



DRV Series Variable Operation Refrigeration Dryers

aerospace
climate control
electromechanical
filtration
liquid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.

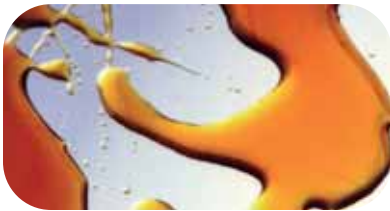
Compressed Air - The 4th Utility

Compressed air is a safe and reliable power source that is widely used throughout industry. Approximately 90% of all companies use compressed air in some aspect of their operations, however unlike gas, water and electricity, compressed air is generated on-site, giving the user responsibility for air quality and operational costs.

Without proper treatment, compressed air systems suffer from performance and reliability issues. Almost all of these issues can be directly attributed to contamination, the main sources of which are:

- The ambient air being drawn into the compressor
- The type and operation of the air compressor
- Compressed air storage vessels
- Distribution pipework

There are 10 major contaminants found in a compressed air system, these are:



- Water Vapor
- Condensed Water
- Water Aerosols
- Atmospheric Dirt
- Rust
- Pipescale
- Liquid Oil
- Oil Aerosols
- Oil Vapor
- Micro-organisms

The largest quantity of contamination introduced into the compressed air system originates from the atmospheric air drawn into the compressor and, not as often believed, introduced by the compressor itself. The most prolific and problematic of the contaminants is water. Water accounts for 99.9% of the total liquid contaminants found in a compressed air system.

High efficiency compressed air filtration is not only used to remove particulate and oil, but most importantly, it removes water aerosols and is key to operating an efficient compressed air system.

Therefore, regardless of what type of compressor is installed, the same level of filtration is required.

Contaminant Removal

Failure to remove this contaminant can cause numerous problems in the compressed air system, such as:

- Corrosion within storage vessels and the distribution system
- Blocked or frozen valves, cylinders, air motors and tools
- Damaged production equipment
- Premature unplanned desiccant changes for adsorption dryers

In addition to problems associated with the

compressed air system, allowing contamination such as water, particulate, oil and micro-organisms to exhaust from valves, cylinders, air motors and tools, can lead to an unhealthy working environment with the potential for personal injury, staff absences and financial compensation claims.

Compressed air contamination will ultimately lead to:

- Inefficient production processes
- Spoiled, damaged or reworked products
- Reduced production efficiency
- Increase manufacturing costs

What is refrigeration drying?

The use of refrigeration drying for compressed air treatment is tested and proven for many industrial applications. Dewpoints of 35°F (1.7°C) to 50°F (10°C) are suitable for many indoor applications where a general removal of bulk water and some vapor is sufficient for the end user's process.

Refrigeration dryers can be used at low pressures as well as high pressures and use no processed compressed air during the air treatment. Proper sizing factors must be used to determine the correct sized dryer for the application based on actual (or "worst case") flow, operating temperature and operating pressure.

Energy prices are a rising concern and a major cost to manufacturing facilities. Therefore, the refrigeration dryer has undergone many improvements to make them more energy efficient without sacrificing the quality of the air provided.

Refrigerated dryers use a set of heat exchangers or a single heat exchanger (with chambers) first to pre-cool the air; second, to refrigerate the air to condense out moisture vapor; and last, to re-heat the air to prevent pipe sweating downstream. Direct Expansion dryers are a type of dryer where the compressed air and the refrigerant come into direct contact via the heat exchanger. While reliable and simple to use, they generally require that the unit continue to run regardless of actual compressed air flow through the dryer. Cycling dryers utilize a thermal mass as the means to absorb the heat from the compressed air. By chilling a thermal mass, a refrigerant compressor may turn off in times of low demand thereby saving energy by shutting off the refrigerant compressor. There is, however, an additional heat transfer (the thermal mass), so a small amount of additional cost may or may not offset the amount of money saved by shutting off the compressor.

Variable Operation Dryers are on the cutting edge of energy efficiency and reliability in the compressed air treatment industry. VOD's self-adjust very quickly based on the actual conditions of even the most dynamic compressed air systems, utilizing only the energy required to treat the air entering the dryer...at any condition.

