



SPECIFICATIONS - ENGINEERING DATA - DIMENSIONS

FRICK OIL SEPARATORS

SCRUBBER TYPE

AMMONIA - HALOCARBONS - HYDROCARBONS

ITEM # 113 & # 114



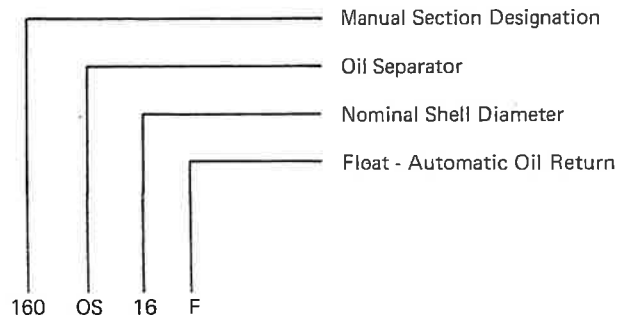
DESCRIPTION

Frick Scrubber Type Oil Separators are designed for vertical mounting in the compressor discharge line of commercial and industrial refrigeration systems to separate entrained oil from the discharge gas and automatically return this oil to the compressor crankcase.

The oil separator consists of a cylindrical shell containing an oil separation pad of interlocking stainless steel mesh.

Frick Oil Separators are available in eight (8) standard sizes to handle a wide range of compressor displacements depending upon the compressor application and the refrigerant used. Refer to Rating Data in Table 1. Available models and nominal overall dimensions are listed in Table 2.

MODEL NO. EXPLANATION



OIL SEPARATION

Oil separation is accomplished by the action of gas-carried oil striking a baffle plate to change direction, at which time it is directed upward against the underside of the stainless steel mesh pad. The oil that accumulates in the bottom of the separator shell activates a float which permits oil to flow back to the compressor crankcase. Refer to Fig. 1.

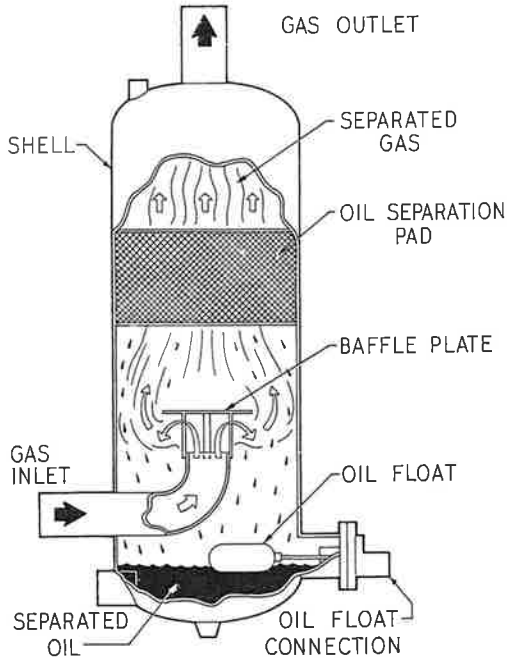


FIG. 1 — CUT-AWAY VIEW, OIL SEPARATOR

MECHANICAL SPECIFICATIONS

ASME CODE — Frick Scrubber Type Oil Separators are designed, fabricated, tested and stamped in accordance with Section 8, Division 1, of ASME Boiler Code for unfired pressure vessels. Vessels with volumes exceeding 5 cubic feet are tested and inspected by insurance inspectors and stamped with a "U" symbol and National Board Registration Number.

DESIGN PRESSURE — 250 psig - pneumatic test pressure, 313 psig, in accordance with ASME Code UG 100 (b) and (c). Consult Home Office for higher design pressures.

DESIGN TEMPERATURE — -20° to 300° F

SHELLS — Separator shells 24 inches in diameter and smaller are high-quality steel pipe SA-53-S-B. Shells of 30 and 36 inch diameters are constructed of carbon steel plate SA515-70, which is machine submerged arc welded along the longitudinal seam. 6 inch diameter shells are equipped with flat heads - larger shells are equipped with ASME 2:1 dish type heads. Consult Home Office for larger diameter oil separators.

OIL SEPARATION PAD — Interlocking type 304 stainless steel mesh, 6 inches thick.

CONNECTIONS — Refrigerant inlet and outlet stub connections are designed for welding (connections are sealed with welded end plates for shipment). Flanged connections are available as optional at extra cost. Safety valve, drain and liquid level sight gauge connections are NPT threaded.

