

Service Facts

Split System Heat Pump 4TWB4024E1000A

A CAUTION

UNIT CONTAINS R-410A REFRIGERANT!

R-410A OPERATING PRESSURE EXCEEDS THE LIMIT OF R-22. PROPER SERVICE EQUIPMENT IS REQUIRED. FAILURE TO USE PROPER SERVICE TOOLS MAY RESULT IN EQUIPMENT DAMAGE OR PERSONAL INJURY.

SERVICE

USE ONLY R-410A REFRIGERANT AND APPROVED POE COMPRESSOR OIL.

<u>IMPORTANT</u> — This document contains a wiring diagram, a parts list, and service information. This is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

WARNING: HAZARDOUS VOLTAGE - DISCONNECT POWER and DISCHARGE CAPACITORS BEFORE SERVICING

| PRODUCT SPECIFICATIONS | | | |
|--|--------------------|--|--|
| OUTDOOR UNIT 12 | 4TWB4024E1000A | | |
| POWER CONNS. — V/PH/HZ ③ | 208/230/1/60 | | |
| MIN. BRCH. CIR. AMPACITY | 12 | | |
| BR. CIR. PROT. RTG. – MAX. (AMPS) | 20 | | |
| COMPRESSOR | CLIMATUFF® | | |
| NO. USED - NO. SPEEDS | 1 - 1 | | |
| VOLTS/PH/HZ | 200/230/1/60 | | |
| R.L. AMPS ⑦ - L.R. AMPS | 9.5 - 57.8 | | |
| FACTORY INSTALLED | \/=0 | | |
| START COMPONENTS ® | YES | | |
| INSULATION/SOUND BLANKET | YES | | |
| COMPRESSOR HEAT | YES | | |
| OUTDOOR FAN | PROPELLER | | |
| DIA. (IN.) - NO. USED | 27.6 - 1 | | |
| TYPE DRIVE - NO. SPEEDS | DIRECT - 1 3420 | | |
| CFM @ 0.0 IN. W.G. ④ | 3420 1 - 1/8 | | |
| NO. MOTORS - HP MOTOR SPEED R.P.M. | 1 - 1/8 850 | | |
| VOLTS/PH/HZ | 200/230/1/60 | | |
| F.L. AMPS | 0.74 | | |
| OUTDOOR COIL — TYPE | SPINE FIN™ | | |
| ROWS - F.P.I. | 1 - 24 | | |
| FACE AREA (SQ. FT.) | 21.99 | | |
| TUBE SIZE (IN.) | 3/8 | | |
| REFRIGERANT | | | |
| LBS. — R-410A (O.D. UNIT) ^⑤ | 7 LBS., 5 OZ. | | |
| FACTORY SUPPLIED | YES | | |
| LINE SIZE - IN. O.D. GAS ® | 5/8 | | |
| LINE SIZE - IN. O.D. LIQ. ® | 3/8 | | |
| CHARGING SPECIFICATION | | | |
| SUBCOOLING | 10°F | | |
| DIMENSIONS | HXWXD | | |
| CRATED (IN.) | 38.4 x 35.1 x 38.7 | | |
| WEIGHT | | | |
| SHIPPING (LBS.) | 255 | | |
| NET (LBS.) | 222 | | |

TUBING INFORMATION

| Tubing Sizes Suction Liquid | | Tubing Length | Additional Refrigerant |
|-----------------------------|----------------------|-------------------|----------------------------|
| 5/8" 5/8" | 3/8" 3/8" | 20' 30' | 3 oz. 8 oz. |
| 5/8" 5/8" 5/8" | 3/8" 3/8" 3/8" | 40' 50' 60' | 14 oz. 19 oz. 24 oz. |
| 5, 5 | 5, 0 | 00 | 02. |

Tubing lengths in excess of sixty (60) feet see application software.

