PENTAIR

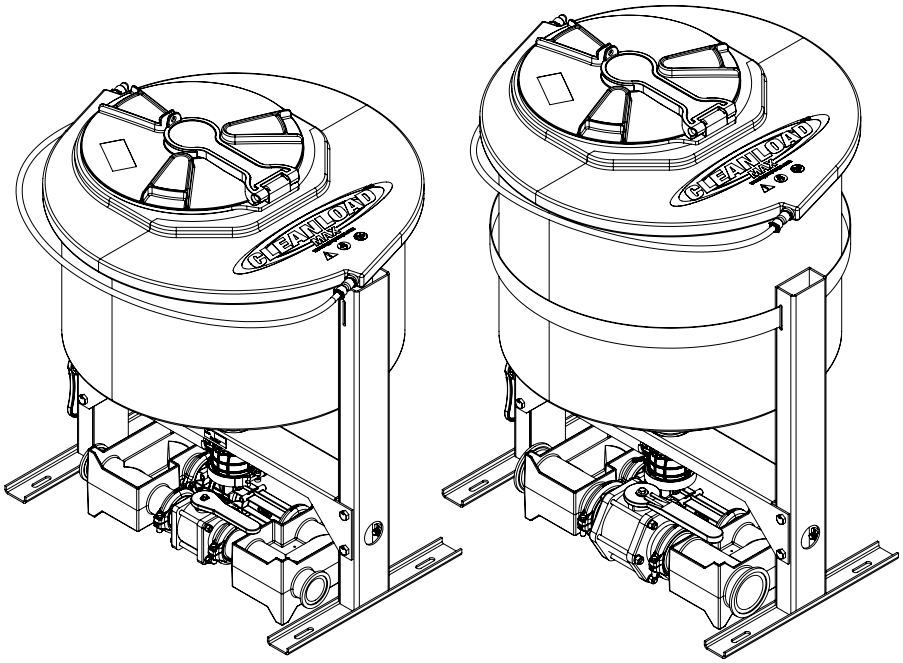
Hypro® Series 3378

HYPRO®

Form L-1587
Rev B

Original Instruction Manual

KEEP FOR FUTURE REFERENCE



3378-1640 & 3378-1660 Series
3378-1140 & 3378-1160 Series
Cleanload Max

Pentair
375 5th Ave., New Brighton, MN 55112
Phone: (651)766-6300 -OR-800-424-9776 Fax: 800-323-6496
www.hypropumps.com

Contents

Introduction....3
- Description....3
- Intended Uses....3
- Purpose of Manual....3
- Misuses....3
- Product Identification....4

Product Technical Data....4
- Tools....5
- Lifting, Transport, and Intermediate Storage....5

Assembly and Installation....5
- Assembly....5
- Installation....5
- Control Systems....6

Commissioning, Start-Up, Operation, Shutdown....7
- Information....7
- Start-Up, Operation, Shutdown....7

Maintenance and Servicing....8
- Information....8
- Disposal....8
- Cleaning....8
- Maintenance, Routine Servicing, and Inspection....8
- Troubleshooting....9
- Replacement Parts....10

Warranty....12

Introduction

Description

Pentair Cleanload chemical eductors are designed to mix fluids and dry chemicals in a self-contained system. The inline eduction system allows the operator to mix chemicals quickly and safely. The Cleanload operates by receiving a fluid into the eductor where a fluid or dry chemical is mixed in. The mixture is then transferred into a holding tank to be used for spraying crops. Construction features a polypropylene venturi eductor and polyethylene hopper tank and FKM gaskets.

Intended Uses

The Cleanload is designed and constructed for incorporation into a large variety of applications that require the mixing of liquid and dry chemicals. All other uses are to be considered misuses unless approved by the manufacturer. The Cleanload can be used in a wide variety of conditions including:

• Fluid temperatures ranging from 1 to 49°C (34 to 120°F).

• The Cleanload must only be used in outdoor or well-ventilated areas.

Purpose of Manual

Hypro has provided this manual to provide instructions and requirements that must be met when installing, using and maintaining the product(s) included in this document.

If the product is sold, the seller must pass this manual on to the new owner.

The following special attention notices are used to notify and advise the user of this product of procedures that may be dangerous to the user or result in damage to the product.

ATTENTION

Attention is used to notify of installation, operation, or maintenance information that is important but not safety related.



This symbol is used to denote the presence of an electrical hazard that will result in personal injury, death or property damage.



