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SPECIFICATIONS — ENGINEERING DATA — DIMENSIONS  
**FRICK RXB ROTARY SCREW COMPRESSOR UNITS**

MODELS: RXB-12 thru -39

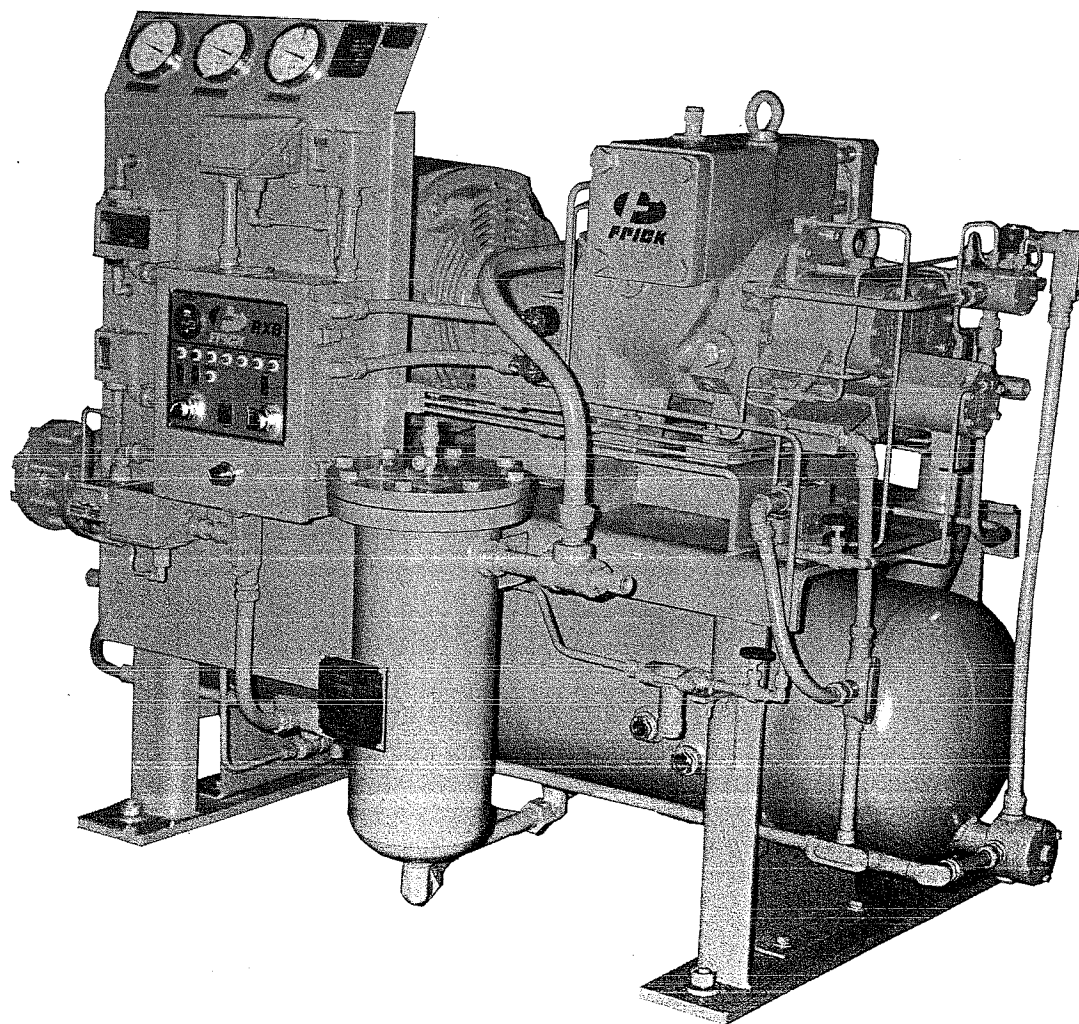


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## DESCRIPTION

The RXB Rotary Screw Compressor unit line consists of six models ranging in capacity from 72.0 cfm (122 M<sup>3</sup>/h) through 222.6 cfm (378 M<sup>3</sup>/h). Standard units are designed for use with ammonia, halocarbon and hydrocarbon refrigerants for either high stage or booster service.

Standard units consist of a XJS Rotary Screw Compressor with Volumizer II variable volume ratio control and integral suction strainer; drive coupling and guard; electromechanical control center; suction and discharge line stop valves; suction and discharge check valves and a three-stage horizontal oil separator/reservoir. All components have been selected for maximum reliability and arranged to assure ready accessibility for servicing. The units are factory packaged, complete with wiring and piping.

## MODEL XJS COMPRESSOR

Incorporates the latest available technology to bring large screw compressor reliability and efficiency to small screw compressor sizes.

**HOUSING** — All castings are designed and tested to meet the requirements of ASHRAE 15-78 safety code for 350 PSIG maximum discharge pressure and are class 40 grey iron to assure structural integrity, mechanical and thermal stability under all operating conditions.

**ROTORS** — The rotors are machined from steel forgings to the exacting tolerances of the latest SRM asymmetric profile. The five lobed male rotor is directly connected to the gear drive. The seven lobed female rotor is driven by the male rotor on a thin oil film.

**BEARINGS** — Antifriction bearings with a rated bearing life in excess of 100,000 hours are used for reduced frictional horsepower and superior rotor positioning, resulting in reduced power consumption, particularly at the higher pressure ratios. Cylindrical roller bearings are provided to handle the radial loads and the thrust loads are absorbed by angular contact ball bearings. In addition, thrust balance pistons are provided to reduce the thrust load and improve bearing life.

**SHAFT SEAL** — The compressor shaft seal is a single face type with a spring loaded carbon stationary surface and a cast iron rotating seat. The seal is capable of sealing up to 350 PSIG but is vented to low pressure to provide extended seal life.

**VOLUMIZER® II VARIABLE VOLUME RATIO CONTROL** — The XJS compressor incorporates a simple automatic mechanism which adjusts the compressor volume ratio during operation to the most efficient of three possible volume ratios depending on system requirements, (patent pending). This minimizes the power penalty associated with over- or undercompression and reduces excess bearing loading caused by running a machine at a less efficient  $V_i$ .

**CAPACITY CONTROL** — The compressor incorporates a slide valve for capacity control, allowing infinite capacity adjustment from 100% to 25% of full load. Slide valve control is the most efficient unloading method available for part load operation of a screw compressor.

## LUBRICATION SYSTEM

The RXB unit is designed for operation without an oil pump for normal high stage service. All oil required for main oil injection and lubrication is provided by positive gas differential pressure and passes through a 15 micron filter. The lubrication system on a unit designed for booster duty and for some low differential pressure high stage applications will require the full lube oil pump option.

**OIL SEPARATOR/RESERVOIR** — The oil separator is a horizontal, three-stage design with integral sump. Two sight glasses are located in the reservoir section and one in the coalescing section. The separator is designed and constructed in accordance with ASME Section VIII, Div. 1 for a maximum design working pressure of 300

PSIG and supplied with relief valve. A 500 watt heater maintains oil temperature during compressor shutdown and is replaceable without shutting the compressor down.

A coalescent separator element is provided for final gas/oil separation of particles down to less than 1 micron. Oil is drained from the coalescer section and returned to the compressor suction during operation.

**OIL FILTER** — All lubrication and injection oil will pass through a 15 micron full flow filter.

**OIL COOLING** — The cooling of the compressor oil may be achieved by either liquid refrigerant injection oil cooling, (standard) or by the use of water or thermosiphon oil cooling. Water cooled and thermosiphon are supplied with ASME shell and tube heat exchangers mounted on the unit.

## CONTROL CENTER

The compressor package includes a factory mounted and wired electromechanical control center of gasketed NEMA 1 construction. Safety controls include high and low pressure cutouts, oil pressure cutout and high discharge temperature cutout. Standard operating controls include compressor manual/remote switch, safety reset push button, remote/auto/manual capacity control switch, manual capacity control switch, liquid injection temperature control, automatic capacity control pressure switches including solenoids and three-step volume ratio controls.

A manual reset is included for safety trips. Liquid filled gauges for suction pressure, oil pressure and discharge pressure are panel mounted.

## THERMOMETERS

For suction, discharge and oil temperature are supplied mounted on the unit.

## VALVES

Suction and discharge stop and check valves are supplied. The compressor contains an internal suction strainer.

## ACCESSORIES and OPTIONAL ITEMS

**FULL LUBE PUMP** — Lubrication and oil injection may be achieved by using a positive displacement direct driven gear type oil pump capable of maintaining lube oil supply at low pressure differentials, operating independent of the compressor. Required on all booster applications and for some low differential pressure high stage applications.

**ECONOMIZER** — Increased refrigeration capacity with relatively low increase in brake horsepower can be achieved by the use of a Frick economizer system. The economizer consists of a shell and coil or shell and tube liquid subcooler with appropriate controls. Refrigerant vapor from the subcooler is piped to an optimized pressure port on the compressor.

**MOTORS** — The compressor drive motor can be supplied and mounted by Frick Company. In addition, a customer supplied motor can be factory mounted by Frick Company.

**STARTERS** — Starter packages complete with all accessories needed to interface with the RXB, pre-wired to numbered terminal strips are available.

**SPECIAL PACKAGES** — For special refrigerant selection, special drivers or any dual or two stage applications — consult Frick Company.

STANDARD DESIGN DATA (WITH METRIC EQUIVALENTS)

| RXB MODEL NO. | MOTOR SPEED RPM | COMPRESSOR DISPLACEMENT |                    | RATINGS R-717 (1) |                | RATINGS R-22 (2) |                | UNIT WEIGHT LESS MOTOR |     |
|---------------|-----------------|-------------------------|--------------------|-------------------|----------------|------------------|----------------|------------------------|-----|
|               |                 | CFM                     | M <sup>3</sup> /HR | CAPACITY TR       | POWER BHP (kw) | CAPACITY TR      | POWER BHP (kw) | LBS                    | KGS |
|               |                 |                         |                    |                   |                |                  |                |                        |     |
| 12            | 1750            | 72.0                    | 122                | 25.5 (89.7)       | 29.4 (21.9)    | 23.2 (81.6)      | 31.6 (23.6)    | 1600                   | 726 |
| 15            | 3550            | 89.2                    | 152                | 31.6 (111.1)      | 36.4 (27.5)    | 28.8 (101.3)     | 39.1 (29.2)    | 1600                   | 726 |
| 19            | 3550            | 110.2                   | 187                | 39.1 (137.5)      | 45.1 (33.6)    | 35.6 (125.2)     | 48.5 (36.2)    | 1700                   | 771 |
| 24            | 1750            | 145.7                   | 248                | 51.4 (180.8)      | 59.3 (44.2)    | 46.8 (164.6)     | 63.7 (47.5)    | 1900                   | 862 |
| 30            | 3550            | 179.8                   | 305                | 63.6 (223.7)      | 73.5 (54.8)    | 58.0 (204.0)     | 78.9 (58.8)    | 2100                   | 953 |
| 39            | 3550            | 222.6                   | 378                | 78.8 (277.1)      | 91.0 (67.9)    | 71.8 (252.5)     | 97.7 (72.9)    | 2100                   | 953 |

(1) R-717: +20°F (-6.7°C) suction and 95°F (35°C) condensing with 10°F (5.5°C) liquid subcooling and 10°F (5.5°C) suction superheat.

(2) R-22: +20°F (-6.7°C) suction and 105°F (40.6°C) condensing with 10°F (5.5°C) liquid subcooling and 10°F (5.5°C) suction superheat.

EQUIPMENT SELECTION

SCREW COMPRESSOR UNIT

The following information is required for final unit selection:

- Refrigerant R717, R22, Other - Consult Frick Co.
- Duty Single Stage, High Stage, Booster, Other - Consult Frick Co.
- Lube Oil Pump: Booster, Low ΔP Full Lube (Opt)
- Oil Filter Single (Std), Dual (Opt)
- Oil Cooling Liquid Injection (Std)
- Water Cooled Cooler (Inlet Water Temp °F, ΔT °F Req'd) (Opt)
- Thermosyphon (Opt)
- Saturated Suction Temperature °F
- Condensing Temperature °F
- Intermediate Temperature (Booster) °F
- Suction Superheat °F
- Liquid Subcooling °F
- Economizer - Kit Only (Opt)
- Economizer - Mounted DX Cooler (Opt)
- Rating TR BHP (Including Liquid Subcooling, Suction Superheat, Liquid Injection and 50 Hz corrections as applicable)

COMPRESSOR DRIVER

The following information is required for proper coordination of the screw compressor unit and the compressor driver:

- Driver Type Electric Motor, Other - Consult Frick Co.
- Motor Speed RPM
- Motor Specifications HP, Frame
- Service Factor, Full Load Amps
- Bearings (Ball or Sleeve)
- Motor Power Volts, 3 Phase, Hz (60 or 50 Hz)
- Motor Supplied By Frick, Others
- Motor Mounted by Frick, Others
- Motor Enclosure ODP, TEFC, Group
- Motor Starting Method Explosion Proof Class Group
- Other - Consult Frick Co.
- Rotation Clockwise facing opposite the drive end of motor (facing compressor input shaft).

MOTOR SELECTION

Motors for high stage applications may be selected for the design operating condition, however motors for booster applications need to be sized for start-up and pull-down duty as well as for the design condition. For booster applications start-up and pull-down will quite often be the more demanding requirement.

For starting torque refer to page 54.

MOTOR STARTER PACKAGE

Starter packages are available from Frick Company with all necessary interlocks prewired to terminals numbered for direct connection to the RXB unit junction box.

The following information must be specified for each individual application:

STARTING METHOD - Choose across-the-line, wye-delta open transition or wye-delta closed transition starting.

ACROSS-THE-LINE STARTING - Yields full motor starting torque. However, power companies and/or in-house power distribution systems often require other starting methods to achieve reduced starting inrush current. Note: Reducing the inrush current also reduces the starting torque. A careful analysis of compressor torque requirements versus the available motor starting torque must be made. This can be accomplished by plotting the motor speed-torque curve (obtained from motor vendor) against the compressor speed-torque curve. The available motor torque should exceed the compressor torque requirement by a minimum of 20% at the worst portion of the curve. This usually occurs at approximately half-speed in the region known as the motor pull-up torque (P.U.T.). When plotting these curves please remember that for starting methods other than across-the-line the motor torque values are reduced as follows:

WYE-DELTA (OPEN OR CLOSED TRANSITION) — Starting torque available is 33% of normal. While wye-delta open transition starters exhibit the same torque characteristics as wye-delta closed transition starters, closed transition is the more preferred method. This is because open transition allows the motor to get out of synch with the power line during transition. This can result in damaging power spikes that tend to nuisance trip circuit breakers and shorten motor and power distribution equipment life. This is especially true for screw compressors which represent relatively low inertia loads.

OVERCURRENT PROTECTION — Choose either the Starter package or the Combination starter package with circuit breaker disconnect. In the majority of cases the Starter package (without circuit breaker disconnect) is chosen and motor overcurrent protection is provided by the motor feeder circuit breaker in the electrical power panel.

COMPRESSOR MOTOR DATA — Indicate the motor horsepower, voltage, frequency (Hertz), full load amps (FLA) and speed (RPM).

#### STANDARD CONDITIONS — HIGH STAGE

The RXB high stage ratings for R717 and R22 are based on 10°F liquid subcooling (except no external liquid subcooling in economizer ratings), 10°F suction superheat (not contributing to the refrigeration effect) and thermosyphon or water cooled oil cooling.

#### SELECTION PROCEDURE — HIGH STAGE

The final rating for an RXB unit at any condition is determined from the standard rating and all of the applicable correction factors.

Capacity (TR) = standard rating (or economizer rating) X subcooling correction factor X superheat correction factor X liquid injection correction factor if applicable (see page 42 ) X 0.83 (50 Hz only).

Brake horsepower (BHP) = standard rating (or economizer rating) X 1.01 (liquid injection correction factor if applicable) X 0.83 (50 Hz only).

#### LIQUID SUBCOOLING CORRECTION FACTORS — HIGH STAGE

For liquid subcooling other than 10°F, determine the liquid subcooling capacity correction factor (S.C.C.F.) in the following manner using the actual number of degrees of liquid subcooling (S.C.):

$$\text{For R717: S.C.C.F.} = 1 + (\text{S.C.} - 10^\circ\text{F}) (.0025)$$

$$\text{For R22: S.C.C.F.} = 1 + (\text{S.C.} - 10^\circ\text{F}) (.005)$$

No brake horsepower correction is required for liquid subcooling.

#### SUCTION SUPERHEAT CORRECTION FACTORS—HIGH STAGE

For suction superheat in excess of 10°F determine the suction superheat capacity correction factor (S.H.C.F.) in the following manner using the actual number of degrees of suction superheat (S.H.):

$$\text{For R717: S.H.C.F.} = \frac{1}{1 + (\text{S.H.} - 10^\circ\text{F}) (.0027)}$$

$$\text{For R22: S.H.C.F.} = \frac{1}{1 + (\text{S.H.} - 10^\circ\text{F}) (.0028)}$$

It is recommended that a minimum of 10°F of suction superheat be maintained to insure that all refrigerant entering the compressor is in the vapor state.

No brake horsepower correction is required for suction superheat.

#### STANDARD CONDITIONS — BOOSTER

The RXB booster ratings for R717 and R22 are based on liquid cooled to intermediate temperature, no suction superheat and thermosyphon or water cooled oil cooling.

#### SELECTION PROCEDURE — BOOSTER

The final rating for an RXB unit at any condition is determined from the standard rating and all of the applicable correction factors.

Capacity (TR) = standard rating X liquid temperature correction factor X superheat correction factor X 0.98 (liquid injection correction factor if applicable) x 0.83 (50 Hz only).

Brake horsepower (BHP) = standard rating x 1.01 (liquid injection correction factor if applicable) x 0.83 (50 Hz only).

#### LIQUID TEMPERATURE CORRECTION FACTORS — BOOSTER

For liquid temperatures greater than the saturated intermediate temperature determine the liquid temperature de-rating factor (L.T.D.F.) in the following manner:

$$\text{For R717: L.T.D.F.} = 1 - (\text{TD}) (.0025)$$

$$\text{For R22: L.T.D.F.} = 1 - (\text{TD}) (.005)$$

Where TD is the temperature difference in degrees between the actual liquid temperature and the saturated intermediate temperature. No brake horsepower correction is required.

#### SUCTION SUPERHEAT CORRECTION FACTORS — BOOSTER

For suction superheat in excess of 0°F determine the suction superheat capacity correction factor (S.H.C.F.) in the following manner using the actual number of degrees of suction superheat (S.H.):

$$\text{For R717: S.H.C.F.} = \frac{1}{1 + (\text{S.H.}) (.0027)}$$

$$\text{For R22: S.H.C.F.} = \frac{1}{1 + (\text{S.H.}) (.0028)}$$

It is recommended that a minimum of 10°F of suction superheat be maintained to insure that all refrigerant entering the compressor is in the vapor state.

