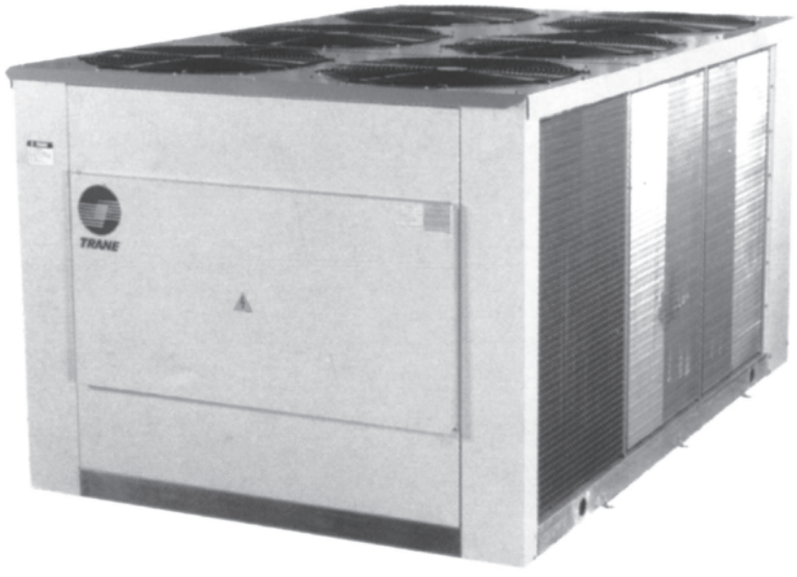
Installation Operation Maintenance

Split System
Condensing Units
20-55 Tons

R22/R407C

- Standard Ambient
- High Ambient



Models

RAUP 250 RAUP 500
RAUP 300 RAUP 600
RAUP 400

690807890001

January 2020

RAUP-IOM-R22/R407C
Rev.D

Performance Data

Foreword

These installation operation and maintenance instructions are given as a guide to good practice in the installation, putting, into service, operation and periodic maintenance by the Trane Product user. They do not contain the full service procedures necessary for the continued successful operation of this equipment. The services of a qualified service technician should be employed through the medium of a maintenance contract with a reputable service company.

Warranty

Warranty is based on the general terms and conditions of The Trane Company. The warranty is void if the equipment is repaired or modified without the written approval of Trane, if the operating limits are exceeded or if the control system or the electrical wiring is modified. Damage due to misuse, lack of maintenance or failure to comply with the manufacturer's instructions or recommendations is not covered by the warranty obligation.

Receiving/Handling

On arrival, inspect the unit before signing the delivery note. Specify any damage on the delivery note, and send a registered letter of protest to the last carrier of the goods within 72 hours of delivery. Notify the local Trane Sales Office at the same time. The unit should be totally inspected within 15 days of delivery.

If any concealed damage is discovered, stop unpacking the shipment . Take photos of the damaged material if possible. Notify the Carrier immediately by phone and registered mail. Notify the local Trane Sales office. Concealed damage must be reported within 15 days of delivery.

Contents

MODEL NOMENCLATURE

R	A	U	P	2	5	0	D	1	B	0	A
1	2	3	4	5	6	7	8	9	10	11	12

Digit No.1 = Product Type
R = Remote Condensing Unit

Digit No.2 = Product Type
A = Air Cooled

Digit No.3 = Product Type
U = Unit Up-Flow Air Flow

Digit No.4 = Development Sequence
P = Major Development

Digit No.5, 6, and 7 = Nominal Gross Capacity (MBH)
(Note: The alphabetic letter "O" is not used in Digit 6 or 7, only the number "0" is used.)

250 = 250 MBH	400 = 400 MBH	600 = 600 MBH
300 = 300 MBH	500 = 500 MBH	

Digit No.8 = Electrical Rating / Utilization Range

D = 380-415V / 3Ph / 50Hz	3 = 230V / 3Ph / 60Hz
K = 380V / 3Ph / 60Hz	4 = 460V / 3Ph / 60Hz

Digit No.9 = Motor / Compressor Controls
1 = DOL (3-wire) Starter

Digit No.10 = Additional Design Sequence
B = Micro-P controller with R22
E = Micro-P controller with R407C
F = Carel pCO5 controller with R22
G = Carel pCO5 controller with R407C
H = Carel pCO5 controller with R410A (not for High Ambient)
J = Micro-P controller with R410A (not for High Ambient)
K = Micro-P controller + VFD Low Ambient Control with R22
L = Micro-P controller + VFD Low Ambient Control with R407C
M = Carel pCO5 controller + VFD Low Ambient Control with R22
N = Carel pCO5 controller + VFD Low Ambient Control with R407C

Digit No.11 = Factory Installed Options
(Note: The alphabetic letter "O" is not used in Digit 11, only the number "0" is used.)

0 = None	3 = Crankcase Heater
1 = Blue fin	4 = Copper fin

2 = Suction/Liquid shut off valve
D = Serviceable Filter Drier + Shut-off Sight Glass+ Ship Loose Solenoid V+ Crankcase + Coil Standard
E = Serviceable Filter Drier + Shut-off Sight Glass+ Ship Loose Solenoid V+ Crankcase + Coil Blue Fin
F = Serviceable Filter Drier + Shut-off Sight Glass+ Ship Loose Solenoid V+ Crankcase + Coil Copper Fin
S = Special (Write additional option in PO note)

Digit No.12 = Ambient Indicator
A = Standard Ambient with R22, R407C for 50 and 60 Hz, Standard Ambient with R410A for 50 Hz only
B = High Ambient (R22, R407c) for 50 Hz only.

Note
"K", "3", and "4" in Digit No. 8 cannot applicable with "B" in Digit No.12
"H" and "J" in Digit No.10 cannot applicable with "B" in Digit No.12

General Data (380-415V)(50Hz)

Air Cooled Outdoor Unit

UNIT MODELS		RAUP250D	RAUP300D	RAUP400D	RAUP500D	RAUP600D
POWER CONNECTION	V/ph/Hz	380-415/3/50	380-415/3/50	380-415/3/50	380-415/3/50	380-415/3/50
MCA[1]	A	53.9	58.1	91.6	102.1	110.1
PERFORMANCES[2]						
Gross Cooling Capacity[2]	kW (MBH)	73.9 (253)	90.3 (308)	113.9 (389)	147.9 (505)	180.5 (617)
Unit Capacity Steps (%)		100-50	100-50	100-75-50-25	100-75-50-25	100-75-50-25
Total Compressor Power Input[2]	kW	25.2	26.8	36.2	50.4	53.6
Sound Power Level	dB (A)	87	89	89	90	92
SYSTEM DATA						
Refrigerant Type		R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C
No. Refrigerant Circuits		1	1	2	2	2
Refrigerant Connection Type		Sweat	Sweat	Sweat	Sweat	Sweat
Refrigerant Charge approximate per circuit	lb (kg)	44 (20)	60.6 (27.5)	43 (19.5)	44 (20)	60.6 (27.5)
Suction Line OD	in (mm)	2-1/8	2-1/8	1-5/8	2-1/8	2-1/8
Liquid line OD	in (mm)	7/8	7/8	7/8	7/8	7/8
COMPRESSOR						
Compressor Type		Scroll	Scroll	Scroll	Scroll	Scroll
No. Used		2	2	4	4	4
Model		13T+13T	15T+15T	2x(10T+10T)	2x(13T+13T)	2x(15T+15T)
Speed Number		1	1	1	1	1
Motor Number		1	1	1	1	1
V/ph/Hz		380-415/3/50	380-415/3/50	380-415/3/50	380-415/3/50	380-415/3/50
RLA/LRA (each)[2]	A	22.9/145	24.2/175	20.7/130	22.9/145	24.2/175
Motor RPM	rpm	2900	2900	2900	2900	2900
COIL						
Coil Size (HxL)	in	63x71	63x80	46x71	58x71	50x96
	mm	1,600x1,803	1,600x2,032	1,168x1,803	1,473x1,803	1,270x2,444
No. Used		1	1	2	2	2
Face Area	sq ft (m^2)	31.06 (2.88)	35.00 (3.25)	45.36 (4.21)	57.19 (5.31)	66.66 (6.21)
Tube Size OD	in (mm)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)
Tube Type		Plain	Plain	Plain	Plain	Plain
Rows		3	3	3	3	3
Fin Type				Uncoat Corrugated Fin		
Fins per inch		12	12	12	12	12
Refrigerant Flow Control		-	-	-	-	-
FAN						
Fan Type		Propeller	Propeller	Propeller	Propeller	Propeller
No. used		2	3	3	4	6
Diameter	in (mm)	(28) 710	(28) 710	(28) 710	(28) 710	(28) 710
No. of Blade		4	4	4	4	4
Pitch Angle	degree	29	29	29	29	29
Drive Type		Direct	Direct	Direct	Direct	Direct
Nominal Airflow[3]	cfm (cmh)	11,500 (19,539)	15,000 (25,485)	17,100 (29,053)	22,280 (37,853)	29,400 (49,950)
MOTOR						
No. of Motor		2	3	3	4	6
Motor hp (each)	hp (kW)	0.4 (0.3)	0.4 (0.3)	0.4 (0.3)	0.4 (0.3)	0.4 (0.3)
No. of Speed		1	1	1	1	1
Motor Speed	rpm	875	875	875	875	875
V/ph/Hz		380-415/3/50	380-415/3/50	380-415/3/50	380-415/3/50	380-415/3/50
RLA/LRA (each)		1.2/3.40	1.2/3.40	1.2/3.40	1.2/3.40	1.2/3.40
DIMENSION (HxWxD)						
Crated (Shipping)	in	67x103x56	67x126x56	65x113x85	77x113x85	73x128x85
	mm	1,700x2,620x1,420	1,700x3,200x1,420	1,650x2,880x2,160	1,960x2,880x2,160	1,850x3,240x2,160
Uncrated (Net)	in	58x90x48	58x116x48	56x102x76	68x102x76	60x117x76
	mm	1,465x2,294x1,222	1,465x2,952x1,222	1,414x2,583x1,920	1,718x2,583x1,920	1,515x2,980x1,920
WEIGHT						
Crated (Shipping)	lb (kg)	1,419.8 (644)	1,675.5 (760)	2,284 (1,036)	2,824 (1,281)	2,745 (1,245)
Uncrated (Net)	lb (kg)	1,375.7 (624)	1,631.4 (740)	2,207 (1,001)	2,747 (1,246)	2,668 (1,210)
Minimum Outdoor Air Temperature for Mechanical cooling						
Standard Ambient Operating Range	F	59-133	59-133	59-133	59-133	59-133
	C	15-45	15-45	15-45	15-45	15-45
High Pressure (cut out / cut in)	psig			398 ± 14 / 313 ± 21		
Low Pressure (cut out / cut in)	psig			27 ± 7 / 45.5 ± 7		

[1] MCA - Minimum Circuit Ampacity is 125% of the largest compressor RLA plus 100% of the other compressor RLA plus the sum of the motor RLA.

[2] At 7 deg C SST and 35 deg C Ambient, 400V, Subcooling 8.3 K, Superheat 11.1 K.

[3] Nominal Airflow is rated with standard air-dry coil.

TRANE

General Data (230V)(60Hz)

Air Cooled Outdoor Unit

UNIT MODELS		RAUP2503	RAUP3003	RAUP4003	RAUP5003	RAUP6003
POWER CONNECTION	V/ph/Hz	230/3/60	230/3/60	230/3/60	230/3/60	230/3/60
MCA[1]	A	86.3	111.7	145.3	163.6	212.0
PERFORMANCES[2]						
Gross Cooling Capacity[2]	kW (MBH)	73.9 (253)	90.3 (308)	113.9 (389)	147.9 (505)	180.5 (617)
Unit Capacity Steps (%)		100-50	100-50	100-75-50-25	100-75-50-25	100-75-50-25
Total Compressor Power Input[2]	kW	25.2	26.8	36.2	50.4	53.6
Sound Power Level	dB (A)	87	89	89	90	92
SYSTEM DATA						
Refrigerant Type		R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C
No. Refrigerant Circuits		1	1	2	2	2
Refrigerant Connection Type		Sweat	Sweat	Sweat	Sweat	Sweat
Refrigerant Charge approximate per circuit	lb (kg)	44 (20)	60.6 (27.5)	43 (19.5)	44 (20)	60.6 (27.5)
Suction Line OD	in (mm)	2-1/8	2-1/8	1-5/8	2-1/8	2-1/8
Liquid line OD	in (mm)	7/8	7/8	7/8	7/8	7/8
COMPRESSOR						
Compressor Type		Scroll	Scroll	Scroll	Scroll	Scroll
No. Used		2	2	4	4	4
Model		13T+13T	15T+15T	2x(10T+10T)	2x(13T+13T)	2x(15T+15T)
Speed Number		1	1	1	1	1
Motor Number		1	1	1	1	1
V/ph/Hz		230/3/60	230/3/60	230/3/60	230/3/60	230/3/60
RLA/LRA (each)[2]	A	35.7/237	45.7/255	32.1/237	35.7/237	45.7/255
Motor RPM	rpm	2900	2900	2900	2900	2900
COIL						
Coil Size (HxL)	in	63x71	63x80	46x71	58x71	50x96
	mm	1,600x1,803	1,600x2,032	1,168x1,803	1,473x1,803	1,270x2,444
No. Used		1	1	2	2	2
Face Area	sq ft (m^2)	31.06 (2.88)	35.00 (3.25)	45.36 (4.21)	57.19 (5.31)	66.66 (6.21)
Tube Size OD	in (mm)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)
Tube Type		Plain	Plain	Plain	Plain	Plain
Rows		3	3	3	3	3
Fin Type				Uncoat Corrugated Fin		
Fins per inch		12	12	12	12	12
Refrigerant Flow Control		-	-	-	-	-
FAN						
Fan Type		Propeller	Propeller	Propeller	Propeller	Propeller
No. used		2	3	3	4	6
Diameter	in (mm)	(28) 710	(28) 710	(28) 710	(28) 710	(28) 710
No. of Blade		4	4	4	4	4
Pitch Angle	degree	29	29	29	29	29
Drive Type		Direct	Direct	Direct	Direct	Direct
Nominal Airflow[3]	cfm (cmh)	11,500 (19,539)	15,000 (25,485)	17,100 (29,053)	22,280 (37,853)	29,400 (49,950)
MOTOR						
No. of Motor		2	3	3	4	6
Motor hp (each)	hp (kW)	0.92 (0.685)	0.92 (0.685)	0.92 (0.685)	0.92 (0.685)	0.92 (0.685)
No. of Speed		1	1	1	1	1
Motor Speed	rpm	925	925	925	925	925
V/ph/Hz		230/3/60	230/3/60	230/3/60	230/3/60	230/3/60
RLA/LRA (each)		2.97/3.5	2.97/3.5	2.97/3.5	2.97/3.5	2.97/3.5
DIMENSION (HxWxD)						
Crated (Shipping)	in	67x103x56	67x126x56	65x113x85	77x113x85	73x128x85
	mm	1,700x2,620x1,420	1,700x3,200x1,420	1,650x2,880x2,160	1,960x2,880x2,160	1,850x3,240x2,160
Uncrated (Net)	in	58x90x48	58x116x48	56x102x76	68x102x76	60x117x76
	mm	1,465x2,294x1,222	1,465x2,952x1,222	1,414x2,583x1,920	1,718x2,583x1,920	1,515x2,980x1,920
WEIGHT						
Crated (Shipping)	lb (kg)	1,419.8 (644)	1,675.5 (760)	2,284 (1,036)	2,824 (1,281)	2,745 (1,245)
Uncrated (Net)	lb (kg)	1,375.7 (624)	1,631.4 (740)	2,207 (1,001)	2,747 (1,246)	2,668 (1,210)
Minimum Outdoor Air Temperature for Mechanical cooling						
Standard Ambient Operating Range	F	59-133	59-133	59-133	59-133	59-133
	C	15-45	15-45	15-45	15-45	15-45
High Pressure (cut out / cut in)	psig			398 ± 14 / 313 ± 21		
Low Pressure (cut out / cut in)	psig			27 ± 7 / 45.5 ± 7		

[1] MCA - Minimum Circuit Ampacity is 125% of the largest compressor RLA plus 100% of the other compressor RLA plus the sum of the motor RLA.

[2] At 7 deg C SST and 35 deg C Ambient, 400V, Subcooling 8.3 K, Superheat 11.1 K.

[3] Nominal Airflow is rated with standard air-dry coil.

General Data (380-415V)(60Hz)

Air Cooled Outdoor Unit

UNIT MODELS		RAUP250K	RAUP300K	RAUP400K	RAUP500K	RAUP600K
POWER CONNECTION	V/ph/Hz	380/3/60	380/3/60	380/3/60	380/3/60	380/3/60
MCA[1]	A	51.5	65.9	87.0	97.6	125.1
PERFORMANCES[2]						
Gross Cooling Capacity[2]	kW (MBH)	73.9 (253)	90.3 (308)	113.9 (389)	147.9 (505)	180.5 (617)
Unit Capacity Steps (%)		100-50	100-50	100-75-50-25	100-75-50-25	100-75-50-25
Total Compressor Power Input[2]	kW	25.2	26.8	36.2	50.4	53.6
Sound Power Level	dB (A)	87	89	89	90	92
SYSTEM DATA						
Refrigerant Type		R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C
No. Refrigerant Circuits		1	1	2	2	2
Refrigerant Connection Type		Sweat	Sweat	Sweat	Sweat	Sweat
Refrigerant Charge approximate per circuit	lb (kg)	44 (20)	60.6 (27.5)	43 (19.5)	44 (20)	60.6 (27.5)
Suction Line OD	in (mm)	2-1/8	2-1/8	1-5/8	2-1/8	2-1/8
Liquid line OD	in (mm)	7/8	7/8	7/8	7/8	7/8
COMPRESSOR						
Compressor Type		Scroll	Scroll	Scroll	Scroll	Scroll
No. Used		2	2	4	4	4
Model		13T+13T	15T+15T	2x(10T+10T)	2x(13T+13T)	2x(15T+15T)
Speed Number		1	1	1	1	1
Motor Number		1	1	1	1	1
V/ph/Hz		380/3/60	380/3/60	380/3/60	380/3/60	380/3/60
RLA/LRA (each)[2]	A	21.4/160	27.1/155	19.3/160	21.4/160	27.1/155
Motor RPM	rpm	2900	2900	2900	2900	2900
COIL						
Coil Size (HxL)	in	63x71	63x80	46x71	58x71	50x96
	mm	1,600x1,803	1,600x2,032	1,168x1,803	1,473x1,803	1,270x2,444
No. Used		1	1	2	2	2
Face Area	sq ft (m^2)	31.06 (2.88)	35.00 (3.25)	45.36 (4.21)	57.19 (5.31)	66.66 (6.21)
Tube Size OD	in (mm)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)
Tube Type		Plain	Plain	Plain	Plain	Plain
Rows		3	3	3	3	3
Fin Type				Uncoat Corrugated Fin		
Fins per inch		12	12	12	12	12
Refrigerant Flow Control		-	-	-	-	-
FAN						
Fan Type		Propeller	Propeller	Propeller	Propeller	Propeller
No. used		2	3	3	4	6
Diameter	in (mm)	(28) 710	(28) 710	(28) 710	(28) 710	(28) 710
No. of Blade		4	4	4	4	4
Pitch Angle	degree	29	29	29	29	29
Drive Type		Direct	Direct	Direct	Direct	Direct
Nominal Airflow[3]	cfm (cmh)	11,500 (19,539)	15,000 (25,485)	17,100 (29,053)	22,280 (37,853)	29,400 (49,950)
MOTOR						
No. of Motor		2	3	3	4	6
Motor hp (each)	hp (kW)	0.64 (0.48)	0.64 (0.48)	0.64 (0.48)	0.64 (0.48)	0.64 (0.48)
No. of Speed		1	1	1	1	1
Motor Speed	rpm	900	900	900	900	900
V/ph/Hz		380/3/60	380/3/60	380/3/60	380/3/60	380/3/60
RLA/LRA (each)		1.65/3.21	1.65/3.21	1.65/3.21	1.65/3.21	1.65/3.21
DIMENSION (HxWxD)						
Crated (Shipping)	in	67x103x56	67x126x56	65x113x85	77x113x85	73x128x85
	mm	1,700x2,620x1,420	1,700x3,200x1,420	1,650x2,880x2,160	1,960x2,880x2,160	1,850x3,240x2,160
Uncrated (Net)	in	58x90x48	58x116x48	56x102x76	68x102x76	60x117x76
	mm	1,465x2,294x1,222	1,465x2,952x1,222	1,414x2,583x1,920	1,718x2,583x1,920	1,515x2,980x1,920
WEIGHT						
Crated (Shipping)	lb (kg)	1,419.8 (644)	1,675.5 (760)	2,284 (1,036)	2,824 (1,281)	2,745 (1,245)
Uncrated (Net)	lb (kg)	1,375.7 (624)	1,631.4 (740)	2,207 (1,001)	2,747 (1,246)	2,668 (1,210)
Minimum Outdoor Air Temperature for Mechanical cooling						
Standard Ambient Operating Range	F	59-133	59-133	59-133	59-133	59-133
	C	15-45	15-45	15-45	15-45	15-45
High Pressure (cut out / cut in)	psig			398 ± 14 / 313 ± 21		
Low Pressure (cut out / cut in)	psig			27 ± 7 / 45.5 ± 7		

[1] MCA - Minimum Circuit Ampacity is 125% of the largest compressor RLA plus 100% of the other compressor RLA plus the sum of the motor RLA.

[2] At 7 deg C SST and 35 deg C Ambient, 400V, Subcooling 8.3 K, Superheat 11.1 K.

[3] Nominal Airflow is rated with standard air-dry coil.

