



Ultramax Refrigerated Compressed Air Dryers

TREATMENT PACKAGES

(Dryers | Filters | Water Separators)

Brochure & Technical Data



RFD Dryer Series

DESCRIPTION

Designed and built tough for Australian Conditions, Ultramax offers the RFD Digital Cycling Refrigerated Compressed Air Dryer Treatment Packages. These treatment packages include a host of innovative design features focused on efficiency, durability and quick maintenance.

Advantages and Features:

Ultramax provides a whole range of products for filtration and air purification applications with a cost effective price;

- Designed for Harsh Australian Conditions. The RFD Dryers easily run with rated flows at 60 C° (maximum inlet temperature) and 50 C° (ambient temperature)
- Energy saving – true green product
- 3-in-1 heat exchanger
- High efficiency compressors
- Globally marketable refrigerant R-134a
- Standard electronic timer drains for 10 scfm and above
- Refrigerant analyzer indicator
- Fan cycle switch
- Easy removable side panels and parts
- Consistent dew point performance
- Low power consumption
- Low pressure drop
- Insulated heat exchanger
- Evaporator with multi-stage separator stainless steel demister
- High quality fan motors
- Oversized condenser
- Ideal for breathing air applications



RFD SERIES - BUILT FOR AUSTRALIAN HARSH CONDITIONS

Key to the design of RFD Series is its use of environmentally friendly **R134a refrigerant** gas, making it suitable for low and high temperature applications whilst retaining excellent thermodynamic properties. Additionally operating at consistently lower pressures aids in increasing the compressors lifespan and reduces daily wear and tear. Innovative engineering solutions have also resulted in extra power being added to the heat exchangers, a no loss insulation system and constant dewpoint at all flow ranges. Using the R-134a refrigerants also allows our units to operate within high ambient temperature environments making them ideal for Australia's demanding conditions.



Key Features

WHY USE R-134A REFRIGERANT GAS?

All Ultramax refrigerant dryers use R-134a refrigerant, offering the following host of features:

- Does not deplete ozone
- Thermodynamic properties similar to R-12 (dichlorodifluoromethane)
- 100% chlorine free
- Environmentally Friendly
- Completely inert
- High and low temperature refrigerant
- Operates at nearly half the pressure of other refrigerants, so the compressor life span will increase.
- R-134a makes the refrigerated dryer much more tolerant to adverse conditions such as high ambient temperature.

STREAMLINED WIRING & ELECTRICAL PROTECTION

Quick and easy access to the dryer internals is a key design feature of the Ultramax RFD Series dryers. RFD-1110 and larger dryers include a unique electrical box which can be accessed from the outside via an access panel. This makes it easy to access the electrical controls for installation set-up and service. All of the Ultramax RFD Series dryers are rated to IP54 standard which means the electrical controls are protected from limited dust and water spray from any direction.



Built to Australian Specification and Australian Conditions



Key Features



ALL-IN-ONE INBUILT FILTERS & COMPACT DESIGN

Ultramax Refrigerated Air Dryers are suitable for some of the smallest of installation spaces. This is due to having two **integrated filters housings** built directly into the dryer frame, offering a huge advantage in not only space efficiency but also in terms of service times as well. With filters coming pre-installed upon arrival, both labour and piping costs are greatly reduced during the installation process. This compact design offers further benefits in terms of placement flexibility onsite and increased economy during transport and shipping.