No brake horsepower correction is required for suction superheat.

# RXB-12

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (1750 RPM MOTOR)

R-717 HIGH STAGE

| R-717   |              | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |              |
|---|--------------|---|---------------|---------------|----------------|----------------|--------------|
|   |              | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |              |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40.<br>8.7* | TR<br>BHP   | 5.6<br>16.4   | 5.4<br>18.7   | 5.2<br>21.3    | 4.9<br>24.6    | 4.7<br>28.6  |
|   | -35.<br>5.4* | TR<br>BHP   | 6.6<br>17.1   | 6.3<br>19.3   | 6.1<br>21.9    | 5.8<br>24.9    | 5.5<br>28.5  |
|   | -30.<br>1.6* | TR<br>BHP   | 7.6<br>17.9   | 7.3<br>20.1   | 7.1<br>22.6    | 6.8<br>25.4    | 6.5<br>28.8  |
|   | -25.<br>1.3  | TR<br>BHP   | 8.8<br>18.6   | 8.5<br>20.9   | 8.2<br>23.4    | 7.9<br>26.2    | 7.5<br>29.5  |
|   | -20.<br>3.6  | TR<br>BHP   | 10.1<br>19.4  | 9.8<br>21.8   | 9.4<br>24.4    | 9.1<br>27.2    | 8.7<br>30.3  |
|   | -15.<br>6.2  | TR<br>BHP   | 11.6<br>20.1  | 11.2<br>22.7  | 10.8<br>25.4   | 10.4<br>28.3   | 10.0<br>31.4 |
|   | -10.<br>9.1  | TR<br>BHP   | 13.2<br>20.8  | 12.8<br>23.5  | 12.3<br>26.4   | 11.9<br>29.4   | 11.5<br>32.6 |
|   | -5.<br>12.2  | TR<br>BHP   | 15.0<br>21.2  | 14.5<br>24.3  | 14.0<br>27.4   | 13.5<br>30.5   | 13.0<br>33.8 |
|   | 0.<br>15.7   | TR<br>BHP   | 16.9<br>21.5  | 16.4<br>24.9  | 15.9<br>28.3   | 15.4<br>31.6   | 14.8<br>35.1 |
|   | 5.<br>19.6   | TR<br>BHP   | 19.1<br>21.7  | 18.5<br>25.4  | 18.0<br>29.1   | 17.4<br>32.7   | 16.8<br>36.4 |
|   | 10.<br>23.8  | TR<br>BHP   | 21.4<br>21.8  | 20.8<br>25.6  | 20.2<br>29.6   | 19.6<br>33.7   | 18.9<br>37.6 |
|   | 15.<br>28.5  | TR<br>BHP   | 24.0<br>21.8  | 23.3<br>25.8  | 22.7<br>30.0   | 22.0<br>34.4   | 21.3<br>38.7 |
|   | 20.<br>33.5  | TR<br>BHP   | 26.9<br>21.9  | 26.1<br>25.8  | 25.3<br>30.2   | 24.6<br>34.9   | 23.8<br>39.6 |
|   | 25.<br>39.0  | TR<br>BHP   | 30.0<br>21.9  | 29.1<br>25.9  | 28.2<br>30.3   | 27.4<br>35.2   | 26.6<br>40.3 |
|   | 30.<br>45.1  | TR<br>BHP   | 33.4<br>21.8  | 32.4<br>25.9  | 31.4<br>30.3   | 30.5<br>35.3   | 29.6<br>40.7 |
|   | 35.<br>51.6  | TR<br>BHP   | 37.2<br>21.5  | 36.0<br>25.9  | 34.9<br>30.4   | 33.9<br>35.4   | 32.8<br>40.9 |
| 40.<br>58.6   | TR<br>BHP    | 41.3<br>21.1  | 40.0<br>25.7  | 38.7<br>30.4  | 37.5<br>35.5   | 36.4<br>41.1   |              |

NOTE: Capacities based on 10° Liquid Subcooling, 10° Suction Superheat with the Superheat not contributing to the refrigeration effect.

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (1750 RPM MOTOR)  
WITH FLASH TYPE ECONOMIZER (SEE PAGE 52 FOR SELECTIONS  
BASED ON DIRECT EXPANSION OR SHELL and COIL ECONOMIZERS)

# RXB-12E

| R-717   |              | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |              |
|---|--------------|---|---------------|---------------|----------------|----------------|--------------|
|   |              | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |              |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40.<br>8.7* | TR<br>BHP   | 6.6<br>17.4   | 6.5<br>19.9   | 6.4<br>22.8    | 6.2<br>26.4    | 6.0<br>31.0  |
|   | -35.<br>5.4* | TR<br>BHP   | 7.7<br>18.1   | 7.5<br>20.6   | 7.4<br>23.4    | 7.2<br>26.8    | 7.1<br>30.9  |
|   | -30.<br>1.6* | TR<br>BHP   | 8.8<br>18.9   | 8.7<br>21.4   | 8.5<br>24.2    | 8.4<br>27.4    | 8.2<br>31.2  |
|   | -25.<br>1.3  | TR<br>BHP   | 10.1<br>19.7  | 9.9<br>22.3   | 9.8<br>25.1    | 9.6<br>28.2    | 9.4<br>31.9  |
|   | -20.<br>3.6  | TR<br>BHP   | 11.4<br>20.5  | 11.3<br>23.2  | 11.1<br>26.1   | 11.0<br>29.3   | 10.8<br>32.8 |
|   | -15.<br>6.2  | TR<br>BHP   | 13.0<br>21.2  | 12.8<br>24.0  | 12.7<br>27.1   | 12.5<br>30.3   | 12.3<br>33.9 |
|   | -10.<br>9.1  | TR<br>BHP   | 14.6<br>21.8  | 14.5<br>24.9  | 14.3<br>28.1   | 14.1<br>31.5   | 13.9<br>35.2 |
|   | -5.<br>12.2  | TR<br>BHP   | 16.5<br>22.2  | 16.3<br>25.7  | 16.2<br>29.1   | 16.0<br>32.6   | 15.7<br>36.4 |
|   | 0.<br>15.7   | TR<br>BHP   | 18.4<br>22.5  | 18.3<br>26.2  | 18.1<br>30.0   | 17.9<br>33.7   | 17.7<br>37.7 |
|   | 5.<br>19.6   | TR<br>BHP   | 20.6<br>22.5  | 20.4<br>26.6  | 20.3<br>30.7   | 20.1<br>34.8   | 19.9<br>39.0 |
|   | 10.<br>23.8  | TR<br>BHP   | 22.9<br>22.5  | 22.8<br>26.7  | 22.6<br>31.2   | 22.4<br>35.7   | 22.2<br>40.2 |
|   | 15.<br>28.5  | TR<br>BHP   | 25.4<br>22.4  | 25.3<br>26.7  | 25.1<br>31.4   | 24.9<br>36.3   | 24.7<br>41.3 |
|   | 20.<br>33.5  | TR<br>BHP   | 28.1<br>22.3  | 28.0<br>26.6  | 27.8<br>31.5   | 27.6<br>36.7   | 27.3<br>42.1 |
|   | 25.<br>39.0  | TR<br>BHP   | 31.1<br>22.1  | 30.8<br>26.5  | 30.7<br>31.4   | 30.4<br>36.8   | 30.2<br>42.6 |
|   | 30.<br>45.1  | TR<br>BHP   | 34.3<br>21.8  | 34.0<br>26.3  | 33.7<br>31.3   | 33.5<br>36.9   | 33.3<br>42.9 |
|   | 35.<br>51.6  | TR<br>BHP   | 37.7<br>21.4  | 37.3<br>26.1  | 37.1<br>31.2   | 36.8<br>36.7   | 36.5<br>42.9 |
|   | 40.<br>58.6  | TR<br>BHP   | 41.4<br>20.7  | 41.0<br>25.7  | 40.6<br>31.0   | 40.3<br>36.6   | 40.0<br>42.8 |

**R717 HIGH STAGE**

NOTE: Ratings based on Liquid Subcooling by flash type economizer, 10°F Suction Superheat with the Superheat not contributing to the refrigeration effect, no Liquid Subcooling from condenser or external source. No allowance for vapor line pressure drop or economizing vessel temperature split is included in the ratings above.

# RXB-15

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (3550 RPM MOTOR)

R717-HIGH STAGE

| R-717   |              |           | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |
|---|--------------|-----------|---|---------------|---------------|----------------|----------------|
|   |              |           | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40.<br>8.7* | TR<br>BHP | 7.0<br>20.5   | 6.7<br>23.3   | 6.5<br>26.6   | 6.2<br>30.6    | 5.8<br>35.7    |
|   | -35.<br>5.4* | TR<br>BHP | 8.2<br>21.4   | 7.9<br>24.1   | 7.6<br>27.3   | 7.2<br>31.0    | 6.9<br>35.5    |
|   | -30.<br>1.6* | TR<br>BHP | 9.5<br>22.3   | 9.2<br>25.1   | 8.8<br>28.2   | 8.5<br>31.7    | 8.1<br>36.0    |
|   | -25.<br>1.3  | TR<br>BHP | 11.0<br>23.2  | 10.6<br>26.1  | 10.2<br>29.3  | 9.8<br>32.7    | 9.4<br>36.8    |
|   | -20.<br>3.6  | TR<br>BHP | 12.6<br>24.2  | 12.2<br>27.2  | 11.7<br>30.4  | 11.3<br>33.9   | 10.9<br>37.8   |
|   | -15.<br>6.2  | TR<br>BHP | 14.4<br>25.1  | 14.0<br>28.3  | 13.5<br>31.7  | 13.0<br>35.3   | 12.5<br>39.2   |
|   | -10.<br>9.1  | TR<br>BHP | 16.5<br>25.9  | 15.9<br>29.4  | 15.4<br>32.9  | 14.8<br>36.6   | 14.3<br>40.7   |
|   | -5.<br>12.2  | TR<br>BHP | 18.7<br>26.5  | 18.1<br>30.3  | 17.5<br>34.1  | 16.9<br>38.1   | 16.3<br>42.2   |
|   | 0.<br>15.7   | TR<br>BHP | 21.1<br>26.9  | 20.5<br>31.1  | 19.8<br>35.3  | 19.2<br>39.5   | 18.5<br>43.8   |
|   | 5.<br>19.6   | TR<br>BHP | 23.8<br>27.1  | 23.1<br>31.7  | 22.4<br>36.3  | 21.7<br>40.8   | 20.9<br>45.4   |
|   | 10.<br>23.8  | TR<br>BHP | 26.7<br>27.2  | 26.0<br>32.0  | 25.2<br>37.0  | 24.4<br>42.0   | 23.6<br>46.9   |
|   | 15.<br>28.5  | TR<br>BHP | 30.0<br>27.2  | 29.1<br>32.1  | 28.3<br>37.4  | 27.4<br>42.9   | 26.5<br>48.3   |
|   | 20.<br>33.5  | TR<br>BHP | 33.5<br>27.3  | 32.5<br>32.2  | 31.6<br>37.7  | 30.7<br>43.5   | 29.7<br>49.4   |
|   | 25.<br>39.0  | TR<br>BHP | 37.4<br>27.3  | 36.3<br>32.3  | 35.2<br>37.8  | 34.2<br>43.9   | 33.1<br>50.3   |
|   | 30.<br>45.1  | TR<br>BHP | 41.7<br>27.2  | 40.4<br>32.3  | 39.2<br>37.9  | 38.1<br>44.1   | 36.9<br>50.8   |
|   | 35.<br>51.6  | TR<br>BHP | 46.4<br>26.9  | 44.9<br>32.3  | 43.5<br>37.9  | 42.2<br>44.1   | 41.0<br>51.1   |
|   | 40.<br>58.6  | TR<br>BHP | 51.6<br>26.4  | 49.9<br>32.1  | 48.3<br>38.0  | 46.8<br>44.3   | 45.4<br>51.2   |

NOTE: Capacities based on 10° Liquid Subcooling, 10° Suction Superheat with the Superheat not contributing to the refrigeration effect.

HIGH STAGE — CAPACITY and BRAKE HORSEPOWER RATING (3550 RPM MOTOR)  
WITH FLASH TYPE ECONOMIZER (SEE PAGE 52 FOR SELECTIONS  
BASED ON DIRECT EXPANSION OR SHELL and COIL ECONOMIZERS)

# RXB-15E

| R-717   |          | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |
|---|----------|---|---------------|---------------|----------------|----------------|
|   |          | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40. TR  | 8.3   | 8.1           | 8.0           | 7.8            | 7.5            |
|   | 8.7* BHP | 21.7  | 24.8          | 28.5          | 33.0           | 38.6           |
|   | -35. TR  | 9.5   | 9.4           | 9.2           | 9.0            | 8.8            |
|   | 5.4* BHP | 22.6  | 25.7          | 29.2          | 33.4           | 38.5           |
|   | -30. TR  | 11.0  | 10.8          | 10.6          | 10.4           | 10.2           |
|   | 1.6* BHP | 23.6  | 26.7          | 30.2          | 34.2           | 38.9           |
|   | -25. TR  | 12.5  | 12.4          | 12.2          | 12.0           | 11.8           |
|   | 1.3 BHP  | 24.6  | 27.8          | 31.3          | 35.2           | 39.8           |
|   | -20. TR  | 14.3  | 14.1          | 13.9          | 13.7           | 13.5           |
|   | 3.6 BHP  | 25.5  | 28.9          | 32.5          | 36.5           | 40.9           |
|   | -15. TR  | 16.2  | 16.0          | 15.8          | 15.6           | 15.4           |
|   | 6.2 BHP  | 26.4  | 30.0          | 33.8          | 37.9           | 42.3           |
|   | -10. TR  | 18.3  | 18.1          | 17.9          | 17.6           | 17.4           |
|   | 9.1 BHP  | 27.2  | 31.0          | 35.0          | 39.3           | 43.9           |
|   | -5. TR   | 20.5  | 20.4          | 20.2          | 19.9           | 19.6           |
|   | 12.2 BHP | 27.7  | 32.0          | 36.3          | 40.7           | 45.5           |
|   | 0. TR    | 23.0  | 22.8          | 22.6          | 22.4           | 22.1           |
|   | 15.7 BHP | 28.0  | 32.7          | 37.4          | 42.1           | 47.1           |
|   | 5. TR    | 25.7  | 25.5          | 25.3          | 25.0           | 24.8           |
|   | 19.6 BHP | 28.1  | 33.1          | 38.3          | 43.4           | 48.7           |
| 10. TR  | 28.6     | 28.4  | 28.2          | 27.9          | 27.7           |                |
| 23.8 BHP  | 28.1     | 33.3  | 38.9          | 44.6          | 50.2           |                |
| 15. TR  | 31.7     | 31.5  | 31.3          | 31.0          | 30.8           |                |
| 28.5 BHP  | 28.0     | 33.3  | 39.2          | 45.3          | 51.5           |                |
| 20. TR  | 35.1     | 34.9  | 34.7          | 34.4          | 34.1           |                |
| 33.5 BHP  | 27.8     | 33.2  | 39.3          | 45.8          | 52.5           |                |
| 25. TR  | 38.8     | 38.5  | 38.3          | 38.0          | 37.7           |                |
| 39.0 BHP  | 27.6     | 33.0  | 39.2          | 46.0          | 53.2           |                |
| 30. TR  | 42.8     | 42.4  | 42.1          | 41.8          | 41.5           |                |
| 45.1 BHP  | 27.2     | 32.9  | 39.1          | 46.0          | 53.5           |                |
| 35. TR  | 47.1     | 46.6  | 46.2          | 45.9          | 45.6           |                |
| 51.6 BHP  | 26.7     | 32.6  | 38.9          | 45.8          | 53.6           |                |
| 40. TR  | 51.7     | 51.1  | 50.7          | 50.3          | 49.9           |                |
| 58.6 BHP  | 25.9     | 32.1  | 38.7          | 45.6          | 53.5           |                |

R717 HIGH STAGE

NOTE: Ratings based on Liquid Subcooling by flash type economizer, 10°F Suction Superheat with the Superheat not contributing to the refrigeration effect, no Liquid Subcooling from condenser or external source. No allowance for vapor line pressure drop or economizing vessel temperature split is included in the ratings above.

# RXB-19

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (3550 RPM MOTOR)

R717 HIGH STAGE

| R-717   |              | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |              |
|---|--------------|---|---------------|---------------|----------------|----------------|--------------|
|   |              | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |              |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40.<br>8.7* | TR<br>BHP   | 8.7<br>25.4   | 8.4<br>28.8   | 8.0<br>32.9    | 7.6<br>37.9    | 7.2<br>44.2  |
|   | -35.<br>5.4* | TR<br>BHP   | 10.1<br>26.5  | 9.8<br>29.8   | 9.4<br>33.8    | 9.0<br>38.4    | 8.5<br>44.0  |
|   | -30.<br>1.6* | TR<br>BHP   | 11.8<br>27.6  | 11.3<br>31.0  | 10.9<br>34.9   | 10.5<br>39.3   | 10.0<br>44.5 |
|   | -25.<br>1.3  | TR<br>BHP   | 13.6<br>28.8  | 13.1<br>32.3  | 12.6<br>36.2   | 12.1<br>40.5   | 11.6<br>45.5 |
|   | -20.<br>3.6  | TR<br>BHP   | 15.6<br>30.0  | 15.1<br>33.7  | 14.5<br>37.7   | 14.0<br>42.0   | 13.5<br>46.9 |
|   | -15.<br>6.2  | TR<br>BHP   | 17.9<br>31.1  | 17.3<br>35.0  | 16.7<br>39.2   | 16.1<br>43.7   | 15.5<br>48.5 |
|   | -10.<br>9.1  | TR<br>BHP   | 20.4<br>32.1  | 19.7<br>36.4  | 19.1<br>40.8   | 18.4<br>45.4   | 17.7<br>50.4 |
|   | -5.<br>12.2  | TR<br>BHP   | 23.1<br>32.8  | 22.4<br>37.6  | 21.7<br>42.3   | 20.9<br>47.1   | 20.2<br>52.3 |
|   | 0.<br>15.7   | TR<br>BHP   | 26.1<br>33.3  | 25.4<br>38.5  | 24.6<br>43.7   | 23.8<br>48.9   | 22.9<br>54.2 |
|   | 5.<br>19.6   | TR<br>BHP   | 29.5<br>33.6  | 28.6<br>39.2  | 27.7<br>44.9   | 26.8<br>50.5   | 25.9<br>56.2 |
|   | 10.<br>23.8  | TR<br>BHP   | 33.1<br>33.7  | 32.2<br>39.6  | 31.2<br>45.8   | 30.2<br>52.0   | 29.2<br>58.1 |
|   | 15.<br>28.5  | TR<br>BHP   | 37.1<br>33.7  | 36.1<br>39.8  | 35.0<br>46.3   | 33.9<br>53.1   | 32.8<br>59.9 |
|   | 20.<br>33.5  | TR<br>BHP   | 41.5<br>33.8  | 40.3<br>39.8  | 39.1<br>46.7   | 38.0<br>53.9   | 36.8<br>61.2 |
|   | 25.<br>39.0  | TR<br>BHP   | 46.3<br>33.8  | 44.9<br>39.9  | 43.6<br>46.8   | 42.4<br>54.3   | 41.0<br>62.3 |
|   | 30.<br>45.1  | TR<br>BHP   | 51.6<br>33.7  | 50.0<br>40.0  | 48.6<br>46.9   | 47.1<br>54.6   | 45.7<br>62.9 |
|   | 35.<br>51.6  | TR<br>BHP   | 57.5<br>33.3  | 55.6<br>40.0  | 53.9<br>46.9   | 52.3<br>54.7   | 50.8<br>63.3 |
|   | 40.<br>58.6  | TR<br>BHP   | 63.8<br>32.6  | 61.8<br>39.7  | 59.8<br>47.0   | 57.9<br>54.8   | 56.2<br>63.5 |

NOTE: Capacities based on 10° Liquid Subcooling, 10° Suction Superheat with the Superheat not contributing to the refrigeration effect.