TRANE

General Data (460V)(60Hz)

Air Cooled Outdoor Unit

UNIT MODELS		RAUP2504	RAUP3004	RAUP4004	RAUP5004	RAUP6004
POWER CONNECTION	V/ph/Hz	460/3/60	460/3/60	460/3/60	460/3/60	460/3/60
MCA[1]	A	49.1	55.3	70.5	93.0	104.8
PERFORMANCES[2]						
Gross Cooling Capacity[2]	kW (MBH)	73.9 (253)	90.3 (308)	113.9 (389)	147.9 (505)	180.5 (617)
Unit Capacity Steps (%)		100-50	100-50	100-75-50-25	100-75-50-25	100-75-50-25
Total Compressor Power Input[2]	kW	25.2	26.8	36.2	50.4	53.6
Sound Power Level	dB (A)	87	89	89	90	92
SYSTEM DATA						
Refrigerant Type		R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C
No. Refrigerant Circuits		1	1	2	2	2
Refrigerant Connection Type		Sweat	Sweat	Sweat	Sweat	Sweat
Refrigerant Charge approximate per circuit	lb (kg)	44 (20)	60.6 (27.5)	43 (19.5)	44 (20)	60.6 (27.5)
Suction Line OD	in (mm)	2-1/8	2-1/8	1-5/8	2-1/8	2-1/8
Liquid line OD	in (mm)	7/8	7/8	7/8	7/8	7/8
COMPRESSOR						
Compressor Type		Scroll	Scroll	Scroll	Scroll	Scroll
No. Used		2	2	4	4	4
Model		13T+13T	15T+15T	2x(10T+10T)	2x(13T+13T)	2x(15T+15T)
Speed Number		1	1	1	1	1
Motor Number		1	1	1	1	1
V/ph/Hz		460/3/60	460/3/60	460/3/60	460/3/60	460/3/60
RLA/LRA (each)[2]	A	20.7/130	22.9/145	15.7/130	20.7/130	22.9/145
Motor RPM	rpm	2900	2900	2900	2900	2900
COIL						
Coil Size (HxL)	in	63x71	63x80	46x71	58x71	50x96
	mm	1,600x1,803	1,600x2,032	1,168x1,803	1,473x1,803	1,270x2,444
No. Used		1	1	2	2	2
Face Area	sq ft (m^2)	31.06 (2.88)	35.00 (3.25)	45.36 (4.21)	57.19 (5.31)	66.66 (6.21)
Tube Size OD	in (mm)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)
Tube Type		Plain	Plain	Plain	Plain	Plain
Rows		3	3	3	3	3
Fin Type				Uncoat Corrugated Fin		
Fins per inch		12	12	12	12	12
Refrigerant Flow Control		-	-	-	-	-
FAN						
Fan Type		Propeller	Propeller	Propeller	Propeller	Propeller
No. used		2	3	3	4	6
Diameter	in (mm)	(28) 710	(28) 710	(28) 710	(28) 710	(28) 710
No. of Blade		4	4	4	4	4
Pitch Angle	degree	29	29	29	29	29
Drive Type		Direct	Direct	Direct	Direct	Direct
Nominal Airflow[3]	cfm (cmh)	11,500 (19,539)	15,000 (25,485)	17,100 (29,053)	22,280 (37,853)	29,400 (49,950)
MOTOR						
No. of Motor		2	3	3	4	6
Motor hp (each)	hp (kW)	1.1 (0.815)	1.1 (0.815)	1.1 (0.815)	1.1 (0.815)	1.1 (0.815)
No. of Speed		1	1	1	1	1
Motor Speed	rpm	900	900	900	900	900
V/ph/Hz		460/3/60	460/3/60	460/3/60	460/3/60	460/3/60
RLA/LRA (each)		1.25/2.62	1.25/2.62	1.25/2.62	1.25/2.62	1.25/2.62
DIMENSION (HxWxD)						
Crated (Shipping)	in	67x103x56	67x126x56	65x113x85	77x113x85	73x128x85
	mm	1,700x2,620x1,420	1,700x3,200x1,420	1,650x2,880x2,160	1,960x2,880x2,160	1,850x3,240x2,160
Uncrated (Net)	in	58x90x48	58x116x48	56x102x76	68x102x76	60x117x76
	mm	1,465x2,294x1,222	1,465x2,952x1,222	1,414x2,583x1,920	1,718x2,583x1,920	1,515x2,980x1,920
WEIGHT						
Crated (Shipping)	lb (kg)	1,419.8 (644)	1,675.5 (760)	2,284 (1,036)	2,824 (1,281)	2,745 (1,245)
Uncrated (Net)	lb (kg)	1,375.7 (624)	1,631.4 (740)	2,207 (1,001)	2,747 (1,246)	2,668 (1,210)
Minimum Outdoor Air Temperature for Mechanical cooling						
Standard Ambient Operating Range	F	59-133	59-133	59-133	59-133	59-133
	C	15-45	15-45	15-45	15-45	15-45
High Pressure (cut out / cut in)	psig			398 ± 14 / 313 ± 21		
Low Pressure (cut out / cut in)	psig			27 ± 7 / 45.5 ± 7		

[1] MCA - Minimum Circuit Ampacity is 125% of the largest compressor RLA plus 100% of the other compressor RLA plus the sum of the motor RLA.

[2] At 7 deg C SST and 35 deg C Ambient, 400V, Subcooling 8.3 K, Superheat 11.1 K.

[3] Nominal Airflow is rated with standard air-dry coil.

General Data (R22/R407C Hi Ambient)(50Hz)

Air Cooled Outdoor Unit

UNIT MODELS		RAUP250	RAUP300	RAUP400	RAUP500	RAUP600
POWER CONNECTION	V/ph/Hz	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50
MCA[1]	A	54.2	58.4	91.9	102.6	110.8
PERFORMANCES[2]						
Gross Cooling Capacity[2]	kW (MBH)	73.9 (253)	90.3 (308)	113.9 (389)	147.9 (505)	180.5 (617)
Unit Capacity Steps (%)		100-50	100-50	100-75-50-25	100-75-50-25	100-75-50-25
Total Compressor Power Input[2]	kW	25.2	26.8	36.2	50.4	53.6
Sound Power Level	dB (A)	87	89	89	90	92
SYSTEM DATA						
Refrigerant Type		R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C	R22 / R407C
No. Refrigerant Circuits		1	1	2	2	2
Refrigerant Connection Type		Sweat	Sweat	Sweat	Sweat	Sweat
Refrigerant Charge approximate per circuit	lb (kg)	44 (20)	60.6 (27.5)	43 (19.5)	44 (20)	60.6 (27.5)
Suction Line OD	in (mm)	2-1/8	2-1/8	1-5/8	2-1/8	2-1/8
Liquid line OD	in (mm)	7/8	7/8	7/8	7/8	7/8
COMPRESSOR						
Compressor Type		Scroll	Scroll	Scroll	Scroll	Scroll
No. Used		2	2	4	4	4
Model		13T+13T	15T+15T	2x(10T+10T)	2x(13T+13T)	2x(15T+15T)
Speed Number		1	1	1	1	1
Motor Number		1	1	1	1	1
V/ph/Hz		380/3/50	380/3/50	380/3/50	380/3/50	380/3/50
RLA/LRA (each)[2]	A	20.7/130	22.9/145	15.7/130	20.7/130	22.9/145
Motor RPM	rpm	2900	2900	2900	2900	2900
COIL						
Coil Size (HxL)	in	63x71	63x80	46x71	58x71	50x96
	mm	1,600x1,803	1,600x2,032	1,168x1,803	1,473x1,803	1,270x2,444
No. Used		1	1	2	2	2
Face Area	sq ft (m^2)	31.06 (2.88)	35.00 (3.25)	45.36 (4.21)	57.19 (5.31)	66.66 (6.21)
Tube Size OD	in (mm)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)
Tube Type		Plain	Plain	Plain	Plain	Plain
Rows		4	4	4	4	4
Fin Type				Uncoat Corrugated Fin		
Fins per inch		12	12	12	12	12
Refrigerant Flow Control		-	-	-	-	-
FAN						
Fan Type		Propeller	Propeller	Propeller	Propeller	Propeller
No. used		2	3	3	4	6
Diameter	in (mm)	(28) 710	(28) 710	(28) 710	(28) 710	(28) 710
No. of Blade		4	4	4	4	4
Pitch Angle	degree	29	29	29	29	29
Drive Type		Direct	Direct	Direct	Direct	Direct
Nominal Airflow[3]	cfm (cmh)	11,500 (19,539)	15,000 (25,485)	17,100 (29,053)	22,280 (37,853)	29,400 (49,950)
MOTOR						
No. of Motor		2	3	3	4	6
Motor hp (each)	hp (kW)	1.1 (0.815)	1.1 (0.815)	1.1 (0.815)	1.1 (0.815)	1.1 (0.815)
No. of Speed		1	1	1	1	1
Motor Speed	rpm	900	900	900	900	900
V/ph/Hz		380/3/50	380/3/50	380/3/50	380/3/50	380/3/50
RLA/LRA (each)		1.50/5.24	1.50/5.24	1.50/5.24	1.50/5.24	1.50/5.24
DIMENSION (HxWxD)						
Crated (Shipping)	in	67x103x56	67x126x56	65x113x85	77x113x85	73x128x85
	mm	1,700x2,620x1,420	1,700x3,200x1,420	1,650x2,880x2,160	1,960x2,880x2,160	1,850x3,240x2,160
Uncrated (Net)	in	58x90x48	58x116x48	56x102x76	68x102x76	60x117x76
	mm	1,465x2,294x1,222	1,465x2,952x1,222	1,414x2,583x1,920	1,718x2,583x1,920	1,515x2,980x1,920
WEIGHT						
Crated (Shipping)	lb (kg)	1,419.8 (644)	1,675.5 (760)	2,284 (1,036)	2,824 (1,281)	2,745 (1,245)
Uncrated (Net)	lb (kg)	1,375.7 (624)	1,631.4 (740)	2,207 (1,001)	2,747 (1,246)	2,668 (1,210)
Minimum Outdoor Air Temperature for Mechanical cooling						
Standard Ambient Operating Range	F			59-125		
	C			15-52		
High Pressure (cut out / cut in)	psig			460 ± 14 / 360 ± 21		
Low Pressure (cut out / cut in)	psig			27 ± 7 / 45.5 ± 7		

[1] MCA - Minimum Circuit Ampacity is 125% of the largest compressor RLA plus 100% of the other compressor RLA plus the sum of the motor RLA.

[2] At 7 deg C SST and 35 deg C Ambient, 400V, Subcooling 8.3 K, Superheat 11.1 K.

[3] Nominal Airflow is rated with standard air-dry coil.

Installation

General Information

This manual cover the installation of the RAUP 250, RAUP 300 (single circuit), and RAUP 400, RAUP 500, RAUP 600 (dual circuilts) air cooled condensing units. Installation procedures should be performed in the sequence that they appearin this manual. Do not destroy or remove the manual from theunit. The manual should should remain weather-protected with the unituntil all installation procedures are complete.

Note: It is not the intention of this manual to cover all possible variations in the systems that may occur or to provide comprehensive information concerning every possible contingency that may be encountered during an installation. If additional information is required or if specific problems arise that are not fully discussed in this manual, contact your local sales office.

Note: "Warnings" and "Cautions" appear at appropriate places in this manual. Your personal safety and the proper operation of this machine require that you follow them carefully. The Company assumes on liability for installations or servicing performed by unqualified personnel.

Unit nameplate

The unit nameplate gives the full model reference. The power supply of the unit is specified and must not vary by more that 5% of the specified voltage.

Machine room installation requirements

Foundation
A special base or foundation is not required when the floor is level and of sufficient strength to support the unit's weight.

Lifting of the unit
Four lifting lugs are provided at the base of each unit for crane lift. Attach cable slings to each lug (refer to Figure1) and install a spreader bar between the cable to protect the unit. Make sure that the lifting equipment is capable of handling the weight of the unit.(Table 1)

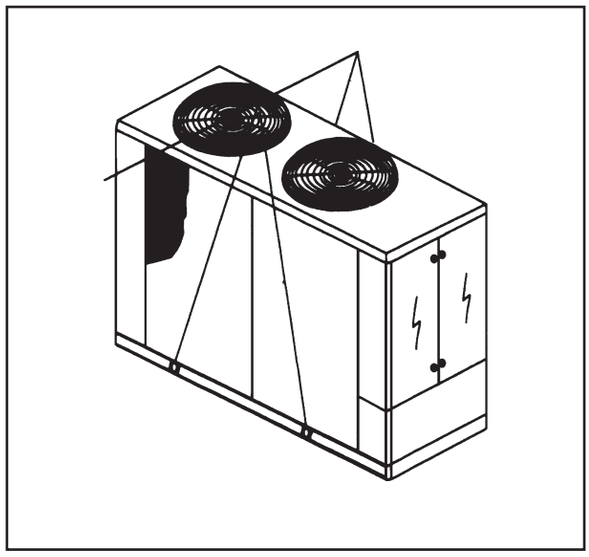
Clearances
Provide sufficient clearance around the unit for performance of service and maintenance. Caution unit operation is a function of the air temperature. Any recycling of the air fed out by the fans will increase the air intake temperature over the condense fins and result in a high temperature out. Make sure nothing prevents air flow to run through the unit coils. Refer to dimensional drawing recommended for detailed clearances, under "Dimensional Data" section.

Special lifting and moving instruction

A specific lifting method is recommended as follows:
1. Four lifting points are built into the unit
2. Slings and spreader bar to be provided by rigger and attached to the four lifting points.
3. Minimum rated lifting capacity (vertical) of each sling and spreader bar shall be no less than the tabulated unit shipping weight.
4. Caution :The unit must be lifted with the utmost care Avoid shock load by lifting slowly and evenly.

Figure 1

Lifting of the unit



Isolation and Sound Emission (option)

The most effective form of isolation is to locate the unit away from any sound sensitive area. Structurally transmitted sound can be reduced by using spring or rubber isolators. The isolators are effective in reducing the low frequency sound generated by compressors and therefore are recommended for sound sensitive installations. An acoustical engineer should always be consulated on critical applications. For maximum isolation effect the refrigeration lines and electrical conduct should also be isolated. Use flexible eletrical conduit. State and local codes on sound emissions should always be considered. Since the environment in which a sound source is located affects sound pressure, unit placement must be carefully evaluated.

Installation

Refrigerant circuit
One circuit on sizes 250 and 300, and two circuits on sizes 400, 500 and 600. Single circuit units will have two compressors manifolded. Both circuits of the four compressor units are manifolded. Refrigerant connections not connected are sealed and plugged.

Refrigerant pipe connections
Determination of the size of the pipe connections.

Liquid line
Size the liquid line on the basis of:
1. Full load operating conditions.
2. A pressure drop of 100 kPa maximum.
3. A liquid velocity not exceeding 3 m/s (to avoid hammer).

Suction line
Design the suction line to provide sufficient gas velocity in both horizontal and vertical runs to carry the compressor oil and ensure a uniform rate of return to the compressor. Size the hot gas line on the basis of:
1. Producing gas velocity in horizontal runs at least 2.5 m/s at minimum operating conditions.
2. Producing gas velocity in vertical risers at least 5 m/s at minimum operating conditions.
3. Gas velocity should not exceed 20 m/s under maximum load conditions.
4. Maximum pressure drop in suction line should not exceed 20 kPa.

Pitch the horizontal run of suction line toward the evaporator.

Refrigerant line isolation
Isolate the refrigerant lines from the building to prevent normal vibration in the lines from the building structure. Also avoid bypassing the isolation system on the unit by attaching the refrigerant piping or electric conduit too rigidly.
Any unit vibration can travel along rigid pipes or conduits to the building.

Pressure and leak testing
When pressure and leak testing, these safety precautions must be adhered to:
1. Do not work in a closed area where refrigerant may be leaking- a sufficient quantity of vapors may be present to cause personal injury. Provide adequate ventilation.
2. Do not use oxygen or ecetylene in place of refrigerant and dry nitrogen for leak testing- a violent explosion may result.
3. Always use a pressure regulator , valves and gauges to control drum and line pressures when pressure testing the system. Excessive pressures may cause line ruptures, equipment damage or an explosion resulting in personal injury.

Pressure test the liquid line , and suction line at pressures dictated by local codes.

Caution: Do not exceed the high pressure control setting plus 0.7 bar. Test pressures on liquid line and on suction line must comply with local and national codes.

Charge enough refrigerant into the system to raise the pressure to 1 bar. Using oil-pumped dry nitrogen, build the system pressure to 7 bar.
Check the piping and the evaporator unit for leaks with a leak detector. Be very thorough in this test, checking every possible point of leakage. If leaks are found during the testing, release the test pressure, break the connection and make a new joint. Retest to make sure the connection is solid.

Field evacuation
For field evacuation , use a rotary-style vacuum pump. Determine the pump size required for proper unit evacuation.

Installation

Table 1A : Electrical data 380-415V 50Hz

Model	Unit					Motor Data				
	Power Connection	Voltage Range	MCA @380V	Max. Fuse Size @380	Qty	Compressor RLA@380V(each)	Compressor LRA@380V(each)	Condenser Qty	Condenser Hp (each)	Condenser RLA@380V (each)
RAUP 250	380V/3ph/50Hz	380-415	53.9	76.8	2	22.9	145	2	0.50	1.20
RAUP 300	380V/3ph/50Hz	380-415	58.1	82.3	2	24.2	175	3	0.50	1.20
RAUP 400	380V/3ph/50Hz	380-415	91.6	112.3	4	20.7	130	3	0.50	1.20
RAUP 500	380V/3ph/50Hz	380-415	102.1	125.0	4	22.9	145	4	0.50	1.20
RAUP 600	380V/3ph/50Hz	380-415	110.1	134.3	4	24.2	175	6	0.50	1.20

Table 1B : Electrical data 380-415V 60Hz

Model	Unit					Motor Data				
	Power Connection	Voltage Range	MCA @380V	Max. Fuse Size @380	Qty	Compressor RLA@380V(each)	Compressor LRA@380V(each)	Condenser Qty	Condenser Hp (each)	Condenser RLA@380V (each)
RAUP 250	380V/3ph/60Hz	380-415	52.1	73.8	2	21.7	160	2	0.50	1.65
RAUP 300	380V/3ph/60Hz	380-415	65.9	93.0	2	27.1	155	3	0.50	1.65
RAUP 400	380V/3ph/60Hz	380-415	87.0	106.3	4	19.3	160	3	0.50	1.65
RAUP 500	380V/3ph/60Hz	380-415	97.6	119.0	4	21.4	160	4	0.50	1.65
RAUP 600	380V/3ph/60Hz	380-415	125.1	152.2	4	27.1	155	6	0.50	1.65

Table 1C : Electrical data 460V 60Hz

Model	Unit					Motor Data				
	Power Connection	Voltage Range	MCA @460V	Max. Fuse Size @460	Qty	Compressor RLA@460V(each)	Compressor LRA@460V(each)	Condenser Qty	Condenser Hp (each)	Condenser RLA@460V (each)
RAUP 250	460V/3ph/60Hz	460-480	49.1	69.8	2	20.7	130	2	0.50	1.25
RAUP 300	460V/3ph/60Hz	460-480	55.3	78.2	2	22.9	145	3	0.50	1.25
RAUP 400	460V/3ph/60Hz	460-480	70.5	86.2	4	15.7	130	3	0.50	1.25
RAUP 500	460V/3ph/60Hz	460-480	93.0	113.7	4	20.7	130	4	0.50	1.25
RAUP 600	460V/3ph/60Hz	460-480	104.8	127.7	4	22.9	145	6	0.50	1.25

Table 1D : Electrical data 230V 60Hz

Model	Unit					Motor Data				
	Power Connection	Voltage Range	MCA @230V	Max. Fuse Size @230V	Qty	Compressor RLA@230V(each)	Compressor LRA@230V(each)	Condenser Qty	Condenser Hp (each)	Condenser RLA@230V (each)
RAUP 250	230V/3ph/60Hz	220-240	86.3	122.0	2	35.7	237	2	0.50	2.90
RAUP 300	230V/3ph/60Hz	220-240	111.7	157.4	2	45.7	255	3	0.50	2.90
RAUP 400	230V/3ph/60Hz	220-240	145.3	177.4	4	32.1	237	3	0.50	2.90
RAUP 500	230V/3ph/60Hz	220-240	163.6	199.3	4	35.7	237	4	0.50	2.90
RAUP 600	230V/3ph/60Hz	220-240	212.0	257.7	4	45.7	255	6	0.50	2.90

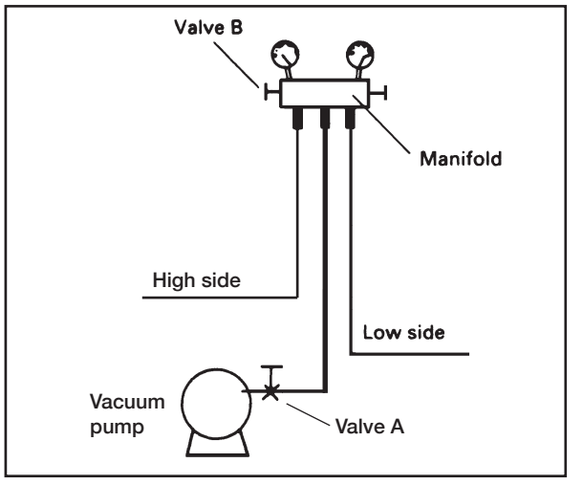
Note: [1] MCA = Minimum circuit ampacity = 125% of the largest compressor RLA plus 100% of the other compressor(s) RLA plus the sum of the condenser fan RLA.

[2] Maximum fuse size = 225% of the largest compressor RLA plus 100% of the other compressor(s) RLA plus the sum of the condenser fan RLA.