QUICK-CARTRIDGE SYSTEM

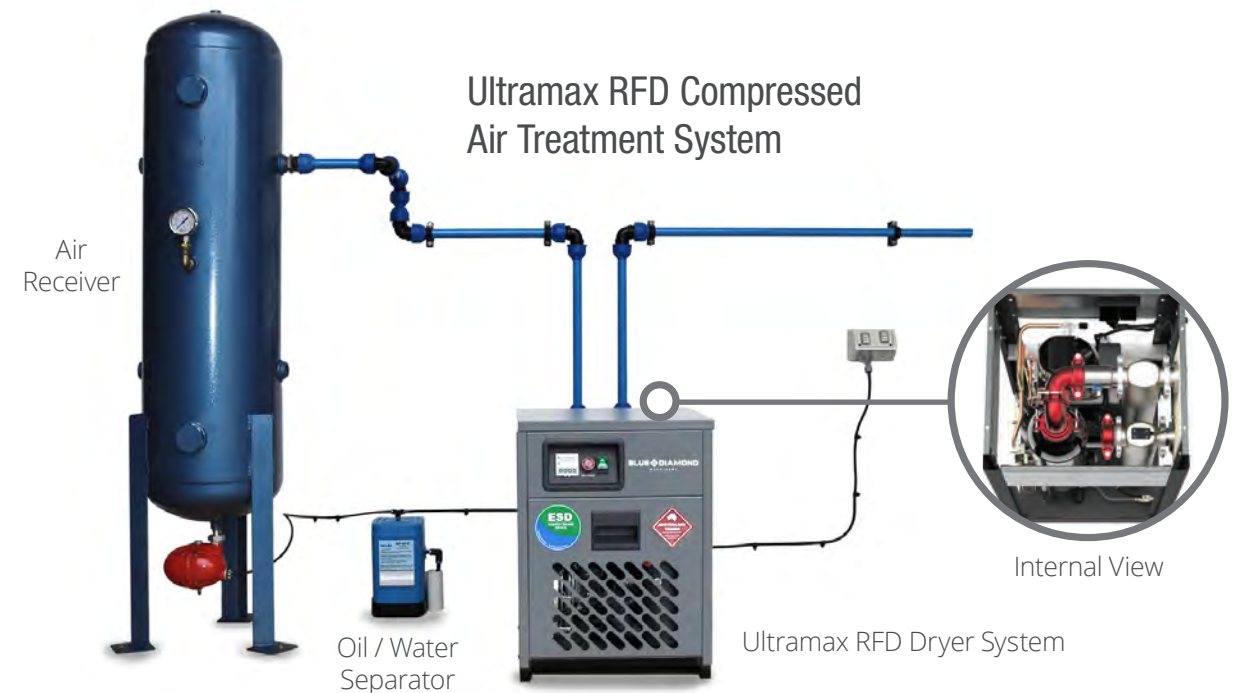
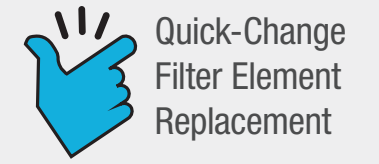
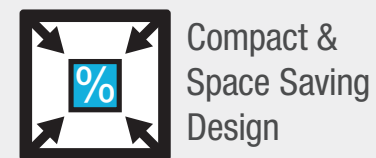
Key to the Ultramax RFD Dryers success is the unique "Quick-Change" filter system. Drawing on the feed back of a host of experienced field engineers and service technicians, our design engineers have created a industry first, service friendly, zero clearance design that allows maintenance to be undertaken in only a couple of minutes by streamlining installation fixtures and mounts. Our **tie-rod free**, quick-fit design allows replacement filters to be easily slotted in and resealed in a fraction of the time of a traditional system.

Ultramax RFD Dryer units come with compressed air filter kits already **pre-fitted**. Each kit contains a filter with a X Element (coalescing filter for particulate removal) used for up to 1 micron particles alongside another with a Y Element (coalescing filter for oil removal), used to remove oil down to 0.01 ppm. As these kits are pre-fitted, onsite installation and additional, hidden filter costs normally associated with traditional Dryers are minimised.



When comparing a traditional dryer, filter and bypass system (above) to a system built around an Ultramax RFD Series Dryer (below), the gains in space efficiency and the savings in cost and time not spent on installation and fittings becomes

obvious. By incorporating the filter housings within the dryer body itself and utilising a "Quick-Cartridge" element replacement system, Ultramax RFD Series Dryers offer excellent performance in an efficient, convenient and compact package.

