DRY-PAK® INDUSTRIAL AIR DRYER Installation and Instruction Manual

Models DS0-00-000 through DS5-00-000
Models DO0-00-000 through DO5-00-000

INSTALLATION:

1) Dryer must be installed where the ambient temperature is between 32˚F (0˚C) and 125˚F (52˚C).

2) Mount dryer in a vertical position.

3) For maximum flow, INLET and OUTLET air connections should be 3/8" pipe size or 3/8" copper tubing with 3/8" pipe thread connections. Never use tubing smaller than 3/8". It is recommended that ½" tubing be used where piping runs exceed 15 feet (5m) from dryer to point of use. Models DS0 through DS3 have ¼" FPT purge exhaust ports located in the casting, above the solenoid valves. Models DS4 and DS5 purge exhaust ports are located at the outlet of the solenoid valve, in the bottom of the dryer. Attaching a tube smaller than ½" OD (1" for DS4 and DS5) to exhaust port will restrict air flow, causing dryer malfunction.

4) Make sure that all pipe connections are clear of joint sealing compound, metal chips or foreign material of any sort.

5) INLET and OUTLET air connections should be assembled with a pipe sealant such as teflon tape to prevent leaks or galling of the threads. After pressurizing system check all pipe connections for leaks.

"Warning. This Dryer is NOT provided with electrical overload protection. The electrical power source for this Dryer must incorporate one amp protection. All machinery must be fitted with means to isolate it from electrical energy sources. The isolator must be capable of being locked where an operator is unable, from any of the points to which he/she has access, to check that the energy is still cut off.

6) Before making electrical connections, check data plate for electrical characteristics. Since overload protection is not provided in the dryer, the unit should be wired into a protected circuit.

7) It is recommended that a bypass line with shutoff valves be installed to provide constant air flow in the event the dryer should require servicing. (SEE INSTALLATION DIAGRAM)

8) It is suggested that you install a regulator with pressure gauge and a coalescing filter up stream from the dryer to maintain constant air pressure to the dryer and remove entrained or free moisture and oil. It is also recommended that an after filter be installed to remove any desiccant dust that may migrate downstream.

DRY-PAK® ORDERING INFORMATION

MODEL NUMBERING

POSITION 1 2 3 4 5 6 7 8

SEE MODEL NUMBERS

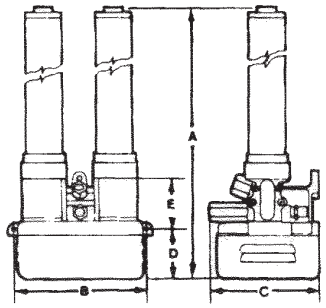
ELECTRICAL CODE
A = 115VAC/50-60Hz
F = 220 VAC/50-60Hz

ATMOSPHERIC DEW POINT
C = -100°F
E = -40° F
G = 0°F

OPTIONS
Use positions 6, 7 and 8 for any desired options.

C = British Pipe Threads
F = Fungus Proof Wiring
M = Exhaust Mufflers

Note: 000 in positions 6, 7 and/or 8 indicate standard configuration



MODEL NUMBER	Approximate Dimensions (in.)					INLET ---- OUTLET
	A	B	C	D	E	
DS0-A0-000	12.50	7.37	6.06	2.87	2.81	
DS1-A0-000	17.00	7.37	6.06	2.87	2.81	**3/8" NPT**
DS2-A0-000	18.50	7.37	6.06	2.87	2.81	--------
DS3-A0-000	23.75	7.37	6.06	2.87	2.81	**3/8" NPT**
DS4-A0-000	32.25	7.37	6.06	2.87	2.81	
DS5-A0-000	35.50	8.37	6.06	8.00	2.81	

In the chart below there are two numbers in each square. The lower number is the is the amount of air flow in SCFM available for use. The top number is the amount of input air required by the dryer to provide the output plus the purge requirement. The purge requirement, the amount of air required to regenerate the towers is the difference between the two figures.

When ordering a Dry-Pak®, after you specify the model number, you MUST specify the operating pressure and output flow requirements. You will find the output flow listed as the lower number in the chart below.

