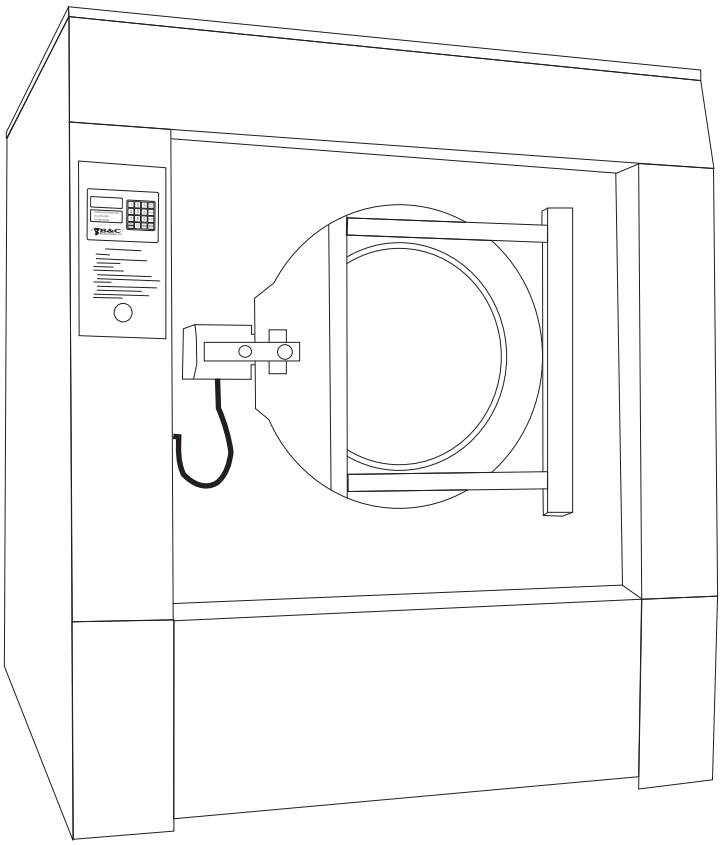
Washer-Extractor

SI Series Installation and Operation Manual



B&C Technologies
Panama City, FL
(850) 249-2222
(850) 249-2226 FAX
www.bandctech.com

Revision 1.92
24-Jan-2011

Table of Contents

B&C Technologies

Panama City, FL
(850) 249-2222
(850) 249-2226 FAX
www.bandctech.com

Accurate Technologies

Samutprakarn, Thailand
+66 (0) 2740-5511
+66 (0) 2740-5522 FAX
www.accuratethai.com

Introduction

SI Series Washer-Extractors

The SI line is the industrial freestanding washer-extractor series of machines from B&C Technologies. It is an open pocket washer-extractor with a large door opening for easy and quick loading and unloading. It has been developed for the institutional and industrial market, and is suitable for commercial laundries, hotel, food processing plants, factories and other places where laundry might be process

The design allows for top performance at lowest possible operation cost and investment. The flexible electronic control center ensures that maximum productivity is obtained.

The SI series utilizes high quality material, such as 304 (18/8) stainless steel in vital parts in contact with the wash solution. It has a stainless steel cabinet for long life with easily removable panels.

The key advantages of this series are the simplicity of the microprocessor and the electronic AC drive system, which utilizes only one motor. The system allows for washing and extraction at any speed and mechanical action to suit any textile fiber used today and tomorrow. A built in suspension system isolate objectionable vibrations and the high speed final extraction saves time and energy in the finishing operation.

The main bearing is located outside the wash solution and will not be damaged, should the shell seals leak. The machine is provided with two V-seals, which are very reliable and will last for many years. The calculated life expectancy of the bearing is in excess of twenty years.

The five compartment, side mounted supply dispenser for powder and liquid detergents are standard and the machine is designed to accept the connection of 8 additional external chemical lines and pumps. More chemical connections are available as an option.

The SI series can be provided with tilt devices that can tilt the machine one or both ways. This option provides for easy loading and unloading and saves hard labor.

The SI series is also prepared to accept the connection of water reuse systems. The tanks can be equipped with or without steam or electrical heat depending on installation and operation. The water reuse system is programmable by the machines control.

Customer Service
For technical assistance, call:
Phone: (850)-249-2222
FAX: (850) 249-2226
e-mail: techsupport@bandctech.com
Web: www.bandctech.com

In Thailand
Phone: +66 (0) 2740-5511
FAX: +66 (0) 2740-5522
e-mail: sales@accuratethai.com
Web: www.accuratethai.com

Replacement Parts
In the event that literature or replacement parts are required, contact your local distributor, or contact B&C Technologies at the above phone numbers/internet addresses.

SI Model Family Options

Family	*Capacity*	*Control*	*Voltage*
SI	110	E-EL6	2 - 200-240V, 50/60Hz, 3ph
	135	P-PLC...	4 - 380-480V, 50/60Hz, 3ph
	200		6 - 575V, 50/60Hz, 3ph
	275		
	300		

Fills	*Heat*	*Dispenser*	*Drains*
1 - Cold	N - None	1 - 1 Cup	1R - 1 Rear
2 - Cold, Hot	D - Direct Steam	5 - 5 Cup	2R - 2 Rear
3 - Cold, Hot, Aux	I - Indirect Steam		1D - 1 Down
R - aux w/ no valve			2D - 2 Down

Tilt	*Door*	*Prep*	*Approvals*	*Packing*	*Design Rev.*
N - None	S - Standard	N - None	A - USA	B - Bag	A
F - Fwd Only	A - Automatic	F - EMI Filter	E - Europe	C - Crate	
R - Rev Only	C - Auto w/ Chute	O - Ozone	None		
B - Fwd + Rev					

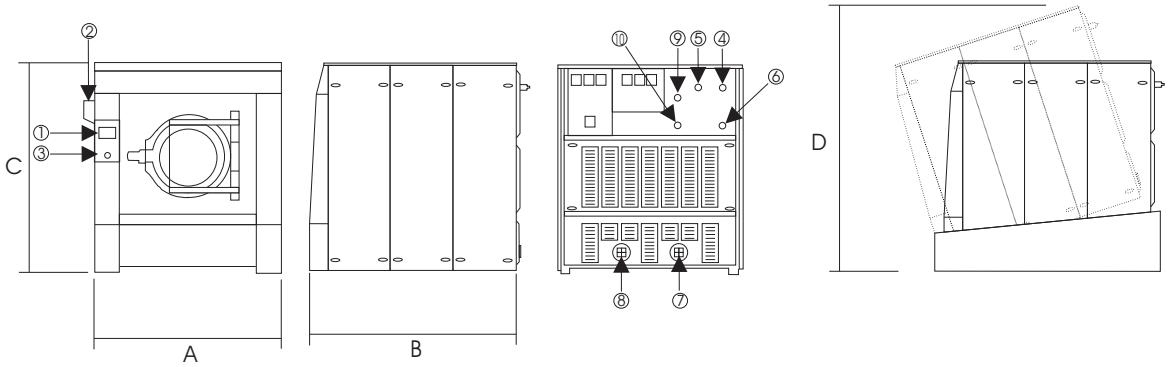
SI-275-E2-2N51R-NSNABA

Family
Capacity
Voltage Control
Fills
Heat
Dispenser
Drains
Tilt
Door
Prep
Approvals
Packing
Design Rev.

Introduction

General Specifications

Capacity	US	Metric	SI-110		SI-135		SI-200		SI-275		SI-300	
Cylinder	lbs	kg	110	50	135	60	200	90	275	125	300	136
Diameter	inch	mm	37	940	43	1092	46	1169	52	1321	52	1321
Length	inch	mm	25	635	25	635	32	813	34	864	38	965
Volume	cu ft	liters	15.5	440	21	595	30.76	871	41.76	1182	46.74	1322
Door Opening	inch	mm	20	510	24.5	625	24.5	625	28.5	725	28.5	725
Speeds (Programmable)												
Wash	rpm		39		36		35		33		33	
Distribution	rpm		59		55		53		50		50	
Extract 1	rpm		390		360		350		330		330	
Extract 2	rpm		515		480		465		435		435	
Extract 3	rpm		645		600		580		545		545	
Extract 4	rpm		780		725		700		60		660	
Maximum "G" Force	g		320		320		320		321		321	
Motor Size	HP	kw	7.5	5.5	10	7.5	15	11	25	18	30	22.5
Utility Connections												
Water	inch	DN	1	25	1-1/4	32	1-1/4	32	1-1/4	32	1-1/4	32
Drain	inch	mm	4	102	4	102	4	102	4	102	4	102
Steam	inch	DN	3/4	20	3/4	20	1	25	1	25	1	25
Air	inch	DN	1/4	8	3/8	10	3/8	10	3/8	10	3/8	10
Dimensions												
A - Width	inch	mm	55	1395	64	1625	67	1700	74	1880	74	1880
A - Width (Tilt)	inch	mm	63	1598	72	1828	75	1903	82	2083	82	2083
B - Depth	inch	mm	65	1650	70.5	1790	81	2055	86	2185	90	2286
B - Depth (Tilt)	inch	mm	73	1853	78.5	1993	89	2258	94	2388	98	2489
C - Height (Standard)	inch	mm	72	1830	73	1855	76.7	1955	84.3	2140	85	2159
C - Height (1 way tilt)	inch	mm	75	1905	76	1930	79.7	2024	87.3	2217	88	2235
C - Height (2 way tilt)	inch	mm	78	1981	79	2006	82.7	2100	90.3	2293	91	2311
D - Height (Tilted, 1 way tilt)	inch	mm	86.2	2190	88.5	2248	102.2	2596	113.2	2875	114.2	2901
D - Height (Tilted, 2 way tilt)	inch	mm	89.2	2266	91.5	2324	105.2	2672	116.2	2952	117.2	2677
Weight												
Net	lbs	kg	3300	1500	4800	2180	5900	2680	8500	3860	8750	3977
Shipping (Domestic)	lbs	kg	3500	1590	5000	2270	6100	2770	8700	3950	9000	4090
Export Crated	lbs	kg	3700	1680	5300	2405	6400	2905	9000	4085	11750	5341



1. Microprocessor Controls
2. Supply Dispenser
3. Control Compartment
4. Hot Water Inlet
5. Cold Water Inlet
6. Steam Inlet
7. Reuse Drain (Optional)
8. Drain
9. Electrical Connection
10. Air Inlet

Key Symbols

Anyone operating or servicing this machine must follow the safety rules in this manual. Particular attention must be paid to the DANGER, WARNING, and CAUTION blocks which appear throughout the manual

The lightening flash and arrowhead within the triangle is a warning sign alerting you of the presence of dangerous voltage.

The exclamation point within the triangle is a warning sign alerting you of important instructions concerning the machine and possible dangerous conditions.

This warning symbol alerts you to the presence of possible dangerous drive mechanisms within the machine. Guards should always be in place when the machine is in operation. Be careful when servicing any drive mechanism.

This warning symbol indicates the presence of possibly dangerous chemicals. Proper precautions should be taken when handling corrosive or caustic material.

This warning symbol indicates the presence of hot surfaces that could cause serious burns. Stainless steel and steam lines can become extremely hot and should not be touched.

This warning symbol indicates the presence of possible dangerous pinch-points. Moving mechanical parts can crush an/or sever body parts.

Before servicing any equipment, make certain it is disconnected from the electrical power source. Never allow operation of the machine when any safety device is malfunctioning. Never bypass safety devices.

Introduction

Safety Checklist

Before Initial start up of a B&C free-standing washer extractor perform the following safety check:

A. Make sure all electrical and plumbing connections have been made in accordance with applicable codes and regulations.

B. Make sure the machine is grounded electrically.

C. Make sure the machine has flexible air, water fill, and drain connections of the correct size, length and type, with no kinks, and that they are securely attached and/or clamped.

D. Make sure the transport brackets have been removed.

Before machine is placed in operation, the door safety interlock must be checked for proper operation as follows:

A. When the washer is energized electrically and in operation, the loading door must be locked in the closed position. Verify this by attempting to open the loading door when the machine is operating. If necessary, check the door safety interlock and sensors for proper operation. Consult the service manual, or call a qualified service technician if necessary.

B. When the washers loading door is open, it should not be possible to start the machine. Verify this by attempting to start the washer with the door open. Also, close the door without locking it and verify that it is not possible to start the machine with the door not locked. If necessary, check the door lock sensors for proper operation,. Consult the service manual, or call a qualified service technician. If additional information is required, contact your local distributor or call the manufacturer of the machine.

Before servicing any equipment, make certain it is disconnected from the electrical power source. Never allow operation of the machine when any safety device is malfunctioning. Never bypass safety devices.

Introduction

Safety Checklist

To provide personal safety and keep the machine in proper working order, follow all maintenance and safety procedures presented in this manual. If questions regarding safety arise. Contact the factory immediately.

Use factory authorized spare parts to avoid safety hazards.

Operator safety

Never insert hands or objects into basket until it has completely stopped. Doing so could result in serious injury

To ensure the safety of machine operators the following maintenance checks must be performed daily.

1. Prior to operating the machine, verify that all warning signs are present and legible. Missing or illegible signs must be replaced immediately. Make certain that spares are available.

2. Check door interlock before starting operation of the machine, see safety check list.

3. Do not attempt to operate the machine if any of the following conditions are present:

3.1 The door does not remain securely locked during the entire cycle.

3.2 Excessively high water level is evident.

3.3 Machine is not connected to a properly grounded circuit.

Do not bypass any safety devices in the machine.

Never operate the machine with a bypassed or disconnected out-of-balance switch. Operating the machine with severe out-of-balance loads could result in personal injury and serious equipment damage.

Introduction

Safety Checklist

Safe Operation Environment

Safe operation requires an appropriate operating environment for both the operator and the machine. If questions regarding safety arise, contact the factory.

