

# Holiday Dmv

## CROSSROADS

OSD - Oxygen Sensing device

### timed sequence system

- cycles between sieve beds according to a timer (90 seconds)
- determines which bed gets the air directed to it & when

### Pressure Sensing System

- pressure transducer connected to O<sub>2</sub> tank to keep track of pressure in that tank
- looks for 15# pressure before cycling from 1 sieve bed to the other
- time change/pressure depends on altitude

max. length of tubing = 50' including the canula

# Holiday Dmv

## CROSSROADS

moisture condensation in tubing -

- shorter tubing as much as poss.
- raise tubing up if on floor (put on tables/chairs/etc.)
- try to keep away from heaters or fireplaces or windows
- use room temp. water in humidifier
- use long tubing from O<sub>2</sub> concentrator to humidifier, then canula & short tube to pt. (secure bottle)

no internal battery backup system for running concentrator

Power failure alarm runs off of a cap. on PCB

adult flowmeter on concentrator can be replaced by ped. flowmeter on machine, or used in conjunction w/ a remote ped. flowmeter

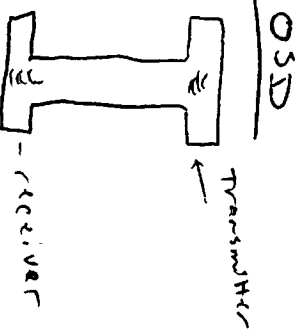
# Holiday Duv

## CROSSROADS

- Cycling of sieve beds allows N + water vapor to be exhausted
- keeps beds from getting contaminated w/ too much moisture
  - too much moisture keeps sieve from pulling out N effectively

Need to keep constant pressure on sieve material for proper absorption of N

- 1.2 sec. pause between solenoids being activated where pressure between beds is equalized
- beds pressurized for 9.4 sec.
  - while 1 sieve bed is pressurized, the other 1 is being exhausted



Sound waves sent through O<sub>2</sub> which tells how concentrated the O<sub>2</sub> is  
→ also senses temp. + adjusts for altitude

# Holiday Duv

## CROSSROADS

OSD (cont.)

warnings = 85% - yellow light on front  
75% - yellow light + audible alarm  
60% - audible alarm + red light

\* machine will still keep running

- \* takes approx. 5-10 min. for O<sub>2</sub> tank to fill after turning concentrator on - some may take longer
- if it drops down after running for a few hours, there's a problem
- pressure in tank usually stays pretty constant after tank is allowed to get initial pressure level

OSD Samples but ignores levels for 1<sup>st</sup> 15 minutes of operation  
- after 15 min, it keeps track of O<sub>2</sub> levels + alarms if there's a problem

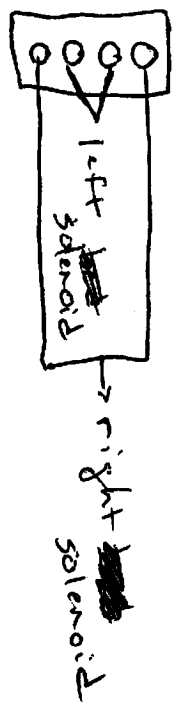
# Holiday Drw

## CROSSROADS

I.S.  
Type 1

If pump doesn't cycle properly, it's either the directional valve or the board

value connector



Proper voltage = good PCB  
bad value

bad (no or cont.) voltage = bad board

Va. Medical Repair

- Richmond
- auth. repair facility for concentrators

Cross port valve leakage

→ bad O-rings in valve assembly (4 way valve)

# Holiday Drw

## CROSSROADS

cap. for PCB (power fail alarm)

110-3000-003 (part #)

Power inverter

mod. # XP1100

man. = Exeltech  
800-886-4683  
Ft Worth, TX

output = 120VAC, 60Hz

True sine wave

cost = \$750<sup>00</sup>

For use only w/ models 303DZ

↳ 303DS (Devilbiss)

must be hardwired directly to the car battery

Final Gasolina Filter (Internal)

- change every 2 years

intake Filter (external)

- inspect 1<sup>st</sup> a year
- change as necessary, not to exceed 8760 hrs.

Compressor HEPA Filter (Internal)

- change every 5 years or 25,000 hrs.