DEHYDRATION — Vessels are cleaned and dried internally and connections sealed for shipment.

FINISH — Gray chromate primer.

INSTALLATION OF SEPARATOR

The internal float valve for automatic oil return is furnished as standard on all separators and is factory installed. Line valves (1/2" screwed) for drain, pump out and return to crankcase are furnished for field installation.

The Schematic (Fig. 2) of the oil separator installed in the system is for illustration purpose only.

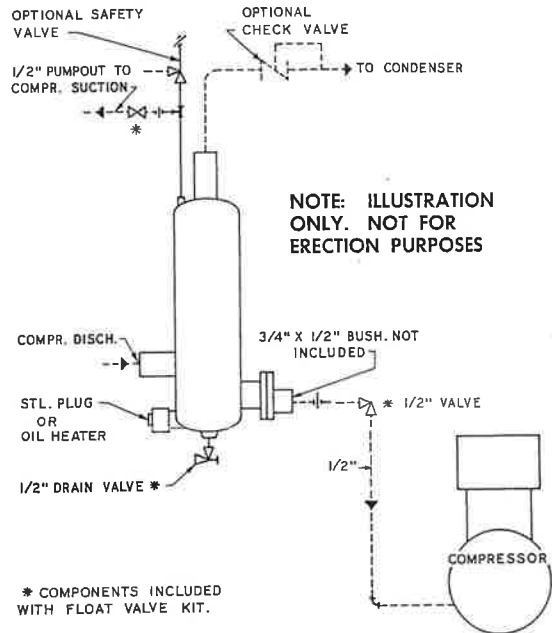


FIG. 2 — SCHEMATIC OF SEPARATOR IN SYSTEM

MATERIAL SPECIFICATIONS

SHELL — 8" through 24" diameter, SA-53-S-B pipe.
30" diameter and larger, SA-515-70 plate.

FORMED STEEL HEADS — SA-285-C

NOZZLES — SA-53 - S - B pipe

COUPLINGS — SA - 105

THREDOLETS — SA - 105

SCRUBBER PAD — Stainless Steel, Type 304

OPTIONAL FEATURES (Available at extra cost)

CUNO OIL FILTER — Complete with gaskets and extra cartridge.

WELDING NECK AND SOCKET FLANGES — For refrigerant inlet and outlet connections.

SAFETY VALVES — Single or dual type.

TUBULAR LIQUID LEVEL GAUGE — Vessels are equipped with NPT threaded connection to accommodate this assembly.

OIL HEATER with THERMOSTAT — 250 watt for 6" and 8" diameters: 500 watt for 12" and larger.

SELECTION DATA

It is advisable to install individual separators for each compressor in the system. Oil separators should never be oversized since their efficiency is based on accurate gas velocity and cfm.

The ratings for these separators are based upon the maximum gross compressor displacement (in cfm) as indicated in Design or Capacity Rating Data Tables for specific compressors at NORMAL

OPERATING conditions. See TABLE 1 for available models and proper ratings.

In selecting a separator, the ratings in TABLE 1 should be used without multipliers for conditions of frequent cycling, long pull-down periods and when it is anticipated that the system will be extremely sensitive to oil carry-over. The multiplier is to be used only when selecting a separator for maximum condition of 30° F saturated suction temperature or for continuous operation.

MODEL NO.	Gross Compressor Displacement (cfm)			
	HIGH STAGE		LOW STAGE	
	Ammonia	Halocarbons	Ammonia	Halocarbons
160 OS6-F	75	30	80	45
160 OS8-F	125	55	160	80
160 OS12-F	320	125	450	220
160 OS16-F	480	215	750	400
160 OS20-F	750	325	1200	600
160 OS24-F	1100	410	1500	700
160 OS30-F	1800	650	2000	1100
160 OS36-F	2600	1400	2800	1800
Correction Factor to compressor cfm for use if any of the following conditions exist:				
1. Suction pressure never exceeds 30°F				
2. System cycles infrequently	.91	.80	.67	.89
3. System operates constantly				

TABLE 1 - RATING DATA

METHOD OF SELECTION

The following data must be determined before an oil separator selection can be made:

1. Compressor Size
2. RPM
3. CFM
4. Type of Refrigerant
5. Duty (Booster or High Stage)
6. Suction Temperature
7. Ambient Temperature (If low enough to condense refrigerant vapor, install oil heater.) Oil heater with thermostat should maintain 110° to 120° F oil temperature.

