NATIONAL PRIDE EQUIPMENT REVERSE OSMOSIS SYSTEM THREE PHASE - WALL MOUNT USER'S MANUAL

NATIONAL PRIDE

SKIP PAGE

NPE RO SYSTEM

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INTRODUCTION

This User's Manual outlines installation, operation, maintenance and troubleshooting details vital to the sustained performance of your system.

The test results which are included with this User's Manual indicate your system's permeate and concentrate test results.

If your system is altered at the site of operation or if the feed water conditions change, contact NPE to determine the proper recovery for your application.

NOTE: IN ORDER TO MAINTAIN THE MANUFACTURER WARRANTY, AN OPERATING LOG MUST BE MAINTAINED AND COPIES WILL NEED TO BE SENT TO NATIONAL PRIDE EQUIPMENT FOR REVIEW.

NOTE: PRIOR TO OPERATING OR SERVICING THE RO SYSTEM UNIT, THIS USER'S MANUAL MUST BE READ AND FULLY UNDERSTOOD.

NOTE: IT IS UNSAFE TO OPERATE OR SERVICE THIS DEVICE WITHOUT FIRST READING AND UNDERSTANDING THE ENTIRE USER'S MANUAL. KEEP THIS MANUAL AND OTHER ASSOCIATED DOCUMENTATION FOR FUTURE REFERENCE.

SAFETY

This Safety section of this User's Manual outlines the various safety headings used throughout this manual's text and are enhanced and defined below:

NOTE: INDICATES STATEMENTS THAT PROVIDE FURTHER INFORMATION AND CLARIFICATION.

CAUTION: INDICATES STATEMENTS THAT ARE USED TO IDENTIFY CONDITIONS OR PRACTICES THAT COULD RESULT IN EQUIPMENT OR ANY TYPE OF PROPERTY DAMAGE.

WARNING: INDICATES STATEMENTS THAT ARE USED TO IDENTIFY CONDITIONS OR PRACTICES THAT COULD RESULT IN INJURY OR LOSS OF LIFE. FAILURE TO FOLLOW WARNINGS COULD RESULT IN SERIOUS INJURY OR EVEN DEATH.

WARNING: DO NOT REMOVE ANY CAUTION, WARNING, OR OTHER DESCRIPTIVE LABELS FROM THE EQUIPMENT.

WARNING: DO NOT REMOVE ANY PAGES FROM THE SUPPLIED READING MANUALS OR OTHER INFORMATIONAL DOCUMENTS.

SAFETY

WARNING: EYE PROTECTION SHOULD BE WORN AT ALL TIMES WHEN OPERATING THE RO SYSTEM AS UNIT HAS HIGH PRESSURE WATER LINES AND MEMBRANE HOUSINGS WHICH MAY LEAK IF FITTINGS LOOSEN OVER TIME.

WARNING: UNIT INSTALLATION MUST ADHERE TO ALL LOCAL ELECTRICAL AND PLUMBING CODES.

WARNING: ALL MAINTENANCE AND REPAIR ACTIONS ARE TO BE PERFORMED BY MAINTENANCE PERSONNEL WHO HAVE BEEN TRAINED AND FULLY READ THE DOCUMENTATION FOR ALL SYSTEM INFORMATION.

CAUTION: TO AVOID ANY ELECTRICAL SHOCK HAZARD, DO NOT OPERATE THIS DEVICE WHEN COVERS OR CONTROLLER ENCLOSURE IS OPENED.

CAUTION: ALL ELECTRICAL POWER MUST BE TURNED OFF AND THE LOCK OUT PROCEDURE MUST BE UTILIZED TO ENSURE ALL POWER IS SHUT OFF PRIOR TO SERVICING OR PERFORMING SYSTEM MAINTENANCE TO ANY POTION OF THE EQUIPMENT.

CAUTION: DO NOT OPERATE THIS DEVICE IN AN EXPLOSIVE ENVIRONMENT OR IN THE PRESENCE OF FLAMMABLE MATERIALS.

WARNING: MOVEMENT OR VIBRATIONS DURING SHIPMENTS MAY CAUSE CONNECTIONS TO LOOSEN. PLEASE CHECK ALL CONNECTIONS PRIOR TO TURNING ON THE POWER.

