



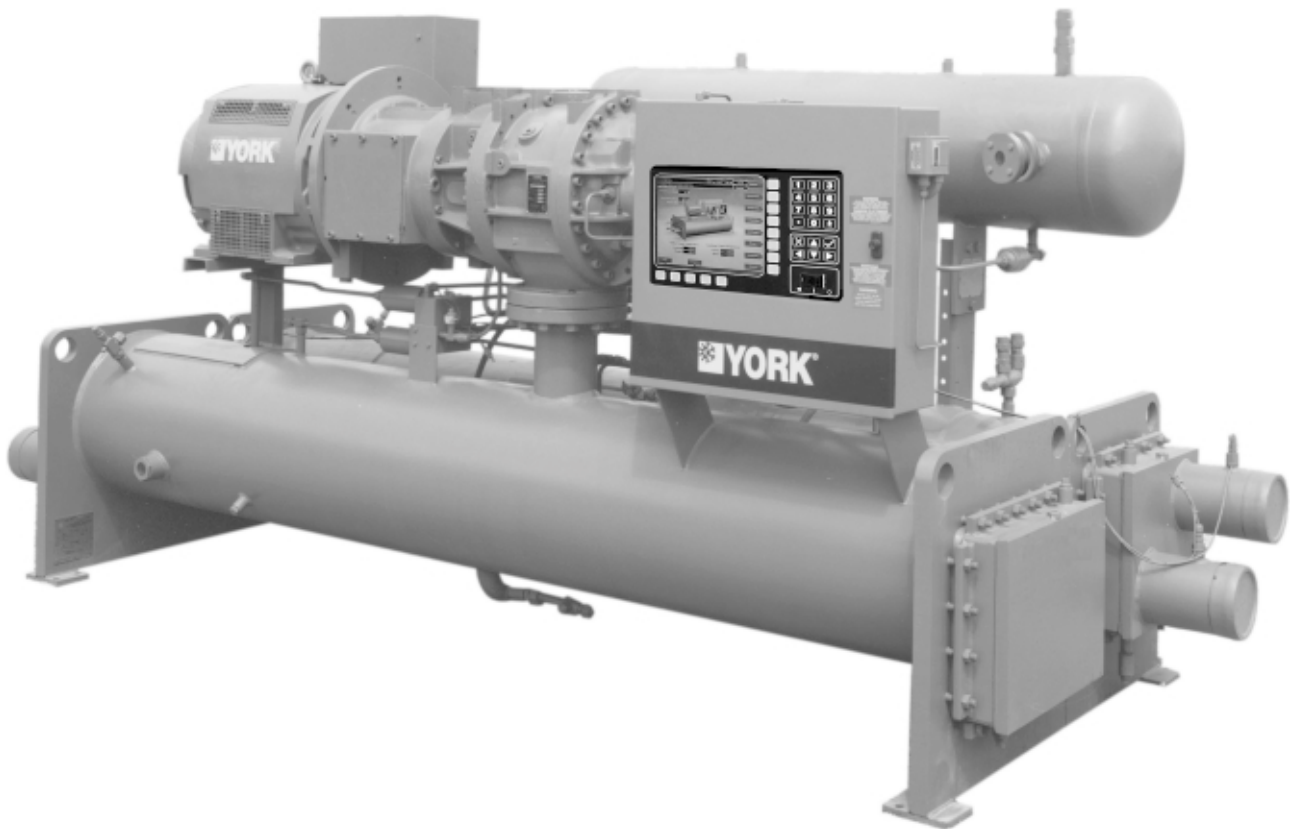
**MILLENNIUM®
ROTARY SCREW LIQUID CHILLERS**

INSTALLATION INSTRUCTIONS

Supersedes: Nothing

Form 160.80-N1 (1099)

**FIELD RE-ASSEMBLY FOR
FORM 3 & FORM 7 SHIPMENT OF
MODEL YS BA BA S0 thru YS FC FB S5
(STYLE E)
100 THRU 675 TONS**



00202VIP

REFERENCE INSTRUCTIONS

- FORM 160.80-NOM1 – INSTALLATION - OPERATION - MAINTENANCE INSTRUCTION
- FORM 160.80-PW1 – ELECTRO-MECHANICAL STARTER WIRING DIAGRAM
- FORM 160.80-PW2 – SOLID STATE STARTER WIRING DIAGRAM

IMPORTANT!

READ BEFORE PROCEEDING!

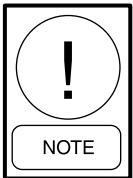
GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During installation, operation, maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, oils, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized operating/service personnel. It is expected that this individual possesses independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood this document and any referenced materials. This individual shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question.

SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to areas of potential hazard:



NOTE is used to highlight additional information which may be helpful to you.



CAUTION identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution. Usually an instruction will be given, together with a brief explanation.

CHANGEABILITY OF THIS DOCUMENT

In complying with YORK's policy for continuous product improvement, the information contained in this document is subject to change without notice. While YORK makes no commitment to update or provide current information automatically to the manual owner, that information, if applicable, can be obtained by contacting the nearest YORK Applied Systems Service office.

It is the responsibility of operating/service personnel to verify the applicability of these documents to the equipment in question. If there is any question in the mind of operating/service personnel as to the applicability of these documents, then prior to working on the equipment, they should verify with the owner whether the equipment has been modified and if current literature is available.

