

GreenSource iSeries Model SV - Split System Water Source Heat Pump 1½ to 6 Ton

Engineering
Submittal
Sheet



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Overview and Certifications



Condenser Section



Compact Air Handler/Fan Coil



Standard Features, Factory Installed Options, and Field Installed Accessories

Standard Features for both Condenser Section and Air Handler/Fan Coil Section

- ▶ **SV Model 018 - 070**
 - 8 Models from 1 ½ through 6 tons
 - Cabinetry is constructed using heavy-gauge, G90 galvanized steel
- ▶ **Quiet Operation**
 - All panels are insulated with ½" thick, 1.5 lb./cu.ft. density micromat fiberglass insulation for both thermal insulation and noise reduction
- ▶ **Serviceability**
 - All units are designed to be serviced from the front of the unit
- ▶ **Refrigerant Circuit**
 - Model SV Split Systems are designed using the optimum combination of compressor, water and copper aluminum-fin evaporator coils with thermal expansion valves (TXV) to provide peak performance

- ▶ **Standard Warranty**
 - 1-year Parts Limited Warranty
 - 5-year Compress or Limited Warranty

Standard Features for Condenser Section

- ▶ **Voltages**
 - 208-230/1/60
 - 277/1/60
 - 208/3/60
 - 460/3/60
- ▶ **Water Connections**
 - All water connections are heavy duty bronze FPT fittings securely fastened to the unit corner post
- ▶ **Coaxial Condenser Coil**
 - Heavy duty copper coaxial condenser coil for optimum heat transfer efficiencies

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Standard Features, Factory Installed Options, and Field Installed Accessories continued...

► Filter Drier

- Comes with the unit, it is field installed, protects unit from air and other contamination from mixing with refrigerant and oil

► Electronic circuit board/Unit Protection Module

- Low and high pressure switch protection
- Alarm output
- Water coil/coaxial coil/condenser freeze protection
- Anti-short cycling
- 5 minute delay
- Low pressure bypass at start up
- Random unit start
- Brown out protection

► Optional Features for SV Condenser Section

- 1/2" Closed Cell Foam Insulation
- 1/2" Dual Density Insulation with Compressor Blanket
- 1/2" Closed Cell Foam Insulation with Compressor Blanket
- Compressor Monitor Relay
- 3-Phase Monitor
- Pump/Valve Relay
- Boilerless Control
- Flow Proving Switch
- 40 Amp External Disconnect Switch
- Fire Alarm Relay
- Wire for 208 Volt
- Fault LED
- 2 Way Solenoid Valve
- Measure Flow Regulator (3 GPM/Ton)
- 2 Way Solenoid & Measure Flow Regulator

Standard Features for Air Handler/Fan Coil Section

► Air Handler/Fan Coil Transformer

- Standard 50VA with manual reset feature

► Unit Configurations

- Horizontal or Vertical
- Straight through air discharge horizontal configuration only
- End blow air discharge horizontal configuration only
- Top blow air discharge vertical configuration only

► Voltages

- 208-230/1/60
- 277/1/60
- 460/3/60

► Filter Rack

- Unit comes standard with 1" Filter rack and construction filter

► Blower Motor

- Constant Torque ECM Motor

► Evaporator Coil

- Cooper Hair Pins with Aluminum Fin evaporator coils with factory installed TXV
- 50VA Transformer

► Filter Rack Hanging Brackets

- All horizontal units come standard with hanging bracket kits for suspending the unit from field supplied hanger rods

► Optional Features for SV Air Handler/Fan Coil

- Variable Speed Constant CFM ECM
- DuoGuard™ Evaporator Coil
- Closed Cell Foam Insulation
- Energy Management Switch
- 40 amp External Disconnect Switch
- Wire for 208 Volts
- MERV-8 filter w/ 4-Sided Filter Rack
- MERV-13 filter w/ 4-Sided Filter Rack
- 75, 100 VA Transformer

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Condenser Section Model Nomenclature

MODEL:	SV	018-	1	CS	C	F	X	X	X	X	A	X	A	G	X	X	X	F	X
SV																			
NOMINAL CAPACITY:																			
018, 024, 030, 036, 042, 048, 060, 070																			
VOLTAGE DESIGNATION:																			
1 - 208-230/1/60 2 - 277/1/60 3 - 208-230/3/60 4 - 460/3/60																			
CABINET CONFIGURATION:																			
CS - Condensing Section																			
COAX OPTIONS:																			
C - Copper N - Cupro-Nickel																			
WATER CONNECTIONS:																			
F - Front X - NA X - NA X - NA X - NA																			
REVISION LEVEL:																			
A - Current X - NA																			
WATER FLOW CONTROL OPTIONS																			
2 - 2 Way Solenoid Valve 3 - MeasureFlow (3 GPM/Ton) 4 - 2 Way Solenoid + MeasureFlow																			
GENERAL ELECTRICAL OPTIONS (up to 5 available per unit)																			
C - Compressor Monitor Relay D - Phase Monitor E - Pump/valve relay G - Boilerless control H - Flow proving switch J - Disconnect Switch K - Fire Alarm Relay/Dual Power T - Fault LED X - As default for non used electrical codes X - NA X - NA																			
STAND CONTROL																			
APPLICATION:																			
G - EXTENDED RANGE (Geothermal) X - NA																			
CABINET CONSTRUCTION:																			
A - G90 Steel / 1/2" Standard 1.5LB Dual Density Fiberglass C - G90 Steel / 1/2" Closed Cell Foam D - G90 Steel / 1/2" Standard 1.5LB Dual Density Fiberglass, Extra Quiet F - G90 Steel / 1/2" Closed Cell Foam, Extra Quiet																			

Fan Coil Model Nomenclature

MODEL:	SV	018-	1	AV	X	X	L	T	P	U	A	X	A	G	J	X	5	X	X	X	X	1
SV																						
NOMINAL CAPACITY:																						
018, 024, 030, 036, 042, 048, 060, 070																						
VOLTAGE DESIGNATION:																						
1 - 208-230/1/60 2 - 277/1/60 4 - 460/3/60																						
CABINET CONFIGURATION:																						
VT - Vertical HZ - Horizontal X - NA X - NA																						
RETURN AIR CONFIGURATION:																						
L - Left R - Right																						
DISCHARGE AIR CONFIGURATION:																						
T - Top S - Straight E - End																						
FAN/MOTOR OPTIONS:																						
T - Constant Torque ECM A - Variable Speed Constant CFM ECM																						
AIR COIL OPTIONS:																						
U - Uncoated Air Coil D - Duo Guard Air Coil																						
REVISION LEVEL:																						
A - Current																						
AIR FILTRATION:																						
1 - Standard Throwaway Filter w/ 2-Sided Filter Rack 1" 4 - MERV8 - 2" w/ 4-Sided Filter Rack 5 - MERV13 - 2" w/ 4-Sided Filter Rack X - NA X - NA X - NA X - NA																						
TRANSFORMER:																						
5 - 50 VA 7 - 75 VA STANDARD 1 - 100 VA X - NA																						
GENERAL ELECTRICAL OPTIONS (up to 5 available per unit):																						
A - EMS relay J - Disconnect Switch M - Wire to 208 V X - As default for non used electrical codes																						
APPLICATION:																						
T - TXV																						
CABINET CONSTRUCTION:																						
A - G90 Steel / 1/2" Standard 1.5LB Dual Density Fiberglass C - G90 Steel / 1/2" Closed Cell Foam X - NA																						

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Water Source Heat Pump 1½ to 6 Ton



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AHRI/ANSI 13256-1 Capacity and Efficiency Data – Variable Speed Constant CFM ECM and Constant Torque ECM

Models	Water Loop Heat Pump				Ground Loop Heat Pump			
	Cooling 86 °F		Heating 68 °F		Cooling 77 °F		Heating 32 °F	
	Capacity (Btuh)	EER (Btuh/W)	Capacity (Btuh)	COP	Capacity (Btuh)	EER (Btuh/W)	Capacity (Btuh)	COP
SV018	18,904	13.3	21,091	4.4	20,449	15.7	13,786	3.5
SV024	22,604	13.1	24,894	4.3	23,874	15.0	16,208	3.3
SV030	26,437	13.0	29,642	4.3	27,922	14.3	19,540	3.2
SV036	34,951	13.8	36,959	4.3	37,302	15.9	24,853	3.5
SV042	38,619	13.0	41,638	4.3	40,869	14.8	27,284	3.2
SV048	43,268	13.6	51,778	4.3	45,129	15.4	33,540	3.5
SV060	54,331	13.0	64,068	4.3	57,373	14.9	44,373	3.2
SV070	62,106	13.6	70,428	4.3	64,202	15.6	47,886	3.3



Ratings based upon AHRI/ANSI 13256-1 with 1" disposable filter.

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Condenser Section Physical Data

Description	SV018	SV024	SV030	SV036	SV042	SV048	SV060	SV070
Compressor Type (Qty 1)	Reciprocating	Reciprocating	Reciprocating	Reciprocating	Reciprocating	Scroll	Scroll	Scroll
Factory Charge, R410A (oz)**	40	44	52	61	58	59	93	90
Liquid Line Sweat Connection (in)	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Suction Line Sweat Connection (in)	3/4	3/4	3/4	3/4	3/4	3/4	7/8	7/8
Water Connection Size								
Water Connection Size, FPT	3/4	3/4	3/4	3/4	3/4	1	1	1
Coaxial Coil Volume (gal)	0.14	0.14	0.24	0.27	0.27	0.49	0.62	0.62
Max Water Working Pressure (PSIG)	400	400	400	400	400	400	400	400
Cabinet								
Weight - Operating (lbs)	99	102	110	125	130	167	171	178
Weight - Shipping (lbs)	127	130	137	151	156	192	195	202

Fan Coil Physical Data

Description	SV018	SV024	SV030	SV036	SV042	SV048	SV060	SV070
Condensate Connection Size, FPT	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Liquid Line Sweat Connection (in)	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Suction Line Sweat Connection (in)	1/2	5/8	5/8	3/4	3/4	3/4	7/8	7/8

ECM Fan Motor & Blower

Fan Motor Type/Speeds	ECM Const Air Flow	ECM Const Air Flow	ECM Const Air Flow	ECM Const Air Flow	ECM Const Air Flow	ECM Const Air Flow	ECM Const Air Flow	ECM Const Air Flow
Fan Motor (HP)	1/3	1/3 / 1/2*	1/3 / 1/2*	1/2	3/4	3/4	1	1
Blower Wheel Size (Dia. x W)	9x7	9x7	9x7	9x7	10x8	10x8	11x9	11x9

Vertical Cabinet (AV)

Air Coil Dimensions (H x W)	16x16.5	20x16.5	20x16.5	24x20.2	24x20.2	24x26.75	24x26.75	32x26.2
Standard Filter - 1" Throwaway (L x H)	16x20	20x20	20x20	24x24	24x24	24x30	24x30	16x30 @2
Optional Filter - 2" MERV-8 or 13 Throwaway (L x H)	16x20	20x20	20x20	24x24	24x24	24x30	24x30	16x30 @2
Weight - Operating (lbs)	70	72	76	96	107	123	140	158
Weight - Shipping (lbs)	98	100	103	122	134	148	164	182

Horizontal Air Handler

Air Coil Dimensions (H x W)	16x16.5	16x20.5	16x20.5	18x27.5	18x27.5	20x32	20x32	20x42
Standard Filter - 1" Throwaway (L x H)	16x20	16x25	16x25	18x30	18x30	20x34.5	20x34.5	20x24 @2
Optional Filter - 2" MERV-8 or 13 Throwaway (L x H)	16x20	16x25	16x25	18x30	18x30	20x34.5	20x34.5	20x24 @2
Weight - Operating (lbs)	71	76	76	93	100	110	121	138
Weight - Shipping (lbs)	105	107	110	138	133	135	151	187



Units (024 & 030) with -4 voltage (460/1/60), the X13 motor will be 1/2 HP rather than 1/3 HP.



Factory Charge is based on 25 ft of lineset with linset diameter according to table. Charge adjustments will need to be made for linesets of differing length and/or diameters. Additional charge must also be added for factory supplied filter drier. All charge rates MUST ALWAYS to be confirmed and adjusted if necessary by subcooling and superheat measurements (even with a 25 ft lineset and default factory charge). See section on charging according to subcooling and superheat.

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Operating Limits - Cooling & Heating	
Description	Extended Range Option
COOLING	
Minimum ambient air temperature	50
Maximum ambient air temperature	100
Minimum evaporator entering air db/wb °F	68/57
Rated air coil entering air db/wb °F	80/67
Maximum evaporator entering air db/wb °F	95/85
Minimum water coil entering fluid temperature °F	50
Water loop typical coil entering fluid range temperature °F	70/90
Maximum water coil entering fluid temperature °F	110
HEATING	
Minimum ambient air temperature °F	40
Maximum ambient air temperature °F	85
Minimum evaporator entering air db °F	50
Rated air coil entering air °F	68
Maximum evaporator entering air db °F	80
Normal water coil entering fluid range °F	25-80
Minimum water coil entering Fluid °F	20*

* antifreeze solution is required at these fluid temperatures.

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Electrical Data - Condenser Section Only

Model	Voltage Code	Voltage/Hz/Phase	Voltage Min/Max	Compressor			Min Circuit Amps	Max Fuse/HACR
				QTY	RLA	LRA		
SV018	1	208-230/1/60	197/253	1	6.5	43.0	8.1	15
	2	265/1/60	238/292	1	5.8	46.0	7.3	15
SV024	1	208-230/1/60	197/253	1	7.4	43.0	9.3	15
	2	265/1/60	238/292	1	6.7	46.0	8.4	15
	3	208-230/3/60	197/253	1	5.9	63.0	7.4	15
	4	460/3/60	414/506	1	2.9	30.0	3.6	15
SV030	1	208-230/1/60	197/253	1	9.9	54.0	12.4	20
	2	265/1/60	238/292	1	8.5	46.0	10.6	15
	3	208-230/3/60	197/253	1	6.9	63.0	8.6	15
	4	460/3/60	414/506	1	5.4	30.0	6.8	15
SV036	1	208-230/1/60	197/253	1	13	74.0	16.3	25
	2	265/1/60	238/292	1	11.3	67.0	14.1	25
	3	208-230/3/60	197/253	1	7.8	68.0	9.8	15
	4	460/3/60	414/506	1	3.9	34.0	4.9	15
SV042	1	208-230/1/60	197/253	1	13.6	88.0	17.0	30
	3	208-230/3/60	197/253	1	8.8	68.0	11.0	15
	4	460/3/60	414/506	1	4.4	34.0	5.5	15
SV048	1	208-230/1/60	197/253	1	15.7	84.0	19.6	35
	3	208-230/3/60	197/253	1	11	88.0	13.8	20
	4	460/3/60	414/506	1	5.4	44.0	6.8	15
SV060	1	208-230/1/60	197/253	1	26.3	134.0	32.9	50
	3	208-230/3/60	197/253	1	15.6	110.0	19.5	35
	4	460/3/60	414/506	1	7.8	52.0	9.8	15
SV070	1	208-230/1/60	197/253	1	28.3	178.0	35.4	60
	3	208-230/3/60	197/253	1	19.2	136.0	24.0	40
	4	460/3/60	414/506	1	8.7	66.1	10.9	15



UNIT POWER SUPPLY: A voltage variation of +/- 10% of nameplate rating is acceptable. Phase imbalance shall not exceed 2%.

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Electrical Data - Air Handler/Fan Coil Section with Variable Speed Constant CFM ECM

Model	Voltage Code	Voltage/Hz/Phase	Voltage Min/Max	Blower Motor		Min Circuit Amps	Max Fuse/ HACR
				FLA	HP		
SV018	1	208-230/1/60	197/253	2.8	0.30	3.5	15
	2	265/1/60	238/292	2.6	0.30	3.3	15
SV024	1	208-230/1/60	197/253	2.8	0.30	3.5	15
	2	265/1/60	238/292	2.6	0.30	3.3	15
	4	460/3/60	414/506	2.6	0.30	3.3	15
SV030	1	208-230/1/60	197/253	2.8	0.30	3.5	15
	2	265/1/60	238/292	2.6	0.30	3.3	15
	4	460/3/60	414/506	2.6	0.30	3.3	15
SV036	1	208-230/1/60	197/253	4.3	0.5	5.4	15
	2	265/1/60	238/292	4.1	0.5	5.1	15
	4	460/3/60	414/506	4.1	0.5	5.1	15
SV042	1	208-230/1/60	197/253	6.8	0.8	8.5	15
	4	460/3/60	414/506	5.5	0.8	6.9	15
SV048	1	208-230/1/60	197/253	6.8	0.80	8.5	15
	4	460/3/60	414/506	5.5	0.80	6.9	15
SV060	1	208-230/1/60	197/253	9.1	1.00	11.4	20
	4	460/3/60	414/506	6.9	1.00	8.6	15
SV070	1	208-230/1/60	197/253	9.1	1.00	11.4	20
	4	460/3/60	414/506	6.9	1.00	8.6	15



208/230V units shipped with transformer wired for 230V—for 208V remove orange transformer primary lead and replace with red lead. All blower motors are single phase. 460/3/60 units with variable speed constant CFM ECM has a 460V single phase ECM and requires one line, one neutral, and one ground wire.

