Water to Water Geothermal Heat Pump

3-Phase Models – Both 208 & 460

Installation Instructions

Model: RA-WE-*-2 (208, 3-Phase)**
RD-WE-*-2 (208, 3-Phase)**
RA-WE-*-3 (460, 3-Phase)**
RD-WE-*-3 (460, 3-Phase)**

Installer

This manual provides the changes in electrical installation and is an addition to the standard NI701 Installation & Operating Instructions.

- This additional document only replaces NI701 pages 5, 21-23, and Drawings UAW701 and 705.
- All general information, mechanical details and installation, general operating and troubleshooting, etc. is the same for all models.

Tested to UL Standards 1995 and CSA Standards C22.2

Drawings: **UAW708, UAW707**

DO NOT DESTROY THIS MANUAL. PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE BY A SERVICE TECHNICIAN.

Intertek

AHRI CERTIFIED www.ahridirectory.org
Water Source HP
ANSI/AHRI/ASHRAE/ISO13256-1

www.northernheatpump.com

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Appleton, MN 56208
320-297-9100
info@northerngeo.com

RA-WE – Electrical Data – Three-Phase, 208

Model	Voltage	Compressor		Total	Min.	Max. Fuse/ HACR
	(60 Hz)	RLA	LRA	FLA	Ampac.	
RA-WE-036	200/230-3	13.5	88	13.5	16.8	25
RA-WE-050	200/230-3	17.6	123	17.6	22.0	30
RA-WE-060	200/230-3	20.5	155	20.5	25.6	40
RA-WE-072	200/230-3	23.2	164	23.2	29.0	45
Control box*	120-1			10.8	12.6	15

RD-WE – Electrical Data – Three-Phase, 208

Model	Voltage	Compressor		Total	Min.	Max. Fuse/ HACR
	(60 Hz)	RLA	LRA	FLA	Ampac.	
RD-WE-080	200/230-3	13.7/13.5	83.1/88.0	13.7/13.5	17.1/16.9	25/25
RD-WE-096	200/230-3	16.0 x 2	110 x 2	16.0 x 2	20.0 x 2	30 x 2
RD-WE-120	200/230-3	19.2 x 2	136 x 2	19.2 x 2	24.0 x 2	35 x 2
RD-WE-144	200/230-3	23.2 x 2	164 x 2	23.2 x 2	29.0 x 2	45 x 2
Control box*	120-1			10.8	12.6	15

RA-WE – Electrical Data – Three-Phase, 460

Model	Voltage	Compressor		Total	Min.	Max. Fuse/ HACR
	(60 Hz)	RLA	LRA	FLA	Ampac.	
RA-WE-036	460-3	6.0	44.0	6.0	7.5	10
RA-WE-050	460-3	7.8	52.0	7.8	9.75	15
RA-WE-060	460-3	8.7	66.1	8.7	10.8	15
RA-WE-072	460-3	11.2	75.0	11.2	14.0	20
Control box*	120-1			10.8	12.6	15

RD-WE – Electrical Data – Three-Phase, 460

Model	Voltage	Compressor		Total	Min.	Max. Fuse/ HACR
	(60 Hz)	RLA	LRA	FLA	Ampac.	
RD-WE-080	460-3	6.2/6.0	41.0/44.0	6.2/6.0	7.8/7.5	10/10
RD-WE-096	460-3	7.8 x 2	52.0 x 2	7.8 x 2	9.75 x 2	15 x 2
RD-WE-120	460-3	8.7 x 2	66.1 x 2	8.7 x 2	10.8 x 2	15 x 2
RD-WE-144	460-3	11.2 x 2	75.0 x 2	11.2 x 2	14.0 x 2	20 x 2
Control box*	120-1			10.8	12.6	15

Note: Dual compressor models contain dual power circuits for the compressors, amperages shown are for each circuit.

