



Donaldson  
FILTRATION SOLUTIONS

# Industrial Filtration

## Membrane Dryers

VarioDry

FRL SF 0010 - SF 0150

### MAIN FEATURES & BENEFITS

- 11 types with 10 m<sup>3</sup>/h up to 150 m<sup>3</sup>/h flow capacity
- SF Superplus with 2 prefilters, membrane module, activated carbon filter and pressure regulator
- Very low purge air consumption
- Compact design
- Diagonal cross wrapped fibres for high drying efficiency
- Easy to install, maintenance free membrane module
- No electrical power supply required
- Almost noiseless operation
- Does not contain silicone, can be used for painting application



Modular compressed air purification unit  
FRL SF Superplus

### INDUSTRIES



- Machine building and plant engineering / construction



- Paint and finish



- Food and beverage



- Chemical



- Energy / Environmental

Donaldson Filtration Deutschland GmbH  
Büssingstr. 1  
D-42781 Haan  
Tel.: +49 (0) 2129 569 0  
Fax: +49 (0) 2129 569 100  
E-Mail: CAP-de@donaldson.com  
Web: [www.donaldson.com](http://www.donaldson.com)

Donaldson®  
Ultrafilter

## PRODUCT DESCRIPTION

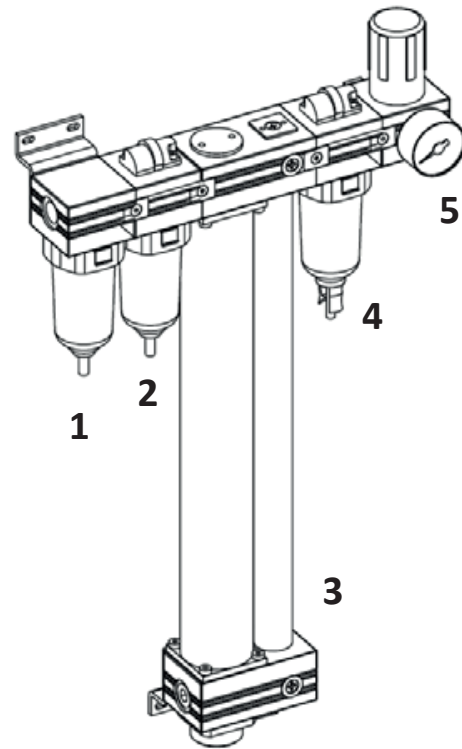
Membrane dryer module (VarioDry FRL Standard) or complete purification package (VarioDry FRL Superplus) consisting of membrane dryer module, 2-stage pre filtration, activated carbon after filter and pressure regulator.

### Function description (VarioDry FRL Superplus)

In the first pre filtration / separator stage (1) bulk particulate and water droplets are retained in order to protect the following sub micro filter SMF (2). In this 2nd pre filtration stage (coalescence filter) oil aerosols are removed down to a level of 0,01 mg/m<sup>3</sup> and the compressed air quality in terms of solid particulates downstream this filtration stage corresponds to Class 1 acc. to ISO8573-1. This 2-stage pre filtration ensures further a perfect protection of the following membrane dryer module (3) which may not be contaminated with liquid oil or solid particulates.

Depending on the inlet conditions the compressed air can be dried down to a pressure dewpoint of -40°C. In the following activated carbon filter (4) oil vapor, hydrocarbons as well as smells and odors are removed so the compressed air quality in terms of oil corresponds to Class 1 acc. to ISO 8573-1.

With the pressure regulator (5) the operating pressure for the downstream application can be adjusted individually according to the requirement of the application



### The VarioDry FRL is designed and developed for following applications:

- **Downstream equipment:**  
Creation of dry, oil-free and particulate-free compressed air for point of use applications e.g. packing machinery
- **Breathing air:**  
Removal of oil and particles as well as smell and odours

