www.icecompanies.com
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Operator & Parts Manual

Automatic Scrubber

i20NBL
i20NBTL-OB
i20NBTL
i24BTL

i-SYNERGY
Cleaning Management in Motion

8130060
REV.04 (03-2016)

INTERNATIONAL CLEANING EQUIPMENT

READ OPERATOR MANUAL CAREFULLY!

IMPORTANT: To ensure full warranty protection, please fill out & return your warranty card.

Please fill out at time of installation for future reference.

Model No. _____

Serial No. _____

Machine Options _____

Sales Rep. _____

Sales Rep. Phone No. _____

Customer ID Number _____

Installation Date _____

HOW TO ORDER PARTS

Only use ICE Company supplied or equivalent parts. Parts and supplies may be ordered online,by phone, by fax or by mail.

1. Identify the machine model.
2. Identify the machine serial number from the data label.
3. Ensure the proper serial number is used from the parts list.
4. Identify the part number and quantity.
   Do not order by page or reference numbers.
5. Provide your name, company name, customer ID number,billing and shipping address, phone number and purchase order number.

PROTECT THE ENVIRONMENT

Please dispose of packaging materials,old machine components such as batteries, hazardous fluids, including antifreeze and oil, in an environmentally safe way according to local waste disposal regulations.

Always remember to recycle.

International Cleaning Equipment
XiangShi Road LiaoBu DongGuan GuangDong China
Tel: 0769 - 81850061
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Specifications and parts are subject to change without notice.

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SAFETY PRECAUTIONS

This machine is intended for commercial use. It is designed exclusively to scrub hard floors in an indoor environment and is not constructed for any other use. Only use recommended accessories.

All operators shall read, understand and exercise the following safety precautions:

1. Do not operate machine:
- Unless trained and authorized.
- Unless you have read and understand the operators manual.
- In flammable or explosive areas.
- If not in proper operating condition.
- In outdoors areas.

2. Before starting machine:
- Make sure all safety devices are in place and operate properly.

3. When using machine:
- Go slow on inclines and slippery surfaces.
- Follow all safety guidelines.
- Be very careful when using the machine in reverse.
- Reduce speed when turning.
- Report and fix any damage to machine prior to operating it.
- Never allow children to play on or around.
- Do not operate on inclines that exceed 5% (3°).

