Phillips® REFRIGERATION
VALVES • VESSELS • SYSTEMS • CONTROLS

For Ammonia (R717) and Other Refrigerants

Description

Phillips Dry Oil Separators immediately and constantly return refined oil to the crankcase of reciprocating compressors.

Design Function

Phillips Dry Oil Separator operation is as simple as all Phillips products, mounting either horizontally or vertically and containing no internal moving parts. Stainless steel mesh pads provide the highly efficient coalescing surface required to separate oil from refrigerant vapor with low pressure drop. An external Phillips float valve automatically returns oil directly to either the compressor crankcase or an oil receiver. See Bulletin 270.

Figure 1: Horizontal Phillips DOS

Simple pipe hangers are needed for horizontal mounting. Check valve should be added downstream of separator.

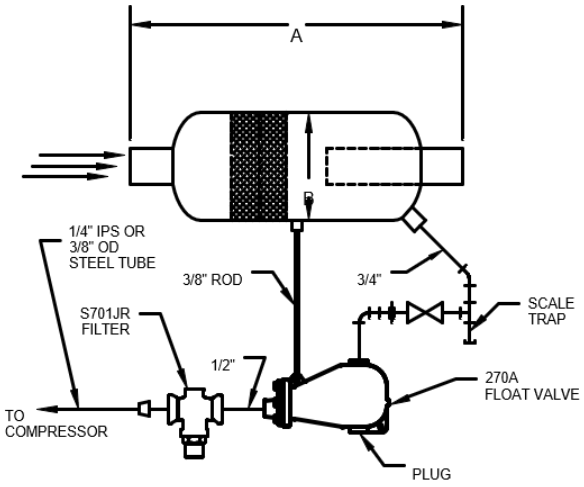


Figure 2: Phillips DOS in Cold Ambients

Single compressors in cold ambients require additional protection, such as a thermostat strapped to the bottom of the separator shell to control a solenoid in the oil return, preventing return of refrigerant.

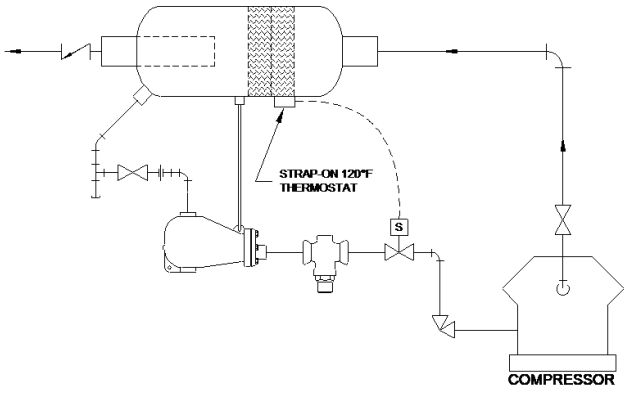


Figure 3: Phillips Dry Oil Separator with 2 or more compressors

One Phillips Dry Oil Separator can feed two or more compressors if an oil receiver with a heater and Phillips

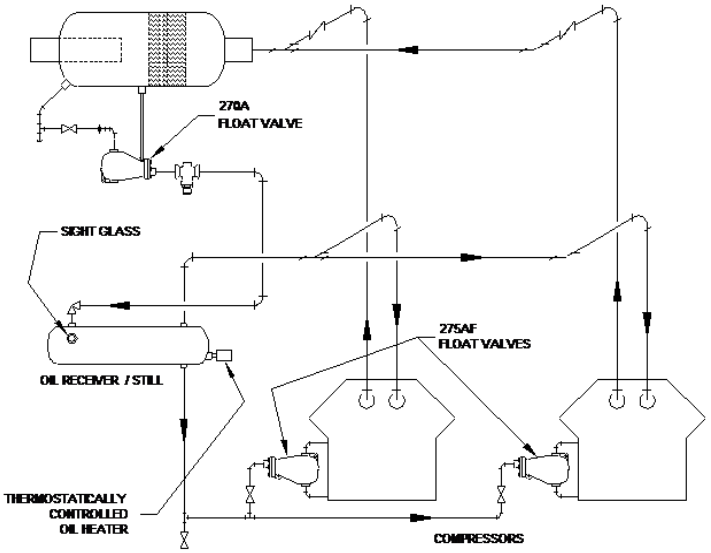
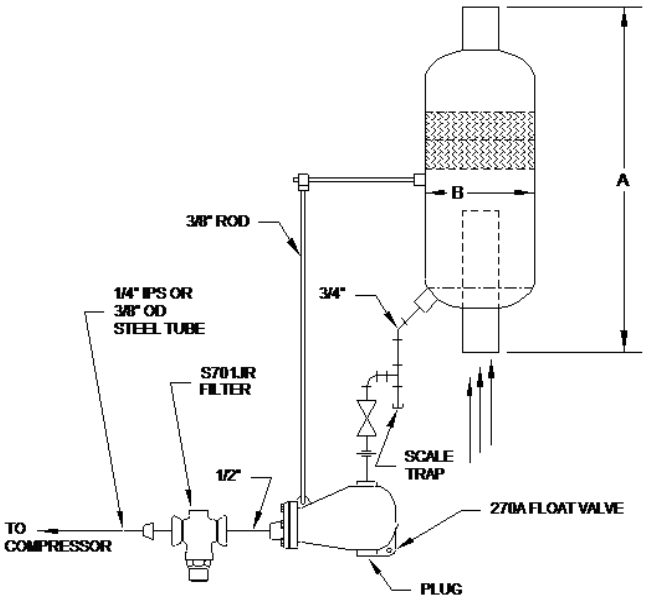


