

MULTI V™

Hydro Kit Medium Temperature (K2)

Hydro Kit High Temperature (K3)

Installation Manual



Hydro Kit Medium Temperature (K2)
Btu/h 107,500



Hydro Kit High Temperature (K3)
Btu/h 86,000

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WARNING

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Note:

This symbol indicates additional helpful information such as an explanation, a comment, or a clarification about the subject.



This symbol indicates a tip or recommendation.

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Tips contain practical information that may help the user solve a problem or describe actions that may save time.

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IMPORTANT!

- Please read this manual completely before installing the product.
- As an installer or service provider, it is your job to install or service the system to operate safely and efficiently. Improper installation, adjustment, alteration, service, or maintenance is dangerous to personnel and/or property and can void the warranty.
- Follow the instructions in this manual to prevent product malfunction, property damage, injury or death to the user or other people. Incorrect operation due to ignoring any instructions will cause harm or damage.
- The level of seriousness is classified by the symbols described below.

WARNING

This symbol indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.

Note:

This symbol indicates additional helpful information such as an explanation, a comment, or a clarification about the subject.



This symbol indicates a tip or recommendation.

Recommendations instruct the user to apply the suggested practice to ensure the best operating results in order to achieve the maximum benefit of the product.

Tips contain practical information that may help the user solve a problem or describe actions that may save time.

Roughing-In

WARNING

If the air conditioner is installed in a small space, take measures to prevent the refrigerant concentration from exceeding safety limits in the event of a refrigerant leak.

Consult the latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers) Standard 15. If the refrigerant leaks and safety limits are exceeded, it may result in personal injuries or death from oxygen depletion.

Do not install, remove, or re-install the unit by yourself (customer).

There is risk of fire, electric shock, physical injury or death.

Ask the dealer or an authorized technician to install the unit.

Improper installation by the user may result in water leaks, fire, electric shock, physical injury or death.

For re-installation, always contact the dealer or an authorized service provider.

There is risk of fire, electric shock, physical injury or death.

Be very careful when transporting the unit.

- Indoor unit weight and size preclude one person carrying the unit. Use two or more people to transport the unit without the assistance of mechanical transport equipment because there is a risk of personal injury.
- Some products use polypropylene bands for packaging. Do not use polypropylene bands to lift the unit.
- Suspend the water source unit from the base at specified positions. Support the outdoor unit a minimum of four points to avoid slippage from rigging apparatus.

Do not handle indoor units without the use of gloves and protective clothing. The unit may have sharp edges.

There is a risk of personal injury.

Dispose the packing materials safely.

Destroy the structure of plastic packaging and boxes to prevent children from playing with them. There is a risk of injury, suffocation and/or death to humans, animals and wildlife.

Do not install the unit on an unstable structure.

It may result in the failure of the structure, property damage, equipment damage, and/or personal injury or death.

Install the unit in a safe location where nobody can step on or fall onto it.

There is risk of unit damage, physical injury or death.

R410A and R134a refrigerants create toxic gases when burned. Do not store or use flammable products near the unit.

There is risk of product failure, fire, and physical injury or death.

Replace all control box and panel covers after completing work.

Failure to do so may result in dust or water infiltration, causing fire, electric shock, and physical injury or death.

Always wear safety glasses and work gloves when installing the unit. A rapid release of R410A and R134a refrigerants may cause frostbite.

Roughing-In — Continued

⚠ WARNING

Properly insulate all cold surfaces when installing this product.
Uninsulated cold surfaces may generate condensate that may drip and cause water damage to wall and floors.

This product is engineered to be used for comfort cooling / heating. It is not to be used in applications that require precision cooling or heating such as data centers, food preservation, wine coolers, refrigeration and / or freezer applications.
There is risk of property damage.

Provide field-installed electrical isolation devices to protect sensitive equipment sharing a power source with this product. Provide sufficient protection against the effects of electromagnetic fields (EMF) and electrical noise.
Inverter equipment, private power generators, high-frequency medical equipment, or radio communication equipment may cause the

air conditioner to malfunction.

Install the unit considering the potential for earthquakes.
Improper installation may cause the unit to fall over, resulting in physical injury or death.

Do not install this product in a location that is noise sensitive. Provide additional acoustical treatment as needed.
The risk is occupants may be discomforted.

Provide sufficient electrical system protection against lighting strikes.
The risk is loss of warranty, product damage, and / or complete loss of this product.

When installing refrigerant piping, consider pipe expansion.
Improper pipe installation may lead to pipe fatigue, failure, and a rapid release of refrigerant, frostbite, suffocation, physical injury, and or death.

Power Wiring and Communications Cabling

⚠ WARNING

The information contained in this manual is intended for use by a qualified, experienced service technician who is familiar with safety procedures and equipped with the proper tools and test instruments.
Failure to carefully read and follow all instructions in this manual may result in equipment malfunction, property damage, personal injury or death.

Always use lock-out, tag-out procedures!
Ensure the electrical power is off and the disconnect is locked and tagged prior to working on the Hydro Kit.

All electric work must be performed by a licensed electrician and conform to local building codes or, in the absence of local codes, with the National Electrical Code, and the instructions given in this manual.
If the power source capacity is inadequate or the electric work is not performed properly, it may result in fire, electric shock, physical injury or death.

This equipment uses high voltage electricity. Only a qualified, experienced electrician should wire this system. Never assume that the electrical power has been disconnected. Verify with a meter.
Failure to properly respect electricity, use industry best grounding practices, follow suggested wiring instructions, local, and NEC codes can lead to electrical shock, physical injury, seizures, and death.

Refer to local, state, and federal codes, and use power wires of sufficient current capacity and rating.
Wires that are too small may generate heat and cause a fire.

Use a properly sized circuit protective device. Using an undersized protective device will lead to equipment malfunction. Installing an oversized protective device may cause burns, fire, and death.
There is risk of fire, electric shock, explosion, physical injury or death.

Always ground the unit following local, state, and NEC codes.
There is risk of fire, electric shock, and physical injury or death.

Do not use a field-provided communications cable between the Hydro Kit and the Hydro Kit Wall Mounted Controller. Use only LG provided communications cable. Do not shorten, modify, lengthen, or remove factory plug-able connectors from the communications cable provided with the Hydro Kit Wall Mounted Controller wiring kit. The product will malfunction.

Verify all power, ground, and communications wires and cables are properly terminated before applying power to the product. Securely tighten all wire terminations.
Improper and/or loose wire and communications cable terminations may cause product malfunction, fire, physical injury or death.

Properly secure power wires and communications cables at connectors, and provide slack in cable to eliminate wire strain.
Inadequate connections may generate heat or cause a fire and result in physical injury or death.

Turn power off at the unit disconnect before servicing.
Electrical shock can cause physical injury or death.

Installation

⚠ WARNING

Always use lock-out, tag-out procedures!

Ensure the electrical power is off and the disconnect is locked and tagged prior to working on the Hydro Kit.

Verify the piping system has been properly evacuated (<500 ppm), and the system's refrigerant charge is correct before commissioning and after any repair is made.

Improper system evacuated and/or an improper refrigerant charge may cause product malfunction.

Do not install the units outside.

There is risk of fire, electric shock, explosion, and physical injury or death.

Do not change the settings of the protection devices.

If the pressure switch, thermal switch, or other protection device is shorted and forced to operate improperly, or parts other than those specified by LG are used, there is risk of fire, electric shock, explosion, and physical injury or death.

Do not store or use flammable gas or combustibles near the unit.

There is risk of product failure, fire, explosion, and physical injury or death.

Replace all control box and panel covers.

If cover panels are not installed securely, dust, water and animals may enter the outdoor unit, causing fire, electric shock, and physical injury or death.

Always check for system refrigerant leaks after the unit has been installed or serviced.

Low refrigerant levels may cause product failure, and exposure to high concentration levels of refrigerant gas may lead to illness or death.

⚠ WARNING

Hydro Kit High Temperature Water Heater (K3) must be kept in an upright position during installation.

To avoid oil migration from the onboard compressor.

Do not make refrigerant substitutions. Use the refrigerant listed on the nameplate of the unit.

If a different refrigerant is used, or air mixes with original refrigerant, the unit will malfunction and be damaged.

Take appropriate actions at the end of HVAC equipment life to recover, recycle, reclaim or destroy refrigerants according to applicable U.S. Environmental Protection Agency (EPA) rules.

Wiring Precautions

⚠ WARNING

Turn the power off at the nearest disconnect before servicing the equipment.

Electrical shock can cause physical injury or death.

Do not supply power to the unit until all electrical wiring, controls wiring, piping, installation, and refrigerant system evacuation are completed AND the commissioning agent has authorized you to do so.

Operation and Maintenance

WARNING

Do not allow water, dirt, or animals to enter the (Hydro Kit) unit.

There is risk of unit failure, fire, electric shock, physical injury or death.

Do not provide power to or operate the unit if it is flooded or submerged.

There is risk of fire, electric shock, physical injury or death.

Do not operate the disconnect switch with wet hands.

There is risk of fire, electric shock, physical injury or death.

Periodically verify the equipment mounts have not deteriorated.

If the base collapses, the unit could fall and cause property damage, product failure, physical injury or death.

Do not touch the refrigerant piping during or after operation.

It can cause burns or frostbite.

Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts.

The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.

If a refrigerant gas leak is detected, leave the room!

Refrigerant gas in sufficient quantity in an enclosed area can cause suffocation and death. Obtain a properly maintained Self Contained Breathing Apparatus (SCBA) and training on how to use it before reentering the area

For the High Temperature Heating Model (K3), turn on the power at least six (6) hours before operation begins.

Starting operation immediately after turning on the main power switch can result in severe damage to the compressor(s). Keep the power switch on during the operational season.

Clean up the site after servicing is finished, and check that no metal scraps, screws, or bits of wiring have been left inside or surrounding the Hydro Kit.

Hydro Kit Models

This manual describes how to install the Multi V™ Hydro Kit. The Hydro Kit is available in two models. Refer to Table 1 for model chassis, model number and capacities.

Table 1: Hydro Kit Model Numbers and Capacities

Unit	Chassis Name	Model Number	Capacity
Hydro Kit Medium Temperature	K2	ARNH963K2A2	Cooling: 95,900 Btu/h Heating: 107,500 Btu/h
Hydro Kit High Temperature	K3	ARNH763K3B2	Heating Only: 86,000 Btu/h

These units are to be used in conjunction with LG's Multi V Variable Refrigerant Flow (VRF) Heating, and Air Conditioning system. Both units operate on 208–230 V, 60 Hz, 1-phase power.

⚠ WARNING

Install these unit(s) in the location(s) specified by your design engineer, HVAC system layout drawings and project specifications. Perform the installation according to the procedures in this manual. Improper installation may result in injury to or death of personnel, equipment malfunction and/or property damage.

Note:

More in-depth technical and performance information on these units is available in the Multi V™ Hydro Kit Engineering Manual available at <http://www.lg-vrf.com>.



HydroKit Medium Temperature (K2)



HydroKit High Temperature (K3)

HydroKit Nomenclature

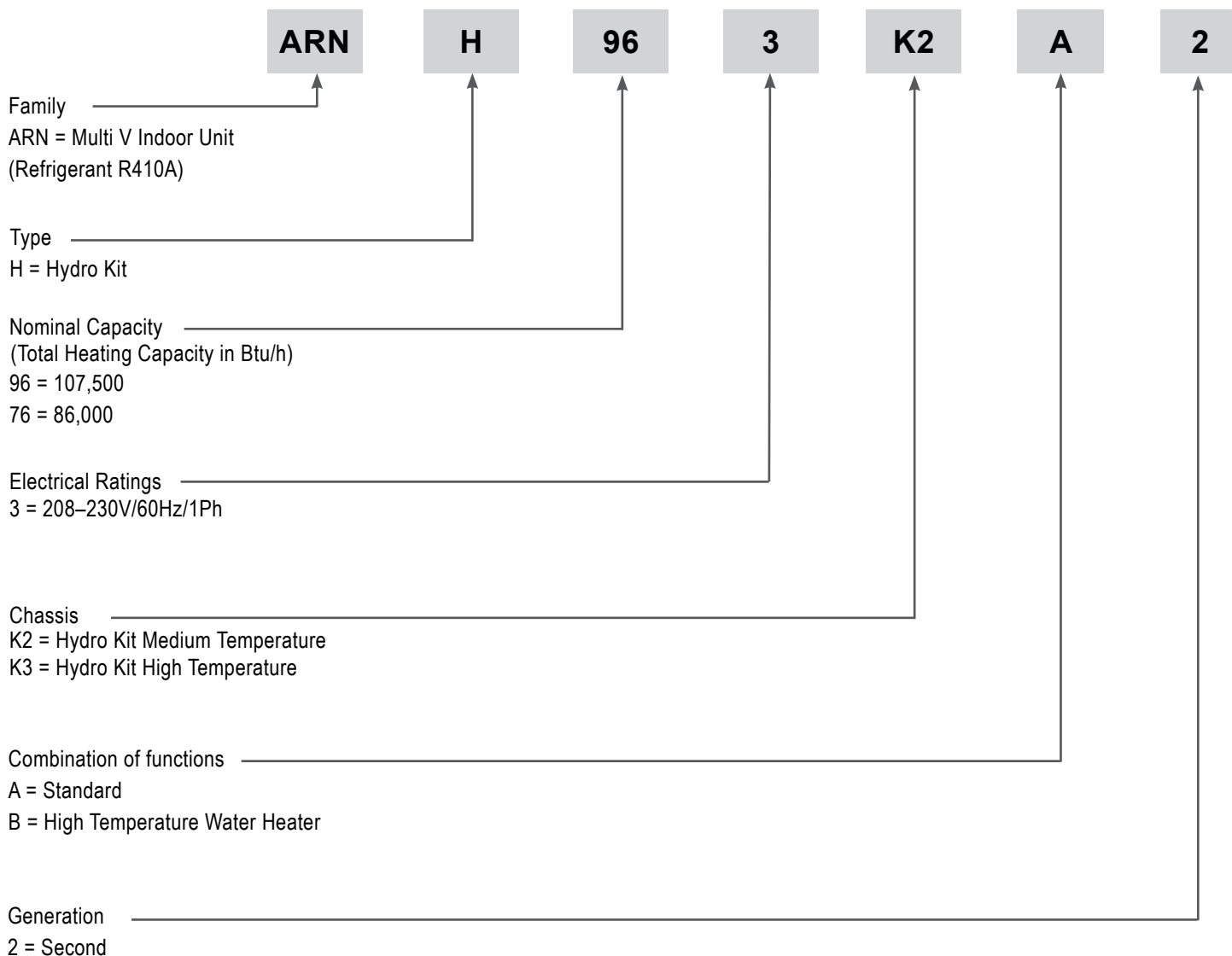


Table 2 compares main features of the two Hydro Kit models.

Hydro Kit Compatibility

The Hydro Kit is fully compatible with Multi V III, Multi V IV and Multi V Water IV units. The Hydro Kit is not compatible with Multi V Mini, Multi V Plus II, Multi V Sync II, Multi V Space, Multi V Water II, Multi V Water Mini or any duct-free split products.

Table 2: Hydro Kit Product Features.

Features		ARNH963K2A2	ARNH763K3B2
Controller Based Functions	Self diagnosis	√	√
	Auto Start	√	√
	*Manual or Auto Restart	√	√
	Child Lock	√	√
	Group Control ¹	√	√
	Timer (on/off) ²	X	√
	Timer (weekly) ²	X	√
BMS Integration	Hydro Kit Wall Mounted Controller	√	√
	Network Solution (LGAP)	√	√
	Remote Enable/Disable via LG Dry Contact ³	PQDSB-1	PQDSB-1
	Power Distribution Indicator (PDI) Interface	X	√
Options	Remote Temperature Sensor	PQRSTA0	PQRSTA0
	Solar Heating Circuit Interface ¹	PHLLA	X

Features		ARNH963K2A2	ARNH763K3B2
Hydro Kit Based Functions	Hydronic Circuit Isolation	√	X
	Water Pump ON/ OFF Control	√	√
	Factory Mounted Flow Switch	√	√
	Conventional line voltage (208-230° v) Thermostat Interface ²	√	√
	Conventional 24 vac Thermostat Interface ²	√	X
	Conventional Mechanical Thermostat Interface ¹	√	√
	Indirect Tank Water Pre-Heating	√	√
	3rd Party Solar Heating System Flow Control	√	X
	Storage Tank Heating Operation Timer	√	√
	Water Temperature Reset	√	√
	Overheating Protection	√	√
	Emergency Heating Operation	√	√

¹Hydro Kit models (i.e., K2 and K3 chassis) cannot be mixed within the same group. Each Hydro Kit unit group must be connected to the same outdoor unit. Hydro Kit units within the same group must have the same DIP switch settings. The only DIP switch that can differ is the group control setting switch, where one Hydro Kit will be the master and the remaining Hydro Kit units will be slaves.

²Manual restart is not available when the Hydro Kit is configured for conditioned space control, using a conventional thermostat.

³Sold separately and field installed.

KEY:

√: Available

X: Not available

UNIT PIPE, WIRE AND CABLE CONNECTION



The following diagrams display all piping and cable routing locations on the two chassis.

Hydro Kit Medium Temperature — K2

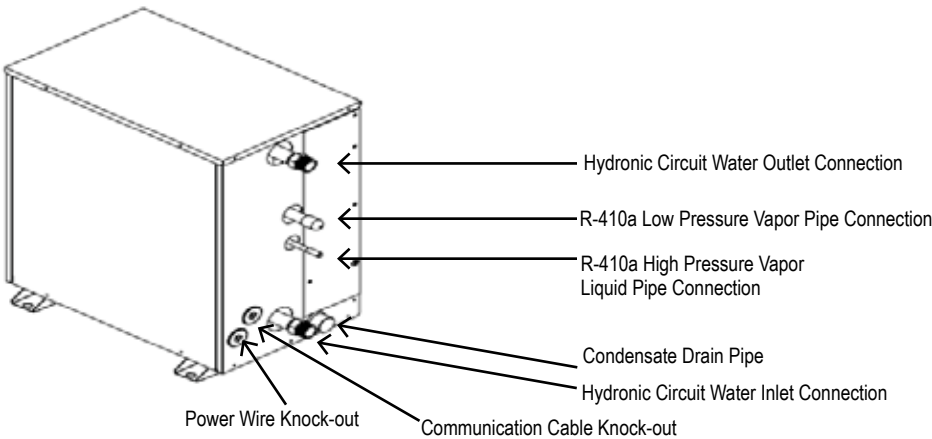


Figure 1: Medium Temperature (K2) Unit Connections

Hydro Kit High Temperature — K3

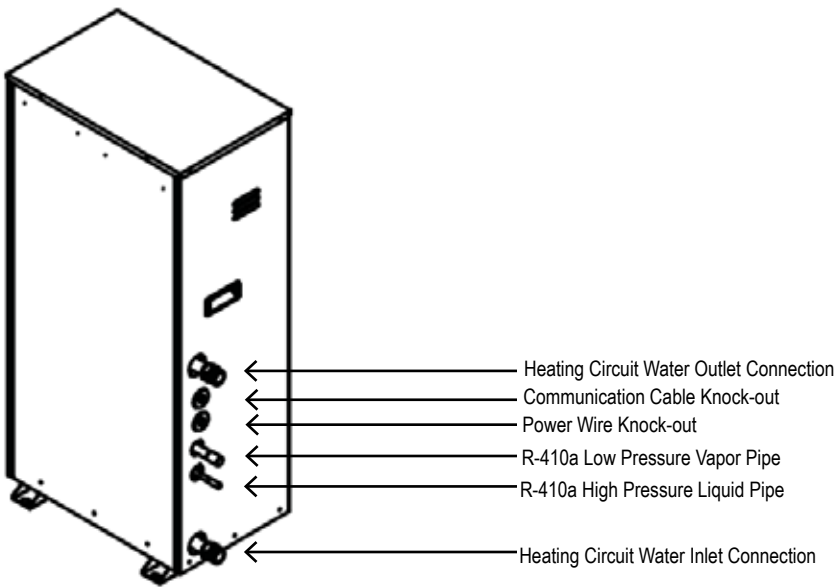





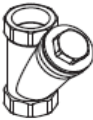
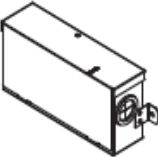
Figure 2: High Temperature (K3) Unit Connections



Installation Parts

Table 3 lists installation parts for the K2 and K3 models of the Hydro Kit. Be sure all field-provided parts meet appropriate local and national codes. Quantities are per each unit installed.

Table 3: Parts and Accessories Provided for each Hydro Kit

Part	Quantity	Part Image
Installation Manual (this manual)	1	n/a
Hydro Kit Remote Control Panel	1	
Sensor Well	1	
Indirect Hot Water Storage Tank Sensor	1	
Refrigerant Strainer	1	
Independent Power Module	1	

Optional Accessories

Table 4 lists additional optional accessories available through LG Electronics.

Table 4: Optional Accessories Available from LG Electronics

Part	Model	Description
Remote Wall Mounted Sensor	PQRSTA0	Control via the Hydro Kit based on conditioned space temperature.
Dry Contact	PQDSB-1	Binary closure- Remote Enable/Disable.
Solar Heating System Interface Kit	PHLLA	Solar heating system interface.

SPECIFICATIONS



Table 5 lists specifications for each Hydro Kit chassis (K2 and K3). Note that due to the functionality of each Hydro Kit some types of specs will not be available on certain unit models.

Table 5: Hydro Kit Specifications

Type		ARNH963K2A2	ARNH763K3B2
Power Supply (V/Hz/Ph)		208-230/60/1	208-230/60/1
Rated Cooling Capacity (Btu/h)		95,900	n/a
Rated Heating Capacity (Btu/h)		107,500	86,000
Nominal Dimensions W x D x H (In)		21 x 25 x 13	21 x 43 x 13
Net Weight (lbs)		78	208
Shipping Weight (lbs)		89	219
Type		Brazed Plate Heat Exchanger	Brazed Plate Heat Exchanger
Refrigerant to Water Heat Exchanger	Rated Water Flow (GPM)	24.3	9.5
	Pressure Drop (ft-wg)	23.1	7
Water Pipe Connections	Inlet Diameter	1" MPT	1" MPT
	Outlet Diameter	1" MPT	1" MPT
Refrigerant Pipe Connections	Liquid ODU (in)	3/8	3/8
	Vapor Gas ODU (in)	7/8	3/4
Drain Connection		1" MPT	1" MPT
Multi V ODU Comm. Cable (AWG -# Conductors, type)		18-2 stranded shielded	18-2 stranded shielded
Hydro Kit Wall Mounted Controller Communication Cable		Use LG supplied cable only	Use LG supplied cable only
Internal Circuit	Refrigerant Type	-	R410A
	Control Device	-	Electronic Expansion Valve
Multi V System	Refrigerant Type	R410A	R134a
	Refrigerant Charge (lbs)	-	6.6
	Control Device	Electronic Expansion Valve	Electronic Expansion Valve

Figure 3 shows the dimensional diagram of the Hydro Kit Medium Temperature, along with piping and cabling information.

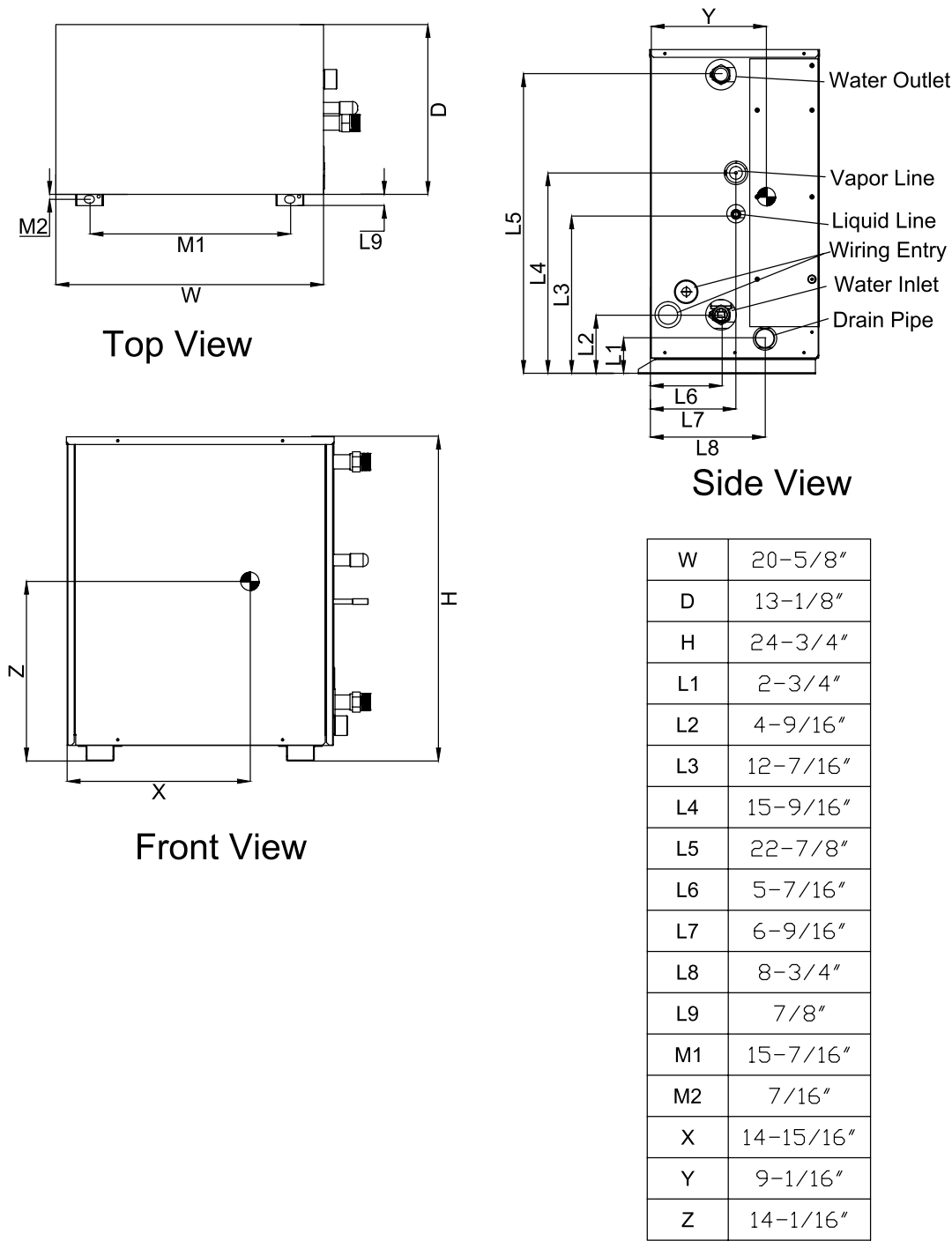


Figure 3: Dimensions for Hydro Kit — K2

DIMENSIONS

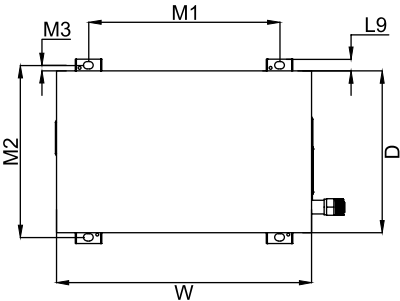


Hydro Kit - K3

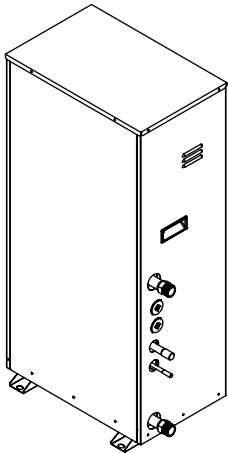
Figure 4 shows the dimensional diagram of the Hydro Kit High Temperature, along with piping and cabling information.