4. Before leaving or servicing machine:
- Stop on level surface.
- Turn off machine.

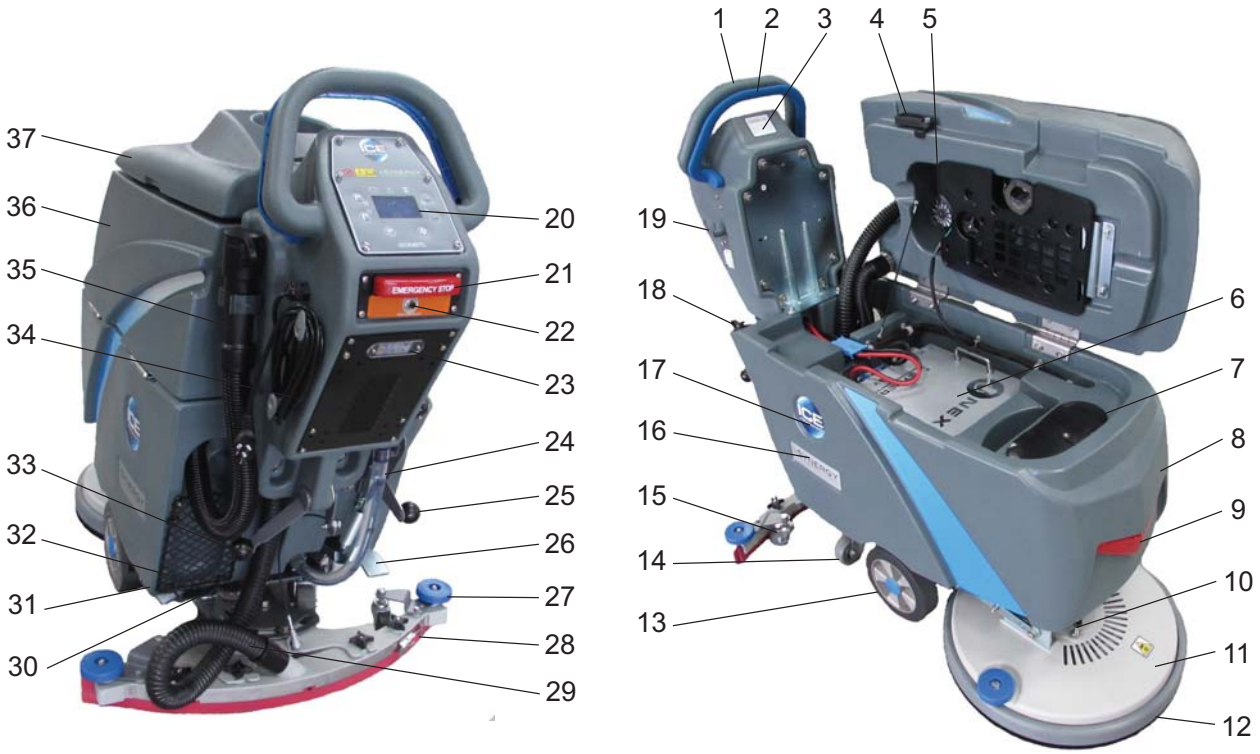
5. When servicing machine:
- Read operators manual thoroughly prior to operating or servicing this machine.
- Use manufacturer supplied or approved replacement parts.
- Secure machine with wheel blocks prior to jacking the machine up.
- Use approved jack or hoist to safely elevate the machine.
- Disconnect batteries prior to working on machine.
- Avoid moving parts. Do not wear loose fitting clothing while servicing machine.

⚠ WARNING: Fire or Explosion Hazard. Keep sparks and open flames away! Keep battery compartment open when charging.

⚠ WARNING: Flammable materials can cause an explosion or fire. Do not use flammable materials in tanks.

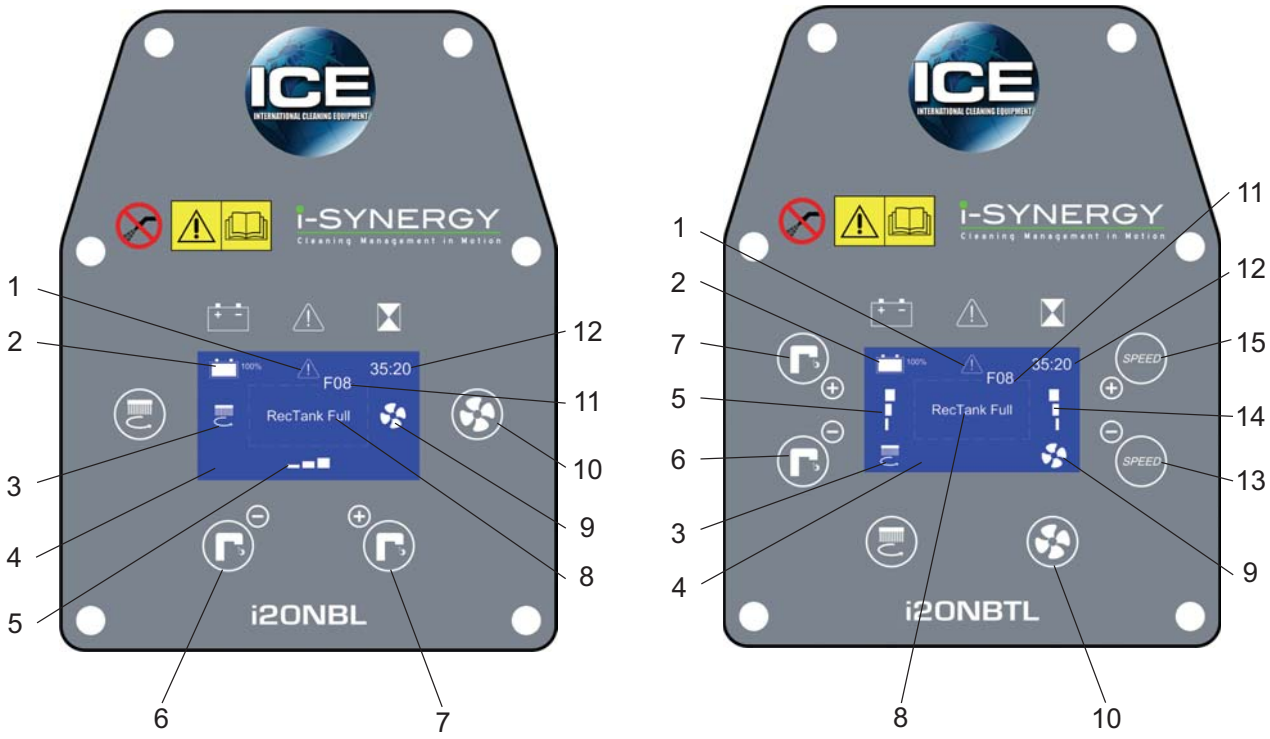
⚠ WARNING: Flammable materials or reactive metals can cause explosion or fire. Do not pick up.

