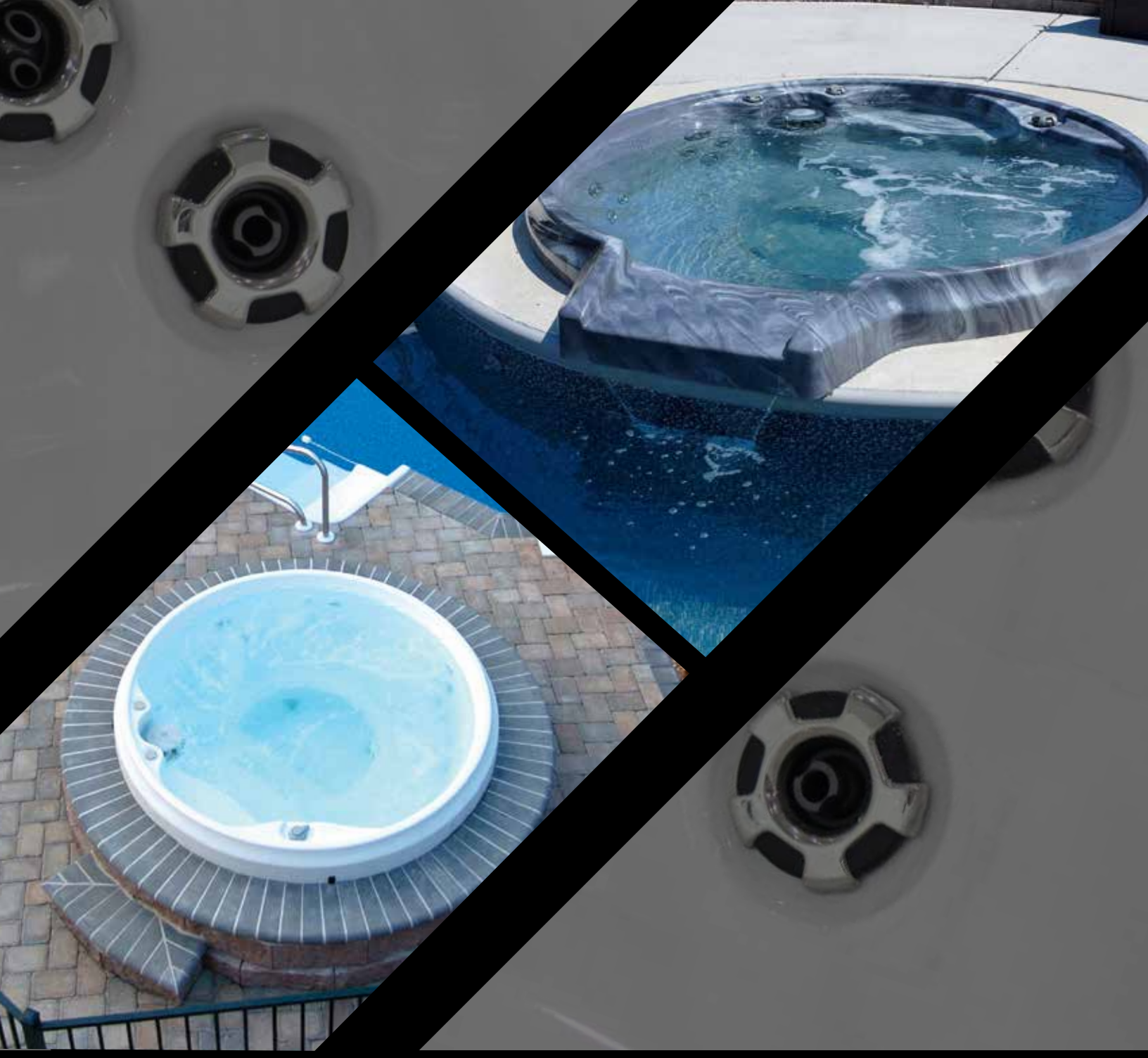

50th YEAR ANNIVERSARY

Cardinal Systems, Inc.

EST. 1976

LUXURY SPAS

INSTALLATION MANUAL

Cardinal Systems, Inc.

50 YEAR ANNIVERSARY

LUXURY SPA

INSTALLATION MANUAL

LUXURY SPA PRODUCT INFORMATION

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PLEASE NOTE: MSDS sheets for essential spa parts are available upon request from Customer Service (customerservice@cardinalsystemsinc.com)

ALL LUXURY SPAS MEET THE 2021 INTERNATIONAL SWIMMING POOL AND SPA CODE GUIDELINES.

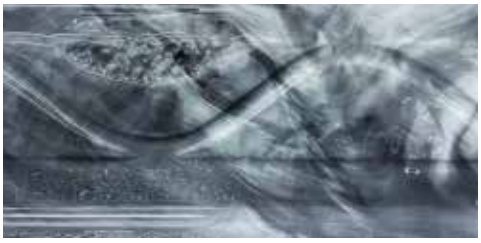
LUXURY SPA PRODUCT INFORMATION

SPILL-OVER

STANDARD

SPA PRODUCT PROFILE

- Shapes available: 85” Round or 84” Square (both 34” deep)
- Spillover (waterfall effect) and Standard (non-spillover)
- Sterling Silver or Storm Cloud (gray) color options; manufactured from lucite acrylic material
- 12 jet and 25 jet models - Gallons:
    - Round (340)
    - Square (370)



FEATURES

- CMP adjustable hydrotherapy jets
    - Large jet rating: 15 GPM
    - Small jet rating: 10 GPM
- Waterway™ spa main drains
- Waterway™ 360 Vortex Skimmer with 50. Sq. ft. filter included
- Diverter valve for whirlpool action
- Easy-entry safety steps
- Interior-embossed wave detail

WHY FOAM?

The foam at the foundation of our Spas helps insulate the Spas, prevents heat loss, reduces noise from the pump, and provides stability for the plumbing and fittings during transportation and installation.