Variations of the standard Dry-Pak® models may be ordered by adding the appropriate letter in positions 4 through 8, after the model number, in the ordering information chart on the top left side of this page.

Dry-Paks® with custom flow requirements may be ordered by contacting the factory for ordering information. In addition, larger flow requirements can be accommodated by using the ED Series of twin-tower air dryers manufactured by Dielectric. For literature or further information contact Dielectric at (800) 341-

Operating PRESSURES @70°F Inlet Air Temperature	Inlet / Outlet SCFM Ordering Information for 0° F Atms D.P.						Inlet / Outlet SCFM Ordering Information for -40° F Atms D.P.						Inlet / Outlet SCFM Ordering Information for -100° F Atms D.P.					
	DS0	**DS1**	**DS2**	**DS3**	**DS4**	**DS5**	**DS0**	**DS1**	**DS2**	**DS3**	**DS4**	**DS5**	**DS0**	**DS1**	**DS2**	**DS3**	**DS4**	**DS5**
175	8.0	15.7	20.3	31.8	57.0	82.0	7.8	12.0	15.8	24.7	43.2	63.0	4.8	9.9	13.7	20.3	34.0	50.0
	7.3	14.2	17.7	28.5	52.0	73.0	7.1	10.5	13.6	21.4	35.1	54.0	4.1	8.4	11.5	17.0	28.9	42.0
150	6.0	12.4	16.5	23.8	47.0	73.0	4.7	9.3	12.3	18.9	36.0	55.0	3.7	7.8	10.8	15.9	27.8	44.0
	5.3	10.8	14.5	20.6	42.0	64.0	4.0	7.8	10.1	15.5	30.0	46.0	3.0	6.3	8.6	12.6	22.8	35.0
125	5.2	10.2	14.2	21.3	40.0	62.0	4.0	8.2	10.7	16.1	31.0	46.0	3.2	6.5	9.2	13.8	24.0	36.0
	4.4	8.7	11.9	17.8	35.0	54.0	3.2	6.7	8.5	12.7	26.0	38.0	2.5	5.0	6.9	10.4	19.0	28.0
120	5.0	9.7	13.5	20.8	39.0	58.0	3.7	8.0	10.5	15.8	29.8	43.8	3.2	6.2	9.0	13.5	23.0	34.0
	4.2	8.1	11.3	17.0	34.0	50.0	2.9	6.4	8.3	12.5	24.8	35.8	2.4	4.7	6.8	10.2	18.0	27.1
110	4.7	9.0	12.5	18.8	37.9	55.8	3.5	7.2	9.7	14.5	29.0	42.4	2.9	5.7	8.2	12.3	22.0	33.8
	4.0	7.5	10.4	15.6	32.8	47.8	2.8	5.7	7.5	11.3	24.0	34.4	2.2	4.2	6.0	9.0	17.0	26.1
100	4.2	8.5	11.5	17.3	34.0	51.0	3.2	6.7	9.0	13.5	26.4	38.0	2.7	5.5	7.7	11.2	20.0	30.0
	3.5	7.0	9.4	14.1	29.0	43.0	2.5	5.2	6.8	10.2	21.4	30.0	2.0	4.0	5.4	8.1	15.0	22.4
90	3.7	7.7	10.5	15.8	30.4	45.0	3.0	6.2	8.2	12.3	23.1	33.8	2.5	5.0	7.0	10.5	17.8	26.8
	3.0	6.2	8.3	12.4	25.4	37.0	2.4	4.7	6.0	9.0	18.1	25.8	1.8	3.5	4.8	7.2	12.3	19.2
80	3.5	7.0	9.5	14.3	26.2	40.0	2.7	5.5	7.2	10.8	20.0	30.0	2.2	4.5	6.2	9.3	15.7	23.6
	2.8	5.5	7.3	11.0	21.2	32.0	2.0	4.0	5.0	7.5	15.0	22.0	1.5	3.0	4.0	5.9	10.7	15.8
70	3.0	6.2	8.5	12.7	24.5	36.5	2.4	5.0	6.5	9.3	18.5	27.1	2.0	4.0	5.7	8.6	14.0	21.4
	2.3	4.7	6.3	9.4	19.5	28.5	1.6	3.5	4.3	6.5	13.5	19.1	1.2	2.4	3.5	5.3	9.0	13.8
60	2.8	5.7	7.5	11.2	22.0	33.2	2.1	4.2	5.7	8.6	17.1	24.9	1.7	3.5	5.0	7.5	12.8	19.5
	2.1	4.0	5.2	7.8	17.0	25.1	1.4	2.8	3.5	5.4	12.1	16.9	1.0	2.0	2.7	4.1	7.8	11.9
50	2.4	4.7	6.5	9.8	19.0	29.0	1.8	3.7	5.0	7.5	14.5	21.0	1.5	3.0	4.2	6.3	10.9	17.0
	1.7	3.3	4.2	6.3	14.0	21.0	1.1	2.2	2.7	4.1	9.5	13.0	0.8	1.5	2.0	3.0	5.9	9.4
40	2.0	4.0	5.5	8.3	15.5	23.8	1.5	3.2	4.2	6.3	11.8	17.2	1.2	2.6	3.7	5.6	8.8	13.7
	1.3	2.5	3.3	4.9	10.5	15.8	0.8	1.7	2.0	3.0	6.8	9.2	.53	1.0	1.4	2.1	3.8	6.1
30	1.7	3.2	4.5	6.8	12.0	19.0	1.3	2.6	3.5	4.8	9.8	14.1	1.0	2.1	3.0	4.5	7.5	11.0
	1.0	1.7	2.2	3.3	7.4	11.0	0.6	1.1	1.2	1.8	4.8	6.1	.34	.60	.70	1.0	2.5	3.4