Environmental Conditions

1. Ambient temperature. Water in the machine will freeze at temperatures of 32F (0C) or below. Temperatures above 120 F (50C) will result in more frequent motor overheating and, in some cases, malfunction or premature damage to solid state devices that are used in the machines. Special cooling devices may be necessary.

2. Humidity. Relative humidity above 90% may cause the machine's electronics or motors to malfunction or may trip the ground fault interrupter. Corrosion problems may occur on some metal components. If the relative humidity is below 30% belts and rubber hoses may eventually develop dry rot. This condition can result in hose leaks, which may cause hazards external to the machine in conjunction with adjacent electrical equipment.

3. Ventilation. The need for make-up air openings for such laundry room accessories as dryers , ironers, water heaters, etc. must be evaluated periodically. Louvers, screens, or other separating devices may reduce the available air opening significantly..

4. Radio Frequency Emissions. A filter is available for machines in installations where floor space is shared with equipment sensitive to radio frequency emissions. All machines that are shipped to CE countries are equipped with this filter and comply with the EMI regulations.

5. Elevation. If the machine is to be operated at elevations over 3280 feet (1000 m) above sea level, pay special attention to water levels and electronic settings (particularly temperature) or desired result may not be achieved.

6. Chemicals. Keep stainless steel surfaces free of chemical residues to avoid corrosion.

7. Water damage. Do not spray the machine with water. Short circuiting and serious damage may result. Repair immediately all seepage due to faulty gaskets, etc.

Do not place volatile or flammable fluids in any machine. Do not clean the machine with volatile or flammable fluids such as acetone, lacquer thinners, enamel reducers, carbon tetrachloride, gasoline, benzene, naphtha, etc. Doing so could result in serious personal injury and/or damage to the machine.

Machine Location

1. Foundation. The concrete floor must be of sufficient strength and thickness to handle the floor loads generated by the machine at high extract speeds.

Introduction

Safety Checklist

2. Service/ Maintenance Space. Provide sufficient space to allow comfortable performance of service procedures and routine maintenance. This is especially important in connection with machines equipped with AC inverter drives. Consult installation instructions for specific details.

Replace all panels that are removed to perform service and maintenance procedures. Do not operate the machine with missing guards or with broken or missing parts. Do not bypass any safety devices

Input and output services

1. Water pressure. Best performance will be realized if water is provided at a pressure of 30-60 psi (2.0-4.0 bar). Although the machine will function properly at lower pressure, increased fill time will occur. Water pressure higher than 100 psi (7.0 bar) may result in damage to machine plumbing. components failure (s) and personal injuries.

2. Optional Steam heating pressure. Best performance will be realized if steam pressure is provided at a pressure of 30-80 psi (2.0-5.4 bar). Steam pressure higher than 100 psi (7.0 bar) may result in damage to steam components and may cause personal injuries. For machines equipped with optional steam heat, install piping in accordance with approved commercial steam practices. Failure to install the supplied steam filter may void the warranty.

3. Compressed Air. For machines requiring compressed air service, best performance will be realized if air is provided at a pressure of 80-100psi (5.4-6.7 bar). Large capacity machines could experience door seal failures if compressed air service is interrupted. Ensure the provided air is filtered and dry. Wet and/or dirty air will cause rapid deterioration of internal components and void your warranty on these parts.

4. Drainage System. Provide drain lines or troughs large enough to accommodate the total quantity of water that could be dumped if all machines on the site drained at the same time from the highest attainable level. If drain troughs are used, they should be covered to support light foot traffic

5. Power. For personal safety and for proper operation, the machine must be grounded in accordance with state and local codes. The ground connection must be to a proven earth ground, not to conduits or water pipes. An easy-access disconnect switch should be provided.

Ensure that a ground wire from a proven earth ground Is connected to the ground lug in the electrical junction box on this machine. Without proper grounding personal injury from electrical shock could occur and machine malfunctions may be evident. Computer-controlled machines must have a proper ground to

Introduction

Safety Checklist

prevent computer malfunctions.

Always disconnect power and water supplies before a service technician performs any service procedure. Where applicable, steam and/or compressed air supplies should also be disconnected before service is performed

AC Inverter Drive

Machines equipped with AC drives require special attention with regard to the operating environment.

1. An especially dusty or linty environment will require more frequent cleaning of the AC drive cooling fan filters and of the AC drive itself.

2. Power line fluctuations from sources such as an interruptible power supplies (UPS) can adversely affect machines equipped with the AC drive. Proper suppression devices should be utilized on the incoming power to the machine to avoid problems.

3. A clean power supply free from voltage spikes and surges is absolutely essential for machines equipped with the AC drive. Nonlinear inconsistencies (peaks and valleys) in the power can cause the AC drive to generate nuisance errors. If voltage is above 230V for 200 V installations or above 460V for 400V installations, a buck/boost transformer is recommended. If voltage is above 240V or 480V, a buck/boost transformer is required unless the factory advises differently.

4. Sufficient space to perform service procedures and routine preventive maintenance is especially important for machines equipped with AC drives.

Misuse

Even though this machine is an atmospheric vessel, never use it for any purpose other than washing fabrics. Such misuse will void any warranty, and could cause serious injury or death.

1. Never wash petroleum-soaked rags in the machine. This could result in an explosion

2. Never wash machine parts or automotive parts in the machine. This could result in serious damage to the basket.

3. Never stone wash in the machine. It could wear the basket and serious damage might occur to the machine.

4. Never use the machine for dyeing and with harsh chemicals that can cause corrosion and other health hazards.

5. Never allow children to play on or around this machine. Death or serious injury can result if children become trapped in the machine. Do not leave children unattended while the machine door is open. these cautions apply to animals as well.

Installation

Theory of Operation

The B&C SI models use a single-speed motor to drive the cylinder via V-belts in all speeds. The cylinder is supported by two spherical roller bearings located in split pillow block housings made of cast steel.

The motor is controlled by the computer control located in the front and the AC inverter drive located in the rear panel. Any speed can be programmed for any wash cycle. Some speed ranges are blocked out for programming due to safety reasons. These speed ranges are ones that the machine cannot operate at due to its spring or suspension resonance. This speed range is not important and normal speeds for wash or extraction are not within this range. Any wash speed in the range of 10-50 RPM and extraction speeds 150 to max RPM can be programmed. Further, any reversing action can be programmed. Normal reversing action is 16 seconds forward, pause for 4 seconds, and 16 seconds reverse. Any temperature between 70F to 200F (20-95C) can be programmed. Any water level in the range of the machine parameters can be programmed in centimeters. The computers will automatically provide safety levels for steam injections and door operations.

Water entry into the machine is through electromagnetic water valves controlled by the computer. The computer also controls the drain, supply dispenser, any external liquid supplies, steam injection and any other vital functions of the wash program. The control also records cycles and data of importance that are used for maintenance purposes.

The steam, if installed is injected in the bottom of the shell via a steam injector. The steam is controlled by a steam valve that is activated by the control.

The cylinder is perforated, allowing water to pass through and drain from within during drain and extract steps. Lifting ribs inside the cylinder lift the load from the wash solution and allow the load to tumble and falling back into the solution when the load reaches the approximate 10-11 o'clock or 1-2 o'clock positions. This mechanical action removes soil from the fabric. Furthermore, the lifters are perforated on the top so that water can cascade over the goods and wet them quickly. This reduces water consumption as water is picked up at the cylinder's lowest point and lifted and splashed over the goods at the highest point as the cylinder rotates.

A stainless steel door is provided for loading and unloading. A door lock system prevents operation of the machine when the door is open. The door is locked during operation utilizing an air cylinder and a manual latch for safety reasons. The door lock is provided with magnetic sensor to indicate that the machine is locked and provide for start of the machine when the door is closed and locked.

The AC drive, brake unit, contactor, circuit overload protectors, input power supply connections, external supply connections, and control transformer are behind a cover of the rear of the machine. Pneumatic controls together with the air pressure regulator for the door seal are also located here.

Installation

Theory of Operation

The supply dispenser is mounted on the left side of the machine and is accessed by opening the cover door. Supplies, both liquid and powder; may be added by pulling the dispenser cups out and placing the appropriate supply in each. Supplies are flushed into the machine at the proper time in the cycle, controlled by the micro computer.

Holes are provided in the top of the supply dispenser for connection to an external, central liquid supply unit. Electrical connections are provided for the liquid supply unit on a terminal strip inside the rear control module. Refer to page 34 for connection details.

Installation

Inspection and Uncrating

Delivery inspection

Upon delivery, visually inspect crate, protective cover, and unit for any visible shipping damage. If the crate, protective cover, or unit are damaged or signs of possible damage are evident, have the carrier note the condition on the shipping document before the shipping receipt is signed, or advise the carrier of the conditions as soon as it is discovered.

Remove the crate and protective cover as soon after delivery as possible. if any damage is discovered upon removal of the crate and/or protective cover, advise the carrier and file a written claim immediately.

Customer Service

If literature or replacement parts are required contact the source from whom the machine was purchased or contact :

B&C Technologies
(850) 249-2222
(850) 249-2226 FAX
info@bandctech.com
www.bandctech.com

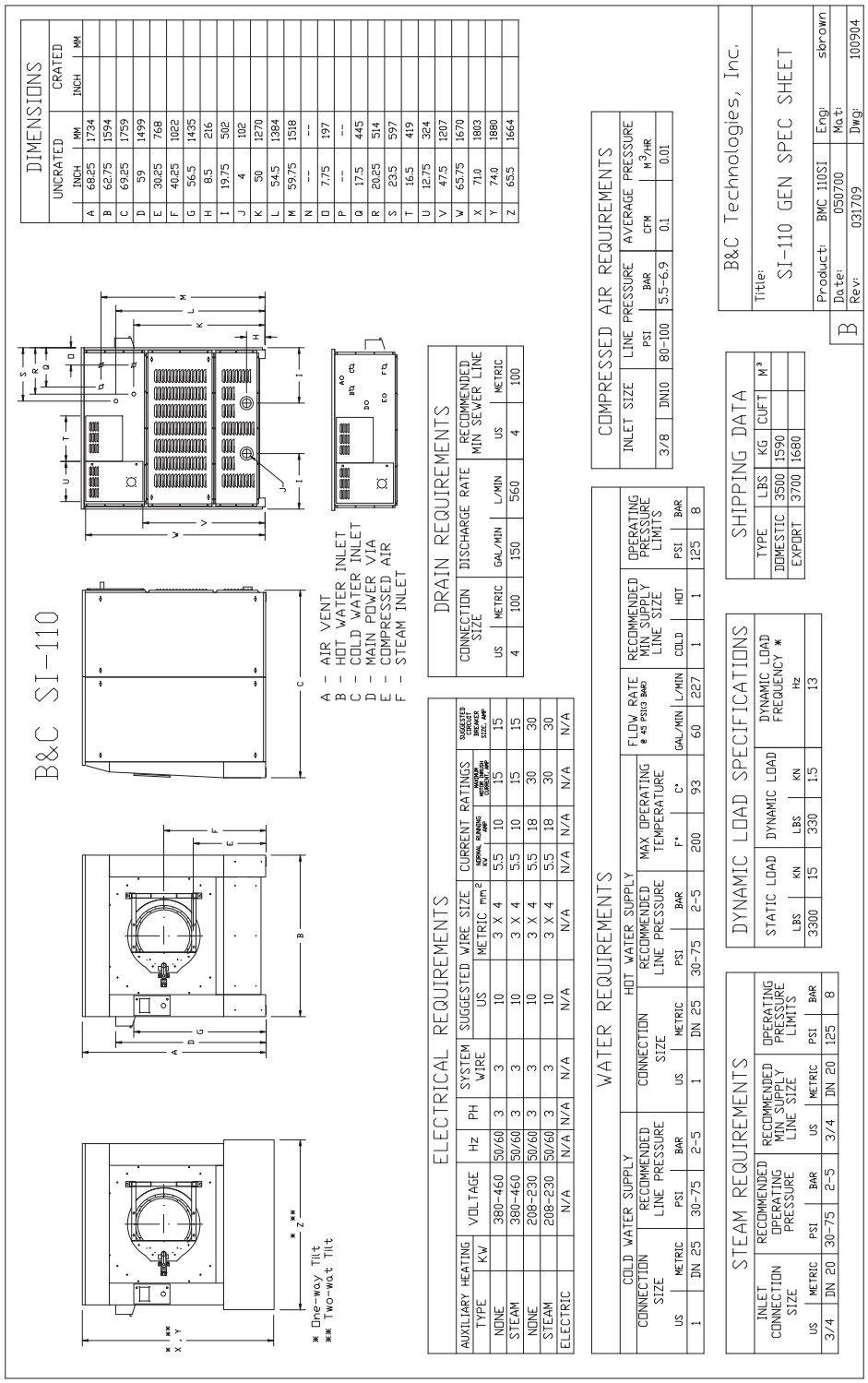
for the name of the nearest authorized parts distributor.

A record of each machine is on file with the manufacturer. The serial number decal is located at the rear of the machine. Always provide the machine's serial number and model number when ordering parts or when seeking technical assistance.

NOTE!
Keep the manuals, installation instructions and the wiring diagrams which accompany the machine in a safe place for ready reference. They have been included with the machine at no charge. Additional copies are available at a nominal charge.

