POLICY BULLETIN

Tecumseh Compressor Company
Compressor Group

Part of PB 128

Engineering Policy on: **APPLICATION GUIDELINES FOR LOW TEMP COMMERCIAL REFRIGERATION SYSTEMS USING ROTARY COMPRESSORS**

Issued: August 21, 2001

REV DATE: 2/02/2010

A rotary compressor is a precision piece of equipment, designed and manufactured to very close tolerances. For superior performance and long term reliability the following parameters **must** be maintained when applying Tecumseh rotary compressors in **Low Temp** packaged refrigeration applications.

1.	Refrigerant:	R-404A (or as otherwise designated ***by Tecumseh)***
2.	Evaporator Temperature Range:	Low Back Pressure -40 to 10°F (-40 to -12.2°C) See page 4.
3.	Condensing Temperature Range:	80 to 140 °F (26.7 to 60 °C) See page 4.
4.	Pressure Ratio:	Maximum for R-404A, 16.7:1
5.	Motor Temperature:	266 °F (130 °C) Maximum (Resistance Method)
6.	Shell Bottom:	Minimum of Saturated Condensing Temperature plus 10 °F (5.6 °C)
7.	Discharge Gas Temperature:	260 °F (126.7 °C) Maximum (D2I) providing maximum motor temperature is not exceeded.
8.	The rotary is a direct suction compressor with a factory installed suction screen. See Policy Bulletin No. PB-120	
9.	Suction Gas Temperature:	5 °F (2.8 °C) Minimum Superheat **NOTE:** Under transient flood back conditions, less than 5 °F (2.8 °C) superheat is permissible, providing the above shell bottom parameter is maintained. Maximum suction temperature should be limited to maintain acceptable motor and discharge temperatures (see 5 and 7 above).
10.	Voltage Range (Run):	See Policy Bulletin No. PB-113
11.	Voltage (Start)	Minimum is 90 % of lowest rated voltage when measured at the terminals at locked rotor conditions.
12.	Abnormal Discharge Pressure:	750 PSIG (5171 kPa) Maximum

13.	Tubing:	The rotary compressor is an internally solid mounted compressor. Therefore it requires tubing designed with shock loops to prevent transmission of noise and vibration to the unit. Tubing should be designed to maintain acceptable stress levels.
14.	Mounting Components:	Grommet 70941, Sleeve 71000 for ¼ inch through bolt max. Sleeve 70953 for 5/16 inch through bolt max. Bolt Torque 10 to 13 ft./lbs. See Policy Bulletin No. PB-109
15.	Cooling of Compressor:	A compressor-cooling fan may be required to limit motor and discharge temperatures as discussed in item 5 and 7.
16.	Cycle rate:	During normal operation, the cycle rate of the compressor should not exceed five (5) cycles per hour, with sufficient run time to insure that the proper quantity of oil will return to the compressor.
17.	Testing for new applications:	See page 3.

EP-13 “Application Guidelines for Packaged Refrigeration Systems Using Rotary Compressors”

EP-15 “Refrigerant Charge Procedure for Rotary Compressors and Condensing Units”

Documentation Needed for New Applications

1. Unit description including:
   - A. Expansion device – expansion valve, capillary tube, etc.
   - B. Evaporator description – dimensions, tube sizes, number of circuits, diagram if possible.
   - C. Condenser description – dimensions, tube sizes, number of circuits, diagram if possible.
   - D. Airflow system – number of fans and motors, airflow amount if possible
   - E. Defrost system – electric, off cycle, hot gas, etc.
   - F. Other special features – accumulator, receiver, pump down cycle, check valves, etc.
   - G. Refrigerant charge amount

2. Test data from the following tests (test per industry standard or manufacturer’s test):
   - A. Maximum load test
   - B. Minimum load test
   - C. Defrost test

3. The test data above should include at least the information listed below.
   - A. Temperatures
     - a. Suction tube – before compressor accumulator
     - b. Discharge tube – 2 inches from joint at compressor and insulated
     - c. Compressor bottom shell
     - d. J. tube – tube between compressor accumulator and compressor housing
     - e. Condenser outlet
     - f. Compressor middle of housing
     - g. Room temperature and humidity, if applicable
     - h. For water cooled applications – inlet and outlet water
     - i. Product temperatures
     - j. Liquid entering expansion device
   - B. Pressures – please specify gauge or absolute
     - a. Suction
     - b. Discharge
     - c. If unable to provide pressures, please provide condenser and evaporator mid temperatures
   - C. Electrical
     - a. Volts
     - b. Amps
       1. Total
       2. Compressor
   - D. Reading intervals
     - a. When cycling – 10 second intervals for at least 10 minutes after start of an on cycle
     - b. For continuous run tests – 1 minute intervals
   - E. Compressor sight glass – If sample compressor has a sight glass, observe oil level. Minimum oil level is above the outboard bearing on the horizontal and above the bottom of cylinder block on the vertical. Maximum oil level is not above the bottom of the oil pickup tube cap on the horizontal and not above the top of the sight glass on the vertical.

