YORK BY JOHNSON CONTROLS	CENTRIFUGAL LIQUID CHILLERS	
INSTALLATION INSTRUCTIONS	Supersedes: 160.75-N3 (211)	Form 160.75-N3 (615)

FIELD RE-ASSEMBLY FOR FORM 3, 7, 9 AND FORM 10 SHIPMENT

MODEL YK CHILLERS (STYLE G)
R-134A (COOLING ONLY)

WITH GRAPHIC CONTROL CENTER
FOR ELECTRO-MECHANICAL STARTER,
SOLID STATE STARTER AND VARIABLE SPEED DRIVE

LD15222

Issue Date:
June 15, 2015

IMPORTANT!

READ BEFORE PROCEEDING!

GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During rigging, installation, operation, maintenance, or service, individuals may be exposed to certain components or conditions including, but not limited to: heavy objects, refrigerants, 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 rigging, installation, and 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 rigging, installation, and operating/service personnel. It is expected that these individuals possess 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 the on-product labels, this document and any referenced materials. This individual shall also be familiar with and comply with all applicable industry and governmental standards and regulations pertaining to the task in question.

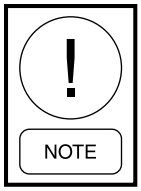
SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to specific situations:

Indicates a possible hazardous situation which will result in death or serious injury if proper care is not taken.

Identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution if proper care is not taken or instructions and are not followed.

Indicates a potentially hazardous situation which will result in possible injuries or damage to equipment if proper care is not taken.



Highlights additional information useful to the technician in completing the work being performed properly.

External wiring, unless specified as an optional connection in the manufacturer's product line, is not to be connected inside the control cabinet. Devices such as relays, switches, transducers and controls and any external wiring must not be installed inside the micro panel. All wiring must be in accordance with Johnson Controls' published specifications and must be performed only by a qualified electrician. Johnson Controls will NOT be responsible for damage/problems resulting from improper connections to the controls or application of improper control signals. Failure to follow this warning will void the manufacturer's warranty and cause serious damage to property or personal injury.

CHANGEABILITY OF THIS DOCUMENT

In complying with Johnson Controls' policy for continuous product improvement, the information contained in this document is subject to change without notice. Johnson Controls makes no commitment to update or provide current information automatically to the manual or product owner. Updated manuals, if applicable, can be obtained by contacting the nearest Johnson Controls Service office or accessing the Johnson Controls QuickLIT website at http://cgproducts.johnsoncontrols.com.

It is the responsibility of rigging, lifting, and operating/service personnel to verify the applicability of these documents to the equipment. If there is any question regarding the applicability of these documents, rigging, lifting, and operating/service personnel should verify whether the equipment has been modified and if current literature is available from the owner of the equipment prior to performing any work on the chiller.

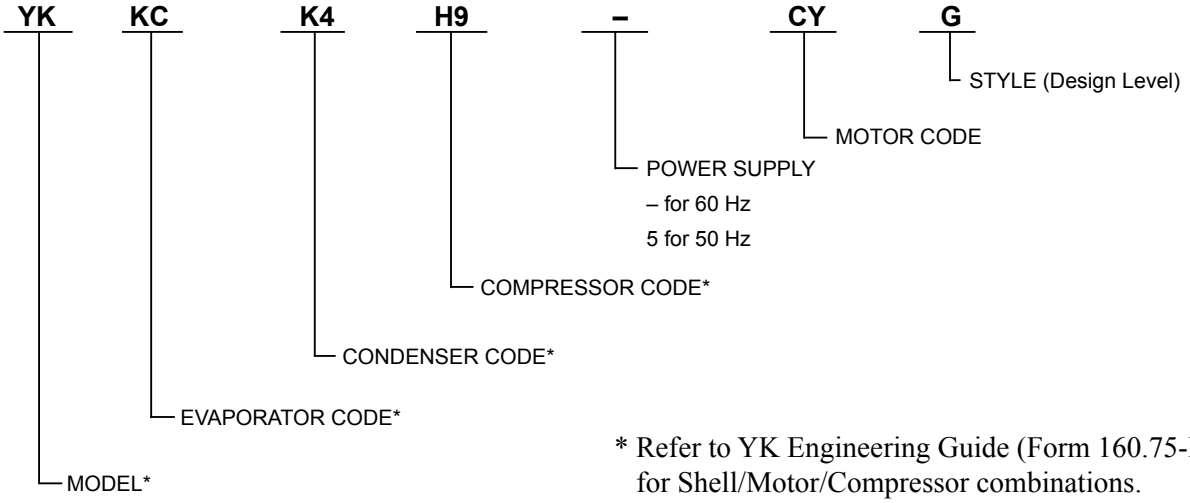
CHANGE BARS

Revisions made to this document are indicated with a line along the left or right hand column in the area the revision was made. These revisions are to technical information and any other changes in spelling, grammar or formatting are not included.

ASSOCIATED LITERATURE

MANUAL DESCRIPTION	FORM NUMBER
Solid State Starter (Mod "B") – Operation and Maintenance	160.00-O2
Variable Speed Drive – Operation	160.00-O1
Installation – Unit	160.54-N1
Operation – OptiView Control Panel	160.54-O1
Renewal Parts – Unit	160.75-RP1
Renewal Parts – OptiView Control Center	160.54-RP1
Wiring Diagram – Field Control Modifications for YK Chiller (Style G)	160.75-PW4
Wiring Diagram – YK Chiller (Style G) OptiView Control Center with Remote Low or Medium Voltage EMS	160.75-PW5
Wiring Diagram – YK Chiller (Style G) OptiView Control Center with Unit Mounted Low or Medium Voltage SSS, Unit Mounted Low Voltage VSD with Modbus, or Remote Medium Voltage VSD	160.75-PW6
Installation - Unit	160.75-N1
Operation - Unit	160.75-O1

NOMENCLATURE



* Refer to YK Engineering Guide (Form 160.75-EG1) for Shell/Motor/Compressor combinations.

LIST OF FIGURES

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INTRODUCTION

This instruction explains the procedure to be used for reassembling the Model YK Chiller shipped disassembled (Shipping Form 3 and 7).

NOTE

Chillers MUST be field reassembled under the supervision of a Johnson Controls representative.

For instructions on installing the unit, refer to the *Unit Installation Instructions (Form 160.75-N1)*.

FORMS OF SHIPMENT

Form 3 – Driveline Separate From Shells – Shipped as two major assemblies. The unit is first factory assembled, refrigerant piped, wired and leak tested; then dismantled for shipment. Close-coupled compressor/open motor assembly is removed from shells and skidded; however, the evaporator/condenser is not skidded. All wiring integral with compressor is left on it, and all conduit is left on the shell. All openings on the compressor and shell are closed and charged with dry nitrogen (2 to 3 PSIG).

The shipment may include miscellaneous packaging of the control center, oil eductor filter, tubing, water temperature controls, wiring, oil, isolators, solid state starter or variable speed drive (options). The Refrigerant charge is shipped in appropriate cylinders. For P and Q compressors the control panel is removed for shipment. For H9 and K compressors the control panel is shipped on a folded bracket. Refer to the *Installation - Unit (Form 160.75-N1)* for more details.

Form 7 – Split Shells – Shipped as three major assemblies. The unit is first factory assembled, refrigerant piped, wired and leak tested; then dismantled for shipment. Close-coupled compressor/open motor assembly is removed from shells and skidded.

Evaporator and condenser shells are separated at tube sheets and are not skidded. Refrigerant lines between the shells are flanged and capped; tube sheets are also bolted, requiring NO welding.

