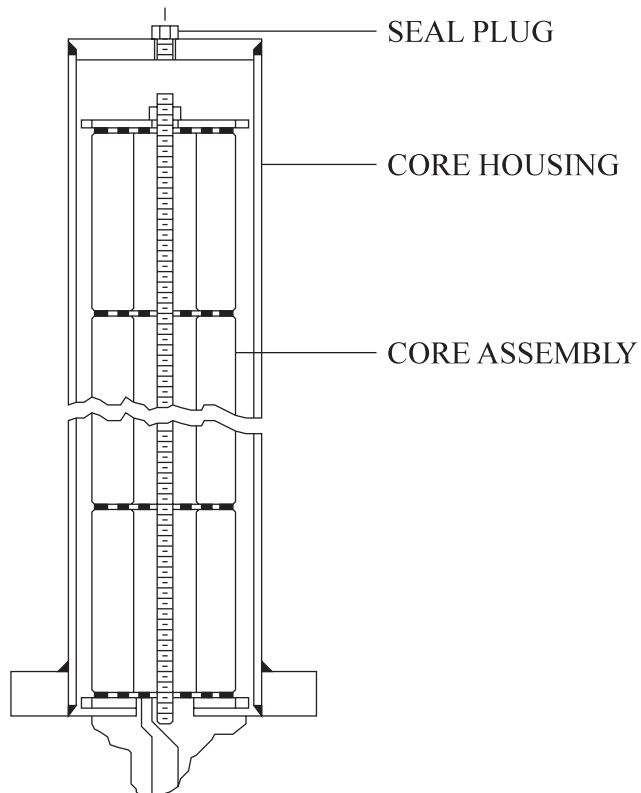
Models HMD84 through HMD385



CORE HOUSING WITH CORE ASSEMBLY

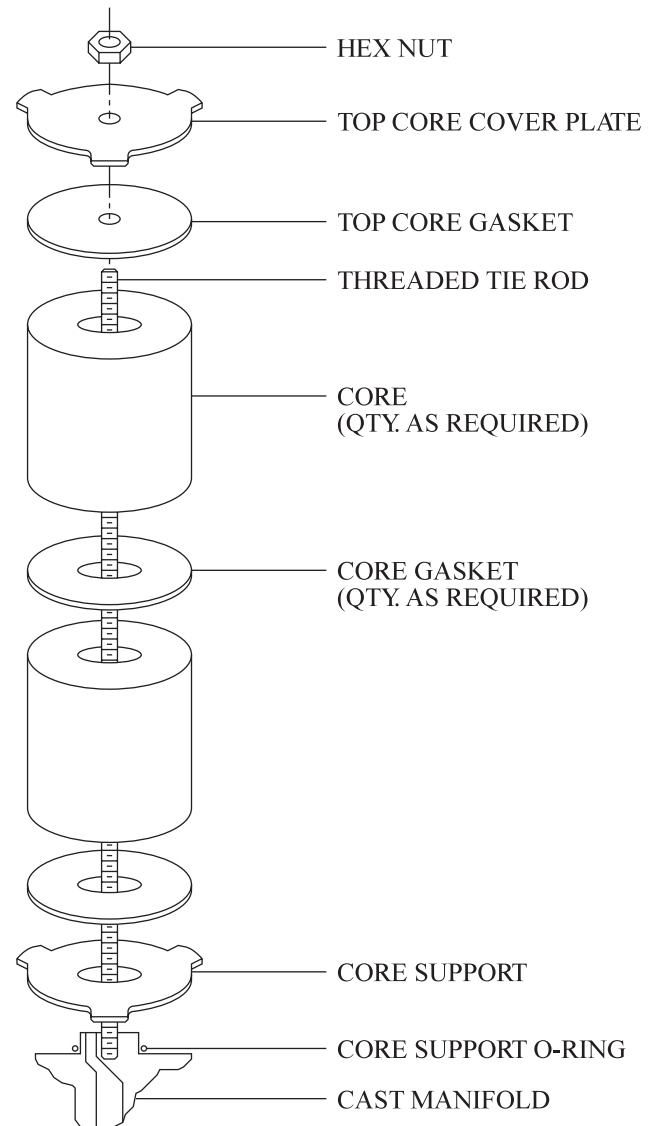
Models HMD84 through HMD170

See Spare Parts and Accessories Table for Core Assembly Overhaul Kit part numbers.