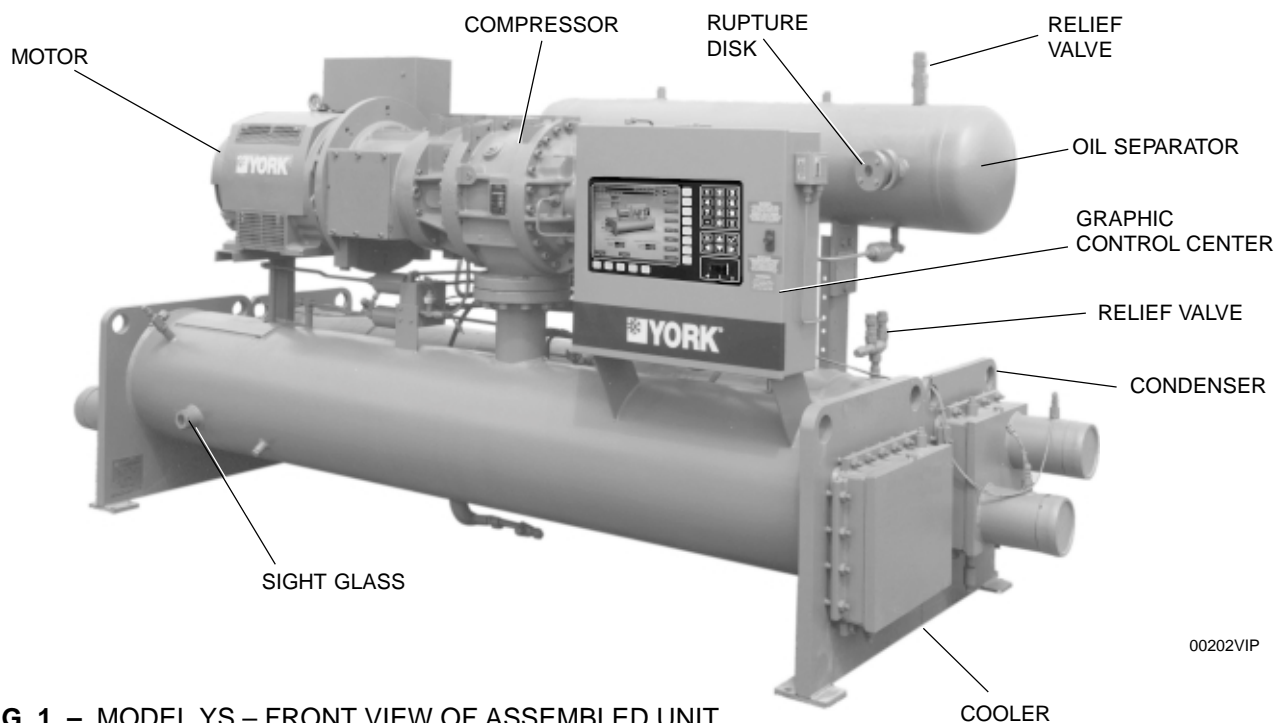
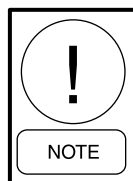


FIG. 1 – MODEL YS – FRONT VIEW OF ASSEMBLED UNIT

GENERAL

This instruction explains the procedure to be used for reassembling the Model YS Rotary Screw Chiller shipped disassembled. (Shipping Form 3 or Form 7.)



Units MUST be field reassembled under the supervision of a YORK service representative.

For Installation Instructions other than unit re-assembly, refer to Form 160.80-NOM1.

FORMS OF SHIPMENT

FORM 3 – DRIVELINE SEPARATE FROM SHELLS – Shipped as three major assemblies. The unit is first factory assembled, refrigerant piped, wired and leak tested, then dismantled for shipment. Compressor/open motor assembly is removed from shells and skidded. Evaporator/condenser assembly is not skidded. Oil separator is skidded.

All wiring integral with the compressor is shipped on the compressor, and all conduit is shipped on the heat exchanger. All openings on the compressor, oil separator, and the shell are closed and charged with dry nitrogen [5 psig (34 kPa)].

Miscellaneous chiller components, [control center, oil educator filter, tubing, water temperature controls, wiring, oil, vibration isolators, solid state starter (option), etc.] are packaged separately and shipped with the chiller. R-22 or R-134a charge is shipped concurrently or separately in 50 lb. and 125 lb. cylinders.

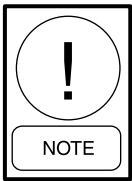
FORM 7 – SPLIT SHELLS – The unit is shipped as four major assemblies (evaporator, condenser, motor/compressor assembly and oil separator). The unit is first factory assembled, refrigerant piped, wired and leak tested, then dismantled for shipment. Compressor/open motor assembly is removed from shells and skidded. Oil separator is skidded.

Evaporator and condenser shells are separated at tube sheets and are not skidded. Refrigerant lines between shells are flanged and capped. Tube sheets will require bolting in the field. No welding is required.

All wiring integral with compressor is shipped on it. All wiring harnesses on shells are removed.

All openings on compressor, oil separator and shells are closed and charged with dry nitrogen [5 psig (34 kPa)].

Miscellaneous packaging of control center, oil educator filter, tubing, wiring, oil, isolators, solid state starter (option), and other miscellaneous items are shipped concurrently in a separate box. R-22 or R-134a charge is shipped concurrently or separately in 50 lb. and 125 lb. cylinders.



When more than one unit is involved, the major parts of each unit will be marked to prevent mixing of assemblies. (Piping and Wiring Drawings to be furnished by YORK.)

INSPECTION – DAMAGE – SHORTAGE

The unit shipment should be checked on arrival to see that all major pieces, boxes and crates are received. Each unit should be checked on the trailer or rail car when received, before unloading, for any visible signs of damage. Any damage or signs of possible damage must be reported to the transportation company immediately for their inspection.

When received at the job site, all containers should be opened and contents checked against the packing list. Any material shortage should be reported to YORK immediately.

YORK WILL NOT BE RESPONSIBLE FOR ANY DAMAGE IN SHIPMENT OR AT JOB SITE OR LOSS OF PARTS. (Refer to Shipping Damage Claims, Form 50.15-NM.)

DATA PLATE

A unit data plate is mounted on the control center assembly of each unit, giving unit model number, design working pressure, water passes, refrigerant charge, serial numbers, and motor power characteristics and connection diagrams.

RE-ASSEMBLY

Refer to Installation Instruction, YS Rotary Screw Chiller, Form 160.80-NOM1 for other instructions. The following is a step-by-step procedure to be used to assemble the units.

FORM 7 SHIPMENT (SEE FIG. 2)

1. Locate cooler and condenser shells in their final position.
2. Remove shipping closures from flanges on refrigerant line on bottom of cooler and condenser. (Shells are shipped with holding charge of nitrogen.) Discard gaskets. Install orifice plate using new gaskets and 3/4" x 3" long cap screws and nuts.
3. Bolt tube sheets together using cap screws, lock washers and nuts. (See Fig. 2.)