MULTI V Hydro Kit Installation Manual

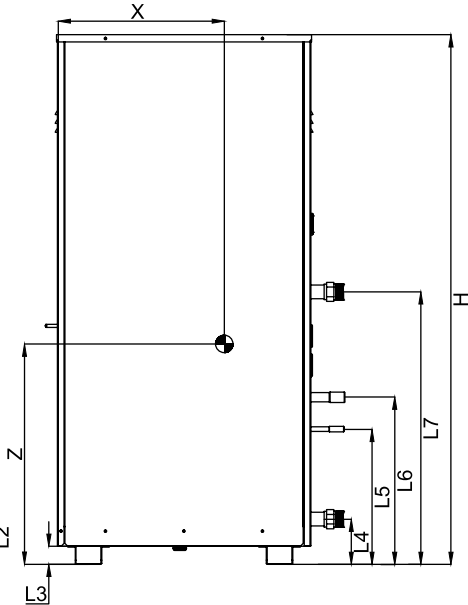
W	20-5/8"
D	13-1/8"
H	42-1/2"
L1	10-3/4"
L2	3-1/2"
L3	1-1/4"
L4	3-7/16"
L5	10-3/4"
L6	13-1/4"
L7	21-3/4"
L8	2-1/16"
L9	1/2"
M1	15-7/16"
M2	13-7/8"
M3	7/16"
X	13"
Y	5-1/8"
Z	16-1/2"



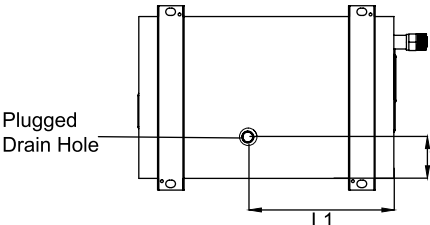
Top View



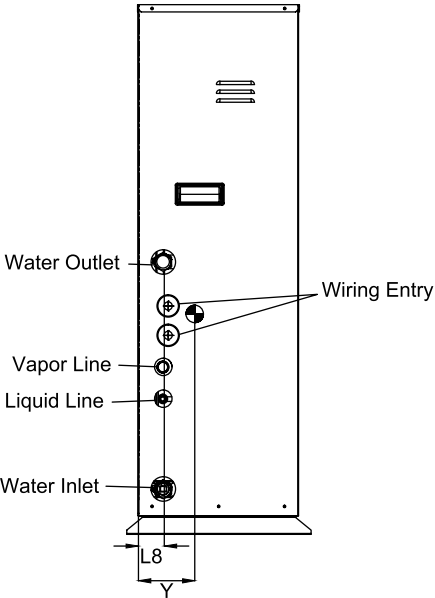
Isometric View



Front View



Bottom View

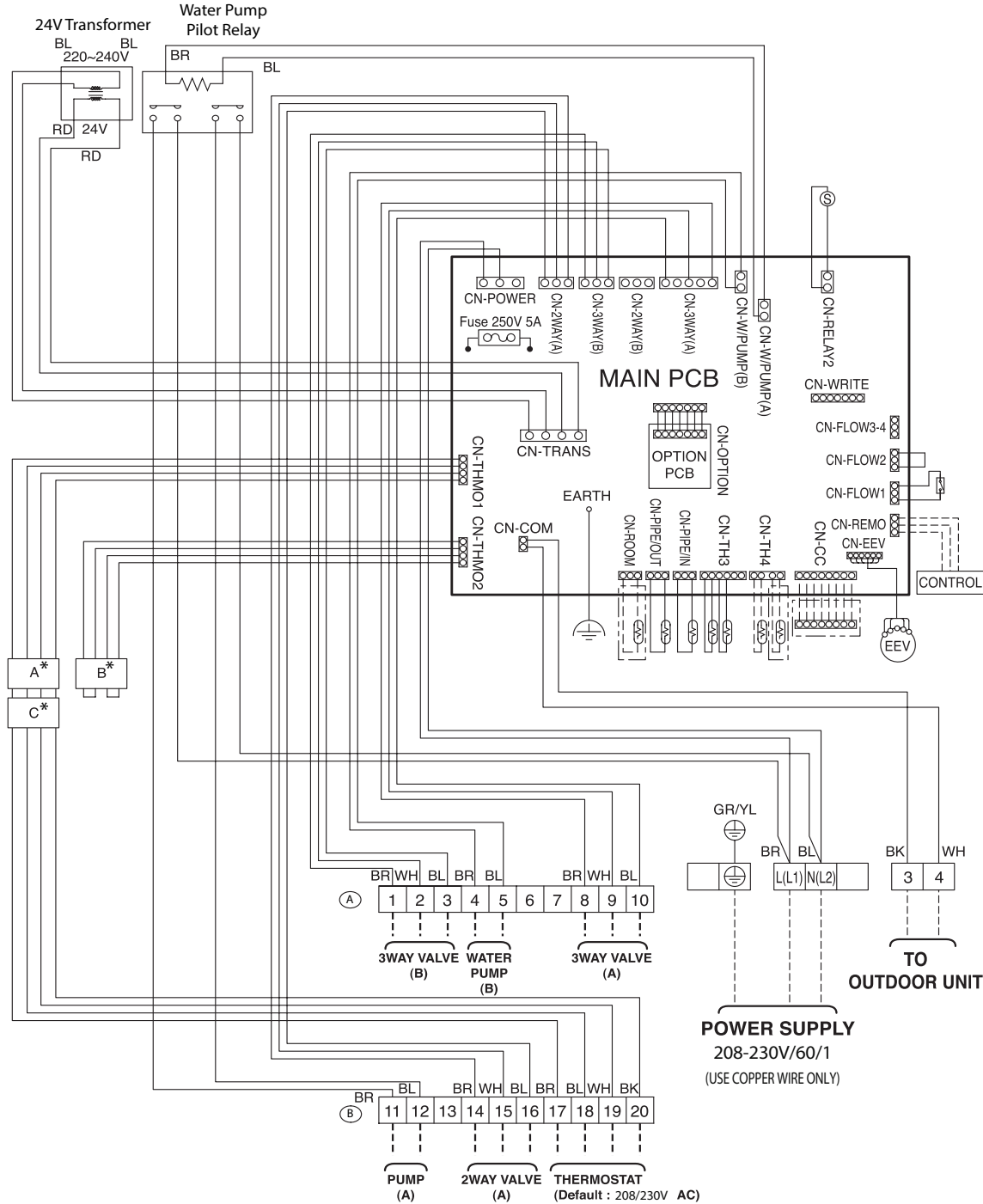


Side View

Figure 4: Dimensions for Hydro Kit (K3)



Figure 5 shows the wiring diagram for the Hydro Kit Medium Temperature.



*For 24V thermostat disconnect housing A and C then connect housing B and C

SYMBOL	DESCRIPTION
CN-2WAY (A)	To terminal strip B, screws 14, 15, 16
CN-2WAY (B)	Not used
CN-3WAY (A)	To terminal strip A, screws 8, 9, 10
CN-3WAY (B)	To terminal strip A, screws 1, 2, 3
CN-CC	Optional LG Dry Contact connection
CN-COM	Multi V communication to outdoor or water source unit
CN-EEV	R410A EEV valve
CN-FLOW1	Factory mounted flow switch
CN-FLOW2	Not used
CN-FLOW3-4	Not used
CN-OPTION	Option card interface
CN-PIPEIN	Heat exchanger - refrigerant pipe in temperature
CN-PIPEOUT	Heat exchanger - refrigerant pipe out temperature
CN-POWER	AC power to PCB
CN-REMO	Hydro Kit unit controller
CN-ROOM	LG Remote Temperature Sensor (optional)
CN-TH3(TOP/LEFT)	Heat exchanger-inlet water temperature sensor
CN-TH3(BOTTOM/CENTER)	Heat exchanger-outlet water temperature sensor
CN-TH4(TOP)	Temperature sensor: Solar heating circuit temperature sensor (optional)
CN-TH4(BOTTOM)	Temperature sensor: Hot water storage tank sensor (field mounted)
CN-TH401	2nd Party 208-230/60/1 thermostat (optional)
CN-TH402	2nd Party 24VAC thermostat (optional)
CN-TRANS	24 Volt power to PCB
CN-W/PUMP (A)	To terminal strip B, screws 11, 12: Solar heating system circulating pump
CN-W/PUMP (B)	To terminal strip A, screws 4, 5: Solar heating system circulating pump
CN-WRITE	Not used
EARTH	Earth/Ground
N	Neutral (-) power connection 208-230/60/1
⊥	Ground
⊕	Thermistor
⊖	Fuse

SYMBOL	DESCRIPTION
CN-ROOM	LG remote temperature sensor (optional)
CN-REMO	Remote mounted Hydro Kit unit controller
CN-CC	LG Dry Contact PCB interface (2nd party binary signal enable/disable)
CN-TH4 (TOP)	LG Solar Kit temperature sensor for secondary heated water storage tank
CN-TH4 (BOTTOM)	LG provided hot water tank temperature sensor
CN-EEV	5-wire harness from power module accessory CN-EEVMAIN to CN-EEV on the Hydro Kit MAIN PCB
CN-WRITE	Single wire from power module accessory CN-EEVMAIN to Hydro Kit MAIN PCB
CN-EEV/LOAD	Wire harness from power module accessory to Hydro Kit EEV valve

TERMINAL STRIP	SCREW TERMINALS
(A)	1, 2, 3
(A)	4, 5
(A)	6, 7
(A)	8, 9, 10
(B)	11, 12
(B)	13
(B)	14, 15, 16
(B)	17, 18, 19, 20

NOTE: If a 24 volt thermostat will be used, adjust wiring harness configuration

Wire Harness A	PCB interface 208-230/60/1 or mechanical conventional thermostat
Wire Harness B	PCB interface for 24VAC conventional thermostat
Wire Harness C	Wire harness Plug C to conventional thermostat terminals 18, 19, 20




SYMBOL	COLOR
BK	Black
BL	Blue
BR	Brown
GR	Green
RD	Red
YL	Yellow
WH	White

Figure 5: Wiring for Hydro Kit (K2 Chassis)

Hydro Kit - K3

[illegible]

Sockets and Connections - Main PCB	
SYMBOL	DESCRIPTION
CN-3WAY (A)	To terminal strip A, screws 4,5,6
CN-CC	Optional LG Dry Contact connection
CN-COM	Multi V communication to outdoor or water source unit
CN-CC	Optional LG Dry Contact connection
CN-COM	Multi V communication to outdoor or water source unit
CN-EV	W10VA EVV value
CN-FLOW1	Factory mounted flow switch
CN-FLOW3-4	Power to RS-484 communications PCB
CN-OPTION	Option card interface
CN-PIPEIN	Heat exchanger - refrigerant pipe in temperature
CN-PIPEOUT	Heat exchanger - refrigerant pipe out temperature
CN-POWER	AC power to PCB
CN-REMO	Hydro Kit unit controller
CN-ROOM	LG Remote Temperature Sensor (optional)
CN-TH3(TOP/LEFT)	Heat exchanger-inlet water temperature sensor
CN-TH3(BOTTOM/CENTER)	Heat exchanger-outlet water temperature sensor
CN-TH4(TOP)	Not used
CN-TH4(BOTTOM)	Hot water storage tank sensor (field mounted)
CN-THM01	To terminal strip A, screws 7,8,9,10
CN-WRITE	Not used
EARTH	Earth Ground
CN-DC	Communications link with inverter board

SYMBOL	DESCRIPTION
CN-COOLING	Inverter PCB cooling fan
CN-Heater1	R134A compressor crankcase heater
CN-N/F	Filtered power to inverter
AC (N)	Line power neutral
AC (L)	Line power 208-230/60/1
W, U, V	Inverter compressor connection
CN-EV1	R134A circuit EV
CN-485/DRY	Communications link
P-SENSOR (L)	R134A low pressure sensor
P-SENSOR (H)	R134A high pressure sensor
CN-TH3	R134A compressor discharge pipe thermistor
CN-TH2	R134A compressor suction pipe thermistor
CN-INVERTER	Power to noise filter
	Ground
	Thermistor
	Fuse

Field Connections - LG Sourced Accessories	
SYMBOL	DESCRIPTION
CN-ROOM	LG remote temperature sensor (optional)
CN-REMO	Remote mounted Hydro Kit Unit Controller
CN-CC	LG Dry Contact PCB interface (3rd party binary signal enable/disable)
CN-TH4 (BOTTOM)	Temperature sensor: Hot water storage tank sensor (field mounted)

TERMINAL STRIP	SCREW TERMINALS
(A)	1, 2
(A)	3
(A)	4,5,6
(A)	7,8, 9, 10

SYMBOL	COLOR
BK	Black
BL	Blue
BR	Brown
GR	Green
RD	Red
YL	Yellow
WH	White

Figure 6: Wiring for Hydro Kit (K3 Chassis)

Unpack the Indoor Unit / Inspect for Freight Damage

Choose a location in the vicinity of the installation before removing the protective materials.

Note:

After opening, if the unit is damaged, repack the unit as it was shipped to you. RETAIN ALL PACKING MATERIALS. In general, freight damage claims will be denied if the original packing materials are not retained for the claims adjuster to inspect. Call your supervisor on how to proceed with filing a freight claim and to order a replacement unit.

1. Before opening, check the unit model number on the box. Verify it is the correct capacity, unit type and voltage. Refer to Nomenclature Chart on page 10 of this manual.
2. Place the box on a solid surface right side up.
3. Cut the white reinforced nylon straps.
4. Open the top of the box and fold back all four flaps.
5. Remove the protective cardboard.
6. The walls and top panels are not attached to the bottom of the box. Lift the cardboard carton by the flaps and remove the box walls and top and place it to the side.
7. Remove the moisture barrier plastic bonnet.
8. Check the unit nameplate data and model number. Verify the unit voltage, and capacities are correct before proceeding.
9. Remove and retain the installation manual. It is located under the unit, on top of the unit, or taped and inserted inside the unit cabinet.
10. Lift the unit (but not by refrigerant piping!) and inspect for freight damage. If damage is found, repack the unit as it was received in the original container.

Note:

DO NOT lift the unit by the refrigerant piping. Use the hanger brackets or the unit case only to lift the unit. Damage to the piping components may occur.

Location Selection

Select a location for installing the unit where:

- The location is indoors in a conditioned space and protected from outdoor weather events.
- The mounting structure will support the weight of the unit(s), piping, and accessories.
- The unit is level.
- Space is allocated for heat exchanger maintenance and draining.
- Space is allocated for the connection of necessary piping.
- Proper electrical panel clearance requirements are satisfied.
- The unit is not exposed to steam, humid air, caustic, and/or acidic chemical vapors such as but not limited to Chlorine or Muratic acid.
- Provide minimum maintenance clearance and electrical component service areas as shown in Figure 7
- Refer to Table 6 for clearance measurements specific to each chassis.

ROUGHING-IN

Roughing-In the Hydro Kit Chassis

Figure 7: Minimum Clearance Areas Around Units

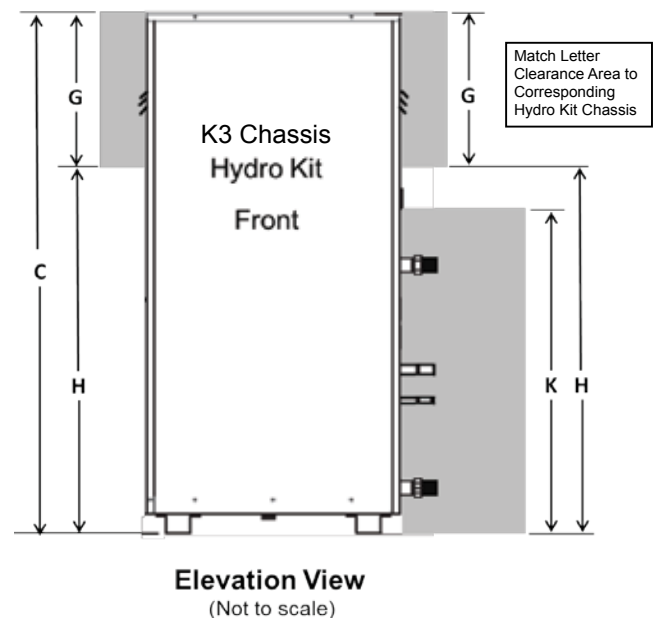
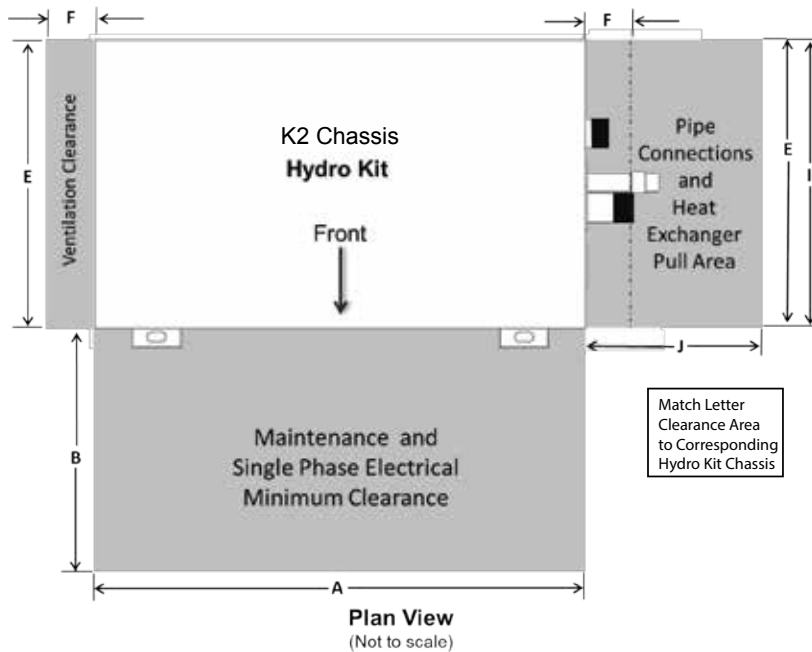


Table 6: Hydro Kit Minimum Clearance Dimension in Inches

Hydro Kit Chassis	Maintenance			Ventilation				Piping / Heat Exchanger Pull		
	A	B	C	E	F	G	H	I	J	K
K2	20-1/2	24		---	---	---	---	13-1/2	8	25
K3	20-1/2	24	42-1/2	13-1/2	3-1/2	10-1/2	32	13-1/2	14	27

Transporting / Lifting

- Refer to Table 7 for accurate weights before transporting or lifting.
- When lifting the unit, use the lifting straps and place around the unit.
- Always lift the unit using properly sized lifting straps rated to carry the unit weight.
- Ensure the straps are long enough to maintain a maximum of a 40° angle as shown at "A" in Figure 8.
- Center of gravity information regarding each Hydro Kit unit can be found on the dimensional drawings for the specific unit, on Figure 3 and Figure 4 of this installation manual.

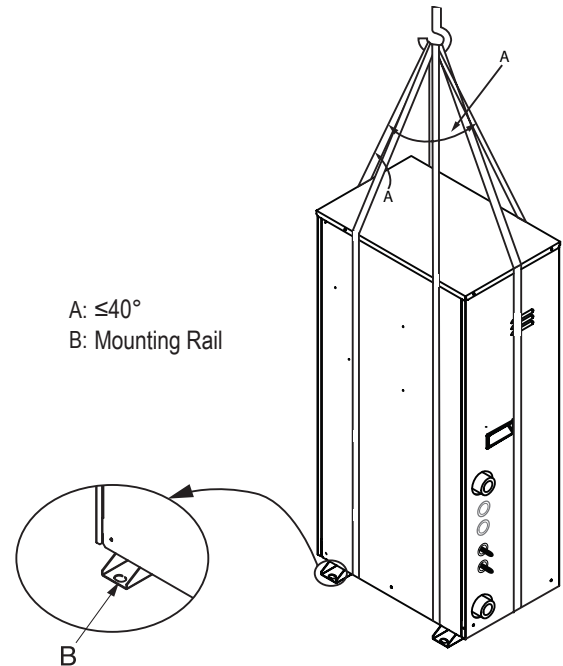
Table 7: Hydro Kit Chassis Net and Shipping Weights

Chassis	Net Weight (lbs.)	Shipping Weight (lbs.)
ARNH963K2A2	78	89
ARNH763K3B2	208	219

⚠ WARNING

- One person should not carry the product.
- Some products include polypropylene bands around the unit for packaging. Do not use polypropylene bands to lift the unit.
- Tear apart and throw away plastic packaging bags so that children may not play with them and risk suffocation and death.
- Lift the water source unit from the base at specified locations. Support the water source unit at a minimum of six (6) points to avoid slippage from the rigging apparatus.
- Do not drop the unit when carrying it with a forklift.
- Use a minimum of three (3) lifting straps.
- Place a protective cloth or other soft material at the locations where the casing comes in contact with the lifting straps to prevent damage to painted surfaces.
- Always know where the center of gravity of the water source unit is before lifting. Hoist the unit with the center of gravity centered among the lifting straps.
- Use caution when using forklift to transport an unpackaged unit. Consider the unit's center of gravity when lifting. Protect the painted surfaces as necessary to prevent damage to the unit finish.

Figure 8: Proper Transportation of Unit



ROUGHING-IN

General Mounting / Anchoring

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General Mounting

Securely attach the Hydro Kit to a concrete pad, base rails, or other mounting platform anchored to the building structure.

Avoid placing the unit in a low lying area where water may accumulate. Refer to dimensional drawing on page 15 and on page 16 of this manual, and follow the applicable local code for clearance, mounting, anchor, and vibration attenuation requirements.

Place rubber isolation pads between the mounting feet and the base. Secure the feet to the base using washers and nuts. Fix the unit tightly with bolts as shown below in Figure 9.

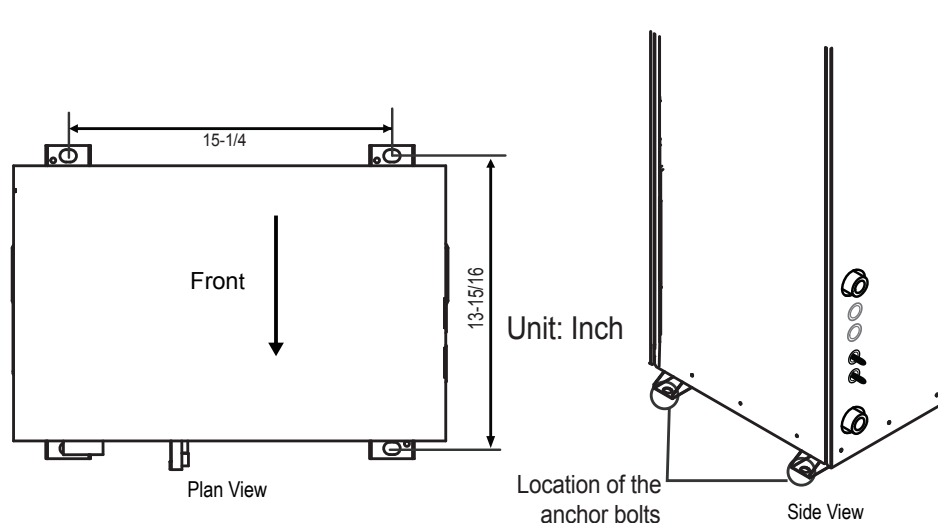
⚠ WARNING

- When building a base support for the Hydro Kit, ensure that the floor surface / location has enough strength to support the weight of the unit, enough space for pipes and wiring, the condensate drain connection, and the floor drain.
- Install the Hydro Kit to a base and in a manner approved by the structural engineer to minimize damage to the unit in the event of an earthquake. Any deficiency in installation may cause unit to fall, resulting in physical injury or death.

Anchoring the Hydro Kit Unit

Figure 9 shows the proper location and mounting of the anchor bolts for the Hydro Kit.