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (3550 RPM MOTOR)  
WITH FLASH TYPE ECONOMIZER (SEE PAGE 52 FOR SELECTIONS  
BASED ON DIRECT EXPANSION OR SHELL and COIL ECONOMIZERS)

# RXB-19E

| R-717   |          | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |
|---|----------|---|---------------|---------------|----------------|----------------|
|   |          | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40. TR  | 10.2  | 10.1          | 9.8           | 9.6            | 9.3            |
|   | 8.7* BHP | 26.9  | 30.7          | 35.3          | 40.9           | 47.8           |
|   | -35. TR  | 11.8  | 11.6          | 11.4          | 11.2           | 10.9           |
|   | 5.4* BHP | 28.0  | 31.8          | 36.2          | 41.4           | 47.7           |
|   | -30. TR  | 13.6  | 13.4          | 13.2          | 12.9           | 12.7           |
|   | 1.6* BHP | 29.2  | 33.1          | 37.3          | 42.3           | 48.2           |
|   | -25. TR  | 15.5  | 15.3          | 15.1          | 14.9           | 14.6           |
|   | 1.3 BHP  | 30.4  | 34.4          | 38.8          | 43.6           | 49.3           |
|   | -20. TR  | 17.7  | 17.5          | 17.2          | 17.0           | 16.7           |
|   | 3.6 BHP  | 31.6  | 35.8          | 40.3          | 45.2           | 50.7           |
|   | -15. TR  | 20.1  | 19.8          | 19.6          | 19.3           | 19.0           |
|   | 6.2 BHP  | 32.7  | 37.1          | 41.8          | 46.9           | 52.4           |
|   | -10. TR  | 22.6  | 22.4          | 22.1          | 21.8           | 21.5           |
|   | 9.1 BHP  | 33.7  | 38.4          | 43.4          | 48.6           | 54.3           |
|   | -5. TR   | 25.4  | 25.2          | 25.0          | 24.6           | 24.3           |
|   | 12.2 BHP | 34.4  | 39.6          | 44.9          | 50.4           | 56.3           |
|   | 0. TR    | 28.5  | 28.3          | 28.0          | 27.7           | 27.4           |
|   | 15.7 BHP | 34.7  | 40.5          | 46.3          | 52.1           | 58.3           |
|   | 5. TR    | 31.8  | 31.6          | 31.3          | 31.0           | 30.7           |
|   | 19.6 BHP | 34.8  | 41.0          | 47.4          | 53.7           | 60.3           |
| 10. TR  | 35.4     | 35.2  | 34.9          | 34.6          | 34.3           |                |
| 23.8 BHP  | 34.8     | 41.2  | 48.2          | 55.2          | 62.1           |                |
| 15. TR  | 39.3     | 39.0  | 38.8          | 38.4          | 38.1           |                |
| 28.5 BHP  | 34.6     | 41.3  | 48.5          | 56.1          | 63.8           |                |
| 20. TR  | 43.5     | 43.2  | 42.9          | 42.6          | 42.2           |                |
| 33.5 BHP  | 34.4     | 41.1  | 48.6          | 56.7          | 65.0           |                |
| 25. TR  | 48.0     | 47.7  | 47.4          | 47.0          | 46.7           |                |
| 39.0 BHP  | 34.2     | 40.9  | 48.6          | 56.9          | 65.9           |                |
| 30. TR  | 53.0     | 52.5  | 52.1          | 51.8          | 51.4           |                |
| 45.1 BHP  | 33.7     | 40.7  | 48.4          | 56.9          | 66.2           |                |
| 35. TR  | 58.3     | 57.7  | 57.3          | 56.8          | 56.5           |                |
| 51.6 BHP  | 33.0     | 40.3  | 48.2          | 56.7          | 66.3           |                |
| 40. TR  | 64.0     | 63.3  | 62.8          | 62.2          | 61.8           |                |
| 58.6 BHP  | 32.0     | 39.7  | 47.9          | 56.5          | 66.2           |                |

R717 HIGH STAGE

NOTE: Ratings based on Liquid Subcooling by flash type economizer, 10°F Suction Superheat with the Superheat not contributing to the refrigeration effect, no Liquid Subcooling from condenser or external source. No allowance for vapor line pressure drop or economizing vessel temperature split is included in the ratings above.

# RXB-24

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (1750 RPM MOTOR)

R717 HIGH STAGE

| R-717   |          | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |
|---|----------|---|---------------|---------------|----------------|----------------|
|   |          | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40. TR  | 11.4  | 10.9          | 10.4          | 9.9            | 9.4            |
|   | 8.7* BHP | 33.1  | 37.6          | 43.0          | 49.5           | 57.6           |
|   | -35. TR  | 13.2  | 12.7          | 12.2          | 11.7           | 11.1           |
|   | 5.4* BHP | 34.5  | 38.9          | 44.1          | 50.1           | 57.4           |
|   | -30. TR  | 15.3  | 14.8          | 14.2          | 13.6           | 13.0           |
|   | 1.6* BHP | 36.0  | 40.5          | 45.5          | 51.3           | 58.1           |
|   | -25. TR  | 17.7  | 17.1          | 16.5          | 15.8           | 15.2           |
|   | 1.3 BHP  | 37.5  | 42.2          | 47.2          | 52.9           | 59.4           |
|   | -20. TR  | 20.4  | 19.7          | 19.0          | 18.3           | 17.6           |
|   | 3.6 BHP  | 39.1  | 43.9          | 49.1          | 54.8           | 61.1           |
|   | -15. TR  | 23.3  | 22.5          | 21.7          | 21.0           | 20.2           |
|   | 6.2 BHP  | 40.5  | 45.7          | 51.1          | 57.0           | 63.3           |
|   | -10. TR  | 26.6  | 25.7          | 24.8          | 24.0           | 23.1           |
|   | 9.1 BHP  | 41.9  | 47.4          | 53.2          | 59.2           | 65.7           |
|   | -5. TR   | 30.1  | 29.2          | 28.3          | 27.3           | 26.3           |
|   | 12.2 BHP | 42.8  | 49.0          | 55.1          | 61.5           | 68.2           |
|   | 0. TR    | 34.1  | 33.1          | 32.0          | 31.0           | 29.9           |
|   | 15.7 BHP | 43.4  | 50.2          | 57.0          | 63.7           | 70.7           |
|   | 5. TR    | 38.4  | 37.3          | 36.2          | 35.0           | 33.8           |
|   | 19.6 BHP | 43.8  | 51.1          | 58.6          | 65.9           | 73.3           |
| 10. TR  | 43.2     | 42.0  | 40.7          | 39.4          | 38.1           |                |
| 23.8 BHP  | 43.9     | 51.6  | 59.7          | 67.8          | 75.8           |                |
| 15. TR  | 48.4     | 47.0  | 45.6          | 44.2          | 42.8           |                |
| 28.5 BHP  | 44.0     | 51.9  | 60.4          | 69.2          | 78.1           |                |
| 20. TR  | 54.1     | 52.6  | 51.0          | 49.5          | 48.0           |                |
| 33.5 BHP  | 44.1     | 52.0  | 60.8          | 70.3          | 79.8           |                |
| 25. TR  | 60.4     | 58.6  | 56.9          | 55.2          | 53.5           |                |
| 39.0 BHP  | 44.1     | 52.1  | 61.1          | 70.9          | 81.2           |                |
| 30. TR  | 67.4     | 65.3  | 63.3          | 61.5          | 59.6           |                |
| 45.1 BHP  | 43.9     | 52.2  | 61.1          | 71.2          | 82.0           |                |
| 35. TR  | 75.0     | 72.5  | 70.3          | 68.2          | 66.2           |                |
| 51.6 BHP  | 43.4     | 52.1  | 61.2          | 71.3          | 82.5           |                |
| 40. TR  | 83.3     | 80.5  | 78.0          | 75.6          | 73.3           |                |
| 58.6 BHP  | 42.6     | 51.8  | 61.3          | 71.5          | 82.8           |                |

NOTE: Capacities based on 10° Liquid Subcooling, 10° Suction Superheat with the Superheat not contributing to the refrigeration effect.

HIGH STAGE — CAPACITY and BRAKE HORSEPOWER RATING (1750 RPM MOTOR)  
WITH FLASH TYPE ECONOMIZER (SEE PAGE 52 FOR SELECTIONS  
BASED ON DIRECT EXPANSION OR SHELL and COIL ECONOMIZERS)

# RXB-24E

R717 HIGH STAGE

| R-717   |          | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |
|---|----------|---|---------------|---------------|----------------|----------------|
|   |          | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40. TR  | 13.4  | 13.1          | 12.8          | 12.5           | 12.2           |
|   | 8.7* BHP | 35.1  | 40.1          | 46.0          | 53.3           | 62.4           |
|   | -35. TR  | 15.4  | 15.2          | 14.9          | 14.6           | 14.2           |
|   | 5.4* BHP | 36.6  | 41.4          | 47.2          | 53.9           | 62.2           |
|   | -30. TR  | 17.7  | 17.5          | 17.2          | 16.9           | 16.5           |
|   | 1.6* BHP | 38.1  | 43.1          | 48.7          | 55.2           | 62.9           |
|   | -25. TR  | 20.3  | 20.0          | 19.7          | 19.4           | 19.0           |
|   | 1.3 BHP  | 39.7  | 44.9          | 50.6          | 56.9           | 64.3           |
|   | -20. TR  | 23.1  | 22.8          | 22.5          | 22.1           | 21.8           |
|   | 3.6 BHP  | 41.2  | 46.7          | 52.5          | 58.9           | 66.1           |
|   | -15. TR  | 26.2  | 25.8          | 25.5          | 25.2           | 24.8           |
|   | 6.2 BHP  | 42.7  | 48.4          | 54.6          | 61.2           | 68.4           |
|   | -10. TR  | 29.5  | 29.2          | 28.9          | 28.5           | 28.1           |
|   | 9.1 BHP  | 44.0  | 50.1          | 56.6          | 63.4           | 70.9           |
|   | -5. TR   | 33.2  | 32.9          | 32.5          | 32.1           | 31.7           |
|   | 12.2 BHP | 44.8  | 51.7          | 58.6          | 65.8           | 73.4           |
|   | 0. TR    | 37.2  | 36.9          | 36.5          | 36.1           | 35.7           |
|   | 15.7 BHP | 45.3  | 52.8          | 60.4          | 68.0           | 76.0           |
|   | 5. TR    | 41.5  | 41.2          | 40.9          | 40.4           | 40.0           |
|   | 19.6 BHP | 45.4  | 53.5          | 61.8          | 70.1           | 78.6           |
| 10. TR  | 46.2     | 45.9  | 45.5          | 45.1          | 44.7           |                |
| 23.8 BHP  | 45.4     | 53.8  | 62.8          | 72.0          | 81.0           |                |
| 15. TR  | 51.2     | 50.9  | 50.6          | 50.1          | 49.7           |                |
| 28.5 BHP  | 45.2     | 53.8  | 63.3          | 73.2          | 83.2           |                |
| 20. TR  | 56.7     | 56.3  | 56.0          | 55.5          | 55.1           |                |
| 33.5 BHP  | 44.9     | 53.6  | 63.4          | 73.9          | 84.8           |                |
| 25. TR  | 62.6     | 62.2  | 61.8          | 61.3          | 60.9           |                |
| 39.0 BHP  | 44.6     | 53.4  | 63.3          | 74.2          | 85.9           |                |
| 30. TR  | 69.1     | 68.5  | 68.0          | 67.5          | 67.1           |                |
| 45.1 BHP  | 44.0     | 53.1  | 63.1          | 74.3          | 86.4           |                |
| 35. TR  | 76.0     | 75.2  | 74.7          | 74.1          | 73.6           |                |
| 51.6 BHP  | 43.1     | 52.6  | 62.8          | 73.9          | 86.5           |                |
| 40. TR  | 83.5     | 82.6  | 81.9          | 81.2          | 80.6           |                |
| 58.6 BHP  | 41.8     | 51.8  | 62.5          | 73.7          | 86.3           |                |

NOTE: Ratings based on Liquid Subcooling by flash type economizer, 10°F Suction Superheat with the Superheat not contributing to the refrigeration effect, no Liquid Subcooling from condenser or external source. No allowance for vapor line pressure drop or economizing vessel temperature split is included in the ratings above.

# RXB-30

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (3550 RPM MOTOR)

R717 HIGH STAGE

| R-717   |                     | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |
|---|---------------------|---|---------------|---------------|----------------|----------------|
|   |                     | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40. TR<br>8.7* BHP | 14.2<br>41.3  | 13.6<br>46.9  | 13.0<br>53.6  | 12.4<br>61.7   | 11.8<br>71.9   |
|   | -35. TR<br>5.4* BHP | 16.5<br>43.0  | 15.9<br>48.5  | 15.2<br>55.0  | 14.6<br>62.5   | 13.9<br>71.6   |
|   | -30. TR<br>1.6* BHP | 19.1<br>44.9  | 18.5<br>50.5  | 17.8<br>56.7  | 17.0<br>64.0   | 16.3<br>72.5   |
|   | -25. TR<br>1.3 BHP  | 22.1<br>46.8  | 21.3<br>52.6  | 20.6<br>58.9  | 19.8<br>66.0   | 18.9<br>74.1   |
|   | -20. TR<br>3.6 BHP  | 25.4<br>48.7  | 24.5<br>54.8  | 23.7<br>61.3  | 22.8<br>68.4   | 21.9<br>76.2   |
|   | -15. TR<br>6.2 BHP  | 29.1<br>50.6  | 28.1<br>57.0  | 27.1<br>63.8  | 26.2<br>71.1   | 25.2<br>79.0   |
|   | -10. TR<br>9.1 BHP  | 33.1<br>52.2  | 32.1<br>59.2  | 31.0<br>66.3  | 29.9<br>73.8   | 28.8<br>81.9   |
|   | -5. TR<br>12.2 BHP  | 37.6<br>53.4  | 36.5<br>61.2  | 35.3<br>68.8  | 34.1<br>76.7   | 32.8<br>85.0   |
|   | 0. TR<br>15.7 BHP   | 42.5<br>54.2  | 41.3<br>62.7  | 40.0<br>71.1  | 38.7<br>79.5   | 37.3<br>88.3   |
|   | 5. TR<br>19.6 BHP   | 48.0<br>54.6  | 46.5<br>63.8  | 45.1<br>73.1  | 43.7<br>82.2   | 42.2<br>91.5   |
|   | 10. TR<br>23.8 BHP  | 53.9<br>54.8  | 52.3<br>64.4  | 50.8<br>74.5  | 49.2<br>84.7   | 47.6<br>94.5   |
|   | 15. TR<br>28.5 BHP  | 60.4<br>54.9  | 58.7<br>64.8  | 56.9<br>75.4  | 55.2<br>86.4   | 53.4<br>97.4   |
|   | 20. TR<br>33.5 BHP  | 67.5<br>55.0  | 65.6<br>64.8  | 63.7<br>75.9  | 61.8<br>87.7   | 59.8<br>99.6   |
|   | 25. TR<br>39.0 BHP  | 75.4<br>55.0  | 73.1<br>65.0  | 71.0<br>76.2  | 68.9<br>88.4   | 66.8<br>101.4  |
|   | 30. TR<br>45.1 BHP  | 84.0<br>54.8  | 81.4<br>65.1  | 79.0<br>76.3  | 76.7<br>88.9   | 74.4<br>102.3  |
|   | 35. TR<br>51.6 BHP  | 93.5<br>54.2  | 90.5<br>65.0  | 87.7<br>76.4  | 85.1<br>88.9   | 82.6<br>103.0  |
|   | 40. TR<br>58.6 BHP  | 103.9<br>53.1   | 100.5<br>64.6 | 97.3<br>76.5  | 94.3<br>89.2   | 91.5<br>103.3  |

NOTE: Capacities based on 10° Liquid Subcooling, 10° Suction Superheat with the Superheat not contributing to the refrigeration effect.