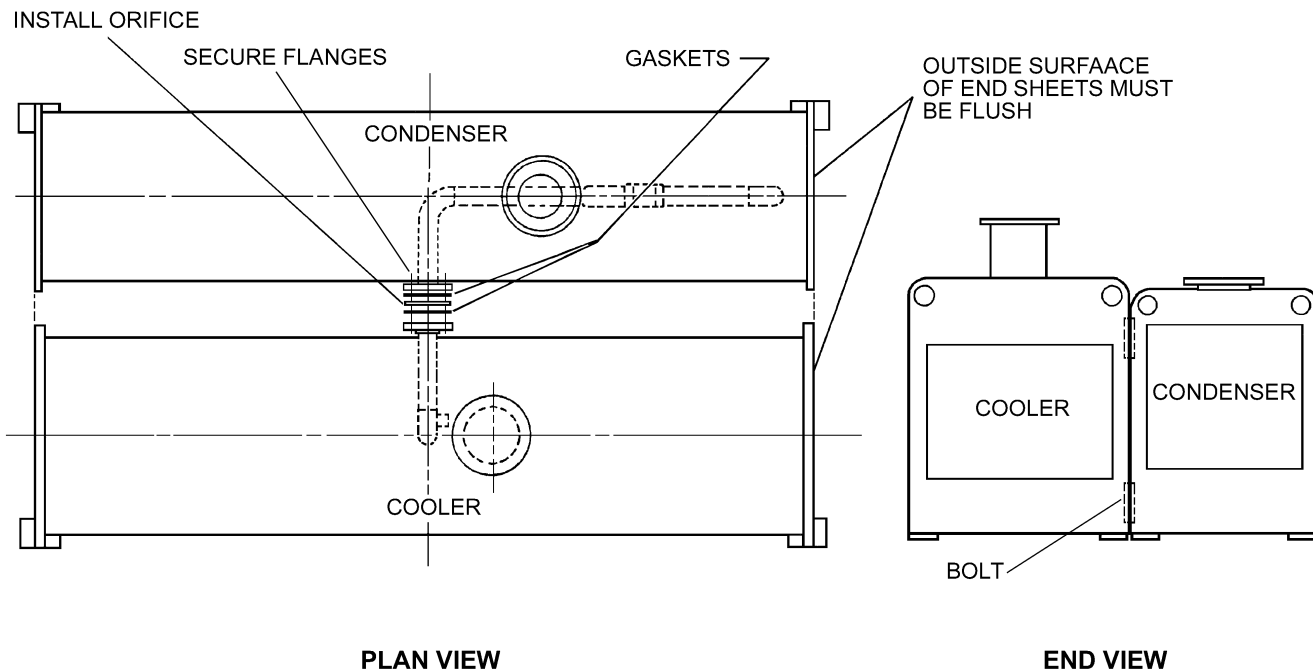


FIG. 2 – FORM 7 SHIPMENT

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FORM 3 AND FORM 7 SHIPMENT

1. Assemble vibration isolators to unit. (Refer to Form 160.80-NOM1.)
2. Level shells in both directions. The longitudinal alignment of the shell should be checked by placing a level on the top of the shell, next to the discharge connection. The transverse alignment should be checked by placing a level on the tops of both end sheets. Refer to Installation Instruction, Form 160.47-NOM3 for additional instructions to level unit. After shell is leveled, wedge and shim each corner of the shell to solidly support it while assembling the other parts.
3. Lift compressor-motor assembly and remove packing materials and shipping skids. Keep the compressor unit supported by the hoist until all connections are finally made to the shell assembly. (Refer to Fig. 3 for rigging method.) Remove closure covers and be sure flanges are clean.

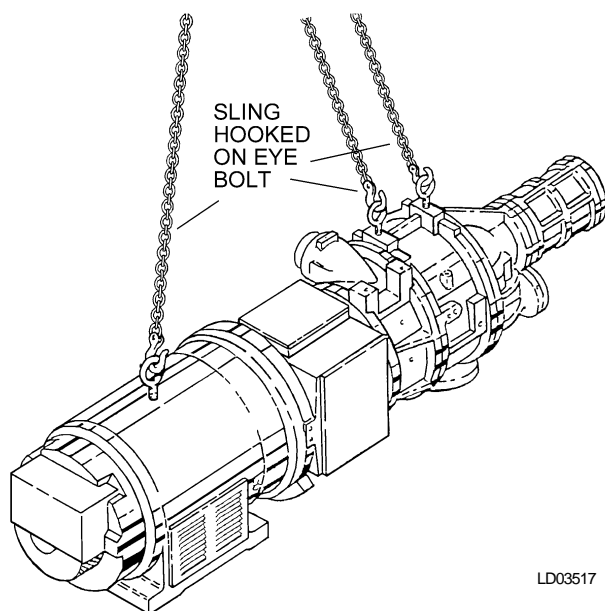


FIG. 3 – RIGGING COMPRESSOR ASSEMBLY

Cooler-Condenser Shells – Remove all refrigerant connection covers.



Shells are shipped with a 5 psig nitrogen charge.