Installation

SI-110 Technical Specifications



DIMENSIONS

	UNCRATED INCH	UNCRATED MM	CRATED INCH	CRATED MM
A	68.25	1734		
B	62.75	1594		
C	69.25	1759		
D	59	1499		
E	30.25	768		
F	40.25	1022		
G	56.5	1435		
H	8.5	216		
I	19.75	502		
J	4	102		
K	50	1270		
L	54.5	1384		
M	59.75	1518		
N	--	--		
O	7.75	197		
P	--	--		
Q	17.5	445		
R	20.25	514		
S	23.5	597		
T	16.5	419		
U	12.75	324		
V	47.5	1207		
W	65.75	1670		
X	710	1803		
Y	740	1880		
Z	65.5	1664		

ELECTRICAL REQUIREMENTS

AUXILIARY HEATING TYPE	AUXILIARY HEATING KW	VOLTAGE	Hz	PH	SYSTEM WIRE	SUGGESTED WIRE SIZE US	SUGGESTED WIRE SIZE METRIC mm²	CURRENT RATINGS NOMINAL RUNNING AMP KW	CURRENT RATINGS MAXIMUM INTERRUPTED CURRENT AMP	SUGGESTED CIRCUIT BREAKER SIZE, AMP
NONE		380-460	50/60	3	3	10	3 X 4	5.5	10	15	15
STEAM		380-460	50/60	3	3	10	3 X 4	5.5	10	15	15
NONE		208-230	50/60	3	3	10	3 X 4	5.5	18	30	30
STEAM		208-230	50/60	3	3	10	3 X 4	5.5	18	30	30
ELECTRIC		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

DRAIN REQUIREMENTS

CONNECTION SIZE US	CONNECTION SIZE METRIC	DISCHARGE RATE GAL/MIN	DISCHARGE RATE L/MIN	RECOMMENDED MIN SEWER LINE US	RECOMMENDED MIN SEWER LINE METRIC
4	100	150	560	4	100

COMPRESSED AIR REQUIREMENTS

INLET SIZE	LINE PRESSURE PSI	LINE PRESSURE BAR	AVERAGE PRESSURE CFM	AVERAGE PRESSURE M^3/HR
3/8	DN10	80-100	5.5-6.9	0.1	0.01

WATER REQUIREMENTS

COLD WATER SUPPLY CONNECTION SIZE US	COLD WATER SUPPLY CONNECTION SIZE METRIC	COLD WATER SUPPLY RECOMMENDED LINE PRESSURE PSI	COLD WATER SUPPLY RECOMMENDED LINE PRESSURE BAR	HOT WATER SUPPLY CONNECTION SIZE US	HOT WATER SUPPLY CONNECTION SIZE METRIC	HOT WATER SUPPLY RECOMMENDED LINE PRESSURE PSI	HOT WATER SUPPLY RECOMMENDED LINE PRESSURE BAR	MAX OPERATING TEMPERATURE F°	MAX OPERATING TEMPERATURE C°	FLOW RATE @ 45 PSI/3 BAR GAL/MIN	FLOW RATE @ 45 PSI/3 BAR L/MIN	RECOMMENDED MIN SUPPLY LINE SIZE COLD	RECOMMENDED MIN SUPPLY LINE SIZE HOT	OPERATING PRESSURE LIMITS PSI	OPERATING PRESSURE LIMITS BAR
1	DN 25	30-75	2-5	1	DN 25	30-75	2-5	200	93	60	227	1	1	125	8

STEAM REQUIREMENTS

INLET CONNECTION SIZE US	INLET CONNECTION SIZE METRIC	RECOMMENDED OPERATING PRESSURE PSI	RECOMMENDED OPERATING PRESSURE BAR	RECOMMENDED MIN SUPPLY LINE SIZE US	RECOMMENDED MIN SUPPLY LINE SIZE METRIC	OPERATING PRESSURE LIMITS PSI	OPERATING PRESSURE LIMITS BAR
3/4	DN 20	30-75	2-5	3/4	DN 20	125	8

DYNAMIC LOAD SPECIFICATIONS

STATIC LOAD LBS	STATIC LOAD KN	DYNAMIC LOAD LBS	DYNAMIC LOAD KN	DYNAMIC LOAD FREQUENCY * Hz
3300	15	330	1.5	13

SHIPPING DATA

TYPE	LBS	KG	CUFT	M^3
DOMESTIC	3500	1590		
EXPORT	3700	1680		

B&C Technologies, Inc.

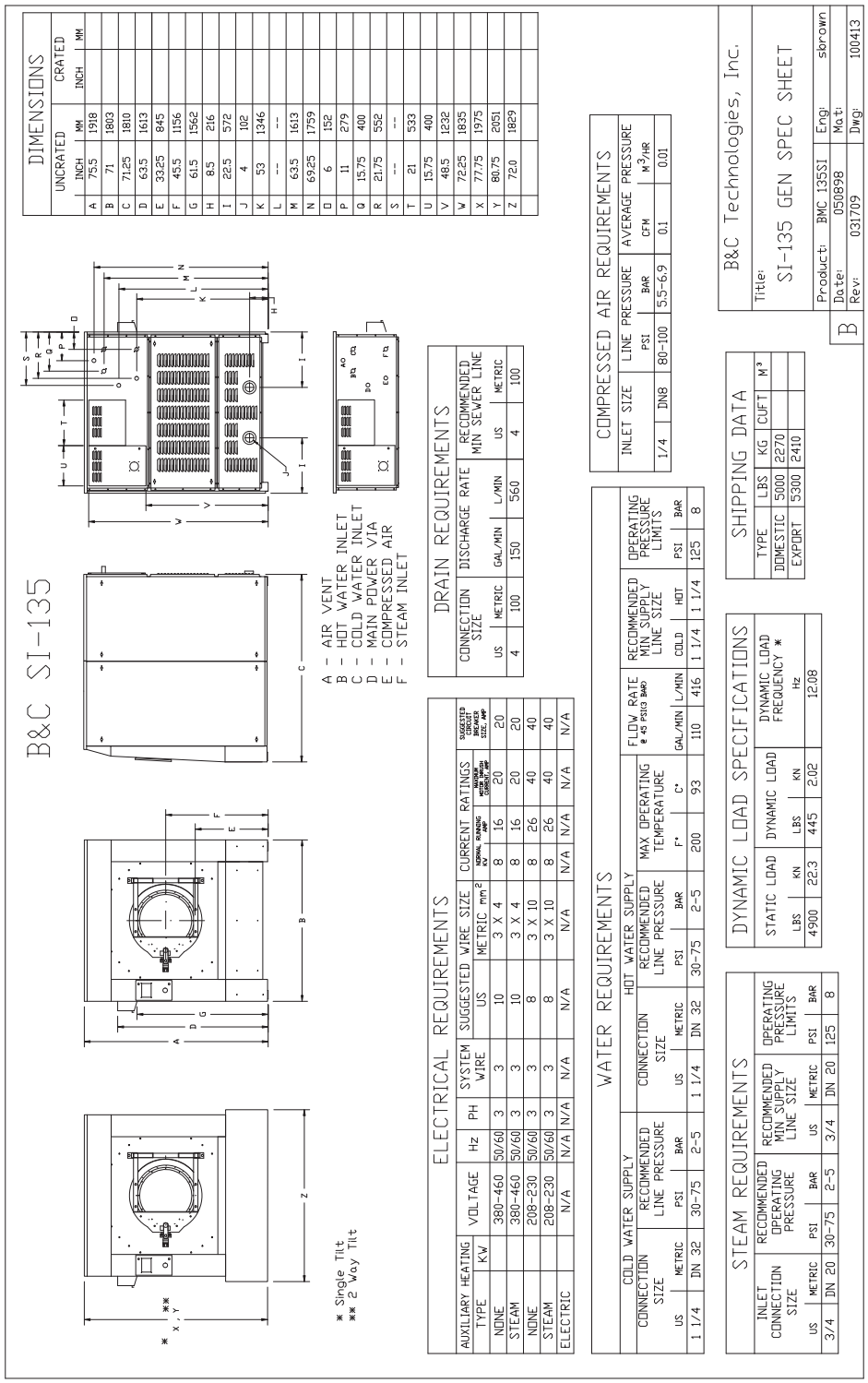
Title: SI-110 GEN SPEC SHEET

Product:	BMC 110SI	Eng:	sbrown
Date:	050700	Mat:	
Rev:	031709	Dwg:	100904

B

Installation

SI-135 Technical Specifications



DIMENSIONS

	UNCRATED INCH	UNCRATED MM	CRATED INCH	CRATED MM
A	75.5	1918		
B	71	1803		
C	71.25	1810		
D	63.5	1613		
E	33.25	845		
F	45.5	1156		
G	61.5	1562		
H	8.5	216		
I	22.5	572		
J	4	102		
K	53	1346		
L	--	--		
M	63.5	1613		
N	69.25	1759		
O	6	152		
P	11	279		
Q	15.75	400		
R	21.75	552		
S	--	--		
T	21	533		
U	15.75	400		
V	48.5	1232		
W	72.25	1835		
X	77.75	1975		
Y	80.75	2051		
Z	72.0	1829		

DRAIN REQUIREMENTS

CONNECTION SIZE		DISCHARGE RATE		RECOMMENDED MIN SEWER LINE	
US	METRIC	GAL/MIN	L/MIN	US	METRIC
4	100	150	560	4	100

COMPRESSED AIR REQUIREMENTS

INLET SIZE	LINE PRESSURE PSI	LINE PRESSURE BAR	AVERAGE PRESSURE CFM	AVERAGE PRESSURE M^3/HR
1/4	DN8	80-100	5.5-6.9	0.1	0.01

ELECTRICAL REQUIREMENTS

AUXILIARY HEATING TYPE	AUXILIARY HEATING KW	VOLTAGE	Hz	PH	SYSTEM WIRE	SUGGESTED WIRE SIZE US	SUGGESTED WIRE SIZE METRIC mm^2	CURRENT RATINGS NOMINAL RANGING AMP KW	CURRENT RATINGS MINIMUM CIRCUIT AMPS	SUGGESTED CIRCUIT BREAKER SIZE, AMP
NONE		380-460	50/60	3	3	10	3 X 4	8	16	20	20
STEAM		380-460	50/60	3	3	10	3 X 4	8	16	20	20
NONE		208-230	50/60	3	3	8	3 X 10	8	26	40	40
STEAM		208-230	50/60	3	3	8	3 X 10	8	26	40	40
ELECTRIC		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

WATER REQUIREMENTS

COLD WATER SUPPLY CONNECTION SIZE US	COLD WATER SUPPLY CONNECTION SIZE METRIC	COLD WATER SUPPLY RECOMMENDED LINE PRESSURE PSI	COLD WATER SUPPLY RECOMMENDED LINE PRESSURE BAR	HOT WATER SUPPLY CONNECTION SIZE US	HOT WATER SUPPLY CONNECTION SIZE METRIC	HOT WATER SUPPLY RECOMMENDED LINE PRESSURE PSI	HOT WATER SUPPLY RECOMMENDED LINE PRESSURE BAR	MAX OPERATING TEMPERATURE F°	MAX OPERATING TEMPERATURE C°	FLOW RATE @ 45 PSI/3 BAR GAL/MIN	FLOW RATE @ 45 PSI/3 BAR L/MIN	RECOMMENDED MIN SUPPLY LINE SIZE COLD	RECOMMENDED MIN SUPPLY LINE SIZE HOT	OPERATING PRESSURE LIMITS PSI	OPERATING PRESSURE LIMITS BAR
1 1/4	DN 32	30-75	2-5	1 1/4	DN 32	30-75	2-5	200	93	110	416	1 1/4	1 1/4	125	8

DYNAMIC LOAD SPECIFICATIONS

STATIC LOAD LBS	STATIC LOAD KN	DYNAMIC LOAD LBS	DYNAMIC LOAD KN	DYNAMIC LOAD FREQUENCY * Hz
4900	22.3	445	2.02	12.08

SHIPPING DATA

TYPE	LBS	KG	CUFT	M^3
DOMESTIC	5000	2270		
EXPORT	5300	2410		

STEAM REQUIREMENTS

INLET CONNECTION SIZE US	INLET CONNECTION SIZE METRIC	RECOMMENDED OPERATING PRESSURE PSI	RECOMMENDED OPERATING PRESSURE BAR	RECOMMENDED MIN SUPPLY LINE SIZE US	RECOMMENDED MIN SUPPLY LINE SIZE METRIC	OPERATING PRESSURE LIMITS PSI	OPERATING PRESSURE LIMITS BAR
3/4	DN 20	30-75	2-5	3/4	DN 20	125	8