## PRODUCT SPECIFICATIONS

| Features:   | Benefits:   |
|---|---|
| 11 types with 10 m <sup>3</sup> /h up to 150 m <sup>3</sup> /h                                | Wide range of available models allow perfect adaption to customer application   |
| SF Superplus with prefilters, membrane module, activated carbon filter and pressure regulator | 2-stage pre filtration perfectly protects the membrane module and ensure long-life operation. The activated carbon afterfilter removes oil vapor and hydrocarbons to ensure highest compressed air quality for point of use applications. An integrated pressure regulator enables individual adjustment of operating pressure. |
| Very low purge air consumption  | Economic operation with low energy consumption  |
| Compact, lightweight design   | Ideal for point-of-use application with low space requirement   |
| Diagonal cross wrapped fibers   | Special fiber architecture and alignment offer high surface area and best drying efficiency   |
| Maintenance free membrane module  | Low service and maintenance cost  |
| Easy to install   | Only connection to compressed air system required.  |
| No electrical supply required   | No electrical power consumption of controllers or valves; no electrical installation required   |
| Silent operation  | Operation in noise-sensitive areas possible.  |

| Technical Data:                                    |   |
|--|---|
| Maximum operating pressure:                        | 12.5 bar g  |
| Maximum operating temperature:                     | 60°C  |
| Pressure drop:                                     | approx 0.2 bar g  |
| Prefiltration requirement (FRL VarioDry Standard): | max.1 µm particulates; 0,01 mg/m <sup>3</sup> oil content |

## PRODUCT SPECIFICATIONS

| Inlet Conditions | Temperature = 35°C/ Pressure = 7 bar g |                          |                         |                          |                         |                          |                         |                          |
|------------------|--|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|
| Type             | Dewpoint Reduction                     |                          |                         |                          |                         |                          |                         |                          |
|                  | 20 K                                   |                          | 35 K                    |                          | 55 K                    |                          | 75 K                    |                          |
|                  | m <sup>3</sup> /h inlet                | m <sup>3</sup> /h outlet | m <sup>3</sup> /h inlet | m <sup>3</sup> /h outlet | m <sup>3</sup> /h inlet | m <sup>3</sup> /h outlet | m <sup>3</sup> /h inlet | m <sup>3</sup> /h outlet |
| SF 0010          | 10                                     | 9                        | 6,4                     | 5,4                      | 4                       | 3                        | 2                       | 1                        |
| SF 0015          | 15                                     | 14                       | 9,6                     | 8,1                      | 5,9                     | 4,4                      | 3                       | 1,5                      |
| SF 0020          | 20                                     | 18                       | 12,8                    | 10,8                     | 7,9                     | 5,9                      | 4                       | 2                        |
| SF 0025          | 25                                     | 23                       | 16                      | 13,5                     | 9,9                     | 7,4                      | 5                       | 2,5                      |
| SF 0035          | 35                                     | 32                       | 22,4                    | 18,9                     | 13,8                    | 10,3                     | 7                       | 3,5                      |
| SF 0050          | 50                                     | 45                       | 32                      | 27                       | 19,8                    | 14,8                     | 10                      | 5                        |
| SF 0065          | 65                                     | 59                       | 41,6                    | 35,1                     | 25,7                    | 19,2                     | 13                      | 6,5                      |
| SF 0080          | 80                                     | 72                       | 51,2                    | 43,2                     | 31,6                    | 23,6                     | 16                      | 8                        |
| SF 0100          | 100                                    | 90                       | 64                      | 54                       | 39,5                    | 29,5                     | 20                      | 10                       |
| SF 0125          | 125                                    | 113                      | 80                      | 67,5                     | 49,4                    | 36,9                     | 25                      | 12,5                     |
| SF 0150          | 150                                    | 135                      | 96                      | 81                       | 59,3                    | 44,3                     | 30                      | 15                       |

## CORRECTION FACTORS FOR DIFFERENT PRESSURES:

| Operating pressure p <sub>ü</sub> bar | 5    | 6    | 7 | 8    | 9    | 10   | 11   | 12   |
|---------------------------------------|------|------|---|------|------|------|------|------|
| Correction factor f <sub>pü</sub>     | 0.57 | 0.78 | 1 | 1.21 | 1.42 | 1.64 | 1.85 | 2.06 |

Determination of the table value to the different types working pressure:  $V_{Tab} = V_0 / f_{p0}$