OPERATION

In operation, the entering flow of moist, compressed air is directed through one of the two desiccant chambers containing compression packed molecular sieve. Moisture is picked up by the desiccant as the main stream air passes through the desiccant bed and the dried air is released through the outlet port. A small portion of this dried air is passed through a sized orifice to the other chamber to purge the desiccant of moisture collected during the previous cycle.

Major details of construction:

1,2.... Left and right desiccant towers.
3,4.... Inlet and outlet check balls.
5,6.... Left and right inlet valve seat.
7,8.... Left and right outlet valve seat.
9,10... Left and right calibrated purge air flow orifice
11,12. Left and right purge solenoid valves.

Cycle phase 1: Right dehydration and left tower purge . . . duration 27 seconds:

The right purge solenoid valve is closed, the left is open, venting the left desiccant tower to atmosphere. The check balls are held against the left valve seats by the higher pressure in the right desiccant tower. While most of the air being dried by the right tower leaves the outlet, a portion of the high pressure dry air passes through the orifice and expands at low pressure in the left tower which was wetted in the previous cycle. The expanding air flow picks up the moisture and carries it through the open purge solenoid valve outlet to atmosphere. At completion of cycle phase 1, the elapsed cycle time is 25 seconds.

Cycle phase 2: Right dehydration and left dwell . .duration 3 seconds:

Both purge solenoid valves are closed and dry air continues to flow through the calibrated purge orifice until the air pressure in the left tower is equal to the air pressure in the right tower. At completion of cycle phase 2, the elapsed cycle time is 30 seconds.