*All three-phase models utilize a separate single phase, 120V, 20A circuit to feed power to the controls, load and source pumps, and desuperheater.

Electrical Hookup – 3-Phase Models – Both 208 and 460

⚠ WARNING

DISCONNECT ALL ELECTRICAL POWER BEFORE ELECTRICALLY CONNECTING OR SERVICING THE UNIT. FAILURE TO DISCONNECT THE ELECTRICAL POWER BEFORE WORKING ON THIS PRODUCT CAN CREATE A HAZARD LEADING TO PERSONAL INJURY OR DEATH.

Compressor Power Source – 3-Phase
The nameplate and/or Installation and Operating Manual specification page provides RLA, LRA, and total amps requirement. Select the proper wire size to comply with your type of wire routing and NEC field wiring requirements.

The field power supply connection is located at the compressor contactor in the lower right hand corner of the control box. Dual compressor models have separate contactors that feed each compressor individually. A dedicated circuit must be fed to each contactor, see electrical data chart for circuit breaker requirements.

⚠ WARNING

USE ONLY COPPER WIRE FOR CONNECTION TO THE CIRCUIT BREAKER TERMINALS AND INSIDE THIS PRODUCT'S CABINET.

Disconnect – field provided external safety disconnect is required, see nameplate max amps.

Grounding – route and install the proper size ground conductor between the ground lug above the compressor contactor and the building service entrance panel ground bus. This must be a conductor wire size according to NEC code for the total amp rating of the installed model. The conduit is not sufficient ground conductor.

⚠ WARNING

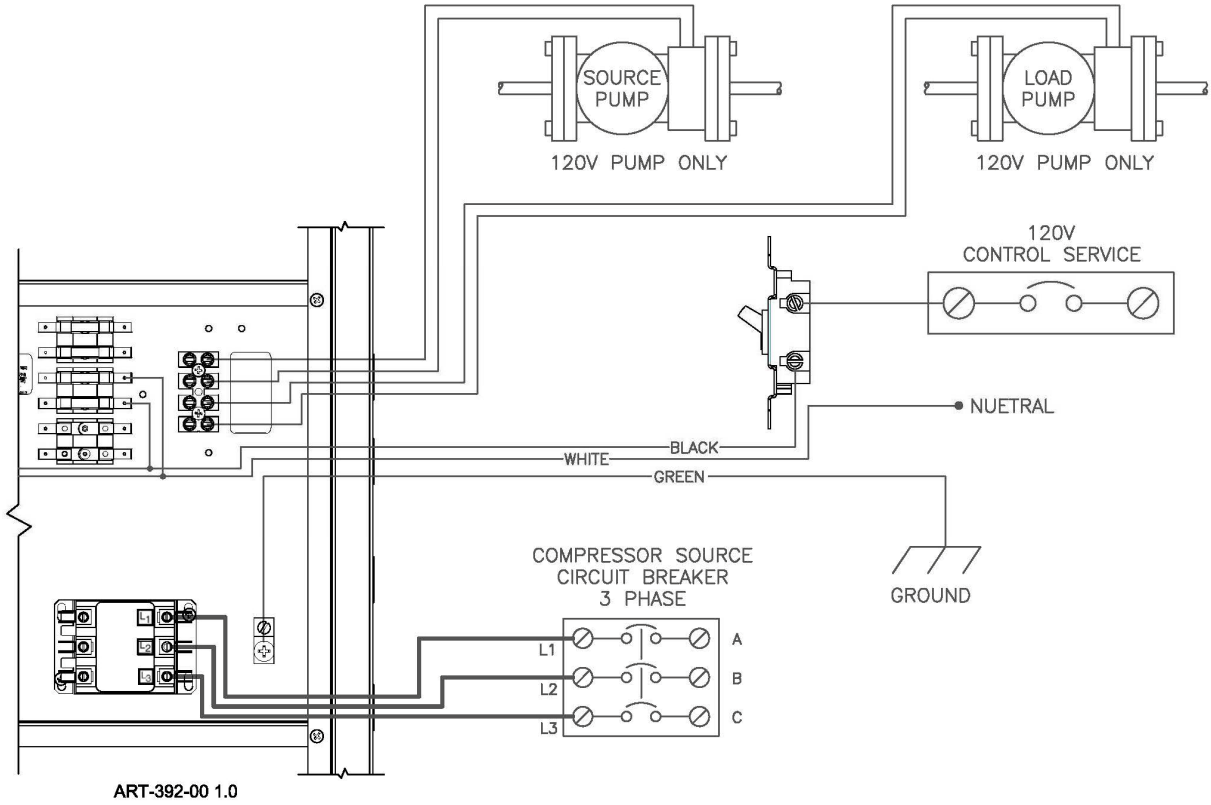
TO AVOID THE RISK OF ELECTRIC SHOCK OR DEATH, WIRING TO THE UNIT MUST BE PROPERLY GROUNDED. FAILURE TO PROPERLY GROUND THE UNIT CAN RESULT IN A HAZARD LEADING TO PERSONAL INJURY OR DEATH.

