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 electromechanical
filtration
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 hydraulics
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Hydraulic and Lube Filtration Products

Catalog 2300-15



ENGINEERING YOUR SUCCESS.

The Parker Hannifin Filtration Group assures:

- Consistent quality
- Technical innovation
- Premier customer service

Parker's technical resources provide the right filtration technologies that conform to your requirements. That's why thousands of manufacturers and equipment users around the world rely on Parker Filtration products and people.

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High-performance filtration systems for production machinery in industrial, mobile and military/marine.



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Liquid filtration systems for beverage, chemical and food processing; cosmetic, paint, water treatment; photo-processing; and micro-chip fabrication.



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The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale".

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Please consult factory for the latest brochure of Parker's fluid analysis and fluid condition monitoring products.

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Introduction

Parker Hannifin is comprised of eight global groups: Aerospace, Climate & Industrial Controls, Fluid Connectors, Seal, Hydraulics, Filtration, Automation and Instrumentation.

The Filtration Group consists of ten technical sales and service locations: Finite Filter, Hydraulic Filter Division North America, Hydraulic Filter Division Europe (two locations), Process Filter, Finn Filter, Racor, Parker Hannifin Brazil and Parker Hannifin Korea.

Customer Support Information

Technical Support You Can Count On

Parker's technical resources assure you of the right filtration technologies, advanced designs, consistent manufacturing and a network of helpful, specialized professionals trained to support your team.

We listen to you; then we design the right filtration solution. Parker holds over 150 patents on innovative filtration products, including filtration membranes, differential pressure indicators, cartridge bypass valves and spin-in elements.

Parker Filtration makes the technological investments needed to assure the highest quality products. Examples are modern clean rooms, sophisticated testing equipment, CAD/CAM engineering, and CNC integrated equipment that is helping us design tomorrow's filtration products today.

Quality Is Top Priority

Parker Filtration has had a total quality management system in place for years, as well as a Director of Corporate Quality for all of Parker. This structure helps us continually meet our customers' expectations for the highest technical standards, reliable supply and responsive service. From the Group President on down, "Quality" at Parker means more than making a product the right way. Quality permeates our whole organization so that every employee thinks about what he or she does and what is expected by our customers.

"Always Available"



Customer Service

Parker Filtration distributors provide local stock and technical design help including 24-hour emergency service. They are further supported by our "ever ready" manufacturing teams.



So if you need more technical literature or applications support please call us toll free at 1-800-253-1258 or at our 24 hour corporate help line at **1-800-C-PARKER**.

Parker Hannifin Corporation
Hydraulic Filter Division
16810 Fulton County Road #2
Metamora, OH 43540
Toll Free: (800) 253-1258
Phone: (419) 644-4311
Fax: (419) 644-6205
<http://www.parker.com/hydraulicfilter>



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climate control
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fluid & gas handling
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12AT/50AT Series

Spin-On Filters



ENGINEERING YOUR SUCCESS.

12AT/50AT Series

Spin-On Filters

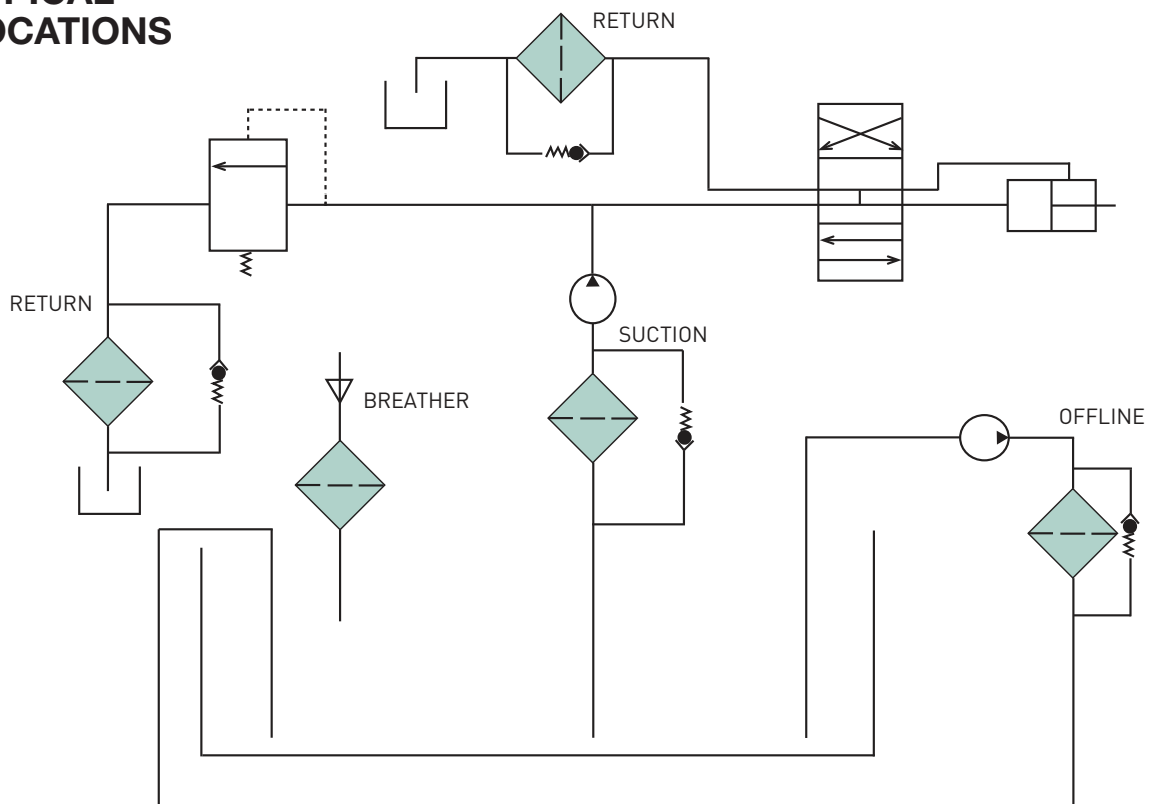
Applications for Spin-On Filters

- Mobile Equipment
- Hydrostatic Drives
- Industrial Power Units
- Reservoir Breathers

Often, economic conditions dictate what type of filter is used on a piece of equipment. When costs are tight, you need a filter that is inexpensive, yet uncompromising in performance and quality. Parker's spin-on filters fit that need. They are built to fit demanding design parameters in today's mobile and industrial equipment. No compromising.



TYPICAL LOCATIONS



12AT/50AT Series

Spin-On Filters

Typical Element Performance: 12AT

| Media Code | Filter Media | Beta Ratios | Particle Size/Efficiency |
|------------|--------------|---------------------|--------------------------|
| 25C | Cellulose | B ₂₅ =2 | 25 / 50% |
| 10C | Cellulose | B ₁₀ =2 | 10 / 50% |
| 03C | Cellulose | B ₃ =2 | 3 / 50% |
| 20B | Microglass | B ₂₀ =75 | 20 / 98.7% |
| 10B | Microglass | B ₁₀ =75 | 10 / 98.7% |

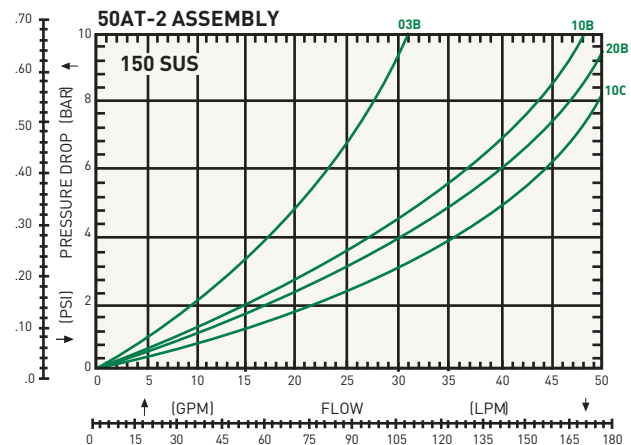
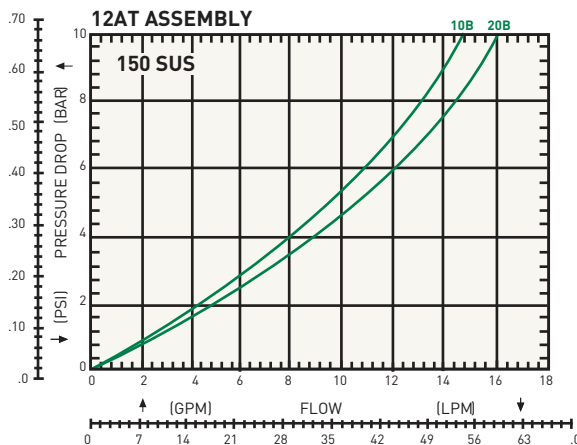
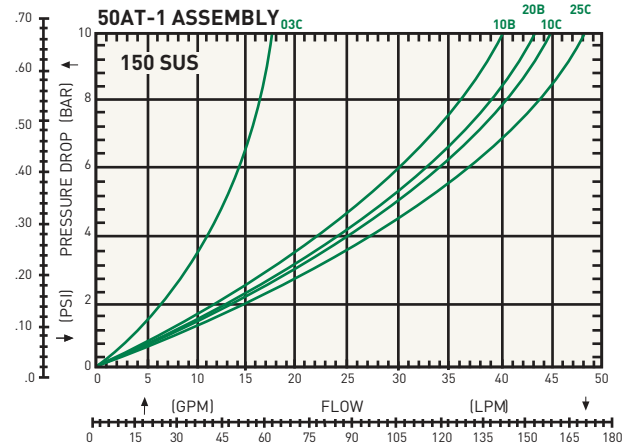
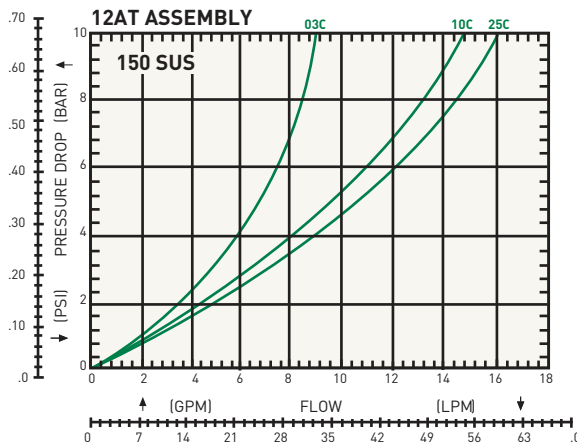
Actual results are dependent on system flow rates, fluid viscosities, and other parameters.

Typical Element Performance: 50AT

| Media Code | Filter Media | Beta Ratios | Particle Size/Efficiency |
|------------|--------------|---------------------|--------------------------|
| 25C | Cellulose | B ₂₅ =2 | 25 / 50% |
| 10C | Cellulose | B ₁₀ =2 | 10 / 50% |
| 03C | Cellulose | B ₃ =2 | 3 / 50% |
| 20B | Microglass | B ₂₀ =75 | 20 / 98.7% |
| 10B | Microglass | B ₁₀ =75 | 10 / 98.7% |
| 10C-2 | Cellulose | B ₁₀ =2 | 10 / 50% |
| 20B-2 | Microglass | B ₂₀ =75 | 20 / 98.7% |
| 10B-2 | Microglass | B ₁₀ =75 | 10 / 98.7% |
| 03B-2 | Microglass | B ₃ =75 | 3 / 98.7% |

Actual results are dependent on system flow rates, fluid viscosities, and other parameters.

| Beta Rating | Efficiency at (X) Particle Size |
|-------------|---------------------------------|
| Bx = 2 | 50.0% |
| Bx = 20 | 95.0% |
| Bx = 75 | 98.7% |
| Bx = 200 | 99.5% |
| Bx = 1000 | 99.99% |



12AT/50AT Series

Spin-On Filters

Installation and Specification Data Model 12AT

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 150 psi (10.3 bar)

Design Safety Factor: 2.5:1

Operating Temperatures:

-40°F to 225°F (-40°C to 107°C)

Element Collapse Rating:

100 psid minimum

Element Condition Indicators:

Gauge: Color coded 15/25 psi

Gauge: Color coded vacuum

Pressure Switch: Normally open

20 +/- 2 psi

5 Amps @ 24 VDC

Vacuum Switch: Normally open

5" +/- 1" Hg

1.0 Amp @ 120 VAC

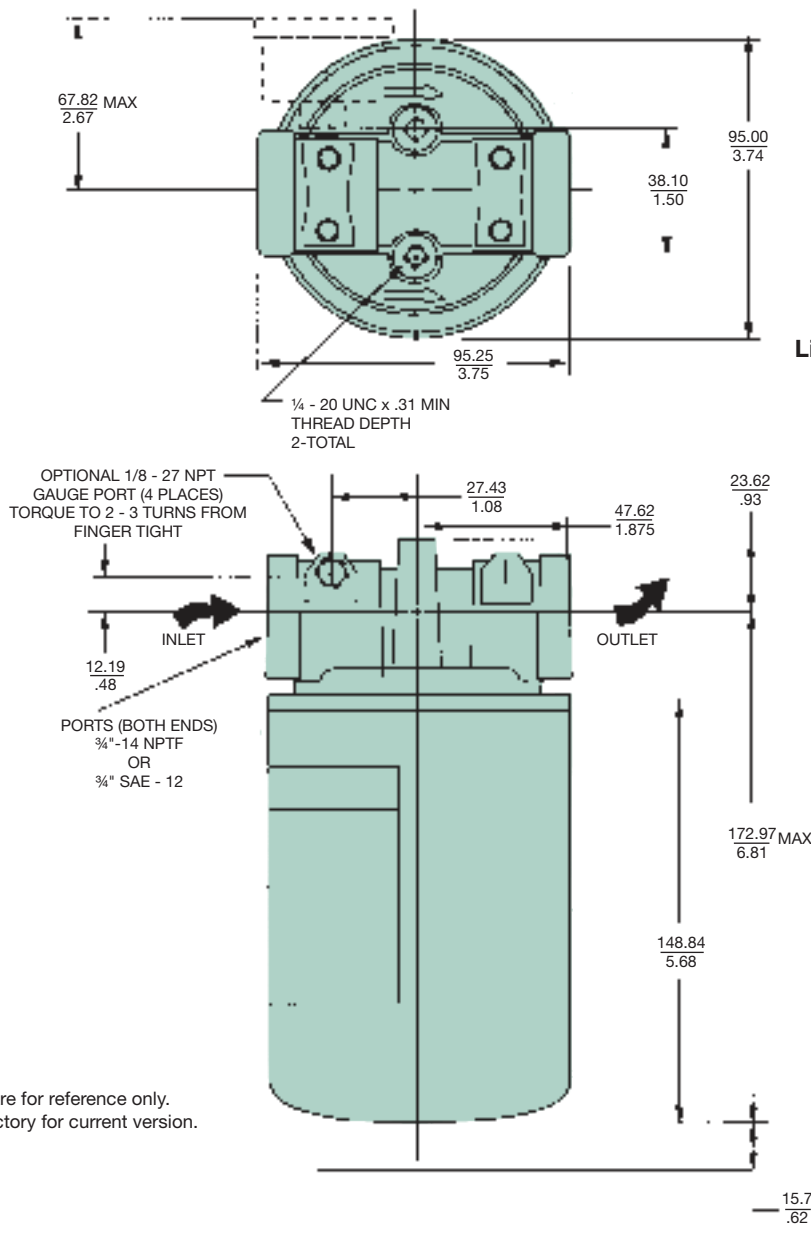
Filter Material:

Head: Aluminum

Cannister: Low Carbon Steel

Shipping Weights (approximate):

1.6 lbs.



Linear Measure: millimeter
inch

Drawings are for reference only.
Contact factory for current version.

12AT/50AT Series

Spin-On Filters

Installation and Specification Data Model 50AT

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 150 psi (10.3 bar)

Design Safety Factor: 2.5:1

Operating Temperatures:

-40°F to 225°F (-40°C to 107°C)

Element Collapse Rating:

100 psid minimum

Element Condition Indicators:

Gauge: Color coded 15/25 psi

Gauge: Color coded vacuum

Pressure Switch: Normally open

20 +/- 2 psi

5 Amps @ 24 VDC

Vacuum Switch: Normally open

5" +/- 1" Hg

1.0 Amp @ 120 VAC

Filter Material:

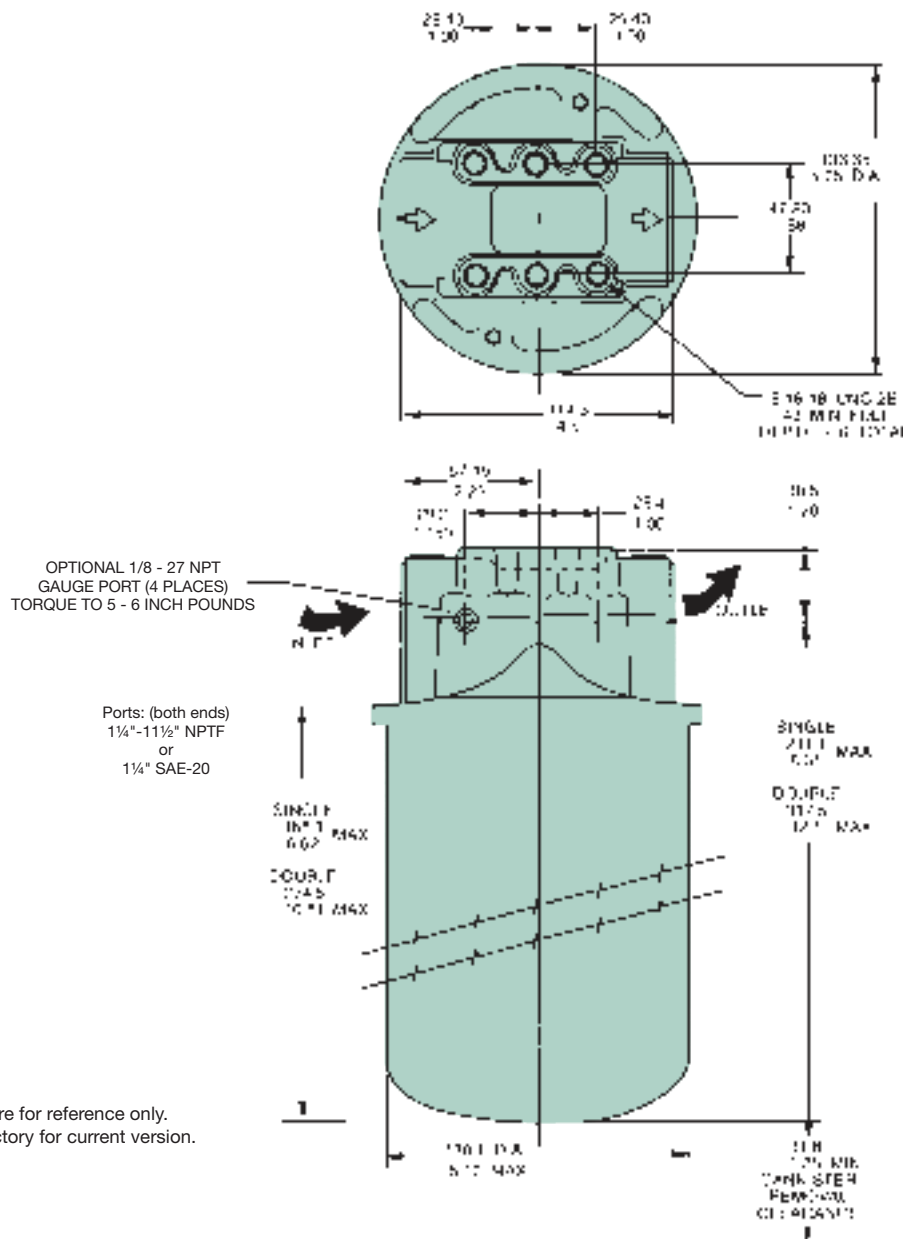
Head: Aluminum

Cannister: Low Carbon Steel

Shipping Weights (approximate):

Single length: 3.7 lbs.

Double length: 5.3 lbs.



Drawings are for reference only.
Contact factory for current version.

12AT/50AT Series

Spin-On Filters

Reservoir Breather Assemblies 12AT and 50AT

Sizing

Select the proper size cannister for the maximum rate of reservoir draw down or air exchange rate. As a rule of thumb, clean pressure drop should be limited to 0.18 psid (5" H₂O).

A pipe flange, weld collar, etc. may be used to connect the cannister adapter kit to the reservoir. Make sure that air is not able to leak around the adapter. When mounting on the side of the reservoir, make sure the installation is above the surface of the fluid.

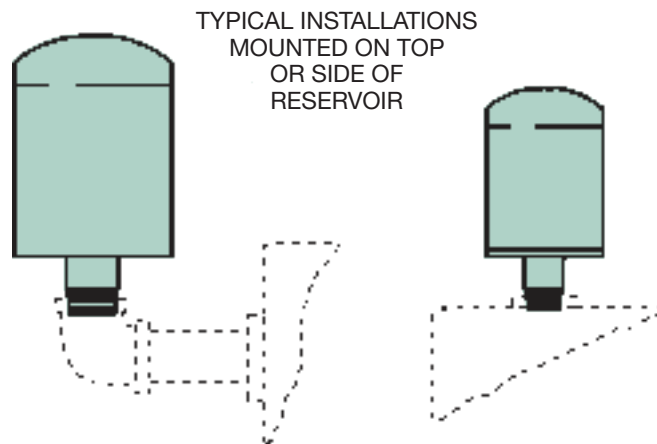
Recommended cannister change out is after 500 hours of operation. More frequent replacement may be required when operated in heavily contaminated areas such as grinding operations, primary metal mills, and on mobile equipment. Under such conditions, increase replacement frequency to every 250 hours.

| Model | Air Rating* | Element | Adapter Kit |
|----------|-------------|---------|-------------|
| 12AT-03C | 1 micron | 926543 | 926876 |
| 12AT-10C | 2 micron | 921999 | 926876 |
| 12AT-25C | 5 micron | 925023 | 926876 |
| 50AT-03C | 1 micron | 926541 | 926875 |
| 50AT-10C | 2 micron | 926169 | 926875 |
| 50AT-25C | 5 micron | 926170 | 926875 |

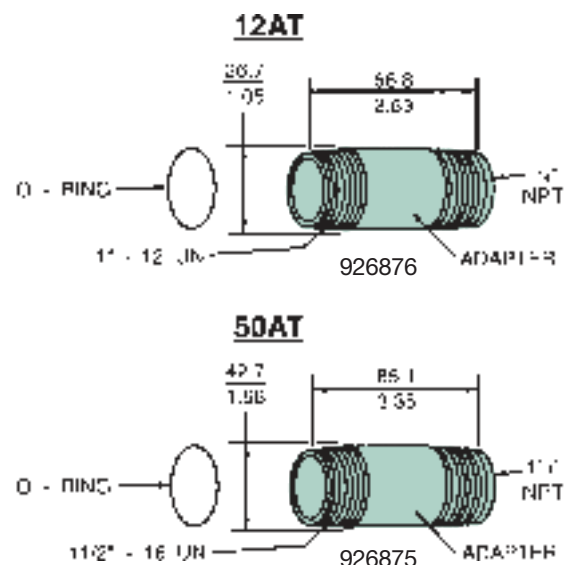
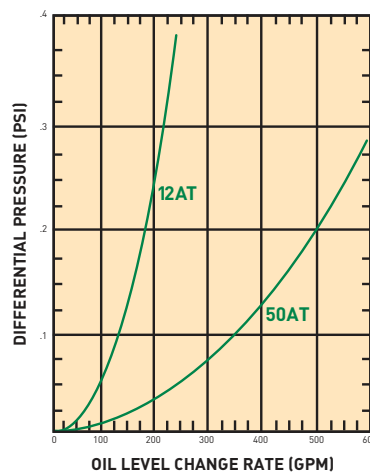
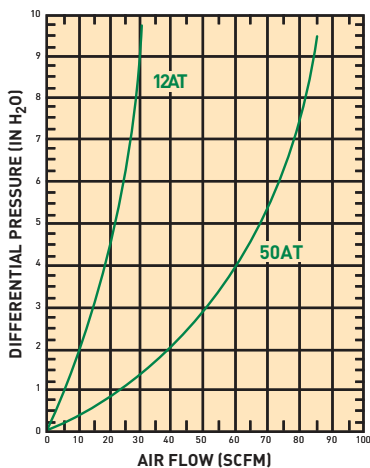
* 99% Removal efficiency for particles larger than the stated size in air.

Graphs are for 03C cannisters only. Total pressure drop across cannister, adapter, and pipe may be found by adding pressure drops below:

- + 1.5% for each inch of 12AT adapter or 3/4" pipe used.
- + 3.0% for each 3/4" elbow used.
- + 1.0% for each inch of 50AT adapter or 1-1/4" pipe used.
- + 2.0% for each 1-1/4" elbow used.



ALLOW 1.25" FOR CANNISTER REMOVAL CLEARANCE



12AT/50AT Series

Spin-On Filters

Filter Service

Filter cannisters need to be replaced when the pressure gauge reads the filter bypass setting. For example, if a 12AT filter has a 25 psi bypass valve, it needs to be replaced when the pressure gauge reads 25 psi. If no indicator of any kind is used, replace the cannister after the first 50 hours of operation, and every 250 hours thereafter. More frequent replacement could be required depending on operating conditions.

When servicing a 12AT or 50AT filter, use the following procedure:

- A. Shut down the main system and release pressure in the filter line.
- B. Unthread the cannister and discard it along with the accompanying seal. A strap wrench may be required.
- C. Apply a small amount of lubricant to the new cannister seal.
- D. Install the new cannister and hand tighten 3/8 to 1/2 turn after gasket makes contact with head.

Accessory Parts List

| Description | 12AT | 50AT |
|------------------------|--------|--------|
| Gauge - 15 psi | 936911 | 936911 |
| Gauge - 25 psi | 936912 | 936912 |
| Pressure switch-25 psi | 926923 | 926923 |
| Vacuum switch | 926949 | 926949 |
| Breather adapter kit | 926876 | 926875 |
| Vacuum gauge | 936909 | 936909 |

Replacement Cannisters

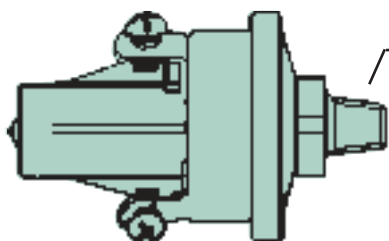
| Media | 12AT | 50AT | 50AT-2 |
|-------|--------|--------|--------|
| 25C | 925023 | 926170 | N/A |
| 10C | 921999 | 926169 | 927736 |
| 03C | 926543 | 926541 | N/A |
| 20B | 928764 | 928767 | 929446 |
| 10B | 928763 | 928766 | 929445 |
| 03B | N/A | 934200 | 932073 |



Indicator Gauge (15 PSI)

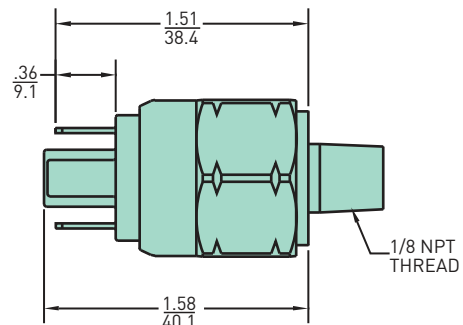


Indicator Gauge (25 PSI)



Vacuum Switch

1/8-27 NPTF



Pressure Switch

Linear Measure = $\frac{\text{inches}}{\text{mm}}$

12AT/50AT Series

Spin-On Filters

How To Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------------|----------|------------|----------|-----------|-----------|----------|
| | 50AT | 2 | 10C | N | 25 | DD | N |

| BOX 1: Seals | |
|--------------|-------------|
| Symbol | Description |
| None | Buna |

| BOX 2: Basic Assembly | |
|-----------------------|------------------------------|
| Symbol | Description |
| 12AT | Spin-on (3/4" nom.) |
| 50AT | Spin-on (1 1/4" nom.) |

| BOX 3: Length | |
|---------------|-------------------------------------|
| Symbol | Description |
| None | Single length cannister |
| 2 | Double length cannister (50AT only) |

| BOX 4: Cannister Media | |
|------------------------|------------------|
| Symbol | Description |
| 25C* | Cellulose |
| 10C | Cellulose |
| 03C* | Cellulose |
| 20B | Microglass |
| 10B | Microglass |
| 03B ** | Microglass |

* Not available in 50AT-2
** Not available in 12AT

| BOX 5: Indicator Symbol | |
|-------------------------|-------------|
| Symbol | Description |
| N | None |

| BOX 6: Bypass Setting | |
|-----------------------|----------------|
| Symbol | Description |
| 25 | 25 psid |
| 15 | 15 psid |
| 3 | 3 psid |
| X | No bypass |

| BOX 7: Ports | |
|--------------|--------------------|
| Symbol | Description |
| 12AT | |
| BB | 3/4" NPTF |
| MM | SAE-12 |
| 50AT | |
| DD | 1-1/4" NPTF |
| OO | SAE-20 |

| BOX 8: Gauge Port Location | |
|----------------------------|--|
| Symbol | Description |
| N | None |
| H | Inlet and outlet, both sides (all ports drilled and tapped) |

NOTE: Gauges must be ordered separately.

Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.



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 hydraulics
 pneumatics
 process control
 sealing & shielding



PT Series

Tank Top Filters



ENGINEERING YOUR SUCCESS.

PT Series

Applications

Together we can...

Preserve the environment.
Minimize waste and promote energy efficiency.

Achieve worldwide filtration solutions.
Build global confidence.

Redefine new limits.
Forge ahead with advanced technology.

Keep contamination under control.
Reduce maintenance costs.

Enhance total system reliability.
Focus on customer satisfaction.

Reach optimum potential.
Drill to greater depths.

...engineer your success.



The new PT series filter is available in two diameters and three lengths for flow ranges from 5-50 gpm. The PT2 and PT4 filter cartridges utilize Microglass media in 2, 5, 10 and 20 microns for the industry's best particle removal efficiency and retention.

This unique design simply threads into a ported weld ring or flange, which can be bolted to a metal reservoir.

The disposable filter cartridge is a single-piece construction, which incorporates the nylon cover and integral 25 psi bypass valve. The flow path is inside-out and requires no special tools for service.

This concept assures minimal installation costs with the least space requirements for return line applications.

Typical Applications

- Turf Maintenance
- Material Handling
- Aerial Lifts
- Fan Drive

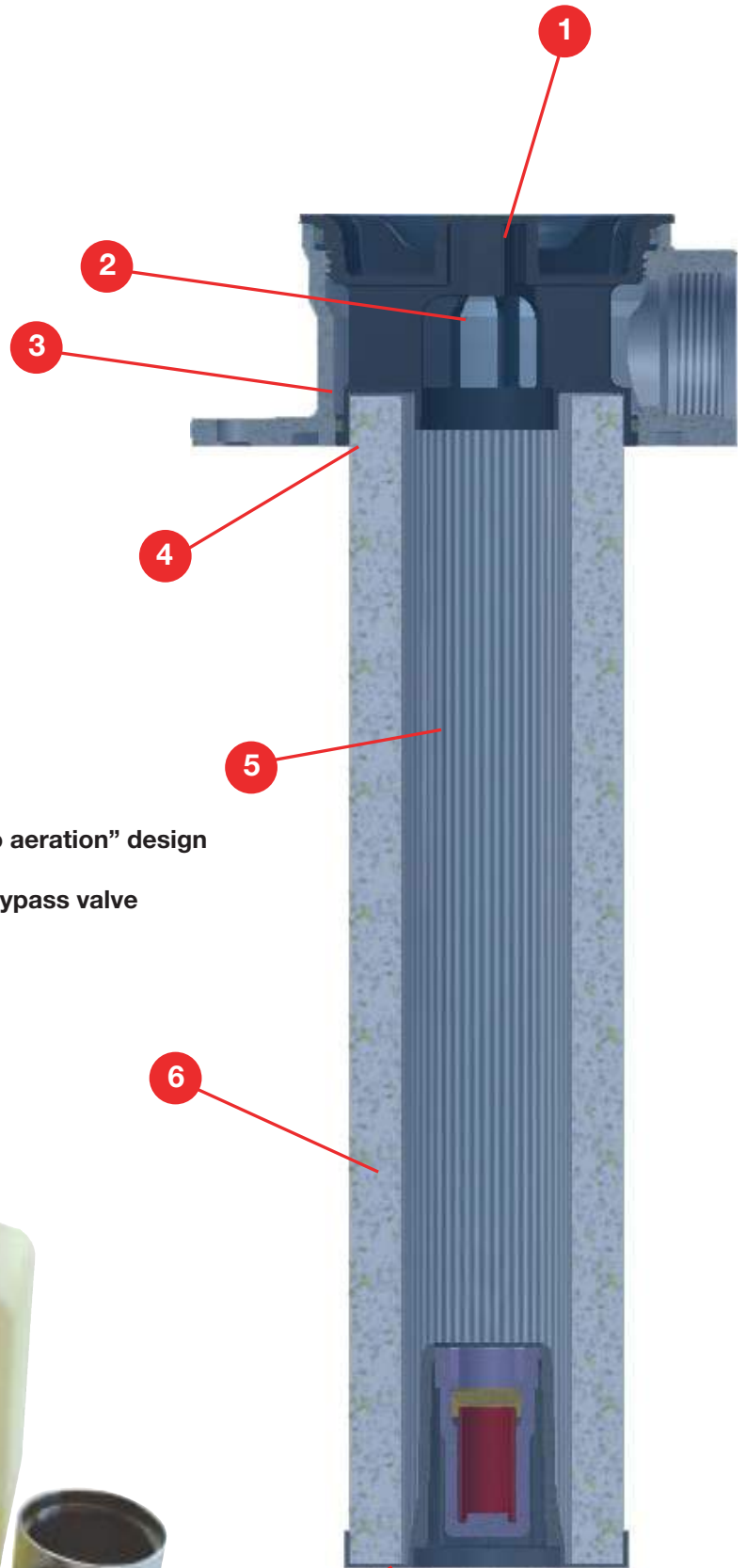


The PT Series filter combines high efficiency Microglass filtration with low cost installation featured in a new patented element design.

PT Series

Features

- 1 Easy element assembly removal
- 2 Unique high flow top end cap
- 3 Lightweight cast aluminum head
- 4 Patented filter element assembly
- 5 Bowl-less, inside-out flow
- 6 Downstream element support with “no aeration” design
- 7 Solid bottom endcap with integrated bypass valve
- 8 Low profile tank top design



PT Series

Patented Filter Element
Premium original equipment performance every time

Tank Top, Bowl-Less Design
Reduces weight
Significant cost savings over filters with bowls

Bottom Endcap Integrated Bypass Valve
New bypass valve with every element change
Insures reliable performance

Inside-Out Element Flow Path
Contamination contained within the element
No system contamination during element servicing

No Aeration Design
Oil cascades down the perforated outer support core
No system aeration

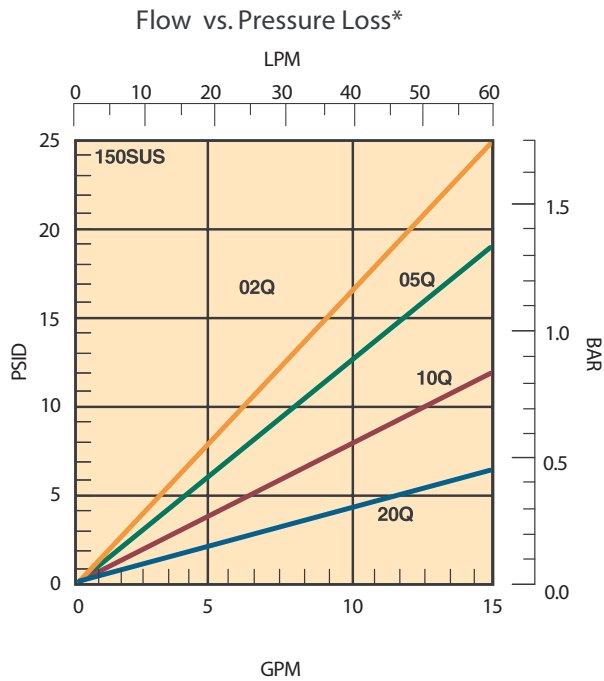
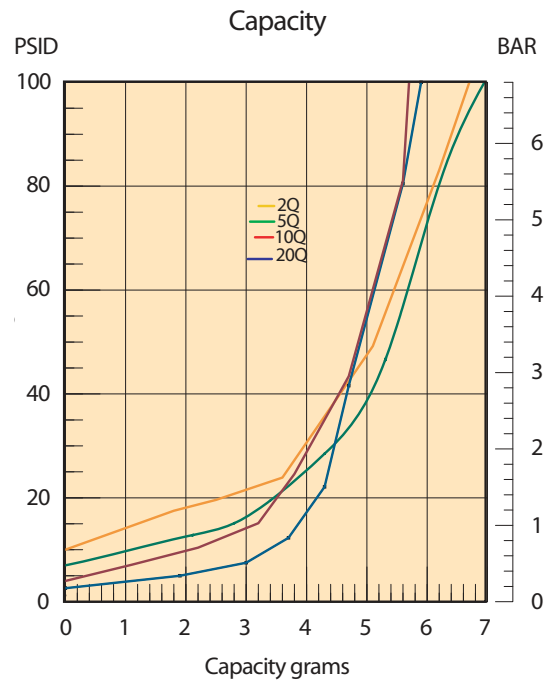
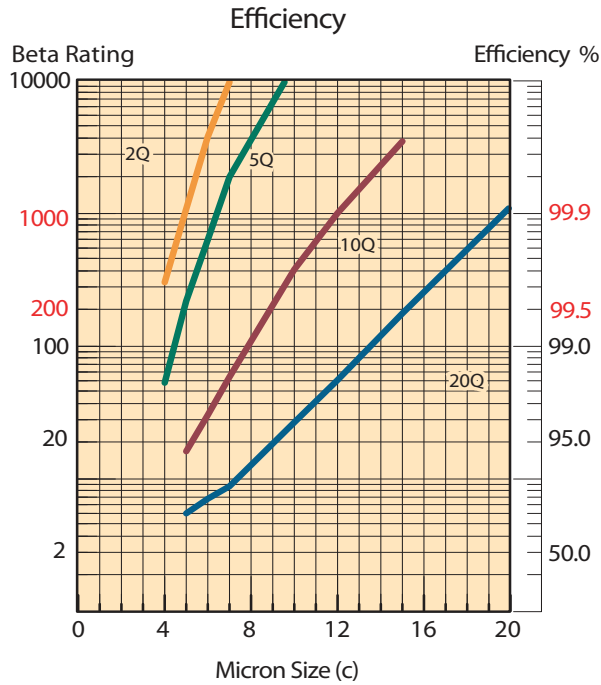
High Flow, Low Pressure Drop Top Endcap Design
Long element life
Lower maintenance costs

Premium Microglass Media
Superior dirt holding capacity and efficiency
Less maintenance and downtime



PT Series

PT2-1 Element Performance

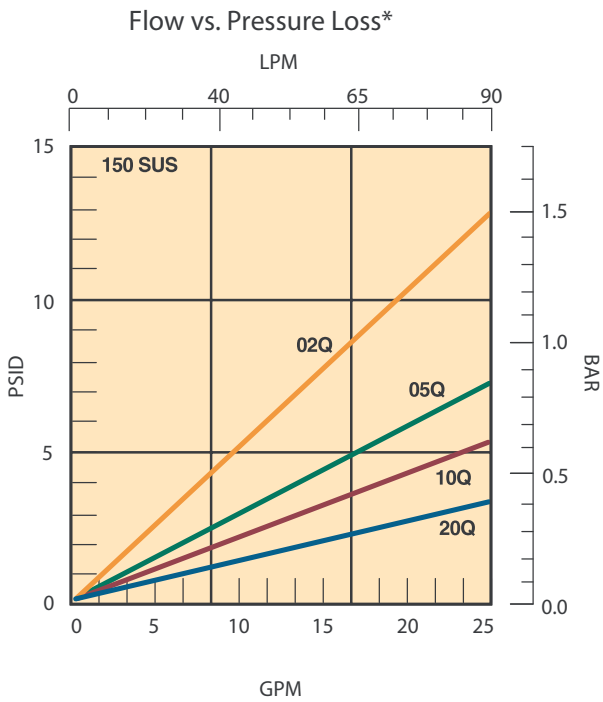
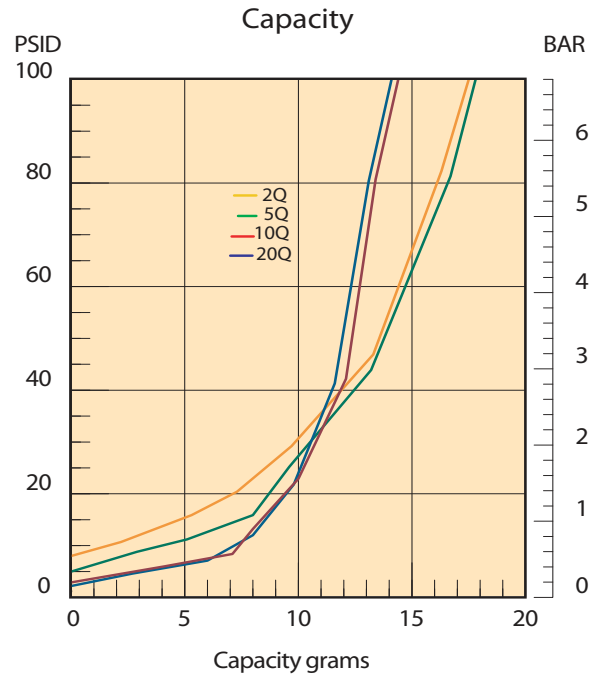
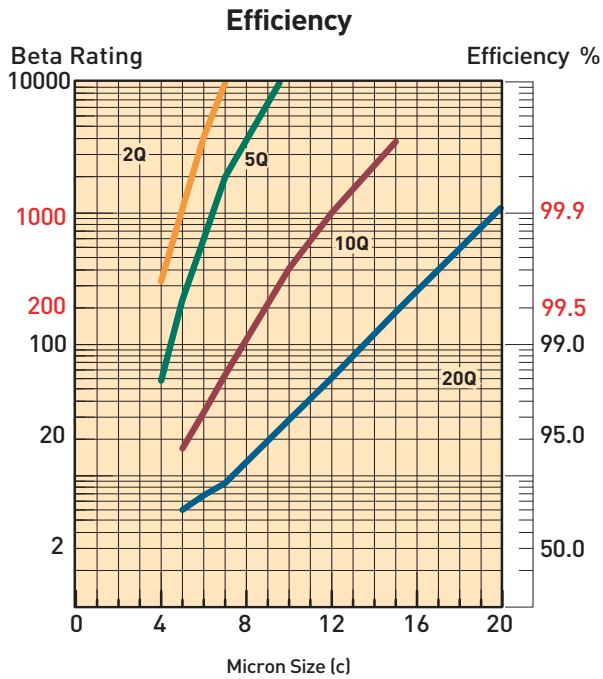


Results typical from Multi-pass tests run per test standard ISO 16889 @ 10 gpm to 100 psid terminal - 10 mg/L BUGL. Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

*Note: Pressure drop calculations are based on SAE-12 porting.

PT Series

PT2-2 Element Performance

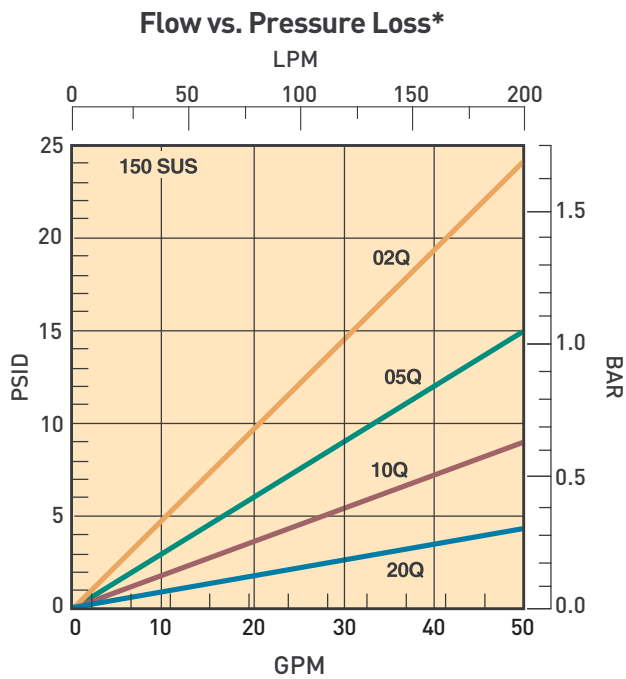
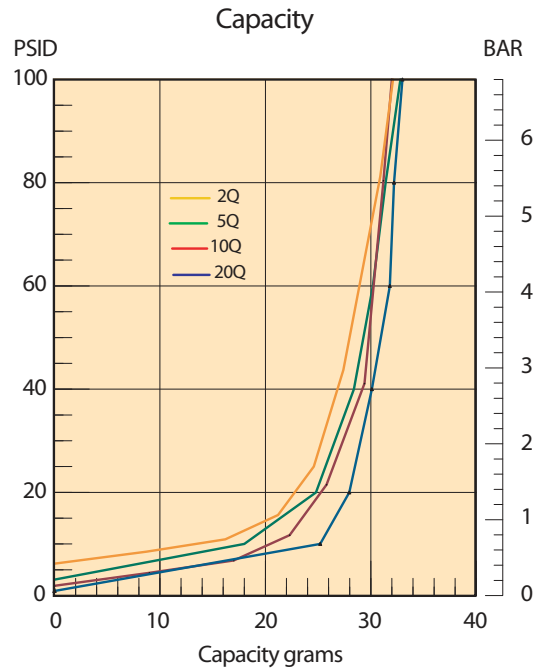
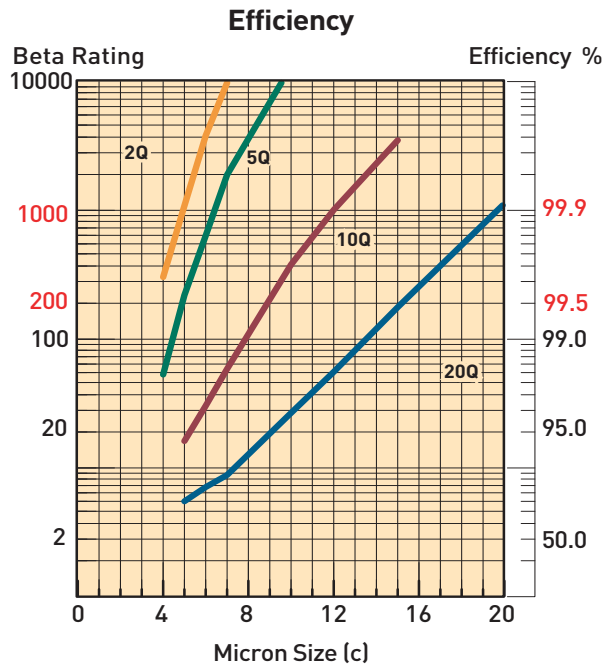


Results typical from Multi-pass tests run per test standard ISO 16889 @ 15 gpm to 100 psid terminal - 10 mg/L BUGL. Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

*Note: Pressure drop calculations are based on SAE-12 porting.

PT Series

PT4-1 Element Performance

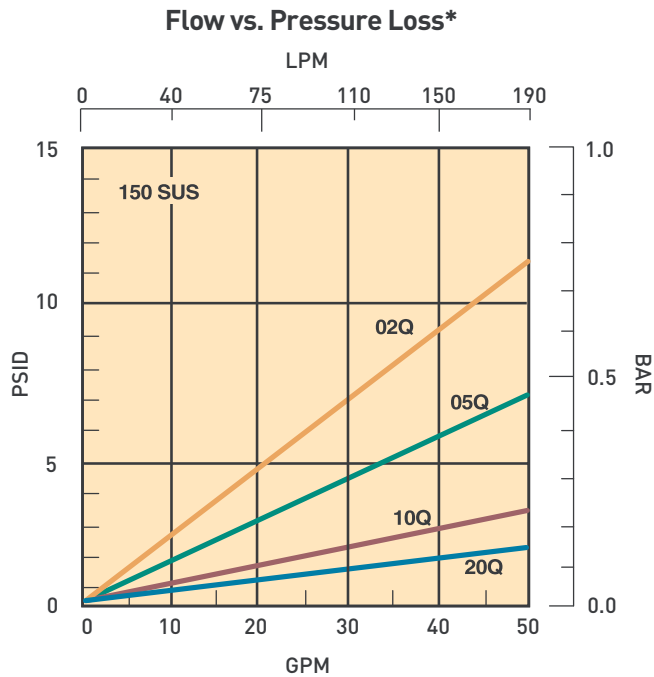
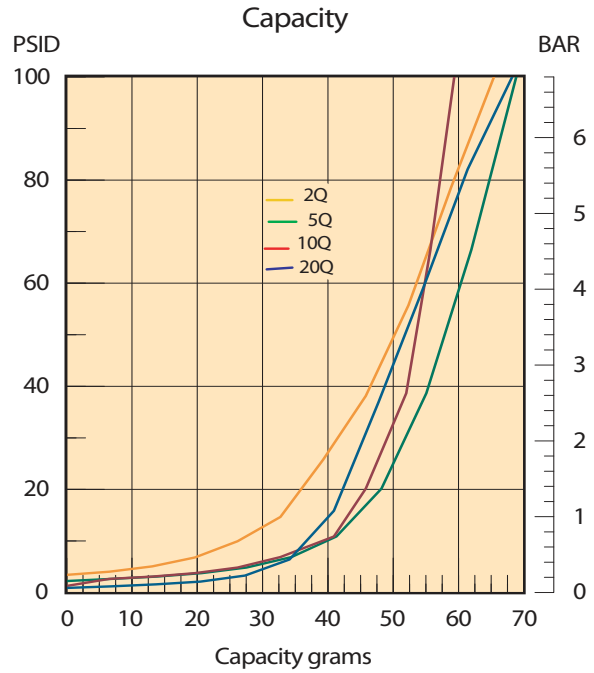
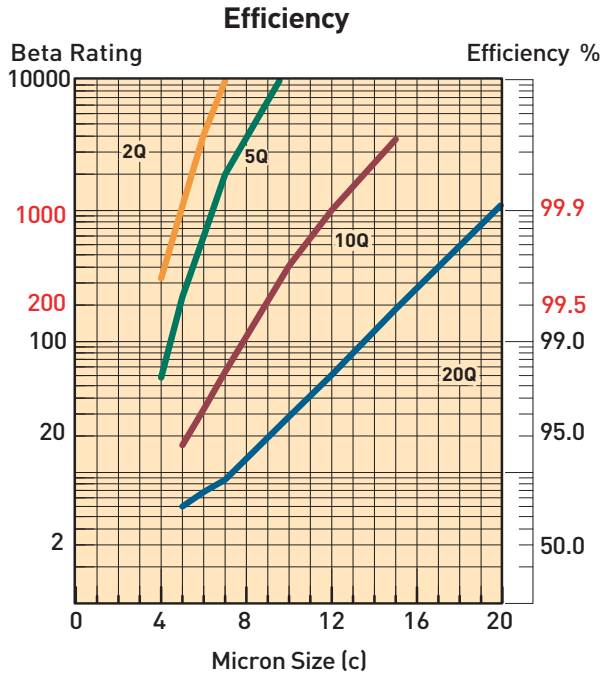


Results typical from Multi-pass tests run per test standard ISO 16889 @ 15 gpm to 100 psid terminal - 10 mg/L BUGL. Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

*Note: Pressure drop calculations are based on SAE-16 porting.

PT Series

PT4-2 Element Performance

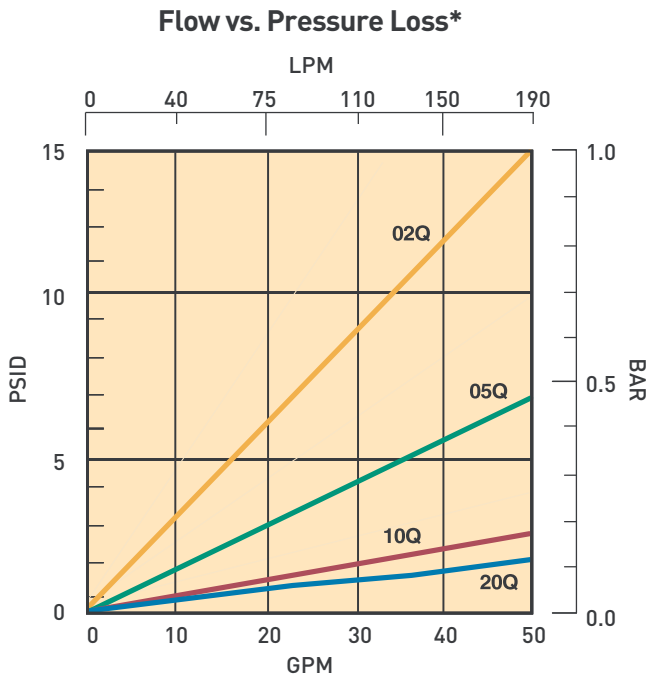
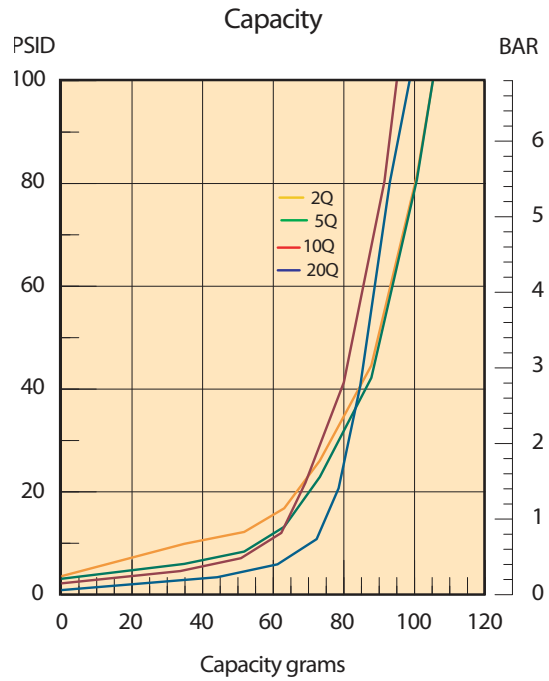
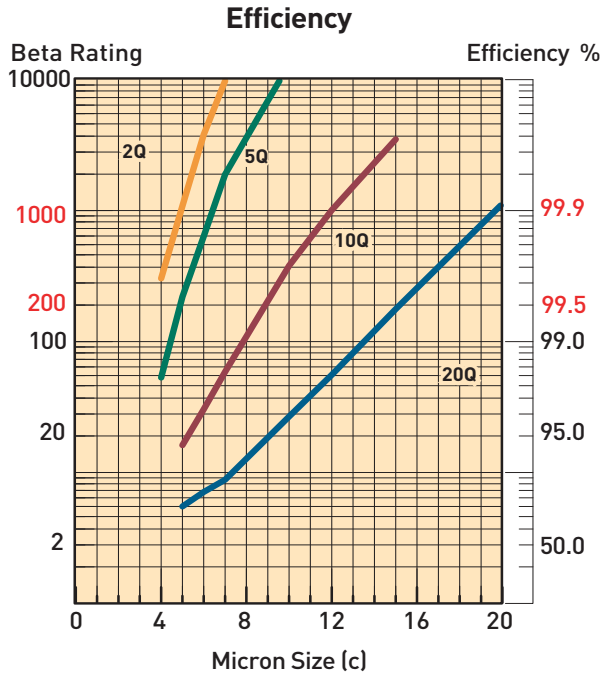


Results typical from Multi-pass tests run per test standard ISO 16889 @ 30 gpm to 100 psid terminal - 10 mg/L BUGL. Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

*Note: Pressure drop calculations are based on SAE-16 porting.

PT Series

PT4-3 Element Performance



Results typical from Multi-pass tests run per test standard ISO 16889 @ 45 gpm to 100 psid terminal - 10 mg/L BUGL. Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

*Note: Pressure drop calculations are based on SAE-16 porting.

PT Series

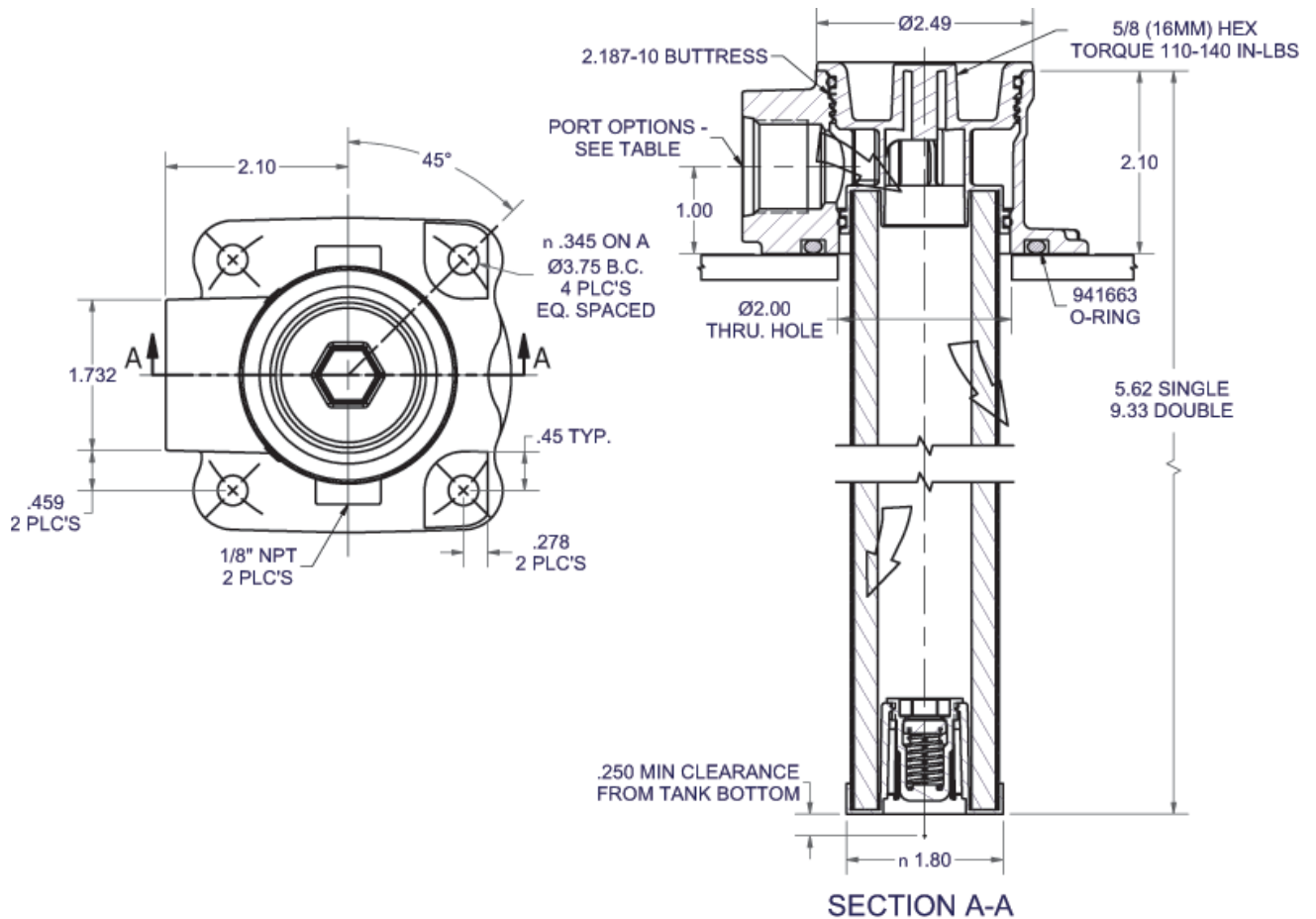
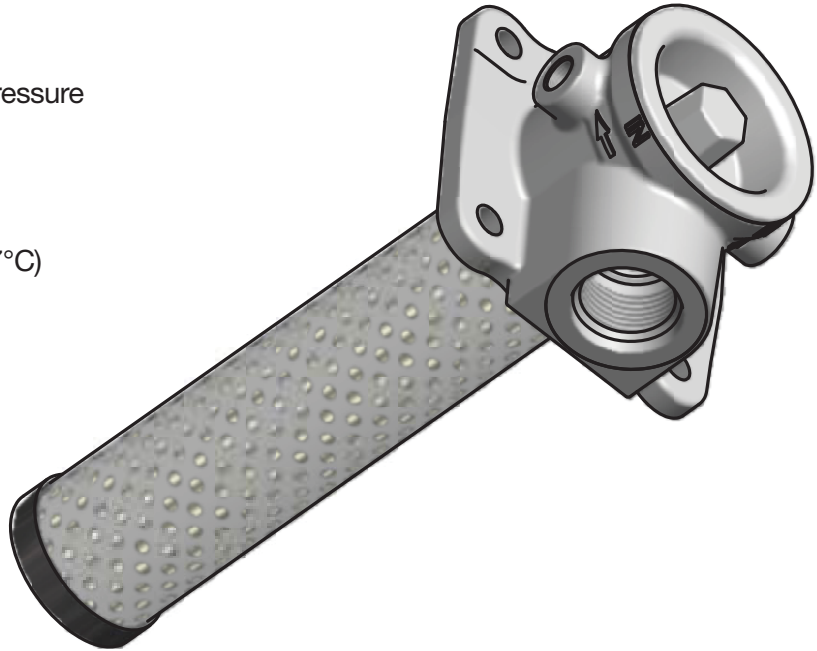
Specifications - PT2

Maximum Allowable Operating Pressure (MAOP): 150 psi (10.3 bar)

Element Burst Rating: 150 psid

Operating Temperatures:
Buna: -40°F (-40°C) to 225°F (107°C)

Materials:
Tank Flange: aluminum
Endcaps: nylon



PT Series

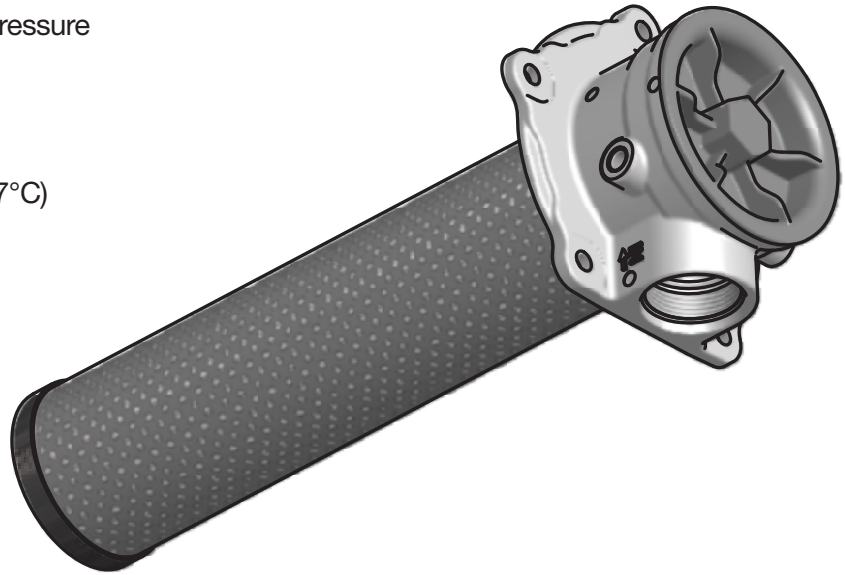
Specifications - PT4

Maximum Allowable Operating Pressure (MAOP): 150 psi (10.3 bar)

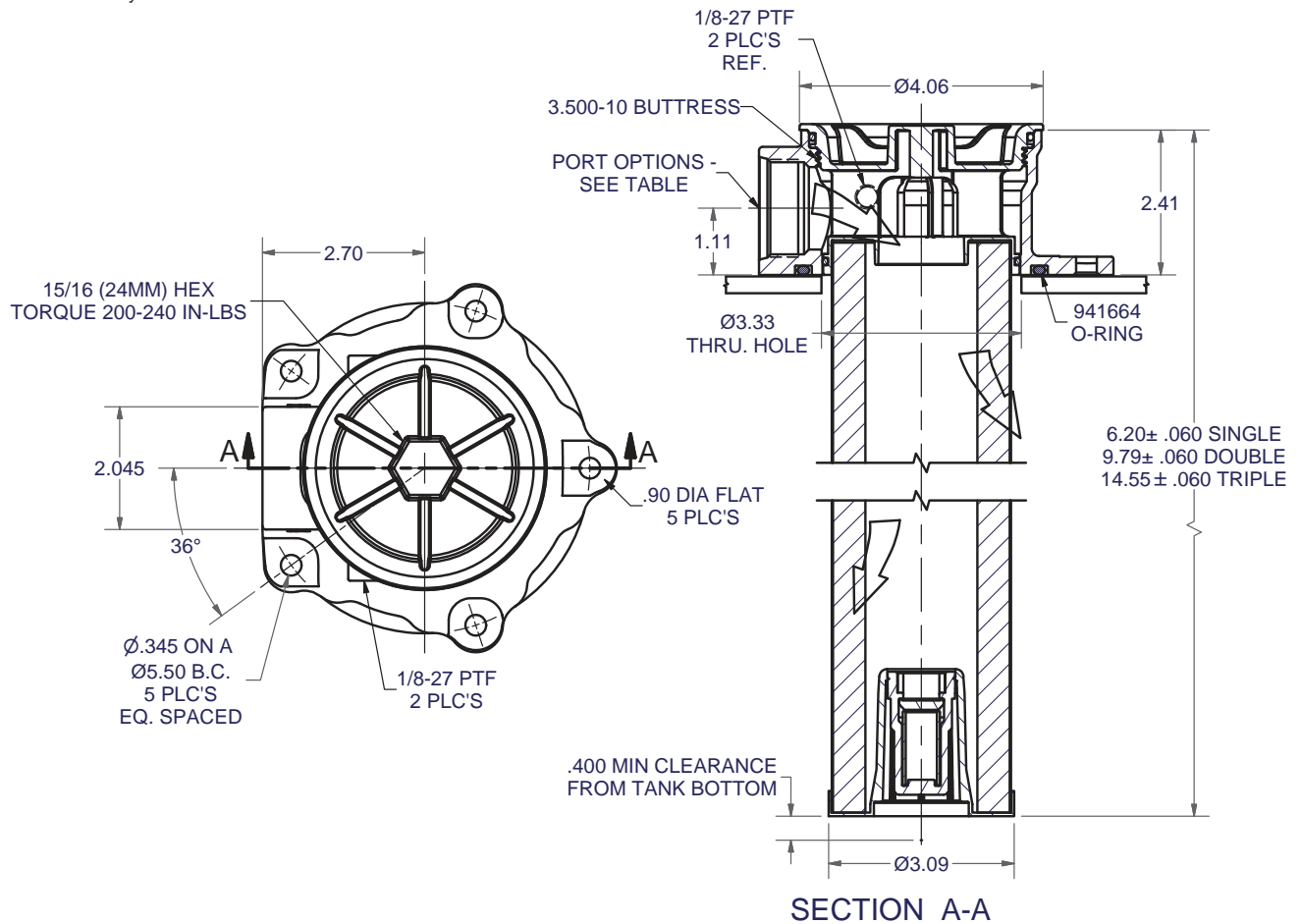
Element Burst Rating: 150 psid

Operating Temperatures:
Buna: -40°F (-40°C) to 225°F (107°C)

Materials:
Tank Flange: aluminum
Endcaps: nylon



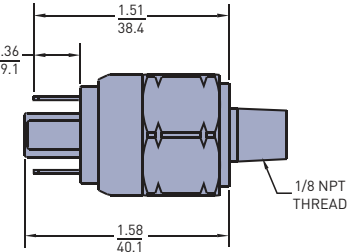
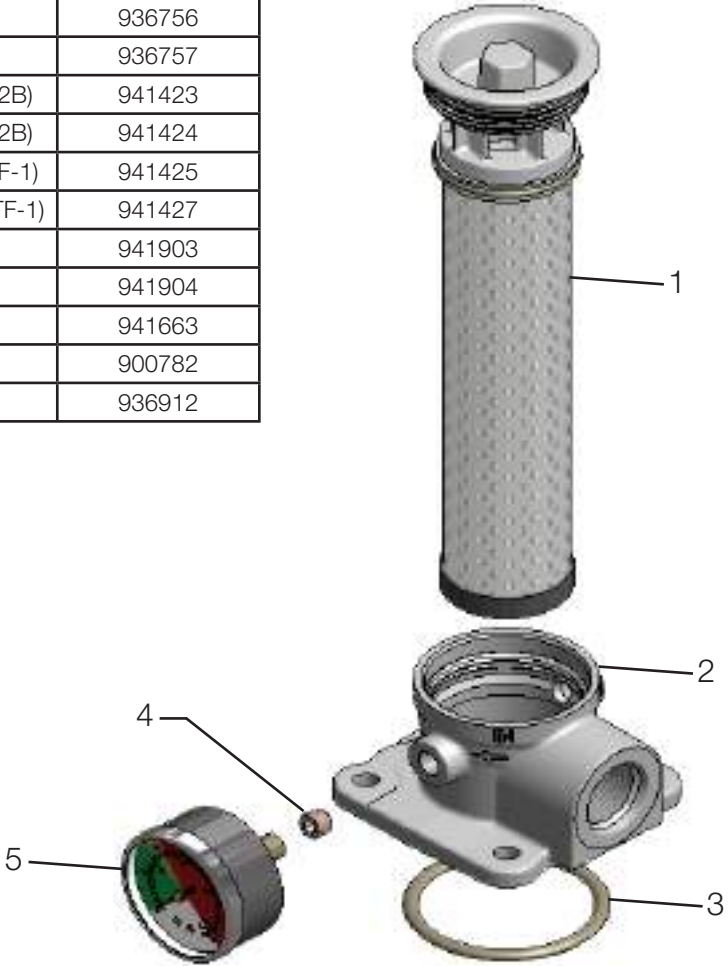
Drawings are for reference only.
Contact factory for current version.



PT Series

PT2 Parts List

| INDEX | PART DESCRIPTION | PART NUMBER |
|-------|---|-------------|
| 1 | PT2-1-02Q-25 psid bypass | 936750 |
| | PT2-1-05Q-25 psid bypass | 936751 |
| | PT2-1-10Q-25 psid bypass | 936752 |
| | PT2-1-20Q-25 psid bypass | 936753 |
| | PT2-2-02Q-25 psid bypass | 936754 |
| | PT2-2-05Q-25 psid bypass | 936755 |
| | PT2-2-10Q-25 psid bypass | 936756 |
| | PT2-2-20Q-25 psid bypass | 936757 |
| 2 | PT2 DIE CAST SAE-12 (1.062-12 UN-2B) | 941423 |
| | PT2 DIE CAST SAE-16 (1.312-12 UN-2B) | 941424 |
| | PT2 DIE CAST 3/4" NPT (.750-14 NPTF-1) | 941425 |
| | PT2 DIE CAST 1" NPT (1.000-11.5 NPTF-1) | 941427 |
| | PT2 DIE CAST G3/4" BSPF | 941903 |
| | PT2 DIE CAST G1" BSPF | 941904 |
| 3 | O-RING | 941663 |
| 4 | 1/8-27 PIPE PLUG | 900782 |
| 5 | 1/8-27 PRESSURE GAUGE | 936912 |

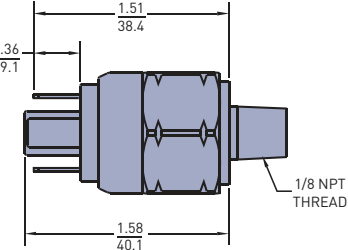
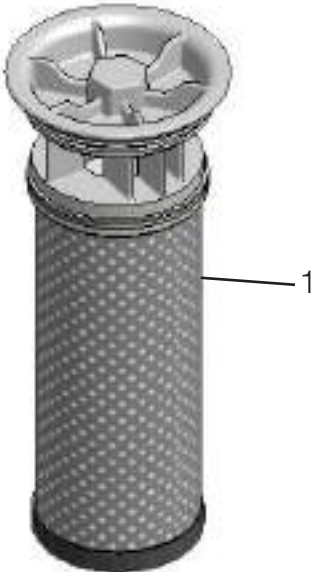


Linear measure = $\frac{\text{inches}}{\text{mm}}$
 Pressure Switch (926923)

PT Series

PT4 Parts List

| INDEX | PART DESCRIPTION | PART NUMBER |
|-------|---|-------------|
| 1 | PT4-1-02Q-25 psid bypass | 936742 |
| | PT4-1-05Q-25 psid bypass | 936743 |
| | PT4-1-10Q-25 psid bypass | 936744 |
| | PT4-1-20Q-25 psid bypass | 936745 |
| | PT4-2-02Q-25 psid bypass | 936746 |
| | PT4-2-05Q-25 psid bypass | 936747 |
| | PT4-2-10Q-25 psid bypass | 936748 |
| | PT4-2-20Q-25 psid bypass | 936749 |
| | PT4-3-02Q-25 psid bypass | 936876 |
| | PT4-3-05Q-25 psid bypass | 936877 |
| | PT4-3-10Q-25 psid bypass | 936878 |
| | PT4-3-20Q-25 psid bypass | 936879 |
| 2 | PT4 DIE CAST SAE-16 (1.312-12 UN-2B) | 941417 |
| | PT4 DIE CAST SAE-20 (1.625-12 UN-2B) | 941448 |
| | PT4 DIE CAST 1" NPT (1.000-11.5 NPTF-1) | 941449 |
| | PT4 DIE CAST 1 1/4" NPT (1.250-11.5 NPTF-1) | 941450 |
| | PT4 DIE CAST G1" BSPF | 941905 |
| | PT4 DIE CAST G1 1/4" BSPF | 941906 |
| 3 | O-RING | 941664 |
| 4 | 1/8-27 PIPE PLUG | 900782 |
| 5 | 1/8-27 PRESSURE GAUGE | 936912 |



Linear measure = $\frac{\text{inches}}{\text{mm}}$
 Pressure Switch (926923)

PT Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| PT2 | 1 | 10Q | B | G | G | S16 | 1 |

| BOX 1: Filter Series ¹ | |
|-----------------------------------|-----------------|
| Symbol | Description |
| PT2 | Tank top filter |
| PT4 | Tank top filter |

| BOX 2: Element Length | |
|-----------------------|-----------------------------|
| Symbol | Description |
| 1 | Single |
| 2 | Double |
| 3 | Triple (Avail. on PT4 only) |

Consult factory for additional element lengths

| BOX 3: Media Code | |
|-------------------|---------------------------|
| Symbol | Description |
| 02Q | Microglass III, 2 micron |
| 05Q | Microglass III, 5 micron |
| 10Q | Microglass III, 10 micron |
| 20Q | Microglass III, 20 micron |

| BOX 4: Seals | |
|--------------|--------------------|
| Symbol | Description |
| B | Nitrile (NBR) |
| V | Fluorocarbon (FKM) |

| BOX 5: Indicator | |
|------------------|------------------------|
| Symbol | Description |
| P | Port plugged |
| G | Pressure Gauge, 25 psi |
| S | Pressure Switch |

| BOX 6: Bypass | |
|---------------|------------------|
| Symbol | Pressure Setting |
| G | 25 PSI (1.7 bar) |

| BOX 7: Ports | |
|--------------|-------------------------|
| Symbol | Description |
| PT2 | |
| G12 | G $\frac{3}{4}$ " BSPP |
| G16 | G1" BSPP |
| N12 | $\frac{3}{4}$ " NPT |
| N16 | 1" NPT |
| S12 | SAE-12 |
| S16 | SAE-16 |
| PT4 | |
| G16 | G1" BSPP |
| G20 | G1 $\frac{1}{4}$ " BSPP |
| N16 | 1" NPT |
| N20 | 1 $\frac{1}{4}$ " NPT |
| S16 | SAE-16 |
| S20 | SAE-20 |

| BOX 8: Options | |
|----------------|-----------------|
| Symbol | Description |
| 1 | None |
| W ² | Steel weld ring |

Notes:

- The filters include the element you select already installed.
- When "W" is selected in Box 8, the PT2 port options are "N12" and "S12"; the PT4 port options are "N16" and "S16".

Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.





aerospace
 climate control
 electromechanical
filtration
 fluid & gas handling
 hydraulics
 pneumatics
 process control
 sealing & shielding



KLT and KLS Series

Tank Top Return Line Filters



ENGINEERING YOUR SUCCESS.

KLT/KLS Series

Tank Top Return Line Filters

Applications for KLT and KLS Filters

- Mobile Equipment
- Construction, Refuse
- Industrial Power Units
- Machine Tool
- Oil Field



Parker's new KLS /KLT Tank Top Return Line Filters are ideally suited for Mobile and Industrial high to medium flow return applications, from 30 to 120 GPM. This cost-effective, in-tank filter series provides maximum flow and dirt holding capacity for longer filter element life in a simple, easy-to-install-and-service assembly.



The generous element size with extensive media area ensures continuous filtration during cold start up conditions. The inside-to-out flow path with closed bottom provides additional assurance that all contaminants remain captured during element service removal.

The filters have a pressure rating of 150 psi static, a temperature range of -40°F to 225°F, and are available in a wide range of high-efficiency Microglass III media in 2, 5, 10 and 20 micron for all system cleanliness requirements. Bypass valves are built into the element to ensure further performance integrity. A new bypass is provided with each element change.

This rugged design meets the needs for the demanding applications in mobile off-highway and on-highway applications for construction equipment, logging, refuse vehicles, mining, oil and gas recovery, marine, and industrial power units.

| Feature | Advantage | Benefit |
|--|---|--|
| <ul style="list-style-type: none"> • Tank top mounted filter | <ul style="list-style-type: none"> • Saves space and reduces mounting hardware | <ul style="list-style-type: none"> • Lower cost, easy to integrate • KLS model directly retrofits competitive housing |
| <ul style="list-style-type: none"> • Two-piece head and element construction perforated with metal outer wrap | <ul style="list-style-type: none"> • No bowl required • Provides excellent flow diffusing, eliminating aeration | <ul style="list-style-type: none"> • Reduced cost and assembly weight • Improved performance |
| <ul style="list-style-type: none"> • High efficiency Microglass media maximizing filtration area | <ul style="list-style-type: none"> • Combines high particle capture efficiency with high dirt holding capacity and lower ΔP | <ul style="list-style-type: none"> • Cleaner fluids, longer lasting with fewer service intervals • Continuous filtration for cold start ups • Lower operating costs |
| <ul style="list-style-type: none"> • Element design includes intergral disposable bypass valve with closed bottom end cap | <ul style="list-style-type: none"> • New bypass with each element change • Ensures captured contaminants are removed with each element change | <ul style="list-style-type: none"> • Ensures reliable bypass performance • No leakage • Cleaner fluids reduce risk for contamination during service |
| <ul style="list-style-type: none"> • Magnetic prefiltration | <ul style="list-style-type: none"> • Removes large ferrous contaminants | <ul style="list-style-type: none"> • Extends element life • Visual indication of component wear |
| <ul style="list-style-type: none"> • Fill and gauge ports | <ul style="list-style-type: none"> • Add fluid through high performance filter media • Gauge ports allow for added instrumentation | <ul style="list-style-type: none"> • Initial fluid integrity extends system component life • Monitor element life |

KLT/KLS Series

Specifications

Pressure Ratings:
Maximum Allowable Operating Pressure (MAOP): 150 psi (10.3 bar)

Operating Temperatures:
 -40°F (-40°C) to 225°F (107°C)

Element Burst Rating:
 150 psid (10.3 bar)

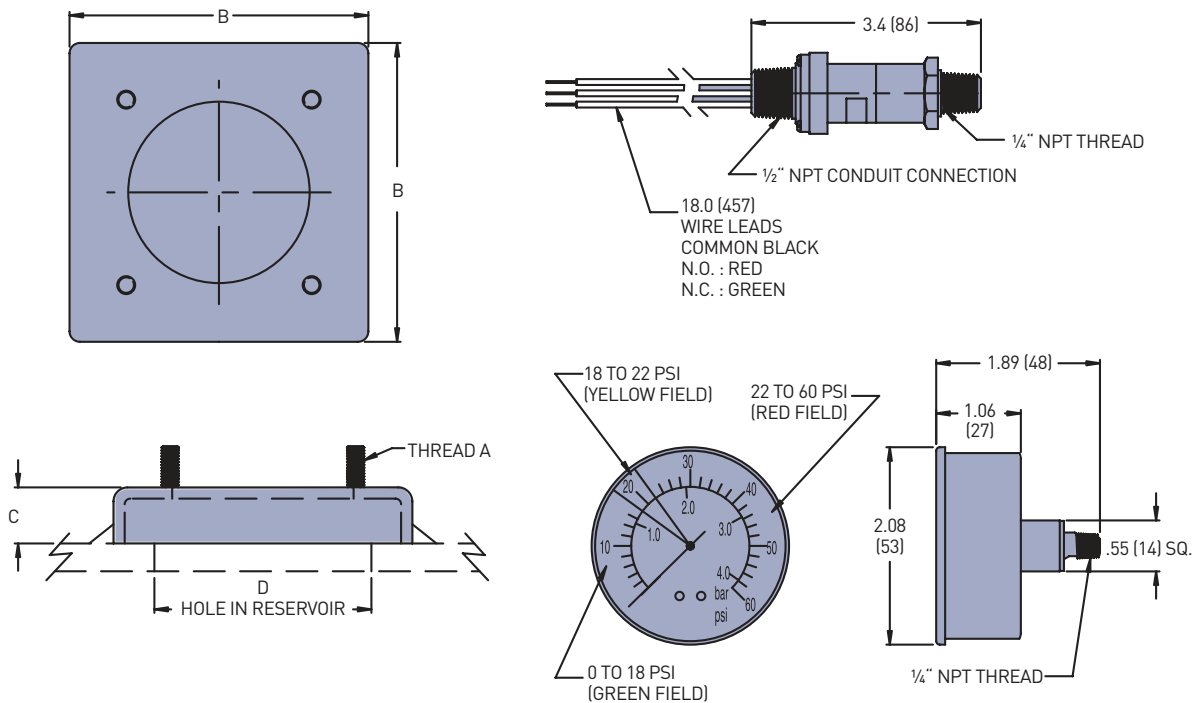
Filtration Rating:
 2, 5, 10 & 20 Microns at Beta > 200

Element Condition Indicators:
 Gauge: 0-60 psi color coded
 Switch: SPDT 5A @ 24 VDC and 250 VAC

Materials:
 Head & Cover: Cast Aluminum Alloy
 Bypass Valve: Nylon
 Filter Media: Microglass III
 Element End Caps: Nylon

Weights (approximate):
 KLT-23 lbs. (1.36 kg)
 KLT-44 lbs. (1.81 kg)
 KLT(S)-78 lbs. (3.63 kg)
 KLT(S)-810 lbs. (4.54 kg)

KLT Weld Plate Drawings



Linear Measure: inch (mm)

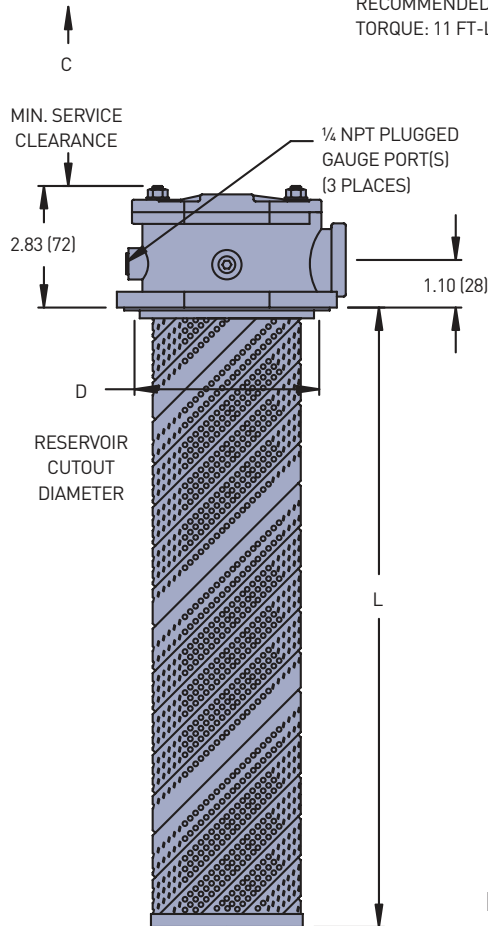
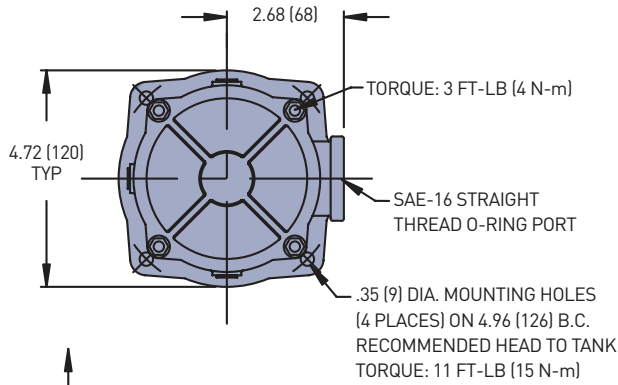
| Dimension | KLT Filter Model | |
|-----------|--------------------|---------------------|
| | KLT-2/KLT-4 | KLT-7/KLT-8 |
| A | 5/16-18 UNC-2A | 3/8-16 UNC-2A |
| B | 5.33 (135) | 7.15 (182) |
| C | 1.00 (25) | 1.00 (25) |
| D | 4.50/3.75 (114/95) | 6.25/5.50 (159/140) |

Drawings are for reference only.
 Contact factory for current version.

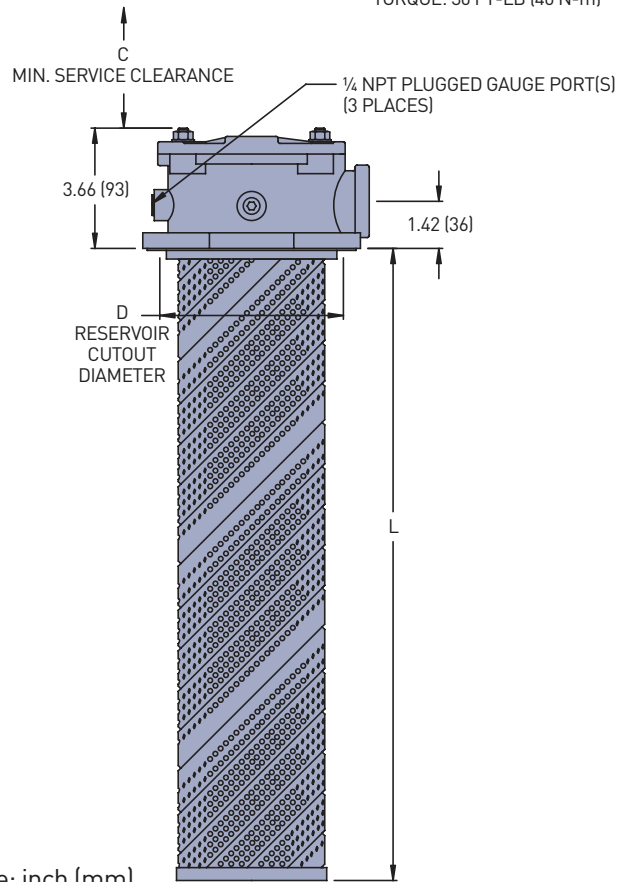
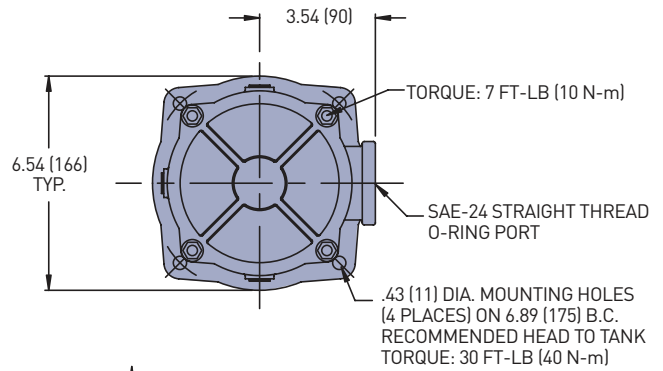
KLT Series

Dimensional Drawings

KLT 2 / KLT 4



KLT 7 / KLT 8



Linear Measure: inch (mm)

Drawings are for reference only.
Contact factory for current version.

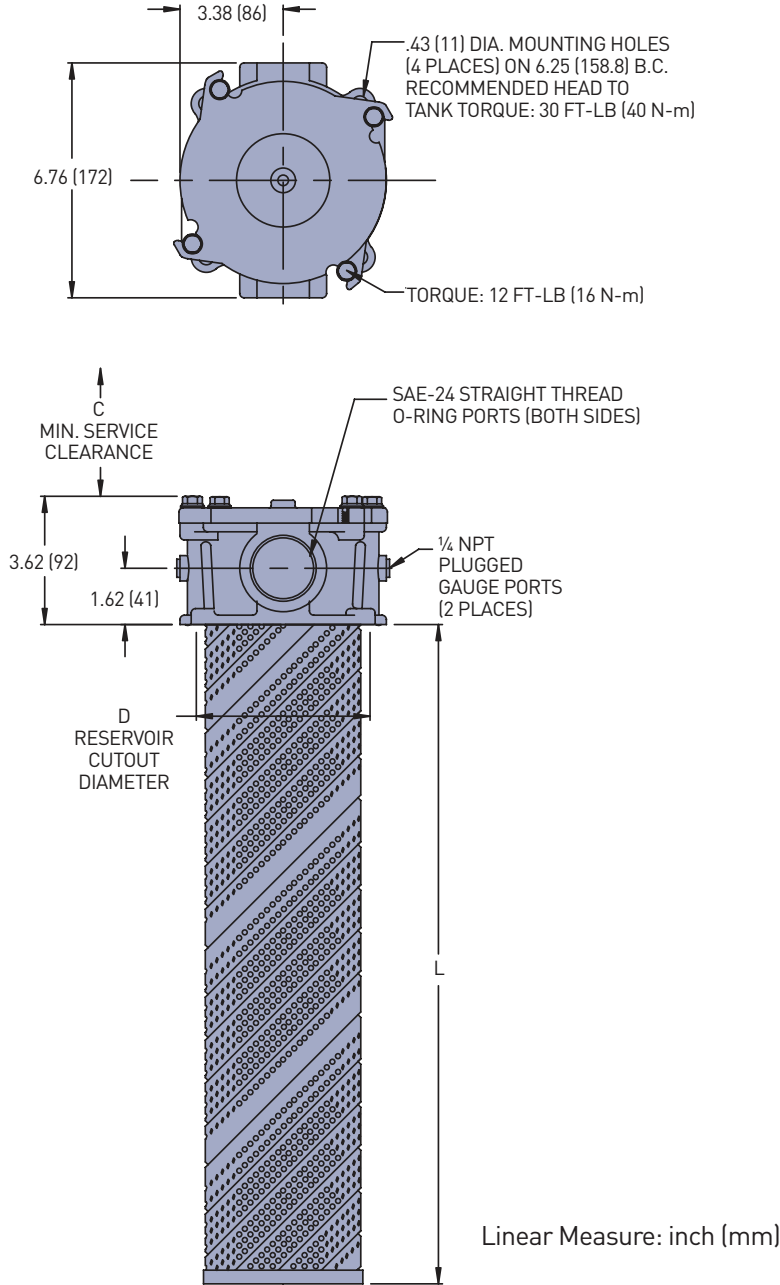
| Dimensions | KLT Filter Model | |
|------------|------------------------------|------------|
| | KLT-2 | KLT-4 |
| C | 5.75 (146) | 9.50 (241) |
| L | 4.16 (106) | 7.75 (197) |
| D | $\frac{3.6 (93)}{3.56 (90)}$ | |

| Dimensions | KLT Filter Model | |
|------------|---------------------------------|-------------|
| | KLT-7 | KLT-8 |
| C | 13.00 (330) | 19.25 (489) |
| L | 11.46 (291) | 17.70 (450) |
| D | $\frac{5.36 (136)}{5.26 (133)}$ | |

KLT Series

Dimensional Drawings

KLS 7 / KLS 8



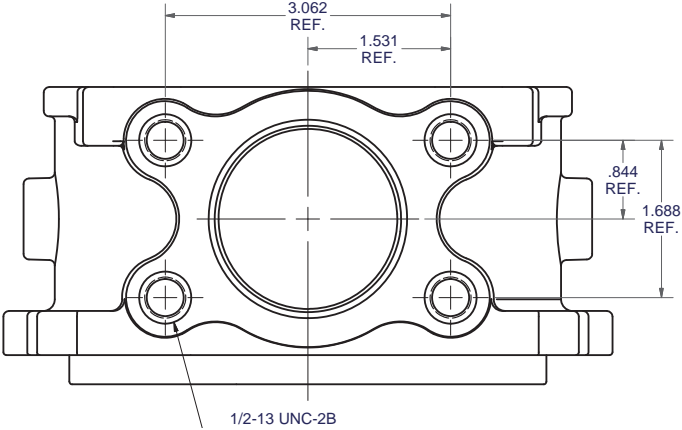
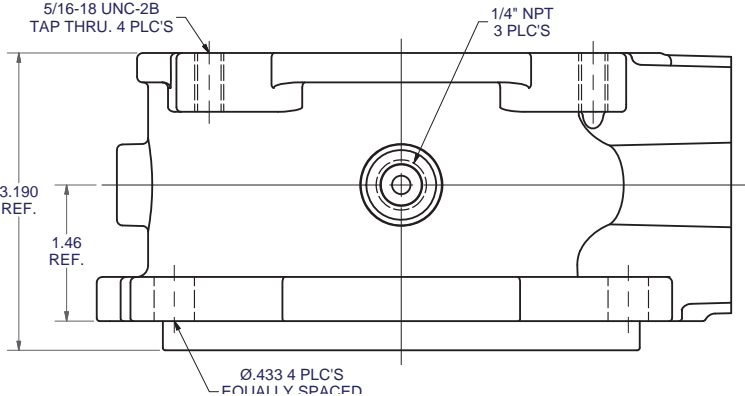
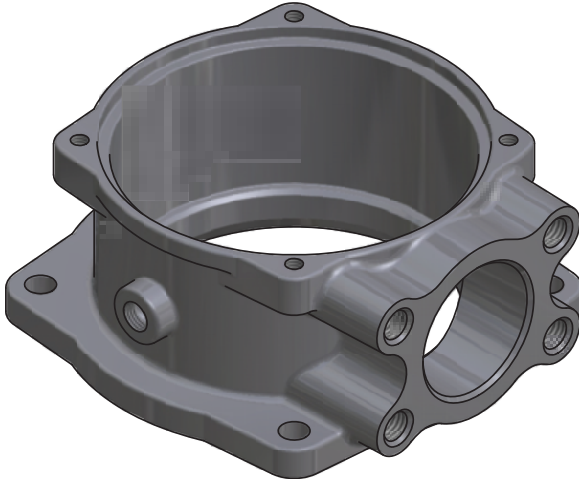
| Dimensions | KLS Filter Model | |
|------------|------------------|-------------|
| | KLS-7 | KLS-8 |
| C | 13.00 [330] | 19.25 [489] |
| L | 11.46 [291] | 17.70 [450] |
| D | 5.00 [127] | |
| | 4.80 [122] | |

Drawings are for reference only.
Contact factory for current version.

KLT Series

Dimensional Drawing

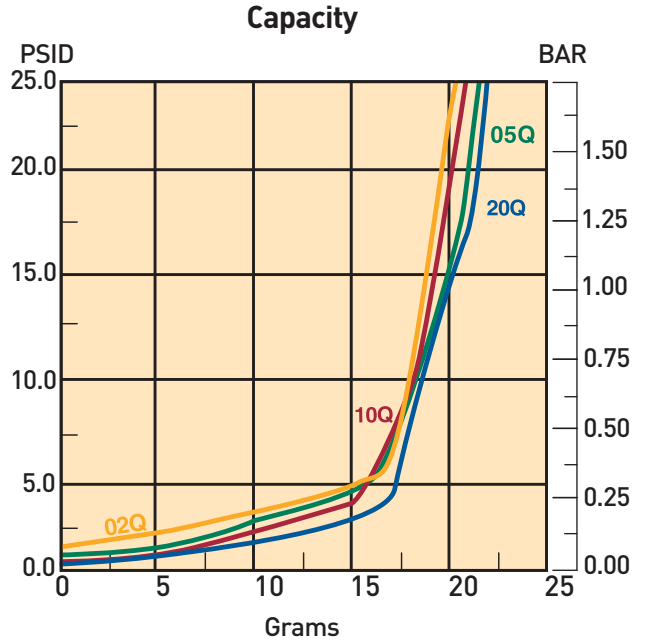
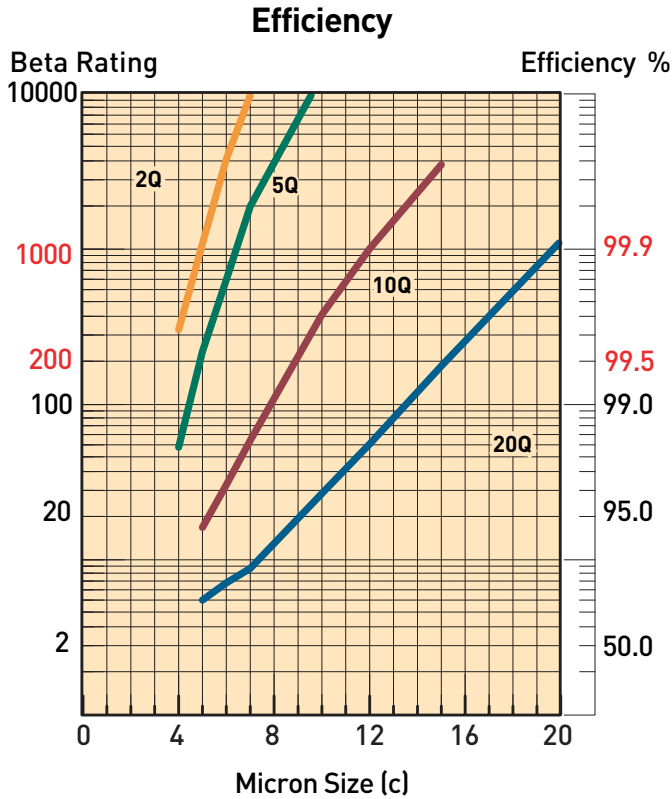
KLT with 2" Port



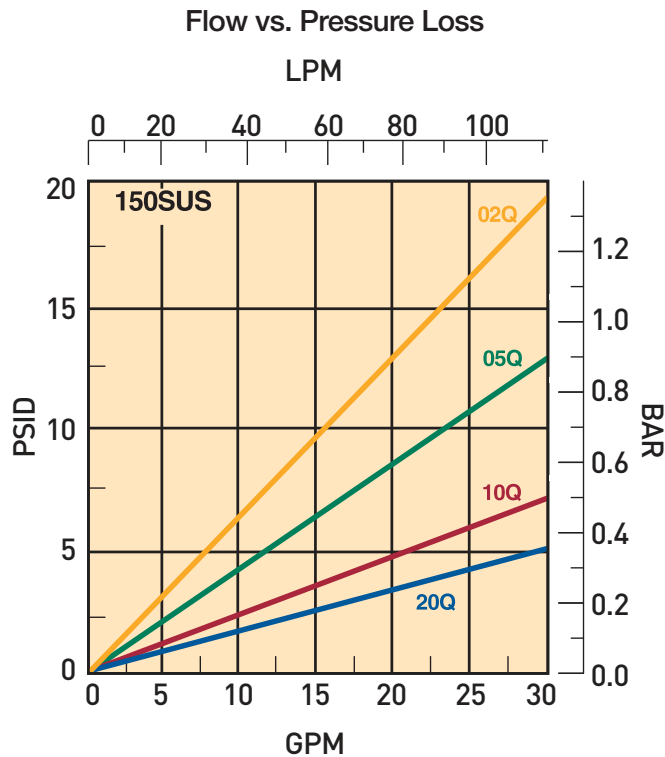
Drawings are for reference only.
Contact factory for current version.

KLT Series

KLT-2 Element Performance

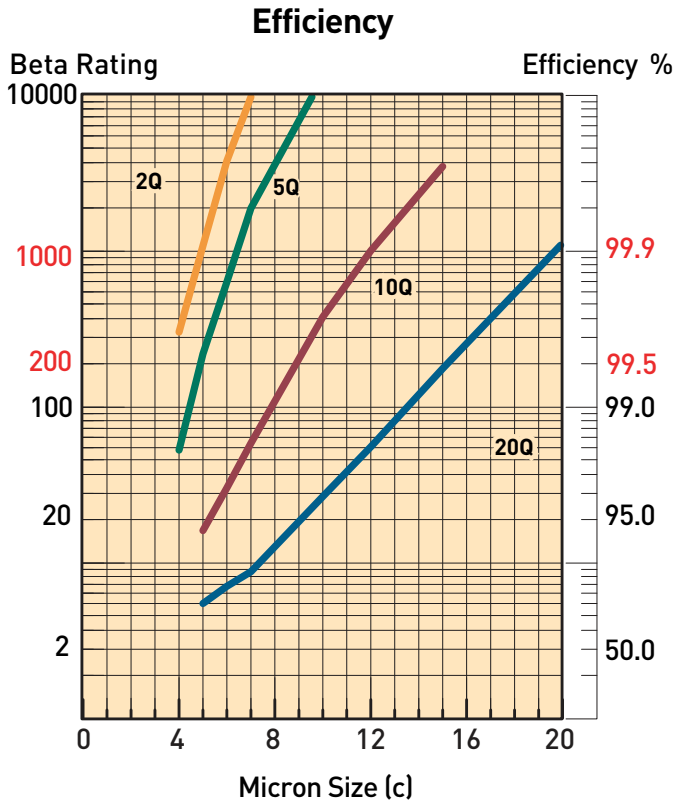


Multipass tests run @ 15 gpm to 25 psid terminal - 10 mg/L BUGL

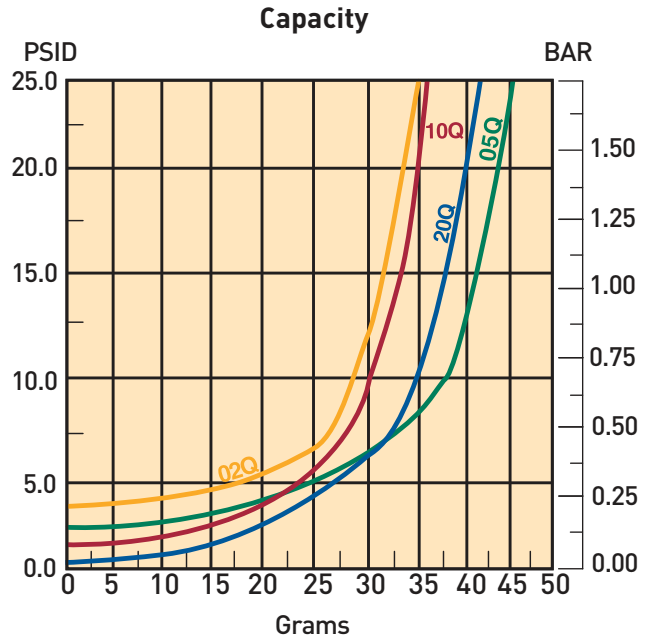


KLT Series

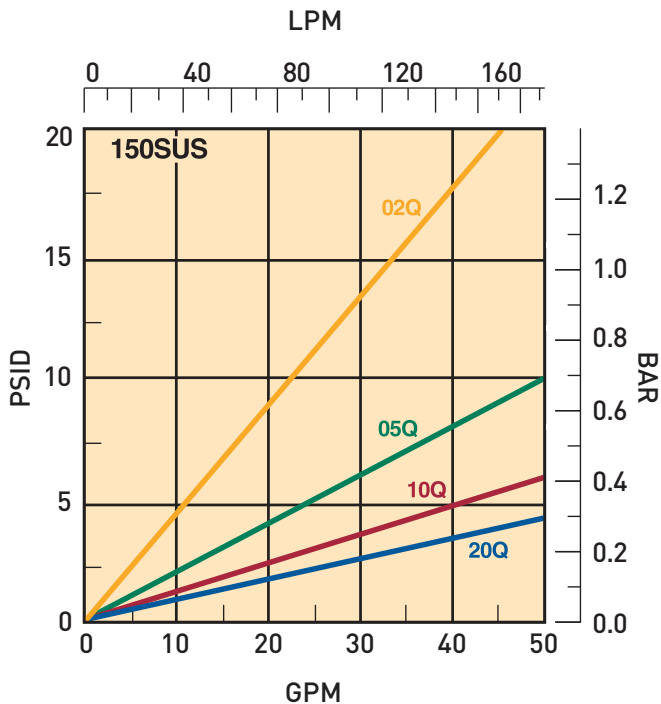
KLT-4 Element Performance



Multipass tests run @ 30 gpm to 25 psid terminal - 10 mg/L BUGL

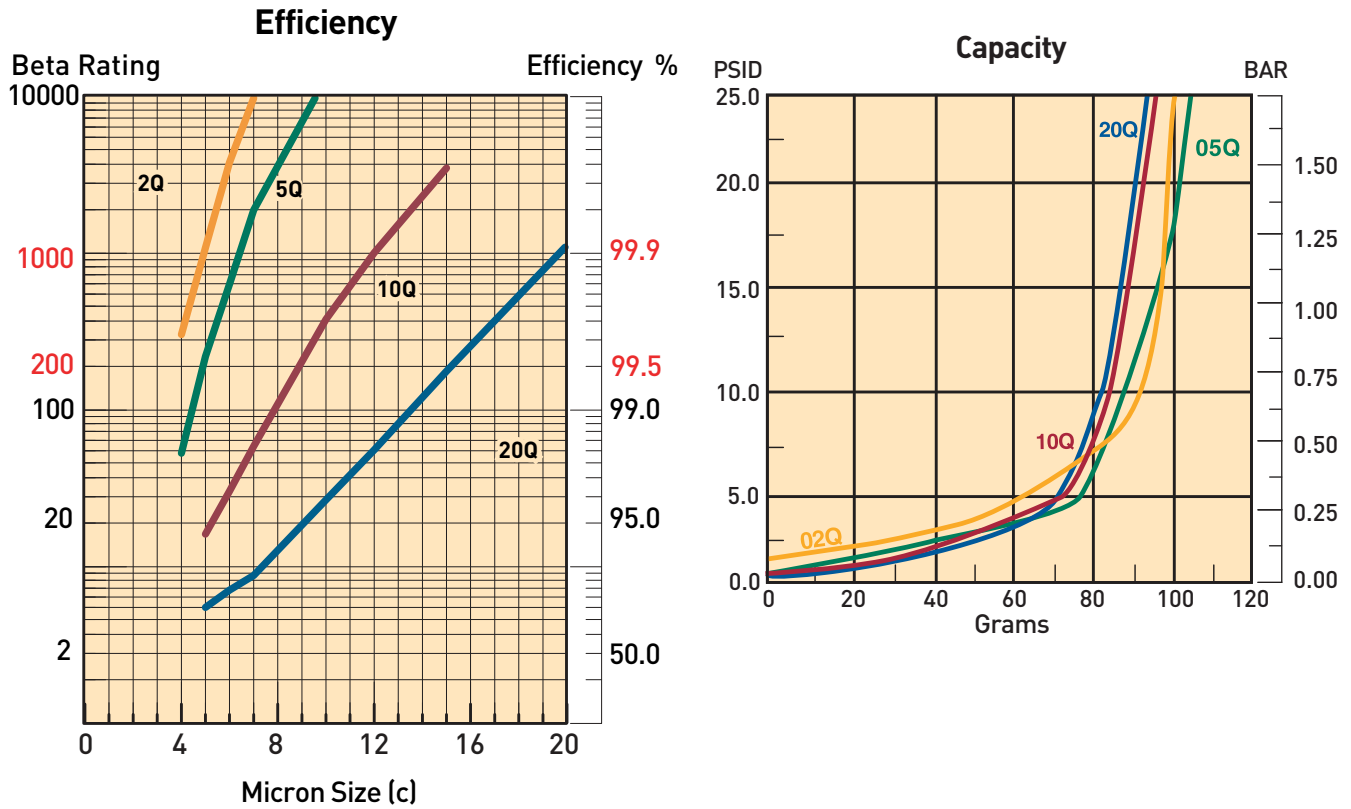


Flow vs. Pressure Loss



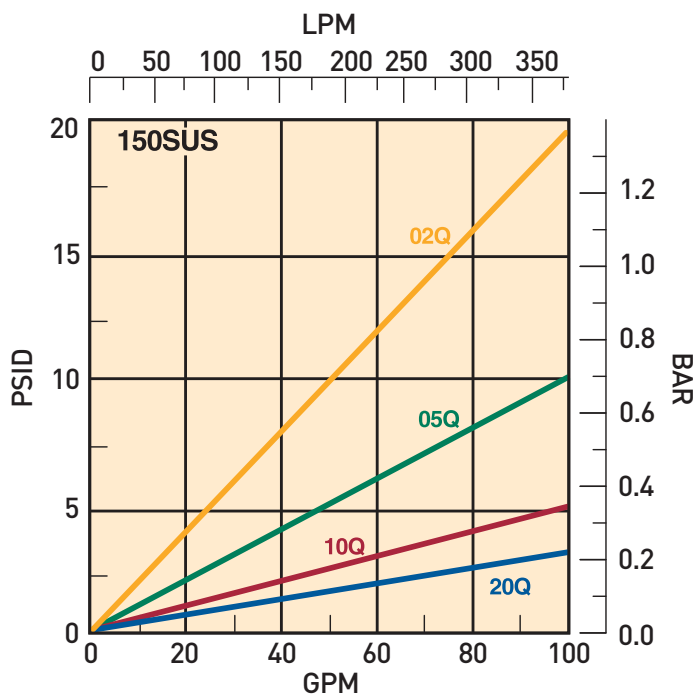
KLT/KLS Series

KLT/KLS-7 Element Performance



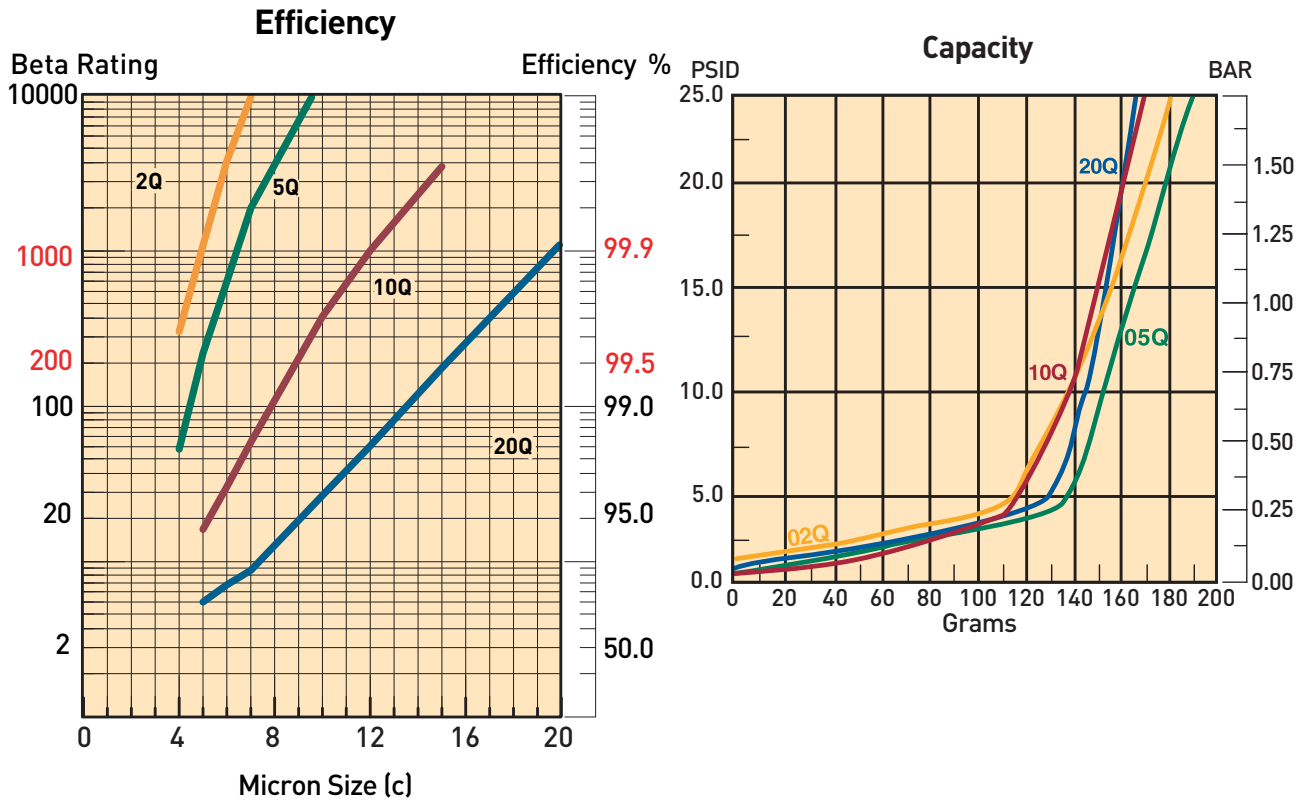
Multipass tests run @ 50 gpm to 25 psid terminal - 10 mg/L BUGL

Flow vs. Pressure Loss



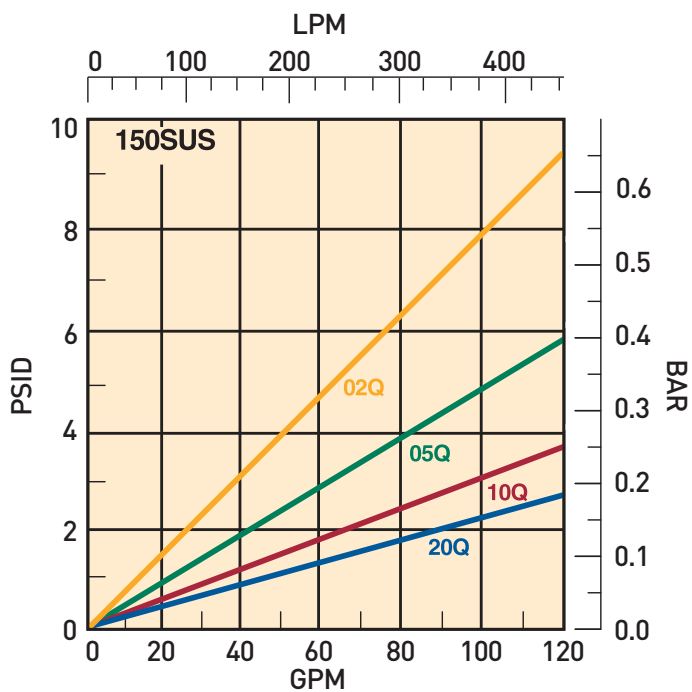
KLT/KLS Series

KLT/KLS-8 Element Performance



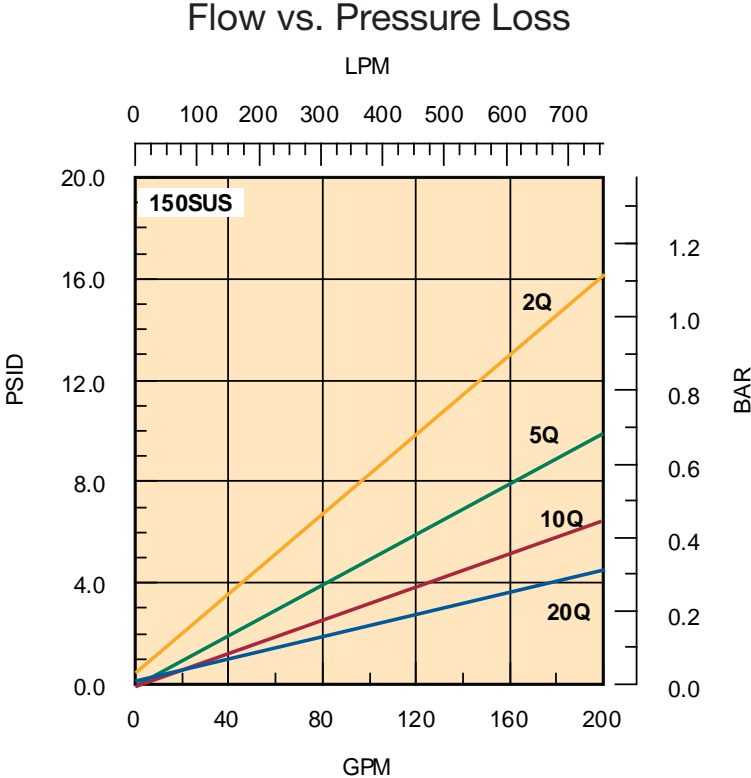
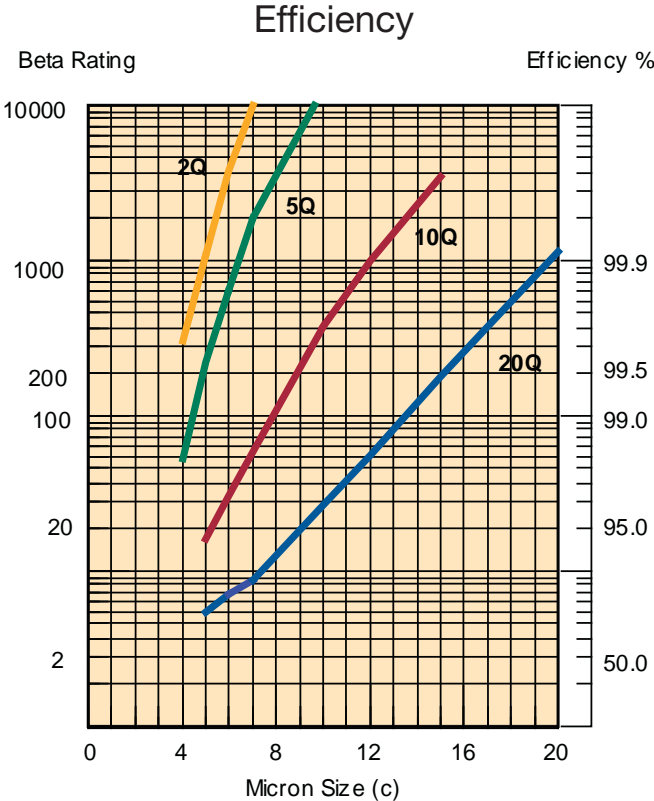
Multipass tests run @ 70 gpm to 25 psid terminal - 10 mg/L BUGL

Flow vs. Pressure Loss



KLT/KLS Series

KLT with 2" Port - Element Performance



KLT and KLS Series

Operating and Maintenance Instructions

A. Mounting

1. Standard mounting.
 - a. Cut proper size hole in the top of the reservoir.
 - b. Drill holes for studs within the proper bolt circle.
 - c. Set the filter into the cutout hole and secure with proper size bolts, nuts and lock washers.
 - d. Torque nuts in accordance with drawing.
2. Mounting procedure using weld plate.
 - a. Rough cut proper size hole in the top of reservoir.
 - b. Weld the weld plate concentric to the rough cut hole.
 - c. Mount the filter onto the studs and secure with nuts and lock washers.
 - d. Torque nuts in accordance with drawing.
3. Utilize proper fittings.

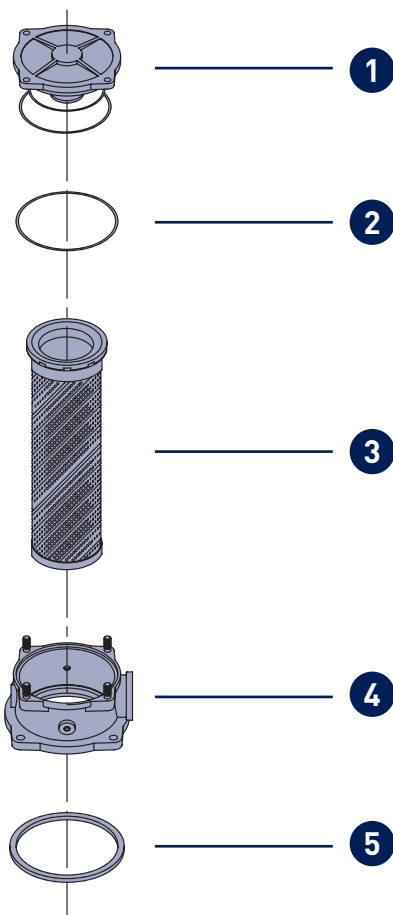
B. Start-Up

1. Check for and eliminate leaks upon system start-up.
2. Check differential pressure indicator, if installed, to monitor element condition.

C. Service

1. An element must be serviced when the indicator indicates service is required.

NOTE: If the filter is not equipped with an indicator, the element should be serviced according to machine manufacturer's instructions.



Parts List

| Index | Description | Part Number | Quantity |
|-----------|--|---------------|----------|
| 1 | Cover Assembly (Includes Cover o-ring) | | |
| | KLT2/KLT4 | 937049 | 1 |
| | KLT7/KLT8 | 937047 | 1 |
| | KLS7/KLS8 | 937048 | 1 |
| 2 | Cover o-ring | | |
| | KLT2/KLT4, Nitrile | N72239 | 1 |
| | KLT2/KLT4, FKM | V72239 | 1 |
| | KLT7/KLT8, Nitrile | N72251 | 1 |
| | KLT7/KLT8, FKM | V72251 | 1 |
| | KLS7/KLS8, Nitrile | N72251 | 1 |
| | KLS7/KLS8, FKM | V72251 | 1 |
| 3 | Element (see How to Order page) | | |
| 4 | Filter Head (Includes gauge plugs & studs) | | |
| | KLT2/KLT4 (S16) | 5841216 | 1 |
| | KLT7/KLT8 (S24) | 5841224 | 1 |
| | KLS7/KLS8 (S24) | 937318 | 1 |
| | KLS7/KLS8 (2" Flange) | 942157 | 1 |
| 5 | Tank Gasket | | |
| | KLT2/KLT4 | 108x98x5.5B | 1 |
| | KLT7/KLT8 | 152x136x6B | 1 |
| | KLS7/KLS8 (O-Ring) | N72355 (C.F.) | 1 |
| Not Shown | Weld Plate | | |
| | KLT2/KLT4 | 300041 | 1 |
| | KLT7/KLT8 | 300042 | 1 |
| Not Shown | Pressure Switch | NS-1C-19R/EL | 1 |
| Not Shown | Pressure Gauge | 936913 | 1 |

C.F. = Consult Factory

D. Servicing Dirty Element

1. Shut system down to assure that there is NO PRESSURE OR FLOW into the filter housing.
2. Remove the filter cover.
3. Remove and discard the contaminated element cartridge.

E. Before Installing a New Element Cartridge

1. Clean the magnetic core with a lint-free cloth.
2. Check all seals and replace if necessary.

F. To Install a New Element Cartridge

1. Lubricate all seals.
2. Mount new filter cartridge.
3. Re-install the cover.
4. Torque the cover nuts per drawing.

Perform procedures B1 and B2 to ensure no leaks are present.

KLT and KLS Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| KLT | 7 | 10Q | B | P | G | S24 | 1 |

| BOX 1: Filter Series | |
|----------------------|--|
| Symbol | Description |
| KLT | Single port return-line filter |
| KLS | Dual port return-line filter (-7 and -8 models only) |

| BOX 2: Filter Model | |
|---------------------|--------------------------------|
| Symbol | Description |
| 2 | 30 GPM (115 l/m nominal flow) |
| 4 | 50 GPM (190 l/m nominal flow) |
| 7 | 100 GPM (380 l/m nominal flow) |
| 8 | 120 GPM (455 l/m nominal flow) |

| BOX 3: Media Code | |
|-------------------|---------------------------|
| Symbol | Description |
| 02Q | Microglass III, 2 micron |
| 05Q | Microglass III, 5 micron |
| 10Q | Microglass III, 10 micron |
| 20Q | Microglass III, 20 micron |
| WR | Water Removal |

| BOX 4: Seals | |
|---|---------------|
| Symbol | Description |
| B | Nitrile (NBR) |
| V | Fluorocarbon |
| *NOTE: Nitrile tank gasket always supplied. | |

| BOX 5: Indicator | |
|------------------|--|
| Symbol | Description |
| P | No indicator; plugged pressure port(s) |
| G | Pressure gauge, 0-60 psig |
| S | Pressure switch |

| BOX 6: Bypass | |
|---------------|-------------------|
| Symbol | Pressure Setting |
| G | 25 psid (1.7 bar) |

| BOX 7: Ports | |
|--------------|------------------------|
| Symbol | Description |
| KLT-2/4 | |
| S16 | SAE-16 (1 5/16"-12) |
| KLT-7/8 | |
| S24 | SAE-24 (1 7/8"-12) |
| N24 | 1 1/2" NPT |
| Y32 | 2" Code 61 Flange Face |
| KLS-7/8 | |
| S24 | 2 x SAE-24 (1 7/8"-12) |
| N24 | 2 x 1 1/2-NPT |

| BOX 8: Options | |
|----------------|-----------------------|
| Symbol | Description |
| 1 | None |
| TP | Weld plate (KLT only) |

Replacement Elements

| Element Code | Nitrile | | | | Fluorocarbon | | | |
|--------------|---------|---------|---------|---------|--------------|---------|---------|---------|
| | 2 | 4 | 7 | 8 | 2 | 4 | 7 | 8 |
| 20Q | 936967Q | 936971Q | 936975Q | 936979Q | 937269Q | 937273Q | 937277Q | 937281Q |
| 10Q | 936966Q | 936970Q | 936974Q | 936978Q | 937268Q | 937272Q | 937276Q | 937280Q |
| 05Q | 936965Q | 936969Q | 936973Q | 936977Q | 937267Q | 937271Q | 937275Q | 937279Q |
| 02Q | 936964Q | 936968Q | 936972Q | 936976Q | 937266Q | 937270Q | 937274Q | 937278Q |
| WR | 937258 | 937259 | 937260 | 937261 | C.F. | C.F. | C.F. | C.F. |

C.F. = Consult Factory

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.





aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Moduflow™ *Plus* Series

Low Pressure Filters



ENGINEERING YOUR SUCCESS.

Moduflow™ Plus Series

Applications

- Power Unit Fabrication
- Off-line Filter Loops
- Mobile Equipment

The Moduflow filter is widely considered the most versatile filter available on the market.

The patented end cap minimizes turbulence and pressure loss through the filter, improving system performance.

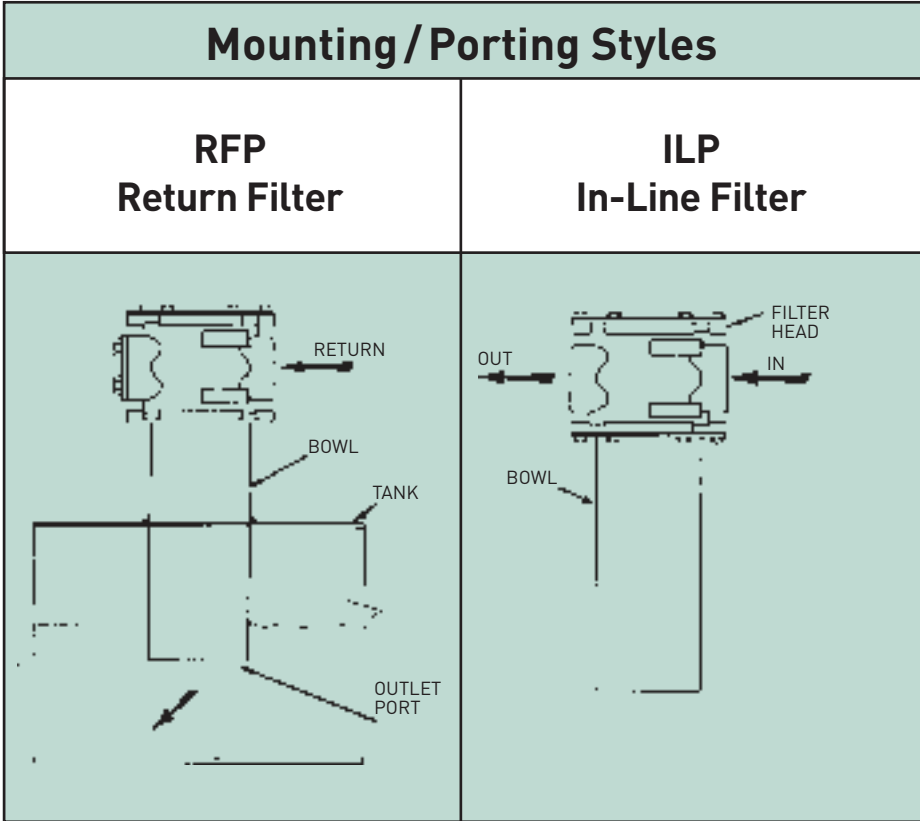
The newly designed closed bottom elements for the RFP and ILP models insures all contamination remains trapped within the element as the filter is serviced.

A wide variety of visual and electrical indicators allows you to know exactly when the element needs to be serviced. There is even a “no element” indicator that can sense when there is not an element installed in the filter.

From top to bottom, the Moduflow filter series provides the high level of filtration and long term dependability so vital to today’s hydraulic systems.



Parker’s new patented Moduflow element was designed with built-in diverter and bypass valve, to meet your application needs.



Moduflow™ Plus Series

Features

Flanges

- NPT or SAE 3/4" to 2"
- Lightweight aluminum

Cover

- Slotted for quick release
- Lightweight aluminum

Indicators

- Visual or electrical
- Mounted on either side
- Standard "no element" indication

Bowl

- Single or double length
- Durable steel construction

Bypass (not visible)

- Integral 35 psi bypass replaced with every element change

Element (not visible)

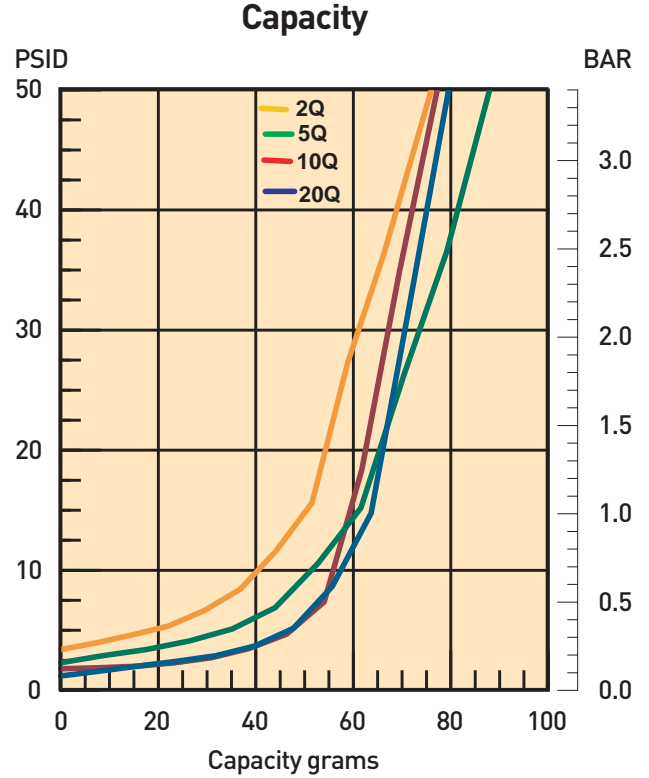
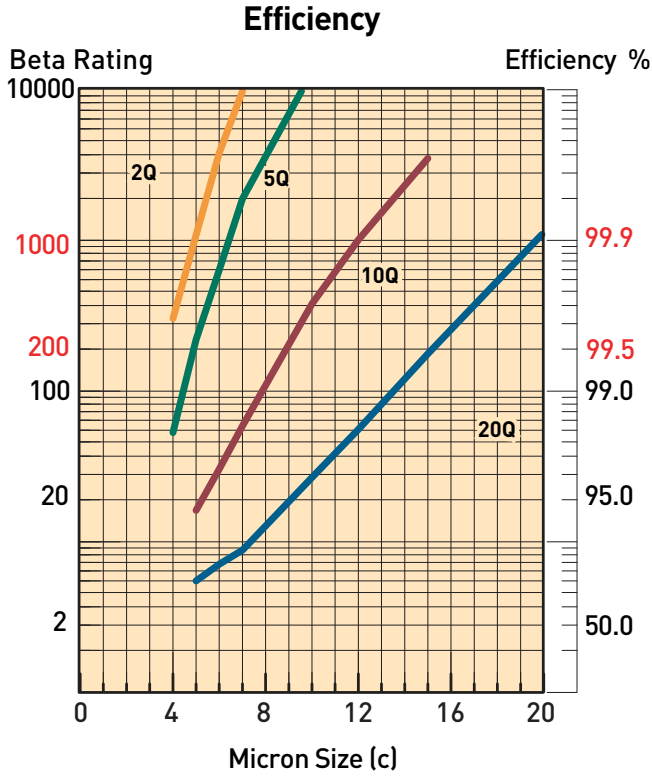
- Available in high performance Microglass III media
- Single or double length



| Feature | Advantage | Benefit |
|---|---|---|
| <ul style="list-style-type: none"> • Top access element service | <ul style="list-style-type: none"> • Oil remains in housing • Quicker elements change | <ul style="list-style-type: none"> • No Spills • Reduced maintenance costs |
| <ul style="list-style-type: none"> • Slotted cover | <ul style="list-style-type: none"> • Quick release cover • Cap screws remain in housing | <ul style="list-style-type: none"> • Reduced maintenance costs • No loose parts to lose |
| <ul style="list-style-type: none"> • Closed bottom elements | <ul style="list-style-type: none"> • Removes all contaminant during element service | <ul style="list-style-type: none"> • No downtime contamination from servicing |
| <ul style="list-style-type: none"> • Visual or electrical indicators | <ul style="list-style-type: none"> • Know exactly when to service elements | <ul style="list-style-type: none"> • Helps prevent bypass condition • No premature disposal |
| <ul style="list-style-type: none"> • Flange face ports | <ul style="list-style-type: none"> • Flexible mounting (3/4" to 2") | <ul style="list-style-type: none"> • Easy plumbing to your system |

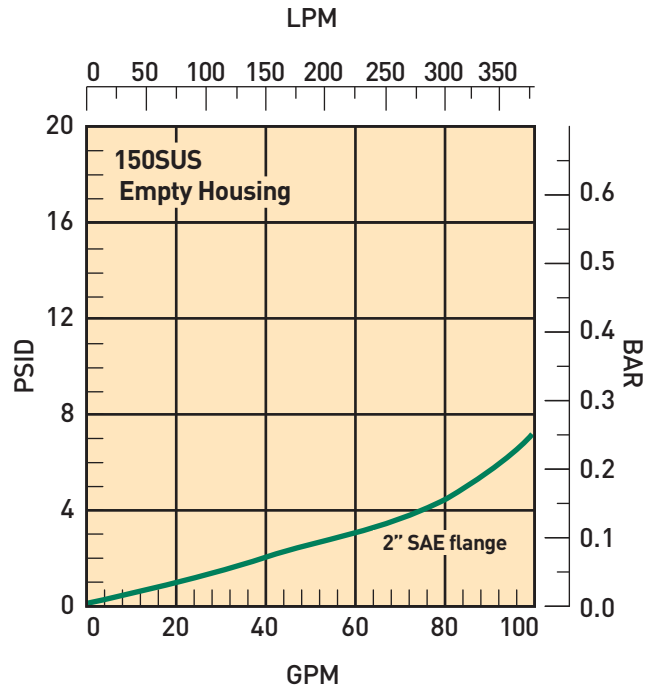
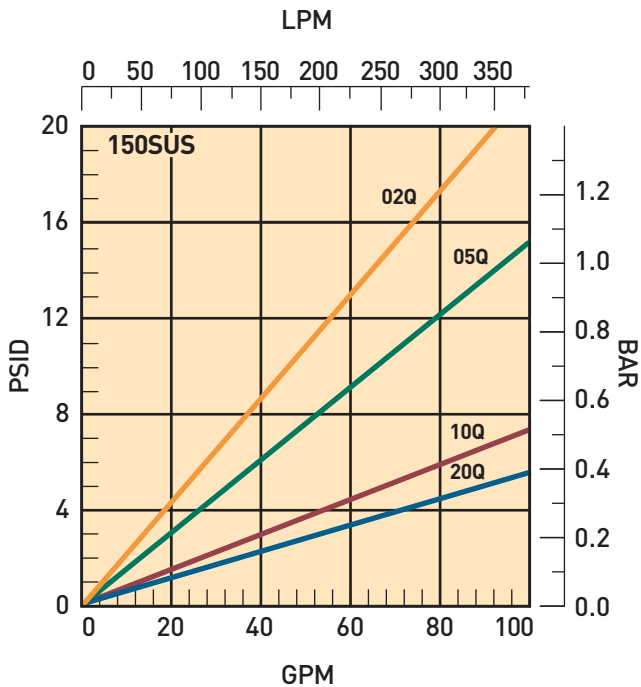
Moduflow™ Plus Series

RFP-1 and ILP-1 Element Performance



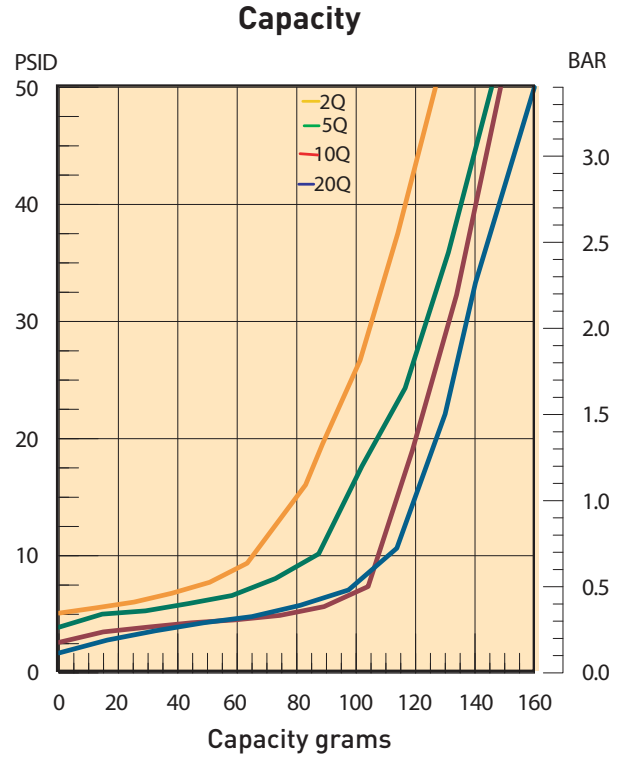
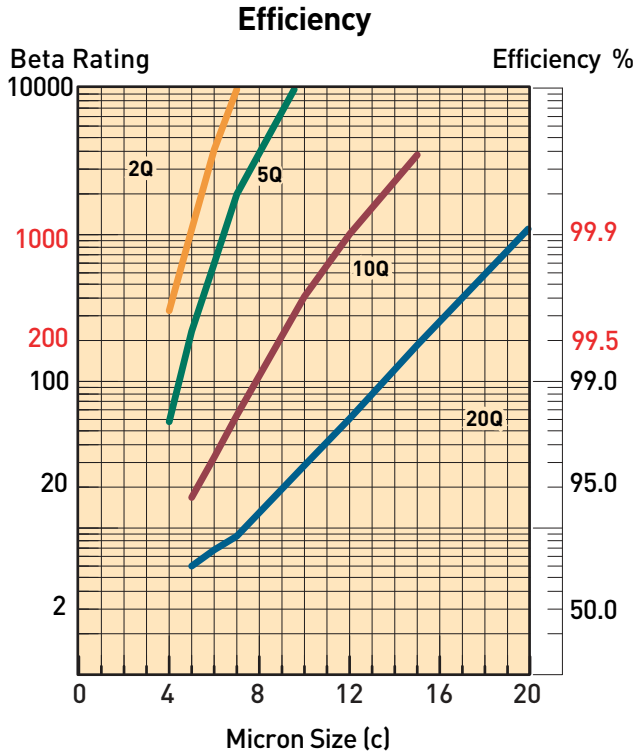
Multipass tests run @ 40 gpm to 50 psid terminal - 5mg/L BUGL

Flow vs. Pressure Loss



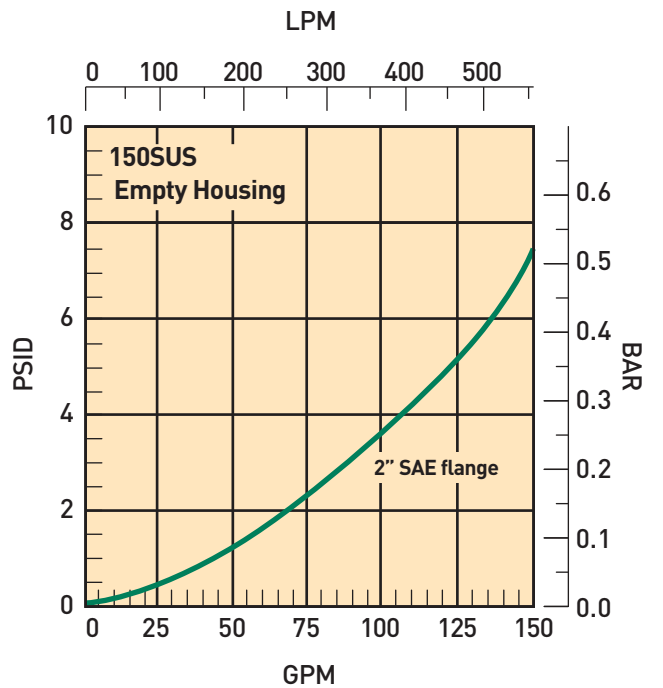
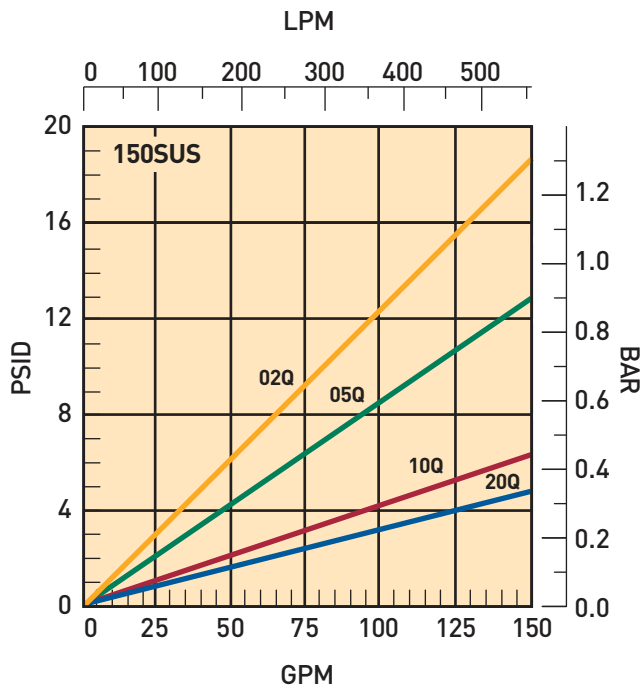
Moduflow™ Plus Series

RFP-2 and ILP-2 Element Performance



Multipass tests run @ 80 gpm to 50 psid terminal - 5mg/L BUGL

Flow vs. Pressure Loss



Moduflow™ Plus Series

Specifications: RFP, ILP

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 200 psi (13.8 bar)
 Design Safety Factor: 2:1
 Rated Fatigue Pressure: 150 psi (10.3 bar)

Element Burst Rating: 70 psid (4.8 bar)

Filter Materials:

Head, Cover, Flanges: die cast aluminum
 Bowl: steel

Operating Temperatures:

Nitrile: -40°F to 225°F (-40°C to 107°C)
 Fluorocarbon: -15°F to 275°F (-26°C to 135°C)

Weight (approximate):

Single: 20 lbs. (9.1 kg)
 Double: 25 lbs. (11.3 kg)

Indicators:

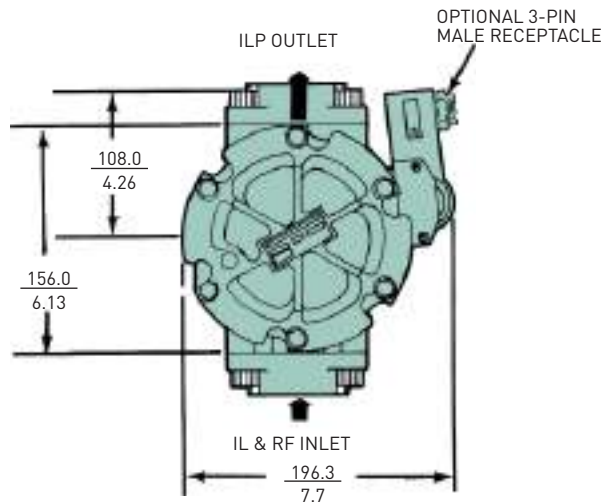
Visual (optional)
 Electrical (optional) 15A @ 250VAC / .5A @ 125 VDC
 Electrical ("D" option) 5A @ 250VAC / 3A @ 28 VDC

Color Coding:

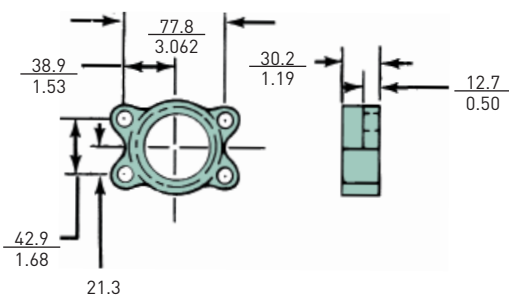
White (normally closed)
 Red (normally open)
 Black (common)

| Model | Dimensions: $\frac{\text{mm}}{\text{inch}}$ | | | |
|-----------------------------------|---|-----------------------|-----------------------|----------------------|
| | A | B | C | D |
| RFP-1 with optional 2" fitting | $\frac{68.3}{2.69}$ | — | $\frac{390.0}{15.37}$ | $\frac{117.1}{4.61}$ |
| RFP-1 without optional 2" fitting | $\frac{65.0}{2.56}$ | $\frac{378.0}{14.87}$ | — | $\frac{114.0}{4.50}$ |
| RFP-2 with optional 2" fitting | $\frac{68.3}{2.69}$ | — | $\frac{625.0}{24.61}$ | $\frac{117.1}{4.61}$ |
| RFP-2 without optional 2" fitting | $\frac{68.3}{2.69}$ | $\frac{612.0}{24.11}$ | — | $\frac{114.0}{4.50}$ |
| ILP-1 | $\frac{65.0}{2.56}$ | $\frac{336.0}{13.24}$ | N/A | $\frac{117.1}{4.61}$ |
| ILP-2 | $\frac{68.3}{2.69}$ | $\frac{618.0}{24.32}$ | N/A | $\frac{117.1}{4.61}$ |

Drawings are for reference only.
 Contact factory for current version.