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (3550 RPM MOTOR)  
WITH FLASH TYPE ECONOMIZER (SEE PAGE 52 FOR SELECTIONS  
BASED ON DIRECT EXPANSION OR SHELL and COIL ECONOMIZERS)

# RXB-30E

| R-717   |              | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |                |
|---|--------------|---|---------------|---------------|----------------|----------------|----------------|
|   |              | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |                |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40.<br>8.7* | TR<br>BHP   | 16.7<br>43.8  | 16.4<br>50.0  | 16.0<br>57.4   | 15.6<br>66.5   | 15.2<br>77.8   |
|   | -35.<br>5.4* | TR<br>BHP   | 19.2<br>45.6  | 18.9<br>51.7  | 18.6<br>58.9   | 18.2<br>67.3   | 17.8<br>77.6   |
|   | -30.<br>1.6* | TR<br>BHP   | 22.1<br>47.5  | 21.8<br>53.8  | 21.4<br>60.8   | 21.0<br>68.9   | 20.6<br>78.5   |
|   | -25.<br>1.3  | TR<br>BHP   | 25.3<br>49.5  | 24.9<br>56.0  | 24.6<br>63.1   | 24.2<br>71.0   | 23.7<br>80.2   |
|   | -20.<br>3.6  | TR<br>BHP   | 28.8<br>51.4  | 28.4<br>58.2  | 28.0<br>65.5   | 27.6<br>73.5   | 27.2<br>82.5   |
|   | -15.<br>6.2  | TR<br>BHP   | 32.6<br>53.3  | 32.2<br>60.5  | 31.8<br>68.1   | 31.4<br>76.3   | 31.0<br>85.3   |
|   | -10.<br>9.1  | TR<br>BHP   | 36.8<br>54.9  | 36.5<br>62.6  | 36.0<br>70.6   | 35.5<br>79.2   | 35.1<br>88.4   |
|   | -5.<br>12.2  | TR<br>BHP   | 41.4<br>55.9  | 41.0<br>64.5  | 40.6<br>73.1   | 40.1<br>82.0   | 39.6<br>91.6   |
|   | 0.<br>15.7   | TR<br>BHP   | 46.4<br>56.5  | 46.0<br>65.9  | 45.6<br>75.3   | 45.1<br>84.8   | 44.5<br>94.9   |
|   | 5.<br>19.6   | TR<br>BHP   | 51.8<br>56.7  | 51.4<br>66.8  | 51.0<br>77.1   | 50.5<br>87.5   | 49.9<br>98.1   |
|   | 10.<br>23.8  | TR<br>BHP   | 57.6<br>56.6  | 57.2<br>67.1  | 56.8<br>78.4   | 56.3<br>89.8   | 55.7<br>101.1  |
|   | 15.<br>28.5  | TR<br>BHP   | 63.9<br>56.3  | 63.5<br>67.1  | 63.1<br>79.0   | 62.6<br>91.3   | 62.0<br>103.8  |
|   | 20.<br>33.5  | TR<br>BHP   | 70.8<br>56.1  | 70.3<br>66.8  | 69.8<br>79.2   | 69.3<br>92.3   | 68.7<br>105.8  |
|   | 25.<br>39.0  | TR<br>BHP   | 78.2<br>55.6  | 77.6<br>66.6  | 77.1<br>79.0   | 76.5<br>92.6   | 75.9<br>107.2  |
|   | 30.<br>45.1  | TR<br>BHP   | 86.2<br>54.9  | 85.4<br>66.2  | 84.8<br>78.7   | 84.3<br>92.7   | 83.7<br>107.8  |
|   | 35.<br>51.6  | TR<br>BHP   | 94.8<br>53.8  | 93.9<br>65.6  | 93.2<br>78.4   | 92.5<br>92.2   | 91.9<br>107.9  |
|   | 40.<br>58.6  | TR<br>BHP   | 104.1<br>52.1 | 103.0<br>64.6 | 102.1<br>78.0  | 101.3<br>92.0  | 100.6<br>107.7 |

**R717 HIGH STAGE**

NOTE: Ratings based on Liquid Subcooling by flash type economizer, 10°F Suction Superheat with the Superheat not contributing to the refrigeration effect, no Liquid Subcooling from condenser or external source. No allowance for vapor line pressure drop or economizing vessel temperature split is included in the ratings above.

# RXB-39

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (3550 RPM MOTOR)

R717 HIGH STAGE

| R-717        |           | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |
|--------------|-----------|---|---------------|---------------|----------------|----------------|
|              |           | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |
| -40.<br>8.7* | TR<br>BHP | 17.5<br>51.1  | 16.8<br>58.1  | 16.1<br>66.4  | 15.4<br>76.4   | 14.6<br>89.0   |
| -35.<br>5.4* | TR<br>BHP | 20.4<br>53.3  | 19.7<br>60.1  | 18.9<br>68.1  | 18.1<br>77.4   | 17.2<br>88.7   |
| -30.<br>1.6* | TR<br>BHP | 23.7<br>55.6  | 22.9<br>62.6  | 22.0<br>70.2  | 21.1<br>79.2   | 20.2<br>89.7   |
| -25.<br>1.3  | TR<br>BHP | 27.4<br>58.0  | 26.4<br>65.1  | 25.4<br>73.0  | 24.5<br>81.7   | 23.5<br>91.7   |
| -20.<br>3.6  | TR<br>BHP | 31.5<br>60.4  | 30.4<br>67.9  | 29.3<br>75.9  | 28.2<br>84.7   | 27.1<br>94.4   |
| -15.<br>6.2  | TR<br>BHP | 36.0<br>62.6  | 34.8<br>70.6  | 33.6<br>79.0  | 32.4<br>88.0   | 31.2<br>97.8   |
| -10.<br>9.1  | TR<br>BHP | 41.0<br>64.7  | 39.7<br>73.2  | 38.4<br>82.1  | 37.0<br>91.4   | 35.7<br>101.5  |
| -5.<br>12.2  | TR<br>BHP | 46.6<br>66.1  | 45.2<br>75.7  | 43.7<br>85.2  | 42.2<br>95.0   | 40.6<br>105.3  |
| 0.<br>15.7   | TR<br>BHP | 52.7<br>67.1  | 51.1<br>77.6  | 49.5<br>88.1  | 47.9<br>98.5   | 46.2<br>109.3  |
| 5.<br>19.6   | TR<br>BHP | 59.4<br>67.6  | 57.6<br>79.0  | 55.9<br>90.5  | 54.1<br>101.8  | 52.3<br>113.3  |
| 10.<br>23.8  | TR<br>BHP | 66.7<br>67.9  | 64.8<br>79.7  | 62.9<br>92.3  | 60.9<br>104.8  | 58.9<br>117.0  |
| 15.<br>28.5  | TR<br>BHP | 74.8<br>68.0  | 72.7<br>80.2  | 70.5<br>93.4  | 68.4<br>107.0  | 66.2<br>120.6  |
| 20.<br>33.5  | TR<br>BHP | 83.6<br>68.1  | 81.2<br>80.3  | 78.9<br>94.0  | 76.5<br>108.6  | 74.1<br>123.4  |
| 25.<br>39.0  | TR<br>BHP | 93.4<br>68.1  | 90.6<br>80.5  | 88.0<br>94.3  | 85.4<br>109.5  | 82.7<br>125.5  |
| 30.<br>45.1  | TR<br>BHP | 104.1<br>67.8   | 100.8<br>80.6 | 97.8<br>94.5  | 95.0<br>110.0  | 92.1<br>126.7  |
| 35.<br>51.6  | TR<br>BHP | 115.8<br>67.1   | 112.1<br>80.5 | 108.6<br>94.6 | 105.4<br>110.1 | 102.3<br>127.5 |
| 40.<br>58.6  | TR<br>BHP | 128.7<br>65.8   | 124.4<br>80.0 | 120.4<br>94.7 | 116.8<br>110.4 | 113.3<br>127.9 |

NOTE: Capacities based on 10° Liquid Subcooling, 10° Suction Superheat with the Superheat not contributing to the refrigeration effect.

HIGH STAGE - CAPACITY and BRAKE HORSEPOWER RATING (3550 RPM MOTOR)  
WITH FLASH TYPE ECONOMIZER (SEE PAGE 52 FOR SELECTIONS  
BASED ON DIRECT EXPANSION OR SHELL and COIL ECONOMIZERS)

# RXB-39E

R717 HIGH STAGE

| R-717   |          | SATURATED CONDENSING TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG |               |               |                |                |
|---|----------|---|---------------|---------------|----------------|----------------|
|   |          | 75.0<br>125.8   | 85.0<br>151.7 | 95.0<br>181.1 | 105.0<br>214.2 | 115.0<br>251.5 |
| SATURATED SUCTION TEMPERATURE, °F / CORRESPONDING PRESSURE, PSIG (*in Hg) | -40. TR  | 20.7  | 20.3          | 19.8          | 19.4           | 18.8           |
|   | 8.7* BHP | 54.2  | 61.9          | 71.1          | 82.3           | 96.4           |
|   | -35. TR  | 23.8  | 23.5          | 23.0          | 22.5           | 22.0           |
|   | 5.4* BHP | 56.5  | 64.0          | 72.9          | 83.4           | 96.1           |
|   | -30. TR  | 27.3  | 27.0          | 26.6          | 26.1           | 25.5           |
|   | 1.6* BHP | 58.8  | 66.6          | 75.2          | 85.3           | 97.2           |
|   | -25. TR  | 31.3  | 30.8          | 30.4          | 29.9           | 29.4           |
|   | 1.3 BHP  | 61.3  | 69.3          | 78.1          | 87.9           | 99.3           |
|   | -20. TR  | 35.6  | 35.2          | 34.7          | 34.2           | 33.7           |
|   | 3.6 BHP  | 63.7  | 72.1          | 81.2          | 91.1           | 102.1          |
|   | -15. TR  | 40.4  | 39.9          | 39.4          | 38.9           | 38.3           |
|   | 6.2 BHP  | 66.0  | 74.9          | 84.3          | 94.5           | 105.7          |
|   | -10. TR  | 45.6  | 45.1          | 44.6          | 44.0           | 43.4           |
|   | 9.1 BHP  | 67.9  | 77.5          | 87.5          | 98.0           | 109.5          |
|   | -5. TR   | 51.3  | 50.8          | 50.3          | 49.7           | 49.0           |
|   | 12.2 BHP | 69.2  | 79.9          | 90.5          | 101.6          | 113.4          |
|   | 0. TR    | 57.4  | 57.0          | 56.5          | 55.8           | 55.1           |
|   | 15.7 BHP | 70.0  | 81.6          | 93.3          | 105.1          | 117.5          |
|   | 5. TR    | 64.1  | 63.6          | 63.1          | 62.5           | 61.8           |
|   | 19.6 BHP | 70.2  | 82.7          | 95.5          | 108.3          | 121.4          |
| 10. TR  | 71.4     | 70.9  | 70.3          | 69.7          | 69.0           |                |
| 23.8 BHP  | 70.1     | 83.1  | 97.1          | 111.2         | 125.2          |                |
| 15. TR  | 79.2     | 78.7  | 78.1          | 77.5          | 76.8           |                |
| 28.5 BHP  | 69.8     | 83.1  | 97.8          | 113.1         | 128.6          |                |
| 20. TR  | 87.6     | 87.0  | 86.5          | 85.8          | 85.1           |                |
| 33.5 BHP  | 69.4     | 82.8  | 98.0          | 114.3         | 131.0          |                |
| 25. TR  | 96.8     | 96.0  | 95.5          | 94.8          | 94.0           |                |
| 39.0 BHP  | 68.9     | 82.4  | 97.9          | 114.7         | 132.8          |                |
| 30. TR  | 106.7    | 105.8   | 105.1         | 104.3         | 103.6          |                |
| 45.1 BHP  | 68.0     | 82.0  | 97.5          | 114.7         | 133.5          |                |
| 35. TR  | 117.4    | 116.3   | 115.4         | 114.5         | 113.8          |                |
| 51.6 BHP  | 66.6     | 81.3  | 97.1          | 114.2         | 133.7          |                |
| 40. TR  | 128.9    | 127.6   | 126.5         | 125.4         | 124.5          |                |
| 58.6 BHP  | 64.6     | 80.1  | 96.6          | 113.9         | 133.4          |                |

NOTE: Ratings based on Liquid Subcooling by flash type economizer, 10°F Suction Superheat with the Superheat not contributing to the refrigeration effect, no Liquid Subcooling from condenser or external source. No allowance for vapor line pressure drop or economizing vessel temperature split is included in the ratings above.

**LIQUID INJECTION OIL COOLING**

High stage compressor units may be supplied with single port (low Vi) or dual port (low Vi and high Vi) liquid injection oil cooling. Single port will be furnished for low compression ratio operation and dual port for high compression ratio operation. Booster compressor units use single port liquid injection oil cooling due to the typically lower compression ratios.

The control system on high stage units with dual port liquid injection oil cooling automatically switches the liquid refrigerant supply to the high port when the compressor is operating at higher compression ratios (at 5.0 Vi) for best efficiency.

The following table gives the evaporator temperature limits for liquid injection use and single port application.

| CONDENSING TEMPERATURE | MAXIMUM EVAP TEMP |       | MINIMUM * EVAP TEMP  |
|------------------------|-------------------|-------|----------------------|
|                        | LIQUID INJ. USE   |       | SINGLE PORT (LOW Vi) |
|                        | R717              | R22   | R717 & R22           |
| 75°F                   | +10°F             | + 5°F | -23°F                |
| 85°F                   | +25°F             | +15°F | -17°F                |
| 95°F                   | +35°F             | +25°F | -11°F                |
| 105°F                  | +40°F             | +35°F | - 4°F                |

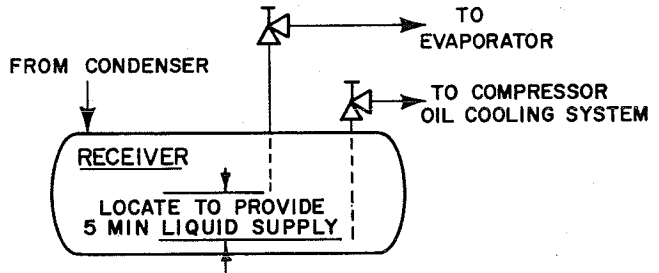
\* Dual Injection Kit will be shipped by Frick below these temperatures.

Where low compression ratios are anticipated, thermosyphon or water cooled oil cooling should be used.

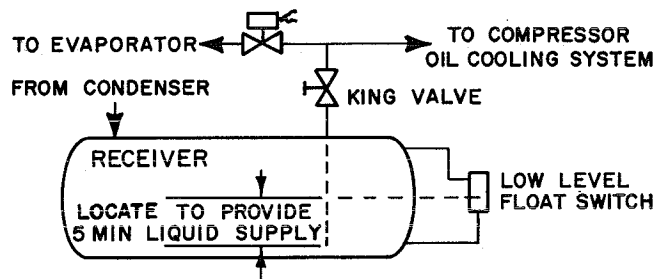
It is imperative that an uninterrupted supply of high pressure liquid refrigerant be provided to the injection system at all times. Two items are of extreme importance, the design of the receiver/liquid injection supply and the size of the liquid line.

It is recommended that the receiver be oversized sufficiently to retain a five (5) minute supply of refrigerant for oil cooling. The evaporator supply must be secondary to this consideration. Two methods of accomplishing this are shown.

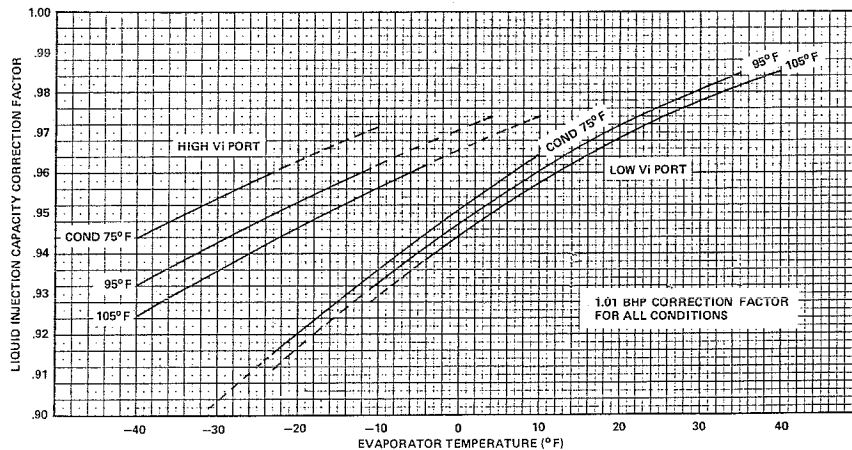
The dual dip tube method uses two dip tubes in the receiver. The liquid injection tube is below the evaporator tube to assure continued oil cooling when the receiver level is low.



The level control method utilizes a float level control on the receiver to close a solenoid valve feeding the evaporator when the liquid falls below that amount necessary for five (5) minutes of liquid injection oil cooling.



**HIGH STAGE LIQUID INJECTION CORRECTION FACTORS – R717 and R22**



**BOOSTER LIQUID INJECTION CORRECTION FACTORS – R717 and R22**

CAPACITY CORRECTION FACTOR .98 (for all conditions)  
BHP CORRECTION FACTOR 1.01 (for all conditions)

Liquid line sizes and the additional receiver volume (quantity of refrigerant required for five (5) minutes of liquid injection oil cooling) are given in the following table.

| REF        | RXB MODEL | LIQUID LINE SIZE (*) |           | FLOW RATE (LB) 5 MIN | LIQUID VOLUME CU FT |    |
|------------|-----------|----------------------|-----------|----------------------|---------------------|----|
|            |           | PIPE SCH 80          | TUBING OD |                      |                     |    |
| HIGH STAGE | R717      | 12                   | 1/2       | 10                   | .3                  |    |
|            |           | 15                   | 1/2       | 12.5                 | .4                  |    |
|            |           | 19                   | 1/2       | 15                   | .4                  |    |
|            |           | 24                   | 1/2       | 20                   | .6                  |    |
|            |           | 30                   | 1/2       | 25                   | .7                  |    |
|            | 39        | 1/2                  | 30        | .8                   |                     |    |
|            | R22       | 12                   | 3/4       | 5/8                  | 30                  | .4 |
|            |           | 15                   | 3/4       | 5/8                  | 37.5                | .5 |
|            |           | 19                   | 3/4       | 5/8                  | 45                  | .6 |
|            |           | 24                   | 3/4       | 7/8                  | 60                  | .8 |
| 30         |           | 3/4                  | 7/8       | 75                   | 1.0                 |    |
| 39         | 3/4       | 7/8                  | 95        | 1.3                  |                     |    |
| BOOSTER    | R717      | 12                   | 1/2       | 2                    | .1                  |    |
|            |           | 15                   | 1/2       | 2.5                  | .1                  |    |
|            |           | 19                   | 1/2       | 3.5                  | .1                  |    |
|            |           | 24                   | 1/2       | 4.5                  | .1                  |    |
|            |           | 30                   | 1/2       | 5.5                  | .2                  |    |
|            | 39        | 1/2                  | 6.5       | .2                   |                     |    |
|            | R22       | 12                   | 3/4       | 1/2                  | 6                   | .1 |
|            |           | 15                   | 3/4       | 1/2                  | 7                   | .1 |
|            |           | 19                   | 3/4       | 1/2                  | 9                   | .1 |
|            |           | 24                   | 3/4       | 1/2                  | 12                  | .2 |
| 30         |           | 3/4                  | 1/2       | 14.5                 | .2                  |    |
| 39         | 3/4       | 1/2                  | 18        | .3                   |                     |    |

\* 100 foot liquid line. For longer runs increase line size accordingly.