4. Place gasket (item 16) on the cooler suction flange and lower the compressor assembly. Guide the studs through the gasket and suction flange on top of cooler. (See Fig. 4.)
4. Insert the cap screws, washers, and nuts (items 14, 13, 11) to fasten the motor to the motor support bracket. Level the compressor-motor. If necessary, adjust the screws and nuts to level compressor, and add shims (item 12) if necessary, between the motor feet and the support. (See Fig. 5, Detail A.)
5. Assemble nuts (item 15) to studs on the cooler suction flange. Tighten nuts alternately and evenly, to insure a leak tight fit.
6. Remove the hoist from the compressor-motor assembly.
7. Place gasket (item 18) on the condenser discharge connection and then place the condenser shut-off valve (item 19) on the discharge connection. Make sure the handle of the shut-off valve is perpendicular to the condenser shell. Place gasket (item 20) on the top side of the shut-off valve.
8. Remove all cover closures from the oil separator flanges and wipe all connection surfaces clean. Lower the oil separator carefully keeping it level and horizontal to the condenser shell. Line up the compressor discharge port with the oil separator connection. Push the oil separator connection until it seats itself. Use cap screws (item 22) and washers (item 24) to fasten the oil separator connection to the compressor. Complete the connection to the condenser shell using cap screws (item 21) and nuts (item 17). Keep hoist rigging attached to the oil separator.
9. Fasten the support bracket between the condenser and the end of the oil separator with the proper hardware (items 25, 26, 27).
10. Tighten all screws and nuts on the discharge flange and the support bracket.
11. Assemble the Control Center to the unit (see Fig. 4). Also see Forms 160.80-PW1 or 160.80-PW2.
12. **Solid State Starter (Optional)** – Install starter per Figs. 4 and 5. Also install piping connections.
13. Install refrigerant piping, oil lines, and oil return system filters. Refer to Typical Piping Drawing, Fig. 6.

14. Pressure test. *NOTE: Relief valves must be plugged (or capped).* Refer to Form 160.80-NOM1.

15. Evacuate and charge with refrigerant.

16. Charge the oil separator with the proper type and quantity of YORK oil.

17. **All Units** – Complete installation and finally level the unit per Installation Instruction, Form 160.47-NOM3.

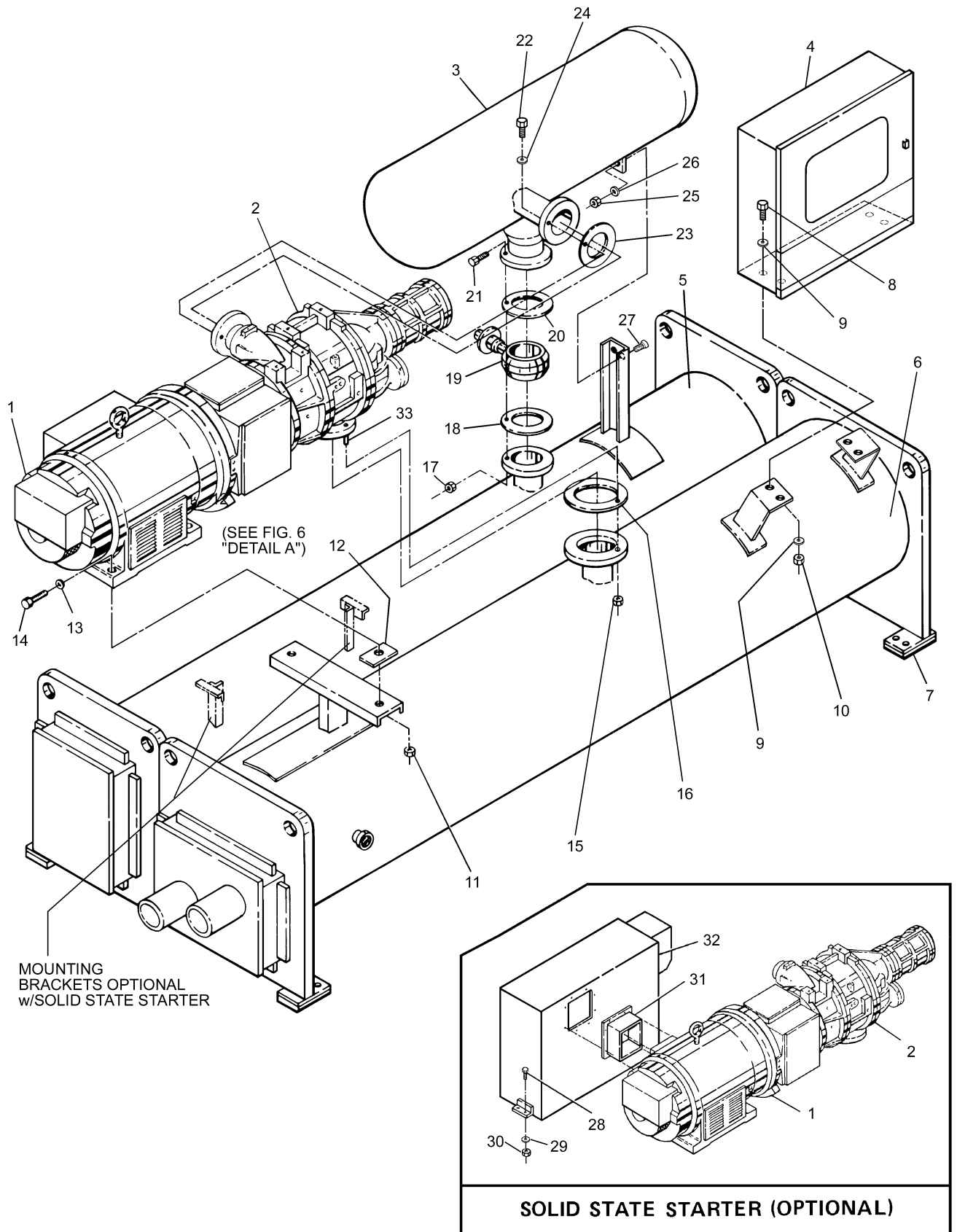
COMPRESSOR SIZE	R-22		R-134a	
	OIL TYPE	QTY	OIL TYPE	QTY
S0	C	10	H	10
S1	C	10	H	10
S2	C	10	H	10
S3	S	10	H	10
S4	S	15	H	15
S5	S	15	H	15

Quantity in gallons.