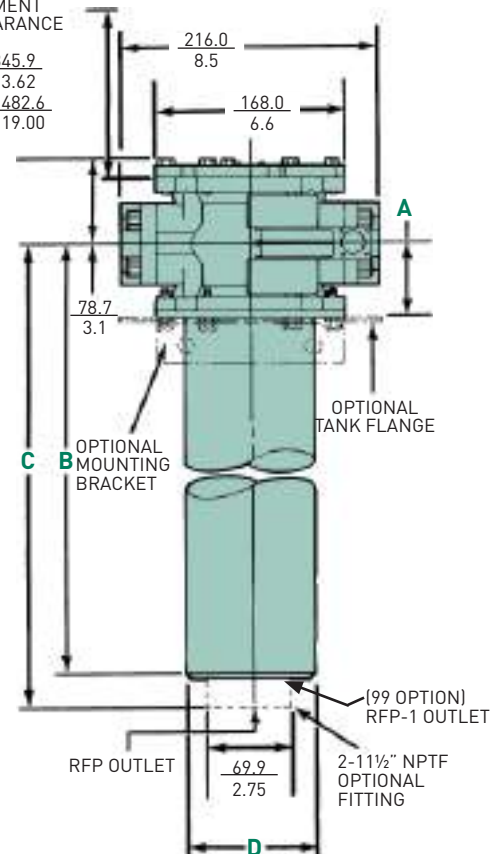
OPTIONAL PORT FLANGE



Linear Measure: $\frac{\text{millimeter}}{\text{inch}}$

MINIMUM ELEMENT REMOVAL CLEARANCE

Single: $\frac{345.9}{13.62}$
 Double: $\frac{482.6}{19.00}$



Moduflow™ Plus Series

Drawings are for reference only.
Contact factory for current version.

Specifications: DILP

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 200 psi (13.8 bar)
Design Safety Factor: 2:1
Rated Fatigue Pressure: 150 psi (10.3 bar)

Element Burst Rating: 70 psid (4.8 bar)

Filter Materials:

Divter Valve Assembly: die cast aluminum
Check Valve Assembly: die cast aluminum
Filter Assembly: see IL2 specifications

Operating Temperatures:

Nitrile: -40°F to 225°F (-40°C to 107°C)
Fluorocarbon: -15°F to 275°F (-26°C to 135°C)

Weight (approximate):

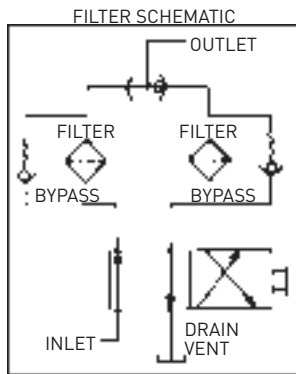
Single: 55 lbs. (24.9 kg) / Double: 65 lbs. (29.5 kg)

Indicators:

Visual (optional)
Electrical (optional) 15A @ 250VAC / .5A @ 125 VDC
Electrical ("D" option) 5A @ 250VAC / 3A @ 28 VDC

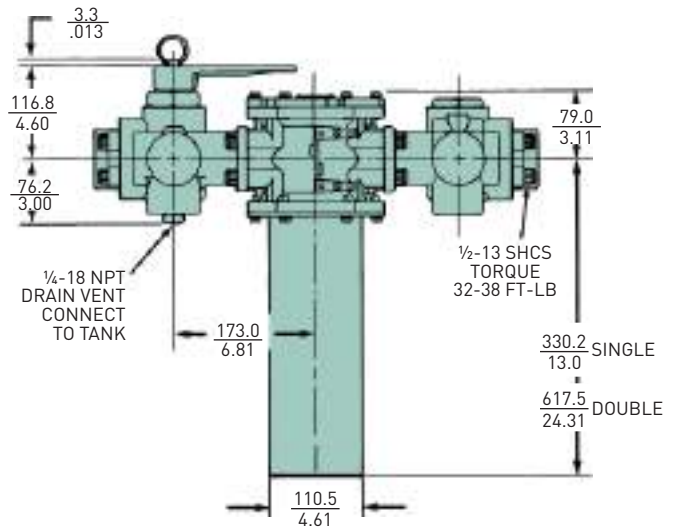
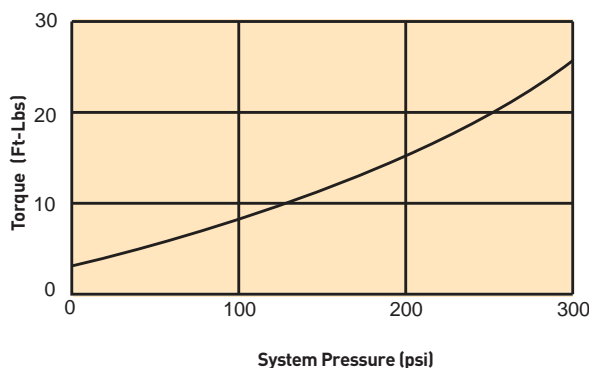
Color Coding:

White (normally closed)
Red (normally open)
Black (common)

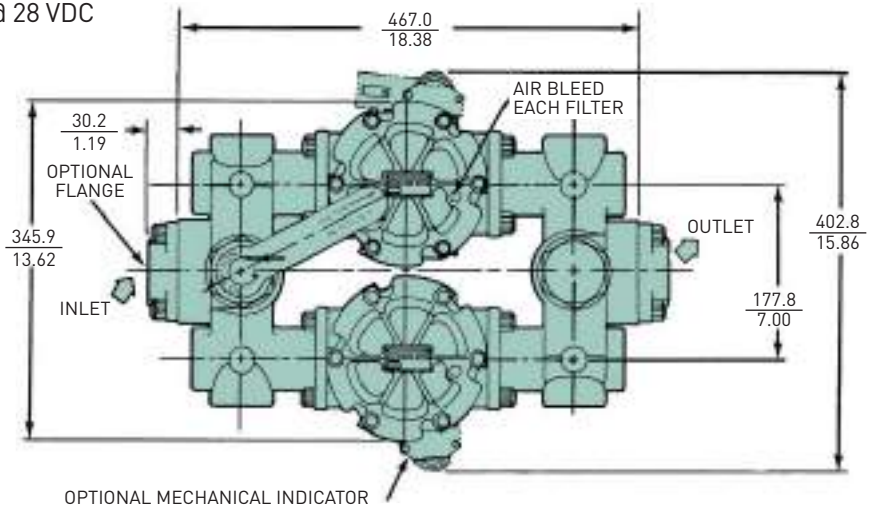


BOTH CHECK VALVES
MOVE SAME DIRECTION

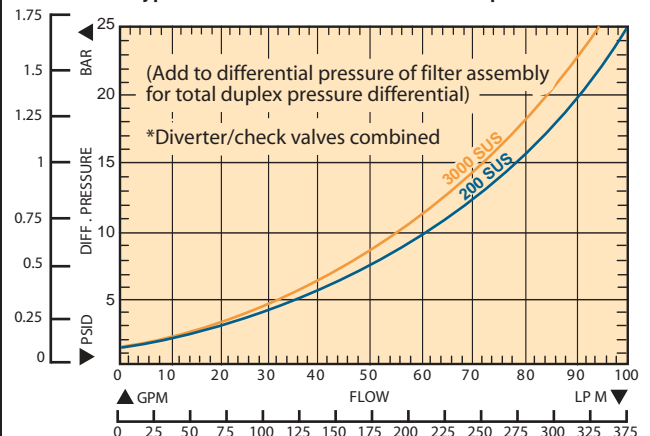
Approximate handle torque required for changeover.



Linear Measure: millimeter
inch



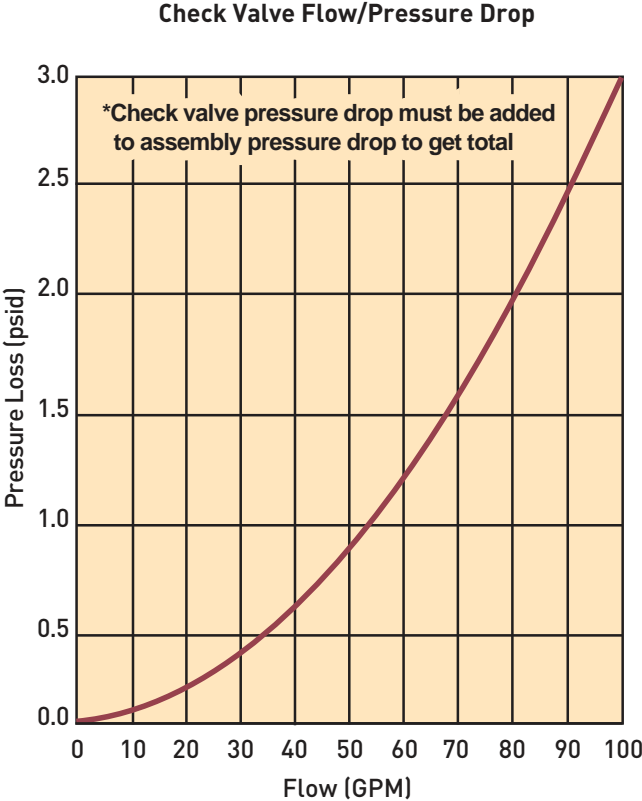
Typical Flow/Pressure Curves For Duplex Valves



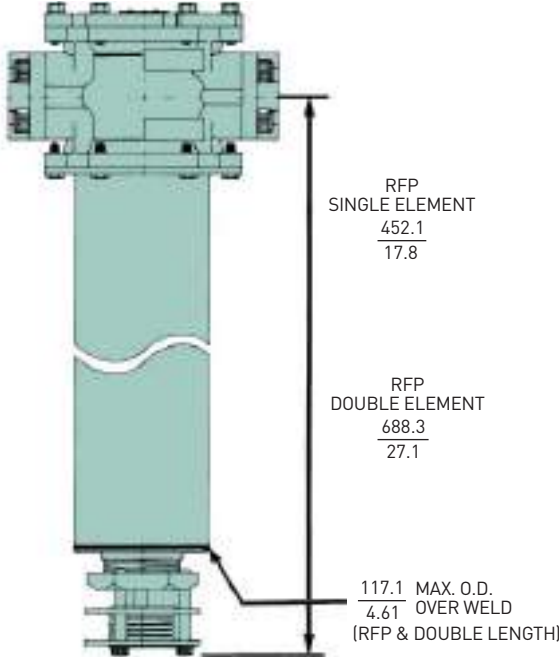
Moduflow™ Plus Series

Specifications

For return line applications (RFP), the fluid returning to the reservoir holds the check valve open. When the system is shut down, the check valve closes automatically.



Linear Measure: millimeter
inch



Drawings are for reference only.
Contact factory for current version.

Moduflow™ Plus Series

Specifications

Lower Cost than many single unit filters.

Moduflow™ Manifold Extended Filter Range

Use Model MM Manifold to handle return line flows up to 130 gpm.

- Rated static pressure: 300 psi
- Typical burst pressure: 900 psi
- Easily mounted on ModuFlow™

High Flows At Low Cost

The model MM manifold is designed to extend the flow range of ModuFlow™ Filters when operating with 10 Micron and finer filter media. When mounted to a pair of RFP-2 or ILP-2 filters, this manifold will allow flows up to 130 gpm in return lines (15 fps velocity).

Note: The Model MM manifold is not applicable to suction lines due to its pressure drop characteristics.

When used with two ModuFlow™ filters, the total cost is often less than a single unit filter rated for 130 gpm flow. Tank-top mounted (Model RFP) filters will require only one manifold on the filter inlet ports. In-line mounted (Model ILPav) filters will require two manifolds, one on the inlet and one on the outlet ports.

Multiple Uses

Although designed for manifold ModuFlow™ filters, the Model MM can be used in a variety of applications which require:

- Splitting flow between components

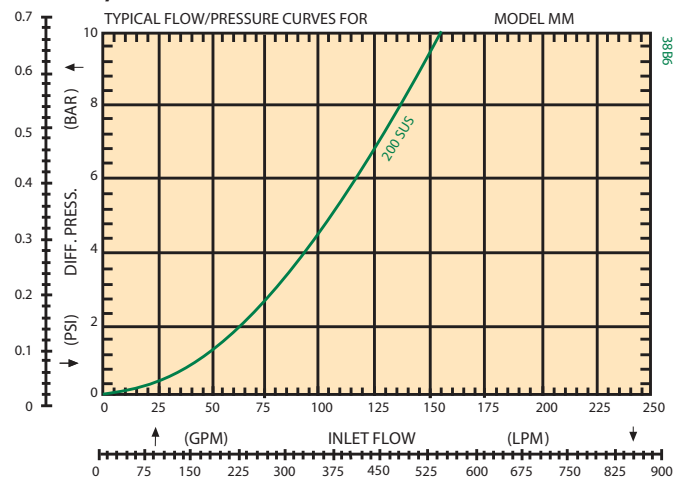
Such applications are frequently encountered on mobile equipment, machine tools, and large lubricating systems. In such applications, use of a manifold can often reduce total piping and installation costs.

Proven Reliability

The rugged design of the Model MM manifold has been proven in demanding mobil equipment applications. At the factory, we have cycle tested the Model MM through the full range of rated flow and pressure to insure reliable service.

Parker Filter Division maintains the same high standards in delivery, quality, and service. Considering this, plus features, flexibility, price, and performance, the Model MM manifold is a valuable addition to your fluid power component list.

FLOW/PRESSURE CURVE



Moduflow™ Plus Series

Specifications

MANIFOLD SPECIFICATIONS

Rated Static Pressure, maximum:
20.7 bar (300 psi)

Typical Burst Pressure:
62.1 bar (900 psi)

Operating Temperature (Buna seals):
+121°C to -40°C (+250°F to 40°F)

Housing Material:
ANSI 356-T6 cast aluminum

Approximate Shipping Weight:
3.6 kg (8 lbs)

Porting: See Options Below

Order Screws and O-Rings Separately:

Inlet & outlet screws (12 required):

Order P/N 900228

Outlet port o-rings (2 required):

Nitrite: Order P/N N72228

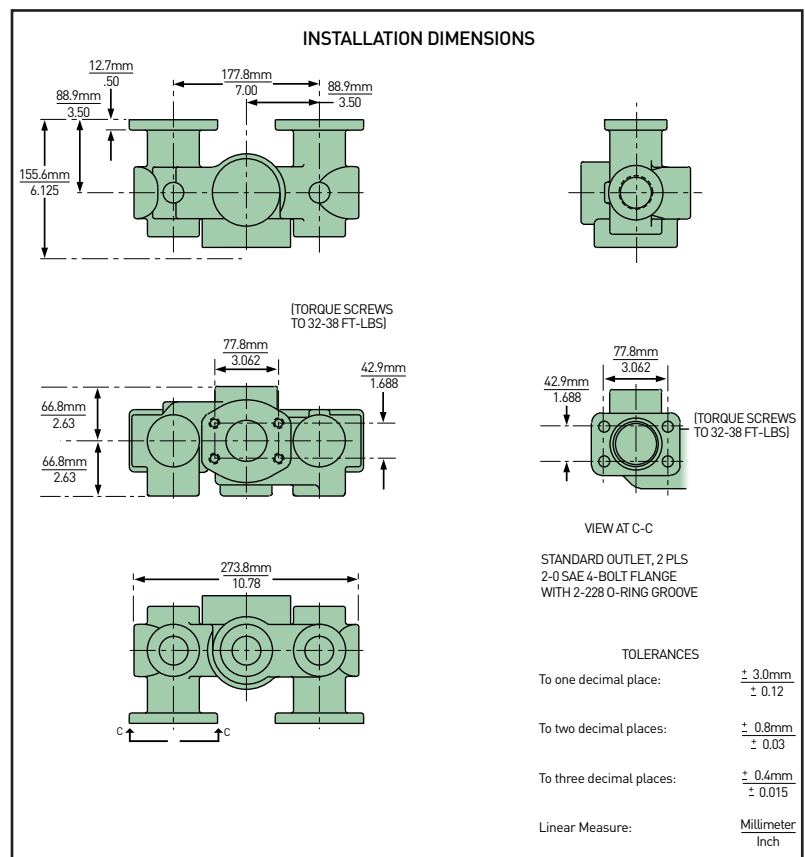
Fluorocarbon: Order P/N V92228

HOW TO ORDER MANIFOLDS:

| Part Number | Description |
|-------------|-------------------|
| 926466 | Moduflow Manifold |

- * Tank-top mounted RFP filters will require one manifold on filter inlets: in-line mounted ILP filters will require two manifolds on both inlets and outlets.

Drawings are for reference only.
Contact factory for current version.

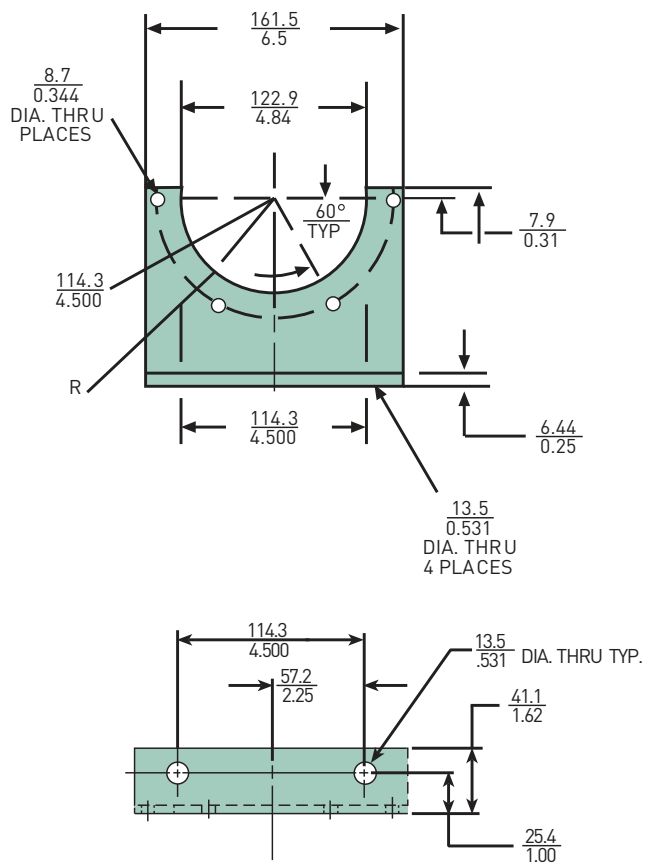


Moduflow™ Plus Series

Accessories

Linear Measure: millimeter
inch

OPTIONAL MOUNTING BRACKET (924904)



"M" OPTION-VISUAL INDICATOR,
NO ELEMENT WARNING



Drawings are for reference only.
Contact factory for current version.

"E" OPTION-ELECTRICAL INDICATOR



Moduflow™ Plus Series

Parts List

Flange Kits (flange, 4 bolts, o-ring)

| Size | Code | Part Number | |
|--------------|------|-------------|--------------|
| | | Buna | Fluorocarbon |
| ¾ inch NPTF | YB | 924788 | 926013 |
| 1 inch NPTF | YC | 924787 | 926012 |
| 1¼ inch NPTF | YD | 924912 | 926004 |
| 1½ inch NPTF | YE | 924786 | 926011 |
| 2 inch NPTF | YF | 924785 | 926010 |
| SAE - 12 | YM | 924784 | 926009 |
| SAE - 16 | YN | 924783 | 926008 |
| SAE - 20 | YO | 924913 | 926005 |
| SAE - 24 | YP | 924782 | 926007 |
| BLANK FLANGE | — | 924781 | 926006 |

RFP/ILP/ DILP Replacement Elements

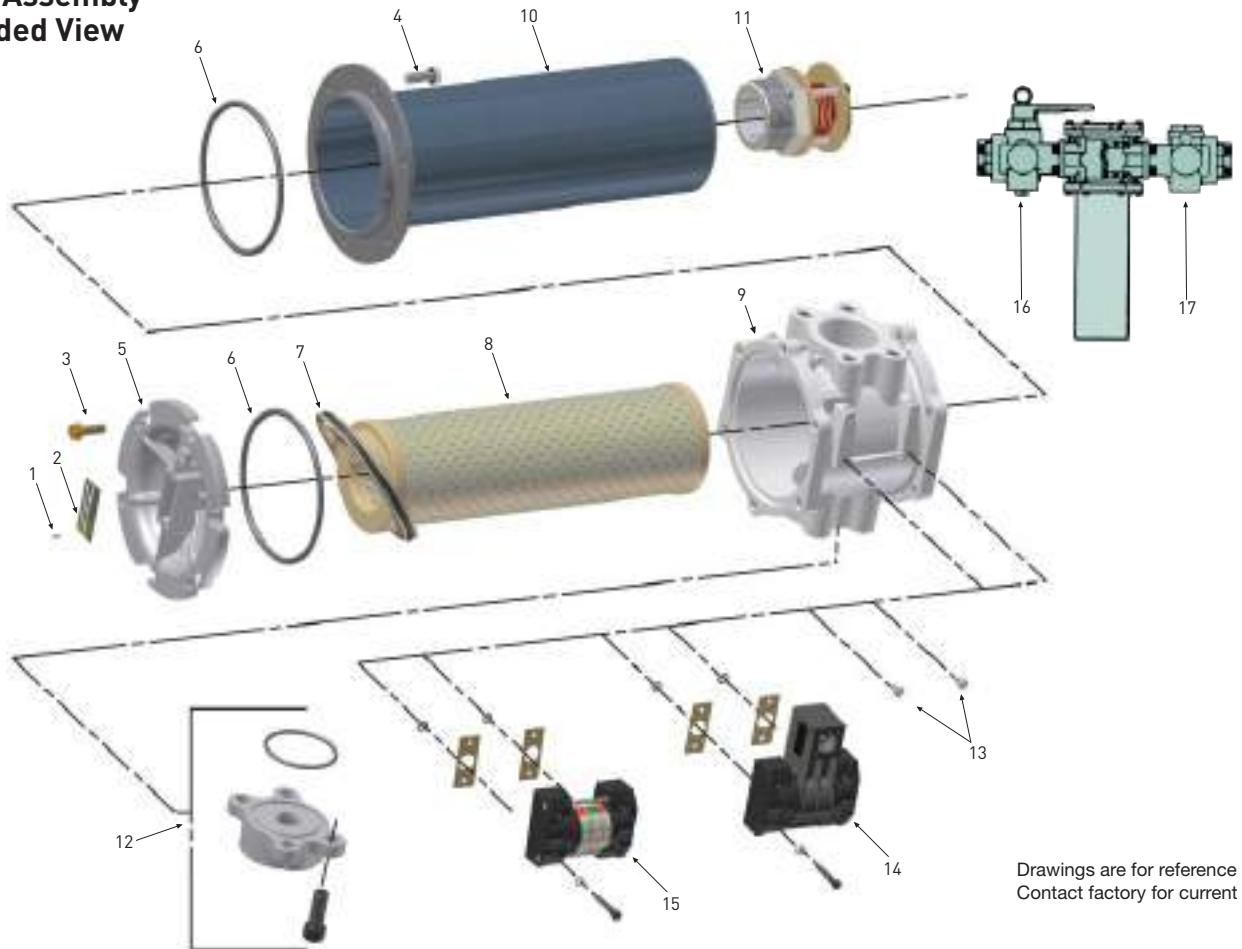
| Media | Nitrile Seals | | | | Fluorocarbon Seals | | | |
|-------|---------------|---------------------|------------|---------------------|--------------------|---------------------|------------|---------------------|
| | New Single | Replaces Old Single | New Double | Replaces Old Double | New Single | Replaces Old Single | New Double | Replaces Old Double |
| 02Q | 937393Q | 932686Q | 937397Q | 932692Q | 937401Q | 932689Q | 937405Q | 932695Q |
| 05Q | 937394Q | 932687Q | 937398Q | 932693Q | 937402Q | 932690Q | 937406Q | 932696Q |
| 10Q | 937395Q | 932688Q | 937399Q | 932694Q | 937403Q | 932691Q | 937407Q | 932697Q |
| 20Q | 937396Q | 933116Q | 937400Q | 933117Q | 937404Q | 933118Q | 937408Q | 933119Q |
| WR | 940733 | | 940734 | | 940735 | | 940736 | |

Moduflow™ Plus Series

Parts List

| Index | Description | Part No. | Quantity | Index | Description | Part No. | Quantity |
|-------|-------------------------------------|----------------|----------|-----------|---|----------------|----------|
| 1 | Screws, Nameplate..... | 900028 | 2 | 11 | Check Valve Assy. | 925120 | 1 |
| 2 | Name Plate, Unstamped..... | 920928 | 1 | 12 | Flange Kits..... | Refer to Table | 1 |
| 3 | Cover Screws, 5/16-18 UNC x 1"..... | 926633 | 6 | | O-Ring | V72228 | 1 |
| 4 | Bowl Screws, 5/16-18 UNC x 1"..... | 926633 | 6 | 13 | Plug Kit, Fastener, self-sealing, o-ring seal included with fastener | 925974 | 2 |
| 5 | Cover, Without nameplate..... | 924634 | 1 | 14 | Indicator Electrical | | Optional |
| 6 | O-Ring, cover | | | | 35 psid..... | 926643 | |
| | Nitrile..... | N72350 | 2 | | 35 psid, 3-pin male receptacle | 926753 | |
| | Fluorocarbon..... | V72350 | 2 | | Gasket | 926126 | 2 |
| | | | | | O-Ring | V72010 | 2 |
| 7 | Element Seal | | | 15 | Indicator Visual | | Optional |
| | Nitrile..... | 937410 | 1 | | 35 psid 4-band..... | 926748 | |
| | Fluorocarbon..... | 937411 | 1 | | Bracket, Inline mounting..... | 924904 | Optional |
| 8 | Element..... | Refer to Table | 1 | | Indicator Kit, Remote mount.... | 924894 | Optional |
| 9 | Head, Machined only..... | | 1 | 16 | Changeover Valve Assy., Duplex | 926758 | Optional |
| | 2" SAE Flange | 925972 | 1 | 17 | Check Valve Assy., Duplex..... | 926757 | Optional |
| | 1½" SAE Flange | 926146 | 1 | | Drain Plug, SAE-24 for RFP model | | |
| | 1½" NPTF | 925949 | 1 | | Nitrile..... | 909992 | 1 |
| 10 | Bowl, Select desired model | | 1 | | Fluorocarbon..... | 928363 | 1 |
| | ILP-1..... | 925916 | | Not Shown | O-Ring between tank and bowl | N72265 | 1 |
| | ILP-2..... | 924816 | | | | | |
| | RFP-1..... | 937626 | | | | | |
| | RFP-1 with 2 inch NPTF fitting... | 924676 | | | | | |
| | RFP-2..... | 937627 | | | | | |
| | RFP-2 with 2 inch NPTF fitting... | 924818 | | | | | |

Filter Assembly Exploded View



Drawings are for reference only.
Contact factory for current version.

Moduflow™ Plus Series

How to Order

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| ILP | 1 | 10Q | B | MP | 35 | Y9Y9 | 1 |

| BOX 1: Filter Series Symbol | | Description |
|-----------------------------|--|--|
| RFP | | Return-line filter, inlet on side outlet on bottom |
| ILP | | In-line filter |
| DILP | | In-line duplex |

| BOX 2: Element Length Symbol | | Description |
|------------------------------|--|-------------|
| 1 | | Single |
| 2 | | Double |

| BOX 3: Media Code Symbol | | Description |
|--------------------------|--|---------------------------|
| 02Q | | Microglass III, 2 micron |
| 05Q | | Microglass III, 5 micron |
| 10Q | | Microglass III, 10 micron |
| 20Q | | Microglass III, 20 micron |
| WR | | Water Removal |

| BOX 4: Seals Symbol | | Description |
|---------------------|--|--------------|
| B | | Nitrile |
| E | | EPR |
| V | | Fluorocarbon |

| BOX 5: Indicator Symbol | | Description |
|-------------------------|--|---|
| P | | Pressure ports drilled & plugged only; no indicator |
| M | | Visual indicator w/"no element" warning |
| E | | Electrical indicator only |
| D | | Electrical indicator only, 3-pin male receptacle |

Note: First letter of indicator code = left side of filter head when looking into inlet with bowl down; second letter = right side of filter head when looking into inlet with bowl down.

| BOX 6: Bypass Setting Symbol | | Description |
|------------------------------|--|-------------|
| 35 | | 35 psid |

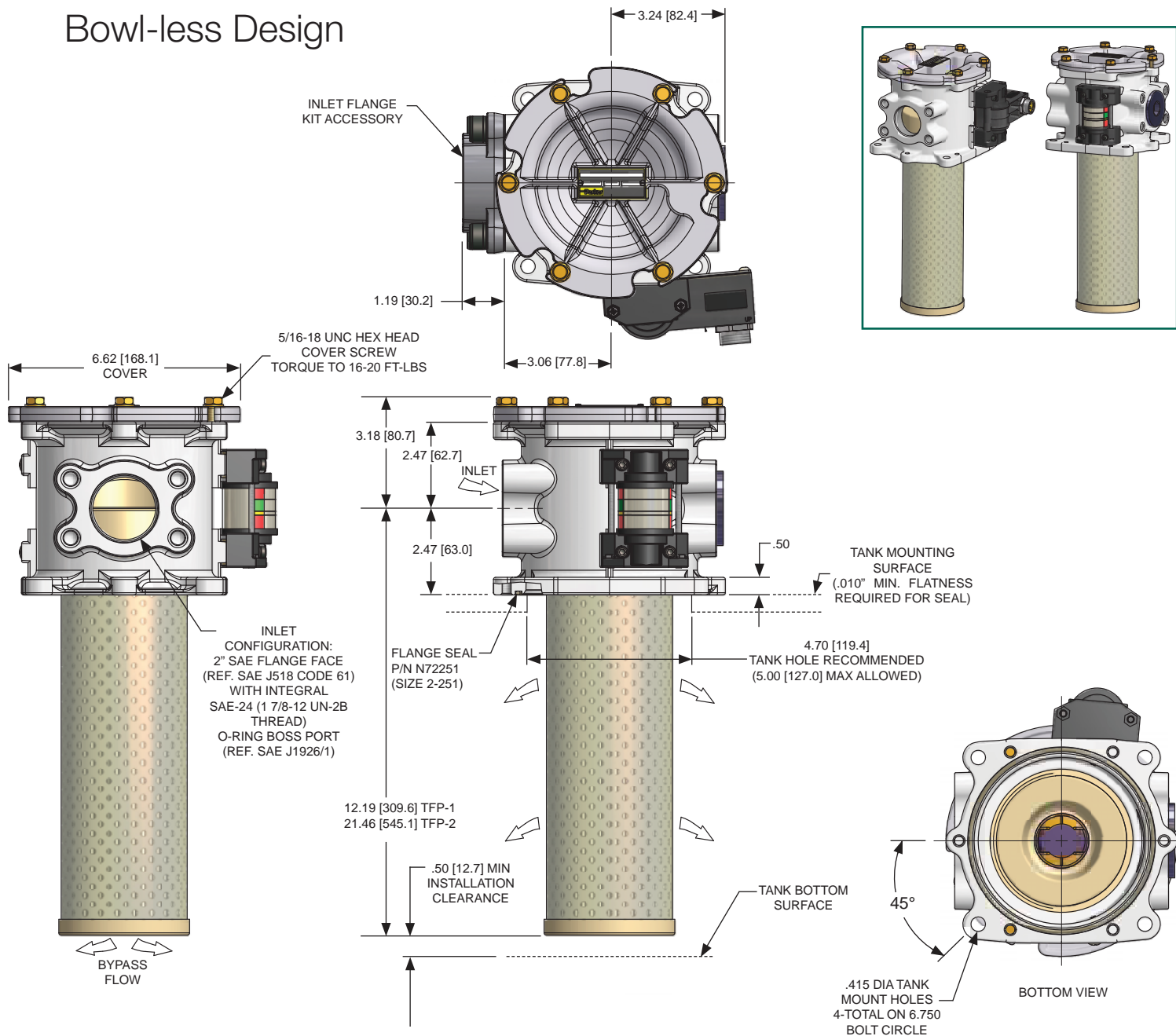
| BOX 7: Port Options | | | | |
|---------------------|--------------------------|-------------------------|---------------------------|--------------------------|
| Filter Model | Inlet Symbol/Description | | Outlet Symbol/Description | |
| RFP | Y9 | 2" flange face | 99 | No fitting |
| | P9 | SAE-24 integral threads | F9 | 2" NPTF |
| | | | F8 | External check valve |
| ILP | Y9 | 2" flange face | Y9 | 2" flange face |
| | P9 | SAE-24 integral threads | P9 | SAE-24 integral threads |
| | | | E9 | 1½ NPTF integral threads |
| DILP | Y9 | 2" flange face | Y9 | 2" flange face |

1) First pair of symbols denotes inlet for all filter styles; second pair of symbols denotes outlet.
 2) Four symbols required: two for inlet, two for outlet.
 3) Unused ports in filters come plugged with a blank flange.
 4) See Flange Kits table for port flange options. Flange Kits are ordered separately.

| BOX 8: Options Symbol | | Description |
|-----------------------|--|-------------|
| 1 | | None |

Moduflow™ Plus TFP Series

Bowl-less Design



Features

- Shorter port-to-port distance.
- Direct tank mount capability eliminates need for adaptor flanges and bowl.
- Standard head incorporates 2" SAE flange face with integral SAE-24 port configuration.
- Filter head and element 2-piece construction requires no filter bowl.
- Patented element design with integral bypass valve and inside to out flow path.

Advantages

- Provides a smaller footprint and reduced weight.
- Aluminum die cast head reduces weight and direct tank mount flange reduces installation time and cost.
- Enables one common head to be used.
- Simplifies ordering model code.
- Reduces assembly cost by 25%.
- Ensures all contaminants remain captured during service.
- New bypass valve with each element ensures operation reliability.

Moduflow™ Plus TFP Series

How to Order

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| TFP | 1 | 10Q | B | MP | 35 | C32 | 1 |

| BOX 1: Series | |
|---------------|--|
| Symbol | Description |
| TFP | Return-line filter |
| TFPW | Return-line filter anodized for HWHC fluid |

| Box 2: Element Length | |
|-----------------------|-------------|
| Symbol | Description |
| 1 | Single |
| 2 | Double |

| Box 3: Media Code | |
|-------------------|---------------------------|
| Symbol | Description |
| 02Q | Microglass III, 2 micron |
| 05Q | Microglass III, 5 micron |
| 10Q | Microglass III, 10 micron |
| 20Q | Microglass III, 20 micron |
| WR | Water Removal |

| BOX 4: Seals | |
|--------------|--------------|
| Symbol | Description |
| B | Nitrile |
| E | EPR |
| V | Fluorocarbon |

| BOX 5: Indicator | |
|------------------|---|
| Symbol | Description |
| P | Pressure ports drilled & plugged only; no indicator |
| M | Visual indicator w/"no element" warning |
| E | Electrical indicator only |
| D | Electrical indicator only, 3-pin male receptacle |

Note: Two letters are required for the indicator code (e.g. "MP")

| BOX 6: Bypass | |
|---------------|-------------------|
| Symbol | Description |
| 35 | 35 (2.4 bar) psid |

| BOX 8: Ports | |
|--------------|--|
| Symbol | Description |
| C32 | 2" SAE flange face/SAE-24 combination inlet port |

| BOX 8: Options | |
|----------------|-------------|
| Symbol | Description |
| 1 | None |

Replacement Elements

| Media | TFP-1 | | | Media | TFP-2 | | |
|-------|---------|--------------|--------------------|-------|---------|--------------|--------------------|
| | Nitrile | Fluorocarbon | Ethylene Propylene | | Nitrile | Fluorocarbon | Ethylene Propylene |
| 02Q | 937393Q | 937401Q | 937671Q | 02Q | 937397Q | 937405Q | 937675Q |
| 05Q | 937394Q | 937402Q | 937672Q | 05Q | 937398Q | 937406Q | 937676Q |
| 10Q | 937395Q | 937403Q | 937673Q | 10Q | 937399Q | 937407Q | 937677Q |
| 20Q | 937396Q | 937404Q | 937674Q | 20Q | 937400Q | 937408Q | 937678Q |
| WR | 940733 | 940735 | N/A | WR | 940734 | 940736 | N/A |



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



RF7 Series

Low Pressure Filters



ENGINEERING YOUR SUCCESS.

RF7 Series

Applications

- Mobile equipment
- Power unit fabricators
- Off-line filter loops

The Parker RF7 filter is designed for those applications where dependable, yet economical, return line system protection is required. The in-tank mounting design makes the RF7 ideally suited for use by power unit fabricators and mobile equipment manufacturers...or anyone who views equipment space at a premium, but not at the expense of performance.



Element Condition Indicator

- True pressure differential
- Know, at a glance, when to change the filter element
- Gauge also available

Two-Piece Construction (Head/Tube)

- Easy in-tank mounting

Diffuser Tube

- Disperses return flow below reservoir fluid level
- Prevents fluid aeration
- Closed bottom provides for even fluid dispersal
- Prevents objects from falling into the reservoir during element servicing

Vent

- For variable displacement pump applications

Bypass Valves

- Virtually zero leakage
- Multiple valves for high flow



Cartridge/Element Handle

- Easy to remove entire assembly for servicing

Bypass Filter Screen

- Prevents gross contamination from passing through the filter — even during bypass



Cover Lock-Band with "T" Handle

- Easy access for servicing
- No loose parts to remove and handle
- No special tools required for removal

RF7 Series

Element Features

Inside each Parker Filter... a quality Parker Element

The important item in a filter assembly is the element. It has to capture and hold contaminants that can damage or stop a machine...while at the same time allowing the required flow of clean fluid so the machine can function properly.

There are many ways to design and build an element, and it's easy to produce a low cost element. However, cost is not a good selection criteria... especially when the risk is loss of critical performance.

For instance, consider wire mesh reinforcement. Not all filter elements have it. It's used in Parker elements to keep the pleats from collapsing or bunching.

If pleats bunch, the effective surface area of the element is reduced, excessive pressure drop develops, and the filter assembly may go into the bypass mode. This condition wastes energy and allows unfiltered fluid flow back into the system, effectively shortening filter life.

Gasket Ring Seal

- Positive sealing for optimum element efficiency

Protective Perforated Cylinder

- Necessary for inside-to-outside flow
- Prevents media "blow out"

Wire Reinforced Media (Not Visible)

- Prevents pleat bunching
- Helps prevent media migration
- Maintains media efficiency



Engineered Element Design

- The right combination of pleat depth and number of pleats means lower pressure losses (longer life)
- Dirt holding capability is maximized for less frequent element change-out

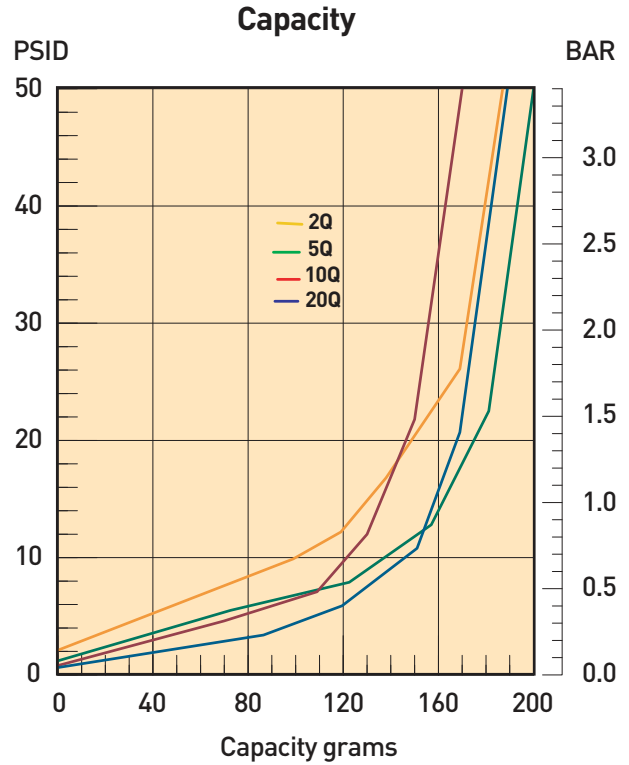
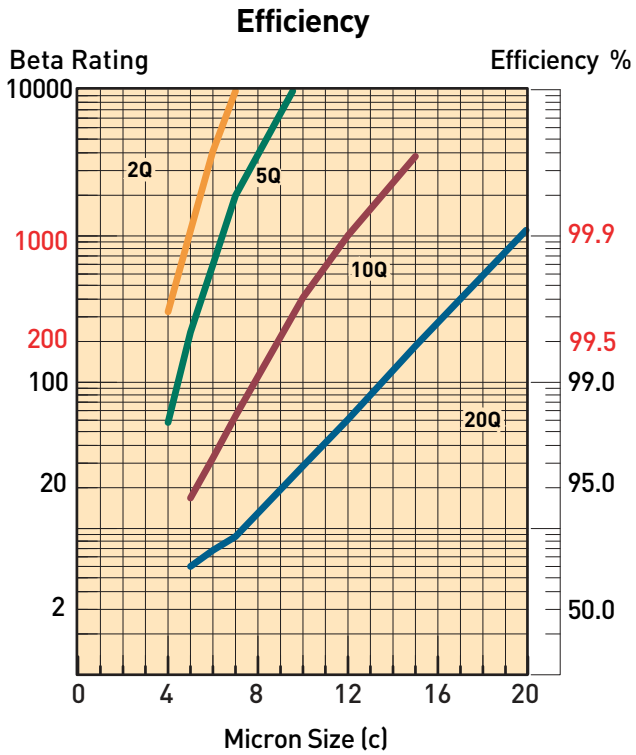
Elements for Every Application

- Standard Microglass III media for long life and excellent system protection
- Economical cellulose elements also available

| Features | Advantage | Benefits |
|---|--|---|
| <ul style="list-style-type: none"> • Tank mounted design. | <ul style="list-style-type: none"> • Saves space and reduces hardware requirements. | <ul style="list-style-type: none"> • Easy to integrate into system design. |
| <ul style="list-style-type: none"> • Cover fill port. | <ul style="list-style-type: none"> • Allows 100% filtration of all new system oil. | <ul style="list-style-type: none"> • Eliminates contamination before it can cause problems. |
| <ul style="list-style-type: none"> • High flow capacity. | <ul style="list-style-type: none"> • One filter may handle all return line flows. | <ul style="list-style-type: none"> • Cost savings in filters and hardware. |
| <ul style="list-style-type: none"> • Broad range of filter media available – including water removal. | <ul style="list-style-type: none"> • Choose the proper medium for system parameters. | <ul style="list-style-type: none"> • Cost savings by avoiding both "over" and "under" filtration. |
| <ul style="list-style-type: none"> • Inside-to-outside flow through element with a closed bottom end cap. | <ul style="list-style-type: none"> • All contamination is trapped inside of element assembly. | <ul style="list-style-type: none"> • Contamination is not reintroduced into the system during replacement. |
| <ul style="list-style-type: none"> • Wire reinforced Microglass III elements. | <ul style="list-style-type: none"> • Rugged construction stands up to abuse of cyclic flows without performance loss. • Wire support reduces pleat bunching, keeps pressure drop consistent. | <ul style="list-style-type: none"> • The reliable filtration provided assures equipment protection, reduces downtime, maximizes element life, and allows the hydraulic system to operate properly. |
| <ul style="list-style-type: none"> • Multipass tested elements (per ANSI/NFPA T3.10.8.8 R1-1990 modified for fine filtration). | <ul style="list-style-type: none"> • Filter performance backed by recognized and accepted laboratory test standards. | <ul style="list-style-type: none"> • Filters you select have consistent performance levels. |
| <ul style="list-style-type: none"> • Complete element performance data disclosure. | <ul style="list-style-type: none"> • All pertinent information is provided in an easy-to-compare format. | <ul style="list-style-type: none"> • Provides an easy guide to proper filter selection. |

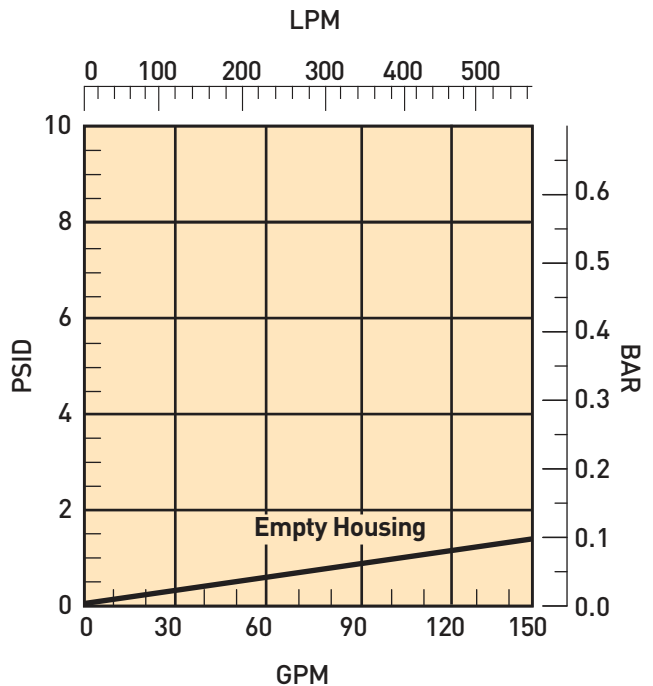
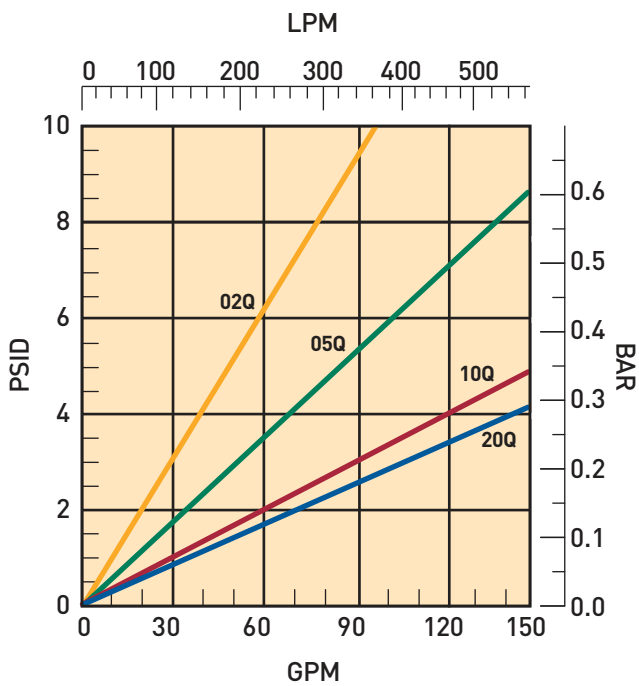
RF7 Series

RF7-1 Element Performance



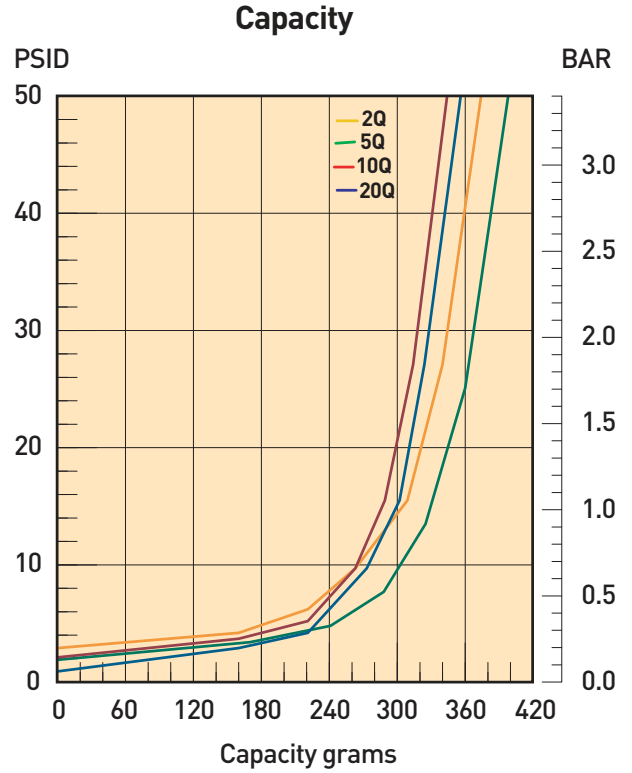
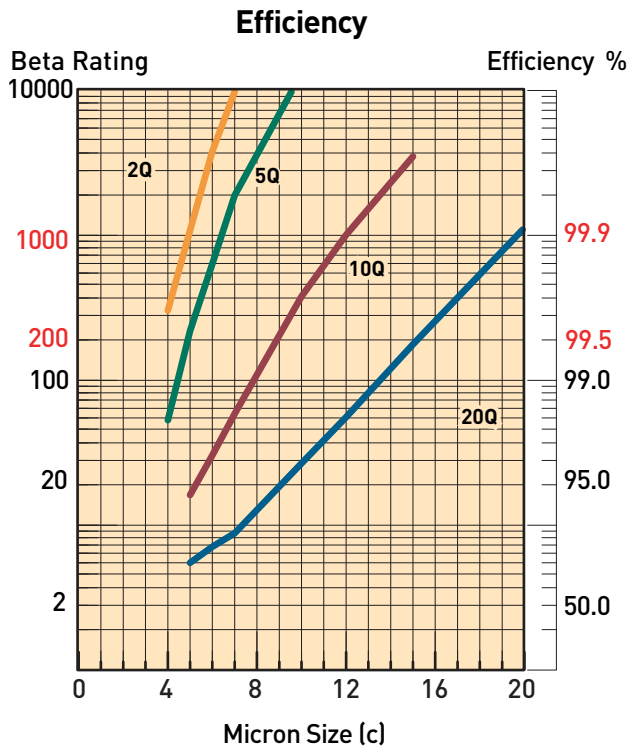
Results typical from Multi-pass tests run per test standard ISO 16889 @ 50 gpm to 50 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



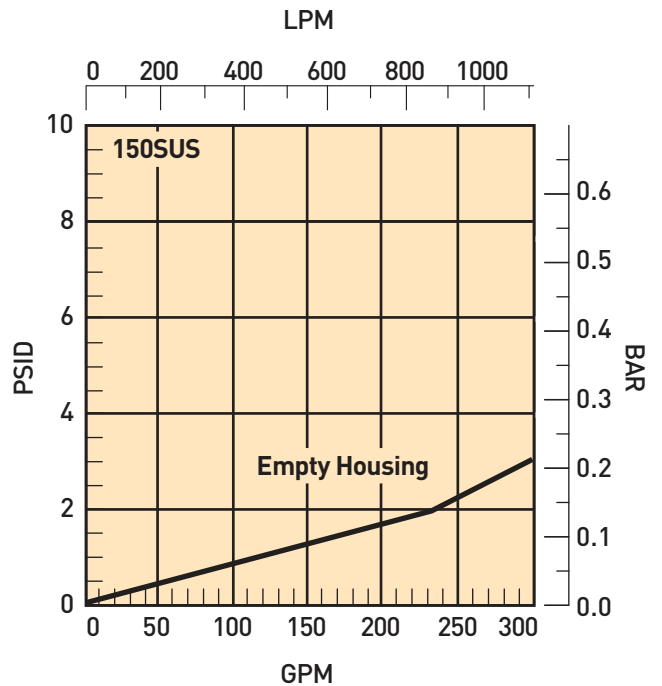
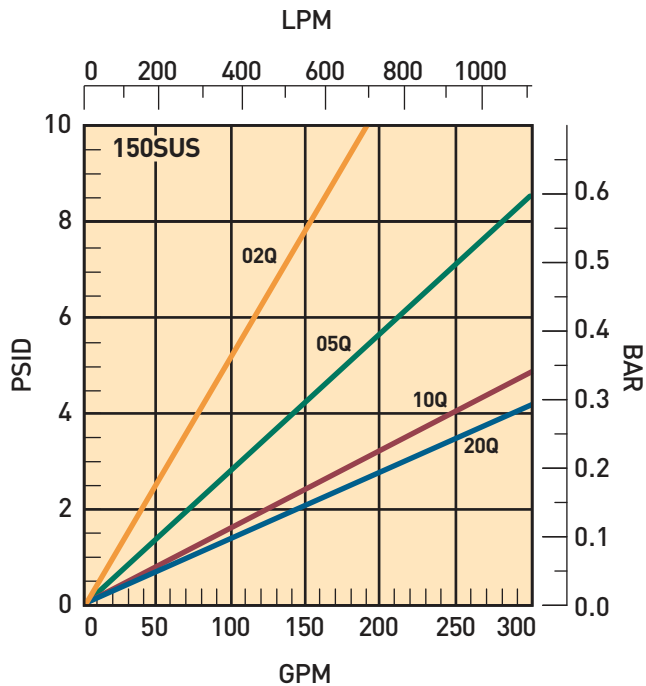
RF7 Series

RF7-2 Element Performance



Results typical from Multi-pass tests run per test standard ISO 16889 @ 80 gpm to 50 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



RF7 Series

Specifications

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 150 psi (10.3 bar)

Design Safety Factor: 3:1

Element Burst Rating:

50 psid (3.4 bar) minimum.

Materials:

Cast Aluminum Head & Cover
Steel Diffuser Tube
Steel Clamp

Operating Temperatures:

Nitrile; -40°F to 225°F
(-40°C to 107°C)

Fluorocarbon; -15°F to 275°F
(-26°C to 135°C)

Weight (approximate):

RF7-1 34 lbs. (15.4 kg)

RF7-2 42 lbs. (19 kg)

Indicators:

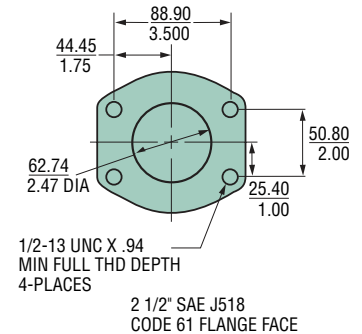
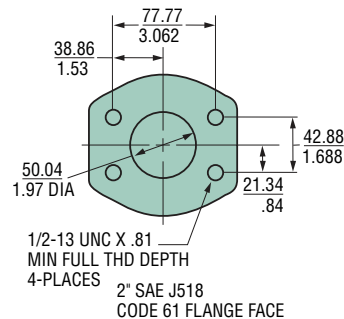
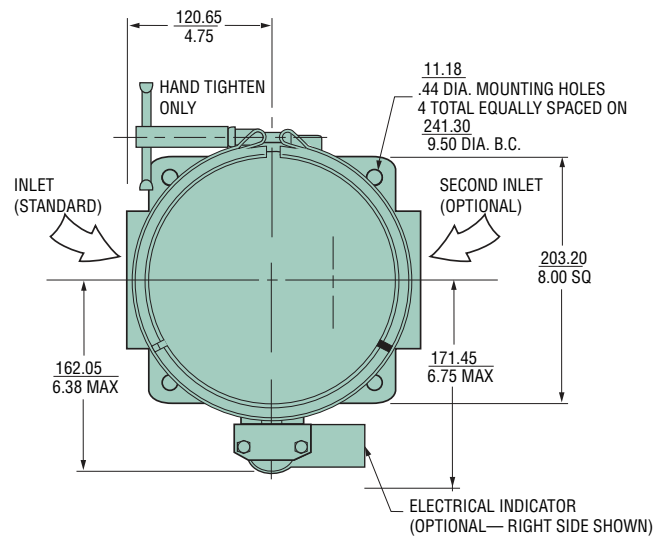
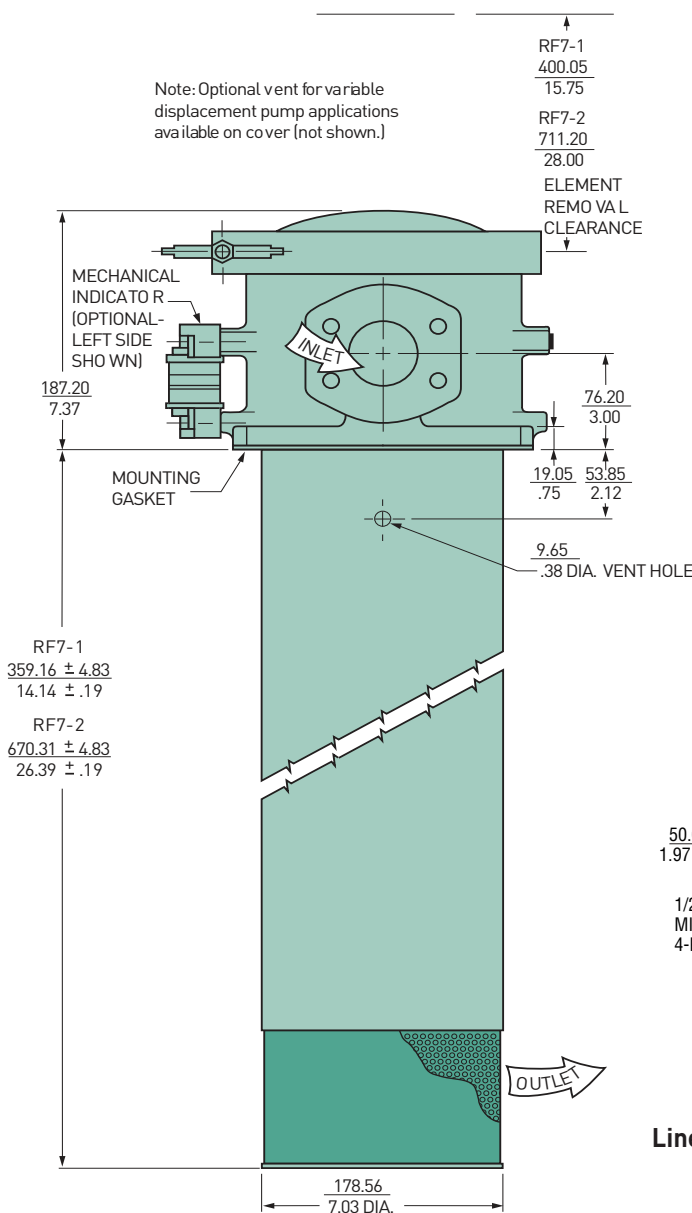
Visual system pressure type
(gauge or pressure switch).

Visual pressure differential type.

Electrical pressure differential type.

15A @ 250 VAC

.5A @ 125 VDC



Linear Measure: millimeter
inch

Dimensions are intended for reference only.

Drawings are for reference only.
Contact factory for current version.

RF7 Series

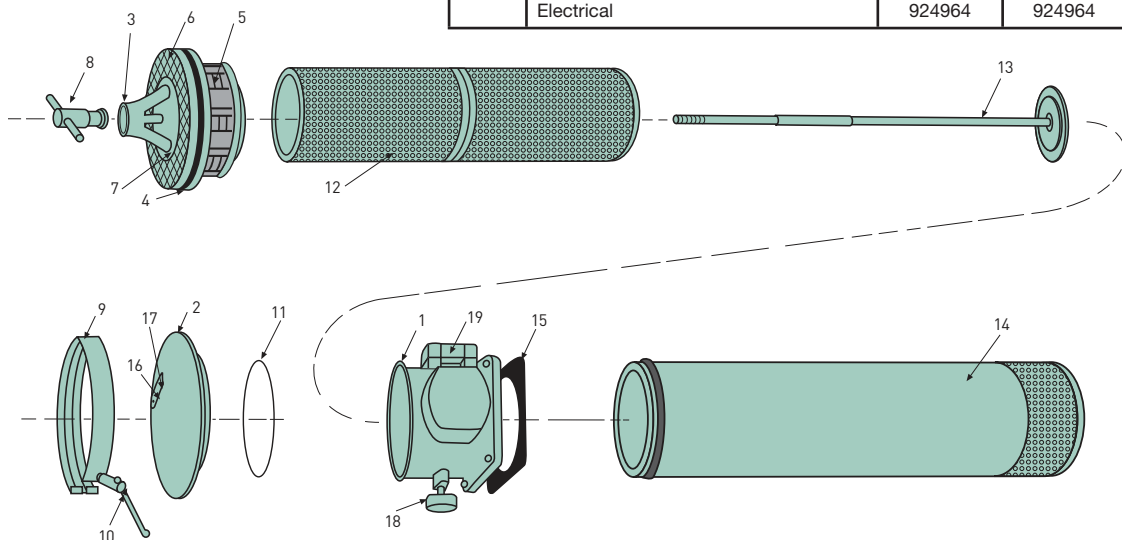
Specifications

Filter Service

When servicing an RF7 filter, use the following procedure:

- A. Stop all flow to the filter.
- B. Loosen the clamp handle counterclockwise and remove the clamp assembly.
- C. Remove the filter cover by lifting upward.
- D. Pull the entire cartridge assembly out by grabbing onto the "T" handle.
- E. Unscrew the "T" handle from the bypass assembly (with mesh screen) and remove the bypass assembly.
- F. Lift the element over the exposed rod assembly and discard.
- G. Place a new element over the rod and seat on the bottom.
- H. Re-attach the bypass assembly to the top of the element.
- I. Replace the "T" handle and hand-tighten.
- J. Firmly place the entire cartridge assembly back into the filter housing.
- K. Set the cover back on the housing, reattach the clamp assembly and hand tighten the handle.

| Parts List | | | |
|------------|--------------------------------------|-------------|--------|
| Index | Description | Part Number | |
| | | RF7-1 | RF7-2 |
| 1 | Head - Single Inlet | | |
| | 2" SAE Flange Face w/gage ports | 932549 | 932549 |
| | 2 1/2" SAE Flange Face w/gage ports | 932483 | 932483 |
| | 2" SAE Flange Face w/indicator | 932484 | 932484 |
| | 2 1/2" SAE Flange Face w/indicator | 932485 | 932485 |
| | Head - Double Inlets | | |
| 2 | 2" SAE Flange Face w/gage ports | 932550 | 932550 |
| | 2 1/2" SAE Flange Face w/gage ports | 932551 | 932551 |
| | 2" SAE Flange Face w/indicator | 932552 | 932552 |
| | 2 1/2" SAE Flange Face w/indicator | 932553 | 932553 |
| 3 | Bypass Mount | 932288 | 932288 |
| 4 | Lipseal | | |
| | Nitrile | 932415 | 932415 |
| | Fluorocarbon | 932488 | 932488 |
| 5 | Bypass Valve (6) | 930507 | 930507 |
| 6 | Screen | 932416 | 932416 |
| 7 | Screen Retaining Ring | 932417 | 932417 |
| 8 | "T" Handle Assembly | 903889 | 903889 |
| 9 | Clamp | 909876 | 909876 |
| 10 | Clamp Handle | 926768 | 926768 |
| | Cover O-Ring | | |
| | Nitrile | N72263 | N72263 |
| | Fluorocarbon | V72263 | V72263 |
| 12 | Element (See model code page) | | |
| 13 | Cartridge Rod Assembly | 933067 | 932418 |
| 14 | Diffuser Tube Assembly | 933064 | 932419 |
| 15 | Gasket | | |
| | Nitrile | 932420 | 932420 |
| | Fluorocarbon | 932489 | 932489 |
| 16 | Nameplate | 920928 | 920928 |
| 17 | Drivescrew (2) | 900028 | 900028 |
| 18 | Pressure Gauge | 936912 | 936912 |
| 19 | Indicators | | |
| | Visual | 924776 | 924776 |
| | Electrical | 924964 | 924964 |



RF7 Series

How to Order

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| | RF7 | 2 | 10Q | MP | 25 | y999 | 1 |

| BOX 1: Seals | |
|--------------|----------------|
| Symbol | Description |
| None | Nitrile |
| F3 | Fluorocarbon |

| BOX 2: Basic Assembly | |
|-----------------------|-----------------------|
| Symbol | Description |
| RF7 | In-tank return filter |

| BOX 3: Length | |
|---------------|----------------------|
| Symbol | Description |
| 1 | Single length |
| 2 | Double length |

| BOX 5: Indicator(s) | |
|---------------------|----------------------------|
| Symbol (2 Required) | Description (See Note A) |
| P | Gauge, port plugged |
| G | Gauge, color coded |
| S | Pressure switch |
| M | Visual indicator |
| E | Electrical indicator |

Note A: (First letter of indicator code = left side of filter head when looking into inlet with bowl down; second letter = right side of filter head when looking into inlet with bowl down.)

| BOX 7: Ports | |
|---------------|---------------------------------------|
| Symbol | Description |
| <u>Inlet</u> | <u>Side</u> |
| Y9 | 2" SAE flange face (Standard) |
| Z9 | 2½" SAE flange face (Standard) |
| 2Y9 | Two Inlets, 180° apart (Optional) |
| 2Z9 | Two Inlets, 180° apart (Optional) |
| <u>Outlet</u> | <u>No fitting</u> |
| 99 | No fitting |

| BOX 4: Media Code | |
|-------------------|----------------|
| Symbol | Description |
| 20Q | Microglass III |
| 10Q | Microglass III |
| 05Q | Microglass III |
| 02Q | Microglass III |
| 10C | Cellulose |
| WR | Water Removal |

| BOX 6: Bypass Setting | |
|-----------------------|----------------|
| Symbol | Description |
| 25 | 25 psid |

| BOX 8: Modifications | |
|----------------------|-------------|
| Symbol | Description |
| 1 | None |

Replacement Elements

| Media | Single Length | | Double Length | |
|-------|---------------|--------------|---------------|--------------|
| | Nitrile | Fluorocarbon | Nitrile | Fluorocarbon |
| 20Q | 933800Q | 933808Q | 933812Q | 933156Q |
| 10Q | 933802Q | 933809Q | 933814Q | 933155Q |
| 05Q | 933804Q | 933810Q | 933816Q | 933153Q |
| 02Q | 933806Q | 933811Q | 933818Q | 933152Q |
| 10C | 908648 | 923551 | 932498 | 932503 |
| WR | 928563 | 933853 | 932501 | 932506 |

Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.



aerospace
 climate control
 electromechanical
filtration
 fluid & gas handling
 hydraulics
 pneumatics
 process control
 sealing & shielding



BGT Series

Low Pressure Filters



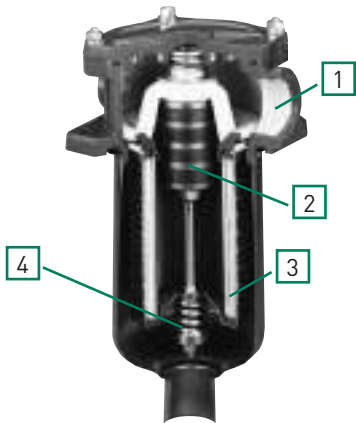
ENGINEERING YOUR SUCCESS.

BGT Series

Applications

- Flows to 640 GPM
- 3 Micron Absolute to 120 Micron Absolute
- Disposable or Recleanable Elements
- Visual and Electrical Indicators
- Microglass elements
- Magnetic prefiltration
- Full flow bypass valve
- No internal leakage paths
- Inside-to-out flow thru element
- Complete contaminant removal during element service
- LEIF® element (600 and 1000 Series only)

BGT Tank Mounted Return Flow Filters



BGT Filters feature Parker's exclusive Magnetic Prefiltration core which collects ferromagnetic particles from fluid upstream of the filter element. This feature alone could save hundreds of dollars a year by protecting costly equipment from increased wear and malfunction by assuring that the fluid is as pure as possible when it leaves the filter. Even during bypass due to cold start up, ferris contaminant is collected by the magnetic core, a feature of importance on any fluid power system.

Take a close look and compare Parker features with any other filter.

1. Fluid flows through the inlet port into an enlarged area which reduces fluid velocity. Inlet flow does not impinge on the element.

2. Filtration begins with magnetic prefiltration of ferromagnetic particles in the full fluid flow upstream of the element, not downstream or in the reservoir. Built-in or system generated ferromagnetic wear debris (even particles smaller than the element rating) are collected by the high strength (3.0K Gauss) magnetic column. This results in extended element and oil life and reduced maintenance and downtime, which reduces overall operating cost.

3. Fluid passes through the element in an inside-to-outside direction, collecting particles inside the filter cartridge. This eliminates reinjection of contaminant during element change. Clean fluid then returns to the reservoir through the diffuser which prevents fluid aeration.

Normal return line filters, that flow outside-to-inside, allow contaminated fluid to drain back into the reservoir when the element is serviced.

4. Simplified bypass design and location prevents flushing previously collected contaminant back into the system. Since the element serves as the valve there is no troublesome separate valve to remove when changing elements. Magnetic filtration occurs even during bypass. All potential leakage paths are o-ring sealed to eliminate bypass leakage that occurs in loose fitting valve assemblies.

BGT Filters are available with disposable

Specifications

Housing Data:

Material:

Head – Aluminum Alloy
Diffusor – Steel
Internals – Carbon Steel and Aluminum
Seals – Nitrile (Standard), Fluorocarbon

Pressure Rating:

Static – 150 psi (10.3 bar)

Temperature Range:

Operating -40°F to +250°F
(-40°C to +120°C)

elements of several contamination class levels for use in all common fluids.

Optional accessories include visual and electric warning indicators that assure proper element service.

BGT Series

How To Size Tank Top Filters

Element Pressure Drop Factor:

Multiply the actual flow rate times the applicable ΔP factor to determine the pressure drop with a fluid viscosity of 140 SSU. Correct for other viscosities by applying the following formula: Flow rate (GPM) x filter factor x (new viscosity in SSU/140 SSU).

Flow/Pressure Drop Data

Fluid Conditions: Viscosity-140 SSU Sp. Gr. - 0.88

| Media Code | 600 | Size Code 1000 | 2000 |
|------------|------|----------------|-------|
| 02Q (L) | .082 | .0493 | .0246 |
| 05Q (L) | .031 | .0187 | .0091 |
| 10Q (L) | .022 | .0129 | .0066 |
| 20Q (L) | .014 | .0088 | .0044 |

Example:

Element Size Code = 600
 Element Media Code = 10
 Filter Factor = .022 (From chart)
 Flow = 160 GPM
 Viscosity = 160 SSU

Formula:

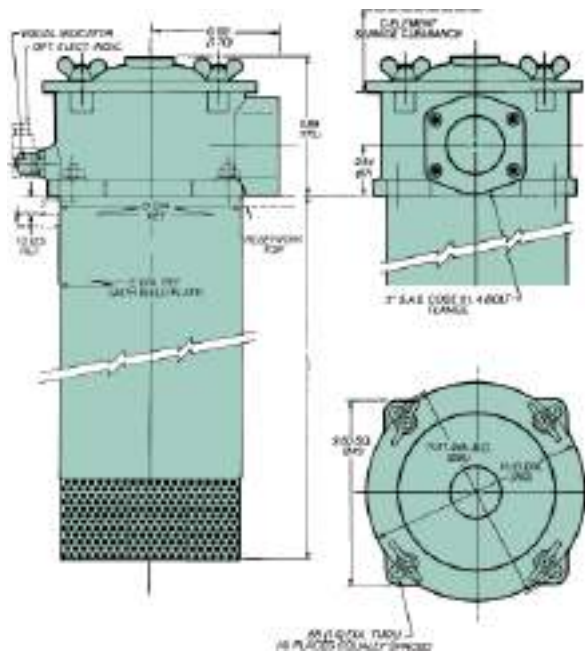
$$160 \text{ GPM} \times .022 \times (160 \text{ SSU}/140 \text{ SSU}) = 4.0 \text{ PSID}$$

Element Data

| Media Type | Absolute Rating | Multipass Test Results To ISO 4572 (Time Weighted Averages) | | | | | | |
|----------------|-----------------|--|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | B ₃ | B ₆ | B ₁₀ | B ₁₂ | B ₂₀ | B ₂₅ | B ₃₆ |
| Microglass III | 3 | ≥100 | 800 | 2000 | >5000 | ∞ | ∞ | ∞ |
| Microglass III | 6 | 8 | ≥100 | 1000 | 2000 | >5000 | ∞ | ∞ |
| Microglass III | 10 | 6 | 22 | ≥100 | ≥200 | >5000 | ∞ | ∞ |
| Microglass III | 20 | - | 2 | 8 | 20 | ≥100 | ≥200 | >5000 |

Dimensions

BGT-13, BGT-15, BGT-17



Drawings are for reference only.
 Contact factory for current version.