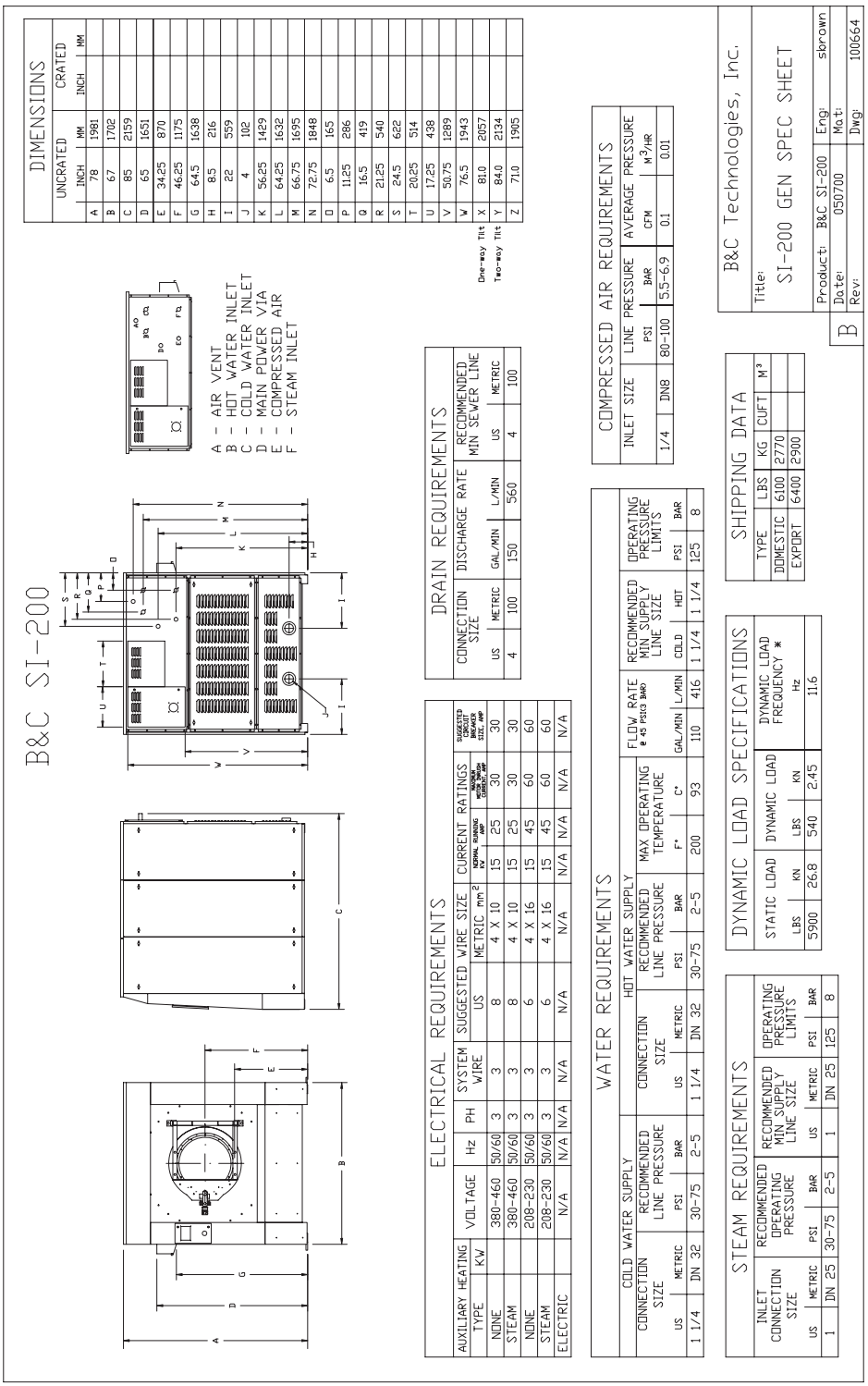
B&C Technologies, Inc.

Title: SI-135 GEN SPEC SHEET

Product: BMC 135SI | Eng: sbrown
Date: 050898 | Mat:
Rev: 031709 | Dwg: 100413

Installation

SI-200 Technical Specifications



DIMENSIONS

	UNCRATED INCH	UNCRATED MM	CRATED INCH	CRATED MM
A	78	1981		
B	67	1702		
C	85	2159		
D	65	1651		
E	34.25	870		
F	46.25	1175		
G	64.5	1638		
H	8.5	216		
I	22	559		
J	4	102		
K	56.25	1429		
L	64.25	1632		
M	66.75	1695		
N	72.75	1848		
O	6.5	165		
P	11.25	286		
Q	16.5	419		
R	21.25	540		
S	24.5	622		
T	20.25	514		
U	17.25	438		
V	50.75	1289		
W	76.5	1943		
X	81.0	2057		
Y	84.0	2134		
Z	71.0	1905		

One-way Tilt
Two-way Tilt

DRAIN REQUIREMENTS

CONNECTION SIZE		DISCHARGE RATE			RECOMMENDED MIN SEWER LINE	
US	METRIC	GAL/MIN	L/MIN		US	METRIC
4	100	150	560		4	100

COMPRESSED AIR REQUIREMENTS

INLET SIZE	LINE PRESSURE PSI	LINE PRESSURE BAR	AVERAGE PRESSURE CFM	AVERAGE PRESSURE M^3/HR
1/4	DN8	80-100	5.5-6.9	0.1	0.01

ELECTRICAL REQUIREMENTS

AUXILIARY HEATING TYPE	AUXILIARY HEATING KW	VOLTAGE	Hz	PH	SYSTEM WIRE	SUGGESTED WIRE SIZE US	SUGGESTED WIRE SIZE METRIC mm^2	CURRENT RATINGS NORMAL RUNNING W/A	CURRENT RATINGS MAXIMUM OVERCURRENT AMP	SUGGESTED CIRCUIT BREAKER SIZE AMP
NONE		380-460	50/60	3	3	8	4 X 10	15	25	30
STEAM		380-460	50/60	3	3	8	4 X 10	15	25	30
NONE		208-230	50/60	3	3	6	4 X 16	15	45	60
STEAM		208-230	50/60	3	3	6	4 X 16	15	45	60
ELECTRIC		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

WATER REQUIREMENTS

COLD WATER SUPPLY CONNECTION SIZE US	COLD WATER SUPPLY CONNECTION SIZE METRIC	COLD WATER SUPPLY RECOMMENDED LINE PRESSURE PSI	COLD WATER SUPPLY RECOMMENDED LINE PRESSURE BAR	HOT WATER SUPPLY CONNECTION SIZE US	HOT WATER SUPPLY CONNECTION SIZE METRIC	HOT WATER SUPPLY RECOMMENDED LINE PRESSURE PSI	HOT WATER SUPPLY RECOMMENDED LINE PRESSURE BAR	MAX OPERATING TEMPERATURE F°	MAX OPERATING TEMPERATURE C°	FLOW RATE @ 45 PSI/3 BAR GAL/MIN	FLOW RATE @ 45 PSI/3 BAR L/MIN	RECOMMENDED MIN SUPPLY LINE SIZE COLD	RECOMMENDED MIN SUPPLY LINE SIZE HOT	OPERATING PRESSURE LIMITS PSI	OPERATING PRESSURE LIMITS BAR
1 1/4	DN 32	30-75	2-5	1 1/4	DN 32	30-75	2-5	200	93	110	416	1 1/4	1 1/4	125	8

SHIPPING DATA

TYPE	LBS	KG	CUFT	M^3
DOMESTIC	6100	2770		
EXPORT	6400	2900		

DYNAMIC LOAD SPECIFICATIONS

STATIC LOAD LBS	STATIC LOAD KN	DYNAMIC LOAD LBS	DYNAMIC LOAD KN	DYNAMIC LOAD FREQUENCY * Hz
5900	26.8	540	2.45	11.6

STEAM REQUIREMENTS

INLET CONNECTION SIZE US	INLET CONNECTION SIZE METRIC	RECOMMENDED OPERATING PRESSURE PSI	RECOMMENDED OPERATING PRESSURE BAR	RECOMMENDED MIN SUPPLY LINE SIZE US	RECOMMENDED MIN SUPPLY LINE SIZE METRIC	OPERATING PRESSURE LIMITS PSI	OPERATING PRESSURE LIMITS BAR
1	DN 25	30-75	2-5	1	DN 25	125	8

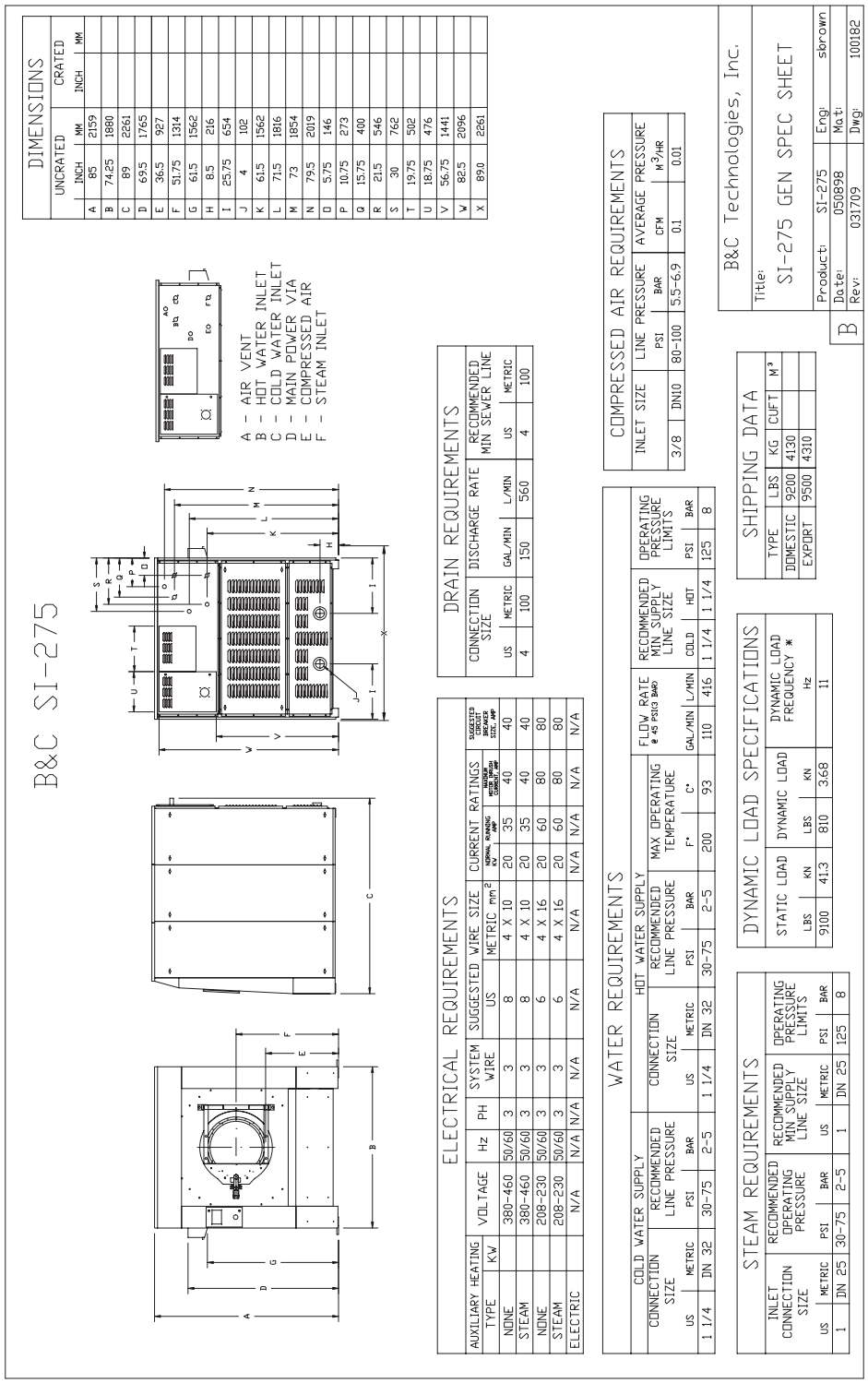
B&C Technologies, Inc.

Title: SI-200 GEN SPEC SHEET

Product: B&C SI-200 Eng: sbrown
Date: 050700 Mat:
Rev: Dwg: 100664

Installation

SI-275 Technical Specifications



DIMENSIONS	UNCRATED		CRATED	
	INCH	MM	INCH	MM
A	85	2159		
B	74.25	1880		
C	89	2261		
D	69.5	1765		
E	36.5	927		
F	51.75	1314		
G	61.5	1562		
H	8.5	216		
I	25.75	654		
J	4	102		
K	61.5	1562		
L	71.5	1816		
M	73	1854		
N	79.5	2019		
O	5.75	146		
P	10.75	273		
Q	15.75	400		
R	21.5	546		
S	30	762		
T	19.75	502		
U	18.75	476		
V	56.75	1441		
W	82.5	2096		
X	89.0	2261		

ELECTRICAL REQUIREMENTS							
AUXILIARY HEATING		VOLTAGE	Hz	PH	SYSTEM WIRE	SUGGESTED WIRE SIZE	
TYPE	KW					US	METRIC mm²
NONE		380-460	50/60	3	3	8	4 X 10
STEAM		380-460	50/60	3	3	8	4 X 10
NONE		208-230	50/60	3	3	6	4 X 16
STEAM		208-230	50/60	3	3	6	4 X 16
ELECTRIC		N/A	N/A	N/A	N/A	N/A	N/A

CURRENT RATINGS		SUGGESTED MAIN BREAKER SIZE AMP
NORMAL RUNNING AMPS	MINIMUM CIRCUIT AMPACITY	
20	35	40
20	35	40
20	60	80
20	60	80
N/A	N/A	N/A

WATER REQUIREMENTS											
COLD WATER SUPPLY				HOT WATER SUPPLY							
CONNECTION SIZE		RECOMMENDED LINE PRESSURE		CONNECTION SIZE		RECOMMENDED LINE PRESSURE		MAX OPERATING TEMPERATURE		FLOW RATE @ 45 PSI/3 BAR	RECOMMENDED MIN SUPPLY LINE SIZE		OPERATING PRESSURE LIMITS	
US	METRIC	PSI	BAR	US	METRIC	PSI	BAR	F°	C°	GAL/MIN	L/MIN	COLD	HOT	PSI	BAR
1 1/4	DN 32	30-75	2-5	1 1/4	DN 32	30-75	2-5	200	93	110	416	1 1/4	1 1/4	125	8

DRAIN REQUIREMENTS					
CONNECTION SIZE		DISCHARGE RATE			RECOMMENDED MIN SEWER LINE
US	METRIC	GAL/MIN	L/MIN	US	METRIC
4	100	150	560	4	100

COMPRESSED AIR REQUIREMENTS				
INLET SIZE	LINE PRESSURE		AVERAGE PRESSURE	
	PSI	BAR	CFM	M^3/HR
3/8	DN10	80-100	5.5-6.9	0.1	0.01

STEAM REQUIREMENTS						
INLET CONNECTION SIZE		RECOMMENDED OPERATING PRESSURE		RECOMMENDED MIN SUPPLY LINE SIZE		OPERATING PRESSURE LIMITS
US	METRIC	PSI	BAR	US	METRIC	PSI	BAR
1	DN 25	30-75	2-5	1	DN 25	125	8

