

CUBE ICEMAKER MODELS SC130 SC220 SC270 SC500 SC1000 SC2000



INSTALLATION

AND

SERVICE MANUAL

Revision 10

STUART MANUFACTURING

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TABLE OF CONTENTS

	PAGE
Specifications	1
Installation Instructions	2
Adjustments	3
Operation of Machine	4 - 5
Cleaning & Servicing	5
Trouble Shooting	6 - 8
Logic Board Flow Chart	9 - 12
Main Circuit Function Diagram	13
Wiring Diagrams	14 - 26
Parts List	27
Warranty	28
Warranty Return Guidelines	29

SPECIFICATIONS

MODEL	SC130	SC220	SC270	SC500	SC1000	SC1000C	SC2000
ELECTRICAL	240 volts 50 hz 5.6 amps	240 volts 50 hz 8.6 amps	240 volts 50 hz 8.6 amps	240 volts 50 hz 12.0 amps	415 volts 50 hz 10 amps/ph.	415 volts 50 hz 10 amps/ph.	415 volts 50 hz 18 amps/ph.
REFRIGERATION	R404A 315g	R404A 630g	R404A 740g	R404A 1400g	R404A 3700g	R404A	R404A
SUCTION PRESSURE @ 32deg. C FLOODED EVAPORATOR	232kpa	232kpa	232kpa	232kpa	232kpa	232kpa	232kpa
FAN PRESSURE CONTROL Cut In Cut Out	1660 1240	1660 1240	1660 1240	1660 1240	1660 1240	1660 1240	1660 1240
WATER PRESSURE	All Models Minimum: Maximum			um: 140 k um: 350 k	pa pa		
OPERATING TEMPERATURE	All Models Minimum: 1 degree Celsius Maximum: 43 degrees Celsius						
WATER CONNECTION REQUIREMENTS	All Models 3/4" BSP male stop cock						
DRAINAGE	All Models 25mm diameter PVC						
ICE WEIGHT (Total	l both slabs)						
	SC130 1,500g	SC220 2,100g	SC270 2,700g	SC500 5,400g	SC1000 10,800g	SC1000C 10,800g	SC2000 21,600g
PURGE AMOUNT	200ml	300ml	300ml	400ml	500ml	500ml	1000ml

Continuing product improvement may necessitate changes of specifications without notice.

INSTALLATION INSTRUCTIONS

LOCATION

- 1. Must be well ventilated and weather-proof. Allow a minimum of 250mm above icemaker for correct ventilation.
- 2. Machine must be installed on hard surface and LEVEL.
- 3. 3/4" BSP male stop cock required on potable water supply. The non-return valve supplied with each machine MUST be installed at the supply cock. Incoming water temperature affects ice production. Therefore, avoid above ground plumbing and pipes exposed to direct sunlight.
- 4. If water pressure is over 350kpa, a pressure reduction valve must be fitted.
- 5. Make sure drain hoses have no kinks and have a fall to drainage point.
- 6. Each icemaker should have it's own power circuit. Do not share with other equipment.

START-UP PROCEDURE

- 1. <u>ENSURE MACHINE IS LEVEL</u>
- 2. Connect non return valve to tap, then water hose between valve and icemaker and turn on water. Note! Non return valve must always be fitted at the water supply point.
- 3. Remove front and side panels.
- 4. Turn on power.
- 5. Wait until the "Hi float" light is illuminated, then press and hold RESET button for about 5 seconds. The machine should now be in normal icemaking mode. i.e. the compressor and water pump should both be running and No.2 displayed.
- 6. Set water purge (see water purge adjustment—Page 3).
- 7. Allow machine to complete two (2) cycles before making any adjustments (see Page 3).
- 8. Replace all panels.

<u>NOTE:</u> On some models the top ice cubes may be slightly thinner than the bottom ice cubes. This is quite normal.

ADJUSTMENTS

There are only two (2) adustments which can be made to the machine, Water Purge and Ice Thickness.

WATER PURGE

Water purge should be set at approximately 5-10% of the weight of ice per cycle (Check specifications chart on page 1 for recommended amount) As the water purge is time activated, it will vary with water pressure.

