

# W, XW and F - Series Oil Separators

## Application

Oil separator's function is to assure the correct return of oil to compressor's crankcase. The use of an oil separator may represent significant energy and operational cost savings by assuring that evaporator is operating free of excessive oil. W and F series oil separators are recommended for:

- Low evaporator temperature applications.
- Medium evaporator temperature applications, when the condensing unit is above the evaporator.
- Applications where refrigerant lines are excessively long, i. e. supermarkets.
- When in doubt that lines size are properly designed.

## Features, Advantages and Benefits

- \* Suitable for use with HCFC's, HFC's and the lubricants that go with them.
- \* Hermetic or take apart units.
- \* Positive seating float valve.
- \* Solid copper connections.
- \* Corrosion resistant electrostatic powder paint.
- \* Approved by: UL file SA8547  
CSA file LR100624
- \* Maximum Working Pressure 31 bar (W series),  
34.5 bar (F series).
- \* Burst Pressure 155 bar (W series),  
172.4 bar (F series)

W and XW series are sealed oil separators and F series have a removable flange. Each oil separator features a unique screen and baffle arrangement to enhance oil separation from refrigerant-gas mixtures. The use of a lightweight stainless steel float allows for a faster response in returning lubricants back to compressor. Solid copper fittings and a 3/8 SAE flare fitting for oil return, allows for easy installation. Ideal for use in air conditioning, commercial refrigeration and low temperature applications.

## Why Oil Separators Are Needed?

Refrigeration compressors are lubricated by refrigerant oil that circulates from the crankcase or housing. When the compressor operates, refrigerant oil will leave the compressor in a mixture with the hot compressed refrigerant gas. Small amounts of oil circulating through the system will not affect the system's performance. However, too much circulating oil interferes with the operation of flow controls, the evaporator, the condenser and filter driers.



### Nomenclature

EXAMPLE: W559011		
W	5590	11
Series W = Welded XW = Welded	Model	Connection size in 1/8"

At low temperature installations, refrigerant oil thickens and becomes difficult to move out of the evaporator. Accumulation of refrigerant oil in the evaporator can affect its efficiency and could lead to compressor's failures.

Installing an oil separator between the compressor and the condenser will protect the refrigerant system. The use of an oil separator will maintain correct oil level in the compressor and increase efficiency of the evaporator. All of these benefits will lead to lower energy costs for the system.

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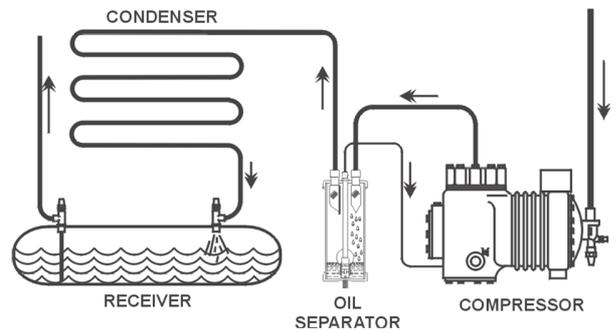
## Function

A mixture of refrigerant and oil from the compressor enters into the inlet of the oil separator. This mixture flows through a screen and baffle arrangement to cause the fine particles of oil to gather and drop to the bottom of the oil separator.

The refrigerant oil gathers in the bottom of the oil separator unit, where a float operated needle valve opens to allow the return of oil to the compressor. Oil returns quickly to the compressor because of the higher pressure in the oil separator than in the crankcase. When the oil level has lowered, the needle valve will re-seat to prevent refrigerant discharge gas from by-passing to the compressor crankcase.

## Installation

The oil separator should be installed in the discharge line as close as possible to the compressor. An initial charge of refrigerant oil must be added to the oil separator to actuate the float mechanism to return oil to the compressor. Use the same type of oil that is in the crankcase of the compressor. If a system is equipped with a suction accumulator, it is recommended that the oil return from the separator be connected to the suction line, just ahead of the accumulator. This will provide maximum protection against returning liquid refrigerant to the crankcase. If the system is not equipped with a suction accumulator, the oil return line on suction cooled compressors may be connected to the suction line if more convenient than the crankcase. On air cooled compressors, oil return must be made directly to the crankcase to avoid damage to the compressor valves.



If the separator is exposed to outside ambient temperatures, it must be insulated to prevent refrigerant condensation during off periods, resulting in return of liquid to the compressor crankcase. Small low wattage strap-on heaters are available for oil separators, and if any problem from liquid condensation in the separator is anticipated, a continuously energized heater is highly recommended.

## Service Hints

During long off-cycles or long manual shutdowns, liquid refrigerant may collect in the oil separator. The return of liquid refrigerant to the compressor through the oil return line may cause slugging and possible damage to the compressor. A check valve installed in the discharge line between the oil separator and the condenser will help prevent the liquid refrigerant from returning to the compressor. Insulating the oil separator will prevent it from acting as a condenser and passing heat to the surrounding air. The addition of a filter in the oil return line will help keep the oil clean.

**W, XW and F Series Oil Separators Capacity Table (kW)  
At Evaporator Temperature**

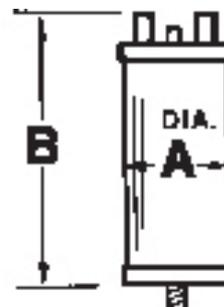
MODEL		R-448A, R-449A		R-134a		R-502		R-404A/507	
SEALED									
W	XW	-40 °C	40 °C	-40 °C	40 °C	-40 °C	40 °C	-40 °C	40 °C
---	XW55824	5.3	7.0	3.5	5.3	5.3	7.0	5.3	7.0
---	XW55855	15.8	19.3	11.4	15.8	16.7	20.2	14.1	19.3
---	XW55877	24.6	28.1	16.7	22.4	26.4	29.9	22.8	29.9
W55889	---	31.6	36.9	22.4	29.9	33.4	40.4	29.9	38.7
W559011	---	40.4	47.4	28.1	40.4	42.2	51.0	36.9	49.2
W559213	---	49.2	61.5	33.4	46.6	56.2	61.5	52.7	66.8
W569011	---	45.7	49.2	33.4	48.3	52.7	70.3	42.2	52.7
W569213	---	56.2	63.3	41.3	56.2	70.3	84.3	52.7	66.8
W569417	---	87.9	105.4	63.3	88.7	105.4	123.0	84.3	109.0

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## Dimensional Data

### Sealed Units (W Series)

MODEL	OIL RETURN SIZE (in)	CONNECTION SIZE (in)	DIMENSIONS mm (in)	
			A	B
W55889	3/8 FLARE	1-1/8 SOLDER	102 (4.0)	413 (16.25)
W559011		1-3/8 SOLDER		495 (19.50)
W559213		1-5/8 SOLDER		505 (19.88)
W569011	3/8 FLARE	1-3/8 SOLDER	152 (6.0)	400 (15.75)
W569213		1-5/8 SOLDER		483 (19.00)
W569417		2-1/8 SOLDER		495 (19.50)



### Sealed Units (XW Series)

MODEL	OIL RETURN SIZE (in)	CONNECTION SIZE (in)	DIMENSIONS mm (in)	
			A	B
XW55824	1/4 FLARE	1/2 SOLDER	102 (4.0)	273 (10.75)
XW55855		5/8 SOLDER		332 (13.19)
XW55877		7/8 SOLDER		381 (15.00)