DYNAMIC LOAD SPECIFICATIONS					
STATIC LOAD		DYNAMIC LOAD		DYNAMIC LOAD FREQUENCY *	
LBS	KN	LBS	KN	Hz	
9100	41.3	810	3.68	11	

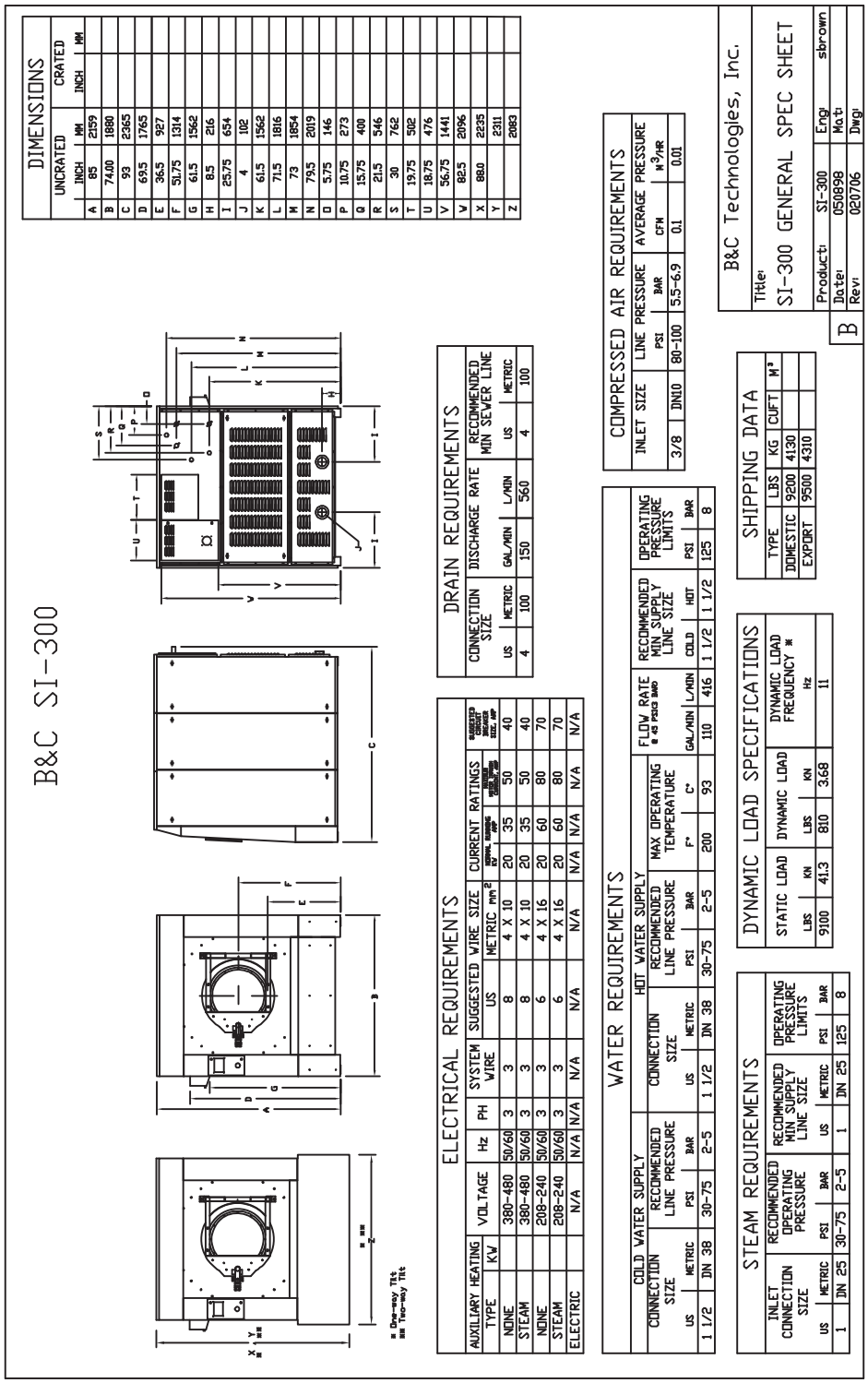
SHIPPING DATA				
TYPE	LBS	KG	CUFT	M^3
DOMESTIC	9200	4130		
EXPORT	9500	4310		

Product:	SI-275	Eng:	sbrown
Date:	050898	Mat:	
Rev:	031709	Dwg:	100182

B

Installation

SI-300 Technical Specifications



Installation

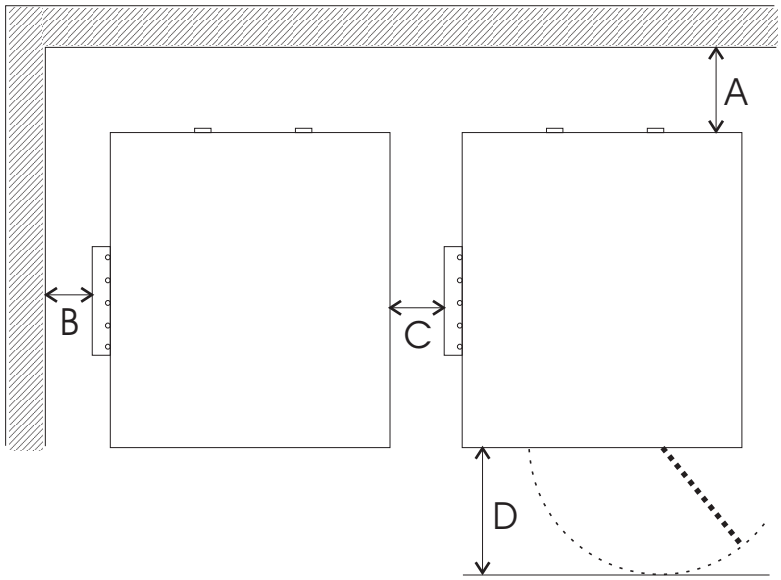
Dimensional Clearances

When installing the washer-extractor, it is important to allow adequate clearance on all sides of the machine. When multiple machines are installed, it is important to allow for the specified minimum clearances between machines. The following table shows recommended minimum clearances for the various freestanding models.

Note

The dimensions are approximate and subject to normal manufacturing tolerances. If exact dimensions are required for construction purposes, request certified drawings from the factory. We reserve the right to make changes at any time without notice.

	UNITS Metric	UNITS US	SI Series		SI Series Tilt	
(A) Minimum rear clearance	mm	in	760	30	760	30
(B) Minimum clearance between machine and wall	mm	in	455	18	455	18
(C) Minimum clearance between machines	mm	in	455	18	455	18
(D) Minimum front clearance	mm	in	850	33	1220	48



Installation

Machine Foundation

Thoroughness of details must be stressed with all foundation work to insure a stable unit installation, eliminating possibilities of excessive vibrations during extraction.

The machine must be anchored to a smooth level surface so that the entire base of the machine is supported and rest on the mounting surface. Note! Do not support the machine on only four points.

Note! Freestanding washer-extractors do not require anchoring bolts unless specified by state or local codes. However it is always recommended that the machines be anchored.

Special care must be taken when machines are installed on an upper floor. Make sure that the floors are designed to carry the static and dynamic loads of the machines. Further vibrations should be taken into consideration so that the machine does not create vibrations in the building.
Static and dynamic loads on the floor or foundation are shown in the table below. This table can be used as reference when designing floors and foundations. See figure for mounting bolt layout measurement and pattern.

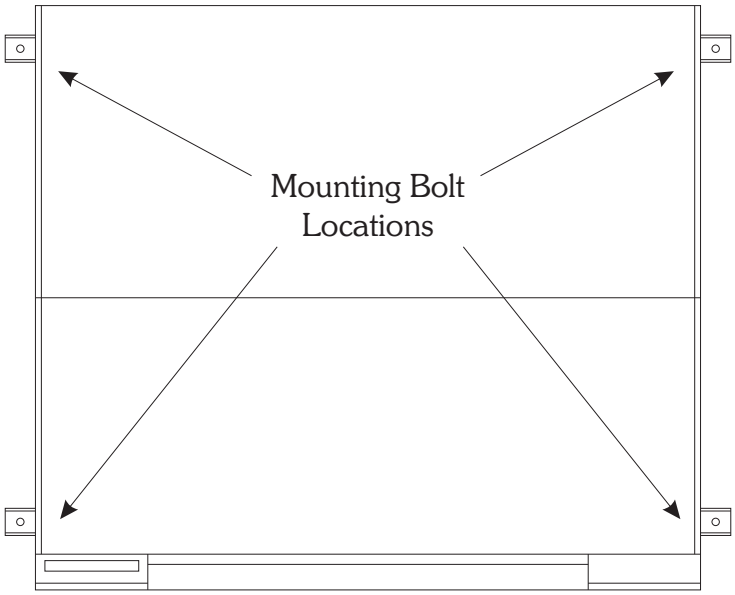
Ensure that the machine is installed on a level floor of sufficient strength and that the recommended clearances for inspection and maintenance are provided. Never allow the inspection and maintenance space to be blocked

Floor Load Data

	Static floor load		Static pressure		Dynamic floor load		Max dynamic load		Dynamic pressure	
	kN	lbs	kN/m2	lbs-ft2	kN	lbs	kN	lbs	kN/m2	lbs-ft2
SI-110	15	3300	5.7	117	1.5	330	1.5	330	0.57	11.7
SI-110 TILT	17	3900	6.5	138.5	1.5	330	1.5	330	0.57	11.7
SI-135	22.3	4900	7.4	152	1.5	330	1.5	330	0.5	10.25
SI-135 TILT	24.9	5600	8.3	173.9	1.5	330	1.5	330	0.5	10.25
SI-200	26.8	5900	7.13	149	2.45	540	2.45	540	0.88	18.3
SI-200 TILT	30.25	6800	7.13	149	2.45	540	2.45	540	0.88	18.3
SI-275	47.7	10500	11.96	248	4.09	900	4.09	900	1.04	21.3
SI-275 TILT	51.3	11300	13.05	267	4.09	900	4.09	900	1.04	21.3

Installation

Foundation Bolt Location



Typical Grouting Pattern

Installation

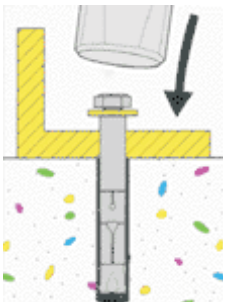
Mounting Bolt Installation

All B&C washer-extractors must be secured by the use of machinery anchor bolts (SI Series uses 3/4-10). High strength machinery anchors should be embedded in 3500 psi (24000 N/m2) reinforced concrete. See Figure. For detailed information regarding the machine anchor bolt, see the instructions included with the anchor bolts themselves. The following information is just an example.

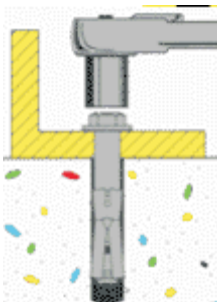
After the concrete has cured, proceed as follows:

Select a carbide drill bit with a diameter equal to the anchor diameter. Drill hole to any depth exceeding the desired embedment.

Clean hole or continue drilling to accommodate drill fines (concrete dust). Please wear eye protection.



Drive the anchor into the hole through material being fastened until washer is flush with material.



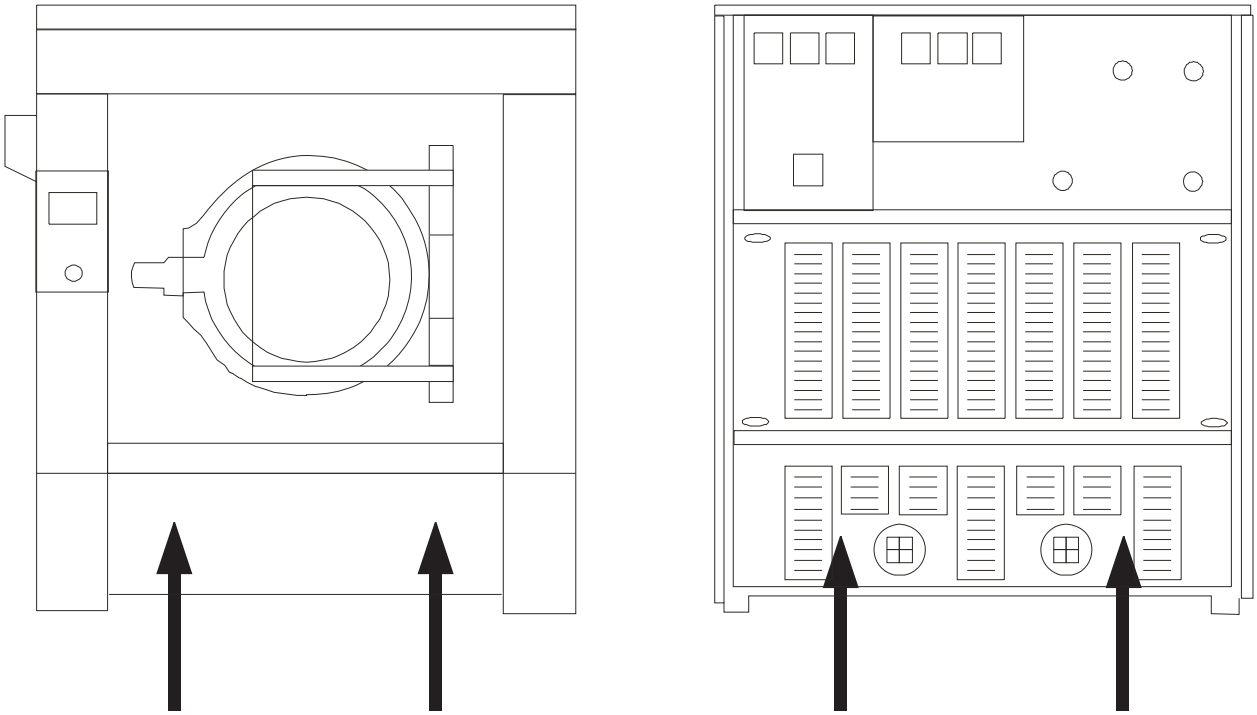
Expand bolt by tightening the anchor 3 to 5 turns, or to the specified torque requirements.