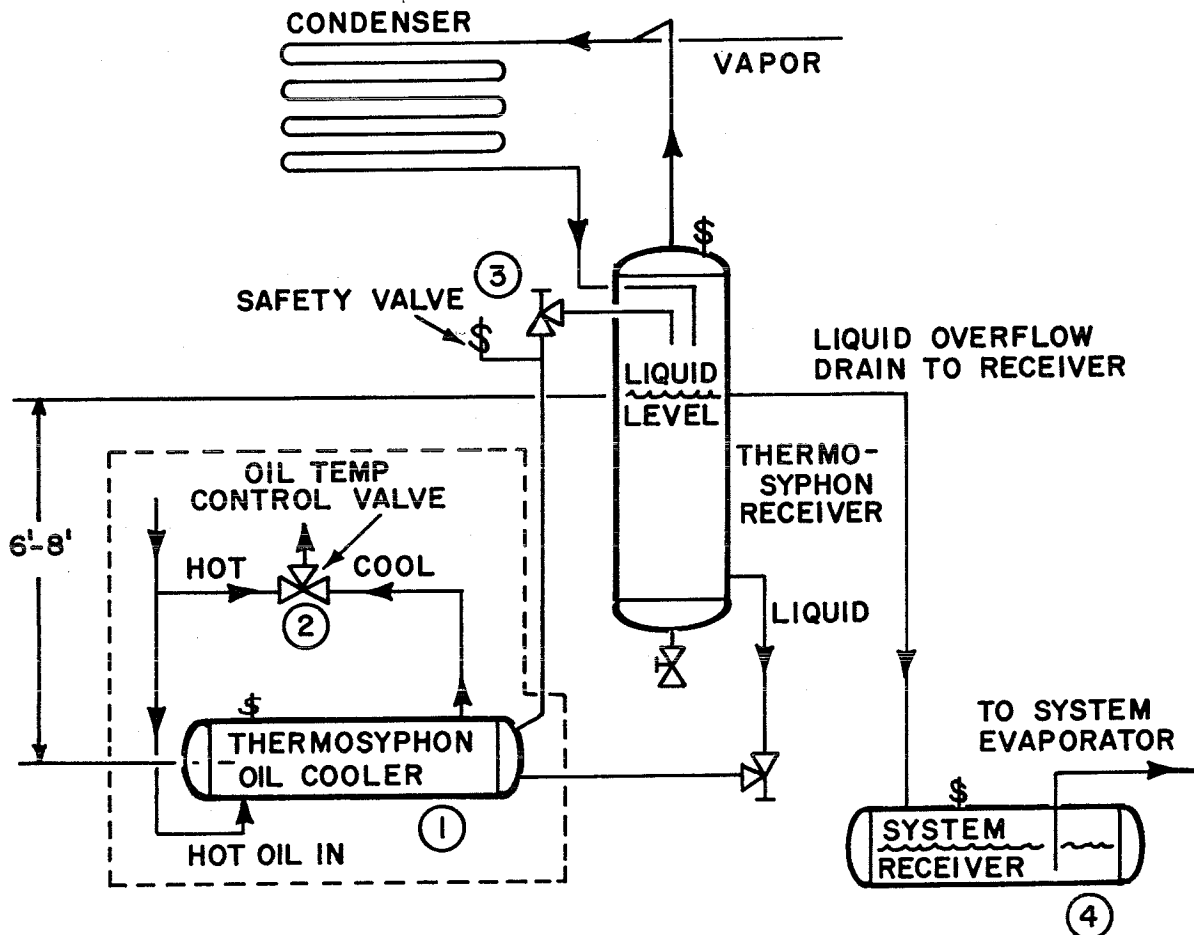
### THERMOSYPHON OIL COOLING

Thermosyphon oil coolers, like water (or glycol) cooled oil coolers, eliminate the capacity and power penalties associated with liquid injection oil cooling. Thermosyphon oil coolers have the further advantages of eliminating water (or glycol) pump power consumption and maintenance, tube fouling and potential system contamination.

The principle of operation is as follows (see diagram). A supply of high pressure liquid is maintained in a receiver at a predetermined minimum head above the oil cooler. Gravity causes the liquid refrigerant to flow to the oil cooler where a portion of the liquid is boiled off, thereby cooling the hot oil. New liquid from the receiver displaces the lighter refrigerant liquid/vapor mixture which rises to the receiver dropping out the remaining liquid before allowing the vapor to return to the condenser completing the cycle.

**PIPING ARRANGEMENT FOR THERMOSYPHON OIL COOLING SYSTEMS** - The components and piping of a thermosyphon oil cooling system include a liquid source at condensing pressure, adequate static head to provide fluid flow, appropriate control valves, safety relief valves, service valves and pump out connections. The arrangement of component placement and fluid flow requirements must be designed to suit the individual refrigeration system layout with consideration given to piping safety practices.

The component and piping arrangement shown below is intended only to illustrate the operating principles of thermosyphon oil cooling. Other component layouts may be better suited to a specific installation.



1. Thermosyphon oil cooler is supplied with the oil side piped to the compressor unit and stub ends supplied on the refrigerant side.
2. Three-way oil temperature control valve is required where condensing temperature is expected to go below 65°F.
3. Refrigerant side safety valve is required in this location only when refrigerant isolation valves are installed.
4. System receiver must be mounted below thermosyphon receiver level in this arrangement.

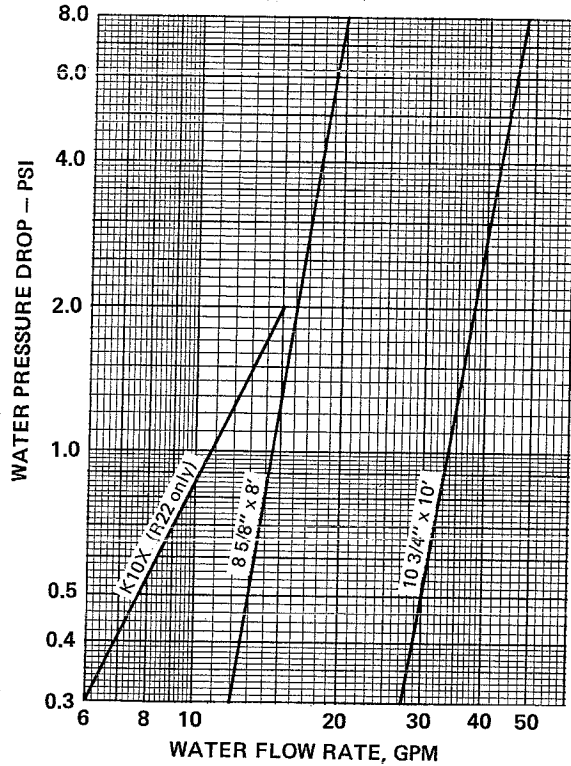
**WATER COOLED OIL COOLER SELECTION**

Use the following formula, OCHR tables and graph to determine the cooling water flow (GPM), standard water cooled oil cooler selection and the resulting cooling water pressure drop.

To find the required cooling water flow (GPM) use the following formula:

$$GPM = \frac{OCHR}{500 (T_o - T_i)}$$

- OCHR — Oil cooler heat rejection (BTU/HR)
- T<sub>o</sub> — Cooling water outlet temp (not to exceed 110°F)
- T<sub>i</sub> — Cooling water inlet temp (°F)



**OIL COOLER HEAT REJECTION (OCHR) – 1,000 BTU/HR**

Based on 10°F superheat (superheat enthalpy not contributing to refrigerant effect) and 10°F subcooling. For applications having greater than 10°F of compressor suction superheat, consult Frick Company.

**OIL COOLER HEAT REJECTION (OCHR) – 1000 BTU/HR (Based on 10°F Superheat, 10°F Liquid Subcooling)**

| EVAP<br>T °F | COND<br>T °F | RXB SCREW COMPRESSOR MODELS – HIGH STAGE R717 |      |      |      |      |       |
|--------------|--------------|---|------|------|------|------|-------|
|              |              | 12  | 15   | 19   | 24   | 30   | 39    |
| -40          | 75           | 28.8  | 35.7 | 43.8 | 56.6 | 70.2 | 85.7  |
| -35          |              | 29.3  | 36.3 | 44.5 | 57.3 | 70.9 | 87.1  |
| -30          |              | 29.7  | 36.6 | 45.0 | 57.8 | 71.4 | 87.6  |
| -25          |              | 30.1  | 37.0 | 45.3 | 58.2 | 71.7 | 87.9  |
| -20          |              | 31.0  | 37.2 | 45.5 | 58.3 | 71.7 | 87.8  |
| -15          |              | 30.3  | 37.2 | 45.4 | 58.0 | 71.0 | 87.1  |
| -10          |              | 30.2  | 36.9 | 44.9 | 57.3 | 70.2 | 85.5  |
| - 5          |              | 29.8  | 36.3 | 44.0 | 56.0 | 68.5 | 83.3  |
| 0            |              | 29.0  | 35.4 | 42.8 | 54.2 | 66.1 | 80.1  |
| 5            |              | 28.0  | 34.0 | 40.4 | 51.7 | 62.9 | 76.1  |
| 10           |              | 26.5  | 32.0 | 38.5 | 48.5 | 58.6 | 70.8  |
| 15           |              | 24.7  | 29.6 | 35.6 | 44.6 | 53.9 | 64.6  |
| 20           |              | 22.8  | 27.2 | 32.4 | 40.3 | 48.5 | 58.0  |
| 25           |              | 20.5  | 24.5 | 29.1 | 36.0 | 43.1 | 51.3  |
| 30           |              | 18.2  | 21.7 | 25.6 | 31.5 | 37.5 | 44.3  |
| 35           |              | 15.9  | 18.8 | 22.0 | 26.8 | 31.8 | 37.5  |
| 40           | 14.2         | 16.7  | 19.4 | 23.6 | 27.6 | 32.3 |       |
| -40          | 85           | 34.3  | 42.4 | 52.2 | 67.5 | 83.7 | 103.1 |
| -35          |              | 34.8  | 43.1 | 52.9 | 68.4 | 84.8 | 104.2 |
| -30          |              | 35.5  | 43.8 | 53.8 | 69.3 | 85.7 | 105.4 |
| -25          |              | 36.1  | 44.5 | 54.5 | 70.2 | 86.9 | 106.3 |
| -20          |              | 36.6  | 45.1 | 55.1 | 70.9 | 87.4 | 107.3 |
| -15          |              | 37.0  | 45.4 | 55.6 | 71.8 | 87.8 | 107.5 |
| -10          |              | 37.2  | 45.7 | 55.7 | 71.4 | 87.7 | 107.2 |
| - 5          |              | 37.3  | 45.7 | 55.6 | 71.0 | 87.0 | 105.6 |
| 0            |              | 37.1  | 45.0 | 55.0 | 70.0 | 85.7 | 104.9 |
| 5            |              | 36.5  | 44.6 | 53.9 | 68.4 | 83.7 | 102.6 |
| 10           |              | 35.6  | 42.8 | 52.3 | 66.2 | 80.7 | 97.7  |
| 15           |              | 34.4  | 41.7 | 50.2 | 63.2 | 76.7 | 92.7  |
| 20           |              | 32.7  | 39.5 | 47.3 | 59.5 | 72.2 | 82.7  |
| 25           |              | 30.6  | 36.9 | 44.0 | 55.0 | 66.3 | 79.7  |
| 30           |              | 28.5  | 34.2 | 40.6 | 50.5 | 60.5 | 72.5  |
| 35           |              | 26.2  | 31.3 | 37.0 | 45.7 | 54.6 | 65.1  |
| 40           | 23.8         | 28.3  | 33.3 | 40.8 | 48.5 | 57.3 |       |

OIL COOLER HEAT REJECTION (OCHR) – 1000 BTU/HR (Based on 10°F Superheat, 10°F Liquid Subcooling)

| EVAP<br>T °F | COND<br>T °F | RXB SCREW COMPRESSOR MODELS – HIGH STAGE R717 |      |      |       |       |       |
|--------------|--------------|---|------|------|-------|-------|-------|
|              |              | 12  | 15   | 19   | 24    | 30    | 39    |
| -40          | 95           | 40.2  | 50.1 | 61.7 | 79.9  | 99.1  | 122.1 |
| -35          |              | 41.0  | 50.7 | 62.4 | 80.9  | 100.2 | 123.5 |
| -30          |              | 41.7  | 51.7 | 63.0 | 82.0  | 101.6 | 125.1 |
| -25          |              | 42.6  | 52.6 | 64.6 | 83.1  | 103.2 | 127.1 |
| -20          |              | 43.4  | 53.6 | 65.7 | 84.7  | 104.6 | 128.5 |
| -15          |              | 44.2  | 54.4 | 66.6 | 85.7  | 105.8 | 129.8 |
| -10          |              | 44.8  | 55.1 | 67.4 | 86.5  | 106.6 | 130.7 |
| - 5          |              | 45.3  | 55.6 | 67.9 | 87.0  | 107.0 | 131.0 |
| 0            |              | 45.8  | 55.9 | 68.0 | 86.9  | 106.8 | 130.5 |
| 5            |              | 45.6  | 55.8 | 67.8 | 86.4  | 105.9 | 129.2 |
| 10           |              | 45.3  | 55.4 | 67.0 | 85.2  | 104.3 | 126.9 |
| 15           |              | 44.7  | 53.2 | 65.6 | 83.2  | 101.5 | 123.2 |
| 20           |              | 43.6  | 52.9 | 63.7 | 80.5  | 98.1  | 118.7 |
| 25           |              | 42.1  | 50.8 | 61.1 | 76.9  | 93.4  | 113.0 |
| 30           |              | 40.2  | 48.4 | 57.9 | 72.6  | 87.7  | 105.8 |
| 35           |              | 38.0  | 45.6 | 54.4 | 67.8  | 81.7  | 98.1  |
| 40           |              | 35.7  | 42.6 | 50.6 | 62.9  | 75.4  | 90.3  |
| -40          | 105          | 48.0  | 59.5 | 73.3 | 95.1  | 118.1 | 145.8 |
| -35          |              | 48.2  | 59.5 | 73.3 | 95.0  | 118.1 | 145.3 |
| -30          |              | 48.8  | 60.4 | 74.2 | 96.2  | 119.4 | 147.0 |
| -25          |              | 49.7  | 61.6 | 76.6 | 97.8  | 121.2 | 149.3 |
| -20          |              | 50.8  | 62.8 | 77.1 | 99.6  | 123.4 | 151.7 |
| -15          |              | 51.9  | 64.2 | 78.6 | 101.3 | 125.3 | 154.1 |
| -10          |              | 53.0  | 65.9 | 80.0 | 103.3 | 127.1 | 156.2 |
| - 5          |              | 53.9  | 66.3 | 81.1 | 104.5 | 128.6 | 157.6 |
| 0            |              | 54.7  | 67.2 | 81.9 | 105.1 | 129.5 | 158.6 |
| 5            |              | 55.2  | 67.7 | 82.5 | 105.5 | 129.9 | 158.9 |
| 10           |              | 55.5  | 68.0 | 82.6 | 105.4 | 129.7 | 158.6 |
| 15           |              | 55.5  | 67.8 | 82.2 | 104.7 | 128.3 | 156.5 |
| 20           |              | 55.3  | 67.1 | 81.2 | 103.1 | 126.2 | 153.5 |
| 25           |              | 54.3  | 65.9 | 79.6 | 100.8 | 122.9 | 149.3 |
| 30           |              | 53.0  | 64.2 | 77.2 | 97.8  | 118.7 | 143.8 |
| 35           |              | 51.3  | 61.9 | 74.2 | 93.3  | 113.3 | 136.6 |
| 40           |              | 49.1  | 58.2 | 70.6 | 88.2  | 106.8 | 128.7 |
| -40          | 115          | 57.5  | 71.4 | 88.0 | 114.5 | 142.1 | 175.4 |
| -35          |              | 56.4  | 70.2 | 86.6 | 112.3 | 139.6 | 172.2 |
| -30          |              | 56.7  | 70.4 | 86.7 | 112.4 | 139.5 | 172.3 |
| -25          |              | 57.8  | 71.6 | 88.1 | 113.9 | 141.5 | 174.4 |
| -20          |              | 59.0  | 73.0 | 89.7 | 116.1 | 143.9 | 177.3 |
| -15          |              | 60.4  | 74.7 | 91.6 | 118.4 | 146.7 | 180.6 |
| -10          |              | 61.8  | 76.3 | 93.6 | 120.8 | 149.4 | 183.7 |
| - 5          |              | 63.2  | 77.9 | 95.5 | 122.9 | 151.9 | 186.3 |
| 0            |              | 64.4  | 79.3 | 97.0 | 124.8 | 154.0 | 189.0 |
| 5            |              | 65.6  | 80.5 | 98.3 | 126.2 | 155.7 | 191.0 |
| 10           |              | 66.5  | 82.0 | 99.4 | 127.3 | 156.8 | 191.9 |
| 15           |              | 67.0  | 82.1 | 99.9 | 127.7 | 157.2 | 192.0 |
| 20           |              | 67.4  | 82.3 | 99.9 | 127.5 | 156.5 | 190.3 |
| 25           |              | 67.6  | 82.0 | 99.3 | 126.5 | 154.9 | 188.8 |
| 30           |              | 66.6  | 81.2 | 98.0 | 124.4 | 152.1 | 185.1 |
| 35           |              | 65.8  | 79.8 | 96.1 | 121.6 | 148.3 | 180.1 |
| 40           |              | 64.3  | 77.6 | 93.3 | 117.5 | 143.1 | 173.4 |

