

A New Standard in Rapid Separations

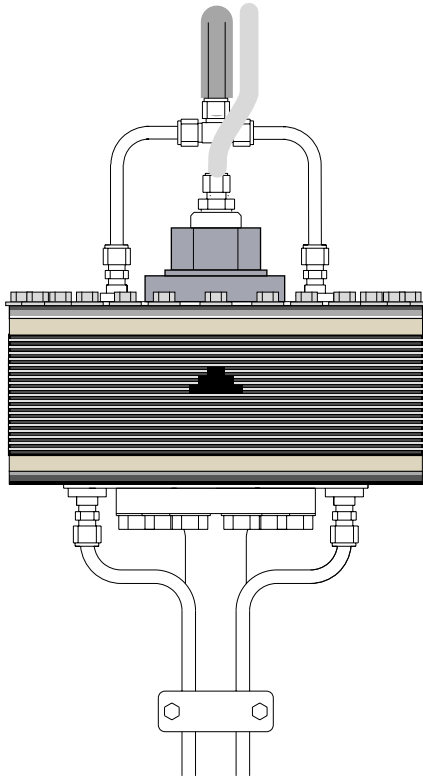
MADE IN U.S.A.

Pilot Test Package

V \diamond SEP[®] Series LP

This package contains information and application forms for those interested in leasing New Logic's bench scale Pilot Machine, the Series LP V \diamond SEP. Attached are the following forms and documents:

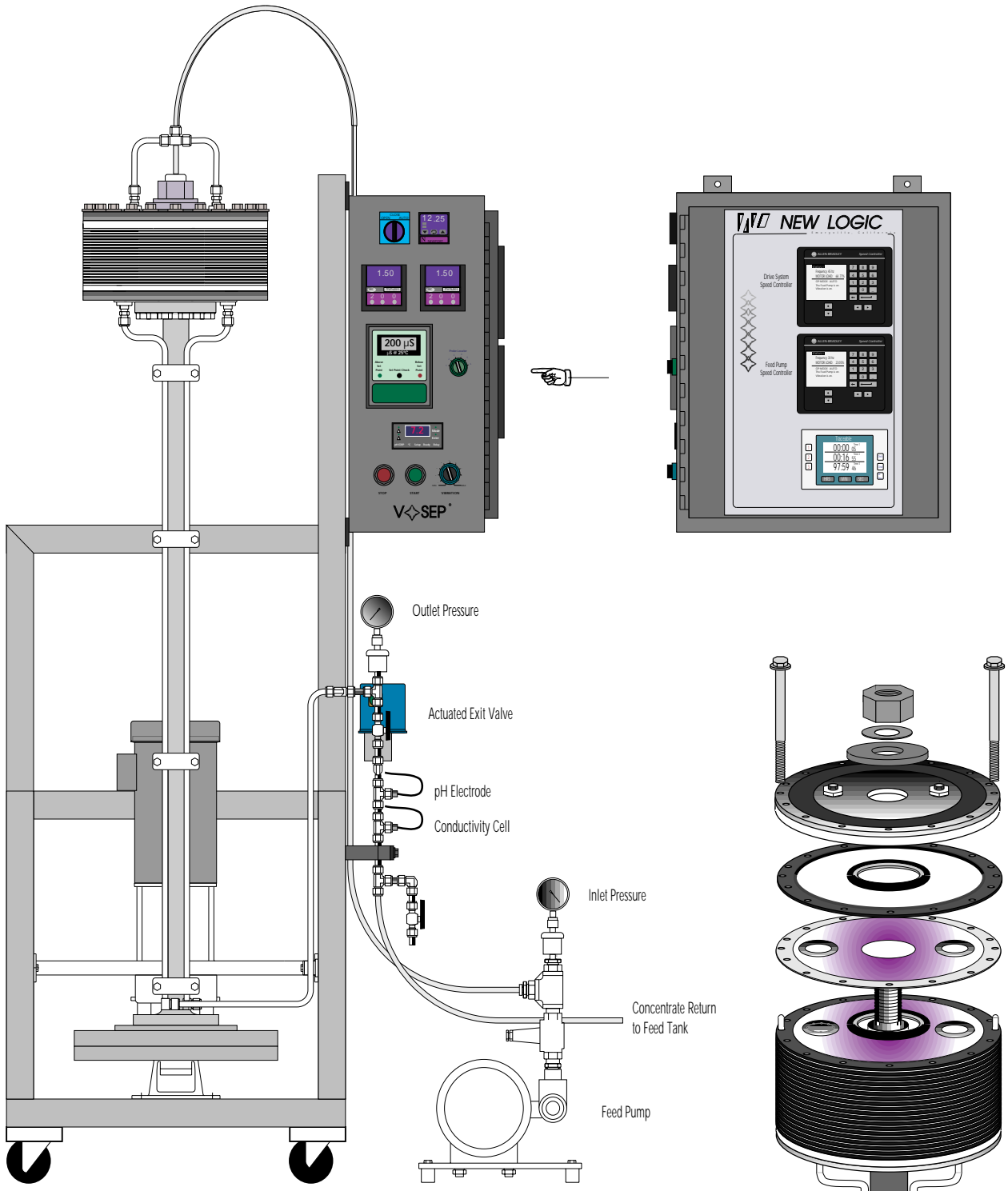
- 1] Pilot Machine Illustration
- 2] Test Sample Description Form
- 3] Plant Engineering Survey
- 4] Test Set up Illustration
- 5] Series LP Machine Specifications
- 6] Filter Pack Assembly Picture
- 7] Sample Tracking Label
- 8] Blank Test Data Sheet
- 9] Qualitative Data Sheet
- 10] Filtration Spectrum
- 11] Performance Calculations