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Electrical Data - Air Handler/Fan Coil Section with Constant Torque ECM							
Model	Voltage Code	Voltage/Hz/Phase	Voltage Min/Max	Blower Motor		Min Circuit Amps	Max Fuse/ HACR
				FLA	HP		
SV018	1	208-230/1/60	197/253	2.8	0.30	3.5	15
	2	265/1/60	238/292	2.6	0.30	3.3	15
SV024	1	208-230/1/60	197/253	2.8	0.30	3.5	15
	2	265/1/60	238/292	2.6	0.30	3.3	15
	4	460/3/60	414/506	2.1	0.50	2.6	15
SV030	1	208-230/1/60	197/253	2.8	0.30	3.5	15
	2	265/1/60	238/292	2.6	0.30	3.3	15
	4	460/3/60	414/506	2.1	0.50	2.6	15
SV036	1	208-230/1/60	197/253	4.1	0.5	5.1	15
	2	265/1/60	238/292	3.9	0.5	4.9	15
	4	460/3/60	414/506	2.1	0.5	2.6	15
SV042	1	208-230/1/60	197/253	6.0	0.8	7.5	15
	4	460/3/60	414/506	4.6	0.8	5.8	15
SV048	1	208-230/1/60	197/253	6.0	0.80	7.5	15
	4	460/3/60	414/506	4.6	0.80	5.8	15
SV060	1	208-230/1/60	197/253	7.6	1.00	9.5	15
	4	460/3/60	414/506	4.0	1.00	5.0	15
SV070	1	208-230/1/60	197/253	7.6	1.00	9.5	15
	4	460/3/60	414/506	4.0	1.00	5.0	15



208/230V units shipped with transformer wired for 230V—for 208V remove orange transformer primary lead and replace with red lead. All blower motors are single phase. 460/3/60 units with a constant torque ECM has a 460V single phase ECM and requires two power and one ground wire.

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Blower Performance Constant Torque ECM														
Model	Fan Speed	Rated Airflow (Motor tap will vary)	Available External Static Pressure (in. wc. Wet coil and filter included)											
			0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20
SV018	1	650	630	590	560	530	490	-	-	-	-	-	-	-
	2		720	700	670	630	600	560	-	-	-	-	-	-
	3		790	770	750	710	670	620	560	-	-	-	-	-
	4		910	890	850	810	740	670	590	520	-	-	-	-
	5		1010	970	920	860	810	750	660	530	-	-	-	-
SV024	1	850	650	610	580	560	520	-	-	-	-	-	-	-
	2		740	720	690	660	620	570	-	-	-	-	-	-
	3		850	830	800	770	730	690	630	-	-	-	-	-
	4		950	920	890	870	840	820	770	650	-	-	-	-
	5		1160	1110	1050	990	920	800	670	560	-	-	-	-
SV030	1	950	620	600	570	540	490	-	-	-	-	-	-	-
	2		730	710	670	640	610	550	-	-	-	-	-	-
	3		820	790	760	740	710	670	630	-	-	-	-	-
	4		940	910	880	850	800	740	660	-	-	-	-	-
	5		1070	1010	950	900	840	760	670	-	-	-	-	-
SV036	1	1200	1120	1090	1055	1030	1000	-	-	-	-	-	-	-
	2		1260	1230	1200	1170	1140	1080	-	-	-	-	-	-
	3		1330	1293	1253	1210	1167	1100	1030	-	-	-	-	-
	4		1400	1357	1307	1250	1193	1120	1040	963	-	-	-	-
	5		1470	1420	1360	1290	1220	1140	1050	970	890	-	-	-
SV042	1	1400	1270	1250	1230	1210	-	-	-	-	-	-	-	-
	2		1440	1420	1410	1410	1400	1380	1340	-	-	-	-	-
	3		1540	1530	1510	1500	1490	1470	1430	1350	-	-	-	-
	4		1650	1630	1610	1600	1580	1530	1460	1360	1240	-	-	-
	5		1730	1720	1700	1670	1620	1570	1490	1380	1260	1100	-	-
SV048	1	1600	1390	1370	1350	1320	-	-	-	-	-	-	-	-
	2		1600	1580	1550	1530	1510	-	-	-	-	-	-	-
	3		1730	1700	1670	1650	1630	1600	1580	1540	-	-	-	-
	4		1830	1810	1780	1760	1740	1710	1670	1600	1520	-	-	-
	5		1930	1910	1880	1860	1830	1780	1720	1640	1540	1420	-	-
SV060	1	2000	1900	1880	1860	1820	-	-	-	-	-	-	-	-
	2		2000	1970	1950	1920	1890	1860	-	-	-	-	-	-
	3		2110	2090	2060	2030	2010	1970	1940	1910	1880	-	-	-
	4		2220	2200	2170	2140	2110	2080	2050	2060	2050	2000	1920	-
	5		2340	2320	2290	2260	2230	2210	2180	2150	2110	2070	2000	1930
SV070	1	2100	2050	2010	1970	1930	-	-	-	-	-	-	-	-
	2		2150	2120	2080	2030	1990	1960	-	-	-	-	-	-
	3		2270	2230	2200	2160	2120	2080	2040	2010	1980	-	-	-
	4		2390	2350	2320	2280	2250	2200	2160	2130	2100	2070	2030	-
	5		2520	2480	2450	2420	2380	2330	2290	2260	2220	2170	2100	2020



Note: Air flow is 70% of tabulated values during fan only operation.
Air flow is 85% of tabulated value during passive dehumidification mode when enabled.

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



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Blower Performance Variable Speed Constant CFM ECM																
Model	Rated Airflow	Tap	Adjust Settings	Fan Only	Available External Static Pressure (in. wc. Wet coil and filter included)											
					0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20
SV018	650	B	-	550	540	540	540	540	540	540	530	520	500	-	-	-
			Norm	650	650	650	650	650	650	640	630	610	590	-	-	-
			+	750	750	750	750	750	750	740	730	710	690	-	-	-
SV024	850	C	-	720	720	720	720	720	720	720	700	650	560	-	-	-
			Norm	850	850	850	850	850	850	850	850	800	700	-	-	-
			+	960	960	960	960	960	960	960	960	880	790	-	-	-
SV030	950	D	-	810	810	810	810	810	810	810	770	720	650	-	-	-
			Norm	950	950	950	950	950	950	950	900	850	780	-	-	-
			+	980	980	980	980	980	980	980	950	900	820	-	-	-
SV036	1200	A	-	1020	1020	1020	1020	1020	1020	1000	990	960	930	-	-	-
			Norm	1200	1200	1200	1200	1200	1200	1180	1160	1130	1090	-	-	-
			+	1380	1380	1380	1380	1380	1380	1360	1330	1300	1250	-	-	-
SV042	1400	B	-	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	-	-
			Norm	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	-	-
			+	1630	1630	1630	1630	1630	1630	1630	1630	1630	1630	1630	-	-
SV048	1600	A	-	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	-	-
			Norm	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	-	-
			+	1810	1810	1810	1810	1810	1810	1810	1810	1810	1810	1810	-	-
SV060	2000	A	-	1700	1700	1700	1700	1700	1700	1700	1700	1700	1690	1690	1680	-
			Norm	2000	2000	2000	2000	2000	2000	2000	2000	2000	1980	1980	1980	-
			+	2220	2220	2220	2220	2220	2220	2220	2220	2220	2130	2100	2070	-
SV070	2200	B	-	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	-
			Norm	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	-
			+	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	-



Note: Air flow is 70% of tabulated values during fan only operation.

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



BOSCH

Horizontal Cabinet Corner Weights

Configuration			Left Hand Evaporator				Right Hand Evaporator			
Model	Unit	Total	Left Front*	Right Front*	Left Back	Right Back	Left Front*	Right Front*	Left Back	Right Back
SV018	71	14	12	20	25	12	14	25	20	48
	32	6	5	9	11	5	6	11	9	22
SV024	76	16	13	21	27	13	16	27	21	48
	34	7	6	10	12	6	7	12	10	22
SV030	76	16	12	21	28	12	16	28	21	52
	34	7	5	10	13	5	7	13	10	23
SV036	93	19	14	25	35	14	19	35	25	66
	42	9	6	11	16	6	9	16	11	30
SV042	100	21	15	27	37	15	21	37	27	64
	45	10	7	12	17	7	10	17	12	29
SV048	110	22	18	33	36	18	22	36	33	62
	50	10	8	15	16	8	10	16	15	28
SV060	121	26	19	34	42	19	26	42	34	69
	55	12	9	15	19	9	12	19	15	31
SV070	138	30	22	38	48	22	30	48	38	76
	63	14	10	17	22	10	14	22	17	35

* Front is control box end

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



BOSCH

Refrigerant Charge, General Line Sizing and Capacity Multiplier¹

Model	Factory R410A Charge (oz) ²	Refrigerant Line O.D. Size (Based on Equivalent Line Length) ³								Suct. Line Riser Max. ⁴
		25 FT ²		35 FT		50 FT		75 FT		
		LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	
SV018	40	3/8	5/8	3/8	5/8	3/8	5/8	3/8	3/4	5/8
SV024	40	3/8	5/8	3/8	5/8	3/8	3/4	3/8	7/8	5/8
SV030	48	3/8	3/4	3/8	3/4	3/8	3/4	3/8	7/8	3/4
SV036	61	3/8	3/4	3/8	3/4	3/8	7/8	3/8	7/8	3/4
SV042	58	3/8	3/4	3/8	3/4	3/8	7/8	3/8	7/8	7/8
SV048	59	3/8	3/4	3/8	7/8	3/8	7/8	3/8	1-1/8	7/8
SV060	79	3/8	7/8	1/2	7/8	1/2	1-1/8	1/2	1-1/8	7/8
SV070	76	3/8	7/8	1/2	1-1/8	1/2	1-1/8	1/2	1-1/8	7/8
Capacity Multiplier		1.00		0.995		0.990		0.980		

Example 1:

Model SV036 with 45ft of equivalent length of 3/8" O.D Liquid Line and factory supplied filter drier 860-006. Estimated Total System Charge = Factory charge +/- (45ft - 25 ft) x .60 oz/ft + filter drier adjustment. Estimated Total System Charge = 61 oz + (20ft x .60 oz/ft) + 11 oz = 84 oz. Estimate an additional 23 oz of R410A refrigerant is required. After adding estimated additional charge, adjust final charge according to subcooling and superheat measurements. See section on charging according to subcooling and superheat.

Example 2:

Model SV060 with 10ft of equivalent length of 3/8" O.D Liquid Line and factory supplied filter drier 860-006. Total system charge= Factory charge +/- (25ft - 10ft) x .60 oz/ft + filter drier adjustment. Total System Charge = 79 oz - (15ft x .60 oz/ft) + 11 oz = 81 oz. Add 2 oz of R410A refrigerant. After adding estimated additional charge, adjust final charge according to subcooling and superheat measurements. See section on charging according to subcooling and superheat.

Example 3:

Model SV030 with 25ft of equivalent length of 3/8" O.D Liquid Line and factory supplied filter drier 860-005. Total system charge = Factory charge + adjustment for larger liquid line diameter + filter drier adjustment. Total System Charge = 48 oz - (25ft x .44 oz/ft) + (25ft x .60 oz/ft) + 8 oz = 60 oz. Add 12 oz of R410A refrigerant. After adding estimated additional charge, adjust final charge according to subcooling and superheat measurements. See section on charging according to subcooling and superheat.



Note: 1. Liquid and suction line sizes should be sized according to table, not according to king valve connection size.



Note: 2. Factory Charge is based on 25 ft of lineset with inset diameter according to table. Charge adjustments will need to be made for linesets of differing length and/or diameters. Additional charge must also be added for factory supplied filter drier. All charge rates MUST ALWAYS be confirmed and adjusted if necessary by subcooling and superheat measurements (even with a 25 ft lineset and default factory charge). See section on charging according to subcooling and superheat.



Note: 3. Next diameter size up should be used if equivalent length is longer than shown (75 ft is max).



Note: 4. Suction line max riser diameter is typically sized to meet minimum of 1,250 FPM refrigerant velocity for proper oil return.



Note: 5. With 1/2" liquid lines it is recommended to place units as close as practical (minimizing the increased refrigerant volume imposed by the larger line) for maximum compressor life.

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton

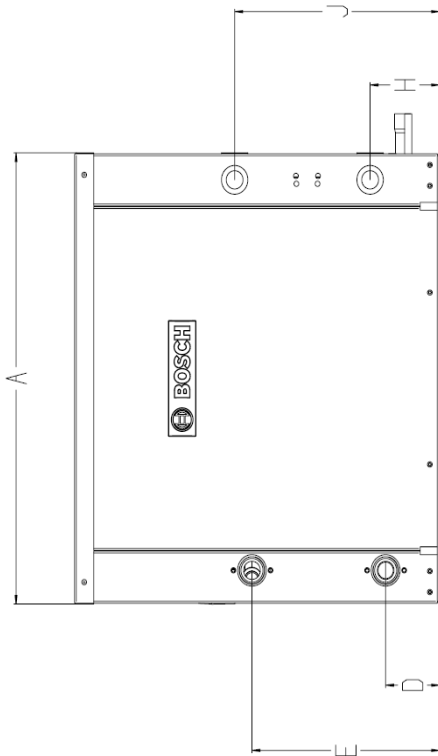
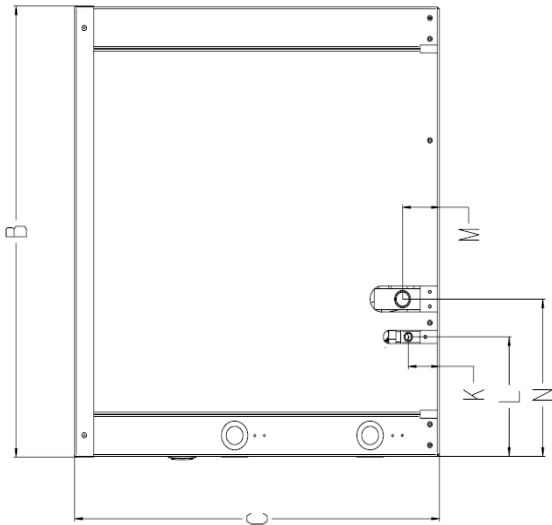


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SV Condenser Section Dimensions

Model	A Width	B Depth	C Height	D Water In	E Water Out	F Liquid Connection	G Suction Connection	H Electrical Knockout	J Water Connections	K Service Valve Gas		M Service Valve Liquid	N Service Valve Liquid	Service Valve Liquid Connection
SV018, 024-CS	21.5	21.5	19.00	2.8	8.5	3/8"	3/4"	3.6	3/4" F.P.T.	1.6	5.7	1.9	7.5	3/4 ID
SV030-CS	21.5	21.5	19.00	2.8	9.8	3/8"	3/4"	3.6	3/4" F.P.T.	1.6	5.7	1.9	7.5	3/4 ID
SV036, 042-CS	21.5	26.0	19.00	2.8	10.8	3/8"	3/4"	3.6	3/4" F.P.T.	1.6	7.0	1.9	8.8	3/4 ID
SV048-CS	24.0	32.5	21.00	3.3	13.2	3/8"	3/4"	3.6	1" F.P.T.	1.6	5.2	1.9	7.1	3/4 ID
SV060-CS	24.0	32.5	21.00	3.3	13.2	3/8"	1"	3.6	1" F.P.T.	1.6	5.2	1.9	7.1	7/8 ID
SV070-CS	26.0	33.3	21.00	2.9	13.4	3/8"	1"	3.6	1" F.P.T.	1.6	8.4	1.9	10.2	7/8 ID

All dimensions in inches. All dimensions within +/- 0.125. Specifications subject to change without notice.



Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton

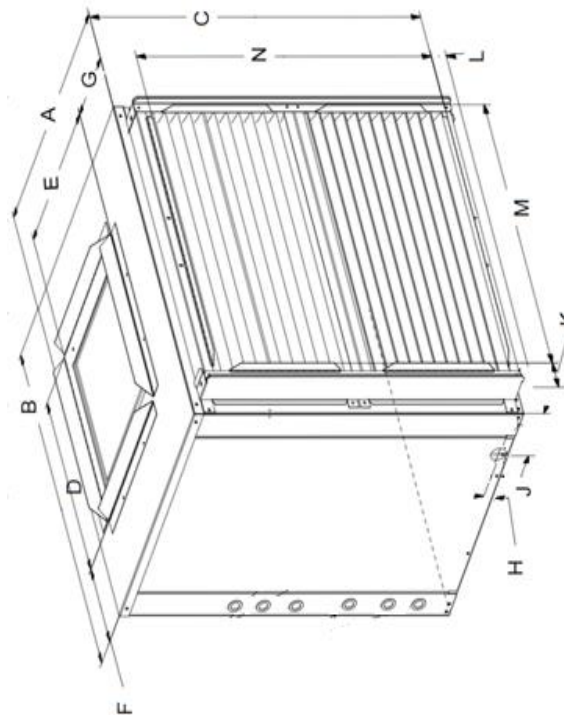


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SV Vertical Air Handler Dimensions

Model	Width		Depth	Height	C	D	Discharge Depth	E	Discharge Width	F	G	H	J	K	L	M	N	P	Condensate Drain Connection	Recommended Replacement Nominal Filter Size
	A	B																		
SV018	21.5	21.5	21.5	21.62	14.0	14.0	14.0	4.5	5.2	5.2	1.0	1.0	4.4	1.8	1.6	18.0	18.0	16.0	3/4" F.P.T.	20x20x1
SV024	21.5	21.5	21.5	21.62	14.0	14.0	14.0	4.5	5.2	5.2	1.0	1.0	4.4	1.8	1.6	18.0	18.0	20.0	3/4" F.P.T.	20x20x1
SV030	21.5	21.5	21.5	21.62	14.0	14.0	14.0	4.5	5.2	5.2	1.0	1.0	4.4	1.8	1.6	18.0	18.0	20.0	3/4" F.P.T.	20x20x1
SV036	21.5	26.0	26.0	25.62	16.0	14.0	16.0	6.2	5.0	5.0	1.0	1.0	4.4	2.0	1.6	22.0	22.0	24.0	3/4" F.P.T.	24x24x1
SV042	21.5	26.0	26.0	25.62	16.0	14.0	16.0	6.2	5.0	5.0	1.0	1.0	4.4	2.0	1.6	22.0	22.0	24.0	3/4" F.P.T.	24x24x1
SV048	24.0	32.5	32.5	25.62	18.0	14.0	18.0	7.5	6.2	6.2	1.0	1.0	4.4	2.3	1.6	28.0	28.0	24.0	3/4" F.P.T.	24x30x1
SV060	24.0	32.5	32.5	25.62	18.0	14.0	18.0	7.5	6.2	6.2	1.0	1.0	4.4	2.3	1.6	28.0	28.0	24.0	3/4" F.P.T.	24x30x1
SV070	33.3	26.00	26.00	33.62	18.0	16.0	18.0	7.5	7.2	7.2	1.0	1.0	4.4	2.6	1.6	28.0	30.0	32.0	3/4" F.P.T.	16x30x1 (2)

All dimensions in inches. All dimensions within +/- 0.125. Specifications subject to change without notice.
 1" filter rack extends 1.23" beyond the side of the unit. 2" filter rack length is .2" longer, lengthening dim M by .2"
 The 2" filter rack is 4 sided with a filter access door on each end and can accept either a 1" or 2" filter
 Refrigerant line connections are located in back corner. Field piping can be brought in through knockouts located in front or back corner.
 On units 018, 024, 030 the left hand configuration comes with the e-box in the back of the unit but can be accessed through the front.



Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



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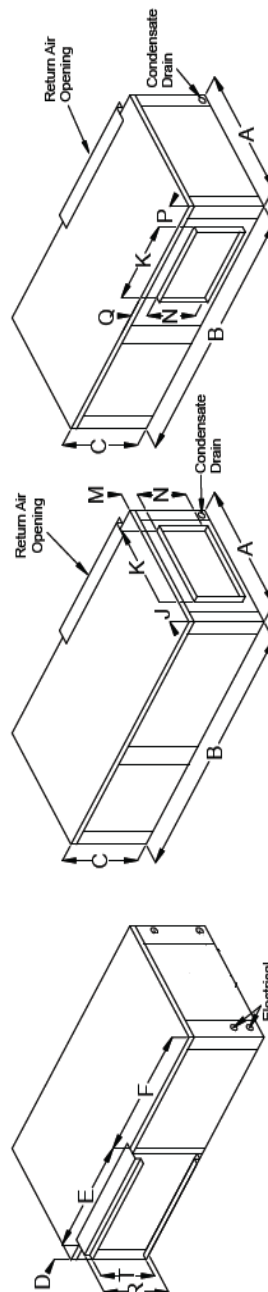
SV Horizontal Air Handler Dimensions

Model	A	B	C	D	E	F	J	K	M	N	P	Q	R	T	Condensate Drain Connection	Recommended Replacement Nominal Filter Size
SV018	22.0	43.0	17.0	1.5	20.15	21.35	5.42	9.13	6.11	9.65	4.92	1.23	16.3	14.5	3/4" FPT	16 x 20 x 1
SV024	22.0	43.0	17.0	1.5	25.0	16.5	5.42	9.13	6.11	9.65	4.92	1.23	16.3	14.5	3/4" FPT	16 x 25 x 1
SV030	22.0	43.0	17.0	1.5	25.0	16.5	5.42	9.13	6.11	9.65	4.92	1.23	16.3	14.5	3/4" FPT	16 x 25 x 1
SV036	22.0	54.5	19.0	1.5	30.15	22.85	6.47	9.13	7.5	10.28	5.97	1.21	18.3	16.5	3/4" FPT	18 x 30 x 1
SV042	22.0	54.5	19.0	1.5	30.15	22.85	5.27	10.45	6.46	11.3	4.77	1.22	18.3	16.5	3/4" FPT	18 x 30 x 1
SV048	25.0	54.5	21.0	1.5	34.6	18.4	7.25	10.45	7.46	11.36	6.75	2.16	20.3	18.5	3/4" FPT	20 x 34.5 x 1
SV060	25.0	54.5	21.0	1.5	34.6	18.4	6.32	11.76	6.81	12.5	5.82	1.68	20.3	18.5	3/4" FPT	20 x 34.5 x 1
SV070	25.0	65.0	21.0	1.5	48.1	15.4	6.32	11.76	6.81	12.5	5.82	1.68	20.3	18.5	3/4" FPT	20 x 24 x 1 (2)

All dimensions in inches. All dimensions within +/- 0.125. Specifications subject to change without notice.

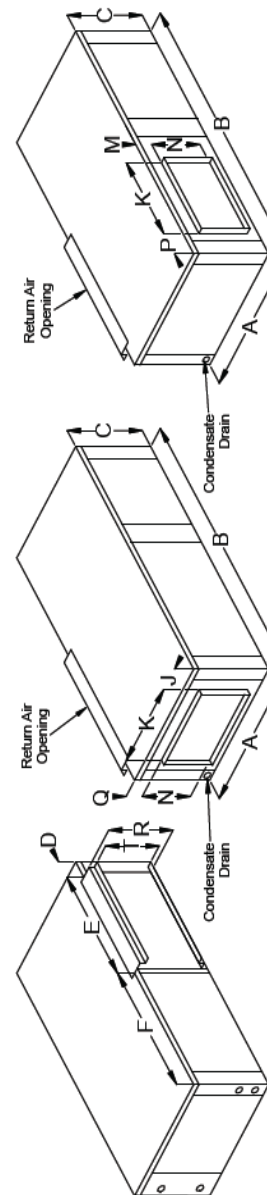
1" filter rack extends 1.23" beyond the side of the unit. 2" filter rack extends 2.89" beyond the side of the unit. 2" filter rack length is 2" longer, lengthening dim M by .2"

The 2" filter rack is 4 sided with a filter access door on each end and can accept either a 1" or 2" filter. Refrigerant line connections are located directly behind refrigerant line knockouts.



Left Hand Return End Blow (FLE)

Left Hand Return Straight Through (FLS)



Right Hand Return End Blow (FRE)

Right Hand Return Straight Through (FRS)

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



BOSCH

SV018 (650 CFM) Capacity Data

COOLING									HEATING						
Entering Fluid Temp (F)	Water Flow (GPM)	Pressure Drop PSI (FOH)	Entering Air Temp (db/ wb) F	Total Capacity (MBTUH)	Sensible Capacity (MBTUH)	Heat of Rejection (MBTUH)	Power Input (kW)	EER	Entering Fluid Temp (F)	Pressure Drop PSI (FOH)	Entering Air Temp (F)	Total Capacity (MBTUH)	Heat of Absorption (MBTUH)	Power Input (kW)	COP
50	2.5	1.2 (2.8)	75/63	21.3	15.9	24.6	1.1	18.6	30*	1.4 (3.2)	60	11.0	8.2	1.0	3.2
			80/67	22.9	16.6	26.4	1.2	19.9			70	10.4	7.5	1.0	2.9
			85/71	24.7	17.2	28.2	1.2	21.4			80	9.7	6.8	1.1	2.7
	4	2.9 (6.6)	75/63	22.3	16.4	25.4	1.1	20.9		3.3 (7.6)	60	11.8	8.9	1.0	3.4
			80/67	24.1	17.1	27.3	1.1	22.7			70	11.2	8.1	1.1	3.1
			85/71	26.0	17.7	29.2	1.1	24.7			80	10.5	7.4	1.1	2.8
	5	4.3 (9.9)	75/63	22.6	16.5	25.7	1.0	21.8		4.9 (11.3)	60	12.2	9.2	1.0	3.4
			80/67	24.5	17.2	27.6	1.0	23.8			70	11.5	8.4	1.1	3.1
			85/71	26.4	17.9	29.6	1.0	26.0			80	10.7	7.6	1.1	2.9
60	2.5	1.2 (2.7)	75/63	20.1	15.4	23.7	1.2	16.3	40*	1.4 (3.1)	60	13.3	10.2	1.1	3.6
			80/67	21.7	16.1	25.4	1.2	17.4			70	12.7	9.5	1.1	3.3
			85/71	23.4	16.7	27.1	1.3	18.7			80	12.0	8.8	1.2	3.1
	4	2.8 (6.4)	75/63	21.0	15.8	24.4	1.2	18.1		3.2 (7.3)	60	14.4	11.2	1.1	3.8
			80/67	22.8	16.5	26.3	1.2	19.6			70	13.7	10.4	1.1	3.5
			85/71	24.6	17.1	28.2	1.2	21.2			80	12.9	9.6	1.2	3.2
	5	4.1 (9.6)	75/63	21.4	16.0	24.7	1.1	18.8		4.7 (10.9)	60	14.8	11.6	1.1	3.9
			80/67	23.2	16.7	26.6	1.1	20.4			70	14.1	10.7	1.2	3.6
			85/71	25.1	17.3	28.5	1.1	22.2			80	13.2	9.9	1.2	3.2
70	2.5	1.1 (2.7)	75/63	18.9	14.9	22.6	1.3	14.3	50	1.2 (2.8)	60	16.3	12.9	1.1	4.2
			80/67	20.4	15.5	24.3	1.3	15.3			70	15.6	12.1	1.2	3.8
			85/71	22.1	16.2	26.1	1.4	16.3			80	14.9	11.2	1.3	3.5
	4	2.7 (6.2)	75/63	19.7	15.3	23.4	1.3	15.7		2.9 (6.6)	60	17.6	14.2	1.2	4.4
			80/67	21.4	16.0	25.2	1.3	17.0			70	16.8	13.2	1.2	4.0
			85/71	23.2	16.6	27.0	1.3	18.3			80	16.0	12.2	1.3	3.6
	5	4.0 (9.2)	75/63	20.1	15.4	23.7	1.2	16.3		4.3 (9.9)	60	18.1	14.6	1.2	4.4
			80/67	21.8	16.1	25.5	1.2	17.6			70	17.2	13.6	1.2	4.1
			85/71	23.6	16.7	27.3	1.2	19.1			80	16.4	12.5	1.3	3.7
80	2.5	1.1 (2.6)	75/63	17.7	14.3	21.6	1.4	12.6	60	1.2 (2.7)	60	19.0	15.6	1.2	4.6
			80/67	19.1	15.1	23.2	1.4	13.4			70	18.2	14.5	1.3	4.2
			85/71	20.7	15.7	24.9	1.4	14.3			80	17.5	13.5	1.3	3.8
	4	2.6 (6.0)	75/63	18.5	14.6	22.3	1.3	13.7		2.8 (6.4)	60	20.6	17.0	1.2	4.9
			80/67	20.1	15.4	24.0	1.4	14.8			70	19.7	15.9	1.3	4.4
			85/71	21.8	16.1	25.8	1.4	15.8			80	18.8	14.8	1.4	4.0
	5	3.9 (8.9)	75/63	18.7	14.8	22.5	1.3	14.1		4.1 (9.6)	60	21.3	17.5	1.3	5.0
			80/67	20.4	15.5	24.2	1.3	15.2			70	20.3	16.4	1.3	4.5
			85/71	22.2	16.3	26.1	1.3	16.5			80	19.4	15.2	1.4	4.1
85	2.5	1.1 (2.5)	75/63	16.9	14.1	20.9	1.4	11.8	70	1.1 (2.7)	60	21.8	18.2	1.3	5.0
			80/67	18.4	14.8	22.6	1.5	12.6			70	21.0	17.1	1.3	4.6
			85/71	19.9	15.5	24.2	1.5	13.3			80	20.2	16.0	1.4	4.2
	4	2.6 (5.9)	75/63	17.8	14.5	21.7	1.4	12.8		2.7 (6.2)	60	23.7	20.0	1.3	5.3
			80/67	19.3	15.2	23.4	1.4	13.7			70	22.7	18.7	1.4	4.8
			85/71	20.9	15.9	25.1	1.4	14.7			80	21.8	17.5	1.5	4.4
	5	3.8 (8.8)	75/63	18.1	14.5	22.0	1.4	13.2		4.0 (9.2)	60	24.4	20.7	1.3	5.4
			80/67	19.7	15.3	23.7	1.4	14.2			70	23.4	19.3	1.4	4.9
			85/71	21.4	16.0	25.5	1.4	15.3			80	22.4	18.0	1.5	4.5
90	2.5	1.1 (2.5)	75/63	16.3	13.8	20.4	1.5	11.0	80	1.1 (2.6)	60	24.8	20.9	1.3	5.5
			80/67	17.7	14.5	22.0	1.5	11.7			70	24.0	19.7	1.4	5.0
			85/71	19.2	15.1	23.6	1.5	12.5			80	23.1	18.5	1.5	4.6
	4	2.5 (5.8)	75/63	17.1	14.0	21.1	1.4	11.9		2.6 (6.0)	60	26.9	23.1	1.4	5.8
			80/67	18.6	14.8	22.8	1.5	12.8			70	25.8	21.6	1.4	5.2
			85/71	20.2	15.6	24.5	1.5	13.7			80	24.9	20.3	1.5	4.8
	5	3.8 (8.7)	75/63	17.3	14.2	21.3	1.4	12.2		3.9 (8.9)	60	27.7	23.9	1.4	5.9
			80/67	19.0	14.9	23.1	1.4	13.2			70	26.6	22.3	1.5	5.3
			85/71	20.6	15.7	24.8	1.5	14.2			80	25.6	21.0	1.5	4.8
100	2.5	1.0 (2.4)	75/63	14.9	13.1	19.2	1.5	9.6	Extended Range - Anti-freeze required	1.1 (2.6)	60	24.8	20.9	1.3	5.5
			80/67	16.2	14.0	20.6	1.6	10.2			70	24.0	19.7	1.4	5.0
			85/71	17.6	14.6	22.2	1.6	10.9			80	23.1	18.5	1.5	4.6
	4	2.4 (5.6)	75/63	15.7	13.4	19.8	1.5	10.3		2.6 (6.0)	60	26.9	23.1	1.4	5.8
			80/67	17.1	14.2	21.4	1.5	11.1			70	25.8	21.6	1.4	5.2
			85/71	18.5	14.9	23.0	1.6	11.8			80	24.9	20.3	1.5	4.8
	5	3.6 (8.4)	75/63	15.9	13.6	20.0	1.5	10.6		3.9 (8.9)	60	27.7	23.9	1.4	5.9
			80/67	17.3	14.3	21.6	1.5	11.4			70	26.6	22.3	1.5	5.3
			85/71	18.8	15.3	23.2	1.6	12.1			80	25.6	21.0	1.5	4.8
110	2.5	1.0 (2.3)	75/63	13.5	12.6	17.9	1.6	8.4	Extended Range - Anti-freeze required	1.1 (2.6)	60	24.8	20.9	1.3	5.5
			80/67	14.8	13.2	19.3	1.7	8.9			70	24.0	19.7	1.4	5.0
			85/71	16.0	13.9	20.8	1.7	9.4			80	23.1	18.5	1.5	4.6
	4	2.4 (5.5)	75/63	14.2	12.8	18.5	1.6	9.0		2.6 (6.0)	60	26.9	23.1	1.4	5.8
			80/67	15.5	13.6	20.0	1.6	9.5			70	25.8	21.6	1.4	5.2
			85/71	16.9	14.3	21.6	1.7	10.2			80	24.9	20.3	1.5	4.8
	5	3.5 (8.2)	75/63	14.4	12.9	18.7	1.6	9.1		3.9 (8.9)	60	27.7	23.9	1.4	5.9
			80/67	15.8	13.6	20.2	1.6	9.8			70	26.6	22.3	1.5	5.3
			85/71	17.2	14.4	21.8	1.6	10.5			80	25.6	21.0	1.5	4.8

* Extended Range - Anti-freeze required

- ▶ AHRI/ISO13256-1 certified performance is rated at entering air conditions of 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating.
- ▶ Tabulated unit performance does not include fan or pump power corrections required for AHRI/ISO standard performance ratings.
- ▶ Unit performance may be interpolated. Extrapolation is not allowed.
- ▶ For conditions other than rating conditions provided, consult the FHP BST selection software.
- ▶ Ratings below 40°F are with a methanol solution.
- ▶ Due to variations in installation, actual performance may vary from the tabulated data. Performance contained herein are as a result of extensive testing by FHP and are not express warranties between the parties and may be changed at any time.
- ▶ Continuous research and development to improve our products may result in a change to the current design and specifications without notice.