120 Control Service – these models require a 15-amp (minimum) standard general service 120 source. See hookup, next page and appropriate servicing disconnect switch should be field installed external to the main geo cabinet.

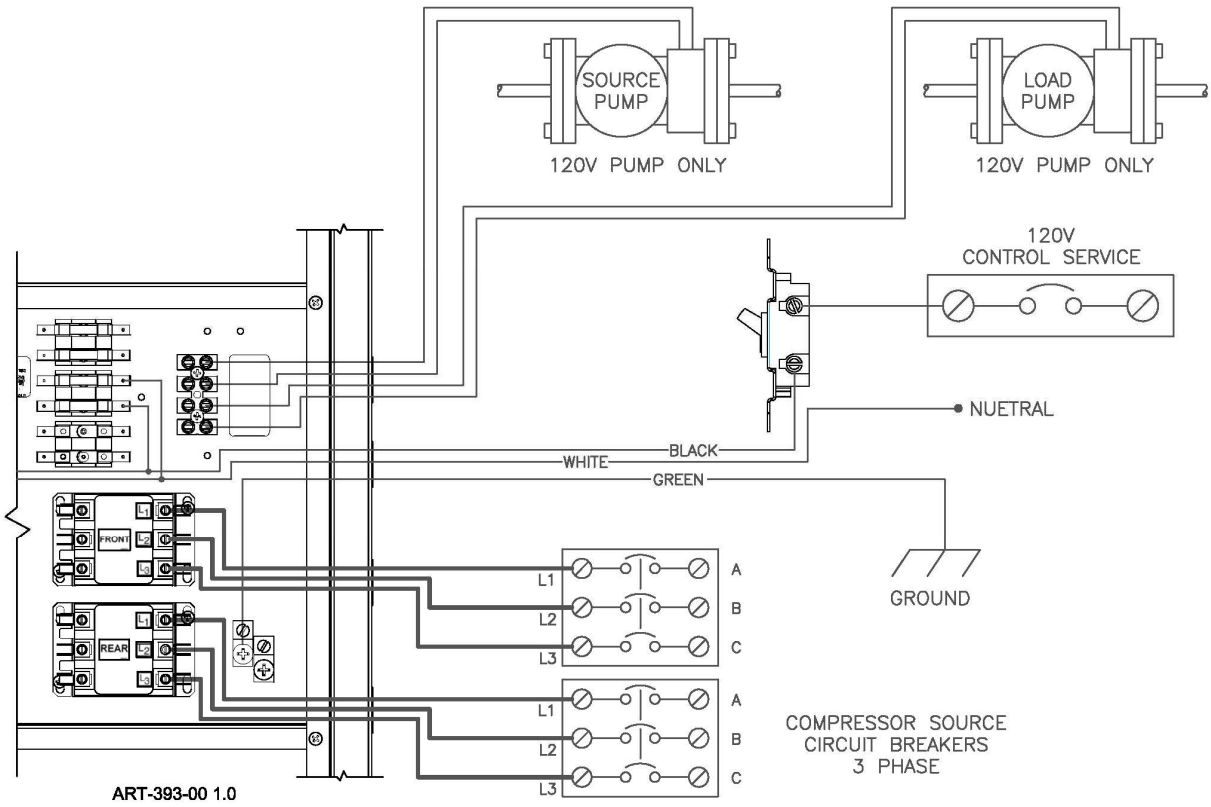
This 120 source is used for the control transformer and outputs 120VAC for both the source and load pumps. Each pump output is internally fused at 10 amps.