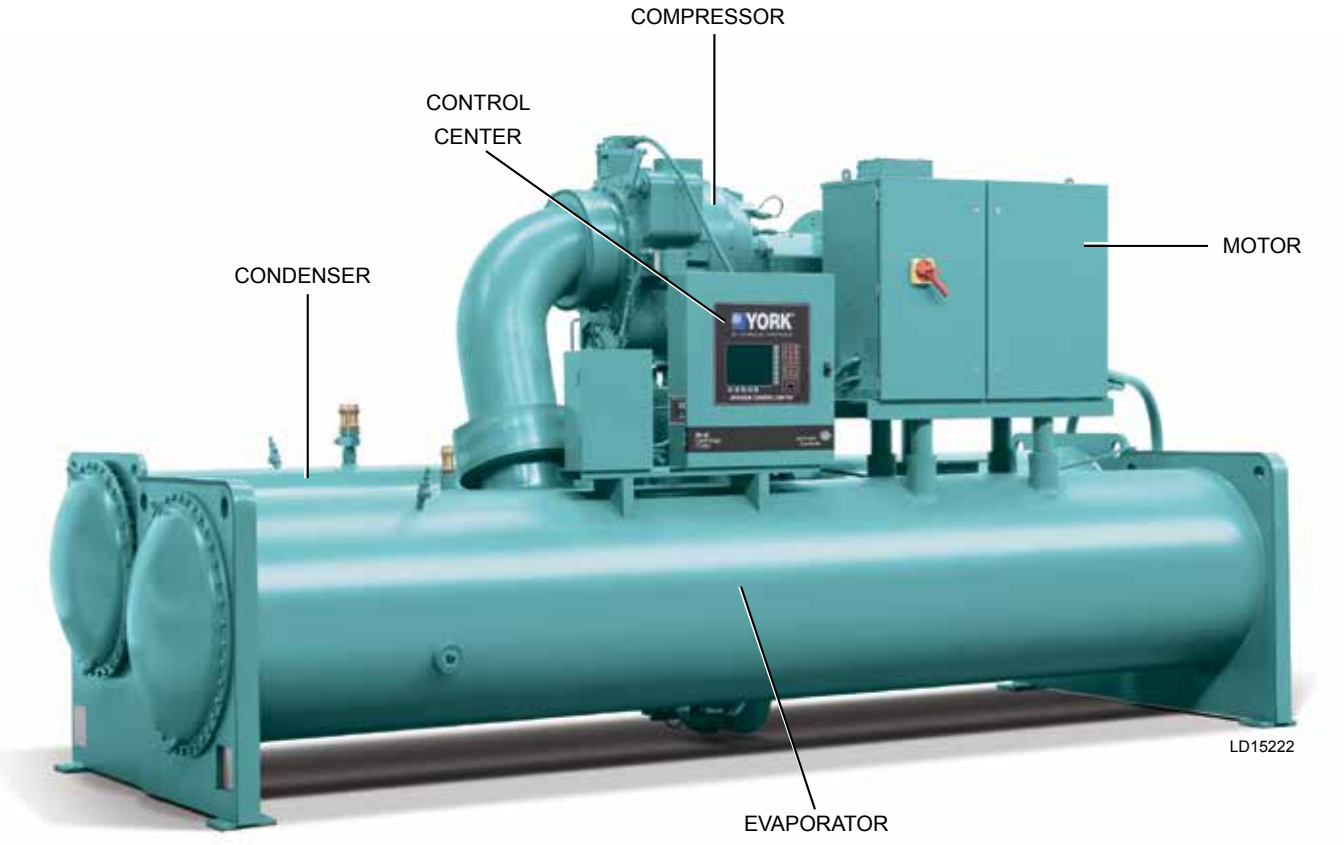


FIGURE 1 - FRONT VIEW OF ASSEMBLED UNIT

All wiring integral with the compressor is left on. All wiring harnesses on shells are removed.

All openings on compressor and shells are closed and charged with dry nitrogen (2 or 3 PSIG).

The shipment may include miscellaneous packaging of control center, oil eductor filter, tubing, water temperature controls, wiring, oil, isolators, solid state starter or variable speed drive (options). Refrigerant charge is shipped in appropriate cylinders. For P and Q compressors the control panel is removed for shipment. For H9 and K compressors the control panel is shipped on a folded bracket. Refer to the *Installation - Unit (Form 160.75-N1)* for more details.

NOTE

When more than one chiller is involved, the major parts of each unit will be marked to prevent mixing of assemblies. Piping and wiring drawings to be furnished by Johnson Controls.

FORM 9 – Unit Separate from Variable Speed Drive

Shipped as two major assemblies:

- Chiller Unit
- Variable Speed Drive

The unit is first factory assembled, refrigerant piped, wired and leak tested; then dismantled for shipment. Evaporator/condenser is not skidded.

All wiring integral with compressor is left on it, and all conduit is left on shell. All openings on compressor, and shell are closed and charged with dry nitrogen (2 to 3 PSIG).

Miscellaneous packaging of tubing, water temperature controls, wiring, isolators, etc. The unit is shipped with a nitrogen charge. Refrigerant charge shipped in appropriate cylinders. See Figure 4.

FORM 10 – Unit Separate from Variable Speed Drive

Shipped as two major assemblies:

- Chiller Unit
- Variable Speed Drive

The unit is first factory assembled, refrigerant piped, wired and leak tested; then dismantled for shipment. Evaporator/condenser is not skidded.

All wiring integral with compressor is left on it, and all conduit is left on shell.

Miscellaneous packaging of tubing, water temperature controls, wiring, isolators, etc. The unit is shipped with refrigerant charge. See Figure 4.

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.

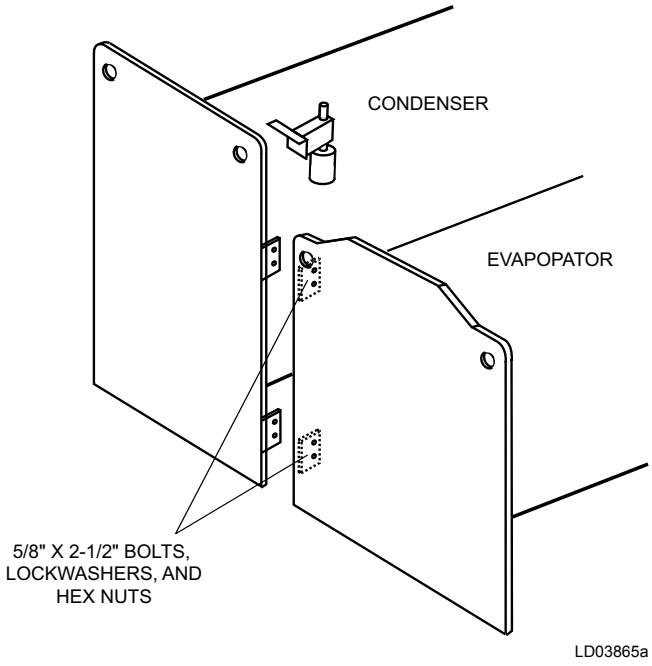


FIGURE 2 - FORM 7 SHIPMENT

NOTE

Johnson Controls 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.)

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 Johnson Controls immediately. (Refer to Shipping Damage Claims, Form 50.15-NM.)

DATA PLATES

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.

A Control Panel data plate, which includes control panel part number and serial number is also included. If the unit is equipped with a Solid State Starter or Variable Speed Drive (optional), it has its own data plate with serial number.

RE-ASSEMBLY

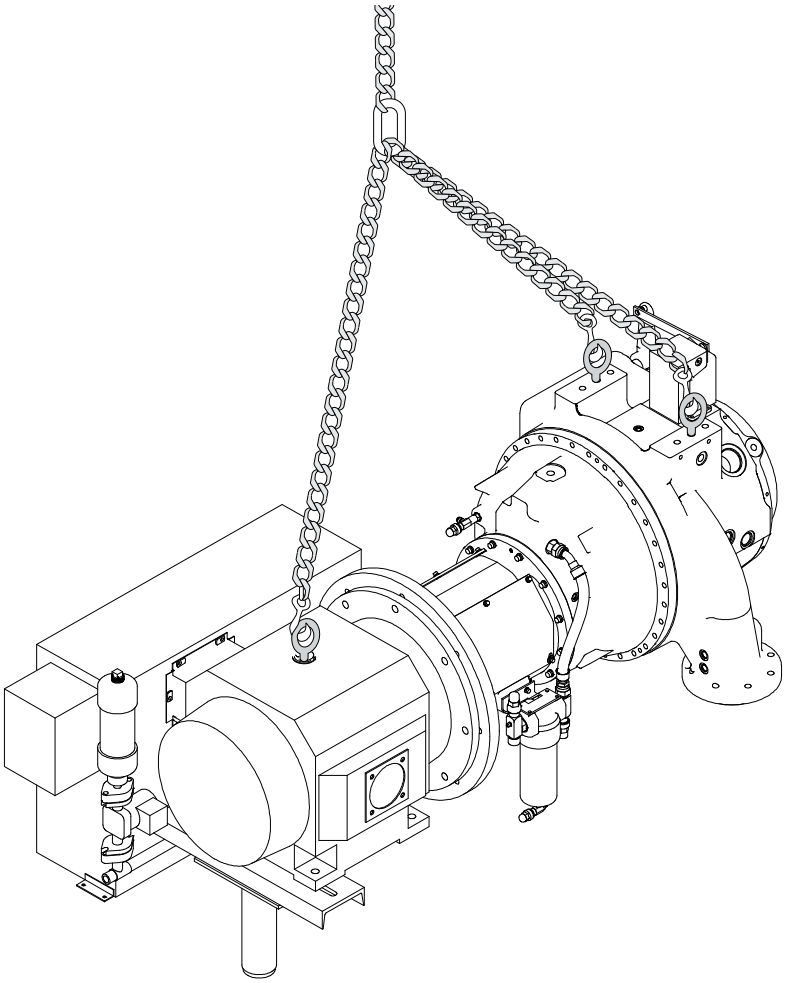
The following is a step-by-step procedure to be used to re-assemble the chiller. Refer to the *Unit Installation Instructions (Form 160.75-N1)* for other instructions.

Form 7 Shipment

1. Locate cooler and condenser shells in their final position. Rigging holes exist on the top corners of each tube sheet, four per shell.
2. Bolt the tube sheets together as shown in *Figure 2*. Note that the outside surfaces of the tube sheets must be flush.

Form 3 and Form 7 Shipment

1. Assemble vibration isolators to unit. (Refer to the *Unit Installation Instructions (Form 160.75-N1)*)
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 the *Unit Installation Instructions (Form 160.75-N1)* for additional instructions to level the 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 (Refer to *Figure 3 on Page 10*). Carefully lower the compressor/motor assembly on to the supports on the cooler. Fasten compressor/motor assembly with the proper hardware. Do not tighten the bolts until all connections are made to the compressor.
4. Bolt the suction line between the compressor and the cooler using proper gaskets and hardware.
5. Install the fill piece or isolation valve between the compressor and the condenser using proper gaskets and hardware.
6. Connect the oil line between the compressor oil drain flange and the oil sump flange. Be sure to install proper gaskets and hardware.
7. Complete the refrigerant liquid piping beneath the cooler and condenser. Be sure the fill piece, orifice plate, gaskets and hardware are properly installed.
8. Tighten all hardware installed in steps 3 thru 7 above.
9. Assemble the Control Center to unit. Note: Large units have panel mounted on brackets for shipping. Small units are shipped separately.
10. Assemble the Oil Pump Control Panel.
11. Install refrigerant piping and oil return system filters.
12. Pressure test. NOTE: Relief valves must be plugged (or capped). Refer to *Operation - Unit (Form 160.75-O1)*.
13. Evacuate and charge with refrigerant. Refer to *Operation - Unit (Form 160.75-O1)*.
14. **All Units –** Complete installation and finally level the unit per the *Unit Installation Instructions (Form 160.75-N1)*.