INSTALLATION

POSITIONING THE SPA

- If installing a Spillover model, the notch in the Spillover lip is designed to set on top of the pool's coping.
- Determine the proper elevation for your finished Spa.
- Excavate at least an additional 8" below the Spa is necessary for a concrete or block base.
- The plumbing trench should be wide enough to accommodate (4) 2" pipes, and located near the stair section of the Spa. This will allow the pre-installed pipe to align relative to the trench.
- The Spa should only be supported by the **Footwell** (the large flat section on the bottom of the Spa)
- Pour concrete or use block below the Footwell to insure a sturdy base
  (refer to bullet point 3 for depth measurement).

TIP:
2" of dry bottom mix on top of the foundation will help when leveling the Spa.

INSTALLING THE SPA

- For safety purposes and to avoid damaging the Spa, make sure you have sufficient help when lowering the Spa into position.
- Do NOT lift the Spa by it's plumbing. Tip: Tape the open plumbing to avoid dirt and stones getting in the plumbing lines and causing issues during start-up.
- Place the spa on the prepared concrete pad and level the spa to the elevation you chose.
- Make sure plumbing lines are accessible and **facing the plumbing trench.**
- For Spillover Spas specifically, ensure the trough is center-cantilevered over the edge of the pool.
- Connect the labeled spa plumbing to the corresponding 2" rigid plumbing you installed in the trench
  (View details in SPA PLUMBING section [pg. 7])
- Once the Spa is securely in place and leveled properly, backfill with dirt, sand, or stone being cautious not to damage the Spa Shell in the process.

SPA PLUMBING

- A Spa should be placed no further than 50’ from the equipment pad for optimum Spa performance.
- 2” rigid pipe should run from the equipment pad to the Spa. It is important that each line be ran individually to maximize flow ***(Do NOT tee lines underground)***
- Spa plumbing lines should NOT be plumbed through salt systems or chlorine generators without installing a bypass line to reduce system back pressure.

- The Spa has (2) or (4) 2” PVC pipes with couplings attached depending on the Spa model. These pipes will be labeled ‘Spa Suction’, ‘Spa Return’, ‘Booster Suction’ and ‘Booster Return’. Attach these plumbing lines to the 2” rigid pipe in your plumbing trench. Mark the rigid pipe for reference at the filter pad.

12 JET SPA INSTALLATION

- The 2” suction line should be attached to the front of the pool pump ***as shown in Diagrams on page 8.***
- The 2” return line should be attached to the a 3-way valve located after the pool and spa heater. A check valve should be installed in the Spa return line to reduce backflow equalization. ***See Diagrams on page 9.***

25 JET SPA INSTALLATION *(MINIMUM OF 2 PUMPS BOTH 1 1/2 HP OR MORE FOR OPTIMUM PERFORMANCE)*

- The 2” suction line should be attached to the front of the pool pump ***as shown in Diagrams on page 8.***
- The 2” return line should be attached to the a 3-way valve located after the pool and spa heater. A check valve should be installed in the Spa return line to reduce backflow equalization. ***See Diagrams on page 9.***
- The 2” Booster suction line should be attached to the front of your booster pump and the booster return to the return side of the pump.

OPTIONAL LIGHT INSTALLATION

- If installing a light in the Spa, we recommend a 3" LED light with an acrylic/fiberglass niche.
- A flat area for the light is located on the second step riser.

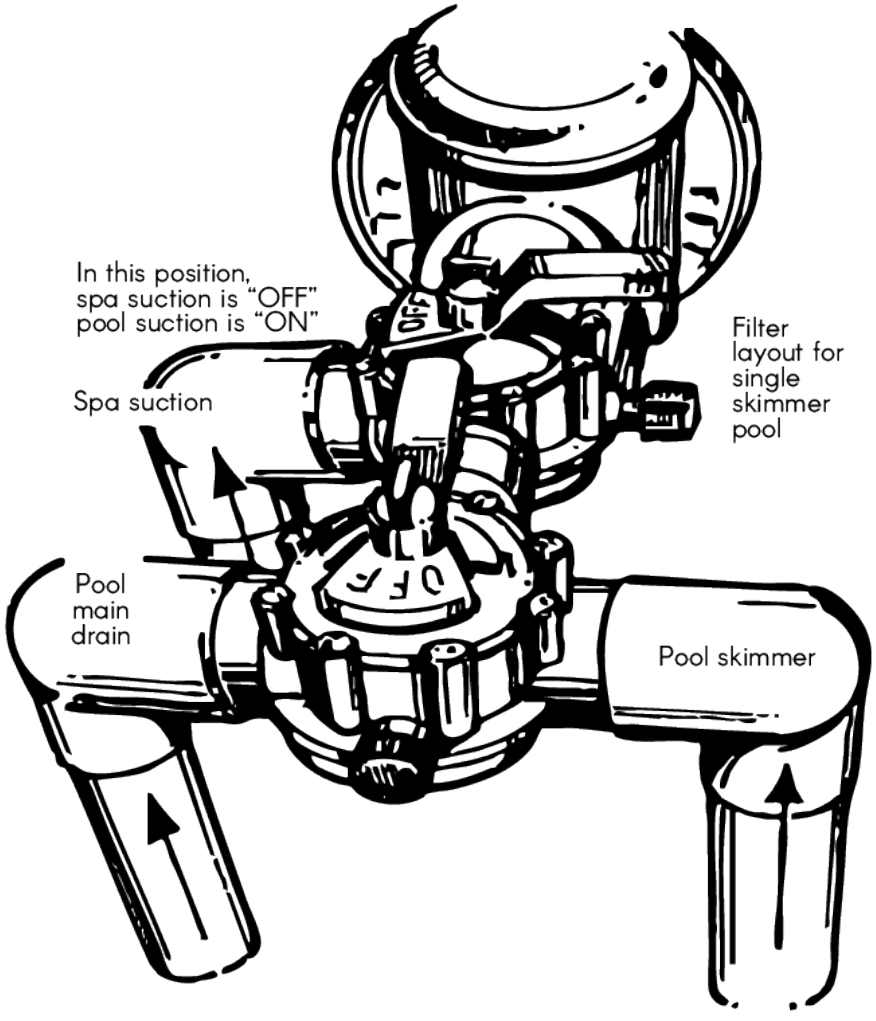
NOTE:
Light holes are not factory drilled and will need to be drilled and installed in the field.