LEGEND TO FIG. 4

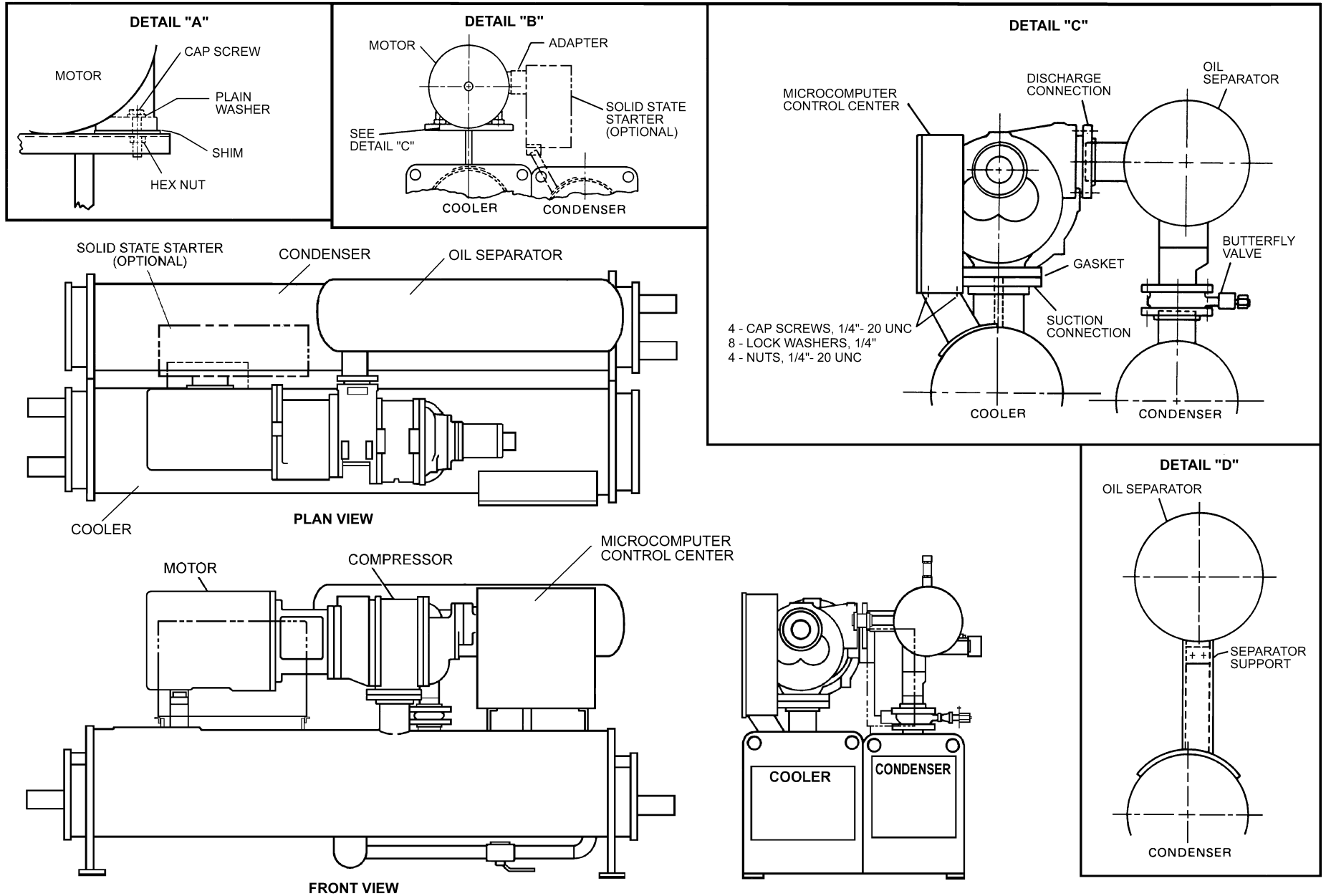
ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Motor	18	Gasket
2	Compressor	19	Butterfly Valve
3	Oil Separator	20	Gasket
4	MicroComputer Control Center	21	3/4" Cap Screw, Hex Hd. – 10 UNC
5	Condenser	22	5/8" Cap Screw, Hex Hd. – 11 UNC
6	Cooler	23	Gasket
7	Isolator(s)	24	Plain Washer
8	1/4" Cap Screw, Hex Hd. – 20 UNC	25	5/8" Hex Nut – 11 UNC
9	1/4" Lockwasher	26	5/8" Lockwasher
10	1/4" Nut – 20 UNC	27	5/8" Cap Screw, Hex Hd. – 11 UNC
11	3/4" Hex Nut – 10 UNC	28	1/4" Cap Screw, Hex Hd. – 20 UNC
12	Shim	29	1/4" Lockwashers
13	3/4" Plain Washer	30	1/4" Hex Nut – 20 UNC
14	3/4" Cap Screw, Hex Hd. – 10 UNC	31	Adapter
15	M20 or M22 Hex Nut	32	Solid State Starter
16	Gasket	33	Stud (M20) or (M22)
17	3/4" Hex Nut – 10 UNC		

FIG. 4 – FIELD ASSEMBLY – EXPLODED VIEW – PARTS LEGEND



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FIG. 4 – FIELD ASSEMBLY – EXPLODED VIEW