Felt pre-Filter (external)

- change every 3 months

## O<sub>2</sub> Concentrators

- designed to remove Nitrogen from room air and give pt. almost pure O<sub>2</sub> while at home so they aren't constantly on an O<sub>2</sub> tank
- room air has 21% O<sub>2</sub>, 78% Nitrogen, 1% misc. gases
- concentrator removes all the Nitrogen, leaving 99% O<sub>2</sub> + 1% misc. gases
- max. length of tubing allowed between concentrator and pt. is 50', including the canula
- when you first turn on the machine, turn off the flow meter & allow 5-10 minutes for O<sub>2</sub> to collect in the collector tank
- pressure stays pretty constant after it gets to initial pressure level, even during use
- runs on AC power - no battery backup for operation
- power failure alarm runs off a cap. on PCB
- can hook a humidifier to flowmeter if pt. needs humidity, or can just run tubing to pt.
- adult flowmeter can be swapped out for a peds. flowmeter, or used in conjunction w/ a remote flowmeter

## Pm / performance test

- check power cord condition, plug in
- turn off flow through flow meter
- while allowing concentrator to run & build up O<sub>2</sub> in tank, check hours on meter & condition of external gross particle filter as well as intake filter
- check timing of solenoid that switches flow between sieve beds
- sieve beds are pressurized for 9.4 sec., then valve switches to other side w/ a 1.2 sec. delay in center of valve assembly where pressure is equalized between beds
- while 1 sieve bed is pressurized, the other is being exhausted (exhaustion phase allows nitrogen & water vapor to go out to room air)
- too much moisture in sieve bed keeps it from removing Nitrogen effectively
- hook miniox oxygen monitor w/ oxygen sensor to flow meter after calibration (21% for room air / low limit)
- turn on flow meter, check level of O<sub>2</sub> output (takes a few minutes of running flow)
- acceptable output is  $93\% \pm 3\%$   
3% of 93% = 2.79  
range = 90.21% to 95.79%

## filter replacement

final bacteria filter (internal)

- change every 2 years

intake filter (external)

- inspect 1<sup>cc</sup> a year
- change as necessary, not to exceed 8760 hrs.

compressor HEPA filter (internal)

- change every 5 years or 25,000 hours

Felt prefilter (external)

- change every 3 months

- some models have an oxygen sensing device (OSD) that tells you when  $O_2$  is not reaching proper concentration in collection tank
  - D5 has OSD
  - DZ doesn't
- we have the 515 DZ model
- performance test is required every 3 months on models w/out OSD to ensure that proper  $O_2$  concentration is being produced

## 515 NORMAL OPERATING SEQUENCE

Note: When the concentrator is turned "On", the following normal operating sequence should be observed when pressure gauges are attached to the sieve bed test points.

1. The four-way valve is quickly cycled back and forth several times to prevent a static condition in the compressor. This rapid cycling only happens on start-up.
2. The PC board applies 7 or 15 VDC to the right solenoid for approximately 9.4 seconds. The left sieve bed pressurizes\*\*\* while the right sieve bed is depressurized to approximately 2 PSI.  
*(See Note)*
3. The DC Voltage is removed from the right solenoid. No voltage is applied to either solenoid for approximately 1.2 seconds. The spool goes to its rest position. Both beds are pressurized with neither having a path to exhaust.
4. The DC Voltage is applied to the left solenoid for approximately 9.4 seconds. The right sieve bed pressurizes\*\*\* while the left bed is depressurized to approximately 2 PSI.
5. The DC Voltage is then removed from the left solenoid. No voltage is applied to either solenoid as described in step 3. Then this sequence repeats from step 2 on.