Industrial Fluid Separation

New Logic

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www.vsep.com



 NEW LOGIC 1295 67th Street, Emeryville, CA 94608 (510) 655-7305	
LP Machine	Figure 2.0
CE Approved LP V-SEP Machine	12/11/00

Test Sample Description

V

Date: _____

Customer Information

Company Name _____

Contact Name _____ Phone _____

Address _____

_____ Fax _____



Brief description of material being tested: _____

Process Flow Rate _____ GPM

Operating Temp. in Process _____ °C

Liquid Chemical Composition: _____

TDS*: _____ %w/w pH: _____

Conductivity: _____ μS

Suspended Solids Composition: _____

TSS**: _____ %w/w ParticleSp. Gv: _____

Particle Size Distribution: _____

S

E

Process Objectives

Wastewater Treatment -

Desired Clean Water (Filtrate) Recovery: _____ %

Quality Limits- TSS: _____ ppm TDS: _____ ppm

Turbidity: _____ NTU Color Reduction _____ %

Solid Product Recovery- Desired % Solids _____ %w/w

Other: _____

Process Description: _____

P

Process Goals: _____

*TDS: Total Dissolved Solids

**Total Suspended Solids

V

Material Description

MSDS: Follows Included with Sample
Have you included a chemical analysis?: yes no
Health Hazard: yes no Environmental Hazard: yes no



Special Rheological Behavior

Gel Point% Solids: _____%w/w (Point at which pumping is not feasible)
Thixotropic: yes no (Thins on shearing.)
Dilatant yes no (Thickens with shearing.)
Shear labile yes no (Degrades under shearing.)
Gel forming yes no (Forms a gel on standing.)
 Other _____

S

Handling

Heating allowed yes no (Max Temp: _____ °C)
Freezing allowed yes no
Needs refrigeration yes no
Keep from light yes no (Photo sensitive)
Septic yes no (Biologically active)
pH Sensitive yes no (Allowable pH range: _____)
Corrosive yes no (Compatible Materials:
 Stainless Steel Polypropylene
 Other _____)

E

Cleaning Procedure

Appropriate procedure to clean stainless steel and Teflon parts which contact the process fluid: _____

P

V
*
S
E
P

Cleaning Procedure

Unless alternative arrangements are made in advance, it is New Logic's policy to return all samples to the customer upon completion of all bench testing. To facilitate this process, please fill out the following information.