This symbol is used to denote the presence of a hazard that will result in personal injury, death or property damage.

California Proposition 65 Warning -- This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Misuses

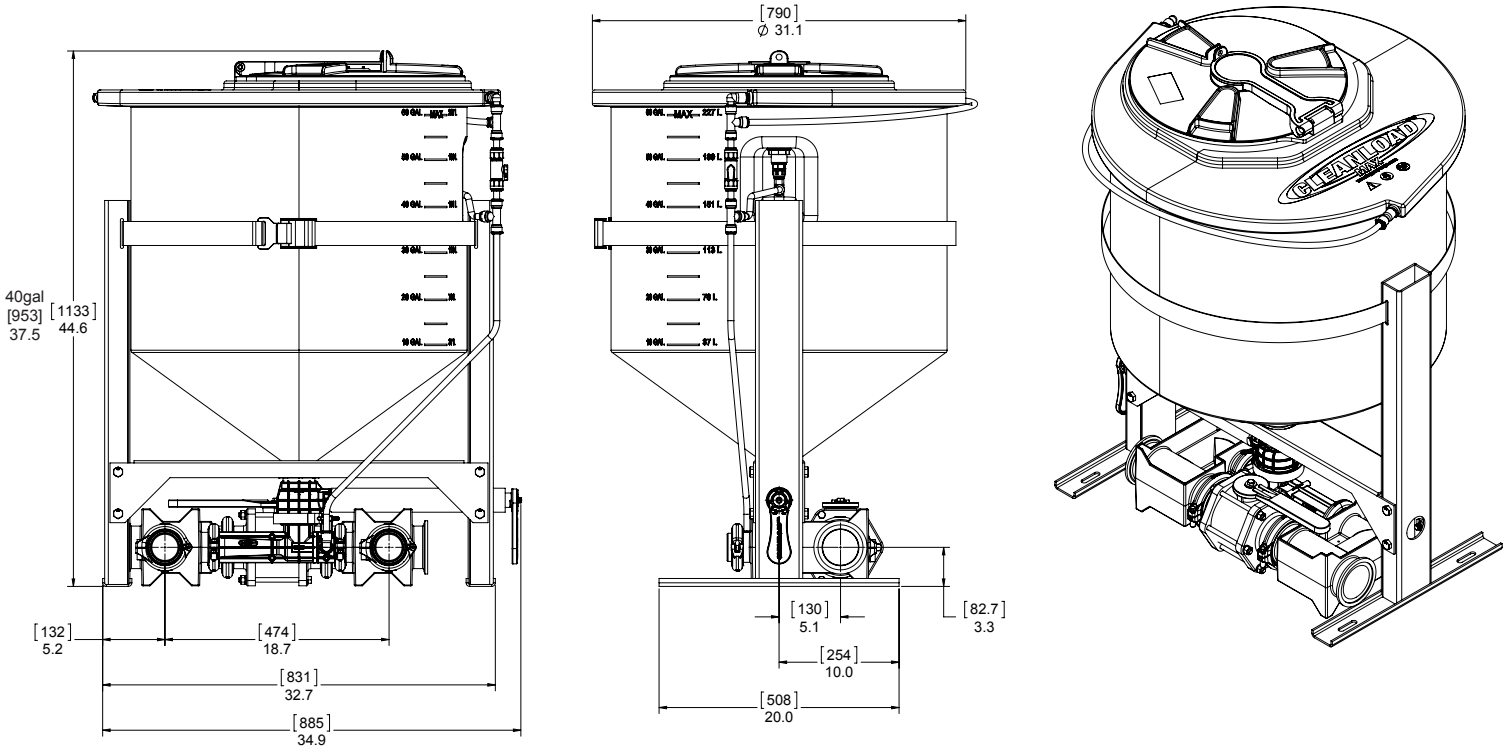
Hypro Cleanload are designed to operate effectively within the pressure and environmental ranges. Going outside of these ranges will void the warranty and could cause damage to property, serious injury or death.

- **DO NOT use the Cleanload in a potentially explosive environment.**
- **DO NOT use the Cleanload without the tank lid securely attached.**
- **DO NOT operate the Cleanload with missing, damaged, or leaking parts. Inspect for damaged parts prior to each use.**
- **DO NOT use the Cleanload in drinking water or any other system producing products for human consumption.**
- **DO NOT use the Cleanload without the proper personal protection equipment.**
- **DO NOT use the Cleanload if it is not properly secured into position.**
- **DO NOT exceed the maximum pressure when using the Cleanload.**
- *****DO NOT use the Cleanload in wind exceeding 10 MPH.*****
- **DO NOT move the Cleanload when filled with fluid.**

Product Identification

Hypro uses serialized labeling to enable users to precisely identify the Cleanload's manufacturing date.
Serial Number:
First and second digits: year (12 = 2012)
Third through fifth digits: consecutive day of the year the Cleanload was manufactured.
Sixth through eighth digit: unique system ID number.