7V occurs only if there's a short in OSD installed on PCB

### \*\*\* Approximate Sieve Bed Pressures

@Sea level -----28 PSI

@2500 Ft-----26 PSI

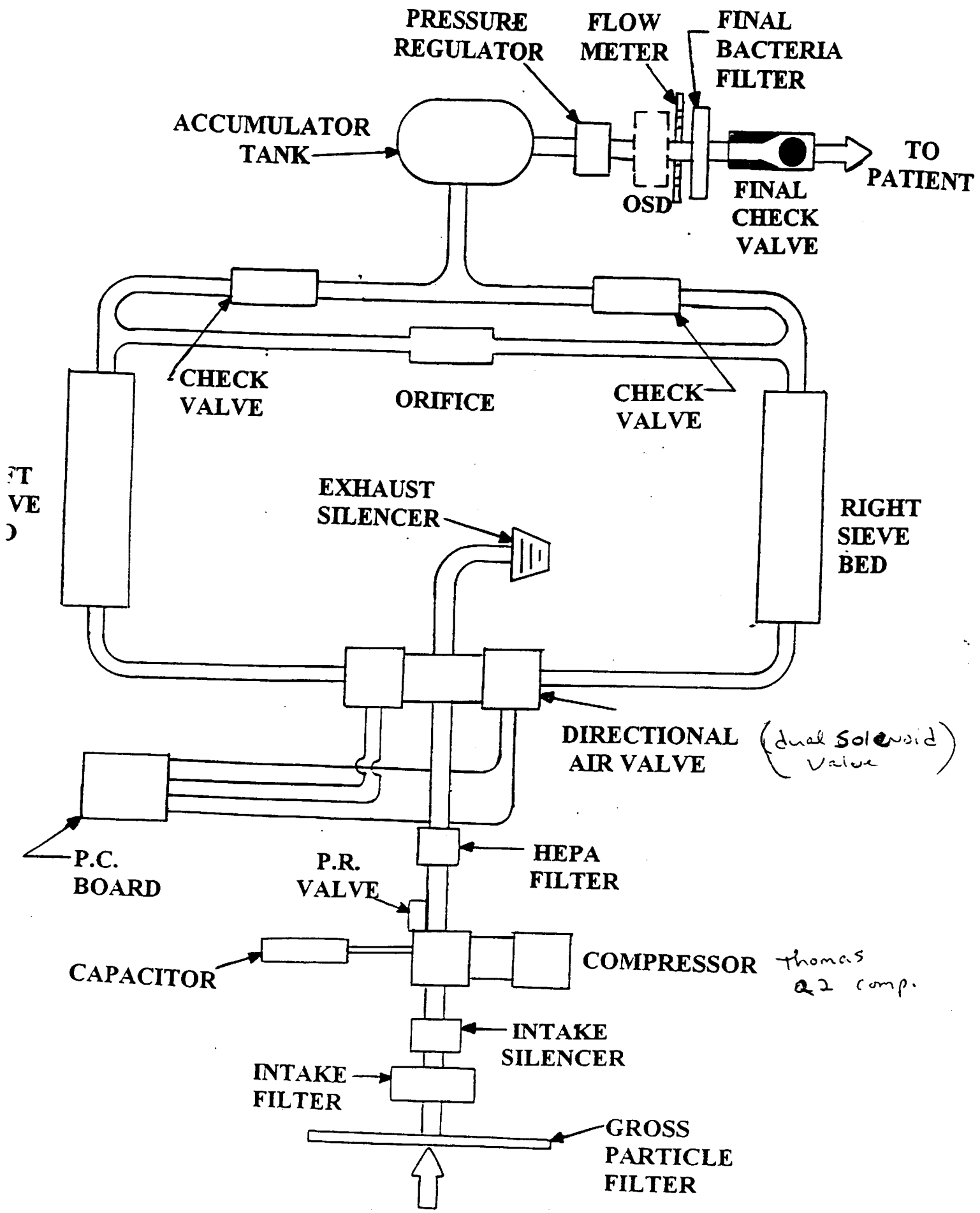
@5000 Ft-----23 PSI

Concentration Specification: @1-5 LPM ----- 93%+ 3%

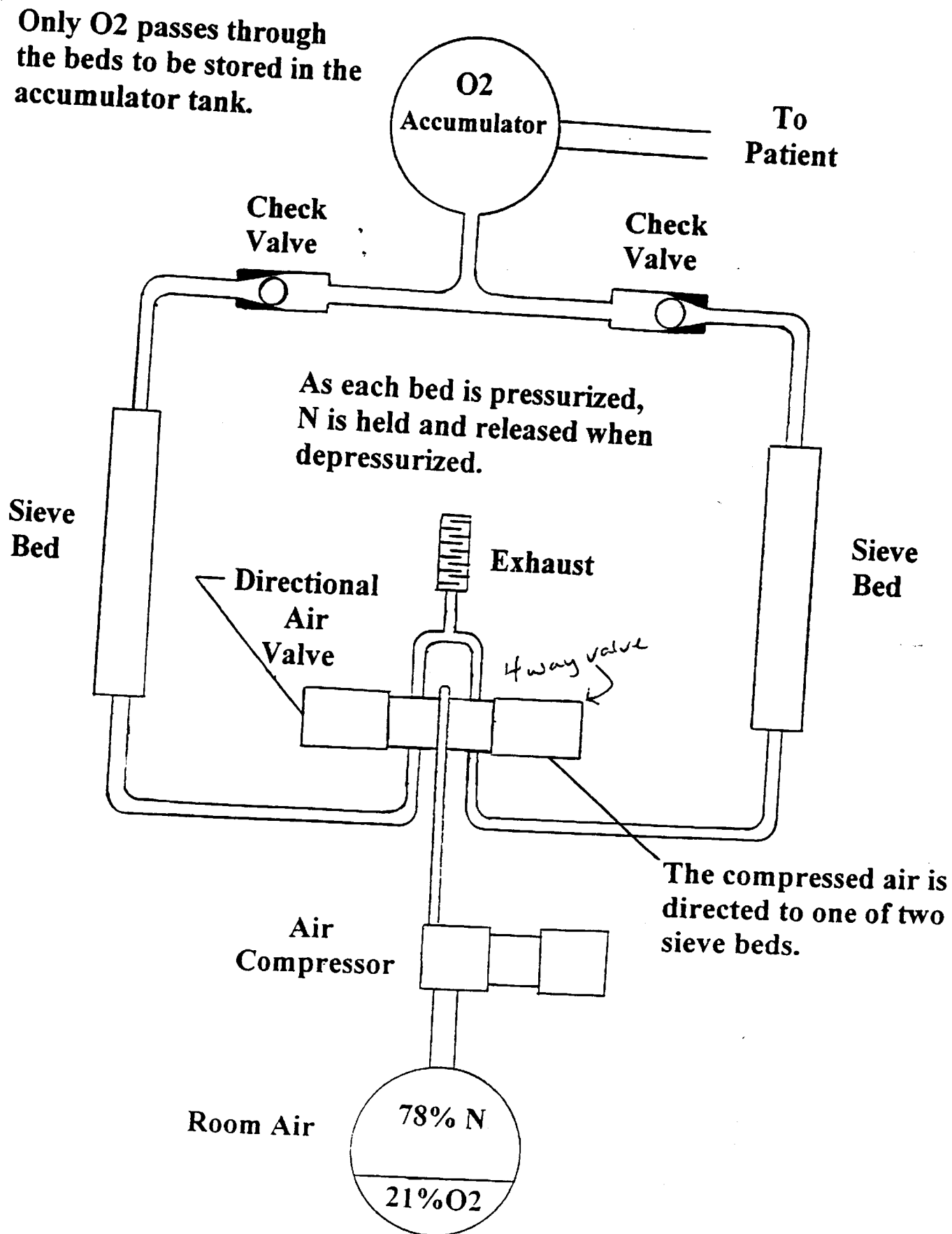
Note: On units with Short-Tube OSD only, (Serial #H20000DS and higher) the right sieve bed will pressurize first and the solenoid voltage is 7.5 VDC.