The use of refrigeration dryers is preferred:

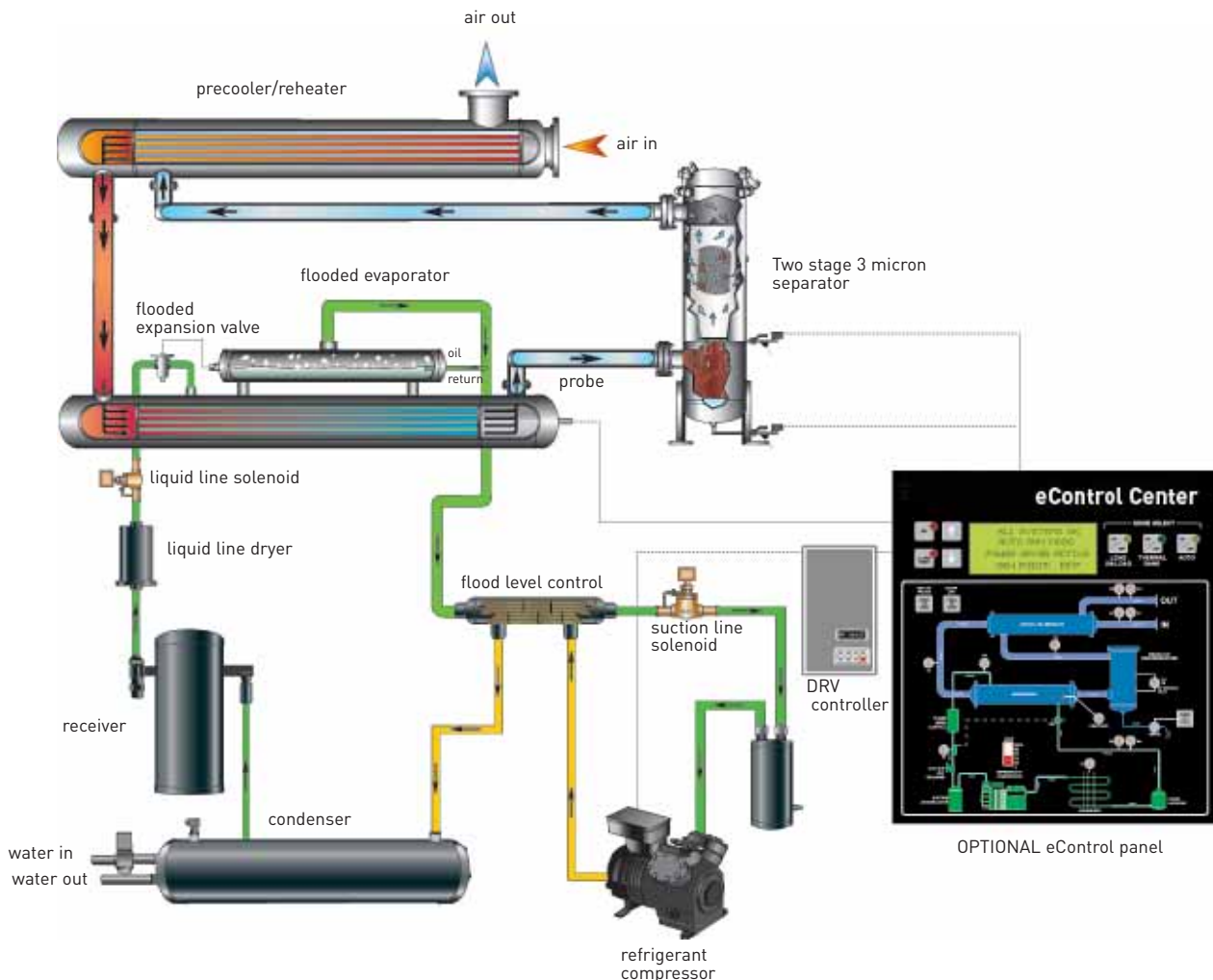
- in the capacity range of 5 scfm to 15000 scfm
- inlet temperatures to 120°F (48.9°C)
- wide ranges of operating pressures
- indoor applications
- system with fluctuating conditions and demand



Behind the scenes of the DRV Series Variable Operation Refrigeration Dryer

domnick hunter DRV Series Variable Operation Refrigeration Dryer offers the most advanced dryer technology available today. By utilizing a patented refrigeration system, coupled with variable speed controls, the **DRV Series** maximizes overall efficiency to make it the most advanced, energy efficient dryer on the market today.