- Certified in accordance with the Air-Source Unitary Air-conditioner Equipment certification program, which is based on AHRI standard 210/240.
- ② Rated in accordance with AHRI standard 270.
- 3 Calculated in accordance with Natl. Elec. Codes. Use only HACR circuit breakers or fuses.
- $\textcircled{4} \ \, \mathsf{Standard} \, \mathsf{Air} \, \mathbf{--} \, \mathsf{Dry} \, \mathsf{Coil} \, \mathbf{--} \, \mathsf{Outdoor} \, \\$
- (5) This value approximate. For more precise value see unit nameplate.
- Max. linear length 60 ft.; Max. lift Suction 60 ft.; Max lift Liquid 60 ft.
 For greater length consult refrigerant piping software Pub. No. 32-3312-0* (* denotes latest revision).
- This value shown for compressor RLA on the unit nameplate and on this specification sheet is used to compute minimum branch circuit ampacity and max. fuse size. The value shown is the branch circuit selection current.
- No means no start components. Yes means quick start kit components. PTC means
 positive temperature coefficient starter.

A CAUTION

CONTAINS REFRIGERANT!

SYSTEM CONTAINS OIL AND REFRIGERANT UNDER HIGH PRESSURE. RECOVER REFRIGERANT TO RELIEVE PRESSURE BEFORE OPENING SYSTEM.

Failure to follow proper procedures can result in personal illness or injury or severe equipment damage.

A WARNING

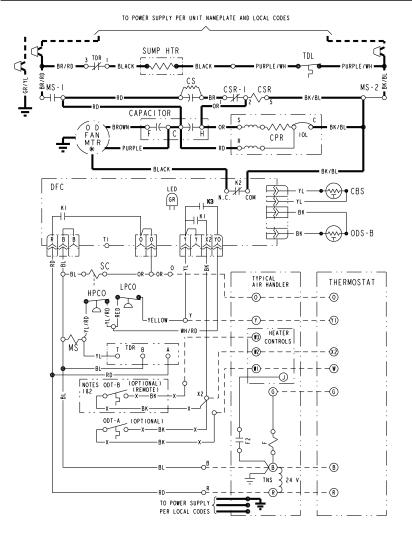
THIS INFORMATION IS INTENDED FOR USE BY INDIVIDUALS POSSESSING ADEQUATE BACKGROUNDS OF ELECTRICAL AND MECHANICAL EXPERIENCE. ANY ATTEMPT TO REPAIR A CENTRAL AIR CONDITIONING PRODUCT MAY RESULT IN PERSONAL INJURY AND OR PROPERTY DAMAGE. THE MANUFACTURER OR SELLER CANNOT BE RESPONSIBLE FOR THE INTERPRETATION OF THIS INFORMATION, NOR CAN IT ASSUME ANY LIABILITY IN CONNECTION WITH ITS USE.

A CAUTION

RECONNECT ALL GROUNDING DEVICES.

ALL PARTS OF THIS PRODUCT CAPABLE OF CONDUCTING ELECTRICAL CURRENT ARE GROUNDED. IF GROUNDING WIRES, SCREWS, STRAPS, CLIPS, NUTS OR WASHERS USED TO COMPLETE A PATH TO GROUND ARE REMOVED FOR SERVICE, THEY MUST BE RETURNED TO THEIR ORIGINAL POSITION AND PROPERLY FASTENED.

SCHEMATIC DIAGRAM





HAZARDOUS VOLTAGE! DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING. FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH!

USE COPPER CONDUCTORS ONLY! UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT!

COLOR OF WIRE
BLACK WIRE WITH BLUE MARKER BR/BL BLACK WIRE ... BLACK OR ORANGE YELLOW WHITE BROWN WН PR PURPLE

NOTES

- IF ODT-B IS NOT USED, ADD JUMPER BETWEEN W2 & W3
 AT AIR HANDLER.
 IF USED, ODT-B MUST BE MOUNTED REMOTE OF CONTROL
 BOX IN AN APPROVED WEATHER PROOF ENCLOSURE.
 IF ODT-A IS NOT USED, ADD JUMPER BETWEEN WI & W2
 AT AIR HANDLER.
 LOW VOLTAGE (24 V.) FIELD WIRING MUST BE 18 AWG MIN.

FOR CANADIAN INSTALLATIONS
POUR INSTALLATIONS CANADIENNES
CAUTION: NOT SUITABLE FOR USE ON
SYSTEMS EXCEEDING 150V-TO-GROUND.
ATTENTION: NE CONVIENT PAS AUX ATTENTION: NE CONVIENT PAS AUX INSTALLATIONS DE PLUS DE 150 V A LA TERRE.

TDR relay cycles sump heat off during compressor operation and delays energizing the sump heat for 30 mins after "Y" call is removed.