RXB ROTARY SCREW COMPRESSOR UNITS  
ENGINEERING DATA

OIL COOLER HEAT REJECTION (OCHR) - 1000 BTU/HR (Based on 10°F Superheat, 10°F Liquid Subcooling)

| EVAP<br>T °F | COND<br>T °F | RXB SCREW COMPRESSOR MODELS - HIGH STAGE R22 |      |      |      |      |       |      |
|--------------|--------------|--|------|------|------|------|-------|------|
|              |              | 12   | 15   | 19   | 24   | 30   | 39    |      |
| -40          | 75           | 18.7   | 22.9 | 27.8 | 35.6 | 43.6 | 53.1  |      |
| -35          |              | 18.1   | 22.1 | 26.8 | 34.2 | 42.1 | 50.8  |      |
| -30          |              | 17.4   | 21.4 | 25.8 | 32.7 | 40.0 | 48.5  |      |
| -25          |              | 16.6   | 20.2 | 24.4 | 30.9 | 37.7 | 45.7  |      |
| -20          |              | 15.7   | 19.1 | 23.0 | 28.9 | 35.4 | 42.6  |      |
| -15          |              | 14.6   | 17.7 | 21.2 | 26.6 | 32.2 | 38.9  |      |
| -10          |              | 13.2   | 15.9 | 19.0 | 23.8 | 28.8 | 34.6  |      |
| - 5          |              | 11.8   | 13.9 | 16.7 | 20.9 | 25.1 | 30.1  |      |
| 0            |              | 10.1   | 12.1 | 14.4 | 17.9 | 21.4 | 25.7  |      |
| 5            |              | 8.5  | 10.2 | 12.0 | 14.9 | 17.7 | 21.2  |      |
| 10           |              | 6.8  | 8.0  | 9.5  | 11.7 | 13.8 | 16.4  |      |
| 15           |              | 4.9  | 5.8  | 6.8  | 8.3  | 9.8  | 11.6  |      |
| 20           |              | 3.0  | 3.4  | 4.0  | 4.9  | 5.7  | 6.7   |      |
| 25           |              | 0.8  | 1.0  | 1.1  | 1.4  | 1.6  | 1.8   |      |
| -40          |              | 85   | 24.1 | 29.4 | 36.1 | 46.2 | 56.8  | 69.3 |
| -35          |              |  | 23.7 | 29.1 | 35.4 | 45.2 | 55.5  | 67.8 |
| -30          | 23.3         |  | 28.5 | 34.7 | 44.1 | 54.0 | 66.0  |      |
| -25          | 22.8         |  | 27.8 | 33.6 | 42.8 | 52.3 | 63.6  |      |
| -20          | 22.2         |  | 27.0 | 32.6 | 41.3 | 50.4 | 61.2  |      |
| -15          | 21.4         |  | 26.0 | 31.3 | 39.5 | 48.1 | 58.3  |      |
| -10          | 20.5         |  | 24.8 | 29.8 | 37.6 | 45.6 | 55.1  |      |
| - 5          | 19.2         |  | 23.2 | 27.7 | 34.8 | 42.2 | 50.9  |      |
| 0            | 17.8         |  | 21.4 | 25.6 | 32.0 | 38.7 | 46.5  |      |
| 5            | 16.4         |  | 19.6 | 23.3 | 29.0 | 34.9 | 41.9  |      |
| 10           | 15.6         |  | 17.8 | 21.1 | 26.1 | 31.3 | 37.4  |      |
| 15           | 13.3         |  | 15.8 | 18.6 | 23.0 | 27.3 | 32.7  |      |
| 20           | 11.5         |  | 13.6 | 16.0 | 19.7 | 23.4 | 27.8  |      |
| 25           | 9.7          |  | 11.4 | 13.4 | 16.3 | 19.3 | 22.8  |      |
| 30           | 7.8          |  | 9.1  | 10.5 | 12.8 | 15.1 | 17.7  |      |
| 35           | 5.7          |  | 6.7  | 7.7  | 9.3  | 10.9 | 12.8  |      |
| 40           | 3.7          | 4.3  | 4.9  | 5.9  | 6.9  | 8.0  |       |      |
| -40          | 95           | 30.2   | 37.1 | 45.3 | 58.3 | 71.8 | 88.1  |      |
| -35          |              | 30.0   | 36.6 | 44.8 | 57.4 | 70.6 | 86.6  |      |
| -30          |              | 29.7   | 36.4 | 44.3 | 56.6 | 69.6 | 85.1  |      |
| -25          |              | 29.4   | 36.0 | 43.7 | 55.8 | 68.5 | 83.6  |      |
| -20          |              | 29.1   | 35.5 | 43.0 | 54.8 | 67.0 | 81.7  |      |
| -15          |              | 28.7   | 34.9 | 42.3 | 53.6 | 65.5 | 79.7  |      |
| -10          |              | 28.1   | 34.1 | 41.4 | 52.2 | 63.6 | 77.2  |      |
| - 5          |              | 27.5   | 33.2 | 40.0 | 50.3 | 61.3 | 74.4  |      |
| 0            |              | 26.4   | 31.8 | 38.2 | 48.0 | 58.0 | 70.4  |      |
| 5            |              | 25.1   | 30.2 | 36.1 | 45.2 | 54.7 | 66.0  |      |
| 10           |              | 24.2   | 28.5 | 34.0 | 42.4 | 51.1 | 61.5  |      |
| 15           |              | 22.4   | 26.9 | 31.8 | 39.5 | 47.5 | 57.0  |      |
| 20           |              | 21.0   | 24.8 | 29.5 | 36.5 | 43.8 | 52.3  |      |
| 25           |              | 19.5   | 22.9 | 27.0 | 33.2 | 39.7 | 47.3  |      |
| 30           |              | 17.6   | 20.8 | 24.4 | 29.9 | 35.5 | 42.2  |      |
| 35           |              | 15.8   | 18.5 | 21.6 | 26.3 | 31.2 | 37.0  |      |
| 40           | 13.9         | 16.2   | 19.0 | 22.8 | 26.9 | 31.7 |       |      |
| -40          | 105          | 37.1   | 45.7 | 56.0 | 72.0 | 88.9 | 109.0 |      |
| -35          |              | 36.9   | 45.3 | 55.4 | 71.2 | 88.3 | 107.8 |      |
| -30          |              | 36.7   | 45.1 | 55.0 | 70.6 | 87.0 | 106.6 |      |
| -25          |              | 36.7   | 45.0 | 54.8 | 70.2 | 86.3 | 105.6 |      |
| -20          |              | 36.6   | 44.7 | 53.4 | 69.7 | 85.6 | 104.7 |      |
| -15          |              | 36.4   | 44.7 | 54.0 | 69.0 | 84.6 | 103.2 |      |
| -10          |              | 36.4   | 44.3 | 53.7 | 68.2 | 82.8 | 101.6 |      |
| - 5          |              | 36.1   | 43.8 | 52.5 | 67.1 | 81.9 | 99.6  |      |
| 0            |              | 35.5   | 43.1 | 52.0 | 65.7 | 80.1 | 97.1  |      |
| 5            |              | 34.8   | 42.0 | 50.4 | 63.1 | 77.5 | 93.6  |      |
| 10           |              | 33.7   | 40.6 | 48.7 | 61.0 | 74.0 | 89.5  |      |
| 15           |              | 32.5   | 39.1 | 46.6 | 58.5 | 70.6 | 85.1  |      |
| 20           |              | 31.3   | 37.5 | 44.5 | 55.4 | 67.1 | 80.7  |      |
| 25           |              | 30.0   | 35.7 | 42.5 | 52.7 | 63.4 | 76.0  |      |
| 30           |              | 28.6   | 33.9 | 40.1 | 49.6 | 59.4 | 71.1  |      |
| 35           |              | 27.0   | 31.8 | 37.5 | 46.2 | 53.0 | 65.8  |      |
| 40           | 25.2         | 29.7   | 34.9 | 42.7 | 49.7 | 60.4 |       |      |

OIL COOLER HEAT REJECTION (OCHR) – 1000 BTU/HR (Based on 10°F Superheat, 10°F Liquid Subcooling)

| EVAP<br>T °F | COND<br>T °F | RXB SCREW COMPRESSOR MODELS – HIGH STAGE R22 |      |      |       |       |       |
|--------------|--------------|--|------|------|-------|-------|-------|
|              |              | 12   | 15   | 19   | 24    | 30    | 39    |
| -40          | 115          | 44.8   | 55.5 | 67.7 | 87.4  | 108.2 | 133.0 |
| -35          |              | 44.5   | 54.8 | 67.1 | 86.5  | 106.7 | 131.3 |
| -30          |              | 44.5   | 54.7 | 66.9 | 86.1  | 106.2 | 130.3 |
| -25          |              | 44.8   | 55.1 | 67.1 | 86.2  | 106.2 | 130.3 |
| -20          |              | 44.4   | 55.1 | 67.2 | 85.9  | 106.0 | 129.7 |
| -15          |              | 45.2   | 55.3 | 67.3 | 86.1  | 105.8 | 129.2 |
| -10          |              | 45.4   | 55.5 | 67.2 | 85.8  | 105.3 | 128.6 |
| - 5          |              | 45.4   | 55.3 | 67.1 | 85.4  | 104.6 | 128.4 |
| 0            |              | 45.4   | 55.2 | 66.7 | 84.7  | 103.6 | 126.2 |
| 5            |              | 45.2   | 54.9 | 66.2 | 83.8  | 102.3 | 124.3 |
| 10           |              | 44.7   | 54.0 | 65.0 | 82.1  | 100.0 | 121.3 |
| 15           |              | 43.8   | 52.8 | 63.4 | 79.8  | 97.0  | 117.5 |
| 20           |              | 42.9   | 51.6 | 61.7 | 77.4  | 93.9  | 109.1 |
| 25           |              | 41.8   | 50.0 | 59.8 | 74.8  | 90.5  | 108.9 |
| 30           |              | 40.7   | 48.6 | 57.8 | 72.0  | 85.4  | 104.6 |
| 35           |              | 39.4   | 46.9 | 55.6 | 69.0  | 83.0  | 99.6  |
| 40           |              | 38.0   | 45.0 | 53.1 | 65.7  | 78.8  | 94.3  |
| -40          | 125          | 54.1   | 66.8 | 82.0 | 106.0 | 131.4 | 161.8 |
| -35          |              | 53.5   | 66.0 | 81.0 | 104.5 | 129.2 | 158.9 |
| -30          |              | 53.4   | 65.9 | 80.6 | 103.8 | 128.4 | 157.8 |
| -25          |              | 53.6   | 66.0 | 80.7 | 103.5 | 128.5 | 157.3 |
| -20          |              | 54.0   | 66.3 | 81.0 | 104.0 | 128.4 | 157.4 |
| -15          |              | 54.4   | 66.8 | 81.4 | 104.4 | 128.5 | 157.5 |
| -10          |              | 55.2   | 67.6 | 82.3 | 105.3 | 129.6 | 158.6 |
| - 5          |              | 55.7   | 68.1 | 82.6 | 105.5 | 129.7 | 158.6 |
| 0            |              | 56.1   | 68.4 | 83.0 | 105.7 | 129.8 | 158.3 |
| 5            |              | 56.4   | 68.6 | 83.0 | 105.6 | 129.3 | 157.6 |
| 10           |              | 57.3   | 68.6 | 82.8 | 105.0 | 128.4 | 156.3 |
| 15           |              | 56.3   | 68.0 | 82.2 | 104.0 | 126.9 | 154.2 |
| 20           |              | 55.8   | 67.4 | 81.0 | 102.1 | 124.3 | 150.9 |
| 25           |              | 54.8   | 66.2 | 79.4 | 99.9  | 121.5 | 146.4 |
| 30           |              | 54.2   | 65.2 | 77.7 | 97.6  | 118.2 | 143.0 |
| 35           |              | 53.3   | 63.8 | 75.9 | 95.0  | 115.7 | 138.5 |
| 40           |              | 51.8   | 62.3 | 73.9 | 92.1  | 111.1 | 134.2 |

RXB ROTARY SCREW COMPRESSOR UNITS  
ENGINEERING DATA

OIL COOLER HEAT REJECTION (OCHR) - 1000 BTU/HR (Based on 0°F Superheat, 0°F Liquid Subcooling)

| EVAP<br>T°F | INTER-<br>MEDIATE<br>T°F | RXB SCREW COMPRESSOR MODELS - BOOSTER R717 |      |      |      |      |      |
|-------------|--------------------------|--|------|------|------|------|------|
|             |                          | 12   | 15   | 19   | 24   | 30   | 39   |
| -80         | -20                      | 7.0  | 8.6  | 10.7 | 13.9 | 16.6 | 20.6 |
| -75         |                          | 6.6  | 8.2  | 10.1 | 13.0 | 16.0 | 19.9 |
| -70         |                          | 5.8  | 7.2  | 8.8  | 11.4 | 14.1 | 17.4 |
| -65         |                          | 5.0  | 6.1  | 7.6  | 9.9  | 12.2 | 14.9 |
| -60         |                          | 4.2  | 5.0  | 6.2  | 8.0  | 10.0 | 12.1 |
| -55         |                          | 2.9  | 3.6  | 4.4  | 5.7  | 7.0  | 8.6  |
| -50         |                          | 1.8  | 2.2  | 2.8  | 3.5  | 4.3  | 5.2  |
| -45         |                          | 1.0  | 1.2  | 1.4  | 2.0  | 2.3  | 2.7  |
| -80         | -10                      | 8.3  | 10.3 | 12.7 | 16.4 | 20.4 | 25.2 |
| -75         |                          | 7.9  | 9.8  | 12.1 | 15.6 | 19.4 | 23.9 |
| -70         |                          | 7.5  | 9.2  | 11.3 | 14.7 | 18.2 | 22.4 |
| -65         |                          | 7.0  | 8.6  | 10.6 | 13.7 | 16.9 | 20.7 |
| -60         |                          | 5.9  | 7.3  | 9.0  | 11.8 | 14.4 | 17.6 |
| -55         |                          | 5.0  | 6.4  | 7.6  | 9.8  | 12.0 | 14.7 |
| -50         |                          | 3.8  | 4.6  | 5.8  | 7.4  | 9.1  | 11.1 |
| -45         |                          | 2.5  | 3.1  | 3.8  | 4.9  | 5.9  | 7.2  |
| -40         | 1.3                      | 1.6  | 2.0  | 2.5  | 3.0  | 3.9  |      |
| -35         | 0.2                      | 0.3  | 0.4  | 0.5  | 0.5  | 0.7  |      |
| -80         | 0                        | 9.7  | 12.1 | 14.9 | 19.3 | 24.0 | 29.6 |
| -75         |                          | 9.3  | 11.6 | 14.3 | 18.5 | 23.0 | 28.3 |
| -70         |                          | 8.9  | 11.2 | 13.7 | 17.7 | 21.9 | 27.0 |
| -65         |                          | 8.5  | 10.6 | 13.0 | 16.8 | 20.8 | 25.5 |
| -60         |                          | 8.0  | 9.9  | 12.2 | 15.8 | 19.5 | 23.9 |
| -55         |                          | 7.1  | 8.8  | 10.7 | 13.9 | 17.2 | 21.0 |
| -50         |                          | 6.1  | 7.5  | 9.3  | 11.9 | 14.7 | 17.8 |
| -45         |                          | 4.9  | 6.1  | 7.4  | 9.5  | 11.7 | 14.2 |
| -40         | 3.5                      | 4.3  | 5.2  | 6.7  | 8.2  | 10.1 |      |
| -35         | 2.1                      | 2.6  | 3.1  | 4.0  | 4.6  | 5.8  |      |
| -30         | 0.9                      | 1.0  | 1.3  | 1.6  | 2.0  | 2.4  |      |
| -80         | 10                       | 11.3                                       | 14.1 | 17.3 | 22.5 | 28.0 | 34.5 |
| -75         |                          | 10.8                                       | 13.5 | 16.6 | 21.6 | 26.8 | 33.1 |
| -70         |                          | 10.5                                       | 13.0 | 16.1 | 20.8 | 25.7 | 31.8 |
| -65         |                          | 10.2                                       | 12.6 | 15.5 | 20.0 | 24.8 | 30.0 |
| -60         |                          | 10.1                                       | 12.0 | 14.9 | 19.1 | 23.6 | 29.0 |
| -55         |                          | 9.2  | 11.4 | 14.0 | 18.1 | 22.3 | 27.5 |
| -50         |                          | 7.5  | 10.6 | 12.9 | 16.7 | 20.7 | 25.2 |
| -45         |                          | 7.4  | 9.1  | 11.1 | 14.3 | 17.6 | 21.5 |
| -40         | 6.2                      | 7.6  | 9.3  | 11.9 | 14.7 | 17.8 |      |
| -35         | 4.7                      | 5.8  | 7.2  | 9.0  | 11.1 | 13.5 |      |
| -30         | 3.2                      | 3.9  | 4.7  | 6.0  | 7.3  | 8.9  |      |
| -25         | 1.8                      | 2.1  | 2.5  | 3.2  | 3.9  | 4.7  |      |
| -20         | 0.3                      | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  |      |
| -80         | 20                       | 14.2                                       | 17.7 | 21.8 | 28.4 | 35.3 | 43.5 |
| -75         |                          | 13.3                                       | 16.5 | 20.4 | 26.5 | 32.9 | 40.5 |
| -70         |                          | 12.7                                       | 15.9 | 19.5 | 25.2 | 31.3 | 38.5 |
| -65         |                          | 12.3                                       | 15.2 | 18.7 | 24.3 | 30.1 | 37.2 |
| -60         |                          | 11.8                                       | 14.7 | 18.0 | 23.3 | 28.9 | 35.5 |
| -55         |                          | 11.4                                       | 14.0 | 17.4 | 22.1 | 27.6 | 33.9 |
| -50         |                          | 10.8                                       | 13.3 | 16.4 | 21.0 | 26.0 | 31.9 |
| -45         |                          | 10.1                                       | 12.5 | 15.3 | 19.6 | 24.2 | 29.6 |
| -40         | 9.0                      | 11.0                                       | 13.5 | 17.3 | 21.4 | 26.1 |      |
| -35         | 7.9                      | 9.5  | 11.7 | 14.9 | 18.3 | 22.1 |      |
| -30         | 6.3                      | 7.8  | 9.5  | 12.1 | 14.8 | 18.0 |      |
| -25         | 4.7                      | 5.7  | 6.9  | 8.8  | 10.7 | 13.0 |      |
| -20         | 2.9                      | 3.7  | 4.3  | 5.4  | 6.8  | 8.0  |      |
| -15         | 1.2                      | 1.4  | 1.8  | 2.2  | 2.7  | 3.1  |      |

OIL COOLER HEAT REJECTION (OCHR) -- 1000 BTU/HR (Based on 0°F Superheat, 0°F Liquid Subcooling)

| EVAP<br>T°F | INTER-<br>MEDIATE<br>T°F | RXB SCREW COMPRESSOR MODELS -- BOOSTER R717 |      |      |      |      |      |
|-------------|--------------------------|---|------|------|------|------|------|
|             |                          | 12  | 15   | 19   | 24   | 30   | 39   |
| -80         | 30                       | 19.1  | 23.6 | 29.3 | 38.0 | 47.2 | 58.3 |
| -75         |                          | 16.8  | 20.9 | 25.7 | 33.3 | 41.4 | 51.0 |
| -70         |                          | 15.6  | 19.3 | 24.1 | 30.8 | 38.2 | 47.0 |
| -65         |                          | 14.8  | 18.3 | 22.3 | 29.2 | 36.1 | 44.4 |
| -60         |                          | 14.2  | 17.7 | 21.8 | 28.3 | 35.0 | 43.1 |
| -55         |                          | 13.8  | 17.1 | 21.0 | 27.2 | 33.7 | 41.3 |
| -50         |                          | 13.3  | 16.4 | 20.4 | 25.9 | 32.1 | 39.5 |
| -45         |                          | 12.6  | 15.6 | 19.1 | 24.6 | 30.4 | 37.2 |
| -40         |                          | 11.9  | 14.6 | 17.9 | 23.0 | 28.3 | 34.7 |
| -35         |                          | 10.9  | 13.6 | 16.5 | 21.2 | 26.1 | 31.9 |
| -30         |                          | 9.5   | 11.7 | 14.3 | 18.2 | 22.4 | 27.3 |
| -25         |                          | 8.2   | 10.1 | 12.4 | 15.6 | 19.1 | 23.3 |
| -20         |                          | 6.6   | 8.0  | 9.7  | 12.3 | 15.0 | 18.2 |
| -15         |                          | 5.2   | 5.7  | 6.8  | 8.7  | 10.6 | 12.7 |
| -10         |                          | 2.6   | 3.2  | 3.9  | 4.9  | 5.9  | 7.1  |
| - 5         |                          | 0.9   | 1.3  | 1.3  | 1.7  | 2.0  | 2.4  |
| -80         |                          | 40  | 29.6 | 36.9 | 45.5 | 59.1 | 73.5 |
| -75         | 22.7                     |   | 28.2 | 34.9 | 45.2 | 56.2 | 69.3 |
| -70         | 19.8                     |   | 24.6 | 30.3 | 39.3 | 48.6 | 60.0 |
| -65         | 18.2                     |   | 22.6 | 27.9 | 36.0 | 44.7 | 55.0 |
| -60         | 17.2                     |   | 22.5 | 26.3 | 34.0 | 42.0 | 51.7 |
| -55         | 16.5                     |   | 20.5 | 25.1 | 32.5 | 40.1 | 49.2 |
| -50         | 15.9                     |   | 19.7 | 24.3 | 31.2 | 38.5 | 47.1 |
| -45         | 15.4                     |   | 19.0 | 23.2 | 29.9 | 36.7 | 44.9 |
| -40         | 14.7                     |   | 18.1 | 22.1 | 28.3 | 34.8 | 42.4 |
| -35         | 13.9                     |   | 21.1 | 20.6 | 26.5 | 32.4 | 39.3 |
| -30         | 13.0                     |   | 15.9 | 19.3 | 24.6 | 30.1 | 36.6 |
| -25         | 11.5                     |   | 14.1 | 17.1 | 21.6 | 26.3 | 31.9 |
| -20         | 10.2                     |   | 12.4 | 15.0 | 19.0 | 23.0 | 27.7 |
| -15         | 8.7                      |   | 10.7 | 12.9 | 16.5 | 19.8 | 24.3 |
| -10         | 6.8                      |   | 8.3  | 10.1 | 12.7 | 15.5 | 18.7 |
| - 5         | 4.7                      |   | 5.7  | 6.9  | 8.7  | 10.5 | 12.7 |
| 0           | 2.6                      |   | 2.3  | 3.8  | 4.7  | 5.7  | 6.9  |

