ECOLAB®

COMMANDER Series 4400 Facility Cleaning Systems

Installation and Operation Manual

Retain this manual for installation, operation, and servicing information.

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28691/0309/0620
Part No. 9478-2513

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1.0 Preface

This manual has been written to present the basic installation and operation characteristics of the Commander series line.

Guidelines will be suggested in reference to the preferred method of installation, however, the variety of equipment and the surrounding physical environment will dictate the actual installation.

- All personnel concerned are to make themselves thoroughly familiar with the appropriate parts of this manual before attempting to install, operate or service the system.
- This manual contains important warnings and instructions. Read and retain for future reference.

Use only recommended Ecolab Detergents with the Commander systems. Read labels instructions on detergent containers thoroughly.
- Store and use Ecolab detergents at room temperature
- Keep from freezing
- Insure adequate ventilatiop when using a Commander system

If handling detergents directly is unavoidable, wear rubber gloves and protective clothing as recommended on detergent container label. Protect skin, eyes, and mucous membranes from contact with concentrated detergents and use solutions. The following personal protective devices should be used:

- Safety goggles of face shields
- Rubber gloves
- Rubber boots
- Protective clothing

Rinse all empty containers with clean water. Immediately rinse off any spills on skin or surfaces. Refer to precautions and first aid instructions on detergent label.

WARNING: These installation and servicing instructions are for use by qualified personnel only. The installation must be made in accordance with local plumbing and electrical codes.

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2.0 Introduction

The Commander series Foam/Sanitize/Rinse stations were developed to handle a wide range of applications and pressures. The stations are compatible with all detergents and sanitizers.

The foamers were designed to generate foam from one or two containers by simultaneously blending either one or two Ecolab detergents in the aspirator body. The water movement through the special aspirator creates a vacuum, resulting in a blended detergent solution into which regulated air is injected to produce foam. The detergent concentration in the foam is controlled by the use of metering tips into the detergent inlet entering into the aspirator body. Foam consistency is a function of the:

- Water Hardness
- Detergent Concentration
- Type of Ecolab Product
- Water Pressure
- Air Pressure
- Foam Wand and Hose Configuration

The Commander series of foam stations are capable of producing foam for cleaning and sanitizing in applications intended for use in the dairy, food and beverage industries.

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3.0 Equipment Selection

3.1 Commander Series Drop Stations Identification Number Designation

LOCAL/ASPIRATED

	LOW (50-100) psi)	BOOSTED (100-400 psi)	HIGH (400-800 psi)
FOAM	4411	4421	4431
RINSE/FOAM		4451	4461
RINSE/FOAM/SANITIZE	4445	4455	4465
SANITIZE	4413		
RINSE		4450	4460

CENTRAL

	LOW (50-100 psi)	BOOSTED (100-400 psi)	HIGH (400-800 psi)
FOAM	4412		
SANITIZE	4414		
RINSE/FOAM/SANITIZE		4456	4466
RINSE/FOAM		4452	4462

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4.0 Equipment Specifications

4.1 Dimension

Model	Height inc/cm	Width in/cm	Depth in/cm
4411 - LP Aspirated Foam	20/50.8	12/30.48	4/10.16
4412 - LP Central Foam	20/50.8	12/30.48	4/10.16
4413 - LP aspirated sanitize	30/76.20	3/7.62	6/15.24
4414 - LP central sanitize	30/76.20	3/7.62	6/15.24
4421 - BP aspirated foam	20/50.8	12/30.48	4/10.16
4431 - HP aspirated foam	20/50.8	12/30.48	4/10.16
4445 - LP rinse/aspirated foam/sanitize	18/45.72	14/35.56	4/10.16
4450 - BP rinse	30/76.20	3/7.62	6/15.24
4451 - BP/rinse/aspirated foam	34/86.36	12/30.48	6/15.24
4452 - BP/rinse/aspirated foam	34/86.36	12/30.48	6/15.24
4455 - BP rinse/aspirated foam/sanitize	18/45.72	14/35.56	4/10.16
4456 - BP rinse/aspirated foam/sanitize	18/45.72	14/35.56	4/10.16
4460 - HP rinse	18/45.72	12/30.48	6/15.24
4461 - HP rinse/aspirated foam	30/76.20	3/7.62	6/15.24
4462- HP rinse/central foam	34/86.36	12/30.48	6/15.24
4465 - HP rinse/aspirated foam/sanitize	34/86.36	12/30.48	6/15.24
4466 - HP rinse/central foam/sanitize	18/45.72	4/10.16	4/10.16