Figure 9: Location of the Anchor Bolts

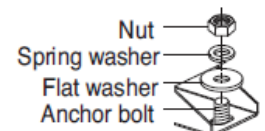
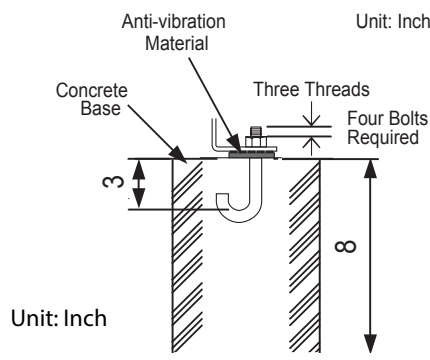


✓ Guidelines

- Securely fasten all four (4) corners to the supporting base.
- If not otherwise directed by the structural engineer or local codes, Use a 7/16 inch or 1/2 inch diameter J-bolt. Use a hexagon nut with a spring washer.
- Include anti-vibration material chosen by the acoustics engineer.
- Include enough space for refrigerant piping and electrical wiring when installing through the bottom of the unit.
- Use an H-beam, concrete support, or other acceptable support structure designed by a structural engineer.

Note:

- All referenced materials are to be field-supplied. Images are not to scale, are for reference only, and are not intended to be used for design purposes.
- Always install per mounting instruction and detail provided by the design or structural engineer.



Drip Pan (Optional and Field Supplied)

Depending on the location of the unit an optional drip pan may be necessary underneath the unit. The K2 unit creates condensate and has a 1.0" MPT condensate pipe connection on the right side. The K3 High Temperature Heating model does not create condensate. All cold surfaces are insulated from the factory. However, the unit is equipped with a base pan drain hole. This hole is provided to drain water that may enter the unit during maintenance and service.

Roughing-In the Hydro Kit Unit Controller

Note:

- It may be necessary to use a handy box that is sized in metric units, depending on the controller model. Check the mounting hole pattern and dimensions on of the Hydro Kit Unit Controller subbase before selecting a handy box.
 - Use only LG-supplied communications cable. Using field-supplied cable may result in communications problems between the Hydro Kit Unit Controller and the Hydro Kit unit.
 - DO NOT cut the quick-connect plugs off or adjust the length of the cable.
 - Keep the communications cable away from high voltage wires and electromagnetic field (EMF) producing equipment.
 - Do not route power wiring and communications cables in the same conduit.
 - Maintain the minimum distance required between the communications cable and power wiring. The minimum required space between the two is dependent on the voltage of the power wiring. Refer to the appropriate Multi V Outdoor Unit Engineering Manual for minimum distance specifications.
1. If the Hydro Kit's water flow will be controlled by monitoring the conditioned space temperature, proper Hydro Kit operation depends on the location of the wall mounted sensor or thermostat. A good location will protect the sensor/thermostat from direct sunlight and local sources of water vapor, heated, and cooled air. If no mounting height was specified by the building designer, place the handy box approximately fifty-five (55) inches above the finished floor if regulations of the American Disability Act (ADA) do not require a lower mounting height.
 2. Pull LG communications cable between the Hydro Kit controller handy box and the Hydro Kit unit. A 30 foot length of cable will be found with the Hydro Kit Controller.
 3. Store a minimal amount of cable in the handy box. Any additional cable should be coiled and stored near the Hydro Kit unit control panel.
 4. If additional cable length is needed, use a 39 foot LG Wired Remote Extension cable (Model No. PZCWRC-1).
 5. If the cable between the Hydro Kit controller and the Hydro Kit unit is too long, do not cut the cable and shorten. Coil any spare communications cable, tie-wrap it, and leave it next to the indoor unit location.

Refrigerant Piping

Refrigerant Safety

ASHRAE Standards 15-2010 and 34-2010 offer guidelines that address refrigerant safety and the maximum allowable concentration of refrigerant in an occupied space. Refrigerant will dissipate into the atmosphere, but a certain volume of air is required for this to occur safely. For R410A refrigerant, the maximum allowable concentration of refrigerant is twenty-six (26) lbs. per 1,000 cubic feet of an occupied space. Buildings with twenty-four (24) hour occupancy allow half of that concentration.¹

ASHRAE Standards 15 and 34 assume that if a system develops a leak, its entire refrigerant charge will dump into the area where the leak occurs. To meet ASHRAE Standards 15 and 34, calculate the refrigerant concentration that may occur in the smallest room volume on the system, and compare the results to the maximum allowable concentration number.¹ Also consult state and local codes in regards to refrigerant safety.

⚠ WARNING

Verify that the maximum refrigerant concentration level in the space where the indoor unit will be mounted meets the concentration limit for the application.

Cutting the Pipes

- Use the accessory piping kit or use pipes purchased locally (Figure 10).
- Measure the distance between the indoor and outdoor units.
- Cut the pipes a little longer than the measured distance.

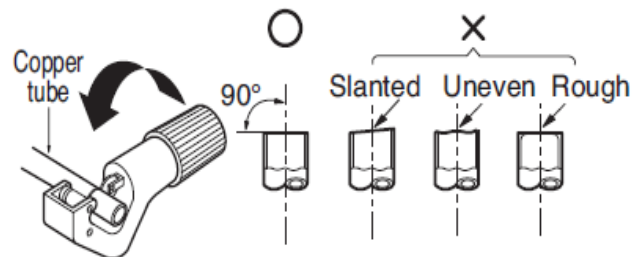


Figure 10: Cutting Pipes

Removal of Burrs

- Completely remove all burrs from the cut cross section of pipe/tube (Figure 11).
- Be sure the end of the copper tubing is pointed downward (toward the floor) as you remove burrs. This will prevent the burrs from falling back into the tubing.

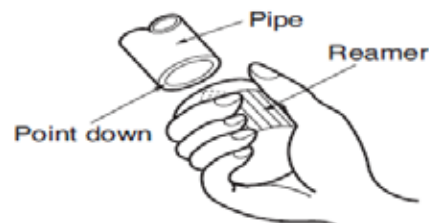


Figure 11: Removing Burrs for Piping

Pipe Brazing

Note:

Make sure to flow Nitrogen during brazing. If brazing is done without flowing Nitrogen, it can generate a thick oxidized coating within the pipe which will interfere with the normal operation of valve and compressor (Figure 12).

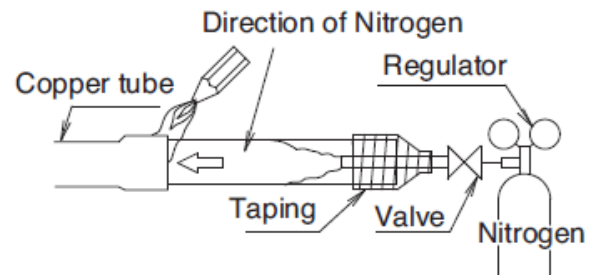


Figure 12: Brazing Pipes

¹ Information about ASHRAE Standard 15-2010 / 34-2010 and addenda current as of the date of this publication.

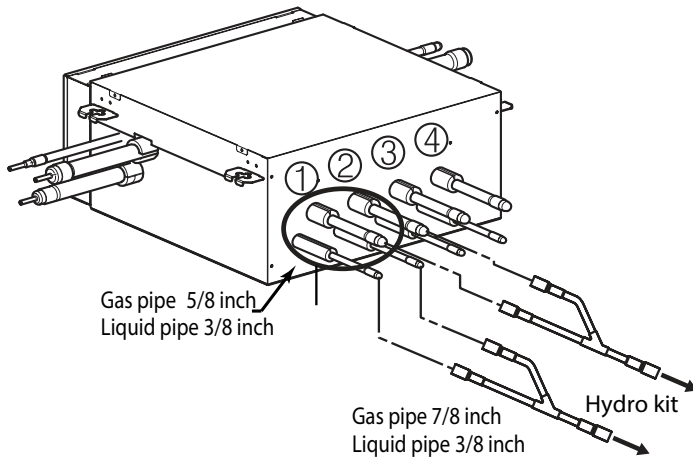


Figure 13: Heat Recovery - Refrigerant Pipe Connections

Refrigerant Piping Support

A properly installed pipe system will have sufficient support so that pipes will not sag during the life of the system. As necessary, place supports closer for segments where potential sagging could occur. Maximum spacing of pipe supports shall meet local codes (Figure 14).

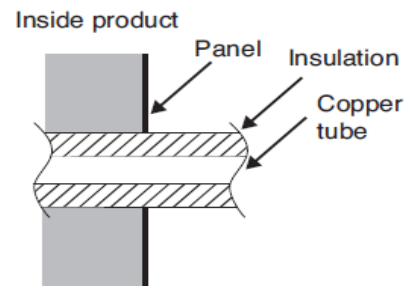


Figure 14: Refrigerant Piping Support

Pipe Insulation

Note:

To prevent condensate from forming on the surface of the insulation, calculate the proper wall thickness required based on the ambient air conditions of the surrounding area. Use calculation procedures provided by the pipe insulation manufacturer.

- Use insulation material with high thermal resistance and rated for the anticipated operating temperature range. If installing in a humid environment, use thicker insulation material as specified by system designer.
- Insulate all cold surfaces to prevent moisture/condensate from forming.
- Insulate and wrap each pipe separately.
- Use field-provided half (1/2) of an inch thick (or better) closed cell insulation.

Typical Refrigerant Line Connection Insulation Detail

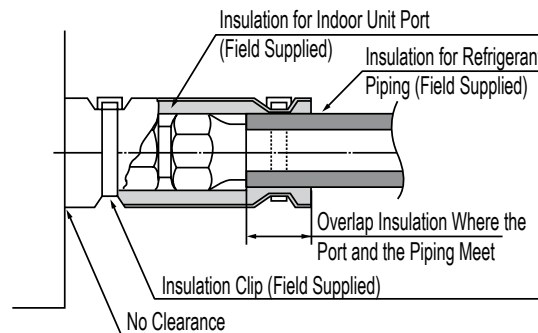


Figure 15: Typical Refrigerant Line Joint Insulation Detail

ROUGHING-IN

Refrigerant Piping

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Pipe Insulation - Continued

- The thickness may need to be increased based on ambient conditions and local codes.
- Wrap all refrigerant and condensate piping, including field-provided isolation ball valves and pipe connection kits provided by LG.
- Glue all insulation joints (see Figure 15).
 - There should be no air gaps between insulation segments, or between the insulation segments and the unit case.
 - Fit insulation material snugly against refrigeration pipe. There should be no air space between pipe surface and surrounding insulation.
- Do not compress the insulation in areas where the piping passes through pipe hangers, conduit, and/or wall sleeves.
 - Protect insulation from compression inside hangers and supports by wrapping with a second layer.

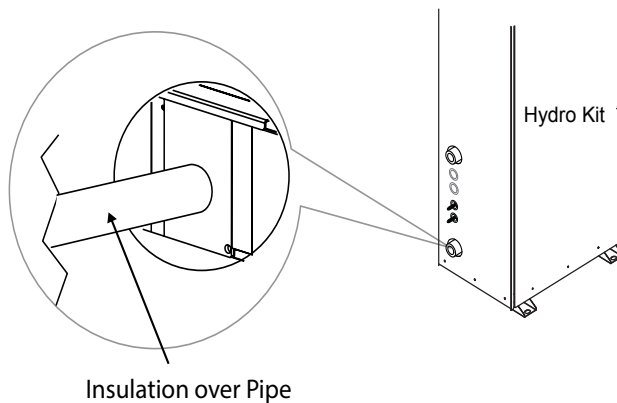


Figure 16: Hydro Kit Pipe Insulation

Condensate Piping for Hydro Kit High Temperature (K3) Only

- The Hydro Kit condensate line connection is designed to be a gravity drain. If a condensate pump is required, it shall be field provided and installed external to the unit case.
- Slope drain line a minimum of 1/4" per foot of horizontal run away from the unit case. Properly vent the condensate line per industry standard practices. See Figure 17.

While making pipe connections, be careful to support pipe to avoid placing lateral force on the drain nipple. Internal damage may occur.

- Condensate pipe connection is 1" male pipe thread.

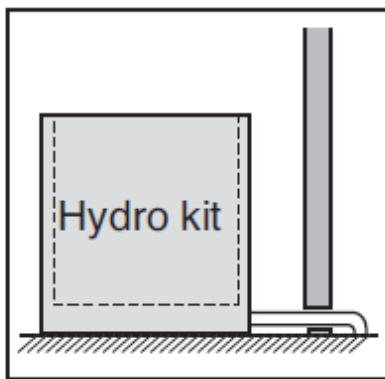


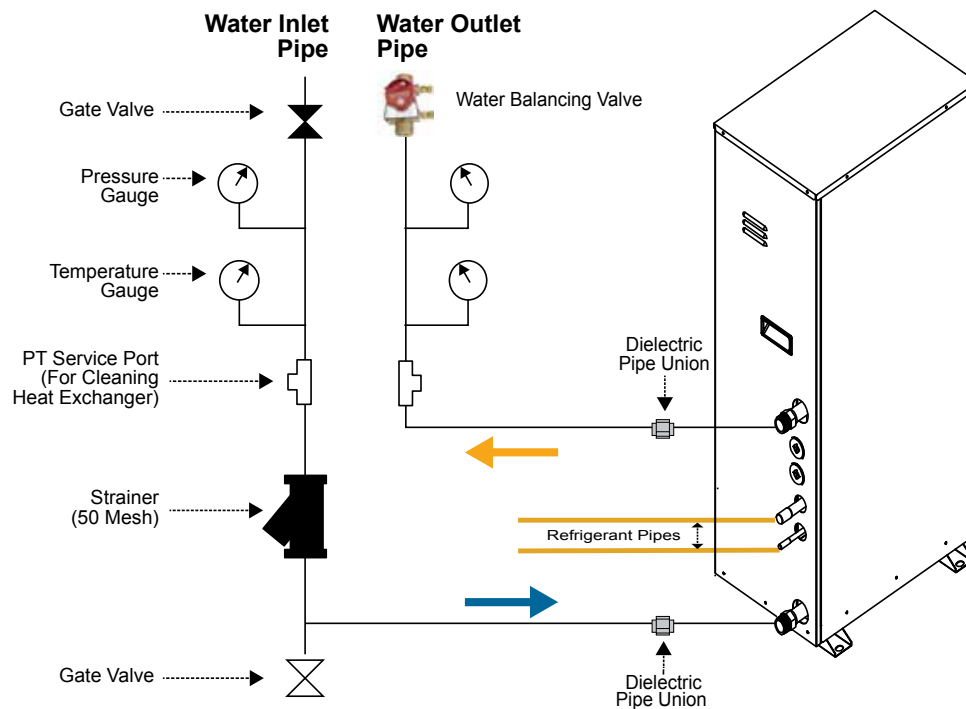
Figure 17: Typical condensate line (field provided - not to scale)

Water Circuit Piping

✓ Guidelines

1. Cap pipe to avoid dust or debris entering the piping.
2. Prior to welding or cutting of piping, check for defects. Check to see there are no slugs or burrs inside pipe before installing.
3. Treat pipe threads with joint compound or Teflon tape to prevent leakage.

Figure 18: Hydro Kit Piping Installation



Note:

The Hydro Kit has a factory internally mounted Flow Switch.

Water Piping Procedure Installation

For the water pipe system, use the closed loop type. Refer to Figure 18 on page 27 when following the procedure below.

1. Select parts that exceed water pressure specifications needed for the Hydro Kit.
2. Use anti-corrosion, steel pipe or copper pipe for water piping.
 - For K3 Chassis Hydro Kit: It is recommended that non-ferrous piping be used to reduce the frequency of strainer maintenance and heat exchanger cleaning.
3. Install a die-electric union fitting where “dissimilar” pipe materials are used. Otherwise install a standard union joint.
4. Install the hose bib fittings.
5. Always, install a Water Circuit Strainer which is provided with the Hydro Kit and place it on the water inlet pipe. For specific steps on installation, see “Strainer Installation” on page 30 of this installation manual.
 - If a replacement strainer is needed, we recommend purchasing an OEM replacement from LG. See specifications for the strainer in the Installation Parts section in Table 3 on page 13 of this installation manual.
6. Install the air vent in the section of the pipe with the highest elevation. This prevents air from gathering in the pipe system that could potentially impede the flow of water in the system. If the water flow drops, an error code will appear on the Hydro Kit Wall Mounted Controller display.
7. Use proper size insulation as outlined by insulation manufacturer.
8. Install a pressure relief valve that meets the design water pressure to prevent unit or water pipe damage as the pressure increases inside the water pipe system.
9. Install isolation valves on the inlet pipe upstream of the strainer and to the outlet pipe of the heat exchanger in order to facilitate heat exchanger and strainer cleaning.

Indirect Water Tank and Floor Heating Installation

This procedure is provided for illustrative purposes and should be used for reference only. When installing the hydronic piping system, adhere to specifications, drawings, and details provided by the system designer. See Figure 19 below.

1. When selecting an indirect water storage tank, ALWAYS use an INDIRECT type tank where the Hydro Kit water circuit is isolated from the domestic water system.
2. Use the pump (see (1) on diagram) with sufficient capacity to assure correct water pressure and to supply water to the Hydro Kit.
3. Install the shut-off valve (see (2) on diagram) on both sides of the pump to allow for cleaning and repair of the pump.
4. Install the flexible connectors (see (3) on diagram) to minimize noise and vibration transferred from the pump.
5. Optionally, install the pressure gauge (see (4) on diagram) to monitor the piping system water pressure.
6. Install the expansion tank (see (5) on diagram) to accommodate changes in system water pressure due to temperature difference.
7. When installing the indirect water tank, insert the water tank temperature sensor provided with the Hydro Kit.

Typical Hydronic Circuit Piping Schematic

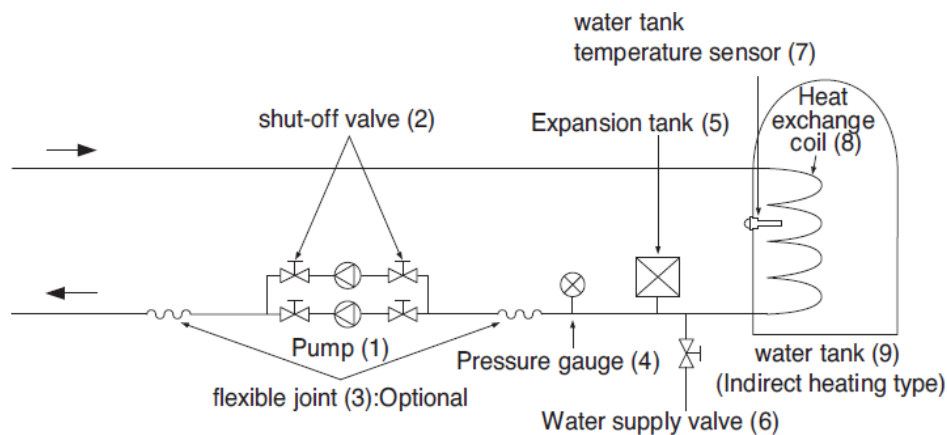


Figure 19: Hydronic Circuit Piping

Strainer Installation

Note:

- Be sure to thoroughly flush the water circuit. Continually check and clean strainers as necessary.
- Continue flushing period until water circuit strainers remain clean.

The guidelines below apply to both models of the Hydro Kit. Refer to Figure 20.

1. Install the strainer provided with the Hydro Kit.
2. Check the strainer direction and install on the inlet side of the heat exchanger.
3. Treat threads with joint compound or wrap the pipe threads with Teflon tape as needed.
4. Access port must be installed downward within 45 degrees of the vertical plane.

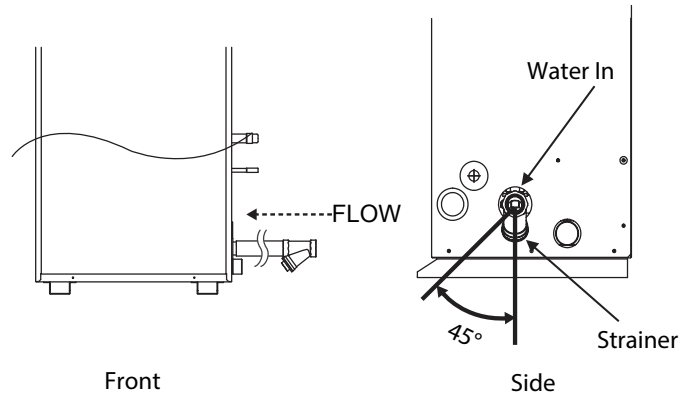


Figure 20: Strainer Installation

Hydro Kit Circuit 3-way Domestic Water Diverting Valve - Space Heating (or Cooling) (K2 Only)

Refer to valve manufacturer's installation instructions.

Hydro Kit Circuit 2-way Isolation Valve (K2 Only) - In-floor Heating

Refer to valve manufacturer's installation instructions.

Solar Heating Kit 3-way Diverting Valve (K2 Only) - Domestic Water Tank Heating

Refer to valve manufacturer's installation instructions.

Freeze Protection Flow Switch (Optional)

Flow switch should be rated for 208-230V and be normally closed.

Note:

Flow switch will perform as the first protection device when heated water is not supplied. If the required water level is not present after installing the flow switch, the water source unit will display a **CH24** error code and will stop operating.

When setting the flow switch, it is recommended to use the default set value of the water source unit to satisfy the minimum flow rate.

- Minimum flow rate range is 50%; Reference flow rate: 3-ton - 10.6 gpm, 4-ton - 13.2 gpm, 4.4-ton - 15.9 gpm.

Select a flow switch following the pressure specification of the water supply system.

Note:

- If the set value does not satisfy the minimum flow rate, or if the set value is changed by the user arbitrarily, it can result in performance deterioration or system failure.
- If the water source unit operates with a hard water supply, the heat exchanger can be damaged or system failure can occur.
- If the water source unit displays a CH24 or CH180 error code, it is possible that the interior of the plate-type heat exchanger is partially frozen. If this occurs, resolve the partial freezing issue and then operate the water source unit again. (Causes of partial freezing: Insufficient heat water flow rate, water not supplied, insufficient coolant, foreign particles inside plate-type heat exchanger.)

Valve Orientation

Refer to valve manufacturer's installation instructions.

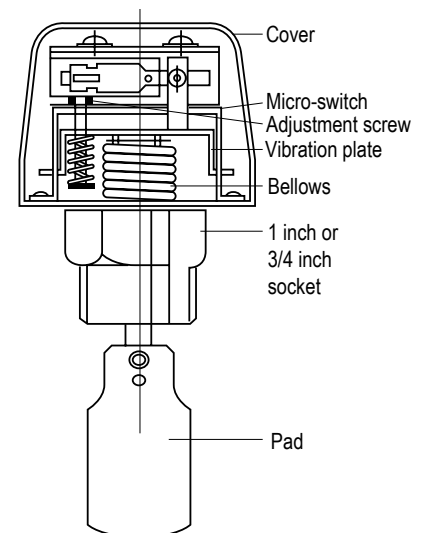


Figure 21: Flow Switch Schematic

Indirect Water Storage Tank Sensor Well (MEG61846102)

Note:

If the storage tank comes with an existing sensor well that can accommodate the LG provided hot water storage tank sensor, then skip the first step in the procedure below.

Procedure - Typical

1. Drill and thread a 1/2" FPT hole in the tank wall at the tank manufacturer's recommended location.
 - This sensor will provide the average tank water temperature to the Hydro Kit.
2. Remove well cap and sensor from the sensor well and place in a secure location.
3. If welding the well to the tank:
 - Insert the well into the thread hole and rotate till the threads on the neck bottom out. Weld the sensor to the tank and pressure test as necessary.
4. No welding installation:
 - Wrap the threads of the sensor well about 8 times with Teflon tape. Insert the well into the threaded hole in the tank wall. Turn clockwise until secure and then finalize tightening using a socket or open-end wrench.

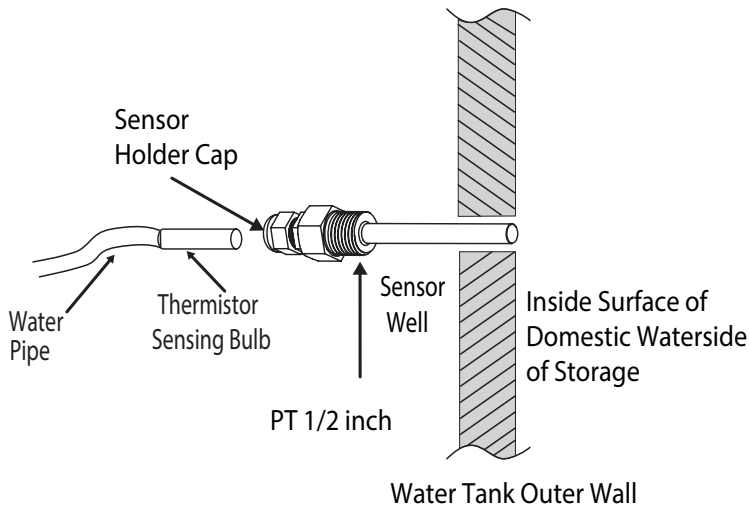


Figure 22: Indirect Water Storage Tank Sensor Well Installation (Typical)

Solar Heating System Interface Kit (PHLLA)

Hydro Kit Medium Temperature (K2 Only)

Refer to Figure 23 as a guide when installing the Solar Heating System Interface Kit onto the Hydro Kit Medium Temperature Chassis. Refer to the Solar Heating System Interface Kit Installation Manual for specific installation procedures.