RXB ROTARY SCREW COMPRESSOR UNITS  
ENGINEERING DATA

OIL COOLER HEAT REJECTION (OCHR) - 1000 BTU/HR (Based on 0°F Superheat, 0°F Liquid Subcooling)

| EVAP<br>T°F | INTER-<br>MEDIATE<br>T°F | RXB SCREW COMPRESSOR MODELS - BOOSTER R22 |      |      |      |      |      |
|-------------|--------------------------|---|------|------|------|------|------|
|             |                          | 12  | 15   | 19   | 24   | 30   | 39   |
| -80         | -20                      | 4.4                                       | 5.4  | 6.7  | 8.5  | 10.5 | 12.9 |
| -75         |                          | 3.3                                       | 4.0  | 5.0  | 6.5  | 7.8  | 9.6  |
| -70         |                          | 2.0                                       | 2.4  | 2.9  | 3.6  | 4.6  | 5.5  |
| -65         |                          | 0.4                                       | 0.5  | 0.6  | 0.8  | 1.0  | 1.1  |
| -80         | -10                      | 5.8                                       | 7.0  | 8.7  | 11.2 | 13.6 | 16.5 |
| -75         |                          | 4.6                                       | 5.9  | 7.2  | 9.2  | 11.3 | 13.8 |
| -70         |                          | 3.6                                       | 4.6  | 5.4  | 6.9  | 8.5  | 10.3 |
| -65         |                          | 2.2                                       | 2.7  | 3.3  | 4.2  | 5.2  | 6.2  |
| -60         |                          | 0.5                                       | 0.7  | 0.8  | 1.1  | 1.5  | 1.6  |
| -80         | 0                        | 7.0                                       | 8.7  | 10.7 | 13.7 | 17.0 | 20.8 |
| -75         |                          | 6.2                                       | 7.7  | 9.4  | 12.0 | 14.8 | 18.1 |
| -70         |                          | 5.2                                       | 6.4  | 8.0  | 10.0 | 12.3 | 15.0 |
| -65         |                          | 4.0                                       | 4.8  | 5.9  | 7.6  | 9.3  | 11.3 |
| -60         |                          | 2.5                                       | 3.1  | 3.8  | 4.8  | 5.9  | 7.2  |
| -55         |                          | 0.8                                       | 1.4  | 1.3  | 1.6  | 2.0  | 2.5  |
| -80         | 10                       | 8.5                                       | 10.5 | 12.9 | 16.6 | 20.5 | 25.0 |
| -75         |                          | 7.7                                       | 9.5  | 11.6 | 14.9 | 18.3 | 22.4 |
| -70         |                          | 6.8                                       | 8.3  | 10.2 | 13.0 | 16.1 | 19.6 |
| -65         |                          | 5.7                                       | 7.0  | 8.6  | 11.0 | 13.5 | 16.4 |
| -60         |                          | 4.5                                       | 5.5  | 6.7  | 8.5  | 10.4 | 12.7 |
| -55         |                          | 3.0                                       | 3.7  | 4.4  | 5.7  | 6.7  | 8.4  |
| -50         |                          | 1.3                                       | 1.6  | 2.0  | 2.4  | 3.0  | 3.6  |
| -80         | 20                       | 10.5                                      | 13.0 | 16.1 | 21.3 | 25.4 | 31.2 |
| -75         |                          | 9.7                                       | 11.9 | 14.6 | 18.8 | 23.2 | 28.5 |
| -70         |                          | 8.8                                       | 10.8 | 13.2 | 17.0 | 21.0 | 25.8 |
| -65         |                          | 7.8                                       | 9.6  | 11.8 | 15.1 | 18.8 | 22.6 |
| -60         |                          | 6.7                                       | 8.2  | 10.0 | 12.8 | 15.8 | 19.2 |
| -55         |                          | 5.4                                       | 6.6  | 8.1  | 10.3 | 12.5 | 15.3 |
| -50         |                          | 3.9                                       | 4.7  | 6.1  | 7.4  | 9.0  | 10.8 |
| -45         |                          | 2.2                                       | 2.5  | 3.1  | 3.9  | 4.7  | 5.7  |
| -40         |                          | 0.1                                       | 0.1  | 0.1  | 0.1  | 0.2  | 0.2  |
| -80         | 30                       | 12.6                                      | 15.8 | 19.4 | 24.9 | 30.6 | 37.6 |
| -75         |                          | 11.9                                      | 14.6 | 17.8 | 22.9 | 28.2 | 34.4 |
| -70         |                          | 10.9                                      | 13.4 | 16.4 | 21.0 | 25.7 | 31.5 |
| -65         |                          | 10.0                                      | 12.3 | 15.0 | 19.0 | 23.3 | 28.2 |
| -60         |                          | 9.0                                       | 11.0 | 13.4 | 17.0 | 20.7 | 25.1 |
| -55         |                          | 7.8                                       | 9.5  | 11.5 | 14.5 | 17.8 | 21.5 |
| -50         |                          | 6.4                                       | 7.9  | 9.5  | 12.0 | 14.5 | 17.6 |
| -45         |                          | 4.9                                       | 6.1  | 7.4  | 9.0  | 10.9 | 13.0 |
| -40         |                          | 3.2                                       | 3.8  | 4.6  | 5.8  | 7.1  | 8.6  |
| -35         |                          | 1.1                                       | 1.3  | 1.6  | 2.1  | 2.4  | 2.9  |
| -80         | 40                       | 15.7                                      | 19.4 | 23.7 | 30.3 | 37.7 | 46.2 |
| -75         |                          | 14.4                                      | 17.8 | 21.8 | 28.0 | 34.5 | 42.4 |
| -70         |                          | 13.4                                      | 16.6 | 20.1 | 25.9 | 31.4 | 38.8 |
| -65         |                          | 12.4                                      | 15.3 | 18.6 | 23.8 | 29.3 | 35.7 |
| -60         |                          | 11.4                                      | 14.2 | 17.1 | 21.8 | 26.7 | 32.5 |
| -55         |                          | 10.4                                      | 12.7 | 15.5 | 19.7 | 24.0 | 29.2 |
| -50         |                          | 9.2                                       | 11.2 | 13.6 | 17.2 | 20.9 | 25.3 |
| -45         |                          | 7.8                                       | 9.5  | 11.5 | 14.4 | 17.5 | 21.2 |
| -40         |                          | 6.2                                       | 7.6  | 9.1  | 11.4 | 13.7 | 16.6 |
| -35         |                          | 4.4                                       | 5.3  | 6.4  | 8.1  | 9.7  | 11.6 |
| -30         |                          | 2.3                                       | 2.9  | 3.4  | 4.2  | 5.0  | 6.0  |
| -25         |                          | 0.1                                       | 0.1  | 0.1  | 0.1  | 0.1  | 0.1  |

**ECONOMIZER OPERATION – HIGH STAGE**

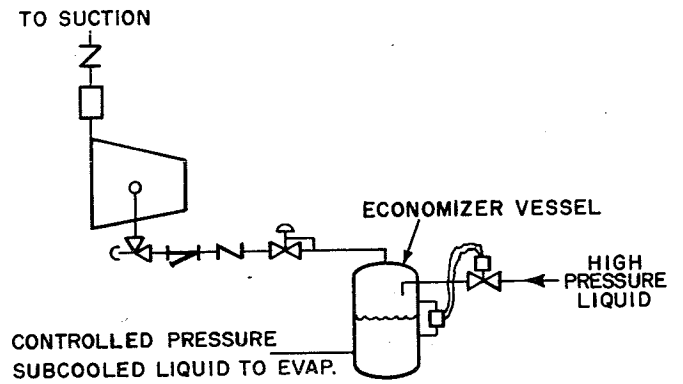
Compressor ratings with the economizer effect included are given in the ratings tables with the "E" suffix. No allowance for vapor line pressure drop has been included. Size the economizer vapor line (including valves, strainer, etc.) from the economizer vessel to the compressor for pressure drop from one to two PSI.

The economizer option requires a liquid subcooler which is usually a shell and coil heat exchanger, similar to an intercooler, or a direct expansion refrigerant chiller. The recommended economizer systems are shown below.

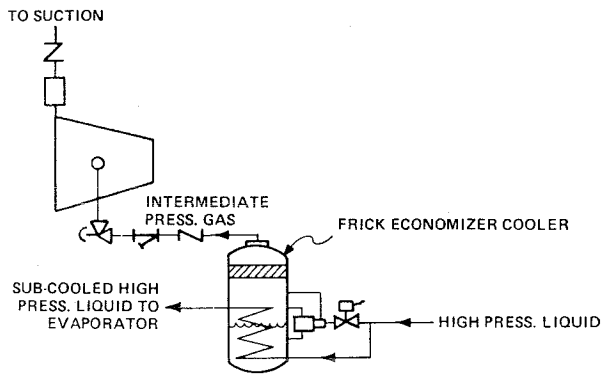
Notice that in both systems there is a strainer and a check valve between the economizer vessel and the economizer port in the compressor. The check valve prevents oil flow from the compressor unit to the economizer during shutdown.

A flash-type subcooler can be used but care should be taken because of the low pressure differential between the flash tank and the evaporators. If a flash tank is used, a back pressure regulator between the flash tank and the economizer must be installed to keep the pressure differential from approaching zero during part load operation.

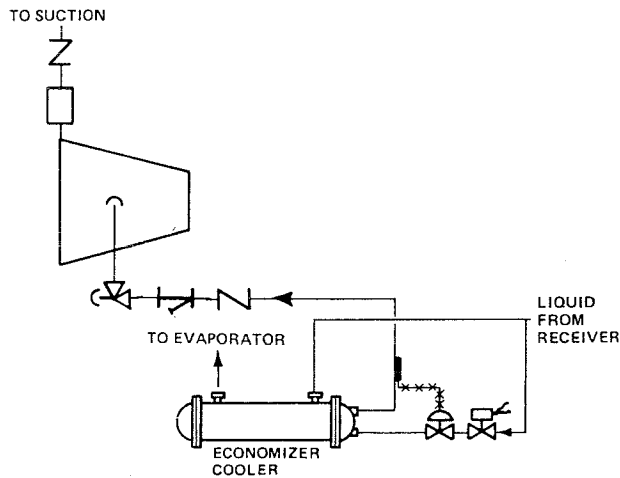
**FLASH ECONOMIZER SYSTEM**



**SHELL and COIL ECONOMIZER SYSTEM**



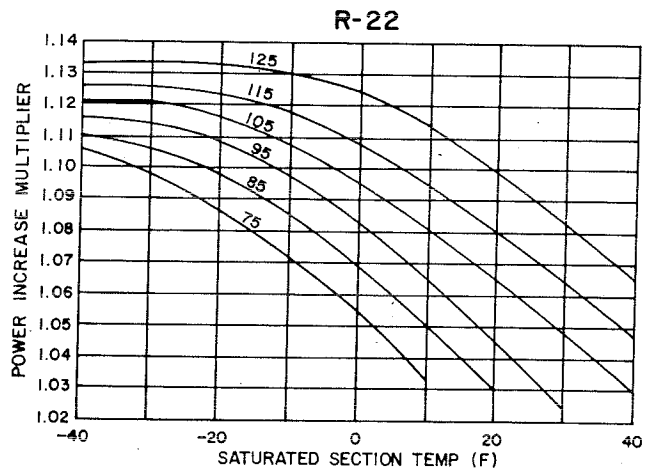
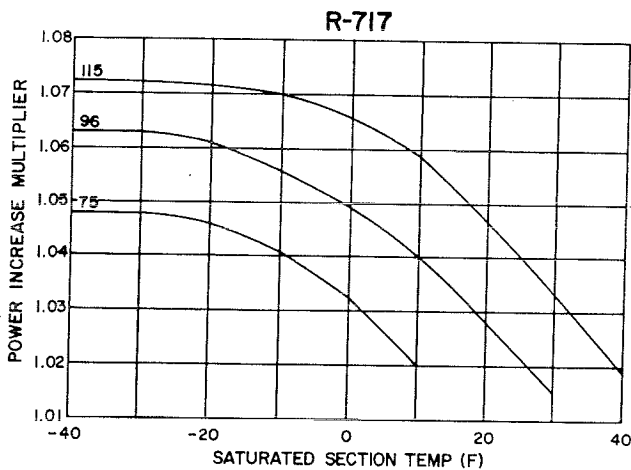
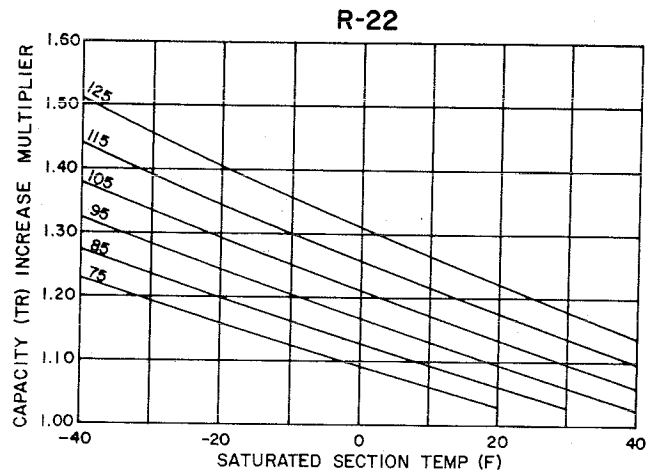
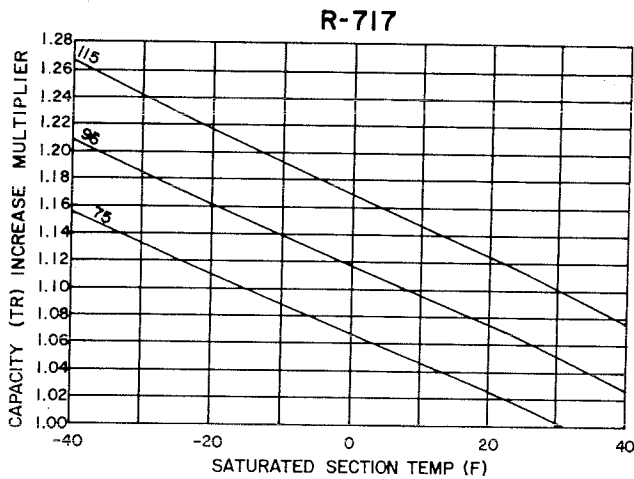
**DIRECT EXPANSION ECONOMIZER SYSTEM**



**HIGH STAGE – CAPACITY and BRAKE HORSEPOWER RATINGS WITH DIRECT EXPANSION OR SHELL and COIL ECONOMIZERS**

PROCEDURE – Determine capacity (TR) and brake horsepower (BHP) from the non-economized, standard rating tables for the appropriate refrigerant (R717 or R22). Multiply these ratings by the capacity and brake horsepower increase multipliers below for the appropriate refrigerant. Apply any other correction factors (sub-cooling, superheat, liquid injection or 50 Hz) using instructions from page 5.

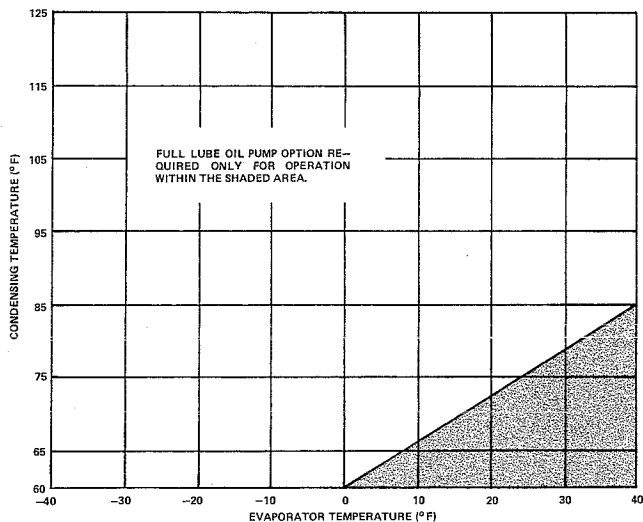
**DIRECT EXPANSION OR SHELL and COIL ECONOMIZER RATING INCREASE MULTIPLIERS**



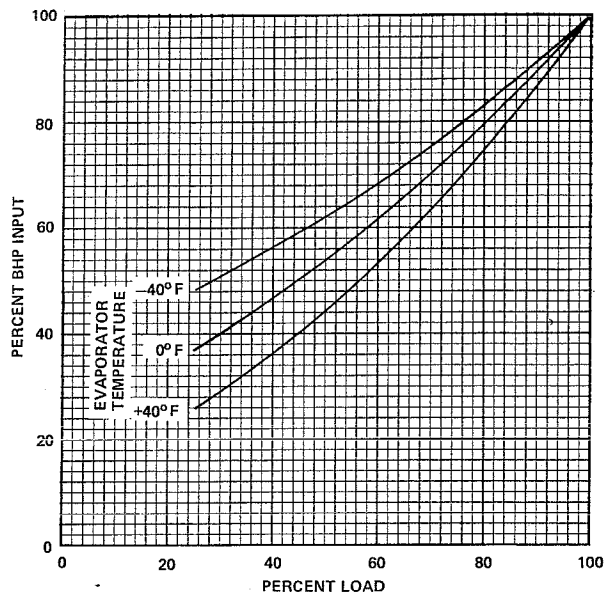
NOTE: Increase multipliers based on liquid subcooling by either direct expansion or shell and coil economizer and result in ratings based on 10°F suction superheat with the superheat not contributing to the refrigeration effect, no liquid subcooling and 10°F liquid temperature split. No allowance for vapor line pressure drop is included in the resulting ratings.

**FULL LUBE OIL PUMP REQUIREMENTS**

The RXB compressor unit is designed for operation without an oil pump for normal high stage service. All booster service and some low differential pressure high stage applications will require the full lube oil pump option. The following graph shows those areas of high stage operation where the full lube oil pump must be used.