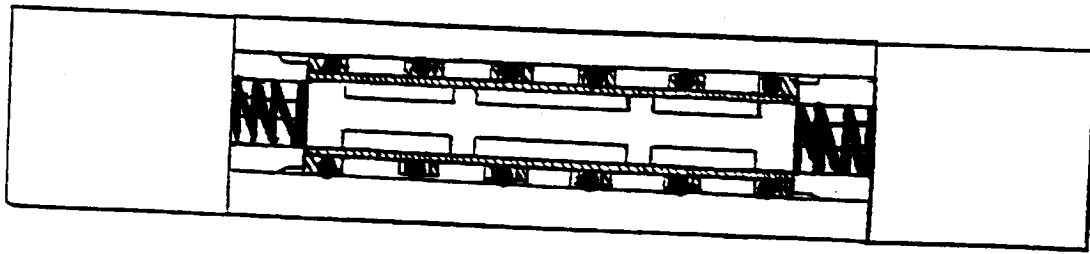
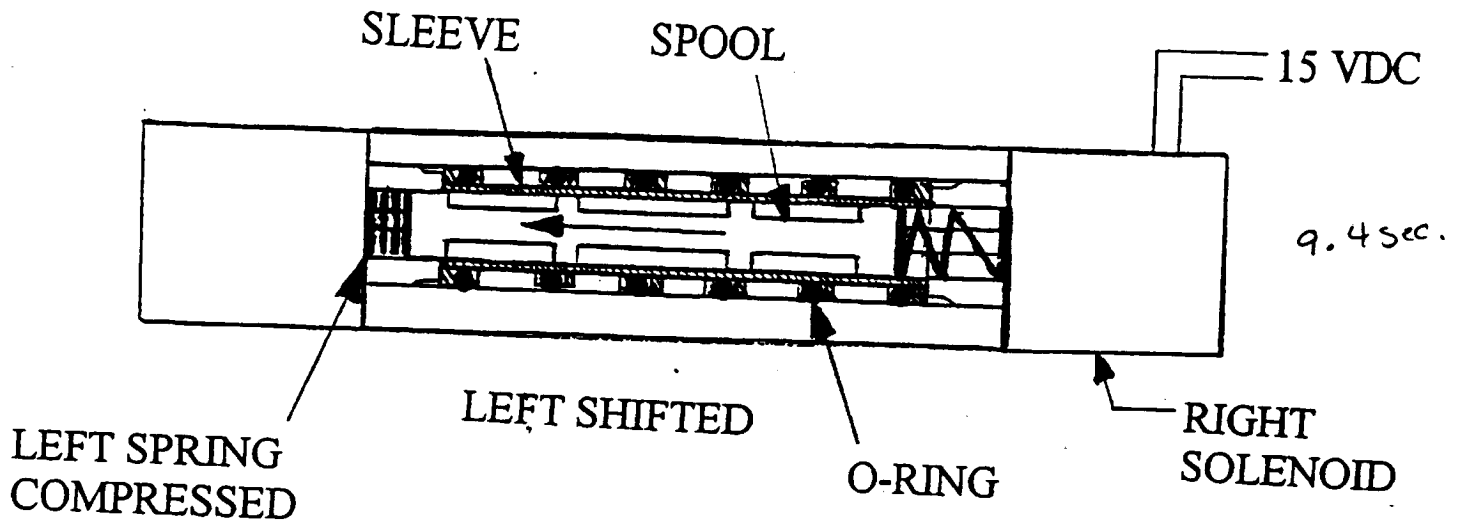