MACHINE COMPONENTS



1. Control Handle
2. Control Handle Start Bail
3. i-synergy™, ID card scanning area
4. Recovery Tank Support Stand
5. Vacuum Motor, 24VDC
6. Lithium-ion Batteries
7. Bucket Fill Port/ Clean-Out Port
8. Solution Tank
9. LED Light
10. Motor Hub Lock Pin (Disk Models)
11. Scrub Head Assembly
12. Scrub Head Skirt
13. Wheels, 8 Inch
14. Caster, 3.15 Inch
15. Caster, 2 Inch, Squeegee Blade Adjustment
16. i-SYNERGY decal
17. ICE Logo
18. Hose Fill-Port
19. Squeegee Storage Bracket
20. Control panel (see Panel components)
21. Emergency Stop Button (Drive Models)
22. Main controller breaker
23. On-board battery charger / Window
24. Solution Tank Level / Drain Hose
25. Heavy Down Pressure Lever
26. Scrub Head Lift Pedal
27. Bumper Rollers
28. Squeegee Assembly
29. Squeegee Vacuum Hose
30. Filter Assembly
31. Ball Valve
32. Cargo Mesh Bag
33. Squeegee Lift Lever
34. Power cord, on-board Battery charger
35. Recovery Tank Drain Hose
36. Recovery Tank
37. Recovery Tank Cover

PANEL COMPONENTS



1. Fault indicator
2. Battery meter
3. Brush motor indicator
4. LED display screen
5. Solution flow indicator
6. Solution flow control button (-)
7. Solution flow control button (+)
8. Fault message display area
9. Vacuum motor indicator
10. Vacuum motor switch
11. Fault code
12. Timer
13. Speed control button (-)
14. Speed indicator
15. Speed contorl button (+)

i-synergy™ INTRODUCTION

i-synergy™ collects operational data from cleaning machines and transmit the information to ICE's server. The ICE server generates daily reports and send them to designated end users by email. From these reports, end users will have information about machines' usage and even specific timings.

Besides, i-synergy™ also collects data on lithium-ion battery, vacuum motor, brush deck motor, transaxle, and other electrical components at least once every minute when the machine is in use and even during battery charging.

i-synergy™ will send notifications instantly to the ICE server in case of any malfunction. ICE maintenance personnel will receive a SMS within minutes from the ICE server for immediate servicing.