LUXURY SPA PLUMBING DIAGRAMS

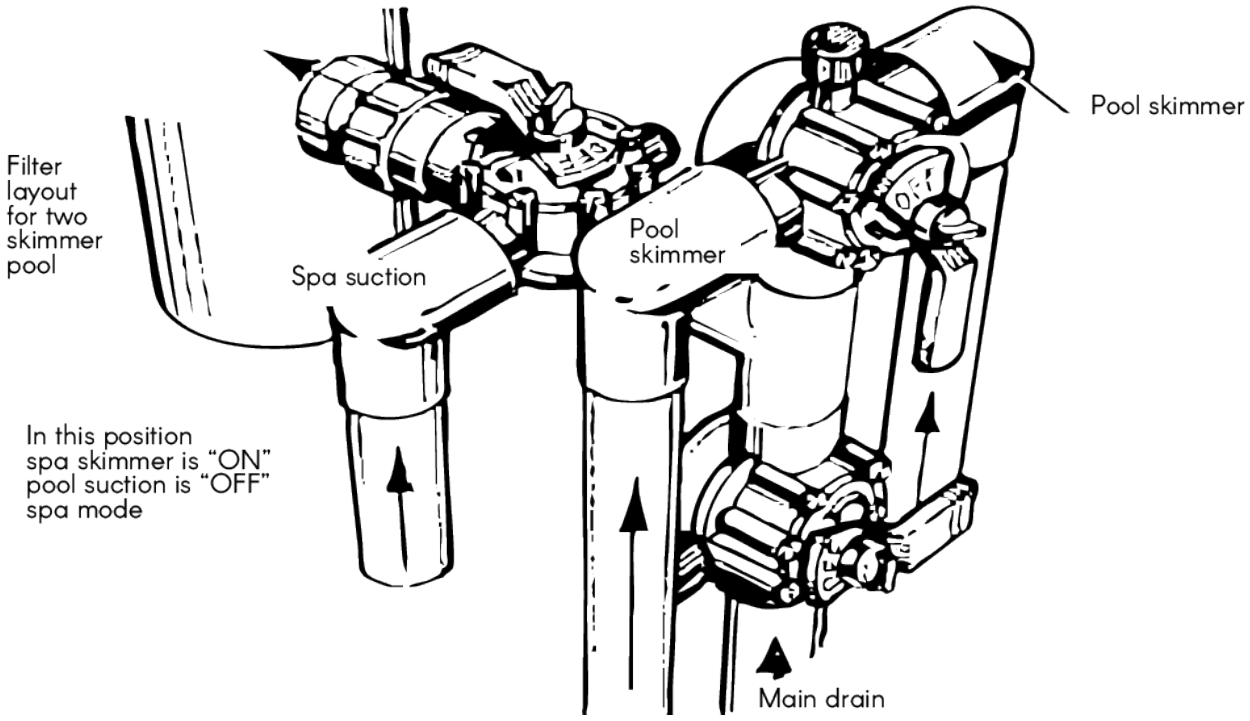
INSTALLING A SINGLE FILTER SYSTEM

The following are a series of suggested plumbing diagrams for installing a single filter system that operates both the pool and the spa. These plumbing layouts will allow for automation of the valves when using electronic control systems.

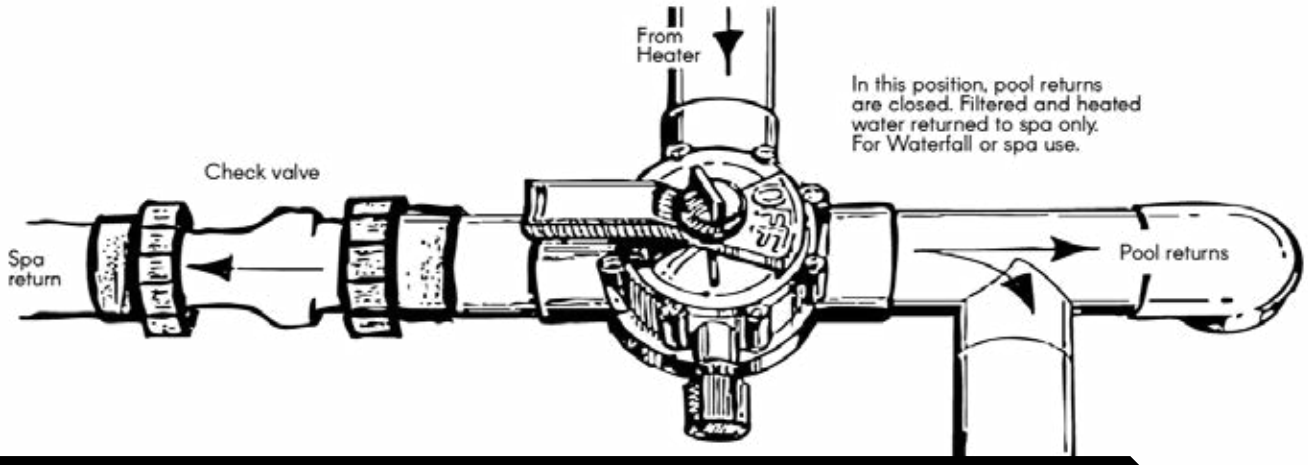
This plumbing illustration is an example of a one skimmer and main drain pool set-up with the spa suction valve in front of the pump. In this position the spa suction is closed and the pool is operational.



The illustration below is set-up for a two skimmer pool with main drain and spa suction. In this position the spa suction is open and the pool suction manifold is closed off.