Bosch Thermotechnology Corp.
Londonderry, NH • Ft. Lauderdale, FL

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



BOSCH

SV024 (850 CFM) Capacity Data

COOLING									HEATING						
Entering Fluid Temp (F)	Water Flow (GPM)	Pressure Drop PSI (FOH)	Entering Air Temp (db/ wb) F	Total Capacity (MBTUH)	Sensible Capacity (MBTUH)	Heat of Rejection (MBTUH)	Power Input (kW)	EER	Entering Fluid Temp (F)	Pressure Drop PSI (FOH)	Entering Air Temp (F)	Total Capacity (MBTUH)	Heat of Absorption (MBTUH)	Power Input (kW)	COP
50	3	1.8 (4.1)	75/63	25.8	19.2	29.9	1.4	18.8	30*	2.0 (4.7)	60	14.2	10.5	1.2	3.3
			80/67	27.8	19.9	32.0	1.4	20.1			70	13.2	9.5	1.3	3.0
			85/71	29.9	20.6	34.2	1.4	21.4			80	12.6	8.7	1.3	2.8
	4	3.0 (6.9)	75/63	26.6	19.5	30.5	1.3	20.3		3.4 (7.9)	60	14.8	11.0	1.3	3.4
			80/67	28.6	20.3	32.6	1.3	21.9			70	13.9	10.1	1.3	3.1
			85/71	30.8	21.1	34.9	1.3	23.6			80	13.1	9.1	1.3	2.9
	6	6.2 (14.3)	75/63	27.4	19.8	31.1	1.2	22.2		7.1 (16.4)	60	15.6	11.7	1.3	3.5
			80/67	29.6	20.7	33.3	1.2	24.2			70	14.7	10.7	1.3	3.2
			85/71	31.9	21.5	35.6	1.2	26.4			80	13.7	9.7	1.4	2.9
60	3	1.7 (4.0)	75/63	24.5	18.5	28.9	1.5	16.4	40*	2.0 (4.5)	60	16.6	12.7	1.3	3.7
			80/67	26.3	19.4	30.8	1.5	17.5			70	15.9	11.8	1.4	3.4
			85/71	28.3	20.1	32.9	1.5	18.6			80	15.1	10.8	1.4	3.1
	4	2.9 (6.7)	75/63	25.2	18.8	29.4	1.4	17.6		3.3 (7.6)	60	17.4	13.4	1.4	3.8
			80/67	27.1	19.7	31.5	1.4	18.9			70	16.6	12.4	1.4	3.5
			85/71	29.2	20.5	33.7	1.4	20.3			80	15.8	11.4	1.5	3.2
	6	6.0 (13.9)	75/63	25.9	19.2	30.0	1.4	19.1		6.9 (15.8)	60	18.3	14.2	1.4	3.9
			80/67	28.0	20.1	32.2	1.4	20.7			70	17.4	13.2	1.4	3.6
			85/71	30.3	20.9	34.4	1.4	22.3			80	16.6	12.1	1.5	3.3
70	3	1.7 (3.8)	75/63	23.0	17.9	27.7	1.6	14.4	50	1.8 (4.1)	60	19.9	15.7	1.4	4.1
			80/67	24.8	18.7	29.7	1.6	15.3			70	19.1	14.7	1.5	3.8
			85/71	26.7	19.5	31.6	1.7	16.1			80	18.4	13.7	1.6	3.5
	4	2.8 (6.5)	75/63	23.7	18.2	28.3	1.5	15.3		3.0 (6.9)	60	20.8	16.6	1.5	4.2
			80/67	25.6	19.1	30.3	1.6	16.4			70	20.0	15.5	1.5	3.9
			85/71	27.6	19.8	32.4	1.6	17.5			80	19.2	14.4	1.6	3.6
	6	5.8 (13.4)	75/63	24.4	18.6	28.9	1.5	16.4		6.2 (14.3)	60	22.0	17.6	1.5	4.4
			80/67	26.5	19.4	30.9	1.5	17.7			70	21.1	16.4	1.6	4.0
			85/71	28.6	20.2	33.1	1.5	19.1			80	20.1	15.3	1.6	3.7
80	3	1.6 (3.7)	75/63	21.6	17.1	26.6	1.7	12.6	60	1.7 (4.0)	60	23.0	18.5	1.5	4.5
			80/67	23.3	18.1	28.4	1.7	13.3			70	22.2	17.6	1.6	4.1
			85/71	25.0	18.9	30.3	1.8	14.1			80	21.4	16.4	1.7	3.8
	4	2.7 (6.3)	75/63	22.2	17.6	27.0	1.7	13.3		2.9 (6.7)	60	24.2	19.6	1.5	4.6
			80/67	24.0	18.4	29.0	1.7	14.2			70	23.3	18.5	1.6	4.2
			85/71	26.0	19.0	31.1	1.7	15.1			80	22.4	17.4	1.7	3.9
	6	5.6 (13.0)	75/63	22.9	17.9	27.6	1.6	14.2		6.0 (13.9)	60	25.5	20.9	1.6	4.8
			80/67	24.8	18.7	29.6	1.6	15.2			70	24.6	19.6	1.7	4.4
			85/71	26.8	19.4	31.8	1.6	16.3			80	23.5	18.3	1.7	4.0
85	3	1.6 (3.7)	75/63	20.8	16.8	25.9	1.8	11.8	70	1.7 (3.8)	60	26.2	21.6	1.6	4.9
			80/67	22.4	17.7	27.7	1.8	12.5			70	25.4	20.4	1.7	4.5
			85/71	24.2	18.5	29.6	1.8	13.1			80	24.6	19.2	1.8	4.1
	4	2.7 (6.2)	75/63	21.4	17.2	26.4	1.7	12.5		2.8 (6.5)	60	27.6	22.9	1.6	5.0
			80/67	23.2	18.0	28.3	1.8	13.2			70	26.7	21.6	1.7	4.6
			85/71	25.0	18.8	30.3	1.8	14.1			80	25.7	20.4	1.8	4.2
	6	5.5 (12.8)	75/63	22.1	17.5	26.9	1.7	13.2		5.8 (13.4)	60	29.2	24.4	1.6	5.2
			80/67	24.0	18.3	29.0	1.7	14.1			70	28.2	22.9	1.7	4.7
			85/71	25.9	19.1	31.1	1.7	15.1			80	27.1	21.5	1.8	4.3
90	3	1.6 (3.6)	75/63	20.0	16.5	25.2	1.8	11.0	80	1.6 (3.7)	60	29.6	24.7	1.7	5.3
			80/67	21.6	17.4	27.0	1.9	11.6			70	28.7	23.4	1.8	4.8
			85/71	23.3	18.2	28.9	1.9	12.3			80	27.8	22.1	1.9	4.4
	4	2.6 (6.1)	75/63	20.6	16.8	25.7	1.8	11.6		2.7 (6.3)	60	31.2	26.2	1.7	5.4
			80/67	22.3	17.7	27.6	1.8	12.3			70	30.2	24.8	1.8	4.9
			85/71	24.1	18.4	29.6	1.8	13.1			80	29.1	23.3	1.9	4.5
	6	5.4 (12.6)	75/63	21.3	17.1	26.3	1.7	12.3		5.6 (13.0)	60	33.3	27.8	1.7	5.7
			80/67	23.1	18.0	28.2	1.8	13.1			70	31.9	26.4	1.8	5.1
			85/71	25.0	18.7	30.3	1.8	14.0			80	30.7	24.7	2.0	4.6
100	3	1.5 (3.5)	75/63	18.4	15.7	23.9	1.9	9.6	* Extended Range - Anti-freeze required	1.6 (3.7)	60	33.3	27.8	1.7	5.7
			80/67	19.9	16.6	25.6	2.0	10.1			70	31.9	26.4	1.8	5.1
			85/71	21.5	17.3	27.4	2.0	10.7			80	30.7	24.7	2.0	4.6
	4	2.5 (5.9)	75/63	18.9	16.1	24.3	1.9	10.1		2.7 (6.3)	60	31.2	26.2	1.7	5.4
			80/67	20.5	16.9	26.1	1.9	10.7			70	30.2	24.8	1.8	4.9
			85/71	22.3	17.6	28.1	2.0	11.3			80	29.1	23.3	1.9	4.5
	6	5.3 (12.2)	75/63	19.5	16.3	24.8	1.8	10.6		5.6 (13.0)	60	33.3	27.8	1.7	5.7
			80/67	21.3	17.1	26.8	1.9	11.3			70	31.9	26.4	1.8	5.1
			85/71	23.0	18.1	28.7	1.9	12.0			80	30.7	24.7	2.0	4.6
110	3	1.5 (3.4)	75/63	16.7	14.9	22.3	2.0	8.3	* Extended Range - Anti-freeze required	1.6 (3.7)	60	33.3	27.8	1.7	5.7
			80/67	18.2	15.7	24.1	2.1	8.8			70	31.9	26.4	1.8	5.1
			85/71	19.5	16.7	25.7	2.1	9.2			80	30.7	24.7	2.0	4.6
	4	2.5 (5.7)	75/63	17.2	15.2	22.8	2.0	8.7		2.7 (6.3)	60	31.2	26.2	1.7	5.4
			80/67	18.7	16.1	24.5	2.0	9.2			70	30.2	24.8	1.8	4.9
			85/71	20.2	17.0	26.3	2.1	9.7			80	29.1	23.3	1.9	4.5
	6	5.1 (11.8)	75/63	17.8	15.5	23.3	1.9	9.1		5.6 (13.0)	60	33.3	27.8	1.7	5.7
			80/67	19.4	16.4	25.1	2.0	9.7			70	31.9	26.4	1.8	5.1
			85/71	21.1	17.1	27.0	2.0	10.3			80	30.7	24.7	2.0	4.6

* Extended Range - Anti-freeze required

- ▶ AHRI/ISO13256-1 certified performance is rated at entering air conditions of 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating.
- ▶ Tabulated unit performance does not include fan or pump power corrections required for AHRI/ISO standard performance ratings.
- ▶ Unit performance may be interpolated. Extrapolation is not allowed.
- ▶ For conditions other than rating conditions provided, consult the FHP BST selection software.
- ▶ Ratings below 40°F are with a methanol solution.
- ▶ Due to variations in installation, actual performance may vary from the tabulated data. Performance contained herein are as a result of extensive testing by FHP and are not express warranties between the parties and may be changed at any time.
- ▶ Continuous research and development to improve our products may result in a change to the current design and specifications without notice.

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



BOSCH

SV030 (950 CFM) Capacity Data

COOLING									HEATING						
Entering Fluid Temp (F)	Water Flow (GPM)	Pressure Drop PSI (FOH)	Entering Air Temp (db/ wb) F	Total Capacity (MBTUH)	Sensible Capacity (MBTUH)	Heat of Rejection (MBTUH)	Power Input (kW)	EER	Entering Fluid Temp (F)	Pressure Drop PSI (FOH)	Entering Air Temp (F)	Total Capacity (MBTUH)	Heat of Absorption (MBTUH)	Power Input (kW)	COP
50	4	2.2 (5.0)	75/63	32.3	23.7	37.4	1.7	19.4	30*	2.5 (5.7)	60	18.0	13.5	1.5	3.4
			80/67	34.8	24.5	40.0	1.7	20.9			70	17.2	12.4	1.6	3.2
			85/71	37.4	25.4	42.6	1.7	22.6			80	16.4	11.3	1.7	2.9
	6	4.5 (10.3)	75/63	33.3	24.2	38.3	1.6	21.3		5.1 (11.8)	60	19.1	14.5	1.6	3.6
			80/67	36.0	25.2	40.9	1.6	23.2			70	18.2	13.3	1.6	3.3
			85/71	38.8	26.0	43.7	1.5	25.4			80	17.2	12.1	1.7	3.0
	8	7.5 (17.3)	75/63	33.9	24.4	38.7	1.5	22.3		8.6 (19.8)	60	20.0	15.1	1.6	3.7
			80/67	36.6	25.4	41.4	1.5	24.5			70	18.8	13.8	1.7	3.3
			85/71	39.5	26.3	44.2	1.5	27.0			80	17.7	12.6	1.7	3.0
60	4	2.1 (4.8)	75/63	30.6	22.9	36.1	1.8	16.9	40*	2.4 (5.5)	60	21.5	16.4	1.6	3.8
			80/67	32.9	24.0	38.5	1.8	18.1			70	20.6	15.2	1.7	3.5
			85/71	35.4	24.9	41.1	1.8	19.5			80	19.7	14.1	1.8	3.2
	6	4.3 (10.0)	75/63	31.6	23.4	36.9	1.7	18.4		4.9 (11.4)	60	22.9	17.6	1.7	4.0
			80/67	34.2	24.3	39.5	1.7	19.9			70	21.9	16.4	1.8	3.6
			85/71	36.8	25.2	42.2	1.7	21.7			80	20.9	15.1	1.8	3.3
	8	7.2 (16.7)	75/63	32.1	23.6	37.3	1.7	19.2		8.3 (19.1)	60	23.7	18.4	1.7	4.1
			80/67	34.7	24.6	40.0	1.7	20.9			70	22.7	17.0	1.8	3.7
			85/71	37.5	25.5	42.7	1.6	22.9			80	21.6	15.7	1.9	3.4
70	4	2.0 (4.6)	75/63	28.8	22.0	34.8	2.0	14.8	50	2.2 (5.0)	60	25.7	20.2	1.8	4.2
			80/67	31.1	23.2	37.1	2.0	15.8			70	24.6	18.9	1.9	3.9
			85/71	33.4	24.1	39.5	2.0	16.9			80	23.7	17.6	2.0	3.5
	6	4.2 (9.6)	75/63	29.7	22.6	35.4	1.9	15.9		4.5 (10.3)	60	27.4	21.7	1.8	4.4
			80/67	32.2	23.6	38.0	1.9	17.1			70	26.1	20.2	1.9	4.0
			85/71	34.7	24.6	40.5	1.9	18.5			80	25.0	18.7	2.0	3.6
	8	7.0 (16.2)	75/63	30.3	22.8	35.9	1.8	16.5		7.5 (17.3)	60	28.3	22.6	1.9	4.5
			80/67	32.7	23.9	38.4	1.8	17.9			70	27.1	21.1	1.9	4.1
			85/71	35.4	24.9	41.1	1.8	19.5			80	25.9	19.4	2.0	3.7
80	4	1.9 (4.5)	75/63	27.0	21.2	33.3	2.1	12.9	60	2.1 (4.8)	60	29.7	23.8	1.9	4.6
			80/67	29.1	22.4	35.5	2.1	13.7			70	28.6	22.5	2.0	4.2
			85/71	31.4	23.3	37.9	2.1	14.6			80	27.5	21.0	2.1	3.8
	6	4.0 (9.3)	75/63	27.8	21.8	33.9	2.0	13.7		4.3 (10.0)	60	31.7	25.6	1.9	4.8
			80/67	30.1	22.8	36.4	2.0	14.8			70	30.4	24.1	2.0	4.4
			85/71	32.6	23.8	38.9	2.1	15.9			80	29.3	22.5	2.1	4.0
	8	6.8 (15.6)	75/63	28.3	22.0	34.3	2.0	14.2		7.2 (16.7)	60	32.8	26.6	2.0	4.9
			80/67	30.7	23.0	36.8	2.0	15.4			70	31.5	25.0	2.1	4.5
			85/71	33.2	24.0	39.4	2.0	16.6			80	30.1	23.4	2.2	4.1
85	4	1.9 (4.5)	75/63	26.0	20.8	32.5	2.2	12.0	70	2.0 (4.6)	60	33.8	27.6	2.0	5.0
			80/67	28.1	21.9	34.7	2.2	12.8			70	32.7	26.1	2.1	4.6
			85/71	30.3	22.9	37.1	2.2	13.6			80	31.6	24.6	2.2	4.2
	6	4.0 (9.3)	75/63	26.8	21.3	33.1	2.1	12.8		4.2 (9.6)	60	36.1	29.7	2.0	5.2
			80/67	29.1	22.4	35.5	2.1	13.7			70	34.8	28.0	2.2	4.7
			85/71	31.5	23.3	38.0	2.1	14.7			80	33.5	26.3	2.3	4.3
	8	6.7 (15.4)	75/63	27.3	21.5	33.5	2.1	13.2		7.0 (16.2)	60	37.4	30.9	2.0	5.4
			80/67	29.6	22.6	35.9	2.1	14.2			70	36.0	29.1	2.2	4.8
			85/71	32.1	23.3	38.6	2.1	15.3			80	34.7	27.3	2.3	4.4
90	4	1.9 (4.4)	75/63	25.0	20.3	31.7	2.2	11.2	80	1.9 (4.5)	60	38.0	31.5	2.1	5.4
			80/67	27.1	21.5	33.9	2.3	11.9			70	36.8	29.9	2.2	4.9
			85/71	29.3	22.2	36.3	2.3	12.7			80	35.6	28.2	2.3	4.5
	6	3.9 (9.0)	75/63	25.8	20.9	32.3	2.2	11.9		4.0 (9.3)	60	40.6	33.9	2.1	5.7
			80/67	28.1	21.8	34.7	2.2	12.8			70	39.2	32.1	2.2	5.1
			85/71	30.4	22.8	37.2	2.2	13.6			80	37.9	30.2	2.4	4.6
	8	6.6 (15.2)	75/63	26.3	21.1	32.7	2.1	12.3		6.8 (15.6)	60	42.0	35.3	2.1	5.8
			80/67	28.6	21.9	35.2	2.2	13.2			70	40.6	33.3	2.3	5.2
			85/71	30.9	23.0	37.6	2.2	14.2			80	39.2	31.2	2.4	4.7
100	4	1.8 (4.2)	75/63	23.1	19.5	30.1	2.4	9.8	Extended Range - Anti-freeze required	2.1 (4.8)	60	39.2	31.2	2.4	4.7
			80/67	25.0	20.4	32.3	2.4	10.4			70	38.0	30.0	2.4	4.4
			85/71	27.0	21.6	34.4	2.5	11.0			80	36.8	28.8	2.5	4.0
	6	3.8 (8.8)	75/63	23.8	19.8	30.7	2.3	10.3		4.3 (10.0)	60	40.6	33.9	2.1	5.7
			80/67	25.9	20.8	33.0	2.4	11.0			70	39.2	32.1	2.2	5.1
			85/71	28.0	22.0	35.2	2.4	11.7			80	37.9	30.2	2.4	4.6
	8	6.4 (14.7)	75/63	24.2	19.9	31.0	2.3	10.6		7.0 (16.2)	60	42.0	35.3	2.1	5.8
			80/67	26.3	21.0	33.4	2.3	11.3			70	40.6	33.3	2.3	5.2
			85/71	28.6	22.0	35.8	2.4	12.1			80	39.2	31.2	2.4	4.7
110	4	1.8 (4.1)	75/63	21.2	18.5	28.5	2.5	8.5	Extended Range - Anti-freeze required	2.1 (4.8)	60	39.2	31.2	2.4	4.7
			80/67	23.0	19.5	30.6	2.6	9.0			70	38.0	30.0	2.4	4.4
			85/71	24.8	20.5	32.7	2.6	9.5			80	36.8	28.8	2.5	4.0
	6	3.7 (8.5)	75/63	21.8	18.9	29.0	2.4	8.9		4.3 (10.0)	60	40.6	33.9	2.1	5.7
			80/67	23.7	19.9	31.1	2.5	9.5			70	39.2	32.1	2.2	5.1
			85/71	25.7	20.8	33.4	2.6	10.0			80	37.9	30.2	2.4	4.6
	8	6.2 (14.3)	75/63	22.1	19.1	29.2	2.4	9.1		7.0 (16.2)	60	42.0	35.3	2.1	5.8
			80/67	24.1	20.0	31.5	2.5	9.7			70	40.6	33.3	2.3	5.2
			85/71	26.1	21.2	33.7	2.5	10.3			80	39.2	31.2	2.4	4.7