NOTES:

1. When the probability of excessive condensation exists, a compressor crankcase oil heater should be considered to avoid heavy concentrations of liquid refrigerant in the crankcase.
2. Avoid wide swings in discharge pressure.

SELECTION EXAMPLE

To select an oil separator for a two cylinder 11 x 10 compressor, using ammonia refrigerant, on single stage duty, at 400 rpm, at 30° F suction temperature or less, and running fairly constant, proceed as follows:

1. From compressor Design Data Table in Publication E40-101, page 4, find the gross displacement of 440 cfm at 400 rpm.
2. Refer to TABLE 1 below and select a model 160-OS-16F good for a gross compressor displacement of 480 cfm.
3. Since the system is operating at 30° F suction temperature, or lower, seldom cycling and not particularly sensitive to oil carry over, we can use the correction factor found at the bottom of TABLE 1.

THUS: 440 x .91 @ 400.4 cfm. This indicates the 16" separator is slightly oversized, but the correct separator selection.

FRICK OIL SEPARATORS – SCRUBBER TYPE
SPECIFICATIONS—ENGINEERING DATA—DIMENSIONS

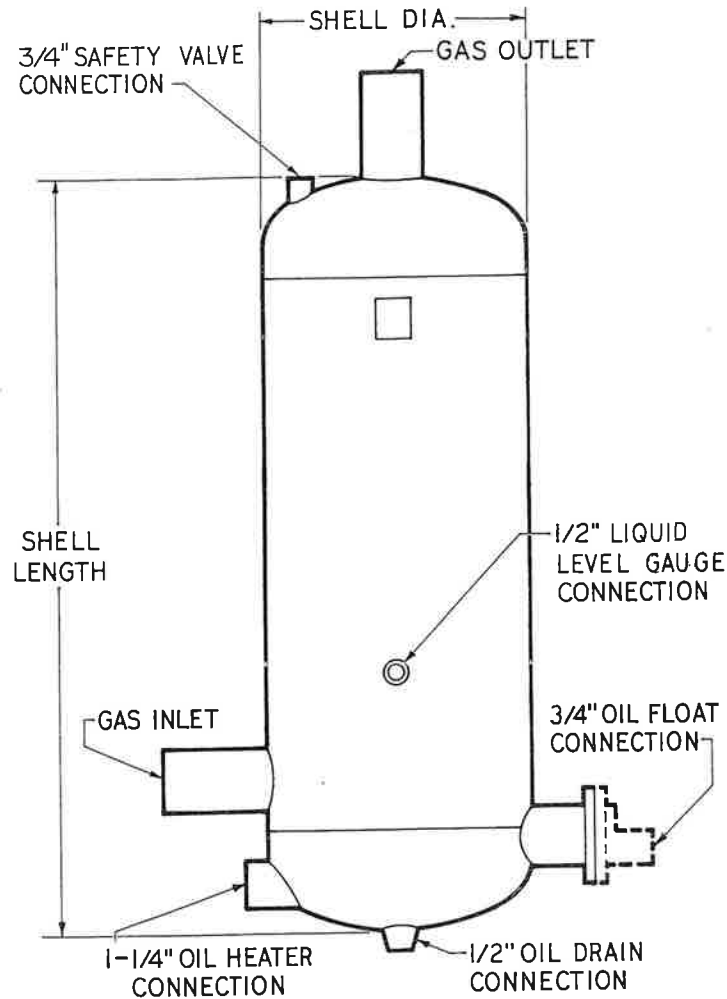


FIG. 3 – DIMENSIONAL OUTLINE DRAWING

MODEL NO.	NOMINAL DIMENSIONS (in.)		
	Conns.	Shell Length	Shell Diameter
160 OS6-F	2	25	6-5/8
160 OS8-F	2	28	8-5/8
160 OS12-F	2-1/2	36	12-3/4
160 OS16-F	3	43	16
160 OS20-F	4	50	20
160 OS24-F	4	54	24
160 OS30-F	5	65	30
160 OS36-F	6	72	36

TABLE 2 – NOMINAL DIMENSIONS

FRICK COMPANY
A subsidiary of International Utilities Corp.
WAYNESBORO, PA. 17268 • 717 / 762-2121

Frick Co., Waynesboro, Pa.
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