MACHINE SET UP & INSTALLATION

UNCRATING MACHINE

Be sure and check packing carton for any damage. Immediately report any damage to carrier. Check the contents of package to ensure that the following items are included:

- Machine
- Lithium-ion Batteries
- Squeegee assembly
- Battery Charger
- Pad Driver
- Brush

INSTALLING BATTERIES

The machine uses the Lithium-ion batteries, the batteries are already in the machine upon delivery; However you will need to connect the Lithium ion batteries to the machine.

WARNING: Fire or Explosion Hazard. Keep sparks and open flames away! Keep battery compartment open when charging.

1. Turn off the machine.
2. Open recovery tank to gain access to battery compartment.
3. Carefully place the Lithium-ion batteries into the compartment. Place the battery brace at the rear of the batteries.
   DO NOT DROP BATTERIES INTO COMPARTMENT!
4. Plug the batteries connector to the machine adaptor, connect machine i-synergy™ COM port with the batteries.

MACHINE SET UP

PRE-OPERATION CHECKS

1. Sweep or dust mop the surface to be cleaned.
2. Check battery meter to make sure batteries are fully charged. (See BATTERY CHARGING)
3. Check that squeegee is properly installed.
4. Check that brush / pad is properly installed.

INSTALLING PAD DRIVER OR BRUSH

1. Ensure that the machine is turned off.
2. Step down on the scrub head lift pedal (see machine components, item #26) to raise the scrub head off the floor.
3. If using a Pad Driver, first attach the appropriate pad to the pad driver surface.
4. Turn the brush motor hub until the slot with the spring clip is visible through the scrub head window.
5. Mount the pad driver or brush to the brush motor hub by lining up the three studs with the three holes in the brush motor hub. Once in the holes, rotate the driver toward the spring clip to lock the pad driver into place.
   If necessary, press down on the motor hub lock pin (see machine componts, item # 10)to lock motor hub in place.
6. For Orbital head Model i20NBTL-OB, you need to attach a rectangular, 20in(508mm)×14in(356mm) Pad to the Orbital Pad driver. align the pad to the Orbital pad driver, press from front-to-back and side to side to alignment.

MOUNTING THE SQUEEGEE ASSEMBLY

1. Lift the squeegee lift lever (see machine components, item #33)to the upward position.
2. Mount the squeegee assembly to the squeegee pivot bracket. make sure the knobs are completely seated into the slots before securing knobs.
3. Connect the vacuum hose to the squeegee assembly. Loop the hose by using the hose clip provided.
4. Check the squeegee blades for proper adjustment.

FILLING THE SOLUTION TANK

The machine is equipped with a hose fill-port (see machine components, item #18) at the rear of the machine, and a bucket fill-port (see machine components, item #7)located under the recovery tank. Before accessing the bucket fill-port make sure that the recovery tank is empty.

Fill the solution tank to the "60L" level on the solution tank sight gauge. When using the bucket fill-port, stop filling when the level reaches the bottom edge of the fill-port.

NOTE: *When filling the solution tank with a bucket, make sure that the bucket is clean. Do not use the same bucket for filling and draining the machine.*

WARNING: Do not put any flammable materials into solution tank. this can cause an explosion or a fire. Only use recommended cleaning chemicals. Contact your janitorial supply distributor for recommendations on proper chemicals.

MACHINE OPERATION

WARNING: Do not operate machine unless you have read and understand this manual.