Dimension Views



Product Technical Data

Performance Charts

General Cleanload Details		
Working Pressure	20-100 PSI (See flow data for specific pressure data.)	0.7-6.9 bar
Flow Rates	19-117 GPM	72-433 L/min
Operating Temperature	34-115°F	1-46°C
Weight	90 lbs.	40.8 Kg

3378-1140-2BYP & 3378-1160-2BYP		
Input Pressure (PSI)	**Eduction Rate (gal/ sec)**	**Flow Rate (gal/min)**
20	0.44	24.76
40	0.71	36.26
60	0.90	43.40
80	0.98	49.24
100	1.08	54.52

3378-1140-2BYP & 3378-1160-2BYP		
Input Pressure (bar)	**Eduction Rate (L/sec)**	**Flow Rate (L/min)**
1.4	1.67	93.73
2.7	2.69	137.26
4.1	3.40	164.29
5.5	3.71	186.39
6.9	4.09	206.38

3378-1640-2BYP & 3378-1660-2BYP		
Input Pressure (PSI)	Eduction Rate (gal/ sec)	Flow Rate (gal/min)
20	0.54	60.63
40	0.79	78.22
60	0.92	91.82
80	0.94	103.91
100	0.94	114.86

3378-1640-2BYP & 3378-1660-2BYP		
Input Pressure (bar)	Eduction Rate (L/sec)	Flow Rate (L/min)
1.4	2.04	229.51
2.7	2.99	296.09
4.1	3.48	348.58
5.5	3.56	393.34
6.9	3.56	434.79

3378-1140-3BYP & 3378-1160-3BYP		
Input Pressure (PSI)	Eduction Rate (gal/ sec)	Flow Rate (gal/min)
20	0.49	24.38
40	0.79	36.13
60	0.93	42.87
80	0.97	49.12
100	1.05	54.41

3378-1140-3BYP & 3378-1160-3BYP		
Input Pressure (bar)	Eduction Rate (L/sec)	Flow Rate (L/min)
1.4	1.85	92.29
2.7	2.99	136.77
4.1	3.52	162.28
5.5	3.67	185.94
6.9	3.97	205.96

3378-1640-3BYP & 3378-1660-3BYP		
Input Pressure (PSI)	Eduction Rate (gal/ sec)	Flow Rate (gal/min)
20	0.56	59.73
40	0.82	78.02
60	0.90	92.23
80	0.92	104.10
100	0.91	114.92

3378-1640-3BYP & 3378-1660-3BYP		
Input Pressure (bar)	Eduction Rate (L/sec)	Flow Rate (L/min)
1.4	2.11	226.10
2.7	3.10	295.34
4.1	3.41	349.13
5.5	3.48	394.06
6.9	3.44	435.02

3378-1140 & 3378-1160		
Input Pressure (PSI)	Eduction Rate (gal/ sec)	Flow Rate (gal/min)
20	0.57	27.06
40	0.86	38.09
60	0.85	44.58
80	1.21	50.46
100	1.18	55.38

3378-1140 & 3378-1160		
Input Pressure (bar)	Eduction Rate (L/sec)	Flow Rate (L/min)
1.4	2.16	102.43
2.7	3.24	144.19
4.1	3.22	168.77
5.5	4.60	191.00
6.9	4.46	209.62

3378-1640 & 3378-1660		
Input Pressure (PSI)	Eduction Rate (gal/ sec)	Flow Rate (gal/min)
20	0.75	64.29
40	0.92	80.88
60	0.79	94.63
80	0.88	106.19
100	0.88	116.92

3378-1640 & 3378-1660		
Input Pressure (barl)	Eduction Rate (L/sec)	Flow Rate (L/min)
1.4	2.86	243.36
2.7	3.49	306.15
4.1	2.98	358.21
5.5	3.35	401.99
6.9	3.35	442.58

Tools

The Cleanload is designed using Metric (mm) size bolts, but it can be mounted by Imperial (Inch) tools as well. In most cases, an adjustable spanner wrench can be used to fit any size bolt.