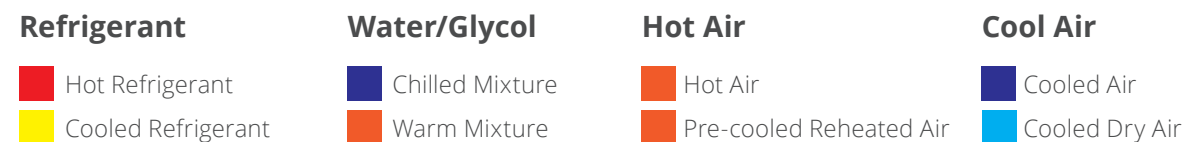
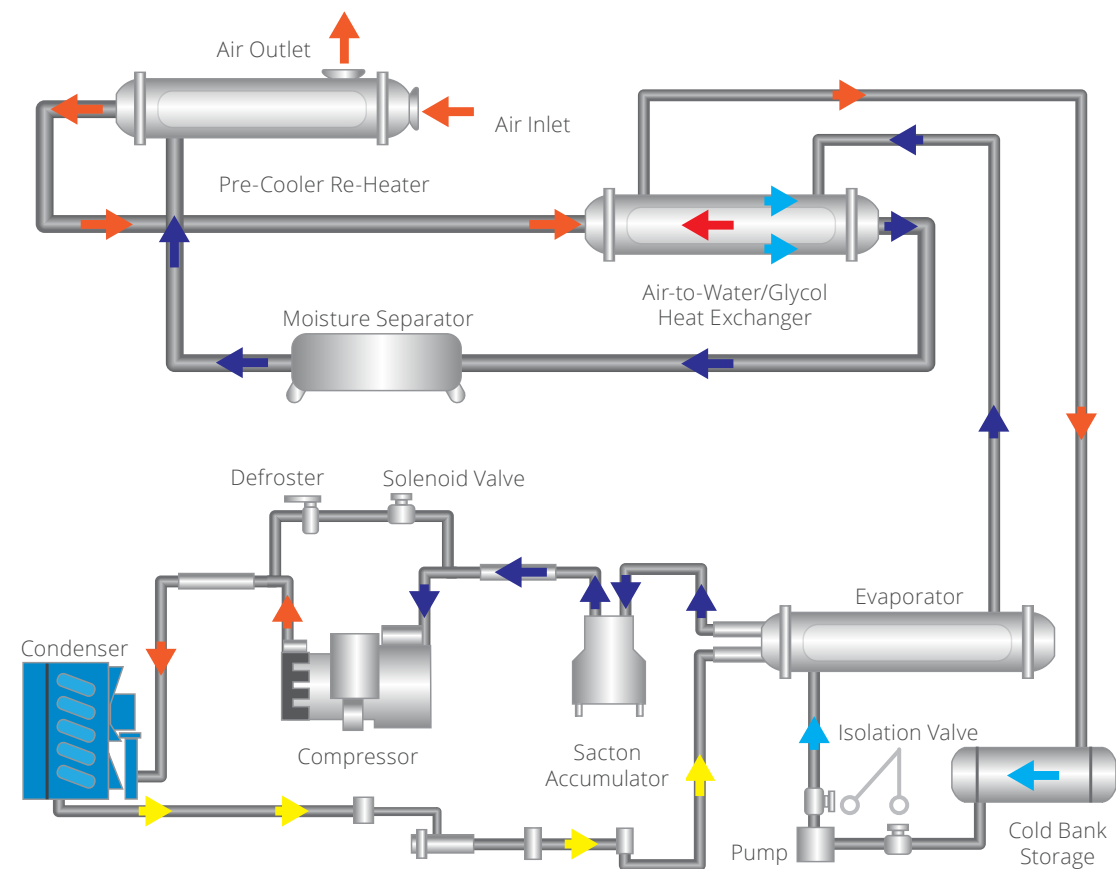


RFD Dryer Series

HOW REFRIGERATED CYCLING DRYERS WORKS

Hot saturated air from the after-cooler enters the air-to-air heat exchanger, where the air is pre-cooled by the cold, dry air leaving the heat exchanger. The pre-cooled air then enters the air/glycol heat exchanger where it is cooled to its final dew point by chilled water/glycol, flowing in the counter-current direction through the shell. The chilled air passes through the moisture separator, which has a high efficiency of separation at different flow rates. Condensate is removed from the using a timed drain valve. Finally, the cold, dry air is reheated in the air-to-air heat exchanger by the incoming hot air for maximum volumetric efficiency before exiting the dryer.