- Refrigeration compressor speed responds directly to inlet load and cycles at very low flows
- Loadless start allows multiple compressor starts
- Dewpoint is unaffected by starting and stopping
- Fully active tube in shell evaporator assures lowest possible dewpoint
- Patented control monitors coldest air temperature to adjust the refrigeration compressor speed, precisely matching the load



Features

- Five-year warranty package
 - R404A environmentally friendly refrigerant
 - Refrigeration low pressure shut down
 - Refrigeration high pressure shut down
 - Refrigeration liquid line dryer
 - Refrigeration suction line dryer
 - Liquid line sight glass
 - Crank case heater
 - Demand drain with alarm light and contacts
 - Drain “push to test” key
 - Hermetic compressor standard on Models DRV1250 through DRV3000. Semi-Hermetic compressor standard on Models DRV3500 and larger.
 - Structural solid steel base
 - Isolation valves for compressor, evaporator, condenser and liquid receive
 - Condenser pressure relief valve
 - Compressor discharge check valve
 - Compressor isolation mounts
 - High efficiency liquid separation
 - Water aerosols
 - Dewpoint controller and display
 - On/off button load/no load mode
 - On/off button stop/start mode
 - Up/down adjustment buttons
 - Set button
 - Hidden superheat button
 - Power saver active LED
 - High dewpoint alarm LED
 - Drain control center
 - Air in pressure gauge
 - Air out pressure gauge
- Options
- Advanced eControl Center
 - NEMA 4
 - Air-cooled condenser (Remote on Models DRV4000 & larger)
 - Remote monitoring and control

High performance components



Tube in Shell Heat Exchanger

All **domnick hunter DRV Series** dryers are fitted with reliable and efficient copper tube in steel shell heat exchangers for rapid and efficient heat transfer.

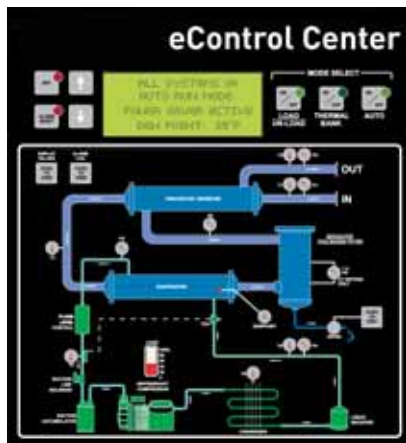


Hermetic & Semi-hermetic Refrigeration Compressors

Models DRV1250 through DRV3000 use time proven and durable hermetic refrigeration compressors. A unique loadless starting design coupled with variable capacity drive (VCD) results in greatly reduced compressor wear. The result...smooth, trouble-free operation and elimination of damaging head pressure starts. Models DRV3500 and larger use semi-hermetic refrigeration compressors to further enhance efficiency. Through a combination of loadless starting, VCD and the added benefits of multi-stage cylinder head unloading, the ultimate in smooth operation and efficiency are realized.



Options



domnick hunter's eControl center features a complete complement of data acquisition functions. The easy to use **eControl** affords superior dryer control along with digital telemetry, for remote analysis of performance. **eControl** features an "Auto" mode that will switch between standard "Load/Unload" and "Thermal Bank" operation as demand dictates. The Auto Selection innovation will greatly expand the dryer's functionality and utility.

eControl has a distinctive "Flow Schematic" with active indicators. Dryer operation is easily viewed and ascertained. Should any parameter be outside a normal value, the system schematic annunciates by flashing the source area problem, as well as specifically stating details in the LCD display. A Load Capacity Meter (LCM) shows the percent-of-burden at which the system is performing at any given moment.

Housed in a NEMA 4X control enclosure, **eControl** will display everything relative to dryer operations. But that's just the surface...In depth information is available at the touch of a button. Easily navigated menus present detailed operational data. Every nuance can be studied (or adjusted if appropriate), assuring both the "wellness" of the dryer, as well as quality of the performance.

Optional **OIL-X EVOLUTION** pre- & after filters complete the perfect compressed air system.



OIL-X EVOLUTION filters provide air quality in accordance with ISO 8573.1:2001, the international standard for compressed air quality. **OIL-X EVOLUTION** coalescing filters are the first range of filters specifically designed to deliver air quality in accordance with ISO 8573.1:2001 when tested with the stringent requirements of the new ISO 12500-1 international for Compressed Air Testing. **OIL-X EVOLUTION** coalescing and dust removal filters are covered by one year compressed air quality guarantee which is automatically renewed with annual maintenance.