Lifting, Transport, and Intermediate Storage

The packaging consists of a pallet for easy shipping and handling.

During unpacking, inspect the contents of the packaging to ensure that all components are accounted for and undamaged. If there are damaged or missing components, please contact the dealer or Hypro. Dispose of the packaging materials properly according to local laws.

Shipment of the Cleanload may be done by a variety of transportation methods, including road, sea, air, or rail. Ensure that the containers are securely fixed to the transport vehicle for safe shipment.

⚠WARNING **DO NOT** stack

If the Cleanload is to be stored for an extended period of time before installation, store the Cleanload in its packaging in a cool dry area.

Assembly and Installation

Assembly

All 3378 Series Models
No Assembly Required

Installation

⚠WARNING Cleanload must be installed in accordance with Hypro installation instructions. Failure to follow instructions completely will void the Limited Warranty.

The Cleanload is a versatile tool that can be used in a variety of applications. Because of the wide range of equipment Cleanloads may be used with, it is not possible to list every installation detail. Consult the manufacturer's documentation for the equipment on which you are mounting the Cleanload to identify suitable plumbing connections and mounting locations.

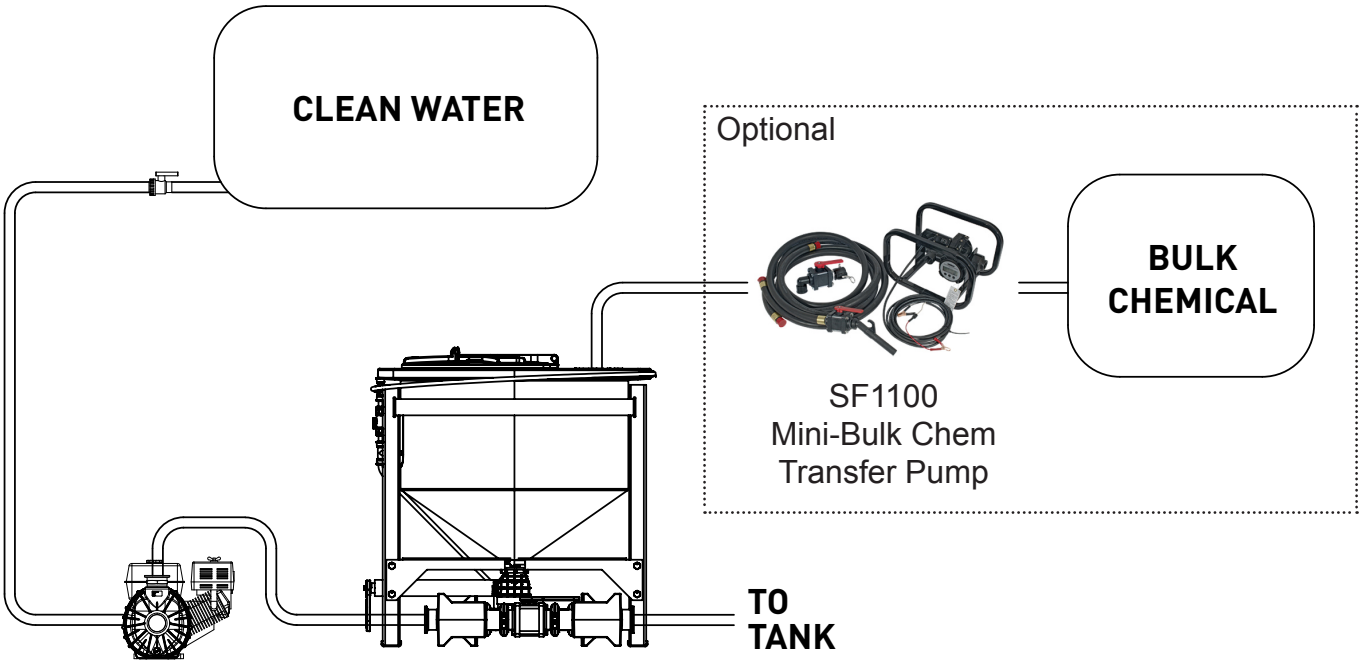
- ⚠ Securely mount the Cleanload in a place that is out of the way of moving equipment and allow for safe routing of plumbing. Ensure that the ball valve handles are easily accessible and have enough clearance to complete their full range of motion.
- ⚠ Connect inlet and outlet hoses, minimum 2" (51mm) internal diameter, using appropriate fittings. Hoses should be made of a compatible material(s) to work with the chemicals being used and a 200 psi (13.8 bar) pressure rating. Route hoses so that there is no risk of persons tripping, falling or running into them. Hoses should also be routed so that they are protected from abrasion and impact forces.
- ⚠ The arrow on the eductor fitting indicates the direction of flow. Both the inlet and outlet of the eductor are compatible with 220 universal flanges.
- ⚠ Elbow fittings, reducers, check valves, and sharp turns in the plumbing create back-pressure on the eductor and reduce performance. Their use should be minimized. Instead of sharp turns or elbow fittings, make sweeping bends with reinforced hose. If sharp turns cannot be avoided, the plumbing should be oversized to reduce flow restriction. Do not reduce the size of the outlet hose or fittings.
- ⚠ To gain the full benefit of the rinse systems built into the Cleanload, provision should be made so that the final rinse is made using clean water.
- ⚠ For transfer and tender truck installations, the final rinse can simply be made when clean water is being transferred into the spray tank.