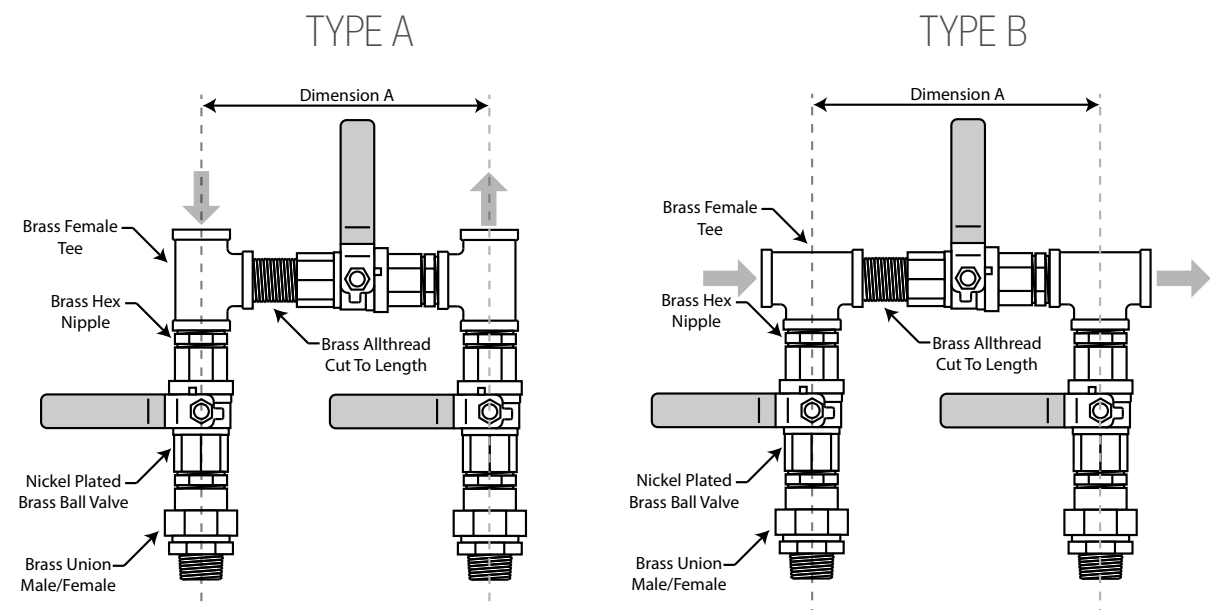
The water/glycol is chilled by a cycling refrigeration system and continuously pumped through the shell side of the air/glycol heat exchanger. The glycol flow rate remains constant, regardless of compressed air load. The refrigeration compressor unloads/or cycles OFF when pre-set temperature is reached for water/ glycol, thus minimizing electrical power consumption.



Key Features

ULTRAMAX QUICK FIT BYPASS SETS

Our pre-made by-pass sets make an ideal addition to your dryer installation. These sets allow for quick by-passing of the dryer during servicing and filter change outs for no interruption or shutting down of the entire compressed air system for no delay in your air supply to production. As an "off the shelf" item, these sets help by lowering initial costs and time spent on installation. Simply order your set from the table below to suit your dryer.



| PART NUMBER* | SUITS DRYER MODEL | DIMENSION A |
|------------------|-------------------|-------------|
| RFD18-42-BPSET | RFD-18 | 117 |
| | RFD-30 | |
| | RFD-42 | |
| RFD66-130-BPSET | RFD-66 | 151 |
| | RFD-96 | |
| | RFD-130 | |
| RFD168-300-BPSET | RFD-168 | 193 |
| | RFD-240 | |
| | RFD-300 | |
| RFD396-498-BPSET | RFD-396 | 290 |
| | RFD-498 | |
| RFD660-870-BPSET | RFD-660 | 382 |
| | RFD-870 | |

PLEASE NOTE: When selecting a model, be sure to specify A or B after the model number for the required type. E.g. RFD18-42-BPSET Type A has a part number of RFD18-42-BPSETA

Key Features

ENERGY SAVING DEVICE (ESD) - LOWER OPERATING COSTS

All Ultramax RFD Dryer units come equipped with a Digital Controller and Energy Saving Device (ESD) which boasts a host of economy features and alarm capabilities, resulting in highly efficient and consistent dryer solution for compressed air applications. Alongside aiding in reducing energy consumption by adjusting compressor output in real time. The ESD feature helps service techs to monitor many useful parameters and readings, greatly aiding in troubleshooting and problem solving, ultimately improving service efficiency and turnaround times.



ESD units allow Ultramax RFD Dryers to continue functioning without the need for compressed air to be moving through the system and offer **autonomous** shut-down features suitable for weekends, nights and holidays. This greatly reduces running costs by simply shutting down the dryer automatically when it is not in use.