**SYSTEM DIAGRAM**

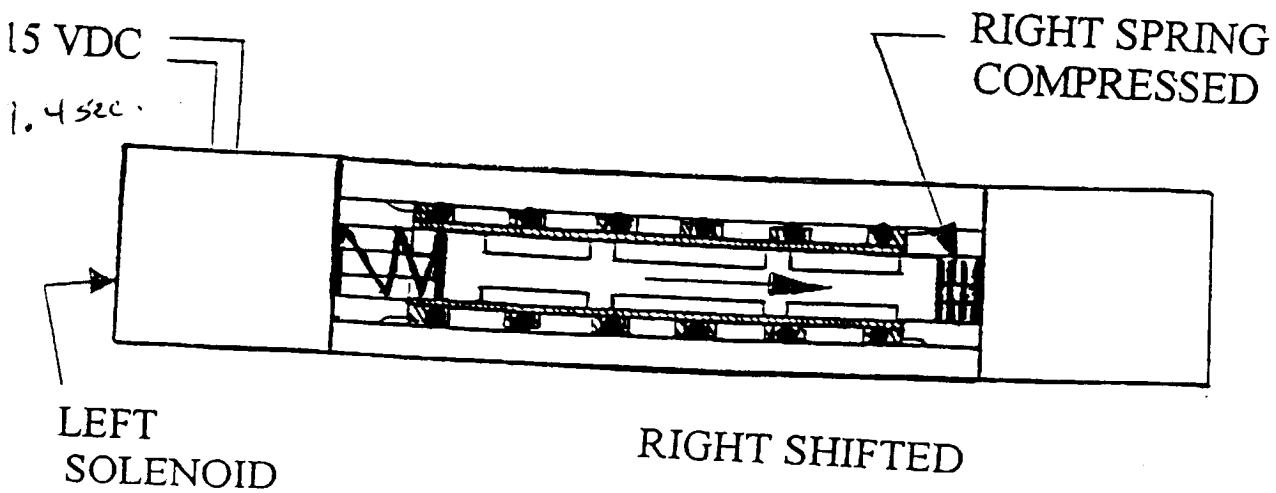


Only O<sub>2</sub> passes through the beds to be stored in the accumulator tank.





REST (MID) 1.2 sec.