Return Line Filter - Series 4

| Dimensions inches (mm) | BGT Filter Model | | |
|------------------------|-----------------------|-------------|--------------|
| | 13 | 15 | 17 |
| C | 18.0 (457) | 27.0 (686) | 48.0 (1219) |
| L | 16.75 (425) | 25.20 (640) | 47.25 (1200) |
| D | 9.49/9.47 (241/240.5) | | |
| E | 10.25/9.70 (260/246) | | |

BGT Series

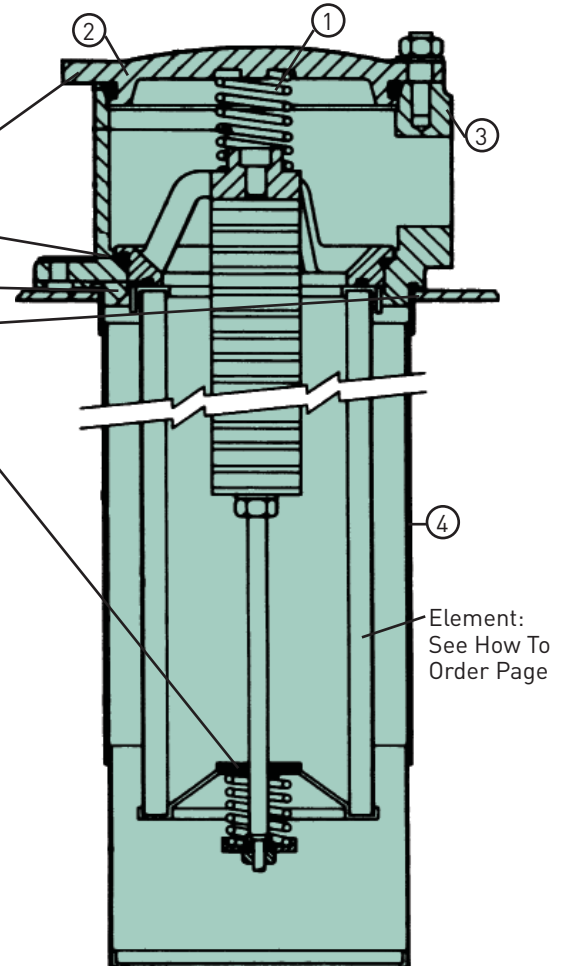
Parts List

Parts Breakdown BGT Series

| Seals | |
|-----------------------------|----------------|
| Part Number | Description |
| BGT 13, 15 or 17 | |
| R-8875 | Cover O-ring |
| SOR-90 | Insert O-ring |
| SOR-85 | Bypass Seals |
| R9875 | Tank Gasket |
| SOR-115 | Element O-Ring |
| Nitrile or Fluorocarbon | Material* |

*Please specify seal material suffix when ordering
Fluorocarbon seals: "-V"

| Bypass Assembly | |
|-----------------|----------|
| 13, 15 or 17 | Pressure |
| 6903184 | Blocked |
| 4903020 | 4.5 PSID |
| 4903004 | 12 PSID |
| 4903008 | 22 PSID |



| Item | Description | Material | Part Numbers | | |
|------|-------------|-------------------|---------------------------|---------|----------|
| | | | BGT-13 | BGT-15 | BGT-17 |
| 1 | Top Spring | Steel | 48371205 | | |
| 2 | Cover | Die Cast Aluminum | 84.22.064.06 (5842206) | | |
| 3 | Head | Die Cast Aluminum | 5841032 | | |
| 4 | Diffusor | Steel | 2110084 | 2110085 | 21100086 |

BGT Series

Operating And Maintenance Instructions Parker Model BGT Tank Top Filters

A. Mounting

1. Standard mounting.
 - a. Cut proper size hole in the top of the reservoir.
 - b. Drill holes for studs within the proper bolt circle.
 - c. Set the filter into the cutout hole and secure with proper size bolts, nuts and lock washers.
2. Utilize proper fittings.

B. Start-Up

1. Check for and eliminate leaks upon system start-up.
2. Check differential pressure indicator, if installed, to monitor element condition.

C. Service

1. An element must be serviced when the indicator indicates service is required.

NOTE: If the filter is not equipped with an indicator, the element should be serviced according to machine manufacturer's instructions.

D. Servicing Dirty Elements

1. Shut system down to assure that there is NO PRESSURE OR FLOW into the filter housing.
2. Remove the filter cover.
3. Remove the filter insert (bridge which holds the element in place).
4. Remove the bypass spring assembly or non-bypass plate from the stud.
5. Remove the contaminated cartridge with a twisting motion.
6.
 - a. Discard the disposable element cartridge.
 - b. Wash cleanable or mesh elements in a non-caustic solvent. Compressed air can be used to facilitate cleaning. Use care to prevent damage to the element during cleaning.

NOTE: Elements finer than 150 microns (100 mesh) may require special ultrasonic cleaning. Consult factory for recommendations.

E. Before Installing A New Element Cartridge

1. Clean the magnetic core with a lint-free cloth.
2. Check all seals and replace if necessary.

F. To Install A New Or Cleaned Element Cartridge

1. Lubricate all seals.
2. Mount new or cleaned Parker filter cartridge.

NOTE: For ease of mounting, hold the cartridge away from the magnetic core until the stud is through the hole in the bottom of the element. Then slide it up to securely seat it to the top of the bridge.

3. Install the bypass spring assembly or non-bypass plate, and tighten until snug.

NOTE: Older versions may have a cotter pin/castellated nut retained bypass spring. In these cases, the nut should be turned down the shaft until the cross drilled hole is visible in the base of a castellation and the cotter pin inserted and ends flared to lock the bypass assembly in place.

4. Re-install the insert into the filter housing, making sure that the top- spring is secure.
5. Re-install the cover. Torque the cover nuts to 22 ft./lbs.
Follow procedures B.1 and B.2.

BGT Series

How to Order

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| BGT | 13 | 10QL | B | V | E | F48 | 1 |

| BOX 1: Basic Assembly Symbol | Description |
|------------------------------|---------------|
| BGT | Return Filter |

| BOX 2: Housing Length Symbol | Description |
|------------------------------|--------------------------------------|
| 11 | 3-390 L/min Return Filter (105 gpm) |
| 12 | 3-500 L/min Return Filter (135 gpm) |
| 13 | 4-600 L/min Return Filter (160 gpm) |
| 15 | 4-1000 L/min Return Filter (265 gpm) |
| 17 | 4-2000 L/min Return Filter (530 gpm) |

| BOX 3: Element Media Symbol | Description |
|-----------------------------|--|
| 02QL | <u>BGT11, 3-390 L/min</u> Leif® Microglass III Element |
| 05QL | Leif® Microglass III Element |
| 10QL | Leif® Microglass III Element |
| 20QL | Leif® Microglass III Element |
| 02QL | <u>BGT12, 3-500 L/min</u> Leif® Microglass III Element |
| 05QL | Leif® Microglass III Element |
| 10QL | Leif® Microglass III Element |
| 20QL | Leif® Microglass III Element |
| 02QL | <u>BGT13, 4-600 L/min</u> Leif® Microglass III Element |
| 05QL | Leif® Microglass III Element |
| 10QL | Leif® Microglass III Element |
| 20QL | Leif® Microglass III Element |
| 02QL | <u>BGT15, 4-1000 L/min</u> Leif® Microglass III Element |
| 05QL | Leif® Microglass III Element |
| 10QL | Leif® Microglass III Element |
| 20QL | Leif® Microglass III Element |
| 02Q | <u>BGT17, 4-2000 L/min</u> Microglass III Element |
| 05Q | Microglass III Element |
| 10Q | Microglass III Element |
| 20Q | Microglass III Element |

| BOX 4: Seals Symbol | Description |
|---------------------|-------------|
| B | Nitrile |

| BOX 5: Indicator Symbol | Description |
|-------------------------|-----------------------------------|
| P | Plugged Indicator Port |
| G | Pressure Gauge |
| S | Pressure Switch |
| V | Visual Differential Indicator |
| E | Electrical Differential Indicator |

| BOX 6: Bypass Symbol | Description |
|----------------------|---------------------------------|
| E | 22 PSID Bypass (1,5 bar) |

| BOX 7: Ports Symbol | Description |
|---------------------|-------------------------------|
| F32 | 2" SAE Flange, Code 61 |
| F48 | 3" SAE Flange, Code 61 |

| BOX 8: Options Symbol | Description |
|-----------------------|-------------------|
| 1 | No Options |
| TP | Weld Plate |

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.





aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Oil Conditioning Unit



ENGINEERING YOUR SUCCESS.

Oil Conditioning Unit

Applications

The Parker Oil Conditioning Units (OCU) are a family of off-line filtration packages designed to effectively remove water or particulate contamination from hydraulic and lube system fluids. The high performance, high capacity design enables the efficient removal of the very fine contaminants that cause premature wear in expensive hydraulic components. In addition, the precursors to varnish are also reduced or eliminated completely.

The compact, user-friendly OCUs are a cost effective method to reduce system contamination while helping to insure the reliability of your hydraulic or lube system.

- **Aviation**
 - ground support equipment
 - simulators
- **Power Generation**
 - steam and gas turbine hydraulic and lubrication
- **Automotive**
 - presses
 - stamping equipment
- **Steel Mills**
 - rolling mills
 - continuous casters
 - sheet mills
- **Injection Molding**
 - hydraulic circuits
- **Railway**
 - car assembly
 - wheel presses
- **Pulp & Paper**
 - machine lubrication
- **Construction**
 - timber harvesting
 - aerial lifts
 - excavators
- **Wind Power**
 - turbine generators
 - gear boxes
- **Oil & Gas**
 - hydraulic equipment

Plastic used in injection molding process



Oil Conditioning Unit Technology



The filter design allows the oil to flow under pressure through 114mm of engineered media with three distinct stages of filtration and water absorption.

The largest particles are retained in the top of the element (1), making for an excellent diagnostic tool. Smaller particles are trapped in the mid stage (2), and the smallest particles are trapped in the lower and most compressed part of the element (3).

The cellulose media allows water absorption of up to 200 milliliters within the filter, reducing the water concentration in oil to less than 100 parts per million.

Equally noteworthy is the efficiency of the media in removing resins, metals and oxidation products, all of which are extremely damaging to close-tolerance components.

Manufactured from a specifically engineered cellulose material wound onto a central core, the OCU combines filtration principles to achieve effective filtration – low flow, low pressure and depth loading axial filtration – flow direction from the top to the bottom.

A card sleeve compresses the lower part of the element to increase the density and a non-woven cloth protects the base and stops particle migration.



Oil Conditioning Unit

Features and Benefits

- Solid Particle Filtration
- Water Absorption
- Sludge, Resin, and Oxidation Absorption

The Parker OCU Benefit

- Removing up to 99% of all Solid Contaminates
- Reducing the Water Concentration to Less than 100 ppm
- Eliminating Resins and Oxidation Products
- Longer Life for Hydraulic Components
- Significant Reduction of Oil Consumption and Oil Disposal Cost
- Low Cost Full Flow Filter Cartridges
- Reduce Equipment Downtime
- Reduce Operating Cost
- Increase Profit



Oil Conditioning Unit

Features and Benefits



Tool-less access and easy service via the T-handle.

The combination of chemically treated cellulose and synthetic layers of media presents a massive surface area to remove solid contamination and emulsified water. The result is both exceptional dirt holding capacity and removal of water concentration to less than 100 ppm.

The engineered base design at the bottom of the housing supports the element under high pressure and provides a channeled migration path for clean fluid to flow back into the primary stream.

The Oil Conditioning Unit is designed as a top load filter, but can be mounted at any angle using the heavy-duty mounting bracket.



The intricately channeled base provides a large footprint to fully support the element under pressure, ensuring uniform loading of the element. Ultra-clean oil flows through the channels into the clean oil stream.

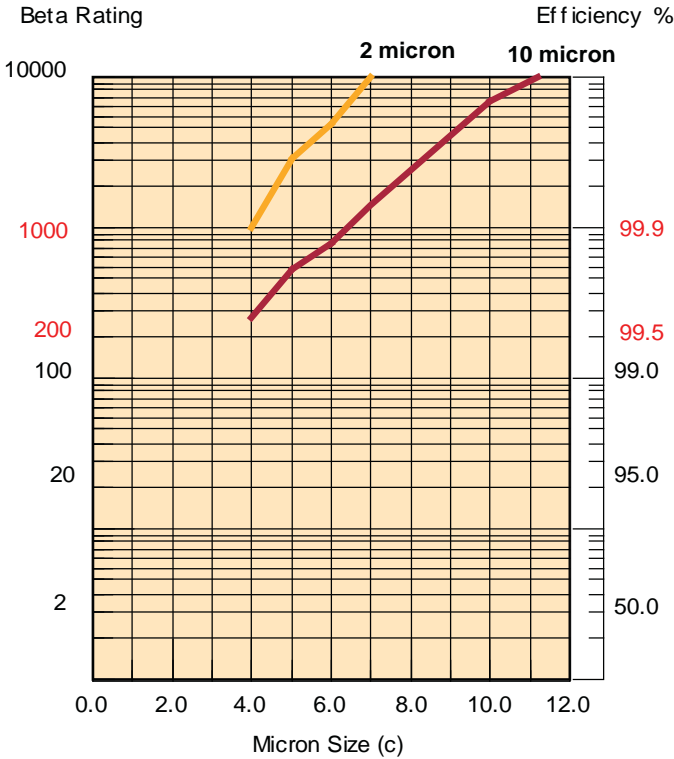
OC1 and OC2

Element Performance

| Model OC1 | | | |
|-------------|-------------|------------------------------|------------------------------|
| Media Grade | Part Number | Capacity @ 25 PSID (1.7 Bar) | Capacity @ 50 PSID (3.5 Bar) |
| 2 Micron | 942650 | 16.2 grams | 23.3 grams |
| 10 Micron | 942652 | 28 grams | 44.3 grams |

| Model OC2 | | | |
|-------------|-------------|------------------------------|------------------------------|
| Media Grade | Part Number | Capacity @ 25 PSID (1.7 Bar) | Capacity @ 50 PSID (3.5 Bar) |
| 2 Micron | 942654 | 22 grams | 45.8 grams |
| 10 Micron | 942656 | 36.5 grams | 61.6 grams |

Efficiency



Results typical from Multi-pass tests run per modified test standard ISO 16889 to 50 psid terminal - 100 mg/L BUGL ISO Medium Test Dust was used per the standard - User results will vary based on system particle distribution.

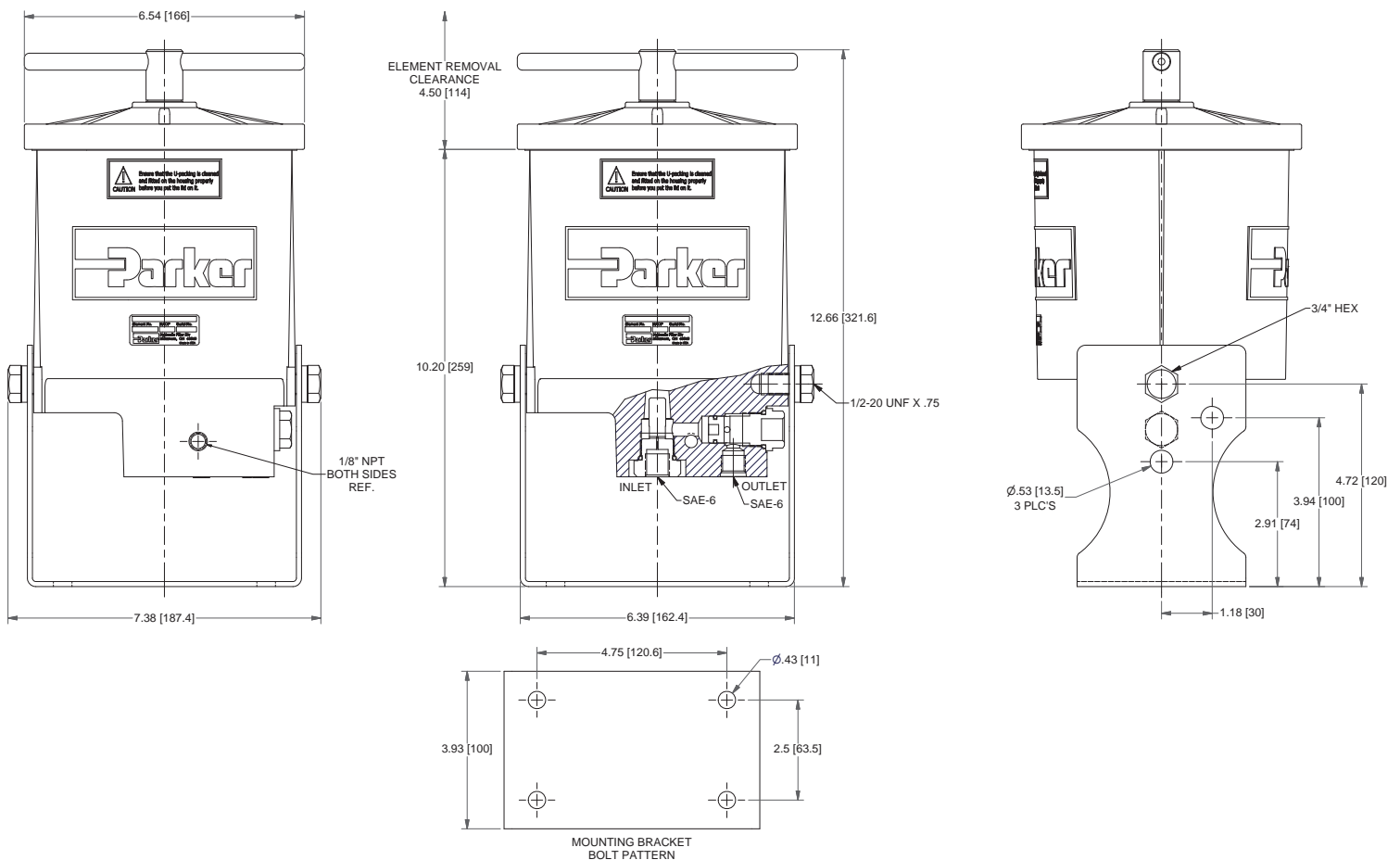
Dirt Holding Capacity results will typically improve with soft or submicron size particles due to reduced surface caking.



OC1 without Pump/Motor

Specifications

| Specifications | OC1 |
|--------------------------|---|
| Maximum Pressure | 180 PSI (12.4 bar) |
| Port Size (inlet/outlet) | SAE 6/SAE 6 |
| Dimensions | W6.38 x D6.54 x H12.48 in. (W162 x D166 x H317 mm) |
| Weight | 10 lbs (4.5 kg) |
| Flow Rate | 0.4 GPM (1.5 L/min.) |

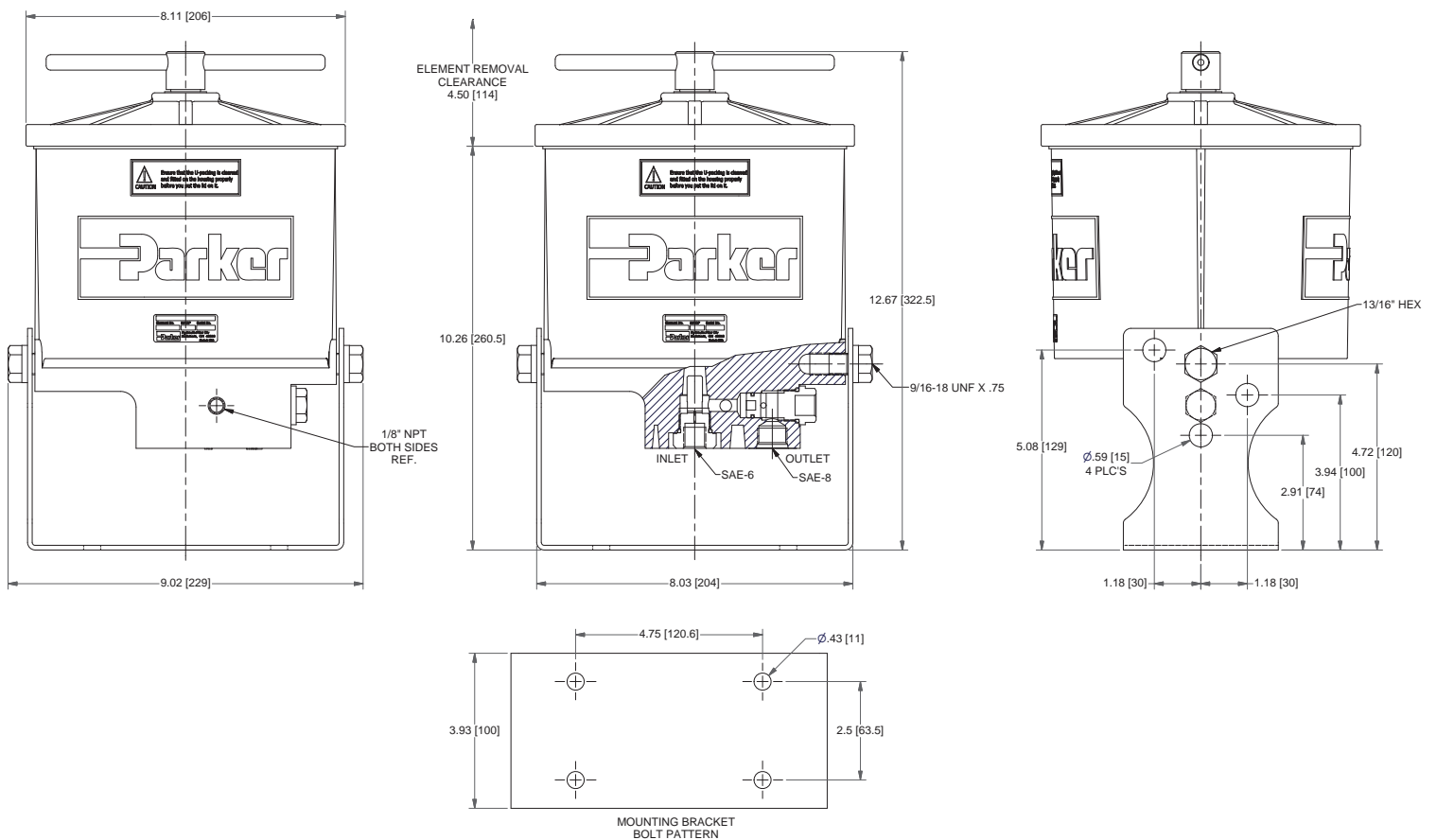


Drawings are for reference only.
Contact factory for current version.

OC2 without Pump/Motor

Specifications

| Specifications | OC2 |
|--------------------------|---|
| Maximum Pressure | 180 PSI (12.4 bar) |
| Port Size (inlet/outlet) | SAE 6/SAE 8 |
| Dimensions | W8.03 x D8.11 x H12.64 in. (W204 x D206 x H321 mm) |
| Weight | 15 lbs (6.8 kg) |
| Flow Rate | 0.5 GPM (2 L/min.) |

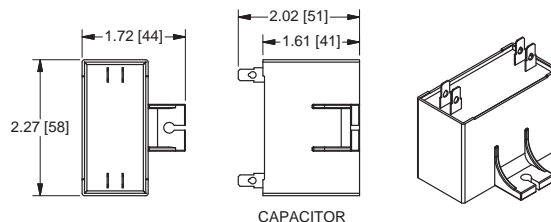
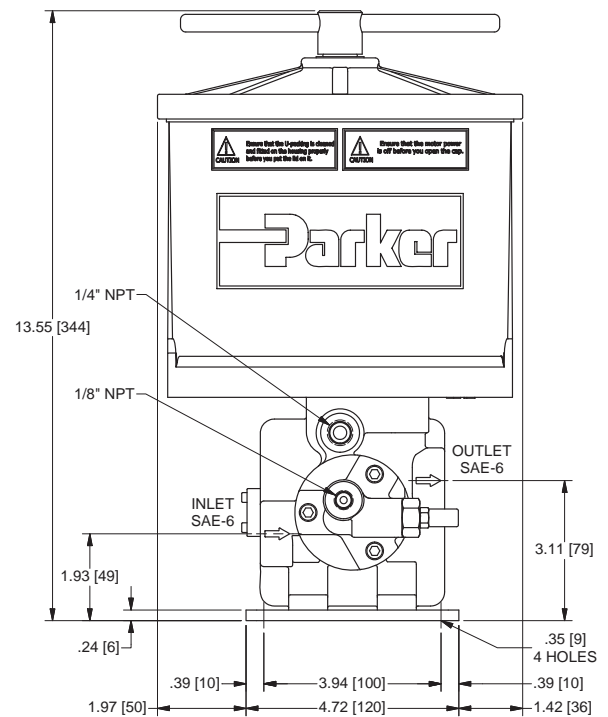
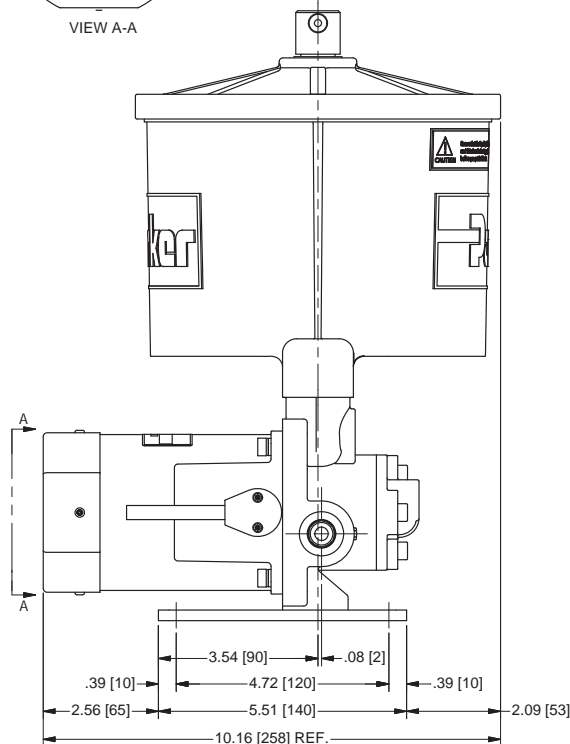
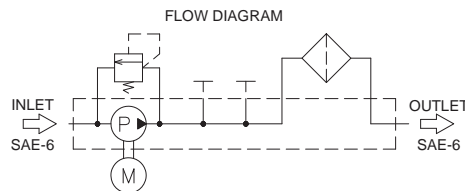
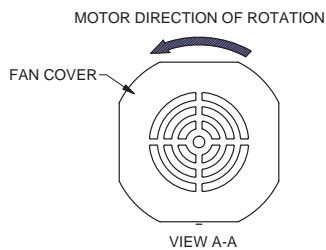


Drawings are for reference only.
Contact factory for current version.

OC2 with Pump/Motor

Specifications

| Specifications | OC2 |
|--------------------------|---|
| Maximum Pressure | 180 PSI (12.4 bar) |
| Port Size (inlet/outlet) | SAE 6/SAE 6 |
| Dimensions | W8.03 x D8.11 x H12.64 in. (W204 x D206 x H321 mm) |
| Weight | 15 lbs (6.8 kg) |
| Flow Rate | 0.5 GPM (2 L/min.) |
| Voltage | 120VAC or 220VAC |



Drawings are for reference only.
Contact factory for current version.

Oil Conditioning Unit

Parts List

| Replacement Parts List | |
|------------------------|----------------------------|
| 942673 | Seal Service Kit (for OC1) |
| 942683 | Seal Service Kit (for OC2) |



| Replacement Elements | |
|----------------------|---------------------------|
| OC1 | |
| 942650 | 2 micron (green) |
| 942652 | 10 micron (orange) |
| OC2 | |
| 942654 | 2 micron filter (green) |
| 942656 | 10 micron filter (orange) |
| 942682 | Water Removal |



Oil Conditioning Unit

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| OC2 | 120 | 10 | V | P | L | S06 | 1 |

| BOX 1: Filter Series ¹ | |
|-----------------------------------|-----------------------------------|
| Symbol | Description |
| OC1 | 0.4 GPM (1.5 L/min.) |
| OC2 | 0.5 GPM (2.0 L/min.) ¹ |

| BOX 4: Seals | |
|--------------|--------------------|
| Symbol | Description |
| V | Fluorocarbon (FKM) |

| BOX 7: Ports ⁴ | |
|---------------------------|---|
| Symbol | Description |
| S06 | SAE-6 Inlet/Outlet Ports |
| S08 | SAE-6 Inlet Port/SAE-8 Outlet Port ⁴ |

| BOX 2: Filter Model ^{1,2} | |
|------------------------------------|--|
| Symbol | Description |
| 120 | 120VAC/1Ph/60Hz Pump/Motor ² |
| 220 | 220VAC/1Ph/50/60Hz Pump/Motor ² |
| X | No Pump/Motor ¹ |

| BOX 5: Indicator | |
|------------------|------------------------|
| Symbol | Description |
| P | Indicator Port Plugged |
| G | Pressure Gauge |
| S | Pressure Switch |

| BOX 8: Options | |
|----------------|-------------|
| Symbol | Description |
| 1 | None |

| BOX 3: Media Code ³ | |
|--------------------------------|----------------------------|
| Symbol | Description |
| 2 | 2 micron |
| 10 | 10 micron |
| WR | Water Removal ³ |

| BOX 6: Bypass | |
|---------------|--------------------------|
| Symbol | Pressure Setting |
| L | 65 psid (4.5 bar) relief |

Notes:

1. When selection from Box 1 is "OC2", and selection from Box 2 is "X", "S08" **must** be selected for Box 7.
2. "120" and "220" are available **only** when "OC2" is selected in Box 1.
3. "WR" available for OC2 **only**.
4. "S08" is **only** used when "OC2" is selected in Box 1 and "X" is selected in Box 2.





aerospace
 climate control
 electromechanical
filtration
 fluid & gas handling
 hydraulics
 pneumatics
 process control
 sealing & shielding



12CS/50CS Series

Coreless Medium Pressure Filters



ENGINEERING YOUR SUCCESS.

12CS/50CS Series

Applications

Together we can...

Preserve the environment.
Minimize waste and promote energy efficiency.

Achieve worldwide filtration solutions.
Build global confidence.

Redefine new limits.
Forge ahead with advanced technology.

Keep contamination under control.
Reduce maintenance costs.

Enhance total system reliability.
Focus on customer satisfaction.

Reach optimum potential.
Drill to greater depths.

...engineer your success.

Parker engineers have developed an innovative alternative to the age old spin-on style can. This new design provides all of the benefits of high efficiency, long life Ecoglass III filtration, without the environmental impact.

The new environmentally-friendly 12CS and 50CS hydraulic filters feature a reusable bowl and a patented filter element constructed of reinforced polymer end caps, microglass media, and polymer pleat support. The element core is permanently attached as part of the filter bowl. When replaced, the element reduces costs, eliminates hot drain requirements, can be easily incinerated, and is better-suited for most landfills.

The 500 psi filters are rated up to 50 gpm, with premium Ecoglass III elements as standard offerings. The patented element design also prevents filter operation if the proper element is not in place.

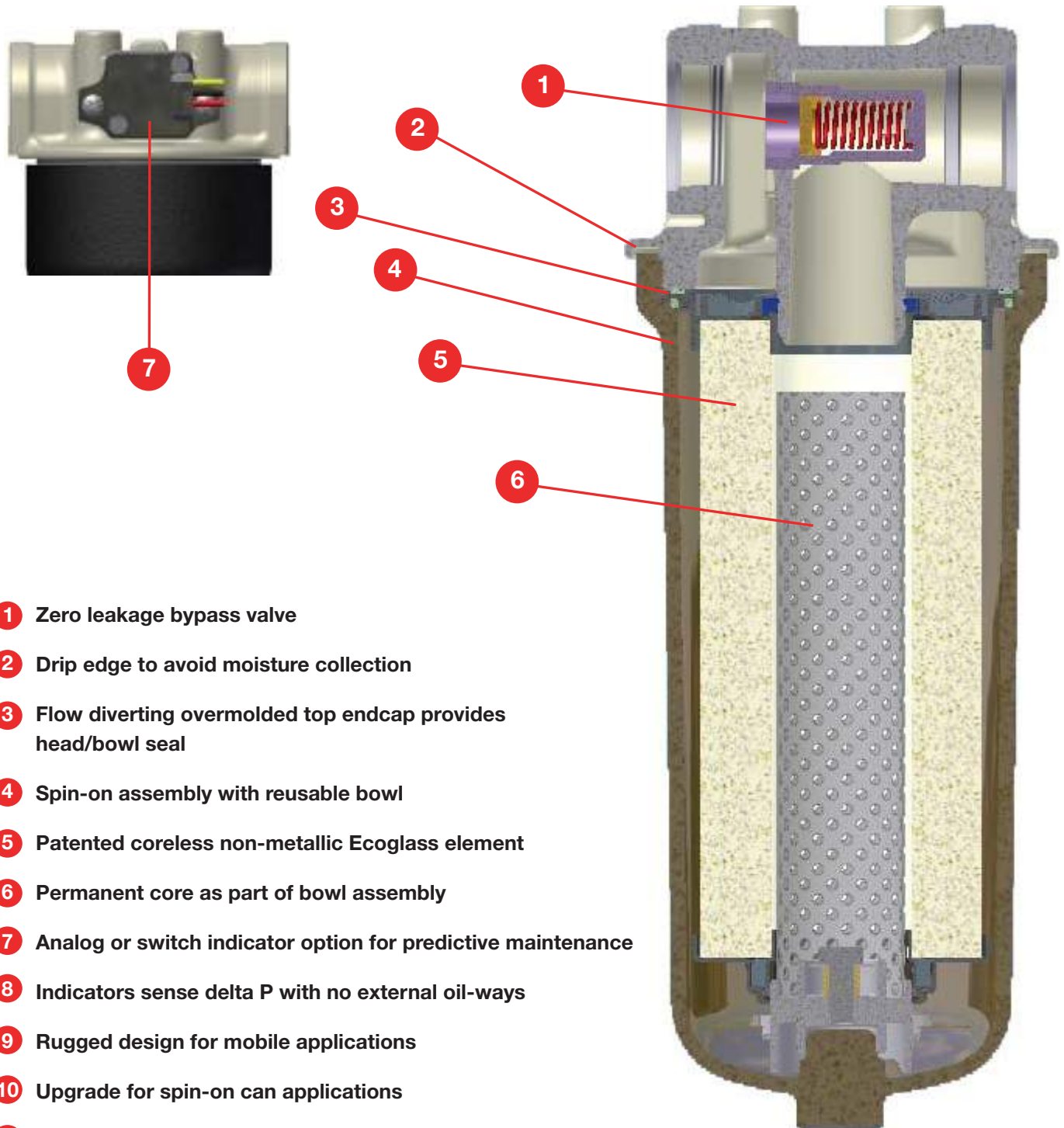
Typical Applications

- **Mobile Ag**
- **Mobile Construction**
- **Material Handlers**
- **Aerial Lifts**
- **Pilot Lines**
- **Charge Pump Hydrostatic Drives**
- **Industrial Power Units**
- **Machine Tools**
- **Joy Stick Controls**



12CS/50CS Series

Features



- 1 Zero leakage bypass valve
- 2 Drip edge to avoid moisture collection
- 3 Flow diverting overmolded top endcap provides head/bowl seal
- 4 Spin-on assembly with reusable bowl
- 5 Patented coreless non-metallic Ecoglass element
- 6 Permanent core as part of bowl assembly
- 7 Analog or switch indicator option for predictive maintenance
- 8 Indicators sense delta P with no external oil-ways
- 9 Rugged design for mobile applications
- 10 Upgrade for spin-on can applications
- 11 Low cost manifold mount option available

12CS/50CS Series

The Smart Alternative to Spin-on Cans!

Patented Filter Element
Provides head-to-bowl seal

Cannot operate without
an element installed

Coreless Ecoglass Elements
Reduces disposal costs and
environmental impact

Ease-of-Service, environmentally
friendly

**Spin-on Assembly with
Reusable Bowl**
Improved, cost effective design

Easy to maintain

500 PSI Operating Pressure
Withstands pressure surges

Application versatility

**Option for Differential
Pressure Sensing including
an Analog 0-5V Output**
For predictive maintenance

No external oil-ways

WASTE.

NOT.

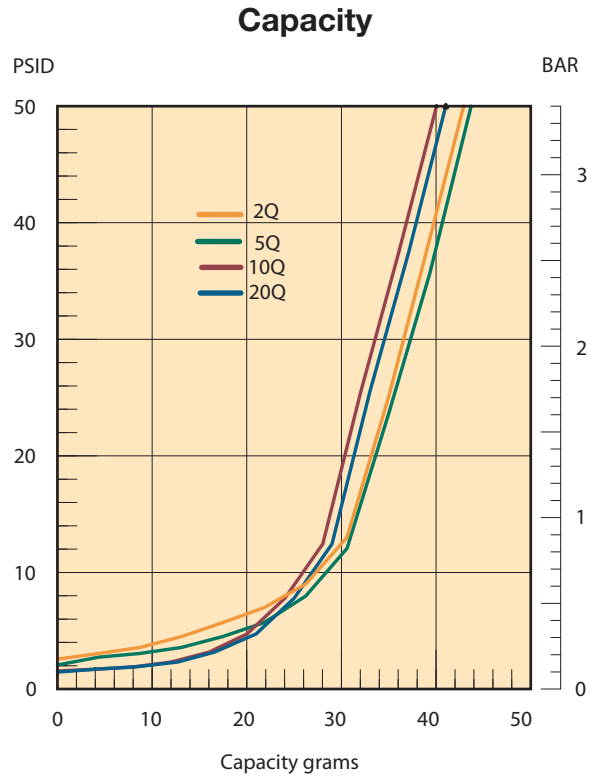
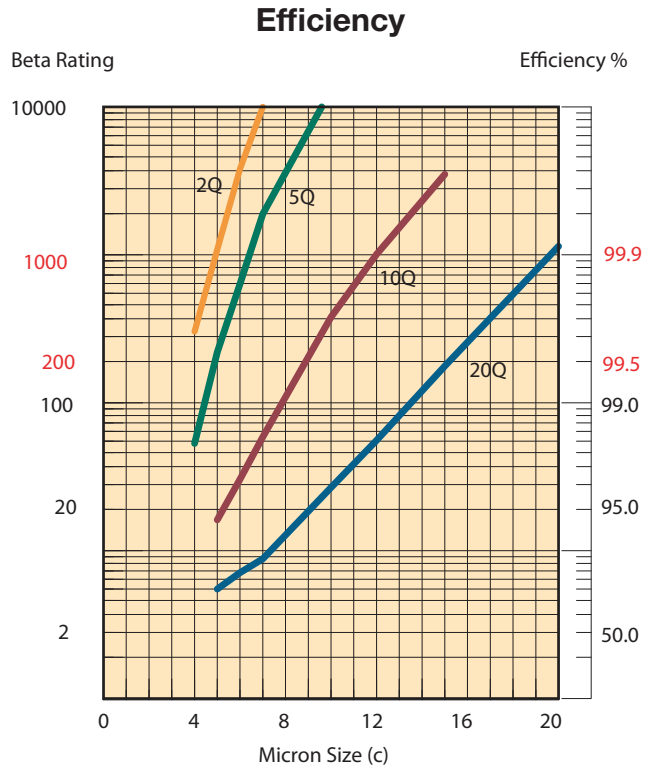
500,000,000+
spin-on cans disposed
of each year in North
American landfills.

30,000,000
gallons of discarded
residual waste oil.

250,000
tons of scrap metal.
Expensive disposal costs.

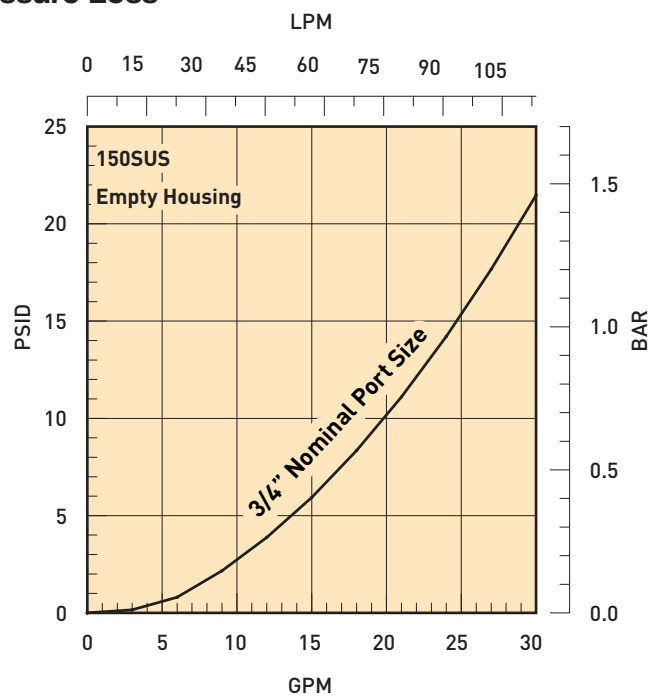
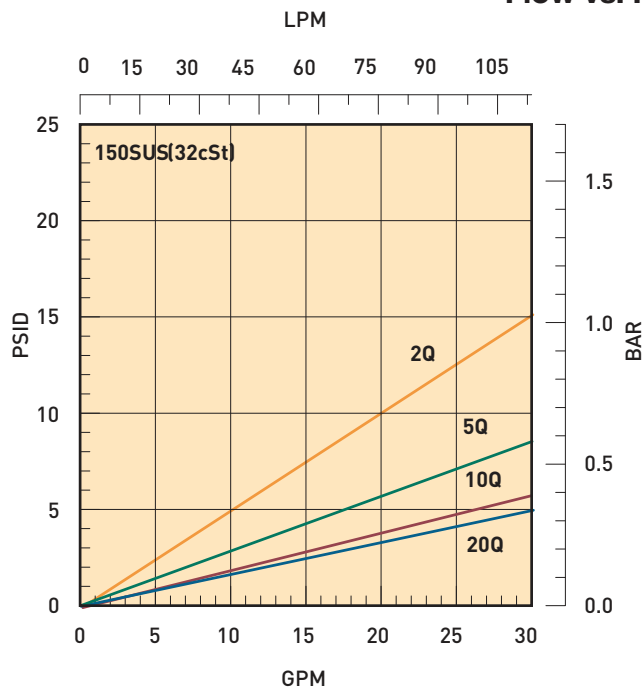
12CS Series

Performance



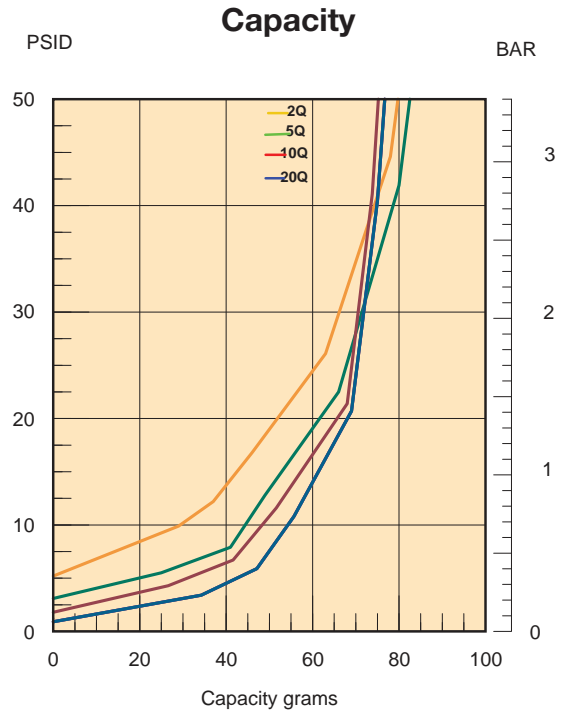
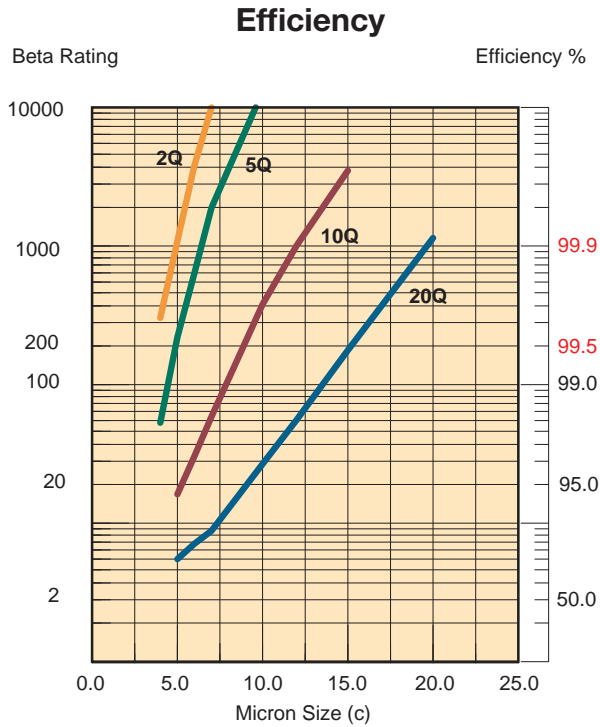
Results typical from Multi-pass tests run per test standard ISO 16889 @ 15 gpm to 50 psid terminal - 10 mg/L BUGL Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



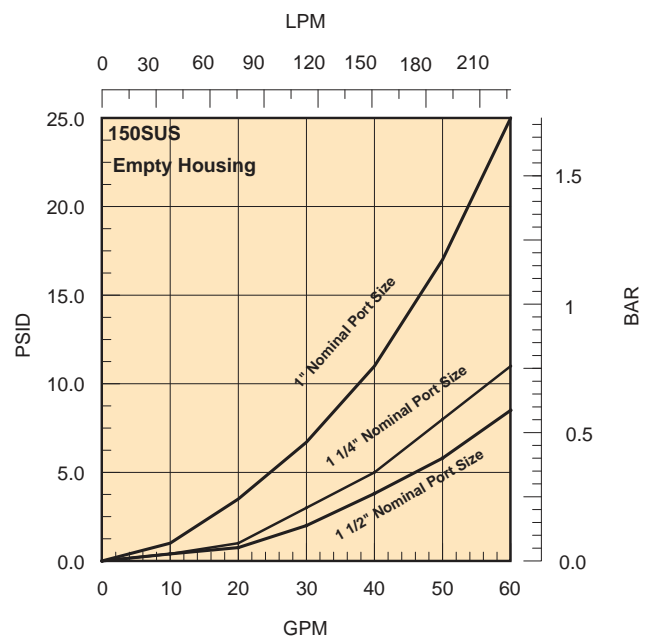
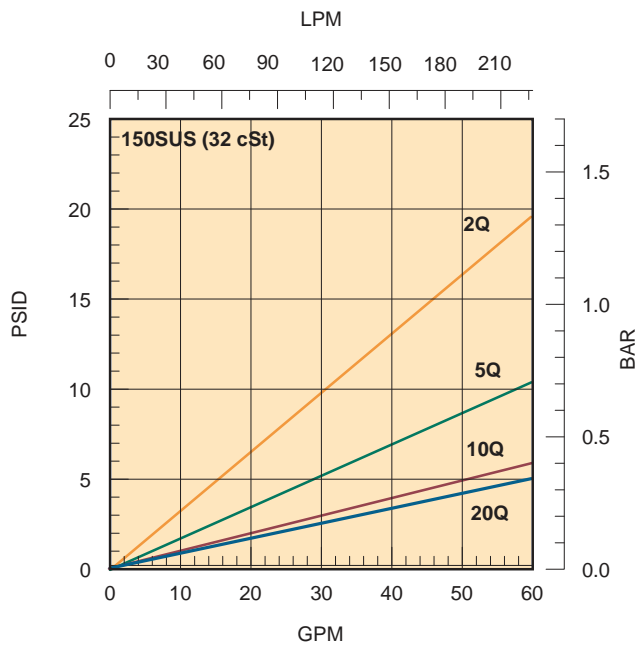
50CS Series

Performance



Results typical from Multi-pass tests run per test standard ISO 16889 @ 30 gpm to 50 psid terminal - 10 mg/L BUGL.
Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



12CS Series

Specifications

Pressure Ratings:

Maximum Allowable
Operating Pressure (MAOP):
500 psi (34.5 bar)

Fatigue: 400 psi (27.6 bar)
1,000,000+ cycles: 0-400 psi

Design Safety Factor: 2.5:1

Operating Temperatures:

Nitrile: -40°F to 225°F
(-40°C to 107°C)

Fluorocarbon: -15°F to 225°F
(-26°C to 107°C)

Element Collapse Rating:

150 psid (10.3 bar)

Weights (approximate):

12CS-2.....3 lbs. (1.4 kg)

Materials:

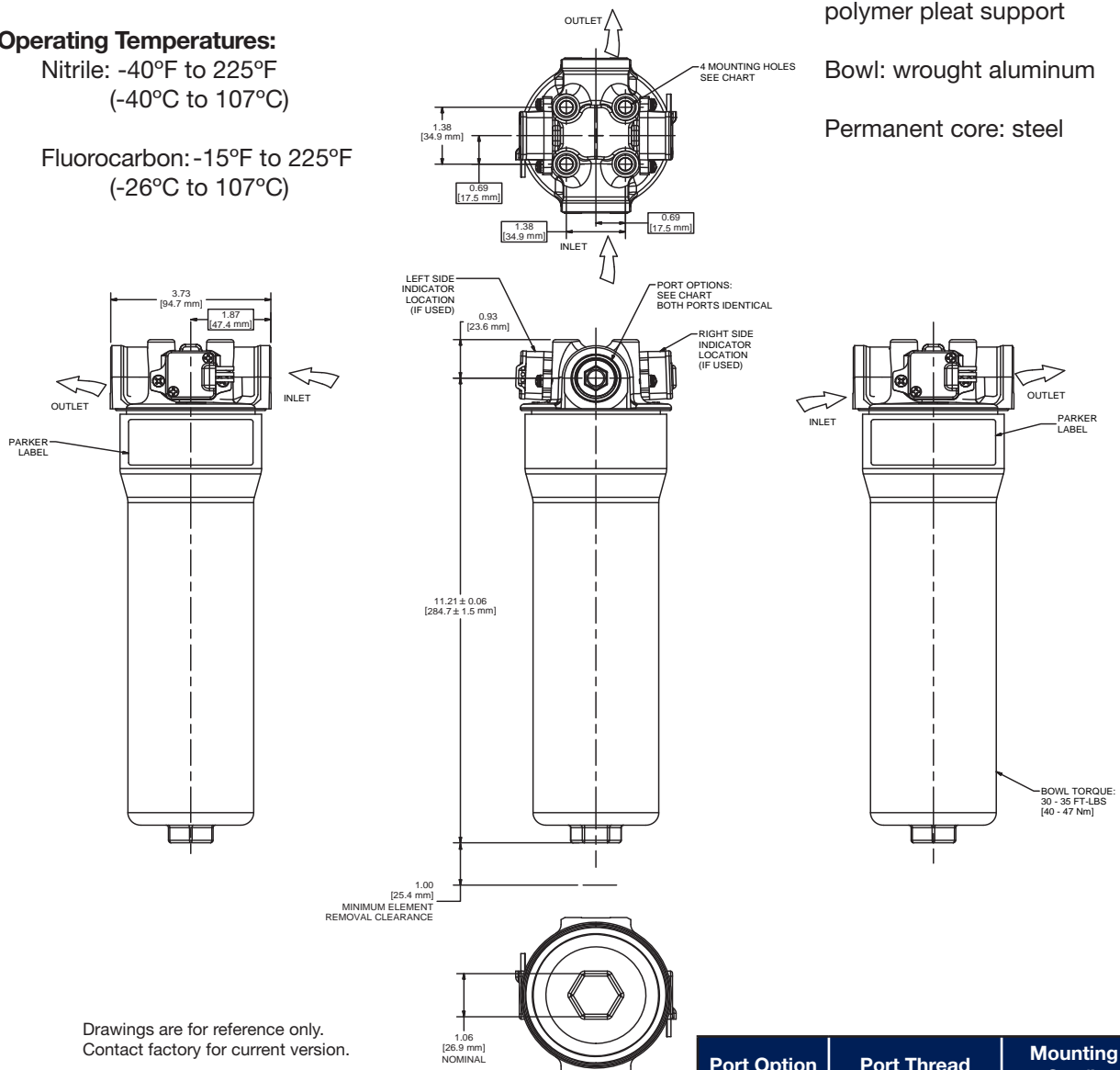
Head: cast aluminum

Bypass valve: nylon with
steel spring

Filter element: reinforced
polymer end caps,
microglass media, and
polymer pleat support

Bowl: wrought aluminum

Permanent core: steel



Drawings are for reference only.
Contact factory for current version.

| Port Option | Port Thread | Mounting Thread Configuration |
|-------------|------------------|-------------------------------|
| S12 | 1-1/16"-12 UN-2B | 3/8" x 16 x 5/8" |
| N12 | 3/4"-14 NPTF-1 | 3/8" x 16 x 5/8" |
| G12 | G3/4" BSPP | 3/8" x 16 x 5/8" |

50CS Series

Specifications

Pressure Ratings:

Maximum Allowable
Operating Pressure (MAOP):
500 psi (34.5 bar)

Fatigue: 400 psi (27.6 bar)
1,000,000 cycles: 0-400 psi

Design Safety Factor: 2.5:1

Operating Temperatures:

Nitrile: -40°F to 225°F
(-40°C to 107°C)

Fluorocarbon: -15°F to 225°F
(-26°C to 107°C)

Element Collapse Rating:

150 psid (10.3 bar)

Weights (approximate):

50CS-1.....6 lbs. (2.7 kg)

Materials:

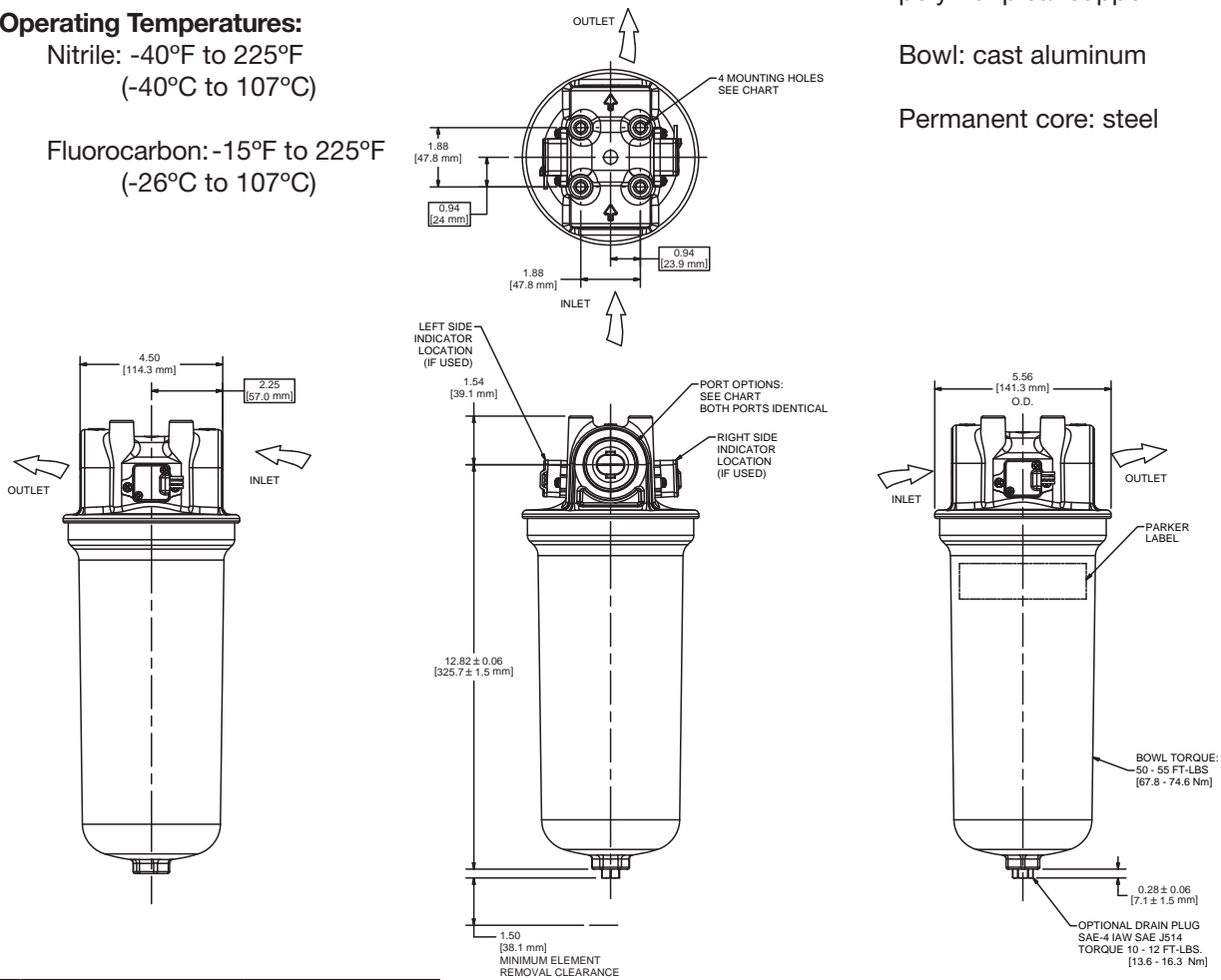
Head: cast aluminum

Bypass valve: nylon with
steel spring

Filter element: reinforced
polymer end caps,
microglass media, and
polymer pleat support

Bowl: cast aluminum

Permanent core: steel



| Port Option | Port Thread | Mounting Thread Configuration |
|-------------|--------------------|-------------------------------|
| S16 | 1-5/16"-12 UN-2B | 3/8" x 16 x 5/8" |
| S20 | 1-5/8"-12 UN-2B | 3/8" x 16 x 5/8" |
| S24 | 1-7/8"-12 UN-2B | 3/8" x 16 x 5/8" |
| N16 | 1"-11.5 NPT -1 | 3/8" x 16 x 5/8" |
| N20 | 1-1/4"-11.5 NPTF-1 | 3/8" x 16 x 5/8" |
| N24 | 1-1/2"-11.5 NPTF-1 | 3/8" x 16 x 5/8" |
| G20 | G1-1/4" BSP | M10 x 1.5 x 16 |

Drawings are for reference only.
Contact factory for current version.

12CS/50CS Series

Element Condition Indicators

1. Electrical Switch
 - Connector: 12" wire leads, 18 Gauge
 - Yellow (NC), black (NO), Red (C)
 - Maximum switching voltage: 30V (DC/AC)
 - Maximum switching current 0.2A
 - Maximum carry current: 0.5A
 - Approvals: CE, IP68

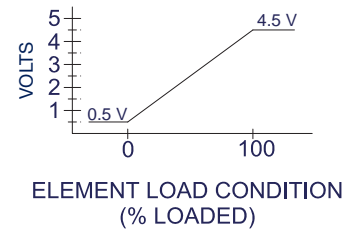
2. Analog Sensor
 - Supply voltage: 4.5 to 5.5 VDC
 - Main output current: 1 mA
 - Output voltage: Ratiometric (see graph)
 - Approvals: CE, IP68
 - Connector: 12" wire leads, 18 Gauge
 - Yellow (analog out)
 - Black (OV)
 - Red (supply +5 V)

3. Visual Indicator
 - Push to test
 - Battery operated
 - Visual LED

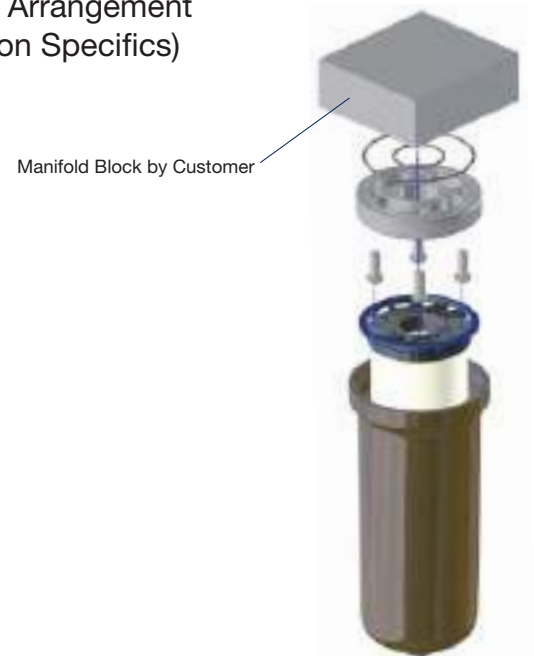
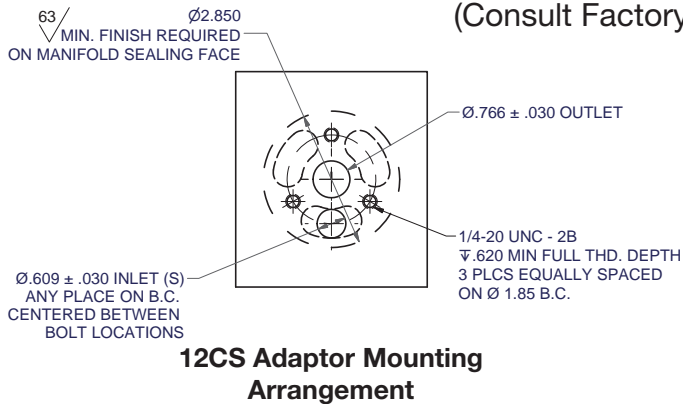


Electrical Switch
or Analog Sensor

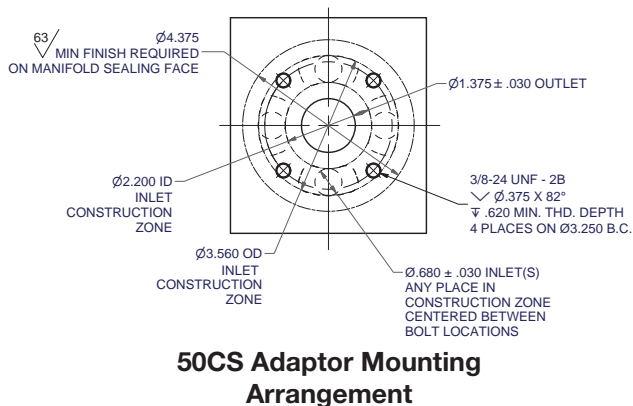
Visual Indicator



Suggested Manifold Mounting Arrangement (Consult Factory for Application Specifics)



Drawings are for reference only.
Contact factory for current version.



| Manifold Adaptor Kits* | | | | |
|------------------------|--------|--------|--------|--------|
| Media | 02QE | 05QE | 10QE | 20QE |
| 12CS | 942204 | 942205 | 942206 | 942207 |
| 50CS | 942208 | 942209 | 942210 | 942211 |

* Kit includes O-rings, adaptor, mounting screws, element and bowl.

12CS/50CS Series

Service Instructions

Filter element should be replaced as indicated by filter indicator or at specified service intervals recommended by the OEM.

Replacement element procedure

- A. Shut down system and release pressure in the filter line.
- B. Loosen bowl and remove rotating counter clockwise.
- C. Remove dirty element from filter head and discard.
- D. Lubricate element seals on clean element and install on filter head element locator.
- E. Install reusable bowl onto element and filter head. Tighten to specified torque.



Parts List

| Index | Description | 12CS | 50CS |
|--------------|---|----------------------|--------|
| 1 | Head Assembly (50 PSI electrical switch indicator ready) | | |
| | SAE-12 | 942249 | N/A |
| | 3/4" NPT | 942250 | N/A |
| | G3/4" BSPP | 942251 | N/A |
| | SAE-16 | N/A | 942259 |
| | SAE-20 | N/A | 942260 |
| | SAE-24 | N/A | 942261 |
| | 1" NPT | N/A | 942262 |
| | 1 1/4" NPT | N/A | 942263 |
| | 1 1/2" NPT | N/A | 942264 |
| G1 1/4" BSPP | N/A | 942265 | |
| 2 | Indicator | | |
| | Electrical | 941814 | 941814 |
| | Analog | 941802 | 941802 |
| | Mounting Screws | 941944 | 941944 |
| 3 | Element (see chart on next page) | | |
| 4 | Bowl Assembly | | |
| | Single - no drain | N/A | 942011 |
| | Single - w/ drain | N/A | 942012 |
| | Double - no drain | 942220 | N/A |
| 5 | Drain Plug SAE-4 | | |
| | Nitrile | N/A | 921088 |
| | Fluorocarbon | N/A | 928882 |
| 6 | Bypass (not shown) | | |
| | 50 psid | 928981 | 933424 |
| 7 | Manifold Adaptor Kit (see drawing on previous page) | | |
| | O-Ring (I.D.) | V92020 | V72135 |
| | O-Ring (O.D.) | V92038 | V72155 |
| | Manifold Adaptor | 941811 | 941986 |
| | Mounting Screws | 975689 | 942174 |
| | Element | see chart on page 85 | |
| | Bowl Assembly | see #4 above | |

12CS/50CS Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 12CS | 2 | 10QE | B | N | K | S12 | 1 |

| BOX 1: Filter Series | |
|----------------------|----------------|
| Symbol | Description |
| 12CS | 20 GPM nominal |
| 50CS | 40 GPM nominal |

| BOX 2: Element Length | |
|-----------------------|--------------------------|
| Symbol | Description |
| 1 | Single (50CS model only) |
| 2 | Double (12CS model only) |

| BOX 3: Media Code | |
|-------------------|-------------------------|
| Symbol | Description |
| 02QE | Ecoglass III, 2 micron |
| 05QE | Ecoglass III, 5 micron |
| 10QE | Ecoglass III, 10 micron |
| 20QE | Ecoglass III, 20 micron |

| BOX 4: Seals | |
|--------------|--------------------|
| Symbol | Description |
| B | Nitrile (NBR) |
| V | Fluorocarbon (FKM) |

| BOX 5: Indicator | |
|------------------|--|
| Symbol | Description |
| N | None |
| M ¹ | Visual indicator w/push to test, right |
| ML | Visual indicator w/push to test, left |
| E ¹ | Electrical w/12" flying leads, right |
| EL | Electrical w/12" flying leads, left |
| A ¹ | Analog w/12" flying leads, right |
| AL | Analog w/12" flying leads, left |

| BOX 6: Bypass | |
|---------------|------------------|
| Symbol | Pressure Setting |
| K | 50 PSI (3.5 bar) |

| BOX 7: Ports | |
|--------------|--------------------------------|
| Symbol | Description |
| 12CS | |
| S12 | SAE-12 integral threads |
| N12 | ¾" NPT integral threads |
| G12 | G¾" BSPP (ISO 228) |
| 50CS | |
| S16 | SAE-16 |
| S20 | SAE-20 |
| S24 | SAE-24 |
| N16 | 1" NPT |
| N20 | 1¼" NPT |
| N24 | 1½" NPT |
| G20 | G1¼" BSPP (ISO 228) |

| BOX 8: Options | |
|----------------|--------------------------------|
| Symbol | Description |
| 1 | None |
| 4 | Drain port on bowl (50CS only) |

Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.

Notes:

1. Consult factory.

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.



Replacement Elements (Ecoglass)

| Media | Filter Model (Nitrile Seals) | | Filter Model (Fluorocarbon Seals) | |
|-------|------------------------------|---------|-----------------------------------|---------|
| | 12CS-2 | 50CS-1 | 12CS-2 | 50CS-1 |
| 02QE | 940765Q | 940816Q | 937619Q | 940881Q |
| 05QE | 940764Q | 940817Q | 937618Q | 940882Q |
| 10QE | 940763Q | 940818Q | 937617Q | 940883Q |
| 20QE | 940762Q | 940819Q | 937622Q | 940884Q |



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



IL8 Series

Medium Pressure Filters



ENGINEERING YOUR SUCCESS.

IL8 Series

Applications

Applications for IL8 series filters

- Lube oil systems
- Power generation plants
- Test stands
- Primary metal equipment
- Pulp & paper equipment
- Offshore drilling and oil patch
- Flushing skids

IL8 series filters are excellent choices for your demanding applications whether you require simplex, duplex or quadplex assemblies.

Wherever high flow or high capacity filters are required, the IL8 series can be applied with confidence.

Filter housings have a simple yet critical job... securely contain the filter element with positive internal sealing.

The IL8 series filter housings are the result of careful engineering. High grade materials are used to provide strength at critical stress points.

The cover and base are anodized aluminum, the handle is nickel plated ductile iron and the bowl is rugged carbon steel. The result is a reliable high performance filter for an array of applications.



IL8 Series

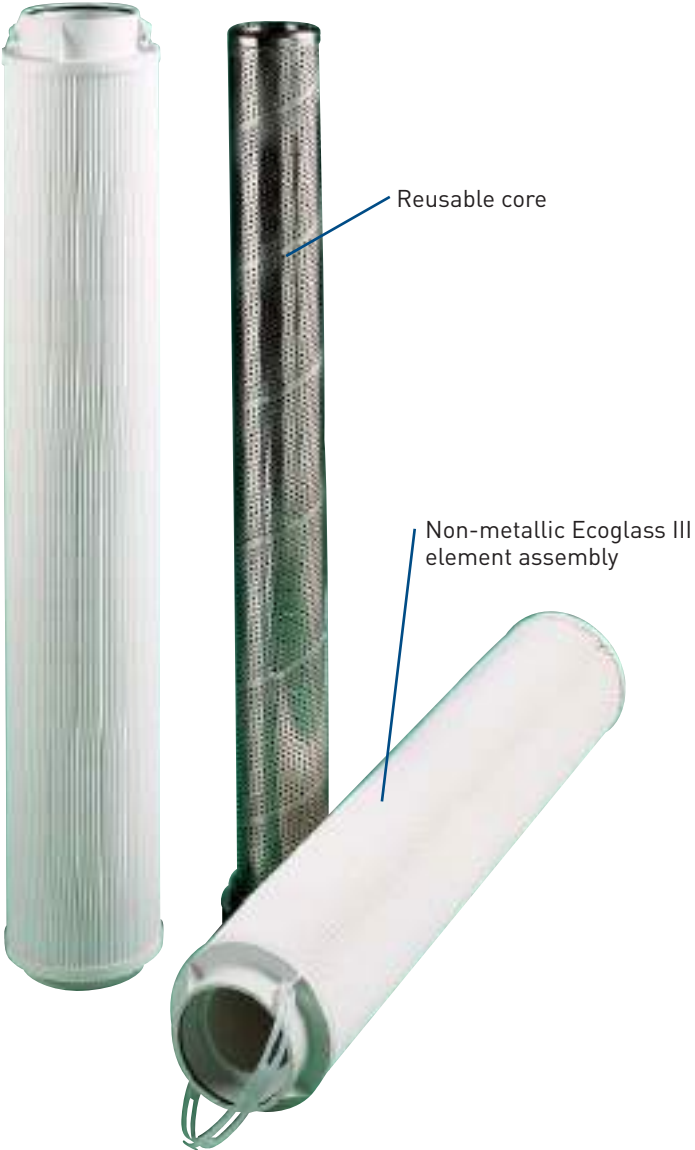
Element Features

Ecoglass III Replacement Elements

Ecoglass III represents the merging of high performance filtration technology with environmentally conscious engineering. The Ecoglass III line of replacement elements feature 100% non-metallic construction. The design reduces solid waste and minimizes disposal costs for industry. The non-metallic construction means lightweight elements (60% less weight) for easier servicing.

The Ecoglass III elements utilize the same proprietary media design as our Microglass III line of replacement elements.

With Ecoglass III, a reusable core is installed into the filter housing and remains in service throughout the life of the assembly.



Microglass III Replacement Elements

Microglass III represents a leap forward in the performance obtainable in hydraulic and lube filter elements.

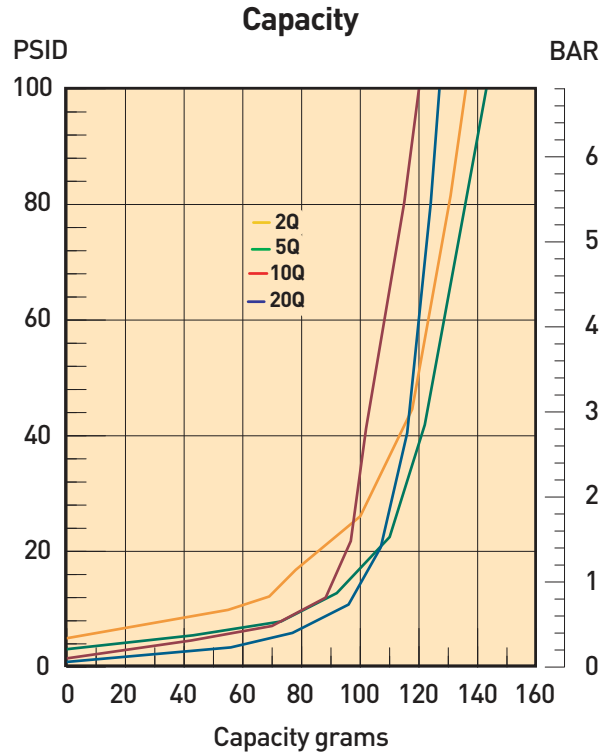
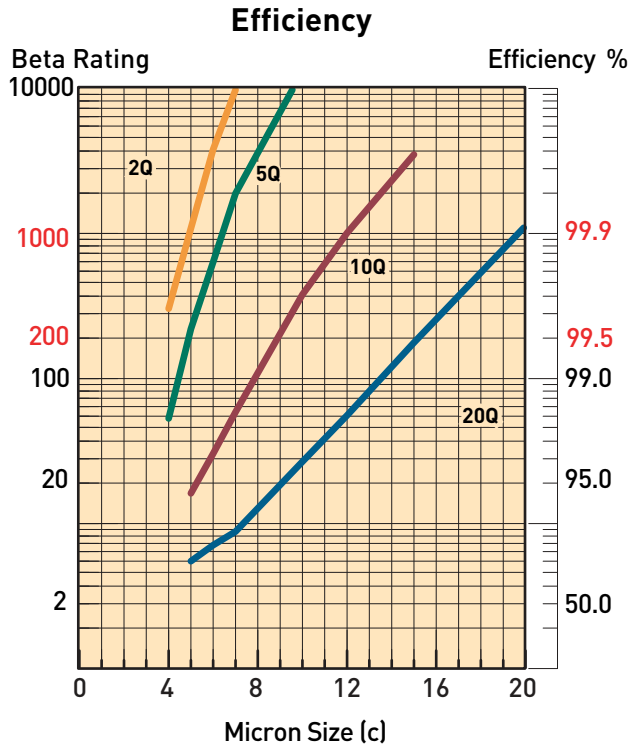
The unique multi-layer design combines high efficiencies with exceptional dirt holding capacities for performance that is unequalled in the industry today. This performance is further enhanced in the IL8 series with the introduction of the deep pleat design. The deep pleat element design increases the amount of media in the element and therefore capacity.