LP =Low Pressure (50-100 psi/3.4-6.9 bar)
BP =Boosted Pressure (100- 400 psi/6.9-27.6 bar)
HP =High Pressure (400-800 psi/27.6-55.17 bar)

Model	Water Supply				Air Supply			
	Water Pressure psi/bar		Flow Rate gpm/lpm		Pressure psi/bar		Flow scfm	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
4411 -LP aspirated foam	50/3.4	100/6.9	2/7.57	4/11.36	40/2.7	90/6.2	3	5
4412-LP central foam	50/3.4	100/6.9	2/7.57	5.18.93	40/2.7	90/6.2	3	5
4413-LP aspirated sanitize	50/3.4	100/6.9	5/18.93	15/56.78	n/a	n/a	n/a	n/a
4414-LP central sanitize	50/3.4	100/6.9	5/18.93	15/56.78	n/a	n/a	n/a	n/a
4445-LP rinse/aspirated foam/sanitize	50/3.4	100/6.9	5/18.93	15/56.78	40/2.7	90/6.2	3	5
4421-BP aspirated foam	150/10.3	400/27.6	2/7.57	4/11.36	40/2.7	90/6.2	3	5
4431-HP aspirated foam	400/27.6	800/55.17	2.5/9.46	4/11.36	40/2.7	90/6.2	3	5
4450-BP rinse	150/10.3	400/27.6	5/18.93	20/75.71	n/a	n/a	n/a	n/a
4451-BP/rinse/aspirated foam	150/10.3	400/27.6	5/18.93	20/75.71	40/2.7	90/6.2	3	5
4452-BP/rinse/central foam	150/10.3	400/27.6	5/18.93	20/75.71	40/2.7	90/6.2	3	5
4455-BP rinse/aspirated foam/sanitize	150/10.3	400/27.6	5/18.93	20/75.71	40/2.7	90/6.2	3	5
4456-BP rinse/aspirated foam/sanitize	150/10.3	400/27.6	5/18.93	20/75.71	40/2.7	90/6.2	3	5
4460-HP rinse	400/27.6	800/55.17	3/11.36	10/37.85	n/a	n/a	n/a	n/a
4461-HP rinse/aspirated foam	400/27.6	800/55.17	3/11.36	10/37.85	40/2.7	90/6.2	3	5
4462-HP rinse/central foam	400/27.6	800/55.17	3/11.36	10/37.85	40/2.7	90/6.2	3	5
4465-HP rinse/aspirated foam/sanitize	400/27.6	800/55.17	3/11.36	10/37.85	40/2.7	90/6.2	3	5
4466-HP rinse/central foam/ sanitize	400/27.6	800/55.17	3/11.36	10/37.85	40/2.7	90/6.2	3	5

LP = Low Pressure (50-100 psi/3.4-6.9 bar)
BP = Boosted Pressure (100- 400 psi/6.9-27.6 bar)
HP = High Pressure (400-800 psi/27.6-55.17 bar)

5.0 Installation Procedures

5.1 Mounting the Commander Drop Stations

It is recommended to mount the drop stations in a vertical position adjacent to the water line.

1. Secure the drop stations to the wall using the screws , washers and wall anchors provided in the installation kit.
2. Backflow preventers are not supplied with the stations, one should be installed on the water line according to local and state plumbing codes.
3. An optional T-strainer is provided with the aspirated units. This strainer should be installed when water quality is questionable to prevent particulates from plugging the aspirator.
4. Mount jug holder.
5. Attach hoses to station.
6. If dual pickup hoses are to be used, remove hex plug and install strainer pickup fitting assembly, (see F&B Repair Parts Manual) and tubing.