1. Lower squeegee assembly to the floor by lowering the squeegee lift lever(see machine components, item #33).
2. Lower the scrub head to the floor by stepping on the scrub head lift pedal(see machine components, item #26).
3. Swiping the ID card (see machine components, item #3) to turn on the machine.
4. Check the battery meter (see Panel components, item #2), if the battery is very low, there will be a Fault code & message on the LED display screen(see Fault code section), and the Fault indicator will blink continuously accompany an audible alarm. please DO NOT continue to operate the machine and recharge the batteries immediately.
5. Check the solution flow indicator (see Panel components, item #5), press the solution flow control button (see Panel components, item #6, 7) to a desired flow rate.
   NOTE: Solution will not begin to flow until the control handle bail is pulled.
6. Turn on the vacuum motor switch(see Panel components, item #10).
7. i20NBL: Pull the control handle bail(see machine components, item #2) backwards to start scrubbing by moving the machine forward.
   The drive model i20NBTL / i24BTL: Pull the control handle bail(see machine components, item #2) backwards to start scrubbing. The machine will automatically propel forward.
   To reverse the drive model, simply push the control handle bail forward. the speed can be adjusted, Adjust the speed control button (see Panel components, item #13, 15) to a desired scrubbing speed.
   NOTE: *45-60 meters (150-200 ft)per minute is the recommended scrubbing speed.*
8. When more brush pressure is needed for heavily soiled areas simply lift the down pressure lever(see machine components, item #25).
9. To stop scrubbing, release the control handle bail, raise the scrub head and the squeegee assembly.

WHILE OPERATING MACHINE

WARNING: Fire Or Explosion Hazard. Do Not Pick Up Flammable Materials Or Reactive Metals.

1. Go slow on inclines and slippery surfaces. Do not operate the machine on inclines that exceed 5% (3°).
2. Do not keep the machine in the same position with pad / brush spinning, keep the machine moving to prevent damage to floor finish.
3. If the squeegee assembly leaves streaks on the floor, raise the squeegee off the floor and wipe the blades down with a damp cloth. Pre-sweep the area to prevent leaving streaks on the floor.
4. Pour a recommended defoamer into the recovery tank if excessive foam appears.

WARNING: Do not allow foam to enter the float shut-off screen, vacuum motor damage will result. Foam will not activate the float shut-off screen.

5. Occasionally check the battery meter(see Panel components, item #2). when the bettery is very low, stop scrubbing and recharge the batteries.

WARNING: When battery is very low, do not continue to operate the machine. Battery damage may result.

6. When the solution tank runs empty, raise the brush head off the floor. Keep the squeegee down and continue to vacuum until all the dirty water is picked up.

NOTE: *See* ***TANK DRAINING*** *section to learn how to drain recovery and solution tanks.*

CIRCUIT BREAKER

The machine is equipped with a resettable circuit breaker(see machine components, item #22) to protect the Main controller. If the circuit breaker should trip, it can't be reset immediately. You must first determine what caused the breaker to trip, and allow the Controller to cool down and then you can manually reset the circuit breakers.

NOTE: *Contact an Authorized Service center for machine repairs.*

HOUR METER

The hour meter (see Panel components, item #12) records the number of total hours the brush motor has been powered on. Use the hour meter to determine when to perform recommended maintenance procedures and to record service history.

TANK DRAINING

1. Turn the machine off.
2. With the squeegee and scrub head in their "up" position, transport machine to approved area for draining tank(s).

DRAINING THE RECOVERY TANK

Any time scrubbing is completed, or when refilling solution tank, the recovery tank should be drained and cleaned.

⚠ WARNING: If the recovery tank is not drained when the solution tank has been refilled, foam or water may enter the float shut-off screen and cause damage to the vacuum motor.

1. While holding the drain hose (see machine components, item #35) upward, remove the cap and lower hose to drain.
2. Open the recovery tank cover and rinse out the tank. Use a rag to remove any excess dirt.
3. Clean the float shut-off screen and debris tray located in the recovery tank .

DRAINING THE SOLUTION TANK

Any time scrubbing operation is completed, the solution tank should be drained and cleaned.

1. Pull the solution tank level hose(see machine components, item #24) off the hose fitting, this will allow the solution to flow freely into a bucket or floor drain.
2. Remove the cover of the filter assembly(see machine components, item #30) to drain the solution tank, check the filter screen and clean up it if necessary.
3. Rinse the solution tank with clean water after every use. This will help prevent chemical buildup and clogging of the solution lines.
4. After rinsing out the tank, securely reconnect the tank level hose to the hose fitting, replace the filter assembly cover and be sure the filter screen and the "O" ring is in the correct position.