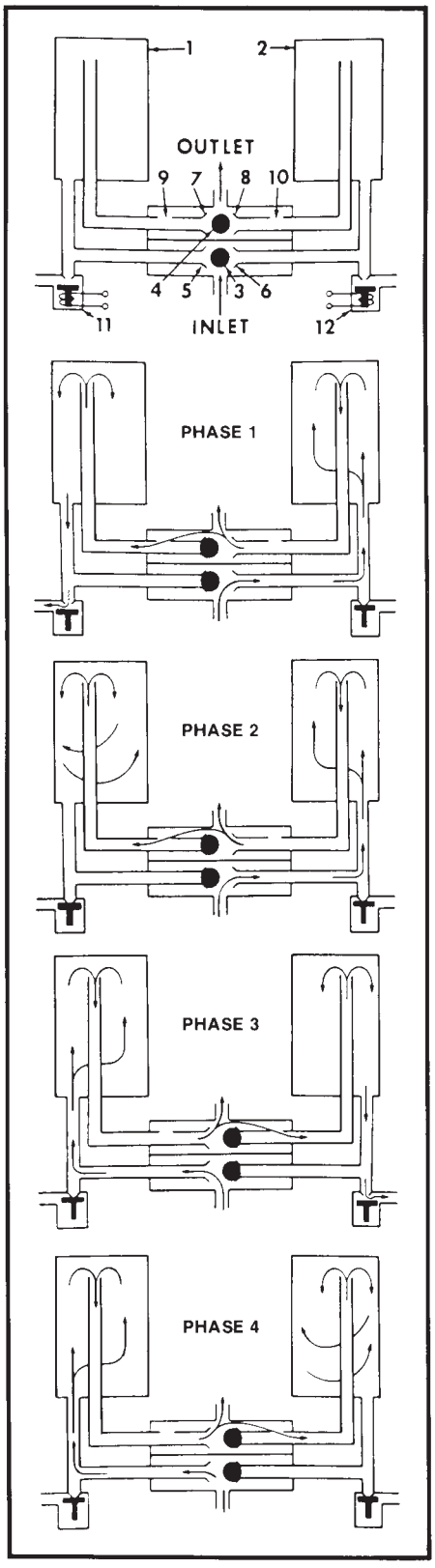
Cycle phase 3: Left dehydration and right tower purge . . . duration 27 seconds:

The left purge solenoid valve is closed, the right is open, venting the right desiccant tower to atmosphere. The check balls are held against the right valve seats by the higher pressure in the left desiccant tower. While most of the air being dried by the left tower leaves the outlet, a portion of the high pressure dry air passes through the orifice and expands at low pressure in the right tower which was wetted in the previous cycle. The expanding air flow picks up the moisture and carries it through the open purge solenoid valve outlet to atmosphere. At completion of cycle phase 3, the elapsed cycle time is 55 seconds.

Cycle phase 4: Left dehydration and right dwell . .duration 3 seconds:

Both purge solenoid valves are closed and dry air continues to flow through the calibrated purge orifice until the air pressure in the right tower is equal to the air pressure in the left tower. At completion of cycle phase 4, the elapsed cycle time is 60 seconds.

DRY-PAK® Flow Diagram



OPERATION SPECIFICATIONS

1. The operating pressure range for all models is 30 to 175 PSIG.

2. The dryer must be operated at the pressure and flow conditions specified when purchased to insure required dew point and maximum operating efficiency.

3. Inlet air temperature must not exceed 140˚F (60˚C).

4. Dryers must not be operated in an environment where temperatures may drop below 32˚F (0˚C).

MAINTENANCE

1. If air flow requirements change from original specifications, the orifices must be replaced. Replacement orifices or orifices to new specifications should be obtained from your distributor. Orifices should always be replaced in matched pairs. Since the orifices determine the perfomance of the dryer, field modification should not be attempted.

2. The solid state cycle timer may be field replaced if necessary (DS models). The mechanical cycle timer is also field replaceable (DO models). An upgrade solid state timer retro kit is available for all (DO models) Dry-Paks.

3. The solenoid valves utilized in these dryers are the most reliable available and should give years of service. If, however, a failure should occur, replacement solenoid valves, coils and internal repair kits are available through your distributor.