DANFOSS REFRIGERATION CONTROLS

Ultramax RFD Series dryers make use of industry leading Danfoss Refrigeration controls. Based in Denmark and with over 80 years of innovative experience, Danfoss produces high quality components, sub-assemblies and integrated solutions for air compressors, refrigerant and absorption dryers for the compressed air industry and provides the Ultramax RFD Series Dryers range with efficient, high quality and reliable controls.



SPARE PARTS & SERVICE

Ultramax stocks an extensive range of spare parts for our full host of RFD Dryers, which when combined with our strong support and service network, ensures our Dryers are able to operate at their best and if any issue should occur, it can be addressed easy and efficiently, minimising any on-site delays.



GROOVED COUPLINGS & FITTINGS

Designed with quick and easy service in mind, grooved couplings and fittings offer increased connection flexibility and durability, allowing service technicians to dismantle and assemble piping efficiently.



FILTER AUTO CONDENSATE DRAINS

Ultramax RFD Dryers include drain tubes connected to both the water separator's timed solenoid drain and the in-line filters housings. These tubes are connected together into one drain tube that **exits the cabinet**. This tube can then easily be connected to a central condensate drain tubing network or point of disposal, removing the need for traditional extensive draining lines and time consuming installation.

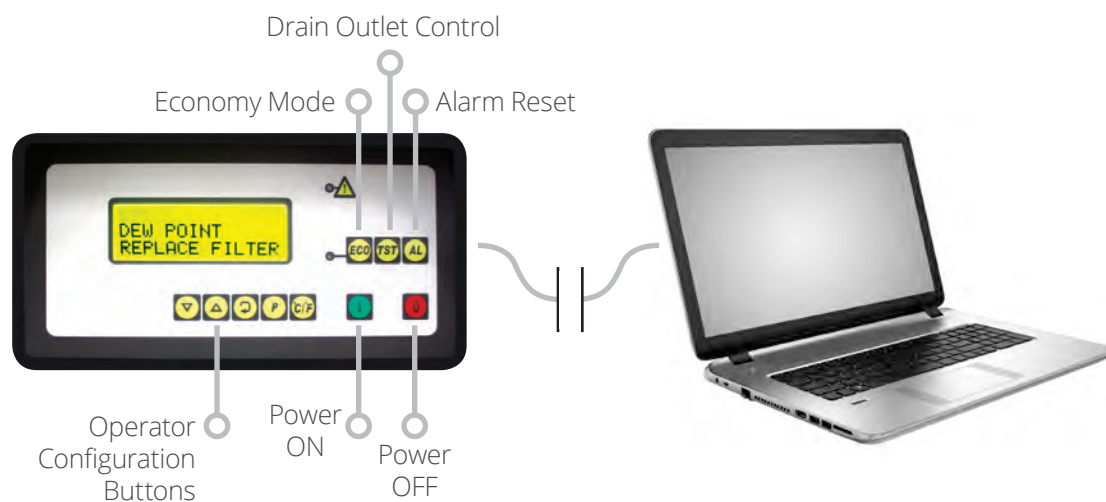


RFD Dryer Series

COMPREHENSIVE CONTROLS

Advanced, User-Friendly Microprocessor Controls Models RFD-1110 and larger dryers include an ESD-3 SMART controller:

- Digital multi-functional display
- Digital dew point temperature read-out for an accurate indication of actual working conditions
- Multiple alarm safety with easy-to-understand coded messages
- Extensive programmability allows system to be personalized to individual user needs
- Status reports for quick reference to dryer operation
- Indicator to optimize preventive maintenance
- Volt-free alarm contact offers a remote status signal
- The controller has 8 temperature sensor inputs



REMOTE MONITORING CAPABILITIES (OPTIONAL)

The Ultramax controller has a communications interface that can be used for remotely monitoring. Modbus RTU protocol is used for communication. The user can remotely start the dryer, stop the dryer, reset any alarm and monitor:

- Evaporator temperature
- Inlet air temperature
- Ambient temperature
- Refrigerant gas high and low temperature
- Fan, compressor and condenser working conditions
- Dew point
- Drain function
- Working hours

Key Features

DIGI-PRO DIGITAL CONTROLLER (MODELS RFD-18 TO RFD-870)

Our newest generation of air dryers makes use of a new range of Digi-Pro series controllers. With these latest Digi-Pro series controllers, our air dryers offer outstanding technology in both form and function.