Dual Source Hydronic Heating Schematic

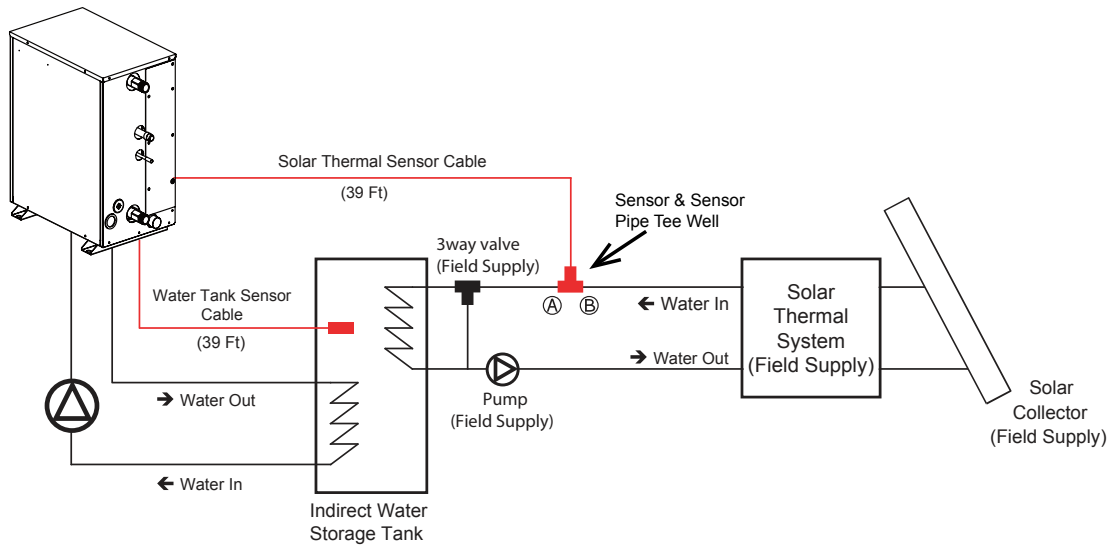


Figure 23: Dual Source Hydronic Heating Schematic

Floor Heating (With Mixing Tank)

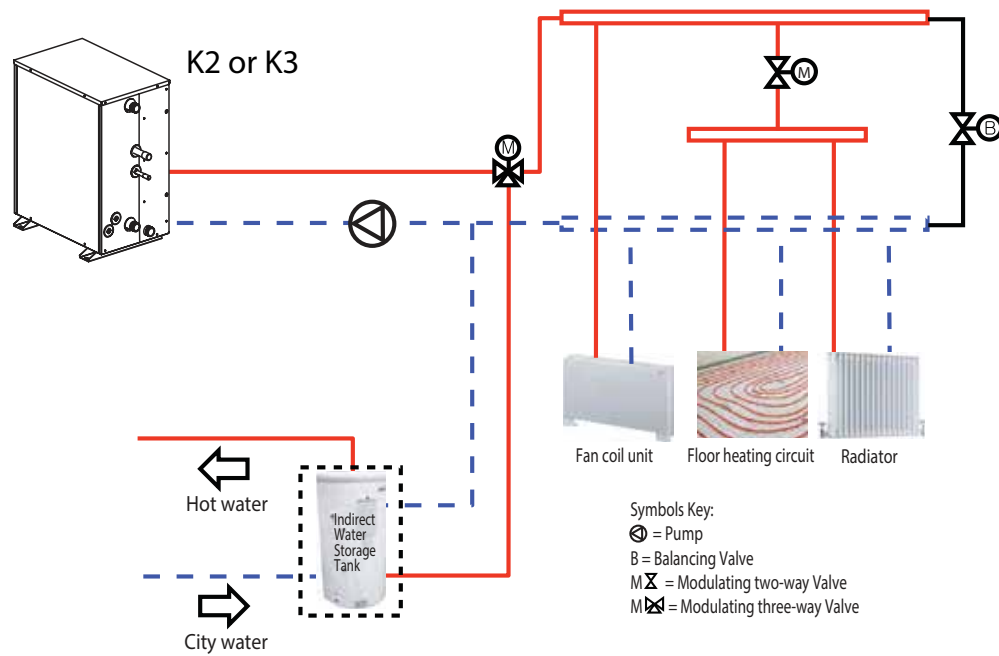


Figure 24: Domestic Water Storage, In-floor, Inductive (Radiator) and Forced Air Hydronic Heating Diagram

ROUGHING-IN

Water Circuit Preparation



Water Quality

Water quality must comply with local or national codes. Be sure to read all cautions and warning in this section before adding antifreeze to the Hydro Kit water circuit.

⚠ WARNING

- Clean water pipes to remove sludge and scale.
- DO NOT charge or operate the Hydro Kit water circuit without the strainer core installed.
- Perform chemical treatment (done by the installer) to prevent rust.

Protection Against Freezing Temperatures

At locations where water temperatures can drop below 59°F (15°C), use an approved antifreeze solution to protect the water pipes. Consult your Hydro Kit unit supplier for locally approved solutions.

To add the right amount of antifreeze:

- Calculate the approximate volume of water in the system.
- Add antifreeze solution to the Hydro Kit water circuit.

Use Table 8 as guidance as to the appropriate type and amount of antifreeze to use.

Table 8: Antifreeze Type and Minimum Temperature for Freeze Protection

Type of Antifreeze	Minimum Temperature for Freeze Protection				
	59°F - 23°F (15°C - -5°C)	14°F (-10°C)	5°F (-15°C)	-4°F (-20°C)	-13°F (-25°C)
Ethylene Glycol	12%	20%	30%	-	-
Propylene Glycol	17%	25%	33%	-	-
Methanol	6%	12%	16%	24%	30%

⚠ WARNING

- Use only one of the above recommended antifreeze solutions.
- Note that pressure drop and performance decreases when antifreeze is used.
- Note that corrosion can occur when using antifreeze. Add corrosion inhibitor.
- Check concentration of the antifreeze periodically in order to maintain correct percentage levels.
- Take care not to touch or handle antifreeze during installation or operation.
- Follow all cautions and direction for local laws pertaining to the usage and handling of antifreeze.
- Do not add antifreeze to heating only systems.

⚠ WARNING

Keep line voltage power away from the communications cable and terminals 3(A) and 4(B). Line voltage power applied to the communications terminals will damage the indoor unit control board.

Note:

- Size all field provided electrical components per NEC and local code. Always use copper wire.
- Maintain a minimum of two (2) inches between line voltage wires and communications or Hydro Kit controller cables.

Procedure

1. Refer to Table 9 for each model's correct electrical data before proceeding with these steps.
2. Provide clean 208/60/1 power to the unit.
 - Maximum acceptable power fluctuation range is 188 volts to 228 volts.
3. Remove the cabinet access panel from the Hydro Kit.
4. Remove the knock-out plug from the unit end panel (Figure 25 for (K2) and Figure 26 for (K3)).
 - Do not use the same knock-out occupied by communications and zone controller cables.
5. Field-install a plastic or rubber grommet to the edge of the wire and cable cabinet access holes.
 - This will prevent wire chaffing.
6. If using conduit, connect the conduit to the unit cabinet.
 - Use field-provided fittings.
 - Follow industry best practice procedures.
7. Provide enough slack wire at each indoor unit to connect to the terminal block without tension on the wire.
8. Route the wire inside the control box paying special attention to keep the wire away from communications cables by a minimum of two (2) inches.
9. Secure the wire to the inside surface of the unit cabinet.
 - Use a field provided nylon wire clamp.
10. Strip approximately half (1/2) of an inch of insulation from each of the power wire conductors.
11. Tightly crimp a spade connector to the Hot, Neutral and Ground Wires.
12. Insert the spade connector under the appropriate terminal block screws.
13. Securely tighten the terminal screws.

Table 9: Hydro Kit Power Wiring Electrical Data

Model	Rated Amps (A)	MCA	MOP
ARNH963K2A2	0.05	0.06	15
ARNH763K3B2	23.0	28.8	50

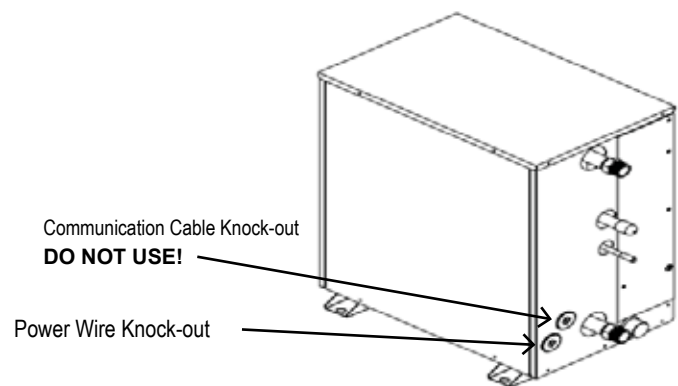


Figure 25: (K2) Hydro Kit Medium Temperature

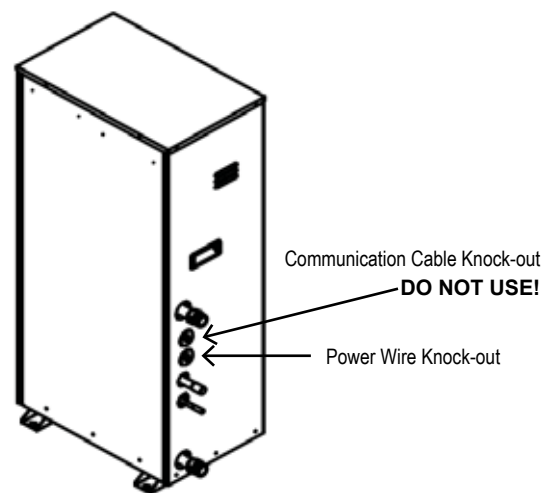


Figure 26: (K3) Hydro Kit High Temperature

Dry Contact - Wiring

Dry Contact May Be Powered Using Two Methods

- Power Source wired directly to the Dry Contact Terminals 1 and 2 and subsequently providing power to the third party binary switch (Figure 27).
- Power source wired to the third party binary switch (device) providing power to the Dry Contact (Figure 28).

Procedure

Connect a CN_DRY with the third party binary contact and monitoring relays to CN-DRY terminals 1 through 4 as shown in either Figure 27 or Figure 28. External wiring is provided by others.

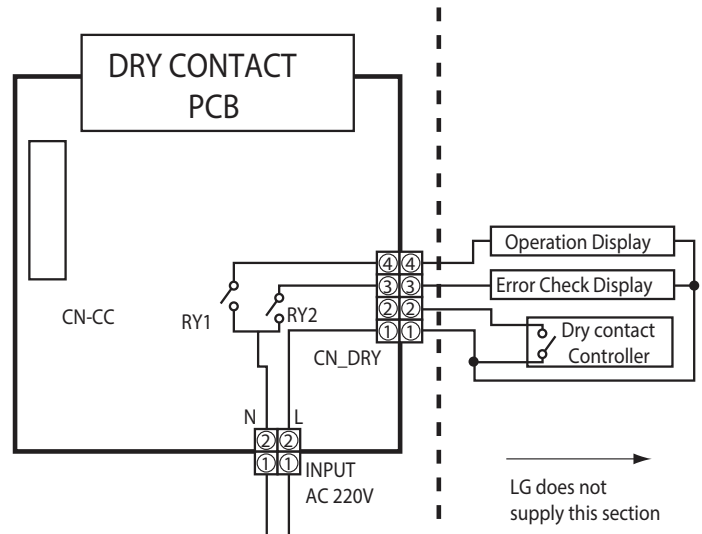


Figure 27: Dry Contact - Direct Power Wiring

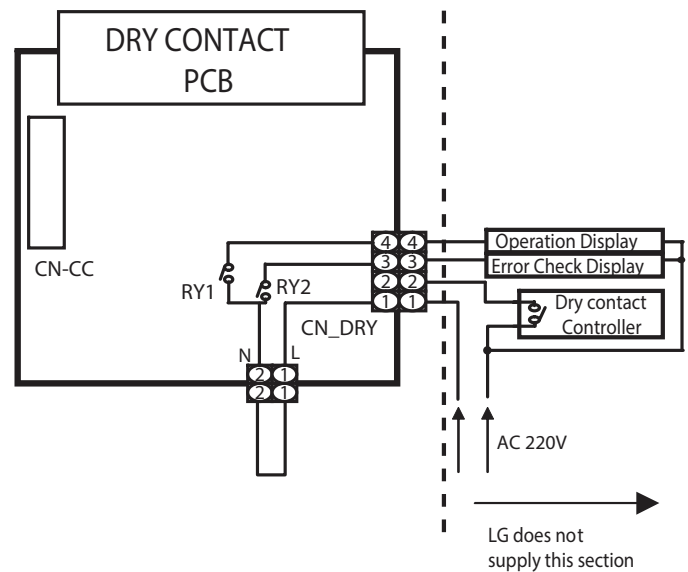


Figure 28: Dry Contact - Indirect Power Wiring

⚠ WARNING

- Keep communications cables away from line voltage wiring, lighting ballasts, and other devices emitting EMF energy.
- Maintain a minimum of two inches between line voltage wires and communications or zone controller cables.
- Never use wire caps.
- Never splice communication cables.
- Star and Wye communications cable configurations are not acceptable.
- Never connect the Hydro Kit controller or other central control products such as AC Smart, PDI, or the LG building management system gateway products to the communications cable between the indoor unit and outdoor unit.

Note:

The minimum distance required between power wires and the communications cable is voltage/amperage dependent and in cases where either are relatively high, the minimum distance may be more than two (2) inches. Refer to the respective LG Multi V Outdoor Unit Engineering Manual on www.lg-vrf.com for detailed information.

Procedure

1. Terminate all Multi V communications cables within the confines of the Hydro Kit unit cabinet.
2. When pulling cable between components, leave enough slack to properly route the cable through the unit keeping it away from the line voltage wiring.

Note:

LG device communications cable voltage does not exceed 5 volts. LG does not require a handy box to mount the Hydro Kit Unit Controller or the optional LG Remote Wall Mounted Sensor. Check local code and install per regulation.

3. Field provides a minimum of 18-2 AWG, stranded and shielded communications wiring between the indoor units, heat recovery boxes (if applicable), Hydro Kit, and outdoor units.
4. Ground the shield of the communications cable at the OUTDOOR UNIT END ONLY.

Communications Cables Between the Water Source or Outdoor Unit and the Hydro Kit/Indoor Units/Heat Recovery Units (Heat Recovery Systems Only)

Refer to the applicable Outdoor or Water Source Unit manuals for cable routing and connection architecture. Figure 29 shows the correct connection communication cable schematic, including the Hydro Kit among the indoor units. Note Figure 30, which shows improperly terminated communication cable connections in a "starburst" pattern.

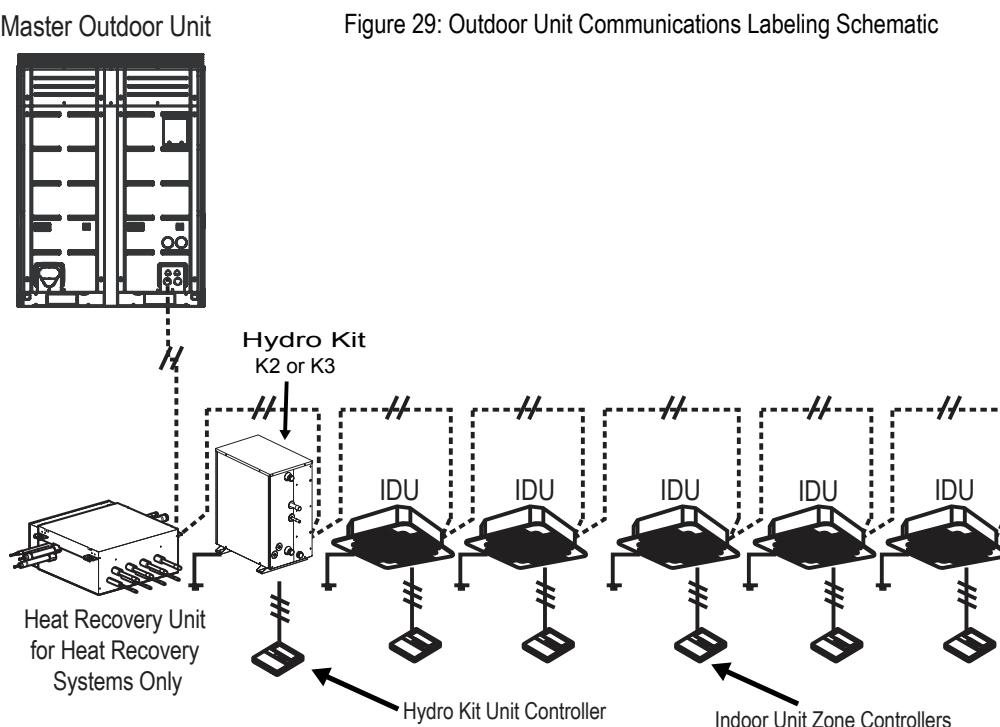


Figure 29: Outdoor Unit Communications Labeling Schematic

✓ Guidelines and Recommendations

- Use a 18-2 AWG, shielded, stranded cable between the outdoor unit(s) and the indoor units / heat recovery units (Heat Recovery Systems Only).
- Cable must be rated for continuous exposure to temperature of up to 140°F.
- Maximum allowable length = 984 feet
- Firmly attach the cable; provide slack but secure in a way to prevent external forces from being imparted on the terminal block.
- Communications cable connecting the outdoor unit and Hydro Kit and other Multi V indoor unit(s) should be installed and terminated in a daisy chain (BUS) configuration starting at the outdoor unit as shown in Figure 29.
- Terminate the cable shield to a grounded surface at the outdoor unit(s) only. Cable shields between connected devices shall be tied together and continuous from the outdoor unit(s) to the last device connected.

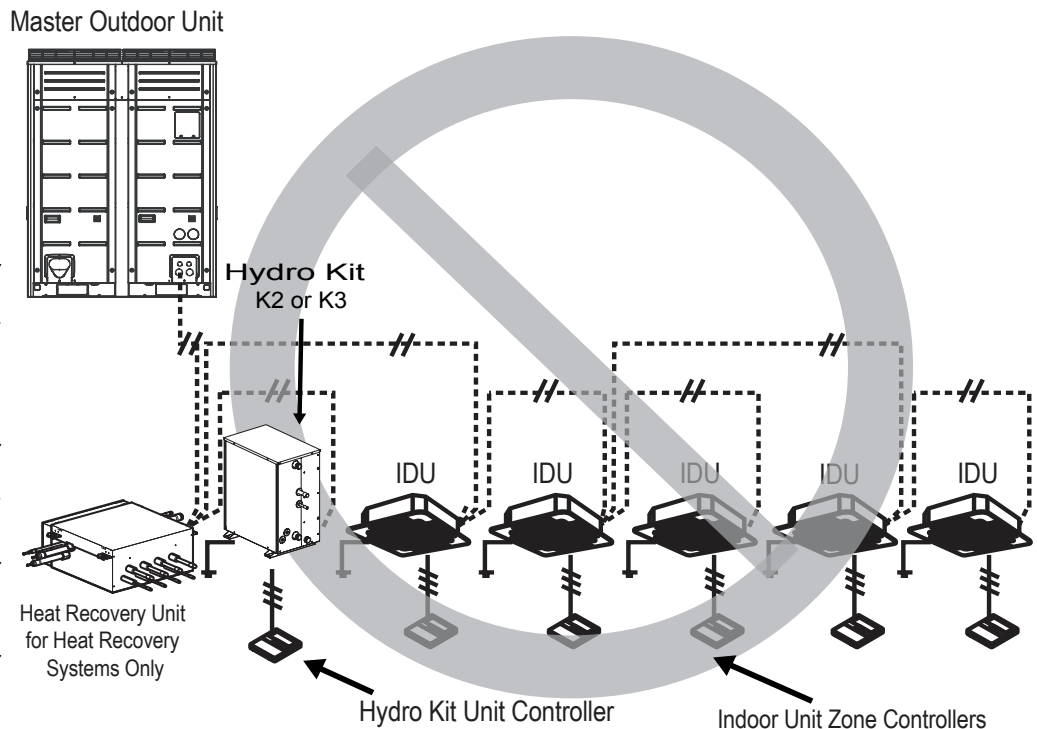
Note:

Select field supplied cable insulation material based on NEC and local code requirements.

Figure 30: Improperly Terminated Communications Cable—Multiple Core Cable in a Starburst Configuration

⚠ WARNING

- Ring and spade terminals used to connect communications cables **MUST** be copper bearing. **Do NOT use terminals** that are galvanized or nickle plate over steel.
- Always verify the communication cable is connected to a communications terminal on the outdoor unit(s). Never apply line voltage power to the communication cable connection. If contact is made, the PCBs may be damaged.
- The shield of the communications cable connecting the outdoor unit(s) to the Hydro Kit(s) and other indoor units should be grounded only to the outdoor unit(s) frame(s). Tie the shield of each cable segment together using a wire nut at the Hydro Kit(s) and other indoor units.
- Never ground the shield of the communications cable to the Hydro Kit indoor unit frame, or other grounded entities of the building.
- Never use a common multiple-core communications cable. Each communications bus shall be provided a separate cable (i.e., between outdoor unit(s) and indoor units; outdoor units and central controller(s)). If communications cables of separate systems are wired using a common multiple-core cable, it will result in a poor communications signal and unacceptable system operation.
- Position the power wiring a minimum of two (2) inches away from the communication cables to avoid operation problems caused by electrical interference. Do not run both in the same conduit.



Communications Cable Between a Single Hydro Kit and a Unit Controller

✓ Guidelines and Recommendations

- Only use LG provided three-core communications cable (provided with the Hydro Kit) and the Unit Controller. Using field provided cable may cause communications errors.
- Set the Hydro Kit operating parameters using DIP switches or by setting up the Unit Controller.

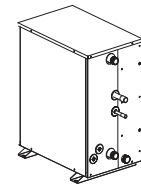
⚠ WARNING

NEVER splice, cut, or extend cable length with field provided cable. If the length needs to be extended, use one (or more) 39 foot LG Cable Extension Kit (PZCWRC1) (sold separately). The maximum length of the cable cannot exceed 164 feet.

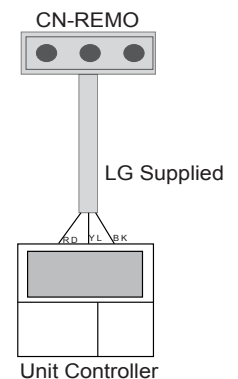
Figure 31: Communication Cable - Single Hydro Kit to Unit Control

Note:

- During roughing in the unit, the female socket MUST BE positioned at the Hydro Kit Unit Controller location.
- The male plug-end of the communications cable must be located at the Hydro Kit indoor unit.
- Do not cut cable or extend cable length. Violating these rules may cause communications errors.



On All Hydro Kit Models



Communications Cable Between a Multiple Hydro Kit Units and the Unit Controller

Note:

Although up to 16 Hydro Kits can be linked together and controlled as one group. All Hydro Kits must be of the same model type. Do not mix K2 and K3 models on the same communication cable! See Figure 32.

⚠ WARNING

NEVER splice, cut, or extend cable length with field provided cable. If the length of the cable between grouped units is greater than 32 feet, extend the length using LG Extension Kit 39' cable (PZCWRC1 sold separately) must be used. The maximum length of the cable cannot exceed 164 feet.

✓ Guidelines and Recommendations

- If any Hydro Kits are to operate together in a group, use one (or multiple) three-core Group Control Kits (sold separately) containing extension and Y-splitter cables. One (1) group control cable kit for each Hydro Kit in the group except for the last indoor unit.
- Always use an LG provided group control communications cable (Group Control Kit; sold separately) between the Hydro Kit and the Unit Controller. Field provided cable will result in communications errors.
- Before running cable, decide which Hydro Kit will be the "Master." The Hydro Kit Unit Controller cable will be routed and connected to this master unit.
- Identify each Hydro Kit unit operating as a group as "Master" or "Slave". Adjust the pertinent DIP switch at each indoor unit.
- Use a daisy chain configuration and connect all of the group's Hydro Kits together starting at the "Master" unit as shown in Figure 32.

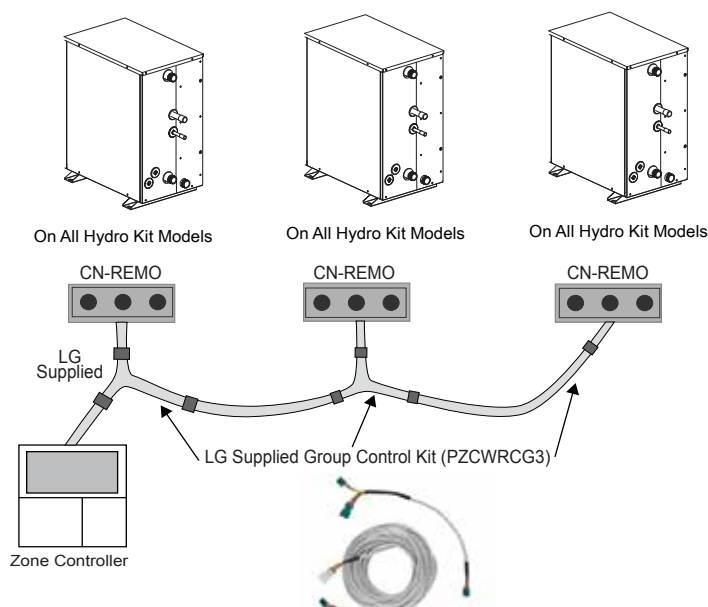


Figure 32: Communication Cable - Multi Hydro Kits to Unit Control

Communications Cable Between the Hydro Kit and the Optional LG Remote Temperature Sensor

LG Remote Temperature Sensor

The optional Remote Temperature Sensor is used in applications where the designer desires to control the Hydro Kit based on space temperature in lieu of leaving water temperature. The thermistor sensor is provided with 50 feet of wiring and a plug for quick connection to the Hydro Kit unit. The communications cable cannot exceed 164 feet in total length.

Follow the guidelines below when routing Communication Cable between the Hydro Kit and the optional LG Remote Temperature Sensor (PQRSTA0).

See Figure 36 for the location of the LG Remote Temperature Sensor socket on the Hydro Kit's main PCB.

Guidelines

- Use only LG supplied communications cable shipped with the Remote Temperature Sensor. A communications error may occur if any other cables are used.
- Locate the zone sensor on a flat interior, dry wall surface away from direct sunlight.
- Avoid placing sensor near significant heating / cooling sources.
- Do not cut or modify the length of the cable. If the cable is too long, roll it up and safely tie-wrap it in an "out of way" location.
- During cable rough-in, be careful not to damage the quick connect plug ends.
- Do not remove and then re-splice back together the quick connect plug-end.
- Route the male plug-end to the Hydro Kit unit.
- Thermostat should be placed at least 55 inches above the finished the floor if the designer or local codes does not specify differently.
- Do not place the Remote Temperature Sensor behind a door or along an entry way.