7A FIG. 5 - FIELD ASSEMBLY

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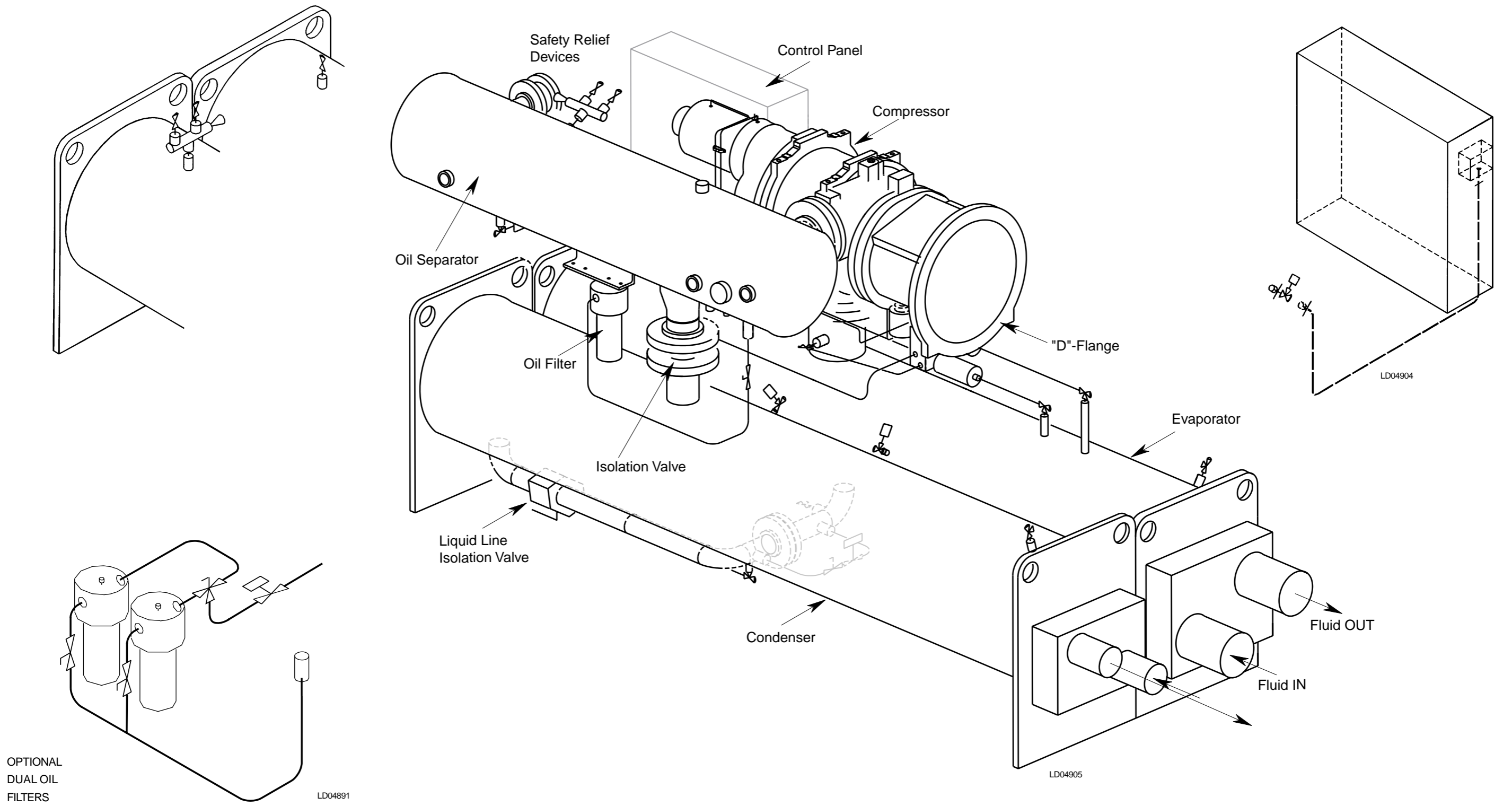
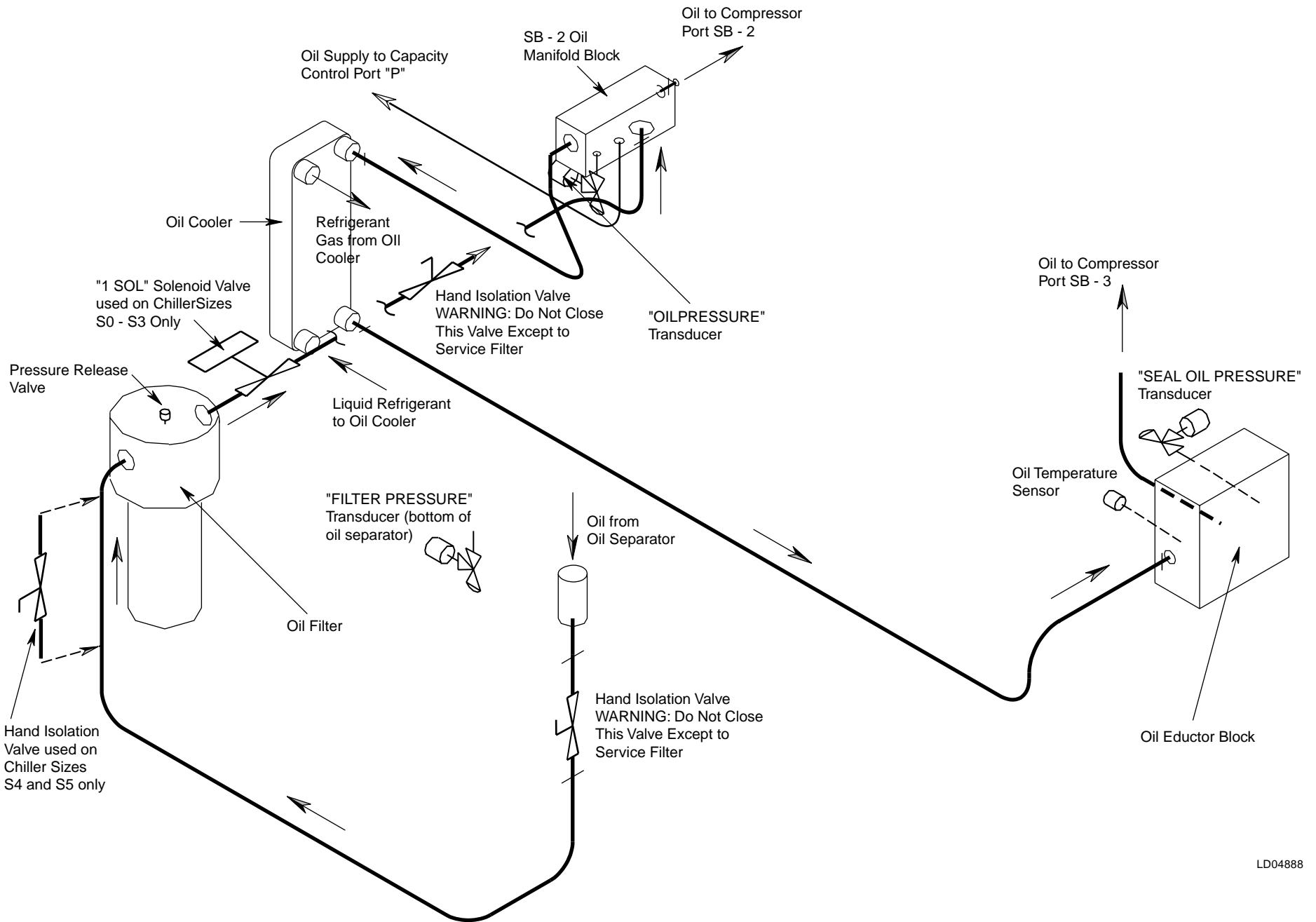