Return address for samples: _____

Contact: _____

Preferred shipping method (e.g., UPS, Freight Delivery Service, etc.): _____

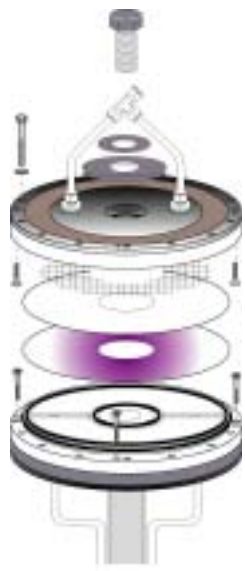
Customer's Shipping Account Number: _____

Internal Authorization Number (if applicable): _____

Special Handling Procedures: _____

Miscellaneous

Please Provide any additional information in the space below which would allow us to better understand your potential application (e.g., brief sketch of the process, data tables, etc.)



Plant Engineering Survey

This form can be used to perform an engineering and economic audit of your process. If you would like a more thorough evaluation of our technology with respect to your particular process, please contact a New Logic sales engineer at (510) 655-7305.

V

Customer Information

Company Name _____

Contact Name _____ Phone _____

Address _____

_____ Fax _____



Process & Processing Objectives

1. Briefly describe your process: (please sketch and/or attach a process flow diagram) _____

2. What is the material which needs to be filtered/separated? (please provide a chemical analysis if available) _____

3. What is the flow rate? _____

4. What are you going to do with:
permeate? _____

concentrate? _____

S

E

Overall Economics

5. What is your acceptable desired payback period for capital projects?

- Less than 1 year Less than 3 years
- Less than 2 years Less than 5 years

6. What is the timing for the project?

- Within 6 months This Fiscal Year
- Next Budget Period Future Project

7. What is your approximate budget for the project?

- Less than \$100,000 (U.S.\$) \$100,000 to \$250,000 (U.S.\$)
- \$250,000 to \$500,000 (U.S.\$) \$500,000 to \$750,000 (U.S.\$)
- \$750,000 to \$1,000,000 (U.S.\$) More than \$1,000,000 (U.S.\$)

P

8. What is your current approximate operating cost per 1000 gallons (m³) or per pound (kg) of product? _____

Determining the Costs (Use \$/unit volume or \$/weight of product if possible)

9. What are your costs:
for incoming water? _____
for pretreatment of incoming water? _____
to discharge the water? _____
for energy? _____
per BTU? _____
for chemical addition? _____
for surcharges? _____
for hauling? _____
for labor? _____
for evaporation (if any)? _____
Concentration _____
Other _____

10. What is the value of the recovered product? _____

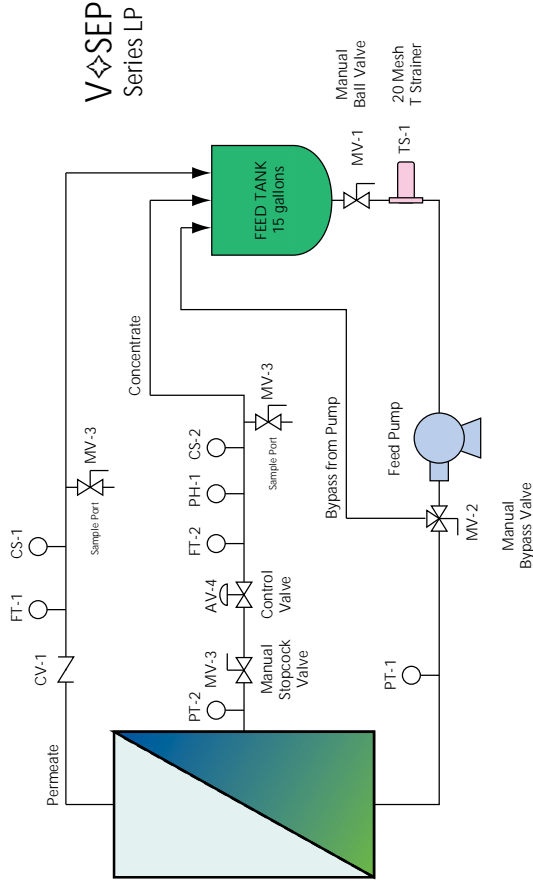
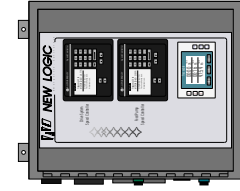
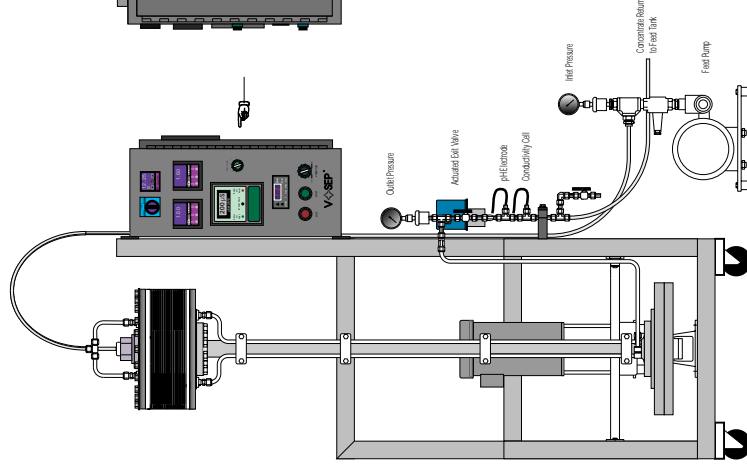
Other Options