SUBCOOLING CHARGING IN COOLING ABOVE 55°F OD AMBIENT

Trane has always recommended installing Trane approved matched indoor and outdoor systems.

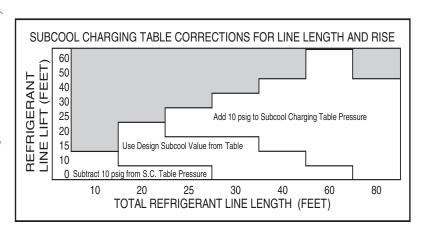
All Trane split systems are AHRI rated with only TXV indoor systems.

The benefits of installing approved indoor and outdoor split systems are maximum efficiency, optimum performance and the best overall system reliability.

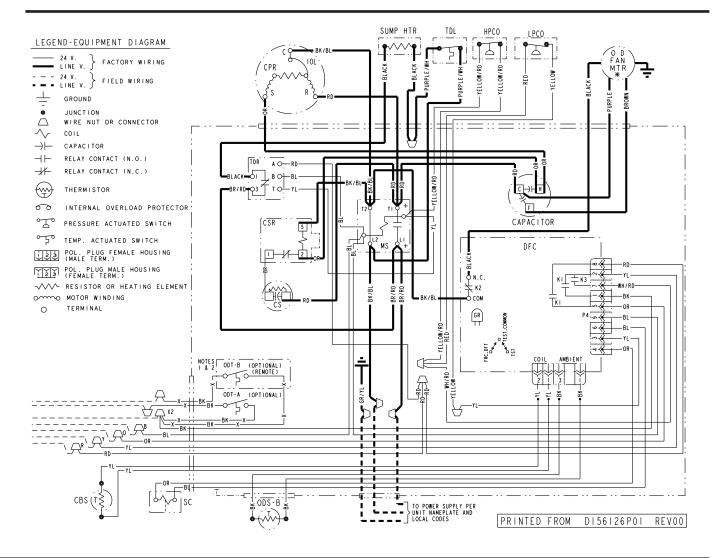
The following charging methods are therefore prescribed for systems with indoor TXVs.

- 1. Subcooling (in the cooling mode) is the only recommended method of charging above 55°F ambient temperatures.
- 2. For best results the indoor temperature should be kept between 70°F to 80°F. Add system heat if needed
- At start-up, or whenever charge is removed or added, the system must be operated for a minimum twenty (20) minutes to stabilize before accurate measurements can
- 4. Measure Liquid Line Temperature and Refrigerant Pressure at service valves.
- 5. Determine total refrigerant line length, and height (lift) if indoor section is above the condenser. Use the Subcool Charging Chart Corrections Table to calculate any additional subcooling required for your specific application.
- 6. Determine the Design Subcooling from the unit nameplate or Service Facts. Add any additional amount of subcooling calculated in Step 5 to the Design Subcooling to arrive at the final subcooling value.

- 7. Locate this value in the appropriate column of the R-410-A Refrigerant Charging Chart. Locate your liquid line temperature in the left column of the chart, and the intersecting liquid line pressure under your calculated subcooling value column. Add refrigerant to raise the pressure to match the chart, or remove refrigerant to lower the pressure. Again, wait twenty (20) minutes for the system conditions to stabilize before adjusting charge again.
- 8. When system is correctly charged, you can refer to System Pressure Curves (in Service Facts) to verify typical performance.