$V_{Tab}$  - Volume Flow table value

$V_0$  - Nominal volume Flow at operating pressure

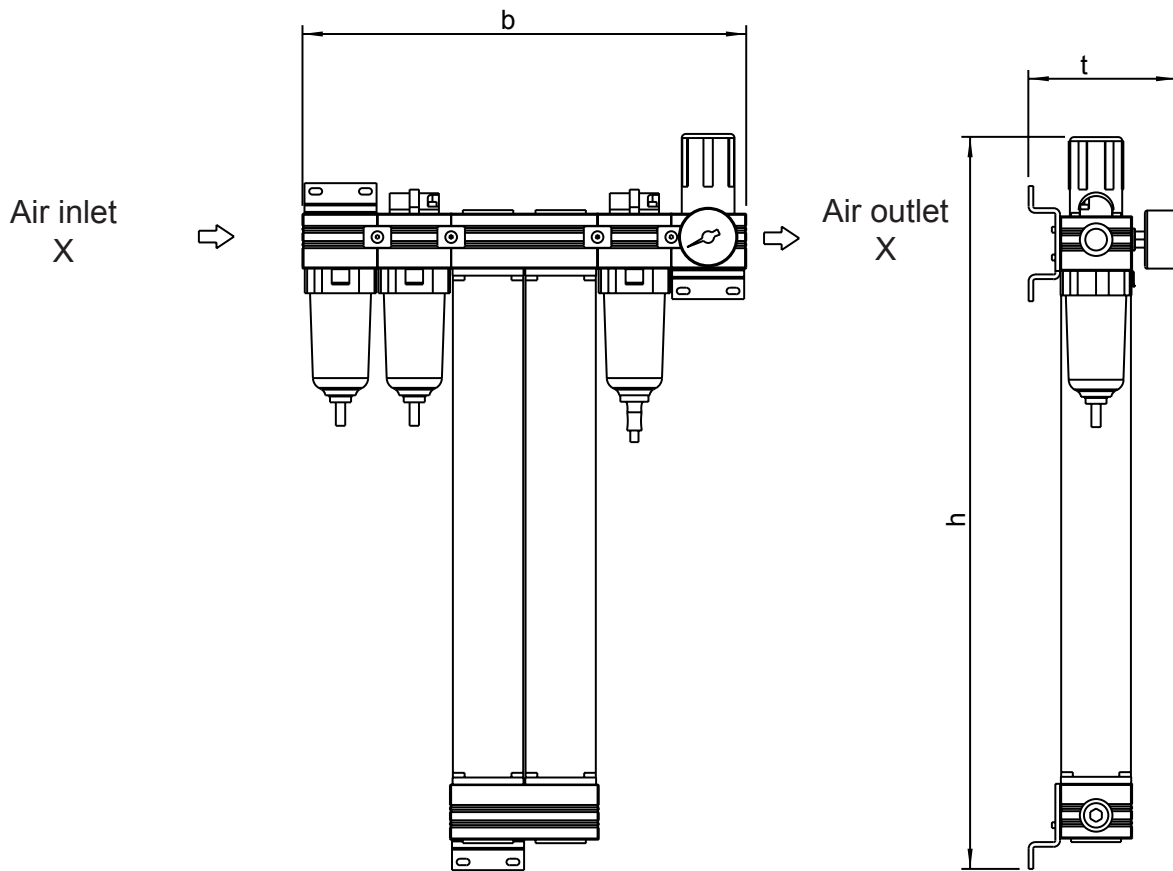
$f_{p0}$  - Correction Factor (pressure)

Example:  $\dot{V}_0 = 100 \text{ m}^3/\text{h}$ , operating pressure = 10 bar (g)

$$\dot{V}_{Tab} = \frac{100 \text{ m}^3/\text{h}}{1,50} = 61 \text{ m}^3/\text{h}.$$

Calculated membrane dryer size: Type SF 0065

## DIMENSIONS



| Type FRL | Connection X G | Weight kg | Hight h mm | Width b mm | Depth t mm |
|----------|----------------|-----------|------------|------------|------------|
| SF 0010  | 1/2"           | 3.2       | 628        | 362        | 127        |
| SF 0015  | 1/2"           | 3.4       | 628        | 362        | 127        |
| SF 0020  | 1/2"           | 3.6       | 628        | 362        | 127        |
| SF 0025  | 1/2"           | 3.8       | 628        | 362        | 127        |
| SF 0035  | 1/2"           | 6.1       | 628        | 379        | 127        |
| SF 0050  | 1/2"           | 6.7       | 628        | 379        | 127        |
| SF 0065  | 1"             | 12.2      | 629        | 738        | 140        |
| SF 0080  | 1"             | 15.8      | 629        | 828        | 140        |
| SF 0100  | 1"             | 19.5      | 629        | 918        | 140        |
| SF 0125  | 1"             | 22        | 629        | 1008       | 140        |
| SF 0150  | 1"             | 22        | 629        | 1010       | 140        |