NOTE: Rig the driveline into place on the chiller, supporting the compressor with two lifting lugs and the motor with either, one, two, or four legs depending on motor design.

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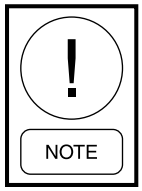
FIGURE 3 - RIGGING – COMPRESSOR/MOTOR ASSEMBLY

FORM 9 and FORM 10 Re-assembly

1. Assemble vibration isolators to unit (refer to *YK Mod G Installation Manual (Form 160.75-N1)*.
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 *YK Mod G Installation Manual (Form 160.75-N1)* for additional instructions to level the unit. After shell is leveled, wedge and shim each corner of the shell to solidly support it while assembling the other parts.
3. Tighten all hardware installed in steps 3 thru 6 above to the specified torque values provided in *Table 1*.
4. Lift the Variable Speed Drive and remove all packing material, for Variable Speed Drive weight refer to *Table 3*. Carefully lower the Variable Speed Drive on to the supports on the condenser. Fasten the Variable Speed Drive to the condenser and to the motor terminal box duct. Make all necessary connections for the VSD cooling loop to be complete.

   The Variable Speed Drive will be shipped with glycol in the cooling system. The Variable Speed Drive coolant must be changed to the inhibitor provided with the shipped loose items prior to starting the unit.

5. Re-connect motor power leads in the Variable Speed Drive to T1, T2, and T3 terminals and torque to 18-20 Ft-lbs. per the labels in the VSD.
6. Re-connect motor winding thermistor shielded cable conductors in the Variable Speed Drive at TB4 (*refer to Unit Wiring and Field Control Modifications (Form 160.75-PW2)*.
7. Re-connect all unit wiring and harnesses (refer to *Unit Wiring and Field Control Modifications (Form 160.75-PW2)*.
8. Pressure test the unit.



Relief valves must be plugged or capped (refer to Operations and Maintenance Form 160.75-O1).

9. **FORM 9 -** Remove Nitrogen and charge unit with Refrigerant (refer to *Operations and Maintenance (Form 160.75-O1)*.
10. **All Units –** Complete installation and finally level the unit (refer to *Installation Manual (Form 160.75-N1)*.

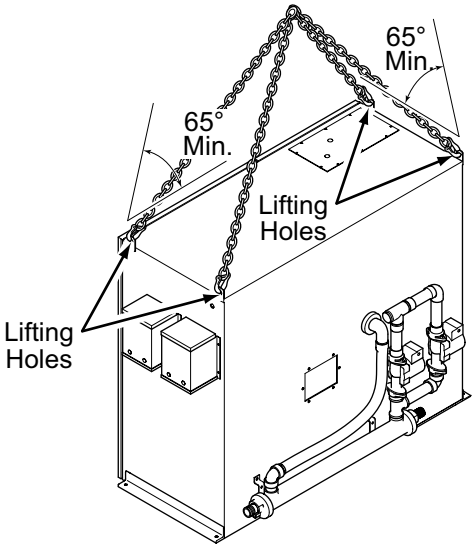
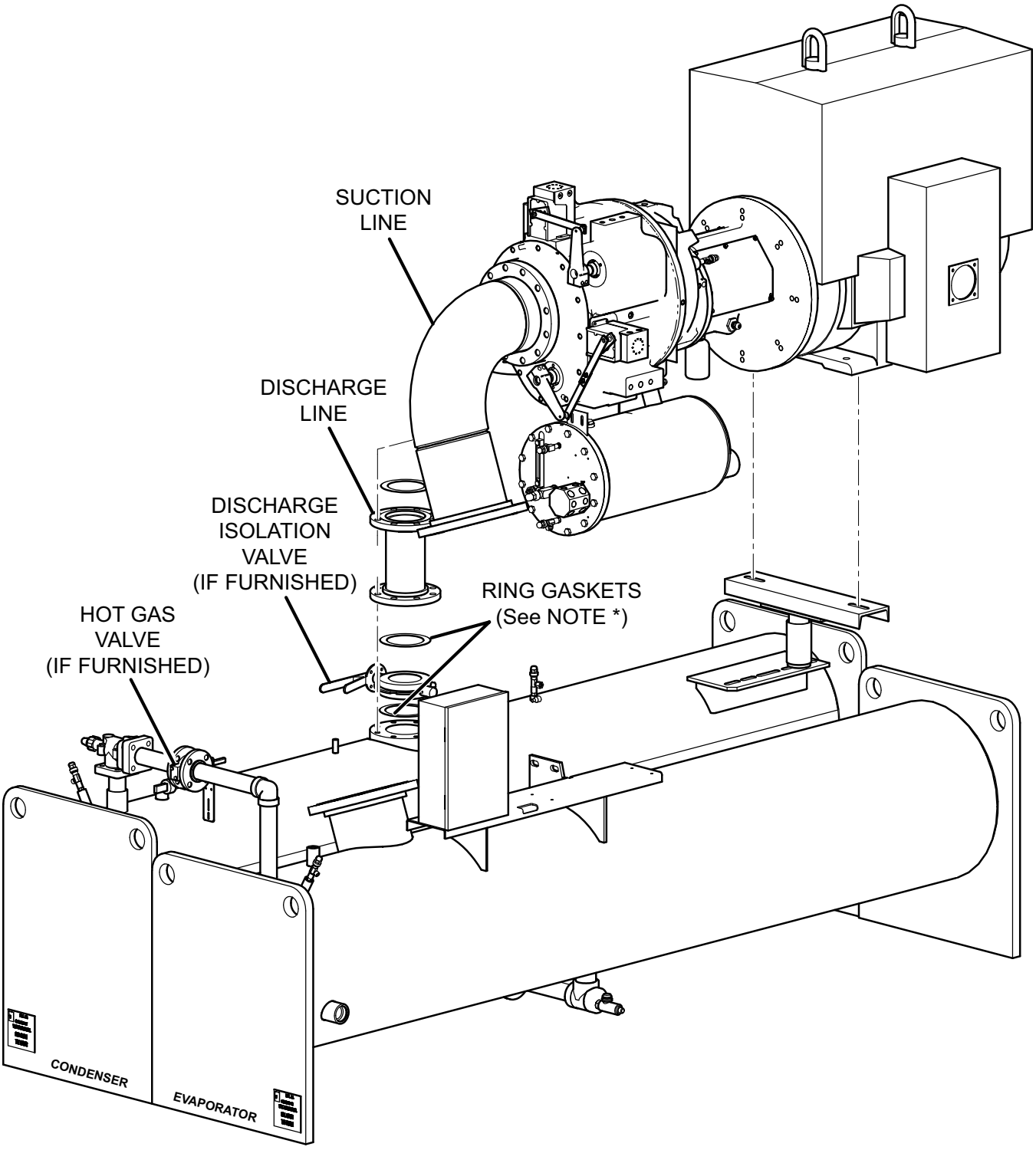


FIGURE 4 - VARIABLE SPEED DRIVE RIGGING

Q3-Q7 AND P7 COMPRESSORS (WITHOUT FALLING FILM)



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

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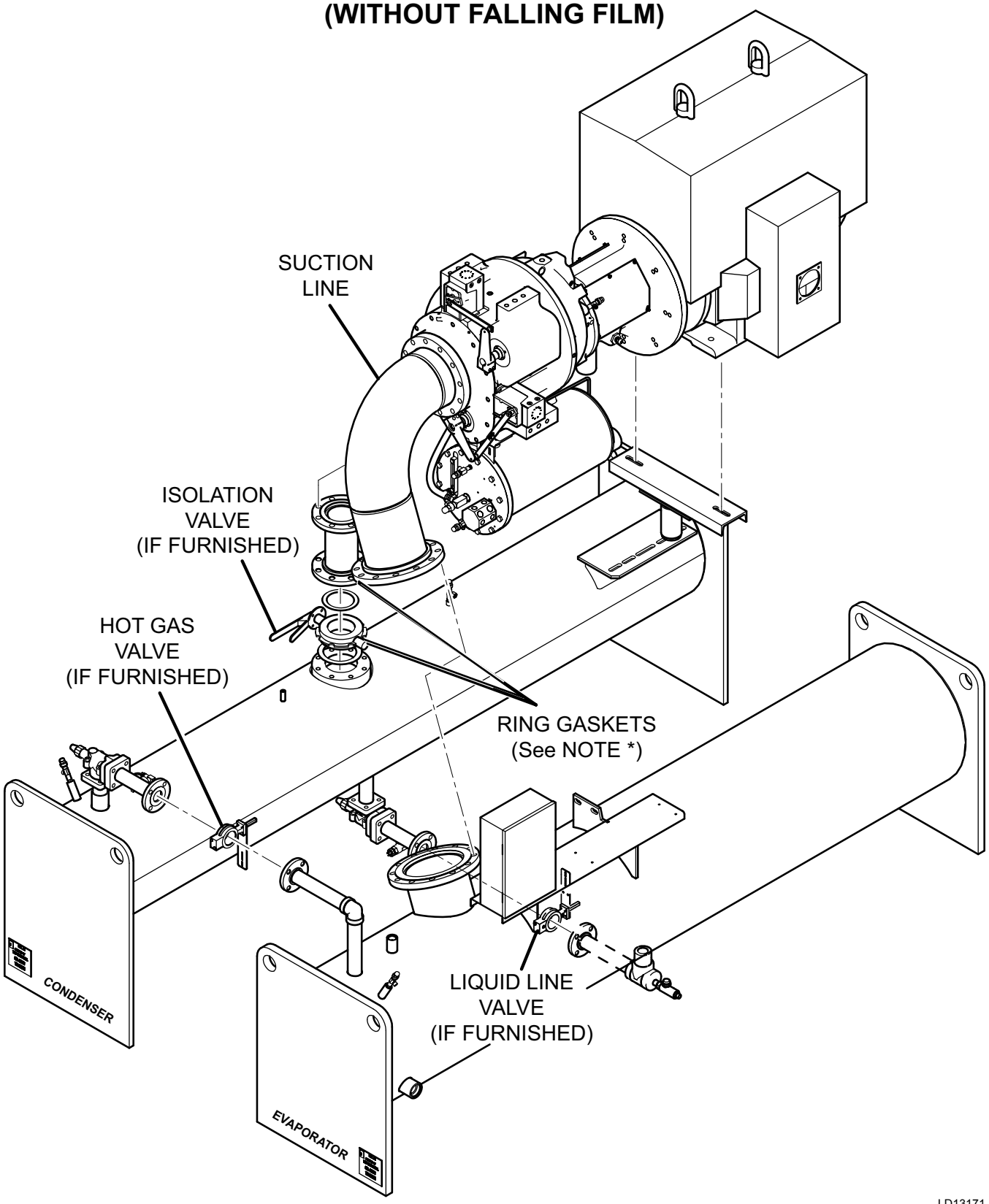
FIGURE 5 - FORM 3 SHIPMENT (Q3-Q7 AND P7 COMPRESSORS WITHOUT FALLING FILM)