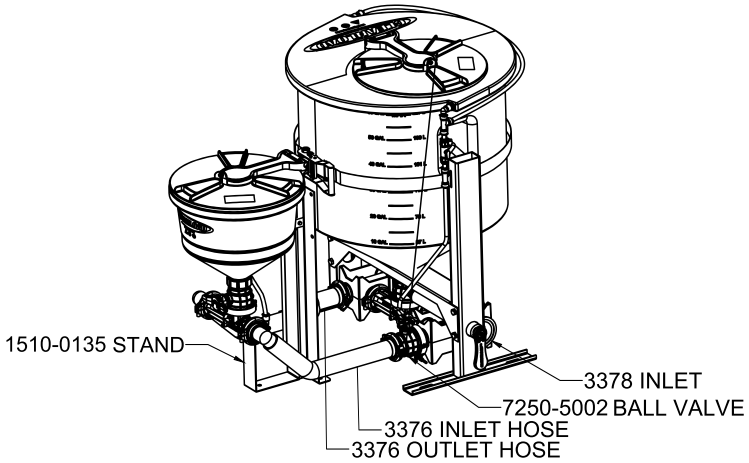
Standard Mounting

- Place on flat even ground.

Pump Plumbing

- Typical tender application





3378 WITH 3376 ASSEMBLY

Control Systems

- All pump systems with electric or hydraulic power sources are required to have a control system which meets all local and national standards.
- For more detail on a typical system installation, see preceding subsections of the “Assembly and Installation” section of this manual.

Commissioning, Start-Up, Operation, Shutdown

Before attempting to operate your Cleanload, the following must be understood and followed to ensure safe operation.

Information

Read the operating instructions (to follow) completely before using the Cleanload.

- ⚠ Always read and follow the chemical label instructions exactly. Understand safe practices for chemical handling, mixing, loading, cleaning, and first aid.
- ⚠ Always wear proper Personal Protective Equipment when handling chemicals, including gloves, eye protection, respirator and safety shoes.
- ⚠ Always pay attention to wind conditions when using the Cleanload. DO NOT use Cleanload in wind in excess of 10MPH due to possibility of tipping.
- ⚠ Always check to make sure that there are no loose objects surrounding the Cleanload that could cause damage to the hopper tank or hoses.
- ⚠ When operating the Cleanload at night, ensure proper lighting (200 to 300 Lux) is present.
- ⚠ **IMMEDIATELY SHUT DOWN the system if leaks, errant spray, operation error, or malfunction occur.**

Start-up, Operation, Shutdown

Before Operation

- Inspect the assembly for signs of leaks.
- Ensure all hoses or fittings are properly attached to the Cleanload.
- Ensure hopper valve (red handle) and Cyclo rinse valve (blue handle) are in the closed position and that the bypass valve (yellow handle) is in the open position.
- Ensure proper pump /system sizing for proper eductor function prior to using chemicals. Trial with water is recommended to ensure safe operation. Proper function is indicated by water being drawn into the line, and not backing up inside the hopper.
- If water backs up in hopper when the pump is on, ensure the hopper valve (red handle) is open to allow flow from the enclosure. If the backup persists, immediately close the Cyclo Rinse (blue handle) and the hopper valve (red handle) and shut off the pump. Review outlet plumbing to minimize restrictions or blockages.