WIRING DIAGRAM



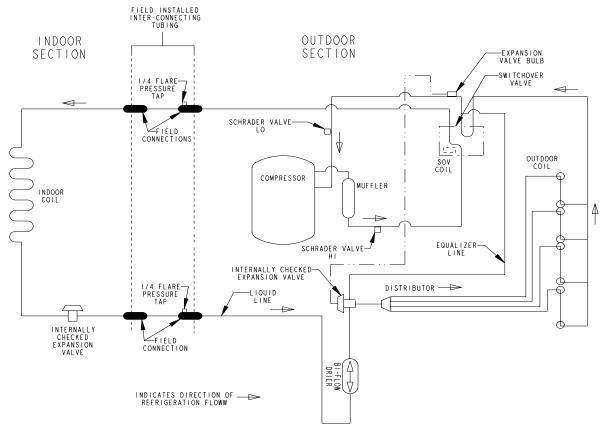
SUBCOOLING CHARGING **BELOW 55°F OD AMBIENT -**IN HEATING ONLY

- 1. The Subcool Charging Method in cooling is not recommended below 55°F outdoor ambi-
- 2. The only recommended method of charging at outdoor ambients below 55°F, is to weigh in the charge in the heating mode.
- 3. Use Nameplate charge plus standard charge adders for line length.
- 4. Check liquid line temperature and pressure (at the OD valves) to obtain a minimum of 10°F subcooling.
- 5. Add charge if a minimum of 10°F subcooling is not obtained with the nameplate charge plus line length correction.
- 6. It is important to return in the spring or summer to accurately charge the system in the cooling mode at outdoor ambients above 55°F.

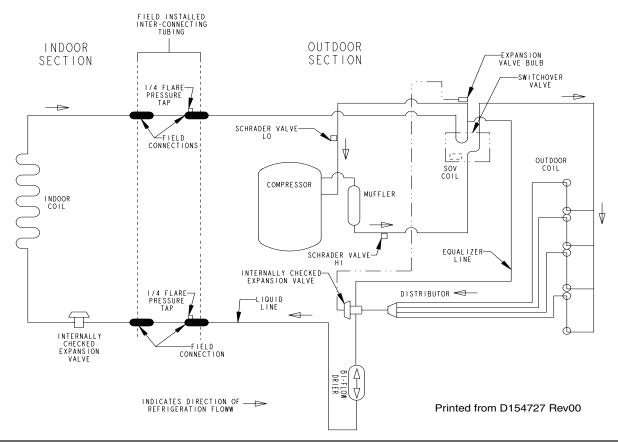
| R-410A REFRIGERANT CHARGING CHART LIGHT DESIGN SUBCOOLING (°F) | | | | | | | |
|--|----------------------------|-----|-----|-----|-----|-----|-----|
| LIQUID TEMP | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| (°F) | LIQUID GAGE PRESSURE (PSI) | | | | | | |
| 55 | 179 | 182 | 185 | 188 | 191 | 195 | 198 |
| 60 | 195 | 198 | 201 | 204 | 208 | 211 | 215 |
| 65 | 211 | 215 | 218 | 222 | 225 | 229 | 232 |
| 70 | 229 | 232 | 236 | 240 | 243 | 247 | 251 |
| 75 | 247 | 251 | 255 | 259 | 263 | 267 | 271 |
| 80 | 267 | 271 | 275 | 279 | 283 | 287 | 291 |
| 85 | 287 | 291 | 296 | 300 | 304 | 309 | 313 |
| 90 | 309 | 313 | 318 | 322 | 327 | 331 | 336 |
| 95 | 331 | 336 | 341 | 346 | 351 | 355 | 360 |
| 100 | 355 | 360 | 365 | 370 | 376 | 381 | 386 |
| 105 | 381 | 386 | 391 | 396 | 402 | 407 | 413 |
| 110 | 407 | 413 | 418 | 424 | 429 | 435 | 441 |
| 115 | 435 | 441 | 446 | 452 | 458 | 464 | 470 |
| 120 | 464 | 470 | 476 | 482 | 488 | 495 | 501 |
| 125 | 495 | 501 | 507 | 514 | 520 | 527 | 533 |
| Refer to Service Facts or Installer's Guide for charging method. | | | | | | | |

