

Donaldson®  
AirCel™

Donaldson®  
Ultrafilter™

## Condensate Drain Valves

Ultramat UFM-T Zero Air-Loss



The highest standards  
in the industry  
**Built to  
Exceed**

  
Donaldson

# Condensate Drain Valves

## *Condensate Drainage without Compressed Air Loss*

As one of the world's leading manufacturers of compressed air purification equipment, Donaldson has built a comprehensive engineering, manufacturing, and customer support network to meet the most demanding applications. With over 30 years of expertise in compressed air filtration and separation technologies, Donaldson manufactures a complete line of high performance zero air-loss condensate drain valves that eliminate compressed air loss, dramatically improve energy efficiency and increase cost savings.

**Optimization of compressed air systems** can provide energy efficiency improvements of 20 to 50 percent. One contributor to the inefficient use of compressed air, which can increase cost, is the condensate drain. Liquid condensate, which naturally accumulates in various spots within a compressed air system, must be drained frequently or serious consequences can adversely impact downstream hardware, finished products and the compressed air system itself.

Typical drains that operate on a timer allow compressed air to vent from the systems with every cycle. Timer-operated drains will open regardless of how much, or how little, condensate has collected between cycles. In addition, float drains are subject to fouling and allow compressed air to bleed out of the system even when the float is resting in its seat.

**Donaldson Ultramat UFM-T zero air-loss condensate drain valve** has a compact design allowing for installation in restricted space applications. The UFM-T is designed to open only when necessary and close before any loss of compressed air can occur. The unique internal reservoir and flow channels reduce the possibility of blockage and minimize fouling of the drain valve seat allowing more thorough processing at a downstream oil/water separator.



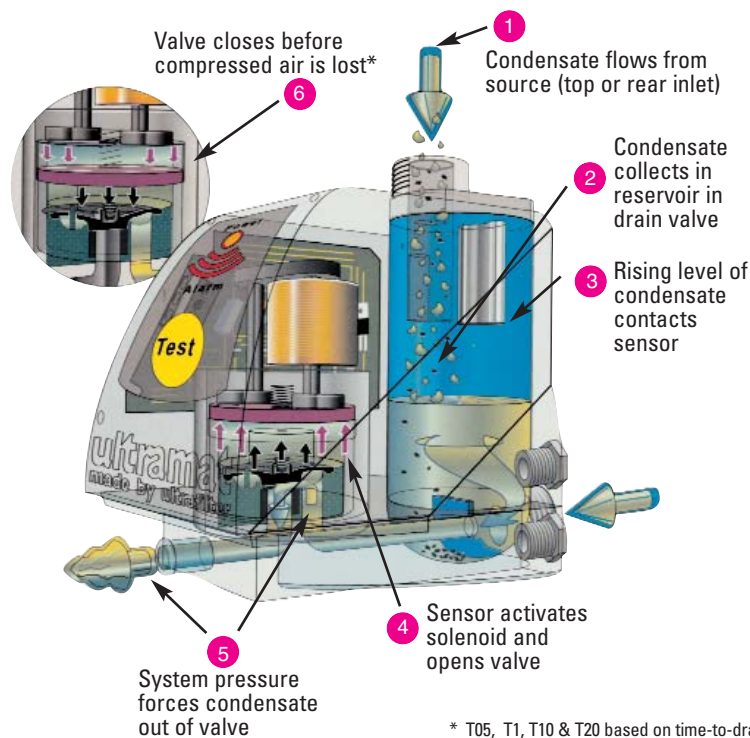
Ultramat UFM-T  
Zero Air-Loss  
Drain Valve

# Condensate Drain Valves

## Benefits

- Design of internal reservoir and flow channel minimizes emulsification of condensate, allowing for more thorough processing at downstream oil/water separator
- Design minimizes fouling of valve seat
- Compact design allows installation in restricted space applications
- Rigid corrosion-resistant housing made from glass fiber reinforced plastic structure
- All metal parts coated; gaskets and diaphragm material is Viton®.
- Ergonomic design with rounded, clearly visible control panel
- Silent operation
- External alarm contacts (excluding T05 drain)
- Easily accessible push-to-test button
- Electronically controlled and self-monitored for operation faults
- Condensate inlet can be from the top or from the rear of the drain
- Preinstalled power cord (UFM-T05 through UFM-T20)
- 24 or 110V - 230 V AC power supply without additional transformers
- Condensate level sensor requires no moving parts
- Pays for itself in less than six months