Installation

When hooking a vacuum pump to a refrigeration system, it is important to connect the pump to both the high and low side of the system.
Follow the pump manufacturer's directions as to the proper methods of using the vacuum pump . The lines used to connect the pump to the system should be copper and of the largest diameter that can pratically be used. Using larger line sizes with minimum flow resistance can significantly reduce evacuation time. Rubber or synthetic hoses are not acceptable for unit evacuation because they have moisture absorbing characteristics which result in excessive rates of outgassing and pressure rise during standing vacuum test. This makes it impossible to determine if the unit has a leak.
An electronic thermopile vacuum gauge should be installed in the common line ahead of the vacuum pump shutoff valve as shown in Figure 2 . Close Valve B and open Valve A. After several minutes, the gauge reading will indicate the minimum blank-off pressure the pump is capable of pulling . Rotary pump should produce vacuum of less than 100 microns.
Open Valve B and evacuate the system to a pressure of 500 microns or less. Valve A must be closed when taking this reading. Once 500 microns or less is obtained, with Valve A closed, a time versus pressure rise should be performed. The maximum allowable rise over a 15 minute period is 200 microns. If pressure rise is greater than 200 microns but levels off to a constant value, excessive moisture is present. If the pressure steadily continues to rise, a leak is indicated.

Figure 2
Vacuum pump connection.



Electrical Connections

Wiring diagrams are furnished with the units, but extra copies may be obtained from the local Trane sales office. The installing contractor is to provide and install fused disconnect switches and the wiring up to the unit control panel. Check all wiring connections and trace the circuits to make sure that they agree with the wiring diagrams.

Caution :
1. All wiring should comply with local and national codes. Type and location of disconnect switches should comply with local and national codes. Install disconnect switch near unit, within sight, for safety.
2. Use copper conductors only for installation wiring. Unit terminals are not designed to accept other type of wiring. The use of aluminium wire may cause galvanic corrosion and/or overheating at the connection points with resultant equipment failure.

Unit Start-Up

Preparation for start-up

Before starting the unit, use the following procedures to ensure that the unit is completely and properly installed and ready for start-up.
The installer must make sure that the following points are checked before the initial start-up.
1. Inspect all wiring connections. Connections should be clean and tight. Trace circuits to ensure that wiring agrees with wiring diagrams provided with the unit. Information in the title block of the wiring diagram should match the data that appears on the unit nameplate.
2. Close the unit power fused disconnect switch and the manual disconnect switch.
3. Check the unit supply voltage to ensure that the voltage is within the utilization range.
4. Check the compressor oil level.
5. Check with a phase-meter the direction of rotation of scroll Trane compressors or check the good operation of the discharge and suction pressures.
6. As the various motors of the system are started, check the direction of rotation and make sure that the driven equipment is operating satisfactorily.
7. Ensure sufficient cooling load available at day of start-up (minimum of 50% of design load).

Preparation

Before putting the system into operation, perform these service and check-out procedures :
1. Before making any electrical power connections make sure that the insulation resistance of all power terminal to earth is in accordance with the international electrical codes. Measure the insulation of all electrical motors using a 500 V DC tester and refer to the manufacturer's specifications.

Warning :
No motor should be started if the insulation resistance is less than 2 mega ohms. Under no circumstances should any voltage be applied to a motor while it is under vacuum.

2. Check the unit supply voltage to ensure that the voltage is within the utilization range.

Caution :
Phase unbalance must not exceed 2% . Supply for all motors is to be within plus or minus 5% of the voltages specified on the compressor nameplate.

3. Place all refrigerant circuit valves in operating position.
4. Reset all controls equipped with a manual reset function.

Installation

Refrigerant charging

After the refrigeration pipework system has been pressure tested and evacuated, and meets the vacuum pressure requirements of paragraph <<Field evacuation>>, the refrigerant may be charged as follows. Be sure to follow the start-up procedure at the same as charging the refrigerant.

1. Loosely connect a cylinder of refrigerant to the 1/4" OD Charging Valve Located on the liquid line.
2. Open and close the valve on the refrigerant cylinder to purge the connection. Tighten the coupling nut.
3. Invert the refrigerant cylinder so that only liquid will enter the system
4. Allow the compressor to continue running throughout the remainder of the charging operation. Do not allow the pressure to fall bellow 0.15 bar.

> **Caution**:
> Do not attempt to start the compressor by blocking the safety controls. Allow the condensing unit to function in a normal manner.

5. Allow the system to continue functioning for approximately 30 minutes. If during this period bubbles appear in the liquid line sight glass, add refrigerant.
6. Leak-test the refrigerant circuit.

Start-up procedure

1. Start the unit by switching to <<On>>
2. After the unit has started, allow it to operate for at least 15 minutes to stabilise operating pressures. Then check :
   - compressor oil level.
   - compressor and fan motor power consumption.
   - suction pressure.
   - discharge pressure.
   - liquid line sight glass.
   - superheat.
   - subcooling.

All readings and measurement should be logged. Procedures are given below.

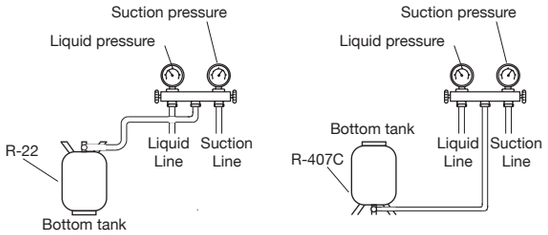
CAUTION

PHASE ROTATION IS CRITICAL

IF SUCTION PRESSURE DOSE NOT FALL TO EXPECTED OPERTATING LEVEL WITHIN THIRTY (30) SECONDS AFTER COMPRESSOR IS STARTED, COMPRESSOR ROTATION MAY BE REVERED.

TO REVERSE ROTATION, DISCONNECT ALL UNIT POWER AND REVERSE ANY TWO (2) INCOMING POWER LEAD WIRES AT THE UNIT HIGH VOLTAGE TERMINAL BLOCK. RECONNECT ALL UNIT POWER, RESTART UNIT, AND RE-CHECK SUCTION PRESSURE.

Refrigerant charge



Note : R-407C refrigerant charge must be liquid phase only.

Oil level

Oil should be visible in the compressor, under full load, in the compressor oil level sight glass. The unit was charged with the proper amount of oil before shipping. Under normal operation, compressor oil is always expected to return to compressor oil sump, and no additional oil should be added. For oil level indication, refer to compressor oil sight glass, as per Figure 3 . If oil is within sight glass visibility, oil quantity should be sufficient.

Refrigerant pressures

Observe operating pressures. If pressures are above or below normal see <<Trouble Analysis>> section. Normal operating pressures are in Table 2. A High & Low pressure settings are found in Table 1

Liquid line sight glass (Optional)

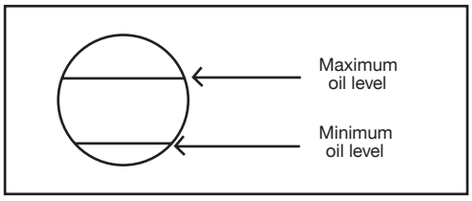
The flow of refrigerant through the sight glass should be smooth and without bubbles. Bubbles indicate a refrigerant shortage and probably a leak, or a restriction in the liquid line.

Superheat

Normal Superheat is 6 to 8 deg C. Overfeeding of the evaporator results in high suction pressure, low superheat and possible liquid carryover. Inadequate or too high a superheat is remedied by adjusting stem on the thermostatic expansion valve (TEV). If this fails to correct the condition, then the valve cage or power element of the TEV may be defective and should be replaced.

> **Caution:**
> 1. Excessive foaming indicates the presence of refrigerant in the oil and will result insufficient compressor lubrication. Turn off the motor and investigate the cause.
> 2. An excess of the oil in the compressor can cause problems in the same way as a lack of oil. Before topping up , contact a qualified service technician. Use only Tranerecommended oils.

Figure 3 - Compressor oil level



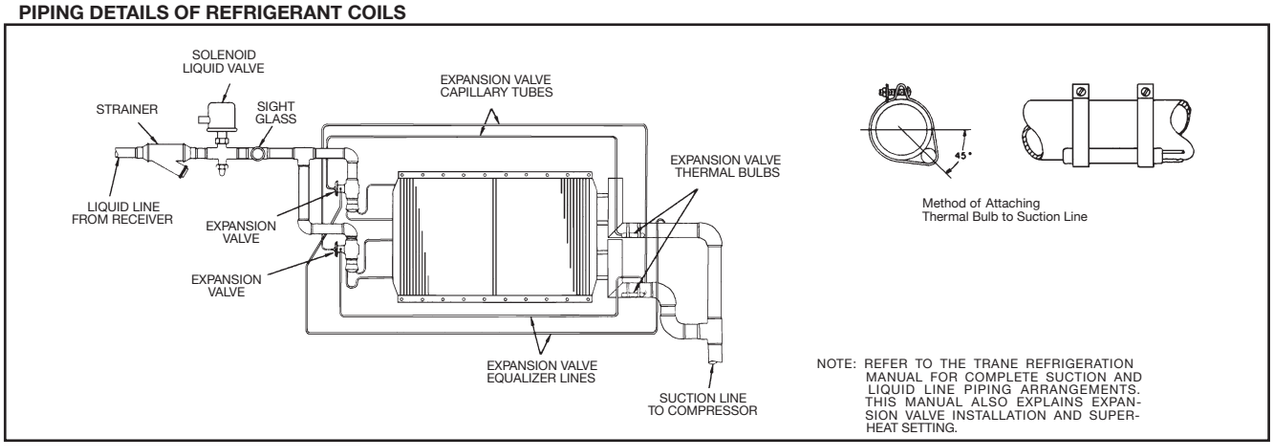
⚠ WARNING

1. Do NOT run the compressor on reverse rotation
2. Do NOT perform any pump down cycle with Scroll compressor
3. Do Not run the compressor below the setting of low pressure switch
4. Do NOT by pass any safety devices when operating the system.

Failure to observe any of the above will cause severe damage to the Scroll compressors.

Operation / Maintenance

Figure 3A
PIPING DETAILS OF REFRIGERANT COILS



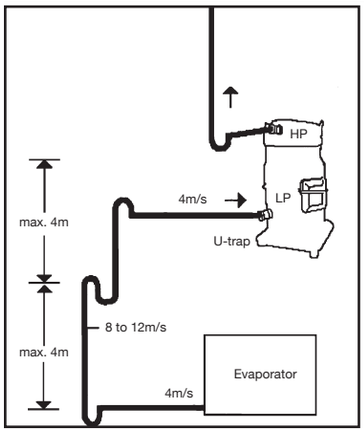


Figure 3B

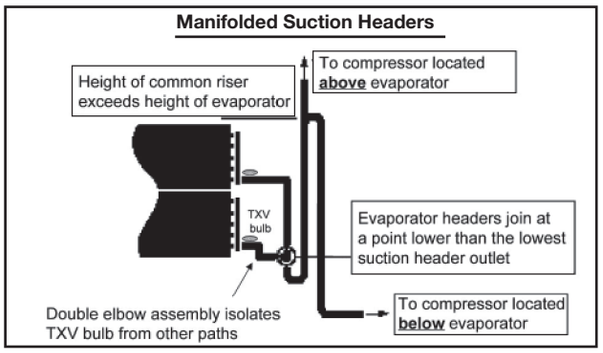


Figure 3C

Table 2 - Normal operating conditions

Ambient	Temperature (C)		
	25	30	40
Discharge pressure (bar)	14-17	17-19	22-25
Suction pressure (bar)	4-6	4-6	4-6

Final checkout
Run the unit sequentially through its stages of cooling. Once proper unit operation is confirmed, perform these final steps:
1. Inspect the unit for debris and/or misplaced tools and hardware.
2. If the unit is operated immediately, be sure all valves are in operating position.
3. Secure all panels including control panel in place.

Operation

Operating the unit
Unit operation unit initialized by turning the control circuit switch in the control panel.

Seasonal start-up procedure
1. Perform the applicable procedures outline under << Annual Maintenance>> in the Maintenance Section
2. Test the entire refrigerant system for leaks.
3. Close the system master disconnect switch
4. Start the system
5. Check the operation of all interlocked equipment.
6. Check oil level and operating pressures after the system has been in operation for 15 to 20 minutes.
7. Check discharge pressure against <<Normal operating conditions>>. If the pressure is above or below the normal level, stop the unit and correct the cause.
8. On Scrolls, compressor sightglass oil levels may be anywhere within the sightglass. Also 2 scrolls manifolded together will have different levels.

Maintenance

The following maintenance are given as an essential part of the required maintenance of this equipment. However the services of a qualified services technician are required to perform the periodic maintenance procedures as part of a regular maintenance contact. Perform all maintenance procedures at the scheduled intervals. This will prolong the life of the unit and reduce the possibility of costly equipment failure. Use an <<operator's log>> to record a weekly <<operator condition history>> for this machine. The operating log for this unit can be a valuable diagnostic tool for service personnel also, the operator, by noticing trends in the operating conditions can often foresee and prevent problem situations before they become serious. It may be required for inspection in the event of warranty claim.

Weekly maintenance

1. Check the compressor oil level. The oil should cover 1/2 of the sight glass when running at full load. Before oil is added allow the compressor to run continuously for 3-4 hours. Check the oil level every 30 minutes. If the level does not return to cover 1/2 of the sight glass contact a qualified service technician.
2. Trane approved compressor oil:
   R22 refrigerant - Trane oil 015E.
   R-407C refrigerant - Trane oil POE.

Note:
The lubricating oils recognised by Trane have been subjected to extensive testing in out laboratories and have been found to give the required satisfactory results for use with Trance compressors.
The use of any oil not conforming to Trane required standard is at the sole responsibility of the user and could result in warranty cancellation.

Maintenance

Caution:

1. Excessive foaming indicates the presence of refrigeration in the oil and will result in insufficient compressor lubrication. Turn off the motor and investigate the cause.
2. An excess of oil in the compressor can cause problems in the same way as a lack of oil. Before topping up, contact a qualified service technician. Use only Trane recommended oil.
3. The flow of refrigerant through the sight glass should be smooth and without bubbles. Bubbles indicate a refrigerant shortage and probably a leak, or a restriction in the liquid line. Contacta qualified service technician. Each sight glass is equipped with a moisture indicator. The colour of the indicator element changes with the amount of moisture in the refrigerant, but also as a function of temperature. It should indicate <<dry>> refrigerant if it indicates <<wet>> run the unit for a minimum of 12 hours and check again. If it remains consistently in <<caution>> or <<wet>> zones, contact a qualified service technician.
4. Run the compressor(s) for a minimum of two (2) hours before taking the initial moisture level readings after a start-up. The moisture indicator element is moisture and temperature sensitive, so the system must be at normal operating temperatures to obtain correct moisture level readings.

3. Observe operating pressures. If pressures are above or below normal, see <<Trouble Analysis>> section. Normal operating pressures are in Table 2.
4. Inspect entire system for any unusual conditions such as noisy compressor, loose access panels, leaky pipes of chattering contactors.
5. Note temperatures, pressures, date and time as well as any observation in a machine log book.

Annual maintenance

1.Remove corrosion from any surface and repaint. Check the condition of the gasket around the control panel door.
2.Perform all weekly maintenance procedures.

Maintenance inspections

If the unit does not perform properly during these inspections, consult the <<Trouble Analysis>> section for possible cause and recommended procedures. The following procedures should be carried out by a qualified service technician as part of a maintenance contract.

The first and last visit will include the seasonal shut down and start-up procedures, when applicable as detailed on the section on <<operation>>. The visits should include the following procedures :

- Inspect contacts of motor contactors.
- Check setting and function of each system control.
- Perform an oil analysis to determine the acidity of the compressor oil and record the results.

Warning / Caution :

The oil analysis procedure must be performed by a qualified service technician. Incorrect interpretation of analysis results can cause damage to the unit. The use of improper analysis procedures can cause hazardous condition that may result in injury to service personnel.

- Refrigerant leak test.
- Check motor winding insulation (once per year).

Other procedures may be necessary, depending on the age and usage of the equipment.

Note :

It is important that the equipment is regularly serviced by a qualified service technician, at least once per year /1000 hours of operation , minimum frequency. Failure to respect this requirement may result in cancellation of Trane warranty and liability.

A maintenance visit by a qualified service technician is also recommended after the first 500 hours of operation after commissioning.

Table 2A

General interconnecting line sizes.

CONDENSING UNIT	LENGTH OF INTERCONNECTING LINES(FT)**																			
	0-20		21-40		41-60		61-80		81-100		101-120		121-140		41-160		161- 180		181-200	
	LINE SIZE - O.D.(IN.)																			
	LIQ	SUCT	LIQ	SUCT	LIQ	SUCT	LIQ	SUCT	LIQ	SUCT	LIQ	SUCT	LIQ	SUCT	LIQ	SUCT	LIQ	SUCT	LIQ	SUCT
RAUP 400	5/8	1 5/8	7/8	1 5/8	7/8	1 5/8	7/8	2 1/8	7/8	2 1/8	7/8	2 1/8	7/8	2 1/8	7/8	2 1/8	7/8	2 1/8	7/8	2 1/8
RAUP 250,500	7/8	1 5/8	7/8	1 5/8	7/8	2 1/8	7/8	2 1/8	7/8	2 1/8	1 1/8	2 1/8	1 1/8	2 1/8	1 1/8	2 1/8	1 1/8	2 1/8	—	—
RAUP 300,600	7/8	1 5/8	7/8	2 5/8	7/8	2 1/8	7/8	2 1/8	1 1/8	2 1/8	1 1/8	2 1/8	1 1/8	2 1/8	—	—	—	—	—	—

** In shaded region, use 2 1/8 for all horizontal runs, and 1 5/8 for all vertical risers.

However, for correct and proper pipe sizing, it is recommended to size piping based on Trane recommended piping guide or use computer aided software where applicable

Compressor

Compressor Motor Winding Thermostat

Each motor winding thermostat is a pilot duty control designed to stop compressor operation if the motor windings become hot due to rapid cycling ,loss of charge, abnormally low suction temperatures, or the compressor running backwards.

Compressor Manifold Piping

The compressor refrigerant piping manifold system was purposely designed to provide proper oil return to both compressors; therefore, the original refrigerant manifolding system should not be modified in any way!

If a compressor replacement is required, do not alter the compressor manifold piping; improper oil return and compressor failure could result. If a suction filter is required, install it a minimum of 18" upstream of the compressor manifold piping.
See Figure 4

Caution : Altering the original manifold piping may cause oil compressor failure.

The scroll compressors in the RAUP units do not unload. Instead, they are staged on and off for various steps of loading. This sequence is critical and must not be changed! Altering this sequence in any way could cause compressor failure.

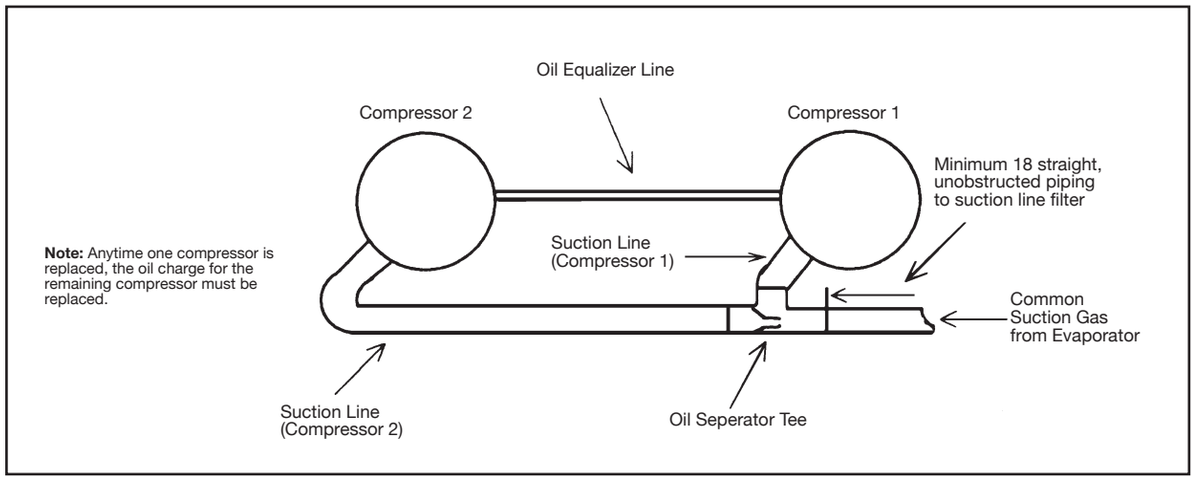
This sequence is of most importance because it maximizes lubrication and ensure proper oil return. Secondly, the design of the oil return with equalizer is critical. The lead compressor must always be in the lead in the sequence. Should it fail, it locks out the circuit immediately, saving the other compressor.

Table 2B
Compressor Sequencing

Unit Size	Control Step	Circuit Comp.1		Circuit Comp.2	
250	1	1	(50%)		-
300	2	1,2	(100%)		-
400	1	1	(50%)		-
500	2	1,2	(100%)		-
600	3	1,2	(100%)	3	(50%)
	4	1,2	(100%)	3,4	(100%)

Note: 1, 2, 3 and 4 indicate which compressor in the unit is operating. (%) indicates the amount of the circuit in the operation during a given step. Refer to dimensional data for the location of the compressors 1, 2, 3 and 4 in the RAUP unit.

Figure 4 :
Location Requirements for Suction Line Filter Installation after Motor Burnout



Trouble Analysis

A. Compressor fails to start

Problems and symptoms	Probable cause	Recommended action.
Full voltage at motor terminal but motor will not run.	Burned-out motor.	Repair or replace.
Inoperative motor starter.	Burned-out holding coil or broken contacts.	Repair or replace.
Open contacts of safety control of thermal overload.	Safety control of thermal overload relays has cut outs.	Call Trane Service.
Electric circuit test shows no current on line side of motor starter.	a) Power failure. b) Disconnect switch open.	Check for blown line fuse or broken leak. Determine why switch was opened.
Electric circuit test show current on line but not on motor side or fuse.	Fuse down. Replace fuse	Check load on motor.
Voltmeter does not read proper voltage.	Low voltage	Call power company.
Motor starter holding coil is not energized.	Open control circuit.	Locate open control and determine cause. See individual control.
Compressor will not operate.	Frozen compressor due to locked or damaged mechanism	Replace Compressor.
Open contact on high pressure switch. Discharge pressure above cut-in setting.	Discharge pressure above cut-in setting of high pressure cut-out switch	See Complaint<<Discharge pressure too high.>>

B. Compressor stops

Problems and symptoms	Probable Cause	Recommended action
High pressure control has cut out.	See H.	See H.
Thermal overload relay has cut out.	a)voltage too low b) cooling load or condensing temperature too high	a) contact power company. b) see discharge pressure too. high.
Winding thermostat has cut out.	Refrigerant shortage	Repair leak, add refrigerant.