Energy efficiency



- **Combines the energy savings of variable speed and cycling to achieve unsurpassed energy savings at all loads**
- **Low pressure drop, non-fouling heat exchangers reduce energy consumption**
- **Patented controls monitor and maintain actual dewpoint while providing maximum part load energy savings**
- **Zero to 100% capacity allows single dryer application with multiple air compressors**
- **No-loss drain valves eliminate waste of valuable compressed air**
- **The industry's only variable speed dryer that will cycle "off"**

Productivity

- Dewpoint is guaranteed under all operating conditions, 0 to 100% load, eliminating potential system contamination
- Smooth modulating refrigeration system eliminates dewpoint spikes
- Robustly designed with rugged system components for reliable operation, minimizing down time and product spoilage
- High efficiency 3 micron element in the separator protects critical applications by removing coalesced water

Reliability



- Heat exchangers designed with grooved tube sheets to provide reliable leak-free operation
- Heat exchangers backed by 10-year warranty
- Soft starting refrigeration compressors provide longer service life and require less maintenance
- Unique design eliminates the need for troublesome hot gas bypass valve
- Refrigeration isolation valves improve serviceability and reduce downtime
- Patented refrigeration system assures oil return to the compressor (regardless of refrigerant velocity), preventing flood-back under all operating conditions
- Patent pending technology prevents nuisance shutdowns in high ambient conditions

Innovation



- Refrigeration compressor speed responds directly to inlet load and cycles off at very low flows. Utilizing Exclusive Proportional Staging & Gain Control
- Flood Level Control protects the compressor from refrigerant “floodback” and ensures proper oil return to the compressor
- Loadless start allows multiple compressor starts
- Dewpoint is unaffected by starting and stopping
- Fully active-tube-in-shell evaporator assures lowest possible dewpoint. Air flows through the tubes, and refrigerant through the shell
- Patented control panel monitors the coldest air temperature, and adjust the refrigeration compressor speed to precisely match the load
- Dewpoint guarantee: 33 - 39°F from 0-100% load
- Optional 100% compressor back-up with auto switching

Technical Data

Model	Capacity scfm	Water-cooled Compressor kW	Dimensions in (mm)			Approx Weight lbs (kg)	Recommended Prefilter	Recommended Afterfilter	Air In/Out	Water In/Out	Power Supply (V/Ph/Hz)
			A	B	C						
DRV 1250	1250	6.4	74 (1880)	41 (1041)	65 (1651)	1850 (839)	AO-055JNFI	AA-055JNFI	3" Flg	1" NPT	460/3/60
DRV 1420	1420	7.2	78 (1981)	48 (1219)	72 (1829)	2130 (966)	AO-2250ODFI	AA-2250ODFI	4" Flg	1" NPT	460/3/60
DRV 1600	1600	8.0	78 (1981)	48 (1219)	72 (1829)	2190 (993)	AO-2250ODFI	AA-2250ODFI	4" Flg	1" NPT	460/3/60
DRV 2000	2000	8.4	102 (2591)	54 (1372)	76 (1930)	2800 (1270)	AO-2250ODFI	AA-2250ODFI	6" Flg	1" NPT	460/3/60
DRV 2500	2500	8.8	106 (2692)	57 (1448)	68 (1727)	3050 (1383)	AO-2300PDFI	AA-2300PDFI	6" Flg	1" NPT	460/3/60
DRV 3000	3000	11	110 (2794)	66 (1676)	84 (2134)	4520 (2050)	AO-2350PDFI	AA-2350PDFI	6" Flg	1" NPT	460/3/60
DRV 3500	3500	13.2	110 (2794)	66 (1676)	84 (2134)	4860 (2205)	AO-2350PDFI	AA-2350PDFI	6" Flg	1½" NPT	460/3/60
DRV 4000	4000	14	114 (2896)	70 (1778)	95 (2413)	5680 (2576)	AO-2350PDFI	AA-2350PDFI	8" Flg	1½" NPT	460/3/60
DRV 4500	4500	16.3	114 (2896)	70 (1778)	95 (2413)	5920 (2686)	AO-2400QDFI	AA-2400QDFI	8" Flg	1½" NPT	460/3/60
DRV 5000	5000	18.9	114 (2896)	69 (1753)	85 (2159)	6415 (2910)	AO-2400QDFI	AA-2400QDFI	8" Flg	2" NPT	468/3/60
DRV 6000	6000	21.6	148 (3759)	76 (1930)	85 (2159)	7725 (3504)	AO-2400QDFI	AA-2400QDFI	8" Flg	2" NPT	460/3/60
DRV 7000	7000	25.9	148 (3759)	79 (2007)	92 (2337)	9225 (4184)	AO-2400QDFI	AA-2400QDFI	8" Flg	2½" NPT	460/3/60
DRV 8000	8000	32.9	148 (3759)	79 (2007)	92 (2337)	9610 (4359)	AO-2450QDFI	AA-2450QDFI	10" Flg	2½" NPT	460/3/60
DRV 9000	9000	37.4	149 (3785)	82 (2083)	92 (2337)	10050 (4763)	AO-2450QDFI	AA-2450QDFI	10" Flg	2½" NPT	460/3/60
DRV 10000	10000	39.8	149 (3785)	82 (2083)	92 (2337)	11020 (4999)	AO-2450QDFI	AA-2450QDFI	10" Flg	2½" NPT	460/3/60
DRV 12500	12500	49.4	154 (3912)	92 (2337)	105 (2667)	13250 (6010)	AO-2500SDFI	AA-2500SDFI	12" Flg	2½" NPT	460/3/60
DRV 15000	15000	56.8	154 (3912)	92 (2337)	105 (2667)	14600 (6623)	AO-2500SDFI	AA-2500SDFI	12" Flg	3" NPT	460/3/60