Start-up, Operation, Shut Down

1. Turn on the pump to generate clean water flow.
2. Open the tank hopper (red handle) and the Cyclo Rinse valve (blue handle), close the bypass valve (yellow handle)
3. Inspect assembly for leaks.
4. Open the chemical container, pour and measure the chemical. Pour the measured chemical into hopper.
5. Triple rinse the measurement container using bottle rinse inside hopper
6. If more than one container is needed repeat steps 4 & 5.
7. Rinse chemical container(s) to ensure any chemicals on the exterior are removed.
8. If container(s) are empty, triple rinse the container(s) using bottle rinse inside hopper.
9. Close the Cyclo rinse valve (blue handle) and wait for 15 seconds. Close the hopper valve (red handle).
10. If more chemicals need to be added to the tank repeat steps 1-11.
11. Open the bypass valve (yellow handle) and continue to transfer water as needed or shut off pump.

Maintenance and Servicing

Information

ATTENTION: Divert or stop all flow to and from the Cleanload system before performing any service or maintenance procedures.

ATTENTION: Always wear proper Personal Protective Equipment when handling chemicals including gloves, eye protection, respirator and safety shoes.

ATTENTION: Always dispose of chemicals and contaminated water in accordance with national and local laws and statutes.

Disposal

When disposing of a Hypro Cleanload, be sure to remove all fluids from the Cleanload before scrapping. These fluids should be disposed of in a manner which complies with local and national regulations. Never dump fluids onto the ground. Once the pump is free of all fluids, it may be scrapped in accordance with local and national laws.

Cleaning

Always flush the Cleanload with clean water after each day's use, if switching chemicals, or if the system is going to be inactive for an extended period of time. Ensure that the components of the Cleanload are free of any chemical buildup or residue, both inside and out. Failing to properly clean the system could lead to reduced performance and component life.

Be sure to thoroughly clean the eductor, ball valves, and internal components in the hopper. Cycle the ball valves open and close during rinsing to ensure they are clean.

Maintenance, Routine Servicing, and Inspection

PREVENTATIVE MAINTENANCE CHECK-LIST			
Check	**Daily**	**Weekly**	**Yearly**
Water Leaks	X		
Plumbing		X	

- Each system's maintenance cycle will be exclusive. If system performance decreases, check immediately.
- Duty cycle, temperature, quality, type of fluid being pumped, and inlet feed conditions all affect the life of Cleanload assemblies and service cycle.
- Label partial containers "seal is broken".
- No sharp objects.

Troubleshooting

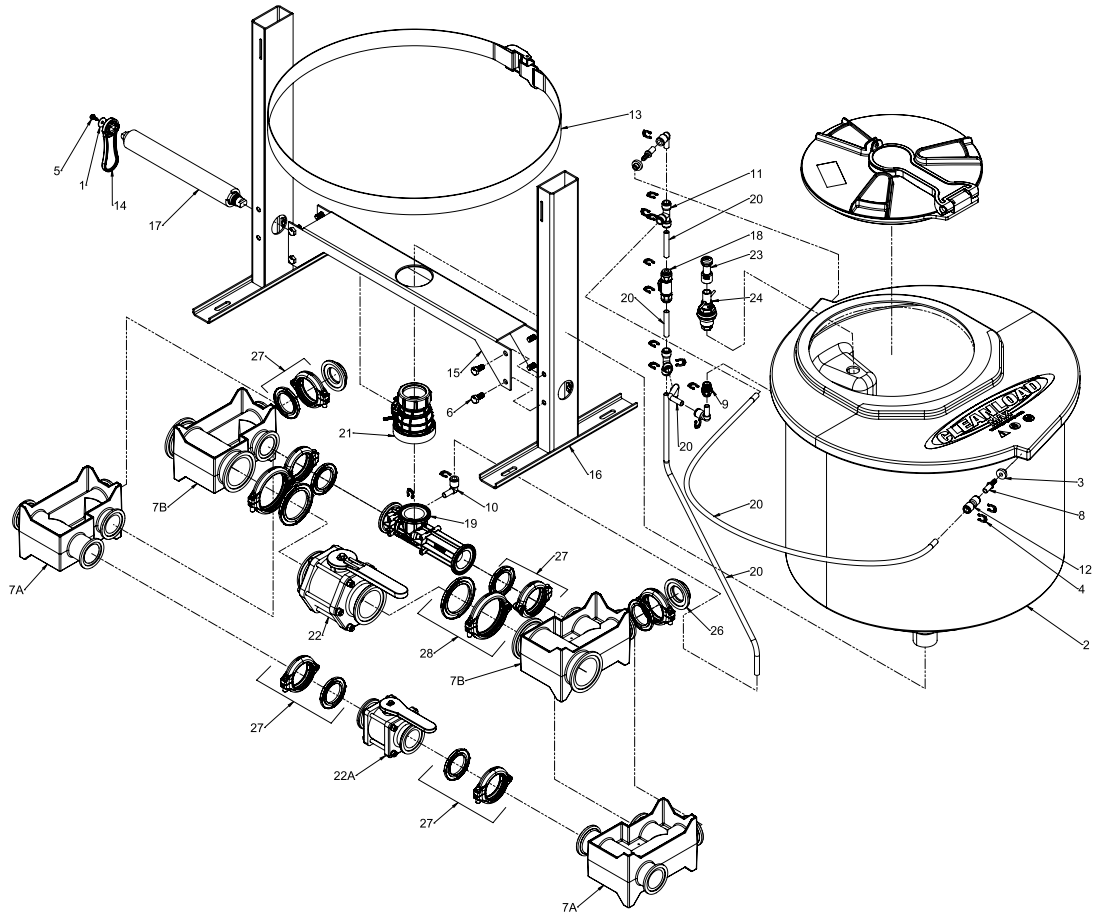
When servicing of a Hypro Cleanload, be sure that all pumps are disconnected from energy sources