Place the machine adjacent to the foundation. Do not attempt to move it by pushing on the sides.

1. Remove the wood skid by unscrewing the carriage bolts holding it to the bottom frame of the machine.
2. Carefully place the machine over the anchor bolts. Raise and level it 1/2 inch above the floor on four points, using spacers that can be removed.
3. Fill the spaces between the machine base and floor with machinery grout. Grout completely under all frame members. Remove front panel and rear panel to gain access to all frame members. Force grout under the machine base until all voids are filled.
4. Remove the spacers carefully, allowing the machine to settle into the wet grout.
5. Attached the mounting bolt washers and lock nuts to the anchor bolts after the grout has hardened. Tighten the lock nuts by even increments-one after the other-until all are tightened evenly and the machine is fastened securely to the floor. The nuts should be tightened in a diagonal fashion, which will help ensure equal tension at all anchor points.
6. Remove the four red transportation brackets which secure the moving components of the machine during shipping.

Installation

Transportation Brackets



Location of transportation brackets inside the machine

Installation

Drain Connection

A drain system of adequate capacity is essential to the machine performance. Ideally the water should empty through a 4 inch vented pipe directly into a sump or floor drain. See figure.

A flexible connection must be made to a vented drain system to prevent an airlock or siphon effect. On the tilt option models a flexible drain hose must be provided of adequate length to compensate for tilting action of the machine. If proper drain size is not available or practical, a surge tank is required. A surge tank in conjunction with a sump pump should be used when gravity drainage is not possible, such as in below-ground-level installations.

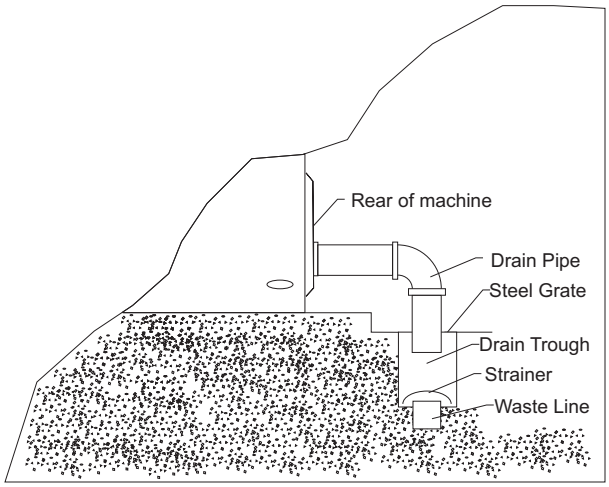
Before any deviation from specified installation procedures is attempted, the customer or installer should contact the manufacturer. Increasing the drain hose length, installing elbows, or causing bends will decrease drain flow rate and increase drain time, impairing machine performance. If the drain arrangement is inadequate, the machine will not extract and will not discharge water properly.

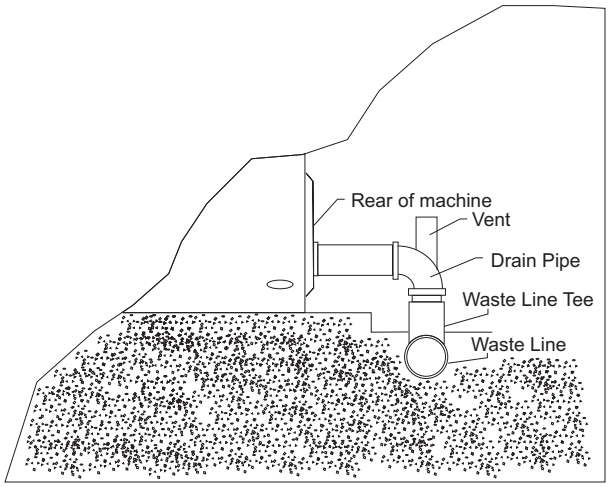
See table below for specific drain information.

Drain Sizing

	Units		SI Series	
	Metric	US		
Drain connection Size	mm	in	102	4
Drain flow capacity	liters/min	gpm	560	150
Recommended drain pit size	liters	gal	850	225

Drain Construction





Installation

Electrical Installation

The AC drive requires a clean power supply free from voltage spikes and surges. A voltage monitor should be used to check incoming power. The customer' s local power company may provide such a monitor.

The AC drive provides for an internal circuit breaker. A separate circuit breaker governs the control circuit.

If input voltage measures above 230V for a 200 V drive or above 460V for a 400V drive, either ask the power company if their representative can lower the voltage or install a bucking transformer kit available from the manufacturer. Voltages above 250V and 490V require additional measures. Contact the distributor or the manufacturer for assistance.

This machine must be installed, adjusted, and serviced by a qualified electrical maintenance personnel familiar with the construction and operation of this type of machinery. They must also be familiar with the potential hazards involved. If this warning is not observed, personal injury or equipment damage resulting in voiding the warranty may result.

When controlling the AC drive with a parameter unit, the machine's computer and its safety features are bypassed. This would allow the basket to rotate at high speeds with the door open. When using a parameter unit to control the AC drive, a large sign should be placed on the front of the machine warning people of the imminent danger.

Never touch terminals or components of the AC drive unless power is disconnected and the "CHARGE" indicator LED is off. The AC drive retains potential deadly voltage for some time after the power is disconnected. There are no user-serviceable parts inside the AC drive. Tampering with the drive will void the warranty

Dangerous voltage are present in the electrical control boxes and at the motor terminals. Only qualified personnel familiar with electrical test procedures, test equipment, and safety precautions should attempt adjustments and troubleshooting. Disconnect power from the machine before removing the control box cover, and before attempting any service procedures.

Installation

Electrical Installation

	200-240V			380-480V		
Machine	Max Amps	Breaker	Wire Size	Max Amps	Breaker	Wire Size
SI-110	21	30	10ga / 4mm	11	15	10ga / 4mm
SI-135	32	40	8ga / 10mm	16	20	10ga / 4mm
SI-200	58	60	6ga / 16mm	29	30	8ga / 10mm
SI-275	79	80	6ga / 16mm	39	40	8ga / 10mm

Note! Do not use phase adders (roto-phase) on inverter driven equipment!

Note! Wire sizes shown are for copper, THHN, 90 conductor per NEC article 310 (USA).

The machine should be connected to an individual branch circuit not shared with lighting or other equipment.

A lockable, load break rated, visible break disconnect switch with safe working clearances is required for all installations. A disconnect plug is also acceptable, so long as it is able to safely break the load, is in an accessible location, and can be locked.

The connection should be shielded in a liquid tight or approved flexible conduit with proper conductor of correct size installed in accordance with National Electric Code (USA) or other applicable codes. The connection must be made by a qualified electrician using the wiring diagram provided with the machine. See the Electrical Connection data Chart for correct wire sizes.

Use wire sizes indicated in the chart for runs up to 50 feet (15m). Use next larger size for runs of 50 to 100 feet (15-30m). Use 2 sizes larger for runs greater than 100 feet (30m).

For personal safety and for proper operation, the machine must be grounded in accordance with state and local codes and in the USA in accordance with the National Electric Code, article 250-96.

The ground connection must be to a proven earth ground, not to conduit or water pipes.

Do not connect the ground to the neutral (N) leg at the terminal strip.

If a DELTA supply system is used, the high leg should be connected to T or L3, as control power is derived from L1 & L2.

Installation

Water Connection

Individual hot and cold plumbing lines with individual shut-off valves must be available to the machine. Hot water should be minimum of 140F (60C). If lower temperature water is used the machine should be equipped for steam heating to heat the wash solution to desired temperature. Best performance will be realized if water is provided at a pressure of 30-60 psi (2.0-4.0 bar). Although the machine will function properly at lower pressures, increased fill times will occur.

Flush the water system for at least two minutes prior to initial use..

Use flexible hoses and install separate screen filters in the lines to keep rust and other foreign particles out of the solenoid valves. Hang the hoses in a large loop. Do not allow the hoses to kink. The water connections to the machine should be supplied by a hot and cold water line of least the sizes shown in the table below. Installation of additional machines will require proportional larger water lines, see table.

To avoid eventual water hammer in the water line, suitable devices to reduce the water hammer should be installed.

NUMBER OF MACHINES	SUPPLY LINE PIPE SIZES							
	SI-110		SI-135		SI-200		SI-275	
	DN	Inch	DN	Inch	DN	Inch	DN	Inch
1	25	1	32	1-1/4	32	1-1/4	40	1-1/2
2	25	1	32	1-1/4	32	1-1/4	40	1-1/2
3	40	1-1/2	50	2	50	2	50	2
4	40	1-1/2	50	2	50	2	50	2
5	50	2	63	2-1/2	63	2-1/2	63	2-1/2
6	50	2	63	2-1/2	63	2-1/2	63	2-1/2

Installation

Steam Connection

Never touch internal or external steam pipes, connections, or components. These surfaces can be extremely hot and will cause severe burns. The steam must be turned off and the pipe, connections, and components allowed to cool before the pipe can be touched

For machines equipped with optional steam heat, install piping in accordance with approved commercial steam practices.

Steam requirements are shown in the table below. Failure to install the supplied steam filter may void the warranty.

MODEL	Units		110SI	
STEAM INLET and CONSUMPTION:				
Steam inlet size	DN	in	20	3/4
Required steam to heat bath 10F (5.55C)LOW	kg	lbs	3.15	7
Required steam to heat bath 10F (5.55C)HIGH	kg	lbs	4.77	10.5
Average Steam consumption per cycle	kg	lbs	72	158

MODEL	Units		SI-135	
STEAM INLET and CONSUMPTION:				
Steam inlet size	DN	in	20	3/4
Required steam to heat bath 10F (5.55C)LOW	kg	lbs	3.8	8.4
Required steam to heat bath 10F (5.55C)HIGH	kg	lbs	5.8	12.76
Average Steam consumption per cycle	kg	lbs	88	194

MODEL	Units		SI-200	
STEAM INLET and CONSUMPTION:				
Steam inlet size	DN	in	25	1
Required steam to heat bath 10F (5.55C)LOW	kg	lbs	5	11
Required steam to heat bath 10F (5.55C)HIGH	kg	lbs	7.7	16.9
Average Steam consumption per cycle	kg	lbs	117	194

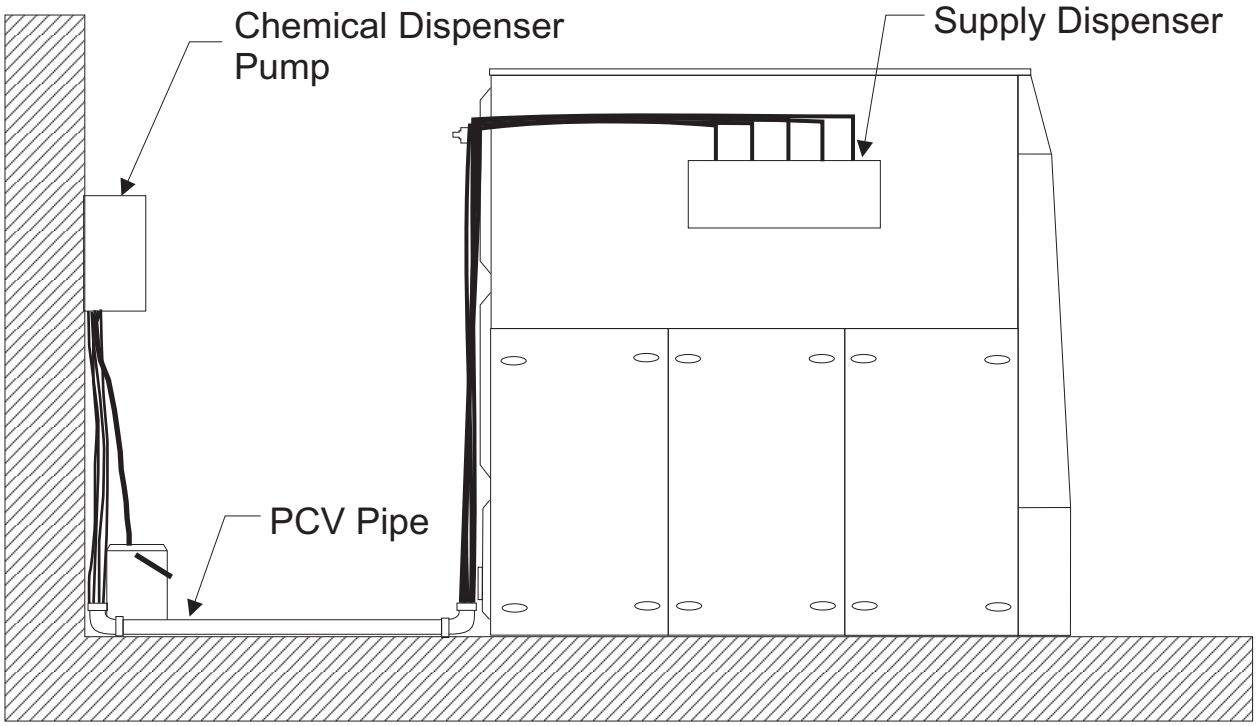
MODEL	Units		SI-275	
STEAM INLET and CONSUMPTION:				
Steam inlet size	DN	in	25	1
Required steam to heat bath 10F (5.55C)LOW	kg	lbs	5.25	11.5
Required steam to heat bath 10F (5.55C)HIGH	kg	lbs	7.95	17.5
Average Steam consumption per cycle	kg	lbs	120	260

Installation

External Chemical Supplies

Wear Eye and hand protection when handling chemicals. Always avoid direct contact with raw chemicals. Read the manufacturer's directions for accidental contact before handling chemicals. Ensure that an eye-rinse facility and an emergency shower are within easy reach. Check at regular intervals for chemical leaks.