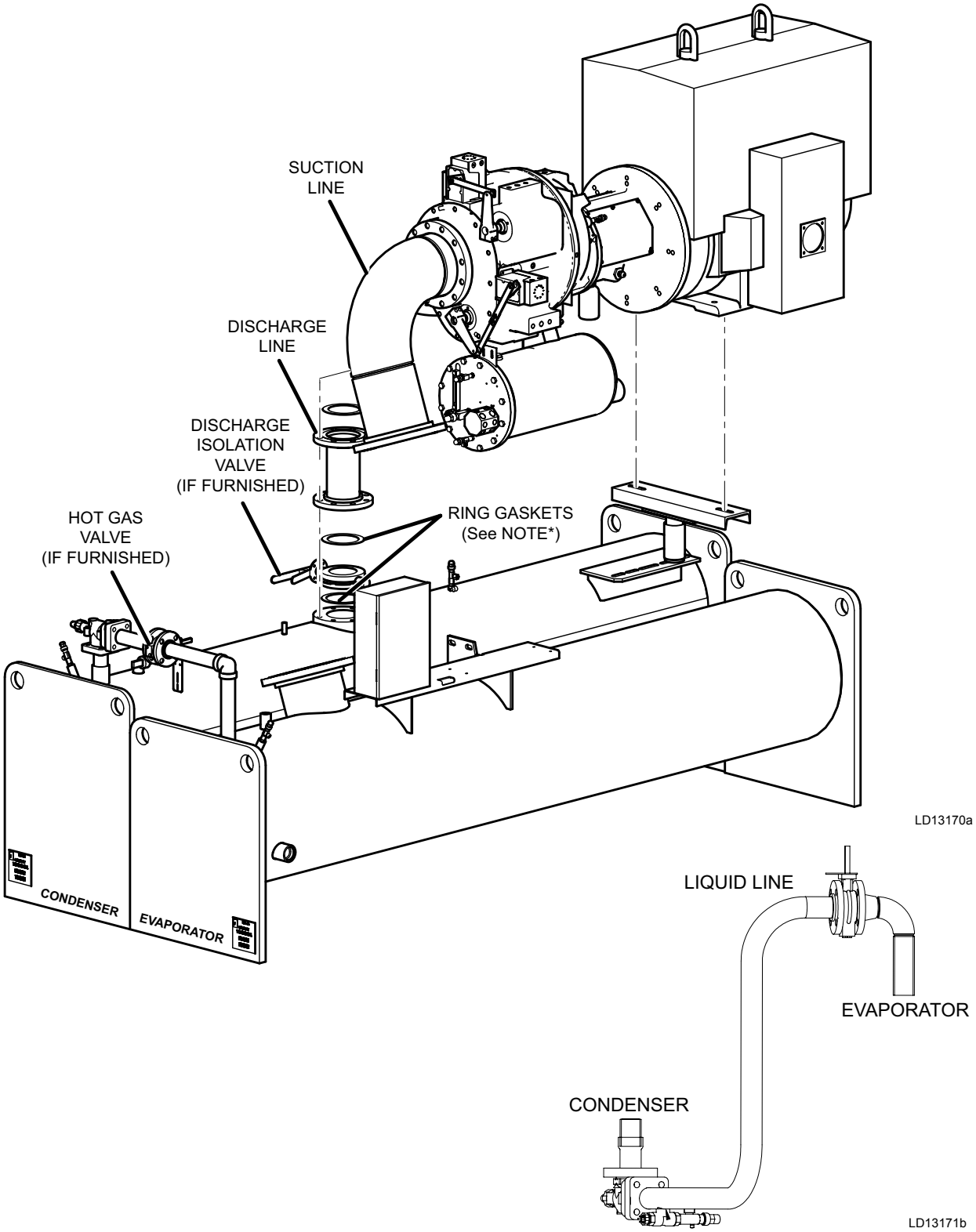
Q3-Q7 AND P7 COMPRESSORS (CONT'D) (WITHOUT FALLING FILM)



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

FIGURE 6 - FORM 7 SHIPMENT (Q3-Q7 AND P7 COMPRESSORS WITHOUT FALLING FILM))

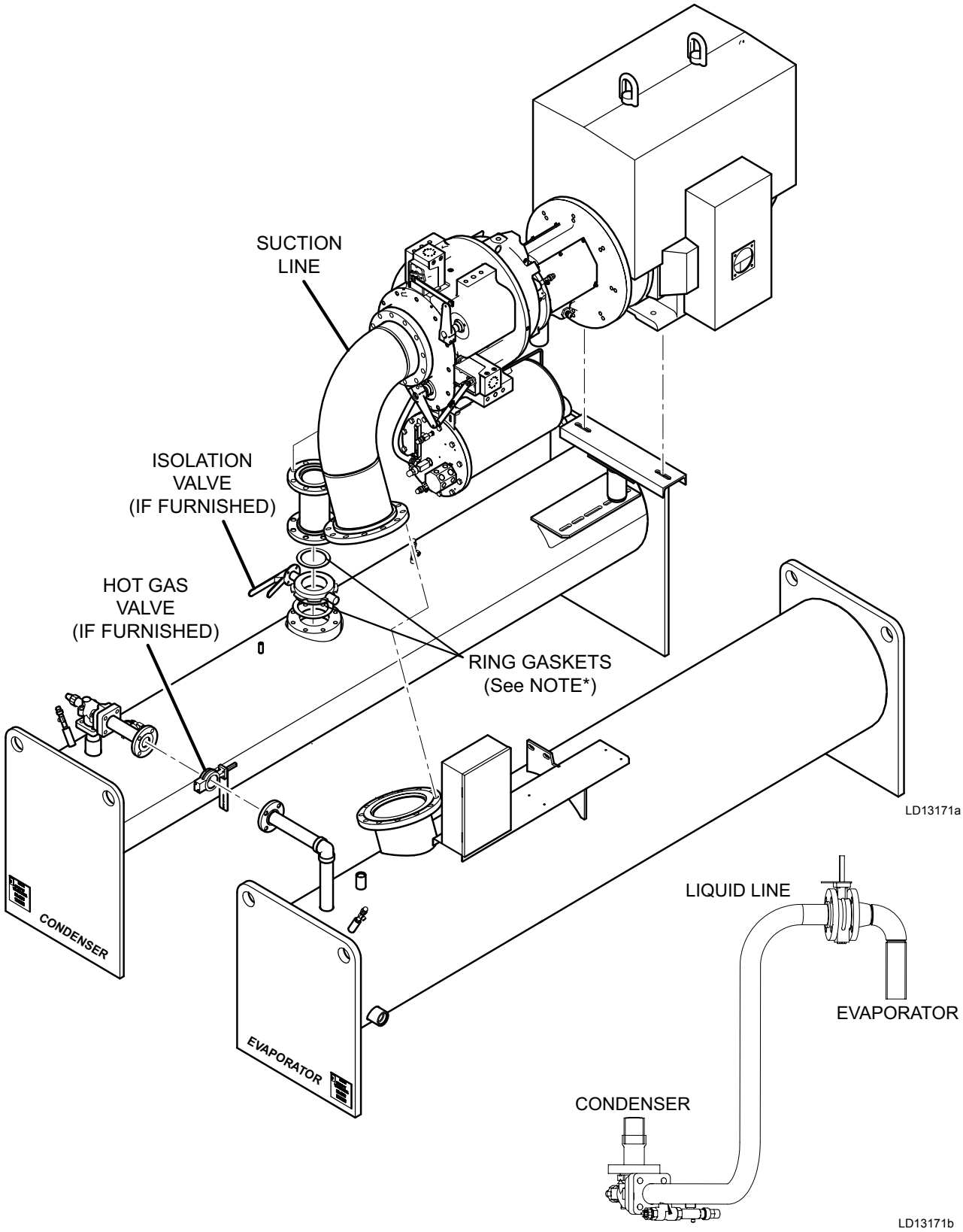
Q3-Q7 AND P7 COMPRESSORS (CONT'D) (WITH FALLING FILM)