BATTERY CHARGING

⚠ WARNING: Fire Or Explosion Hazard. Keep Sparks and Open Flame Away. Keep Battery Compartment Propped Open When Charging.

Only use ICE supplied or approved batteries charger, use unapproved charger may cause damage to the batteries and machine.

Batteries charger specifications:

- **Applicable to charging Lithium-ion batteries**
- **Automatic shut off circuit**
- **Output current of 15 Amps**
- **Output voltage of 24 volts**

1. Place machine in a well ventilated area.
2. Turn the machine off.
3. Connect the charger's AC power supply cord (see machine components, item #34)to a properly grounded receptable.
4. Prop up the recovery tank by the support stand (see machine components, item #4) for ventilation when charging.
5. The charger will automatically begin to charge and will automatically shut off once the batteries are fully charged.
6. Upon completion of charging, disconnect the AC power supply cord.

PREVENTATIVE MAINTENANCE

WARNING: Before performing any maintenance on the machine, be sure that the power is turned off, or the batteries are disconnected!

WARING: Repairs are to be completed by Authorized service centers only. Any repairs completed by unauthorized persons will avoid the warrenty.

DAILY MAINTENANCE

1. Remove pad driver/ brush and clean with approved cleaner.
2. Drain recovery and solution tanks completely and rinse out with clean water. Visually check the recovery tank for debris and clean out as necessary.
3. Raise the squeegee assembly off floor and wipe it down with a damp towel. Be sure to store the squeegee in the up position.
4. Remove the float shut-off assembly and rinse it out with clean water.
5. Clean machine with an approved cleaner and a damp towel.
6. Recharge the batteries.
7. Check the condition of the squeegee blade wiping edge, rotate blade if worn.

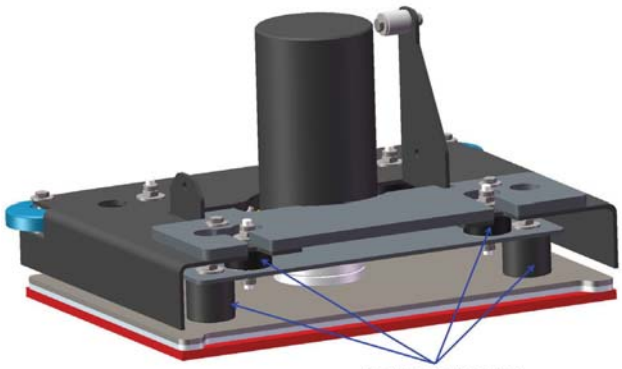
MONTHLY MAINTENANCE

1. Clean the battery tops to prevent corrosion.
2. Check for loose battery cable connections.
3. Inspect and clean the recovery tank cover seal. Replce it if damaged.
4. Lubricate all grease points and pivot points with silicon spray and approved grease.
5. Check the machine for loose nuts and bolts.
6. Check the machine for leaks.

ORBITAL HEAD MAINTENANCE

For Orbital head, you should have checked the eight isolators located in the Orbital head every 300 hours.

1. Using a flashlight, do a visual inspection of the isolators by looking through the opening in the Orbital head and checking for wear or damage to four isolators in the front and four in the rear of the Orbital head. The locations of the isolators are show below.



2. If any of the eight isolators show signs of wear, degradation or damage, contact your local distributor to replace all eight isolators.

MACHINE STORAGE

1. Always store the machine indoors.
2. Always store the machine in a dry area.
3. Always store the machine in its upright position.
4. Always store the machine with the pad driver/ brush raised off the floor.
5. Always store the machine with the squeegee assembly raised off the floor.
6. If storing in an area which may reach freezing temperatures, be sure to drain all fluids from the machine prior to storage. Any damage caused by freezing temperatures will not be covered by the warranty.
7. Drain the recovery tank.
8. Drain the solution tank of all fluid.