The following procedures must be observed when connecting any chemical injector to the washer-extractor. See the figure for a typical supply injection system setup. Undiluted chemicals dripping can damage the machine. Therefore, all chemicals supply dispenser pumps should be mounted below the washer's injection point. All dispenser tubing should also run below the injection point. Loops do not prevent drips if these instructions are not followed. Failure to follow these instructions could damage the machine and void the warranty.



Installation

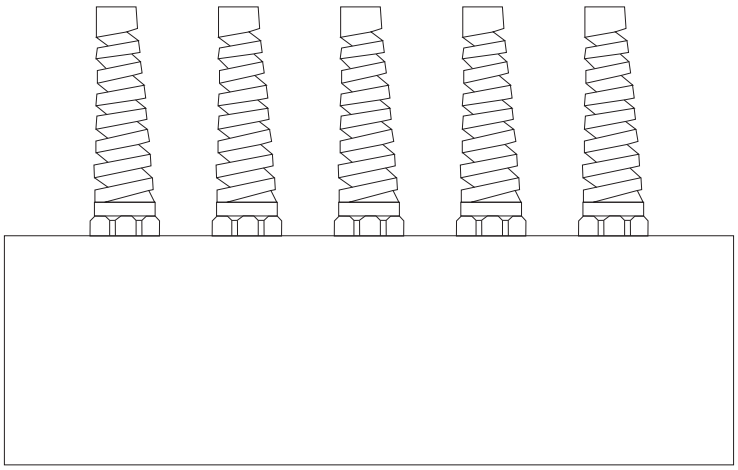
External Chemical Supplies

The supply compartment on the B&C SI models is located on the left side of the machine. Supply cups can be accessed by open the dispenser lid. The supply cups can be removed and filled as desired. Supply compartments are numbered 1,2,3,4 and 5 from the rear of the machine to the front.

External supply connections for the B&C SI washer-extractors are located on top of the supply dispenser. Hose connections should be made via the strain relief. See figure.

1. Remove plugs from base. See figure. Plugs are assembled inside the tubing ring.
2. Install strain relief, included in the seal nut.
3. Insert tubes through base. Do not remove cups. Tube should extend into the plastic cup, with the exception of the softener tube, which should be routed to the outside of the cup.
4. Tighten the seal nut to prevent tubing from escaping the assembly.

Strain Relief for
Supply Connections



Installation

Electrical Connections

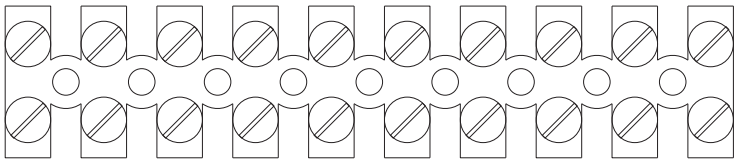
Connection terminals are located in the rear control box for output signals to the chemicals injection supply pump.

Terminals SUPPLY 1 through SUPPLY 8 provide signals for external chemical supply pumps. The signal is a maximum 1 amp at 24V 50/60Hz.

Do not attempt to increase fuse rating as this cause damage to the washer-extractor circuitry.

Any injection system pump, which requires 24-220V AC must be powered by a separate external power source.

Attempting to obtain power from the machine terminals may damage the machine circuit and/or the chemical injection system and is a violation of the National Electric Code. Consult the chemical injection supply system instructions for operational details.



1 2 3 4 5 6 7 8 COM

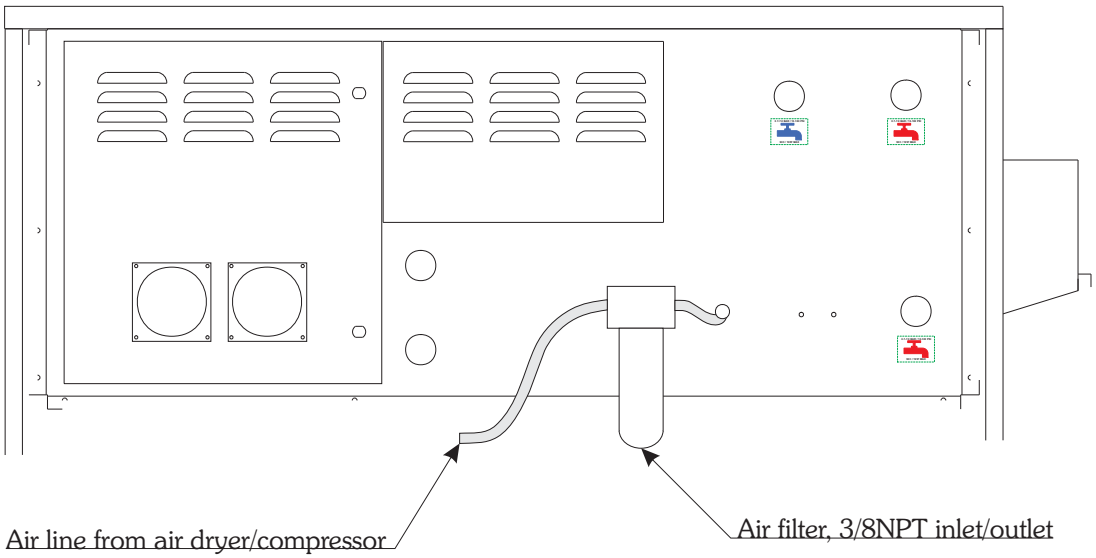
CHEMICAL INJECTION SIGNALS

24VAC, 1.0A MAX TOTAL LOAD

Installation

Compressed Air Connections

Best performance will be realized if air is provided at a pressure of 80-100psi (5.4-6.7 bar). SI series machines will experience door seal and drain failure if compressed air service is interrupted. Ensure the provided air is filtered and dry. Wet and/or dirty air will cause rapid deterioration of internal components and void your warranty on these parts. Install a compressed air dryer to prevent water build up in the airlines. Make sure to use best practice when installing air lines so that water does not damage internal air components - the machine should not be the low point in the air path. Install an inline air filter on each machine to reduce contamination (B&C part number 270-324 or purchase locally).



Installation

Control Function Test

The machine should be cleaned after the installation is complete. A function test should then be executed on the unloaded machine as follows:

1. Check the proper supply for such characteristics as correct voltage, phase, and cycles to be certain they are correct for the machine.

2. Open manual shut-off water valves to the machine.

3. Press Emergency Stop button.

4. Apply power to the machine.

5. Release the Emergency button.

6. Check the door interlock before starting the machine.

   a. Attempt to start the machine with the door open. The machine should not start with the door open.

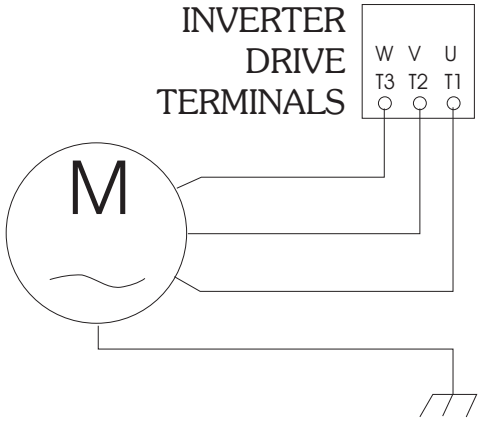
   b. Close the door without locking it and attempt to start the machine. The washer should not start with the door unlocked.

   c. Close and lock the door and start a cycle. Attempt to open the door while the cycle is in progress. The door should not open.

If the door lock and interlock are not functioning properly, call a service technician.

7. For standard processing, select program 30 by pressing key 3 and key 0 on the keypad. Then press enter and the Start key. Run the complete program, checking operation of water inlet valves, drain , and extract functions. Program 30 is a test program that goes through most machine functions.

8. Cylinder rotation must be clockwise in the extract step. If rotation is not correct, disconnect the power to the machine. A qualified technician must reverse any two leads between the AC drive and the motor. See figure.



Operation

Machine Loading

Proper loading of your SI series washer-extractor is a great factor in determining both the performance and longevity of your investment. Small loads are wasteful on many levels:

1. Small loads waste water, chemicals, electricity, and most expensively, time. Running your machine at lower than its rated capacity costs you time and money.

2. Small loads cause more wear and tear on the machine. Small loads are very difficult to balance properly, and will cause excessive vibration during extract. These vibrations mean that bearing loads are higher, reducing the life of the main bearings. The extra vibrations also tend to cause other fasteners on the machine to loosen over time, causing premature wearing and more frequent service.

3. Smaller loads are not easier for the machine to handle - quite the opposite, they are more difficult on the entire machine. When the machine is under loaded, it causes greater stress on the inverter drive, belts, and motor, leading to reduced life of these expensive components.

Refer to the chart below for proper loading.

Dry Weight Capacity		
Model	**Capacity**	
SI-110	110 lb	50 kg
SI-135	135 lb	61 kg
SI-200	200 lb	91 kg
SI-275	275 lb	125 kg
SI-300	300 lb	136 kg

If a scale isn't available, fill the machine up with goods to be laundered. Do not attempt to "stuff" the machine full, but ensure that there is no gap at the top of the cylinder.

Operation

Wash Program Execution

After power is applied to the machine, and the internal diagnostics are complete, the machine is ready for a program to be chosen. The display will show:

PROGRAM N. _

Using the keypad, type the number of the program you wish to run followed by the ENTER key. Standard programs are outlined in the EL6 stock program list, included with the machine. The display will change to show the fist cycle of the selected program:

PRWH 1 EXECUT.?

Press START to execute the program, or RESET to return to program selection. While the program is executing, the display shows the current segment of the program, and the ending condition of the segment. See the following examples:

Level

If the end requirement of the segment (step) is a particular water level, the display will show:

RINSE1 LVL=cm12

cm12 is the actual water level in the machine (12 centimeters). Pressing the LEVEL key shows, for 3 seconds, the required value to advance. If INC or DEC is pressed, you can temporarily modify the value for the current step. Pressing TEMP allows you to see the current temperature of the water. Pressing the TIME key shows the watch dog timer (WDT) value for the current step.

Temperature

If the end condition of the segment is a temperature, the display will show:

WASH3 TEMP = 35C

where 35C is the actual temperature of the wash solution. By pressing TEMP the display will change, for 3 seconds, show the required step temperature for advance. Pressing INC or DEC allows modification of the value for the step. Pressing LEVEL allows you to see the current water level. Pressing the TIME key shows the watch dog timer (WDT) value for the current step.

Time

If the end of the step calls for a time to elapse, the display shows:

RINSE1 T = 2m 30s

In this case, the display shows the time left in the step. INC and DEC allow you to add or subtract minutes for the current cycle. TEMP allows you to view the current water temperature, and LEVEL shows the current water level.

Note: During heating, fill and drain phases, the WDT (watch dog timer) is activated. If the phase does not complete before the timer expires, an alarm will be displayed indicating that the particular phase did not complete within the time allowed.

Single Step Execution

A single step or cycle of a wash program can be executed. At the main prompt, enter zero for the program number. For two seconds, the display changes to:

Operation

Wash Program Execution

SINGLE CYCLE

Then, using the INC and DEC keys, you may choose the cycle you wish to run (PREWASH, WASH, RINSE, SPIN, UNROLL). When you have selected you cycle, confirm by pressing ENTER. The display changes to:

RUN?

Pressing the START key will start the machine.

Partial Program

A program can be partially run. After selecting the program you wish to execute, the display will show:

RUN?

Instead of pressing ENTER to execute the program, press the ADVAN key. The cycles within the program will be displayed incrementally. Choose the point at which you would like to begin, and press the START key. The machine will begin operation from this point.

Displaying the Current Program and Step

While the machine is in operation, pressing then ENTER key will cause the display to show the current program number and step.

PRG 1 STP 3

Soak

You can insert a pause at any point of the wash program with the exception of distribution and spin. To do so, simply press the PAUSE key. The display will begin showing a time, counting up as long as the machine remains paused. Pressing the START key will restart the program at the point it was paused. As long as the machine is paused, all other WDT (watch dog timers) are paused as well.

Advance

While any program is running, you can end the current step and advance to the next one by pressing the ADVAN key. If the key is pressed during a spin, the spin will be aborted, and the standard spin slow down time will be activated.

Halting a Program

At any time during the execution of the wash program, the running program can be terminated by pressing the STOP key.

Water Level Refresh

While a program is running, if the water level drops to a level which is 3cm below the target level, cold water will automatically be added to replenish the level.

Unbalance

If, during a spin segment, the load is excessively out of balance, the spin will stop, and a redistribution of the goods will take place. If three consecutive out of balances occur, the machine will end the program. After the first unbalance, the balance indicator will light on the control panel.

Operation

Wash Program Execution

Power Failure

If the power fails during execution of a program, and is of less than one second, it is ignored. If the failure is longer than one second, the machine stops. Upon restoration of mains power, the display shows CYCLE CONTINUE? and the power failure indicator illuminates on the front panel. If you wish to restart the program at the point in which power failed, press the START key. At this point, the program restarts at the point of power failure and the power failure indicator turns off. If you wish to cancel the program, simply press the RESET key. This function is not active while a single cycle is running.

End of Program

When a program has completed, the message PLEASE WAIT is displayed and the buzzer sounds. The buzzer can be silenced by pressing the RESET key. If the temperature or water level are out of bounds, the display shows the offending value and the door cannot be opened.