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

FIGURE 7 - FORM 3 SHIPMENT (Q3-Q7 AND P7 COMPRESSORS WITH FALLING FILM)

Q3-Q7 AND P7 COMPRESSORS (CONT'D) (WITH FALLING FILM)



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

FIGURE 8 - FORM 7 SHIPMENT (Q3-Q7 AND P7 COMPRESSORS WITH FALLING FILM)

Q3-Q7 AND P7 COMPRESSORS (CONT'D)

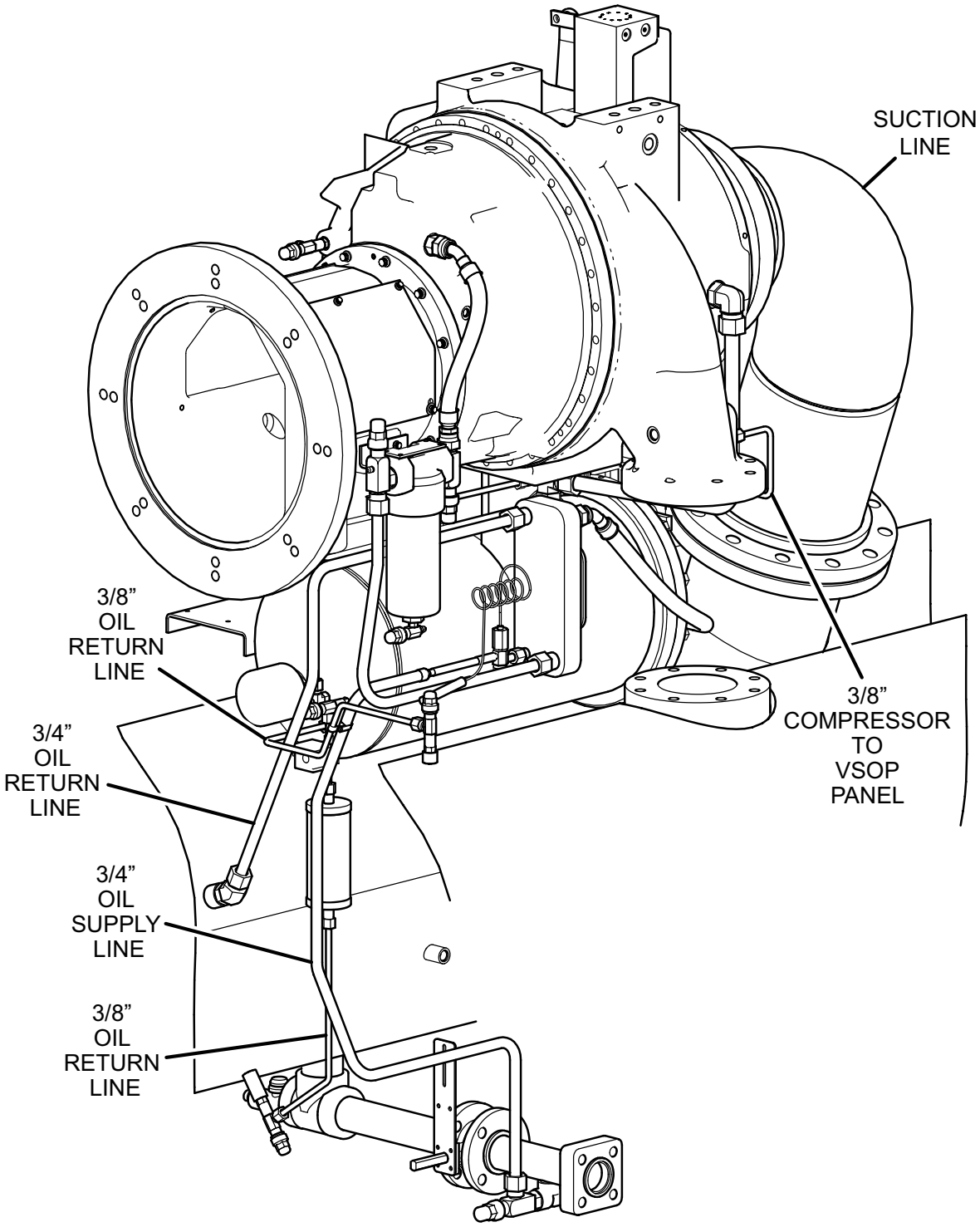


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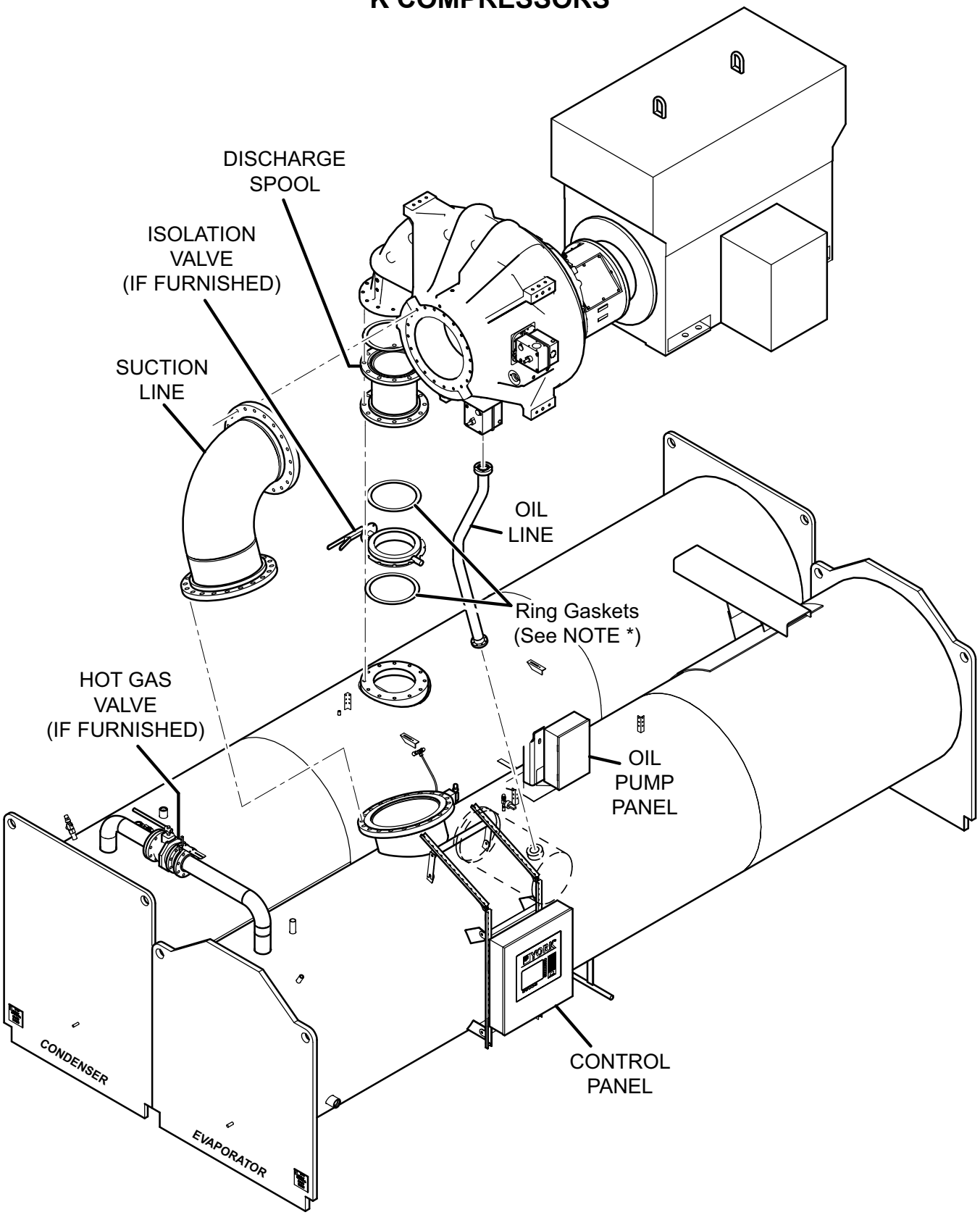
FIGURE 9 - SYSTEM PIPING (Q3-Q7 AND P7 COMPRESSORS)