To check which version board the ice machine has fitted, simply turn the power off and then on at the power point. The unit will beep a number of times. eg 4 beeps = V4, 5 beeps = V5

V6 boards do not beep, they display #6 momentarily. This happens every time the machine is turned on.

Up to and including Version 4.1 Logic Board

To check the water purge, hold a measuring cup under the overflow hose and catch the waste water at the end of the fill cycle. The cup should be held there for at least five (5) minutes as the waste water may take some time to stop running. The purge adjustment is located on the control panel just above the fault light. Adjustment is made using a small screwdriver to turn the adjusting screw anti-clockwise to increase or clockwise to decrease as indicated.

Version 5 and 6 Logic Board

To check the water purge place a measuring cup under the overflow hose and catch the waste water at the end of each fill cycle. The cup should be held there for at least five (5) minutes as the waste water may take some time to stop running. The purge adjustment is set through the buttons on the logic board. With the machine in two (2) mode, <u>press</u> and <u>hold</u> the reset button and then a number will flash which will indicate the setting of the purge time 0 to 9. 1 being 1 second, 9 being 9 seconds and O being 10 seconds. By pressing the fill button this will change the setting to obtain the correct purge amount. Once you let the reset button go, it will return to two (2) mode.

Note: This function only works during freezing cycle.

The purge should be checked at least 3 times. A quick way to check this is by removing panels and having the machine in number 2. Drain water trough by removing drain plug until the machine goes into defrost mode. Replace drain plug and open and close each water curtain, this will now put the machine into fill mode. Once again check the purge amount and if required make purge adjustment. Repeat this at least twice to verify the purge amount.

ICE THICKNESS

The correct weight of ice per cycle has been factory set with the machine LEVEL and the correct purge. If the machine is not installed level this can alter the weight (size) of the ice.

<u>NOTE</u>: Refer to specification chart on page 1 for correct ice weights.

Adjustments are made by moving the adjustable float up or down. The adjustable float is located at the water pump end of the trough.

To make the ice thicker i.e. **heavier**, loosen the brass thumb screw and **lower the float**. To make the ice thinner i.e. **lighter**, **raise the float**. When making any adjustments, it is recommended that you only move the float 1mm to 2mm a time.

After making any adjustments, tighten the thumb screw to ensure the float cannot move.

OPERATION OF MACHINE

NOTE: All buttons on the control panel have a built in five (5) second delay. i.e. each button must be depressed for five (5) seconds before the function will be activated.

When the power is first turned on 0 will appear in the window and 4 beeps will be heard. number on the logic board i.e. 4 beeps = Version 4). (The beeps indicate the version warm up cycle. The machine will then go to No.



WARM UP CYCLE

In this mode the compressor is on, hot gas valve open, water pump and fill solenoid off. (Defrost cycle) The compressor will run for two (2) minutes and will then switch off. The pump will start and nothing else will happen for a further three (3) minutes. At the end of this period the machine will automatically switch to the ICE MAKE CYCLE

On initial start up the warm-up cycle can be cancelled by pushing 2 the reset button.

WHY A WARM UP CYCLE?

The warm up cycle has been designed in the software:

- to protect the machine from damage in the event of a power failure during the a) freezing cycle. By using the WARM UP (defrost) CYCLE when power is restored, any ice which had formed on the icemaking plates before the power failure will be fully removed before the ICE MAKE CYCLE recommences.
- b) because if a fault (3,4 or 5) occurs, the machine will have two (2) attempts at completing the function before shutting down and displaying a fault number. If, on the second attempt, the same fault is not detected, the machine will revert to the ICE MAKE CYCLE and continue to run. Therefore, by using the WARM UP CYCLE between attempts on faults 4 and 5 the machine will not make a double ice slab.