From Dwg. D154557P01 Rev. 3

Heating Refrigeration Cycle



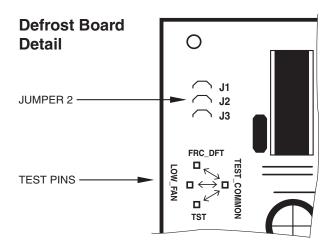
Cooling Refrigeration Cycle



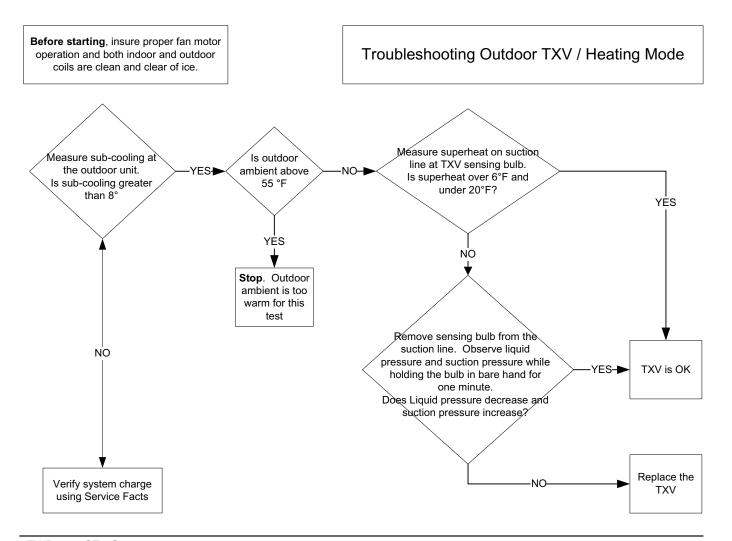
DEFROST TERMINATION TEMPERATURE

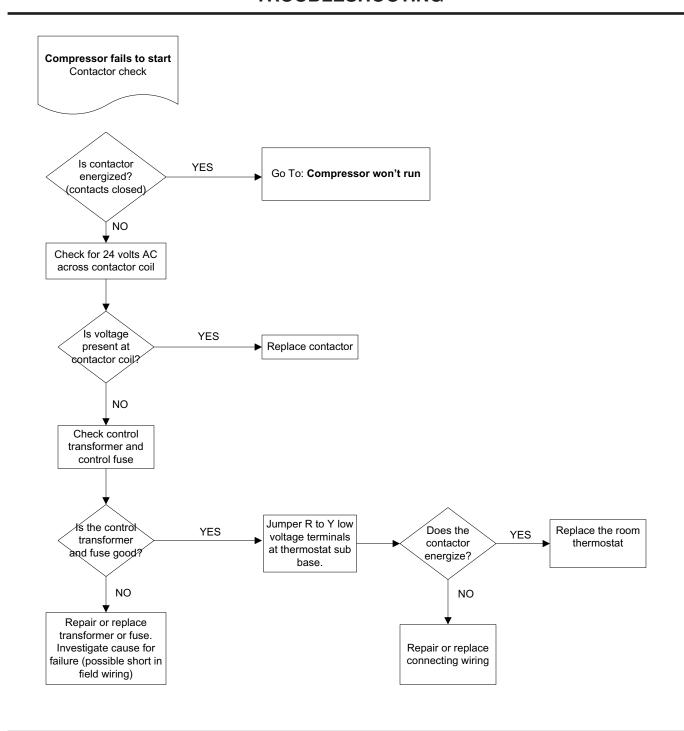
| Defrost Termination Temperatures | | | | |
|----------------------------------|------------------------|---------------------------------|--|--|
| | Outdoor Temperature | Termination Temperature | | |
| As Shipped | >22°F | 47°F | | |
| | 10°F–22°F | ODT + 25°F | | |
| | 6°F–10°F | 35°F | | |
| Cut | >30°F | 47°F | | |
| Jumper 2 | 6°F–30°F | 70°F | | |
| All | < 6°F | 12 min. or 35°F every 3 hrs. | | |

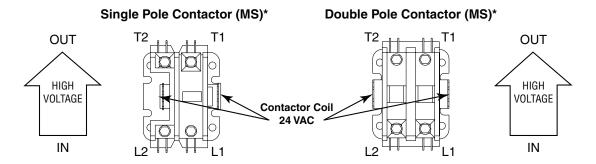
Defrost controls have a selectable termination temperature. Cutting jumper J2 (shown below) will achieve a termination temperature of 70° when the ambient temperature is below 30° (see table at left).