Comment – if either external pump requires a different voltage or power hookup, use 120V relay coil connected to the terminal block. The line voltage relay contacts can then apply the voltage required by the pumps being used at the specific installation site.

Single Compressor Models – 2.5 through 6-ton



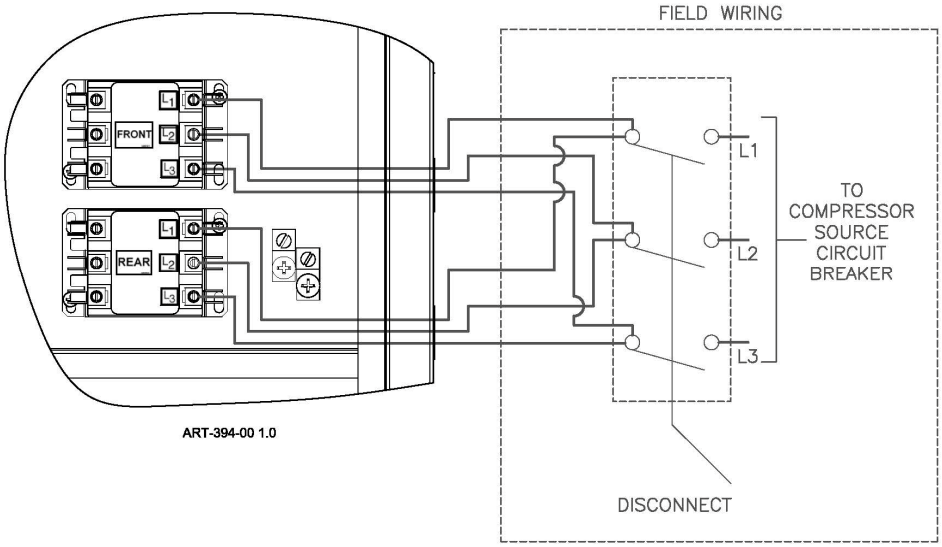
Dual Compressor Models – 6.5 through 12-ton



Note: Some local codes and CEC electric code may require single disconnect and single feed for the main compressor power source. If this is the case, the installer must provide disconnect with multi-feeds per above.

⚠ WARNING

DISCONNECT ALL POWER SOURCES BEFORE OPENING OR SERVICING – COMPRESSOR POWER FEED, 120 CONTROL SERVICE, EXTERNAL PUMP RELAYS, ETC.



Control Wiring

Operating Aquastat (or Buffer Tank Controller, HP-BTC)
The closed for heat contact is simply wired to terminal block R and HW. For set point and differential, see previous section on operating temperature consideration and compressor short cycling.