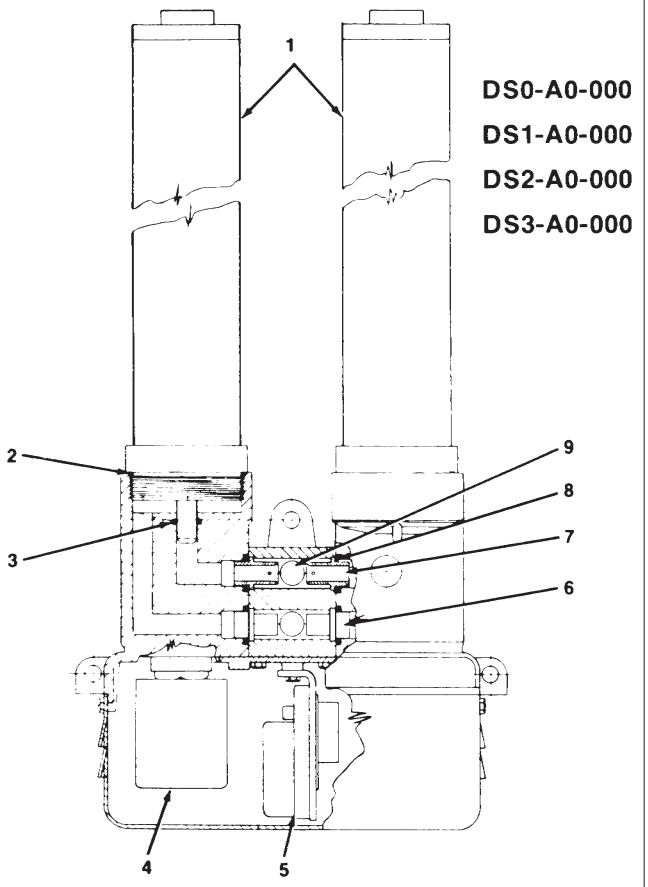
4. Improper packing of the desiccant towers will result in channeling of the desiccant bed, resulting in imperfect purification. For this reason, no attempt should be made to repack towers in the field. Replacement and repacked towers are available from your distributor.

5. If the air being delivered does not meet designated dewpoint, turn off dry air output from the unit for an hour or two to allow the unit to purge the overloaded desiccant towers, or replace desiccant towers. If unit is operated at the specified parameters and oil is not allowed to contaminate the towers, the towers should not require purging or replacement. Therefore, if this condition occurs, add a prefilter and/or change orifices to match the actual amount of air being dried.

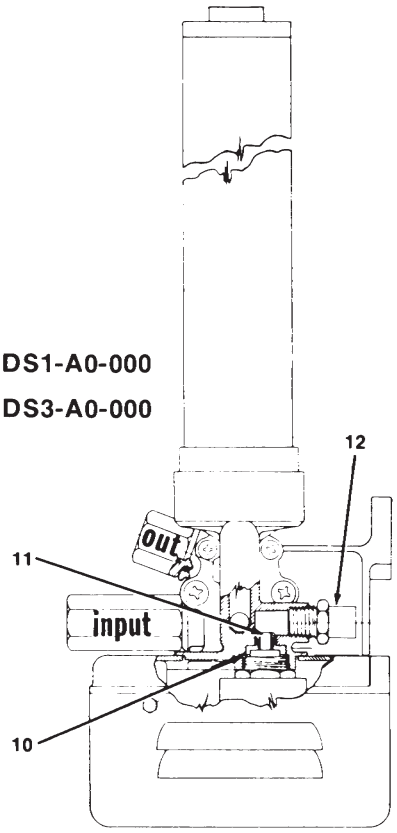
CAUTION

EXCEPT **as otherwise specified by the manuafacturer, this product is specifically designed for compressed air service, and use with any other fluid (liquid or gas) is a misapplication. For example, use with or injection of certain hazardous liquids or gases in the system (such as alcohol or liquid petroleum gas) could be harmful to the unit or result in combustible condition of hazardous external leakage. Manufacture's warranties are void in the event of misapplication, and manufacture assumes no responsibilty for any resulting loss. Before using with fluids other than air, or for non-industrial applications, or for life support systems, consult manufacturer for written approval.**