WARNING: DO NOT OPERATE THIS UNIT IN ENVIRONMENTS WHERE TEMPERATURES MAY BE BELOW 40 DEGREES F OR ABOVE 90 DEGREES F.

WARNING: IMPROPER WATER FLOW, WATER PRE-TREATMENT, MISUSE OR IMPROPER OPERATION OF THIS DEVICE WILL VOID THE MANUFACTURER’S WARRANTY.

CAUTION: FAILURE TO FOLLOW ALL INSTRUCTIONS MAY RESULT IN DAMAGE TO EQUIPMENT OR PERSONAL INJURY.

OPERATING LIMITS

Minimum Feed Temperature	85	Maximum Free Chlorine PPM	0
Maximum Feed Temperature	40	Maximum TDS PPM	1000
Minimum Ambient Temperature	120	Maximum Hardness	0
Maximum Ambient Temperature	40	Minimum pH (Continuous)	11
Minimum Feed Pressure	85	Maximum pH (Continuous)	5
Maximum Feed Pressure	45	Minimum pH (Cleaning 30 Min)	12
Maximum Operating Pressure	120	Maximum pH (Cleaning 30 Min)	2
Maximum SDI Rating SDI	<3		
Maximum Turbidity NTU	1		

SYSTEM LOG INFORMATION

FACTORY DATA

Date Manufactured ________________

Pump Model Number ________________________

RO Model Number ________________

Pump Serial Number _________________________

RO Serial Number _________________

Factory Performance

Feed Water ______________________ PPM
Product Permeate _________________ PPM
Product Rate _____________________ GPM
Drain Rate ________________________ PPM
Inlet Pressure _____________________ PSI
Pump Pressure ____________________ PSI
System Pressure ___________________ PSI

Installation Data

Feed Water TDS ___________________ ppm TDS @ ____________
Hardness _________________________
Iron ______________________________
Misc. _____________________________
Product TDS ______________________ ppm
% TDS Rejection ___________________
Product Rate ______________________ gpm
Drain Rate ________________________ gpm
Operating Pressure Pre-Membrane _____________ psi