* Extended Range - Anti-freeze required

- ▶ AHRI/ISO13256-1 certified performance is rated at entering air conditions of 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating.
- ▶ Tabulated unit performance does not include fan or pump power corrections required for AHRI/ISO standard performance ratings.
- ▶ Unit performance may be interpolated. Extrapolation is not allowed.
- ▶ For conditions other than rating conditions provided, consult the FHP BST selection software.
- ▶ Ratings below 40°F are with a methanol solution.
- ▶ Due to variations in installation, actual performance may vary from the tabulated data. Performance contained herein are as a result of extensive testing by FHP and are not express warranties between the parties and may be changed at any time.
- ▶ Continuous research and development to improve our products may result in a change to the current design and specifications without notice.

Bosch Thermotechnology Corp.
Londonderry, NH • Ft. Lauderdale, FL

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



BOSCH

SV036 (1200 CFM) Capacity Data

COOLING									HEATING						
Entering Fluid Temp (F)	Water Flow (GPM)	Pressure Drop PSI (FOH)	Entering Air Temp (db/ wb) F	Total Capacity (MBTUH)	Sensible Capacity (MBTUH)	Heat of Rejection (MBTUH)	Power Input (kW)	EER	Entering Fluid Temp (F)	Pressure Drop PSI (FOH)	Entering Air Temp (F)	Total Capacity (MBTUH)	Heat of Absorption (MBTUH)	Power Input (kW)	COP
50	4.5	1.7 (3.8)	75/63	40.3	29.9	46.8	2.0	19.7	30*	1.9 (4.4)	60	22.6	16.9	1.8	3.6
			80/67	43.3	31.0	49.8	2.1	21.1			70	21.6	15.6	1.9	3.3
			85/71	46.4	32.1	53.0	2.1	22.6			80	20.6	14.4	2.0	3.1
	6	2.8 (6.4)	75/63	41.4	30.3	47.6	2.0	21.2		3.2 (7.4)	60	23.6	17.8	1.9	3.7
			80/67	44.6	31.4	50.9	2.0	22.8			70	22.5	16.4	1.9	3.4
			85/71	47.9	32.5	54.2	1.9	24.6			80	21.5	15.1	2.0	3.1
	9	5.8 (13.3)	75/63	42.6	30.8	48.6	1.9	22.8		6.6 (15.3)	60	24.8	18.7	1.9	3.8
			80/67	46.0	31.9	51.9	1.9	24.8			70	23.5	17.2	2.0	3.5
			85/71	49.4	33.0	55.3	1.8	26.9			80	22.4	16.0	2.1	3.2
60	4.5	1.6 (3.7)	75/63	38.4	28.9	45.3	2.2	17.4	40*	1.8 (4.2)	60	26.4	20.3	2.0	4.0
			80/67	41.1	30.2	48.2	2.2	18.5			70	25.4	18.9	2.1	3.6
			85/71	44.1	31.2	51.2	2.2	19.7			80	24.5	17.6	2.1	3.3
	6	2.7 (6.2)	75/63	39.3	29.5	46.0	2.1	18.5		3.1 (7.1)	60	27.7	21.4	2.0	4.1
			80/67	42.4	30.7	49.1	2.1	19.9			70	26.5	20.0	2.1	3.7
			85/71	45.5	31.7	52.3	2.1	21.4			80	25.6	18.6	2.2	3.4
	9	5.6 (12.9)	75/63	40.5	29.8	46.9	2.0	19.9		6.4 (14.7)	60	29.6	23.2	2.1	4.2
			80/67	43.7	31.0	50.2	2.0	21.5			70	27.9	21.2	2.1	3.8
			85/71	47.0	32.2	53.4	2.0	23.3			80	26.9	19.7	2.2	3.5
70	4.5	1.6 (3.6)	75/63	36.1	28.1	43.5	2.4	15.2	50	1.7 (3.8)	60	31.7	25.0	2.1	4.4
			80/67	39.0	29.1	46.5	2.4	16.2			70	30.6	23.5	2.2	4.0
			85/71	41.8	30.3	49.4	2.4	17.2			80	29.5	22.0	2.3	3.7
	6	2.6 (6.0)	75/63	37.1	28.5	44.3	2.3	16.2		2.8 (6.4)	60	33.2	26.4	2.2	4.5
			80/67	40.1	29.7	47.3	2.3	17.3			70	32.1	24.8	2.3	4.1
			85/71	43.0	30.8	50.4	2.3	18.5			80	30.8	23.1	2.4	3.8
	9	5.4 (12.5)	75/63	38.2	29.0	45.1	2.2	17.2		5.8 (13.3)	60	35.0	28.1	2.2	4.7
			80/67	41.3	30.1	48.3	2.2	18.6			70	33.7	26.3	2.3	4.3
			85/71	44.4	31.3	51.5	2.2	20.1			80	32.3	24.5	2.4	3.9
80	4.5	1.5 (3.5)	75/63	33.9	27.2	41.7	2.5	13.3	60	1.6 (3.7)	60	36.4	29.3	2.2	4.8
			80/67	36.5	28.4	44.6	2.6	14.1			70	35.2	27.7	2.4	4.4
			85/71	39.3	29.5	47.4	2.6	15.0			80	34.1	26.1	2.5	4.0
	6	2.5 (5.8)	75/63	34.9	27.5	42.5	2.5	14.1		2.7 (6.2)	60	38.2	31.0	2.3	4.9
			80/67	37.7	28.6	45.5	2.5	15.1			70	37.0	29.3	2.4	4.5
			85/71	40.6	29.7	48.5	2.5	16.1			80	35.7	27.5	2.5	4.1
	9	5.2 (12.1)	75/63	35.9	27.9	43.3	2.4	15.0		5.6 (12.9)	60	40.3	33.0	2.3	5.1
			80/67	38.9	29.0	46.4	2.4	16.1			70	38.9	31.1	2.5	4.6
			85/71	41.9	30.2	49.5	2.4	17.3			80	37.5	29.1	2.6	4.2
85	4.5	1.5 (3.4)	75/63	32.8	26.6	40.9	2.6	12.5	70	1.6 (3.6)	60	41.3	33.9	2.3	5.2
			80/67	35.3	27.9	43.6	2.7	13.2			70	40.1	32.1	2.5	4.7
			85/71	38.0	29.1	46.4	2.7	14.0			80	38.8	30.3	2.6	4.3
	6	2.5 (5.7)	75/63	33.7	27.0	41.6	2.6	13.2		2.6 (6.0)	60	43.4	35.9	2.4	5.3
			80/67	36.4	28.3	44.5	2.6	14.0			70	42.1	34.0	2.5	4.9
			85/71	39.2	29.4	47.4	2.6	15.0			80	40.7	32.0	2.7	4.4
	9	5.1 (11.9)	75/63	34.7	27.3	42.4	2.5	13.9		5.4 (12.5)	60	45.9	38.2	2.4	5.5
			80/67	37.6	28.5	45.4	2.5	15.0			70	44.4	36.1	2.6	5.0
			85/71	40.5	29.9	48.4	2.5	16.0			80	42.8	33.9	2.7	4.6
90	4.5	1.5 (3.4)	75/63	31.6	26.2	39.9	2.7	11.7	80	1.5 (3.5)	60	46.3	38.6	2.4	5.6
			80/67	34.2	27.2	42.7	2.8	12.4			70	45.0	36.7	2.6	5.1
			85/71	36.7	28.5	45.4	2.8	13.1			80	43.7	34.7	2.8	4.6
	6	2.4 (5.6)	75/63	32.5	26.6	40.7	2.7	12.3		2.5 (5.8)	60	48.8	40.9	2.5	5.8
			80/67	35.2	27.6	43.5	2.7	13.1			70	47.3	38.8	2.6	5.2
			85/71	37.9	28.8	46.4	2.7	13.9			80	45.8	36.7	2.8	4.8
	9	5.1 (11.7)	75/63	33.5	26.8	41.5	2.6	13.0		5.2 (12.1)	60	51.6	43.7	2.5	6.0
			80/67	36.2	28.2	44.3	2.6	13.9			70	49.9	41.3	2.7	5.4
			85/71	39.0	29.4	47.3	2.6	14.9			80	48.2	38.9	2.9	4.9
100	4.5	1.4 (3.3)	75/63	29.3	25.0	38.1	2.9	10.2	Extended Range - Anti-freeze required	1.5 (3.5)	60	46.3	38.6	2.4	5.6
			80/67	31.6	26.5	40.6	2.9	10.8			70	45.0	36.7	2.6	5.1
			85/71	34.0	27.7	43.3	3.0	11.4			80	43.7	34.7	2.8	4.6
	6	2.4 (5.5)	75/63	30.1	25.5	38.7	2.8	10.7		2.5 (5.8)	60	48.8	40.9	2.5	5.8
			80/67	32.6	26.8	41.4	2.9	11.3			70	47.3	38.8	2.6	5.2
			85/71	35.1	28.0	44.1	2.9	12.0			80	45.8	36.7	2.8	4.8
	9	4.9 (11.4)	75/63	30.9	25.9	39.4	2.8	11.2		5.2 (12.1)	60	51.6	43.7	2.5	6.0
			80/67	33.6	27.0	42.3	2.8	12.0			70	49.9	41.3	2.7	5.4
			85/71	36.2	28.4	45.0	2.8	12.8			80	48.2	38.9	2.9	4.9
110	4.5	1.4 (3.2)	75/63	26.9	24.0	36.1	3.0	8.9	Extended Range - Anti-freeze required	1.5 (3.5)	60	46.3	38.6	2.4	5.6
			80/67	29.0	25.4	38.5	3.1	9.3			70	45.0	36.7	2.6	5.1
			85/71	31.2	26.9	40.9	3.2	9.8			80	43.7	34.7	2.8	4.6
	6	2.3 (5.3)	75/63	27.6	24.5	36.6	3.0	9.2		2.5 (5.8)	60	48.8	40.9	2.5	5.8
			80/67	29.9	25.8	39.2	3.1	9.8			70	47.3	38.8	2.6	5.2
			85/71	32.2	27.1	41.8	3.1	10.4			80	45.8	36.7	2.8	4.8
	9	4.8 (11.0)	75/63	28.3	24.8	37.3	2.9	9.6		5.2 (12.1)	60	51.6	43.7	2.5	6.0
			80/67	30.9	25.9	40.0	3.0	10.3			70	49.9	41.3	2.7	5.4
			85/71	33.3	27.4	42.7	3.0	11.0			80	48.2	38.9	2.9	4.9

* Extended Range - Anti-freeze required

- ▶ AHRI/ISO13256-1 certified performance is rated at entering air conditions of 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating.
- ▶ Tabulated unit performance does not include fan or pump power corrections required for AHRI/ISO standard performance ratings.
- ▶ Unit performance may be interpolated. Extrapolation is not allowed.
- ▶ For conditions other than rating conditions provided, consult the FHP BST selection software.
- ▶ Ratings below 40°F are with a methanol solution.
- ▶ Due to variations in installation, actual performance may vary from the tabulated data. Performance contained herein are as a result of extensive testing by FHP and are not express warranties between the parties and may be changed at any time.
- ▶ Continuous research and development to improve our products may result in a change to the current design and specifications without notice.

