

Wiring Manual

RAUC-W-21

Important! This document is customer property and must be retained by the unit's maintenance personnel.

Library	Service Literature
Product Section	Unitary
Product	Split System Air Conditioning
Model	RAUC
Literature Type	Wiring
Sequence	21
Date	December 2001
File No.	SV-UN-S/S-RAUC-W-21-12/01
Supersedes	New

Split System Remote Condensing Units and EVP Chillers

This wiring manual contains; Field Wiring Schematics for; No Controls, Variable Air Volume, and EVP Control applications, Power Schematics for all controls, Various Control Schematics, and Connection Diagrams.



With 3-D[™] Scroll Compressors

© American Standard Inc, 2001 http://www.trane.com

Table of Contents

General Information Literature Change History 2 Model Number Description 3 Wiring Diagrams Figure 1 Wire Selection & Fuse Replacement Table for 20 through 60 Ton Units 4 Field Control Wiring Diagram Notes 5 Figure 2 Typical Field Control Wiring Diagram for "No System Controls" Application 6 Figure 3 Typical Field Control Wiring Diagram for "Constant Volume" Application 7 Figure 4 Typical Field Control Wiring Diagram for "Variable Air Volume" Application 8 Figure 5 Typical Field Control Wiring Diagram for "EVP" Figure 6 Typical Power Schematic Diagram for 20 through 60 Ton Units 10 Figure 7 Typical "No System Control" Schematic Diagram for 20 through 60 Ton Units 12

Literature Change History

RAUC-W-21 (December 2001)

Original issue of wiring manual; provides typical field wiring and electrical schematics for "V" and later design sequence on RAUC-C20 through C60 Ton units with; no controls, constant volume (CV), variable air volume (VAV) and EVP controls.

Note: The customer connection diagrams and electrical schematics are typical illustrations and are published for general reference only. These diagrams may not reflect the actual wiring in your unit, always refer to the wiring diagrams that shipped with the unit for specific electrical schematic and connection information.

Figure 8
Typical "Constant Volume" Schematic Diagram for
20 through 60 Ton Units 14
Figure 9
Typical "Variable Air Volume" Schematic Diagram
for 20 through 60 Ton Units 16
Figure 10
Typical "EVP" Schematic Diagram for 20 through
60 Ton Units 18
Figure 11
Typical Low Ambient Control and Connection
Diagram for 20 through 60 Ton Units 20
Figure 12
Typical Connection Diagram for 20 through 60 Ton
Units with "No System Controls" Plate 22
Typical "Control Plate" Connection Diagram Notes 24
Figure 13
Typical Connection Diagram with "Constant Volume"
Control Plate
Figure 14
Typical Connection Diagram with "Variable Air
Volume" Control Plate
Figure 15
Typical Connection Diagram with "EVP"
Control Plate 27

Warnings and Cautions

Warnings are provided to alert installing contractors, operators, and service personnel of potential hazards that could result in personal injury or death.

Cautions are designed to alert personnel that equipment damage could occur if specific instructions are not followed.

All Trane products are identified by a multiple-character model number that precisely identifies a particular type of unit. An explanation of the alphanumeric identification codes used for RAUC units is provided on this page. Its use will enable the owner/operator, installing contractors, and service engineers to define the unit's specific components, type of application, i.e. CV, VAV, EVP or No System Controls and options for any particular unit.

When ordering replacement parts or requesting service, be sure to refer to the specific model number, serial number, and DL number (if applicable) stamped on the unit nameplate.

Sample Model No.: <u>RAUC - C60 E B L 1 3 A, F, G, 1, etc</u> Digit No.: 1 2 3 4 5,6,7 8 9 10 11 12 13+

Digit 1 - Unit Type

R = Remote Condensing Unit

Digit 2 - Condenser

A = Air Cooled

Digit 3 - Air Flow U = Up Flow

Digit 4 - Development Sequence C = Third

Digits 5, 6, 7 - Nominal Capacity

C20 = 20 Tons C25 = 25 Tons C30 = 30 Tons C40 = 40 Tons C50 = 50 Tons C60 = 60 Tons

Digit 8 - Power Supply

E = 200/60/3 XL F = 230/60/3 XL 4 = 460/60/3 XL 5 = 575/60/3 XL 9 = 380/50/3 XL D = 415/50/3 XL

Digit 9 - System Control

B = No System ControlC = Constant Volume ControlE = Supply Air VAV ControlP = EVP Control