The new controller design offers one finger adjustment, increasing accessibility and ease of use. Similarly, the multi-functional display provides an accurate digital dew point display as well as coded alarm monitoring of the refrigerant dryer itself.



KEY FEATURES

- Digital dew point monitoring
- Energy-saving mode display
- Periodic maintenance interval display
- Status report
- Hours run meter
- Fahrenheit and Centigrade selection

ELECTRO-MECHANICAL CONTROLLER ESD3 (MODELS RFD-1110 AND ABOVE)

This range of controllers has a communications interface that can be used for remote monitoring. Modbus RTU protocol is used for communication, allowing users to start/stop the dryer, reset any alarm and monitor it remotely:



- Dew point indicator: Located on the control panel, displays dew point reading
- Energy Saving Device: (ESD) This device helps dryer save energy when there is not any compressed air flow through the dryer.
- Filter change alarm on the front panel
- Remote Stop/Start
- Remote Alarm Voltage Free Contacts - Normally Open

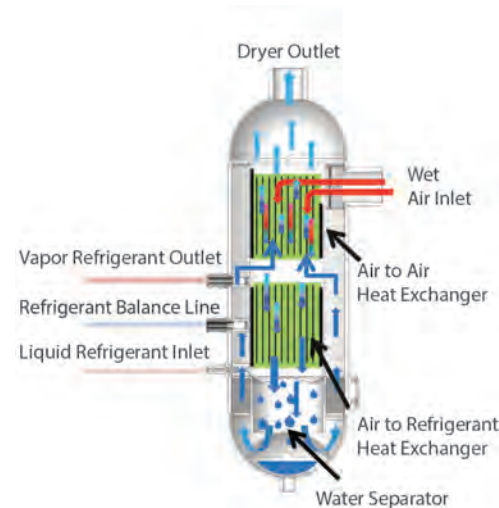
The information in this document is accurate at time of print and is subject to change without notice.

Key Features

ALUMINIUM PLATE HEAT EXCHANGER

The dryers are equipped with a compact Mono-Bloc Heat Exchanger module. This assembly has been specially designed to dry compressed air and includes the following key features:

- Very low pressure drop
- A centrifugal condensate separator for high efficiency condensate removal and requiring no maintenance.
- Rust free for very long service life



SCROLL COMPRESSORS

Selected specifically for their strength against liquid shock and high-energy efficiency, Scroll Compressors are an ideal choice for the RFD Range of Dryer as they offer a compact, quiet and low-maintenance solution.

EASY ACCESS

Cooling components are quickly and easily accessed via the screw free panels and plastic handles located around the unit. Simply unclip the panels in one easy action to change filters and perform other maintenance activities.



Technical Details

DIMENSIONS*

| MODEL | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | WEIGHT (Kg) |
|-----------|-------------|------------|-------------|-------------|
| RFD-18 | 413 | 363 | 557 | 32 |
| RFD-30 | 413 | 363 | 557 | 32 |
| RFD-42 | 413 | 363 | 557 | 32 |
| RFD-66 | 473 | 453 | 832 | 51 |
| RFD-96 | 473 | 453 | 832 | 53 |
| RFD-130 | 473 | 453 | 832 | 55 |
| RFD-168 | 553 | 503 | 874 | 78 |
| RFD-240 | 553 | 503 | 874 | 83 |
| RFD-300 | 553 | 503 | 874 | 86 |
| RFD-396 | 678 | 648 | 1157 | 160 |
| RFD-498 | 678 | 648 | 1157 | 165 |
| RFD-660 | 948 | 728 | 1370 | 220 |
| RFD-870 | 948 | 728 | 1370 | 230 |
| RFD-1110 | 948 | 798 | 1460 | 270 |
| RFD-1380 | 948 | 798 | 1460 | 285 |
| RFD-1710 | 1163 | 778 | 1725 | 392 |
| RFD-2220 | 1163 | 778 | 1725 | 410 |
| RFD-2664 | 1397 | 847 | 1770 | 492 |
| RFD-3132 | 1397 | 847 | 1770 | 520 |
| RFD-4068 | 1467 | 1077 | 1930 | 696 |
| RFD-4680 | 1467 | 1077 | 1930 | 718 |
| RFD-5580 | 2188 | 1062 | 1925 | 900 |
| RFD-6300 | 2188 | 1062 | 1925 | 1000 |
| RFD-7200 | 2697 | 897 | 1975 | 1250 |
| RFD-8400 | 2697 | 897 | 1975 | 1350 |
| RFD-10000 | 2550 | 1550 | 2100 | 1600 |