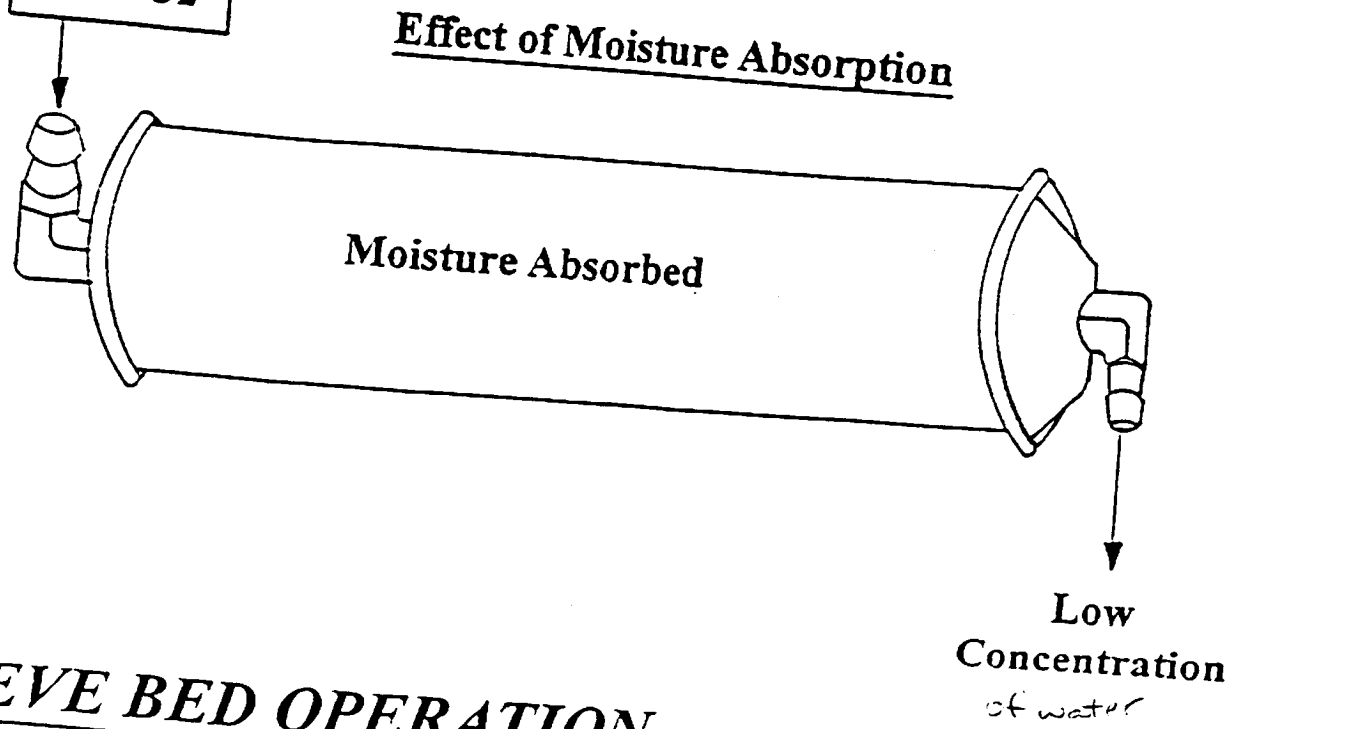
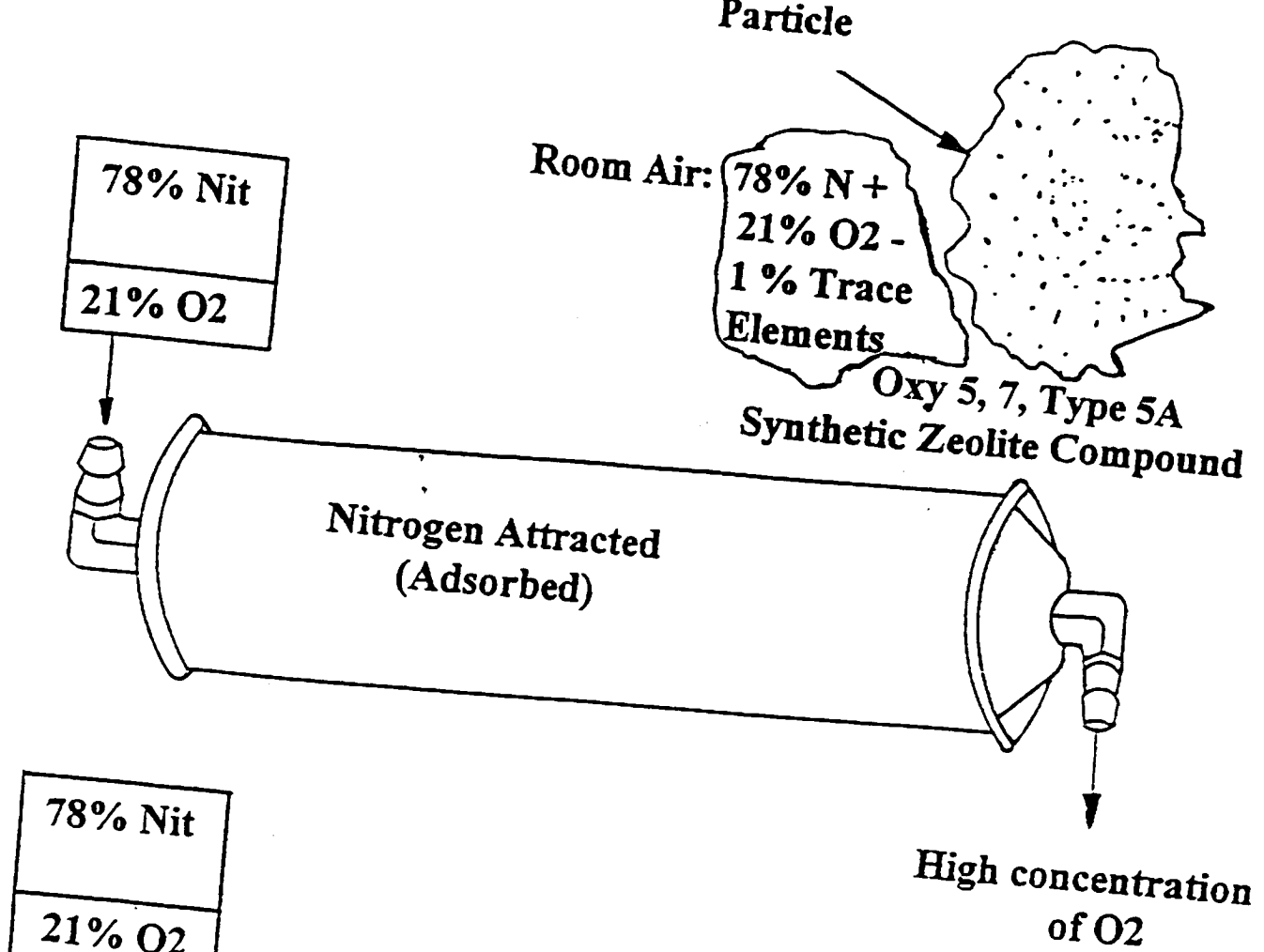
DS = 5/ 55D