The next illustration shows the filtered return water coming from the heater and going to the return manifold. In this position, the pool return water is closed and the spa is ready for action.



FOR SPILL-OVER SPAS:

Because the Spill-Over spa shell is higher than the pool, a check valve must be installed on the spa return side of the valve to prevent spa water from back feeding into the pool when the system is shut off. This check valve is supplied with your kit.

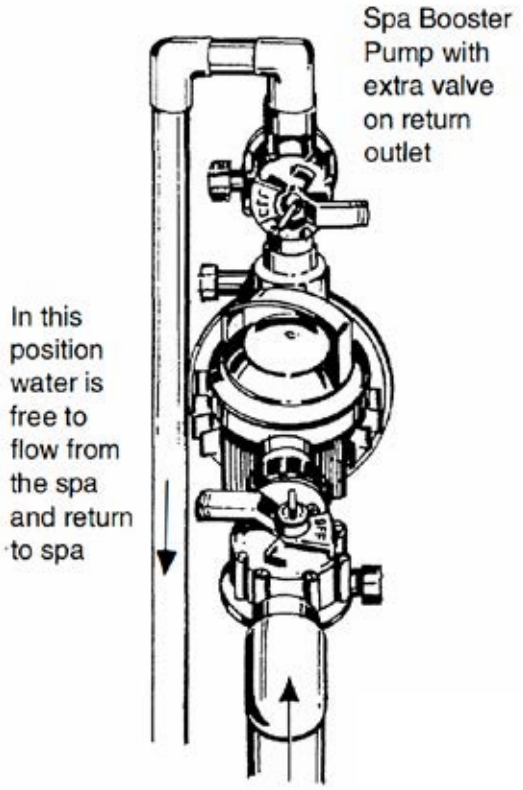
25 JET BOOSTER PUMP

1. Install two 2” MPT X S unions into the inlet and outlet ports of this pump using your standard thread sealant.

2. Install a two-way valve into each union to allow water shut off when servicing the pump.

3. Connect the spa plumbing line marked booster suction into the suction side of the pump.

4. Connect the spa plumbing line marked booster return to the outlet side of the pump.



FILTER CARE

REMOVING THE CARTRIDGE

Spill-Over Spas comes with a pre-installed 50 sq. ft. Anti Vortex cartridge filter system to maintain water clarity. Before removing the cartridge, turn off the spa pumps. Lift the Anti Vortex cover lid from the chamber crown. Using the bar handle on the top of cartridge, turn counterclockwise to remove.

CLEANING THE CARTRIDGE FILTER

After the cartridge is removed from canister, hold the cartridge in an upright position and spray downward into the pleats of the fabric with a garden hose to flush away debris. Cleaning will be easier if the garden hose can be adjusted to a single jet spray.

After hosing off the cartridge, it is highly recommended that the cartridge be allowed to soak in a filter-cleaning solution which is available through your local dealer. Soak the cartridge for 24 hours to remove body oils and body lotions that become impregnated in the cartridge fabric during filtration. After soaking, rinse the cartridge again before placing it back into operation.

WINTERIZING THE SHELL

WARNING: *Do not drain the spa during a ground water saturation condition. Do not leave the spa shell empty for long periods of time. Both of these situations can cause underground water pressure to lift the shell out of position and may void the warranty.*

If you choose to winterize or shut down your spa for a long period of time, be sure to follow one of two options below.

OPTION 1

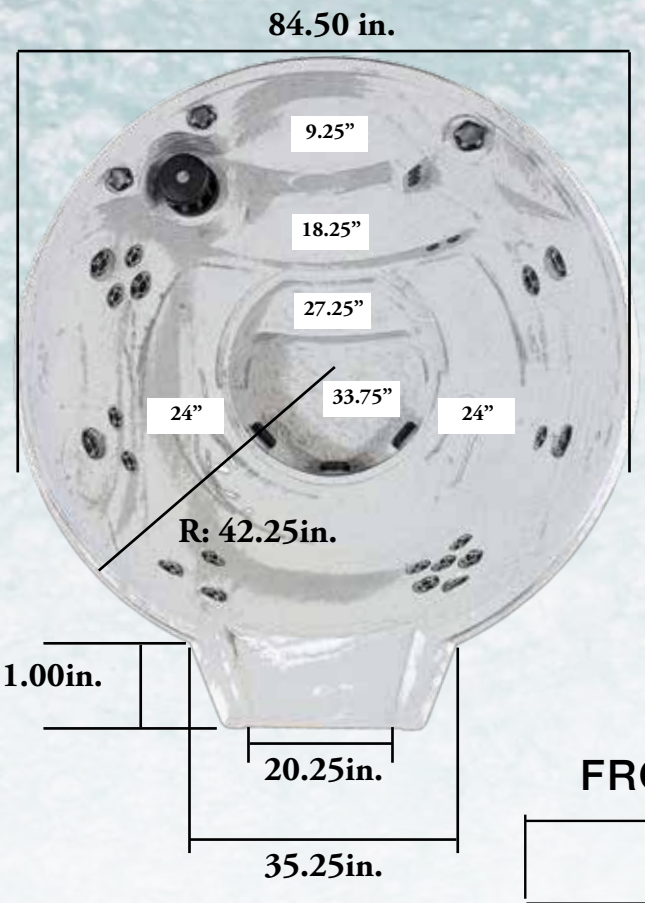
Remove all jet faces, filter cartridge, and drain covers. Blow out all lines and plug with Winter Plugs. Keep the spa filled with water for weight to keep the spa from popping out of the ground due to ground water or freezing ground.