11. What are you currently using for treatment? _____

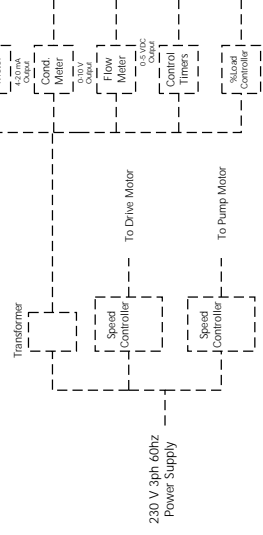
12. Why do you want/have to change current process?
- | | | | |
|---|-------------------------------|---|--------------------------------|
| <input type="checkbox"/> To Improve Efficiency | <input type="checkbox"/> Cost | <input type="checkbox"/> To Reduce Treatment | <input type="checkbox"/> Costs |
| <input type="checkbox"/> Environmental Regulation | | <input type="checkbox"/> To Recover Water and/or Solids | |
| <input type="checkbox"/> New Process | | <input type="checkbox"/> To Replace Old Equipment | |
| <input type="checkbox"/> To Remove a Bottleneck | | | |

Next Generation Series LP

CE Approved with added Devices



Single Pass Operation



Power Supply Diagram



NEW LOGIC
1295 67th Street, Emeryville, CA 94608 (510) 655-7305

New LP Machine

Figure 1.0

Process Flow Diagram - New LP Machine Operation

12/11/00



Pilot Testing



VASEP MACHINE SPECIFICATIONS:

VASEP LP SPECIFICATIONS

CURRENT OPERATION MANUAL: L/P Version 3.0

OPERATING CONDITIONS:

Equipment Rating: Nema 4, Indoor-Outdoor protected from sunlight and rain.
Operating Ambient Temperature Limits: 0-40C
Storage Temperature: -20 - 60C
Relative Humidity: 90% or less, non-condensing
Elevation: 3300 ft (1006 M) without derating.

FILTER PACK:

Membrane Area: L Mode: 0.48 sq. ft. P Mode with 38 membranes: 16.44 sq. ft.
Hold up Volume: P Mode: ~ 0.8 Gallons (3.0 liters)
Filtrate Removal Capacity: ~ 2.25 GPM (8500 ml/min)
Maximum Operating Pressure: 600 PSI
Maximum Shear Rate: 150,000 Inverse Seconds
Wetted Materials: 316 Stainless Steel, Polypropylene, EPDM

VIBRATION SYSTEM:

Drive Bearings: Morse Sealmaster RFB2102
Vibration Motor: BALDOR VM3555 , 2HP 3450RPM, 230VAC 3ph 5.7A
Vibration Motor Controller: WOODS E-TRAC, WFC2002-OC
Input: 208-240VAC 1ph, Output: 3ph 7.5A