FAULT CODE & SOLUTION

The machine is equipped with a LED display screen (see Panel components, item # 4), the LED screen will display the operating hours (see Panel components, item # 12) and the battery level status (see Panel components, item # 2).
When the machine detects a fault, there will be a Fault code (see Panel components, item #11) & Fault message (see Panel components, item #8) display on the LED screen, and the Fault indicator (see Panel components, item #1) will flash continuously, accompany an audible alarm Occasionally.

Once fault occuring, please DO NOT continue operate the machine unless the fault are eliminated. Turn off the machine, then to solve the fault, the fault code & message will be eliminated when machine restart.

If the fault is occurred frequently, or the fault can't be eliminated, please contact ICE service center.

Please refer to the below table to determine the fault cause and the solution.

FAULT CODE	FAULT MESSAGE	MODEL		FAULT CAUSE	SOLUTION
		i20NBL	i20NBTL i24BTL		
F01	Lower Brush Deck	●		Brush deck is off the floor	Release the control handle bail Or Lower the Brush deck
F04	Vac Mtr O.L. RE-START!	●	●	Vacuum motor overload	Turn off the machine,after a moment, RE-START machine
F06	Bru Mtr O.L. RE-START!	●	●	Brush motor overload	
F07	Propel Mtr O.L. RE-START!		●	Propel motor overload	
F08	RecTank Full	●	●	Recovery tank is full Or Bad Solution level sensor	Drain the Recovery tank/Replace the solution level sensor
F10	Batt Low Charge Batt	●	●	Battery is low	Charge the battery
F11	Batt Empty Charge Batt NOW	●	●	Battery is empty	Charge the battery NOW
F12	Brake Wiring Error		●	Bad Brake wiring Bad Brake	Check the brake wiring Replace the Brake assembly
F14	Replace Brake Assy		●	Bad Brake assembly	Replace the brake assembly
F16	Control Unit Overheat! Wait	●	●	Control Unit Overheat	Turn off the machine,after a moment, RE-START machine
F17	Replace Control Unit	●	●	Control Unit Fault	Replace the control unit
F21	Check Vac Mtr	●	●	Bad Vacuum motor or wiring	Check the vacuum motor / Wiring
F22	Check Soln Solenoid	●	●	Solution solenoid wiring fault	Check the wiring & Contactors
F23	Replace Soln solenoid	●	●	Bad Solution solenoid	Replace the solution solenoid
F24	Check Propel Motor		●	Bad propel motor	Check the propel motor / Wiring
F25	Check Brush Motor	●	●	Bad brush motor	Check the brush motor / Wiring
F40	Check Proximity Sw	●	●	Proximity switch fault	Check the Proximity switch
F41	Release Handle	●	●	Operation mistake	Release the control handle bail
F42	Replace Control Unit	●	●	Bad Control Unit	Replace the control unit
F43	Turn Dead Sw Off RE-START!		●	Emergency stop button activated.	Release emergency stop button and restart machine.
F44	Replace Control Unit	●	●	Bad Control Unit	Contact service center, Replace the Control Unit
F45	Return Control Unit	●	●		
F46	Return Control Unit	●	●		
F47	Return Control Unit	●	●		
F48	Return Control Unit	●	●		