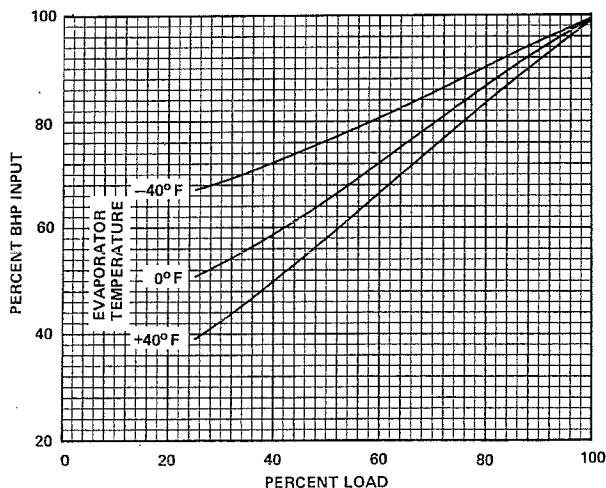
**TYPICAL PART LOAD POWER INPUT WITH FALLING CONDENSING TEMPERATURE – HIGH STAGE**



The above curve is based on a 15°F linear drop in condensing temperature from full load to 25% of full load. This curve is applicable for R717 (85°F to 105°F full load condensing temperature) and R22 (95°F to 115°F full load condensing temperature). It is not applicable if condensing temperature does not drop with compressor unloading as in the following examples:

1. Water cooled condensing temperatures cannot fall below entering water temperature.
2. Single compressor unloading on a multiple compressor system will have negligible effect on system condensing temperature.
3. No condensing temperature drop will occur if condenser fans are cycled off as the load decreases.

**TYPICAL PART LOAD POWER INPUT WITH CONSTANT CONDENSING TEMPERATURE – HIGH STAGE**



This curve is applicable for R717 (85°F to 105°F full load condensing temperature) and R22 (95°F to 115°F full load condensing temperature).

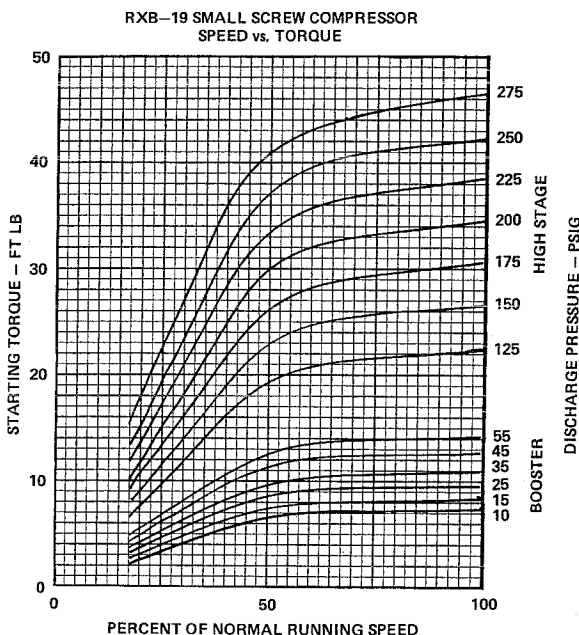
**MOTOR SELECTION and STARTING TORQUE**

Motors must be sized adequate for all expected operating conditions since start-up, pull down and load variations quite often require significantly more horsepower than nominal design.

Motor starting torque capacity must also be considered, especially when other than across-the-line start is employed. Motor starting and pull-up torque must be at least 20% greater than compressor requirements at maximum expected start-up conditions. Refer to the torque data.

NOTE: Motor starting torque varies considerably with various manufacturers - obtain specific torque data for the motor being used.

**RXB SCREW COMPRESSOR SPEED vs STARTING TORQUE AT MAXIMUM UNLOADING**



| RWB MODEL | STARTING TORQUE (*) MULTIPLIER | BREAK-AWAY TORQUE, FT-LB | INERTIA - WR <sup>2</sup> , LB-FT <sup>2</sup> |
|-----------|--------------------------------|--------------------------|--|
| 12        | 1.31                           | 3                        | .9   |
| 15        | .81                            | 3                        | .4   |
| 19        | 1.00                           | 3                        | .6   |
| 24        | 2.65                           | 4                        | 2.9  |
| 30        | 1.63                           | 4                        | 1.3  |
| 39        | 2.02                           | 4                        | 1.8  |

\* High Stage or Booster Application

**STARTING TORQUE FOR ANY SPECIFIC COMPRESSOR**

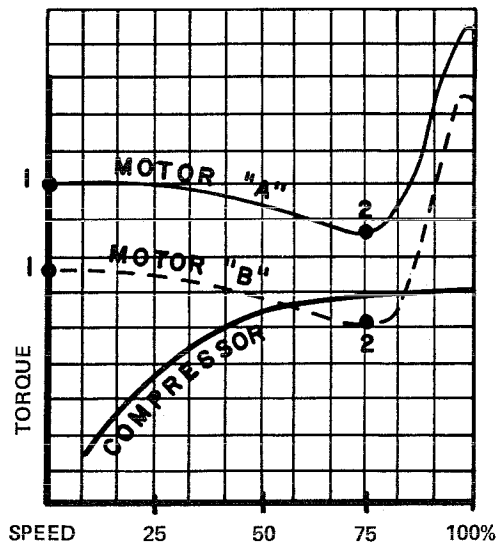
Multiply starting torque value from high stage or booster curves at 100% of normal run speed by starting torque multiplier for appropriate compressor size.

**MOTOR/COMPRESSOR TORQUE**

Assure that the motor STARTING and MINIMUM PULL-UP TORQUE capabilities will exceed the compressor requirement: at the anticipated condition that will be experienced during normal starting.

NOTE: Wye-delta motor starting drastically affect the starting torque available from motors as indicated:

Across-the-line 100% Torque  
Wye-delta 33% Torque



Motor "A": Adequate to start the compressor.

Motor "B": Will not start the compressor.

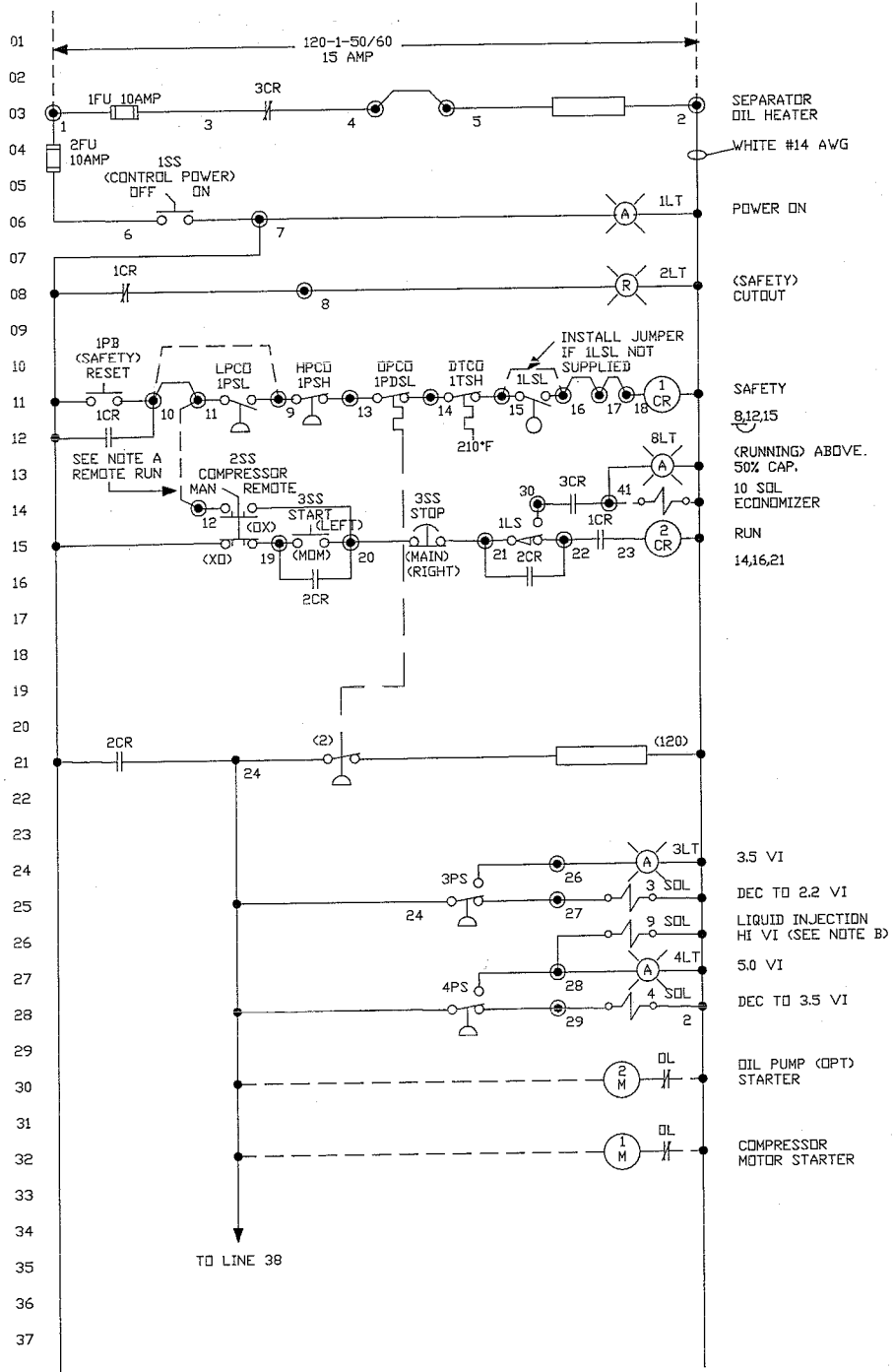
NOTE: Starting torque of both motors (1) is above compressor torque. However, the Pull-Up Torque (2) of motor "B" is below the compressor torque curve and motor "B" will not accelerate the compressor to 100% speed.

**STANDARD MOTOR and FRAME SIZES**

A special drive or motor exceeding the chart sizes may require modified package design. When a modified package design is required there will be cost and delivery considerations.

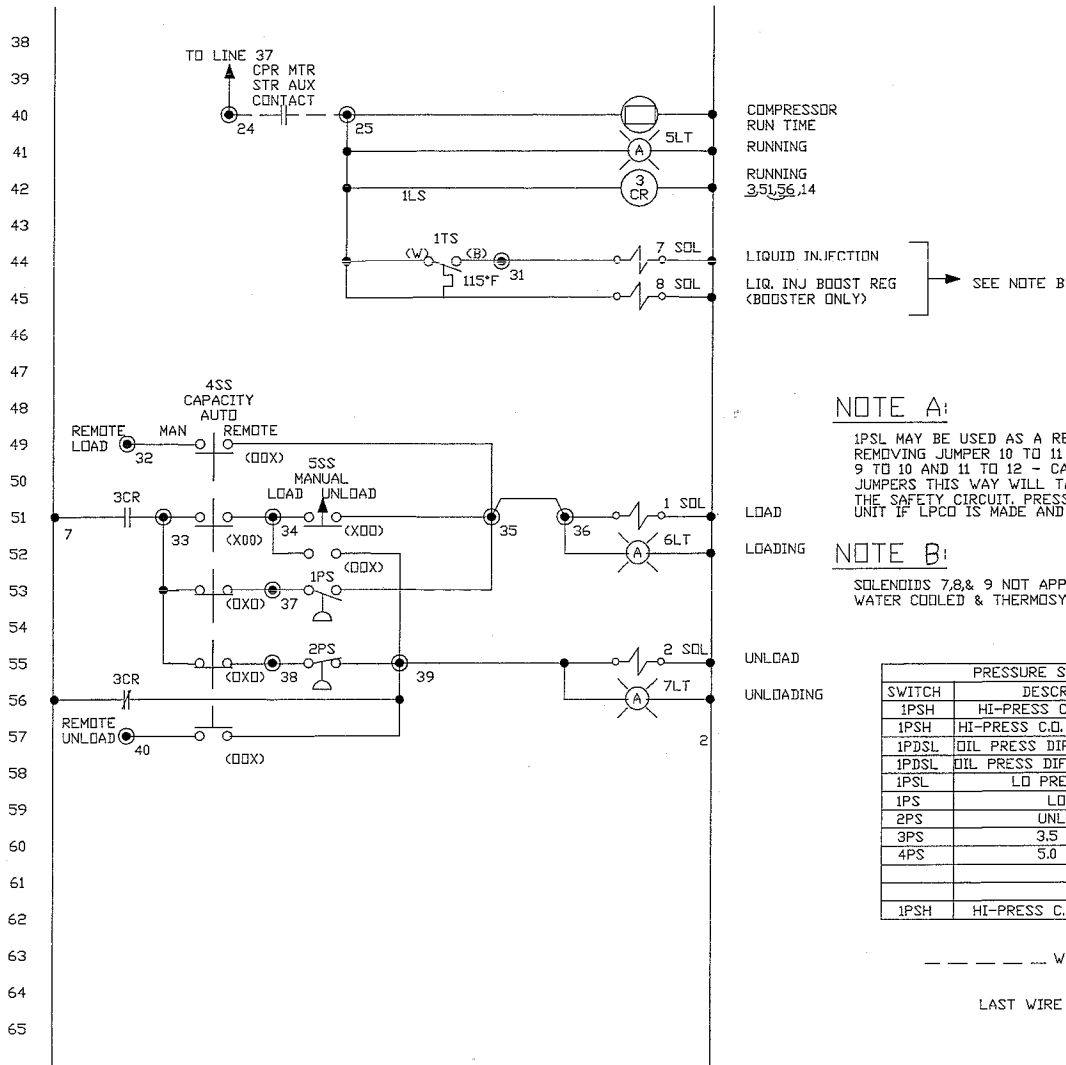
| MOTOR H.P. | FRAME SIZES |         |            |            |
|------------|-------------|---------|------------|------------|
|            | 1750 RPM    |         | 3550 RPM   |            |
|            | RXB-12      | RXB-24  | RXB-15, 19 | RXB-30, 39 |
| 15         | 254T        |         | 254T       |            |
| 20         | 256T        |         | 256T       |            |
| 25         | 284T        |         | 256T       |            |
| 30         | 286T        | 284T/TS | 284TS      |            |
| 40         | 324T/TS     | 286T/TS | 286TS      | 286TS      |
| 50         | 326T/TS     | 324T/TS | 324TS      | 324TS      |
| 60         |             | 326T/TS | 326TS      | 326TS      |
| 75         |             | 364T/TS | 364TS      | 364TS      |
| 100        |             |         |            | 365TS      |
| 125        |             |         |            | 404TS      |
| 150        |             |         |            | 405TS      |

RXB ROTARY SCREW COMPRESSOR UNIT TYPICAL WIRING DIAGRAM

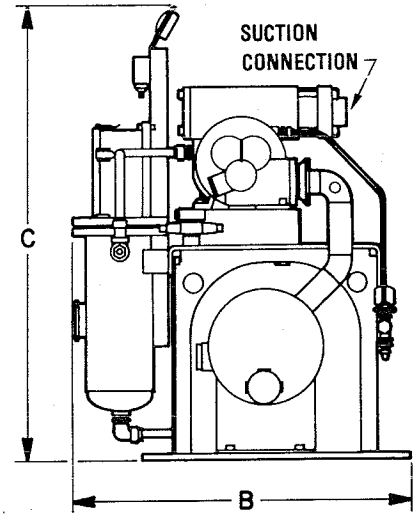
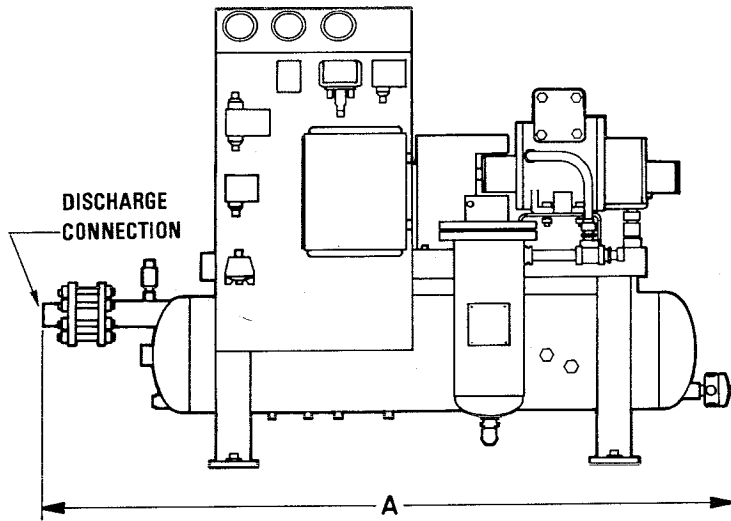


RXB ROTARY SCREW COMPRESSOR UNITS  
ELECTRICAL

RXB ROTARY SCREW COMPRESSOR UNIT TYPICAL WIRING DIAGRAM - continued



| CUSTOMER CONNECTIONS TO CONTROL CIRCUIT |          |                             |
|---|----------|-----------------------------|
| LINE NO.                                | TERM NO. | CIRCUIT DESCRIPTION         |
| 1                                       | 1,2      | CONTROL POWER               |
| 11                                      | 16,17,18 | ADDITIONAL CUTOUPS          |
| 15                                      | 7,12     | REMOTE RUN (SEE NOTE A)     |
| 30                                      | 24,2     | OIL PUMP MOTOR STARTER      |
| 32                                      | 24,2     | CPR MTR STARTER             |
| 40                                      | 24,25    | CPR MTR STARTER AUX CONTACT |
| 49                                      | 7,32     | REMOTE LOAD                 |
| 57                                      | 7,40     | REMOTE UNLOAD               |
| 14                                      | 4,12     | ECONOMIZER                  |
|   |          |                             |
|   |          |                             |



| RXB<br>MODEL<br>NO. | APPROXIMATE DIMENSIONS INCHES/MILLIMETERS |         |         | CONNECTIONS |          |
|---------------------|---|---------|---------|-------------|----------|
|                     | A   | B       | C       | SUCT        | DISCH    |
| 12                  | 84/2142                                   | 42/1071 | 56/1428 | 2.5/63.5    | 2/50.8   |
| 15                  | 84/2142                                   | 42/1071 | 56/1428 | 2.5/63.5    | 2/50.8   |
| 19                  | 84/2142                                   | 42/1071 | 56/1428 | 3/76.2      | 2.5/63.5 |
| 24                  | 84/2142                                   | 42/1071 | 56/1428 | 3/76.2      | 2.5/63.5 |
| 30                  | 84/2142                                   | 42/1071 | 56/1428 | 4/101.6     | 3/76.2   |
| 39                  | 84/2142                                   | 42/1071 | 56/1428 | 4/101.6     | 3/76.2   |

NOTE: The suction and discharge shutoff valves are shipped separately for field installation. Make allowances for piping.