ICE MAKE CYCLE

The display will remain this way during the whole of the icemaking cycle until:

(a) the ice storage bin is full, at which time the number is $\begin{vmatrix} 2 \\ \end{vmatrix}$ displayed. allowing the flaps to close, the As soon as ice is removed from the storage bin, will go back to the start of the ICE MAKE CYCLE.

machine

7

2

- 7 NOTE: The machine will only go into the ICE BIN FULL MODE after a defrost and both flaps must be closed before it will return to the ICE MAKE CYCLE.
- (b) an error occurs, the fault number is displayed and flashes and the alarm sounds. After a fault has been rectified, press the reset button to return the machine to the ICE MAKE CYCLE



ERROR CODES

As described above, the software is designed to make two (2) attempts to complete each function, WATER FILL, MAKE ICE and DEFROST before shutting down and displaying a fault number. If on the second attempt the same fault is detected, the machine will shut down and display one of the following fault numbers:



NOTE!

If an error 3 occurs, the machine will attempt to fill every hour until the water supply is restored. Therefore, if the water supply is interupted after hours, the machine may be functioning normally the next morning and the only evidence of a problem may be a shortage of ice in the bin. If this becomes a regular occurrance, then the cause of the interuption should be rectified.

For more detailed information on the operation of the machine, refer to the OPERATIONAL FLOW CHARTS on pages 9 to 12.



SERVICE MODE

After 3000 hours of ice making time there will be 10 beeps and number $\boxed{8}$ will flash 10 times indicating that the machine requires servicing. This will occur every hour until the machine has been put through a clean cycle. Once the clean cycle has been carried out the machine starts counting the hours again. <u>Note:</u> Ice making time does not include bin full time.



CLEAN CYCLE

NOTE! Ice is a food product and cleaning of the icemaker is recommended on a regular basis, at least three times a year.

- 1. Turn off water and fit new water filter and purge water supply line.
- 2. Empty the remaining ice in storage bin into a clean hygienic sealed receptacle and seal to prevent contamination. (Always dispose the bottom 20% of ice in bin as it will most likely be dust contaminated).
- 3. Remove front, top and right side panels, visually check all components are in satisfactory condition and do not require replacement due to mechanical or electrical breakdown.
- 4. With the machine in No. 2 press & hold the clean button until the machine goes into clean mode No. 6, wait for the water trough to fill and the fill light goes off then remove the drain cap from the trough and allow all the water to drain away and replace the drain cap.
- 5. Mix the specified quantity of cleaning medium as per manufacturers specifications in a separate container and pour into water trough and allow to circulate for 25 minutes maximum or until plate is clean. Then drain the water trough and replace drain cap.
- 6. Mix up sanitizer in a container as per manufacturers specification and pour into water trough and allow to circulate for 5 minutes. Remove drain cap and drain water trough then replace drain cap.
- 7. Press the fill button until the water overflows the trough, remove the drain cap and allow all the water to drain away, replace cap, press fill button again, when full let circulate for 5 minutes before draining trough.
- 8. Replace drain cap and <u>PRESS RESET</u>. When display returns to No. 2 switch off power.
- 9. Vacuum or blow out condenser ensuring dust does not contaminate the surrounding area.
- 10. Wipe out Compressor section removing dust and grime around fan motor. Spin fan and check for noisy bearings.

- 11. Check ribbon cable from logic board back to control board for damage such as cracks or abrasions and ensure it is not in contact with any sharp edges or moving parts.
- 12. Remove pump from trough and drain out and clean out any sludge remaining in trough. Dismantle water distributor and clean with bottle brush taking note that all water holes are clean and unobstructed. Reassemble and refit distributor and water pump.
- 13. Sanitize storage bin as per manufacturers specifications.
- 14. Start machine & check all machine signal functions, ensuring board lights operate when curtains, high / low switches are activated.
- 15. Check purge on fill cycle and adjust if required. (See Page 3)
- 16. After second ice drop check thickness and adjust if required. (See Page 3)
- 17. Replace machine panels.
- 18. Clean down all external surfaces.
- 19. Replace ice into storage bin.

<u>Note:</u> Using none-approved cleaning medium may void ice making plate warranty

TROUBLE SHOOTING

MICROPROCESSOR DIAGNOSTICS

The 2nd generation logic board has a non volatile memory which stores a fault history for the icemaker, plus other diagnostics such as total machine running hours, number of cleaning cycles performed and number of icemaking cycles.