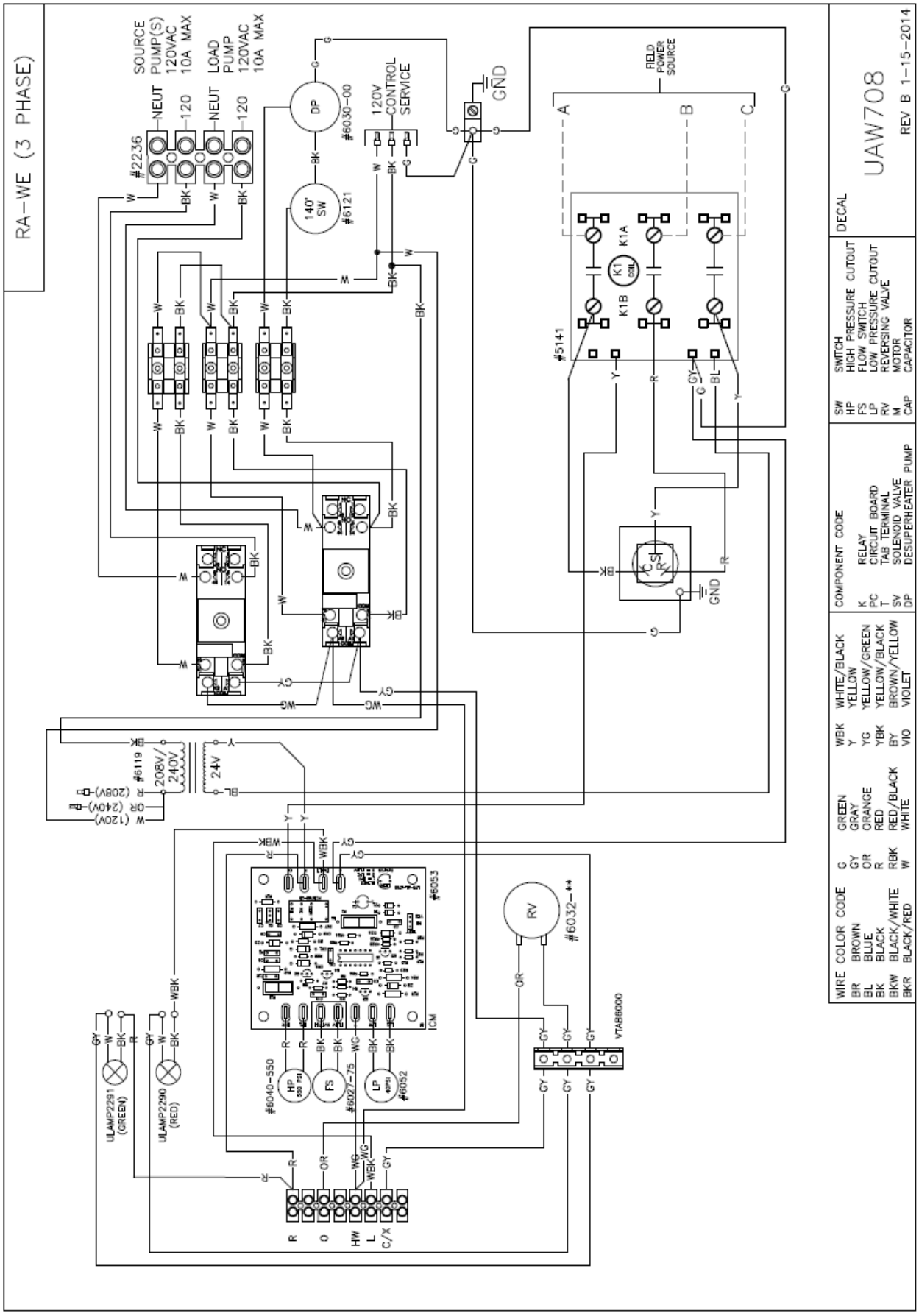
Source Pump
The internal terminal provides 120V 10A fused output for the loop pump or flow center.