# Model 515 Features

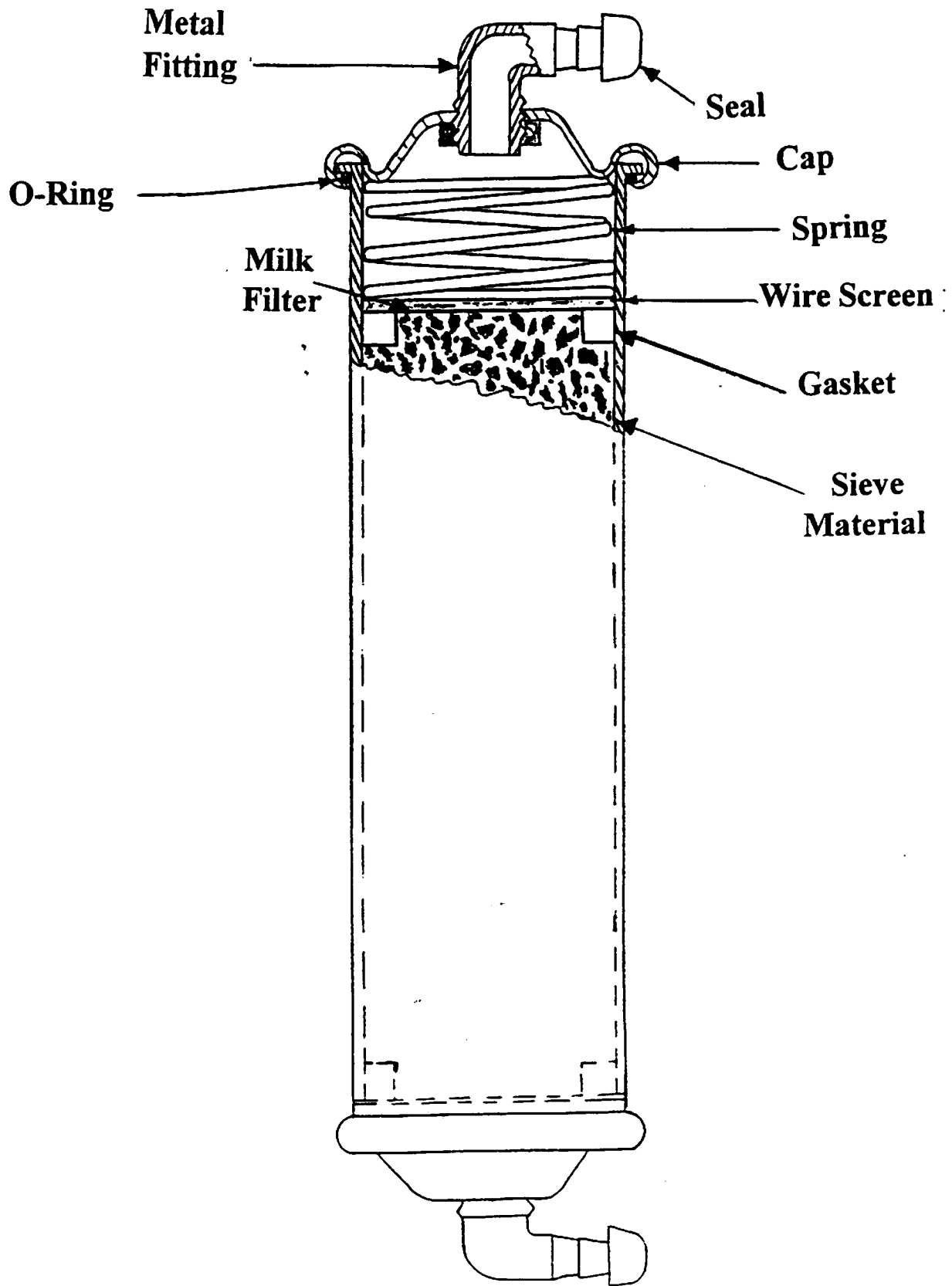
- Thomas Q2 compressor with 5 year warranty
- Dual solenoid 3 position valve with lifetime warranty
- Oxysiv 5 sieve beds
- SMART Track module and modem capability on OSD model (ext. modem)
- Pressure compensated flow meter - tells you what amt is reaching pt.
- Fixed humidifier port and recessed humidifier pocket

## Model 515 Specifications

Delivery rate	1-5 Liters per minute
Oxygen % $\pm 3\%$	93% @ 1-5 LPM
Operating system	Timed cycle
Sound level	50 dBA
Power consumption	400 Watts average
Weight	52 lbs.