OPTION 2 • RECOMMENDED METHOD

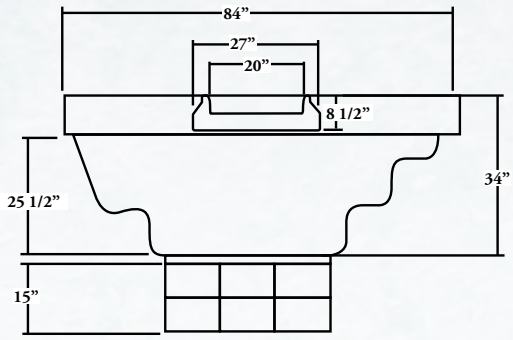
Remove filter, blow all lines from the pad back to the spa and vacuum out all water. Close valves to airlock the lines. Take a large heavy- duty tarp or vinyl liner and place in the spa using water bags or something to hold it to the deck. Fill the tarped spa with water. This will keep water from getting to the lines and provide the weight you need.

DO NOT:
drain the spa shell under extreme wet conditions. If underground water may be present due to ground water saturation, the shell could shift or lift from its position and may void the warranty.

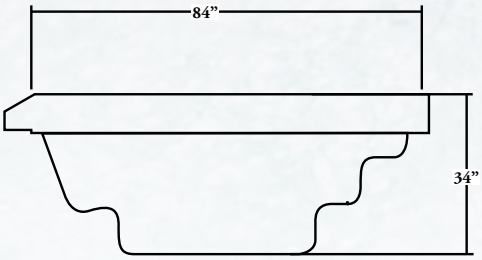
SCHEMATICS - ROUND



FRONT VIEW



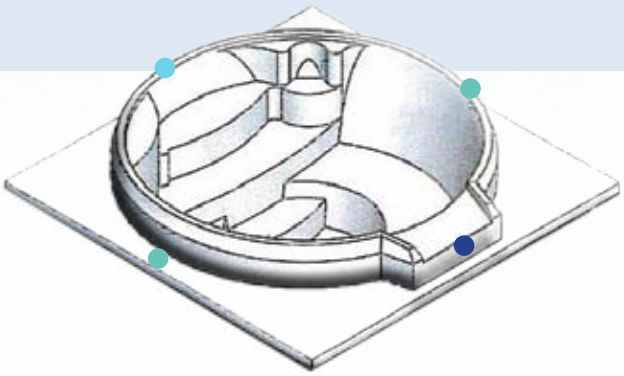
SIDE VIEW



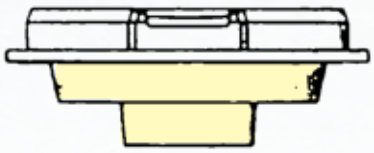
* Round= 340 gallons

WATERFALL/SPILLOVER:

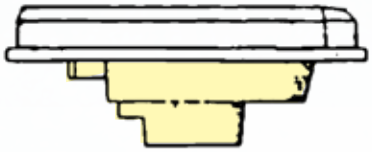
- Edge of lip to edge of frame: 2”
- Edge of spa back to edge of frame: 2.5”
- Left and right side edges of spa to edges of frame: 5.5”



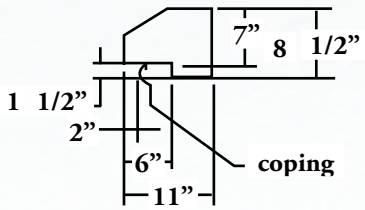
BOTTOM PROFILE: FRONT



BOTTOM PROFILE: SIDE



Round



PLUMBING INSTALLATION - 12 JET (ROUND STANDARD OR SPILLOVER)

***Please note: Plumbing assembly is the same for both spillover and standard models. Plumbing differences are applicable for 12 and 25 jets only. The photos below depict a finished spa with essential plumbing lines assembled, ready to be connected to pump/pool.*

FIGURE A: Spillover side left/left side if viewing from back of standard spa: water lines and air lines (clear) connect to the canister (top) and jet bodies.

FIGURE B: Spillover side right/right side if viewing from back of standard spa: same as Figure A.

FIGURE C: White suction and return lines run from canister (top) to connect to the pool.

FIGURE D: Spillover right side/ride side if viewing from the back of standard spa: Water filtration connected near the steps; connected to the suction/return lines.

FIGURE E: Step view- Suction and Return lines for pump hookup/ Cardinal pool connection

- Two-part liquid, expanding rigid urethane foam is a closed cell, pourable foam, which resists the absorption of water.
- Once fully cured, the foam can be laminated over with any type of polyester, epoxy or vinyl ester resin without melting.
- Reduces pump noice, holds heat from spa, and provides stability for plumbing and fittings.

NOTE: Cutting or removing any protective foam from this spa will void the warranty. The foam protects plumbing lines that cannot be seen underneath.

PLUMBING INSTALLATION - 25 JET (ROUND STANDARD OR SPILLOVER)

***Please note: Plumbing assembly is the same for both spillover and standard models. Plumbing differences are applicable for 12 and 25 jets only. The photos below depict a finished spa with essential plumbing lines assembled, ready to be connected to pump/pool.*

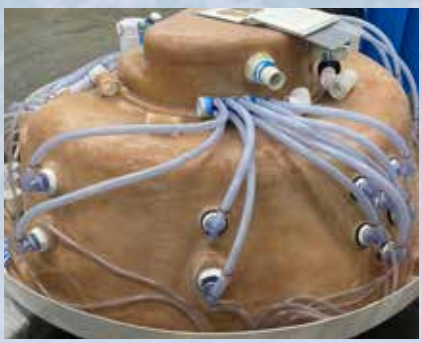


FIGURE A: Spillover side left/left side if viewing from back of standard spa: water lines and air lines (clear) connect to the canister (top) and jet bodies.

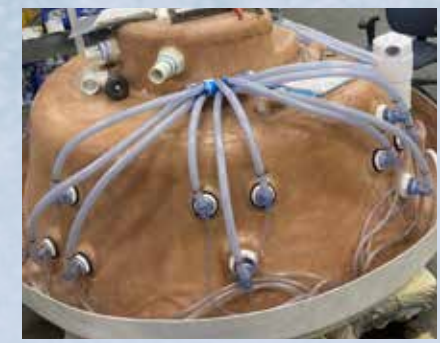


FIGURE B: Spillover side right/right side if viewing from back of standard spa: same as Figure A.