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



BOSCH

SV042 (1400 CFM) Capacity Data

COOLING									HEATING						
Entering Fluid Temp (F)	Water Flow (GPM)	Pressure Drop PSI (FOH)	Entering Air Temp (db/ wb) F	Total Capacity (MBTUH)	Sensible Capacity (MBTUH)	Heat of Rejection (MBTUH)	Power Input (kW)	EER	Entering Fluid Temp (F)	Pressure Drop PSI (FOH)	Entering Air Temp (F)	Total Capacity (MBTUH)	Heat of Absorption (MBTUH)	Power Input (kW)	COP
50	5	2.1 (4.9)	75/63	44.0	33.2	51.5	2.4	18.6	30*	2.4 (5.6)	60	25.2	18.0	2.3	3.3
			80/67	47.4	34.5	55.0	2.4	20.0			70	24.4	17.0	2.3	3.1
			85/71	50.9	35.6	58.6	2.4	21.4			80	23.5	15.8	2.4	2.9
	8	4.9 (11.4)	75/63	45.8	34.0	52.8	2.2	21.0		5.6 (13.0)	60	26.9	19.8	2.3	3.4
			80/67	49.5	35.2	56.5	2.2	22.9			70	25.9	18.5	2.4	3.2
			85/71	53.3	36.4	60.3	2.1	24.9			80	25.0	17.1	2.5	3.0
	11	8.8 (20.2)	75/63	46.7	34.3	53.4	2.1	22.3		10.0 (23.1)	60	28.1	20.6	2.3	3.5
			80/67	50.5	35.6	57.3	2.1	24.5			70	26.9	19.4	2.4	3.3
			85/71	54.5	36.8	61.2	2.0	26.9			80	25.9	17.8	2.5	3.0
60	5	2.0 (4.7)	75/63	41.7	32.2	49.9	2.6	16.3	40*	2.3 (5.4)	60	29.5	22.2	2.4	3.7
			80/67	45.0	33.4	53.3	2.6	17.4			70	28.9	20.9	2.5	3.4
			85/71	48.4	34.6	56.8	2.6	18.5			80	27.9	19.6	2.6	3.2
	8	4.8 (11.0)	75/63	43.6	32.8	51.2	2.4	18.1		5.5 (12.6)	60	32.0	24.2	2.4	3.9
			80/67	47.1	34.1	54.8	2.4	19.6			70	30.9	22.8	2.5	3.6
			85/71	50.7	35.4	58.5	2.4	21.2			80	29.9	21.3	2.6	3.3
	11	8.5 (19.6)	75/63	44.4	33.2	51.9	2.3	19.1		9.7 (22.3)	60	33.3	25.4	2.5	4.0
			80/67	48.1	34.5	55.5	2.3	20.8			70	32.1	23.8	2.6	3.7
			85/71	51.8	35.8	59.3	2.3	22.6			80	31.0	22.3	2.7	3.4
70	5	2.0 (4.6)	75/63	39.5	31.1	48.2	2.8	14.2	50	2.1 (4.9)	60	35.4	27.5	2.5	4.1
			80/67	42.6	32.3	51.5	2.8	15.1			70	34.4	26.0	2.6	3.8
			85/71	45.7	33.6	54.8	2.9	16.0			80	33.5	24.5	2.8	3.5
	8	4.6 (10.7)	75/63	41.2	31.8	49.5	2.6	15.7		4.9 (11.4)	60	38.2	30.0	2.6	4.4
			80/67	44.4	33.3	52.9	2.6	16.8			70	37.1	28.3	2.7	4.0
			85/71	47.9	34.4	56.5	2.7	18.1			80	35.8	26.8	2.8	3.7
	11	8.2 (18.9)	75/63	42.0	32.0	50.1	2.6	16.4		8.8 (20.2)	60	39.7	31.3	2.6	4.5
			80/67	45.4	33.5	53.6	2.6	17.7			70	38.4	29.5	2.7	4.1
			85/71	48.9	35.0	57.2	2.6	19.2			80	37.0	27.9	2.9	3.8
80	5	1.9 (4.4)	75/63	37.0	30.1	46.4	3.0	12.4	60	2.0 (4.7)	60	40.9	32.5	2.6	4.6
			80/67	40.0	31.3	49.6	3.0	13.2			70	39.8	30.9	2.8	4.2
			85/71	42.8	32.9	52.6	3.1	13.9			80	38.4	29.1	2.9	3.8
	8	4.5 (10.3)	75/63	38.6	30.8	47.6	2.9	13.5		4.8 (11.0)	60	44.1	35.5	2.7	4.8
			80/67	41.8	32.1	50.9	2.9	14.5			70	42.8	33.5	2.9	4.4
			85/71	45.1	33.3	54.3	2.9	15.5			80	41.4	31.5	3.0	4.0
	11	7.9 (18.3)	75/63	39.4	31.0	48.2	2.8	14.1		8.5 (19.6)	60	45.8	37.1	2.7	4.9
			80/67	42.6	32.6	51.5	2.8	15.2			70	44.3	35.0	2.9	4.5
			85/71	46.1	33.7	55.1	2.8	16.3			80	42.8	32.8	3.1	4.1
85	5	1.9 (4.4)	75/63	35.8	29.5	45.5	3.1	11.6	70	2.0 (4.6)	60	46.4	37.6	2.7	5.0
			80/67	38.6	31.0	48.5	3.1	12.3			70	45.2	35.7	2.9	4.5
			85/71	41.4	32.3	51.5	3.2	13.0			80	43.9	33.8	3.1	4.2
	8	4.4 (10.2)	75/63	37.3	30.2	46.6	3.0	12.6		4.6 (10.7)	60	50.2	41.1	2.8	5.2
			80/67	40.4	31.7	49.8	3.0	13.5			70	48.7	38.9	3.0	4.8
			85/71	43.5	33.0	53.1	3.0	14.4			80	47.0	36.7	3.2	4.3
	11	7.8 (18.0)	75/63	38.0	30.5	47.1	2.9	13.1		8.2 (18.9)	60	52.2	43.0	2.8	5.4
			80/67	41.2	32.0	50.5	2.9	14.1			70	50.5	40.6	3.0	4.9
			85/71	44.5	33.2	53.9	3.0	15.1			80	48.8	38.2	3.2	4.4
90	5	1.9 (4.3)	75/63	34.5	29.1	44.5	3.2	10.8	80	1.9 (4.4)	60	52.2	42.9	2.8	5.4
			80/67	37.3	30.5	47.4	3.2	11.5			70	50.9	40.8	3.1	4.9
			85/71	40.0	31.9	50.4	3.3	12.1			80	49.4	38.7	3.3	4.4
	8	4.3 (10.0)	75/63	36.0	29.7	45.6	3.1	11.7		4.5 (10.3)	60	56.5	47.0	2.9	5.7
			80/67	39.0	31.0	48.8	3.1	12.5			70	54.7	44.5	3.1	5.1
			85/71	42.0	32.5	51.9	3.2	13.3			80	53.1	42.0	3.4	4.6
	11	7.7 (17.7)	75/63	36.7	30.0	46.1	3.0	12.2		7.9 (18.3)	60	58.8	49.1	3.0	5.8
			80/67	39.8	31.3	49.4	3.0	13.1			70	56.8	46.5	3.2	5.2
			85/71	42.9	32.9	52.7	3.1	14.0			80	54.9	43.7	3.4	4.7
100	5	1.8 (4.2)	75/63	31.9	28.0	42.4	3.4	9.4	* Extended Range - Anti-freeze required						
			80/67	34.5	29.4	45.3	3.5	10.0							
			85/71	37.1	30.7	48.1	3.5	10.5							
	8	4.2 (9.7)	75/63	33.3	28.6	43.5	3.3	10.2							
			80/67	36.1	29.9	46.6	3.3	10.8							
			85/71	38.9	31.4	49.5	3.4	11.5							
	11	7.5 (17.2)	75/63	34.0	28.7	44.1	3.2	10.5							
			80/67	36.9	30.2	47.2	3.3	11.2							
			85/71	39.7	31.7	50.2	3.3	11.9							
110	5	1.8 (4.0)	75/63	29.3	26.7	40.3	3.6	8.2	- AHRI/ISO13256-1 certified performance is rated at entering air conditions of 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating. - Tabulated unit performance does not include fan or pump power corrections required for AHRI/ISO standard performance ratings. - Unit performance may be interpolated. Extrapolation is not allowed. - For conditions other than rating conditions provided, consult the FHP BST selection software. - Ratings below 40°F are with a methanol solution. - Due to variations in installation, actual performance may vary from the tabulated data. Performance contained herein are as a result of extensive testing by FHP and are not express warranties between the parties and may be changed at any time. - Continuous research and development to improve our products may result in a change to the current design and specifications without notice.						
			80/67	31.5	28.4	42.8	3.7	8.6							
			85/71	33.9	29.8	45.6	3.7	9.1							
	8	4.1 (9.4)	75/63	30.5	27.4	41.3	3.5	8.8							
			80/67	33.0	29.0	44.0	3.6	9.3							
			85/71	35.6	30.4	47.0	3.6	9.8							
	11	7.2 (16.7)	75/63	31.1	27.5	41.8	3.4	9.0							
			80/67	33.8	28.9	44.7	3.5	9.6							
			85/71	36.4	30.6	47.6	3.6	10.2							

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



BOSCH

SV048 (1600 CFM) Capacity Data

COOLING									HEATING						
Entering Fluid Temp (F)	Water Flow (GPM)	Pressure Drop PSI (FOH)	Entering Air Temp (db/ wb) F	Total Capacity (MBTUH)	Sensible Capacity (MBTUH)	Heat of Rejection (MBTUH)	Power Input (kW)	EER	Entering Fluid Temp (F)	Pressure Drop PSI (FOH)	Entering Air Temp (F)	Total Capacity (MBTUH)	Heat of Absorption (MBTUH)	Power Input (kW)	COP
50	6	0.9 (2.0)	75/63	51.3	37.7	60.3	2.8	18.3	30*	1.0 (2.3)	60	33.2	25.2	2.5	3.9
			80/67	54.7	39.1	63.9	2.8	19.4			70	30.9	22.3	2.6	3.5
			85/71	58.3	40.3	67.6	2.8	20.6			80	28.6	19.6	2.7	3.1
	8	1.4 (3.3)	75/63	52.9	38.4	61.5	2.7	19.9		1.7 (3.8)	60	34.4	26.2	2.6	3.9
			80/67	56.5	39.7	65.2	2.7	21.2			70	32.0	23.3	2.7	3.5
			85/71	60.3	40.8	69.1	2.7	22.6			80	29.7	20.6	2.8	3.1
	12	3.0 (6.9)	75/63	54.7	39.1	62.9	2.5	21.7		3.4 (7.9)	60	35.9	27.5	2.6	4.0
			80/67	58.4	40.4	66.6	2.5	23.4			70	33.4	24.7	2.8	3.6
			85/71	62.4	41.5	70.6	2.5	25.2			80	30.9	21.9	2.9	3.2
60	6	0.8 (1.9)	75/63	48.6	36.2	58.3	3.0	16.0	40*	1.0 (2.2)	60	37.0	28.4	2.7	4.0
			80/67	51.9	37.9	61.7	3.1	16.9			70	35.1	25.8	2.8	3.6
			85/71	55.4	39.2	65.4	3.1	17.9			80	33.1	23.4	2.9	3.3
	8	1.4 (3.2)	75/63	50.0	37.2	59.3	2.9	17.2		1.6 (3.7)	60	38.6	29.9	2.8	4.1
			80/67	53.5	38.6	63.0	2.9	18.3			70	36.7	27.2	2.9	3.7
			85/71	57.2	39.9	66.7	2.9	19.5			80	34.6	24.7	3.0	3.4
	12	2.9 (6.7)	75/63	51.6	37.9	60.5	2.8	18.6		3.3 (7.7)	60	40.6	31.6	2.8	4.2
			80/67	55.3	39.3	64.3	2.8	19.9			70	38.6	28.8	3.0	3.8
			85/71	59.2	40.4	68.2	2.8	21.4			80	36.4	26.2	3.1	3.5
70	6	0.8 (1.9)	75/63	45.7	35.1	56.1	3.3	14.0	50	0.9 (2.0)	60	43.1	33.5	2.9	4.3
			80/67	48.9	36.7	59.5	3.3	14.8			70	41.1	31.3	3.1	3.9
			85/71	52.5	37.7	63.3	3.3	15.7			80	39.2	28.7	3.2	3.6
	8	1.4 (3.1)	75/63	47.0	35.9	57.1	3.1	14.9		1.4 (3.3)	60	45.1	35.4	3.0	4.4
			80/67	50.4	37.3	60.7	3.2	15.9			70	43.1	32.8	3.1	4.0
			85/71	54.1	38.5	64.5	3.2	16.9			80	40.9	30.2	3.3	3.7
	12	2.8 (6.5)	75/63	48.5	36.5	58.2	3.0	16.0		3.0 (6.9)	60	47.4	37.4	3.1	4.5
			80/67	52.1	38.0	61.9	3.0	17.1			70	45.2	34.9	3.2	4.1
			85/71	55.9	39.1	65.8	3.1	18.3			80	43.1	32.0	3.4	3.8
80	6	0.8 (1.8)	75/63	42.8	33.7	53.8	3.5	12.3	60	0.8 (1.9)	60	48.6	38.6	3.1	4.6
			80/67	45.9	35.4	57.2	3.5	13.0			70	46.7	36.3	3.3	4.2
			85/71	49.1	37.0	60.7	3.6	13.7			80	45.2	33.8	3.4	3.8
	8	1.3 (3.0)	75/63	43.9	34.6	54.7	3.4	13.0		1.4 (3.2)	60	51.0	40.7	3.2	4.7
			80/67	47.4	35.9	58.3	3.4	13.8			70	49.1	38.1	3.3	4.3
			85/71	50.9	37.1	62.1	3.5	14.7			80	47.3	35.6	3.5	3.9
	12	2.7 (6.3)	75/63	45.3	35.0	55.8	3.3	13.8		2.9 (6.7)	60	53.8	43.2	3.2	4.9
			80/67	48.9	36.4	59.5	3.3	14.8			70	51.7	40.4	3.4	4.4
			85/71	52.6	37.7	63.3	3.3	15.8			80	49.7	37.8	3.6	4.0
85	6	0.8 (1.8)	75/63	41.2	33.2	52.5	3.6	11.5	70	0.8 (1.9)	60	54.5	44.0	3.3	4.9
			80/67	44.4	34.6	56.1	3.7	12.1			70	53.0	41.5	3.5	4.5
			85/71	47.7	36.0	59.6	3.7	12.8			80	51.1	39.2	3.7	4.1
	8	1.3 (3.0)	75/63	42.4	33.7	53.5	3.5	12.1		1.4 (3.1)	60	57.3	46.5	3.3	5.0
			80/67	45.8	35.1	57.2	3.6	12.9			70	55.5	43.9	3.5	4.6
			85/71	49.2	36.5	60.8	3.6	13.7			80	53.8	41.3	3.7	4.2
	12	2.7 (6.2)	75/63	43.7	34.2	54.6	3.4	12.9		2.8 (6.5)	60	60.6	49.4	3.4	5.2
			80/67	47.3	35.6	58.3	3.4	13.7			70	58.5	46.6	3.6	4.7
			85/71	50.8	37.1	62.0	3.5	14.6			80	56.5	43.8	3.8	4.3
90	6	0.8 (1.7)	75/63	39.6	32.6	51.3	3.7	10.7	80	0.8 (1.8)	60	60.7	49.8	3.4	5.2
			80/67	42.8	34.0	54.8	3.8	11.4			70	59.0	47.3	3.6	4.7
			85/71	46.0	35.6	58.3	3.8	12.0			80	57.5	44.7	3.9	4.4
	8	1.3 (2.9)	75/63	40.8	33.1	52.3	3.6	11.3		1.3 (3.0)	60	64.0	52.7	3.5	5.4
			80/67	44.1	34.6	55.8	3.7	12.0			70	61.9	49.9	3.7	4.9
			85/71	47.5	36.1	59.4	3.7	12.7			80	60.4	47.2	4.0	4.5
	12	2.6 (6.1)	75/63	42.1	33.5	53.3	3.5	11.9		2.7 (6.3)	60	67.8	56.0	3.6	5.6
			80/67	45.5	35.0	57.0	3.6	12.7			70	65.7	53.1	3.8	5.1
			85/71	49.0	36.7	60.6	3.6	13.6			80	63.6	50.1	4.0	4.6
100	6	0.7 (1.7)	75/63	36.5	31.5	48.8	3.9	9.3	Extended Range - Anti-freeze required						
			80/67	39.5	33.1	52.1	4.0	9.9							
			85/71	42.5	34.7	55.5	4.1	10.4							
	8	1.3 (2.9)	75/63	37.6	31.6	49.7	3.8	9.8							
			80/67	40.8	33.4	53.2	3.9	10.4							
			85/71	44.1	34.7	56.8	4.0	11.0							
	12	2.6 (5.9)	75/63	38.7	32.1	50.6	3.8	10.3							
			80/67	42.0	33.9	54.2	3.8	11.0							
			85/71	45.4	35.4	57.8	3.9	11.7							
110	6	0.7 (1.6)	75/63	33.6	30.0	46.6	4.1	8.2	Continuous research and development to improve our products may result in a change to the current design and specifications without notice.						
			80/67	36.5	31.6	49.8	4.2	8.6							
			85/71	39.2	33.4	53.0	4.3	9.1							
	8	1.2 (2.8)	75/63	34.5	30.4	47.3	4.1	8.5							
			80/67	37.4	32.3	50.5	4.2	9.0							
			85/71	40.5	33.5	54.0	4.3	9.5							
	12	2.5 (5.7)	75/63	35.4	30.8	48.0	4.0	8.9							
			80/67	38.4	32.6	51.3	4.1	9.4							
			85/71	41.8	33.8	55.0	4.2	10.0							

* Extended Range - Anti-freeze required

- ▶ AHRI/ISO13256-1 certified performance is rated at entering air conditions of 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating.
- ▶ Tabulated unit performance does not include fan or pump power corrections required for AHRI/ISO standard performance ratings.
- ▶ Unit performance may be interpolated. Extrapolation is not allowed.
- ▶ For conditions other than rating conditions provided, consult the FHP BST selection software.
- ▶ Ratings below 40°F are with a methanol solution.
- ▶ Due to variations in installation, actual performance may vary from the tabulated data. Performance contained herein are as a result of extensive testing by FHP and are not express warranties between the parties and may be changed at any time.
- ▶ Continuous research and development to improve our products may result in a change to the current design and specifications without notice.