Trouble Analysis

C. Compressor shortcycles

Problems and symptoms	Probable cause	Recommended action
Suction pressure too low and frosting at driver.	Restricted liquid liner driver.	Replace driver core.
Motor starts and stops frequently	Faulty motor.	Replace compressor.

D. Compressor runs Continuously

Problems and symptoms	Probable cause	Recommended action
High temperature in conditioned space	Excessively high cooling load	Check infiltration and insulation of conditioned space.
Bubbles in sight glass	a) Lack of refrigerant. b) Filter driver obstructed	a) Repair leak, add refrigerant. b) Replace driver core.

E. Compressor loses oil

Problems and symptoms	Probable cause	Recommended action
Oil level too low (sight glass).	Insufficient oil charge.	All oil.
Gradual drop of oil level.	Clogged filter drier	Replace.
Excessively cold suction. Noisy compressor	Liquid flooding back to compressor	Readjust superheat setting and verify correct bulb mounting.

F. Compressor is noisy

Problems and symptoms	Probable cause	Recommended action
Abnormally cold suction line: compressor knocks. Valve bulb attachment.	a) Liquid flood-back b) Expansion Valve stuck in open position	a) Check superheat and expansion. b) Repair or replace
Compressor noisy	Incorrect direction of rotation	Inverse the direction of rotation

G. System short of capacity

Problems and symptoms.	Probable cause.	Recommended action
Expansion valve hissed.	Lack of refrigerant.	Add refrigerant.
High pressure drop across filter-drier.	Clogged filter-driver.	Clean or replace.
Superheat too high.	Superheat set too high.	Check superheat and adjust expansion valve
Superheat too high.	Excessive pressure drop in the thermal expansion valve.	Check superheat and reset thermal expansion valve

Trouble Analysis

H. Discharge pressure too high

Problems and symptoms	Probable cause	Recommended action
Too little or too warm condenser air. Restricted air flow.	Excessively warm air leaving condenser. Cuts out on high pressure control.	Clean coil, check fan andmotor for proper operation.
Excessive discharge pressure.	Air or noncondensible gas in system.	Remove air or non condensibles.

J. Discharge pressure too high

Problems and symptoms	Probable cause	Recommended action
Bubbles in sight glass.	Lack of refrigerant.	Repair leak and charge.

K. Discharge pressure too high

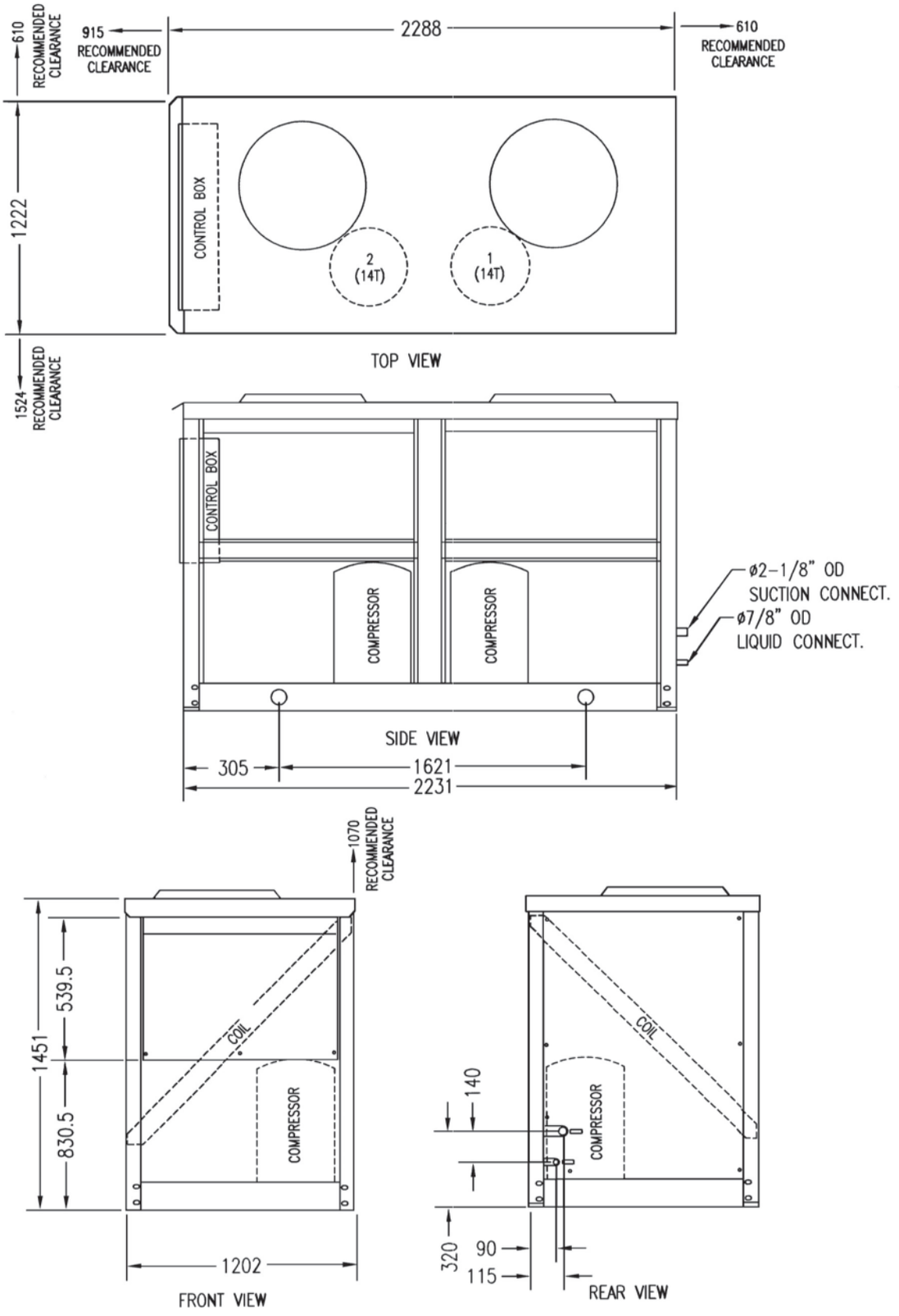
Problems and symptoms	Probable cause	Recommended action
Compressor runs continuously.	Excessive load on evaporator	Check system.
Abnormally cold suction line; liquid flood-back to compressor.	a) Expansion valve opens too far. b) Expansion valve stuck in open position.	a) Adjust superheat and check bulb attachment. b) Repair or replace.

L. Discharge pressure too high

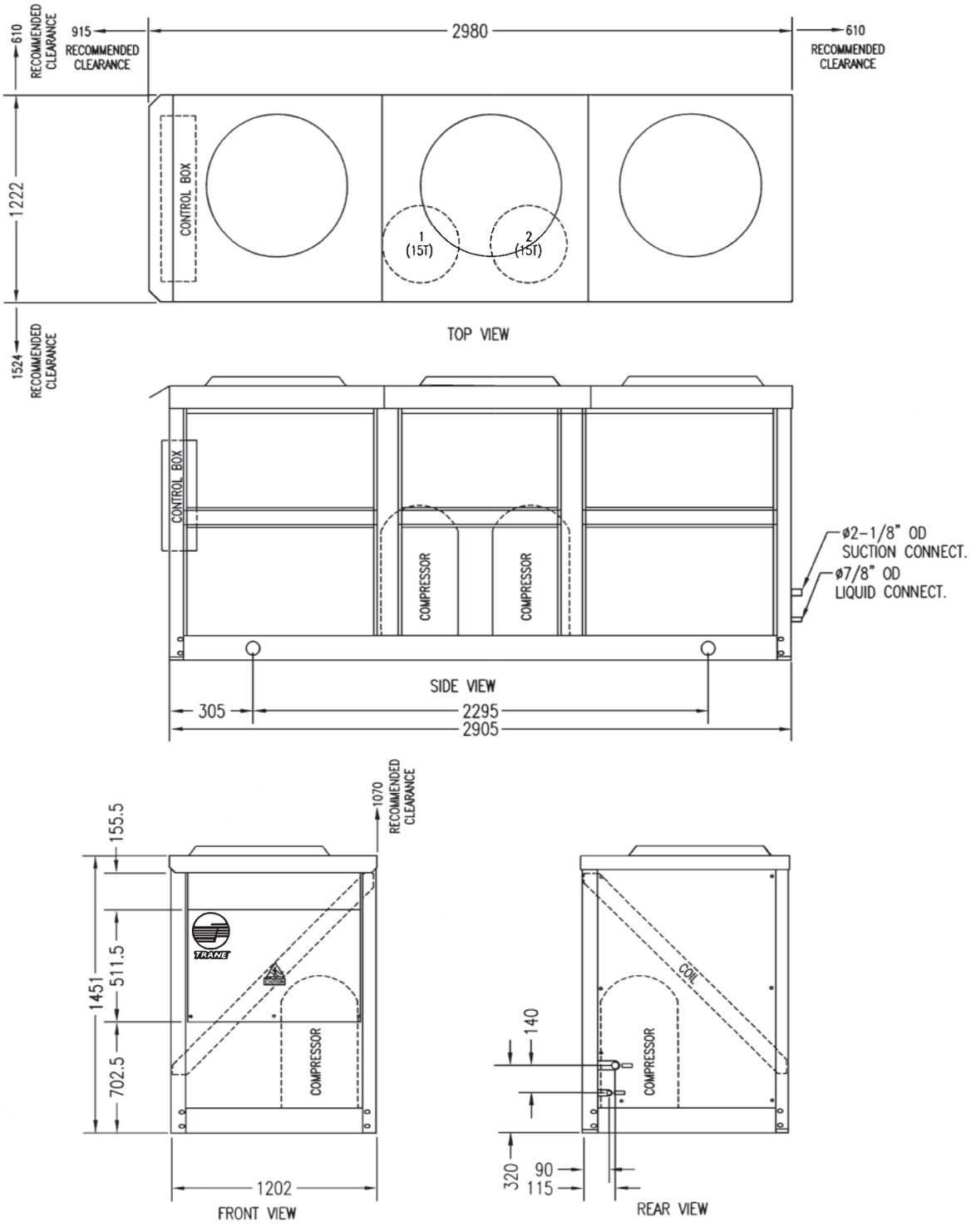
Problems and symptoms	Probable cause	Recommended action
Bubbles in sight glass.	Lack of refrigerant.	Repair leak, add refrigerant.
High pressure drop across filter-drier.	Clogged filter drier.	Replace.
No refrigerant flow through expansion valve.	Expansion valve power element has lost charge.	Replace valve power element.
Loss of capacity.	Obstructed expansion valve.	Clean or replace
Superheat too high.	Too much pressure drop in evaporator.	Check external equaliser of expansion valve.

This is by no means a complete analysis of the scroll refrigeration system. Instead, its intention is to familiarize the operator with the operation of the scroll unit and provide the background necessary for him to recognize and accurately correct or report any developing problem.

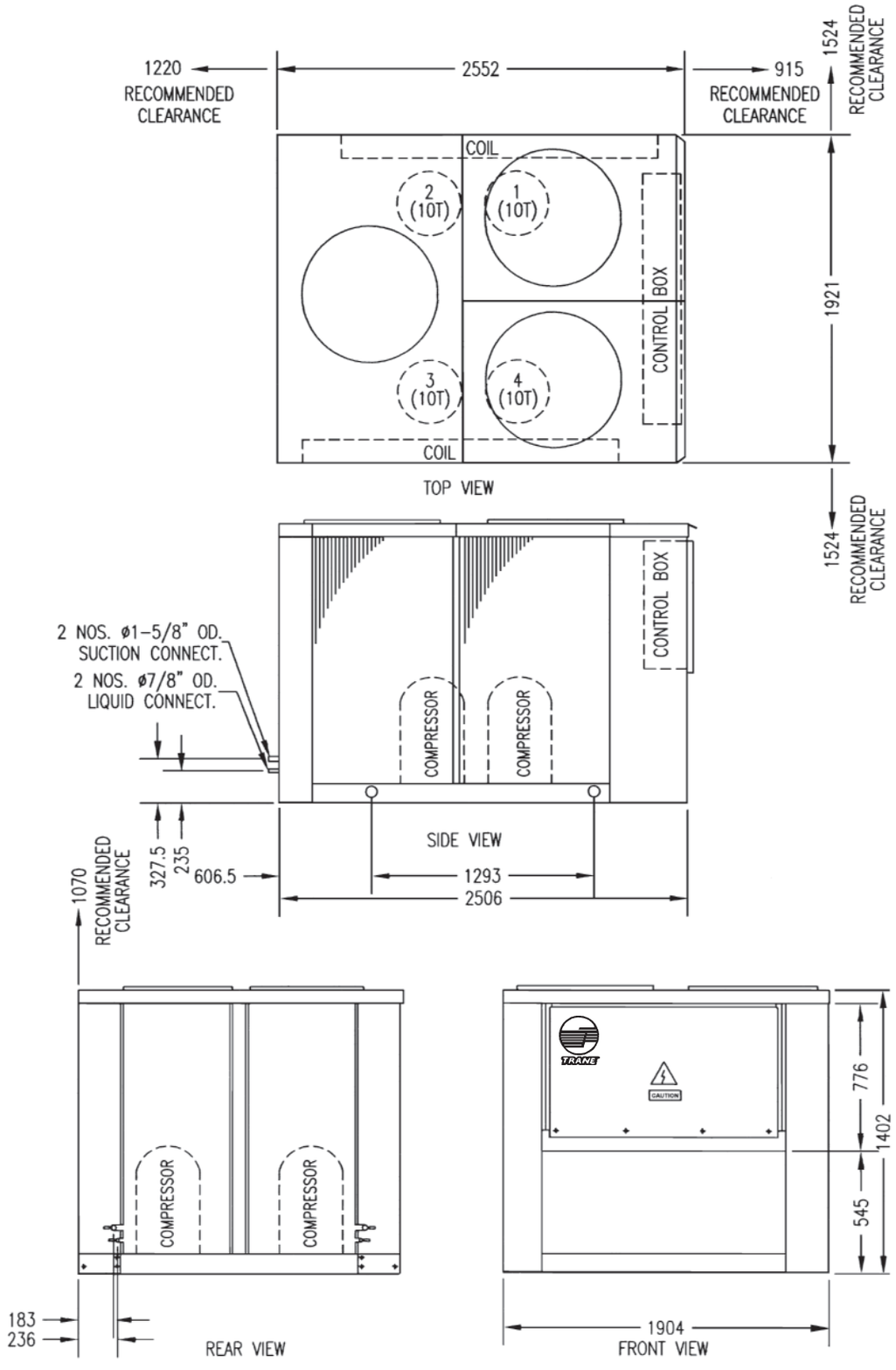
Dimensional Data
Condensing Unit RAUP 250



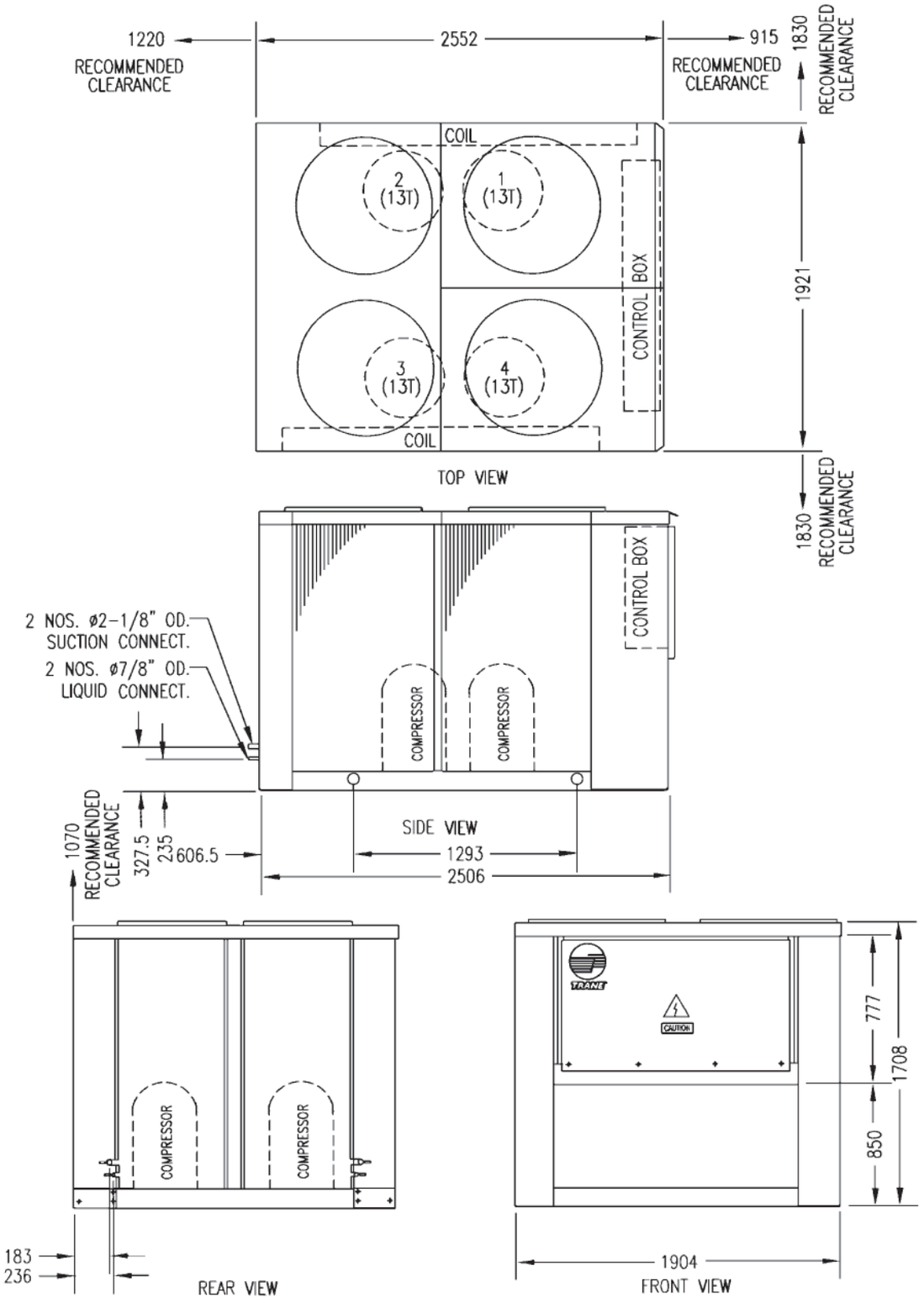
Dimensional Data
Condensing Unit RAUP 300



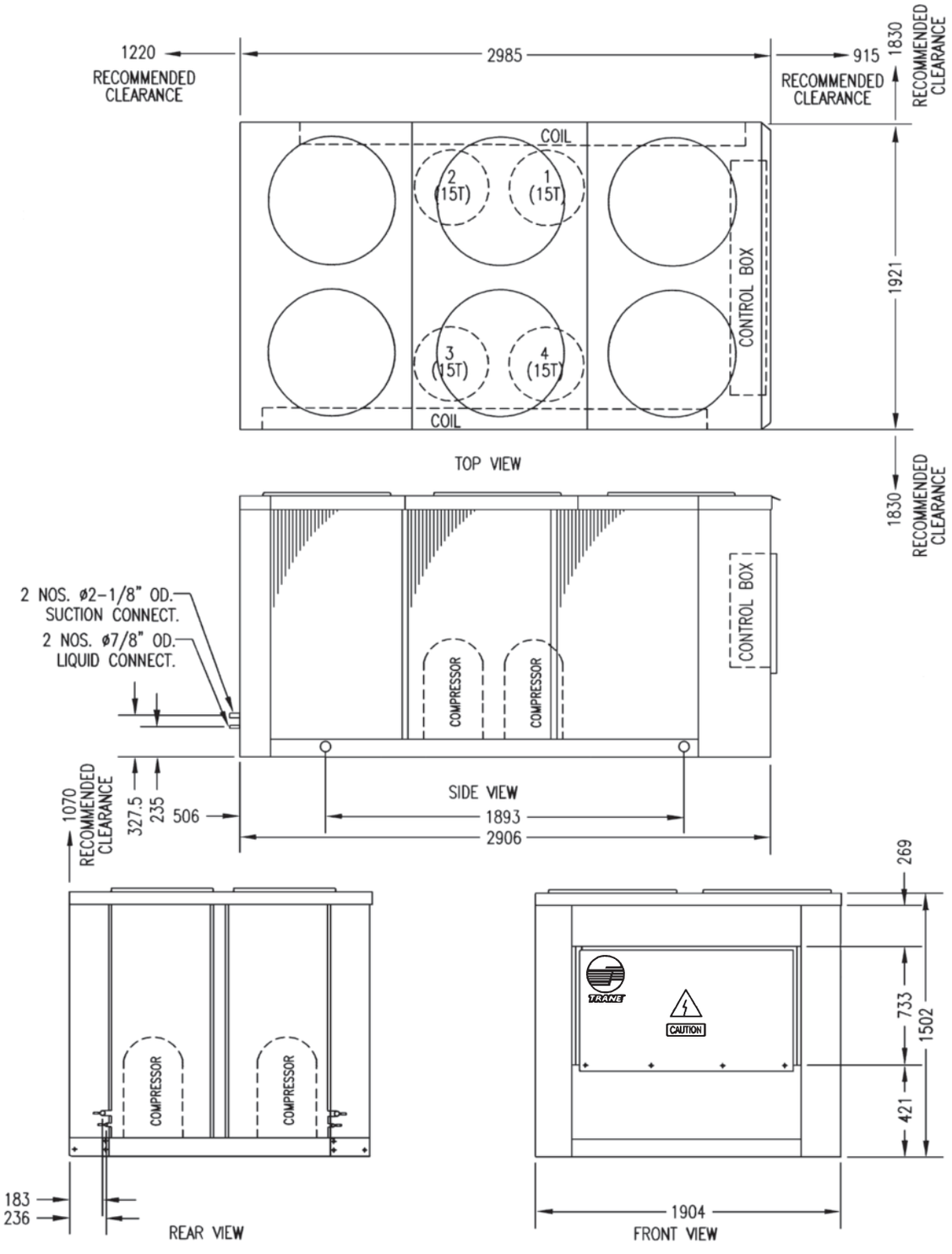
Dimensional Data
Condensing Unit RAUP 400