FIGURE C: Diverter Valve connection to regulate the jets to eurojets. *(feature of 25 jet models only)*

FIGURE D: Diverter Valve connection to regulate the jets to eurojets. *(feature of 25 jet models only)*

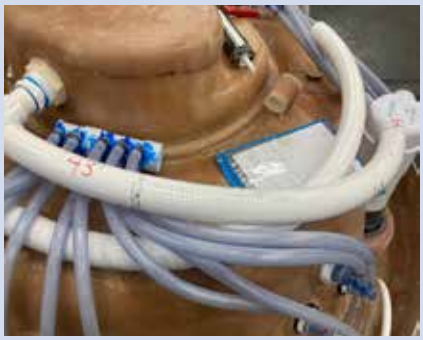
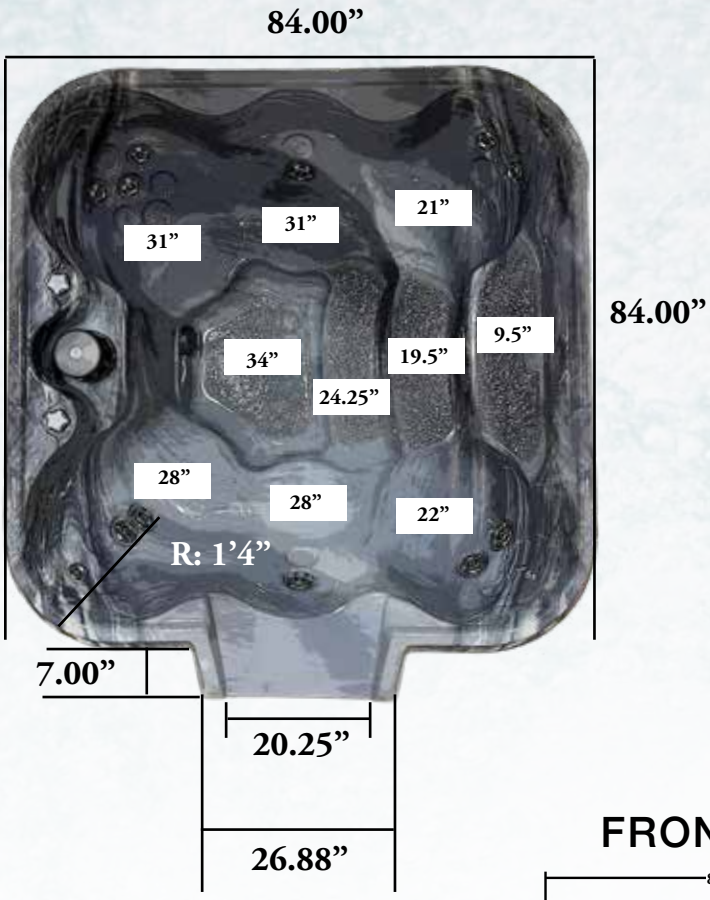


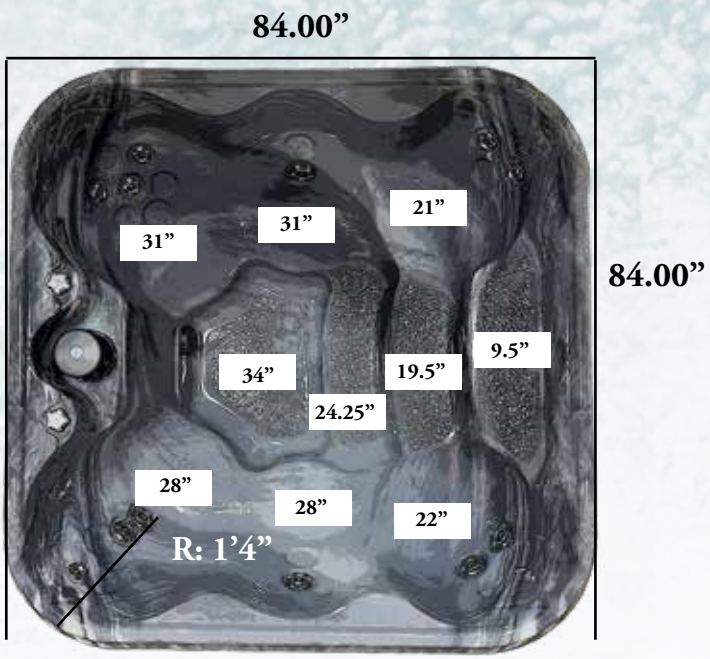
FIGURE E: Right side of spa/step view- Suction and Return lines positioned under Diverter Valve lines for pump hookup/Cardinal pool connection

- Two-part liquid, expanding rigid urethane foam is a closed cell, pourable foam, which resists the absorption of water.
- Once fully cured, the foam can be laminated over with any type of polyester, epoxy or vinyl ester resin without melting.
- Reduces pump noice, holds heat from spa, and provides stability for plumbing and fittings.

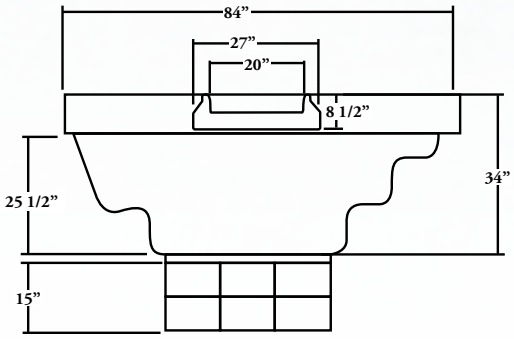
NOTE: Cutting or removing any protective foam from this spa will void the warranty. The foam protects plumbing lines that cannot be seen underneath.