Tested By ____ Date ______________

Approved By _____________________________________ Date ______________

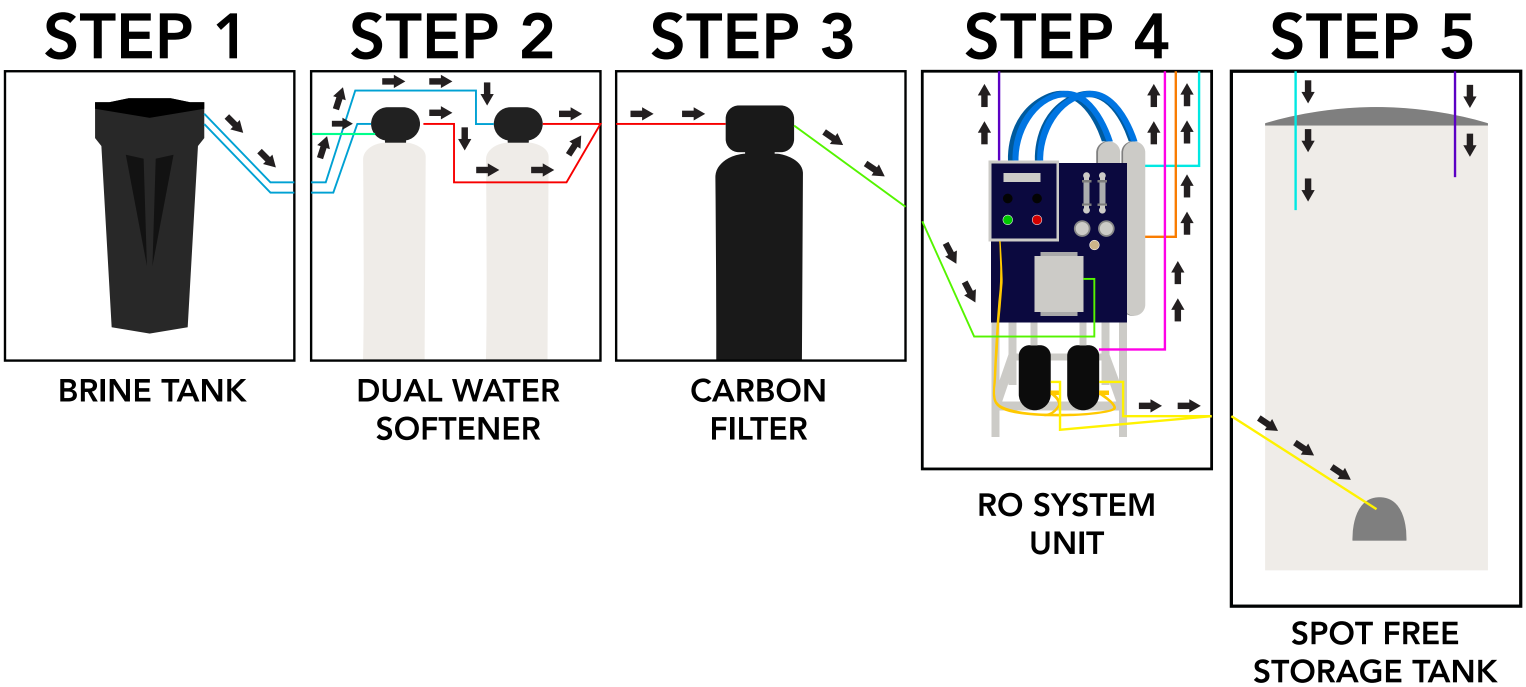
SYSTEM OVERVIEW

National Pride Equipment has developed and manufactured a proprietary RO System to provide a spot free rinse for car wash applications.

This RO System has been engineered to allow for a long longevity of issue free operation and low life cycle cost for the operator. The system utilizes commercial low temperature (high efficiency) RO membranes which operate at low pressure. In addition, all the components (chlorine filter, sediment filter, pumps, etc.) have been selected to improve the system reliability, minimize energy use and reduce required maintenance.