Hydro Kit and the Optional Solar Heating System Tank Sensor Wells and Sensors

Refer to the installation instructions for guidance with roughing-in the Hydro Kit sensor well, sensor bulb and cable. Instructions are found in the Finish Up section of this manual, under the heading, "Indirect Hot Water Storage Tank Well and Sensor (Included with the Hydro Kit. If Ordered Separately, Replacement PN EBG61325701)" on page 48.

For roughing-in guidance on 3rd party provided valves, relays, and other control devices, refer to the instructions found in the Accessories Installation section starting on page 47 of this manual, as well as, instructions provided with the devices.

Independent Power Module (K2 Only)

The Independent Power Module is supplied with the Hydro Kit Medium Temperature (K2) unit. The Independent Power Module protects from a plate heat exchanger burst. If a power outage occurs during normal operation, a plate heat exchanger burst could happen during oil-return and defrosting cycle in cooling mode.

Wiring Pre-Check

- Verify power wiring and communication cable are all properly terminated.
- Test the line voltage wiring insulation. Conduct a Meg-ohm test reaching a value of 2.0MΩ or higher. Test the insulation resistance between the Hydro Kit power wiring terminal block and ground using a DC meg-ohm tester (DC 500V).

Installation

1. Open the front panel of the Hydro Kit and the control box cover.
2. Secure the power module to the wall of the Hydro Kit control panel (Figure 33).
3. Route the power module wiring harness #2 through an opening in the bottom of the control panel (Figure 34).

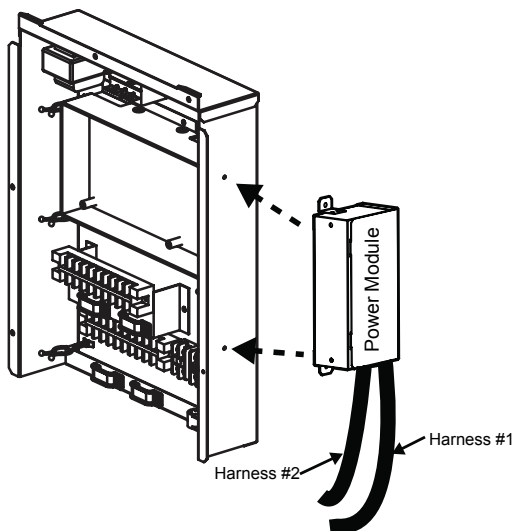


Figure 33: Securing Power Module to Control Panel

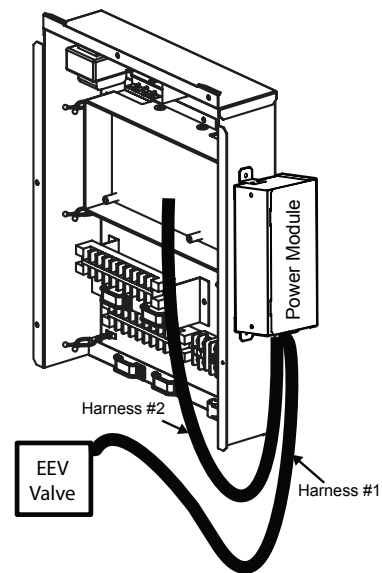


Figure 34: Routing Module Wiring

Independent Power Module (K2) - Continued

⚠ WARNING

- Incorrect wiring will lead to malfunction or damage of the independent power kit.
- Maintain 20 minutes of continuous power to the power module kit to ensure that EEV can close properly. This ensures that EEV is fully charged.

Refer to the Independent Power Module Installation Manual for more detailed information regarding this system.

1. Turn power off at circuit breaker.
2. Disconnect the cable harness plug from the socket tagged **CN-EEV**.
3. Connect the Independent power module wire harness tagged **CN-EEV/LOAD** to the Hydro Kit EEV valve.
4. Connect the Independent power module dual plug wiring harness #2 tagged **CN-EEV/MAIN** to the Hydro Kit's PCB board sockets tagged **CN-EEV** and **CN-WRITE**.
5. Replace the control panel cover and unit cabinet access panel.
6. Restore power to the Hydro Kit.

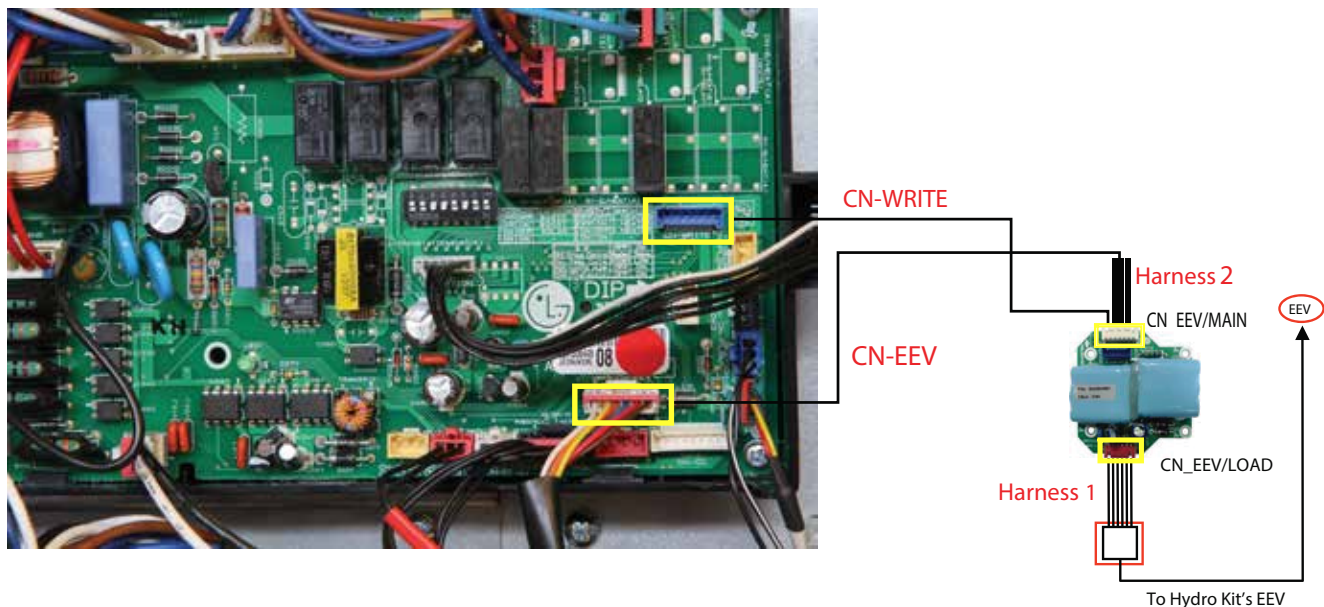
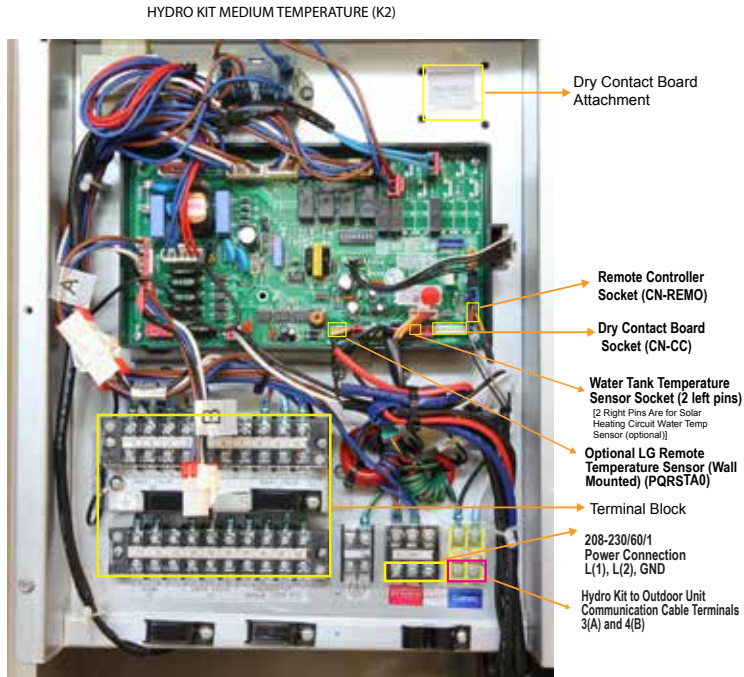


Figure 35: Power Module Wiring Termination Detail

Hydro Kit Medium Temperature (K2) Control Panel Layout

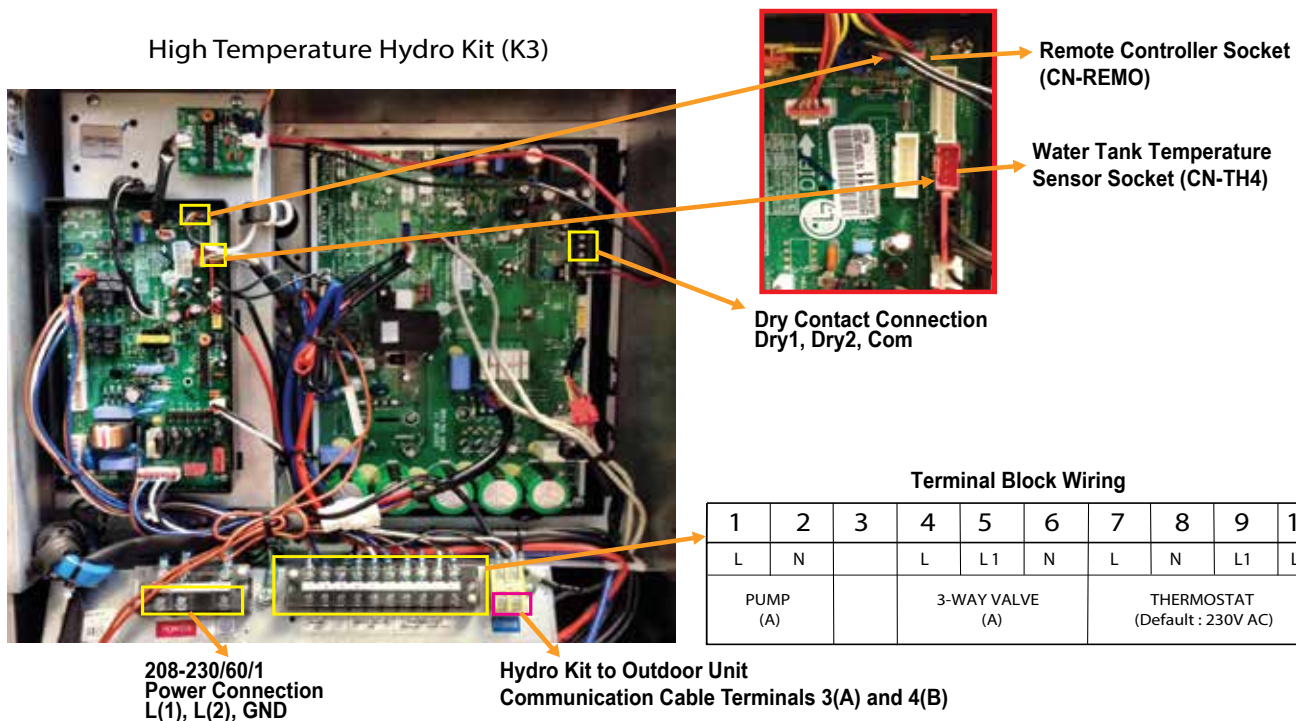


3WAY VALVE (B)			WATER PUMP (B)		Not used		3WAY VALVE (A)		
1 L	2 L1	3 N	4 L	5 N	6	7	8 L	9 L1	10 N
BR	WH	BL	BR	BL			BR	WH	BL

PUM P (A)			2WAY VALVE (A)			THERMOSTAT (Default : 230V AC)			
11 L	12 N	13	14 L1	15 L2	16 N	17 L	18 N	19 L1	20 L2
BR	BL		BR	WH	BL	BR	BL	WH	BK

Figure 36: K2 Hydro Kit Control Panel Layout

Hydro Kit High Temperature (K3) Control Panel Layout



Terminal Block Wiring

1 L	2 N	3	4 L	5 L1	6 N	7 L	8 N	9 L1	10 L2
PUMP (A)			3-WAY VALVE (A)			THERMOSTAT (Default : 230V AC)			

Figure 37: K3 Hydro Kit Control Panel Layout

Hydro Kit Wall Mounted Controller Mounting and Communications Cable Terminations (For All Models)

Procedure

1. Route the female plug-end of the Hydro Kit Wall Mounted Controller cable already located in the handy box or protruding from the wall surface through the large hole on the back side of the subbase.
2. Attach the Hydro Kit Wall Mounted Controller subbase to the wall or handy box. Using the provided screws, insert through the holes in the subbase and tighten screws to anchor (Figure 38).
 - Seal all gaps, holes and other cavities behind the subbase before mounting.
 - If mounting the Hydro Kit Wall Mounted Controller over a handy box, seal the holes in the handy box shell using spray foam or similar insulating material approved for this use by local code.

Note:

The Hydro Kit Wall Mounted Controller is designed to be surface mounted. Recessing the controller will cause the onboard temperature sensor to misread the zone temperature. Refer to Table 24 in this manual for proper wiring connection information.

3. Determine how the communications cable will be routed to the controller. Choose either Back, Top or Right Edge (Figure 39).
4. If not already done, separate the controller body from the controller subbase.
5. Insert a small flat tip screw driver into one of the two slots along the bottom edge of the subbase and gently turn clockwise to depress the retainer tab (Figure 40).
6. With the tab depressed, gently pull on the bottom of the controller body. Repeat for the remaining tab.
 - Take care not to damage the inside components when separating (Figure 40).

⚠ WARNING

Be sure to always have powered off before installation of accessories. Never operate Hydro Kit outside of the operational parameters as outlined in this manual and the product specifications. Never touch wiring or install accessories with wet hands.

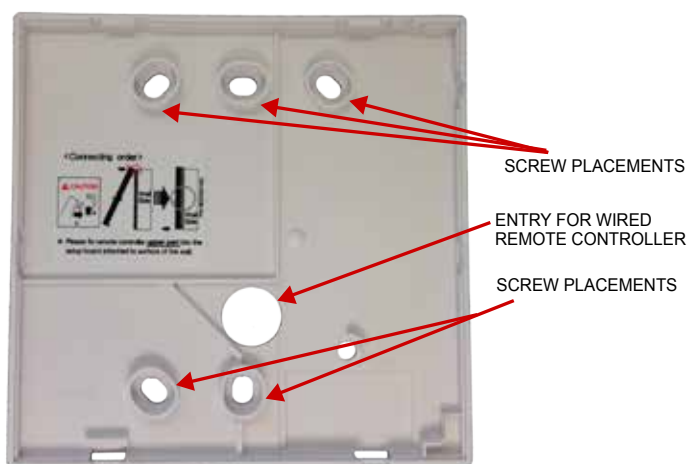


Figure 38: Hydro Kit Unit Controller Subbase

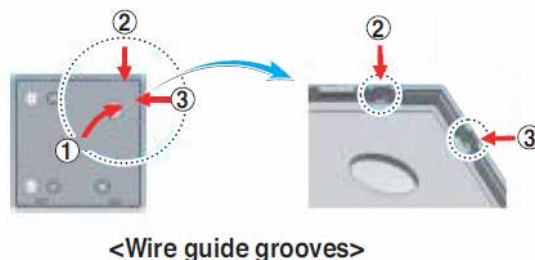


Figure 39: Attaching Remote Control Cable to Termination Points

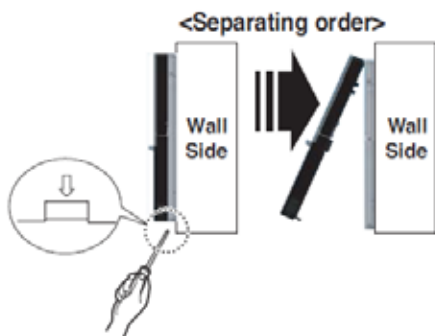
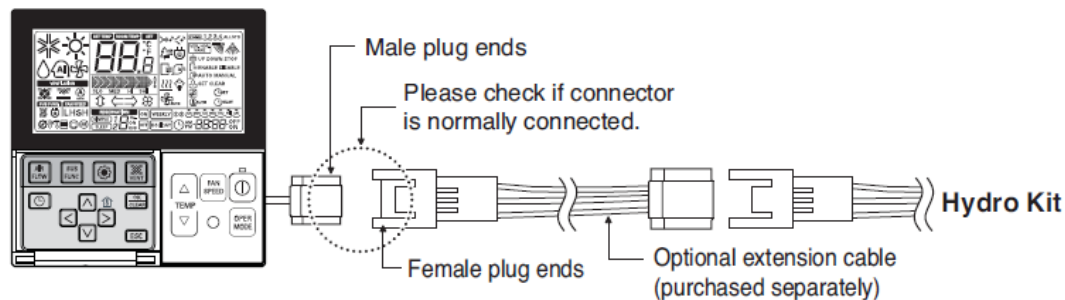


Figure 40: Hydro Kit Controller Subbase Removal

7. If using the top right edge entry point, use needle nose pliers to carefully break-off the tab as shown in Figure 40.
8. Route the cable through the appropriate entry point. Refer back to Step 3.
9. If a back entry is selected, route the female plug-end of the Hydro Kit Wall Mounted Controller cable already located in the handy box or protruding from the wall surface through the large hole on the back side of the subbase. Attach the subbase to the wall or handy box using the appropriate screws or fasteners (Figure 38).
10. Level the controller and tighten screws on the subbase being careful not to overtighten which may bend, stress, cause damage to the PCB board.
11. Plug the male connector of the communications cable whip attached to the subbase to the socket of the already roughed-in communications cable (Figure 41).
12. Attach the controller body to the subbase. First insert the top edge and lastly the bottom edge. Gently push on the frame of the controller body along the bottom edge until you hear it snap into place. Gently pull along the bottom edge to verify it is properly seated (Figure 42).



Kit Unit Controller Communications Cable Termination Detail

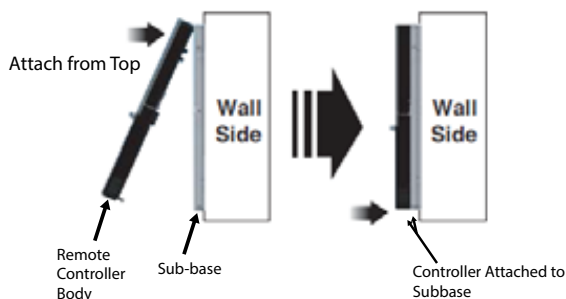


Figure 42: Attaching Controller to Sub-base and to Wall

⚠ WARNING

Be sure to always have powered off before installation of accessories.
Never operate Hydro Kit outside of the operational parameters as outlined in this manual and the product specifications.
Never touch wiring or install accessories with wet hands.

- Do not install cable above 164 ft. This can cause communication errors.

Note:

The Multi V 7-Day Programmable zone controller looks very similar to the Hydro Kit unit controller. Before proceeding with installation verify that you have to correct model controller in your possession. You can tell the two controllers apart by the buttons on the panel. See Figure 43 for the individual controller panels.

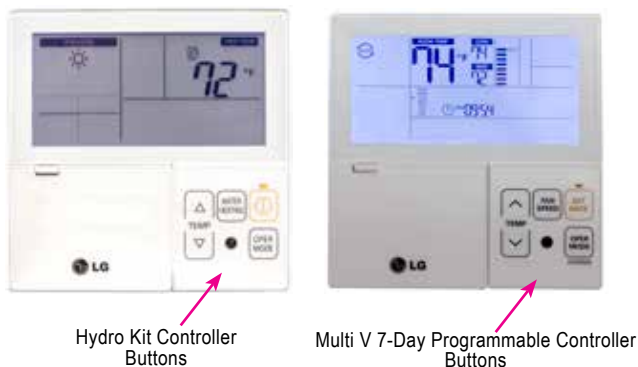


Figure 43: Comparison Hydro Kit and Multi V 7-Day Programmable Controller Buttons

Terminating Group Controlled Hydro Kits

If any of the Hydro Kits were specified to operate in unison, create a group control communications circuit between the Hydro Kits using optional group control cable kits (purchased separately (PZCWRCG3) consisting of three (3) cables as follows:

- One pigtail cable
- One Y-cable
- One 39 foot long extension cable segment

Note:

- Up to 16 Hydro Kits can be members of a group sharing control input from a single Hydro Kit controller.
- Each Hydro Kit group must be connected to the same outdoor unit.
- At the last Hydro Kit Slave unit in the group, a pigtail cable is not required.
- Hydro Kits within the same group must have the same DIP switch settings. The only DIP switch that can differ is the group control setting switch, where one Hydro Kit will be the Master and the remaining Hydro Kits will be Slaves.

Procedure (Termination)

1. Before proceeding with group control cable terminations, verify power is off at all Hydro Kits effected.
2. Choose one Hydro kit of the group and designate it as the "Master" unit of the group.
 - Master designation is achieved by setting DIP switch #1 in the OFF position. Hydro Kits designated as Slave units will need DIP Switch #1 placed in the ON position.
3. If not already recorded, record the "Master" status of this unit and identify all other units in the group as "Slaves". Record the assigned identity of each on the "Pre-Commissioning Device Configuration Worksheet" located at the end of this manual.
4. Starting with the Hydro Kit Master unit, plug in the male end of the pigtail cable into the **CN-REMO** socket.
5. Plug the male end of the extension cable coming from the previous Hydro Kit unit into the **CN-REMO** socket. Refer back to Figure 36 and Figure 37 for specific location of the **CN-REMO** sockets on each Hydro Kit chassis' PCB.
6. Plug the Y-cable into the pigtail at each Hydro Kit; except for the last Slave Hydro Kit in the group, at which no Y-cable cable will be needed (see Figure 44).
7. Connect two extension cable segments to each Y-cable, except for the Y-cable connected to the Master Hydro Kit.
8. At the Master Hydro Kit, connect one extension cable and the communications cable from the Controller to the Y- cable.

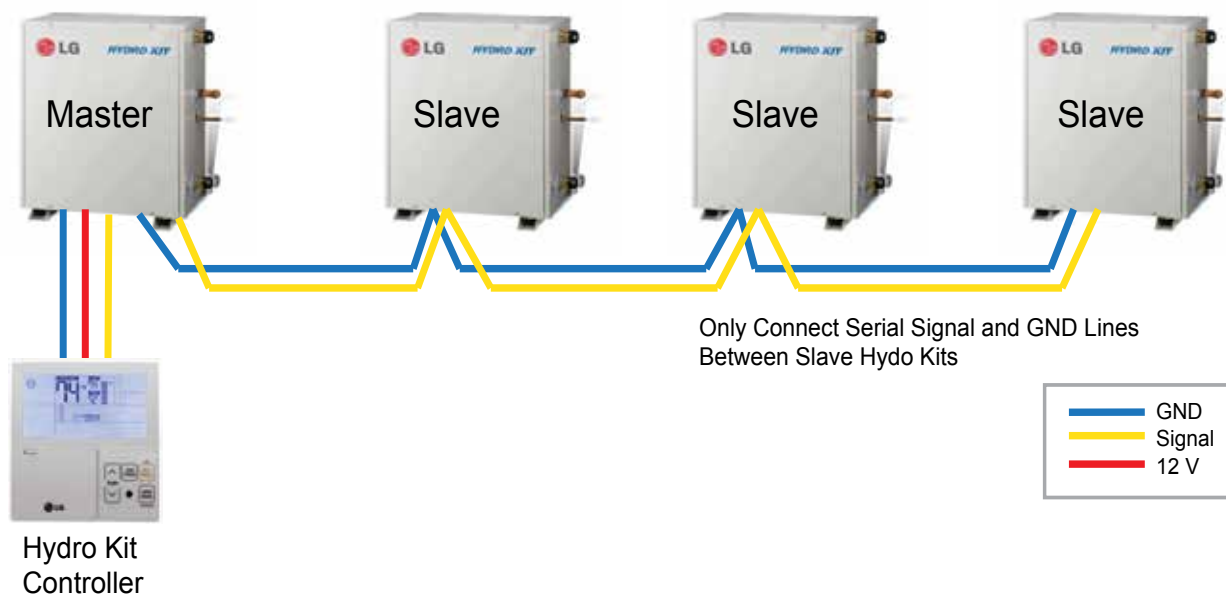


Figure 44: Wiring Schematic - Hydro Kit Controller to Multiple Hydro Kits

Hydro Kit Circuit Water Pump Interlock Circuit Terminations

Refer to Figure 45 and Figure 46 for each respective Hydro Kit chassis when following the procedure for Circuit Water Pump Interlock termination points on the terminal block.

⚠ WARNING

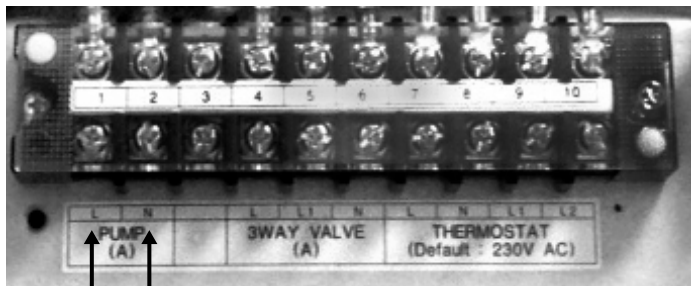
Be sure to always have powered off before installation of accessories.
Never operate Hydro Kit outside of the operational parameters as outlined in this manual and the product specifications.
Never touch wiring or install accessories with wet hands.

Note:

Total current draw of all connected devices provided by others shall not exceed 5 Amperes.