BASIC TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Machine will not operate	Control handle bail not pulled	Pull control handle bail
	Lithium-ion batteries need to be charged	Charge batteries
	Bad lithium-ion batteries	Replace batteries
	Loose batteries connection	Tighten the connector
	Main control unit circuit breaker tripped	Reset main control unit breaker
	Faulty i-synergy™ module	Contact ICE service center
Brush motor will not operate	Scrub head is raised off floor	Lower scrub head
	Faulty scrub head (up/down)switch	Contact ICE service center
	Faulty control handle bail switch	Contact ICE service center
	Faulty brush motor or wiring	Contact ICE service center
	Worn Motor carbon brushes	Contact ICE service center
Machine does not propel (Drive model)	Faulty transaxle motor or wiring	Contact ICE service center
	Worn Motor carbon brushes	Contact ICE service center
Vacuum motor will not operate	Faulty vacuum motor or wiring	Contact ICE service center
	Worn Motor carbon brushes	Contact ICE service center
Little or no solution flow	Ball valve set too low or shut off	Turn on the ball valve
	Solution flow control knob set too low or shut off	Adjust solution control flow knob
	Clogged solution tank filter or solution hose	Clean solution tank filter or flush out solution hose
	Clogged solution Solenoid valve	Remove valve and clean
Poor water pick up	Recovery tank is full	Drain recovery tank
	Loose drain hose cap	Tighten cap
	Clogged float shut-off screen located in recovery tank	clean screen
	Clogged squeegee assembly	Clean squeegee assembly
	Worn squeegee blades	Replace or rotate squeegee blades
	Incorrect squeegee blade deflection	Adjust squeegee blade height
	Loose vacuum hose connections	Secure hose connections
	Clogged vacuum hose	Remove clogged debris
	Damaged vacuum hose	Replace vacuum hose
	Recovery tank cover not in place	Properly position cover
	Damaged recovery tank cover seal	Replace seal
	Faulty vacuum motor	Contact ICE service center
	Low battery charge	Recharge batteries
Short run time	Low battery charge	Fully recharge batteries
	Defective batteries	Replace batteries
	Faulty battery charger	Repair or replace battery charger
	Down pressure lever is set for extra scrub head pressure	Lower down pressure lever

TECHNICAL SPECIFICATIONS

MODEL	i20NBL Brush Assist	i20NBTL W/ Drive	i20NBTL-OB Orbital head	i24BTL Dual disk
DIMENSIONS L	55.7 in / 1,415 mm		53.5 in / 1,360 mm	52.2 in / 1,325 mm
DIMENSIONS W	22 in / 560 mm		22 in / 560 mm	25.6 in / 650 mm
DIMENSIONS H	44.9 in / 1,140 mm		44.9 in / 1,140 mm	44.9 in / 1,140 mm
WEIGHT	210 lbs / 95 Kg	230 lbs / 105 Kg		
WEIGHT with BATTERIES	310 lbs /140 Kg	330 lbs / 150 Kg		
RECOVERY TANK CAPACITY	17.2 Gal / 65 L			
SOLUTION TANK CAPACITY	15.9 Gal / 60 L			
SQUEEGEE WIDTH	30 in / 762 mm			
CLEANING PATH WIDTH	20 in / 500 mm (Disk)		500 mm / 20 in (20 in x 14 in Pad)	24 in / 600mm
PRODUCTIVITY RATE	19,375 ft^2 / 1,800 m^2 h	23,680 ft^2 / 2,200 m^2 h		28,000 ft^2 / 2,600m^2 h
DRIVE SYSTEM	Brush Assisted	Transaxle, 0.27 hp / 0.2KW		
TRAVEL SPEED, MAXIMUM	N/A	246 ft / Min 75 m / Min		
MINIMUM AISLE TURN	63 in / 1,600 mm			
PAD/BRUSH PRESSURE	65 lbs / 30 Kg Min 100 lbs / 45 Kg Max			
SOLUTION FLOW RATE	0 ~ 0.37 Gal / Min 0 ~ 1,400 ml / Min			
BRUSH MOTOR	0.75hp / 0.55KW 220 RPM		0.75hp / 0.55KW 2,200RPM	0.9hp / 0.68KW 2,000RPM
VIBRATIONS @ CONTROLS	N/A		< 2.5 m / s^2 < 8.2 ft / s^2	N/A
VACUUM MOTOR	0.7hp / 0.5KW			
WATER LIFT - AIR FLOW	45 in / 1,143 mm			
BATTERIES	Lithium-ion batteries, 120AH			
RUN TIME PER CHARGE	3.5 Hours	3 Hours		
VOLTAGE DC	24V			
DECIBEL RATE AT OPERATOR'S EAR, INDOORS	68dB(A)		<70dB(A)	68dB(A)
GRADE LEVEL, MAX	5% (3°)			