Malfunction Alarms

The state of the water temperature and water levels are constantly monitored to prevent functioning problems with these devices. Watch Dog Timers (WDT) are used to prevent cycle failure when temperatures, fills, drains, and levels don't meet programmed values. In the event of a program fault, the buzzer sounds and the display changes to show the fault:

LEVEL FAULT

Indicates a problem with the level sensing system. This could be a loose or cracked water level tube, the level sensor, or the level sensing circuit. As long as the system detects a problem with the level sensing system, the machine will be inoperable. The buzzer can be disabled with the RESET

TEMP FAULT

Indicates a problem with the temperature sensing circuitry, temperature probe, or wiring. The machine continues to function, although auxiliary heating (if equipped) is disabled. The Temperature fault indicator on the control panel will be illuminated.

WDT TEMP EXPIRED

Indicates the programmed temperature was not reached within the allotted time. The most common cause is a malfunctioning auxiliary heating system. A short WDT time and very cold water can also cause this problem. Pressing the START key will cancel the alarm.

WDT LEVEL EXPIRED

Indicates the programmed level was not reached within the allotted time. The most common causes:

During Fill

- Faulty water inlet valve
- Low or no water pressure
- Faulty drain valve
- Problem with water level tube

Pressing START will continue the program,

Operation

Wash Program Execution

while RESET will cancel the program.
During Drain

- Drain valve blocked
- Drain hose blocked
- Faulty Drain Valve

Press RESET to end the program.

OVERLOADED!

Indicates a fault in the drive system. Press RESET to clear the fault. If this fault recurs during the next wash program, contact a qualified service technician.

DOOR OPEN!

Indicates the door is not closed properly. This fault disables the machine until cleared, and aborts a program if active. Can also indicate a tilt down switch problem on tilting machines.Press RESET to clear the fault.

DRAIN

Indicates a water level of greater than 2cm a the onset of spin. The machine will resume the spin when the level falls below the threshold. Press RESET to abort the cycle.

For futher information regarding access functions and programming, see the EL-6 Computer Programming and Operating Instructions manual, included with the machine.

Maintenance

Routine Maintenance

Routine maintenance maximizes operating efficiency and minimizes downtime. The maintenance procedures described below will prolong the life of the machine and help prevent accidents.
Daily, weekly, monthly, and quarterly checklist are provided at the end of this section. Laminate the checklists to preserve them for repeated copying. Operators and technicians are encouraged to add checks specific to their machine's particular application. When possible, space is provided on the checklists for this purpose.

The following maintenance procedures must be performed regularly at the required intervals.

Install all panels that are removed to perform service and maintenance procedures. Do not operate the machine with missing guards or with broken or missing parts. Do not bypass any safety devices!

Daily

1. Inspect water inlet valve hose connections on the back of the machine for leaks.

2. Inspect steam hose connections for leaks, where applicable.

3. Verify that insulation is intact on all external wires and that all connections are secured. If bare wire is evident, call a service technician.

4. Check door interlock before starting operation:

   a. Attempt to start the washer with the door open. The washer should not start with the door open.

   b. Close the door without locking it and attempt to start the machine. The machine should not start with the door open.

   c. Close and lock the door and start a cycle. Attempt to open the door while the cycle is in progress. The door should not open. If manual latch is moved out of position the machine should stop.

If the door lock and interlock are not functioning properly, call a service technician.

End of the day

1. Clean the AC drive box air filters.

   a. Snap off the external plastic cover which contains the filter. Remove the foam filter from the cover.

   b. Wash the filter in a mild soap solution or vacuum it clean. Replace damaged filters!

2. Clean the door gasket of residual detergent and foreign matters.

3. Clean the automatic supply dispenser

Maintenance

Routine Maintenance

and the lid inside and out with mild detergent. Rinse with clean water.

4. Clean the washer's top, front and side panels with mild detergent. Rinse with clean water.

5. Leave loading door open at the end of each day to allow moisture to evaporate.

NOTE: Leave loading door open at end of each complete cycle to allow moisture to evaporate. Unload the machine promptly after each completed cycle to prevent moisture build up.

Weekly

1. Check the machine for leaks.

   a. Start an unloaded cycle to fill the machine.

   b. Verify that door and door gasket do not leak.

   c. Verify that the drain valve is operating. If water does not leak out during the prewash segment, drain valve is closed and functioning properly.

Monthly

NOTE: Disconnect power to the machine at its source before performing the monthly maintenance procedures.

1. Each month or after every 200 hours of operation, lubricate bearings. See instructions on the machine.

   a. Use a premium grade lithium based #2 grease. Never mix two types of grease, such as petroleum and silicone.

   b. Pump the grease gun slowly, permitting only the following number of strokes:
   Bearing grease fitting, 2 strokes

Do not pump the grease gun if grease comes out of the bearing housing. This can result in over lubrication, causing damage to bearings and seals.

2. If the machine is provided with automatic lubricators, check that they are injecting grease. Normally they last for approximately one year. Mark new lubricators with installation date

3. Clean the AC drive fins:
   a. Remove the AC drive box cover.
   b. Blow the fins clean using compressed air at a pressure of 60-90 psi (4-6 Bar) or by using canned compressed air. Use care to avoid damaging cooling fan or other components.

NOTE: No amount of visible foreign matter should be allowed to accumulate on fins, the finger guard, or the cooling fans or cooling fan filters. Replace damaged filters.

4. Use the following procedures to determine if V-belts require replacement or adjustment. Call a qualified service technician in either case.

   a. Check V-belts for uneven wear and

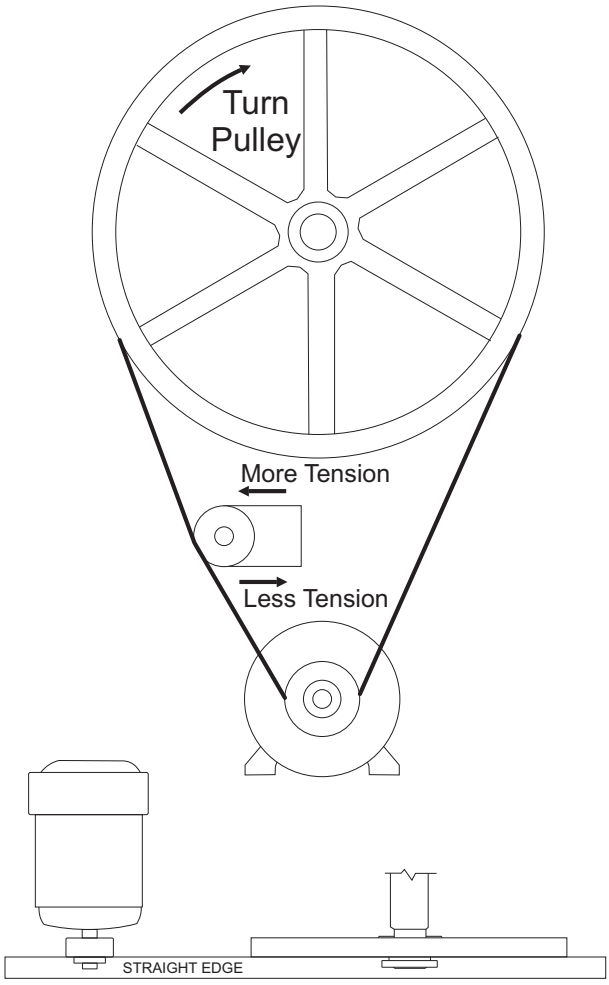
Maintenance

Routine Maintenance

frayed edges.

b. After disconnecting power to the machine and removing all panels necessary for access to the drive belts, use the following method to verify that the V-belts are properly tensioned. Belt deflection should be measured as close to the center of the span length as possible. A set force should be applied in the center of the length, as specified in the table below. Belt tension is adjusted by turning the set screw on the idler pulley. Turning the set screw clockwise tighten the belt, and vice versa.

c. Verify that V-belts are properly aligned by checking pulley alignment. Place a straightedge across both pulley faces. The straight edge should make contact with the pulleys in four places. See figure.



BELT TENSION CHART				
Machine Model	Deflection		Force Applied	
	Inch	mm	Lbs	kg.
SI-110	0.25	6.4	2.2	1
SI-135	0.26	6.6	3.4	1.5
SI-200	0.24	6.1	3	1.4
SI-275	0.51	13	7.8	3.5
SI-300	0.51	13	7.8	3.5

Maintenance

Routine Maintenance

5. Remove back panel and check overflow hose and drain hose for leaks.

6. Unlock the hinged lid and check the supply dispenser hoses and hose connections.

7. Clean inlet hose filter screen:

   a. Turn water off and allow valve to cool, if necessary.

   b. Unscrew inlet hose and remove filter screen.

   c. Clean with compressed air and reinstall. Replace if worn or damage.

8. Tighten motor mounting bolt lock nuts and bearing bolt lock nuts, if necessary.
9. Use compressed air to clean lint from motor.
10. Clean external water and steam filters.

Quarterly

NOTE: Disconnect power to the machine before performing the quarterly maintenance procedures.

1. Tighten door hinges and fasteners, if necessary.

2. Tighten anchor bolts, if necessary.

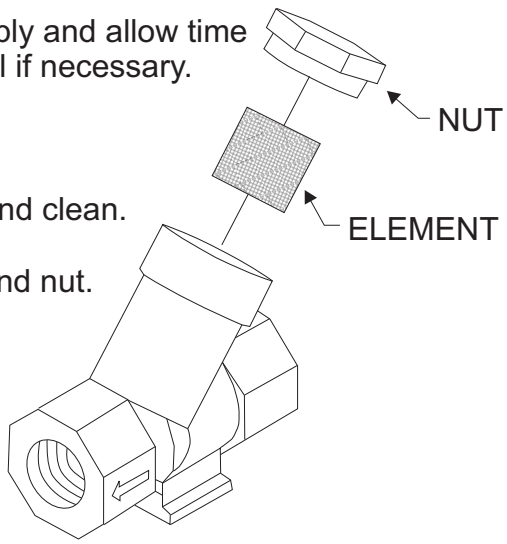
3. Check all painted surfaces for bare metal (matching paint is available from the manufacturer.)

   a. If bare metal is showing, paint with primer or solvent-based paint.

   b. If rust appears, remove it with sand paper or chemical means. Then paint with primer or solvent-based paint.

4. Clean steam filter, where applicable. See picture of steam filter.

1. Turn off steam supply and allow time for the valve to cool if necessary.
2. Unscrew nut.
3. Remove element and clean.
4. Replace element and nut.



Maintenance

Routine Maintenance

Care of stainless steel

Maintain the natural beauty of stainless steel and prolong its service life by following these steps.

1. Ordinary deposits if dirt and grease can be removed with detergent and water. The metal should be thoroughly rinsed and dried after washing. Periodic cleaning will help to maintain the bright surface appearance and prevent corrosion.

2. Contact with dissimilar metal should be avoided whenever possible. This will help prevent galvanic corrosion when salty or acidic solutions are present.

3. Salty or acidic solutions should not be allowed to evaporate and dry on stainless steel. They may cause corrosion. Ensure that the stainless steel is wiped clean of acidic solution residues.

4. Deposits that adhere to the stainless steel should be removed, especially from crevices and corners. When using abrasive cleaners, always rub in the direction of the polish lines or grain of the stainless steel to avoid scratch marks. Never use ordinary steel wool or steel brushes on the stainless steel. Use stainless steel wool or soft non-metal bristle brushes..

5. If the stainless steel appears to be rusting the source of the rust may actually be an iron or steel part not made of stainless steel, such as a nail or screw. One remedy is to paint all carbon steel parts with a heavy protective coating.
Stainless steel fasteners should be used when possible.

6. Discolorations or heat tint from overheating may be removed by scouring with powder or by employing special chemical solutions.

7. Sanitizers or sterilizing solutions should not be left in stainless steel equipment for prolonged periods of time. They often contain chlorine, which may cause corrosion. The stainless steel should be cleaned and rinsed thoroughly of any solution containing chlorine.

8. When an external chemical supply system is used, make certain that no siphoning of chemicals occurs when the washer-extractor is not in use.
Highly concentrated chemicals can cause severe damage to stainless steel and other components within the machine. Damage of this kind is not covered by the manufacturers warranty. Locate the pump below the washer's injection point to prevent siphoning of chemicals into the machine

Decomissioning

Decommissioning

In the event that the machine must be decommissioned, follow the following steps:

1. Remove the chemical injection supply system, if applicable.
   a. Have a qualified electrician disconnect power to the chemical injection supply system and the re-circulation pump at their source.
   b. Using the manufacturer's instructions, carefully remove the chemical injection supply system from the machine. Make certain that no chemicals supplies come in contact with skin or clothing.

2. Clean interior of machine, both basket and shell.
   a. Flush supply dispenser with water.
   b. Run a short rinse cycle to clean chemical residues from the interior of the machine.

3. Disconnect electrical power.
   a. Shut of main power supply at the breaker box or main control panel.
   b. Do not attempt to disconnect power supply wires from power supply. Have a qualified electrician disconnect power to machine at its source.

4. Disconnect hoses.
   a. Disconnect drain hose from sump, gutter, or drain.
   b. Turn off water supply. Disconnect individual hot and cold water inlet hoses from the machine
   c. Disconnect the compressed air supply to the machine.
   d. Allow time for residual water in the machine to drain. Then disconnect drain hoses from the machine.
   e. Disconnect necessary plumbing on the re-circulation system, if applicable.

5. Disconnect steam hoses, if applicable
   a. Turn off steam supply and allow time for the valve to cool.
   b. Disconnect steam hose from machine.

6. Remove the machine from its foundation pad.
   a. Keep all panels in place to provide stability when moving the machine.
   b. Verify that door is closed and secure
   c. Loosen and remove anchor bolts holding the machine base to the floor
   d. Break the grout seal at each corner of the machine, using a crowbar.
   e. Place the machine on skid and bolt the frame to the skid. This will facilitate the removal of the machine on to a truck.

7. Recycle.

The manufacturer uses the highest quality material in their products so that those material may be recycled at the end of the product's service life.

Notes