Digit 10 - Design Sequence

V = Disconnect Redesign

Digit 11 - Ambient Control

- 0 = Standard
- $1 = Low Ambient 0^{\circ} F$

Digit 12 - Agency Approval

- 0 = None
- 3 = UL/CSA

Digit 13 - Miscellaneous Options

- A = Unit Mounted Disconnect Switch
- B = Hot Gas Bypass Valves *
- D = Suction Service Valves
- F = Pressures Gauges & Gauge Piping *
- G = Return Air Sensor *
- H = Condenser Coils with Copper Fins
- T = Flow Switch (EVP Only) *
- 1 = Spring Isolators *
- 2 = Neoprene Isolators *
- 9 = Packed Stock
- * Field Installed Options

Figure 1 Wire Selection & Fuse Replacement Table for 20 through 60 Ton Units

CUSTOMER WIRE SELECTION						
POWER WIRE SELECTION TO DISCONNECT SWITCH (181)						
UNIT SIZE	UNIT	VOLTAGE	DISCONNECT SWITCH	SIZE	CONNECTOR WIRE RANGE	
20 - 40 TON	380/415/4	60/575 VOLT	100 AMP		<1> #14 - 1/0	
50 TON	575	VOLT	100 AMP		(1) #14 - 1/0	
20 - 40 TON	200/2	30 VOLT	250 AMP		(1) #4 – 350 kcmil	
50 - 60 TON	380/415/460 VOLT		250 AMP		(1) #4 - 350 kcmil	
60 TON	575	VOLT	250 AMP		(1) #4 – 350 kcmil	
50 - 60 TON	200/230 VOLT		400 AMP		(1) #1 - 600 kcmil []R (2) #1 - 250 kcmil	
POWER WIRE SELECTION TO MAIN TERMINAL BLOCK (1TB1)						
UNIT SIZE	UNIT	VOLTAGE	TERMINAL BLOCK	SIZE	CONNECTOR WIRE RANGE	
20 - 60 TON	ALL V	ULTAGES	335 AMP		(1) #6 - 350 MCM	
CONTROL WIRE S	ELECTION	TO CONTROL	TERMINAL BLOCKS	(7TB5	THRU 7TB8 6TB9>	
WIRE GAUG	E	DHMS PE	ER 1000 FEET		MAX WIRE LENGTH	
18 AWG			8		500 FT	
16 AWG			5 1000 FT		1000 FT	
14 AWG	14 AWG		3		2000 FT	

Field Control Wiring Diagram Notes

Use with Figures 2, 3, 4 & 5

NDTE:

- 1. ALL WIRING AND COMPONENTS SHOWN DASHED TO BE SUPPLIED AND INSTALLED BY CUSTOMER IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES.
- 2. ALL WIRING TO BE N.E.C. CLASS 1 UNLESS OTHERWISE SPECIFIED.
- 3. CAUTION -- DO NOT ENERGIZE UNIT UNTIL CHECK-OUT AND START-UP PROCEDURES HAVE BEEN COMPLETED.
- 4. ALL THREE PHASE MOTORS ARE PROTECTED UNDER PRIMARY SINGLE PHASE FAILURE CONDITIONS.
- 5 SEE TABLE OF ACCEPTABLE WIRE SIZES FOR CONNECTION TO MAIN UNIT TERMINAL BLOCK (1TB1) OR DISCONNECT SWITCH (1S1).
- 6 SIZE CONTROL WIRING SUCH THAT TOTAL WIRE RESISTANCE OF THE RUN DOES NOT EXCEED 6 DHMS. SEE TABLE FOR WIRE SELECTION.
- 4 STEP CONTROLLER (5011) MIN. RATING N.O. CONTACTS = 150 VA INRUSH/75 VA SEALED; N.C.CONTACTS = 80 VA INRUSH/40 VA SEALED.
- 8 ISOLATION LIQUID SOLENDID VALVES (5L1,5L3), UNLOADING LIQUID SOLENDID VALVES (5L2,5L4) AND HOT GAS BYPASS SOLENDID VALVES (6L5,6L6) -- MAX. SOLENDID RATINGS ARE 72 VA INRUSH/30 VA SEALED.
- 9 EVAPORATOR OR CIRCULATING PUMP CONTROL CIRCUIT MAX. RATINGS ARE 240 VA INRUSH/40 VA SEALED.
- (10) STARTER INTERLOCK (5K1 AUX), OUTSIDE AIR T-STAT (5857), SYSTEM ON/OFF SWITCH (581), STARTER OVERLOAD RELAY (5K1 OL) AND FLOW SWITCH (6858) MIN. RATINGS ARE 250 VA INRUSH/125 VA SEALED.
- 11 SUGGESTED SYSTEM CONTROL SWITCH (5S2) FOR "NO SYSTEM CONTROLS" OPTION IS CUTLER HAMMER 7562K5 2PDT TOGGLE SWITCH OR EQUIVALENT.
- (12) REMOVE RESISTOR (7R5 7TB8-4 & 5) WHEN FIELD SUPPLIED ECONOMIZER IS REQUIRED WITH OPTIONAL VARIABLE AIR VOLUME ("VAV") CONTROLS.
- VIRING FOR DUCT SENSOR (GRT1), CHILLER TEMP SENSOR (GRT2), DISCHARGE AIR SENSOR (GRT3) AND RETURN AIR SENSOR (GRT6) MUST BE SHIELDED CABLE AND NOT RUN IN CONDUIT WITH OTHER WIRING. FOR RUNS UNDER 500 FEET USE 16 GA (MIN) WIRE. FOR RUNS FROM 500 TO 1000 FEET USE 14 GA (MIN) WIRE. MAXIMUM RUN IS 1000 FEET. GROUND SHIELD AT ONE END ONLY.
- (14) SUGGESTED SYSTEM CONTROL SWITCH (5S2) FOR "VAV" CONTROLS OPTION IS CUTLER HAMMER 7580K5 SPST TOGGLE SWITCH OR EQUIVALENT.
- (15) WHEN NIGHT SETBACK IS REQUIRED WITH OPTIONAL "VAV", PROVIDE A CONTACT CLOSURE SUITABLE FOR A DRY CIRCUIT WITH MIN. RATING OF 125 VA/24 VAC PILOT DUTY. REMOVE JUMPER (7TB7-4 & 5) WHEN REQUIRED.
- (16) dutside air t-stat (5557) is required only with "evp" option for low ambient compressor lockout.
- TT CIRCUIT AS SHEWN IS FER A CUSTEMER SUPPLIED EVAPORATOR FAN MOTER (5B1) AND EVAP FAN STARTER (5K1). WHEN "EVP" OPTION IS REQUIRED, THIS CIRCUIT BECOMES A CIRCULATING PUMP MOTOR (5B1) AND A CIRCUL-ATING PUMP STARTER (5K1).
- (18) INSTALL JUMPER (6TB9-7 & 8) WHEN HOT GAS BYPASS OPTION IS REQUIRED WITH OPTIONAL "EVP". INSTALL HOT GAS BYPASS SOLENOID VALVE (6L5) AS SHOWN.
- $\langle 19 \rangle$ when duct sensor (6rti) is required, remove resistor (7r1 from 7tb8-5 & 6).
- CUSTOMER SUPPLIED HEATER CONTACTOR CONTROL CIRCUIT -120V/240V/1PH MAX RATING = 750VA INRUSH, 75VA SEALED; 24V/1PH MAX RATING = 240VA INRUSH, 60VA SEALED.
- (21) ISOLATION LIQUID SOLENDID VALVES (5L1,5L3) ARE REQUIRED FOR CHARGE ISOLATION (PROVIDED AND INSTALLED BY THE FIELD). UNLOADING LIQUID SOLENDID VALVES (5L2,5L4), IF APPLICABLE, ARE PROVIDED INSTALLED BY THE FIELD.
- CAUTION DO NOT RUN LOW VOLTAGE WIRE (30 VOLTS MAXIMUM) IN CONDUIT OR RACEWAY WITH HIGHER VOLTAGE WIRE.
- 23.THE FOLLOWING CAPABILITIES ARE OPTIONAL THEY ARE IMPLEMENTED AND WIRED AS REQUIRED FOR A SPECIFIC APPLICATION.
 - (A) UNIT DISCONNECT SWITCH NON FUSED (AVAILABLE ON ALL CONTROL OPTIONS)
 - B HOT GAS BYPASS (AVAILABLE ON ALL CONTROL OPTIONS)
 - G RETURN AIR SENSOR (AVAILABLE WITH "CONSTANT VOLUME" CONTROL
 - (T FLOW SWITCH (AVAILABLE WITH "EVP" CONTROL)
- $\fbox{24}$ Supply conductors must be sized per ampacities based on 60°C wire.