Bosch Thermotechnology Corp.
Londonderry, NH • Ft. Lauderdale, FL

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



BOSCH

SV060 (2000 CFM) Capacity Data

COOLING									HEATING						
Entering Fluid Temp (F)	Water Flow (GPM)	Pressure Drop PSI (FOH)	Entering Air Temp (db/ wb) F	Total Capacity (MBTUH)	Sensible Capacity (MBTUH)	Heat of Rejection (MBTUH)	Power Input (kW)	EER	Entering Fluid Temp (F)	Pressure Drop PSI (FOH)	Entering Air Temp (F)	Total Capacity (MBTUH)	Heat of Absorption (MBTUH)	Power Input (kW)	COP
50	7.5	1.5 (3.4)	75/63	61.4	45.7	72.3	3.3	18.6	30*	1.7 (3.9)	60	41.6	29.4	3.6	3.4
			80/67	65.6	47.3	76.6	3.4	19.6			70	41.0	27.7	4.0	3.0
			85/71	69.9	48.8	81.2	3.4	20.6			80	41.1	26.4	4.4	2.8
	10	2.5 (5.7)	75/63	62.7	45.9	73.2	3.2	19.8		2.8 (6.6)	60	43.5	31.1	3.7	3.5
			80/67	66.9	47.8	77.5	3.2	20.9			70	42.9	29.2	4.0	3.1
			85/71	71.6	49.0	82.3	3.2	22.1			80	42.4	27.5	4.4	2.8
	15	5.1 (11.9)	75/63	63.9	46.5	73.9	3.0	21.2		5.9 (13.6)	60	44.9	32.5	3.7	3.6
			80/67	68.4	48.1	78.5	3.0	22.5			70	44.2	30.6	4.0	3.2
			85/71	73.1	49.6	83.3	3.1	23.9			80	43.7	28.8	4.4	2.9
60	7.5	1.4 (3.3)	75/63	59.0	44.3	70.9	3.6	16.3	40*	1.6 (3.8)	60	46.7	34.2	3.7	3.7
			80/67	63.0	46.3	75.0	3.7	17.2			70	46.5	32.8	4.1	3.3
			85/71	67.2	47.8	79.4	3.7	18.1			80	46.2	31.1	4.5	3.0
	10	2.4 (5.5)	75/63	60.1	45.1	71.5	3.5	17.3		2.7 (6.3)	60	48.8	36.2	3.8	3.8
			80/67	64.3	46.8	75.8	3.5	18.3			70	48.4	34.4	4.1	3.4
			85/71	68.7	48.2	80.4	3.5	19.4			80	47.8	32.6	4.5	3.1
	15	5.0 (11.5)	75/63	61.3	45.6	72.2	3.3	18.4		5.7 (13.1)	60	50.9	38.2	3.8	3.9
			80/67	65.7	47.0	76.8	3.4	19.6			70	50.2	36.2	4.2	3.5
			85/71	70.2	48.7	81.4	3.4	20.8			80	49.6	34.3	4.6	3.2
70	7.5	1.4 (3.2)	75/63	56.5	43.2	69.5	4.0	14.3	50	1.5 (3.4)	60	54.2	41.2	3.9	4.1
			80/67	60.3	45.2	73.4	4.0	15.1			70	53.6	39.4	4.2	3.7
			85/71	64.4	46.5	77.8	4.1	15.9			80	53.1	37.4	4.6	3.4
	10	2.3 (5.4)	75/63	57.5	44.0	70.0	3.8	15.1		2.5 (5.7)	60	56.3	43.2	3.9	4.2
			80/67	61.6	45.6	74.2	3.8	16.0			70	55.5	41.2	4.3	3.8
			85/71	65.9	46.9	78.7	3.9	17.0			80	54.9	39.2	4.7	3.4
	15	4.8 (11.1)	75/63	58.6	44.5	70.6	3.7	16.0		5.1 (11.9)	60	59.1	45.3	4.0	4.4
			80/67	62.9	46.0	75.0	3.7	17.1			70	57.9	43.2	4.3	3.9
			85/71	67.3	47.4	79.6	3.7	18.1			80	57.0	41.1	4.7	3.5
80	7.5	1.3 (3.1)	75/63	53.7	42.4	67.8	4.3	12.4	60	1.4 (3.3)	60	60.9	47.5	4.0	4.5
			80/67	57.6	43.9	71.9	4.4	13.2			70	60.1	45.5	4.4	4.0
			85/71	61.5	45.3	76.0	4.4	13.9			80	59.6	43.4	4.8	3.7
	10	2.2 (5.2)	75/63	54.8	42.9	68.4	4.2	13.2		2.4 (5.5)	60	63.4	49.9	4.1	4.6
			80/67	58.8	44.3	72.6	4.2	14.0			70	62.5	47.7	4.4	4.1
			85/71	62.9	45.8	76.9	4.3	14.8			80	61.7	45.5	4.8	3.7
	15	4.6 (10.6)	75/63	55.9	43.2	69.1	4.0	13.9		5.0 (11.5)	60	66.7	52.4	4.1	4.7
			80/67	60.0	44.7	73.3	4.0	14.8			70	65.6	49.9	4.5	4.3
			85/71	64.3	46.3	77.7	4.1	15.8			80	64.2	47.8	4.9	3.8
85	7.5	1.3 (3.0)	75/63	52.4	41.9	67.1	4.5	11.6	70	1.4 (3.2)	60	68.0	54.2	4.2	4.8
			80/67	56.2	43.3	71.1	4.6	12.3			70	66.9	52.1	4.5	4.3
			85/71	60.0	44.8	75.2	4.6	13.0			80	66.3	49.9	5.0	3.9
	10	2.2 (5.1)	75/63	53.5	42.1	67.7	4.4	12.2		2.3 (5.4)	60	71.0	57.0	4.2	4.9
			80/67	57.4	43.7	71.8	4.4	13.0			70	69.9	54.5	4.6	4.5
			85/71	61.2	45.5	75.8	4.4	13.8			80	68.9	52.1	5.0	4.0
	15	4.6 (10.6)	75/63	54.5	42.5	68.3	4.2	12.9		4.8 (11.1)	60	74.8	59.9	4.3	5.1
			80/67	58.6	44.1	72.5	4.2	13.8			70	73.5	57.1	4.7	4.6
			85/71	62.6	46.0	76.6	4.3	14.7			80	71.9	54.8	5.1	4.1
90	7.5	1.3 (3.0)	75/63	51.0	41.3	66.4	4.7	10.7	80	1.3 (3.1)	60	75.5	61.1	4.3	5.1
			80/67	54.7	42.8	70.3	4.8	11.4			70	74.2	58.8	4.7	4.6
			85/71	58.5	44.2	74.3	4.8	12.1			80	73.2	56.4	5.1	4.2
	10	2.2 (5.0)	75/63	52.1	41.5	67.0	4.6	11.4		2.2 (5.2)	60	79.0	64.3	4.4	5.3
			80/67	55.8	43.3	70.9	4.6	12.1			70	77.7	61.6	4.8	4.8
			85/71	59.7	44.9	74.9	4.7	12.8			80	76.4	58.9	5.2	4.3
	15	4.5 (10.4)	75/63	53.1	41.9	67.6	4.4	12.0		4.7 (10.8)	60	82.9	68.0	4.5	5.4
			80/67	57.0	43.8	71.5	4.5	12.8			70	81.3	65.0	4.9	4.9
			85/71	61.1	45.1	75.8	4.5	13.6			80	79.8	62.0	5.3	4.4
100	7.5	1.3 (2.9)	75/63	48.3	39.8	65.3	5.2	9.2	Extended Range - Anti-freeze required	1.3 (3.1)	60	74.2	58.8	4.7	4.6
			80/67	51.7	41.7	68.9	5.3	9.8			70	73.2	56.4	5.1	4.2
			85/71	55.3	43.1	72.7	5.3	10.4			80	73.2	56.4	5.1	4.2
	10	2.1 (4.9)	75/63	49.3	40.2	65.8	5.1	9.7		2.2 (5.2)	60	79.0	64.3	4.4	5.3
			80/67	52.9	41.9	69.5	5.1	10.4			70	77.7	61.6	4.8	4.8
			85/71	56.5	43.5	73.3	5.1	11.0			80	76.4	58.9	5.2	4.3
	15	4.4 (10.1)	75/63	50.1	40.8	66.1	4.9	10.2		4.7 (10.8)	60	82.9	68.0	4.5	5.4
			80/67	53.9	42.3	70.0	4.9	11.0			70	81.3	65.0	4.9	4.9
			85/71	57.7	44.2	73.9	4.9	11.7			80	79.8	62.0	5.3	4.4
110	7.5	1.2 (2.8)	75/63	45.4	38.8	64.2	5.8	7.8	Extended Range - Anti-freeze required	1.3 (3.1)	60	74.2	58.8	4.7	4.6
			80/67	48.6	40.6	67.6	5.8	8.3			70	73.2	56.4	5.1	4.2
			85/71	51.9	42.2	71.1	5.9	8.8			80	73.2	56.4	5.1	4.2
	10	2.0 (4.7)	75/63	46.2	39.2	64.4	5.6	8.2		2.2 (5.2)	60	79.0	64.3	4.4	5.3
			80/67	49.6	40.9	68.0	5.6	8.8			70	77.7	61.6	4.8	4.8
			85/71	53.1	42.4	71.7	5.7	9.3			80	76.4	58.9	5.2	4.3
	15	4.3 (9.8)	75/63	47.1	39.3	64.9	5.5	8.6		4.7 (10.8)	60	82.9	68.0	4.5	5.4
			80/67	50.7	41.0	68.5	5.5	9.3			70	81.3	65.0	4.9	4.9
			85/71	54.3	42.7	72.2	5.5	9.9			80	79.8	62.0	5.3	4.4

* Extended Range - Anti-freeze required

- ▶ AHRI/ISO13256-1 certified performance is rated at entering air conditions of 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating.
- ▶ Tabulated unit performance does not include fan or pump power corrections required for AHRI/ISO standard performance ratings.
- ▶ Unit performance may be interpolated. Extrapolation is not allowed.
- ▶ For conditions other than rating conditions provided, consult the FHP BST selection software.
- ▶ Ratings below 40°F are with a methanol solution.
- ▶ Due to variations in installation, actual performance may vary from the tabulated data. Performance contained herein are as a result of extensive testing by FHP and are not express warranties between the parties and may be changed at any time.
- ▶ Continuous research and development to improve our products may result in a change to the current design and specifications without notice.

Bosch Thermotechnology Corp.
Londonderry, NH • Ft. Lauderdale, FL

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



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SV070 (2100 CFM) Capacity Data

COOLING									HEATING						
Entering Fluid Temp (F)	Water Flow (GPM)	Pressure Drop PSI (FOH)	Entering Air Temp (db/ wb) F	Total Capacity (MBTUH)	Sensible Capacity (MBTUH)	Heat of Rejection (MBTUH)	Power Input (kW)	EER	Entering Fluid Temp (F)	Pressure Drop PSI (FOH)	Entering Air Temp (F)	Total Capacity (MBTUH)	Heat of Absorption (MBTUH)	Power Input (kW)	COP
50	9	2.1 (5.5)	75/63	69.5	51.5	81.2	3.5	19.6	30*	2.5 (5.7)	60	46.4	33.6	3.8	3.6
			80/67	74.3	53.3	86.2	3.6	20.7			70	45.8	31.8	4.2	3.2
			85/71	79.1	55.1	91.3	3.6	21.7			80	45.3	30.0	4.6	2.9
	12	3.6 (8.3)	75/63	70.8	52.1	82.1	3.4	20.8		4.1 (9.5)	60	48.0	35.1	3.8	3.7
			80/67	75.8	53.8	87.2	3.4	22.1			70	47.0	33.1	4.2	3.3
			85/71	80.9	55.4	92.5	3.5	23.2			80	46.8	31.2	4.6	3.0
	18	7.5 (17.3)	75/63	72.2	52.4	83.0	3.3	22.2		8.5 (19.7)	60	49.7	36.7	3.9	3.8
			80/67	77.3	54.3	88.2	3.3	23.6			70	48.9	34.7	4.2	3.4
			85/71	82.6	55.9	93.7	3.3	25.0			80	48.3	32.6	4.7	3.0
60	9	2.1 (4.8)	75/63	66.7	50.3	79.5	3.9	17.2	40*	2.4 (5.5)	60	51.9	38.9	3.9	3.9
			80/67	71.4	51.9	84.4	3.9	18.2			70	51.4	37.2	4.3	3.5
			85/71	76.0	53.9	89.2	4.0	19.1			80	50.9	35.3	4.7	3.2
	12	3.5 (8.0)	75/63	68.0	50.8	80.3	3.7	18.2		4.0 (9.2)	60	54.1	40.9	4.0	4.0
			80/67	72.7	52.7	85.2	3.8	19.3			70	53.1	38.9	4.3	3.6
			85/71	77.7	54.1	90.4	3.8	20.4			80	52.6	36.9	4.7	3.3
	18	7.2 (16.7)	75/63	69.2	51.3	81.1	3.6	19.3		8.3 (19.1)	60	56.4	43.1	4.0	4.1
			80/67	74.1	53.3	86.1	3.6	20.5			70	55.5	40.9	4.4	3.7
			85/71	79.3	54.7	91.5	3.6	21.8			80	54.8	38.7	4.8	3.4
70	9	2.0 (4.6)	75/63	63.9	48.9	77.8	4.2	15.1	50	2.1 (5.0)	60	60.4	47.0	4.1	4.4
			80/67	68.3	50.7	82.4	4.3	16.0			70	59.3	44.7	4.4	3.9
			85/71	72.9	52.4	87.2	4.3	16.8			80	58.6	42.6	4.9	3.5
	12	3.4 (7.8)	75/63	65.1	49.4	78.5	4.1	15.9		3.6 (8.3)	60	62.6	49.2	4.1	4.5
			80/67	69.7	51.2	83.3	4.1	16.9			70	61.7	47.0	4.5	4.0
			85/71	74.3	53.2	88.1	4.2	17.8			80	60.9	44.7	4.9	3.6
	18	7.0 (16.1)	75/63	66.1	50.1	79.1	3.9	16.8		7.5 (17.3)	60	65.1	51.3	4.1	4.6
			80/67	71.0	51.7	84.1	4.0	17.9			70	64.0	48.9	4.5	4.1
			85/71	76.0	53.5	89.2	4.0	19.0			80	63.0	46.4	5.0	3.7
80	9	1.9 (4.5)	75/63	60.8	47.8	75.9	4.6	13.1	60	2.1 (4.8)	60	67.9	54.2	4.2	4.7
			80/67	65.1	49.4	80.5	4.7	13.9			70	67.0	51.6	4.6	4.3
			85/71	69.4	51.5	85.0	4.7	14.7			80	66.2	49.3	5.0	3.9
	12	3.3 (7.5)	75/63	61.9	48.3	76.6	4.5	13.8		3.5 (8.0)	60	70.7	56.8	4.2	4.9
			80/67	66.3	50.2	81.1	4.5	14.7			70	69.5	54.3	4.6	4.4
			85/71	70.8	52.0	85.9	4.6	15.5			80	68.5	51.8	5.1	4.0
	18	6.8 (15.6)	75/63	63.0	48.8	77.2	4.3	14.5		7.2 (16.7)	60	73.6	59.4	4.3	5.0
			80/67	67.5	50.7	81.9	4.4	15.5			70	72.3	56.6	4.7	4.5
			85/71	72.3	52.5	86.8	4.4	16.5			80	71.1	53.9	5.1	4.1
85	9	1.9 (4.4)	75/63	59.2	47.1	75.1	4.8	12.2	70	2.0 (4.6)	60	76.0	61.8	4.3	5.1
			80/67	63.4	49.0	79.5	4.9	13.0			70	74.9	59.0	4.7	4.6
			85/71	67.7	50.8	84.0	5.0	13.7			80	73.9	56.4	5.2	4.2
	12	3.2 (7.4)	75/63	60.4	47.3	75.8	4.7	12.9		3.4 (7.8)	60	79.2	64.8	4.4	5.3
			80/67	64.6	49.5	80.2	4.7	13.7			70	77.9	62.1	4.8	4.7
			85/71	69.1	51.3	84.8	4.8	14.5			80	76.6	59.4	5.3	4.3
	18	6.7 (15.4)	75/63	61.4	48.1	76.3	4.5	13.5		7.0 (16.1)	60	82.8	67.9	4.5	5.4
			80/67	65.8	50.0	80.8	4.6	14.4			70	81.2	64.9	4.9	4.9
			85/71	70.4	51.9	85.6	4.6	15.3			80	79.7	61.8	5.3	4.4
90	9	1.9 (4.4)	75/63	57.7	46.5	74.3	5.1	11.4	80	1.9 (4.5)	60	84.5	69.7	4.5	5.5
			80/67	61.7	48.4	78.5	5.1	12.0			70	83.1	67.0	4.9	4.9
			85/71	65.9	50.0	83.0	5.2	12.7			80	81.8	64.3	5.4	4.4
	12	3.2 (7.3)	75/63	58.7	46.9	74.8	4.9	11.9		3.3 (7.5)	60	88.2	72.9	4.6	5.6
			80/67	62.9	48.9	79.2	5.0	12.7			70	86.6	69.8	5.0	5.1
			85/71	67.3	50.6	83.8	5.0	13.5			80	85.1	66.8	5.5	4.6
	18	6.6 (15.1)	75/63	59.7	47.4	75.3	4.8	12.5		6.8 (15.6)	60	92.3	76.7	4.7	5.8
			80/67	64.1	49.3	79.8	4.8	13.3			70	90.5	74.1	5.1	5.2
			85/71	68.6	51.0	84.6	4.8	14.2			80	88.7	70.1	5.6	4.7
100	9	1.8 (4.2)	75/63	54.4	45.2	72.7	5.6	9.7	Extended Range - Anti-freeze required	2.0 (4.6)	60	92.3	76.7	4.7	5.8
			80/67	58.2	47.2	76.7	5.6	10.3			70	90.5	74.1	5.1	5.2
			85/71	62.1	49.3	80.8	5.7	10.9			80	88.7	70.1	5.6	4.7
	12	3.1 (7.1)	75/63	55.4	45.6	73.2	5.4	10.2		3.5 (8.0)	60	92.3	76.7	4.7	5.8
			80/67	59.4	47.5	77.3	5.5	10.9			70	90.5	74.1	5.1	5.2
			85/71	63.4	49.8	81.4	5.5	11.5			80	88.7	70.1	5.6	4.7
	18	6.4 (14.7)	75/63	56.3	46.0	73.6	5.3	10.6		7.0 (16.1)	60	92.3	76.7	4.7	5.8
			80/67	60.5	48.1	77.8	5.3	11.4			70	90.5	74.1	5.1	5.2
			85/71	64.7	50.2	82.2	5.3	12.1			80	88.7	70.1	5.6	4.7
110	9	1.8 (4.1)	75/63	51.2	43.6	71.5	6.2	8.2		1.9 (4.5)	60	92.3	76.7	4.7	5.8
			80/67	54.7	45.8	75.2	6.3	8.8			70	90.5	74.1	5.1	5.2
			85/71	58.5	47.5	79.2	6.3	9.3			80	88.7	70.1	5.6	4.7
	12	3.0 (6.9)	75/63	52.0	44.2	71.7	6.0	8.6		3.3 (7.5)	60	92.3	76.7	4.7	5.8
			80/67	55.8	46.0	75.7	6.1	9.2			70	90.5	74.1	5.1	5.2
			85/71	59.7	47.9	79.7	6.1	9.8			80	88.7	70.1	5.6	4.7
	18	6.2 (14.3)	75/63	52.8	44.3	72.1	5.9	8.9		6.8 (15.6)	60	92.3	76.7	4.7	5.8
			80/67	56.8	46.2	76.2	5.9	9.6			70	90.5	74.1	5.1	5.2
			85/71	60.8	48.3	80.2	5.9	10.2			80	88.7	70.1	5.6	4.7

* Extended Range - Anti-freeze required

- ▶ AHRI/ISO13256-1 certified performance is rated at entering air conditions of 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating.
- ▶ Tabulated unit performance does not include fan or pump power corrections required for AHRI/ISO standard performance ratings.
- ▶ Unit performance may be interpolated. Extrapolation is not allowed.
- ▶ For conditions other than rating conditions provided, consult the FHP BST selection software.
- ▶ Ratings below 40°F are with a methanol solution.
- ▶ Due to variations in installation, actual performance may vary from the tabulated data. Performance contained herein are as a result of extensive testing by FHP and are not express warranties between the parties and may be changed at any time.
- ▶ Continuous research and development to improve our products may result in a change to the current design and specifications without notice.