SCHEMATICS - SQUARE

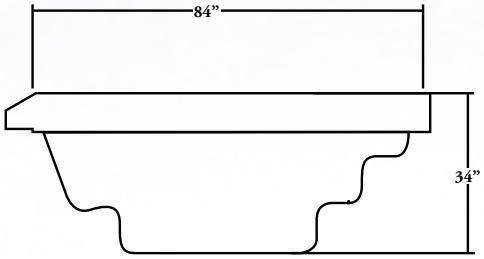




FRONT VIEW



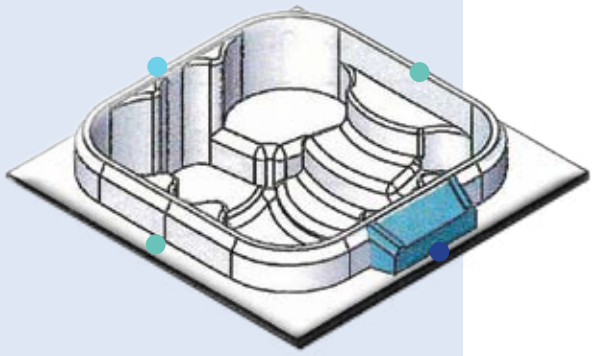
SIDE VIEW



* Square= 370 gallons

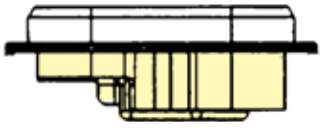
WATERFALL/SPILLOVER:

- Edge of lip to edge of frame: 2.5”
- Edge of spa back to edge of frame: 2”
- Left and right side edges of spa to edges of frame: 5.5”

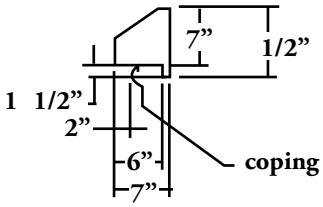


BOTTOM PROFILE: LEFT SIDE (IF FACING SPILLOVER)

BOTTOM PROFILE: BACK SIDE (OPPOSITE OF SPILLOVER)



Square



PLUMBING INSTALLATION - 12 JET (SQUARE STANDARD OR SPILLOVER)

***Please note: Plumbing assembly is the same for both spillover and standard models. Plumbing differences are applicable for 12 and 25 jets only. The photos below depict a finished spa with essential plumbing lines assembled, ready to be connected to pump/pool.*

FIGURE A:

FIGURE B:

FIGURE C:

FIGURE D:

PLUMBING INSTALLATION - 25 JET (SQUARE STANDARD OR SPILLOVER)

***Please note: Plumbing assembly is the same for both spillover and standard models. Plumbing differences are applicable for 12 and 25 jets only. The photos below depict a finished spa with essential plumbing lines assembled, ready to be connected to pump/pool.*

FIGURE A

FIGURE B

FIGURE C

FIGURE D:

FIGURE E:

NOTE:
Cutting or removing any protective foam from this spa will void the warranty. The foam protects plumbing lines that cannot be seen underneath.

MATERIALS - ROUND

PLEASE NOTE: MSDS sheets for essential spa parts are available upon request from Customer Service (customerservice@cardinalsystemsinc.com)

STANDARD/SPILLOVER (12 JET)

PART #	DESCRIPTION
W17-WFRSC	SHELL - WATERFALL ROUND STORM
W1-901	SILICONE-CLEAR-10.3 OZ
W16-309	PLUG - FOR SPA
W17-HARNESS-RD12	WATER & AIR HARNESS RD 12
W17-0960	300 PRO LOC JET BODY
W17-0961	3-1/4 in JET CROWN DIRECTIONAL
W17-0962	3-1/4 in JET CROWN DBL ROTO
W17-0963	400s PRO-LOC JET BODY
W17-0964	4-1/4 in JET CROWN DBL ROTO
W17-0927	AIR CONTROL - TOP ACCESS
W17-0930-DG	SUCTION VGB 251GPM
W17-0965	4-1/4in JET CROWN DIRECTIONAL
W17-0934	COMP RING - TYPHOON JET 400
W17-0936	COMP RING - TYPHOON JET 300
W17-0938	TOP F/ VANE WEIR FILTER
W17-0939	BASKET FILTER - ELITE SERIES
W17-0940	CARTRIDGE F/ W-FALL/P-MATE
W17-0941	FILTER BODY TOP MNT - 50 SQ FT
W17-0947	COMPRESSION SEAL 1/2"
W19-1	COUPLING - 2" SXS
W19-165	PVC PIPE -2" X4"
W19-225	TEE - 2" SLIP X SLIP X SLIP
W19-281	CEMENT - PVC POOL PRO 1 QT
W19-40	AIR TUBING 3/8" X 9/16"
W19-423	PLUG - 2" SPIGOT
W19-429	FLEX PVC PIPE - 2"X100'
W19-426	BUSHING - 2.5"SX2"S
W19-6	REDUCER - 1" X 1/2"
RM-54	LIP CLOSURE F/ WATERFALL SPA
F1-481	8 X 1 1/4 PHIL FLAT WS Z
F16-350	90" X 96" SPA SKID
RM-1099A	URETHANE FOAM COMPONENT A
RM-1099B	URETHANE FOAM COMPONENT B
SA-1551	SPA INSTALLATION/WARRANTY
W16-313	SHEET SCORED SPA

STANDARD/SPILLOVER (25 JET)