Figure 2 Typical Field Control Wiring Diagram for "No System Controls" Application (Refer to the Wire Sizing Table & Notes on page 4 & 5)

"NO SYSTEM CONTROLS" OPTION





Figure 3 Typical Field Control Wiring Diagram for "Constant Volume" Application (Refer to the Wire Sizing Table & Notes on pages 4 & 5)



"CONSTANT VOLUME CONTROLS" OPTION

Figure 4 Typical Field Control Wiring Diagram for "Variable Air Volume" Application (Refer to the Wire Sizing Table & Notes on pages 4 & 5)



"∨A∨ CONTROLS" OPTION

2307-5691

Figure 5 Typical Field Control Wiring Diagram for "EVP" Application (Refer to the Wire Sizing Table & Notes on pages 4 & 5)



[&]quot;E∨P CONTROLS" OPTION

2307-5691

Figure 6 Typical Power Schematic Diagram for 20 through 60 Ton Units





Figure 7 Typical "No System Control" Schematic Diagram for 20 through 60 Ton Units





Figure 8 Typical "Constant Volume" Schematic Diagram for 20 through 60 Ton Units











Figure 10 Typical "EVP" Schematic Diagram for 20 through 60 Ton Units





Figure 11 Typical Low Ambient Control and Connection Diagram for 20 through 60 Ton Units





2307-3900C

Figure 12 Typical Connection Diagram for 20 through 60 Ton Units with "No System Controls" Plate (Use with Figures 13, 14 & 15)





Typical Connections Diagram Notes Use with Figures 13, 14 & 15

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

NDTE:					
1 CONSTANT VOLUME ONLY - WHEN C REMOVE F	USTOMER INSTALLED DUCT SENSOR (6RT1 - RESISTOR (7R1 - 7TB8-5 & 6) AND INSTALL PI	SEE FIELD DIAGRAM> IS REQUIRED, ER FIELD WIRING DIAGRAM.			
2 VARIABLE AIR VOLUME ONLY - REM IS REQU	□VE RESISTOR (7R5 FROM 7TB8-4 & 7TB8-5 JIRED.	> WHEN FIELD SUPPLIED ECONOMIZER			
3 VARIABLE AIR VOLUME ONLY - RES 402 0	SISTOR (7R4 - 200) AS SHOWN IS FOR 20 T N 40 THRU 60 TON UNITS.	HRU 30 TON UNITS, RESISTOR IS			
4 "EVP" ONLY - SEE "EVP" CONTROL WITH "EVP" PLATE (PANEL DIAGRAM FOR INTERCONNECTION BETV AREA 7) INSTALLED AND "EVP" CONTROL PANE	VEEN UNIT CONTROL PANEL (AREA 1) L (AREA 6 - CUSTOMER INSTALLED.			
(5) "E∨P" DNLY - WIRES "50A", "51A" & "103B" ARE REQUIRED FOR 40, 50 & 60 TON UNITS DNLY. WIRES ARE PRESENT ON E∨P ADDER PLATE FOR 20 THRU 30 TON UNITS BUT NOT USED.					
6. VARIABLE AIR VOLUME ONLY - REMOVE FACTORY INSTALLED RESISTOR (7R4 - 600) FROM 7U11 ON ALL 20 THRU 60 TON UNITS.					
IMPORTANT! DO NOT ENERGIZE UNIT UNTIL CHECK-OUT AND START-UP PROCEDURE HAS BEEN COMPLETED					
WARNING HAZARDOUS VOLTAGE! DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING. FAILURE TO DISCONNECT POWER	AVERTISSEMENT VOLTAGE HASARDEUX! DECONNECTEZ TOUTES LES SOURCES ELECTRIQUES INCLUANT LES DISJONCTEURS SITUES A DISTANCE AVANT D'EFFECTUER L'ENTRETIEN.	CAUTION USE COPPER CONDUCTORS ONLY! UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE			

FAUTE DE DECONNECTER LA SDURCE ELECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN PEUT ENTRAINER DES BLESSURES CORPORELLES SEVERES DU LA MORT.

2307-4483B

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

Figure 13 Typical "Constant Volume" Control Plate Connection Diagram (Use with Figure 12)



2307-4483B

Figure 14 Typical "Variable Air Volume" Control Plate Connection Diagram (Use with Figure 12)



2307-4483B

Figure 15 Typical "EVP" Control Plate Connections Diagram (Use with Figure 12)