Figure 4: Vertical Phillips Dry Oil Separator

Note that flow is reversed with drain at inlet end of separator.



ENGINEERING DATA

SIZE	SWEPT VOLUME DISPLACEMENT				DIMENSION (IN.)				SHIPPING WT. (lbs)
	CFM MAXIMUM						INLET & OUTLET		
	AMMONIA		HALOCARBON				IPS	ODC	
	SINGLE STAGE	BOOSTER	SINGLE STAGE	BOOSTER	A	B	C	(Special)	
DOS—2-1/2—3/4	18	36	8	12	16	2-7/8	3/4	—	10
DOS—3-1/2—1-1/4	39	78	16	26	20	4	1-1/4	—	18
DOS—5—1-1/4*	81	162	32	54	22	5-9/16	1-1/4	1-3/8	25
DOS—5—1-1/2*	81	162	32	54	22	5-9/16	1-1/2	1-5/8	25
DOS—6—1-1/2*	117	234	47	78	24	6-5/8	1-1/2	1-5/8	33
DOS—6—2*	117	234	47	78	24	6-5/8	2	2-1/8	33
DOS—8—2*	210	420	84	140	28-1/2	8-5/8	2	2-1/8	44
DOS—8—2-1/2*	210	420	84	140	28-1/2	8-5/8	2-1/2	2-5/8	44
DOS—10—2-1/2*	333	666	133	222	33	10-3/4	2-1/2	2-5/8	75
DOS—10—3*	333	666	133	222	33	10-3/4	3	3-1/5	75
DOS—12—3*	480	960	190	320	35	12-3/4	3	3-1/8	95
DOS—12—4*	480	960	190	320	35	12-3/4	4	4-1/8	95
DOS—16—4	750	1500	300	500	41	16	4	—	148
DOS—20—5	1175	2350	470	780	52	20	5	—	328
DOS—24—6	1715	3430	686	1143	59	24	6	—	466
DOS—30—8	3050	6100	1220	2040	72	30	8	—	741

* The smaller connections shown for sizes 5 through 12 are useful for capacities “in between” the listed maximums or when an oversized body is desired.

Ordering Instructions

Size Selection:

Although separators can be rated in tons within specific pressure or temperature limits, Phillips Dry Oil Separators are simply selected on the basis of CFM displacement of a single compressor, which, in turn, determines the allowable maximum velocity and pressure drop. For two or more compressors in parallel, select on the basis of total displacement.

Efficient range of flow is 23 to 110 percent.

Caution: never reduce a discharge line into a separator. Pick oversized DOS to match line size.

Example 1: Two cylinder 10 x 10 VSA ammonia compressor at 360RPM, 327 CFM and 3” discharge valve: select DOS—10-3 at 333 CFM.

Example 2: Ten cylinder 6-3/4” x 5” ammonia booster at 1000 RPM, 1035 CFM and 4” discharge valve: select DOS—16-4 at 1500 CFM

Example 3: 75CFM single stage R-134 compressor with 1-3/8” discharge line: select DOS—8-2 at 84 CFM with 2-1/8” ODC connection

Example 4: Six cylinder 4-1/2” x 3-1/2” R22 booster at 1200 RPM, 232 CFM and 3” discharge line: select DOS—10-3 at 222 CFM. Choice within 5% of actual flow.

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