Dimensional Data
Condensing Unit RAUP 500



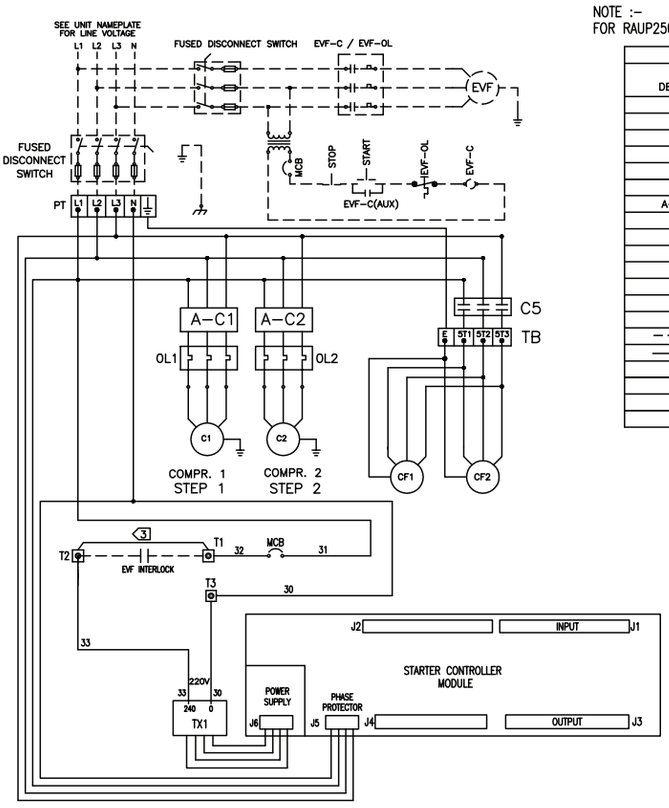
Dimensional Data
Condensing Unit RAUP 600



Schematic & Termination Diagram Micro-P

RAUP 250

SCHEMATIC&TERMINATION DIAGRAM
RAUP250 MODEL



NOTE :-
FOR RAUP250 – COMPRESSOR OVERLOAD ARE INTERNALLY PROTECTED

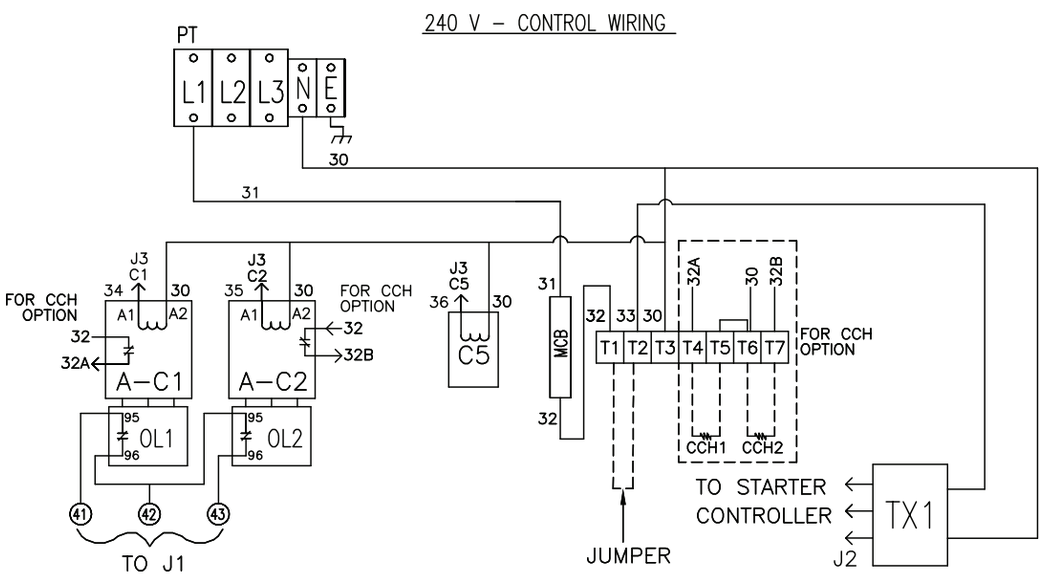
LEGEND	
DEVICE DESIGNATION	DESCRIPTION
LPCO	LOW PRESSURE CUT–OUT
HPCO	HIGH PRESSURE CUT–OUT
HMWT	HIGH MOTOR WINDING T–STAT
OL 1,2	EXTERNAL OVER LOAD, COMPRESSOR
EVF–OL	INTERNAL PROTECTOR, EVAPORATOR FAN
EVF–C	STARTER, EVAPORATOR FAN
A–C1,A–C2	STARTER, COMPRESSOR
EVF	EVAPORATOR FAN
S1	SYSTEM SWITCH
CF 1,2	FAN, CONDENSOR
MCB	CIRCUIT BREAKER
C5	STARTER, CONDENSOR FAN
PT	POWER TERMINALS
TB	BLOCK, TERMINATION
– – – – –	SUPPLIED & INSTALLED BY CUSTOMER
———	FACTORY INSTALLED
⊡	TERMINATION BLOCK, CONTROL
TX1	TRANSFORMER 240V : 24V,12V
C1,C2	COMPRESSOR
CCH	CRANKCASE HEATER

NOTES:
1 DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. PHANTOM LINE ENCLOSURES INDICATE ALTERNATE CIRCUITRY OR AVAILABLE SALES OPTIONS. SOLID LINE INDICATES FACTORY WIRING.
2 REMOVE JUMPER WHEN TEMPERATURE CONTROLLER IS INSTALLED
3 REMOVE JUMPER TO INTERFACE WITH EVF INTERLOCK

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

IMPORTANT
USE COPPER CONDUCTORS ONLY TO PREVENT EQUIPMENT DAMAGE. UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT ANY OTHER WIRING.

240 V – CONTROL WIRING

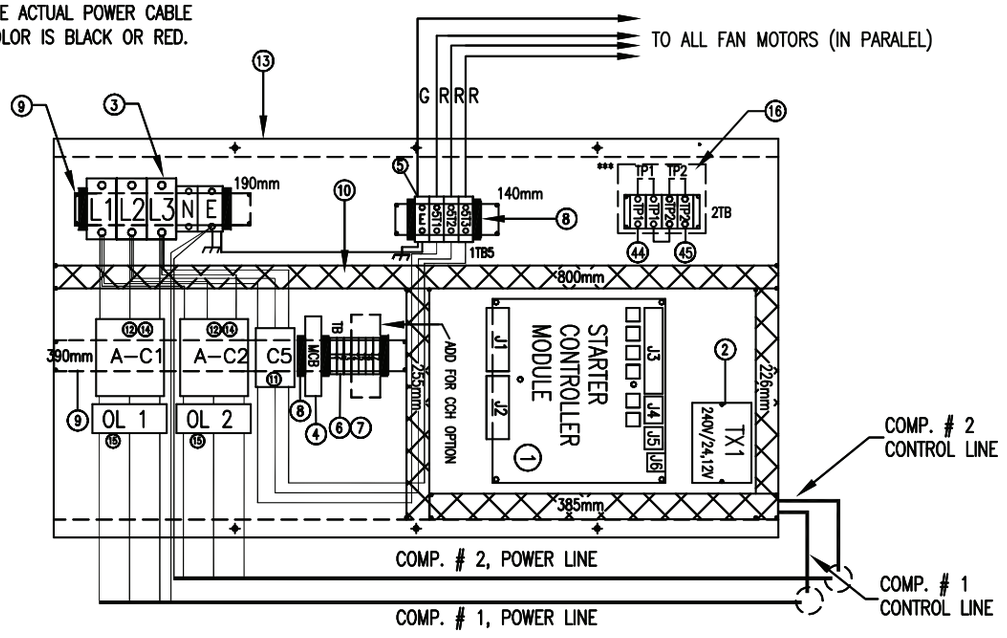


Schematic & Termination Diagram Micro-P

RAUP 250

COMPONENT LAY-OUT/POWER WIRING :-RAUP250 MODEL

POWER CABLE SHOWN IN COLOR
FOR ILLUSTRATION ONLY.
THE ACTUAL POWER CABLE
COLOR IS BLACK OR RED.



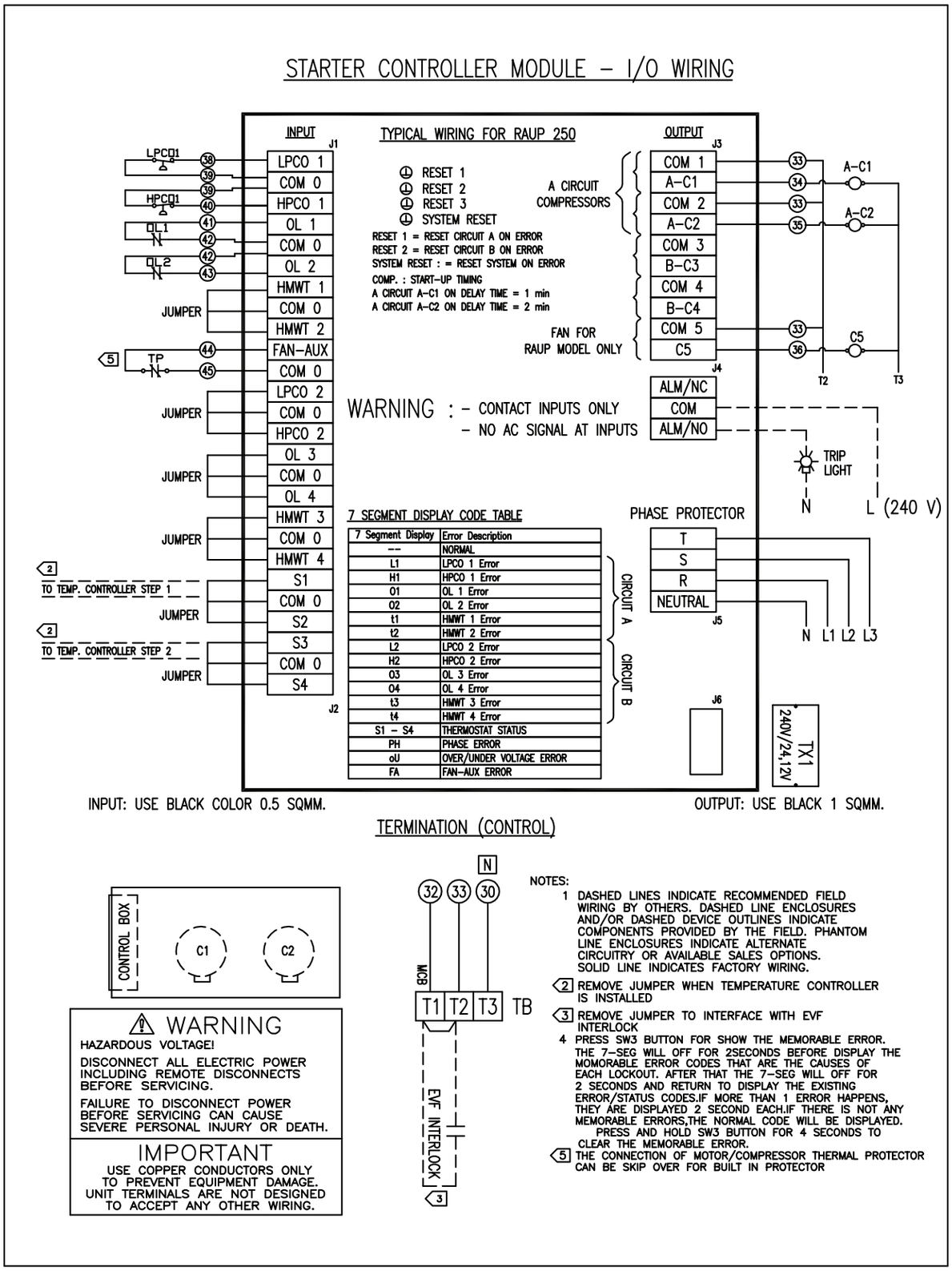
	POWER CABLE SIZE	TOTAL LENGTH
COMP #1	10 AWG	-
COMP #2	10 AWG	-

	NO.	DESCRIPTION	QTY.
	1	STARTER CONTROLLER VERSION 1.2	1
	2	TRANSFORMER 240V/24V & 12V , 30 VA	1
	3	TERMINAL BLOCK, POWER TERMINAL	3
	4	CIRCUIT BREAKER ABB , 1P (6A)	1
	5	TERMINAL BLOCK, FAN MOTOR	4
*	6	TERMINAL BLOCK , 3P	1
	7	TERMINAL END PLATE	1
	8	TERMINAL STOPPER	7
	9	TERMINAL RAIL , Total Length	700
	10	WIRE DUCT, Total Length	1666
	11	CONTACTOR FOR FAN MOTOR W/ AUXILLARY CONTACT	1
	12	CONTACTOR FOR COMPRESSSOR	2
	13	PANEL , STARTER	1
**	14	AUXILLARY CONTACTOR	2
	15	OVERLOAD CONTACTOR	2
***	16	THERMAL PROTECTOR,MOTOR	2

NOTE : * USE TERMINAL BLOCK, 7P FOR COMPRESSOR CRANKCASE HEATER OPTION
** ADD ONTO ITEM 14 FOR COMPRESSOR CRANKCASE HEATER OPTION
*** BUILT IN THERMAL PROTECTOR CAN BE SKIP OVER THEIR CONNECTION

Schematic & Termination Diagram Micro-P

RAUP 250

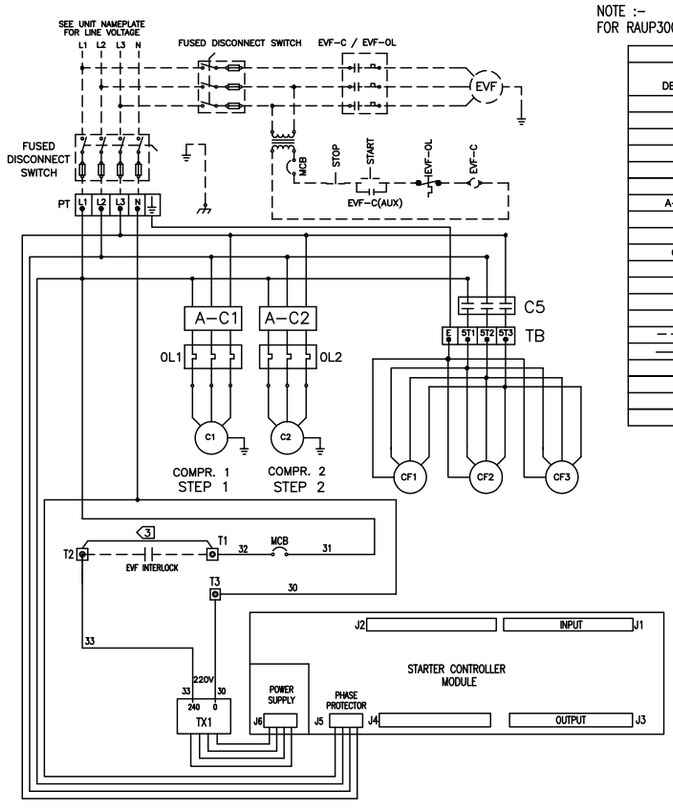


Schematic & Termination Diagram Micro-P

RAUP 300

SCHEMATIC&TERMINATION DIAGRAM

RAUP300 MODEL



NOTE :-
FOR RAUP300 – COMPRESSOR OVERLOAD ARE INTERNALLY PROTECTED

LEGEND	
DEVICE DESIGNATION	DESCRIPTION
LPCO	LOW PRESSURE CUT–OUT
HPCO	HIGH PRESSURE CUT–OUT
HMWT	HIGH MOTOR WINDING T–STAT
OL 1,2	EXTERNAL OVER LOAD, COMPRESSOR
EVF–OL	INTERNAL PROTECTOR, EVAPORATOR FAN
EVF–C	STARTER, EVAPORATOR FAN
A–C1,A–C2	STARTER, COMPRESSOR
EVF	EVAPORATOR FAN
S1	SYSTEM SWITCH
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C5	STARTER, CONDENSOR FAN
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3 REMOVE JUMPER TO INTERFACE WITH EVF INTERLOCK

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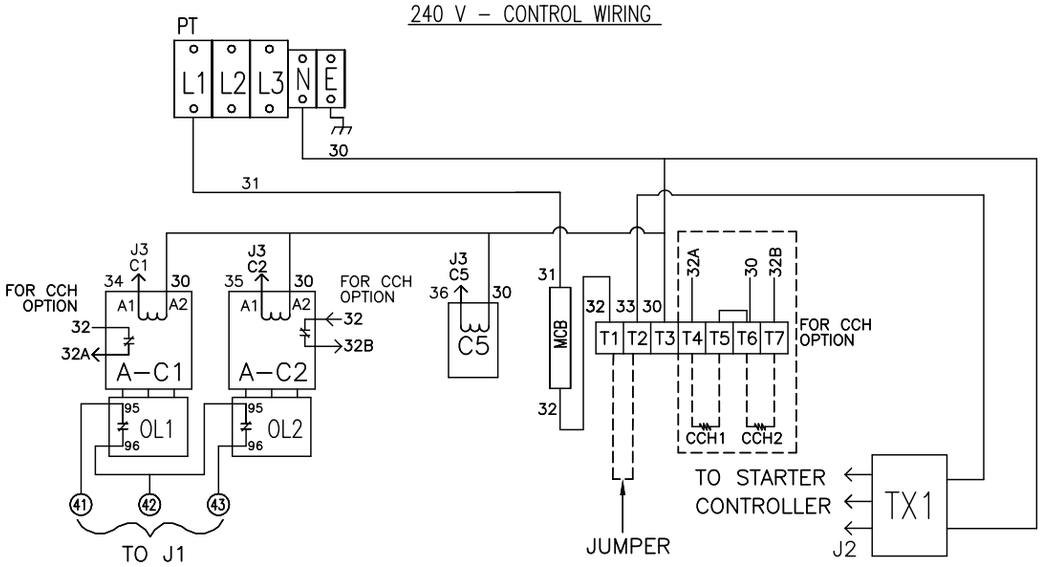
240 V – CONTROL WIRING



Schematic & Termination Diagram Micro-P

RAUP 300

COMPONENT LAY-OUT/POWER WIRING :-RAUP300 MODEL

POWER CABLE SHOWN IN COLOR
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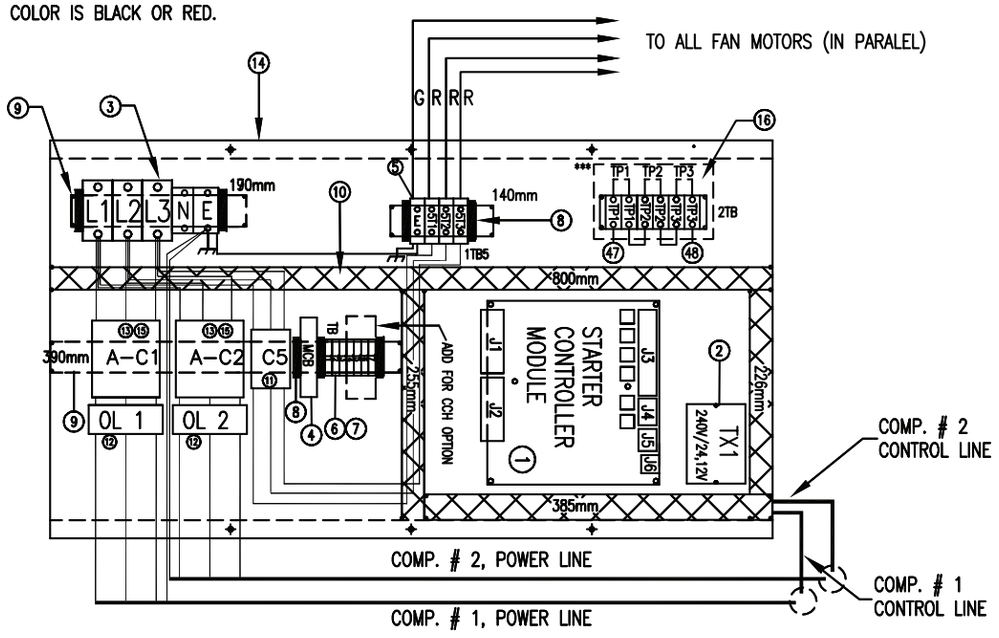
THE ACTUAL POWER CABLE
COLOR IS BLACK OR RED.