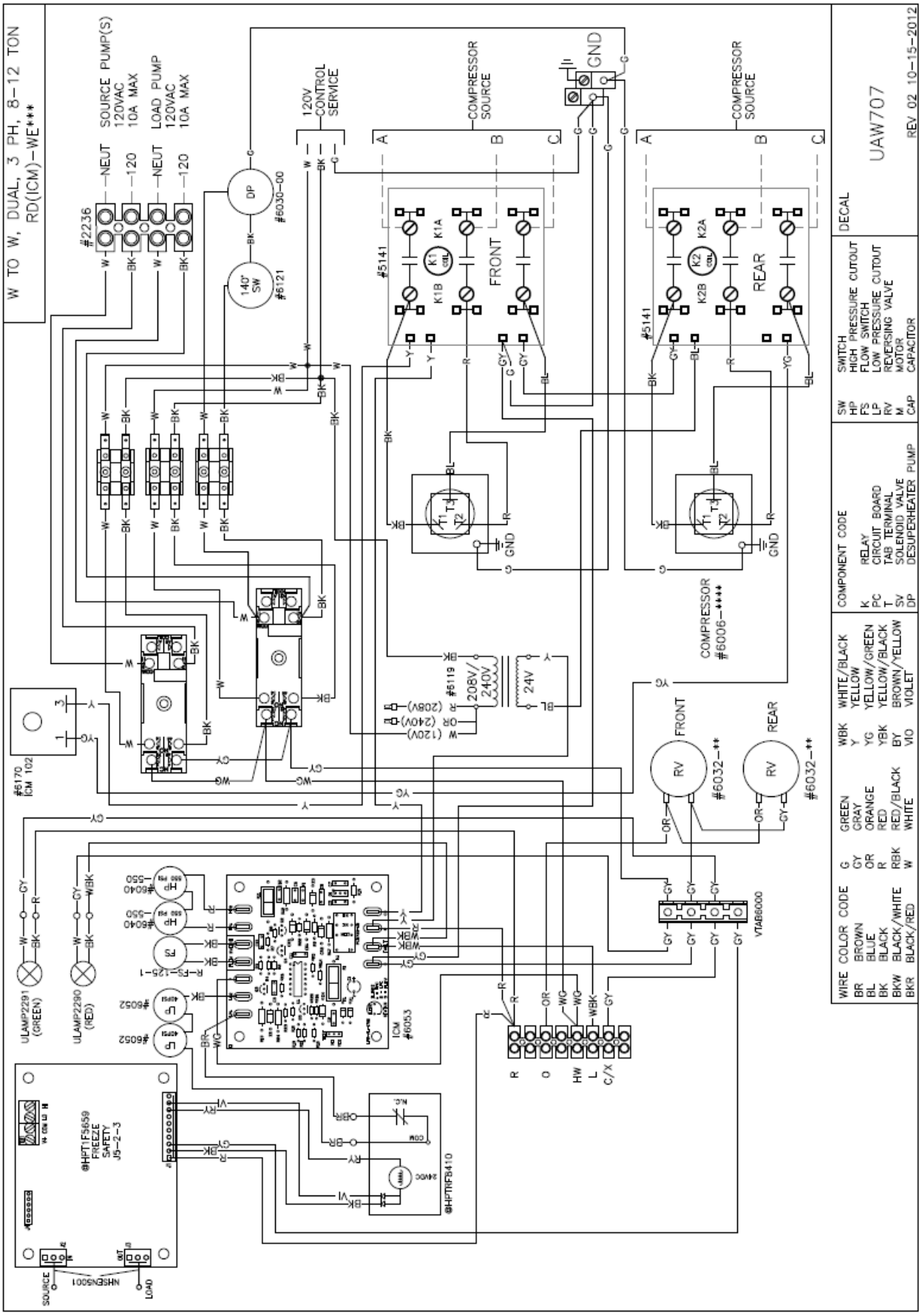
Load Pump (Hydronic)
The external circulating pump for the buffer tank or large single zone system can be operated from the internal "LOAD PUMP" terminal block. Note this is a 10A fused 120V output that operates coincident with the HW input.