We would prefer this information be provided in a spreadsheet format in an electronic file so we can format and display it as desired. If you also wish to provide graphs, they would be welcomed.

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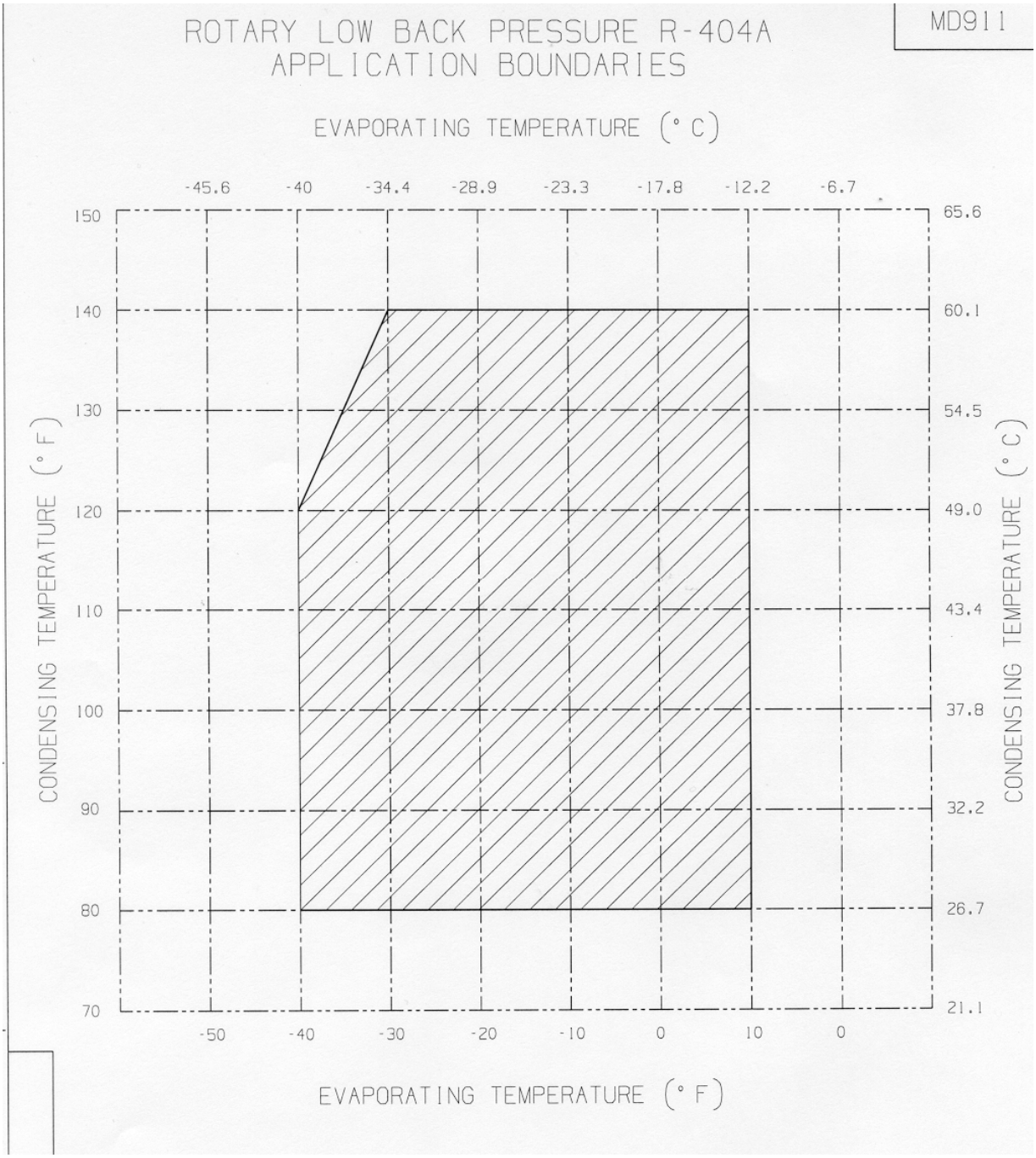

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No. 128

REV.	PAGE	CHANGE RECORD	ENG. NOTICE	DATE
REL	1thru4	Release Policy Bulletin for RG & HG LBP R-404A compressor line using R-404A refrigerant, like policy bulletin PB #125. See attached PDF for changes MR: 237630 Release of LBP R-404A compressors. Reason/Remarks: Customer Issued by: S. Reiniche	EC5240	02-15-07
1	2	Add note in Policy Bulletin to reference EP-15 for REFRIGERANT CHARGE PROCEDURE FOR ROTARY COMPRESSORS AND CONDENSING UNITS. Reasons/Remarks: Update Policy Bulletin Issued by: S. Reiniche	EC15791	2/14/08
2	1	Add “LOW TEMP” to subject line. Reasons/Remarks: To differentiate between PB-128 & PB-125. Issued by: M. Norsworthy	EC30845	2/2/10