With Microglass III you do not have to make a compromise between efficiency and capacity, you can have both.



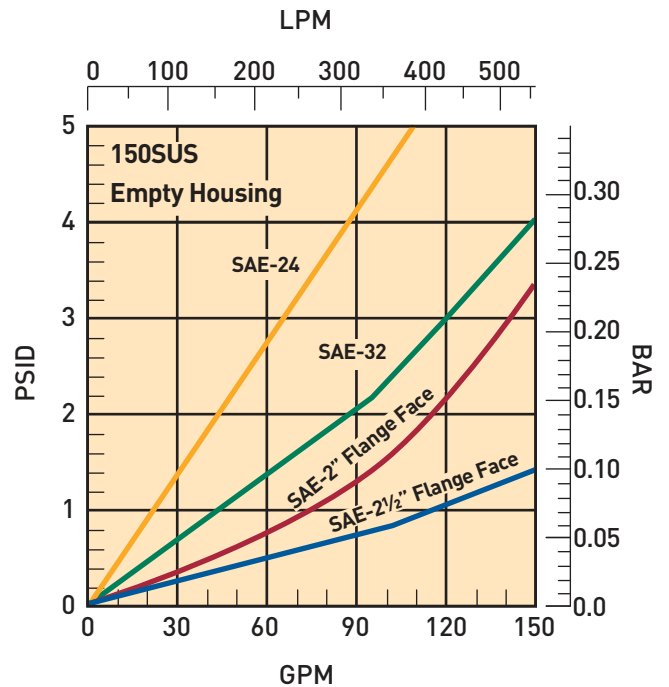
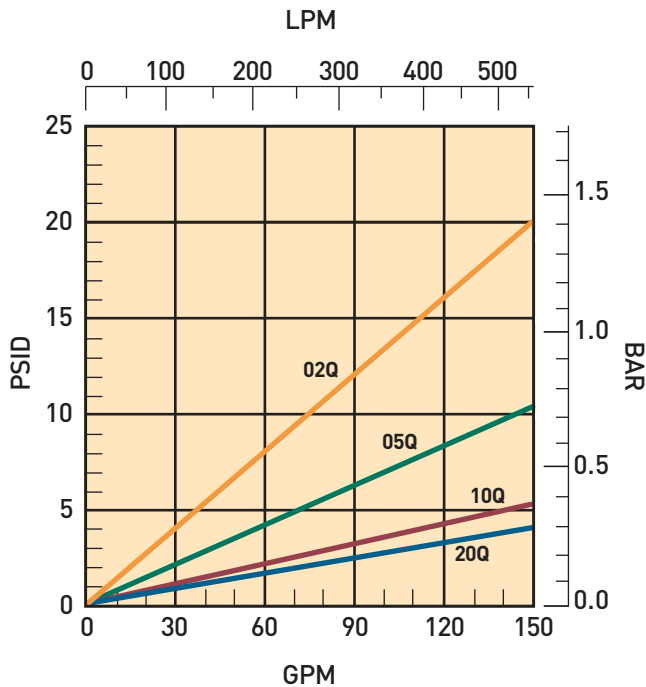
IL8 Series

IL8-1 Element Performance



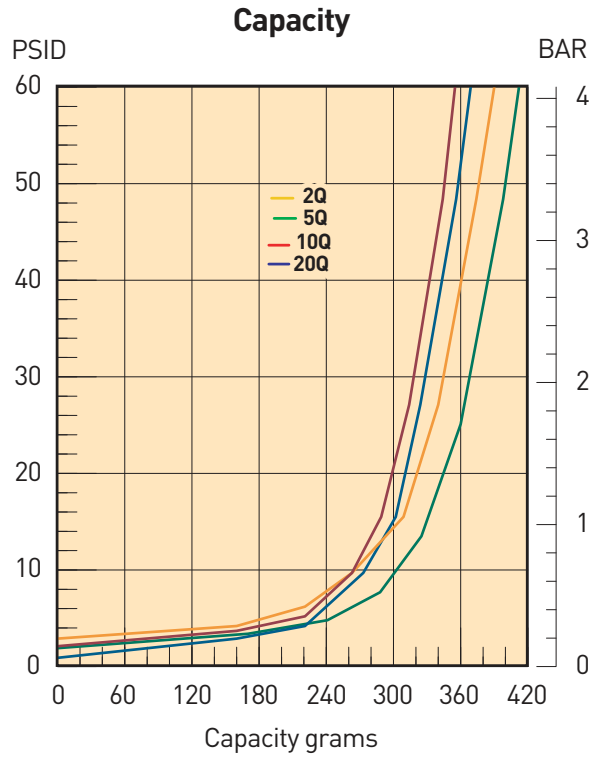
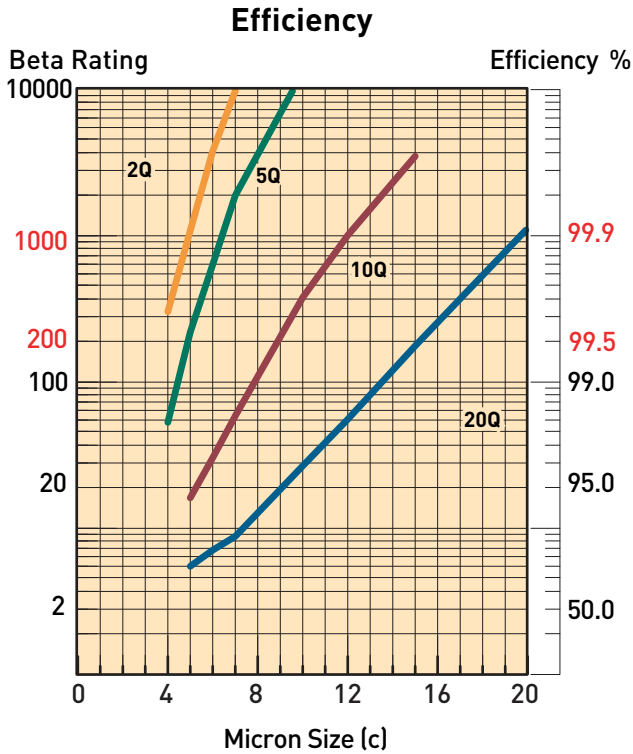
Results typical from Multi-pass tests run per test standard ISO 16889 @ 40 gpm to 60 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



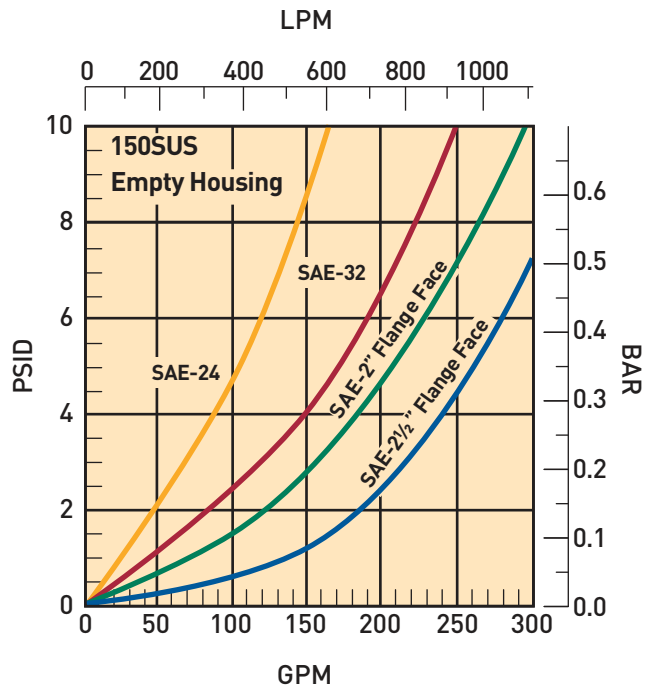
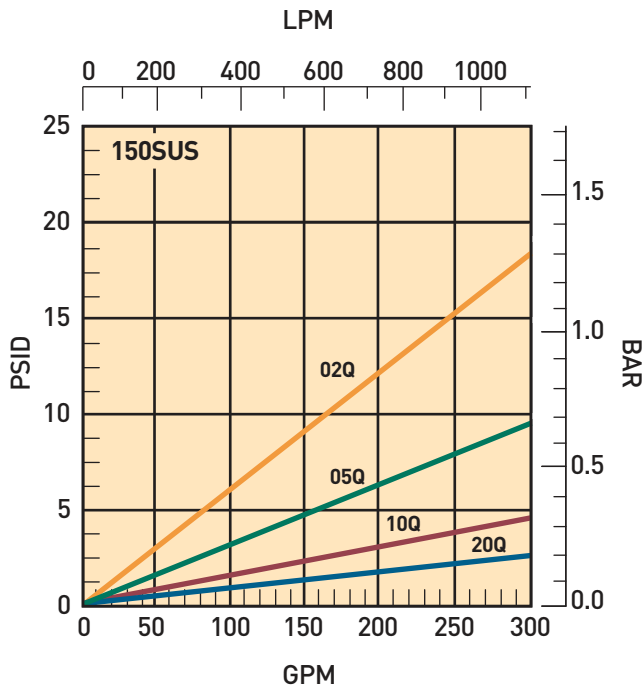
IL8 Series

IL8-2 Element Performance



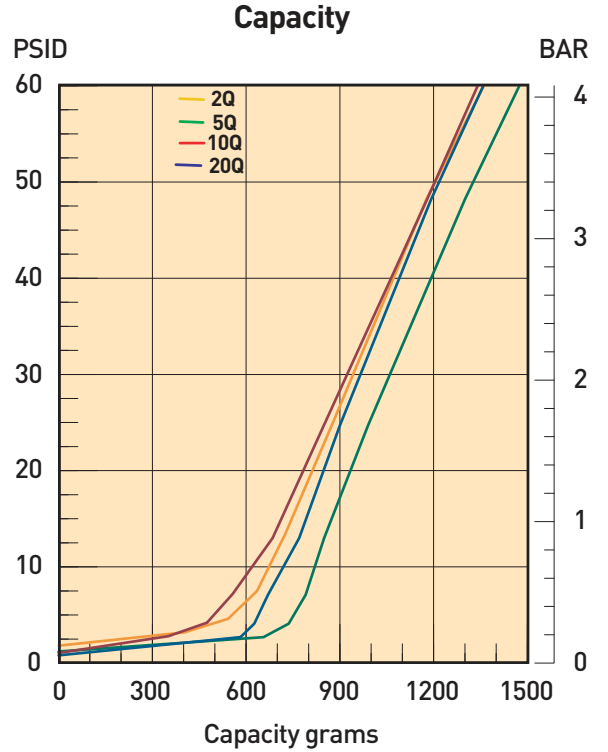
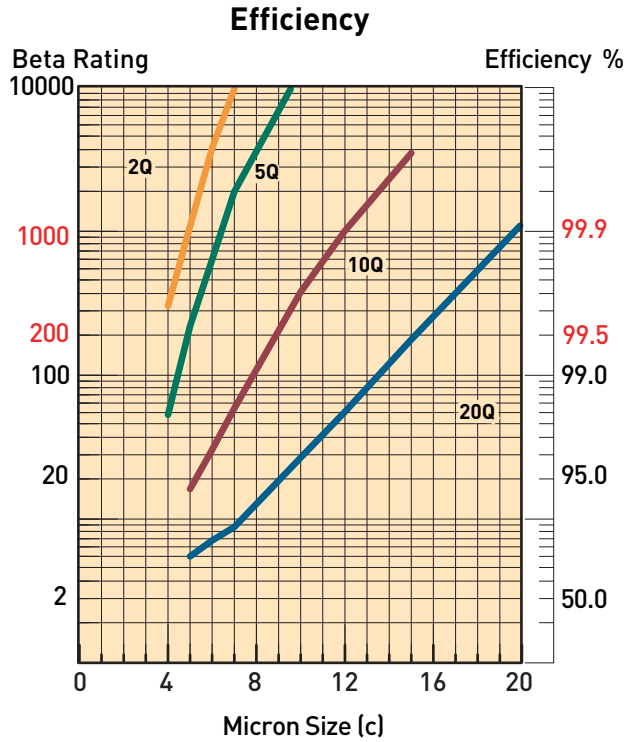
Results typical from Multi-pass tests run per test standard ISO 16889 @ 50 gpm to 60 psid terminal - 10 mg/L BUGL
Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



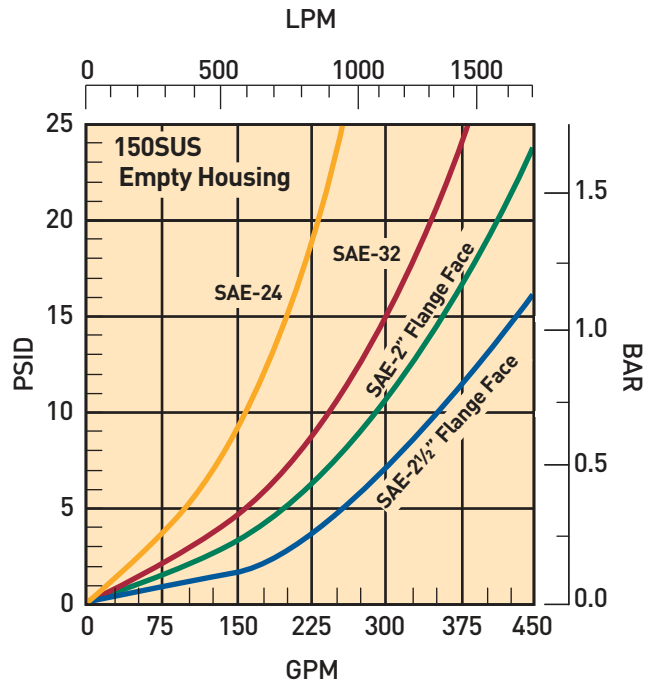
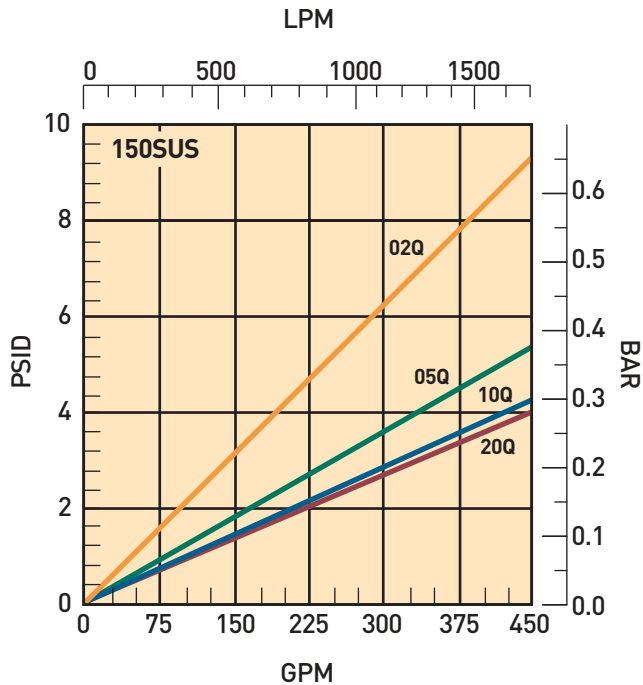
IL8 Series

IL8-3 Element Performance



Results typical from Multi-pass tests run per test standard ISO 16889 @ 50 gpm to 60 psid terminal - 10 mg/L BUGL
Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



IL8 Series

Specifications: IL8/LL8

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 500psi (34.5 bar)
 Rated Fatigue Pressure: 330psi (22.8 bar)
 Design Safety Factor: 3:1

Operating Temperatures:

Buna: -40°F (-40°C) to 225°F (107°C)
 Fluorocarbon: -15°F (-26°C) to 275°F (135°C)

Element Collapse Rating:

150 psid (10.3 bar)

Element Condition Indicators:

Visual (optional)
 Electrical -heavy duty (optional)
 SPDT .25 amps (resistive) MAX 5
 watts 12 to 28 VDC & 110 to 175 VAC
 Note: Product of switching voltage and current
 must not exceed wattage rating

Color Coding:

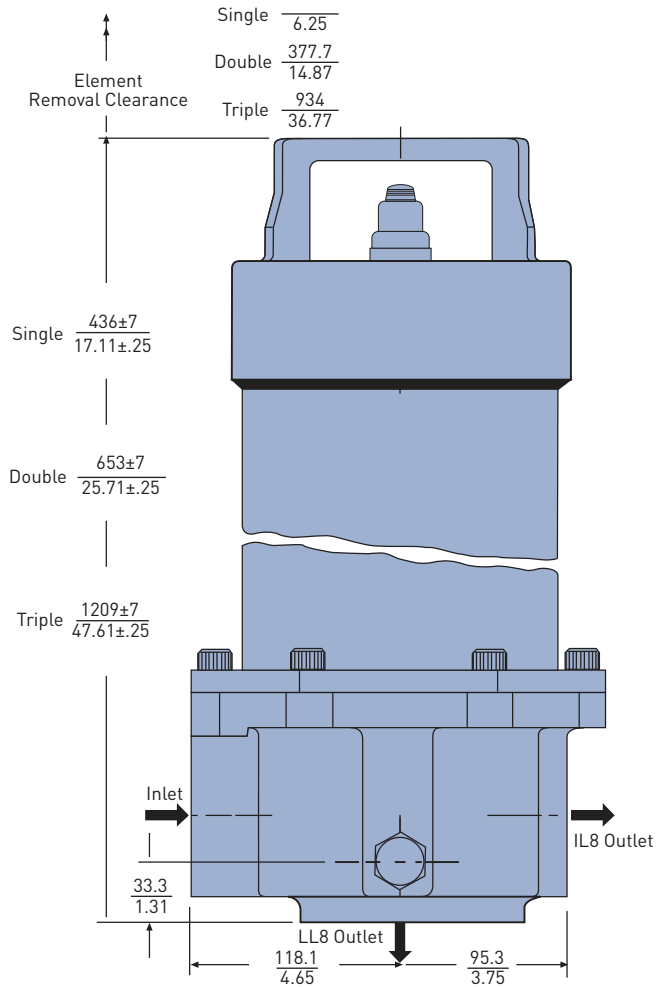
White (common)
 Black (normally open)
 Blue (normally closed)

Materials:

Bowl: low carbon steel
 Cover: anodized aluminum
 Handle: nickel plated ductile iron
 Base: anodized aluminum

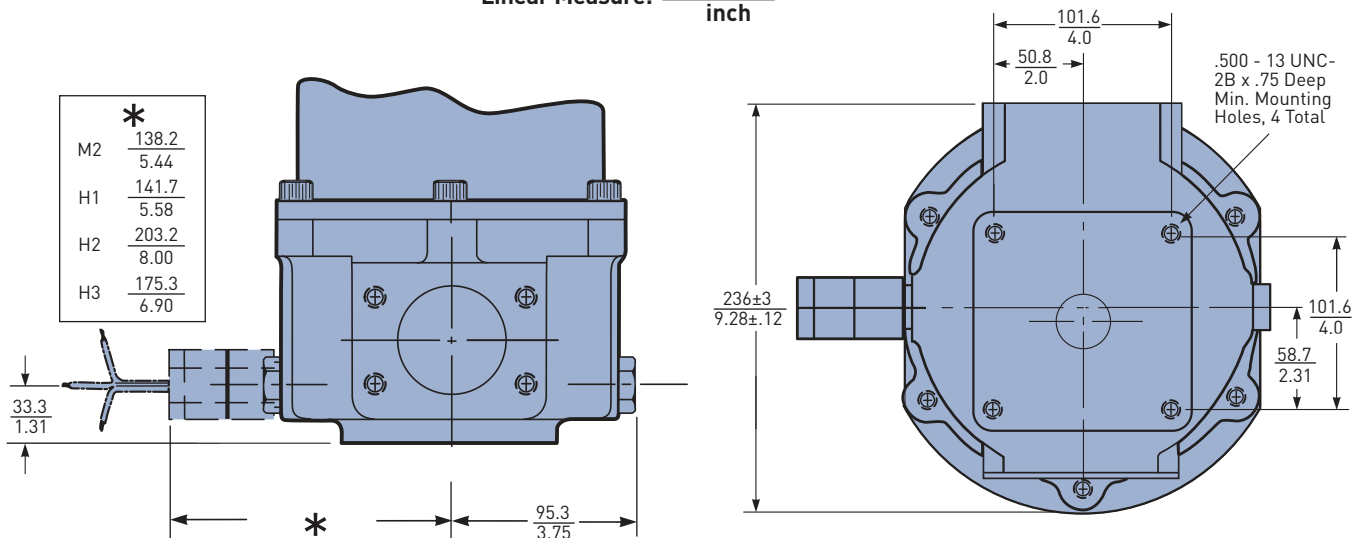
Shipping Weights (approximate):

Single: 40 lbs. (18.1 kg)
 Double: 50 lbs. (22.7 kg)
 Triple: 75 lbs. (34 kg)



Drawings are for reference only.
 Contact factory for current version.

Linear Measure: millimeter
inch



IL8 Series

Specifications: HDIL8/HQIL8

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 400psi (27.6 bar)
 Rated Fatigue Pressure: 330psi (22.8 bar)
 Design Safety Factor: 2.5:1

Operating Temperatures:

-15°F (-26°C) to 200°F (93°C)

Element Collapse Rating:

150 psid (10.3 bar)

Materials:

Changeover valve: steel
 Bowl: low carbon steel
 Cover: anodized aluminum
 Cover handle: nickel plated ductile iron
 Base: steel

Element Condition Indicators:

Visual (optional)
 Electrical-heavy duty (optional)
 SPDT .25 amps (resistive) MAX 5 watts
 12 to 28 VDC & 110 to 175 VAC
 Note: Product of switching voltage and current must not exceed wattage rating

Color Coding:

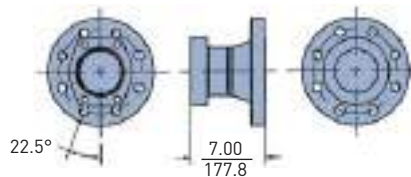
White (common)
 Black (normally open)
 Blue (normally closed)

Shipping Weights (approximate):

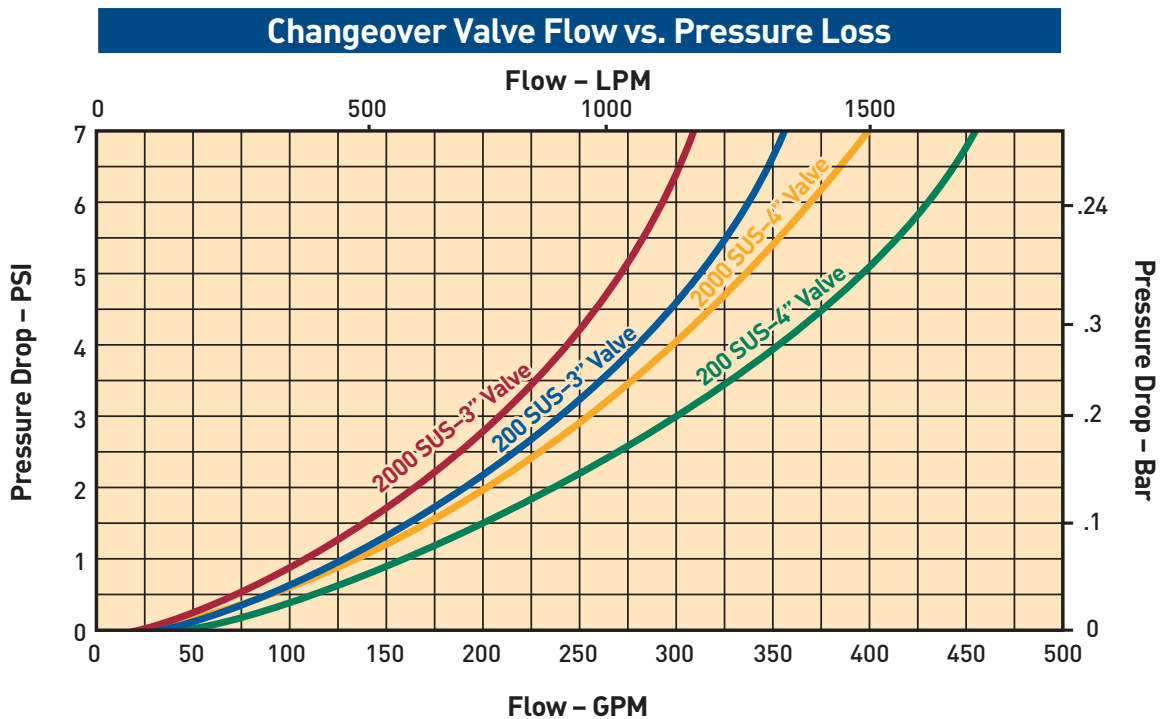
| | |
|---------|-------------------|
| HDIL8-2 | 320 lbs. (145 kg) |
| HDIL8-3 | 375 lbs. (170 kg) |
| HQIL8-2 | 525 lbs. (238 kg) |
| HQIL8-3 | 650 lbs. (295 kg) |

Ansi Flange Adapter

End, Side View



Linear Measure: $\frac{\text{millimeter}}{\text{inch}}$

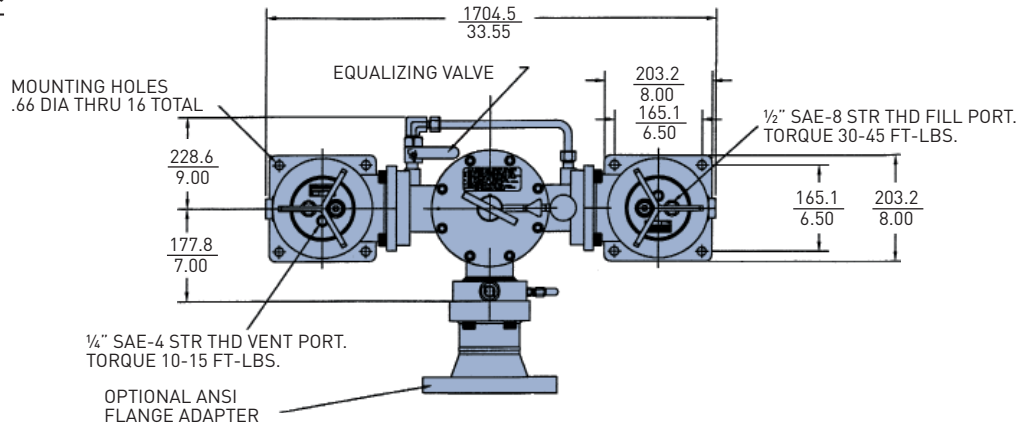


IL8 Series

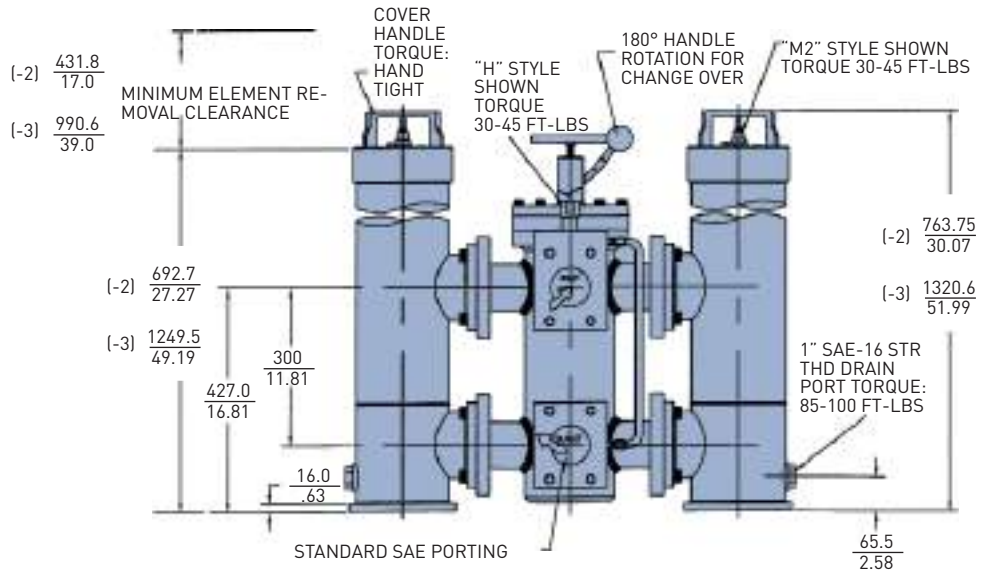
Specifications: HDIL8/HQIL8

Linear Measure: $\frac{\text{millimeter}}{\text{inch}}$

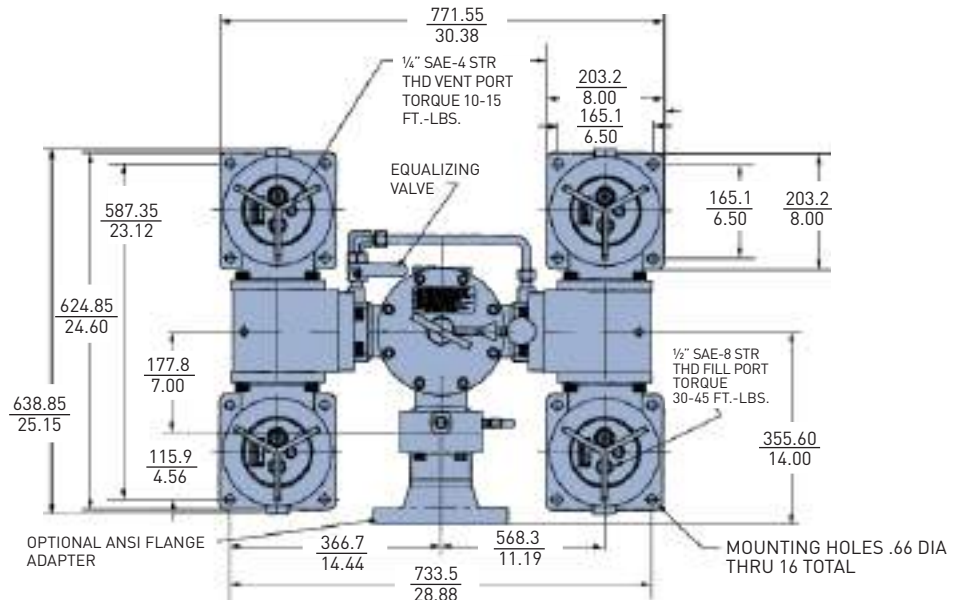
HDIL8 Top View



HDIL8/HQIL8 Side View



HQIL8 Top View



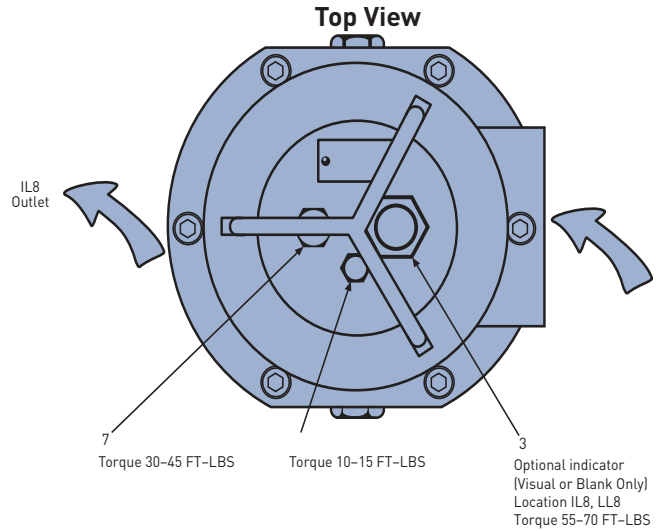
Drawings are for reference only.
Contact factory for current version.

IL8 Series

Element Servicing Instructions: IL8

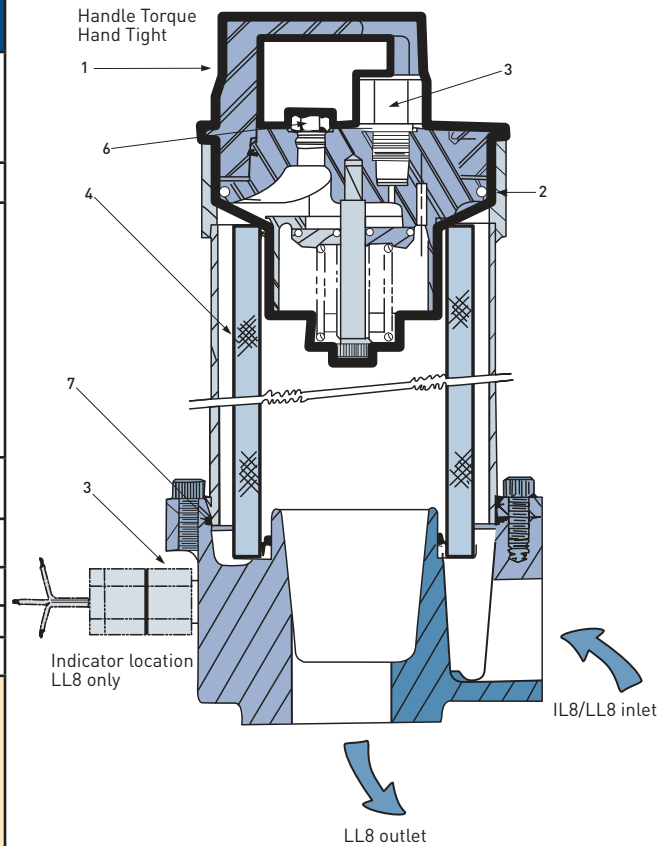
When servicing the IL8/LL8 filter, use the following procedure:

1. Stop the system's power unit.
2. Relieve pressure in the filter line. Drain fluid from housing if desired.
3. Rotate cover handle counter-clock wise. Carefully lift and remove the cover.
4. Remove element from the housing. Discard all disposable elements as they are not cleanable. With Ecoglass III elements the permanent core will remain in the housing.
5. Place new element in housing, centering it on the element locator in the bottom of bowl.
6. Inspect cover o-ring and replace if necessary.
7. Install cover, rotate clockwise and hand tighten.



Parts List

| Index | Description | Nitrile P/N | Fluorocarbon P/N |
|-----------|---|---|--|
| 1 | Cover Assembly 25 psi bypass w/indicator port 50 psi bypass w/indicator port No bypass w/indicator port | 928887 928889 928891 | 928888 928890 928892 |
| 2 | Cover o-ring | N72257 | V72257 |
| 3 | Indicators P option-indicator port plug M 225 PSI M 250 PSI H25 PSI H50 PSI H 225 PSI H 250 PSI H 325 PSI H 350 PSI | N/A N/A N/A N/A N/A N/A N/A N/A N/A | 925515 932026 932027 933053 932905 933141 933142 934164 934165 |
| 4 | Elements (See chart on model code page) | | |
| not shown | Bleed (vent) Plug, SAE 4 | 931357 | 931358 |
| 6 | Fill Plug, SAE 8 | 908822 | 928628 |
| not shown | Drain Port Plug, SAE 10 | 925513 | 928883 |
| 7 | Base O-ring | N72262 | V72262 |
| | Flange Kits (optional) 1 1/2" NPTF (w/2" flange face only) 2" NPTF (w/2" flange face only) SAE-24 (w/2" flange face only) 2 1/2" socket weld (w/2 1/2" flange face only) SAE-32 (w/2 1/2" flange face only) 2 1/2" NPTF (w/2 1/2" flange face only) | 924786 924785 924782 929314 929313 929315 | 926011 926010 926007 929346 929347 929348 |
| NOTE: | The 2 1/2" Flange Face Kits include the minimum width SAE J518 Code 61 Flanges. | | |



Drawings are for reference only. Contact factory for current version.

IL8 Series

Element Servicing Instructions: HDIL8/HQIL8

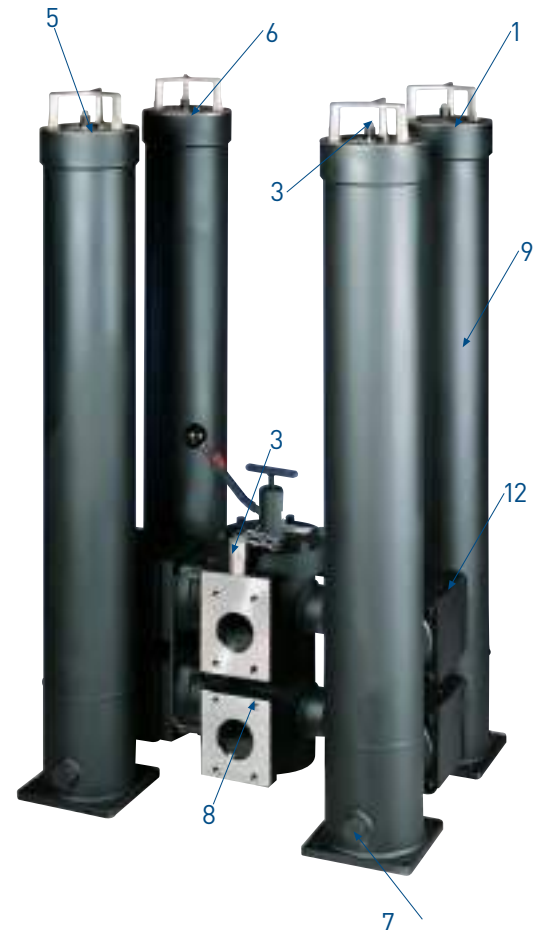
The system does not need to be shut down to service the elements.

1. Red arrow on operating handle points to on-duty chamber(s).
2. Open off-duty vent plug(s). Do not thread out completely.
3. Open the pressure equalizing (fill line) valve slowly to admit fluid to the off-duty chamber(s).
4. When fluid is discharged from the off-duty vent plug(s), close and tighten.
5. Turn the “T” handle, on the center valve section, counter-clockwise 5 turns.
6. Depress the operating handle to unseat the seal shoes, then rotate 180° and return handle upward into the opposite slot.
7. Turn the “T” handle fully clockwise and hand tighten only. This will seat the shoes.
8. Close the pressure equalizing valve.
9. Red arrow now points to the new on-duty chamber(s).
10. Open the new off-duty vent plug(s).
11. Remove the new off-duty chamber cover(s) by rotating counter-clockwise.
12. Remove the new off-duty drain plugs and drain chambers to desired level.
13. Follow steps 3 - 7 on opposite page.
14. Close and tighten the vent plug(s).

Warning: You should not rotate the handle until you equalize the pressure.

Parts List

| Index | Description | HDIL8 | | HQIL8 | |
|-------|---|------------------|------------------|------------------|------------------|
| | | Nitrile | Fluorocarbon | Nitrile | Fluorocarbon |
| 1 | Cover Assembly | 928887 | 928888 | 928887 | 928888 |
| | 25psi bypass w/indicator port | 928889 | 928890 | 928889 | 928890 |
| | 50psi bypass w/indicator port | 928891 | 928892 | 928891 | 928892 |
| | No bypass w/indicator port | | | | |
| 2 | Cover O-ring | N72257 | V72257 | N72257 | V72257 |
| 3 | Indicators | | | | |
| | P option-indicator port plug | N/A | 925515 | N/A | 925515 |
| | M2 25psi | N/A | 932026 | N/A | 932026 |
| | M2 50psi | N/A | 932027 | N/A | 932027 |
| | H 25psi | N/A | 933053 | N/A | 933053 |
| | H 50psi | N/A | 932905 | N/A | 932905 |
| | H2 25psi | N/A | 933141 | N/A | 933141 |
| | H2 50psi | N/A | 933142 | N/A | 933142 |
| | H3 25psi | N/A | 934164 | N/A | 934164 |
| | H3 50psi | N/A | 934165 | N/A | 934165 |
| 4 | Elements (see chart on model code page) | | | | |
| 5 | Bleed (vent) Plug SAE-4 | 931357 | 931358 | 931357 | 931358 |
| 6 | Fill Plug SAE-8 | 908822 | 928628 | 908822 | 928628 |
| 7 | Drain Plug SAE-16 | 925353 | 928364 | 925353 | 928364 |
| 8 | Transfer Valve | | | | |
| | SAE 4" SAE 3" | 933824 933825 | 936123 936122 | 933824 933825 | 936123 936122 |
| 9 | Housing Assembly | | | | |
| | Double length Triple length | 933832 933831 | 933832 933831 | 933832 933831 | 933832 933831 |
| 10 | 5/8"-11 x 3" SHCS | 933928 | 933928 | 933928 | 933928 |
| 11 | 5/8" Lock Washer | 933879 | 933879 | 933879 | 933879 |
| 12 | Adapter Block Kit (block, 3 o-rings, 12 bolts) | N/A | N/A | N/A | 933833 |
| 13 | Flange Adapter Kit (flange, o-ring, 4 bolts) | | | | |
| | 3" SAE 300 lb. flange 4" SAE 300 lb. flange | 934170 934172 | 934171 934173 | 934170 934172 | 934171 934173 |
| 14 | Seal Kit Transfer Valve | Consult factory | | Consult factory | |
| 15 | Seal Kit Housing Assembly | Consult factory | | Consult factory | |
| 16 | Equalizing Valve | Consult factory | | Consult factory | |



IL8 Series

How to Order

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 | BOX 9 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | HDIL8 | 2 | R | 20QE | HM2 | 25 | QQ | 1 |

| BOX 1: SEALS | |
|--------------|--------------|
| Symbols | Description |
| None | Nitrile |
| F3 | Fluorocarbon |

| BOX 2: Basic Assembly | |
|-----------------------|-------------------|
| Symbols | Description |
| IL8 | In-line |
| LL8 | 90° angle porting |
| HDIL8 | Duplex |
| HQIL8 | Quadplex |

| BOX 3: Basic Assembly | |
|-----------------------|---------------|
| Symbols | Description |
| 1 | Single length |
| 2 | Double length |
| 3 | Triple length |

| BOX 4: Core | |
|-------------|-----------------|
| Symbols | Description |
| None* | Disposable core |
| R | Reusable core |

*Single length only

| BOX 5: Element Media | |
|----------------------|----------------|
| Symbols | Description |
| 20QE | Ecoglass III |
| 10QE | Ecoglass III |
| 05QE | Ecoglass III |
| 02QE | Ecoglass III |
| 20Q | Microglass III |
| 10Q | Microglass III |
| 05Q | Microglass III |
| 02Q | Microglass III |

Note: Microglass III elements only available in single length, and must utilize.

| BOX 6: Indicators | |
|-------------------|---|
| Symbol | Description |
| P | Port plugged |
| M2 | Visual auto reset |
| H | Electrical w/ conduit connection |
| H2 | Electrical w/ DIN 43650 connector |
| H3 | Electrical w/ 3-pin ANSI/B 93.55M connector |
| E | Electrical/Visual (w/ 1/2" NPT conduit connection and wire leads) |

Note: Two symbols required, first is for housing, the second is for the cover(s). Electrical indicators only available on the housing

| BOX 7: Bypass & Indicator Setting | |
|-----------------------------------|---------------------------------|
| Symbols | Description |
| 25 | 25 psid |
| 50 | 50 psid |
| XX | No indicator and blocked bypass |

| BOX 8: Ports | |
|--------------|---|
| Symbols | Description |
| | IL8/LL8 |
| PP | SAE-24 straight thread |
| RR | SAE-32 straight thread |
| YY | SAE 2" flange face |
| ZZ* | SAE 2-1/2" flange face |
| | * Note: IL8 outlet port requires minimum width SAE J518 code 61 flange. |
| | HDIL8/HQIL8 |
| WW | 3" SAE flange face (code 61) |
| QQ | 4" SAE flange face (code 61) |

| BOX 9: Option | |
|---------------|----------------|
| Symbols | Description |
| 1 | None |
| 11 | Blocked bypass |

Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.

Replacement Elements

| Microglass III (Fluorocarbon) | | | | Ecoglass III (Fluorocarbon) | | | |
|-------------------------------|---------|---------|---------|-----------------------------|--------|---------|---------|
| Media | Single | Double | Triple | Media | Single | Double | Triple |
| 20Q | 929099Q | 933047Q | 932875Q | 20QE | N/A | 933837Q | 933736Q |
| 10Q | 927661Q | 933046Q | 932874Q | 10QE | N/A | 933836Q | 933735Q |
| 05Q | 927861Q | 933045Q | 932873Q | 05QE | N/A | 933835Q | 933612Q |
| 02Q | 927663Q | 933044Q | 932872Q | 02QE | N/A | 933834Q | 933734Q |
| WR | 929103 | 929109 | 932006 | Reuseable Core | N/A | 933838 | 933636 |

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.





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pneumatics
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15/40/80CN Series

Coreless Medium Pressure Filters



ENGINEERING YOUR SUCCESS.

15/40/80CN Series

Applications

- Compressor Lube Oil
- Off-line Filter Loops
- Machine Tools
(Automotive Standard)
- Hydrostatic Drive
Charge Pumps
- Mobile Equipment
- Pilot Lines For Servo Controls
- Oil Patch Drilling Equipment
- Injection Molding

This partial list of applications for Parker “CN” series filters has a common factor, the need for an economical, medium pressure range filter with excellent fatigue pressure ratings. Prior to the availability of the “CN” filter, applications such as those listed were restricted by limitations of a spin-on can, or forced into the higher cost range of high pressure filters.

The “CN” series fills this gap, and now with the newly increased fatigue rating from 550 to 800 psi, the applications are expanded.

Ecoglass III Replacement Elements

Ecoglass III represents the merging of high performance filtration technology with environmentally conscious engineering. The Ecoglass III line of replacement elements feature 100% non-metallic construction. The design reduces solid waste and minimizes disposal costs for industry. The non-metallic construction means lightweight elements (60% less weight) for easier servicing.

The Ecoglass III elements utilize the same proprietary media design as our Microglass III line of replacement elements.

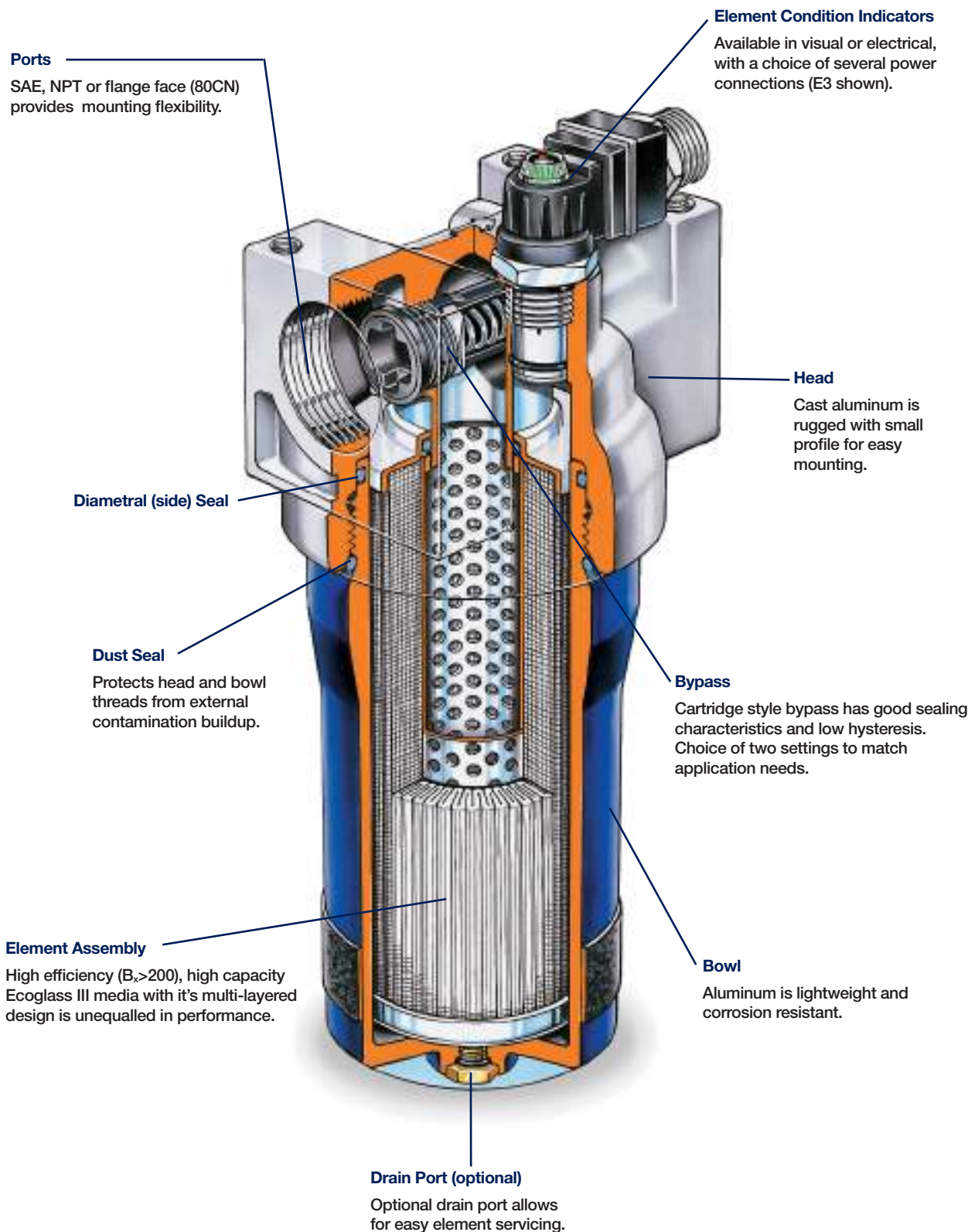
With Ecoglass III, a reusable core is installed into the filter housing and remains in service throughout the life of the assembly.



| Features | Advantages | Benefits |
|--|--|---|
| <ul style="list-style-type: none"> • 800 psi fatigue rating (eight times that of a spin-on) | <ul style="list-style-type: none"> • Ability to provide reliable service under tough cyclic operating conditions • Can be utilized in applications where high pressure filters may have been only option | <ul style="list-style-type: none"> • Reduced downtime due to premature filter failures • Reduced costs, better “fit” for the application |
| <ul style="list-style-type: none"> • Diametral (side) seal between head and bowl • Dust Seal | <ul style="list-style-type: none"> • Proven reliability in cyclic applications • Reduced importance of bowl torque • Prevents contamination from building up on bowl / head threads | <ul style="list-style-type: none"> • No downtime, no leaks • Performs with “real world” service • Easier service, no galling |
| <ul style="list-style-type: none"> • Cast aluminum head | <ul style="list-style-type: none"> • Low profile, lightweight and durable | <ul style="list-style-type: none"> • Less weight, smaller envelop and cleaner appearance |
| <ul style="list-style-type: none"> • Standard Ecoglass III elements | <ul style="list-style-type: none"> • Multi-layered design produced high capacity and efficiency • Reduces pleat bunching, keeps performance consistent | <ul style="list-style-type: none"> • Great performance value • Reliable performance throughout element life • Reduces downtime, maximizes element life |
| <ul style="list-style-type: none"> • Complete performance data disclosure | <ul style="list-style-type: none"> • All pertinent information is provided in an easy-to-compare format | <ul style="list-style-type: none"> • No hidden deficiencies • Easy selection of proper filtration |
| <ul style="list-style-type: none"> • Visual, electrical or electrical/visual indicators available | <ul style="list-style-type: none"> • Check element condition at a glance • Right style for the application | <ul style="list-style-type: none"> • Optimize element life, prevent bypassing • Matches your system electrical connections |

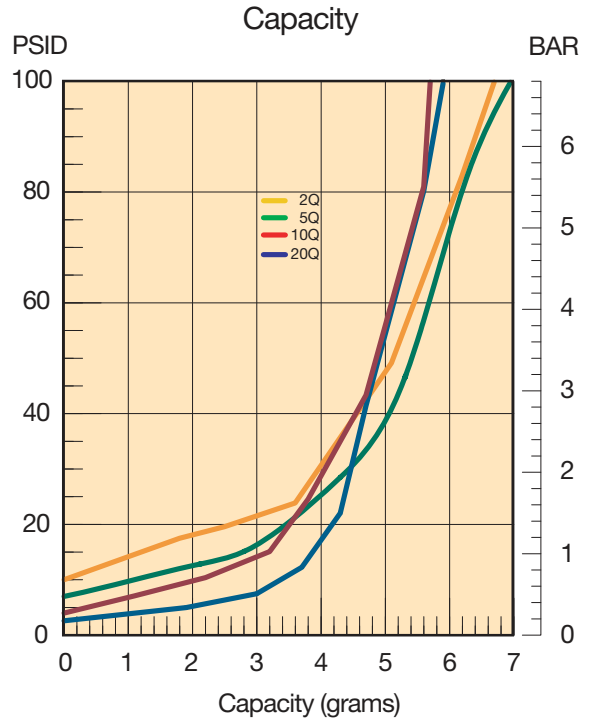
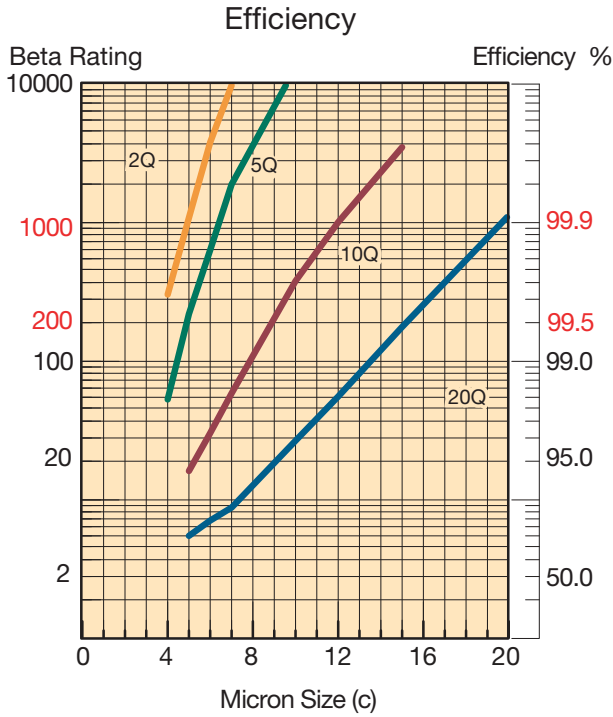
15/40/80CN Series

Features



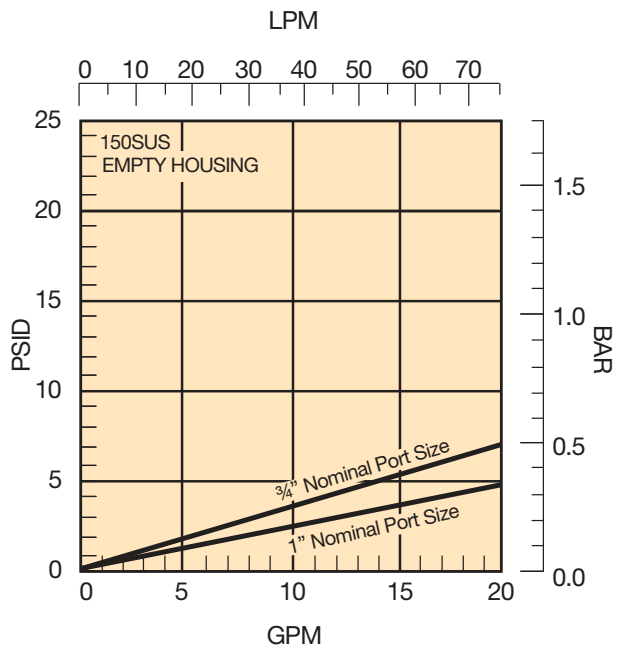
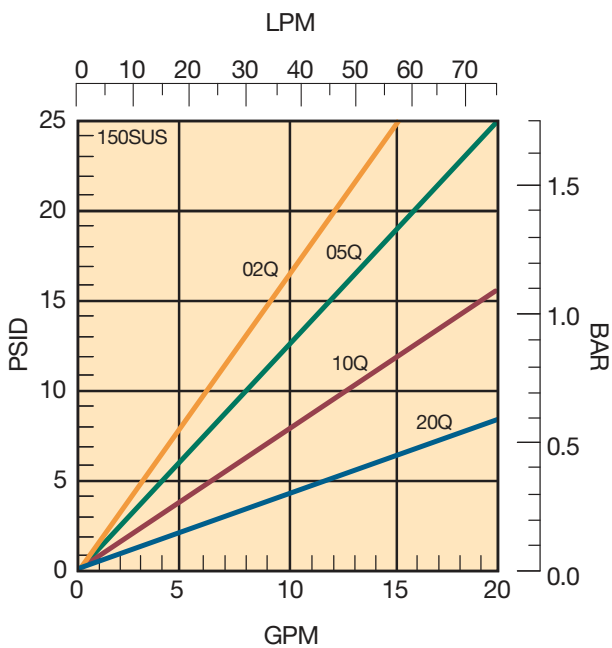
15CN Series

15CN-1 Element Performance



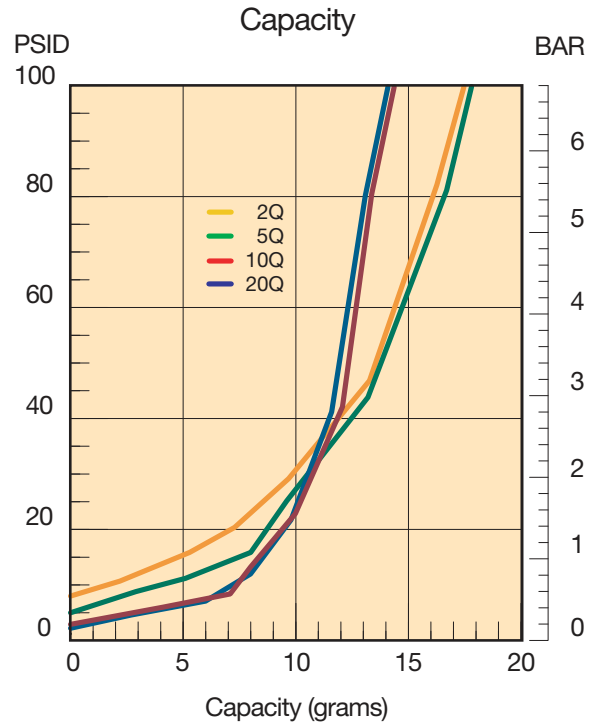
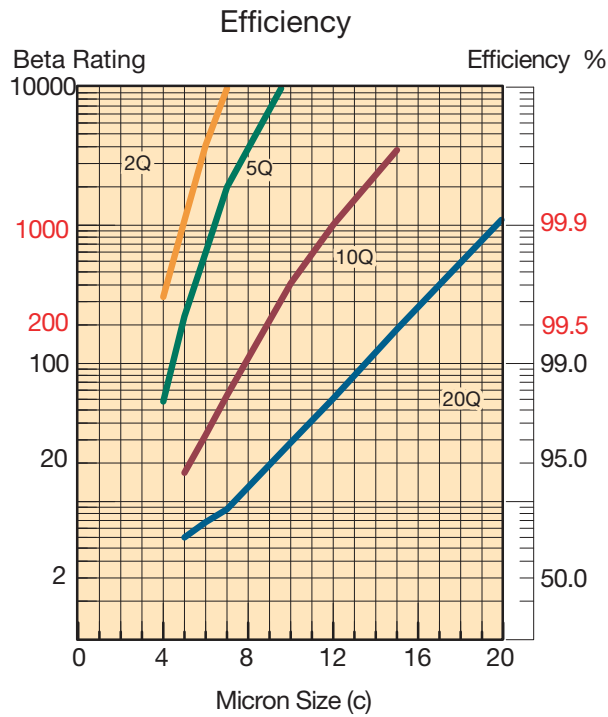
Results typical from Multi-pass tests run per test standard ISO 16889 @ 10 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



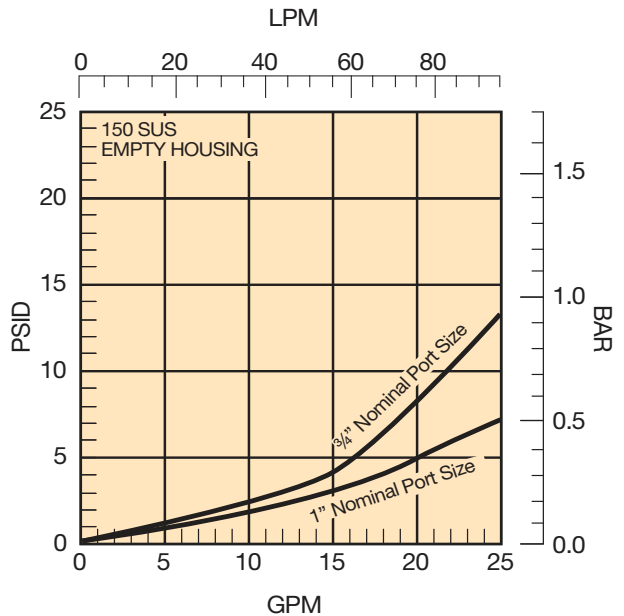
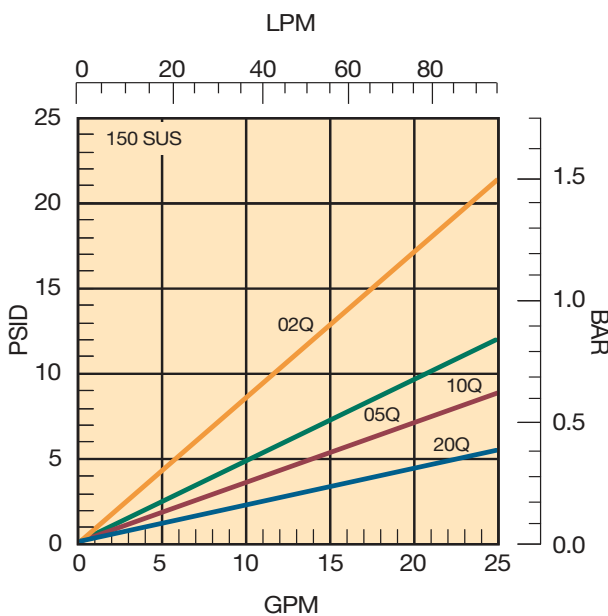
15CN Series

15CN-2 Element Performance



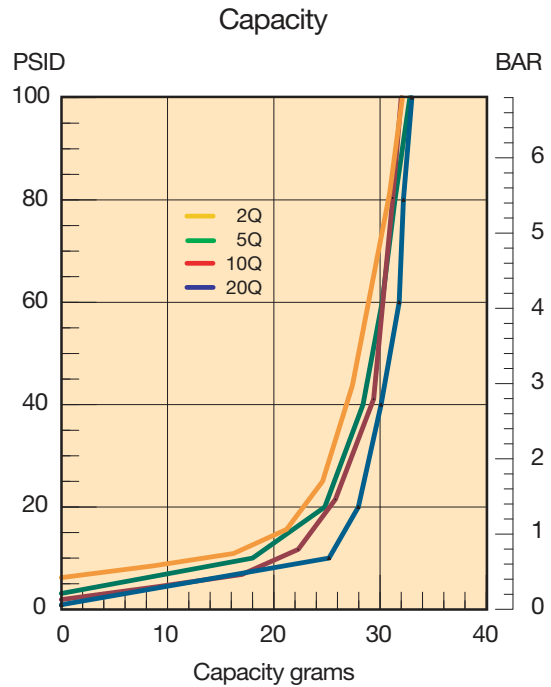
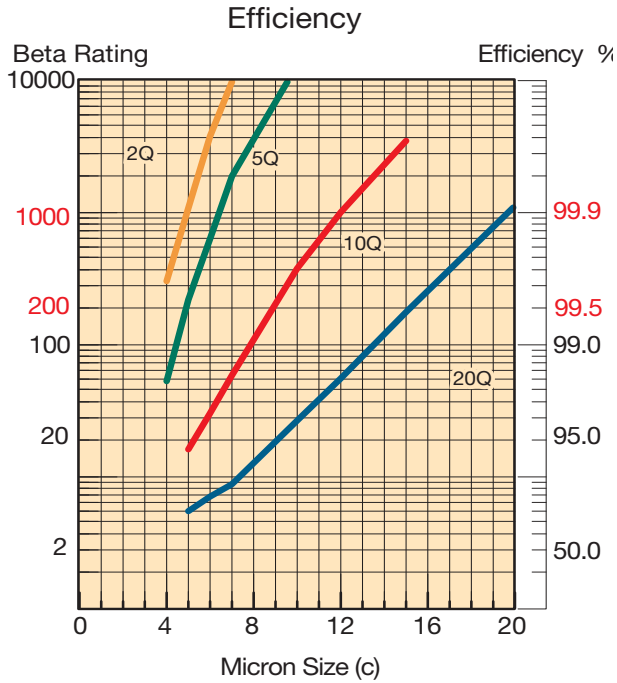
Results typical from Multi-pass tests run per test standard ISO 16889 @ 15 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



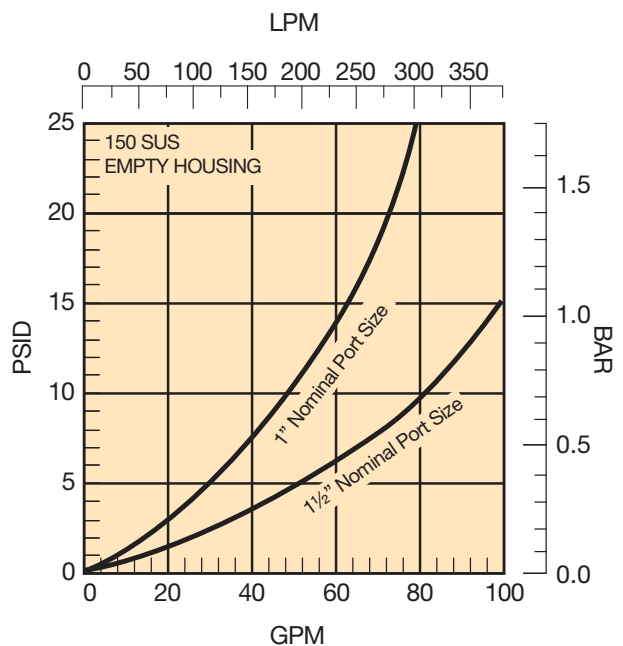
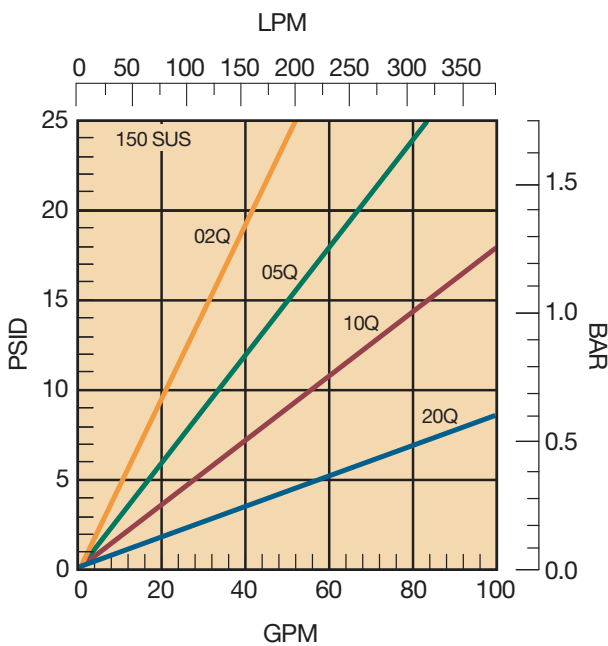
40CN Series

40CN-1 Element Performance



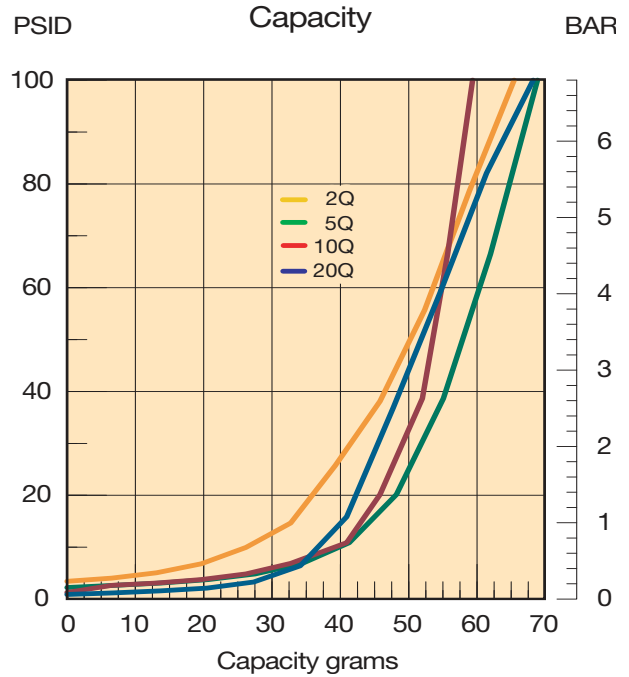
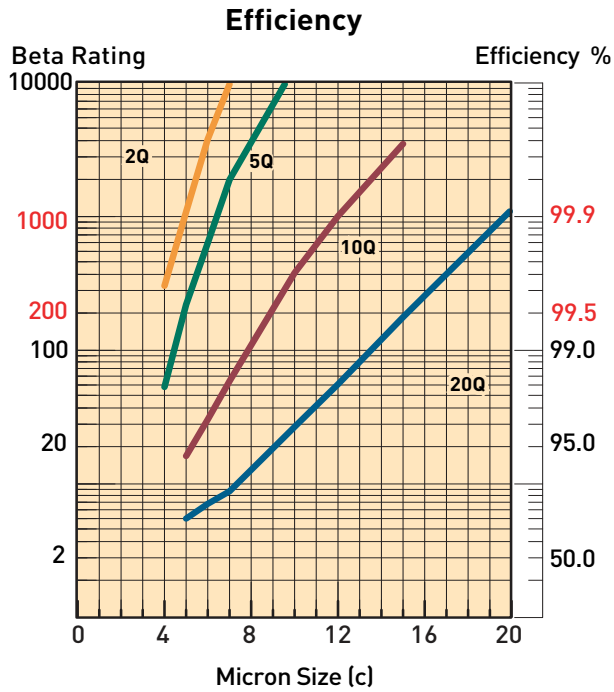
Results typical from Multi-pass tests run per test standard ISO 16889 @ 15 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



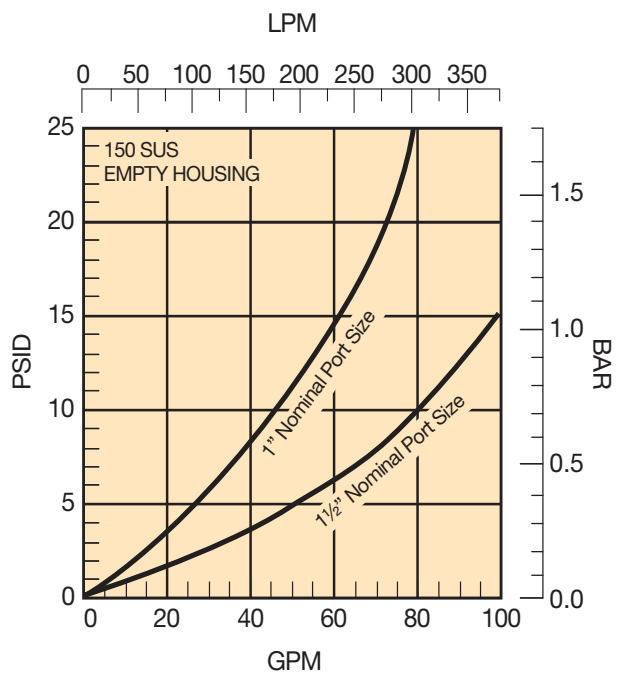
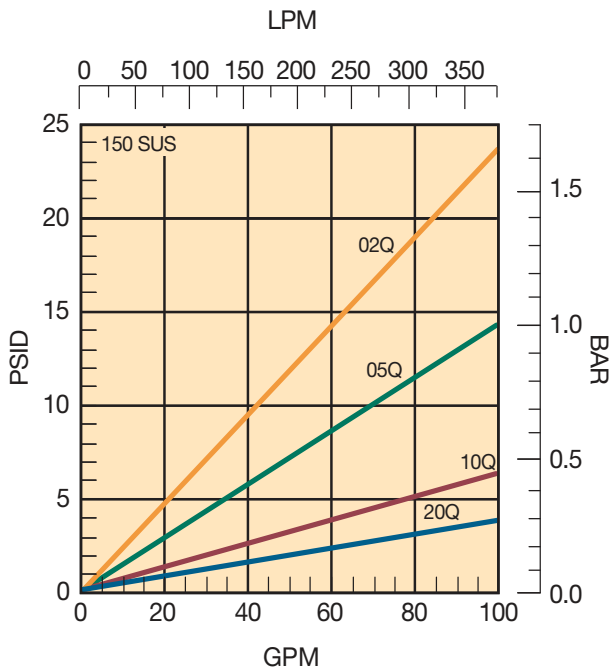
40CN Series