K COMPRESSORS



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

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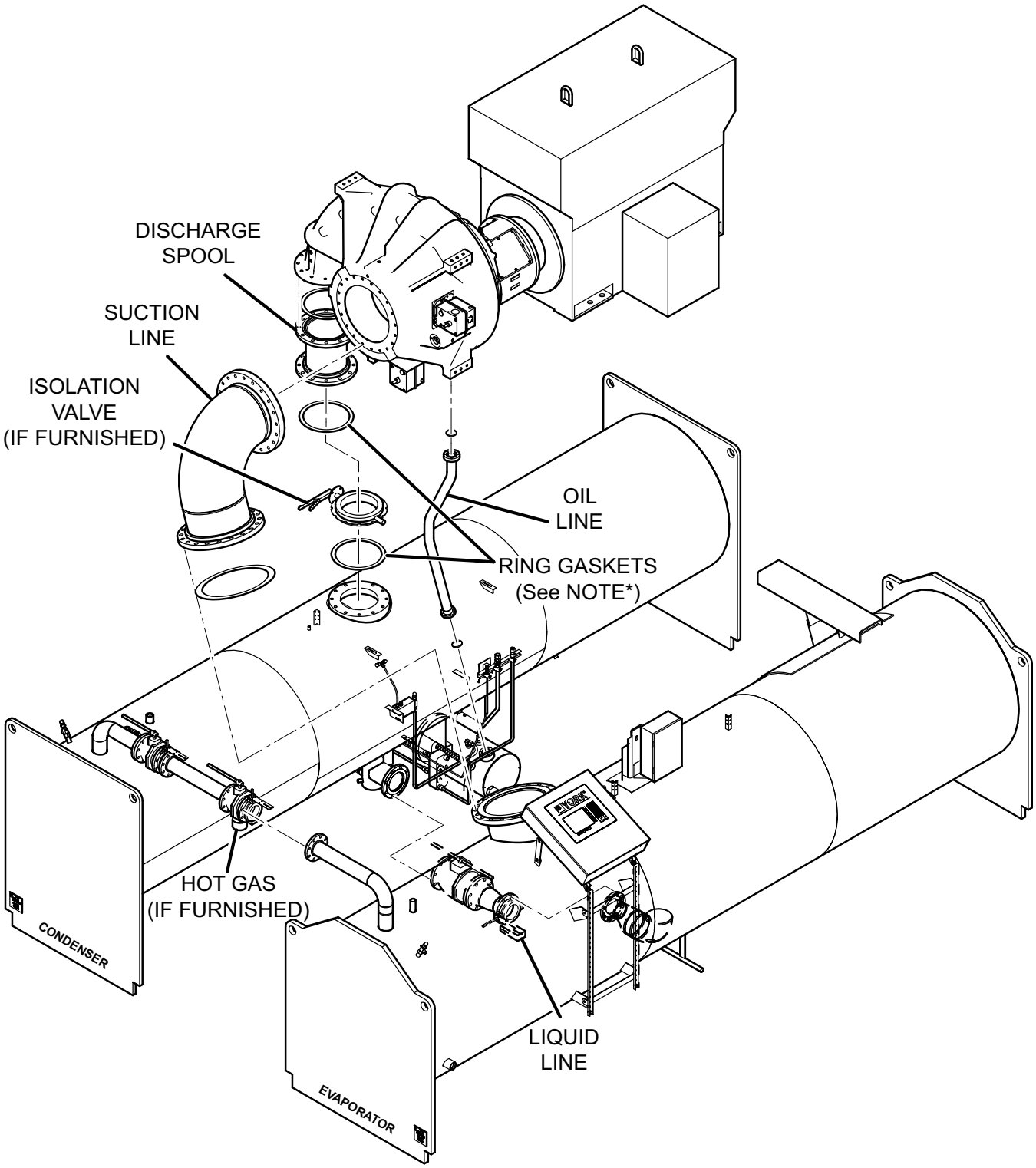
FIGURE 10 - FORM 3 SHIPMENT (K COMPRESSORS)

K COMPRESSORS (CONT'D)



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

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FIGURE 11 - FORM 7 SHIPMENT (K COMPRESSORS)

K COMPRESSORS (CONT'D)

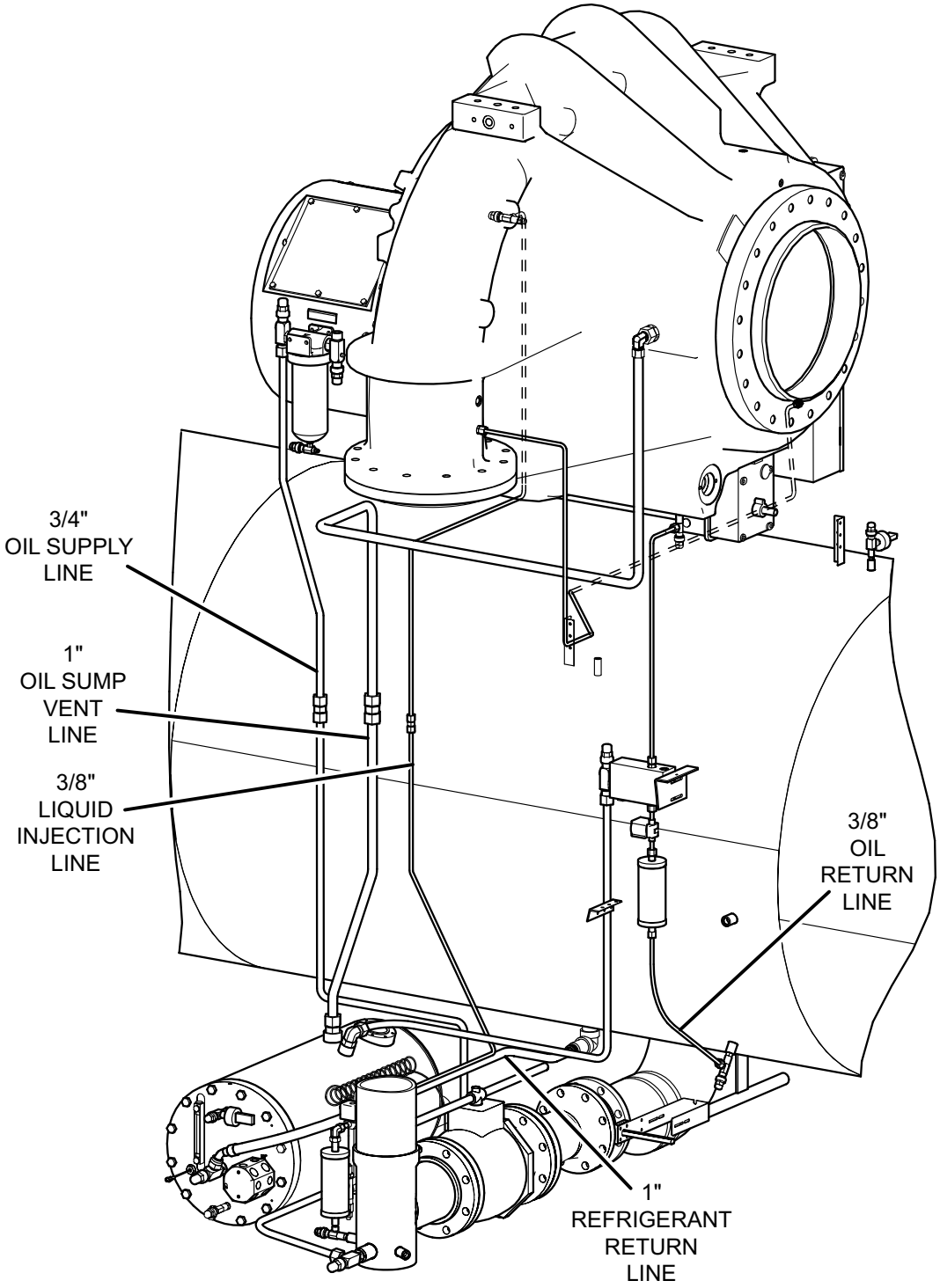

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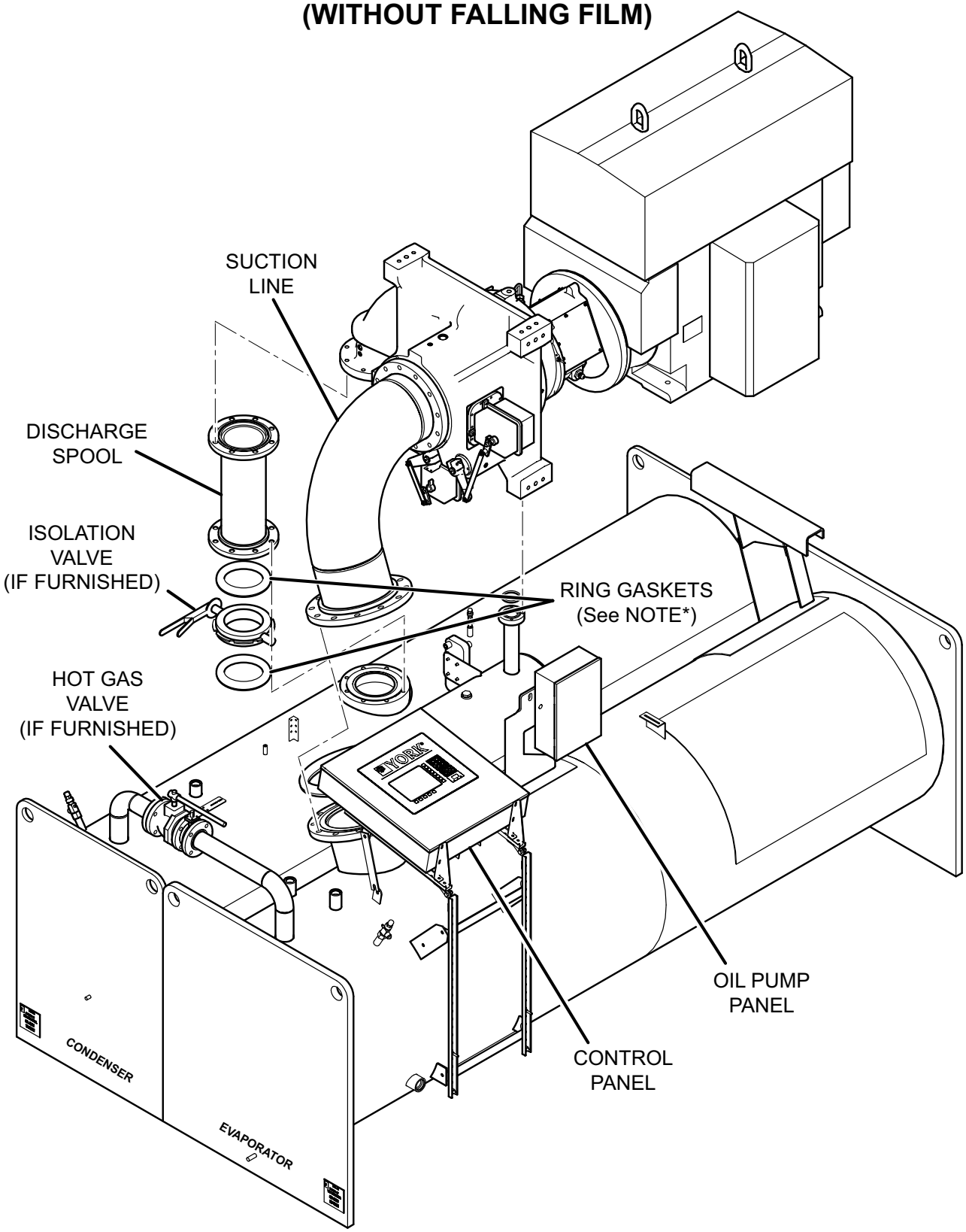
FIGURE 12 - SYSTEM PIPING (K COMPRESSORS)