PRESSURE & TEMPERATURE

The following details apply to all RFD dryer models*

| SUPERHEAT OF THERMOSTATIC EXPANSION VALVE | EVAPORATING PRESSURE | FAN PRESSURE SWITCH | SECURITY HIGH PRESSURE SWITCH | SECURITY LOW PRESSURE SWITCH | DRAIN TIMER | REFRIGERANT TEMPERATURE SWITCH | WATER FLOW VALVE (IF WATER CONDENSER) |
|---|----------------------|---------------------|-------------------------------|------------------------------|-------------|--------------------------------|---------------------------------------|
| 5°C - 10°C | 2.05 bar | 9-12 bar | 25 bar | 1.6 bar | 32 | 45°C | 11 bar |

PLEASE NOTE: Industry best practice of shielding units from direct heat and weathering should be adopted to prevent excessive exposure and increase the longevity of the unit and its components.

*Table details subject to change without notice.

RFD DRYER TECHNICAL SPECIFICATIONS*

| MODEL | CAPACITY (m³/h) | DRYER CAPACITY (cfm) | CONNECTION SIZE | PRE & POST FILTERS | VOLTAGE | ABSORBED POWER (kw) | MAX. AMPERAGE (Amp) | NOMINAL CURRENT (AMP) | FUSE AMPERAGE (Amp) | ELEMENT TYPE | PRESSURE DROP (mbar) | CONTROL TYPE | NOMINAL PRESSURE (bar) | MAX. WORKING PRESSURE (bar) | MIN. / MAX. AMBIENT TEMP °C | MAX. INLET TEMP. °C |
|-----------|-----------------|----------------------|-----------------|--------------------|----------|---------------------|---------------------|-----------------------|---------------------|--------------|----------------------|--------------|------------------------|-----------------------------|-----------------------------|---------------------|
| RFD-18 | 18 | 11 | ½" | G50MX + G50MY | 230/1/50 | 0.32 | 3 | 1.68 | 4 | MKO50KIT-1 | 100 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-30 | 30 | 18 | ½" | G50MX + G50MY | 230/1/50 | 0.32 | 3 | 1.71 | 4 | MKO50KIT-1 | 140 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-42 | 42 | 25 | ½" | G50MX + G50MY | 230/1/50 | 0.37 | 3.5 | 1.97 | 4 | MKO50KIT-1 | 220 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-66 | 66 | 39 | ¾" | G150MX + G150MY | 230/1/50 | 0.37 | 3.5 | 1.81 | 4 | MKO150KIT-1 | 50 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-96 | 96 | 56 | ¾" | G150MX + G150MY | 230/1/50 | 0.60 | 6 | 3.21 | 8 | MKO150KIT-1 | 100 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-130 | 130 | 77 | ¾" | G150MX + G150MY | 230/1/50 | 0.68 | 7 | 3.77 | 8 | MKO150KIT-1 | 150 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-168 | 168 | 99 | 1½" | G500MX + G500MY | 230/1/50 | 0.82 | 8.5 | 4.56 | 10 | MKO500KIT-1 | 100 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-240 | 240 | 141 | 1½" | G500MX + G500MY | 230/1/50 | 1.08 | 11.5 | 6.2 | 16 | MKO500KIT-1 | 150 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-300 | 300 | 177 | 1½" | G500MX + G500MY | 230/1/50 | 1.27 | 12.5 | 5.31 | 16 | MKO500KIT-1 | 80 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-396 | 396 | 233 | 2" | G851MX + G851MY | 230/1/50 | 1.30 | 15 | 5.56 | 16 | MKO851KIT-1 | 120 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-498 | 498 | 293 | 2" | G1210MX + G1210MY | 230/1/50 | 1.30 | 15.5 | 6.23 | 16 | MKO1210KIT-1 | 100 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-660 | 660 | 388 | 2" | G1210MX + G1210MY | 230/1/50 | 1.43 | 20 | 8.43 | 25 | MKO1210KIT-1 | 100 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-870 | 870 | 512 | 2" | G1210MX + G1210MY | 230/1/50 | 1.81 | 24 | 10.57 | 25 | MKO1210KIT-1 | 120 | Digi-Pro | 7 | 16 | 4 / 50 | 60 |
| RFD-1110 | 1110 | 653 | 3" | G1820MX + G1820MY | 400/3/50 | 2.77 | 14.5 | 6.31 | 16 | MKO1820KIT-1 | 220 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-1380 | 1380 | 812 | 3" | G1820MX + G1820MY | 400/3/50 | 3.14 | 16 | 7.71 | 20 | MKO1820KIT-1 | 180 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-1710 | 1710 | 1006 | 3" | G2700MX + G2700MY | 400/3/50 | 4.03 | 21 | 11.53 | 25 | MKO2700KIT-1 | 120 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-2220 | 2220 | 1306 | 3" | G2700MX + G2700MY | 400/3/50 | 4.62 | 22.5 | 11.53 | 25 | MKO2700KIT-1 | 220 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-2664 | 2664 | 1568 | DN100 | Not Included | 400/3/50 | 5.51 | 27 | 13.34 | 30 | Not Included | 170 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-3132 | 3132 | 1843 | DN100 | Not Included | 400/3/50 | 6.16 | 29.5 | 13.14 | 30 | Not Included | 250 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-4068 | 4068 | 2394 | DN100 | Not Included | 400/3/50 | 7.76 | 41.5 | 17 | 50 | Not Included | 200 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-4680 | 4680 | 2754 | DN100 | Not Included | 400/3/50 | 9.92 | 49 | 21.5 | 50 | Not Included | 220 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-5580 | 5580 | 3284 | DN150 | Not Included | 400/3/50 | 11.13 | 57.5 | 23.6 | 63 | Not Included | 200 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-6300 | 6300 | 3708 | DN150 | Not Included | 400/3/50 | 11.91 | 60.5 | 25.05 | 63 | Not Included | 230 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-7200 | 7200 | 4237 | DN150 | Not Included | 400/3/50 | 15 | 81.5 | 31.65 | 100 | Not Included | 220 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-8400 | 8400 | 4943 | DN200 | Not Included | 400/3/50 | 15 | 81.5 | 31.65 | 100 | Not Included | 220 | ESD-3 | 7 | 16 | 4 / 50 | 60 |
| RFD-10000 | 10000 | 5885 | DN200 | Not Included | 400/3/50 | 18.43 | 102 | 44.7 | 125 | Not Included | 220 | ESD-3 | 7 | 16 | 4 / 50 | 60 |