ACCESSING DIAGNOSTIC DISPLAY

To access the diagnostic display:

1. Ensure the machine is in normal icemaking mode. 2

- 2. Press and hold down both the **FILL** and **CLEAN** buttons.
- 3. When the display shows 0 release both buttons.
- 4. Push the **DEFROST** button to change the display to the desired diagnostic number as listed below

<u>NUMBER</u> <u>DIAGNOSTIC FUNCTION</u>

- 0 Displays the fault history for the last 5 machine errors. (First to last)
- 1 Displays number of hours since last service.
- 2 Displays the number of cleaning cycles performed.
- 3 Displays the number of harvest cycles.
- 5. When the desired diagnostic number is displayed, push and release the **RESET** button.
- 6. The selected diagnostic value is displayed on the numeric display.
- 7. To cancel the diagnostic function, press the **RESET** button again.

TROUBLE SHOOTING

CHECKING OPERATION OF REED SWITCHES

The curtain flap switches and the high and low floats have indicator (red LED) lights on the main circuit board.

To check the operation of these switches, set the machine in the WARM UP CYCLE with no water in the water trough.

CURTAIN FLAP SWITCHES

By moving the water curtains ,the lights marked FLAP 1 and FLAP 2 should be **on when** the curtain **is closed** and **off when** the curtain is about 10 to 15mm **open**.

LOW FLOAT

With the low float all the way down, the indicator light should be off, but by moving the float up the indicator light should come on.

<u>NOTE</u>: If the reverse is happening, the float itself is around the wrong way. Remove the clip at the bottom, take the float off and re-install the float the other way round.

HIGH FLOAT

With the float in down position, the light should be off, but by moving the float up, the light should come on.

NOTE: If the reverse is happening, rotate the whole float switch assembly 180degrees

ELECTRONIC CIRCUIT BOARDS FUSE - MAIN CIRCUIT BOARD

The main circuit board is protected by a fuse. If this fuse should blow it will isolate the whole machine. The correct replacement fuse is a slow blow HRC Ceramic. Refer parts list for correct size.

DO NOT USE GLASS TYPE FUSES

When changing circuit boards ensure that:

- (a) The incoming active goes to the relay tab marked COM.
- (b) The ribbon cable connecting the two boards is correctly orientated, i.e. red cable on top of main circuit board and on bottom of the control board.

TROUBLE SHOOTING

ERROR 3

DID NOT FILL WITH WATER IN TIME (3 Minutes)

- (1) Water supply turned off
- (2) Water supply line restricted or frozen
- (3) Blocked strainer in water solenoid
- (4) Faulty water solenoid
- (5) Faulty high level float
- (6) High level float installed incorrectly needs rotating 180 degrees

ERROR 4

DID NOT MAKE ICE IN TIME (40 Minutes)

- (1) Partial loss of refrigerant
- (2) Faulty fan motor
- (3) Dirty condenser
- (4) Faulty compressor
- (5) Hot gas solenoid stuck open
- (6) Restricted capillary tube or expansion valve
- (7) Faulty water pump
- (8) Faulty low float

ERROR 5

DID NOT DEFROST IN TIME (7 Minutes)

- (1) Faulty hot gas solenoid
- (2) Dirty icemaking plate(s)
- (3) Faulty curtain flap switch
- (4) Partial loss of refrigerant
- (5) Ice too thin will not open water curtain





BIN FULL and DEFROST Processing



Clean Cycle Processing

Note 1.

Self Test Procedure. Fail = Buzzer sounds continuously. Pass = Buzzer beeps several times, the number of beeps indicates the logic board version number, e.g. 4 beeps for version 4 etc.

Note 2.

The hot gas solenoid is always opened for 15 seconds before starting the compressor, this allows the gas pressures to equalise before the compressor starts.

Note 3.

Pushing the reset button during the initial start up defrost will cancel the defrost and place the machine in normal ice making mode.

Note 4.