P8-P9 AND H9 COMPRESSORS (WITHOUT FALLING FILM)



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

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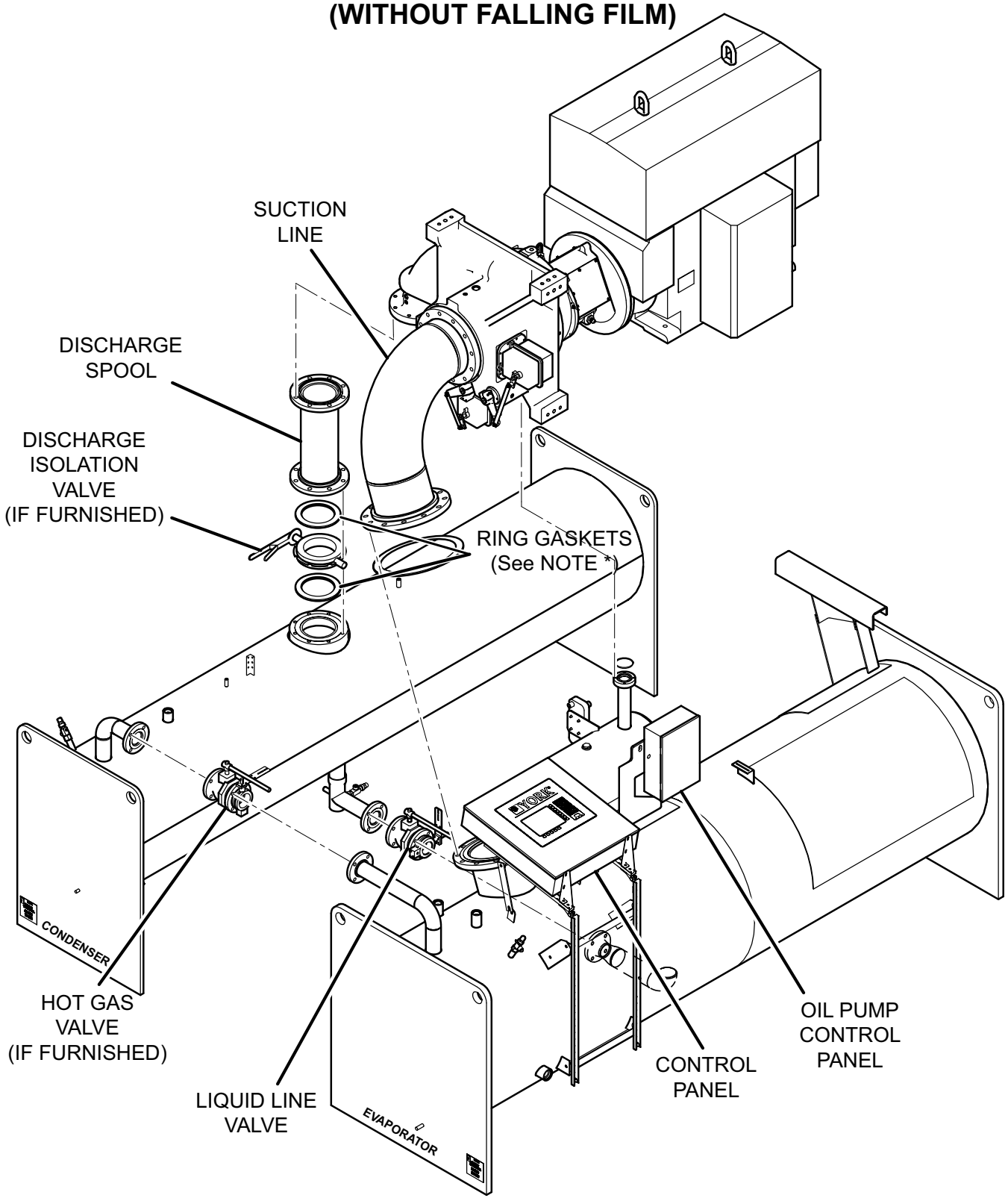
FIGURE 13 - FORM 3 SHIPMENT (P8-P9 AND H9 COMPRESSORS WITHOUT FALLING FILM)

P8-P9 AND H9 COMPRESSORS (CONT'D) (WITHOUT FALLING FILM)



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

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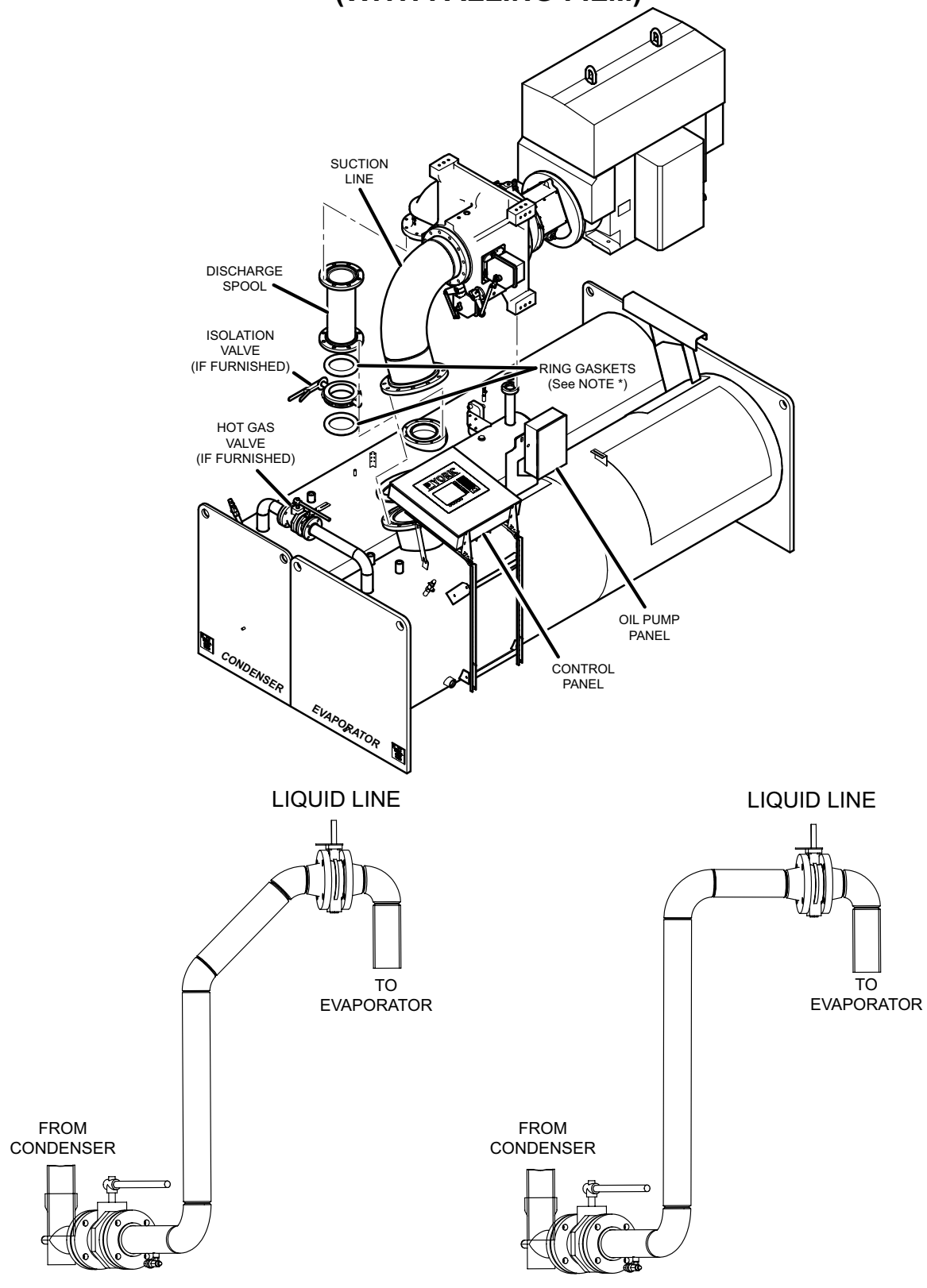
FIGURE 14 - FORM 7 SHIPMENT (P8-P9 AND H9 COMPRESSORS WITHOUT FALLING FILM)

P8-P9, H9 COMPRESSORS (CONT'D)
(WITH FALLING FILM)