Please review the entire Manual prior to installation, start-up, servicing or operating the RO System. This manual will include step by step instructions, general overview, replacement parts for the system and overall guidelines.

RO SYSTEM LAYOUT



RO SYSTEM PLUMBING LAYOUT KEY

Step 1
Tubes go from the Brine Tank to the Dual Water Softener (Blue)

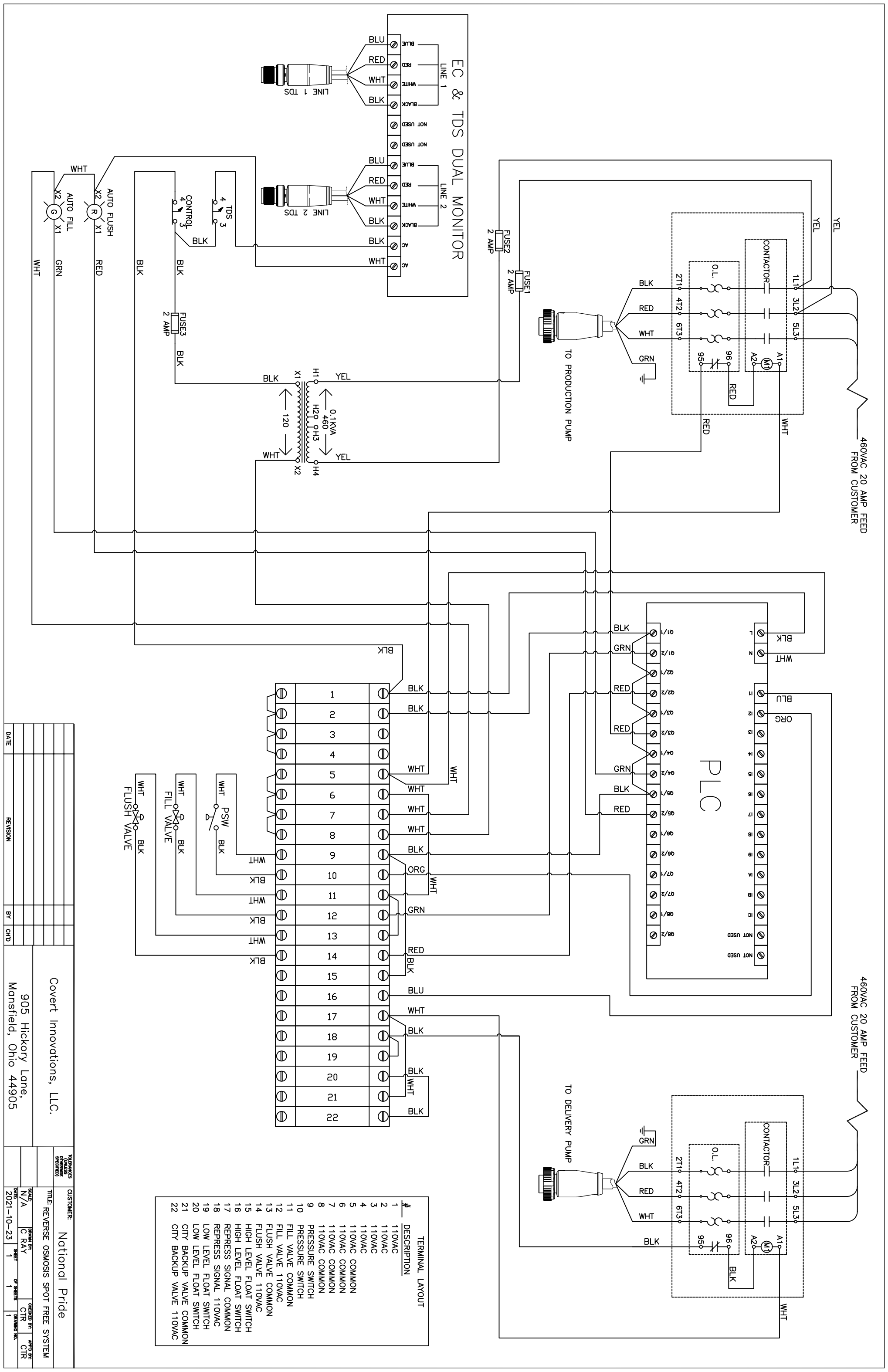
Step 2
Fresh Water Supply into Dual Water Softeners (Green)
Tubes from the Brine Tank to the Dual Water Softeners (Blue)
Soft Water Discharge from Dual Water Softener to Carbon Filter (Red)