	POWER CABLE SIZE	TOTAL LENGTH
COMP #1	10 AWG	-
COMP #2	10 AWG	-

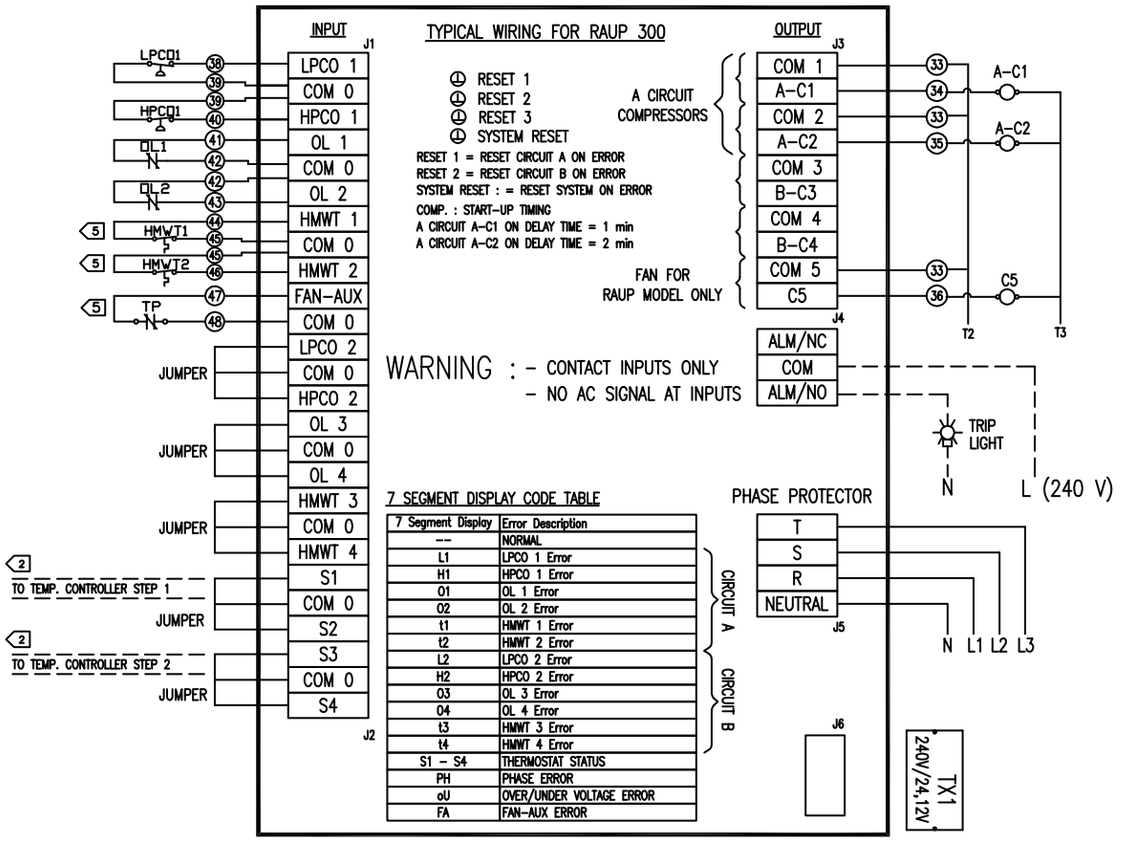
	NO.	DESCRIPTION	QTY.
	1	STARTER CONTROLLER VERSION 1.1	1
	2	TRANSFORMER 220V/24V & 12V , 30 VA	1
	3	TERMINAL BLOCK, POWER TERMINAL	3
	4	CIRCUIT BREAKER ABB , 1P (6A)	1
	5	TERMINAL BLOCK, FAN MOTOR	4
*	6	TERMINAL BLOCK , 3P	3
	7	TERMINAL END PLATE	1
	8	TERMINAL STOPPER	7
	9	TERMINAL RAIL , Total Length	700
	10	PVC TRUNKING 1" , Total Length	1666
	11	CONTACTOR , FAN	1
	12	OVERLOAD CONTACTOR	2
	13	CONTACTOR FOR COMPRESSOR	2
	14	PANEL , STARTER	1
**	15	AUXILLARY CONTACTOR	2
***	16	THERMAL PROTECTOR,MOTOR	3

NOTE : * USE TERMINAL BLOCK, 7P FOR COMPRESSOR CRANKCASE HEATER OPTION
** ADD ONTO ITEM 15 FOR COMPRESSOR CRANKCASE HEATER OPTION
*** BUILT IN THERMAL PROTECTOR CAN BE SKIP OVER THEIR CONNECTION

Schematic & Termination Diagram Micro-P

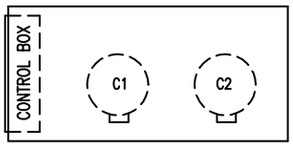
RAUP 300

STARTER CONTROLLER MODULE – I/O WIRING



INPUT: USE BLACK COLOR 0.5 SQMM.

OUTPUT: USE BLACK 1 SQMM.



⚠ WARNING

HAZARDOUS VOLTAGE!

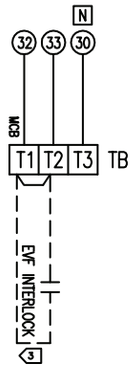
DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

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

IMPORTANT

USE COPPER CONDUCTORS ONLY TO PREVENT EQUIPMENT DAMAGE. UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT ANY OTHER WIRING.

TERMINATION (CONTROL)

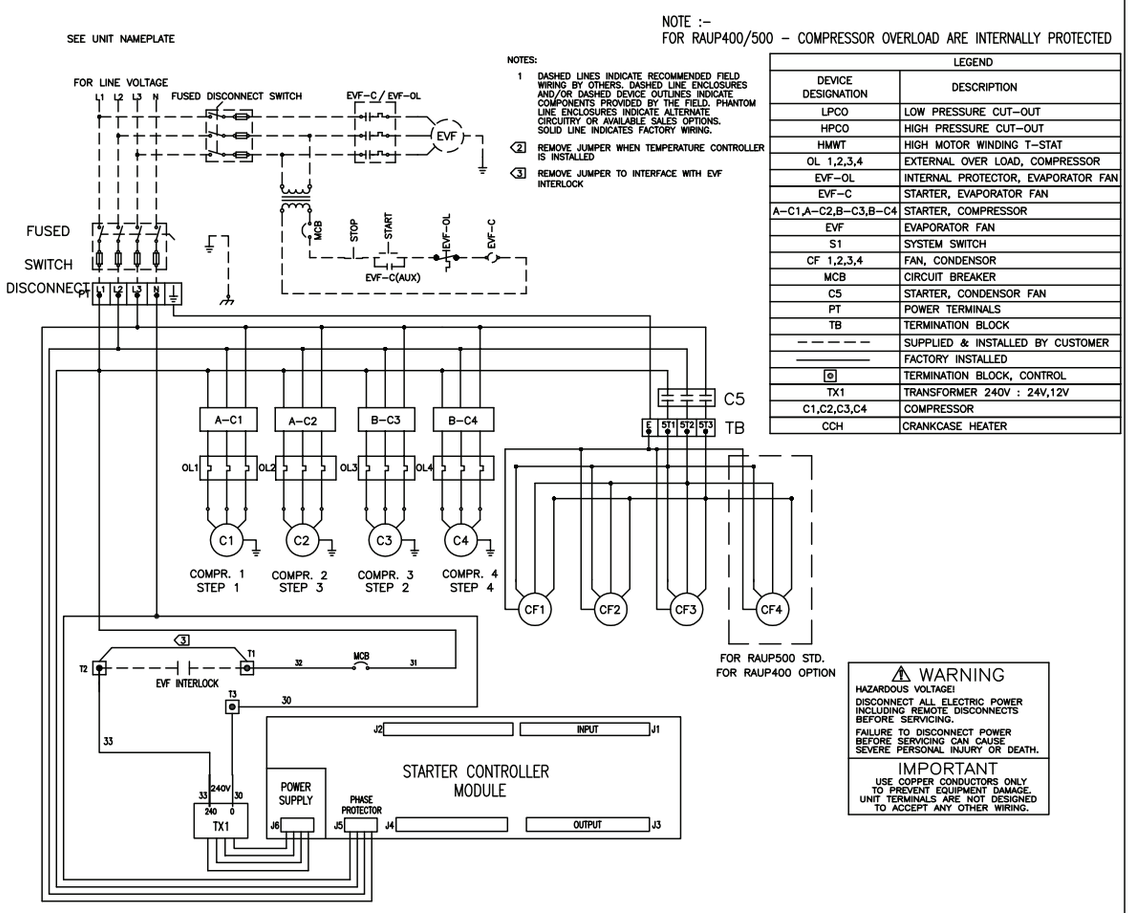


NOTES:

1. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. PHANTOM LINE ENCLOSURES INDICATE ALTERNATE CIRCUITRY OR AVAILABLE SALES OPTIONS. SOLID LINE INDICATES FACTORY WIRING.
2. REMOVE JUMPER WHEN TEMPERATURE CONTROLLER IS INSTALLED
3. REMOVE JUMPER TO INTERFACE WITH EVF INTERLOCK
4. PRESS SW3 BUTTON FOR SHOW THE MEMORABLE ERROR. THE 7–SEG WILL OFF FOR 2SECONDS BEFORE DISPLAY THE MOMORABLE ERROR CODES THAT ARE THE CAUSES OF EACH LOCKOUT. AFTER THAT THE 7–SEG WILL OFF FOR 2 SECONDS AND RETURN TO DISPLAY THE EXISTING ERROR/STATUS CODES.IF MORE THAN 1 ERROR HAPPENS, THEY ARE DISPLAYED 2 SECOND EACH.IF THERE IS NOT ANY MEMORABLE ERRORS,THE NORMAL CODE WILL BE DISPLAYED. PRESS AND HOLD SW3 BUTTON FOR 4 SECONDS TO CLEAR THE MEMORABLE ERROR.
5. THE CONNECTOR OF MOTOR/COMPRESSOR THERMAL PROTECTOR CAN BE SKIP OVER FOR BUILT IN PROTECTOR.

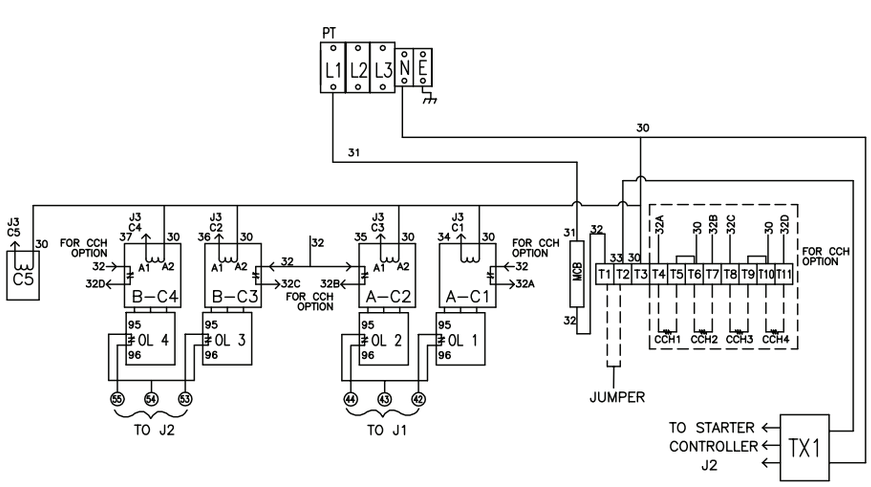
Schematic & Termination Diagram Micro-P RAUP 400-500

SCHEMATIC&TERMINATION DIAGRAM
RAUP400/500 MODEL



LEGEND	
DEVICE DESIGNATION	DESCRIPTION
LPCO	LOW PRESSURE CUT–OUT
HPCO	HIGH PRESSURE CUT–OUT
HMWT	HIGH MOTOR WINDING T–STAT
OL 1,2,3,4	EXTERNAL OVER LOAD, COMPRESSOR
EVF–OL	INTERNAL PROTECTOR, EVAPORATOR FAN
EVF–C	STARTER, EVAPORATOR FAN
A–C1,A–C2,B–C3,B–C4	STARTER, COMPRESSOR
EVF	EVAPORATOR FAN
S1	SYSTEM SWITCH
CF 1,2,3,4	FAN, CONDENSOR
MCB	CIRCUIT BREAKER
C5	STARTER, CONDENSOR FAN
PT	POWER TERMINALS
TB	TERMINATION BLOCK
– – – – –	SUPPLIED & INSTALLED BY CUSTOMER
———	FACTORY INSTALLED
⊙	TERMINATION BLOCK, CONTROL
TX1	TRANSFORMER 240V : 24V,12V
C1,C2,C3,C4	COMPRESSOR
CCH	CRANKCASE HEATER

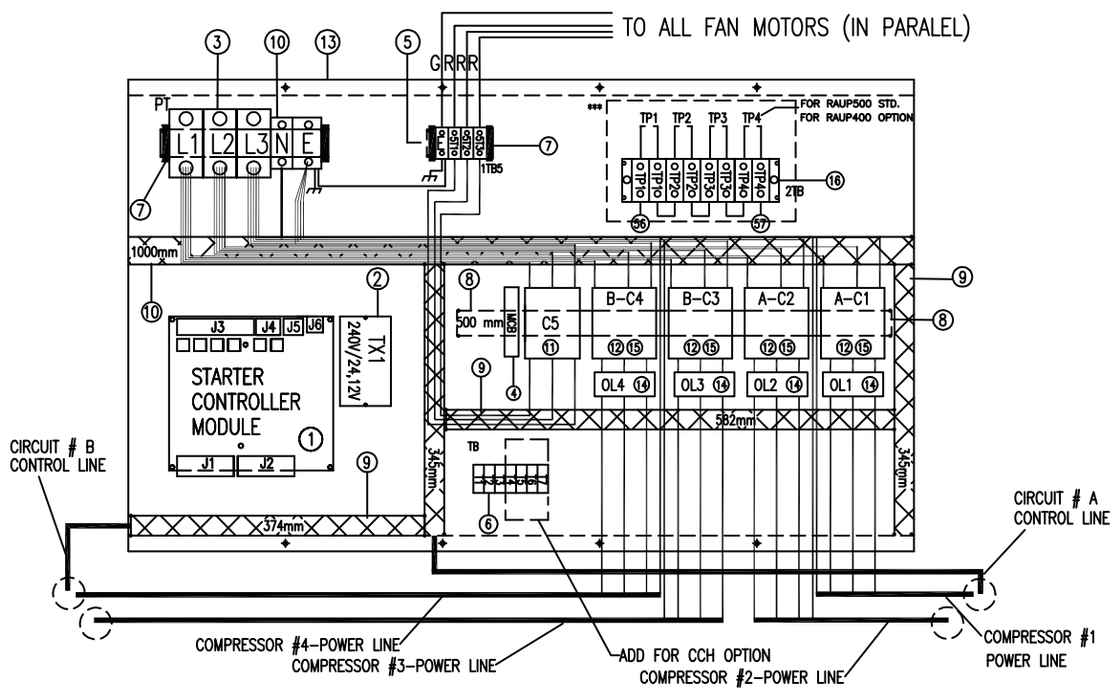
240 V – CONTROL WIRING



Schematic & Termination Diagram Micro-P RAUP 400-500

COMPONENT LAY-OUT/POWER WIRING :-RAUP400/500 MODEL

POWER CABLES SHOWN IN COLOR
FOR ILLUSTRATION ONLY.
THE ACTUAL POWER CABLE
COLOR IS BLACK OR RED.

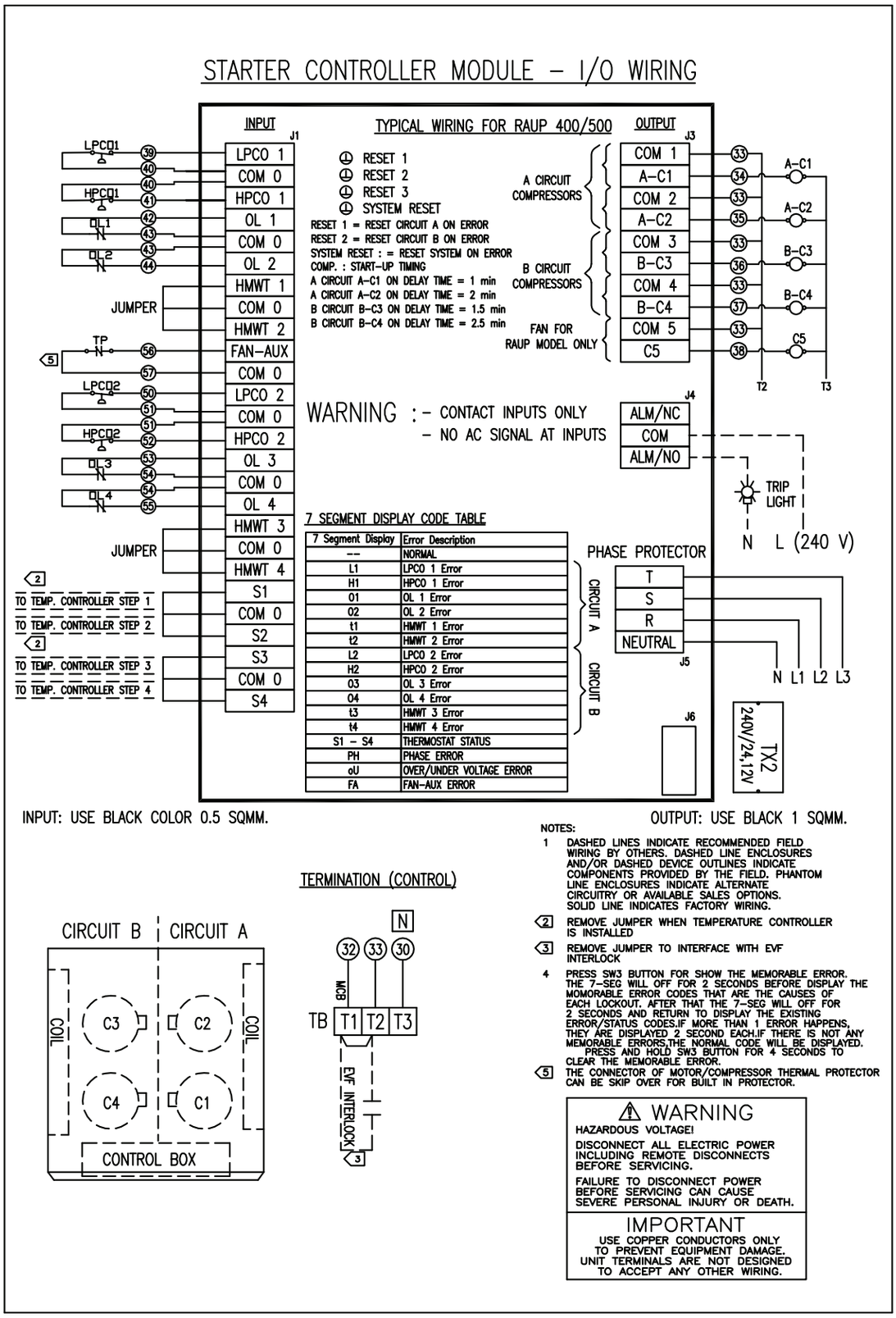


	POWER CABLE SIZE	TOTAL LENGTH
COMP #1	10 AWG	-
COMP #2	10 AWG	-
COMP #3	10 AWG	-
COMP #4	10 AWG	-

	NO.	DESCRIPTION	QTY.
	1	STARTER CONTROLLER	1
	2	TRANSFORMER 240V/24V & 12V ; 30 VA	1
	3	TERMINAL BLOCK , POWER	3
	4	CIRCUIT BREAKER ABB , 1P , (6A)	1
	5	TERMINAL BLOCK , FAN MOTOR	4
*	6	TERMINAL BLOCK , 3P	1
	7	TERMINAL STOPPER	4
	8	DIN RAIL FOR MAGNETIC, Total Length	516
	9	WIRE DUCT , Total Length	2646
	10	TERMINAL BLOCK, N E	2
	11	CONTACTOR FOR FAN MOTOR WITH AUXILLARY CONTACT	1
	12	CONTACTOR FOR COMPRESSOR	4
	13	PANEL , STARTER	1
	14	OVERLOAD CONTACTOR	4
**	15	AUXILLARY CONTACTOR	4
***	16	THERMAL PROTECTOR ,MOTOR	4

NOTE : * USE TERMINAL BLOCK, 7P FOR COMPRESSOR CRANKCASE HEATER OPTION
** ADD ONTO ITEM 15 FOR COMPRESSOR CRANKCASE HEATER OPTION
*** BUILT IN THERMAL PROTECTOR CAN BE SKIP OVER THEIR CONNECTION

Schematic & Termination Diagram Micro-P RAUP 400-500



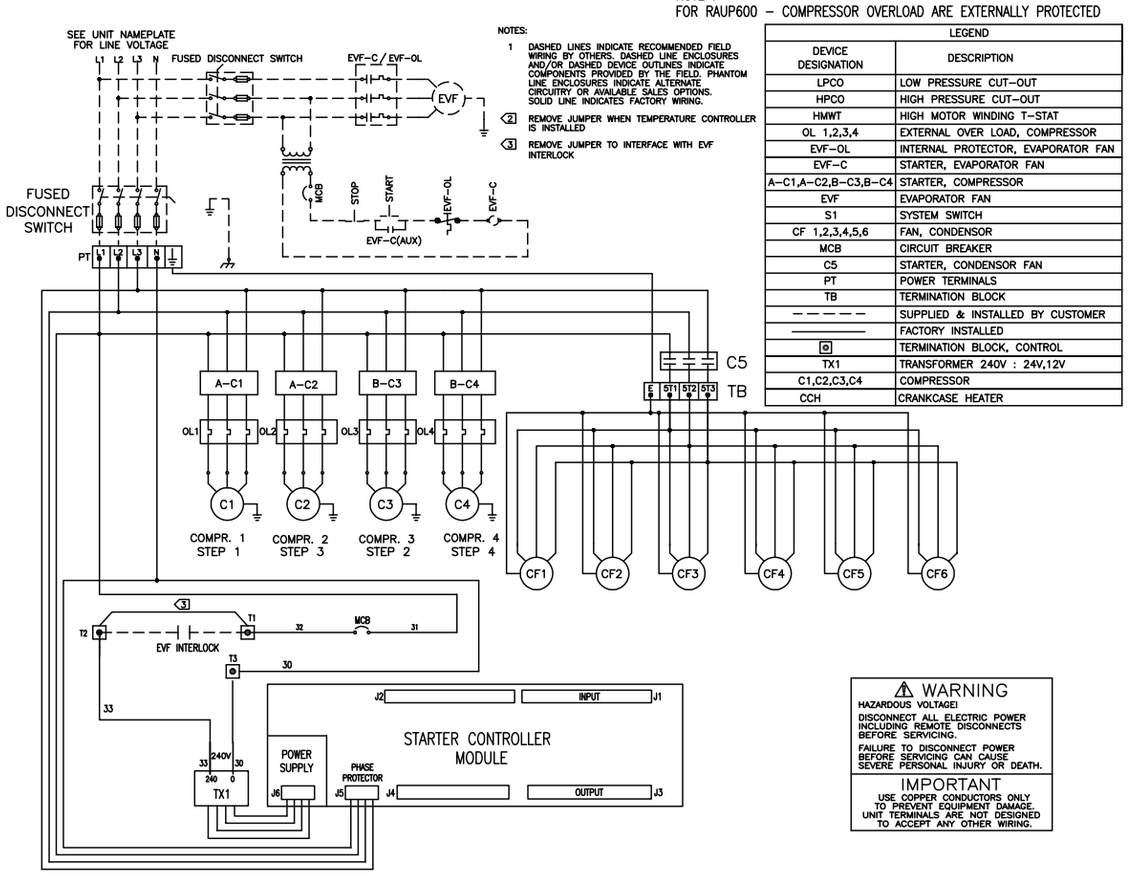
Schematic & Termination Diagram Micro-P

RAUP 600

SCHEMATIC&TERMINATION DIAGRAM

RAUP600 MODEL

NOTE :-
FOR RAUP600 – COMPRESSOR OVERLOAD ARE EXTERNALLY PROTECTED



NOTES:

1. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. PHANTOM LINE ENCLOSURES INDICATE ALTERNATE CIRCUITRY OR AVAILABLE SALES OPTIONS. SOLID LINE INDICATES FACTORY WIRING.
2. REMOVE JUMPER WHEN TEMPERATURE CONTROLLER IS INSTALLED
3. REMOVE JUMPER TO INTERFACE WITH EVF INTERLOCK

LEGEND	
DEVICE DESIGNATION	DESCRIPTION
LPCO	LOW PRESSURE CUT–OUT
HPCO	HIGH PRESSURE CUT–OUT
HMWT	HIGH MOTOR WINDING T–STAT
OL 1,2,3,4	EXTERNAL OVER LOAD, COMPRESSOR
EVF–OL	INTERNAL PROTECTOR, EVAPORATOR FAN
EVF–C	STARTER, EVAPORATOR FAN
A–C1,A–C2,B–C3,B–C4	STARTER, COMPRESSOR
EVF	EVAPORATOR FAN
S1	SYSTEM SWITCH
CF 1,2,3,4,5,6	FAN, CONDENSOR
MCB	CIRCUIT BREAKER
C5	STARTER, CONDENSOR FAN
PT	POWER TERMINALS
TB	TERMINATION BLOCK
– – – – –	SUPPLIED & INSTALLED BY CUSTOMER
———	FACTORY INSTALLED
▣	TERMINATION BLOCK, CONTROL
TX1	TRANSFORMER 240V : 24V,12V
C1,C2,C3,C4	COMPRESSOR
CCH	CRANKCASE HEATER

⚠ WARNING

HAZARDOUS VOLTAGE!