Forced-Air Air Handler/Water Coil
The room thermostat for the forced air coil and its appropriate control mechanism must operate the air handler and the pump for the water coil. Also, if it is to be used for cooling, the thermostat must provide the O terminal reversing valve O function to this Geo unit and appropriately control the compressor HW terminal.

Buffer Tank Controller, Optional
This controller can be considered a central wiring point for all zone thermostats, zone pumps, forced air thermostat, forced air water coil pump, forced air blower (gas furnace blower), etc. Also, see Accessories/Options part numbers. The HP-BTC installation manual provides complete details and drawings for all external hookup devices including the connection between HP-BTC and this NHP geo unit.

> **Note:**
> Once the roomstat is set for COOL it must remain in COOL for the summer season. If it is turned off or switched back and forth, the buffer tank could actually heat up in summer.


RA-WE (3 PHASE)
SOURCE PUMP(S) 120VAC 10A MAX
LOAD PUMP 120VAC 10A MAX
#2236
NEUT
120
DP
#6030-00
140° SW
#6121
120V CONTROL SERVICE
GND
FIELD POWER SOURCE
#5141
K1 COIL
K1A
K1B
K2 COIL
K2A
K2B
#6119
208V/240V
24V
(208V)
(240V)
(120V)
#6053
ICM
HP
FS
LP
#6040-350
#6027-75
#6052
RV
#6032-**
VTAB6000
ULAMP2291 (GREEN)
ULAMP2290 (RED)
R
O
W/G
L
C/X
DECAL
UAW708
REV B 1-15-2014
SW SWITCH
HP HIGH PRESSURE CUTOUT
FS FLOW SWITCH
LP LOW PRESSURE CUTOUT
RV REVERSING VALVE
M MOTOR
CAP CAPACITOR
K RELAY
PC CIRCUIT BOARD
T TAB TERMINAL
SV SOLENOID VALVE
DP DESUPERHEATER PUMP
WIRE COLOR CODE
BR BROWN
BL BLUE
BK BLACK
BKW BLACK/WHITE
BKR BLACK/RED
G GREEN
GY GRAY
OR ORANGE
R RED
RBK RED/BLACK
W WHITE
WBK WHITE/BLACK
Y YELLOW
YG YELLOW/GREEN
YBK YELLOW/BLACK
BY BROWN/YELLOW
VIO VIOLET


W TO W, DUAL, 3 PH, 8-12 TON
RD(ICM)-WE***
UAW707
REV 02 10-15-2012
SOURCE PUMP(S) 120VAC 10A MAX
LOAD PUMP 120VAC 10A MAX
120V CONTROL SERVICE
COMPRESSOR SOURCE
GND
FRONT
REAR
#2236
#5141
#6030-00
#6121
#6119
#6170 ICM 102
#6053 ICM
#6006-**** COMPRESSOR
#6032-** RV
#6040-550 HP
#6052 LP
R-FS-125-1 FS
ULAMP2291 (GREEN)
ULAMP2290 (RED)
VTAB6000
#HPTNFS6410
#HPTIFS659 FREEZE SAFETY J5-2-3
NHSENS001
SOURCE
LOAD
DECAL
SWITCH
HIGH PRESSURE CUTOUT
FLOW SWITCH
LOW PRESSURE CUTOUT
REVERSING VALVE
MOTOR
CAPACITOR
COMPONENT CODE
RELAY
CIRCUIT BOARD
TAB TERMINAL
SOLENOID VALVE
DESUPERHEATER PUMP
WIRE COLOR CODE
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BL BLUE
BK BLACK
BKW BLACK/WHITE
BKR BLACK/RED
G GREEN
GY GRAY
OR ORANGE
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RBK RED/BLACK
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WBK WHITE/BLACK
Y YELLOW
YG YELLOW/GREEN
YBK YELLOW/BLACK
BY BROWN/YELLOW
VIO VIOLET
R O HW L C/X