Procedure

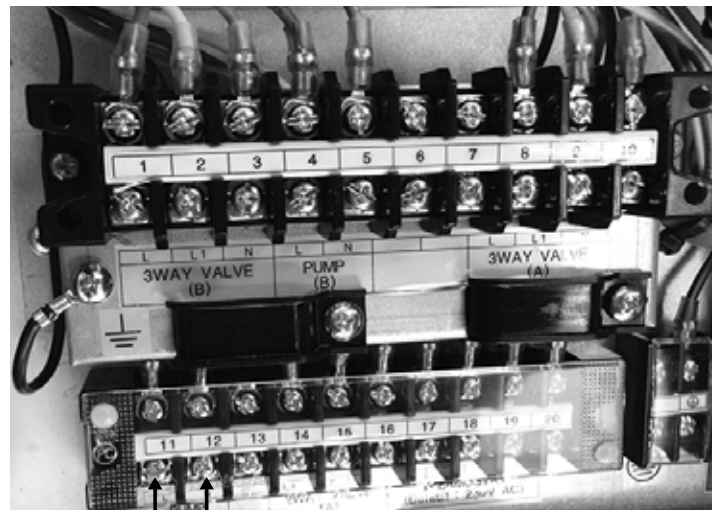
1. Verify the pump being installed was sized correctly considering the system's design flow rate and static head pressure.
2. If not already completed, install the pump and connect it to the piping system.
3. Select a suitable pilot ready with a coil rated for 208-230/60/1 service.
4. Connect appropriately sized wiring per local and NEC Code between the pump starter, the pilot relay, and the Hydro Kit terminal strip. See Figure 45.



Pilot Relay
Pump Motor Starter or Contactor

WIRE TO TERMINALS 1 AND 2 ON HIGH TEMPERATURE (K3) HYDRO KIT

Figure 45: (K3) Hydro Kit -- High Temperature Terminal Block



Pilot Relay

Pump Motor Starter or Contactor

WIRE TO TERMINALS 11 AND 12 ON MEDIUM TEMPERATURE (K2) HYDRO KIT

Figure 46: (K2) Hydro Kit -- Heating/Cooling Terminal Block

Indirect Hot Water Storage Tank Well and Sensor (Included with the Hydro Kit. If Ordered Separately, Replacement PN EBG61325701)

⚠ WARNING

Be sure to always have powered off before installation of accessories.
Never operate Hydro Kit outside of the operational parameters as outlined in this manual and the product specifications.
Never touch wiring or install accessories with wet hands.

Note:

- Installation of the Hot Water Storage Tank Sensor and well is not necessary if the Hydro Kit will be used in applications that do not include heating water in tanks.
- The sensor well and storage tank have to be located such that the 39 foot black sensor cable included with the Hydro Kit, reaches between the Hydro Kit PCB board and Sensor well location on the tank while considering a proper routing path for the sensor cable.
- Choose a path for the Sensor cable that keeps it at least two (2) inches away from power wires.
- Depending on the current draw of nearby wiring, the minimum clearance distance may have to be increased.

🔧 Tools Needed

- Electric drill
- Tap and drill bit properly sized to make a 1/2" FPT hole
- Thermo paste for the sensor well

Procedure

1. If the Indirect Water Storage Tank provided has a sensor well in the selected location, use it.
 - If the Storage Tank does not have a sensor well, choose an appropriate position on the tank and install the well provided with the sensor.
2. Remove the sensor and cable from the well.
 - Loosen and remove the keeping nut at the entry of the well housing.
 - Remove the sensor from the well by gently pulling on the sensor cable.
3. Slide the keeping nut up the sensor wire so it will not get misplaced.
 - Put the sensor, sensor cable and keeping nut assembly in a safe location.
4. If the Indirect Storage Tank has water in it, isolate the tank by closing shutoff valves and drain the tank.
5. The sensor well provided has a 1/2" MPT connection. Drill and tap a 1/2" FPT hole in the wall of the tank at an appropriate location.
 - Depending on the working pressure of the system, choose the appropriate method to seal the sensor threaded connection.
 - If welding the sensor well into the tank:**
 - Insert the well into the thread hole and rotate till the threads on the neck bottom out.
 - Weld the sensor to the tank and pressure test as necessary.
 - Installation without welding:**
 - Wrap the threads of the sensor well about eight (8) times with Teflon tape.
 - Insert the well into the threaded hold in the tank wall.
 - Turn clockwise until tight, using a socket or open-ended wrench.
6. Locate the sensor.
 - Verify the keeping nut is on the sensor cable with the threads facing the sensor bulb.

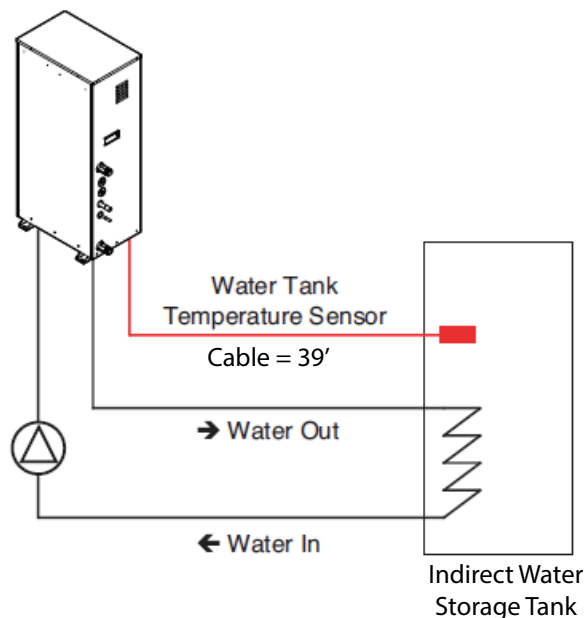


Figure 47: Indirect Hot Water Storage Tank Temperature Sensor Schematic

Indirect Hot Water Storage Tank Well and Sensor (EBG61325701) - Continued

7. Apply a generous portion of Thermo-paste to the sensor and in the well.
 - Use enough to fill the air space between the sensor head and the walls of the sensor well.
8. Push the sensor all the way into the well until it bottoms out.
 - Fill any air gaps with Thermo-paste.
9. Slide the keeping nut down the sensor cable and thread it on the sensor well.
10. Choose a route between the sensor well and the Hydro Kit unit for the sensor lead where the cable is protected from damage, foot traffic; and extreme weather and temperature conditions.
11. Loosely secure the cable to the structure about every three (3) feet with cable ties.
12. Avoid damaging the sensor cable, do not pull the ties too tight.
13. Route the sensor cable through the Hydro Kit casing and into the control panel area.
 - Where the cable passes through a hole with sharp edges, install field supplied protective grommets.
14. Locate socket **CN-TH4**.
 - Before plugging the male connector into the socket, verify unit power is off.
 - Inspect the leads and pins of the sensor cable plug. Look for bent pins; and loose connections between the wire leads and the metal pins in the plug.
15. Plug the sensor male plug-end into the **CN-TH4** socket.
16. Lastly, verify the connection is secure.

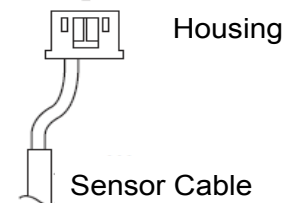
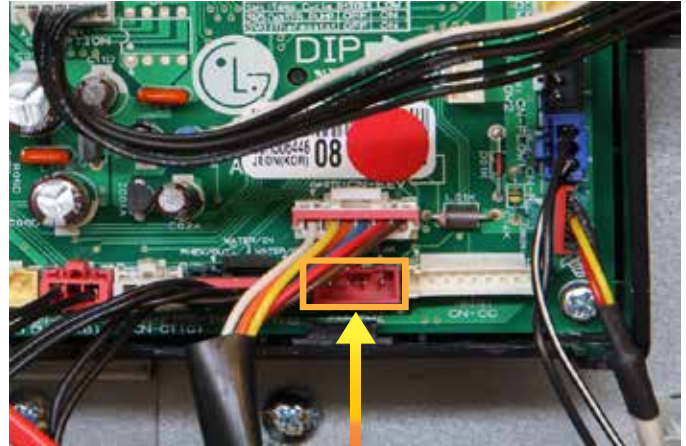


Figure 48: Hot Water Storage Tank Sensor Cable Connection

Solar Heating System Hot Water Storage Tank Temperature Sensor Well (Optional) Included with Solar Interface Kit PN #PHLLA (K2 Model Only)

If optional Solar Heating kit is used, install the sensor well from the kit in a similar manner used to install the water tank temperature sensor.

⚠ WARNING

Be sure to always have powered off before installation of accessories. Never operate Hydro Kit outside of the operational parameters as outlined in this manual and the product specifications. Never touch wiring or install accessories with wet hands.

Hydro Kit Thermostats (Optional Accessories)

Follow Table 10 below to assist with which thermostat options are available for use with each Hydro Kit. Refer to the added information below the table regarding the Thermostat options.

Table 10: Hydro Kit Thermostats

Type	Power	Hydro Kit Unit
Mechanical (1)	1~230 V	High Temperature Only (3)
		Medium Temperature (4)
	1~24 V	High Temperature Only (3)
		Medium Temperature (4)
Electrical (2)	1~230 V	High Temperature Only (3)
		Medium Temperature (4)
	1~24 V	High Temperature Only (3)
		Medium Temperature (4)

⚠ WARNING

- Heating/Cooling Thermostat models must have “Mode Selection” feature to determine operation mode.
- Thermostat must be a manual changeover design and be able to accept separate heating and cooling temperature setpoints.
- Do not use the thermostat terminals to power external loads such as contactors, relays or any other type of control or electrical device. Doing so will damage the unit control board.
- Cooling and heating signals must be sent immediately when the temperature condition is met. There can be no delay in trigger timing.
 1. Use 1~230 V Thermostat for installation.
 2. Some electro-mechanical thermostats have a time delay to protect the compressor, resulting in time lag between mode changes. Users should refer to the Thermostat Installation Manual for any workarounds.
 3. Setting temperature ranges through direct thermostat can be different from direct unit control. The heating set temperature should be chosen within the setting temperature range of the unit.

Follow the procedure below to connect the thermostat to the Hydro Kits.

Refer back to Figure 36 and Figure 37 for the Terminal Block connection locations.

Note:

Set the DIP switch #8 to the **ON** Position, otherwise the Hydro Kit will not recognize the thermostat. The Hydro Kit Controller will display the Thermostat icon and temperature control adjustment via the Hydro Kit Controller will be disabled.

1. Disconnect power to the Hydro Kit.
2. Remove front cover of the unit and open the control box.
3. Identify the power specification of the thermostat to install.
 - If installing a 208-230 V proceed to step 6.
 - If installing a 1~24 V proceed to step 4.
4. Locate connecting cable A and C and disconnect (Figure 49).
5. Connect cable B and C.
6. For Hydro Kit Medium Temperature (K2) Thermostat locate the terminal block in the Hydro Kit and connect the control wiring from the thermostat as shown in Figure 36, terminals 17-20.
7. For Hydro Kit High Temperature, locate terminal block and connect wire as shown in Figure 37, terminals 7-10.

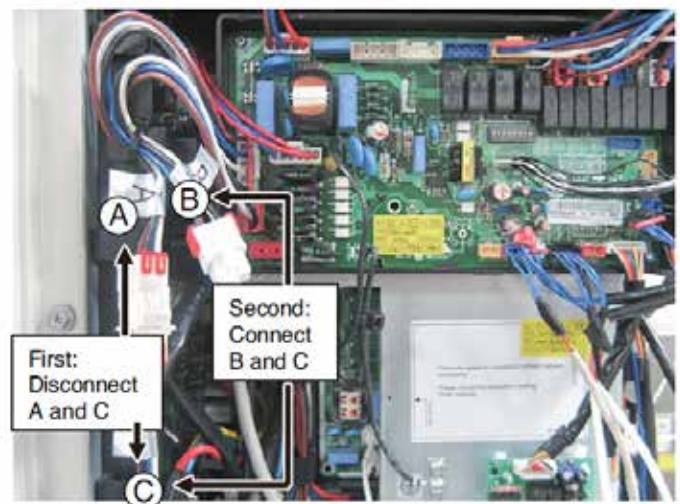


Figure 49: Control Box Cable Connections for Thermostat

Remote Temperature Sensor Installation (PQRSTA0)

The remote temperature sensor can be installed most places where the occupant wants to measure the combined space temperature. Follow the steps below for proper installation.

If the communications cable between the Hydro Kit and the location for the Remote Sensor have not been installed, refer to the Roughing-In section “*LG Remote Temperature Sensor*” on page 40.

⚠ WARNING

- Be sure to always power off Hydro Kit before installation of accessories.
- Never operate Hydro Kit outside of the operational parameters as outlined in this manual and the product specifications.
- Never touch wiring or install accessories with wet hands.

Procedure

1. Locate the end of the communications cable for the Remote Temperature Sensor that protrudes from the wall in the conditioned space.
2. If a handy box was not installed, mark the wall with two dots. Locate the dots about 1 inch to the right of where the cable protrudes from the wall.
 - The two dots should be on a vertical axis about 2-3/8 inches apart with one hole about 1" above the cable protrusion from the wall and the other below.
 - Insert one screw into the wall on each dot leaving about 1/8" of screw shank showing.
3. Terminate the two communications cable leads at the screw terminals on the back side of the Remote Sensor. Polarity does not matter (**CN_ROOM**) (Figure 51).
4. Prepare the wall surface behind the sensor to eliminate any chance of the sensor picking up a false reading.
 - False readings can come from direct air and/or moisture transfer from the wall cavity to the conditioned space through an opening behind the sensor housing.
5. Seal all gaps, cracks, and holes in the wall surface and seal around the communications cable penetration.
 - Use a local code approved caulk or dry-wall compound.
6. Place the sensor casing directly over both the top and bottom screws (see (1) on Figure 52).
 - Slide the sensor housing downward on top of the two (2) screws so that screw head fits snugly into the screw anchor at the back of the unit (see (2) on Figure 52).
7. If the sensor housing is loose after hanging, remove housing from screws, adjust screws again, and then re-hang.
 - Repeat as needed, until sensor fits snug against the wall surface.

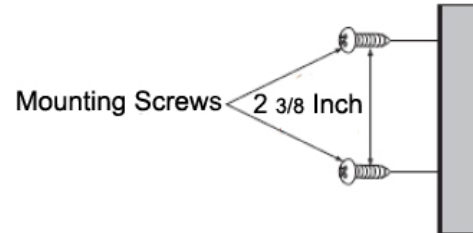


Figure 50: Fixing screws into Remote Temperature Sensor

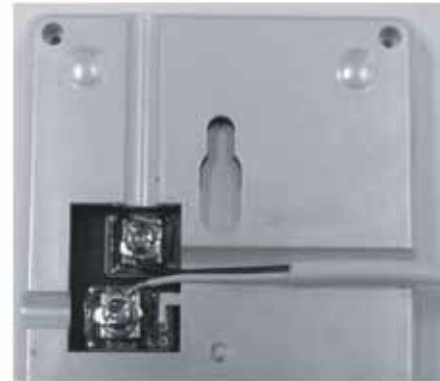


Figure 51: Attaching Connector Wire to Remote Temperature Sensor

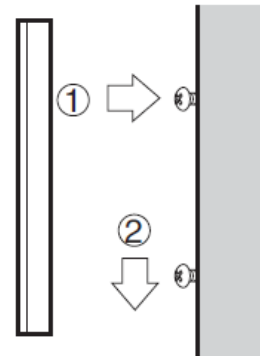


Figure 52: Attaching Remote Temperature Sensor

Accessory Installation

Remote Temperature Sensor Installation - Continued

8. At the Hydro Kit, remove the unit access panel and control panel cover.
9. On the main PCB board locate the socket tagged **CN_ROOM**.
10. Route the sensor wire through the bottom of the control panel and push the plug-end of the remote sensor communications cable into the **CN_ROOM** socket.
11. Re-install the control panel cover and the unit access panel.

Note:

To remove unit: Push unit in upward direction first so that screw heads disengage from the back anchor and then gently pull unit away from the screws (refer to Figure 52, on previous page).

Hydro Kit Circuit 3-Way Domestic Water Valve Wiring Terminations

A Hydro Kit Circuit 3-way Domestic Water valve is required to alternate the flow of heated water from the Hydro Kit (or Solar Heating System Interface) between the indirect hot water storage tank and the portion of the water loop serving devices designed to heat the conditioned space. Follow the valve manufacturer's instructions for wiring termination guidance at the valve. The procedure below describes how to terminate the valve wiring at the Hydro Kit..

Procedure

1. Take front access panel off of the Hydro Kit and remove the control box cover.
2. Locate terminal block and connect wires as shown in the Table for the specific Hydro Kit units as outlined in Figure 36 or Figure 37.
3. Re-install the control box cover and the unit access panel.

WARNING

Be sure to always have powered off before installation of accessories. Never operate Hydro Kit outside of the operational parameters as outlined in this manual and the product specifications. Never touch wiring or install accessories with wet hands.

Plan the Multi V System Central Control Addresses Assignments

Check with the building's Chief Engineer and gather any preferences he may have. If there are no preferences follow the guidelines below:

✓ Guidelines

- Hex assignments do not have to be assigned in any particular order, or an order defined by the routing of the communications cable between the Hydro Kits. In most cases, Hex addresses can be skipped.
- All members of a Hex Group are not required to be on the same Multi V Hydro Kit system.
- Addresses can be assigned at random, not in any particular order, and can be skipped.¹

Hydro Kit/Indoor Unit Central Control Address Assignments

A central control address is made up of two hexadecimal characters.

- The first character in the central control address is the *Hex Group Identifier*.
 - Possible Hex Group Identifiers (in order of lowest to highest) are 0-9 followed by A-F.
- The second character in the address is the *Hex Member Identifier* in a Hex Group.
 - Hex Member Identifiers (in order from lowest to highest) are also 0-9 followed by A-F.

Hex Address Assignment Limitations

✓ Guidelines

- Hex Groups are limited to 16 members (see Figure 55).
- VRF Systems are limited to 16 Hex Groups.
- There is a limit of 256 possible Member Identifiers per Central Control. (See Central Controller Communications Limitations below.)

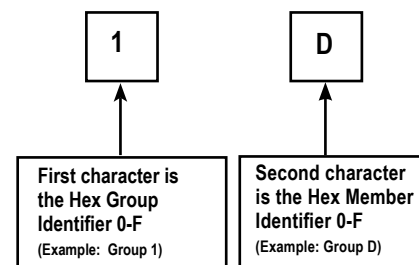


Figure 55: Central Control Address Nomenclature

Multi V System Central Controller Communications Limitations

Each type of Central Controller device is designed to communicate with a limited quantity of Hydro Kits/indoor units. The quantity of Hydro Kits/indoor units that can be connected to a single central control communications cable, therefore, will be defined by the central control device on that cable with the smallest **Maximum Hydro Kit/Indoor Unit/Energy Recovery Ventilator (ERV) Quantity** as shown in Table 11, to the right.

Table 11: Central Controller Indoor Unit Connection Limitations

Group Number

If the building operator wants to know which Hydro Kits/indoor units/ERV units are on each water source unit, and multiple systems serve a building:

- Assign a different group number for each floor. If there are more than 16 indoor units on a floor, multiple Group Numbers may be necessary.

Member Number

Can be assigned at will or for example, can follow the room layout on each floor. For each LG Central Controller product provided on the project, devise a central control address schedule and assign a central control address to each Hydro Kit(s), and EEV(s) units. Record this central control address for each component in the column provided on the Device Configuration Worksheet (located at the end of this manual).

Central Control Device	Maximum Hydro Kit/Indoor Unit/ERV Quantity
AC EZ	32
AC Smart II	64
AC Smart II with Expansion Kit	128
AC SMART Premium	128
LonWorks Gateway	64
BACnet Gateway	256
Advanced Control Platform	256

¹The exception to this is the AC EZ, unit! **DO NOT** skip addresses. Start with Hex address 0. Buttons have pre-assigned Hex addresses. If an address is skipped, the associated button will do nothing.

Upload Central Control Address to Each Hydro Kit

Assign the designated Central Control address to each Hydro Kit using the attached Hydro Kit Unit Controller.

Power Up All Indoor Unit PCB's

Turn the disconnect for each indoor unit to the ON position. **DO NOT** turn the Hydro Kit on (**ON/OFF** Button remains OFF).

WARNING

During the following procedure, **NEVER PUSH** the **ON/OFF** (Enable operation) Button on the Hydro Kit Controller.

For Hydro Kits NOT Being Controlled as a Group

Procedure

1. Verify the Hydro Kit controller cable is plugged into **CN-REMO** socket on the Hydro Kit's main PCB.
2. Using the controller, go to the setup Function **07**.
3. Type in the Hex Central Control address that has been designated for the Hydro Kit.
4. Repeat Steps 1 through 3 for each Hydro Kit in the building.

For Hydro Kits Being Controlled as a Group

1. Before attempting to assign a Central Control address to any Hydro Kit units controlled as a group, choose which unit in the group will be designated as the "Master" Hydro Kit and which Hydro Kits are going to be designated as "Slave" units.
2. From the Master Hydro Kit, remove the unit access panel and control panel cover to access the PCB.
3. Verify a group control pigtail cable is plugged into the **CN-REMO** socket on the Hydro Kit PCB. If it is not, plug the communications cable pigtail into the **CN-REMO** socket at this time.
4. If the group control extension cable between the Hydro Kits is plugged into the Y-cable, unplug the extension cable from the Y-cable.
5. If not already completed, plug the Hydro Kit Unit Controller communications cable into the pigtail cable.
6. Using the controller, go to the setup Function **07**. Type in the Multi V System Central Control address designated for the Master Hydro Kit.
7. Disable power to the Master Hydro Kit. **Do not restore power to the Master Hydro Kit at this time!** It will be restored in step 17.
8. If the Hydro Kit Unit Controller and associated communications cable has already been permanently mounted in place:
 - Plug the Y-cable back into the pigtail and obtain another Hydro Kit Unit Controller with a communications cable.
 - Continue programming the Slave Hydro Kit(s).
9. If necessary, power down the first Slave Hydro Kit unit.
 - Disconnect the Y-cable from the pigtail.
 - Verify that DIP switch #1 is in the OFF position while loading the Central Control address.
10. Plug the Hydro Kit Unit Controller communications cable into the socket on the pigtail cable.

Note:

DO NOT push the **ON/OFF** button or enable the Hydro Kit unit operation at any time during this procedure.

11. Using the controller, go to the setup Function **07**. Enter the Multi V System Central Control address designated for the Hydro Kit.
 - Place DIP Switch No. 3 on the Hydro Kit PCB to the **ON** position.
12. Disable power to the Hydro Kit using the disconnect switch.
 - Wait one (1) minute.
13. While power is off, unplug the Hydro Kit Unit Controller cable from the pigtail socket.
14. Plug the group control Y-cable back into the pigtail.
15. Restore power to that Slave Hydro Kit, and proceed to the next Slave Hydro Kit.
16. Repeat Steps 9 through 15 for each Slave Hydro Kit except the last one in the group. At the last Slave Hydro Kit the process is the same except unplug the group control cable from socket **CN-REMO** on the Hydro Kit PCB board and plug the Hydro Kit Unit Controller cable into the same socket.
17. After all Slave Hydro Kits have Central Control addresses assigned, go back to the Master Hydro Kit unit and restore power.

PRE-COMMISSIONING

DIP Switch Setting - Hydro Kit Medium Temperature

DIP Switch Settings for Hydro Kit Medium Temperature (K2)



Figure 56: Hydro Kit Medium Temperature DIP Switch Block

Figure 56 along with Table 12 below outlines the correct positioning of each DIP switch depending on the functioning of the Hydro Kit unit. These settings are specific to the Hydro Kit Medium Temperature (K2) unit.

⚠ WARNING

Always turn off electric power before adjusting DIP switch settings. There is a risk of electric shock if not turned off.

Guidelines

- DIP switch in the DOWN position is OFF. If it is in the UP position it is ON (as seen in Figure 56).
- Always set DIP switch **#6** to DOWN/OFF.
- Follow DIP switch settings in Table 12 below precisely or unit may not operate properly.

Table 12: Hydro Kit Medium Temperature DIP Switch Settings and Description

x : OFF ● : On

Description	Dip switch setting								Function	Default
	1	2	3	4	5	6	7	8		
Group Control	x								Master	○
	●								Slave	
Installation Scene		x	x						Floor heating only	
		●	x						Floor heating + Hot water + solar booster	
		x	●						Floor heating + Hot water	○
		●	●						Hot water only	
Emergency operation				x					High temperature operation	○
				●					Low temperature operation	
Water pump control					x				Water pump controlled with Hydro Kit	
					●				Water pump NOT controlled with Hydro Kit	○
Antifreeze operation mode						●	x		Normal operation mode (connect short key)	○
						●	●		Antifreeze operation mode (disconnect short key)	
Thermostat connection								x	Thermostat NOT installed	○
								●	Thermostat installed	

⚠ WARNING

- Do not operate the Hydro Kit unit in Freeze avoidance mode without the proper amount of antifreeze chemicals added to the water circuit.
- Do not add any antifreeze while operating in the heating mode.

DIP Switch Settings for Hydro Kit High Temperature (K3)



Figure 57: Hydro Kit High Temperature DIP Switch Block

Figure 57 along with Table 13 below outlines the correct positioning of each DIP switch depending on the functioning of the Hydro Kit unit. These settings are specific to the Hydro Kit High Temperature (K3) unit.

⚠ WARNING

Always turn off electric power before adjusting DIP switch settings. There is a risk of electric shock if not turned off.

Guidelines

- DIP switch in the LEFT position is OFF. If it is in the RIGHT position it is ON (as seen in Figure 57).
- Never place DIP switch **#2** RIGHT/ON and DIP switch **#3** LEFT/OFF.
- Follow DIP switch settings in table precisely or unit may not operate properly.