PLEASE NOTE: Inbuilt filter option not available on all models. External filter elements available - sold separately.

CORRECTION FACTORS FOR RFD AIR DRYERS*

| INLET TEMPERATURE °C | 30 | 35 | 40 | 45 | 50 | 60 | - | - |
|------------------------|------|------|------|------|------|------|------|------|
| F1 | 1.29 | 1 | 0.92 | 0.78 | 0.65 | 0.45 | - | - |
| AMBIENT TEMPERATURE °C | 20 | 25 | 30 | 35 | 40 | 50 | - | - |
| F2 | 1.05 | 1 | 0.98 | 0.93 | 0.84 | 0.7 | - | - |
| PRESSURE BAR | 4 | 6 | 7 | 8 | 10 | 12 | 14 | 16 |
| F3 | 0.80 | 0.94 | 1 | 1.04 | 1.11 | 1.16 | 1.22 | 1.25 |

EXAMPLE FOR CHOOSING THE CORRECT DRYER

If a compressor delivers 200 m³/h at 6 bar the dryer inlet temperature is 40°C and ambient temperature is 30°C. Please choose your Dryer as follows; $200 / 0.94 / 0.92 / 0.98 = 236 \text{ m}^3/\text{h}$ - The correct Dryer for this application is RFD240.

*Table details subject to change without notice.



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About Blue Diamond Machinery

Brothers Justin and Brad, along with partner Chris, created Blue Diamond Machinery on the core value of delivering a better service and right advice, quality and reliable products at an affordable price for trade, mining and construction industry.

Based on this, Blue Diamond Machinery has quickly grown from a small Perth based supplier of generators and compressors, to a leading national business offering Total power, air and industrial solutions. With well over 35 years combined experience Justin and Brad continue to lead and grow their national business by offering high quality, reliable products backed expert advice and support. Ensuring they continue to deliver on and meet the needs of trade, mining and construction industries at the best possible price.