FIG. 6 – TYPICAL SYSTEM PIPING DRAWING



9 FIG. 7 - OIL PIPING SCHEMATIC

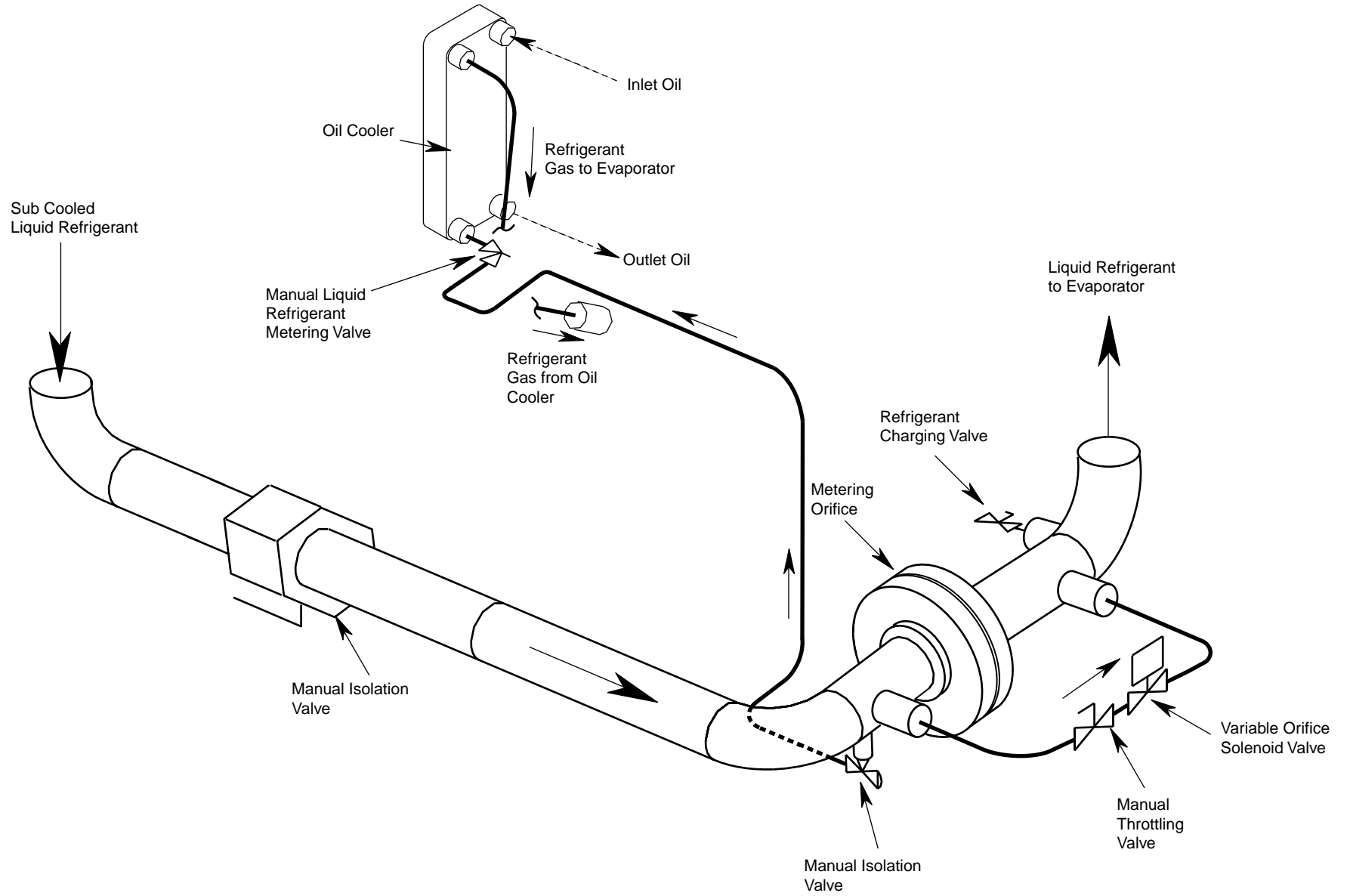
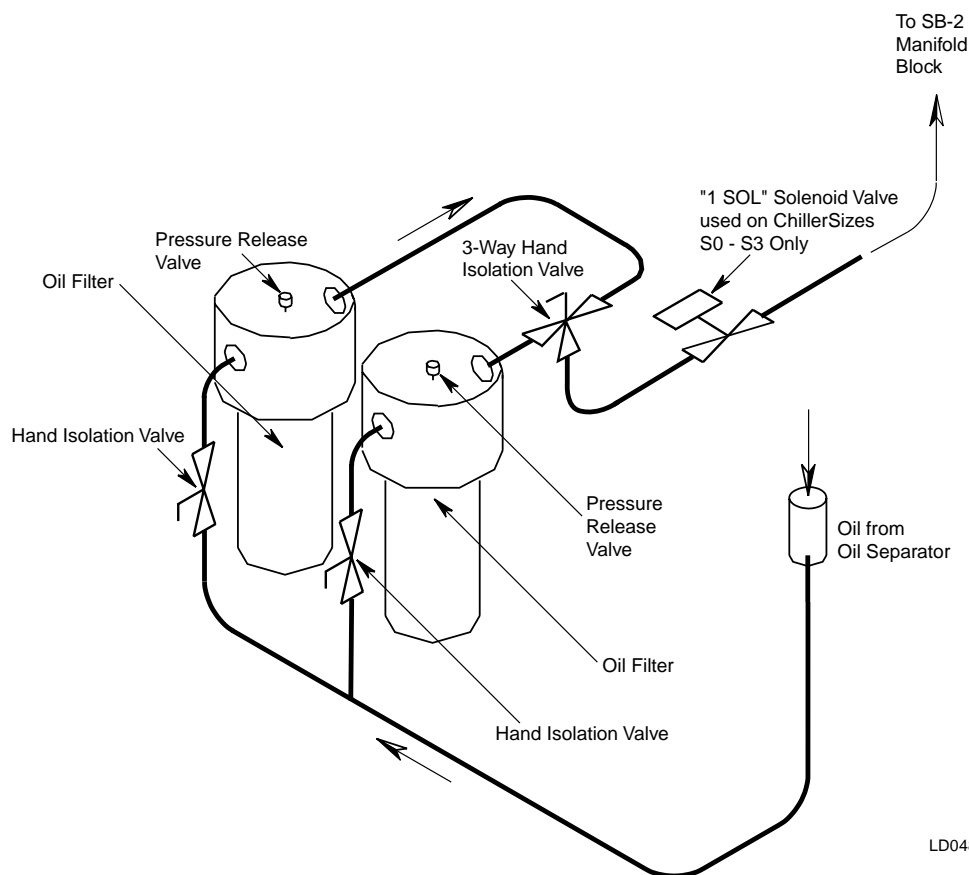