Table 13: Hydro Kit High Temperature DIP Switch Settings and Description

Description	Dip switch setting								Function	Default
	1	2	3	4	5	6	7	8		
Group Control	x								Master	○
	●								Slave	
Installation Scene		x	x						Floor heating only	
		x	●						Floor heating + Hot water	○
		●	●						Hot water only	
Emergency operation				x					High temperature operation	○
				●					Low temperature operation	
Water pump control					x				Water pump controlled with Hydro Kit	
					●				Water pump NOT controlled with Hydro Kit	○
Thermostat connection							x		Thermostat NOT installed	○
							●		Thermostat installed	

PRE-COMMISSIONING

Installer Setting Configuration



How to Enter Installer Setting Mode

During system setup, the Installer Setup Mode must be initiated in order to set detailed functionality of the Remote Controller. This procedure is used to customize the Hydro Kit settings.

This section will describe entering Installer Setting Mode, give a summary of each function and its corresponding code and describe the common settings needed to complete Hydro Kit configuration. For a complete description of all buttons and icons on the Hydro Kit Wall Mounted Controller see, "Hydro Kit (K2, K3) Wall Mounted Controller Operation" on page 70.

⚠ WARNING

Failure to correctly configure functionality through the Installer Setup can cause problems to the unit, user injury or property damage. Configuration should be done by a certified installer (technician). Non-certified technical tampering can result in voiding of warranty to the unit.

Entering Installer Setting Mode

1. Press and hold **Function Setting** button for 3 seconds to place unit into Installer Setting Mode.



- Controller display will initially show the first function code and value (example: **01:01**) at the bottom of the LCD screen (see Figure 58).
2. Press **Function Setting** button repeatedly to cycle through each function code as needed for configuration.
 3. Refer to Table 14 for function code descriptions and their correct code values.

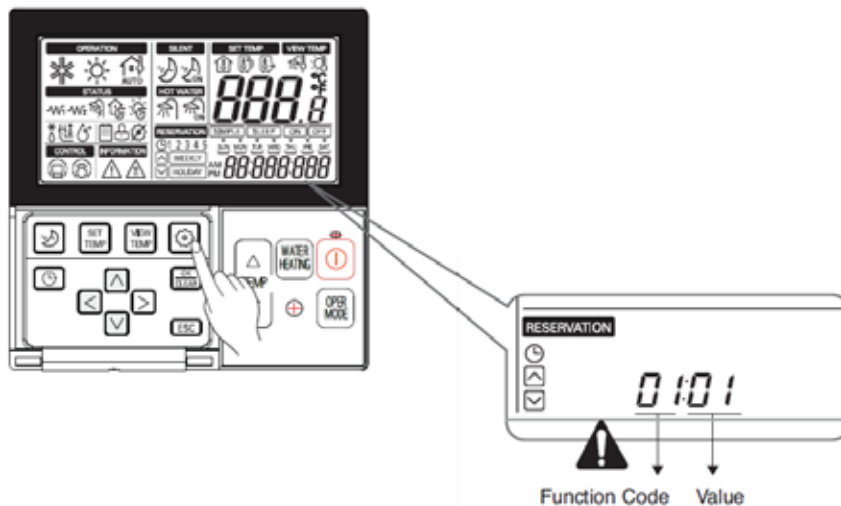


Figure 58: Entering Installer Setting Mode

Installer Setting - Function Codes

Table 14 outlines the various customizable functions available to the Hydro Kit, along with their corresponding code values. Use the **Actual Low/Actual High Comments** columns to log additional anomalies or comments related to the specific function code.

Note:

- All temperature values are stated in Fahrenheit.
- Altitude of region might impact Hydro Kit's ability to reach stated temperatures. Unit capability is rated at sea level.

Table 14: Installer Setting - Function Codes and Parameters

Function	Default	Value #1	Value #2	Actual Low/Actual High Comments
Disable 3 Minute Delay	02:01	01	-	
Remote Air Sensor Connection	03:01	01 : NOT connected 02 : Connected	-	
Celsius/Fahrenheit Switching	04:01	01 : Celsius 02 : Fahrenheit	-	
Setting Temperature Selection	05:02	01 : Air Temperature 02 : Leaving Water Temperature	-	
Auto Dry Contact	06:01	01 : Auto Start OFF 02 : Auto Start ON	-	
Address Setting	07:00	00 ~ FF	-	
Override Setting	08:00	00 : Slave 01 : Master	-	
Water Pump Test Run	09:00	01 : Set		
Zone Temperature Setpoint (Heating Mode)	13:030:016	75 ~ 86 : Upper Limit of setting range	60 ~ 71 : Lower Limit of setting range	
Leaving Water Temperature Setpoint (Heating Mode)	14:080:046	22 ~ 76 : Upper Limit of setting range	86 ~ 114 : Lower Limit of setting range	
Setting Water (DHW) Tank Water Temperature Setpoint	15:080:046	122 ~ 176 : Upper Limit of setting range	86 ~ 114 : Lower Limit of setting range	
Setting Outdoor Temp. Range Water Temperature Reset	23:-10:015	50 - 68 : Upper Limit of setting range	-4 ~ 41 : Lower Limit of setting range	
Setting Indoor air Temp. Range (Weather-dependent operation)	24:021:016	68 ~ 86 : Upper Limit of setting range	60 ~ 66 : Lower Limit of setting range	
Setting leaving water Temp. (Weather-dependent operation)	25:080:046	149 ~ 176 : Upper Limit of setting range	104 ~ 129 : Lower Limit of setting range	
DHW Tank Temperature Deadband Setpoint* (Lower Limit)	27:070:010	104 ~ 129 : Maximum heating Temp.	05~60 min : Maximum heating duration	

PRE-COMMISSIONING

Function Codes - Common Settings



Table 14: Installer Setting - Function Codes and Parameters (Continued)

Function	Default	Value #1	Value #2	Actual Low/Actual High Comments
DHW Tank Temperature Setpoint	28:005:080	33 ~ 68 : Temp. gap from Value #2	122 ~ 176	
Freeze Protection Setpoint	29:003:000	35 ~ 39	00~01	
DHW Water Heating Timers	2b:030	5 ~ 95 min (step: 5 min)	-	
	2b:180:020	0 ~ 600 min (step: 30 min)	20 ~ 95 min (step: 5 min)	
Change Thermal ON/OFF Air Temperature.	2E:00	00~03	-	
Change Thermal ON/OFF Leaving Water Temperature	2F:00	00~03	-	
Program Version	30:***	Display Version Number	-	

* Deadpan is the difference between the upper and lower limit setpoints and the temperature value is in Fahrenheit.

⚠ WARNING

Customer is responsible for maintaining the quality of water in the water circuit.

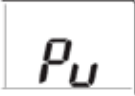
Function Code Descriptions and Common Settings

Table 15 gives a brief description of each Function Code for both Hydro Kit models. Refer to this table, along with Table 14 when customizing the settings through the Installer.

Table 15: Common Function Code Descriptions for Hydro Kits K2 and K3

Function Code	Description
Common Settings	
02 - Disable 3 Minute Delay	This function is only used for an inspection in a factory.
03 - Remote Air Sensor Connection	Remote Air Sensor is connected to the unit and controls by room air temperature.
04 - Celsius/Fahrenheit Switching	Temperature can be switched to read Celsius or Fahrenheit.
05 - Setting Temperature Selection	Unit can be operated either by air temperature or water temperature. Note: Air temperature can only be enabled in conjunction with Remote Air Sensor Connection if enabled and Function Code 03 is set as 02 .
06 - Auto Dry Contact	Allows the Dry Contact to operate under Auto Run Mode or Manual Mode with Remote Controller. If thermostat is used, value should be changed from "2" to "1".
07 - Address Setting	If Central Controller is installed, address assigning can be set through this function.
08 - Override Setting	Overrides Master/Slave selection functionality to prevent the unit's various mode operation. Example: If the unit is set as the Slave, it blocks the ability to switch the unit to the opposite operating mode (such as cooling/heating).

Table 15: Common Function Code Descriptions for Hydro Kit Chassis 2 and Chassis 3 (Continued)

Function Code	Description
09 - Water Pump Test Run	<p>Once water pipe has been installed, Water Test Run Mode is performed to check functioning of water circulation.</p> 
13 - Zone Temperature Setpoint (Heating Mode)	<p>Assign temperature setpoint for air temperature in heating mode.</p> <p>Note: This is only available when Remote Air Temperature Sensor is connected. Accessory PQRSTA0 should be installed. Function Code 03 must be set properly.</p>
14 - Leaving Water Temperature Setpoint (Heating Mode)	<p>Assign heating setpoint temperature range when leaving temperature is selected as setting temperature.</p>
15 - Setting Hot Water (DHW) Tank Water Temperature Setpoint	<p>Assign heating setting temperature range of water tank leaving water.</p> <p>Note: This is only available when DHW tank temperature sensor is installed. DHW tank and DHW tank kit should be installed. DIP Switch #2 and #3 should be set properly.</p>

PRE-COMMISSIONING

Function Codes - Hydro Kit Medium Temperature



Temperature Range Setting for Hydro Kit Medium Temperature

The following Functional Codes are available for the Hydro Kit Medium Temperature.

Function Code 11 - Setting Air Temperature in Cooling Mode

Set air temperature range in cooling mode.

Note:

Setting is only available when Remote Air Temperature Sensor is connected.

- Install PQRSTA0 (Remote Air Temperature Sensor).
- Set Function Code **03** properly.

Function Code 12 - Setting Leaving Water Temperature Cooling Mode

When Leaving Water Temperature is chosen, determine cooling setting temperature range.

Note:

Moisture on the Floor Can Occur

- Keep Leaving Water Temperature higher than 60°F when unit is operating in cooling mode. If not, condensation will occur on the floor.
- If floor is in a humid environment, do not set leaving water temperature below 64°F.

Water Condensation on the Radiator

- Cold water might not flow to the radiator, while unit is operating in cooling mode. Condensation on radiator may occur if cool water enters into the radiator.

Function Code 13 - Setting Air Temperature in Heating Mode

Determine heat temperature setting range when air temperature is selected as setting temperature.

Note:

Setting is only available when Remote Air Temperature Sensor is connected.

- Install PQRSTA0 (Remote Air Sensor).
- Set Function Code **03** properly.

Function Code 14 - Setting Leaving Water Temperature in Heating Mode

When Leaving Water Temperature is chosen, determine heating setting temperature range.

Function Code 15 - Setting Leaving Water Temperature in Heating Mode

When Leaving Water Temperature is chosen, determine heating setting temperature range.

Note:

Setting is only available when DHW Tank temperature sensor is installed.

- Install DHW tank and DHW tank kit.
- Set DIP Switch #2 and #3 properly.

Temperature Control Parameter Setting for Hydro Kit Medium Temperature

The following Function Codes are used to set weather-dependent operations. Refer to Figure 59 for an example of this function.

Function Codes 22 - Setting Cut-Off Temperature in Cooling Mode (FCU Setting Included)

Determine leaving water temperature when the unit is turned off. This function code is used to prevent condensation on the floor while Hydro Kit is in cooling mode.

- Value #1: Cut-Off Temperature. Value #1 is read by the unit when Value #2 is set to '00' (i.e., FCU is installed).
- Value #2: FCU Installed/not installed.
'00' = FCU Installed;
'01' = FCU **NOT** Installed.

Note:

FCU Installation

- If FCU is used, 2-way isolation valve is installed and connected to the Main PCB Assembly 1.
- If Value #2 is set to '00-', and FCU or 2-way isolation valve is **NOT** installed; unit will not operate correctly.

Function Codes 23, 24, and 25 - Setting Weather-Dependent Operation

The unit will automatically adjust target temperature (leaving water or room air) based on outdoor air temperature.

- Value #1 and Value #2 of Function Code 23: Range of outdoor air temperature.
- Value #1 and Value #2 of Function Code 24: Range of indoor room air temperature.
- Value #1 and Value #2 of Function Code 25: Range of auto-adjustable target leaving water temperature.

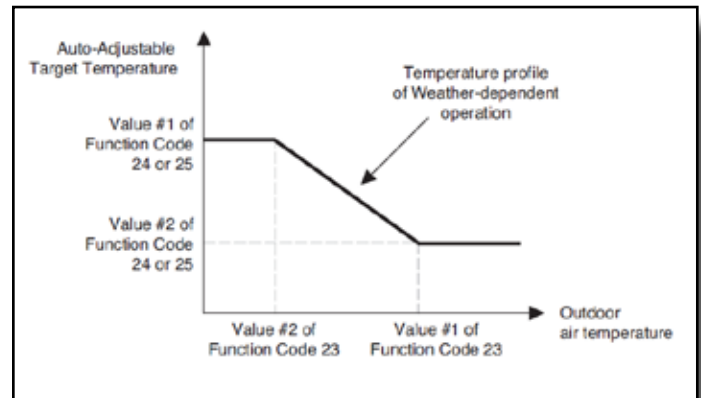


Figure 59: Value #1 and Value #2 Function Codes for Setting Weather-Dependent Operation

Note:

Weather-dependent operation is applied for heating mode only!

Temperature Control Parameter Setting for Water Heating Operation Hydro Kit Medium Temperature

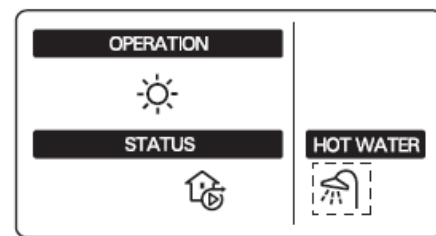
Function Codes 28 and 29

These two functional codes set control parameters for the sanitary water heating operation.

- Value #1 of Function Code 28: Temperature range or setpoint as input from Value #2 of Function Code 28.
- Value #2 of Function Code 28: Maximum temperature.
 - **Example:** If Value #1 is set as '5' and Value #2 is set as '80', the water tank heating will be started when the water tank temperature is below 75°C (167°F).
- Value #1 of Function Code 29: Temperature range or setpoint from target DHW temperature.
- Value #2 of Function Code 29: Determines heating demand priority between DHW tank heating and under floor heating.
 - **Example:** If target temperature is set as '50' and Value #1 is set as '3', then water tank heating will be turned off when the water temperature is above 53°C (127°F). Water tank heating will kick on when water temperature is below 50°C (122°F).
 - **Example:** If Value #2 is set as '0', that means heating priority is on DHW heating. Note that under floor heating can not take place while DHW heating is priority. If Value #2 is set to '1', heating priority will then focus to under floor heating and in this case DHW tank can not be enabled if under floor heating is set as the priority.

Note:

If the Hot Water DHW icon is displayed on the remote controller, DHW is enabled. It can be enabled via manual button input or scheduled programming.



<DHW Heating enable>

Function Code 2B

This function code sets DHW heating timers. Determine time duration, operation time and stop time of the DHW tank heating.

- Value #1 of Function Code 2B: Sets how long DHW tank heating can be continued.
- Value #2 of Function Code 2B: Set how long DHW tank is stopped (non-heating mode). This function is also used to cycle on and off time spans for the DHW tank heating cycle.
- Refer to Figure 60 for examples of a timing sequence chart.

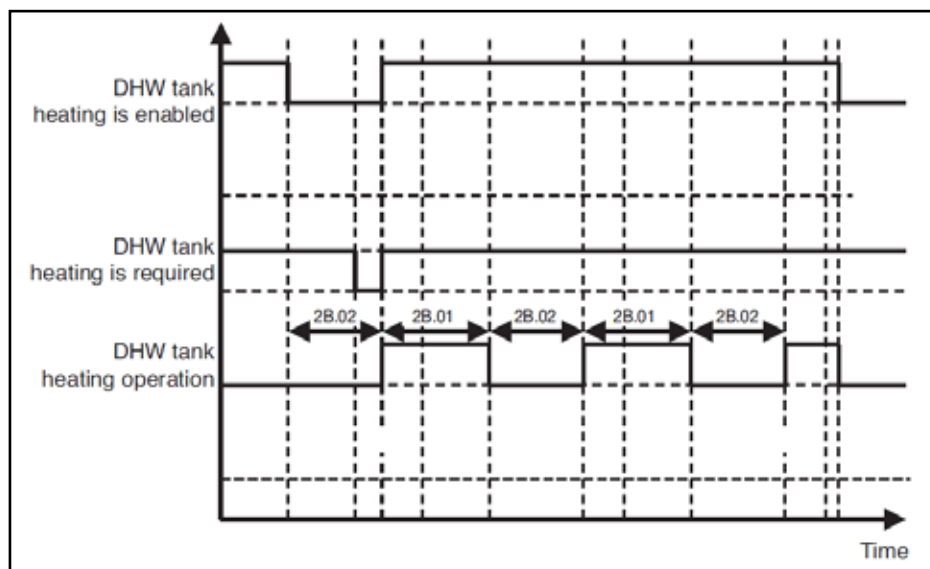


Figure 60: DHW Tank Heating Time Diagram

Temperature Control Parameter Setting for Sanitary Water Heating Operation Hydro Kit Medium Temperature - Continued

Function Code 2C - Setting Water Flow Rate

Setting the value determines the temperature range of the input and output water flow rate. Value #1 of Function Code 2C: Water flow rate which flows to the Hydro Kit. Refer to Table 16 for settings.

Table 16: Water Flow Rate Setting Value

Setting Value	Water Flow Rate (l/min)
50	45~50
55	51~55
60	56~60
65	61~65
70	66~70
75	71~75
80	76~80
85	81~85
90	86~90
92	91~92

Function Code 2E and 2F

Changing Thermal ON/OFF Temperature gap. Refer to Table 17 and Table 18 for the two types of thermal temperature values.

Table 17: Room Air Temperature

	Thermal ON	Thermal OFF
0	-0.9°F (-0.5°C)	2.7°F (1.5°C)
1	7.2°F (4°C)	10.8°F (6°C)
2	3.6°F (2°C)	7.2°F (4°C)
3	-1.8°F (-1°C)	1.8°F (1°C)

Table 18: Leaving Water Temperature and DHW Temperature

	Thermal ON	Thermal OFF
0	-3.6°F (-2°C)	3.6°F (2°C)
1	-10.8°F (-6°C)	7.2°F (4°C)
2	-3.6°F (-2°C)	7.2°F (4°C)
3	-1.8°F (-1°C)	1.8°F (1°C)

Function Code 30

Displays Remote Controller Program Version when selected.

PRE-COMMISSIONING

Function Codes - Hydro Kit High Temperature



Temperature Range Setting for Hydro Kit High Temperature

The following Functional Codes are available for the Hydro Kit High Temperature.

Function Code 13 - Zone Temperature Setpoint

Assign temperature setpoint for air temperature in heating mode.

WARNING

*This is only available when remote air temperature sensor is connected. Accessory PQRSTA0 should be installed. Function Code **03** must be set properly.*

Function Code 14 - Hydro Kit Leaving Water Temperature Operating Range

Assign heating operating temperature range when leaving temperature is selected.

Function Code 15 - Setting Water (DHW) Tank Temperature Operating Range

Assign heating operating temperature range of DHW tank.

WARNING

This is only available when DHW tank temperature sensor is installed. DHW tank and DHW tank kit should be installed. DIP Switch #2 and #3 should be set properly.

Note:

Weather-dependent operation is only available for Heating Mode.

Temperature Control Parameter Setting for Hydro Kit High Temperature

The following Function Codes are used to set weather-dependent operations. Refer to Table 15 for an example of this function.

Function Codes 23, 24, and 25 - Setting Weather-Dependent Operation

The unit will automatically adjust target temperature (leaving water or room air) based on outdoor air temperature (Figure 61).

- Value #1 and Value #2 of Function Code 23: Range of outdoor air temperature.
- Value #1 and Value #2 of Function Code 24: Range of indoor room air temperature.
- Value #1 and Value #2 of Function Code 25: Range of auto-adjustable target leaving water temperature.

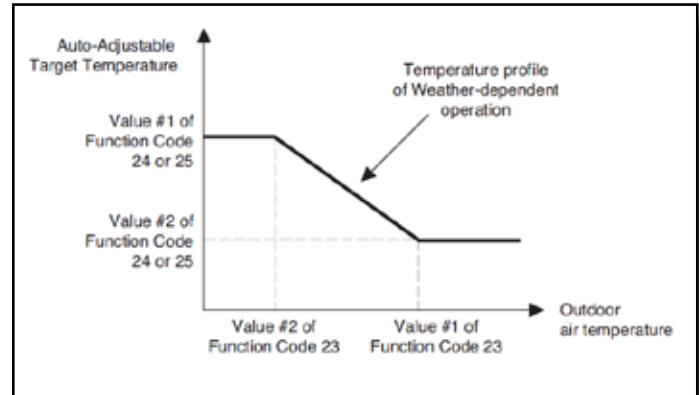


Figure 61: Value #1 and Value #2 Function Codes for Setting Weather-Dependent Operation

Temperature Control Parameter Setting for Hydro Kit High Temperature - Continued

Function Codes 28 and 29

These two functional codes set control parameters for the DHW heating operation.

Note:

If the Hot Water DHW icon is displayed on the remote controller, DHW is enabled. It can be activated through manual button input or scheduled programming (Figure 64).

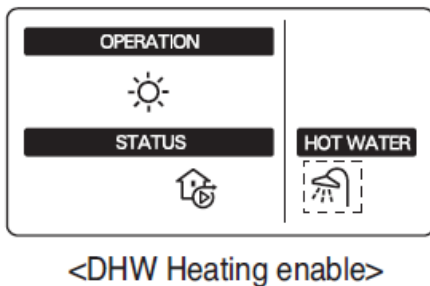


Figure 64: Hot Water DHW Icon on Remote Controller

- Value #1 of Function Code 28: Temperature range or setpoint as input from Value #2 of Function Code 28.
- Value #2 of Function Code 28: Maximum temperature.
 - *Example:* If Value #1 is set as '5' and Value #2 is set as '80', the water tank heating will be started when the water tank temperature is below 167°F (75°C).
- Value #1 of Function Code 29: Temperature range or setpoint from target DHW temperature.
- Value #2 of Function Code 29: Determines heating demand priority between DHW tank heating and under floor heating.
 - *Example:* If target temperature is set as '50' and Value #1 is set as '3', then water tank heating will be turned off when the water temperature is above 127°F (53°C). Water tank heating will kick on when water temperature is below 122°F (50°C).
 - *Example:* If Value #2 is set as '0', that means heating priority is on DHW heating. Note that under floor heating can not take place while DHW heating is priority. If Value #2 is set to '1', heating priority will then focus to under floor heating and in this case DHW tank can not be enabled if under floor heating is set as the priority.

Function Code 2B

This function code sets DHW heating timers. Determine time duration, operation time and stop time of the DHW tank heating.

- Value #1 of Function Code 2B: Sets how long DHW tank heating can be continued.
- Value #2 of Function Code 2B: Set how long DHW tank is stopped (non-heating mode). This function is also used to cycle on and off time spans for the DHW tank heating cycle.
- Refer to Figure 63 for examples of a timing sequence chart.

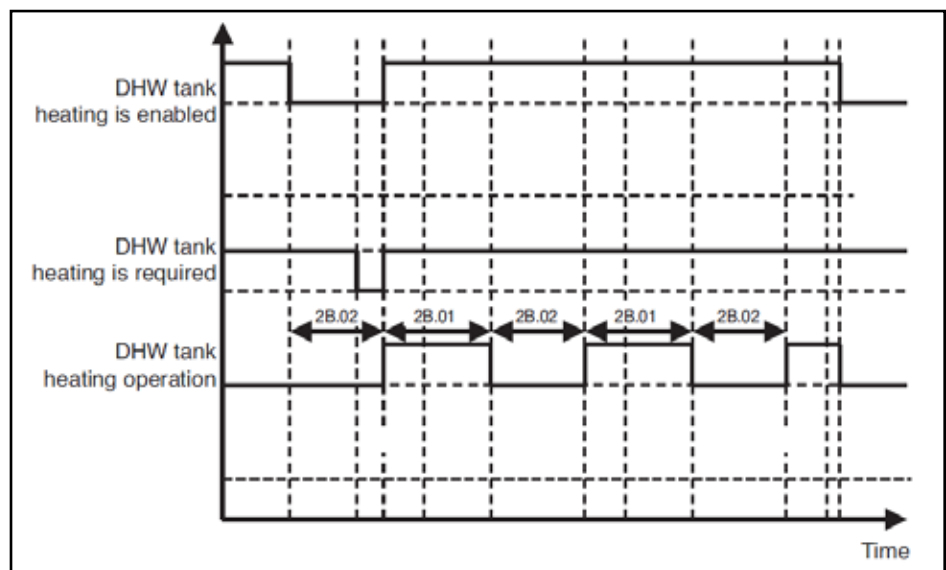


Figure 63: DHW Tank Heating - Time Duration and Time Spans

Temperature Control Parameter Setting for Hydro Kit High Temperature - Continued

Function Codes 2E and 2F

Changing Thermal ON/OFF temperature and temperature gap. Refer to Table 19 and Table 20 for the two types of thermal temperature values.

Table 19: Room Air Temperature

	Thermal ON	Thermal OFF
0	-0.9°F (-0.5°C)	2.7°F (1.5°C)
1	7.2°F (4°C)	10.8°F (6°C)
2	3.6°F (2°C)	7.2°F (4°C)
3	-1.8°F (-1°C)	1.8°F (1°C)

Table 20: Leaving Water Temperature and Indirect Storage Tank Temperature

	Thermal ON	Thermal OFF
0	-3.6°F (-2°C)	3.6°F (2°C)
1	-10.8°F (-6°C)	7.2°F (4°C)
2	-3.6°F (-2°C)	7.2°F (4°C)
3	-1.8°F (-1°C)	1.8°F (1°C)

Function Code 30

Displays Remote Controller Program Version when selected.

UNIT OPERATION

MULTI V™
HYDRO KIT

Hydro Kit (K2, K3) Wall Mounted Controller Operation

Figure 65 shows the Hydro Kit Wall Mounted Controller display screen (top) and panel (bottom). Note that although the image shows all available display icons, they will not be displayed all at once while your Hydro Kit is in operation. Use Table 21 for a description of the functionality of each Panel button when operating and configuring the Hydro Kit unit.