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IMPORTANT

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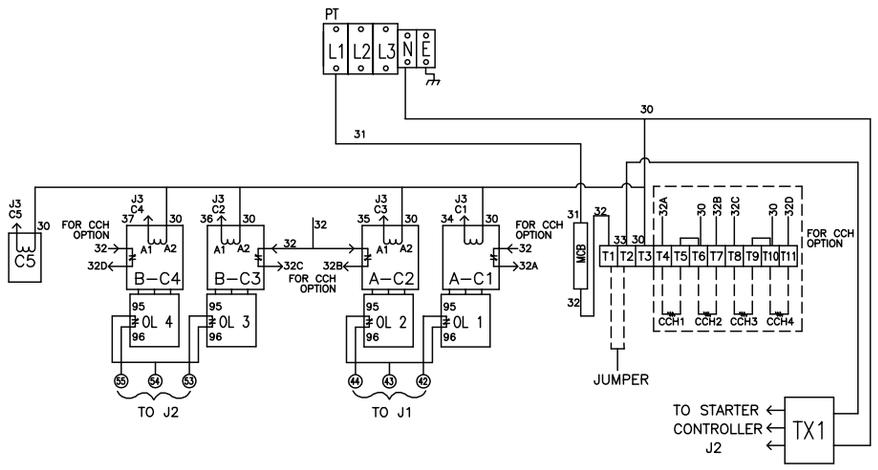
240 V – CONTROL WIRING



Schematic & Termination Diagram Micro-P

RAUP 600

COMPONENT LAY-OUT/POWER WIRING :-RAUP600 MODEL

POWER CABLES SHOWN IN COLOR
FOR ILLUSTRATION ONLY.
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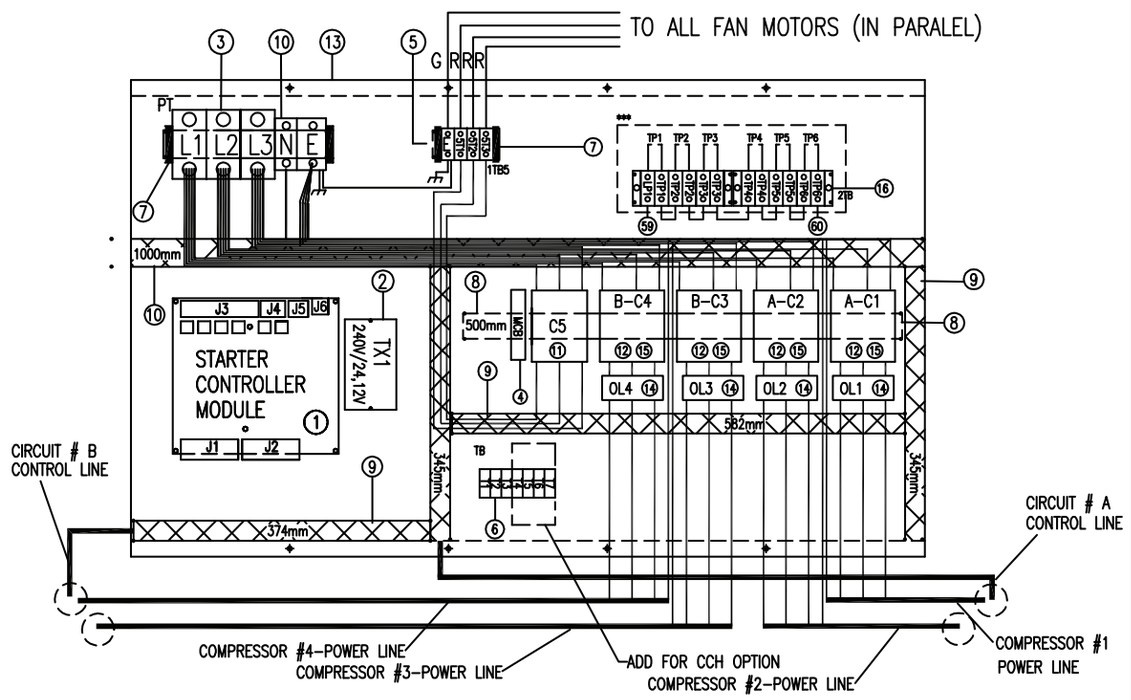
COLOR IS BLACK OR RED.



	POWER CABLE SIZE	TOTAL LENGTH
COMP #1	10 AWG	-
COMP #2	10 AWG	-
COMP #3	10 AWG	-
COMP #4	10 AWG	-

	NO.	DESCRIPTION	QTY.
	1	STARTER CONTROLLER	1
	2	TRANSFORMER 240V/24V & 12V ; 30 VA	1
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	12	CONTACTOR FOR COMPRESSOR	4
	13	PANEL , STARTER	1
	14	OVERLOAD CONTACTOR	4
**	15	AUXILLARY CONTACTOR	4
***	16	THERMAL PROTECTOR,MOTOR	6

NOTE :* USE TERMINAL BLOCK, 7P FOR COMPRESSOR CRANKCASE HEATER OPTION
** ADD ONTO ITEM 15 FOR COMPRESSOR CRANKCASE HEATER OPTION
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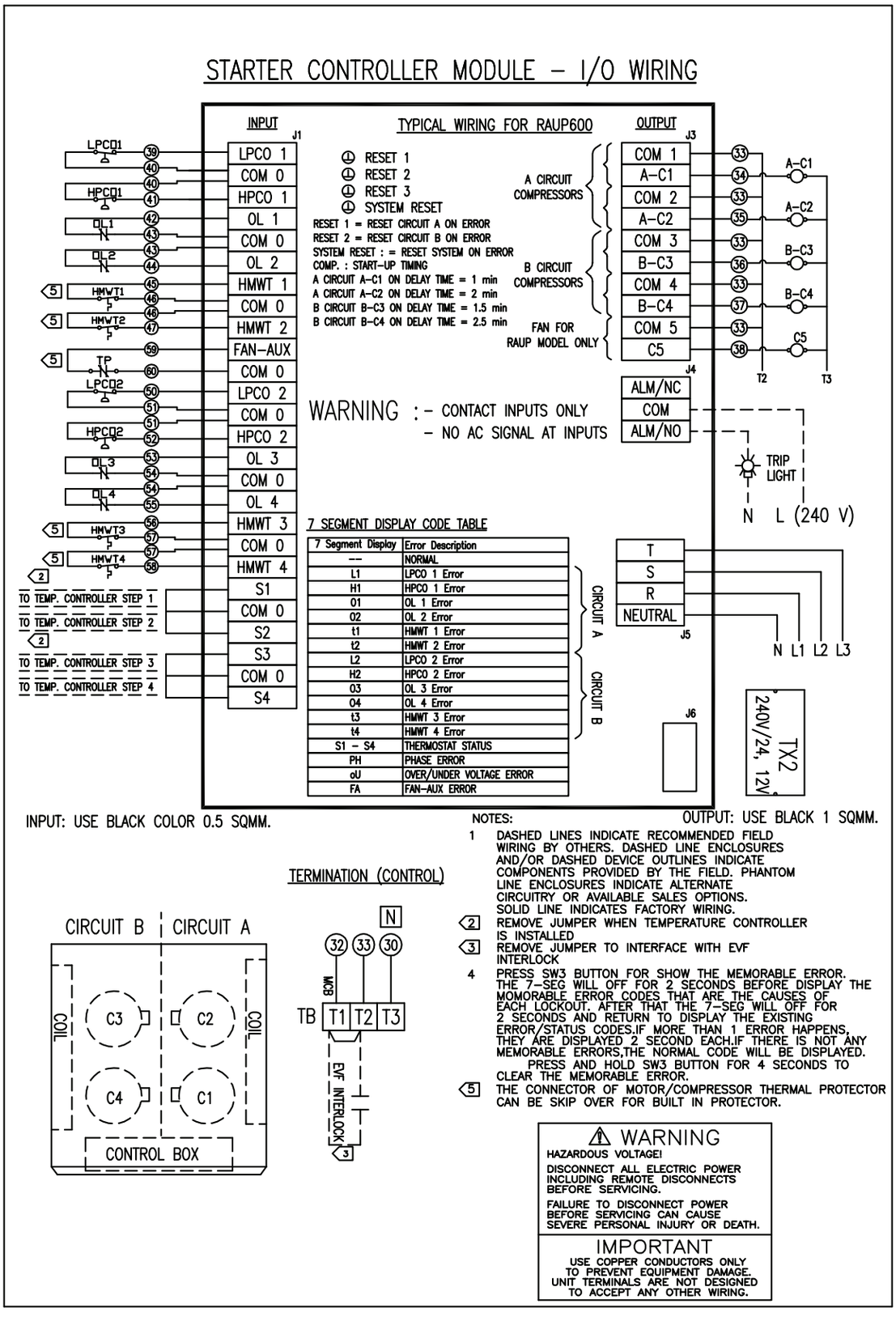
Schematic & Termination Diagram Micro-P

RAUP 600



NOTES:

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2 REMOVE JUMPER WHEN TEMPERATURE CONTROLLER IS INSTALLED

3 REMOVE JUMPER TO INTERFACE WITH EVF INTERLOCK

4 PRESS SW3 BUTTON FOR SHOW THE MEMORABLE ERROR. THE 7–SEG WILL OFF FOR 2 SECONDS BEFORE DISPLAY THE MOMORABLE ERROR CODES THAT ARE THE CAUSES OF EACH LOCKOUT. AFTER THAT THE 7–SEG WILL OFF FOR 2 SECONDS AND RETURN TO DISPLAY THE EXISTING ERROR/STATUS CODES.IF MORE THAN 1 ERROR HAPPENS, THEY ARE DISPLAYED 2 SECOND EACH.IF THERE IS NOT ANY MEMORABLE ERRORS,THE NORMAL CODE WILL BE DISPLAYED. PRESS AND HOLD SW3 BUTTON FOR 4 SECONDS TO CLEAR THE MEMORABLE ERROR.

5 THE CONNECTOR OF MOTOR/COMPRESSOR THERMAL PROTECTOR CAN BE SKIP OVER FOR BUILT IN PROTECTOR.

⚠ WARNING

HAZARDOUS VOLTAGE!

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IMPORTANT

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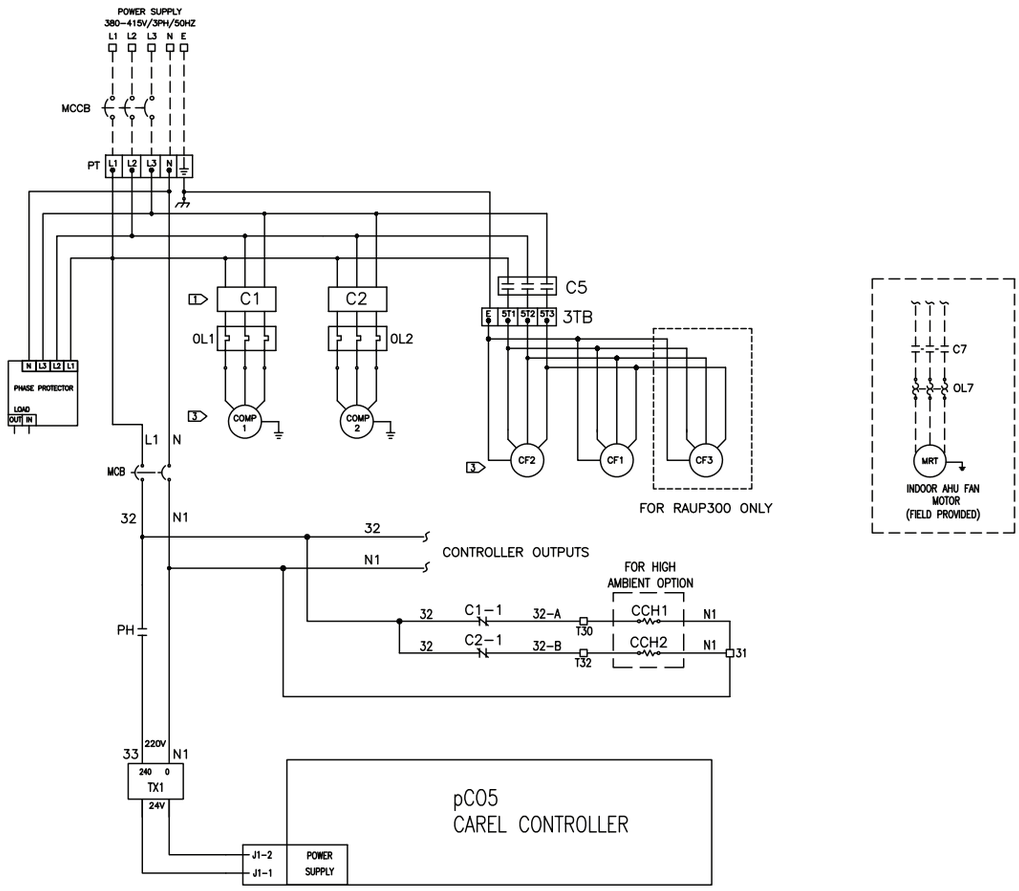
Schematic & Termination Diagram CAREL pCO5 RAUP 250/300

SCHEMATIC&TERMINATION DIAGRAM :-RAUP250/300



NOTE :-
FOR RAUP250/300 - COMPRESSOR OVERLOAD ARE INTERNALLY PROTECTED

LEGEND	
DEVICE DESIGNATION	DESCRIPTION
C1,C2	CONTACTOR, for COMPRESSOR #
C5	CONTACTOR, for CONDENSER FAN #
C7	CONTACTOR, for INDOOR AHU FAN MOTOR
CCH #	CRANKCASE HEATER for COMPRESSOR #
CDS	CONDENSER
CF	CONDENSER FAN #
COMP	COMPRESSOR #
AFS	AIR FLOW SWITCH
HMWT	HIGH MOTOR WINDING THERMOSTAT #
HPCO	HIGH PRESSURE CUT-OUT #
IAT	INLET AIR TEMPERATURE (ROOM TEMP)
LPCO	LOW PRESSURE CUT-OUT #
MCB	MINIATURE CIRCUIT BREAKER
pCO3	CAREL CONTROLLER, pCO5
OL	OVERLOAD RELAY, for COMPRESSOR #
OAT	OUTLET AIR TEMPERATURE (FAN OUTLET TEMP)
PT	POWER TERMINAL
PH	PHASE SEQUENCE / REVERSAL RELAY
R	CONTROL RELAY
TB	TERMINAL BLOCK
TX1	SWITCHING POWER SUPPLY 220-240V:24V
SLV	SOLENOID VALVE
□	TERMINATION BLOCK, CONTROL
- - - - -	SUPPLIED & INSTALLED BY CUSTOMER
———	FACTORY INSTALLED

NOTES:

1. COMPRESSOR STARTER
2. REMOVE JUMPER TO INSTALL EXTERNAL CONTROL DEVICE, IF EXIST.
3. COMPRESSOR AND CF MOTOR ARE INTERNALLY PROTECTED.
4. REQUIRED TEMP INPUT (CAREL NTC THERMISTOR) IF th-TUNE WALL MOUNT SENSOR IS NOT USED.
5. TO MEASURE AHU FAN OUTLET TEMPERATURE.

⚠ WARNING

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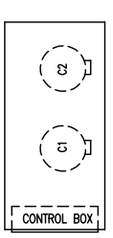
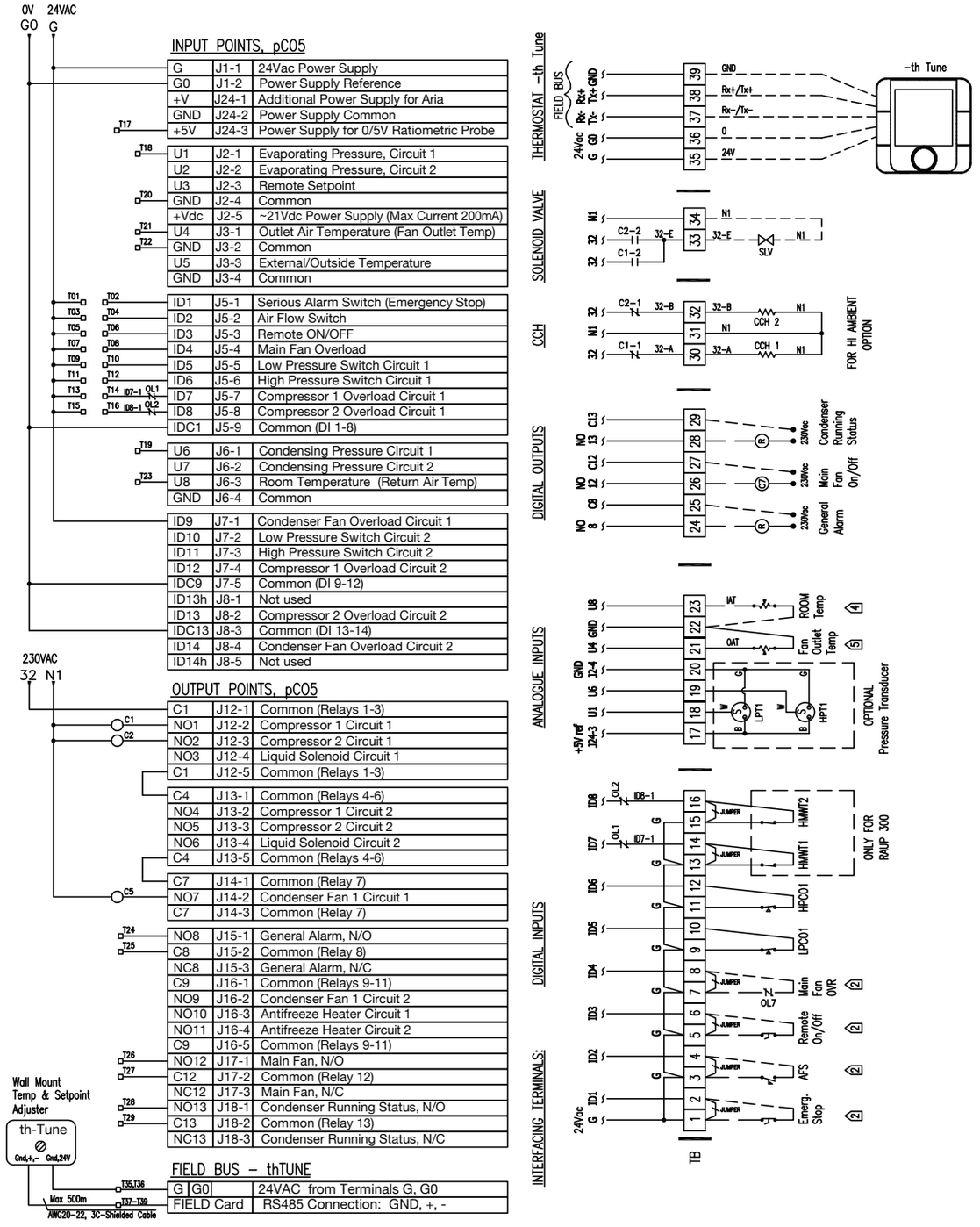
COMPRESSOR LAYOUT