40CN-2 Element Performance



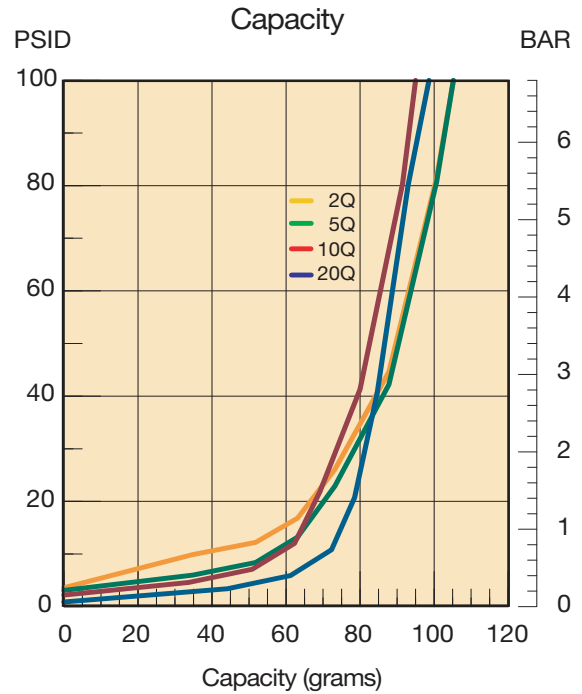
Results typical from Multi-pass tests run per test standard ISO 16889 @ 30 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



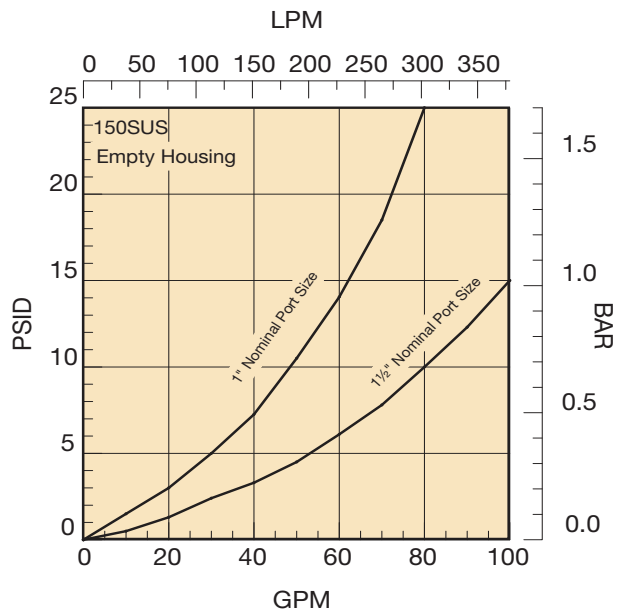
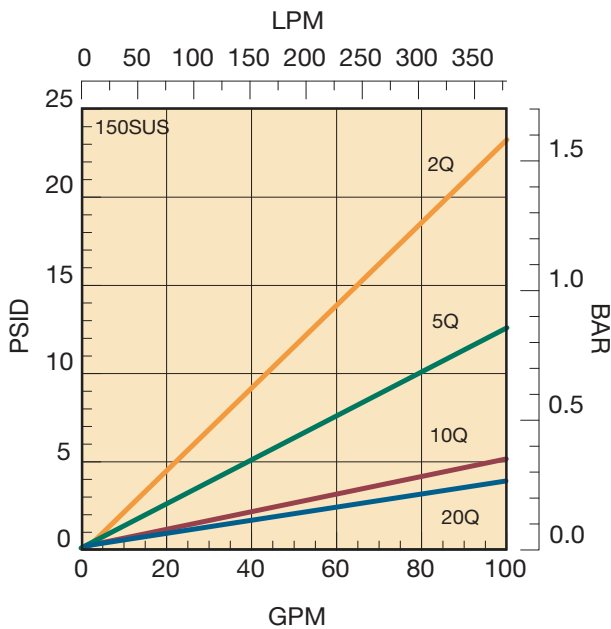
40CN Series

40CN-3 Element Performance



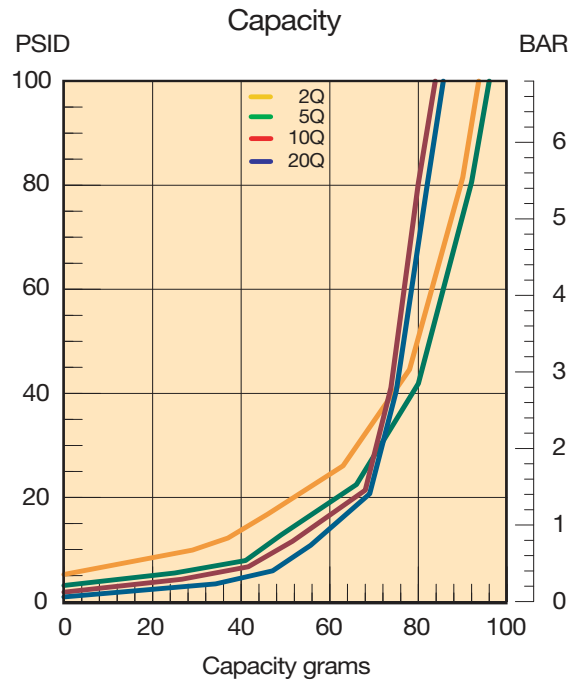
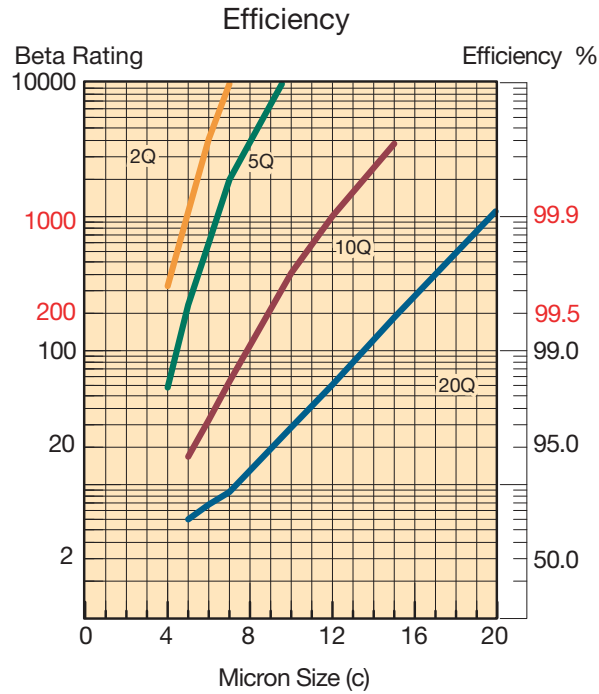
Results typical from Multi-pass tests run per test standard ISO 16889 @ 45 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



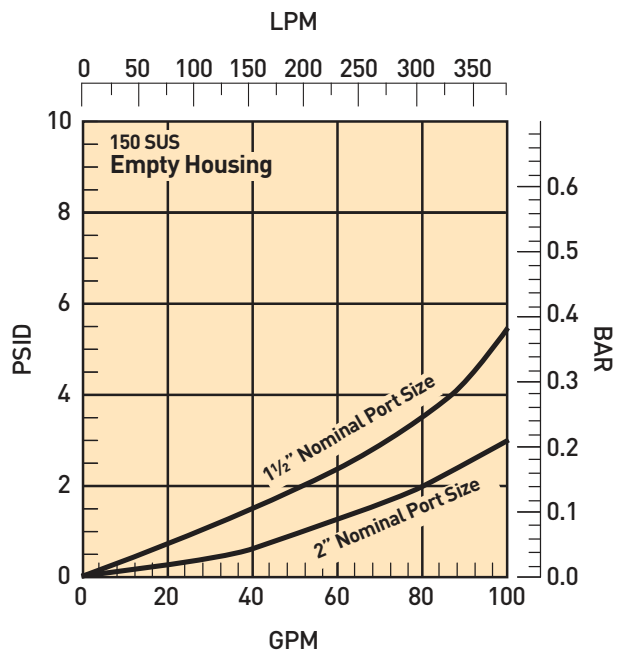
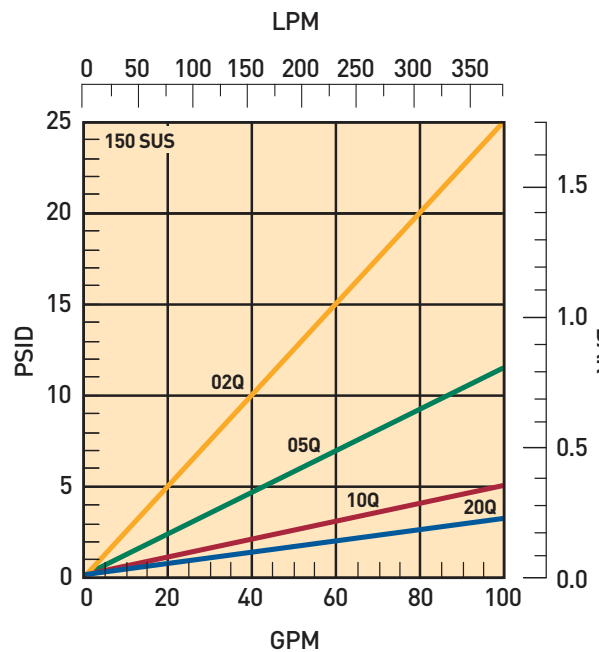
80CN Series

80CN-1 Element Performance



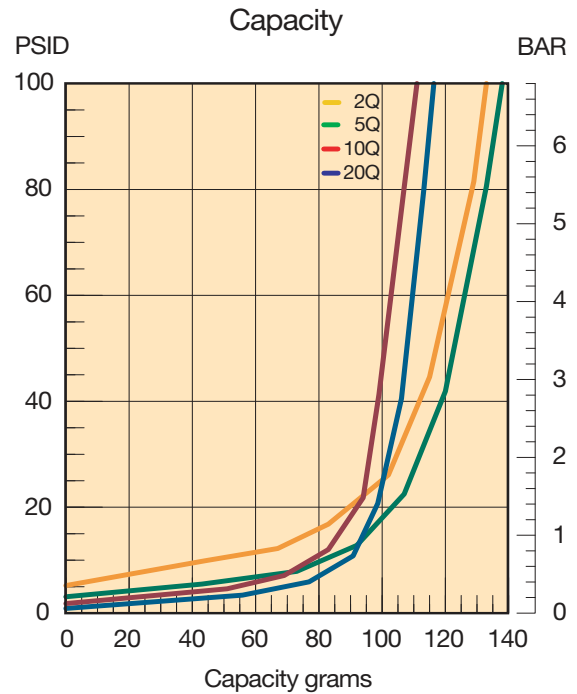
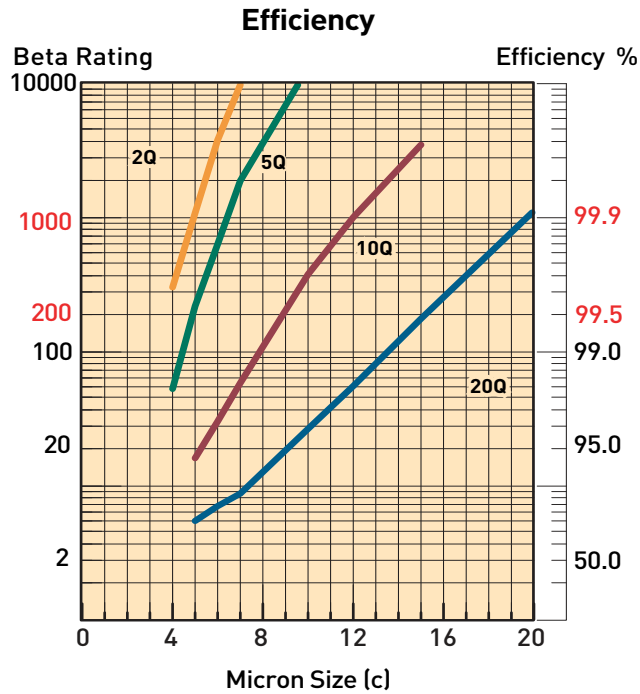
Results typical from Multi-pass tests run per test standard ISO 16889 @ 45 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



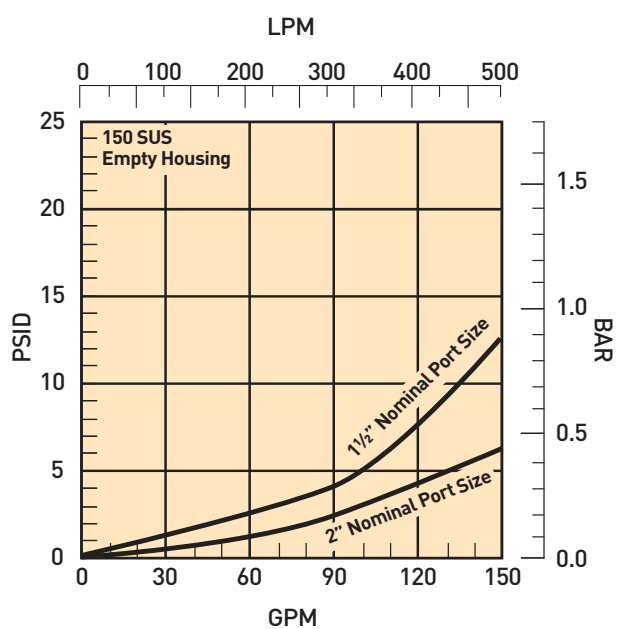
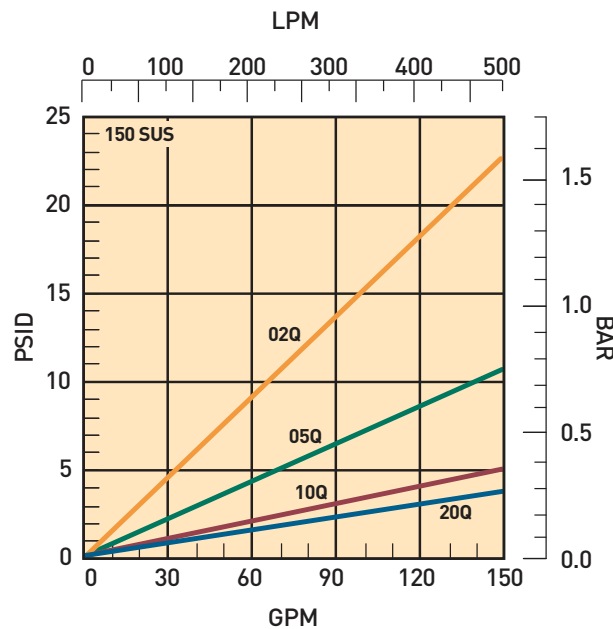
80CN Series

80CN-2 Element Performance



Results typical from Multi-pass tests run per test standard ISO 16889 @ 70 gpm to 100 psid terminal - 10 mg/L BUGL. Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



15/40/80CN Series

Specifications

Maximum Allowable Operating Pressure (MAOP):
1000 psi (69 bar)

Rated Fatigue Pressure:
800 psi (55.2 bar)

Design Safety Factor: 2.5:1

Operating Temperatures:
Nitrile: -40°F (-40°C) to 225°F (107°C)

Fluorocarbon: -15°F (-26°C) to 250°F (121°C)

Element Collapse Rating:
Standard: 150 psi (10.3 bar)

Drawings are for reference only.
Contact factory for current version.

Materials:

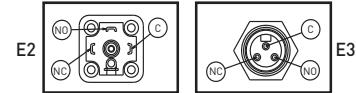
Head and Bowl: Aluminum
Indicators: Alum. body, plastic connectors
Bypass: Nylon

Weights (approximate):

| Model | Single length | Double length |
|-------|--------------------|--------------------|
| 15CN | 2.5 lb. (1.13 kg) | 3.5 lb. (1.6 kg) |
| 40CN | 4.5 lb. (2.00 kg) | 5.5 lb. (2.49 kg) |
| 80CN | 12.4 lb. (5.62 kg) | 15.2 lb. (6.89 kg) |

Element Condition Indicators:

Visual 360° green/red auto reset
Electrical/Visual
5A @ 240VAC, 3A @ 28VDC



Electrical-Heavy Duty

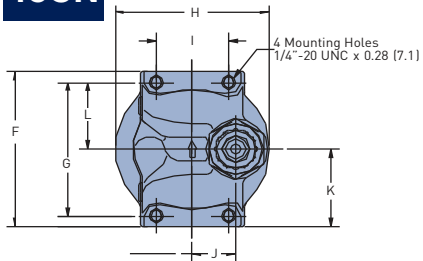
.25A(resistive) MAX 5 watts
12 to 28 VDC & 110 to 175 VAC

Color code:

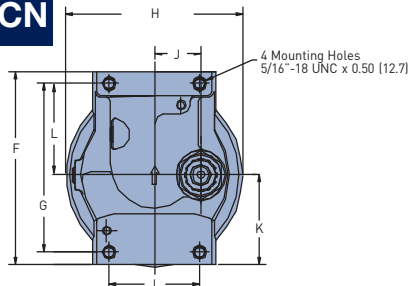
White (common)
Black (normally open)
Blue (normally closed)

| Dimensions are in (mm) | A | B | C | D | E | F | G | H | I | J | K | L | M |
|------------------------|------------------|------------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|------------------|
| 15CN | 6.17 (156.6) | 9.87 (250.7) | 1.83 (46.5) | 1.09 (25.4) | 2.80 (71.1) | 3.38 (85.9) | 2.88 (73.2) | 3.25 (82.6) | 1.50 (38.1) | .90 (22.9) | 1.69 (42.9) | 1.44 (36.6) | NA |
| 40CN | 6.73 (170.8) | 10.33 (262.4) | 2.44 (62.0) | 1.28 (32.6) | 4.22 (107.2) | 5.00 (127.0) | 4.37 (111.0) | 4.80 (121.9) | 2.44 (62.0) | 1.25 (31.8) | 2.32 (58.8) | 2.37 (60.2) | 15.07 (382.8) |
| 80CN | 11.06 (280.9) | 15.81 (401.6) | 3.06 (77.7) | 1.95 (49.5) | 4.91 (124.8) | 6.25 (158.7) | 3.25 (82.6) | 5.96 (151.4) | 4.00 (101.6) | 1.62 (41.1) | 3.12 (79.4) | 1.63 (41.3) | NA |

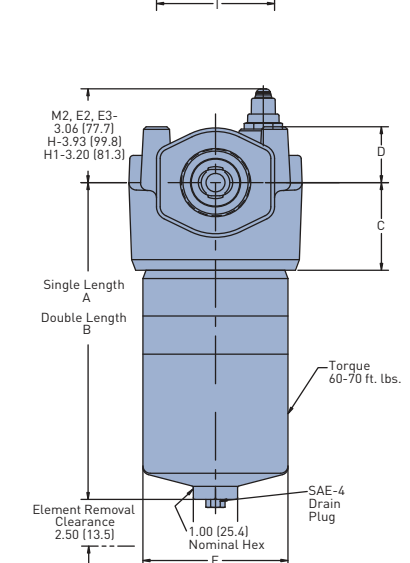
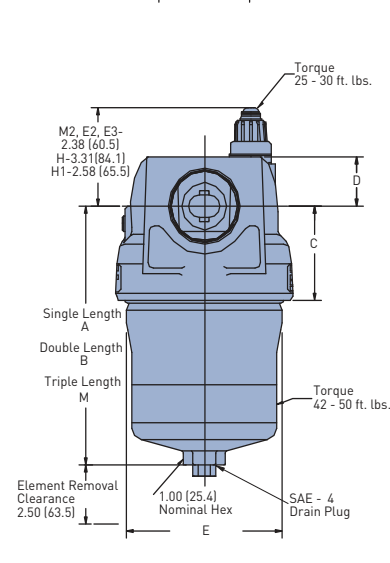
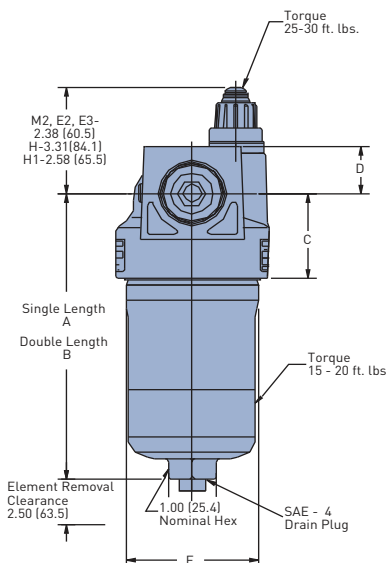
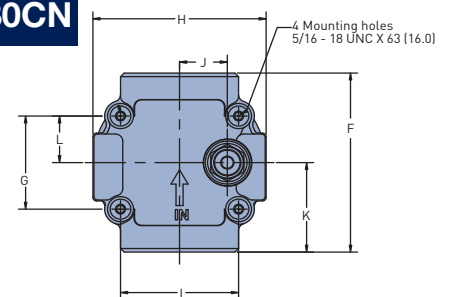
15CN



40CN



80CN



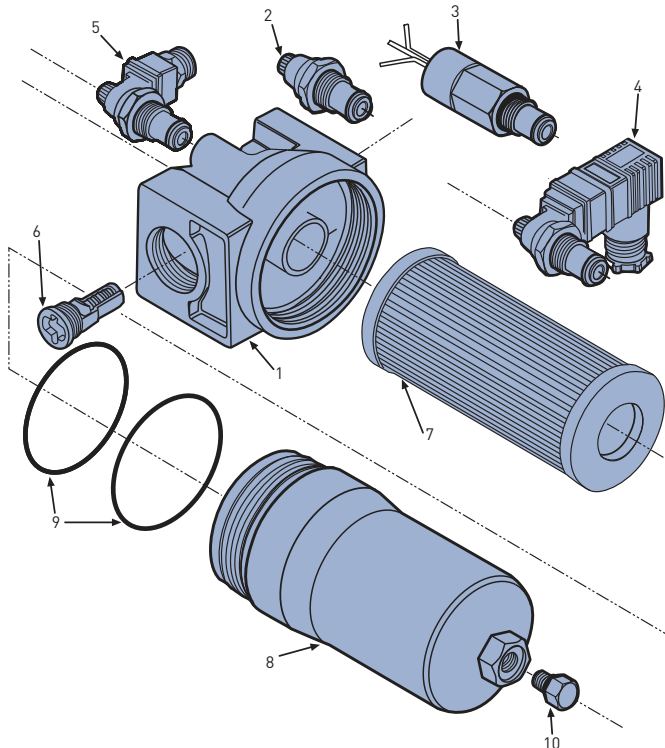
15/40/80CN Series

Element Service Instructions

- A. Stop the system's power unit.
- B. Relieve any system pressure in the filter line.
- C. Drain the filter bowl if drain port option is provided.
- D. Loosen and remove bowl.
- E. Remove element by pulling downward with a slight twisting motion and discard.
- F. Check bowl o-ring for damage and replace if necessary.
- G. Lubricate element o-ring with system fluid and place on post in filter head.
- H. Install bowl and tighten to specified torque.
 - 15CN - 15-20 ft. lbs
 - 40CN - 42-50 ft. lbs
 - 80CN - 60-70 ft. lbs
- I. Confirm there are no leaks after powering the system.

Parts List

| Index | Description | 15CN | 40CN | 80CN | |
|---|--|---|--------|--------|--------|
| 1 | Head | | | | |
| | 3/4" NPT bypass/ indicator ready | 933865 | N/A | N/A | |
| | 3/4" NPT no bypass/ no indicator | 933877 | N/A | N/A | |
| | 3/4" NPT no bypass/ indicator ready | 933869 | N/A | N/A | |
| | 3/4" NPT no indicator/ bypass ready | 933873 | N/A | N/A | |
| | SAE-12 bypass/ indicator ready | 933863 | N/A | N/A | |
| | SAE-12 no bypass/ no indicator | 933875 | N/A | N/A | |
| | SAE-12 no bypass/ indicator ready | 933867 | N/A | N/A | |
| | SAE-12 no indicator/ bypass ready | 933871 | N/A | N/A | |
| | 1" NPT bypass/ indicator ready | 933864 | 932950 | N/A | |
| | 1" NPT no bypass/ no indicator | 933876 | 932986 | N/A | |
| | 1" NPT no bypass/ indicator ready | 933868 | 932962 | N/A | |
| | 1" NPT no indicator/ bypass ready | 933872 | 932974 | N/A | |
| | SAE-16 bypass/ indicator ready | 933862 | 932947 | N/A | |
| | SAE-16 no bypass/ no indicator | 933874 | 932983 | N/A | |
| | SAE-16 no bypass/ indicator ready | 933866 | 932959 | N/A | |
| | SAE-16 no indicator/ bypass ready | 933870 | 932971 | N/A | |
| | 1 1/2" NPT bypass/ indicator ready | N/A | 932948 | 934012 | |
| | 1 1/2" NPT no bypass/ no indicator | N/A | 932984 | 934018 | |
| | 1 1/2" NPT no bypass/ indicator ready | N/A | 932960 | 934016 | |
| | 1 1/2" NPT no indicator/ bypass ready | N/A | 932972 | 934014 | |
| | SAE-24 bypass/ indicator ready | N/A | 932945 | 934027 | |
| | SAE-24 no bypass/ no indicator | N/A | 932981 | 934033 | |
| | SAE-24 no bypass/ indicator ready | N/A | 932957 | 934031 | |
| | SAE-24 no indicator/ bypass ready | N/A | 932969 | 934029 | |
| | 2" NPT bypass/ indicator ready | N/A | N/A | 934020 | |
| | 2" NPT no bypass/ no indicator | N/A | N/A | 934026 | |
| | 2" NPT no bypass/ indicator ready | N/A | N/A | 934024 | |
| | 2" NPT no indicator/ bypass ready | N/A | N/A | 934022 | |
| | SAE-32 bypass/ indicator ready | N/A | N/A | 934035 | |
| | SAE-32 no bypass/ no indicator | N/A | N/A | 934042 | |
| | SAE-32 no bypass/ indicator ready | N/A | N/A | 934040 | |
| SAE-32 no indicator/ bypass ready | N/A | N/A | 934037 | | |
| Flange face, SAE 2" bypass/indicator ready | N/A | N/A | 934103 | | |
| Flange face, SAE 2" no bypass/no indicator | N/A | N/A | 934109 | | |
| Flange face, SAE 2" no bypass/indicator ready | N/A | N/A | 934107 | | |
| Flange face, SAE 2" no indicator/bypass ready | N/A | N/A | 934105 | | |
| 2 | Indicators | | | | |
| | M2-Visual auto reset/ 25 psi | 932026 | 932026 | 932026 | |
| | M2-Visual auto reset/ 50 psi | 932027 | 932027 | 932027 | |
| | 3 | H-Electrical/ 25 psi w/ 1/2" conduit connection | 933053 | 933053 | 933053 |
| | | H-Electrical/ 50 psi w/ 1/2" conduit connection | 932905 | 932905 | 932905 |
| | | H1-Electrical/ 25 psi w/ wire leads | 933054 | 933054 | 933054 |
| | | H1-Electrical/ 50 psi w/ wire leads | 932906 | 932906 | 932906 |
| | Not Shown: | | | | |
| | E-Electrical/Visual 25 psi w/ wire leads | 929610 | 929610 | 929610 | |
| | E-Electrical/Visual 50 psi w/ wire leads | 929587 | 929587 | 929587 | |
| | 4 | E2-Electrical/Visual 25 psi w/ DIN connection | 931153 | 931153 | 931153 |
| | | E2-Electrical/Visual 50 psi w/ DIN connection | 929599 | 929599 | 929599 |
| E3-Electrical/Visual 25 psi w/ 3-pin connection | | 932773 | 932773 | 932773 | |
| E3-Electrical/Visual 50 psi w/ 3-pin connection | 929596 | 929596 | 929596 | | |
| 6 | Bypass Valve | | | | |
| | 25 psid assembly | 928979 | 930507 | 933628 | |
| | 50 psid assembly | 928981 | 933424 | 933630 | |
| Not Shown: | | | | | |
| No bypass plug | 935744 | 927719 | 934174 | | |
| Element (see model code page) | | | | | |
| 8 | Bowl | | | | |
| | Single length | 936758 | 936760 | 936763 | |
| | Double length | 936759 | 936761 | 936764 | |
| | Triple length | - | 936762 | - | |
| 9 | Bowl and Dust Seal | | | | |
| | Buna N (Nitrile) | N72142 | N72239 | N72244 | |
| | Fluorocarbon | V72142 | V72239 | V72244 | |
| 10 | Drain Plug - SAE-4 | | | | |
| | Buna N (Nitrile) | 921088 | 921088 | 921088 | |
| | Fluorocarbon | 928882 | 928882 | 928882 | |



15/40/80 CN Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 40CN | 1 | 10QE | B | M2 | K | N24 | 4 |

| BOX 1: Filter Series | |
|----------------------|----------------|
| Symbol | Description |
| 15CN | In line Filter |
| 40CN | In line Filter |
| 80CN | In line Filter |

| BOX 2: Element Length | |
|-----------------------|--------------------|
| Symbol | Description |
| 1 | Single |
| 2 | Double |
| 3 | Triple (40CN only) |

| BOX 3: Media Code | |
|-------------------|-------------------------|
| Symbol | Description |
| 02QE | Ecoglass III, 2 micron |
| 05QE | Ecoglass III, 5 micron |
| 10QE | Ecoglass III, 10 micron |
| 20QE | Ecoglass III, 20 micron |

| BOX 4: Seals | |
|--------------|--------------------------|
| Symbol | Description |
| B | Nitrile (NBR) |
| E | Ethylene propylene (EPR) |
| V | Fluorocarbon (FKM) |

| BOX 5: Indicator | |
|------------------|---|
| Symbol | Description |
| M2 | Visual Automatic Reset |
| H | Electrical indicator with ½"-14 NPT connection and 12" leads |
| E | Electrical/Visual with ½" NPT conduit connection and wire leads |
| E2 | Electrical/ Visual (DIN43650 Hirschman style connection) |
| E3 | Electrical/Visual (ANSI B.9355M 3-pin Brad Harrison style connection) |
| P | Plugged indicator port |

| BOX 6: Bypass | |
|---------------|------------------|
| Symbol | Pressure Setting |
| G | 25 PSI (1.7 bar) |
| K | 50 PSI (3.5 bar) |

| BOX 7: Ports | |
|--------------|------------------------------|
| Symbol | Description |
| 15CN | |
| N12 | ¾" NPT |
| N16 | 1" NPT |
| S12 | SAE-12 straight thread |
| S16 | SAE-16 straight thread |
| 40CN | |
| N16 | 1" NPT |
| N24 | 1½" NPT |
| S16 | SAE-16 straight thread |
| S24 | SAE-24 straight thread |
| 80CN | |
| N24 | 1½" NPT |
| N32 | 2" NPT |
| S24 | SAE-24 straight thread |
| S32 | SAE-32 straight thread |
| Y32 | Flange face, SAE-2", Code 61 |

| BOX 8: Options | |
|----------------|-----------------------------|
| Symbol | Description |
| 4 | Standard drain port on bowl |
| 21 | No bypass and drain port |

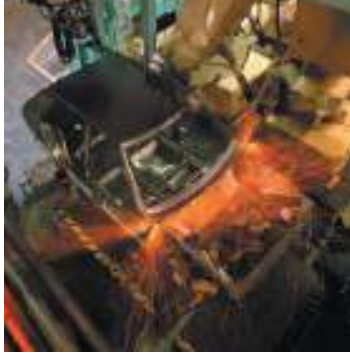
Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.

Replacement Elements (Ecoglass)

| MEDIA | 15CN-1 | 15CN-2 | 40CN-1 | 40CN-2 | 40CN-3 | 80CN-1 | 80CN-2 |
|-------|---------|---------|---------|---------|---------|---------|---------|
| 20QE | 936701Q | 936705Q | 936709Q | 936712Q | 936721Q | 936715Q | 936719Q |
| 10QE | 936700Q | 936704Q | 936708Q | 936601Q | 936720Q | 936602Q | 936718Q |
| 05QE | 936699Q | 936703Q | 936707Q | 936711Q | 936623Q | 936714Q | 936717Q |
| 02QE | 936698Q | 936702Q | 936706Q | 936710Q | 936622Q | 936713Q | 936716Q |

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.





aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



MPD Series

Medium Pressure Filters



ENGINEERING YOUR SUCCESS.

MPD Series

Applications

- Circulating Lube Oil Systems
- Power Generation Control Systems
- Steel Mill Control Systems
- Pulp & Paper Control Systems
- Test Stands
- Automotive Stamping Presses
- Offshore & Land Based Oilfield Applications

MPD series filters are an outstanding choice for today's demanding hydraulic control and circulating oil systems. The MPD's innovative modular design, rugged ductile iron construction and coreless element technology, combined with many other features, provide solutions across a broad range of industrial applications.

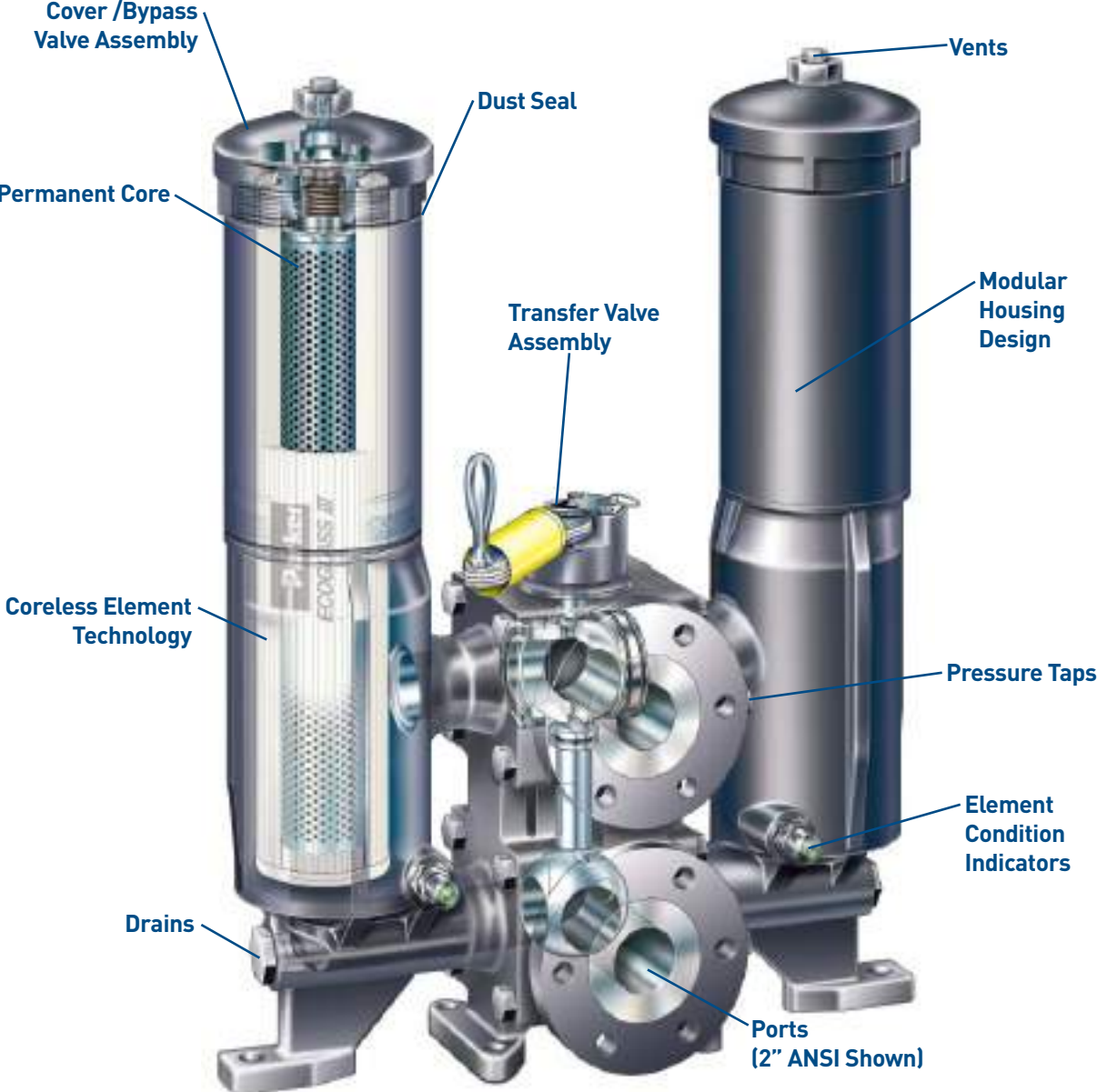
The Modular design provides user flexibility for simplex or duplex applications. Incorporating side chambers as simplex filters along with duplex installations provide common elements across the circuit design.

Construction features like full ported transfer valve with neutral center flow capability offer tremendous benefit in cold start conditions. Standard features like pressure sensing taps, vents, drains and internal pressure equalization make this product incomparable in industry.



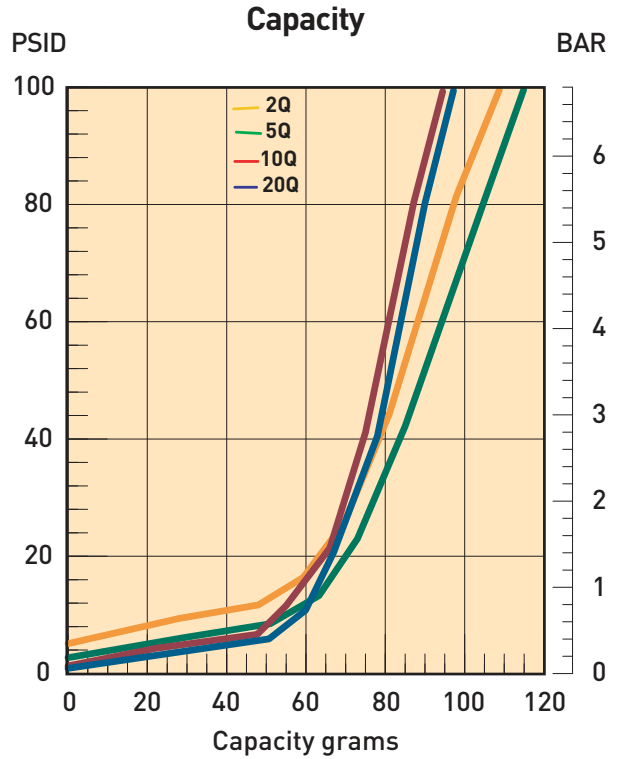
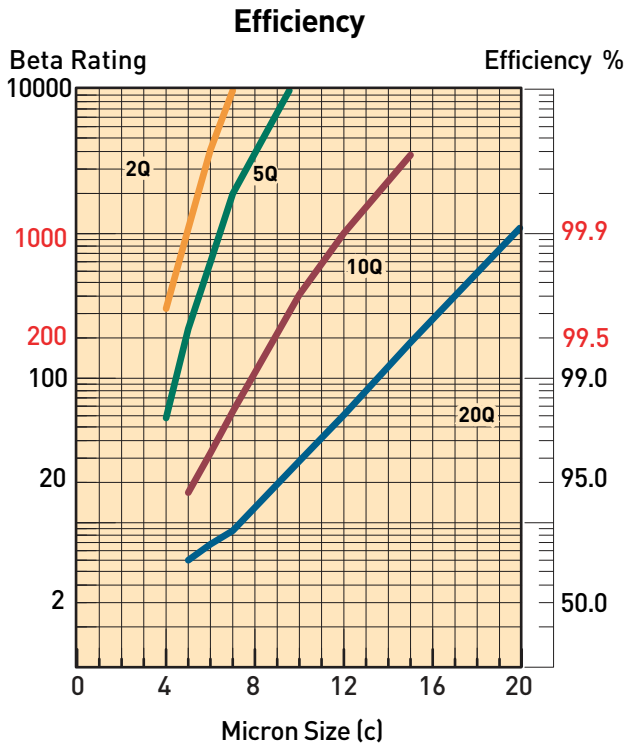
MPD Series

Features



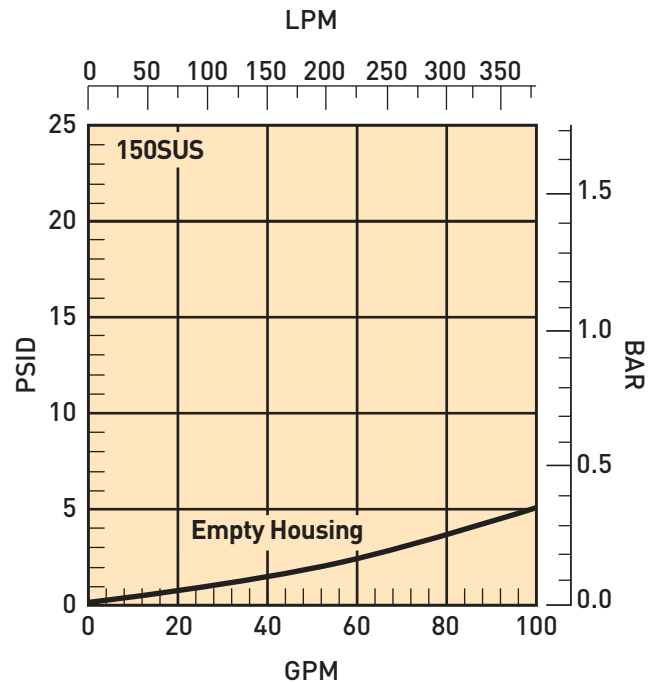
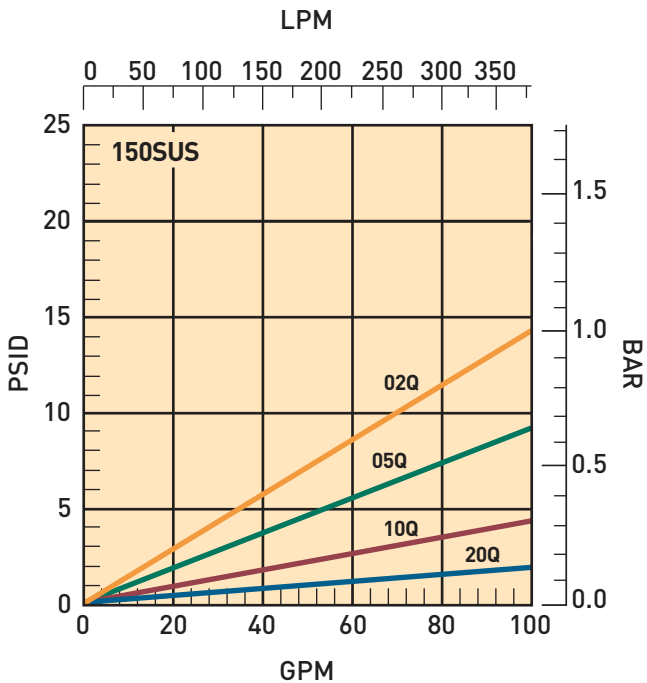
MPD Series

MPD-1 Element Performance



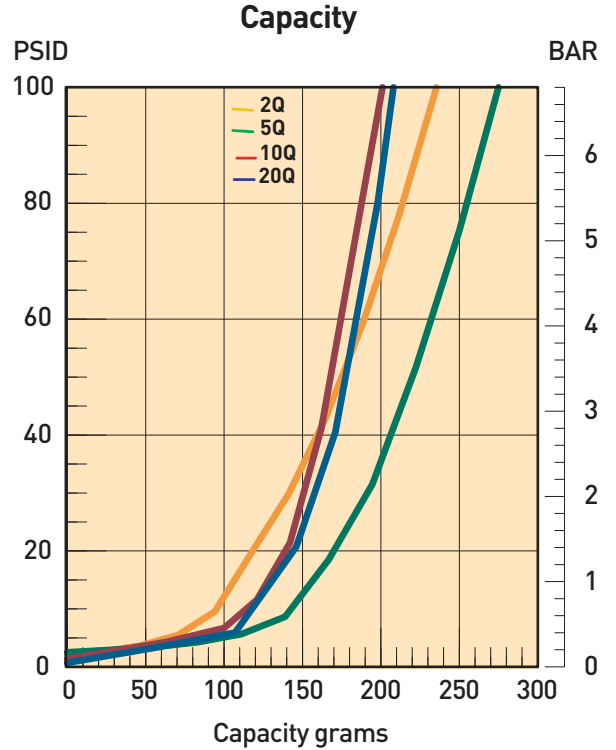
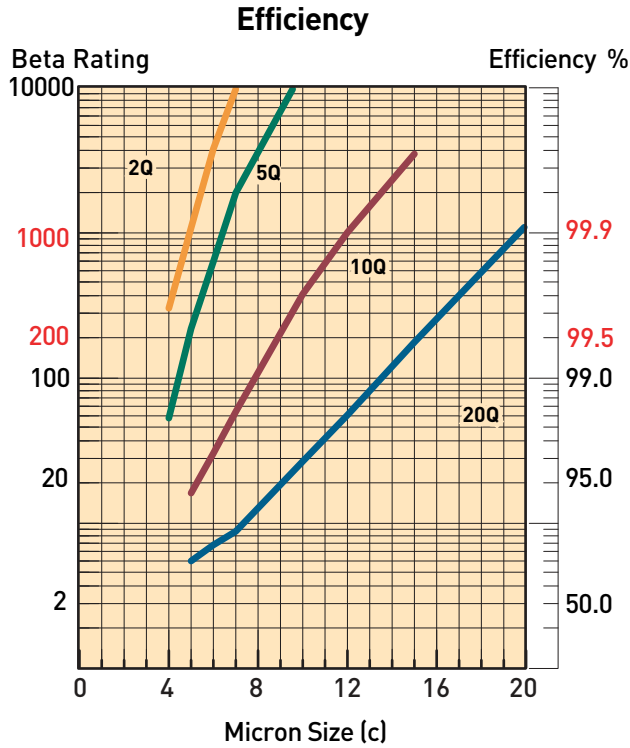
Results typical from Multi-pass tests run per test standard ISO 16889 @ 50 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



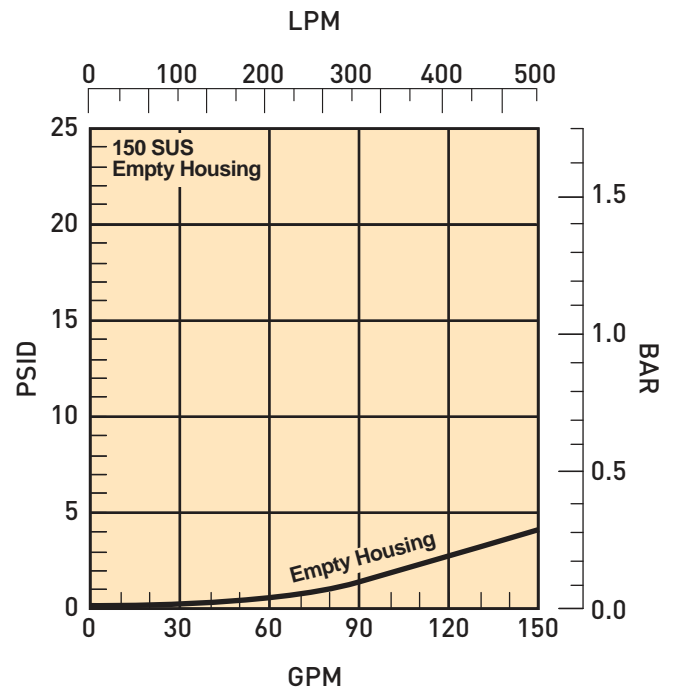
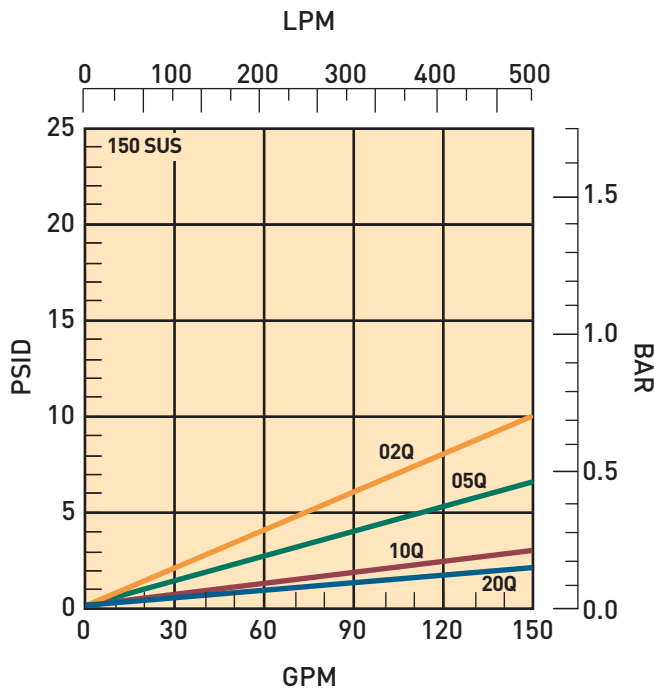
MPD Series

MPD-2 Element Performance



Results typical from Multi-pass tests run per test standard ISO 16889 @ 80 gpm to 100 psid terminal - 10 mg/L BUGL
Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



MPD Series

Replacement Elements

Ecoglass III represents the merging of high performance filtration technology with environmentally conscious engineering. The Ecoglass III line of replacement elements features 100% non-metallic construction.

The design reduces solid waste and minimizes disposal costs for industry. The non-metallic construction means lightweight elements (60% less weight) for easier servicing.

The Ecoglass III elements utilize the same proprietary media design as our Microglass III line of replacement elements.

With Ecoglass III, a reusable core is installed into the filter housing and remains in service throughout the life of the assembly.



Microglass III Replacement Elements

Microglass III represents a leap forward in the performance obtainable in hydraulic and lube filter elements.

The unique multi-layer design combines high efficiencies with exceptional dirt holding capacities for performance that is unequalled in the industry today. This performance is further enhanced in the MPD series with the introduction of the deep pleat design. The deep pleat element design increases the amount of media in the element and therefore increases capacity.

With Microglass III, you do not have to make a compromise between efficiency and capacity; you can have both.

| Feature | Advantage | Benefit |
|---|--|---|
| <ul style="list-style-type: none"> Modular design filter | <ul style="list-style-type: none"> Use a simplex or duplex | <ul style="list-style-type: none"> Reduced installation due to common elements Application flexibility |
| <ul style="list-style-type: none"> Top access cover | <ul style="list-style-type: none"> Remove element from top Lighter than removing entire bowl | <ul style="list-style-type: none"> No oil mess |
| <ul style="list-style-type: none"> Visual and electrical indicators | <ul style="list-style-type: none"> Know exactly when to service elements | <ul style="list-style-type: none"> Keeps system clean |
| <ul style="list-style-type: none"> Drain port | <ul style="list-style-type: none"> Drain all oil from assembly prior to servicing | <ul style="list-style-type: none"> Eliminates cross contamination |
| <ul style="list-style-type: none"> Vent port | <ul style="list-style-type: none"> Purges all trapped air in filter | <ul style="list-style-type: none"> Get the maximum performance from elements Prevents a "spongy" system |
| <ul style="list-style-type: none"> Multipass tested elements (per ANSI/NFPA T3.10.8.8 R1-1990) | <ul style="list-style-type: none"> Element performance backed by recognized test standards | <ul style="list-style-type: none"> Elements selected will have consistent performance levels |
| <ul style="list-style-type: none"> Option of Ecoglass III or Microglass III elements | <ul style="list-style-type: none"> Multi-layer media Coreless as standard HF4 as option | <ul style="list-style-type: none"> High capacity with high efficiency No performance loss from pleat bunching |
| <ul style="list-style-type: none"> Equalizing valve & manifold | <ul style="list-style-type: none"> No external plumbing | <ul style="list-style-type: none"> Safety & reliability |
| <ul style="list-style-type: none"> Upstream & downstream sensing ports | <ul style="list-style-type: none"> Add additional instrumentation | <ul style="list-style-type: none"> Product flexibility |

MPD Series

Specifications

Specifications: MPD Series

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP):

3000 psi (206.9 bar) SAE port — MPDH only

1200 psi (81.6 bar) SAE port;

500 psi (34 bar) ANSI port

Rated Fatigue Pressure:

3000 psi (206.9 bar) SAE port — MPDH only

1200 psi (81.6 bar) SAE port;

500 psi (34 bar) ANSI port

Design Safety Factor: 3:1

*Consult factory for higher operating pressures

Operating Temperatures:

-15°F (-26°C) to 160°F (71°C)

*Consult factory for temperatures outside specified range

Element Collapse Rating:

Standard: 150 psid (10.3 bar)

High collapse Microglass only:

1200 psid (81.6 bar) (SAE);

500 psid (34 bar) (ANSI)

Materials:

Transfer Valve: Ductile Iron

Side Chamber: Ductile Iron

Side Chamber Extension: Steel

Cover: Ductile Iron (MPD), Carbon Steel (MPDH)

Equalizing Valve and Manifolds: Steel

Shipping Weights (approximate):

MPD-1: 215 lbs. (98 kg)

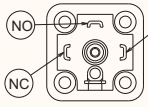

MPD-2: 285 lbs. (129 kg)

Element Condition Indicators:

Type M2 Series: Visual, auto-resetting with a red indication at the designated differential pressure.

In the clean condition, indication is green.

Type E Series: Electrical/Visual, auto-resetting with a red indication at the designated differential pressure. In the clean condition, indication is green. Rated 5 Amps at 125/250 VAC; 5 Amps resistive, 3 amps inductive (sea level) at 28 VDC; SPDT.

| 'E' SERIES ELECTRICAL INDICATOR CONNECTOR CHART | | |
|---|--------------|---|
| CONNECTOR | MODEL CODING | WIRING / MALE CONNECTOR |
| DIN 43650 3 POLE + EARTH DIN 50005 PLUG PIN CODE | E2 |  |
| 3 PIN ANSI/B93.55M (DIMENSIONS ONLY) | E3 |  |

Type H Series: Heavy duty electrical/no visual, rated 0.25 Amps resistive, 12 to 28 VDC and .25 Amps resistive, 110-175 VAC; 5 watts; SPDT.

| 'H' SERIES ELECTRICAL INDICATOR CONNECTOR CHART | | |
|--|--------------|--|
| CONNECTOR | MODEL CODING | WIRING / MALE CONNECTOR |
| ½"-14 NPT CONDUIT ADAPTER W/24" WIRE LEADS (FOR ALL LIGHT TO HEAVY CONDUIT USES) | H | BLACK (NO), BLUE (NC), AND WHITE (C) |
| NONE: 12" WIRE LEADS ONLY | H1 | BLACK (NO), BLUE (NC) AND WHITE (C) |

No indicator P option: plugged indicator port.

Contact factory for other available indicator options & types.

Element Servicing Instructions: MPD

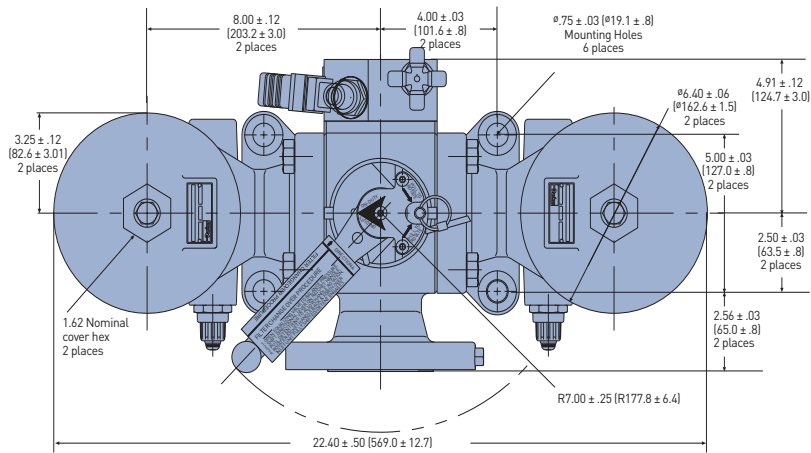
The system does not need to be shut down to service elements; however, pressure must be equalized at both side chambers of the duplex filter before performing transfer valve changeover.

1. Black flow arrow on top of the transfer valve points to the on-duty chamber.
2. Open the equalizing valve (counter-clockwise) to balance pressure at the side chambers.
3. Shift directional lever on the ratchet handle to switch the ratchet direction.
4. Pull detent ring up to disengage the locking pin and allow handle to rotate.
5. Rotate ratchet handle back and forth over the inlet port until the transfer valve is fully shifted and the detent locking pin engages.
6. Slack flow arrow now points to the new on-duty side chamber.
7. Close equalizing valve (clockwise) to isolate the side chambers.
8. Loosen new off-duty vent plug (counter-clockwise) approximately 2 turns. Do not thread out complete.
9. Remove drain plug (counter-clockwise) from new off-duty chamber to lower oil level.
10. Remove new off-duty chamber cover by rotating (counter-clockwise) until unthreaded then lift from chamber.
11. Pull element out from chamber. Discard used disposable elements as they are not cleanable. With Ecoglass elements the permanent core will remain in the chamber.
12. Install new element by centering it on the element locator in the bottom of the chamber and pushing down into place. For Ecoglass elements slide all the way down onto the permanent core.
13. Inspect cover o-rings and replace if necessary.
14. Install cover onto the chamber by rotating clockwise) and tightening to 90-100 ft.-lbs.
15. Install and tighten drain plug (clockwise) to 60-70 ft.-lbs.
16. Open equalizing valve (counter-clockwise) to purge air from the new off-duty chamber.
17. When oil flows from the vent close the equalizing valve (clockwise).
18. Tighten new off-duty vent plug (clockwise) to 15-20 ft.-lbs.

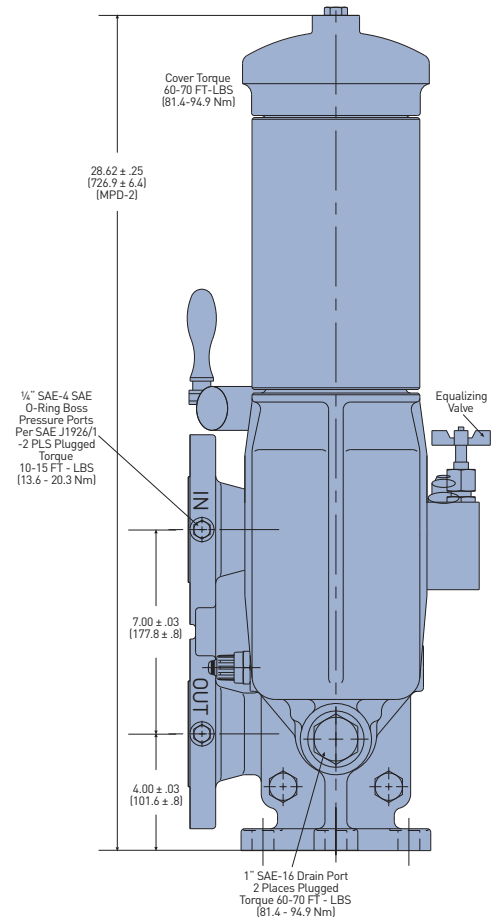
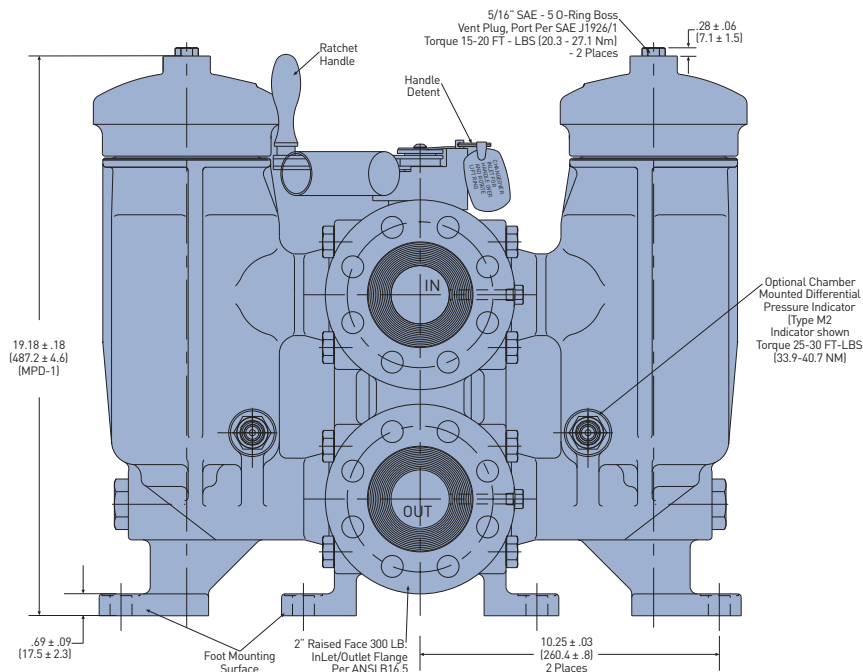
MPD Series

Specifications

ANSI Dimensional Drawing



Linear Measure: inch [millimeter]

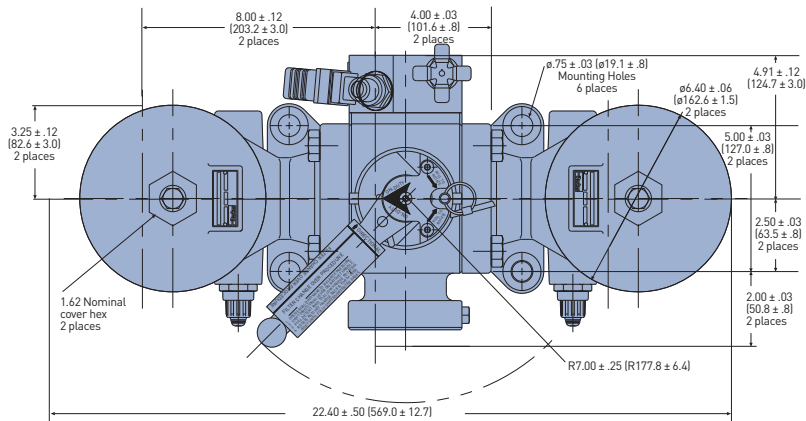


Drawings are for reference only.
Contact factory for current version.

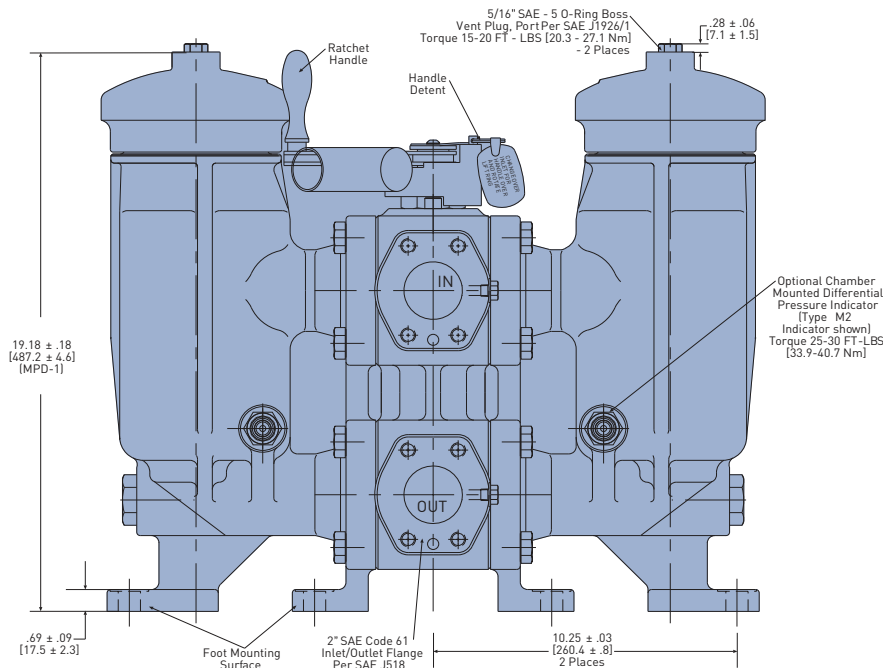
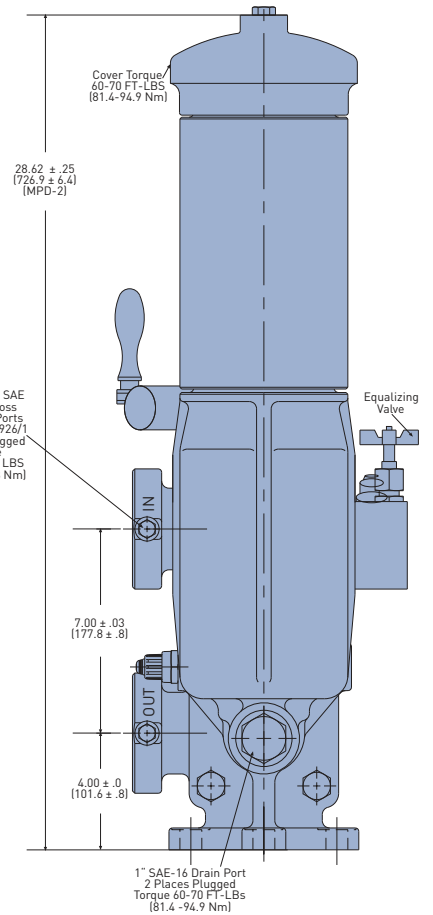
MPD Series

Specifications

SAE Dimensional Drawing



Linear Measure: inch [millimeter]



Drawings are for reference only.
Contact factory for current version.

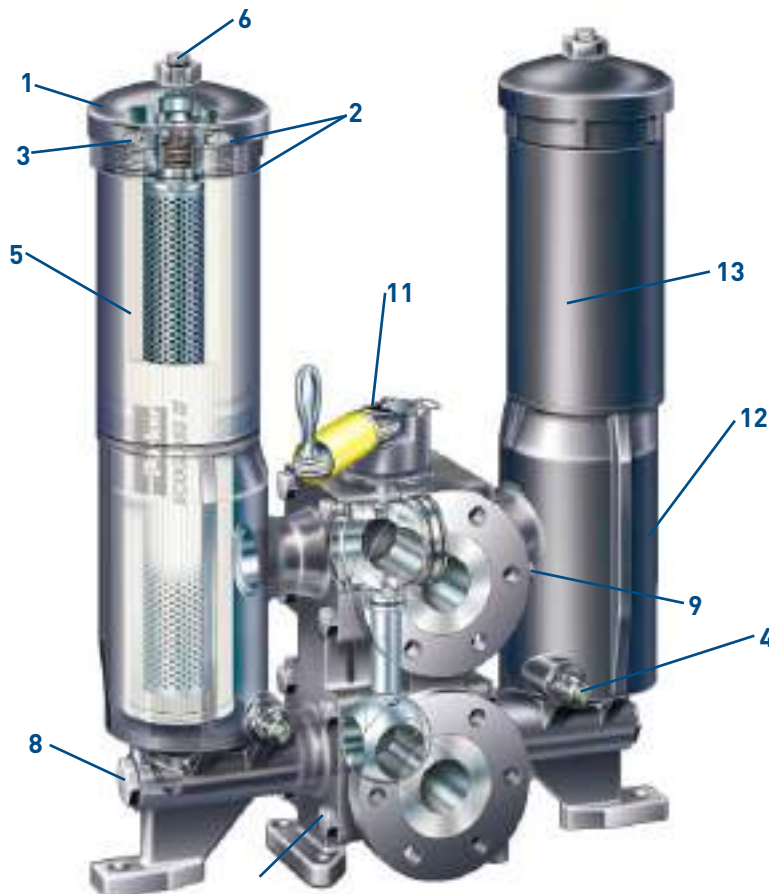
MPD Series

Parts List

| Index | Description | Element Type | | Index | Description | Element Type | |
|--------|---|--------------------------------|---------------------------|-----------------|--|-----------------|------------|
| | | Ecoglass | Microglass | | | Ecoglass | Microglass |
| 1 | Cover Assembly w/ 25psi bypass w/ 50psi bypass w/ no bypass | 936964 | 936964 | 6 | Vent Plug | 935466 | 935466 |
| | | 935965 | 935965 | 7** | Vent Plug O-ring | V93905 | V93905 |
| | | 935966 | 935966 | 8 | Drain Plug w/ O-ring | 928364 | 928364 |
| 2 | Cover (O-ring & Dust Seal) | V72247 | V72247 | 9 | Pressure Tap Plug w/ O-ring | 928882 | 928882 |
| 3 | Cover Backup Ring | 935419 | 935419 | 10** | Equalizing Valve | 928118 | 928118 |
| 4 | Indicator P option-indicator port plug M2 25psi E2 25psi E2 50psi E3 25psi E3 50psi H 25psi H 50psi H1 25psi H1 50psi | 925515 | 925515 | 11 | Transfer Valve Assembly ANSI 2" w/ indicator port SAE 2" w/ indicator port | 935968 | 935968 |
| | | 932026 | 932026 | | | 935969 | 935969 |
| | | 932027 | 932027 | 12 | Housing Assembly right side w/ indicator port right side w/o Indicator port left side w/ indicator port left side w/o Indicator port | 935970 | 935972 |
| | | 931153 | 931153 | | | 935974 | 935975 |
| | | 929599 | 929599 | | | 935971 | 935973 |
| | | 932773 | 932773 | | | 935974 | 935975 |
| | | 929596 | 929596 | 13 | Housing Extension (MPD-2) | 935489 | 935489 |
| | | 933053 | 933053 | | | 922812 | 922812 |
| | | 932905 | 932905 | 14 | 5/8" - 11x1 1/4" HHCS | | |
| | | 933054 | 933054 | 15** | Seal Kit-Transfer Valve | Consult Factory | |
| 932906 | 932906 | 16** | Seal Kit-Housing Assembly | Consult Factory | | | |
| 5 | Element | (see chart on model code page) | | | | | |

* Consult factory for MPDH components

** Not Shown



MPD Series

How to Order

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| | MPD | 1 | 10QE | NE2 | 25 | B2 | 1 |

| BOX 1: Seals | |
|--------------|----------------|
| Symbol | Description |
| None | Nitrile |
| F3 | Fluorocarbon |

| BOX 2: Model Number | |
|---------------------|---------------------------------------|
| Symbol | Description |
| MPD | Duplex filter |
| MPDH | High pressure, 3000 psi duplex filter |

| BOX 3: Element Length | |
|-----------------------|---------------|
| Symbol | Description |
| 1 | Single |
| 2 | Double |

| BOX 4: Element Media | |
|----------------------|--------------|
| Symbol | Description |
| 20QE | Ecoglass III |
| 10QE | Ecoglass III |
| 05QE | Ecoglass III |
| 02QE | Ecoglass III |

| BOX 5: Indicators | |
|-------------------|--|
| Symbol | Description |
| M2 | Visual/Auto reset |
| H | Electrical (w/1/2" npt conduit connection and wire pads) |
| H1 | Electrical (w/1/2" leads only) |
| E2 | Electrical (DIN 43650 Hirschman style connection) |
| E3 | Electrical (ANSI/B93.55M 3-Pin Brad Harrison style connection) |
| P | Indicator port plugged |
| N | No side chamber indicator port |

Note: Two (2) symbols required. First symbol denotes side chamber indicator mounted on inlet side. Second symbol denotes indicator on equalizing valve manifold.

| BOX 6: Bypass | |
|---------------|---------------------------------|
| Symbol | Pressure Setting |
| 25 | 25 PSI (1.7 bar) setting |
| 50 | 50 PSI (3.5 bar) setting |

If "no bypass" option (-11) and an indicator is selected, above symbols (25,50) denote indicator setting

| BOX 7: Ports | |
|--------------|---|
| Symbol | Description |
| B2* | 2" 300 lb RF ANSI Flange (500 psi) |
| Y9 | 2" SAE 4 Bolt Code 61 Flange Face |

Note: * Only available for MPD.

| BOX 8: Options | |
|----------------|-------------|
| Symbol | Description |
| 1 | None |
| 11 | No Bypass |

Please note the bold options reflect standard options with a reduced lead-time of (8) weeks or less. Consult factory on all other lead-time options.

Ecoglass III Replacement Elements (Fluorocarbon)

| Media | MPD-1 | MPD-2 |
|-------|---------|---------|
| 20QE | 935519Q | 935521Q |
| 10QE | 935518Q | 935520Q |
| 05QE | 935517Q | 935458Q |
| 02QE | 935516Q | 935488Q |

HF4 Replacement Elements (Fluorocarbon)

| Media | Element Collapse Rating | Single Length | Double Length |
|-----------|-------------------------|---------------|---------------|
| 3 Micron | 150 psi | HF41L3VQ | HF42L3VQ |
| 3 Micron | 2000 psi | HF41H3VQ | HF42H3VQ |
| 5 Micron | 150 psi | HF41L5VQ | HF42L5VQ |
| 5 Micron | 2000 psi | HF41H5VQ | HF42H5VQ |
| 10 Micron | 150 psi | HF41L10VQ | HF42L10VQ |
| 10 Micron | 2000 psi | HF41H10VQ | HF42H10VQ |
| 20 Micron | 150 psi | HF41L20VQ | HF42L20VQ |
| 20 Micron | 2000 psi | HF41H20VQ | HF42H20VQ |



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



15P/30P Series

High Pressure Filters



ENGINEERING YOUR SUCCESS.