CORE ASSEMBLY

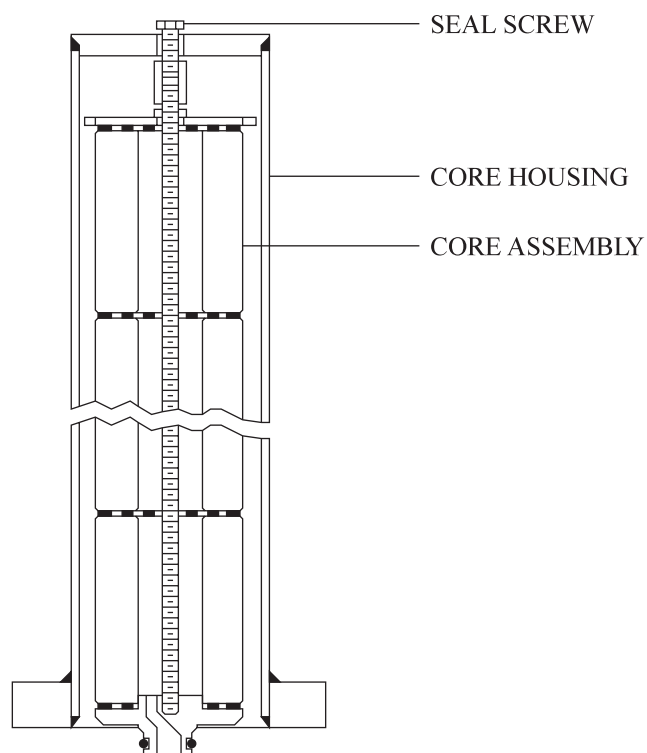
Models HMD84 through HMD170



CORE HOUSING WITH CORE ASSEMBLY

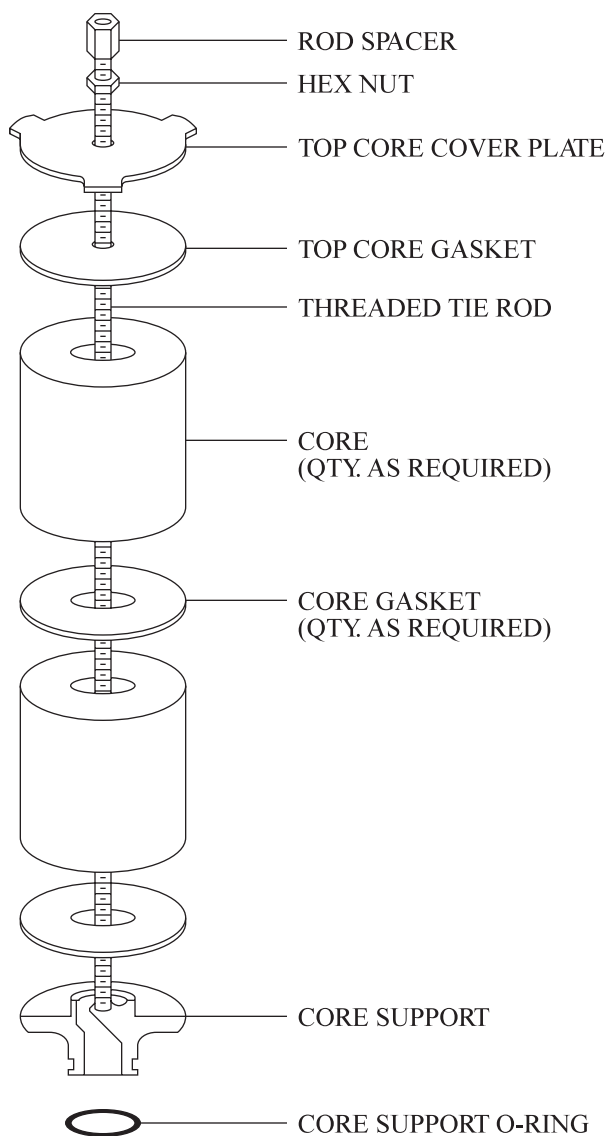
Models HMD230 through HMD385

See Spare Parts and Accessories Table for Core Assembly Overhaul Kit part numbers.