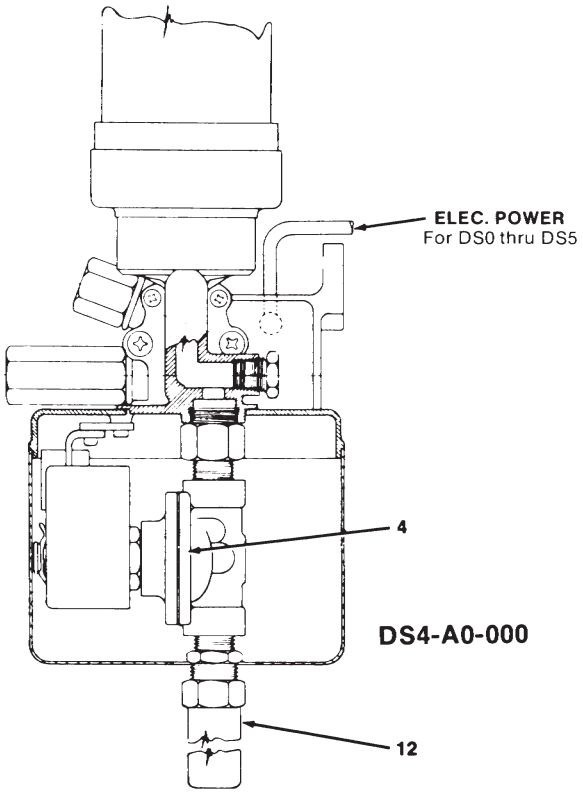
Models DS0-A0-000 through DS5-A0-000
(D00-A00-000 through D05-A0-000)



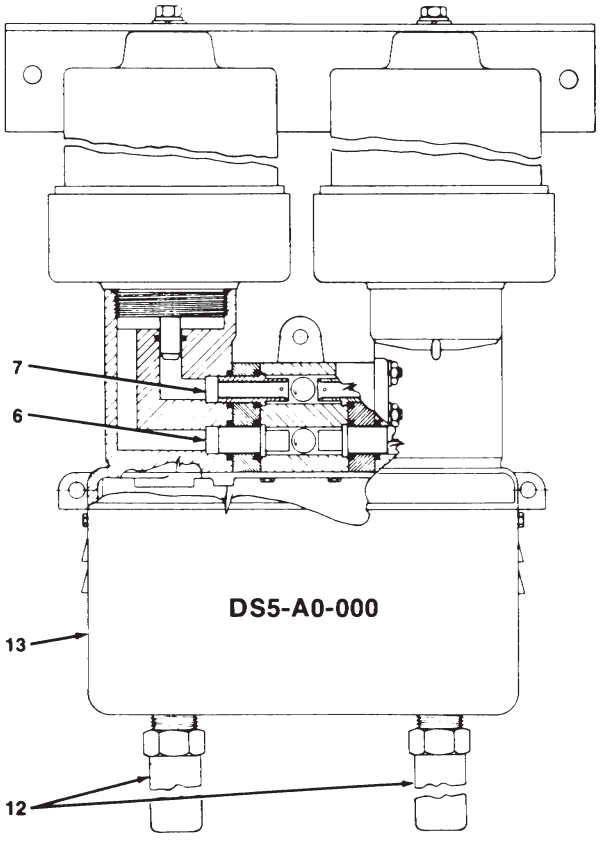
DS0-A0-000
DS1-A0-000
DS2-A0-000
DS3-A0-000



DS0-A0-000, DS1-A0-000
DS2-A0-000, DS3-A0-000



DS4-A0-000



DS5-A0-000

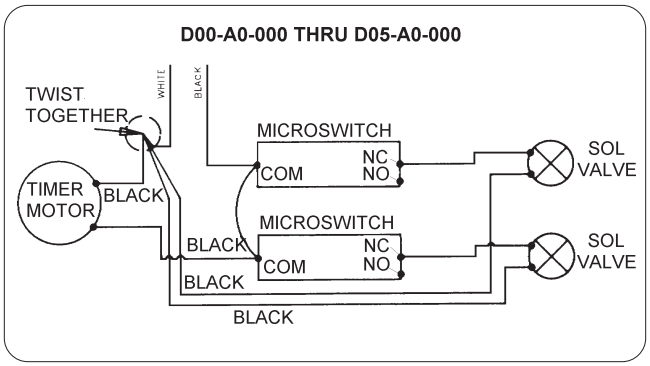
Parts List for Models DO0 through DO5 and DS0 through DS5 DRY-PAK® AIR DRYERS