Table 21: Hydro Kit Wall Mounted Controller Panel Buttons - Function

Number	Function
1	Display Screen
2	Change Temperature Button
3	Water Heating Enable / Disable Button
4	Power Button
5	Operation Mode Selection Button
6	Silent Mode Selection Button*
7	Temperature Setting Mode Button
8	Temperature View Mode Button
9	Function Setting Button
10	Programming Button
11	Direction Button (Up, Down, Left, Right)
12	Set (OK) / Clear Button
13	ESC Button

Figure 65: Hydro Kit Wall Mounted Controller Display and Panel Functionality

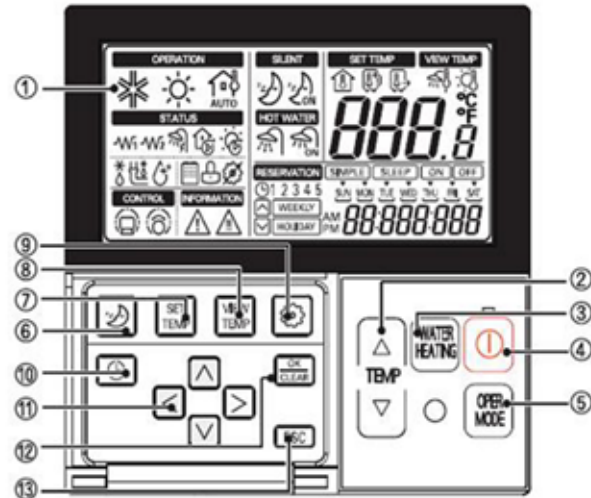


Table 22 describes each Hydro Kit Wall Mounted Controller display icon.

Note:

Depending on the Hydro Kit model, not all icons may display or be functional.

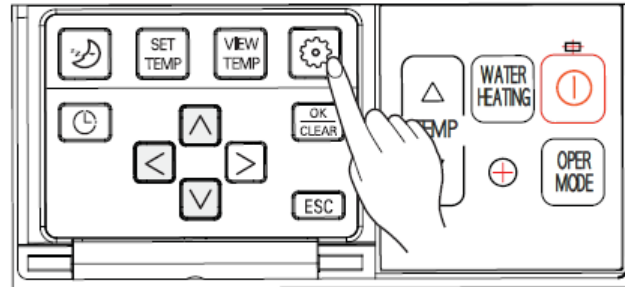
Table 22: Hydro Kit Controller Display Icon Descriptions

Icon	Function	Icon	Function	Icon	Function
	Cooling (K2 model only)		Electric Heater (2) *		Defrost
	Heating		Water Tank Electric Heater*		Water Pipe Anti-freezing
	Weather-Dependant Heating		Water Pump		Outdoor Unit
	Space Temperature		Solar Thermal Circulation Pump		Child Lock
	Water Inlet Temperature		Water Tank Heating Enable / Disable		Function Not Available
	Water Outlet Temperature		Water Tank Heating (Heat Pump Model Only)		Operation Malfunction - Call Service
	Central Controller		Silent Mode ON / OFF*		Operating in Emergency Heat Mode – Call Service
	Thermostat		Water Tank Temperature		
	Electric Heater (1)*		Solar Heating Temperature		

The following function buttons can still be operated during emergency operation of each of the Hydro Kits.

	Power ON/OFF Button
	Temperature View Mode button (*)
	Change Temperature Button (**)
	Water Heating Enable / Disable Button

(*) Temperature measured by failed sensor is displayed as '--'
(**) Note that the unit cannot be turned off by setting the temperature at the remote controller. It is only turned off by the thermostat signal.



The following function buttons cannot be used during emergency operation of each of the Hydro Kits.

	Operation Mode Selection Button
	Programming Button
	Temperature Setting Mode Button

Simultaneous Error Codes or Faults

There may be cases where multiple errors or faults will be tripped at the same time, or closely follow each other. At this point, the unit will default operation and limit functionality based on the most severe fault. For example, if there is a slight operational fault but a major fault also trips, the unit will operate at the safest level that it can during the major fault incident. As an example, the hot water heating might not work in an Emergency Operation mode due to a more severe fault that prevents it from warming. You might need to check the Domestic Hot Water (DHW) sensor and related wiring to trace any troubleshooting issues.

Note:

If the Hydro Kit is operating in Emergency (Safe) Mode, automatic re-start is disabled. If there is a loss of power during Emergency Mode; the unit must be re-started manually. Under normal operating conditions, the Hydro Kit is designed to automatically start up (reboot) once power is restored.

MAINTENANCE

Seasonal (K2, K3)



Maintenance

Table 23 outlines the timeline of maintenance that should be followed for the Hydro Kit. This maintenance table applies to both Hydro Kit Chassis.

- When following the table maintenance schedule, you might want to make copies of this table and then enter the date that maintenance was completed in the **Date Maintenance Performed** column.

Table 23: Maintenance Scheduling Table

Scheduled Time	Maintenance Procedure	Date Maintenance Performed
Monthly	Verify system water level is correct.	
	Purge any air from the system using the manual air vent.	
	Check for water leaks in the system.	
	Test the circulating water loop for proper levels of water treatment chemicals and anti-freeze.	
Quarterly	Verify the strainer is clean.	
	Check the pump, valve stems, and pipe connections for leaks.	
	Check refrigerant pipe and water pipe insulation for tears or other damage that exposes cold surfaces that produce condensation.	
	Replace insulation that is wet and repair as needed.	
Annually	Verify the flow switch is operating correctly.	

Operation Test

Flow Switch Error Troubleshooting - CH14

The following troubleshooting steps should be taken when checking Flow Switch issues.

- Check whether operation of water pump is normal.
- Check for blockage inside water pipe.
 - Refrigerant strainer cleaning
 - Valve locked
 - Valve malfunction
 - Air remaining
- Check for flow switch issue.
 - Flow switch malfunction
 - Unknown operation
 - Flow switch disconnection

Table 24: LG Included Accessories

Accessory	Model No.	Hydro Kit Model	Connection	Description	Use
Hydro Kit Wall Mounted Controller ¹	AKB73355703	K2, K3	CN-REMO	Remote wall mounted controller with 33 foot communications cable.	Schedules, sets operational parameters and monitors system.
Independent Power Module ¹	PRIP0	K2	CN-WRITE & CN-EEV	Backup power to close EEV valve if power failure occurs during Multi V defrost or oil return.	Closes EEV if power outage occurs during defrost or oil return.
Ancillary (Solar) Heating System Tank	MEG61846102	K2, K3	Indirect Heating Tank Wall	Mounting for the indirect hot water storage tank sensor complete with 39 feet of cable with plug connector.	
Indirect Hot Water Storage Tank Sensor ^{1,3}	EBG61325701	K2, K3	CN-TH4 (Boost)	Water storage tank sensor.	Monitors the Hydro Kit indirect water storage tank temperature.
Refrigerant Strainer ⁴	MJC57132402	K2, K3	Inlet Pipe	50 mesh; install on inlet pipe to heat exchanger.	Keeps large particulate from entering the heat exchanger.

¹ Must use LG provided communications cable (included).

³Must have contacts rated for 208-230/60/1.

² Maximum combined current draw of all (field provided) connected accessories must be equal to or less than 5 Amps @ 208-230/60/1.

⁴1" FPT both ends

Table 25: LG Optional Accessories (sold separately)

Accessory	Model No.	Hydro Kit Model	Connection	Description	Use
Wired Remote Extension Cable ¹	PZCWRC1	K2, K3	---	39' communications extension cable.	Extends the length of the Hydro Kit Wall Mounted Controller communications cable beyond 39 feet (cannot be used to extend tank sensor cable length).
Solar Heating System Interface Kit	PHLLA	K2	CN-TH4(Solar)	Kit includes solar heating system tank sensor/cable and tee fitting sensor well.	Monitors a third party solar heating system's water circuit temperature and controls the flow of solar heating system water to the indirect water storage tank.
Ancillary (Solar) Heating System Tank Replacement Sensor ^{1,2,4}	MEG61846102	K2	CN-TH4 (Solar)	Solar heating water storage tank sensor with 39 feet of cable and plug connector.	Monitors the solar heating system water circuit temperature.
Remote Temperature Sensor	PQRSTA0	K2, K3	CN-ROOM	Sensor with 50' communications cable and plug connector.	Monitors and/or controls (optional) the Hydro Kit based on the conditioned space temperature.
Dry Contact ³	PQDSB1	K2, K3	CN-CC	Mounts inside the unit cabinet and provides a external binary signal control interface.	Enables/disables operation from a remote generated binary signal.

¹ Must use LG provided communications cable (included).

⁴ This sensor is included when ordering the PHLLA Solar Heating Interface Kit.

² Field supplied thermo paste required.

³ Maximum combined current draw of all connected accessories must be equal to or less than 5 Amps @ 208-230/60/1.

Hydro Kit Accessories



Table 26: Third Party Accessories (sold separately)

Accessory	Hydro Kit Model	Connection	Voltage Options	Description	Use
Hydro Kit Circuit Water Pump Interlock ¹	K3	TB-1,2	208-230/60/1	Hydro Kit water circuit circulating pump interlock (use a field provided pilot relay).	Provides pump ON/OFF control based on Hydro Kit control logic.
	K2	TB-11,12			
Solar Heating Circuit Water Pump Interlock ^{1,2,3}	K2	TB-4,5	208-230/60/1	Solar heating circuit circulating pump interlock (use a field provided pilot relay).	Provides pump ON/OFF control based on Hydro Kit control logic.
208-230/60/1 Conventional Thermostat ^{1,4}	K3	TB-7,8,9,10	208-230/60/1	Single stage heating only.	Monitors and/or controls (optional) the Hydro Kit based on the conditioned space temperature.
	K2	TB-17,18,19,20 & Harness Plug C to A		Single stage heating/cooling manual changeover.	
24 VAC Conventional Thermostat ⁴	K2	TB-17,18,19,20 & Harness Plug C to B	24 VAC	Single stage heat/cool, must be manual changeover model.	Monitors and/or controls (optional) the Hydro Kit based on the conditioned space temperature.
Mechanical Thermostat ¹	K3	TB-7,8,9,10	---	Single stage manual changeover.	Monitors and/or controls (optional) the Hydro Kit based on the conditioned space temperature.
	K2	TB-17,18,19,20 & Harness Plug C to A		Single stage heating only.	
Hydro Kit Circuit 3-Way Domestic Water Diverting Valve ¹	K3	TB-4,5,6	208-230/60/1	Valve A 208-230/60/1 3-wire SPDT	Diverting valve - circulates water to/from the comfort conditioning equipment and the Hydro Kit water storage tank.
	K2	TB-8,9,10			
Hydro Kit Circuit 2-Way In-floor Heating Isolation Valve ¹	K2	TB-14,15,16	208-230/60/1	Valve (A) 208-230/60/1 2 -wire NO or NC	Partial circuit water isolation valve prevents condensate from forming on floors containing in-floor heating pipe while operating in the cooling mode.
Solar Heating System-Interface Kit ¹	K2	TB-1,2,3	208-230/60/1	Valve (B) 208-230/60/1 3-wire SPDT	Diverting valve circulates water to/from the Ancillary (Solar) Heating Interface and the Hydro Kit heating circuit.

TB = Terminal Block NO = Normally Open
NC = Normally Closed SPDT = Single Pole Double Throw

¹ Maximum combined current draw of all connected accessories must be equal to or less than 5 Amp @ 208-230/60/1.

²Must have contacts rated for 208-230/60/1

³1" FPT both ends

⁴Must have contacts rated for 24VAC

All communication cable to be minimum 18 AWG, 2-conductor, stranded, shielded, and must comply with applicable local and national codes.

Power wiring cable is field provided and must comply with the applicable local and national codes.

Troubleshooting Codes

The following error codes (Table 27) will display during self diagnosis of the Hydro Kit along with any manifestations of malfunctions during the operation of the unit. Errors codes will display by illuminating through red/green LEDs (red for a fault, green for normal function) on the wired remote controller and on the outdoor unit's control board (PCB).

- If two or more faults occur at the same time, the error code with the lower number will display first.
- If an Inverter PCB error occurs, Error Code 12 will display on the remote controller, and Inverter PCB board LED can be used to verify the nature of the error display.
- After correction of the issue, the error code will disappear from the display.

Note:

- Error Codes 01, 08, 17, 18 can be operated during emergency operation (Safe Mode) and are marked accordingly in the table.
- Some error codes are exclusive to Hydro Kit Medium Temperature (K2) or Hydro Kit High Temperature (K3) units and will be marked accordingly in the table.

Inverter PCB Fault LED Display

The following sequencing of the LED lights will display during a fault display. Once you determine the error code based on the sequencing and color of the LED lights, refer to Table 27 for cause and resolution. Note that if the sequencing code is a three digit number, those codes are based on the outdoor unit and not on the Hydro Kit. Refer to the manual associated with your outdoor/water source unit for a complete list of error codes, their cause and resolution.

How to Interpret LED Error Codes

- A blinking Red LED will "count" the 10's of a code. Count the times the LED blinks to determine the code.
 - Example: Three blinks of Red LED = 30 (10 + 10 + 10)
- A blinking Green LED will count the single digits of a code. Count the times the LED blinks to determine the code.
 - Example: Five blinks of the Green LED = 5 (1 + 1 + 1 + 1 + 1)
- If the Red LED and Green LED blink simultaneously, it will count the '100's' of a code. Count the times both are blinking to determine the code.
 - Example: Red and Green LED's blink twice, but both at the same time in sequence = 200 (100 + 100)

Based on the rules above, a code of 115 would display as follows:

- Red and Green LED blink once at the same time (100)
- Red LED blinks one time (10)
- Green LED blinks 5 times (5)

Total= 115 for the error code.

TROUBLESHOOTING

Error Codes



Table 27: Hydro Kit Error Code Troubleshooting

Error Code	Hydro Kit Model	Error Type	Cause
01	(K2, K3) *Enabled for Emergency Operation	Air temperature sensor error	Air temperature sensor has disconnected or short circuited. (Check the wiring, connection at the CN-ROOM socket on the Hydro Kit unit PCB, then check the thermistor.)
02	(K2, K3)	Gas side temperature sensor error	Temperature sensor monitoring the refrigerant system gas line is disconnected or shorted.
03	(K2, K3)	No communication between Hydro Kit Wall Mounted Controller and Hydro Kit	Communication has been lost between the Hydro Kit Wall Mounted Controller and the Hydro Kit for a specific period of time.
05	(K2, K3)	Hydro Kit & outdoor (or water source) unit communication error	Lost communication between the Hydro Kit and the outdoor (water source) unit. Communication cable is loose, disconnected or shorted.
06	(K2, K3)	Liquid side temperature sensor error	Temperature sensor monitoring the refrigerant system liquid line is disconnected or shorted.
08	(K2, K3) *Enabled for Emergency Operation	Indirect Hot Water Storage Tank temperature sensor error	A malfunction with the indirect storage tank hot water temperature sensor was detected. The sensor and/or cable may be disconnected or shorted.
09	(K2, K3)	Indoor unit EEPROM error	Communication error occurred between the microprocessor on the Hydro Kit PCB board and the onboard EEPROM chip. Check EEPROM chip for bent pins and improper installation. If installed OK, potential EEPROM failure.
11	K3	Hydro Kit unit and inverter PCB communication error	Communication was lost between the Hydro Kit main PCB and the R134a Inverter board. Check for bent pins or loose connections in the wiring harness plugs and socket connectors..
12	K3	Inverter PCB error	R134a circuit inverter board has reported a malfunction.
13	K2	Solar heating water circuit temperature sensor error	Temperature sensor monitoring the solar heating system's water circuit is disconnected or shorted.
14	(K2, K3)	Flow switch error	Flow switch malfunction.
15	(K2, K3)	Water pipe overheated	Hydro Kit leaving water has exceeded 185°F (85°C).
16	(K2, K3)	Water inlet & outlet temperature sensor error	Indication that both the refrigerant to water heat exchanger's waterside inlet and outlet temperature sensors simultaneously malfunctioned. Sensor and/or cable may be disconnected or shorted.
17	(K2, K3) *Enabled for Emergency Operation	Water inlet temperature sensor error	The Hydro Kit refrigerant to water heat exchanger's waterside inlet temperature sensor malfunctioned. Sensor and/or cable may be disconnected or shorted.

Table 27: Hydro Kit Error Code Troubleshooting (Continued)

Error Code	Hydro Kit Model	Error Type	Cause
18	(K2, K3) *Enabled for Emergency Operation	Water outlet temperature sensor error	The Hydro Kit refrigerant to water heat exchanger's waterside outlet temperature sensor malfunctioned. Sensor and/or cable may be disconnected or shorted.
21	K3	Inverter compressor IPM defect	R134a circuit compressor and/or inverter board has malfunctioned.
22	K3	Inverter compressor overcurrent	R134a compressor current transformer sensed excessive current draw.
23	K3	Inverter compressor DC Link low voltage	Insufficient power sensed in the DC charging circuit to operate compressor. Obtain an inverter board testing instrument and verify DC charging circuit is operating correctly.
25	K3	High/low Inverter input voltage	R134a circuit inverter sensed the input voltage was out of tolerance (+/- 10%) for a minimum period of 4 seconds.
26	K3	Inverter compressor activation failure	R134a circuit inverter compressor failed to start.
27	K3	Inverter PSC/PFC Fault Error	R134a circuit inverter board detected excessive current draw.
28	K3	Inverter DC Link high voltage error	Excessive power sensed in the DC charging circuit. Triggered by an unexpected stop of the compressor. Check inverter compressor for malfunction. Use an inverter checker to verify the inverter board is operating properly.
29	K3	Inverter compressor overcurrent	R134a circuit compressor locked out due to compressor current transformer sensing a high current draw condition.
32	K3	Excessive rise of inverter compressor discharge temperature	R134a circuit compressor shut down due to high discharge gas temperature.
34	K3	Excessive rise of high pressure of inverter compressor	R134a circuit compressor shut down due to high discharge pressure.
35	K3	Excessive drop of low pressure of inverter compressor	R134a compressor shut down due to low suction pressure.
36	K3	Low pressure ratio error of inverter compressor	R134a compressor high/low side differential pressure ratio dropped below 1.8 for a minimum of three minutes.
40	K3	Inverter compressor CT sensor defect	R134a compressor current transformer failure.
41	K3	Inverter compressor discharge pipe temperature sensor defect	R134a compressor discharge temperature sensor has failed and/or cable is loose, disconnected or shorted.
42	K3	Low pressure sensor defect of inverter compressor	R134a compressor suction pressure sensor has failed and/or cable is loose, disconnected or shorted.

TROUBLESHOOTING

Error Codes

Table 27: Hydro Kit Error Code Troubleshooting (Continued)

Error Code	Hydro Kit Model	Error Type	Cause
43	K3	High pressure sensor defect of inverter compressor	R134a compressor discharge pressure sensor has failed and/or cable is loose, disconnected or shorted.
44	K3	Inverter inside air temperature sensor defect	R134a circuit inverter board ambient air temperature sensor has failed and/or cable is loose, disconnected or shorted.
46	K3	Inverter compressor suction pipe temperature sensor defect	R134a compressor suction temperature sensor has failed and/or cable is loose, disconnected or shorted.
53	K3	Communication error (indoor unit→outdoor unit main PCB)	Lost communication between the Hydro Kit and the outdoor (water source) unit. Communication cable is loose, disconnected or shorted.
60	K3	Inverter PCB EEPROM error	Communication error occurred between the R134a circuit inverter board and the onboard inverter board EEPROM chip. Check EEPROM chip for bent pins and improper installation. If installed OK, potential EEPROM failure.
62	K3	Excessive rise of inverter heatsink temperature	R134a circuit inverter board has sensed a high inverter board heat sink temperature.
65	K3	Inverter heatsink temperature sensor defect	R134a circuit inverter board heat sink temperature sensor has failed and/or cable is loose, disconnected or shorted.
73	K3	Overcurrent (peak) detected at inverter input	R134a circuit inverter board has reported an over current spike occurred.

Final Checks Before Leaving Site

Use the checklist on the following pages to verify all tasks have been completed prior to calling for the Multi V Hydro Kit system to be commissioned. Place the System ID and Hydro Kit ID at the top of the page, sign and date. Provide a copy to your company's project manager or your Multi V System Commissioning Technician.

- After completing the final checks, be sure to reinstall all internal and external covers.
- Be sure power is not connected to the unit. Power will be connected at commissioning.
- If any installation items are incomplete, note the items on the checklist and be sure your supervisor is made aware.
- Check the installation area for tools and debris that may have been left behind.
- If all installation items are correctly completed, the indoor unit is ready for power-up and commissioning.

INSTALLATION CHECKLIST



System ID No.: _____ Hydro Kit Unit ID.: _____

Checked by: _____ Date: _____ Signature: _____

Rough-In	N/A	Not Complete	Complete
Packing materials and literature located and stored in a safe location.			
Unit is properly supported – mounting bolts tight.			
Unit is canted toward gravity drain line connection (K2 only).			
Recommended minimum service clearances followed.			
Inlet water strainer is clean and properly installed.			
Does local code require a secondary drain pan under the Hydro Kit? Is a secondary drain line connected to the pan?			
Refrigerant Piping	N/A	Not Complete	Complete
A dry nitrogen purge rate of three (3) psig was maintained during all brazing activity.			
Refrigerant pipe is properly supported to keep lateral pressure off unit connections.			
Refrigerant shutoff valves are full port design with integral Schrader port rated for R410A (option).			
Shutoff valves have the same internal pipe diameter as the connected pipe (option).			
Two shutoff valves were installed; one (1) high pressure liquid, one (1) low pressure vapor (option).			
Shutoff valves installed with Schrader port between the indoor unit and the ball of the valve (option).			
Condensate System (K2 only)	N/A	Not Complete	Complete
Condensate pipe is properly sized and supported to keep lateral pressure off unit connections.			
Condensate pipe horizontal segments are sloped a minimum of 1/4" per foot of pipe away from the indoor unit.			
Condensate pipe is routed and secured in place to facilitate discharge to an approved drain.			

Insulation	N/A	Not Complete	Complete
Additional housing, refrigerant and condensate pipe insulation has been supplemented to prevent sweating while operating if the Hydro Kit unit installed in abnormal environmental conditions. (Optional - job condition specific.)			
All refrigerant and chilled water pipes are independently insulated. All insulation seams and joints are airtight. Insulation is not compressed. Double layer insulation is provided at pipe supports and wall penetrations.			
Electrical	N/A	Not Complete	Complete
Power provided is single phase, $\pm 10\%$ of indoor unit nameplate specifications.			
Power wires properly sized and protected per NEC and local codes. Indoor unit is properly grounded.			
Power and communications conductors are separated by the recommended minimum distance.			
Terminal block screws are tight. Power wires are not in contact with terminals (3(A) and / or 4(B)). Line voltage wires have spade connectors installed.			
Power wires are properly secured to the control box case to prevent wire tension at the terminal block.			
Wires are protected from chaffing at control box and conduit pipe penetrations.			
Low voltage control cables are properly secured to the control panel case. Terminal block screws are tight and the cable is protected from sharp edges at control box case and conduit openings.			
Cables are installed at recommended distances from high voltage and EMF generating equipment.			
Communications cable between the outdoor (water source) unit and the Hydro kit is terminated at terminals tagged (terminals 3[A] and 4[B]).			
Field provided communications cable is 18-2 stranded and shielded. All terminations are made at the terminal block. No inline splices or wire caps are present. Spade or ring connectors containing copper are used on all communications and low voltage cable terminations.			
Communications cable insulation material is accepted by local code enforcement.			
Communications cable shield is tied back, continuous between the Hydro Kits and the other indoor units and is grounded at the outdoor (water source) unit only.			
Hydro Kit Wall Mounted Controller Communications	N/A	Not Complete	Complete
LG factory provided Hydro Kit Wall Mounted Controller stranded, shielded (white jacket) cable was used between the Hydro Kit Wall Mounted Controller(s) and indoor unit(s).			
Hydro Kit Wall Mounted Controller cable has not been cut, spliced, or tied together with wire caps. Factory plugs are present.			
Cable is securely plugged into the socket on the Hydro Kit Wall Mounted Controller or the three screw terminals on the Hydro Kit Unit Controller.; Yellow to "Y", Red to "R", and Black to "B".			
Hydro Kit Control Panel	N/A	Not Complete	Complete
Hydro Kit Wall Mounted Controller cable is securely plugged into the CN-REMO socket on the Hydro Kit main PCB.			
If an optional remote temperature sensor was installed, the associated cable is plugged into socket CN-ROOM.			
Hydro Kit unit DIP switches have been adjusted for application (group control-master/slave; water heating only, etc.)			
Wiring harness "Plug C" has been properly connected to either "Plug A" or "Plug B" based on the type of thermostat and/or room sensor was installed.			
All wiring harness connections have been checked and are securely connected to the plug sockets.			
Power and communications cables are properly restrained and separated.			

Figure 66: Pre-Commissioning Device Configuration Worksheet

MULTI V Hydro Kit Installation Manual

LG Multi V Pre-Commissioning Device Configuration Worksheet

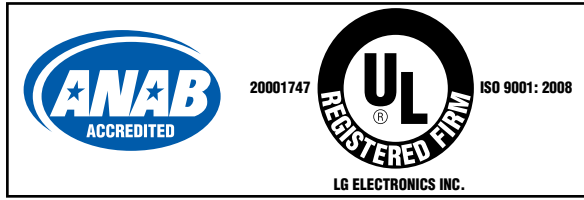
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WHO TO CALL FOR ASSISTANCE

Freight Damage and Unit Replacements.....	Your LG Manufacturer Representative
Missing Parts.....	Your LG Manufacturer Representative
Received Wrong Indoor Unit Model.....	Your LG Manufacturer Representative
Installation, Startup, and Commissioning Technical Assistance	1-888-865-3026

Inverter



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