15P/30P Series

Applications

- Saw mills
- Aircraft ground support equipment
- Asphalt pavers
- Hydraulic fan drives
- Power steering circuits
- Waste trucks
- Cement trucks
- Servo control protection
- Logging equipment

These application examples have one thing in common...the need for clean hydraulic fluid.

Modern high pressure hydraulic systems are demanding. Better controls and long component life are expected. To deliver the high standards of performance, hydraulic components are built with tighter tolerances which increases their sensitivity to contamination.

That's where Parker pressure filters come into play. They filter out ingressed contamination before it jams a valve or scores a cylinder. They block pump generated debris before it gets to servo or proportional valves. Parker pressure filters are a key ingredient in meeting today's system demands.

Put your hydraulic systems in the care of Parker Hydraulic Filter Division. We are committed to designing and building the best filters available to industry.

Indicators

Both visual auto reset style and dual indicator visual/electrical style available to suit your application. Patented design resists false signaling due to vibration.

Straight Thread Ports

SAE straight thread for positive sealing



Bowl Construction

Formed of high grade 6061 T6 aluminum.

Powder painted, corrosion resistant finish.

Knurled for easier ripping when removing and re-assembling.

Bypass Valve (not visible)

May be blocked for critical applications

Hex (not visible)

Hex formed at base of bowl for easy removal

Bowl Configurations

Single and double length bowls available to cover a wide range of flows.

30P available in a duplex version.

Drain Port (not visible)

Clean and easy servicing

Lets you drain bowl before element changes

15P/30P Series

Element Features

Quality elements make the difference

The important item in a filter assembly is the element. It must capture and retain contaminants that can damage system components. At the same time it must allow flow to pass as freely as possible to perform its function.

There are many ways to design and build an element, and it's easy to produce a low cost element. However, cost is not the only selection criteria, especially when the risk is loss of critical machine performance.

For instance, wire mesh reinforcement. Not all filter elements have it. It's used in Parker elements to keep the pleats from bunching or collapsing. If pleats bunch, the effective surface area of the element is reduced, excessive pressure drop develops, and the filter assembly may go into premature bypass mode.

There are many other features that are included standard with every quality Parker element. The table below outlines several.

O-Ring Seal

Positive sealing for optimum element efficiency

Wire Reinforced Media

Prevents pleat bunching

Helps prevent media migration

Maintains media efficiency

Engineered Element Design

The right combination of pleat depth and number of pleats means lower pressure losses (longer life)

Dirt holding capacity is maximized for less frequent element change-out



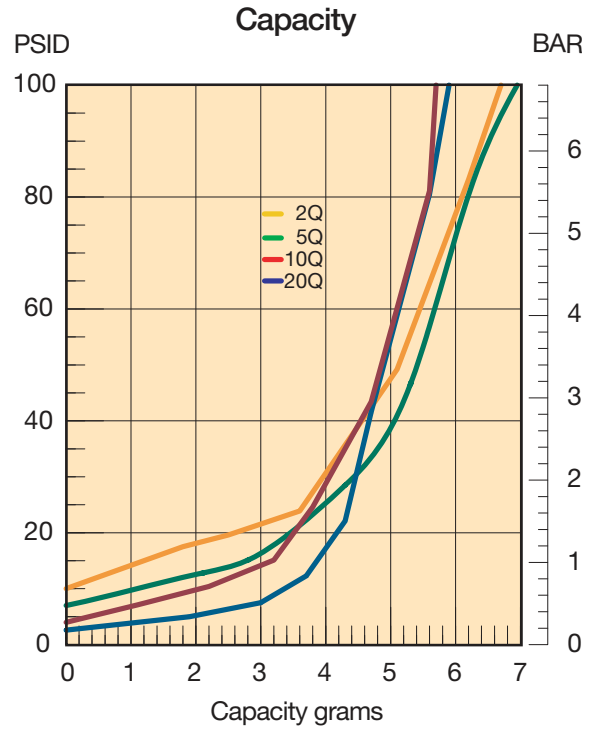
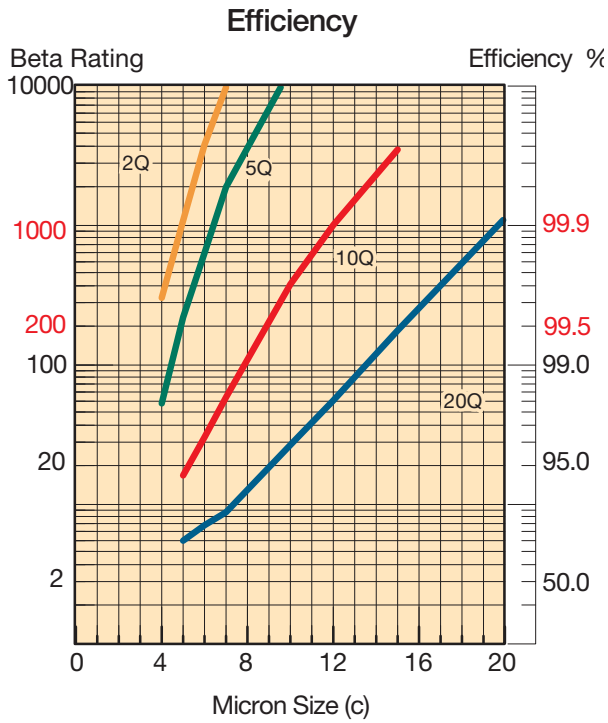
Elements for Every Application

Standard Microglass III media for long life and excellent system protection

| Feature | Advantage | Benefit |
|---|--|--|
| Wire reinforced Microglass III elements | Rugged construction, stands up to abuse of cyclic flows without performance loss Wire support reduces pleat bunching, keeps pressure drops consistent | The reliable filtration provided assures equipment protection, reduces downtime, maximizes element life, and allows the hydraulic system to operate properly |
| Multipass tested elements (per ANSI/NFPA T3.10.8.8 R1-1990) | Filter performance backed by recognized and accepted laboratory test standards | Filters you select have known performance levels |
| Complete element performance data disclosure | All pertinent information is provided in an easy-to-compare format | Provides an easy guide to proper filter selection |

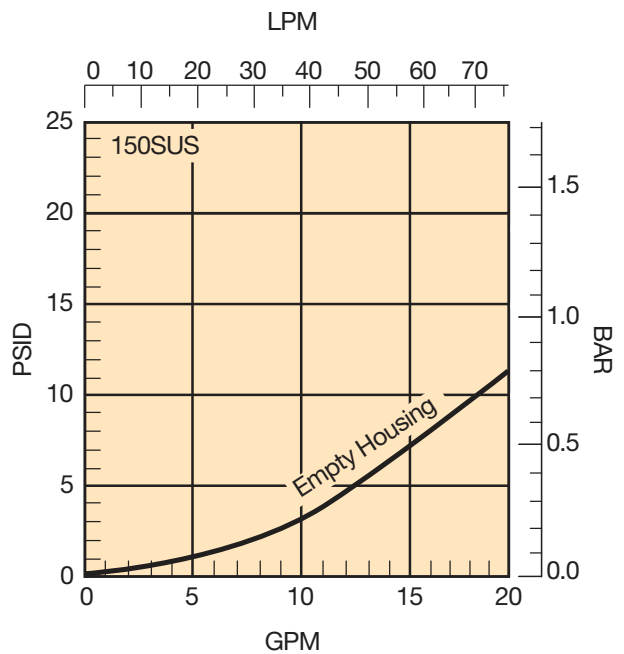
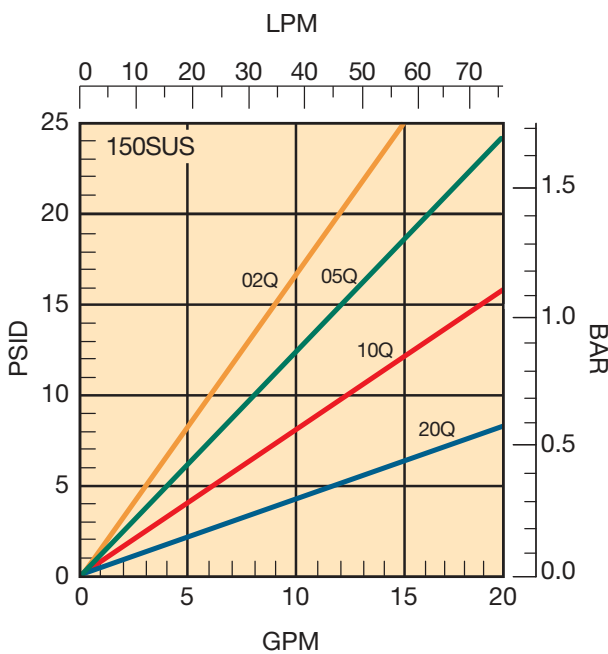
15P Series

15P-1 Element Performance



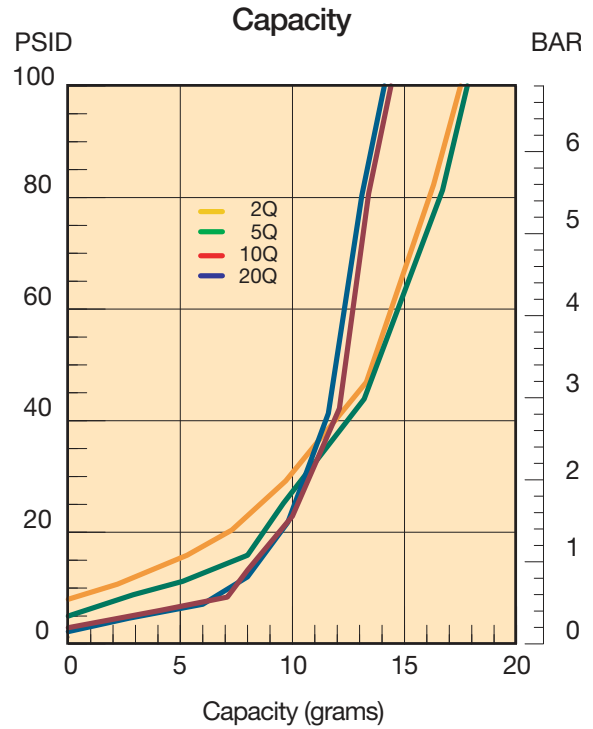
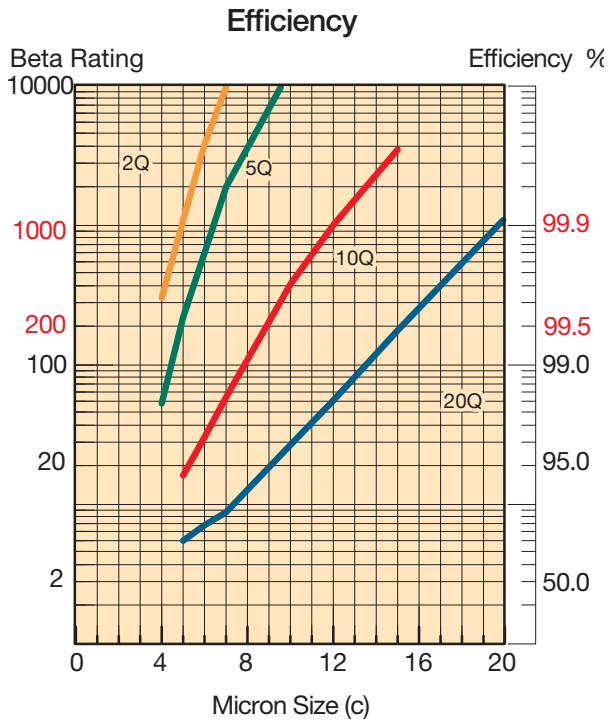
Results typical from Multi-pass tests run per test standard ISO 16889 @ 10 gpm to 100 psid terminal - 10 mg/L BUGL
Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



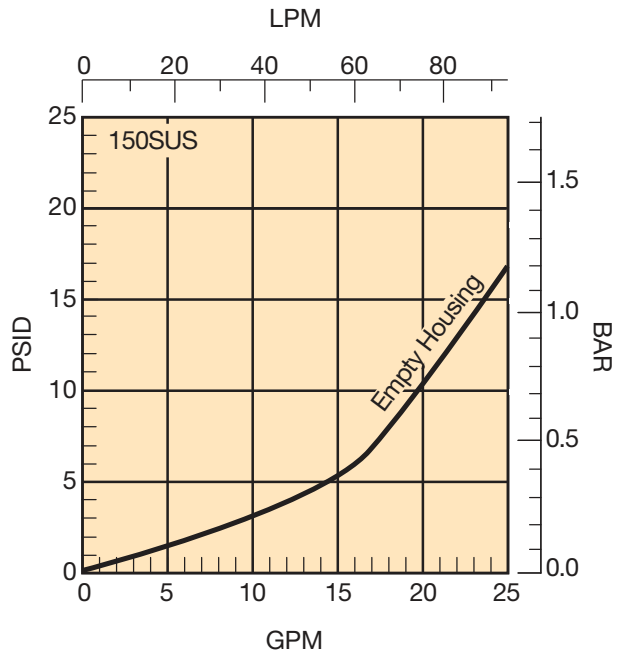
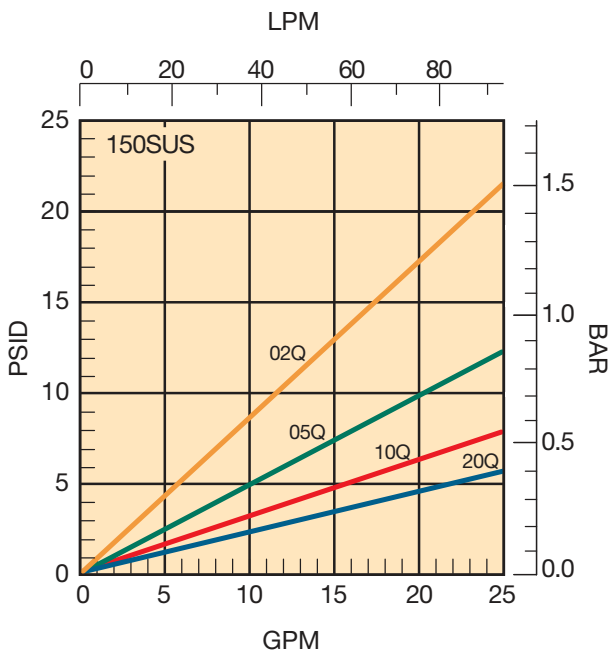
15P Series

15P-2 Element Performance



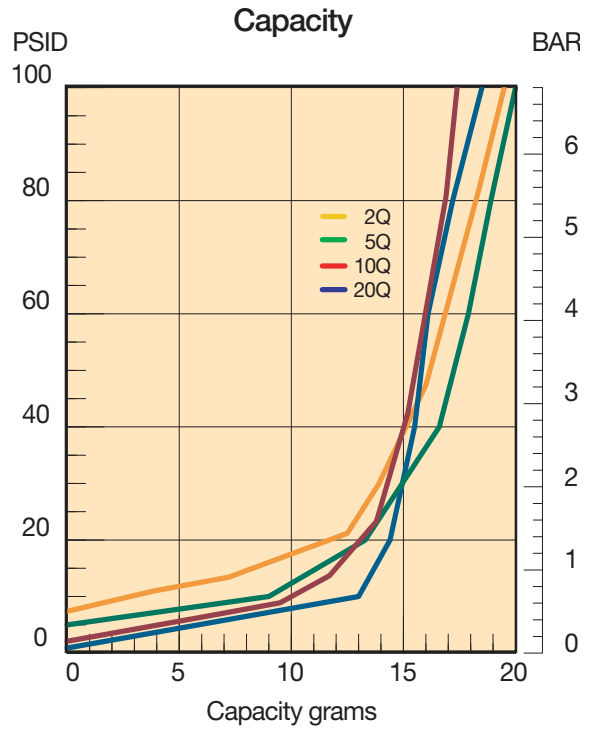
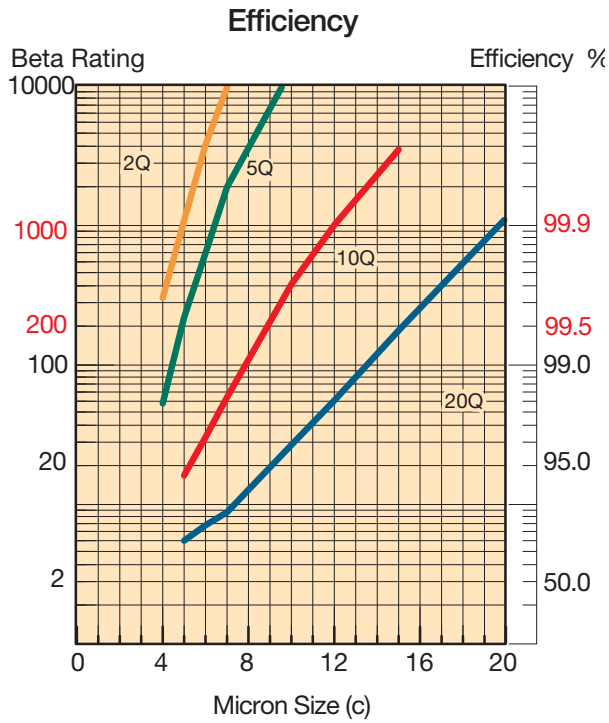
Results typical from Multi-pass tests run per test standard ISO 16889 @ 15 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



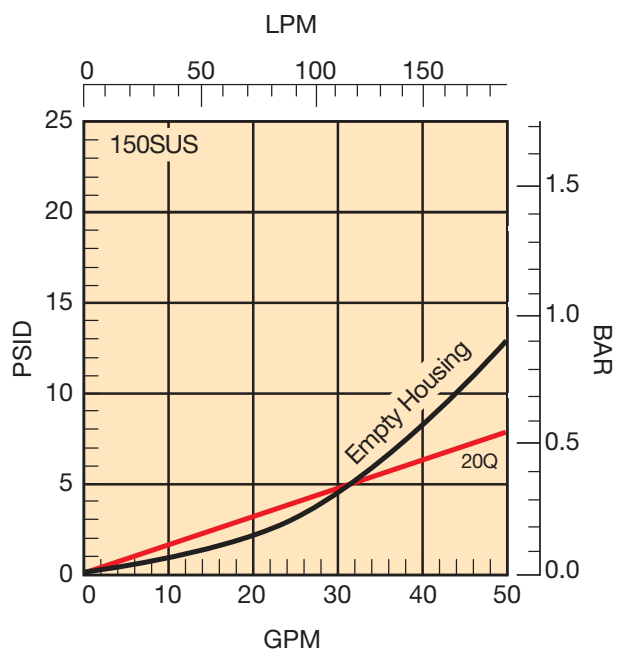
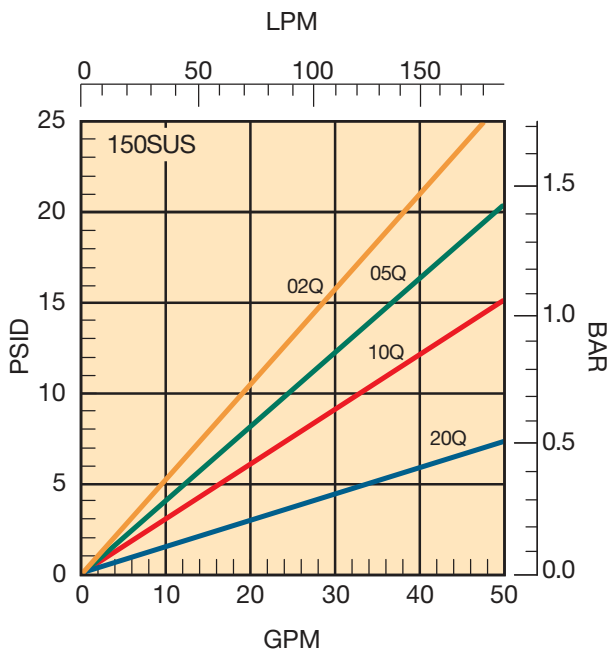
30P Series

30P-1 Element Performance



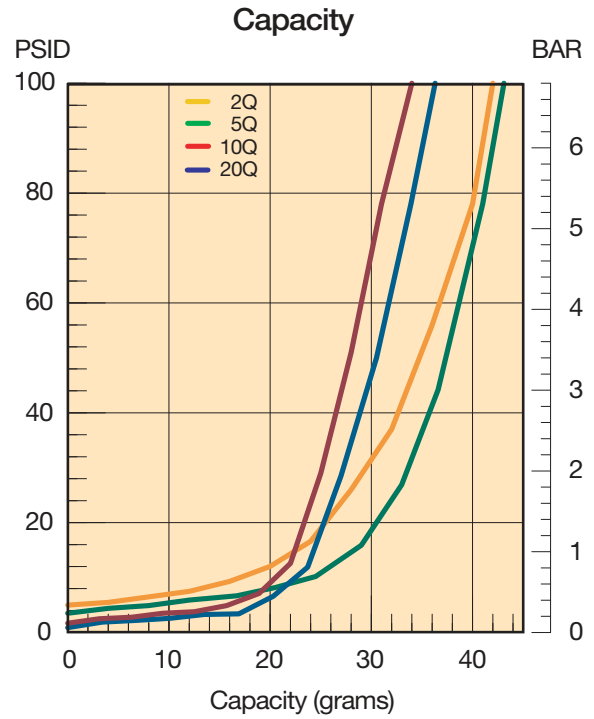
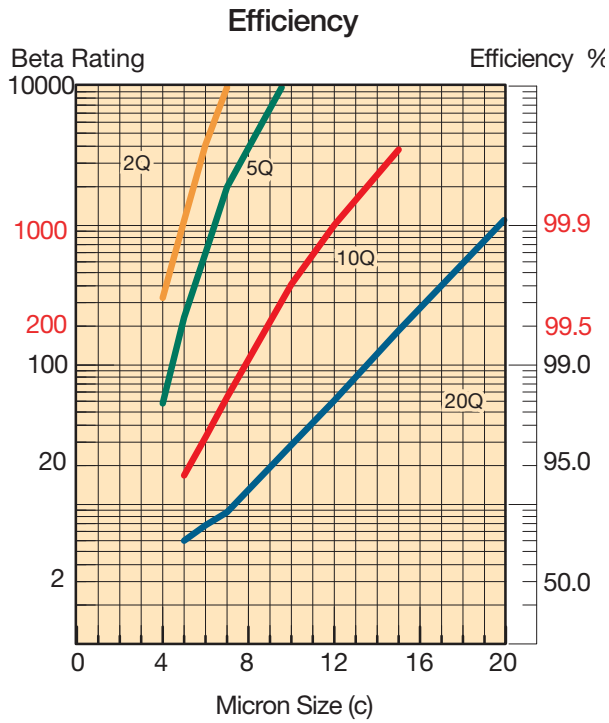
Results typical from Multi-pass tests run per test standard ISO 16889 @ 20 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



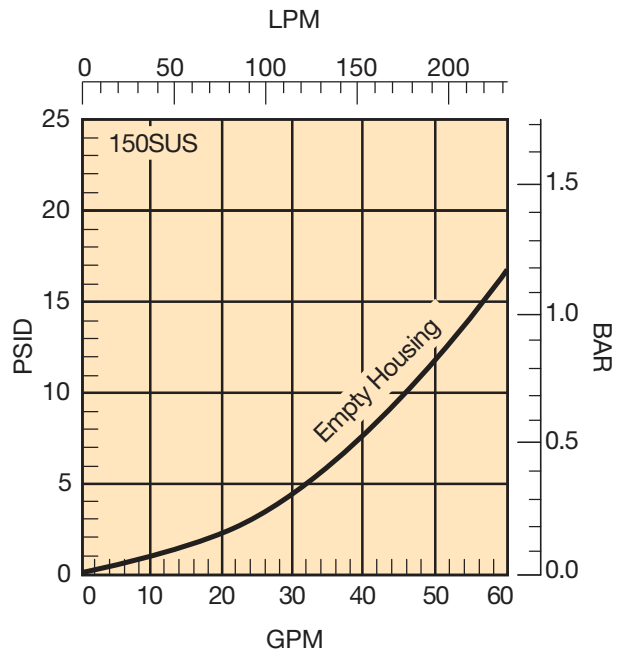
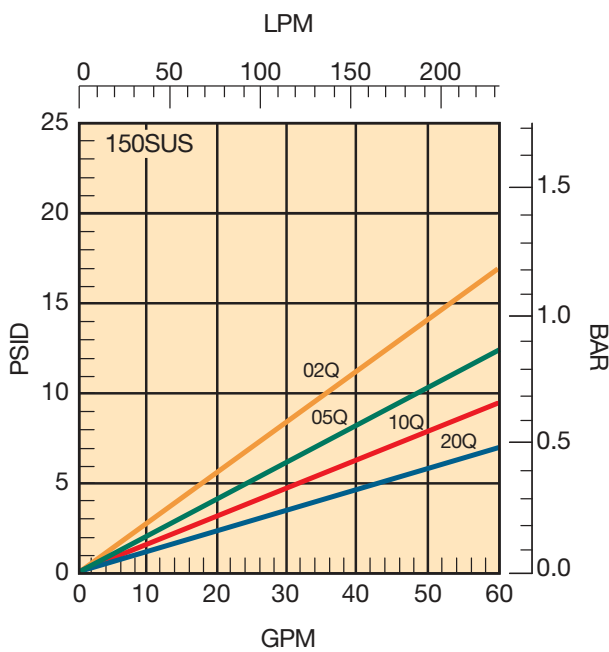
30P Series

30P-2 Element Performance



Results typical from Multi-pass tests run per test standard ISO 16889 @ 30 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



15P Series

Specifications

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 3000 psi (206.9 bar)
Rated Fatigue Pressure: 2000 psi (138 bar)
Design Safety Factor: 3:1

Operating Temperatures:

Buna: -40°F (-40°C) to 225°F (107°C)
Fluorocarbon: -15°F (-26°C) to 275°F (135°C)

Element Collapse Rating:

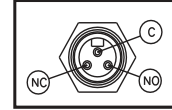
Standard- 350 psid (24.1 bar)
 "H" Option- 2000 psid (138 bar)
 "X" Option- 3000 psid (206.9 bar)

Materials:

Bowl: impacted aluminum (anodized 6061-T6)
 Head: extruded aluminum (anodized 6061-T6)
 Bypass: nylon

Element Condition Indicators:

Visual (optional) 360° green/ red
 Electrical/ Visual (optional)
 5A @ 240VAC, 3A @ 28VDC
 Electrical-heavy duty (optional)
 .25A (resistive) MAX 5 watts
 12 to 28 VDC & 110 to 175 VAC



E3

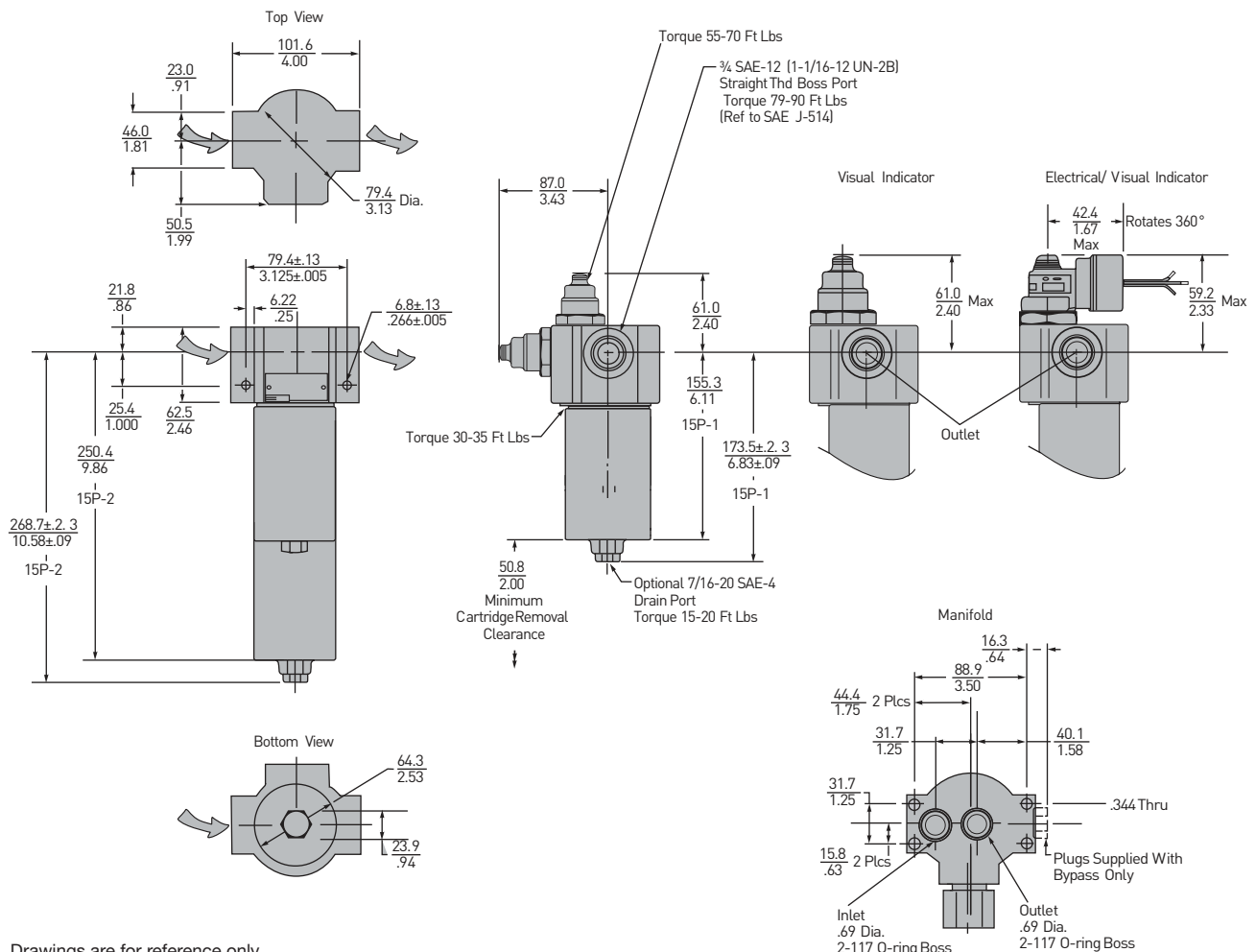
Color Coding:

White (common)
 Black (normally open)
 Blue (normally closed)

Weights (approximate):

15P-1 3.5 lb. (1.6 kg.)
 15P-2 4.6 lb. (2.1 kg.)

Linear Measure: millimeter
inch



Drawings are for reference only.
 Contact factory for current version.

30P/30PD Series

Specifications

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 3000 psi (206.9 bar)
Rated Fatigue Pressure: 2000 psi (138 bar)
Design Safety Factor: 3:1

Operating Temperatures:

Buna: -40°F (-40°C) to 225°F (107°C)
 Fluorocarbon: -15°F (-26°C) to 275°F (135°C)

Element Collapse Rating:

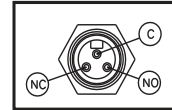
Standard- 350 psid (24.1 bar)
 "H" Option- 2000 psid (138 bar)
 "X" Option- 3000 psid (206.9 bar)

Materials:

Bowl: impacted aluminum (anodized 6061-T6)
 Head: extruded aluminum (anodized 6061-T6)
 Bypass: Nylon

Element Condition Indicators:

Visual (optional) 360° green/ red
 Electrical/ Visual (optional)
 5A @ 240VAC, 3A @ 28VDC
 Electrical-heavy duty (optional)
 .25A (resistive) MAX 5 watts
 12 to 28 VDC & 110 to 175 VAC



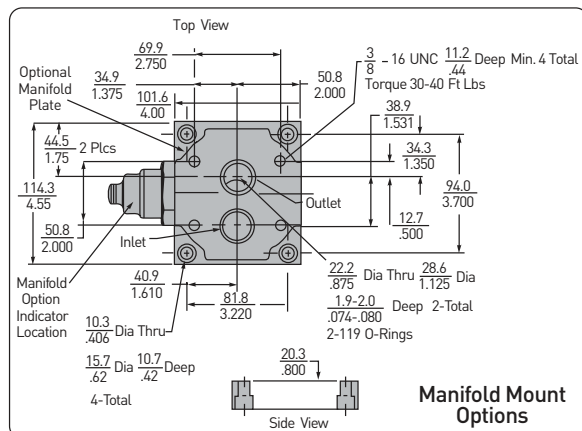
E3

Color Coding:

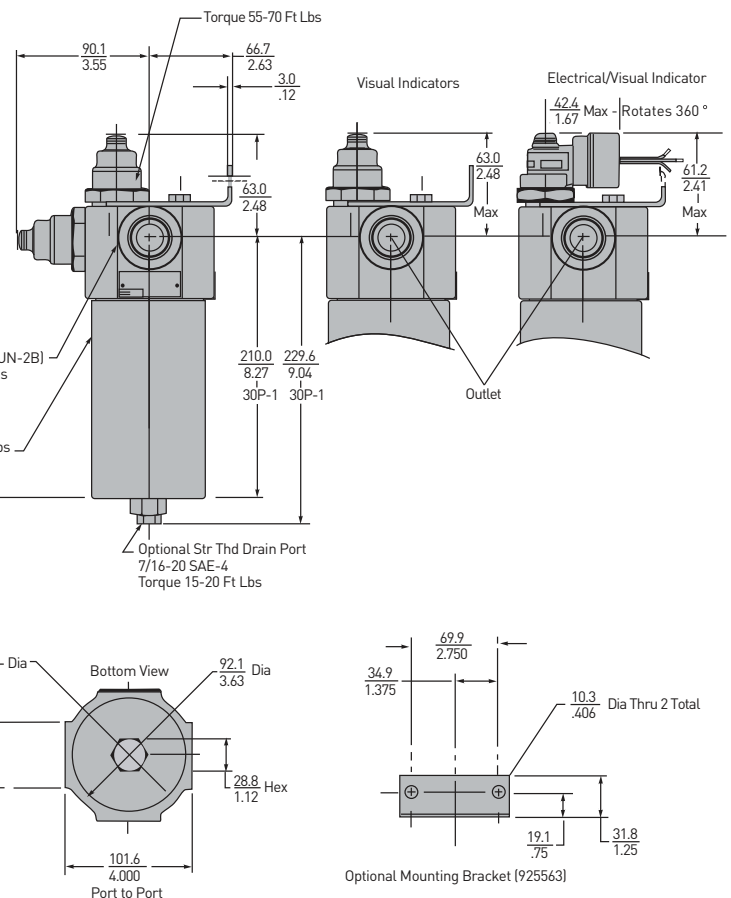
White (common)
 Black (normally open)
 Blue (normally closed)

Weights (approximate):

30P-1 6.4 lb. (2.9 kg.)
 30PD-1 36 lb. (16.3 kg.)
 30P-2 8.7 lb. (3.9 kg.)
 30PD-2 40 lb. (18.1 kg.)



Linear Measure: millimeter
inch



Drawings are for reference only.
 Contact factory for current version.

30P Duplex Filter

The Parker 30PD duplex pressure filter provides uninterrupted filtration for equipment that cannot be shut down for servicing.

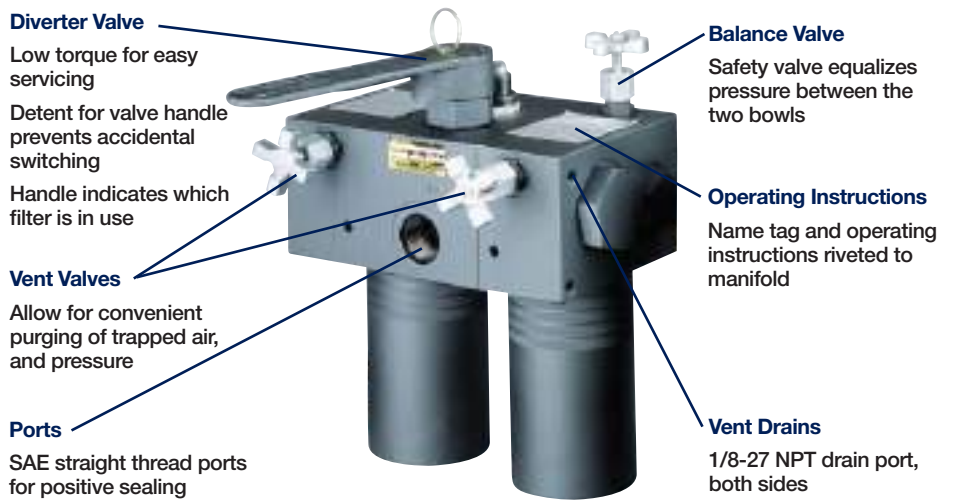
The 30PD allows you to simply switch the diverter valve and service the element while the other side is in service.

Pressure balancing valves and check valves are all neatly assembled in a compact manifold head that makes operation safe, smooth and easy.

Vent valves are also included to insure that all air is purged during service so that maximum system performance is achieved.

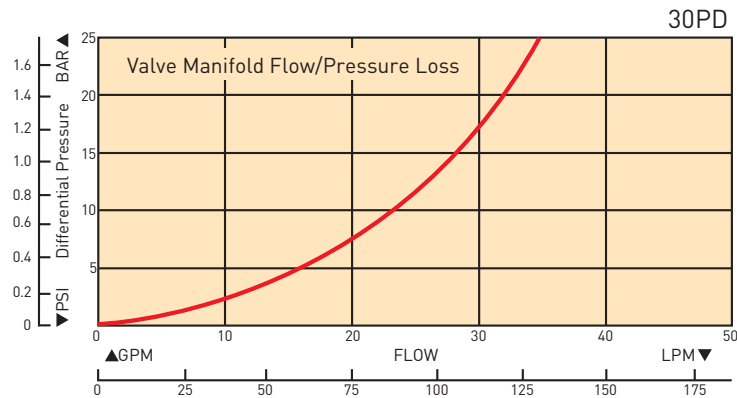
The Parker 30PD makes use of industry proven components. Elements are multi-pass tested in accordance with ANSI/NFPA T3.10.8.8 R1 -1990. Bowls and head are subjected to rigorous fatigue testing to insure a trouble free service life.

Drawings are for reference only. Contact factory for current version.



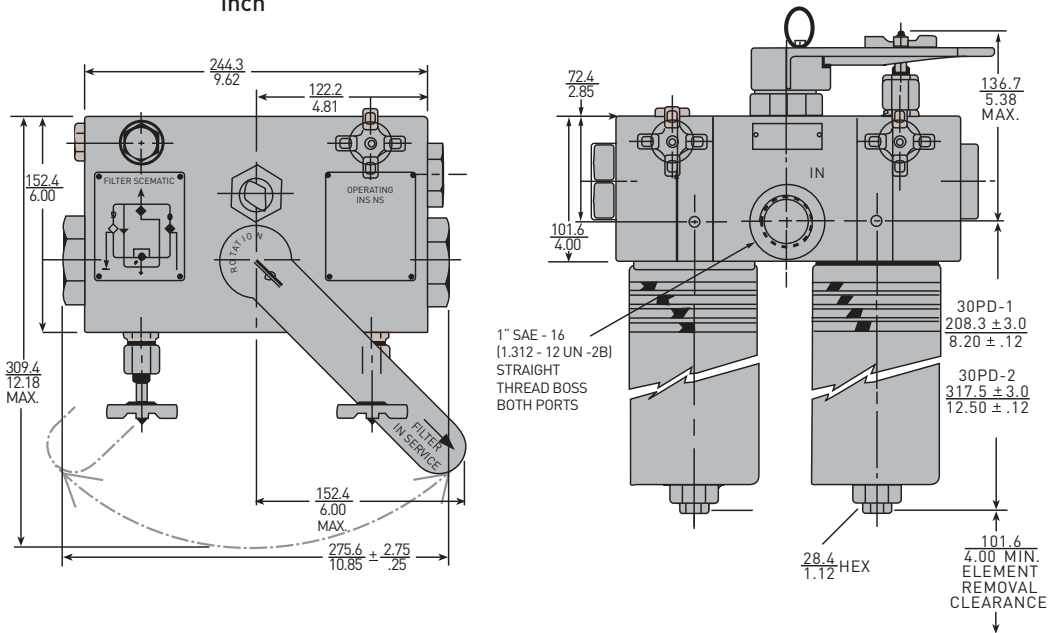
30PD Empty Housing Flow vs Pressure Loss

To obtain total filter assembly pressure loss, add empty housing loss to the pressure loss of selected element on 30P element performance pages.



Installation Dimensions

Linear Measure: millimeter
inch



15P/30P Series

Parts List

| Index | Description | 15P | 30P |
|-------|--|--|--|
| 1 | Head In-line Porting Bypass w/top indicator port No bypass w/top indicator port Bypass w/side indicator port No bypass w/side indicator port Manifold Porting Bypass w/indicator port No bypass w/ indicator port | 931520 931519 931522 931521 931135 931523 | 933956 933956 933955 933955 933954 933954 |
| 2 | Bypass Valve Assembly 50 psid (in-line model only) No bypass | 928981 935744* | 925127 925209 |
| 3 | Elements (see chart on model code page) | | |
| 4 | Bowl O-Ring Nitrile Fluorocarbon | N92138 V92138 | N92151 V92151 |
| 5 | Bowl Single without drain Single with drain Double without drain Double with drain | 937547 937549 937548 937550 | 937551 937553 937552 937554 |
| 6 | Drain Plug, SAE-4 W/nitrile o-ring W/fluorocarbon o-ring | 921088 928882 | 921088 928882 |
| 7 | Nameplate (unstamped) | 920928 | 920928 |
| 8 | Drive Screws | 903393 | 903393 |
| 9 | Mounting Spacer Tube (not shown) | 925650 | N/A |
| 10 | Mounting Bracket Kit | N/A | 925563 |
| 11 | Blank Indicator Kit | 925515 | 925515 |
| 12 | Indicators (fluorocarbon seals) Visual auto reset H option (1/2" conduit connection) E2 option (DIN 43650 connection) E3 option (3 pin ANSI/B93.55M connection) | 932027 932905 929599 929596 | 932027 932905 929599 929596 |
| 13 | Manifold Mounting Kit Manifold O-Rings (2 required) Nitrile Fluorocarbon | N/A N92117 V92117 | 925562 N92119 V92119 |

Note: consult factory for EPR part numbers
*Not for manifold-style head

Element Servicing

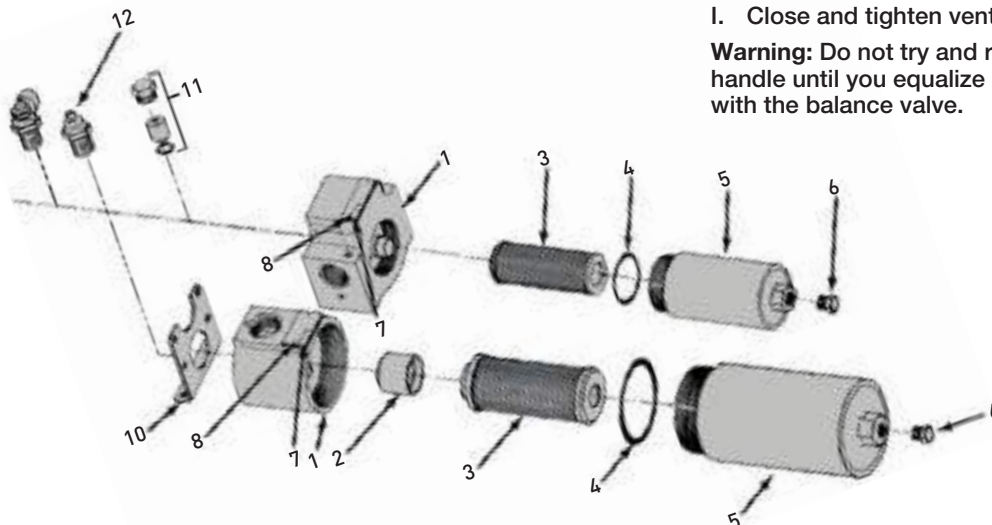
15P/30P

- Stop the system's power unit.
- Relieve any pressure in the filter line and drain filter bowl if drain port is provided.
- Loosen and remove bowl.
- Remove element from housing.
- Place new, clean element in housing, centering it on the element locator.
- Inspect the bowl o-ring and replace if necessary.
- Install bowl and tighten to specified torque.

30PD

- Arrow on diverter handle points to the on-duty chamber.
- Open off-duty vent valve (vent port should be plumbed back to reservoir).
- Open balance valve slowly to admit fluid into off duty chamber.
- When fluid is discharged from vent port, close and tighten.
- Pull up on detent pin and rotate diverter approximately 90° until detent relocates in seat.
- Close and tighten balance valve.
- Open new off-duty vent valve to relieve pressure.
- Follow steps C-G from 15P/30P instructions above.
- Close and tighten vent valve.

Warning: Do not try and rotate handle until you equalize pressure with the balance valve.



15P/30P Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 30P | 1 | 10Q | E | M2 | K | S16 | 4 |

| BOX 1: Filter Series | |
|----------------------|------------------|
| Symbol | Description |
| 15P | Pressure filter |
| 30P | Pressure filter |
| 30PD | Duplex style 30P |

| BOX 2: Element Length | |
|-----------------------|-------------|
| Symbol | Description |
| 1 | Single |
| 2 | Double |

| BOX 3: Media Code | |
|-------------------|----------------------------|
| Symbol | Description |
| 10C | Cellulose (30P, 30PD only) |
| 02Q* | Microglass III, 2 micron |
| 05Q | Microglass III, 5 micron |
| 10Q* | Microglass III, 10 micron |
| 20Q | Microglass III, 20 micron |

Note: For high collapse rated (2000 psid) elements, add "H" behind Q. For Microglass media only. *For 3000 psid collapse rated elements, add "X" behind Q.

| BOX 4: Seals | |
|--------------|--------------------------|
| Symbol | Description |
| B | Nitrile (NBR) |
| E | Ethylene propylene (EPR) |
| V | Fluorocarbon (FKM) |

| BOX 5: Indicator | |
|------------------|--|
| Symbol | Description |
| P | Port plugged |
| M2 | Visual auto reset |
| H | Electrical indicator, w/1/2"-14 NPT connection and 12" leads |
| E | Electrical/visual w/ 1/2" NPT conduit connection and wire leads |
| E2 | Electrical/visual (DIN 43650 Hirschman style connection) |
| E3 | Electrical/visual (ANSI/ B.9355M 3-pin Brad Harrison style connection) |

Note: For side mount indicators, place a "S" after indicator symbol. Not available on 30PD model.

| BOX 6: Bypass | |
|---------------|------------------|
| Symbol | Pressure Setting |
| K | 50 PSI (3.5 bar) |

| BOX 7: Ports | |
|--------------|-----------------------|
| Symbol | Description |
| | 15P |
| S12 | SAE-12 |
| X | 3/4"-manifold porting |
| | 30P |
| S16 | SAE-16 |
| X | 1"-manifold porting |
| | 30PD |
| S16 | SAE-16 |

Note: Customer supplies subplate for 30P manifold porting or may purchase 925562 30P manifold mounting kit. 15P requires no subplate.

| BOX 8: Options | |
|----------------|--------------------------|
| Symbol | Description |
| 1 | None |
| 2 | No bypass |
| 4 | SAE-4 drain port on bowl |
| 21 | No bypass and drain port |

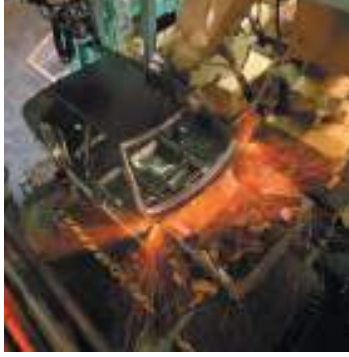
Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.

Replacement Elements (Fluorocarbon Seals)

| Media | 15P-1 | 15P-2 | 30P/30PD-1 | 30P/30PD-2 |
|-------|---------|---------|------------|------------|
| 20Q | 930369Q | 930370Q | 933135Q | 933136Q |
| 10Q | 932612Q | 932618Q | 932624Q | 932630Q |
| 05Q | 932611Q | 932617Q | 932623Q | 932629Q |
| 02Q | 932610Q | 932616Q | 932622Q | 932628Q |
| 20QH | 934983Q | 930544Q | NA | NA |
| 10QH | 932615Q | 932621Q | 932627Q | 932633Q |
| 05QH | 932614Q | 932620Q | 932626Q | 932632Q |
| 02QH | 932613Q | 932619Q | 932625Q | 932631Q |
| 10QX | 933577Q | 933579Q | 933581Q | 933583Q |
| 02QX | 933576Q | 933578Q | 933580Q | 933582Q |

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.





aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



50P Series

High Pressure Filters



ENGINEERING YOUR SUCCESS.

50P Series

Applications

Applications for 50P series filters

- Automotive specified equipment
- Hydrostatic transmission circuits
- Servo and proportional controls
- Offshore drilling rigs
- Mining equipment
- Power units

The design objective for all Parker filters is to achieve a sensible balance between cost and performance.

We use state of the art technology to arrive at innovative yet practical designs. Designs which are cost effective for OEM's and users alike.

The 50P series allows you to customize each filter to closely match your needs. Choose the options which best fit your application. No need to waste money on features you don't need.

The 50P series filters are base mounted, which provides several possible advantages. The bowl up mounting makes servicing the elements quick and easy. Simply remove the top cover to access the element. A drain port is provided to allow oil be removed from filter prior to element servicing. This design reduces the possibility of oil spillage and injury to maintenance personnel.

The 50P series has optional manifold porting for space saving design that reduces the number of fittings and potential leak points. The porting is also designed to match the installation of many other manufacturers. Most important, the 50P series meets the SAE HF4 automotive standard.



50P Series

Features

O-Ring Seal

- Positive sealing for optimum element efficiency

Plastic End Caps

- Excellent corrosion protection
- Laser marked for clear long lasting identification



Microglass III Media

- Multi-layer for high capacity and high efficiency
- Four different micron sizes available
- Wire reinforced to prevent pleat bunching

Spiral Support Cylinders (Not Visible)

- High strength consistent support
- Continuous length eliminates leak points and increases surface area

Meets SAE HF4 specification for automotive uses

| Feature | Advantage | Benefit |
|---|--|---|
| <ul style="list-style-type: none"> • Base mounted filter | <ul style="list-style-type: none"> • No brackets required for installation | <ul style="list-style-type: none"> • Reduced installation costs |
| <ul style="list-style-type: none"> • Top access cover | <ul style="list-style-type: none"> • Remove element from top • Lighter then removing entire bowl | <ul style="list-style-type: none"> • No oil mess |
| <ul style="list-style-type: none"> • Visual and electrical indicators | <ul style="list-style-type: none"> • Know exactly when to service elements | |
| <ul style="list-style-type: none"> • Drain port | <ul style="list-style-type: none"> • Drain all oil from assembly prior to servicing | <ul style="list-style-type: none"> • Eliminates cross contamination |
| <ul style="list-style-type: none"> • Vent port | <ul style="list-style-type: none"> • Purges all trapped air in filter | <ul style="list-style-type: none"> • Get the maximum performance from elements • Prevents a "spongy" system |
| <ul style="list-style-type: none"> • Multipass tested elements (per ANSI/NFPA T3.10.8.8 R1-1990) | <ul style="list-style-type: none"> • Element performance backed by recognized test standards | <ul style="list-style-type: none"> • Elements selected will have consistent performance levels |
| <ul style="list-style-type: none"> • Microglass III elements | <ul style="list-style-type: none"> • Multi-layer media • Wire reinforced pleats | <ul style="list-style-type: none"> • High capacity with high efficiency • No performance loss from pleat bunching |

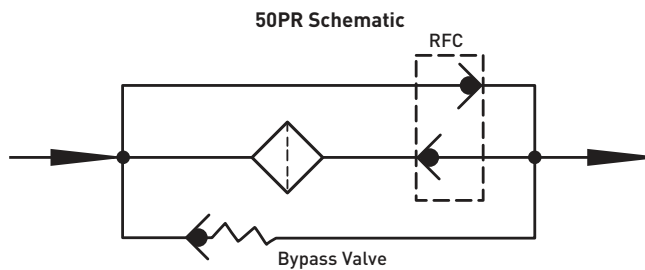
50P Series

50PR Reverse Flow Filter

The 50PR was designed specifically for hydrostatic transmission loops because of its capability to handle reverse flow.

Closed circuit HSTs frequently reverse direction causing flow to reverse in the fluid lines. Pressure filters installed between pump and motor must be able to handle reverse flow without having contaminant washed off of the elements and back into the system. To prevent such an occurrence, the filters require the use of internal check valves to direct the flow through the element in one direction and around the element in the other. Parker's internal check valve design minimizes additional pressure loss and eliminates the cost associated with external valves and fittings. Also the internal design keeps the envelope dimensions of the filter to a minimum as can be seen on the installation drawing.

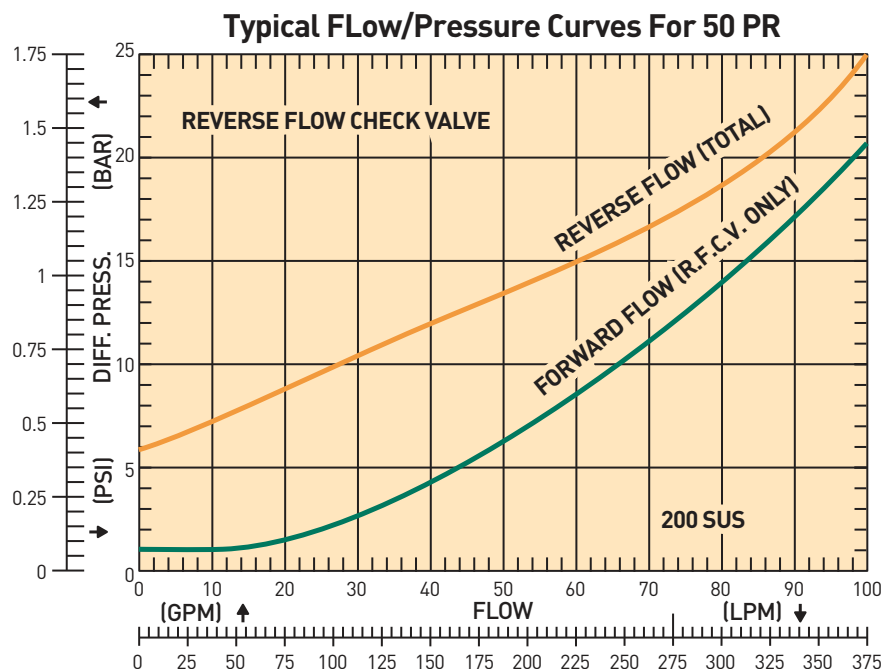
Sizing 50PR Filter Assemblies



To accurately determine the total pressure loss that will be seen when used in your system, the following steps should be taken.

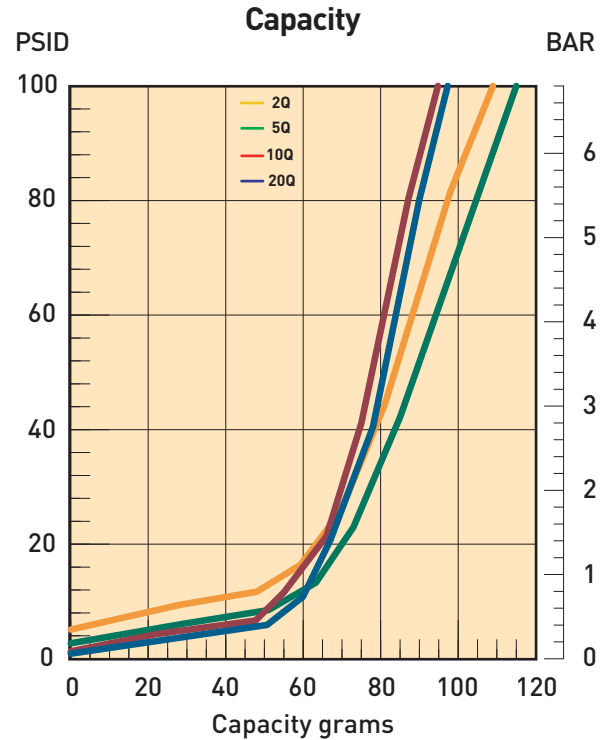
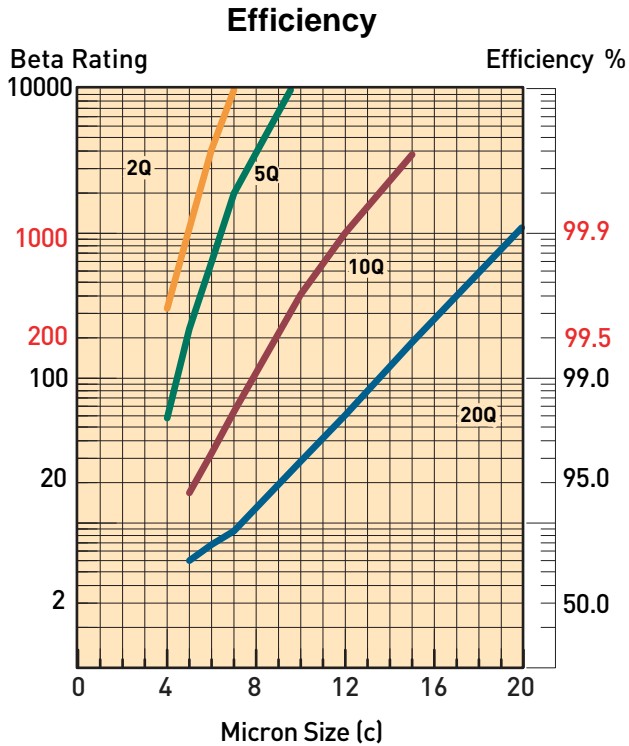
1. Examine the "Flow vs. Pressure" curve below. Find the pressure drop for the maximum system flow on the forward flow curve. Record this value as "housing with check valve pressure loss."
2. Examine the appropriate pressure loss curve for the media and bowl length combination. These curves are found in the Element Performance Data section.
3. Find the pressure drop for the maximum flow rate through the filter and record this value as "element pressure loss."
4. Find the empty housing pressure drop for the maximum flow rate through the filter and record this value as "empty housing pressure loss."
5. Add the values obtained in steps 1 and 3, then subtract out the value from step 4. The resultant pressure loss should not exceed 1/3 of the bypass valve or indicator you intend to select. If this ratio exceeds 1/3, then a double length housing or other media grade may need to be considered.

Contact the Hydraulic Filter Division if there is any doubt as to the total pressure loss you have calculated.



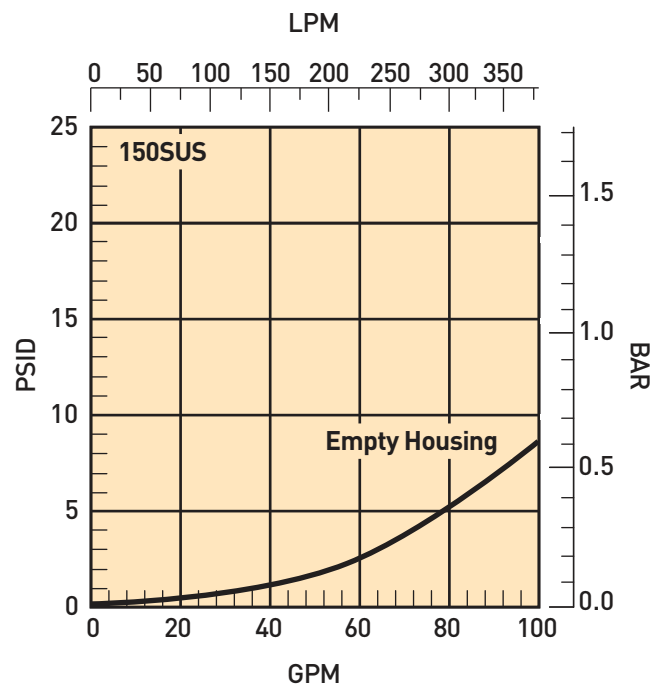
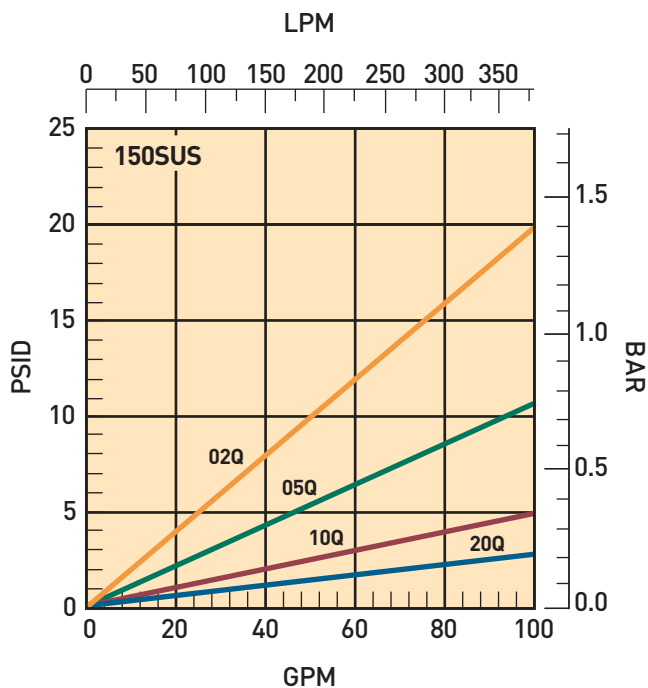
50P Series

50P-1 Element Performance



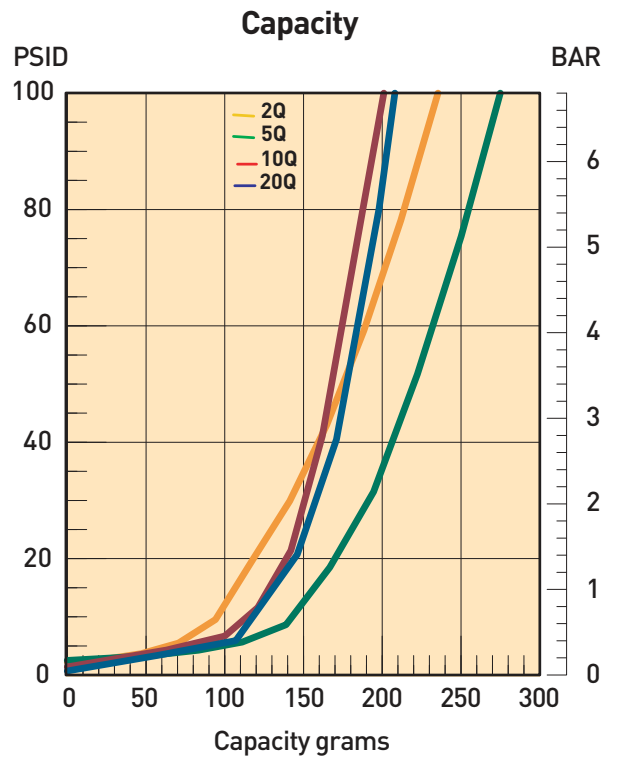
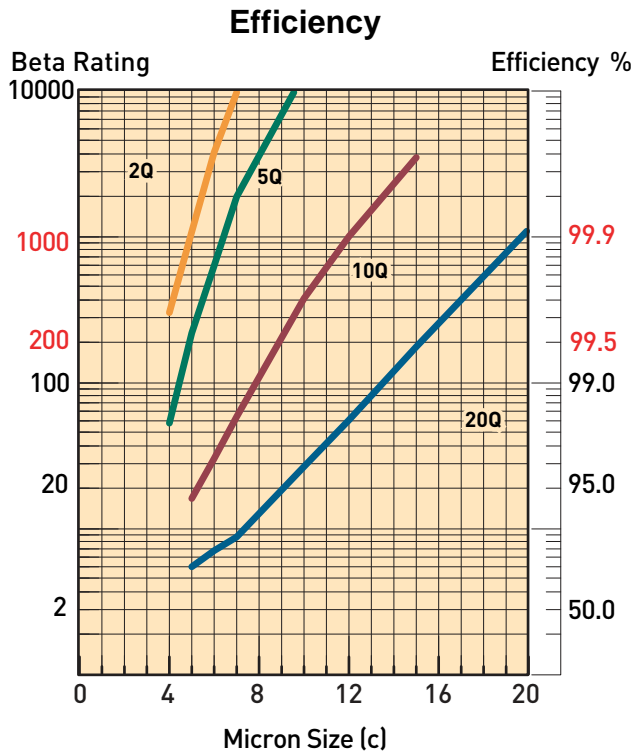
Results typical from Multi-pass tests run per test standard ISO 16889 @ 50 gpm to 100 psid terminal - 10 mg/L BUGL
Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



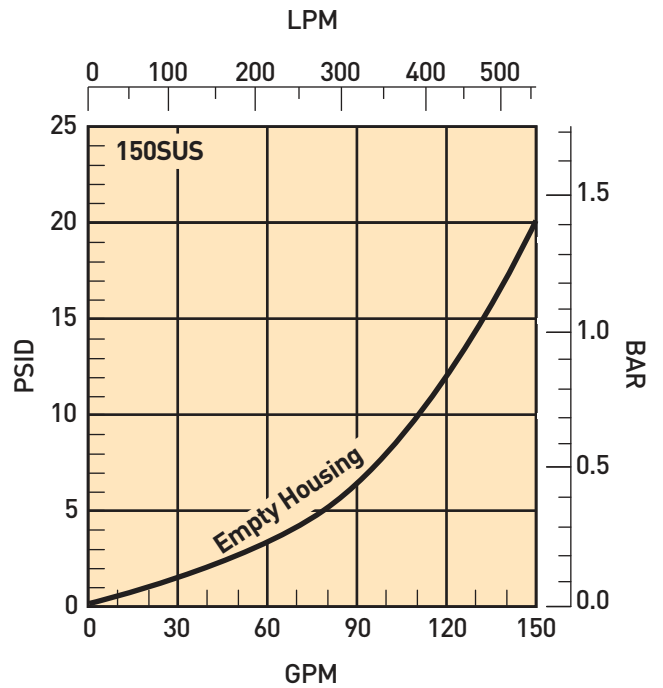
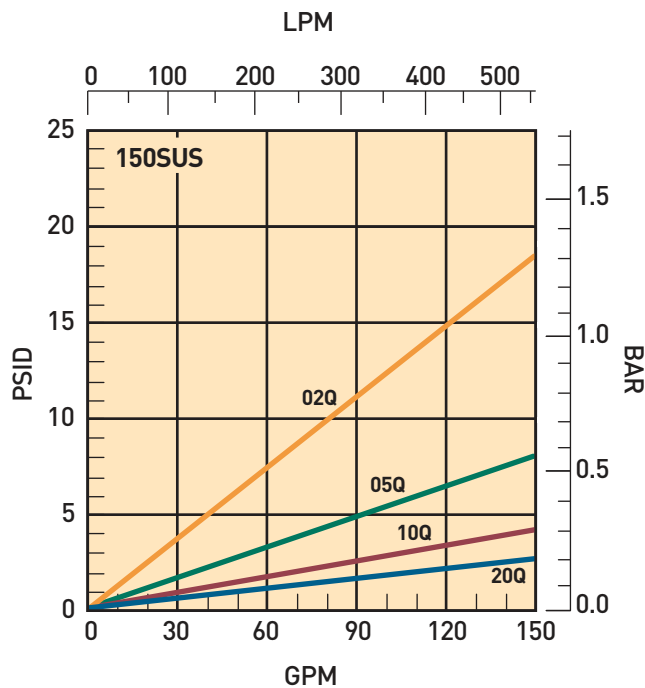
50P Series

50P-2 Element Performance



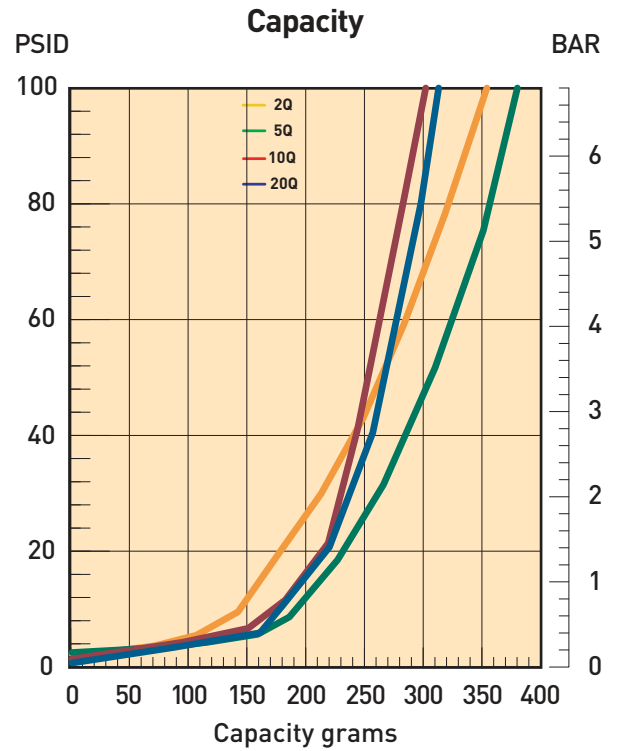
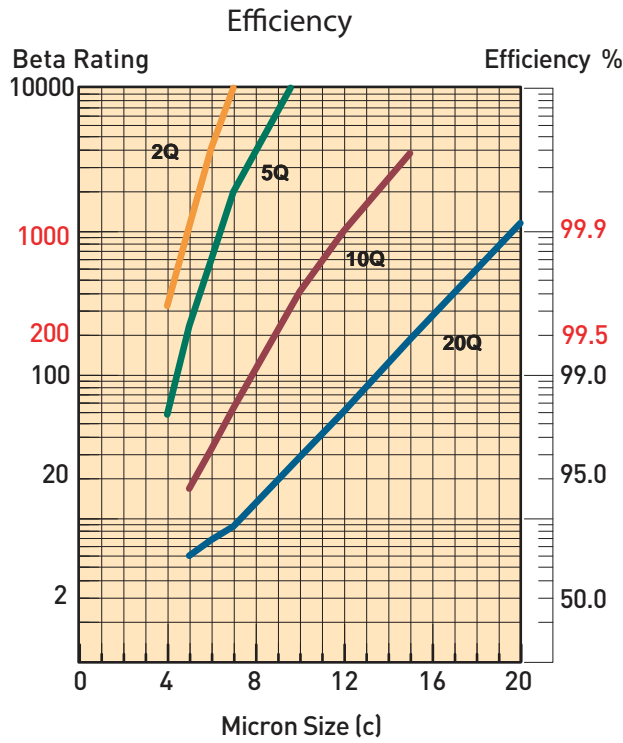
Results typical from Multi-pass tests run per test standard ISO 16889 @ 80 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



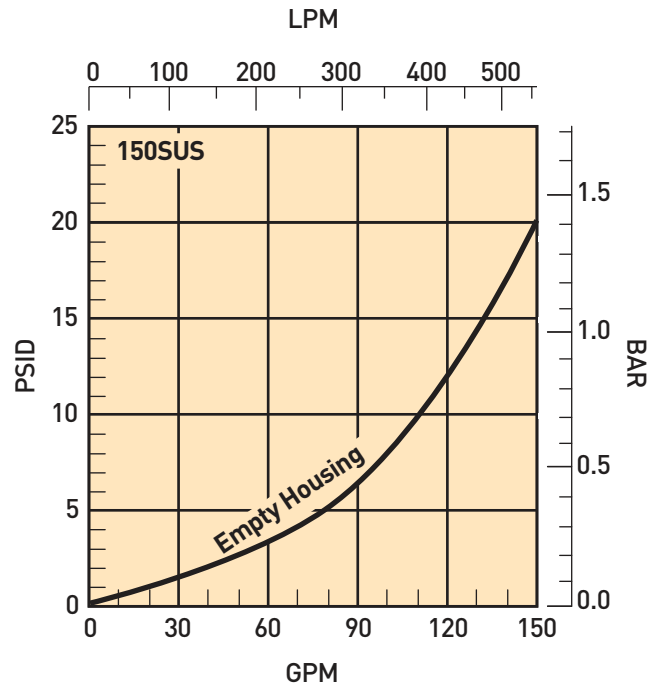
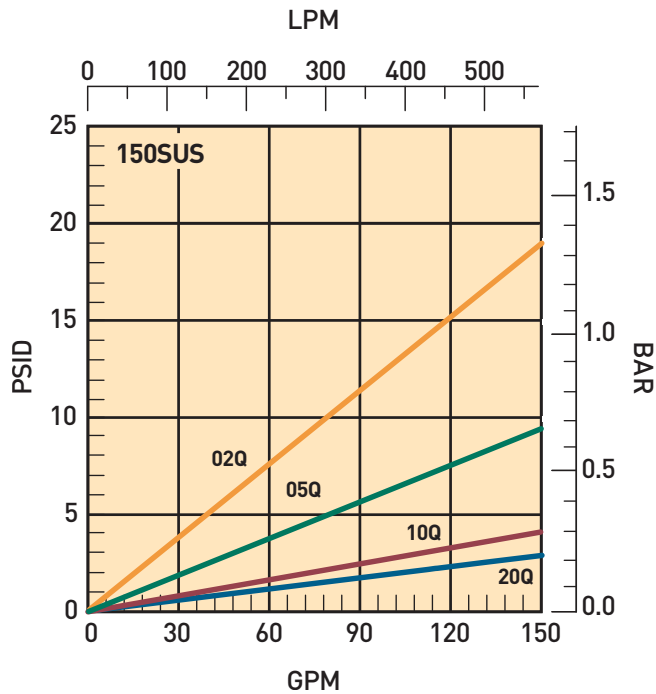
50P Series

50P-3 Element Performance



Results typical from Multi-pass tests run per test standard ISO 16889 @ 80 gpm to 100 psid terminal - 10 mg/L BUGL
 Refer to Appendix on pages 264-265 for relationship to test standard ISO 4572.