Step 3
Soft Water Discharge from Dual Water Softener to Carbon Filter (Red)
Carbon Filter Flex Line from Carbon Filter to RO Unit (Green)

Step 4
Carbon Filter Flex Line from Carbon Filter to RO Unit (Green)
Flex Line from RO Unit to the Spot Free Storage Tank (Blue)
Concentrate Saver Flex line to Sewage (Orange)
Spot Free Re-Pressure Line
From Spot Free Pump Outlet to Rain Bar Solenoid Valves (Pink)

Step 5
From Spot Free Re-Pressure Pump to Rain Bat Solenoid Valves. (Yellow)

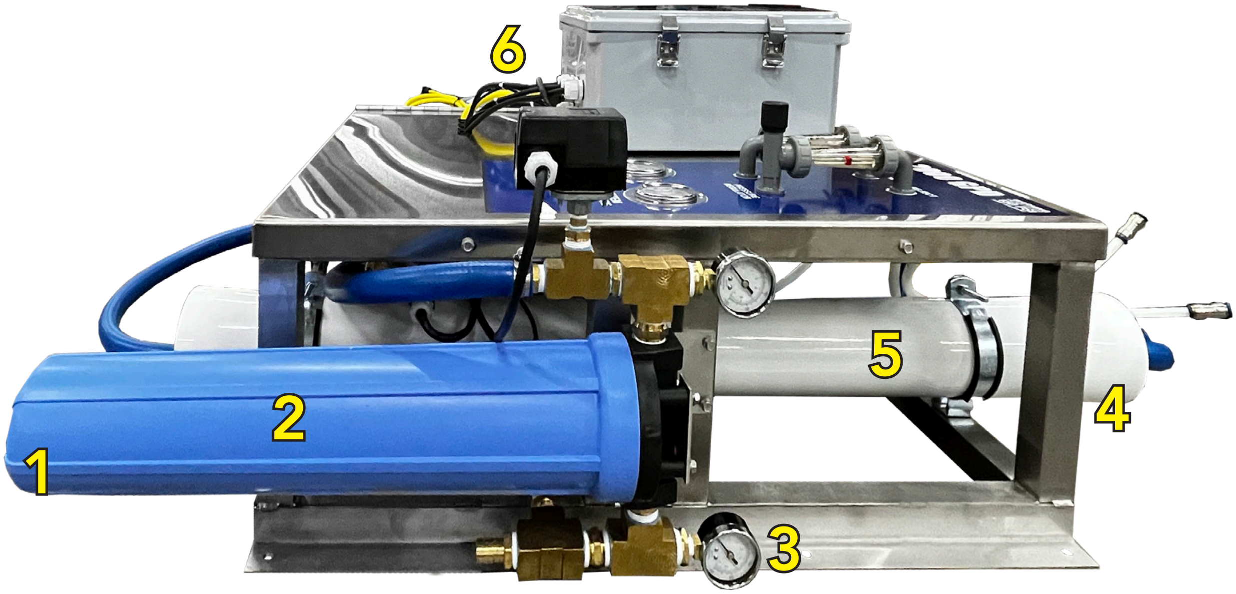
RO ELECTRICAL LAYOUT



SYSTEM LAYOUT

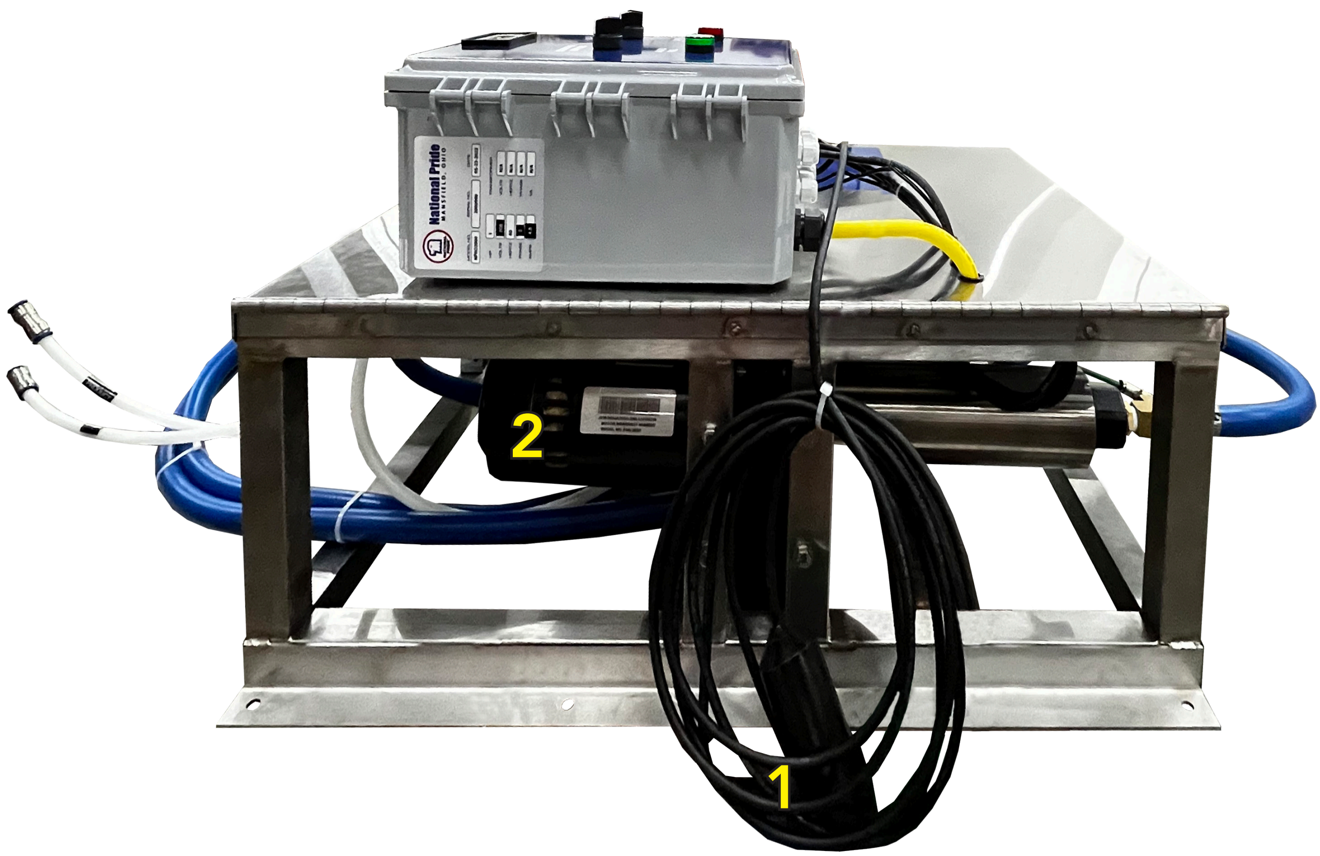
Product Name	Product ID
1. Flo-Meter Non Adjustable	F-44500LE-8
2. Flo-Meter Adjustable	F-44500LA-8
3. TDS Controller	HMDPSC-60D
4. Rear Mount Flange Gauge	GL400RF
5. LED Indicator Light Green	IL-110-GREEN
6. LED Indicator Light Red	1L-110-RED
7. Toggle Switch	XB5AD21