ITEM NO.	DESCRIPTION	UNITS USED ON	QTY	DS/DO0	DS/DO1	DS/DO2	DS/DO3	DS/DO4	DS/DO5
1	DESICCANT TOWER (NEW)	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	48919-501	48919-502	48919-503	16102-503	16102-504	18688-502
1a	DESICCANT TOWER (REBUILT)	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	32043	32045	32047	32049	32051	32053
2	O-RING	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	14000-136	14000-136	14000-136	14000-136	14000-136	14000-136
3	O-RING	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	14000-110	14000-110	14000-110	14000-110	14000-110	14000-110
4	SOLENOID VALVE (115V)	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	21270-1	21270-1	21270-1	21270-1	21260-1	21260-1
4a	SOLENOID VALVE (220V)	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	21270-2	21270-2	21270-2	21270-2	21260-2	21260-2
4b	SOLENOID VALVE REPAIR KIT	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	24815-11	24815-11	24815-11	24815-11	24815-2	24815-2
4c	SOLENOID VALVE COIL (115V)	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	19525-001	19525-1	19525-1	19525-1	19435-1	19435-1
4d	SOLENOID VALVE COIL (220V)	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	19525-002	19525-2	19525-2	19525-2	19435-2	19435-2
5	MECH. TIMER ASSEMBLY(115V60Hz)	DO0-DO5	1	21658-501	21658-501	21658-501	21658-501	21658-501	21658-501
5a	MECH. TIMER ASSEMBLY (220V50Hz)	DO0-D05	1	21658-503	21658-503	21658-503	21658-503	21658-503	21658-514
5b	SOLID STATE TIMER (115V/50-60Hz)	DS0-DS5	1	12440	12440	12440	12440	12440	15460
5c	SOLID STATE TIMER (220V/50-60Hz)	DS0-DS5	1	13335	13335	13335	13335	13335	15461
5d	S.S. TIMER RETRO KIT (115V5060Hz)	DO SERIES TO DS SERIES	1	16938	16938	16938	16938	16942	16940
5e	S.S. TIMER RETRO KIT (220V5060Hz)	DO SERIES TO DS SERIES	1	16939	16939	16939	16939	16943	16941
6&7*	VALVE SEAT KIT (*MODEL / SER. NO. REQUIRED)	DS/DO0-DS/DO5 (DS/DO5)	1	13323	13323	13323	13323	13323	13324
8	O-RING	DS/DO0-DS/DO5 (DS/DO5)	6 (12)	14000-112	14000-112	14000-112	14000-112	14000-112	14000-112
		DS/DO0-DS/DO5 (DS/DO5)	6 (12)	14000-13	14000-13	14000-13	14000-13	14000-13	14000-13
9	BALL CHECK (30 PSIG THRU 80 PSIG)	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	15903-3	15903-3	15903-3	15903-3	15903-3	15903-3
9a	BALL CHECK (90 PSIG THRU 175 PSIG)	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	15903-10	15903-10	15903-10	15903-10	15903-10	15903-10
10	O-RING	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	14000-119	14000-119	14000-119	14000-119	14000-119	14000-119
11	VALVE SEAT	DS0-DS3	2	21572-1	21572-1	21572-1	21572-1	N/A	N/A
12	MUFFLER	DS/DO0-DS/DO5 (DS/DO5)	2 (4)	22646-1	22646-1	22646-1	49160-501	22646-3	22646-3
13	ENCLOSURE	DO0-DO5	1	21273-1	21273-1	21273-1	21273-1	21273-2	22580-501
14	MICROSWITCH	DOO-DO5	2	16171-4	16171-4	16171-4	16171-4	16171-4	16171-4
15	CAM	DO0-DO5	1	20478-506	20478-506	20478-506	20478-506	20478-506	20478-507

Ordering Information - Accessories and Kits
The following information must be provided when ordering kits for DRY-PAK® Air Dryers:
1. Model and Serial Number 2. Operating Pressure 3. Outlet Flow 4. Dew Point 5. Voltage Characteristics

WIRING DIAGRAM - DO SERIES MECHANICAL TIMER

Before installation check the data plate for electrical characteristics. Standard electrical characteristics as illustrated are 115 volt, 60 cycle, single phase. Models operating on other voltages and frequencies are available. Overload protection is not provided in the dryer and the unit should be wired into a protected circuit.