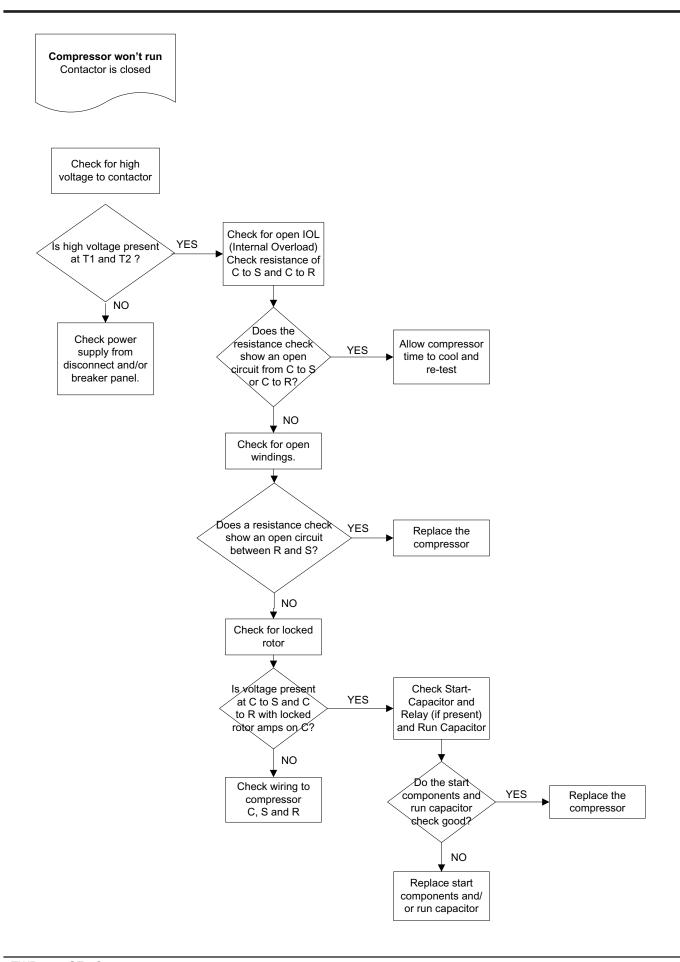
TROUBLESHOOTING







*Refer to Wiring Diagram to determine if a single pole or double pole contactor is used.



PRESSURE CURVES

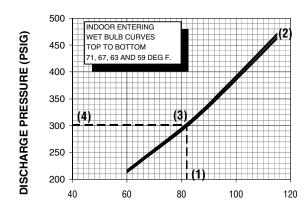
PRESSURE CURVES FOR 4TWB4024E1000A

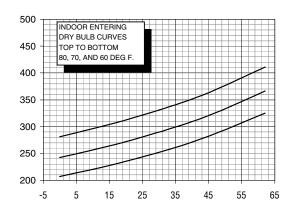
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4TEH3F30B1

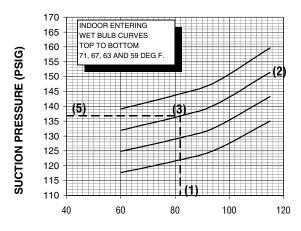
Cooling with Thermal Expansion Valve

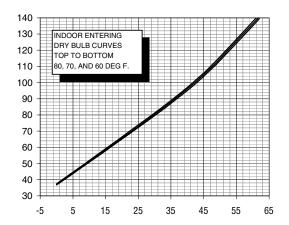
Heating





OUTDOOR TEMPERATURE (Degree F)





OUTDOOR TEMPERATURE (Degree F)

COOLING PERFORMANCE CAN BE CHECKED WHEN THE OUTDOOR TEMP IS ABOVE 65 DEG F.

TO CHECK COOLING PERFORMANCE, SELECT THE PROPER INDOOR CFM, ALLOW PRESSURES TO STABILIZE. MEASURE INDOOR WET BULB TEMPERATURE, OUTDOOR TEMPERATURE, DISCHARGE AND SUCTION PRESSURES. ON THE PLOTS LOCATE OUTDOOR TEMPERATURE (1); LOCATE INDOOR WET BULB (2); FIND INTERSECTION OF OD TEMP. & ID W.B. (3); READ DISCHARGE OR SUCTION PRESSURE IN LEFT COLUMN (4).

EXAMPLE: (1) OUTDOOR TEMP. 82 F.

- (2) INDOOR WET BULB 67 F.
- (3) AT INTERSECTION
- (4) DISCHARGE PRESSURE @ 915 CFM IS 302 PSIG
- (5) SUCTION PRESSURE @ 915 CFM IS 137 PSIG

ACTUAL:

DISCHARGE PRESSURE SHOULD BE +/- 10 PSI OF CHART SUCTION PRESSURE SHOULD BE +/- 3 PSIG OF CHART

INTERCONNECTING LINES GAS - 5/8" O.D. LIQUID - 3/8" O.D.

DWG.NO. 4TWB4024E1



10/10