SYSTEM LAYOUT



Product Name	Product ID
1. Pre Filter Housing	TW-AH0069
2. Pre Filter	TW2005
3. Pressure Gauge	GNL100B
4. Membrane Housing	TW208419
5. Membrane	TW30XLE-4040
6. Pressure Switch	69WR3

SYSTEM LAYOUT



Product Name	Product ID
1. Float Switch	GG2DW2000
2. Pump	WW61050

RO SYSTEM FEATURES

SPOT FREE Production Unit

At National Pride, we are committed to bringing you premium grade equipment that is reliable, durable, and easy to operate.

Our saving space design helps units fit into tight or small pump rooms and range from 2,000 to 12,000 gallons per day. Each unit is thoroughly tested before shipment, ensuring that you receive a product of the highest quality.

STANDARD FEATURES

- Stainless steel wall mount frame
- Built-in TDS meter
- 12" x 48" carbon tank
- Stainless steel multi-stage pump
- Float switch
- Heavy duty PVC membrane housings
- XLE 4040 membranes
- 5 Micron pre-filter and housing
- 1.5 cubic feet carbon de-chlorinator
- Float kit
- Pre-Filter

MODEL NO	GPD	HOUSING	MEMBRANE	AUTOFLUSH	HP
NPRO2000S	2,000	Heavy Duty PVC	(2) XLE - 4040	Yes	Sta-Rite 1.0 HP
NPRO4000S	4,000	Heavy Duty PVC	(2) XLE - 4040	Yes	Sta-Rite 1.0 HP
NPRO6000S	6,000	Heavy Duty PVC	(3) XLE - 4040	Yes	Sta-Rite 2.0 HP
NPRO8000S	8,000	Heavy Duty PVC	(4) XLE - 4040	Yes	Sta-Rite 2.0 HP
NPRO10000S	10,000	Heavy Duty PVC	(5) XLE - 4040	Yes	Sta-Rite 3.0 HP
NPRO12000S	12,000	Heavy Duty PVC	(6) XLE - 4040	Yes	Sta-Rite 3.0 HP