FEED SYSTEM:

Pump: HYDRA-CELL MO3MRSEHHC 3.0gpm at 1725 RPM
Motor: Baldor M3558 , 2HP 1725 RPM, 230VAC 3ph 6.5A
Pump Bypass Valve: WANNER C2ADBESSEF
Feed Pump Starter:
Contactor: ALLEN-BRADLEY 100-A12NL3
Overload Relay: ALLEN-BRADLEY 193-BSB80
Full Voltage Enclosed Starter Part no.: ALLEN-BRADLEY 109-A12FL3-7
Flow Regulator at Process Outlet: Eaton .25gpm Galvanized Steel
Control Valve at Process Outlet: Parker 6Z-PR4-VT-SS IAAW 12AA
Pressure Gauges: 1 on Process Inlet, 1 on Process Outlet
WIKA 0-600 PSI (liquid filled) with ITT Model 14OK Isolators

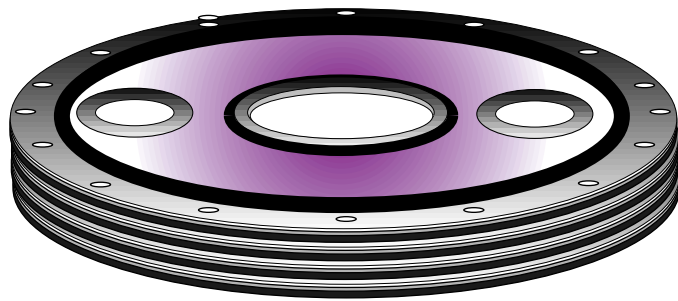
ELECTRICAL POWER REQUIREMENTS: Standard Unit (with 2HP Feed Pump motor)

Voltage: 208-240VAC 3phase
Normal Full Load Operating Current: 11amps (P Mode)
Power Cord: 8ft long with L15-30 plug
Required Receptacle: NEMA L15-30, 30A 3Ø 250VAC 4Wire
Schematic Version: L VER 2.1A + LPA ELV2

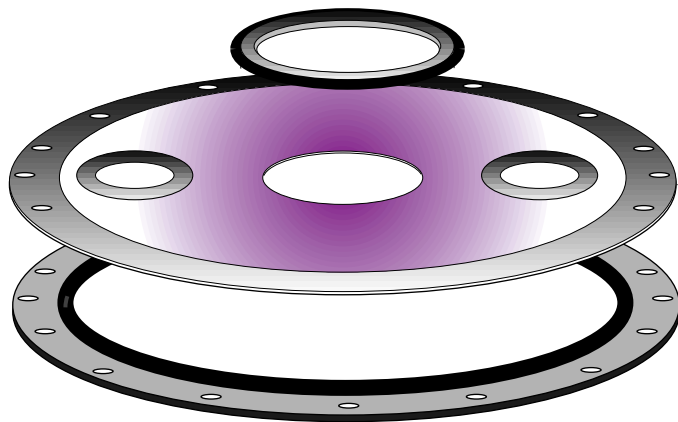
"Standard" LP Filter Pack Design

Parts Needed:

- 19 - Trays (10 Membrane & 9 Diverter)
- 20 - .170" Outer Spacer Rings
- 20 - 2-378 Outer O-rings
- 20 - .146" Inner Retainer Rings
- 20 - 2-341 Inner O-rings
- 16 - 7/16"-20 x 6" Hex Bolts



2nd Tray Diverter Tray

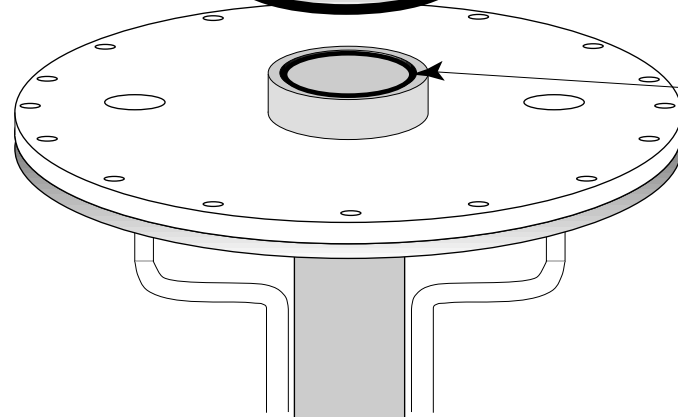


1st Tray Membrane Tray

Outer Spacer Ring: .170"
w/ 2-378 O-ring (All trays the same)