Bin Full is indicated by one or more of the ice curtains remaining open after an ice drop.

Note 5.

The correct quantity of water during fill is signalled by the high float switch, the water fills until the top float switch operates. The water will continue to fill for a period of time after reaching the high float. This is the purge time.

Note 6.

The clean timer is set for 3,000 hours, this timer is reset when the manual clean cycle is activated.

Note 7.

The first time this error occurs the machine will restart at **"Power Up"** if the same error is detected after Power Up the machine will shut down and the appropriate error number will flash on the display.

















SC500 Air Cooled Copeland CS18K6E





SC500 Water Cooled Copeland CS18K6E









PARTS LIST

DESCRIPTION	SC130	SC220	SC270	SC500	SC1000	SC1000C	SC2000
Compressor	050654	050766	050766	050841	050815	050815	050838
Fan/motor assy.	050348	050348	050348	050620	050718	050718	
Fan control	050622	050622	050622	050622	050622	050622	050622
Curtain Assembly—Front	050774	050757	050776	050778	050778 x 2	050778 x 2	050778 x 4
Curtain Assembly—Rear	050773	050756	050775	050777	050777 x 2	050777 x 2	050777 x 4
Evaporator Assembly	050478SP	050751	050523SP	050524SP	050524SP x 2	050524SP x 2	050524SP x 4
Solenoid valve - water	050023	050023	050023	050023	050023	050023	050023 x 2
Solenoid valve - hot gas	050704	050704	050704	050705	050706	050706	050707
Capillary tube	1.62mm	1.78mm	1.78mm				
Expansion valve body	2500mm	2600mm	2500mm	050850	050850	050850	050850
Expansion valve orifice				050851	050851	050851	050851
Power board	050009	050009	050009	050009	050009	050009	050009
Logic board	050010	050010	050010	050010	050010	050010	050010
Interface board					050148	050148	050148
Fuse - 3.15 amp	050011	050011	050011	050011			
Fuse - 5 amp					050180	050180	050180
Switch - water curtain	050043	050043	050043	050043	050043	050043	050043
Magnet - water curtain	050794	050794	050794	050794	050794	050794	050794
Float - high level	050043	050043	050043	050043	050043	050043	050043
Float - low level	050074	050074	050074	050074	050074	050074	050074
Pump - water	050570	050570	050570	050570	050086	050570 x 2	050086
Contactor					050311	050311	050147 + 050311

MANUFACTURER'S LIMITED LABOUR AND PARTS WARRANTY STUART COMMERCIAL ICEMAKERS

Model SC130, SC220, SC270, SC500, SC1000, SC2000

CERISUN PTY. LTD. trading as STUART MANUFACTURING at 1 JAYELEM CRESCENT PADSTOW warrants to the original owner/user that any STUART commercial icemaker manufactured on or after January 1st 1997 shall be free of defects in material or workmanship under normal and proper use and maintenance service as specified by STUART MANUFACTURING and upon proper installation and start-up in accordance with the instruction manual supplied with the Product.

The obligation under this warranty is limited to:

- (1) associated and approved labour costs for a period of two years after the date of original installation;
- (2) the repair and or replacement of parts or assemblies that in the opinion of STUART MANUFACTURING are defective, for a period of two years after the date of original installation;
- (3) the supply or repair of the electronic control board(s) for the lifetime of the Product.

The labour warranty shall include straight time labour charges at the product location only and shall exclude charges for travel time, mileage or other premium charges.

Any labour required to fulfil the warranty obligation must be performed by a refrigeration service company qualified and accepted by STUART MANUFACTURING.

This warranty does not include parts or labour coverage for components failure or other damage resulting from:

- * external electrical power failure or miswiring to the Product for any reason
- * external water supply failure or plumbing problems to the Product for any reason
- * external drain line malfunction
- * adverse operating conditions as set forth in the owner/user manual for the Product.

All claims for labour or parts must be made through the original reseller. The defective part for which reimbursement is claimed, together with the service invoice, must be returned to STUART MANUFACTURING, freight pre-paid, within fifteen days from date of service to be eligible for labour and parts warranty coverage. All replacement parts must be approved STUART parts. Incidents of failure that do not require the replacement of a part shall be explained in sufficient detail on the service invoice to identify the failure. All claims shall include the product model number, serial number, original date of installation and customer identification.