RO SYSTEM REPLACEMENT PARTS

Product ID #	Product Description
STR1008-BF6S	Stainless Wall Mount RO Production Unit
69WR3	Reverse Action Pressure Switch
WW61050	Washworld 1.5hp 3 Phase StarRite Solution Pump Razor
F-44500LA-8	Flow Meter 1/2” Adjustable
F-44500LE-8	Flow Meter 1/2” Non-Adjustable
GL400RF	Pressure Gauge Liquid Filled 1/4” Rear Mount Flange Style
MM28106	Barstock Fittings Pipe Bushing 1/2” MPT x 1/4” FPT
MM32022	Barstock Fittings 3/4” Hose to 1/2” MPT
MM28212	Barstock Fittings Hex Nipple (MxM) 1/4”
ASC8238T405-120	ASCO 1/2” NC Valve 120v
MM28215	Barstock Fittings Hex Nipple (MxM) 3/4”
MM28028	Barstock Fittings Union Tee (FxFxF) 3/4”
MM28109	Barstock Fittings Pipe Bushing 3/4” MPT x 1/4” FPT
MM32023	Barstock Fittings Hose 3/4” x 3/4” MPT
ALT5308901	1/2” Cord Grip
ALT8113305	Oring for 5308901 Cord Grip
MCM7513K241	1/2” Cord Grip Conduit Locknut
CIS808005	1/2” Sch 80 PVC Elbow
CIS805005	1/2” Sch 80 PVC Tee
D-RODECAL2000	Decal Spot Free NPRO2000
D-9001	Control Center Decal
D-ETL	ETL Decal
MM32022	Barstcok Fittings 3/4” Hose to 1/2” MPT
MM28027	Barstock Fittings Union Tee (FxFxF) 1/2”
MM23022	Barstock Fittings 3/4” Hose to 1/2” MPT
MM20092	Male Elbow 90Dg; 1/2 Tube x 1/2NPT
MM28106	Basrtock Fittings Pipe Bushing 1/2” MPT x 1/4” FPT
MM20082	Male Elbow 90Dg; 1/4 Tube x 1/4 NPT
H141206HLL	14 x 12 x 6 Poly Enclosure, Hinged
ABP-1412	Aluminum Back Panel 14 x 12
SR2E201FU	100-240VAC Smart Relay
LC1D18G7	Telemecanique Contactor
LRD14	7-10A Overload Relay
MM28106	Barstock Fittings Pipe Bushing 1/2” MPT x 1/4” FPT
MM28214	Barstock Fittings Hex Nipple (MxM) 1/2”
MM28154	Barstock Fittings Long Pipe Nipple 1/2” x 2.5”

RO SYSTEM REPLACEMENT PARTS

Product ID #	Product Description
MM20055	Nickel Plated Pushlkock Fitting 1/4” Tube x 1/4” MPT
ASC88122403	ASCO S Series Din Connector
TW208419	Axeon Membrane Housing Fiberglass 4” x 40”
TW30XLE-4040	RO Membrane Dimensions 4” x 40”
NERCH900B	4” Conduit Clamp
IL-110-GREEN	LED Indicator 110v Green
IL-110-RED	LED Indicator 110v Red
3044076	Phoenix UT2.5 Term Block
0800886	Phoenix End Bracket
6047167	Phoenix ATP-UT Partition Plate
1050020-110	Zack Marker Strip 1-10
1050020-1120	Zack Marker Strip 11-20
CAFL4U-220	Terminal Block w LED 220v
AGA2	2 AMP Glass Fuse
EPCAFL4U	End Plate
MM28004	Barstock Fittings 90 Dg Pipe Elbow (FxF) 1/2”
9070T100D20	SQD Transformer 110V Secondary
PRO-STM7/8	Single Tube Mount (Set)
MM28044	Barstock Fittings Female Pipe Cross 1/2”
XB5AD21	2 POS NC Selector Switch
MCM9565K27	Square Finish Plug
GG2DW2000	Mechanical Switch - ABS Housing 13 AMP
21534A	Float Switch Weight
TW-AH0069	Filter Housing 2.5 x 20
TW2005	RO Membranes Sediment Filters 2.5” x 20” 5 Micron
STRAB0060-SS	3/4” Prefilter Stainless Steel Mounting Bracket
GNL100B	Pressure Gauge Non Liquid Filled
HMDPSC-60D	Basic Dual TDS Controller
MM28225	Barstock Fittings Male Hex Pipe Reducer 3/4” x 1/2”
MM28111	Barstock Fittings Pipe Bushing 3/4” MPT x 1/2” FPT
CULL-CARBON2.75	Culligan Non Back Washing Carbon with Cullar D+
SP12-HS	Hose Clamp 9-16” - 1-1/4” Stainless Steel
MCM69915K55	3/4” Cord Grip
83400N2	Delran Receptacle Straight Male
CZ14D68F012N	90 Dg Female Cord Set
MM28002	Barstock Fittings 90 Dg Pipe Elbow (FxF) 1/4”
MM20021	Nickel Plated Pushlock Fitting 1/2” Tube Union Connector