PART #	DESCRIPTION
W1-901	SILICONE-CLEAR-10.3 OZ
W16-309	PLUG - FOR SPA
W17-WF RSC	SHELL - WATERFALL ROUND STORM
W17-HARNESS-RD25	WATER & AIR HARNESS RD 25
W17-080	SPA JET - EUROBLASTER
W17-0960	300 PRO LOC JET BODY
W17-0961	3-1/4 in JET CROWN DIRECTIONAL
W17-0962	3-1/4 in JET CROWN DBL ROTO
W17-0963	400s PRO-LOC JET BODY
W17-0964	4-1/4 in JET CROWN DBL ROTO
W17-0927	AIR CONTROL - TOP ACCESS
W17-0929	DIVERTER VALVE - 2" 3-WAY
W17-0930-DG	SUCTION VGB 251GPM
W17-0965	4-1/4in JET CROWN DIRECTIONAL
W17-0934	COMP RING - TYPHOON JET 400
W17-0936	COMP RING - TYPHOON JET 300
W17-0938	TOP F/ VANE WEIR FILTER
W17-0939	BASKET FILTER - ELITE SERIES
W17-0940	CARTRIDGE F/ W-FALL/P-MATE
W17-0941	FILTER BODY TOP MNT - 50 SQ FT
W17-0947	COMPRESSION SEAL 1/2"
W19-1	COUPLING - 2" SXS
W19-161	ELBOW - 90D 2" SXS
W19-165	PVC PIPE -2" X4"
W19-225	TEE - 2" SLIP X SLIP X SLIP
W19-245	ELBOW - 90D 2" SXSP STREET
W19-281	CEMENT - PVC POOL PRO 1 QT
W19-423	PLUG - 2" SPIGOT
W19-426	BUSHING - 2.5"SX2"S
W19-429	FLEX PVC PIPE - 2"X100'
W19-6	REDUCER - 1" X 1/2"
RM-54	LIP CLOSURE F/ WATERFALL SPA
F1-481	8 X 1 1/4 PHIL FLAT WS Z
RM-1099A	URETHANE FOAM COMPONENT A
RM-1099B	URETHANE FOAM COMPONENT B
SA-1551	SPA INSTALLATION/WARRANTY
F16-350	90" X 96" SPA SKID
W16-313	SHEET SCORED SPA

STANDARD/SPILLOVER ROUND HARNESS (12 JET)

PART #	DESCRIPTION
W17-044	MANIFOLD 6PT 3/4
W19-419	CAP - 2" SLIP
W17-047	BRAIDED TUBE 3/4"X300'
W19-330	SPA HOSE CLAMP DW-SS
W17-046	MANIFOLD - 7PT 3/8
W19-261	FLEX PVC PIPE - 1/2 X 100'
W19-40	AIR TUBING 3/8" X 9/16"

STANDARD/SPILLOVER ROUND HARNESS (25 JET)

PART #	DESCRIPTION
W17-044	MANIFOLD 6PT 3/4
W17-043	MANIFOLD 4PT 3/4
W19-419	CAP - 2" SLIP
W17-0946	PLUG - 3/4" RIBBED BARB
W17-047	BRAIDED TUBE 3/4"X300'
W19-330	SPA HOSE CLAMP DW-SS
W17-046	MANIFOLD - 7PT 3/8
W19-261	FLEX PVC PIPE - 1/2 X 100'
W19-40	AIR TUBING 3/8" X 9/16"

PLEASE NOTE: MSDS sheets for essential spa parts are available upon request from Customer Service (customerservice@cardinalsystemsinc.com)

MATERIALS - SQUARE

STANDARD/SPILLOVER (12 JET)

PART #	DESCRIPTION
W1-901	SILICONE-CLEAR-10.3 OZ
W16-309	PLUG - FOR SPA
W17-WFSSC	SHELL WATERFALL SQUARE STORM
W17-HARNESS-SQ12	WATER & AIR HARNESS SQ 12
W17-0960	300 PRO LOC JET BODY
W17-0961	3-1/4 in JET CROWN DIRECTIONAL
W17-0962	3-1/4 in JET CROWN DBL ROTO
W17-0963	400s PRO-LOC JET BODY
W17-0964	4-1/4 in JET CROWN DBL ROTO
W17-0927	AIR CONTROL - TOP ACCESS
W17-0930-DG	SUCTION VGB 251GPM
W17-0965	4-1/4in JET CROWN DIRECTIONAL
W17-0934	COMP RING - TYPHOON JET 400
W17-0936	COMP RING - TYPHOON JET 300
W17-0938	TOP F/ VANE WEIR FILTER
W17-0939	BASKET FILTER - ELITE SERIES
W17-0940	CARTRIDGE F/ W-FALL/P-MATE
W17-0941	FILTER BODY TOP MNT - 50 SQ FT
W17-0947	COMPRESSION SEAL 1/2"
W19-1	COUPLING - 2" SXS
W19-165	PVC PIPE -2" X4"
W19-225	TEE - 2" SLIP X SLIP X SLIP
W19-245	ELBOW - 90D 2" SXSP STREET
W19-281	CEMENT - PVC POOL PRO 1 QT
W19-423	PLUG - 2" SPIGOT
W19-426	BUSHING - 2.5"SX2"S
W19-429	FLEX PVC PIPE - 2"X100'
W19-6	REDUCER - 1" X 1/2"
F1-481	8 X 1 1/4 PHIL FLAT WS Z
RM-54	LIP CLOSURE F/ WATERFALL SPA
RM-1099A	URETHANE FOAM COMPONENT A
RM-1099B	URETHANE FOAM COMPONENT B
SA-1551	SPA INSTALLATION/WARRANTY
F16-350	90" X 96" SPA SKID
W16-313	SHEET SCORED SPA

STANDARD/SPILLOVER (25 JET)

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STANDARD/SPILLOVER SQUARE HARNESS (25 JET)

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W19-330	SPA HOSE CLAMP DW-SS

PLEASE KEEP THIS MANUAL FOR YOUR RECORDS AND WARRANTY PURPOSES.

Scan the QR Code below to register your Spa for Warranty

PLEASE NOTE: You will need your Serial Number found on this Manual/under the Filter Cap of your Spa to complete the Registration.

MSDS sheets for essential spa parts are available upon request from Customer Service (customerservice@cardinalsystemsinc.com)

Cardinal Systems, Inc.

INVEST IN RELAXATION

p: 570.385.4733 | f: 570.385.1318 | customerservice@cardinalsystemsinc.com | cardinalpools.com

250 Route 61 South, Schuylkill Haven, PA 17972

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