Symptom	Probable Cause(s)	Corrective Action
Slow Eduction Rate	Flow restrictions on outlet side of eductor.	Replace 90-degree fittings with sweeping bends using reinforced hose, especially near the eductor outlet. Use 2” (51mm) or larger hose and fittings all the way back to and into the tank. If sharp bends cannot be avoided, use oversized hose and fittings to minimize flow restriction.
	Not enough flow	Check Pump
	The eductor nozzle is plugged.	Looking down into the hopper outlet with the hopper valve open, observe the liquid jet should be centered and straight. If it is off-center or if it is dispersed, flush the system with clean water and remove the fittings from both sides of the eductor. Using a soft tool (wood or plastic) and taking care to not deform the orifice, clear the blockage by pushing it back out toward the inlet side of the fitting. A blocked eductor nozzle indicates that a filtration problem elsewhere in the system must be corrected.
Plugged Container Rinse Nozzle	Debris in the Container Rinse system.	Replace nozzle and make sure there is proper filtration in the pump system before the Cleanload inlet.
Leaks	Loose fittings. Cracked fittings. Over- torqued fittings.	Tighten fittings. Replace fittings. Ensure proper torque (30 in-Lb).

Replacement Parts

The following drawings show the Cleanload and their replacement parts. **Only genuine replacement parts should be used. Failure to follow this warning can result in damage to property, serious injury or death.** If the Cleanload malfunctions or is defective it should be sent back to Hypro for service.

3378 Series Cleanload Max



Ref. No.	Qty. Req'd.	Part No.	Description
1	1	1410-0152	WASHER
2	1	1530-0040	TANK 40 GALLON
2	1	1530-0041	TANK 60 GALLON
3	2	1700-0270	GROMMET
4	15	1800-0020	SAFETY CLIP
5	1	2200-0091	SCREW
6	8	2210-0223	HEX BOLT, M12
7A	2	2400-0139	ADAPTER BYPASS 2" (FOR -2BYP MODELS)
7B	2	2400-0140	ADAPTER BYPASS 3" (FOR -3BYP MODELS)
8	2	2400-0141	HOSE BARB FITTING
9	1	2404-0386	FITTING
10	3	2404-0414	ELBOW FITTING (1/2")
11	2	2404-0415	TEE FITTING (1/2")
12	1	2404-0456	FITTING
13	1	2520-0220	FRAME STRAP
14	1	2800-0027	VALVE HANDLE, RED
15	1	2800-0033B	FRAME CROSSMEMBER
16	2	2800-0033A	FRAME SUPPORT
17	1	2800-0034	VALVE HANDLE EXTENSION
18	1	3305-0114	TWO WAY VALVE (1/2")
19	1	3371-0038R	EDUCTOR 11mm FOR MODELS 3378-1140 & 3378-1160