Schematic & Termination Diagram CAREL pCO5 RAUP 250/300

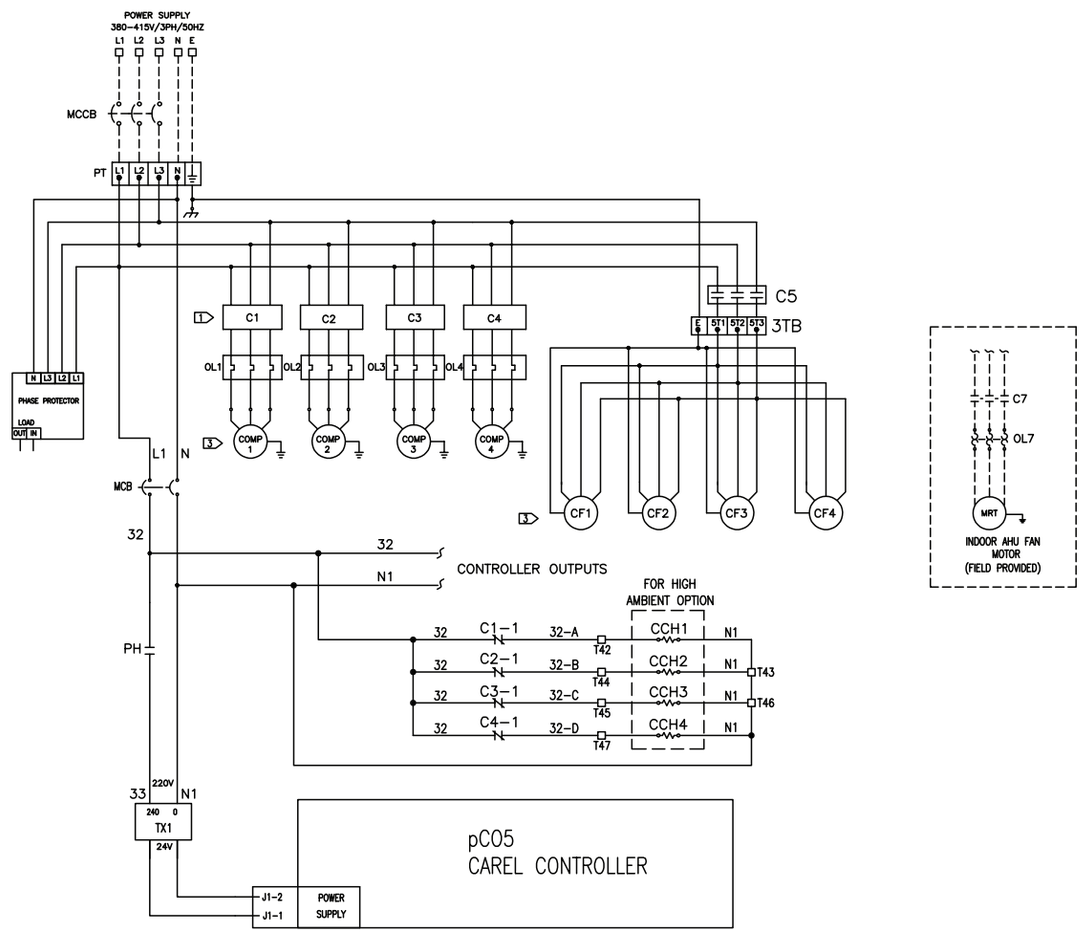
STARTER CONTROLLER MODULE – I/O WIRING :–RAUP250/300

WITH CAREL pCO5 CONTROLLER



Schematic & Termination Diagram CAREL pCO5 RAUP 400/500

SCHEMATIC&TERMINATION DIAGRAM :–RAUP400/500



NOTE :–
FOR RAUP400/500 – COMPRESSOR OVERLOAD ARE INTERNALLY PROTECTED

LEGEND	
DEVICE DESIGNATION	DESCRIPTION
C1,C2,C3,C4	CONTACTOR, for COMPRESSOR #
C5	CONTACTOR, for CONDENSER FAN #
C7	CONTACTOR, for INDOOR AHU FAN MOTOR
CCH #	CRANKCASE HEATER for COMPRESSOR #
CDS	CONDENSER
CF	CONDENSER FAN #
COMP	COMPRESSOR #
AFS	AIR FLOW SWITCH
HMWT	HIGH MOTOR WINDING THERMOSTAT #
HPCO	HIGH PRESSURE CUT–OUT #
IAT	INLET AIR TEMPERATURE (ROOM TEMP)
LPCO	LOW PRESSURE CUT–OUT #
MCB	MINIATURE CIRCUIT BREAKER
pCO3	CAREL CONTROLLER, pCO5
OL	OVERLOAD RELAY, for COMPRESSOR #
OAT	OUTLET AIR TEMPERATURE (FAN OUTLET TEMP)
PT	POWER TERMINAL
PH	PHASE SEQUENCE / REVERSAL RELAY
R	CONTROL RELAY
TB	TERMINAL BLOCK
TX1	SWITCHING POWER SUPPLY 220–240V:24V
SLV	SOLENOID VALVE
□	TERMINATION BLOCK, CONTROL
– – – – – –	SUPPLIED & INSTALLED BY CUSTOMER
———	FACTORY INSTALLED

NOTES:

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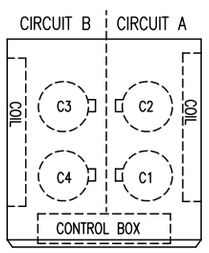
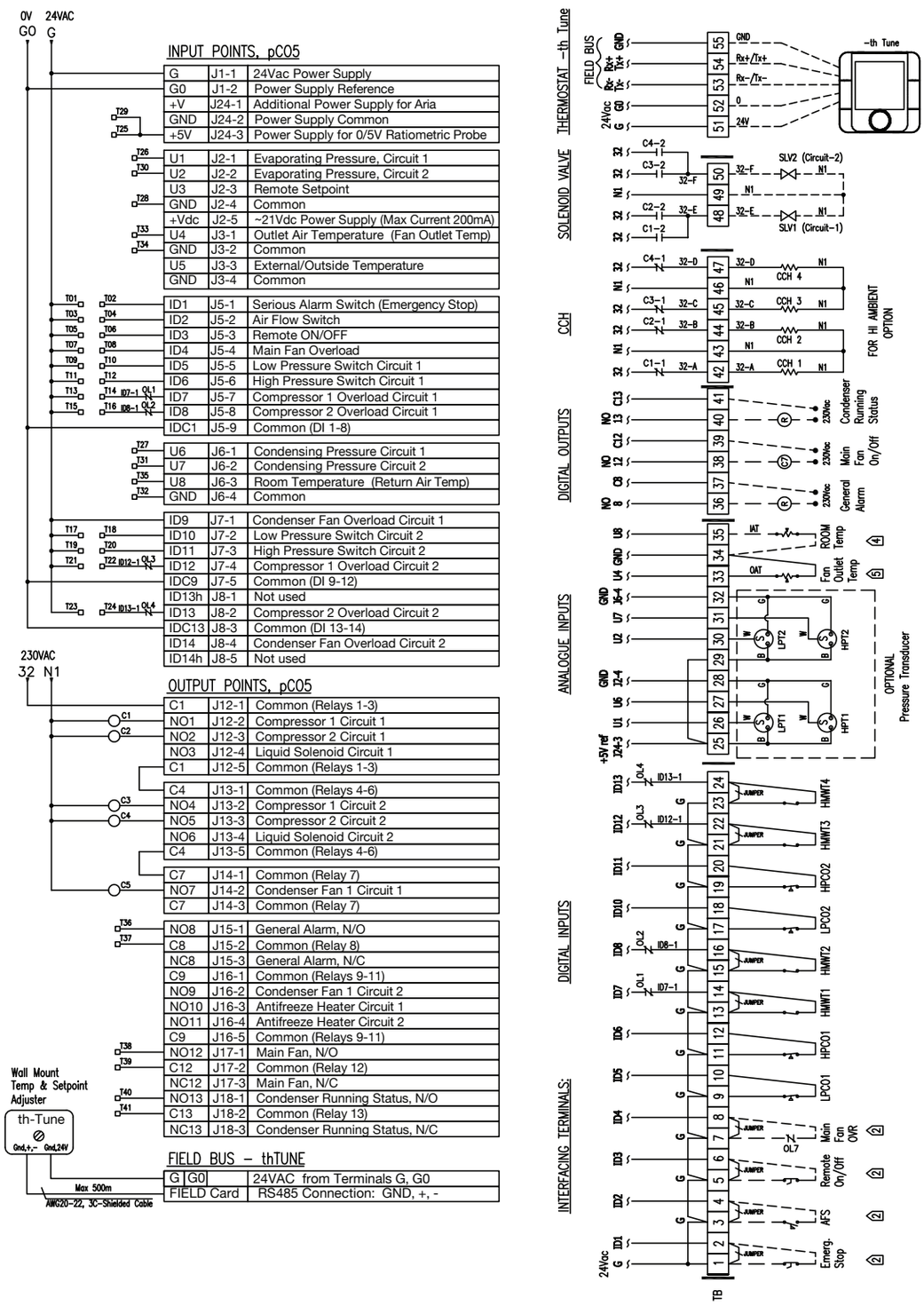
COMPRESSOR LAYOUT



Schematic & Termination Diagram CAREL pCO5 RAUP 400/500

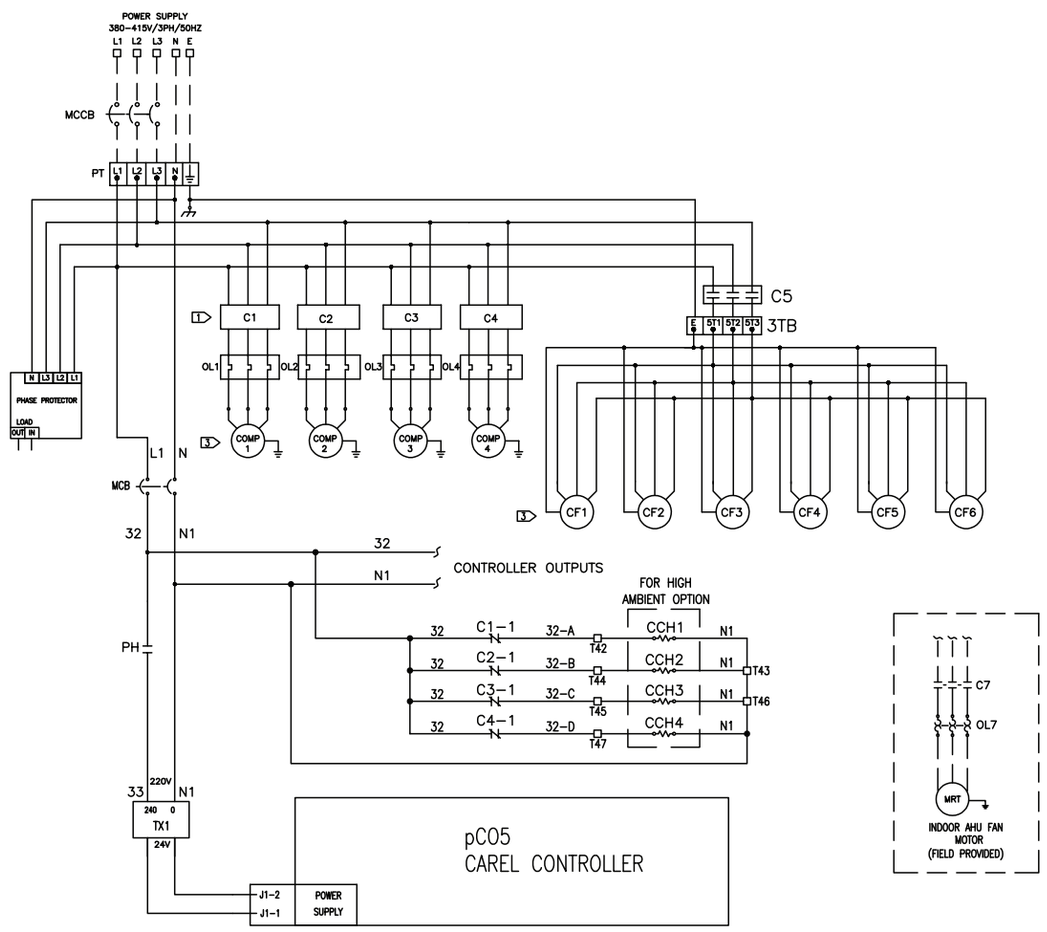
STARTER CONTROLLER MODULE – I/O WIRING :–RAUP400/500

WITH CAREL pCO5 CONTROLLER



Schematic & Termination Diagram CAREL pCO5 RAUP 600

SCHEMATIC&TERMINATION DIAGRAM :–RAUP600



NOTE :–
FOR RAUP600 – COMPRESSOR OVERLOAD ARE INTERNALLY PROTECTED

LEGEND	
DEVICE DESIGNATION	DESCRIPTION
C1,C2,C3,C4	CONTACTOR, for COMPRESSOR #
C5	CONTACTOR, for CONDENSER FAN #
C7	CONTACTOR, for INDOOR AHU FAN MOTOR
CCH #	CRANKCASE HEATER for COMPRESSOR #
CDS	CONDENSER
CF	CONDENSER FAN #
COMP	COMPRESSOR #
AFS	AIR FLOW SWITCH
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pCO3	CAREL CONTROLLER, pCO5
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R	CONTROL RELAY
TB	TERMINAL BLOCK
TX1	SWITCHING POWER SUPPLY 220–240V:24V
SLV	SOLENOID VALVE
□	TERMINATION BLOCK, CONTROL
— — —	SUPPLIED & INSTALLED BY CUSTOMER
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NOTES:

1. COMPRESSOR STARTER
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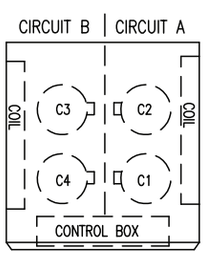
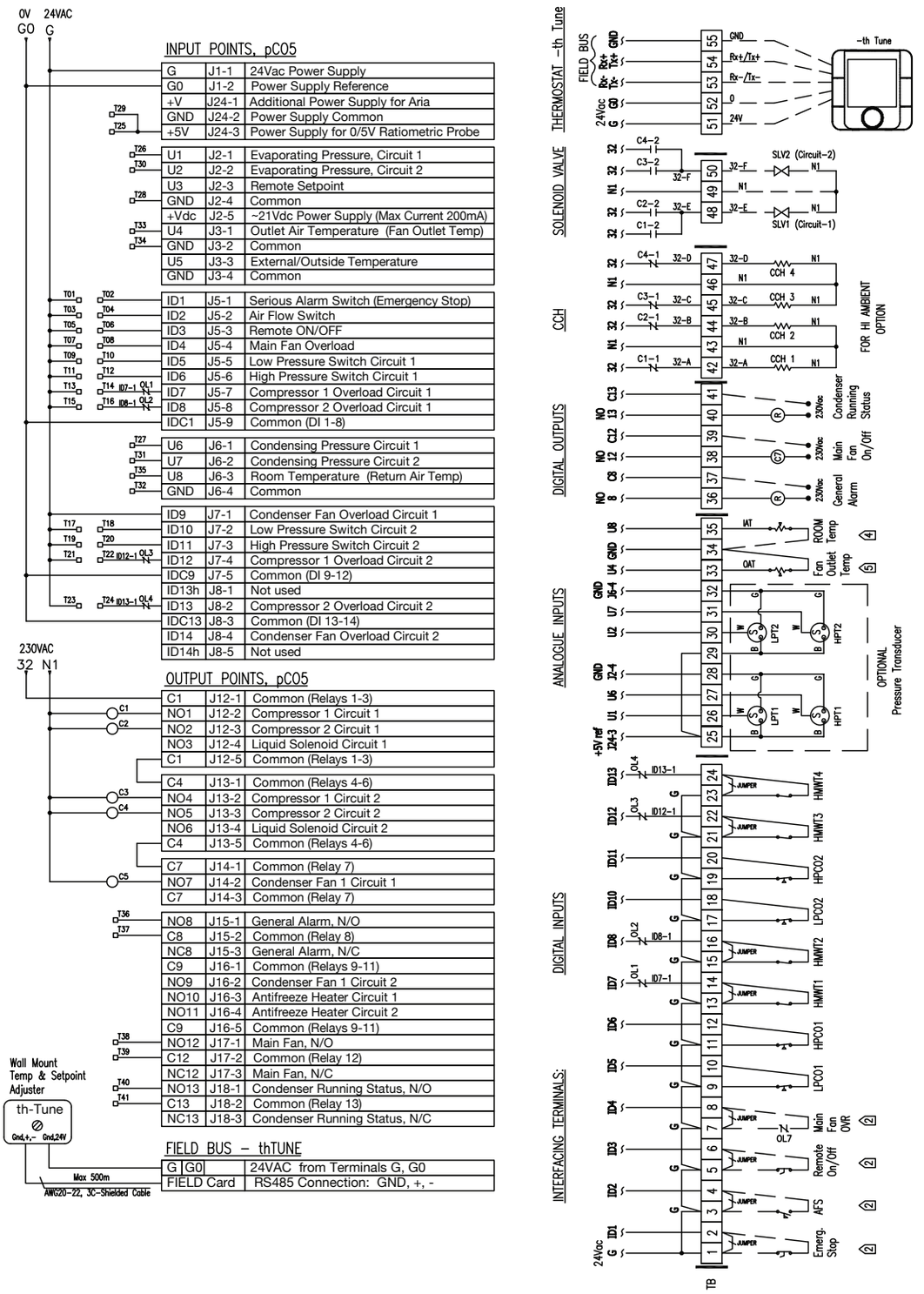
COMPRESSOR LAYOUT



Schematic & Termination Diagram CAREL pCO5 RAUP 600

STARTER CONTROLLER MODULE – I/O WIRING :–RAUP600

WITH CAREL pCO5 CONTROLLER



Installation Checklist

RAUP Trane Air Cooled Condensing Unit

This list must checked off by the installer to ensure correct installation before the unit start up.

Unit acceptance
- ❑ Check for damage, if any, on transportation
- ❑ Check for equipment shipped against delivery slip
- ❑ Check lifting system

Unit positioning
- ❑ Remove packaging
- ❑ Check position of unit
- ❑ Check unit is level
- ❑ Check clearance around condenser
- ❑ Check clearance required for maintenance access
- ❑ Check position of rubber pads

Refrigerant circuit
- ❑ Check filter dryer and sight glass presence
- ❑ Check oil traps presence on discharge line (if there vertical risers>3m)
- ❑ Check pitch for horizontal lines (1cm/m)
- ❑ Check refrigerant presence

Electrical equipment
- ❑ Check direction of rotation of compressors and fan motors
- ❑ Check installation and rating of mains power switch/fuse
- ❑ Check that electrical connections comply with specification
- ❑ Check that electrical connections match information on manufacturer's identification plate
- ❑ Check electrical connections and connections to mains power switch

General
- ❑ Check available cooling charge (50% of rated installation load)
- ❑ Check with other handling installation works

Comments:.....

.....

.....

.....

Signature: ..... Name.....

Order No.....

Work site:.....

Please return to your Trane Service Agency

Commissioning Log Sheet

START-UP ENGINEER/TECHNICIAN NAME : _____

PROJECT NAME : _____

DEALER/CONTRACTOR : _____

SALES OFFICE LOCATION : _____

DATE COMMISSIONED : _____

1.Nameplate information

Model No. _____ Serial No. _____

Voltage _____ RLA _____

2. Compressor (S)

A. Voltage at Compressor Terminals

Comp. No. 1:	T1 _____	T2 _____	T3 _____
Comp. No. 2:	T1 _____	T2 _____	T3 _____
Comp. No. 3:	T1 _____	T2 _____	T3 _____
Comp. No. 4:	T1 _____	T2 _____	T3 _____

Voltage Imbalance : Comp. "1"_____ Comp. "2"_____

Comp. "3"_____ Comp. "4"_____

B. Amp Draw

Comp. No. 1:	T1 _____	T2 _____	T3 _____
Comp. No. 2:	T1 _____	T2 _____	T3 _____
Comp. No. 3:	T1 _____	T2 _____	T3 _____
Comp. No. 4:	T1 _____	T2 _____	T3 _____

3. Operating Conditions

A. Circuit "A"

Discharge Pressure.	_____	Suction Pressure	_____
Liquid Line Pressure.	_____	Suction Line Temp.	_____
Liquid Line Temp.	_____	SuperHeat	_____
Subcooling.	_____	Evap. Entering Air Temp. (DB/WB)	_____
Amblent Temp.	_____	Evap. Discharge Air Temp. (DB/WB)	_____

B. Circuit "B"

Discharge Pressure.	_____	Suction Pressure	_____
Liquid Line Pressure.	_____	Suction Line Temp.	_____
Liquid Line Temp.	_____	SuperHeat	_____
Subcooling.	_____	Evap. Entering Air Temp. (DB/WB)	_____
Amblent Temp.	_____	Evap. Discharge Air Temp. (DB/WB)	_____

4. Controls

A. All Fans Operating Properly? [ ] Yes _____ [ ] No _____ Fan Inoperative

5. Refrigerant Piping

Evacuation Level _____ System Charge _____

Note

Note

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1126/2 Vanich Building 2, 30-31th floor
New Petchburi Road, Makkasan
Ratchathewi, Bangkok, 10400

Amair Limited
999/1 Mu 9, Bangna-Trad K.M. 19
Bangchalong, Bangplee
Samutprakarn, 10540

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Literature Order Number:	RAUP-IOM-R22/R407C (Rev.D)
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Stocking Location:	Bangkok, Thailand

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.