The foregoing warranty shall not apply to:

- (1) Faults caused by dirty water distribution systems or icemaking plates
- (2) Adjustments to ice thickness or purge levels caused by incorrect installation.
- (3) any part or assembly
 - (a) that has been altered, modified or changed
 - (b) that has been subjected to misuse, abuse, neglect or accidents or
 - (c) any Product or part on which the serial or model number has been removed or altered
- (4) any Product that has been installed and/or maintained inconsistant with STUART technical publications
- (5) any product that has been installed or is located outside Australia.

The two years compressor parts warranty shall not apply when the Product's refrigeration system is modified with a condenser, heat reclaim device, or parts and assemblies other than those manufactured by STUART MANUFACTURING unless STUART MANUFACTURING has accepted modification for specific installation in writing.

STUART MANUFACTURING assumes no liability for misuse or inadequate maintenance of the Product. In no event shall the owner/user be entitled to recover incidental or consequential damages, including but not limited to damages for inconvenience, ice purchase, rental or replacement equipment, loss of profits or other commercial loss.

Warranties stated above are the only warranties made in connection with the sale and distribution of the Products.

ANY AND ALL OTHER EXPRESSED, STATUTORY AND IMPLIED WARRANTIES APPLICABLE TO THE PRODUCT, INCLUDING, WITHOUT LIMITATIONS, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE ARE EXPRESSLY DISCLAIMED.

The warranty information set forth above shall be governed by and construed in accordance with the laws of the state of NSW and, if applicable the laws of Australia. The labour warranty, as stated is extended only to the original owner/user and is not assignable to any other owner or user.

WARRANTY CLAIM GUIDELINES

Model SC130, SC220, SC270, SC500, SC1000, SC2000

As from January 1st 1993 all STUART ICEMAKERS will carry a standard two years warranty. This covers two years labour, two years on parts and two years on compressor failure, provided warranty conditions are met and installation is in accordance with published standards.

All dates are from the original date of installation. This date is assumed to be a <u>maximum of eight (8) weeks</u> from the date of invoice to the dealer.

Warranty claims are conditional on the following:

- (1) All claims for labour or parts must be made through the original reseller.
- (2) The defective part must be returned with the service invoice to STUART MANUFACTURING, freight pre-paid, within 15 days of date of service. Details of End User, Model, Serial Number and Date of Installation of the product must be provided with the claim.
- (3) All replacement parts must be detailed and be approved STUART parts.
- (4) All labour only claims must be explained in sufficient detail on the service invoice to properly identify the nature of the failure.
- (5) The labour warranty includes standard straight time charges at the installation location only and does not include charges for travelling time, mileage or other premium charges.
- (6) When consumables such as driers, refrigerant etc. are supplied by the service agent, the cost allowed will be the Refrigeration Wholesalers list price only.
- (7) If a compressor is faulty and requires replacement, the service agent MUST contact Stuart Manufacturing before obtaining a replacement.

The warranty will not apply in the following circumstances:

- (1) When any part, assembly or ice machine:
 - (a) has been altered, modified or changed
 - (b) has been subject to misuse, neglect or accident
 - (c) where the serial number or other identification has been removed or altered.
- (2) When the product has been installed and or maintained in a manner inconsistant with the approved procedure or STUART technical publications.
- (3) The two years compressor warranty will not apply where the refrigeration system has been modified with a condenser, heat reclaim device or part or assembly not approved by STUART MANUFACTURING.

GENERAL

As from 1st January, 1993 the following warranty will apply to all spare parts:

- (a) Replacement parts exchanged while the original equipment is still under manufacturers warranty will be covered on a pro-rata basis up to the warranty expiration of equipment in which they are installed.
- (b) Warranty on spare parts other than the above is three (3) months from the date of installation as evidenced by suitable documentation or eight (8) weeks from the invoice date of sale to the dealer.