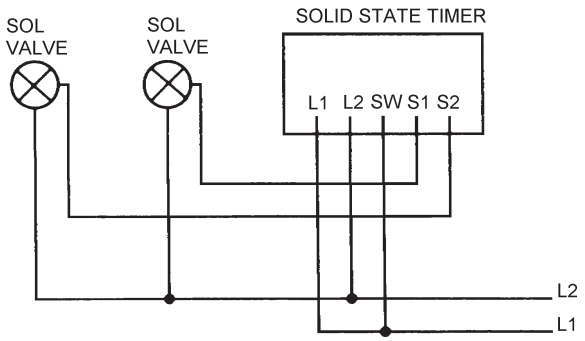
WIRING DIAGRAM - DIELECTRIC SOLID STATE TIMER

The Dielectric Solid State Timer can provide either continuous or cyclical operation of your DRY-PAK® dryer by following the wiring instructions illustrated below. Before wiring, check the data plate for electrical characteristics. Standard electrical characteristics as llustrated are115volt, 50/60 cycle, single phase. Since no overload protection is provided in the dryer, it should be wired into a protected circuit.

CONTINUOUS DUTY

In this configuration, the dryer will run uninterrupted as long as power is supplied at the line. This configuration should be used when drying a continuous stream of air.

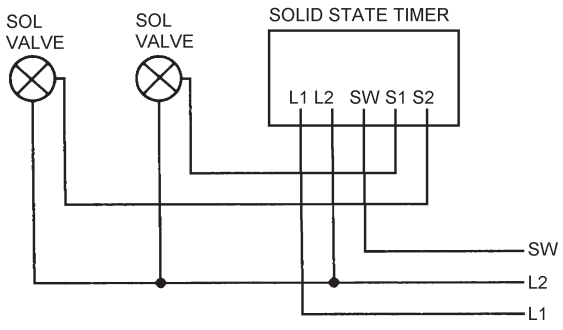
DS0-A0-000 THRU DS5-A0-000



CYCLICAL DUTY

In this configuration, the dryer is intended to cycle on and off with a compressor charging a storage tank or receiver, the tank being charged with dry air from the dryer. Here L1 and L2 are connected to the line side of the pressure switch operating the compressor and SW is connected to the load side of the L1 line at the pressure switch.

DS0-A0-000 THRU DS5-A0-000



WARRANTY

The Manufacturer warrants that all goods supplied hereunder, whether or not of its own manufacture, will be of the kind described herein or in any specification and drawing approved by the Manufacturer and of merchantable quality and free from defects in material or workmanship under normal use and prescribed maintenance for a period of one (1) year, with the exception of air dryers utilizing water sealed compressors as well as the compressors themselves which shall be for two (2) years. Neither this warranty nor any other, expressed or implied, shall apply to goods delivered hereunder which have been damaged or subjected to alteration or negligence after delivery. The Manufacturer's only obligation for breach of this warranty shall be the repair, without charge, or the furnishing F.O.B. Raymond, Maine, of a similar part to replace any part which within one (1) year, with the exception as noted above, from date of shipment is proven to have been defective, provided that (i) the Purchaser shall have notified the Manufacturer within ten (10) days of the discovery of such defect and not later than ten (10) days after the last day of this warranty, and (ii) the Manufacturer shall have the option of requiring the return of the defective material (transportation prepaid) to establish the claim. The Manufacturer shall not in any event be liable for the Purchaser's manufacturing costs, loss of profits, good will or any other special, consequential, incidental, or other damages resulting from such defects. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, WHICH EXTEND BEYOND THE WARRANTY SET FORTH HEREIN.

INSTALLATION DIAGRAM