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Antifreeze Correction							
Antifreeze Type	Antifreeze %	Cooling			Heating		WPD Correction Factor EWT 30 °F
		EWT 90 Deg.F			EWT 30 Deg. F		
		Total Cap.	Sens. Cap	Power	Htg. Cap	Power	
Water	0	1.000	1.000	1.000	1.000	1.000	1.000
Propylene Glycol	5	0.997	0.997	1.004	0.989	0.997	1.060
	10	0.994	0.994	1.006	0.986	0.995	1.125
	15	0.990	0.990	1.009	0.978	0.988	1.190
	25	0.983	0.983	1.016	0.960	0.979	1.300
Methanol	5	0.997	0.997	1.003	0.990	0.997	1.060
	10	0.996	0.996	1.005	0.979	0.993	1.100
	15	0.994	0.994	1.008	0.970	0.990	1.140
Ethanol	5	0.998	0.998	1.002	0.981	0.994	1.160
	10	0.996	0.996	1.004	0.960	0.988	1.230
	15	0.992	0.992	1.006	0.944	0.983	1.280
	25	0.986	0.986	1.009	0.917	0.974	1.400
Ethylene Glycol	5	0.997	0.997	1.003	0.993	0.998	1.060
	10	0.995	0.995	1.004	0.986	0.996	1.120
	15	0.992	0.992	1.005	0.980	0.993	1.190
	25	0.988	0.988	1.009	0.970	0.990	1.330
	30	0.985	0.985	1.012	0.965	0.987	1.400

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Waterside Pressure Drop			
Model	Water Flow Rate (GPM)	Water Side Pressure Drop with out Internal Valve (PSI)	Water Side Pressure Drop with Internal Valve (PSI)
SV018	2.5	1.1	2.1
	4	2.7	5.2
	5	4.0	8.0
SV024	3	1.7	2.0
	4	2.8	3.4
	6	5.8	7.2
SV030	4	2.0	2.6
	6	4.2	5.6
	8	7.0	9.6
SV036	4.5	1.6	2.4
	6	2.6	4.0
	9	5.4	8.6
SV042	5	2.0	3.0
	8	4.6	7.2
	11	8.2	13.0
SV048	6	0.8	1.4
	8	1.4	2.5
	12	2.8	5.4
SV060	7.5	1.4	2.4
	10	2.3	4.1
	15	4.8	8.8
SV070	9	2.0	3.4
	12	3.4	5.9
	18	7.0	12.7

All values based upon pure water at 70° F.

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Factory Installed Options and Applicable Models

	Condenser Section – Unit Size							
Description	SV018	SV024	SV030	SV036	SV042	SV048	SV060	SV070
208-230/1/60	◆	◆	◆	◆	◆	◆	◆	◆
277/1/60	◆	◆	◆	◆	◆	◆	◆	◆
208-230/3/60		◆	◆	◆	◆	◆	◆	◆
460/3/60		◆	◆	◆	◆	◆	◆	◆
Cupro-Nickel Coaxial Condensor Coil	◆	◆	◆	◆	◆	◆	◆	◆
Disconnect Switch	◆	◆	◆	◆	◆	◆	◆	◆
Compressor Monitor Relay	◆	◆	◆	◆	◆	◆	◆	◆
Phase Monitor (3 phase only)	◆	◆	◆	◆	◆	◆	◆	◆
Boilerless Control	◆	◆	◆	◆	◆	◆	◆	◆
Differential Pressure Switch	◆	◆	◆	◆	◆	◆	◆	◆
LED Light Display	◆	◆	◆	◆	◆	◆	◆	◆
2 Way Solenoid Valve	◆	◆	◆	◆	◆	◆	◆	◆
Measure/Flow Device (3 GPM/Ton)	◆	◆	◆	◆	◆	◆	◆	◆
Combo 2 Way Solenoid & Measure Flow	◆	◆	◆	◆	◆	◆	◆	◆

Factory Installed Options and Applicable Models

	Air Handler / Fan Coil Section – Unit Size							
Description	SV018	SV024	SV030	SV036	SV042	SV048	SV060	SV070
208-230/1/60	◆	◆	◆	◆	◆	◆	◆	◆
277/1/60	◆	◆	◆	◆				
460/3/60		◆	◆	◆	◆	◆	◆	◆
Energy Management Relay	◆	◆	◆	◆	◆	◆	◆	◆
Fire Alarm Relay	◆	◆	◆	◆	◆	◆	◆	◆
Blower Monitor Relay	◆	◆	◆	◆	◆	◆	◆	◆
Disconnect Switch	◆	◆	◆	◆	◆	◆	◆	◆
Wire for 208 Volt	◆	◆	◆	◆	◆	◆	◆	◆
4 Sided Filter Rack with MERV-8 Filter	◆	◆	◆	◆	◆	◆	◆	◆
4 Sided Filter Rack with MERV-13 Filter	◆	◆	◆	◆	◆	◆	◆	◆
75, 100 VA Transformer	◆	◆	◆	◆	◆	◆	◆	◆

Greensource iSeries Model SV - Split System

Water Source Heat Pump 1½ to 6 Ton



Specification Guide Continued

1.0 General

Furnish and install BOSCH SV series water source heat pumps as indicated on the plans with capacities and characteristics as listed in the schedule and the specifications that follow. The units shall be manufactured in an ISO 9001:2000 certified facility.

2.0 Horizontal/Vertical Water Source Heat Pumps

Units shall be designed to operate throughout the range of entering fluid temperature of 50°F to 110°F in the cooling mode and 30°F to 80°F in the heating mode. Equivalent units from other manufacturers can be proposed provided approval to bid is given 10 days prior to bid closing. All equipment with a nominal capacity of 134,000 BTUH Total Cooling or lower must be listed in the current AHRI Applied Equipment Directory under the AHRI Standard ISO- 13256-1 Rating. All equipment in this section must meet or exceed the national standard minimum EER and COP as listed in ASHRAE 90.1 All units shall conform to UL1995 standard and certified to CAN/CSA C22.1 No 236 by Intertek-ETL. All units shall have ARI-13256-1 labels, and ETL/UL or NRTL or CSA labels.

2.01 Basic Construction

- A.** Units shall have the air flow arrangement as shown on the plans. If units with these arrangements are not used, the contractor supplying the water source heat pumps is responsible for any extra costs incurred by other trades and must submit detailed mechanical drawings showing duct work requirements and changes or relocation of any other mechanical or electrical system. If other arrangements make servicing difficult the contractor must provide access panels and clear routes to ease service. The architect must approve all changes 10 days prior to bid.
- B.** All units shall have stainless steel drain pans to comply with this project's IAQ requirements. No exceptions shall be allowed.
- C.** All water source heat pumps shall be fabricated from sheet metal finished with G90 galvanized steel. All interior surfaces shall be lined with 1/2 inch thick, multi density acoustic insulation. All insulation must meet NFPA 90A and be certified to meet the GREENGUARD Indoor Air Quality Standard for Low Emitting Products. One blower access panel and one compressor compartment access panels shall be removable with supply and return air duct work in place.
- D.** Unit shall have a floating base pan consisting of a ½" (12 mm) thick high density rubber pad between the compressor base plate and the unit base pan to prevent transmission of vibration to the structure.
- E.** All units shall have a factory installed two sided filter rack capable of accepting one inch filters. Units shall have a 1 inch

thick throwaway type glass fiber filter as standard. The filter rack shall incorporate a 1 inch duct flange. The contractor shall purchase one spare set of filters and replace factory-shipped filters upon completion of start-up.

- Option to E: All units shall have a factory installed four sided filter rack with 2" MERV-8 filters.
 - Option to E: All units shall have a factory installed four sided filter rack with 2" MERV-13 filters.
- F.** Cabinets shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring. Supply and return water connections shall be brass FPT fittings and shall be securely mounted flush to the cabinet allowing for connection to a flexible hose without the use of a back-up wrench. Water connections which protrude through the cabinet shall not be allowed.
 - G.** Hanging brackets shall be provided as standard for horizontal units.
 - H.** All units shall have water-coil freeze sensor as standard.

2.02 Fan and Motor Assembly

- A.** Unit comes standard with Constant Torque CFM ECM.
 - Option A: The fan motor shall be a pre-programmed high efficiency constant torque ECM type.
 - Option B: Variable Speed Constant CFM electronically commutative motor (ECM).
- B.** The fan and motor assembly must be capable of overcoming the external static pressures as shown on the schedule. External static pressure rating of the unit shall be based on a wet coil. Ratings based on a dry coil shall NOT be acceptable.
- C.** All units shall have removable blower inlet ring as standard for ease of service and maintenance.

2.03 Refrigerant Circuit

Units shall use R-410A refrigerant. All units shall have a factory sealed and fully charged refrigerant circuit with the following components:

- A.** Compressors shall be hermetic single stage, reciprocating or scroll type specifically designed for heat pump operation and shall be internally sprung with thermal overload protection and mounted on rubber vibration isolators.
- B.** Refrigerant metering Thermal Expansion Valve (TXV).
- C.** Finned tube refrigerant to air heat exchanger not exceeding 16 fins per inch. Refrigerant to air heat exchangers shall utilize enhanced aluminum fins and rifled copper tube construction rated to withstand 600 PSIG refrigerant working pressure. All air coils shall have non-ferrous aluminum end plates.
 - Option for C: Coils shall have DuoGuard™ tin electroplated copper tubing with polymer coated Aluminum

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Fins coating for enhanced protection against formicary and other types of corrosion. Copper tubes shall be tin coated and aluminum fins coated to pass 1000 hour ASTM B117 salt spray testing.

- D.** Reversing valve. Reversing valves shall be four way solenoid activated refrigerant valves which shall fail to the heating operation should the solenoid fail to function. Reversing valves which fail to the cooling operation shall not be allowed.
- E.** Coaxial (tube in tube) refrigerant to water heat exchanger. Refrigerant to water heat exchangers with copper inner water tube and steel outer refrigerant tube design rated to withstand 600 PSIG working refrigerant pressure and 400 PSIG working water pressure. Shell and Tube style refrigerant to water heat exchangers shall be treated as pressure vessels and shall require refrigerant pressure relief valves piped to the exterior of the building. The contractor supplying the water source heat pumps with Shell and Tube heat exchangers shall be responsible for any additional installation costs. Brazed Plate water to refrigerant heat exchangers shall require additional centrifugal separators added to the supply water piping at each unit. Each separator shall have an automated clean out valve piped to a waste line. The contractor supplying water source heat pumps with Brazed Plate heat exchangers shall be responsible for any additional costs.
 - Option for E: Cupro-Nickel water coil – The refrigerant to water heat exchanger shall be of cupro-nickel inner water tube construction.
- F.** Safety controls including both a high pressure and low pressure switch. Temperature sensors shall not replace these safety switches. See the controls section of this specification for additional information.
- G.** Access fittings shall be factory installed on high and low pressure refrigerant lines to facilitate field service.
- H.** Activation of any safety device shall prevent compressor operation via a lockout circuit. The lockout circuit shall be reset at the thermostat or at the contractor supplied disconnect switch. Units which may be reset at the disconnect switch only shall not be acceptable. Refer to solid state safety circuit below.

2.04 Electrical

A control box shall be located within the unit and shall contain a transformer, controls for the compressor, reversing valve and fan motor operation and shall have a terminal block for low voltage field wiring connections. The transformer shall be rated for a minimum 50 VA and shall have a push button reset circuit breaker on the secondary power.

All units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 volts.

2.05 Solid State Safety Circuit

All units shall have a solid-state UPM safety control circuit with the following features:

1. Anti-short cycle time delay on compressor operation.
2. Random start on power up mode.
3. Brown out/Surge/Power Interruption protection.
4. Low Pressure Switch 120 second bypass timer.
5. Shutdown on the following fault indications:
 - a. high or low refrigerant pressure safety switches inputs.
 - b. Freeze sensors shall monitor refrigerant temperature to the water coil in the heating mode and refrigerant to air coil in the cooling mode.
6. Alarm output which closes for selectable dry contact closure or 24 VAC remote fault indication.
7. Alarm output selectable for constant output for general alarm notification, or pulse output for annunciation of the specific fault alarm.
8. Selectable reset of unit at thermostat or disconnect.
9. Automatic intelligent reset. Unit shall automatically reset after a safety shut down and restart the unit after the anti-short cycle timer and random start timer expire. Should the same fault re-occur within 60 minutes after reset, then a permanent lockout will occur. Reset attempts shall be selectable for either 2 or 4 tries. A condensate overflow will place the unit in an immediate hard lockout.
10. Ability to defeat time delays for servicing.
11. A light emitting diode (LED) to indicate safety alarms. The LED shall annunciate the following alarms:
 - a. high refrigerant pressure,
 - b. low refrigerant pressure,
 - c. low refrigerant temperature to the water coil in the heating operation,
 - d. brown out/surge/ power interruption.
12. The LED will display each fault condition as soon as the fault occurs. If a permanent lockout occurs, then the fault LED will display the type of fault until the unit is reset.
13. UL listed, CUL listed, and RFI, ESD, and transient protected.

Freeze Protection: A freeze stat shall sense the entering refrigerant temperature to the coaxial coil (in the heating mode) and shall activate the compressor lockout circuit when the refrigerant temperature drops below either 15 F or 30 F. The factory default is 30 F and the temperature setting may be set at 15 F by cutting the resistor (R42) located above dip switch. The freeze stat may not provide protection in the case of loss of flow in the heating mode.

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2.06 Options

- A.** Extra quiet construction: Optional compressor blanket shall be provided on units having a capacity above 24,000 BTUH.
- B.** DDC Controls: Unit shall be equipped with a factory installed DDC control capable of interfacing with BacNet, Modbus, and N2 and Lonworks. When choosing Lonworks, a separate Lon card must be purchased. The controller shall be pre-programmed to control the unit and monitor the safety controls. The unit shall be able to operate as a standalone or be incorporated into the building management system. A leaving water and leaving air sensor shall be installed in the unit. Wall sensors shall be available for controlling zone temperature.
- C.** Unit mounted disconnect. A non fused factory mounted disconnect shall be installed on the unit.
- D.** Two Way Motorized Water valve: A two way motorized water valve shall be mounted in the interior of the unit. The valve shall cycle open whenever there is a call for compressor operation. The valve shall be equipped with an end switch.
- E.** The following relays shall be factory installed in the unit
 - a) EMS Relay for remote enabling of the unit.
 - b) Auxiliary pump or valve relay to enable a pump or valve operation when calling for compressor operation.
- F.** A Comfort Alert Module can be ordered separately for Scroll compressors. This device assist in service diagnostics. shall be installed in the units to assist in service diagnostics

3.0 Hose Kits

All units shall be connected with hoses. The hoses shall be either 2 or 3 feet long, braided stainless steel, fire rated hoses. Non fire rated hoses are not acceptable. Optional ball valves with P/T ports, flow controller, Y strainer and electric valve shall be included as specified in the schedule.