TROUBLESHOOTING

Symptom	Solution
Low RO Water Production	**Check Water Pre-Treatment Equipment** Improperly pretreated water can cause the membrane to have low water production. **Check Pressure Pre-Membrane** if Pressure Pre-Membrane is not maintained between 120-200 psi, loss will occur
Unable to Keep Pressure Pre-Membrane Between 120-200 psi	**Check Reject Control Valve** With the RO running, shut off the reject control valve. Pressure should climb above the minimal pressure. If pressure does not increase, pinch off RO drain hose. If pressure still does not increase, the pressure pump needs to be replaced. If the pressure does increase, the reject control valve needs to be replaced.
Spot Free Water is Spotting	**Check Product Water TDS** Test the product water as it is being produced. Sample the water as it moves to the storage tank. If the TDS is high, it could mean the membrane has been compromised. **Check Product Water TDS** The storage tank is an atmospheric storage container which can make it prone to the contamination. Routine cleaning of the tank will eliminate this problem.
RO Display Shows TANK FULL When the Tank is Not Full	**High Level Float Switch is not Working** Using a jumper wire, jump the tank float terminals 15 & 16. If the RO does change to RO running, check wires from control box to float switch. If wire is OK, replace high level float switch.

TROUBLESHOOTING

<table>
<tr><th>Symptom</th><th>Solution</th></tr>
<tr><td>Production Pump Won’t Start</td><td>No Power to RO System
Check RO Controller’s Smart Relay is working. If it is not working, check the source power.
Blown Fuse in the Control Box
Check if either of the fuses look blown. If blown, replace the fuse.
RO Fault Condition Exists
The Production Pump will not start for the displays of TANK FULL, LOW FEED PRESSURE or BAD FLOAT.
High Level Float Switch is not Working
Add a jumper wire to the tank float switch terminals 15 & 16.
If the RO pump does not stop replace the smart relay.
If the RO Pump stops, replace the high level float switch to fix the issue.</td></tr>
<tr><td>RO Display Shows High TDS</td><td>Check Product Water TDS
Test the product water as it is being made. Sample the water as it goes to the storage tank. If the TDS is high it could mean that the membrane has fouled.
Check Storage Tank TDS
The storage tank is an atmospheric storage container which can make it prone to the contamination. Routine cleaning of the tank will get rid of this problem.</td></tr>
</table>

MAINTENANCE

RO System Maintenance Log

The operation and maintenance of an RO machine requires regular data recording and routine preventative maintenance. It is vitally important that the daily log sheet be filled out during each operational shift of use. A startup sheet / log should be filled out containing the informational facts about the operation of your machine. These records are kept strictly for reference. If you have questions concerning the operation of your machine or the method of the data recording, contact the manufacturer.

NOTE: A log is included with this manual.

RO System General Maintenance Guide

As a part of the routine maintenance program, it is suggested that performance data of your RO System is recorded on a regular basis. By recording the performance data, diagnosing and performance problems at a later date will be much easier.

Replace Pre-Filter Cartridges

The standard rule is that once a month the 5 Micron pre-filter should be replaced.
The frequency can very depending on the production demands of the RO System. This filter protects the membrane elements from particles, which me be located in the feed water.

NOTE: A Pressure drop of 8 psi or more during operation indicates that the pre-filter cartridge needs replacing. Use filters rated at 5 micron or less.

Membrane Element Replacement

Membrane life expectancy will very from site to site depending on the water quality. TDS reading of 30 or less is considered to be spot free. Anything above this reading, the membranes should be replaced.

RO SYSTEM WARRANTY

National Pride Equipment RO System

National Pride Equipment warrants to the original consumer / purchaser against defects in material and/or workmanship from the date of original Manufacture as follows:

Limited Warranty, covering materials and workmanship for 1 year from the date of installation, subject to user's to compliance with manufacturers operating and maintenance instructions. Filter and Membranes are excluded by Warranty, and National Pride Equipment responsibility is limited to any Warranty provided by the filter or membranes manufacturer.

National Pride Equipment shall not be held liable for any special, incidental or consequential damages, and will at its option, repair or replace any defective components.

Any parts used for replacement are warranted for the remainder of the original warranty period.
THIS WARRANTY DOES NOT COVER DEFECTS CAUSED BY ACCIDENT, FIRE, FLOOD,
ACTS OF GOD, MISUSE, MISAPPLICATION OR NEGLECT.

Shipping expenses to National Pride Equipment at 905 Hickory Lane, Mansfield, Ohio 44905 are the responsibility of the consumer. National Pride Equipment will ship the repaired or new component at the consumer's expense and will not be responsible for any labor charges or other costs resulting from the removal or installation of the repaired or replaced part.

NATIONAL PRIDE