Ref. No.	Qty. Req'd.	Part No.	Description
19	1	3371-0040R	EDUCTOR 16mm FOR MODELS 3378-1640 & 3378-1660
20	1	3430-0944	KIT TUBING 40 GALLON
20	1	3430-0945	KIT TUBING 60 GALLON
21	1	7250-5000	TANK VALVE
22A	1	9951-2300UF	BALL VALVE 2" (FOR -2BYP MODELS)
22B	1	9951-2300UF	BALL VALVE 3" (FOR -3BYP MODELS)
23	1	PC1/2F-36075	NOZZLE, ProClean CONTAINER RINSE
24	1	PV1/2F1/2M-MA	ProClean CONTAINER RINSE
25	1	TL16-0006	LID KIT
26	2	UF200P	PLUG 2 INCH
27	*	BGUFC0200-S	CLAMP/Gasket 2 IN
28	*	BGUFC0300-S	CLAMP/Gasket 3 IN

* FOR -2BYP MODELS, QTY 6 OF BG-UFC0200-S ARE REQUIRED; QTY 0 OF BG-UFC0300-S IS REQUIRED
* FOR -3BYP MODELS, QTY 4 OF BG-UFC0200-S ARE REQUIRED; QTY 2 OF BG-UFC0300-S ARE REQUIRED

Limited Warranty on Hypro/SHURflo Agricultural Pumps & Accessories

Hypro/SHURflo (hereafter, "Hypro") agricultural products are warranted to be free of defects in material and workmanship under normal use for the time periods listed below, with proof of purchase.

- Accessories: ninety (90) days of use.

This limited warranty will not apply to products that were improperly installed, misapplied, damaged, altered, or incompatible with fluids or components not manufactured by Hypro. All warranty considerations are governed by Hypro's written return policy.

Hypro's obligation under this limited warranty policy is limited to the repair or replacement of the product. All returns will be tested per Hypro's factory criteria. Products found not defective (under the terms of this limited warranty) are subject to charges paid by the returnee for the testing and packaging of "tested good" non-warranty returns.

No credit or labor allowances will be given for products returned as defective. Warranty replacement will be shipped on a freight allowed basis. Hypro reserves the right to choose the method of transportation.

This limited warranty is in lieu of all other warranties, expressed or implied, and no other person is authorized to give any other warranty or assume obligation or liability on Hypro's behalf. Hypro shall not be liable for any labor, damage or other expense, nor shall Hypro be liable for any indirect, incidental or consequential damages of any kind incurred by the reason of the use or sale of any defective product. This limited warranty covers agricultural products distributed within the United States of America. Other world market areas should consult with the actual distributor for any deviation from this document.

Return Procedures

All products must be flushed of any chemical (ref. OSHA section 1910.1200 (d) (e) (f) (g) (h)) and hazardous chemicals must be labeled/tagged before being shipped* to Hypro for service or warranty consideration. Hypro reserves the right to request a Material Safety Data Sheet from the returnee for any pump/product it deems necessary. Hypro reserves the right to "disposition as scrap" products returned which contain unknown fluids. Hypro reserves the right to charge the returnee for any and all costs incurred for chemical testing, and proper disposal of components containing unknown fluids. Hypro requests this in order to protect the environment and personnel from the hazards of handling unknown fluids.

Be prepared to give Hypro full details of the problem, including the model number, date of purchase, and from whom you purchased your product. Hypro may request additional information, and may require a sketch to illustrate the problem.

Contact Hypro Service Department at 800-468-3428 to receive a Return Merchandise Authorization number (RMA#). Returns are to be shipped with the RMA number clearly marked on the outside of the package. Hypro shall not be liable for freight damage incurred during shipping. Please package all returns carefully. All products returned for warranty work should be sent **shipping charges prepaid** to:

HYPRO / PENTAIR
Attention: Service Department
375 Fifth Avenue NW
New Brighton, MN 55112

For technical or application assistance, call the **Hypro Technical/Application number: 800-445-8360**, or send an email to: **technical@hypropumps.com**. To obtain service or warranty assistance, call the **Hypro Service and Warranty number**: **800-468-3428**; or send a fax to the **Hypro Service and Warranty FAX**: **651-766-6618**.

*Carriers, including U.S.P.S., airlines, UPS, ground freight, etc., require specific identification of any hazardous material being shipped. Failure to do so may result in a substantial fine and/or prison term. Check with your shipping company for specific instructions.

Visit www.hypropumps.com/register today to register your product and stay up-to-date on new products and promotional offers.

The following information is required:
Model # _____ Serial # _____

Hypro (08/16)
Printed in USA

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375 Fifth Avenue NW • New Brighton, MN 55112 USA
Phone: (651) 766-6300 • 800-424-9776 • Fax: 800-323-6496
www.hypropumps.com