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

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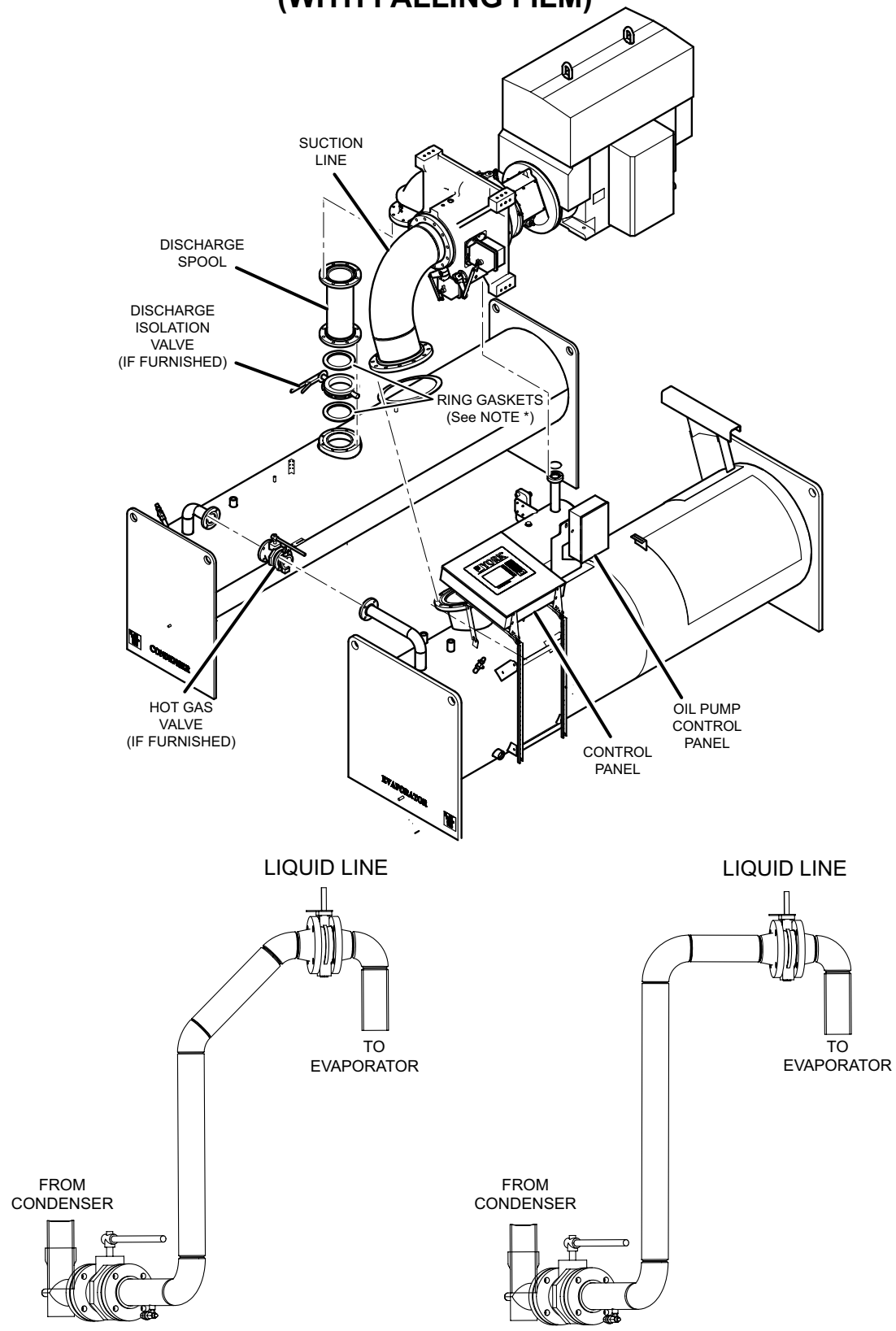
FIGURE 15 - FORM 3 SHIPMENT (P8-P9 AND H9 COMPRESSORS WITH FALLING FILM)

P8-P9, H9 COMPRESSORS (CONT'D) (WITH FALLING FILM)



NOTE:
* Ring Gaskets NOT used for elastomer-lined flange faces at the Isolation Valve.

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FIGURE 16 - FORM 7 SHIPMENT (P8-P9 AND H9 COMPRESSORS WITH FALLING FILM)

P8-P9 AND H9 COMPRESSORS (CONT'D)

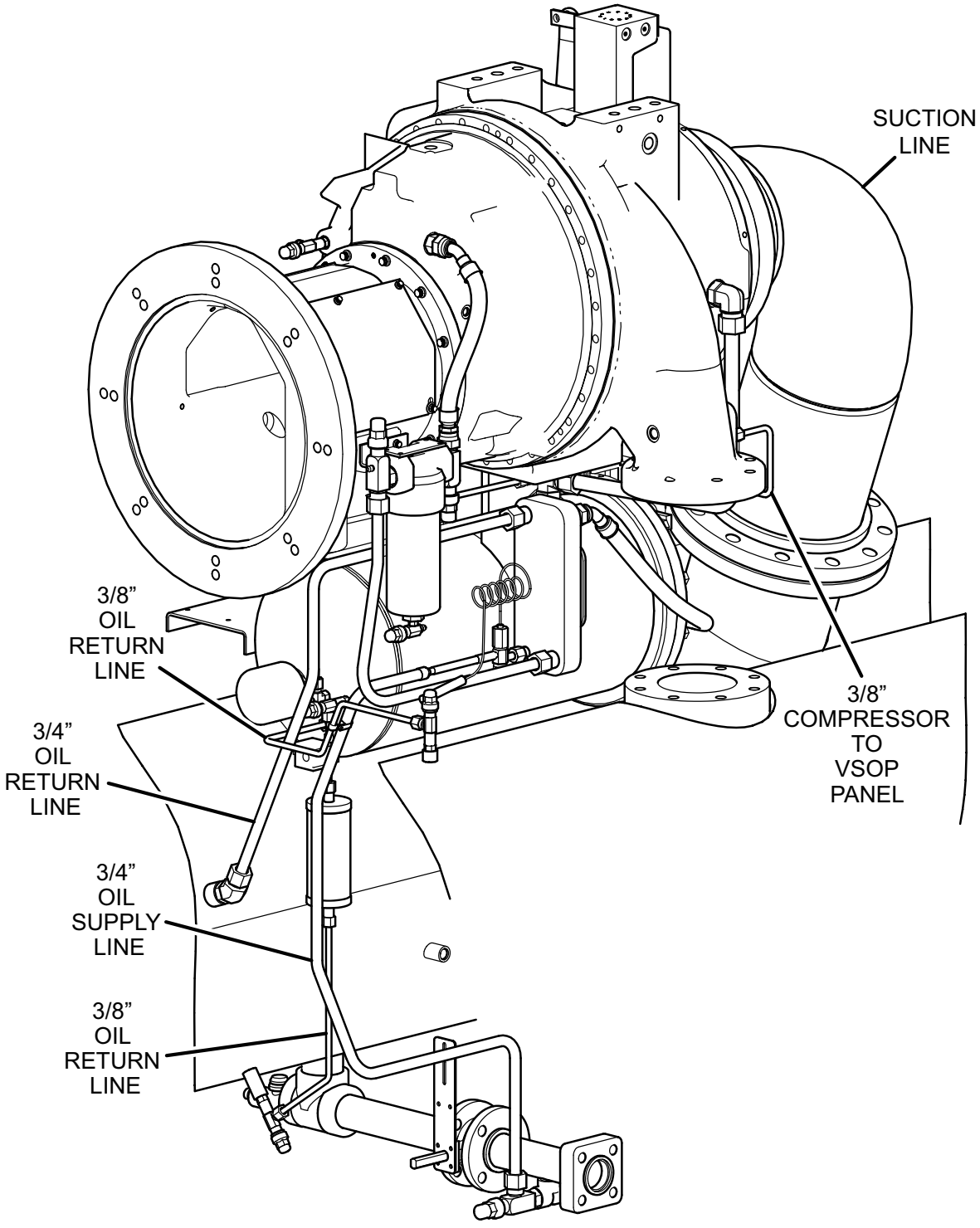

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FIGURE 17 - SYSTEM PIPING (P8-P9 AND H9 COMPRESSORS)

The following factors can be used to convert from English to the most common SI Metric values.

TABLE 1 - SI METRIC CONVERSION

MEASUREMENT	MULTIPLY ENGLISH UNIT	BY FACTOR	TO OBTAIN METRIC UNIT
Capacity	Tons Refrigerant Effect (ton)	3.516	Kilowatts (kW)
Power	Horsepower	0.7457	Kilowatts (kW)
Flow Rate	Gallons / Minute (gpm)	0.0631	Liters / Second (l/s)
Length	Feet (ft)	304.8	Meters (m)
	Inches (in)	25.4	Millimeters (mm)
Weight	Pounds (lbs)	0.4538	Kilograms (kg)
Velocity	Feet / Second (fps)	0.3048	Meters / Second (m/s)
Pressure Drop	Feet of Water (ft)	2.989	Kilopascals (kPa)
	Pounds / Square Inch (psi)	6.895	Kilopascals (kPa)

TEMPERATURE

To convert degrees Fahrenheit (°F) to degrees Celsius (°C), subtract 32° and multiply by 5/9 or 0.5556.

Example: (45.0°F - 32°) x 0.5556 = 27.2°C

To convert a temperature range (i.e., a range of 10°F) from Fahrenheit to Celsius, multiply by 5/9 or 0.5556.

Example: 10.0°F range x 0.5556 = 5.6 °C range

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