FIG. 8 – REFRIGERANT SCHEMATIC



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FIG. 9 – OPTIONAL DUAL OIL FILTER PIPING SCHEMATIC

VACUUM DEHYDRATION

To obtain a sufficiently dry system, the following instructions have been assembled to provide an effective method for evacuating and dehydrating a system in the field. Although there are several methods of dehydrating a system, we are recommending the following, as it produces one of the best results, and affords a means of obtaining accurate readings as to the extent of dehydration.

The equipment required to follow this method of dehydration consists of a wet bulb indicator or vacuum gauge, a chart showing the relation between dew point temperature and pressure in inches of mercury (vacuum), (see last page) and a vacuum pump capable of pumping a suitable vacuum on the system.

OPERATION

Dehydration of a refrigeration system can be obtained by this method because the water present in the system reacts much as a refrigerant would. By pulling down the pressure in the system to a point where its saturation temperature is considerably below that of room temperature, heat will flow from the room through the walls of the system and vaporize the water, allowing a large

percentage of it to be removed by the vacuum pump. The length of time necessary for the dehydration of a system is dependent on the size or volume of the system, the capacity and efficiency of the vacuum pump, the room temperature and the quantity of water present in the system. By the use of the vacuum indicator as suggested, the test tube will be evacuated to the same pressure as the system, and the distilled water will be maintained at the same saturation temperature as any free water in the system, and this temperature can be observed on the thermometer.

If the system has been pressure tested and found to be tight prior to evacuation, then the saturation temperature recordings should follow a curve similar to the typical saturation curve shown as Fig. 10.

The temperature of the water in the test tube will drop as the pressure decreases, until the boiling point is reached, at which point the temperature will level off and remain at this level until all of the water in the shell is vaporized. When this final vaporization has taken place the pressure and temperature will continue to drop until eventually a temperature of 35°F or a pressure of 5mm Hg. is reached.

When this point is reached, practically all of the air has been evacuated from the system, but there is still a small amount of moisture left. In order to provide a medium for carrying this residual moisture to the vacuum pump, nitrogen should be introduced into the system to bring it to atmospheric pressure and the indicator temperature will return to approximately ambient temperature. Close off the system again, and start the second evacuation.

The relatively small amount of moisture left will be carried out through the vacuum pump and the temperature or pressure shown by the indicator should drop uniformly until it reaches a temperature of 35°F or a pressure of 5mm Hg.

When the vacuum indicator registers this temperature or pressure it is a positive sign that the system is evacuated and dehydrated to the recommended limit. If this level can not be reached, it is evident that there is a leak somewhere in the system. Any leaks must be corrected

before the indicator can be pulled down to 35°F or 5mm Hg. in the primary evacuation. During the primary pull-down keep a careful watch on the wet bulb indicator temperature, and do not let it fall below 35°F. If the temperature is allowed to fall to 32°F the water in the test tube will freeze, and the result will be a faulty temperature reading.

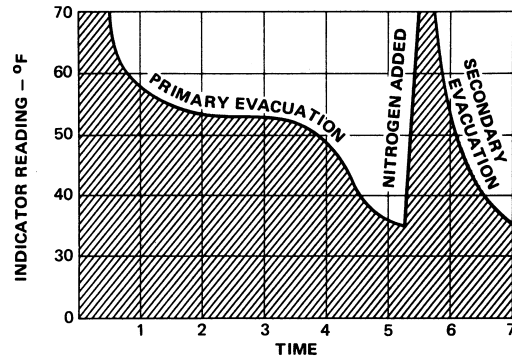


FIG. 10 – SATURATION CURVE

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SYSTEMS PRESSURES

*GAUGE INCHES OF MERCURY (HG) BELOW ONE STANDARD ATMOSPHERE	ABSOLUTE			BOILING TEMPERATURES OF WATER °F
	PSIA	MILLIMETERS OF MERCURY (HG)	MICRONS	
0	14.696	760	760,000	212
10.24*	9.629	500	500,000	192
22.05*	3.865	200	200,000	151
25.98*	1.935	100	100,000	124
27.95*	.968	50	50,000	101
28.94*	.481	25	25,000	78
29.53*	.192	10	10,000	52
29.67*	.122	6.3	6,300	40
29.72*	.099	5	5,000	35
29.842*	.039	2	2,000	15
29.882*	.019	1.0	1,000	+1
29.901*	.010	.5	500	-11
29.917*	.002	.1	100	-38
29.919*	.001	.05	50	-50
29.9206*	.0002	.01	10	-70
29.921*	0	0	0	

* One standard atmosphere = 14.696 PSIA
= 760 mm Hg. absolute pressure at 32°F
= 29.921 inches Hg. absolute at 32°F

NOTES: PSIG = Lbs. per sq. in. gauge pressure
= Pressure above atmospheric
PSIA = Lbs. per sq. in. absolute pressure
= Sum of gauge plus atmospheric pressure



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