First Retainer & O-ring is the same as all the rest:
2-341 O-ring, .146" Retainer



228 O-ring

Note:

Uncompressed, the orings measure .210"

 NEW LOGIC 1295 67th Street, Emeryville, CA 94608 (510) 655-7305			
Series L/P	Figure 20	7/11/94	10/10/00
New "Standard" LP Filter Pack Design (For all applications)			

V[◇]SEP[®] Sample Tracking Label

Quality Control Program

This form is to be used as a method for tracing the origin and final disposition of all test sample fluids to be used at the New Logic Laboratory. It is part of an ongoing Quality Control Program.

This Label must be affixed to each sample container or it will not be accepted and will be returned !

Date Sent to NLI

Date Returned

NLI Control #

Sender's Name & Address:	
Emergency Response Phone #	
Sent to whom at New Logic?	
Description of Material	
Hazardous?	Yes No
Needs Refrigeration?	Yes No
MSDS Attached?	Yes No



V \star SEP P Mode Test Data

Client: _____

Page # _____

Membrane: _____ Batch # : _____

Date _____

Test Sample Fluid: _____

Done By: _____

	% Solids	Conductivity	Ph	COD Level	Sample Taken?
Initial Feed:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Ending Concentrate:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Composite Permeate:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Time	% Recovery	Pressure IN	Pressure OUT	Temp °C	Permeate Flow Rate ml/Min	Concentrate Flow Rate ml/Min	Vibration amplitude	Permeate Conductivity	Open/Close	Concentrate % Solids	% Motor Load
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Observations:

V \blacklozenge SEP Performance Calculations

Concentration Factor:

Concentration Factor = Feed Flow Rate \div Concentrate Flow Rate
Feed Flow Rate = Permeate Flow Rate + Concentrate Flow Rate

Example: Your Permeate Flow Rate is 2179ml/min
Your Concentrate Flow Rate is 179 ml/min

Feed Flow Rate = 2179 ml/min + 179 ml/min
Feed Flow Rate = 2358 ml/min

Concentration Factor = 2358 ml/min \div 179 ml/min
Concentration Factor = 13.2x

Concentrate Flow Rate: (while using the timed duty cycle valve)

Concentrate Flow Rate per Minute = Concentrate Rate per dump \div (Time Open + Time Closed)

Example: 430 ml of concentrate is released each time the valve opens
Your Auto Valve settings are 0.5 minutes open and 3.0 minutes closed

Concentrate Flow Rate = 430 ml \div (0.5 + 3.0)
Concentrate Flow Rate = 430 ml \div 3.5
Concentrate Flow Rate = 123 ml/min

% Recovery: (Permeate)

% Recovery = Permeate Flow Rate \div Feed Flow Rate x 100
Feed Flow Rate = Permeate Flow Rate + Concentrate Flow Rate

Example: Your Permeate Flow Rate is 2179ml/min
Your Concentrate Flow Rate is 179 ml/min

Feed Flow Rate = 2179 ml/min + 179 ml/min = 2358 ml/min
% Recovery = 2179 ml/min \div 2358 ml/min x 100
% Recovery = 92.4%

GFD in P Mode: (Gallons per Square Foot of Membrane per Day)

Example:
2000 ml/min x .0002642 Gal/ml = .528 Gallons
.528 Gal x 1440 min/Day = 761 Gal per Day
761 GPD \div 16.69 SF/Filter Pack = 45.596 GFD

2000 ml/min x .0228 = GFD

Permeate Rate x .0228 = GFD

GFD in L Mode: (Gallons per Square Foot of Membrane per Day)

Permeate Rate x .76 = GFD