NOTE: If using POAA products, use check valve w/silicone o-rings. (Ref. F&B Repair Parts Manual on Ecolab-Sales Support)

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6.0 Operation Procedures

Tip Conversion Chart

Color	Diameter	Size in Drill No.
Gray	.128	30
Black	.098	40
Beige (very light brown)	.070	50
Red	.052	55
White	.043	57
Blue	.040	60
Tan (medium brown)	.035	65
Green	.028	70
Orange	.025	72
Brown (dark)	.023	74
Yellow	.020	76
Purple	.014	79
Pink	.010	87
Clear	No hole - Drill or use as plug	

6.1 Metering Tips

Select tip(s) from the chart to insert into the pickup tubing for product concentration. The tip selection and concentration will depend on the viscosity, product temperatures, pressures and hose type. It will be a trial and error procedure finding the correct tip based on recommended use concentrations. Titrate a sample of collapsed foam to determine concentration.

An optional Low Concentration Metering Tip is available for use when lower concentrations are required (reference Replacement Parts Manual for kit part number).

6.2 Foam Quality

Foam quality is affected by water hardness, detergent concentration and water temperature.
- As water hardness increases, foam quality decreases
- As detergent concentration increase, foam quality increases
- As water temperature increase, foam quality increases

6.3 Product Containers

1. Only properly labeled containers should be used for detergents or sanitizers.
2. Once containers use is complete it should be properly rinsed with clean water.

6.4 Start-up Sequence

When starting up a foamer or sanitizer system, the following sequence should be followed.
1. Open the water ball valve to the drop station and check that detergent/sanitizer is being drawn up through the pickup tubes.
2. For foam systems, open the air ball valve only when the detergent(s) have reached the foam chamber. Adjust the air pressure regulator to achieve the foam consistency desired.

6.5 Shut-Off Procedure

1. When turning off the system, the air ball valve is turned off first followed by the water ball valve.
2. The foam hose should be stored on the provided hose rack and not on the floor.

7.0 Maintenance

The Commander system hoses should be inspected at least every six (6) months or after each 500 hours of operation, whichever comes first. The hose should be examined for any leaks at the crimped on fittings or for any indication of weakness in the hose structure. Replacement hoses are available. Reference F&B Repair Parts Manual.

NOTE: To rinse the foam hose of residue detergent, perform the following procedures:

1. Remove detergent pickup hoses or clamp shut.
2. Turn on the water ball valve and rinse the foam hose.
3. Turn off the water ball valve and tum on the air ball valve to blow dry the foam hose liner.
4. Turn off the air ball valve.

NOTE: To rinse the pick-up tubes, follow the above instructions for rinsing the foam hose, with the addition of placing the pick-up tubes and strainer assemblies in warm water. This will allow flushing of the metering tips and check valve assemblies. This is particularly important with chlorinated detergents that may be corrosive.

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8.0 Troubleshooting

8.1 Foam spatters at nozzle.	1. Detergent concentration too low. 2. Air pressure is too high. 3. Water screen clogged. 4. Foam hose or wand clogged or damaged. 5. Foam hose kinked or not uncoiled. 6. Leak in detergent pick-up Tube/fittings.	a. Metering tip may be plugged. Metering tip orifice too small- Review concentration guidelines. b. Adjust pressure regulator. c. Clean or replace. d. Clean or replace. e. Instruct personnel on proper use and storage. f. Seal tubes by tightening tube clamps on detergent inlet. Replace detergent pick-up tubes and any cracked fittings.
8.2 Improper air injection.	1. Air does not flow when air ball valve is opened. 2. Regulator defective or not turned on. 3. Air check valve is plugged. 4. Regulator filter plugged. 5. Too much air pressure, defective or turned on too far.	a. Check air line connection is properly attached. b. Turn on air supply. Adjust or replace regulator. c. Clean or replace. d. Replace filter. e. Adjust or replace regulator.
8.3 No foam at nozzle.	1. Detergent container empty. 2. Loss of vacuum on detergent.	a. Instruct personnel on proper use. b. Check detergent pick-up tubes. c. Check metering tips for plugging. d. Inspect detergent check valves for plugging. e. Inlet temperature greater than 160°F.
8.4 Restricted or no water flow.	1. Aspirator plugged due to hard water precipitate. 2. Water screen clogged. 3. Low water pressure.	a. Remove precipitate by separating the high pressure hose from the aspirator body and allow a mild acid solution to sit inside the aspirator overnight. b. Clean or replace. c. Check water pressure at foamer inlet.

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9.0 Replacement Parts

Reference Food and Beverage Parts Manual on Ecolab-Sales Support.

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