575V units are available for the Canadian market in place of 460V.

Flow correction factors

To obtain dryer capacity at new conditions, multiply capacity x C1 x C2 x C3.

Ambient Temperature (C1) air-cooled only

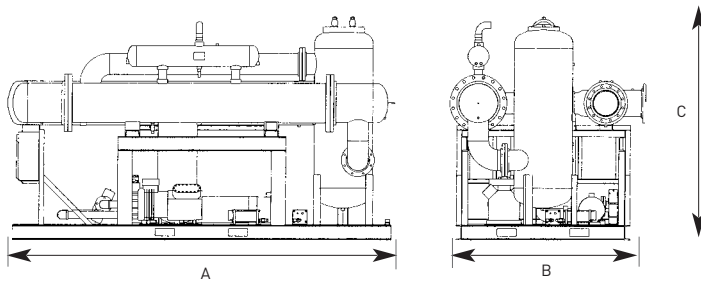
F	90	95	100	105	110	120
C	32	35	38	40	43	49
Factor	1.05	1.08	1.00	0.95	0.90	CF

Inlet Temperature (C2)

F	80	85	90	95	100	105	110	115	120	130	140
C	27	30	32	35	38	40	43	46	49	54	60
Factor	1.5	1.36	1.22	1.11	1.00	0.92	0.83	0.76	0.69	0.56	0.46

Inlet Pressure (C3)

psi g	50	60	70	80	90	100	110	120	130	140	150
bar g	3.45	4.14	4.83	5.52	6.21	6.9	7.59	8.28	8.97	9.66	10.4
Factor	0.80	0.84	0.88	0.92	0.96	1.00	1.01	1.02	1.03	1.04	1.05



A division of Parker Hannifin Corporation

© 2008 Parker-Hannifin Corporation
Publication Reference: DRV 07/08 Rev. 001

Parker Hannifin
domnick hunter division
North Carolina, USA
Tel: (704) 921-9303
Toll Free: 1-800-345-8462
Fax: (704) 921-1960



domnick hunter Canada
Ontario, Canada
Tel: (905) 820-7146
Toll Free: 1-888-342-2623
Fax: (905) 820-5463

www.domnickhunter.com

dh, domnick hunter, OIL-X, OIL-X EVOLUTION, TETPOR, PNEUDRI and VALAIRDATA are registered trademarks of Parker-Hannifin Corporation.

Parker-Hannifin Corporation, domnick hunter division has a continuous policy of product development and although the Company reserves the right to change specifications, it attempts to keep customers informed of any alterations. This publication is for general information only and customers are requested to contact your domnick hunter sales representative for detailed information and advice on a products suitability for specific applications. All products are sold subject to the Company's standard conditions of sale.