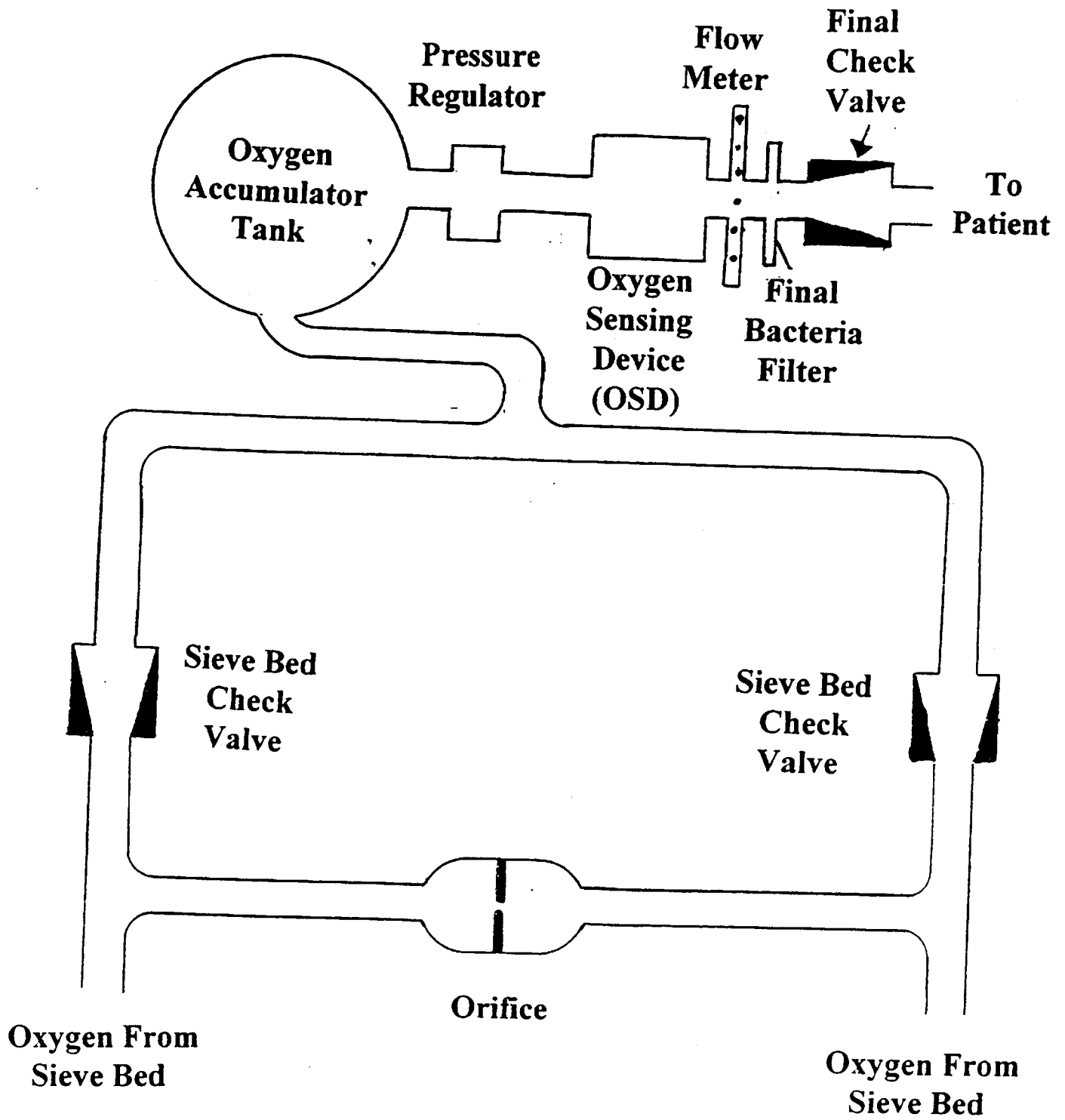


SIEVE BED OPERATION



## *SIEVE BED CONSTRUCTION*

# CHECK VALVE OPERATION



DZ = w/o OSD  
DS = w/ OSD

## Model 515 Features

- **Thomas Q2 compressor with 5 year warranty**
- **Dual solenoid 3 position valve with lifetime warranty**
- **Oxysiv 5 sieve beds**
- **SMART Track module and modem capability on OSD model (ext. modem)**
- **Pressure compensated flow meter - tells you what amt is reaching pt.**
- **Fixed humidifier port and recessed humidifier pocket**

## Model 515 Specifications

<b>Delivery rate</b>	<b>1-5 Liters per minute</b>
<b>Oxygen % <math>\pm 3\%</math></b>	<b>93% @ 1-5 LPM</b>
<b>Operating system</b>	<b>Timed cycle</b>
<b>Sound level</b>	<b>50 dBA</b>
<b>Power consumption</b>	<b>400 Watts average</b>
<b>Weight</b>	<b>52 lbs.</b>