## How The UMT Works

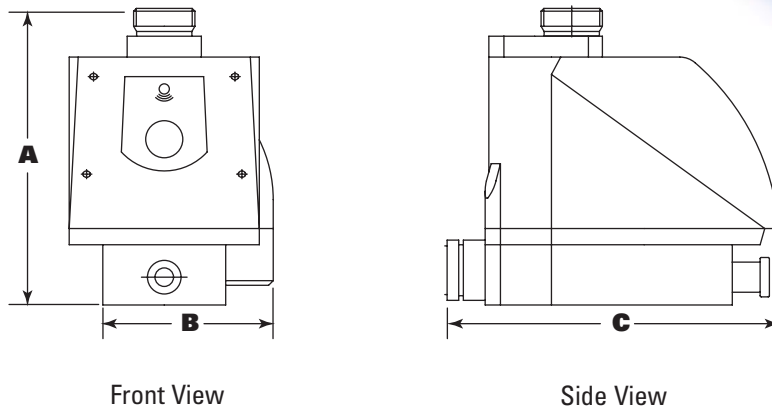


\* T05, T1, T10 & T20 based on time-to-drain; T100 & T20 HP include low level sensor.

® Viton®, is a registered trademark of DuPont Performance Elastomers.

# Condensate Drain Valves

## Dimensions & Specifications



Model	Compressor Capacity <sup>1</sup> (scfm)	Connection (inches NPT)		Operating Pressure (psig)		Operating Temperature		Ambient Temperature		Dimensions (inches)			Weight (lbs)
		Top	Rear	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	A	B	C	
UFM-T05	180	1/2	1/2	12	250	35°F	140°F	35°F	140°F	3.6	3.5	5.1	1.5
UFM-T1	360	1/2	N/A	12	250	35°F	140°F	35°F	140°F	5.0	3.5	4.9	2.0
UFM-T10	360	1/2	1/2	12	250	35°F	140°F	35°F	140°F	5.2	3.5	5.7	2.2
UFM-T20	720	1/2	1/2	12	250	35°F	140°F	35°F	140°F	5.8	3.5	6.9	2.6
UFM-T100	3600	3/4	3/4	12	250	35°F	140°F	35°F	140°F	8.0	5.9	9.4	8.2
UFM-T20 HP <sup>2</sup>	720	3/4	3/4	18	600	35°F	140°F	35°F	140°F	7.5	4.5	9.6	7.3
UMF-P <sup>3</sup>	265	1	—	—	—	—	—	—	—	—	—	—	4.0

<sup>1</sup> Ultramat UFM-T drain capacity matched to compressor sizes with outlet conditions of 100 psig, 100°F and 100% RH.

<sup>2</sup> High pressure unit. Operating pressure: Min 18 psig; Max 600 psig. Requires additional adapters to connect from SSP to NSP connections.

<sup>3</sup> Pneumatic level controlled condensate drain for aggressive condensate.

## Equipment Options



When the rear condensate entry is used, the top entry of the valve must be vented back to the pressure vessel.

A rear-entry adapter is available with a built-in pressure vent, making installation very simple.



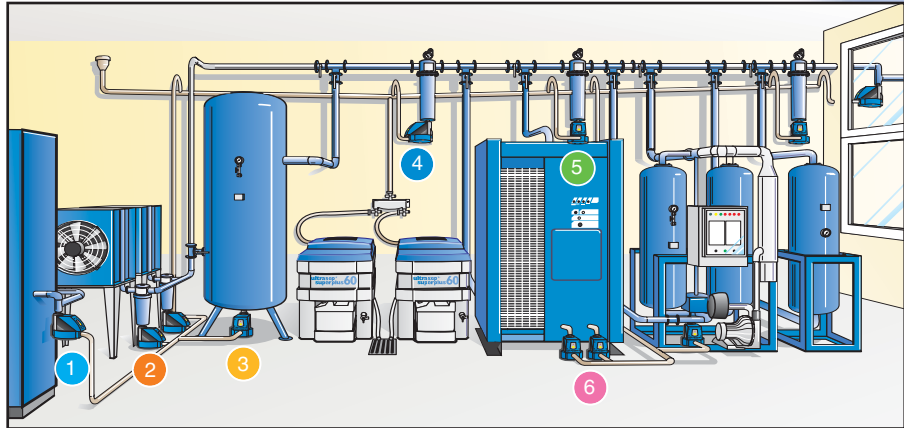
If your condensate is particularly dirty, a ball valve and Y-strainer can be added to protect the drain valve from fouling.