CORE ASSEMBLY

Models HMD230 through HMD385



SPARE PARTS AND ACCESSORIES

All spare parts and accessories should be purchased from your local Representative. In any correspondence always quote dryer model and serial number.

SPECIAL NOTE: The use of non-genuine factory replacement parts will invalidate the warranty and can seriously reduce performance and service life of your dryer.

SPARE PARTS		
MODEL	DESCRIPTION	PART NO.
HMD18 THRU HMD37	SOLENOID VALVE (12VDC)	39225354
	(24VDC)	39225370
	(120VAC)	39213921
	(240VAC)	37978137
	ELECTRIC TIMER (12VDC/24VDC)	39225396
	(120VAC)	39213947
	(240VAC)	37978145
	PNEUMATIC VALVE	37978152
	PNEUMATIC TIMER	37978160
HMD84 THRU HMD170	VALVE ASSEMBLY	39213962
	SOLENOID VALVE (12VDC)	39225362
	(24VDC)	39225388
	(120VAC)	39213939
	(240VAC)	37978178
	ELECTRIC TIMER (12VDC/24VDC)	39225404
	(120VAC)	39213954
	(240VAC)	37978186
	PNEUMATIC VALVE	37978194
	PNEUMATIC TIMER	37978160
	FILTER	37976784
HMD230 THRU HMD385	VALVE ASSEMBLY	39213970
	SOLENOID VALVE (12VDC)	39225362
	(24VDC)	39225388
	(120VAC)	39213939
	(240VAC)	37978178
	ELECTRIC TIMER (12VDC/24VDC)	39225404
	(120VAC)	39213954
	(240VAC)	37978186
	PNEUMATIC VALVE	37978194
	PNEUMATIC TIMER	37978160
	FILTER	37976784

SPARE PARTS AND ACCESSORIES

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SPECIAL NOTE: The use of non-genuine factory replacement parts will invalidate the warranty and can seriously reduce performance and service life of your dryer.

CORE ASSEMBLY OVERHAUL KIT			
MODEL	CORES PER HOUSING	CORES PER KIT	PART NUMBER
HMD18	1	2	39213830
HMD37	2	4	39213848
HMD84	1 (7" LG.)	2	39213855
	1 (3½" LG.)	2	
HMD110	2	4	39213863
HMD138	2 (7" LG.)	4	39213871
	1 (3½" LG.)	2	
HMD170	3	6	39213889
HMD230	4	8	39213897
HMD275	5	10	39213905
HMD385	7	14	39213913

Each CORE ASSEMBLY OVERHAUL KIT consists of the following.

- 1) Replacement Cores as required per dryer.
- 2) Core gasket and O-rings as required per dryer.
- 3) Threaded tie rod and any necessary hardware required to overhaul the core assembly.

SPARE PARTS AND ACCESSORIES

All spare parts and accessories should be purchased from your local Representative. In any correspondence always quote dryer model and serial number.

SPECIAL NOTE: The use of non-genuine factory replacement parts will invalidate the warranty and can seriously reduce performance and service life of your dryer.

REPLACEMENT ORIFICES			
MODEL	ORIFICE		PART NO.
	COLOR CODE	SIZE	
HMD18 THRU HMD37	ORANGE	0.0280	39213988
	PINK	0.0330	39213996
	YELLOW	0.0390	39214002
	BLACK	0.0465	39214010
	RED	0.0550	39214028
	GREEN	0.0625	39214036
	BLUE	0.0730	39214044
	WHITE	0.0860	39214051
	BROWN	0.0995	39214069
HMD84 THRU HMD170	ORANGE	0.0670	39214077
	GREEN	0.0785	39214085
	RED	0.0935	39214093
	BLUE	0.1100	39214101
	BLACK	0.1285	39214119
	WHITE	0.1495	39214127
	YELLOW	0.1770	39214135
	BROWN	0.2090	39214143
HMD230 THRU HMD385	ORANGE	0.0938	39214150
	BLUE	0.1110	39214168
	BLACK	0.1285	39214176
	RED	0.1540	39214184
	WHITE	0.1820	39214192
	GREEN	0.2130	39214200
	YELLOW	0.2500	39214218
	BROWN	0.2950	39214226

See pages 14, 15, 22 and 23 for purge orifice locations.