# Condensate Drain Valves

## Applications

Ultramat zero air-loss, electronically controlled condensate drains are at many points to ensure condensate drainage without compressed air-loss.

- 1 On the compressor itself
- 2 On compressor aftercoolers
- 3 On accumulator/surge tanks
- 4 On coarse coalescing prefilters before refrigerated and desiccant dryers
- 5 On fine coalescing prefilters before refrigerated and desiccant dryers
- 6 On refrigerated dryer cold-points or outlets



## Condensate Drain Valves Provide Energy Savings

The waste cost associated with a timer drain valve can be significant. A single ½ inch timer operated drain valve installed on a 1000 scfm, 100 psig, 100°F compressed air system set to open for 3 seconds every 3 minutes will vent over 3 million standard cubic feet of compressed air annually. This loss results in almost \$550 wasted annually in compressed air costs.

Here is the math deriving the above statement.

- The amount of condensate produced in the compressor aftercooler is 8.50 pounds of water every 3-minute drain cycle<sup>1</sup>.
- The 8.50 pounds of condensate can be drained in 0.90 seconds<sup>2</sup>.
- During the remaining 2.1 seconds of the second drainage period, the amount of compressed air vented from the system is 18.1 standard cubic feet<sup>3</sup>.

- In one year, there are 175,200 drain cycles and the annual loss of compressed air is 3,171,120 standard cubic feet (scf/yr).

The energy loss resulting from the venting of the compressed air is determined by the following thermodynamics equation<sup>4</sup>.

- $E = 2.8246 \times 10^{-8} \times (\text{scf/yr}) \times [nRT/(1-n)] \times [(p_2/p_1)^{(n-1)/n} - 1] / (\text{Motor Eff.} \times \text{Comp. Eff.})$
- Based on a single-stage compressor, ( $n = 1.4$ ), an overall efficiency of 72%, ( $0.90 \times 0.80$ ), and a 0.5 psi loss in the compressor intake, ( $p_1 = 14.2$  psia), the annual energy loss is 10,620 kw-hr/yr.
- At an energy cost of \$0.05/kw-hr, the annual loss is \$531.00.

Contact Donaldson to discover the specific energy savings your application can obtain with Donaldson Ultramat UFM-T zero air-loss condensate drain valves.

<sup>1</sup> As determined by Dalton's law of partial pressures.

<sup>2</sup> Determined by Crane Technical Paper No. 410, Eq. 2-14.

<sup>3</sup> Determined by Crane Technical Paper No. 410, Eq. 1-11.

<sup>4</sup> *Concepts of Thermodynamics*, Edward Obert, Eq. 12-7b.

**T**rust Donaldson Compressed Air & Gas to deliver a complete range of compressed air purification solutions that improve air quality throughout your plant – from the compressor room to all points of use. With over 30 years of expertise in compressed air filtration and separation, Donaldson manufactures a complete line of drying and filtration equipment using innovative designs that focus on energy efficient operation and reliable performance.

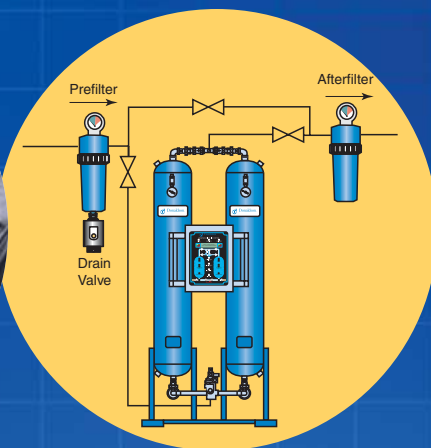
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### Leading Technology



- 550 engineers worldwide
- More than 500 patents held by Donaldson employees
- Custom designed solutions

### Engineered Solutions



- Total system solutions
- Air capacities from 3 to 50,000+ scfm
- High pressure systems up to 10,000 psig

### Knowledgeable Service



- Broad range of innovative filters and dryers
- Ready-to-ship filters and dryers within 48 hours
- Technical expertise and support