Flow vs. Pressure Loss



50P Series

Specifications

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 5000 psi (344.8 bar)
 Rated Fatigue Pressure: 3500 psi (241.4 bar)
 Design Safety Factor: 3:1

Element Collapse Rating:

150 psid (10.2 bar) standard
 2000 psid (138 bar) high collapse "H" option

Operating Temperatures:

Buna: -40°F (-40°C) to 225°F (107°C)
 Fluorocarbon: -15°F (-26°C) to 275°F (135°C)

Filter Materials:

Head (base) and Cover: ductile iron
 Bowl: seamless steel tube

Indicators:

Visual 3 band (clean, change element, bypass)

Electrical: visual as above plus electrical switch with wire leads or connection as selected.

5A @ 240VAC

3A @ 28VDC

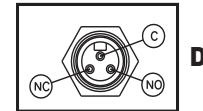
SPDT

Color Coding:

White (normally closed)

Red (normally open)

Black (common)



Shipping Weights (approximate):

50P-1: 56 lb. (25.4 kg)

50P-2: 77 lb. (34.9 kg)

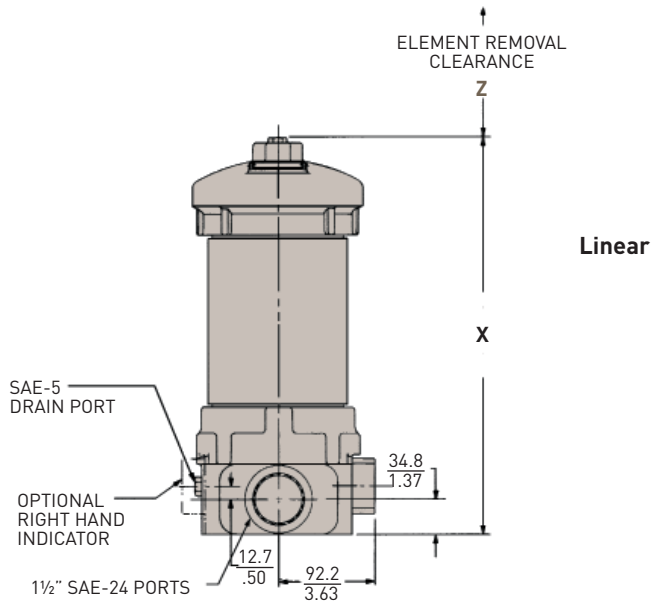
50P-3: 95 lbs. (43.0 kg)

50PR-1: 59 lb. (26.8 kg)

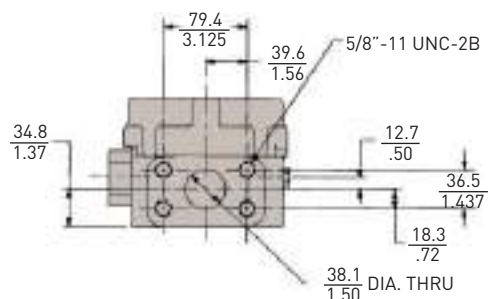
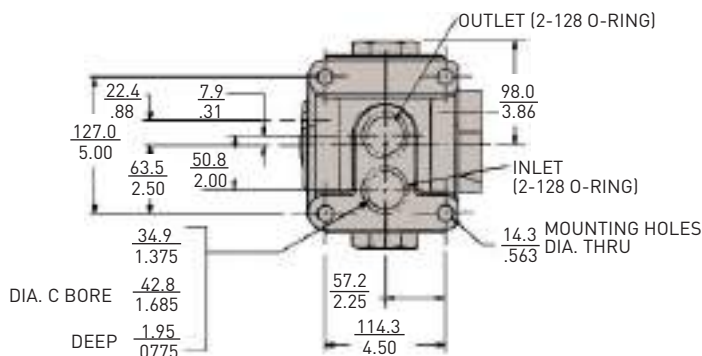
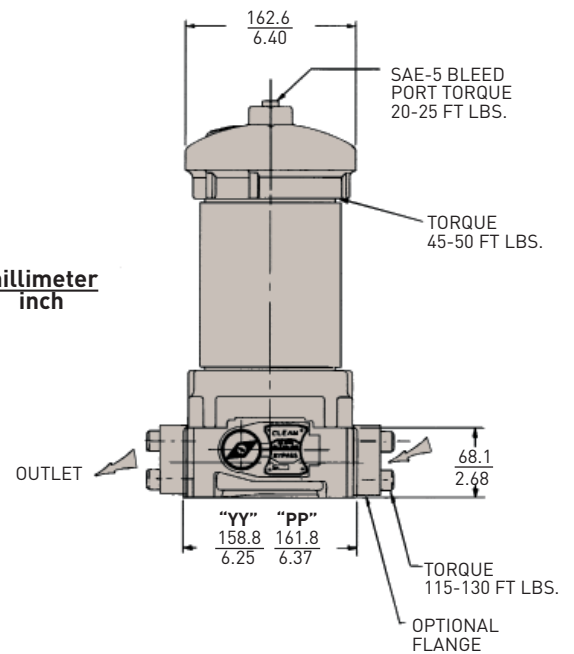
50PR-2: 80 lb. (36.3 kg)

| Dimensions= mm/inches | 50P-1 | 50PR-1 | 50P-2 | 50PR-2 | 50P-3 |
|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| X | $\frac{387.1}{15.24}$ | $\frac{404.6}{15.93}$ | $\frac{622.8}{24.52}$ | $\frac{640.3}{25.21}$ | $\frac{850.4}{33.48}$ |
| Z | $\frac{254.0}{10.00}$ | $\frac{254.0}{10.00}$ | $\frac{508.0}{20.00}$ | $\frac{508.0}{20.00}$ | $\frac{760.2}{30.00}$ |

Drawings are for reference only.
 Contact factory for current version.



Linear Measure: millimeter
inch



50P Series

How to Order

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| F3 | 50P | 1 | 10Q | DL | 90 | PP | 1 |

| BOX 1: Seals | |
|--------------|--------------|
| Symbol | Description |
| None | Buna |
| F3 | Fluorocarbon |
| E8 | EPR |

| BOX 2: Basic Assembly | |
|--|----------------------------------|
| Symbol | Description |
| 50P | 5000 PSI (MAOP) |
| 50PR* | Reverse flow hydrostatic version |
| *Note: Not available in triple length. Must select "1" or "2" in BOX 3 | |

| BOX 3: Length | |
|---------------|---------------|
| Symbol | Description |
| 1 | Single |
| 2 | Double |
| 3 | Triple |

| BOX 4: Element Media | |
|---|----------------|
| Symbol | Description |
| 20Q | Microglass III |
| 10Q | Microglass III |
| 05Q | Microglass III |
| 02Q | Microglass III |
| Note: For high collapse 2000 psid rated elements, add "H" behind Q. | |

| BOX 5: Indicators | |
|---|---|
| Symbol | Description |
| P | Port plugged |
| PL | Port plugged, left side |
| M | Visual indicator |
| ML | Visual indicator, left side |
| E | Electrical indicator with wire leads and conduit connection |
| EL | Electrical indicator with wire leads and conduit connection, left side |
| D | Electrical indicator w/ ANSI/B.93.55M 3-pin Brad Harrison style connection |
| DL | Electrical indicator w/ ANSI/B.93.55M 3-pin Brad Harrison style connection, left side |
| Note: Left side is on viewer's left when looking into inlet port. | |

| BOX 6: Bypass and Indicator Setting | |
|-------------------------------------|------------------|
| Symbol | Pressure Setting |
| 35 | 35 psid |
| 50 | 50 psid |
| 90 | 90 psid |

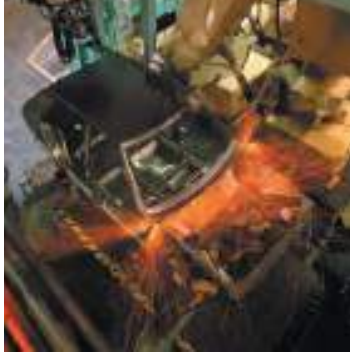
| BOX 7: Ports | |
|--------------|--------------------------------------|
| Symbol | Description |
| PP | SAE-24 straight thread |
| YY | SAE 1½" flange face (J518) |
| XX | 1¾" manifold ports on bottom of head |

| BOX 8: Options | |
|----------------|-----------------------|
| Symbol | Description |
| 1 | None |
| 11 | Blocked bypass |

50P/50PR Replacement Elements (Fluorocarbon)

| Media | Standard Collapse | | | Media | High Collapse | | |
|-------|-------------------|---------|---------|-------|---------------|---------|---------|
| | Single | Double | Triple | | Single | Double | Triple |
| 20Q | 931018Q | 931020Q | 933489Q | 20QH | 930438Q | 931490Q | 936449Q |
| 10Q | 932670Q | 932679Q | 933488Q | 10QH | 932676Q | 932685Q | 936448Q |
| 05Q | 932669Q | 932678Q | 933487Q | 05QH | 932675Q | 932684Q | 936447Q |
| 02Q | 932668Q | 932677Q | 933486Q | 02QH | 932674Q | 932683Q | 936446Q |

Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.



aerospace
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 electromechanical
filtration
 fluid & gas handling
 hydraulics
 pneumatics
 process control
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100P Series

High Pressure Filters



ENGINEERING YOUR SUCCESS.

100P Series

Applications

Features/Applications for High Pressure Hydraulic Filters 100P Series

- Pressures to 6,000 PSI
- Flows to 265 GPM
- Microglass Elements 3 to 20 Micron
- 1½" and 2" Ports - SAE O-Ring or Code 62 Flange
- Reverse Flow Option

Specifications:

Flow Rating: 265 GPM

Operating Pressure: 6000 PSI

Proof Pressure: 9000 PSI

Burst Pressure: 12,000 PSI

Fatigue Pressure:

0-4000-0 PSI@3,000,000 cycles

Bypass Setting: 100 PSID

Fluid Temperature: -40°F to +212°F

Construction:

Head and Cap: Nodular Iron

Bowl: Seamless Steel Tube

Indicators: Brass

Elements: Consult Factory

Weight:

Length 2 -104 Lbs.

Electrical Ratings:

Hirschman Connector without Lamps:

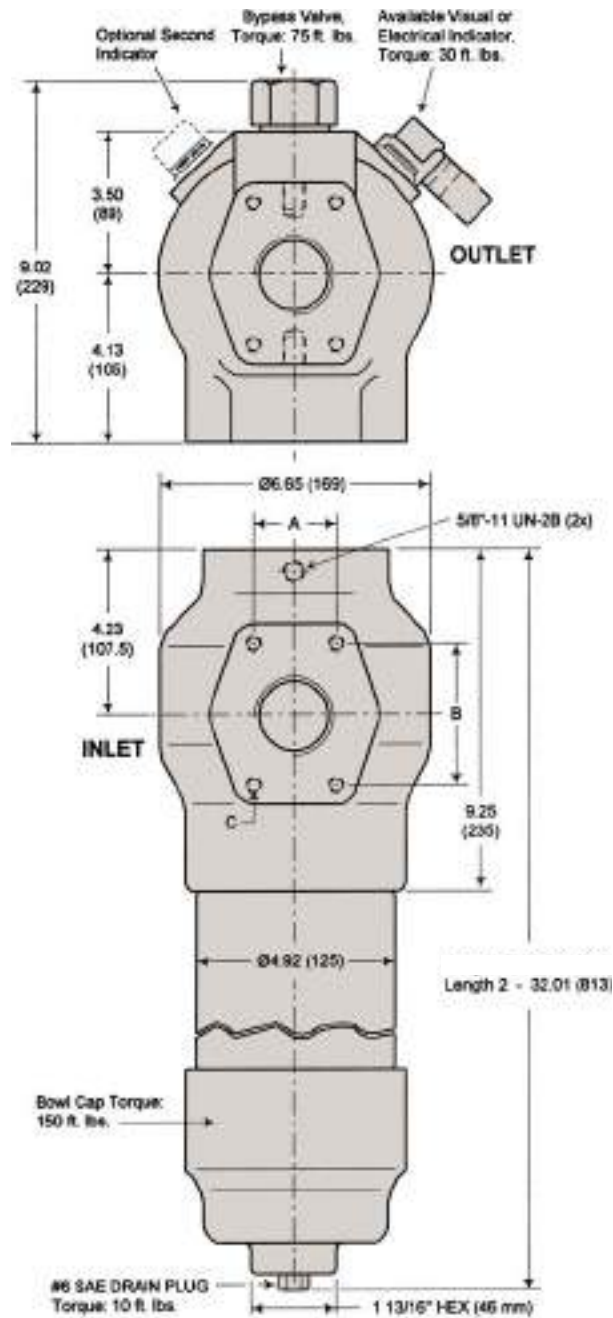
- E2 - 110 VAC, .5 Amp Ind., 2 Amp Res.
- 250 VAC, .5 Amp Ind., 2 Amp Res.
- 28 VDC, 1 Amp Ind., 2 Amp Res.



100P Series

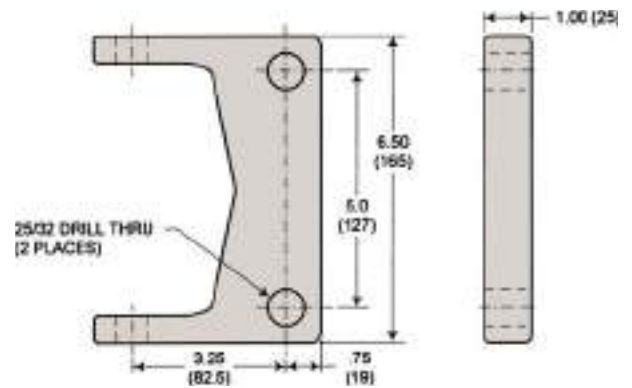
Specifications

Dimensions Inches (mm)



Element Removal Clearance: Length 2 - 23.10

Optional Mounting Bracket



| Port | Dimensions | | |
|------|------------------|------------------|----------------|
| | A | B | C |
| F | 1.437" 36.5mm | 3.125" 79.4mm | 5/8"-11 X 1.4" |
| T | 1.750" 44.5mm | 3.812" 96.8mm | 3/4"-10 X 1.4" |

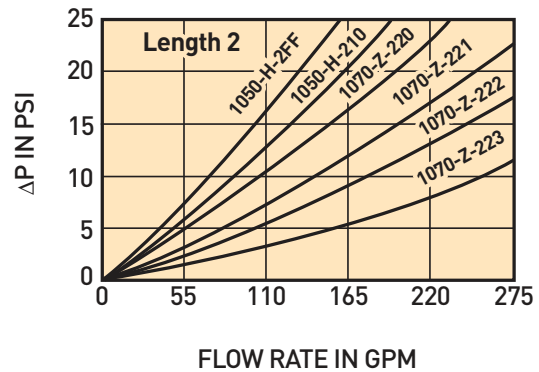
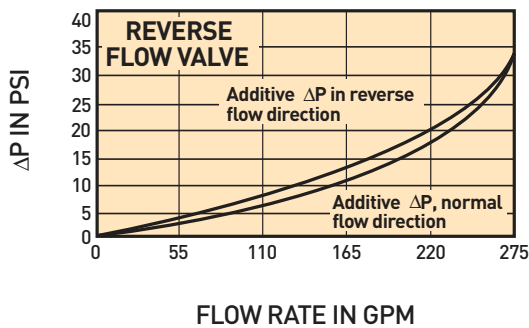
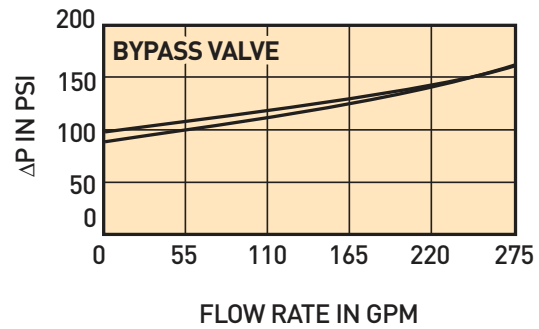
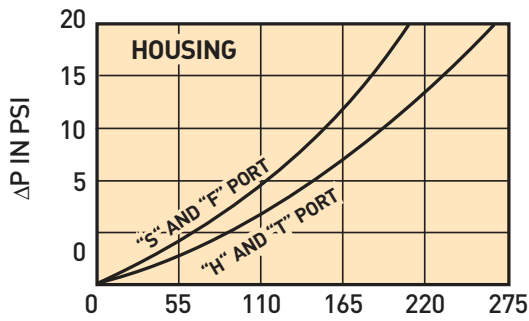
Drawings are for reference only.
Contact factory for current version.

100P Series

Element Performance

Flow/Pressure Drop Data

Fluid Conditions: Viscosity 140 SSU and Sp. Gr. 0.88



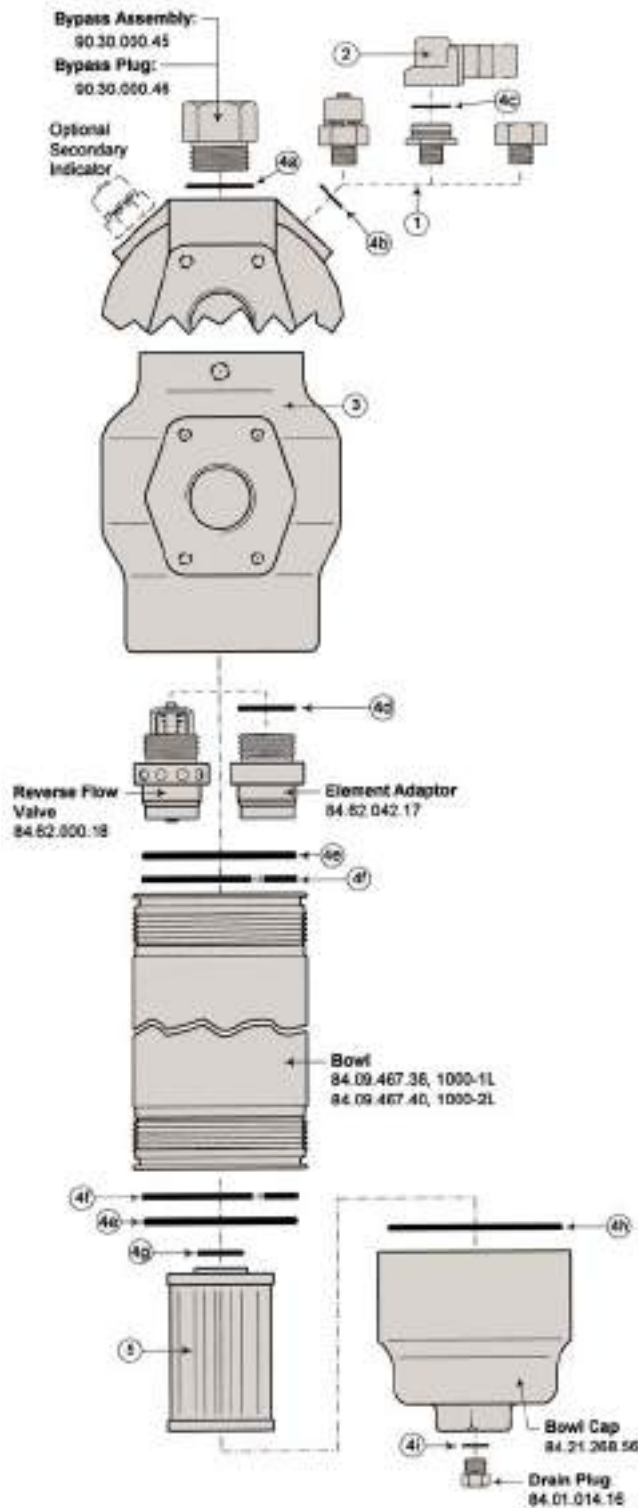
Multipass Test Results to ISO 4572 (Time Weighted Average)

| Media Code | Filtration Rating | | | | | | |
|------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-----------------|
| | $\beta_x \geq 100$ | β_3 | β_6 | β_{10} | β_{12} | β_{20} | β_{25} |
| 02Q | 3 | ≥ 100 99.0 | > 300 99.67 | > 1500 99.93 | > 2000 99.95 | > 5000 99.98 | INF |
| 05Q | 6 | 12 91.7 | ≥ 100 99.0 | > 1000 99.9 | > 2000 99.95 | > 5000 99.98 | INF |
| 10Q | 10 | 8 87.5 | 22 95.4 | ≥ 100 99.0 | ≥ 200 99.5 | > 5000 99.98 | INF |
| 20Q | 20 | - | 2 50.0 | 8 87.5 | 20 95.0 | ≥ 100 99.0 | > 200 99.5 |

Element Beta ratio β_x
Element efficiency in percent*

100P Series

Parts List



Drawings are for reference only.
Contact factory for current version.

| 1 Indicators | | |
|--------------|---------------------|----------------|
| Visual | Electrical Sub-Assy | Indicator Plug |
| 6N50-2A | 90.34.000.24 | 84.01.066.30 |

| 2 Electrical Actuator Assembly | | |
|--------------------------------|-------------|----------------------|
| Hirschmann Connector | | |
| Code | Part Number | Voltages Available |
| E2 | FF3468 | 28 VDC, 250 VAC Max. |

| 3 Head | |
|---|--------------|
| Description | Part Number |
| 1000-F, 1-1/2" SAE 6000 PSI Flange, Code 62 | 84.69.268.20 |
| 1000-T, 2" SAE 6000 PSI Flange, Code 62 | 84.69.268.22 |

| 4 Seals | | | |
|-------------------------------|--------------|--------------|--|
| Description | Buna-N | Viton | |
| (a) Bypass Assy/Plug Seal* | N93924 | V93924 | |
| (b) Indicator to Head Seal* | N72019 | V72019 | |
| (c) Actuator Dust Seal | N72021 | | |
| (d) Adaptor to Head Seal* | 81.10.150.15 | 81.10.152.15 | |
| (e) Head/Bowl/Cap Seal* | N92346 | V92346 | |
| (f) Head to Bowl Back-Up Ring | FF3142 | | |
| (g) Element Seal | N72141 | V72141 | |
| (h) Bowl Cap Seal* | 81.10.150.86 | 81.10.152.86 | |
| (i) Drain Plug Seal* | N93906 | V93906 | |

| 5 Element Kit‡ | | | | |
|--------------------------------------|---------------|-----------|----------------|------------|
| Disposable All Fluids | | | | |
| Length | 3 µm abs. | 6 µm abs. | 10 µm abs. | 20 µm abs. |
| 2 | 939064Q | 939065Q | 939066Q | 939067Q |
| High Collapse Disposable (3000 psid) | | | | |
| Length | 3 µm absolute | | 15 µm absolute | |
| 2 | 940741Q | | 940742Q | |

*Included in Seal Kit: **936063**, Nitrile **8061000013**, Fluorocarbon

†Included in Element Kit

‡To specify seal material, add the following suffix to the part number:

A Nitrile **H** Fluorocarbon

| Options (Not Shown) | |
|---------------------|--|
| Part Number | Description |
| 402904 | Mounting Bracket, Includes (2) 5/8"-11 x 1-1/4" Hex Flange Bolts |

100P Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 100P | 2 | 10Q | B | M2 | M | F32 | 1 |

| BOX 1: Filter Series | |
|----------------------|----------------------|
| Symbol | Description |
| 100P | High Pressure filter |

| BOX 2: Element Length | |
|-----------------------|-------------|
| Symbol | Description |
| 2 | Double |

| BOX 3: Media Code | |
|-------------------|---------------------------|
| Symbol | Description |
| | Standard Element |
| 02Q | Microglass III, 2 micron |
| 05Q | Microglass III, 5 micron |
| 10Q | Microglass III, 10 micron |
| 20Q | Microglass III, 20 micron |
| | High Collapse Element |
| 02QX | Microglass III, 2 micron |
| 10QX | Microglass III, 10 micron |

| BOX 4: Seals | |
|--------------|--------------|
| Symbol | Description |
| B | Nitrile |
| V | Fluorocarbon |

| BOX 5: Indicator | |
|------------------|--------------------------------------|
| Symbol | Description |
| M2 | Visual differential ² |
| E2 | Electrical differential ² |

| BOX 6: Bypass | |
|---------------|------------------------|
| Symbol | Pressure Setting |
| M | 100 PSID (7.0 bar) |
| X | No bypass ³ |

| BOX 7: Ports | |
|--------------|----------------------------|
| Symbol | Description |
| F24 | 1-1/2" SAE flange, Code 62 |
| F32 | 2" SAE flange, Code 62 |

| BOX 8: Options | |
|----------------|--|
| Symbol | Description |
| 1 | None |
| 3 | Reverse flow valve (RFV) |
| TP | Mounting bracket (including bolts) |
| 3TP | RFV & mounting bracket (including bolts) |

Notes:

1. Filters include the element you select already installed.
2. Indicator setting is 73 psid (5,0 bar).
3. When the no bypass option is selected, a high collapse element must also be selected.



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World Pressure Filters

A New Standard in 7,000 psi Pressure Filters



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WPF Series

Applications

Together we can...

Preserve the environment.
Minimize waste and promote energy efficiency.

Achieve worldwide filtration solutions.
Build global confidence.

Redefine new limits.
Forge ahead with advanced technology.

Keep contamination under control.
Reduce maintenance costs.

Enhance total system reliability.
Focus on customer satisfaction.

Reach optimum potential.
Drill to greater depths.

...engineer your success.

Parker engineers have developed what soon will be the industry standard in high pressure hydraulic filtration. The new 7,000 psi WPF series incorporates many advanced features designed for one reason: to improve your bottom line.



Typical Applications

- Aircraft Ground Support
- Injection Molding
- Mining
- Mobile Ag
- Mobile Construction
- Oil & Gas Exploration
- Power Generation
- Primary Metals
- Refuse Trucks



There is no better high pressure filter available today for durability and performance. The reduction of your operating costs is our primary concern, and we are committed to contributing towards your success.



WPF Series

Features



- 1 High strength ductile iron filter head with integral indicator port
- 2 Steel bowl with standard drain port
- 3 Proprietary element endcap assembly includes bypass and reverse flow valves
- 4 Patented deformable tangs secure element in bowl
- 5 Coreless element assembly
- 6 Re-usable element support core

WPF Series

SurgeGuard Elements

Ecoglass design
Non-metallic construction

Environmentally friendly.
Reduced disposal costs due to
minimum mass and oil retention

Proprietary
SurgeGuard protection
System protection
from back-flow

Component performance
integrity with improved flow fatigue
resistance

Integrated bypass & reverse flow
valve technology
Every element serviced provides
new bypass &
reverse flow valve assembly

Reliable, high performance, quick
response design

Low mass, low ΔP
reverse flow valve
Ideal for closed-loop
applications

Greater design and
service flexibility

Patented
deformable tangs
Automatic element
locate and removal

Easy, fast, safe, clean

Element removal
clearance
Benchmarked best-in-class
against major competitors

Ease-of-service.
Machine design flexibility

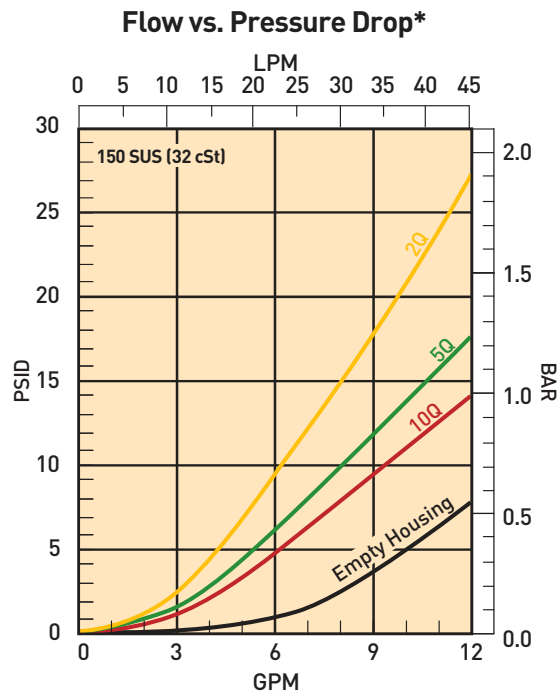
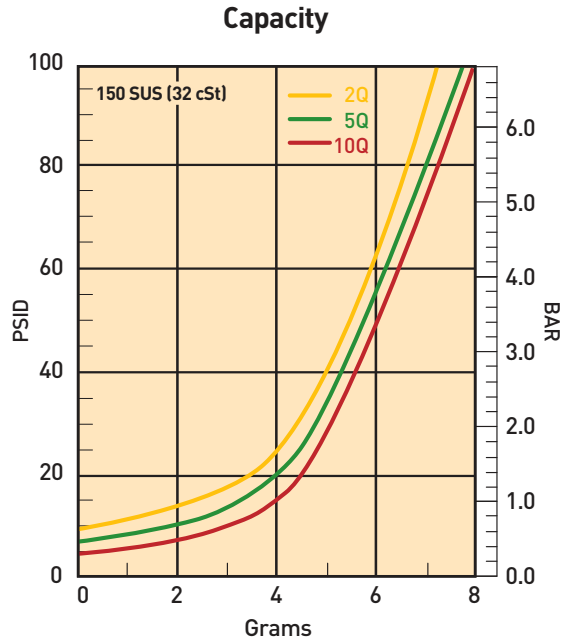
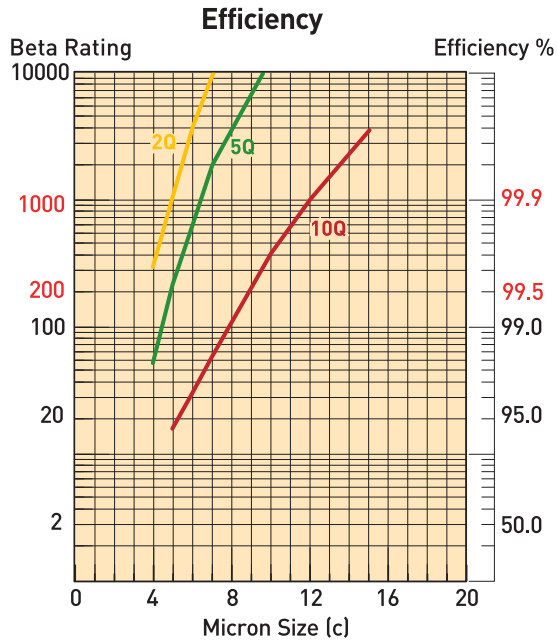
Patented valves
with low hysteresis
Zero leakage
and low friction

Optimum performance



WPF Series

WPF1 Element Performance



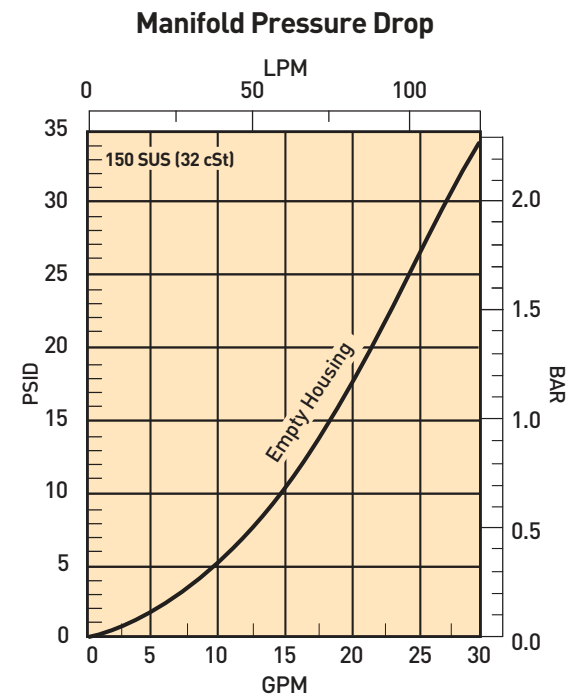
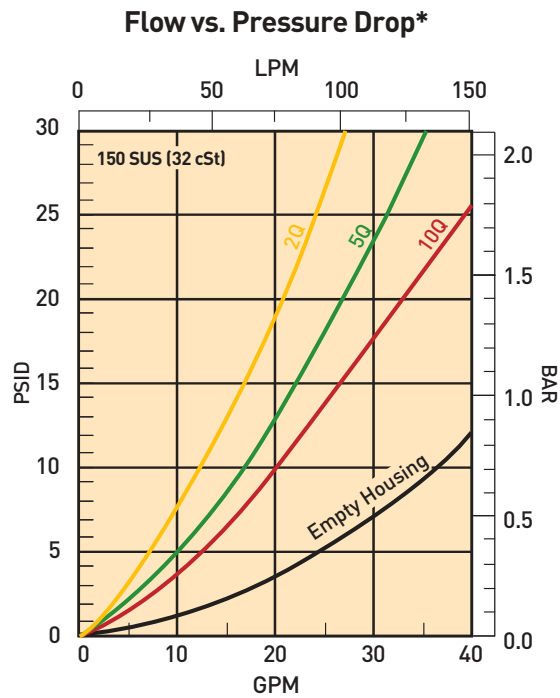
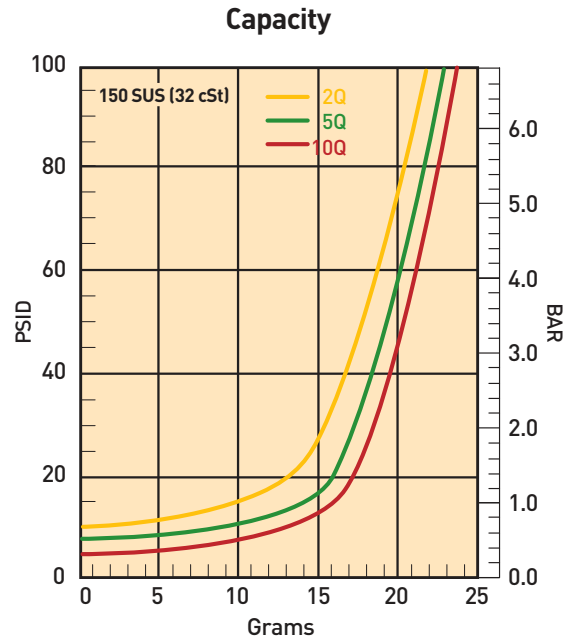
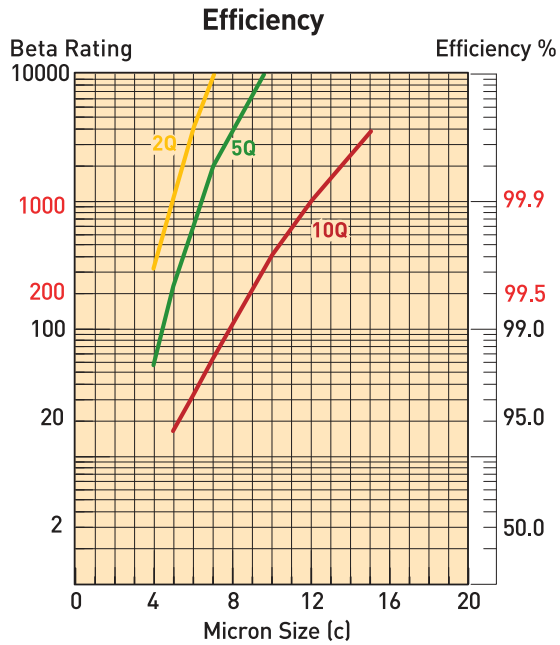
*High Collapse Correction Factor:
 "QH" Elements (2000 psid) = 1.4 times reported loss

Results typical from Multi-pass tests run per test standard ISO 16889 @ 10 gpm to 50 psid terminal - 10 mg/L BUGL.

Note: During reverse flow, ΔP is 20 psid at max. flow.

WPF Series

WPF2 Element Performance



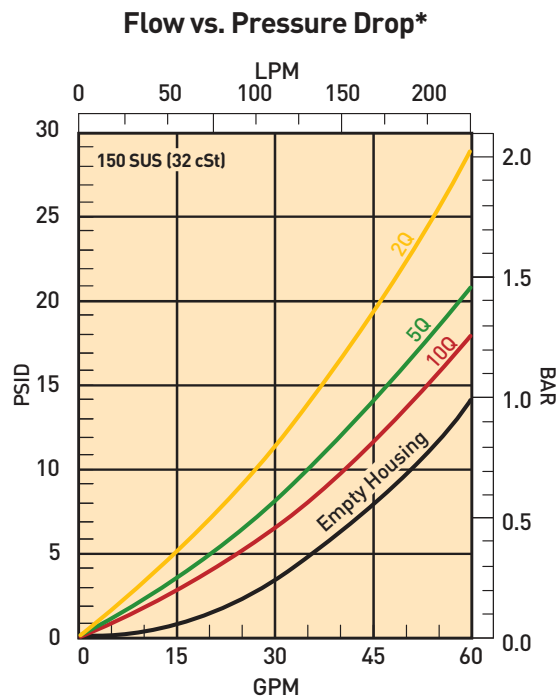
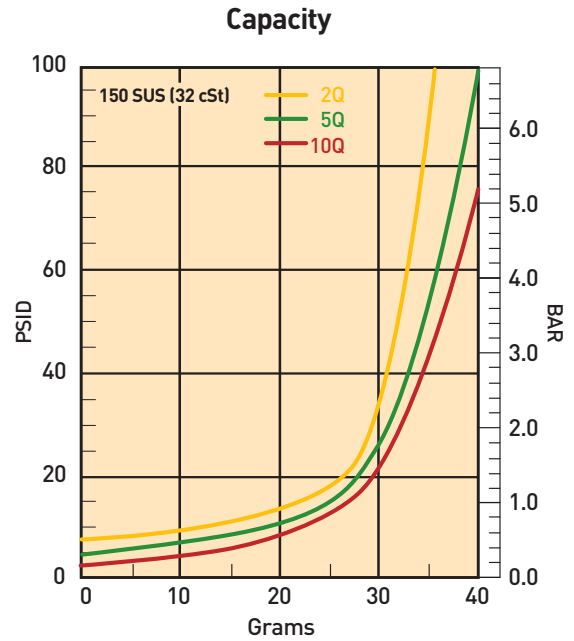
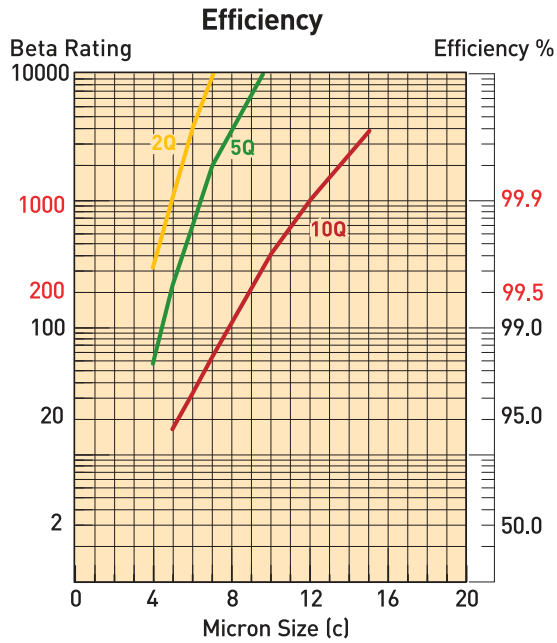
*High Collapse Correction Factor:
 "QH" Elements (2000 psid) = 1.4 times reported loss

Results typical from Multi-pass tests run per test standard ISO 16889 @ 25 gpm to 50 psid terminal - 10 mg/L BUGL.

Note: During reverse flow, ΔP is 20 psid at max. flow.

WPF Series

WPF3 Element Performance



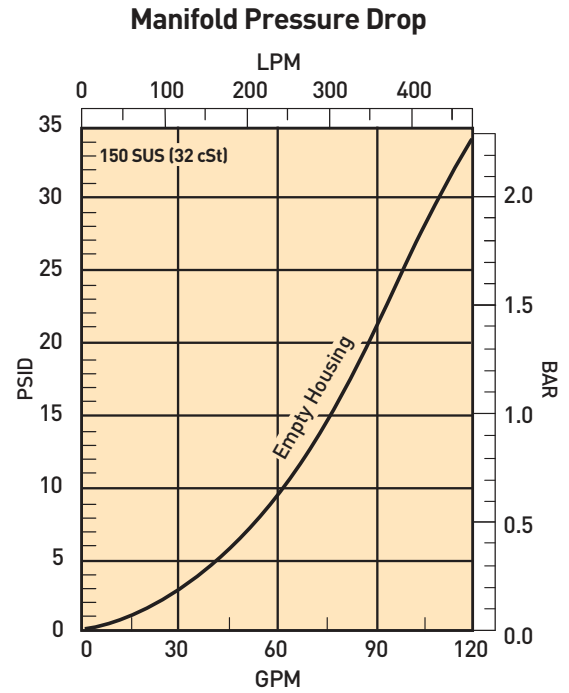
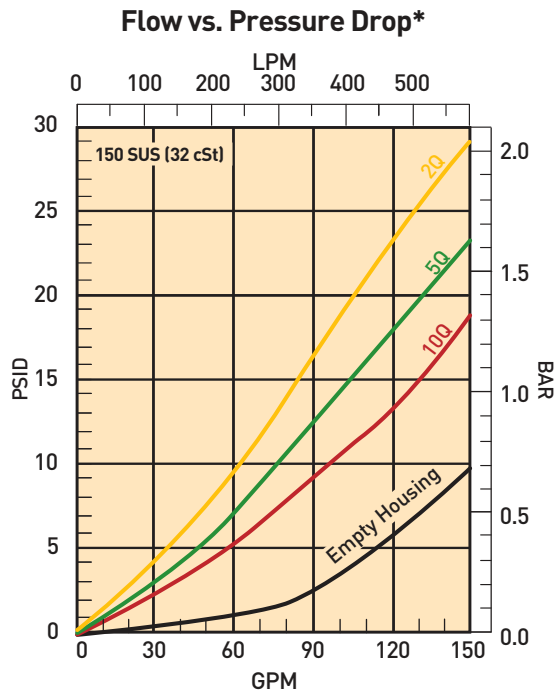
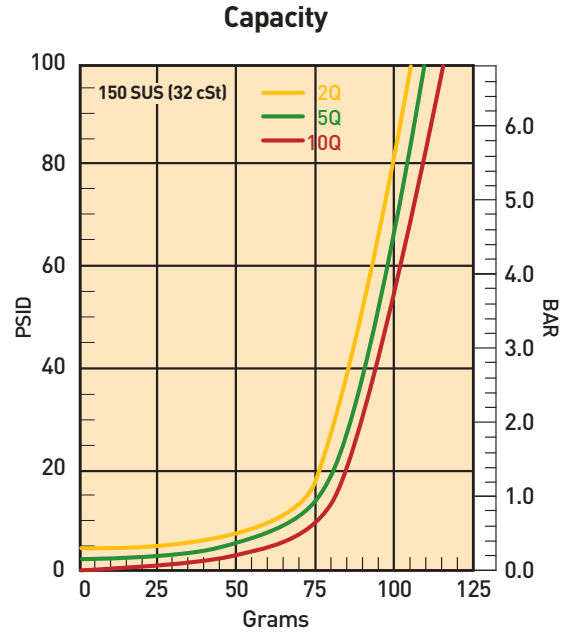
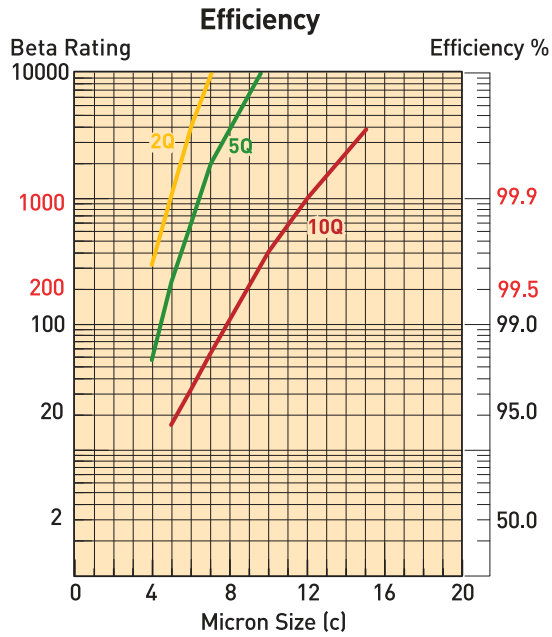
*High Collapse Correction Factor:
 "QH" Elements (2000 psid) = 1.4 times reported loss

Results typical from Multi-pass tests run per test standard ISO 16889 @ 45 gpm to 50 psid terminal - 10 mg/L BUGL.

Note: During reverse flow, ΔP is 20 psid at max. flow.

WPF Series

WPF4 Element Performance



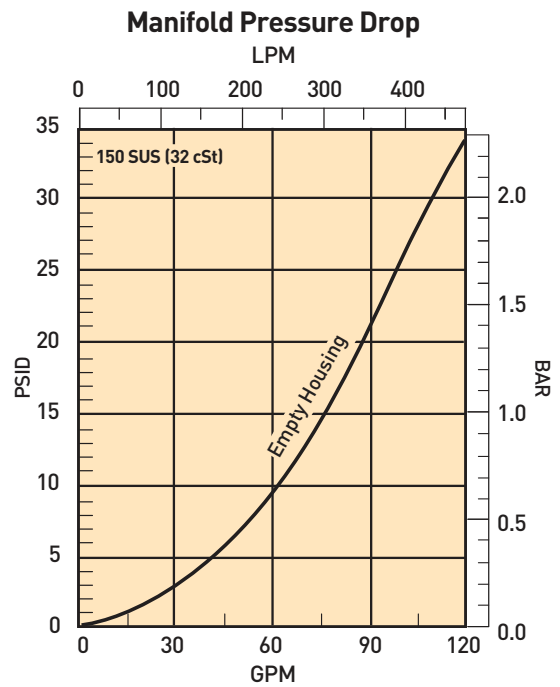
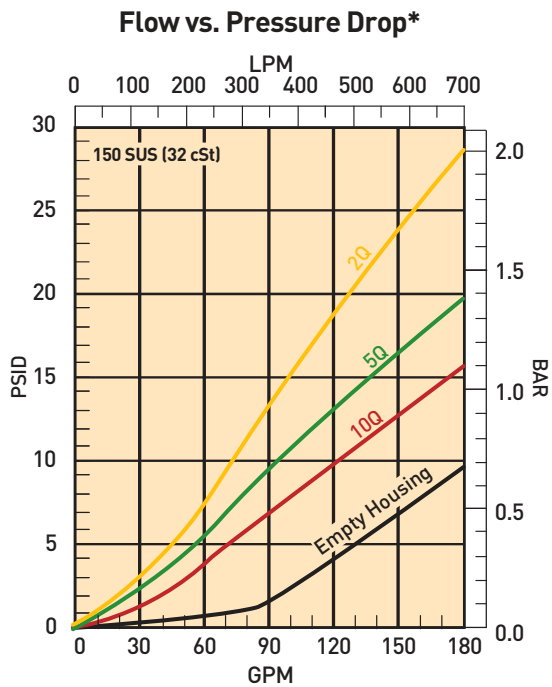
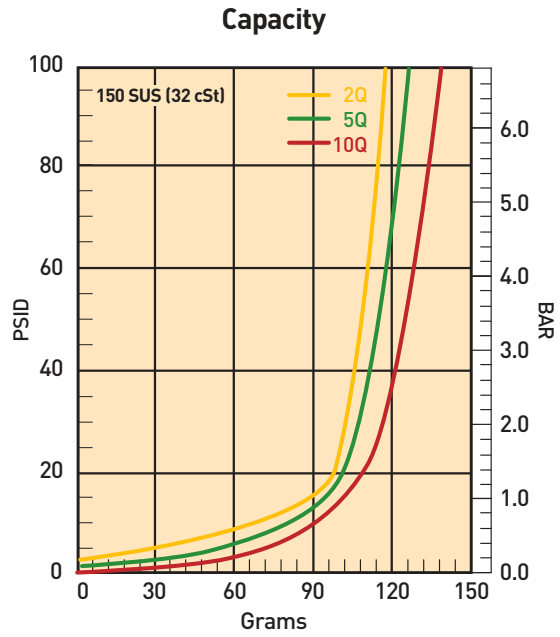
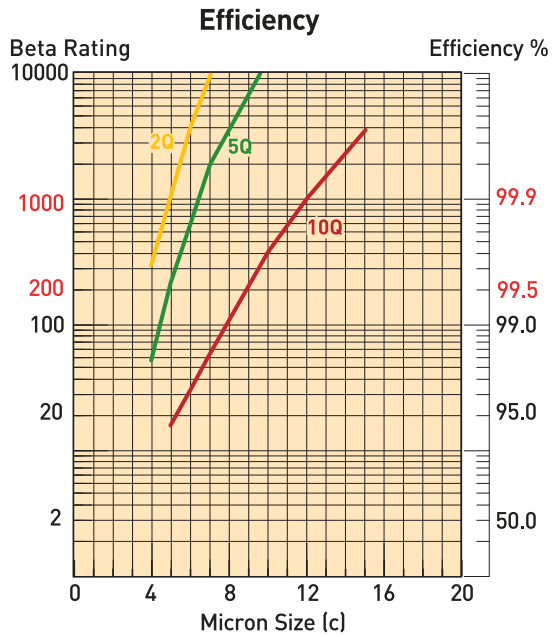
*High Collapse Correction Factor:
 "QH" Elements (2000 psid) = 1.4 times reported loss

Results typical from Multi-pass tests run per test standard ISO 16889 @ 90 gpm to 50 psid terminal - 10 mg/L BUGL.

Note: During reverse flow, ΔP is 20 psid at max. flow.

WPF Series

WPF5 Element Performance



*High Collapse Correction Factor:
 "QH" Elements (2000 psid) = 1.4 times reported loss

Results typical from Multi-pass tests run per test standard ISO 16889 @ 100 gpm to 50 psid terminal - 10 mg/L BUGL.

Note: During reverse flow, ΔP is 20 psid at max. flow.

WPF Series

Specifications

Maximum Allowable Operating Pressure (MAOP):

7000 psi (483 bar)

Rated Fatigue Pressure:

6000 psi (414 bar)

Design Safety Factor: 3:1

Operating Temperatures:

-15°F (-26°C) to 250°F (135°C)

Element Collapse Rating:

Standard: 300 psi (21 bar)

High Collapse: 2000 psi (138 bar)

Materials:

Head: SG Iron

Bowl: Steel

Indicator: Stainless Steel

with Plastic Connectors

Weights:

WPF1 9 lbs. (4.1 kg)

WPF2 13 lbs. (5.9 kg)

WPF3 21 lbs. (9.5 kg)

WPF4 45 lbs. (20.4 kg)

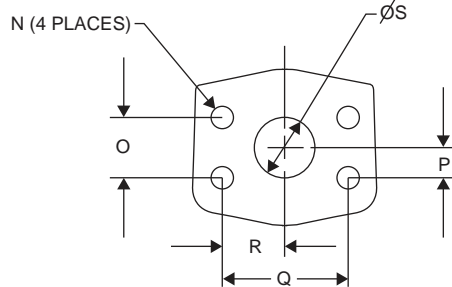
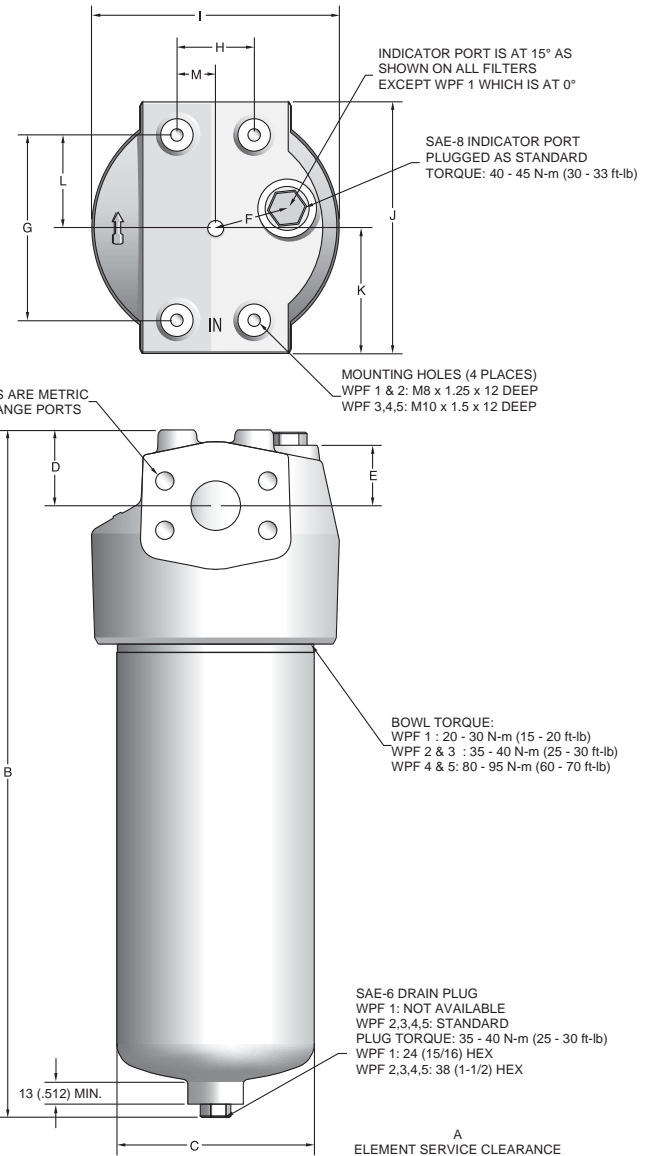
WPF5 67 lbs. (30.4 kg)

Drawings are for reference only.
Contact factory for current version.

T-PORT DIMENSIONS mm (inch)

| Filter Model | A | B | C | D | E | F | G | H | I | J | K | L | M |
|--------------|------------|-------------|-------------|-----------|-----------|-----------|------------|-----------|------------|------------|-------------|-----------|-------------|
| WPF1 | 70 (2.76) | 180 (7.09) | 69.5 (2.74) | 23 (.91) | 15 (.59) | 27 (1.06) | 60 (2.36) | 30 (1.18) | 90 (3.54) | 92 (3.62) | 46 (1.81) | 30 (1.18) | 15 (.59) |
| WPF2 | 79 (3.11) | 293 (11.53) | 75 (2.95) | 32 (1.26) | 26 (1.02) | 30 (1.18) | 80 (3.15) | 40 (1.57) | 98 (3.86) | 110 (4.33) | 55 (2.17) | 40 (1.57) | 20 (.78) |
| WPF3 | 88 (3.47) | 345 (13.58) | 93 (3.66) | 40 (1.57) | 29 (1.14) | 35 (1.38) | 90 (3.54) | 55 (2.17) | 120 (4.72) | 126 (4.96) | 63 (2.48) | 45 (1.77) | 27.5 (1.08) |
| WPF4 | 100 (3.94) | 445 (17.52) | 128 (5.04) | 49 (1.93) | 39 (1.54) | 48 (1.89) | 120 (4.72) | 50 (1.97) | 160 (6.30) | 163 (6.42) | 81.5 (3.21) | 60 (2.36) | 25 (.98) |
| WPF5 | 100 (3.94) | 561 (22.09) | 128 (5.04) | 61 (2.40) | 51 (2.01) | 48 (1.89) | 140 (5.51) | 80 (3.15) | 160 (6.30) | 183 (7.20) | 91.5 (3.60) | 70 (2.76) | 40 (1.57) |

T-Port



| Flange Size | N: Thread & Depth | O | P | Q | R | S |
|-------------|-------------------|--------|-------|--------|--------|--------|
| 3/4" | .750" | .937" | .469" | 2.000" | 1.000" | .750" |
| 1" | 1.000" | 1.093" | .546" | 2.250" | 1.125" | 1.000" |
| 1-1/4" | 1.250" | 1.250" | .625" | 2.625" | 1.312" | 1.250" |
| 1-1/2" | 1.500" | 1.437" | .719" | 3.125" | 1.563" | 1.500" |

WPF Series

Specifications

Maximum Allowable Operating Pressure (MAOP):

7000 psi (483 bar)

Rated Fatigue Pressure:

6000 psi (414 bar)

Design Safety Factor: 3:1

Operating Temperatures:

-15°F (-26°C) to 250°F (135°C)

Element Collapse Rating:

Standard: 300 psi (21 bar)

High Collapse: 2000 psi (138 bar)

Materials:

Head: SG Iron

Bowl: Steel

Indicator: Stainless Steel
with Plastic Connectors

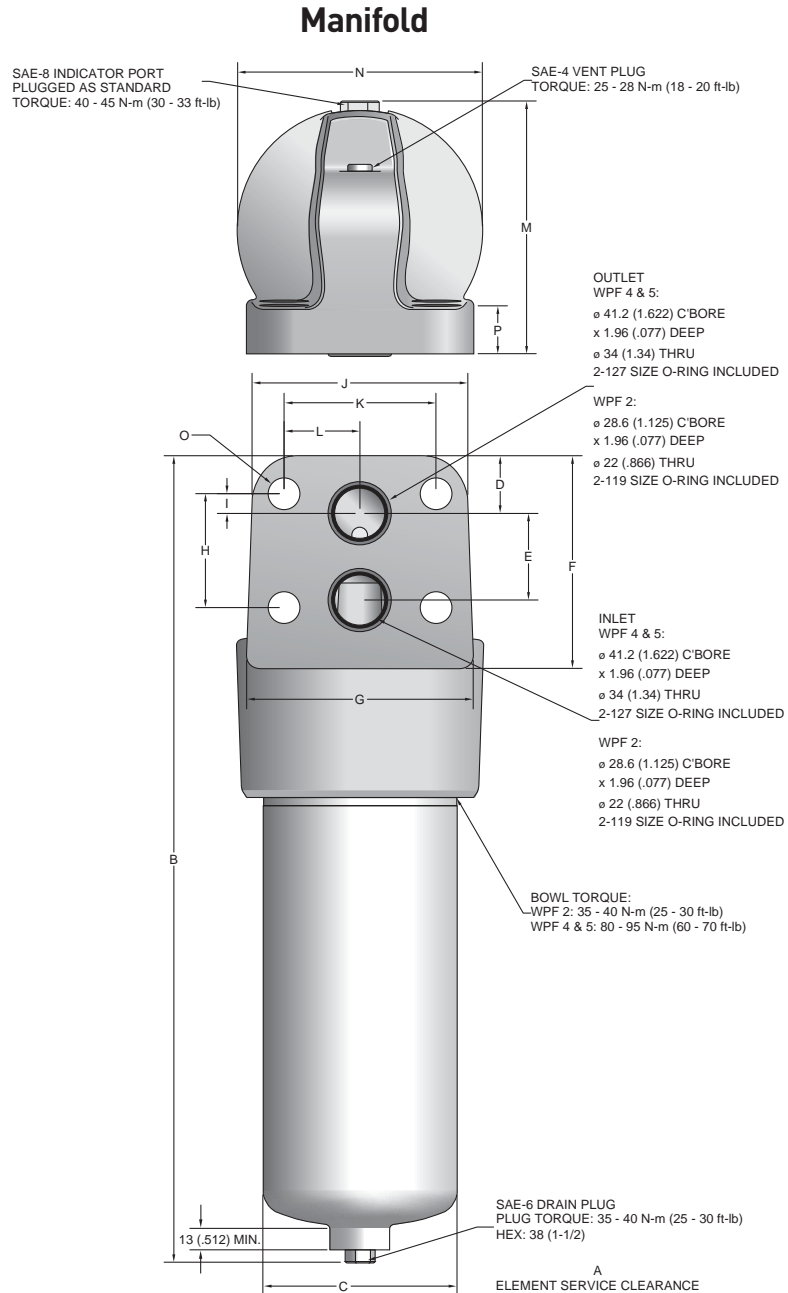
Weights:

WPF2 18 lbs. (8.2 kg)

WPF4 63 lbs. (28.6 kg)

WPF5 70 lbs. (31.7 kg)

Drawings are for reference only.
Contact factory for current version.

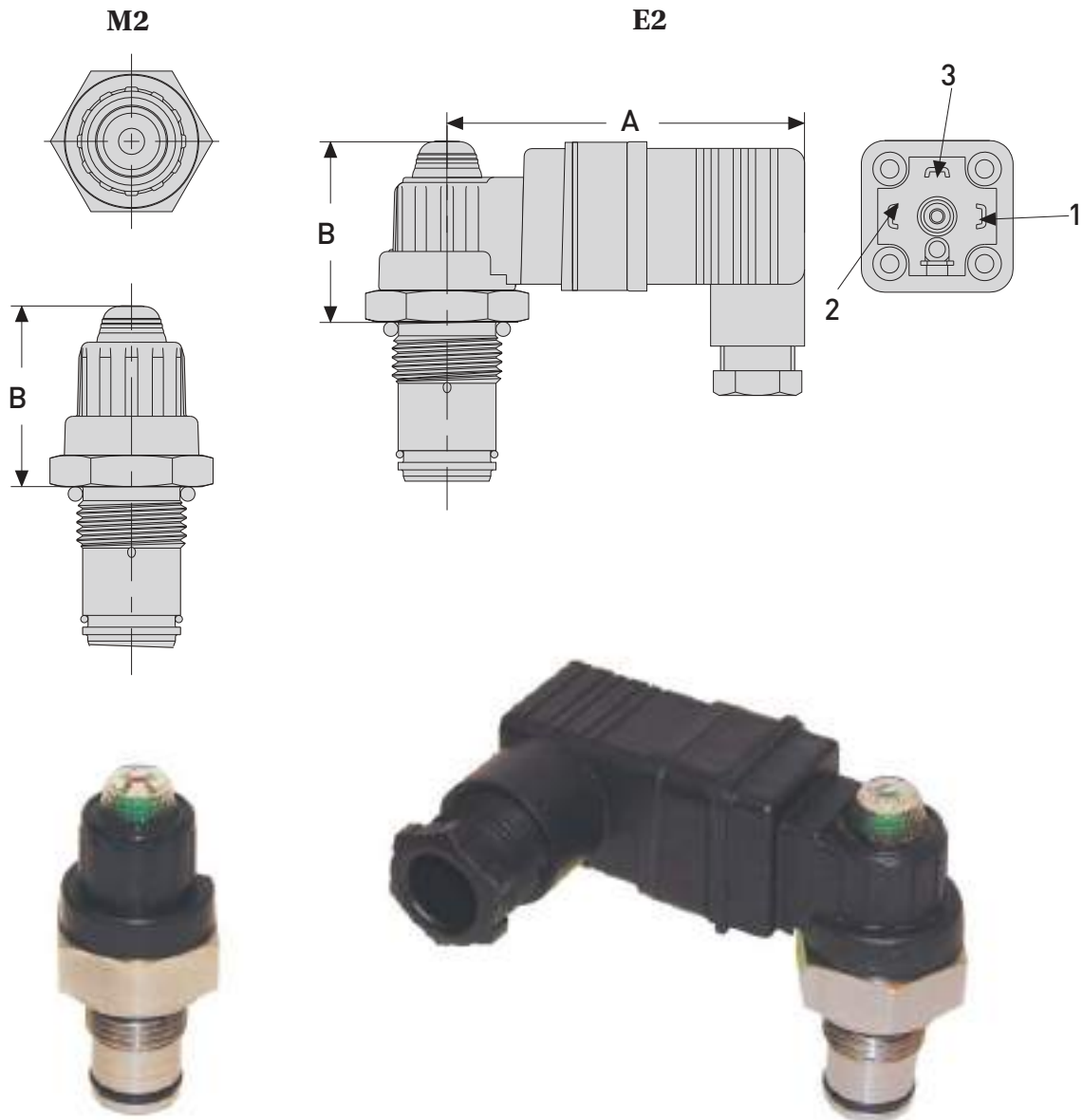


MANIFOLD DIMENSIONS mm (inch)

| Filter Model | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|--------------|------------|-------------|------------|-----------|-----------|------------|------------|-----------|----------|------------|------------|-----------|--------------|------------|----------|-------------|
| WPF2 | 79 (3.11) | 343(13.50) | 75 (2.95) | 24 (.94) | 39 (1.53) | 95 (3.74) | 116 (4.57) | 50 (1.97) | 6 (.24) | 110 (4.33) | 80 (3.15) | 40 (1.57) | 110 (4.33) | 121 (4.76) | 17 (.67) | 30 (1.18) |
| WPF4 | 100 (3.94) | 532 (20.94) | 128 (5.04) | 38 (1.50) | 57 (2.24) | 140 (5.51) | 150 (5.91) | 75 (2.95) | 13 (.51) | 142 (5.59) | 100 (3.94) | 50 (1.97) | 166.5 (6.56) | 161 (6.34) | 21 (.83) | 31.7 (1.25) |
| WPF5 | 100 (3.94) | 627 (24.69) | 128 (5.04) | 38 (1.50) | 57 (2.24) | 140 (5.51) | 150 (5.91) | 75 (2.95) | 13 (.51) | 142 (5.59) | 100 (3.94) | 50 (1.97) | 166.5 (6.56) | 161 (6.34) | 21 (.83) | 31.7 (1.25) |

WPF Series

Indicator Specifications



Torque: 30-33 ft-lb (40-45 N-m)
Indicator setting: 50 psid

INDICATOR DIMENSIONS mm (inch)

| Option | Description | Connection/Power | Wiring | "A" | "B" |
|--------|---------------------|---|--|-------------|-----------|
| M2 | Visual Auto Reset | N/A | N/A | N/A | 49 (1.73) |
| E2 | Electrical - Visual | Din 43650 3 Pole +Earth 5A@125/250 VAC, 3A@28VDC | Pin 1 - Common Pin 2 - Normally Closed Pin 3 - Normally Open | 73.7 (2.90) | 54 (2.13) |

WPF Series

Service & Maintenance Instructions

1 Stop system power and vent captive pressure.

2 Drain filter assembly.

3 Remove bowl and element assembly.

4 Push down to squeeze tangs and lift element.

5 Twist to remove core.

6 Retain reusable core.

7 Discard used element.

8 Insert reusable core into new element until it snaps.

9 Push element assembly into bowl, snap tangs.

10 Inspect o-ring and anti-extrusion ring.

11 Install bowl with new element.

12 Torque bowl, vent and drain plugs.

13 Power up and inspect.

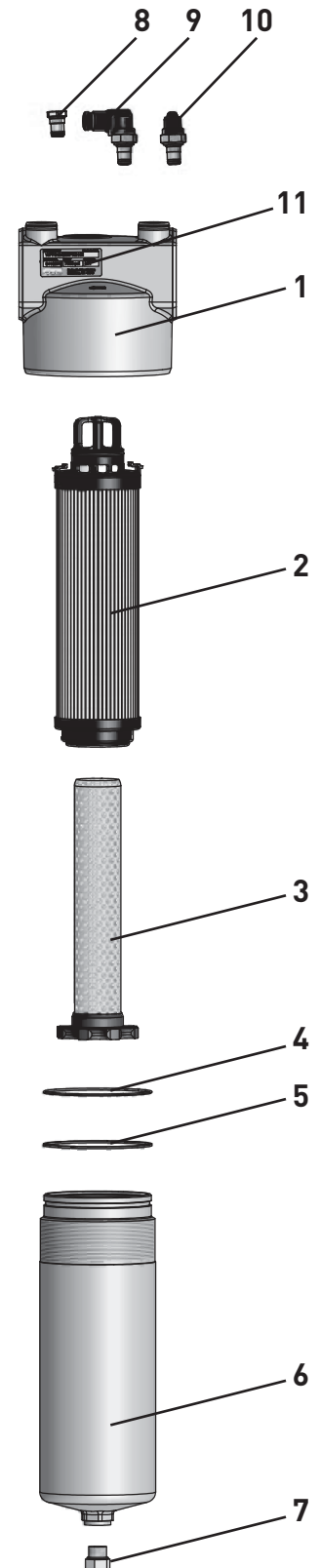


WPF Series

Parts List

T-Port

| Index | Part Description | Part Number |
|-----------|--------------------------|-----------------------|
| 1 | WPF1 Head SAE-8 | 940986 |
| | WPF2 Head 3/4" Flange | 940989 |
| | WPF2 Head SAE-12 | 940988 |
| | WPF3 Head 1" Flange | 940992 |
| | WPF3 Head SAE-16 | 940991 |
| | WPF4 Head 1-1/4" Flange | 940923 |
| | WPF4 Head SAE-20 | 940924 |
| | WPF5 Head 1-1/2" Flange | 940773 |
| | WPF5 Head SAE-24 | 940921 |
| 2 | Element | See chart on page 158 |
| 3 | WPF1 Reusable Core | 941175 |
| | WPF2 Reusable Core | 941176 |
| | WPF3 Reusable Core | 941177 |
| | WPF4 Reusable Core | 941178 |
| | WPF5 Reusable Core | 941179 |
| 4 | WPF1 Bowl O-ring | V92141 |
| | WPF2 Bowl O-ring | V92144 |
| | WPF3 Bowl O-ring | V92042 |
| | WPF4 Bowl O-ring | V92157 |
| | WPF5 Bowl O-ring | V92157 |
| 5 | WPF1 Anti-extrusion Ring | 941185 |
| | WPF2 Anti-extrusion Ring | 934798 |
| | WPF3 Anti-extrusion Ring | 941186 |
| | WPF4 Anti-extrusion Ring | 941187 |
| | WPF5 Anti-extrusion Ring | 941187 |
| 6 | WPF1 Bowl | 941153 |
| | WPF2 Bowl | 941154 |
| | WPF3 Bowl | 941155 |
| | WPF4 Bowl | 941156 |
| | WPF5 Bowl | 941157 |
| 7 | Drain Plug | 934320 |
| 8 | Indicator Plug | 941172 |
| 9 | Electrical Indicator | 941173 |
| 10 | Visual Indicator | 941174 |
| 11 | Name Plate | 920928 |
| Not Shown | Drive Screw (2 required) | 900028 |

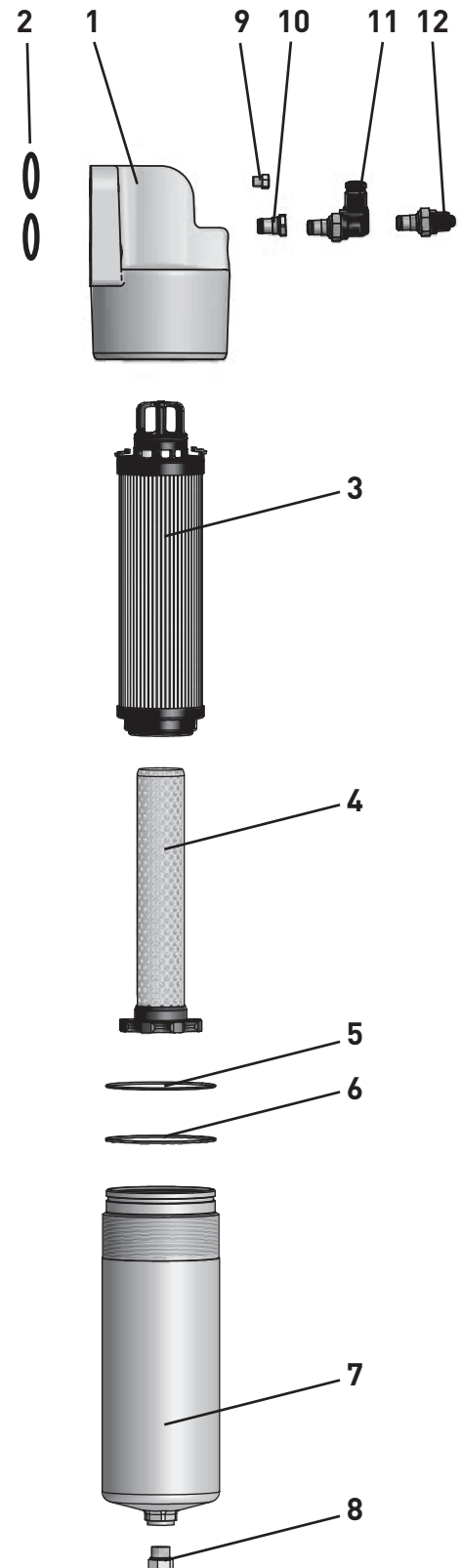


WPF Series

Parts List

Manifold

| Index | Part Description | Part Number |
|-----------|---------------------------------------|-----------------------|
| 1 | WPF2 Manifold Mount Head | 941273 |
| | WPF4 Manifold Mount Head | 940982 |
| | WPF5 Manifold Mount Head | 940982 |
| 2 | WPF2 Manifold Mount O-rings (2 req'd) | V92119 |
| | WPF4 Manifold Mount O-rings (2 req'd) | V92127 |
| | WPF5 Manifold Mount O-rings (2 req'd) | V92127 |
| 3 | Element | See chart on page 158 |
| 4 | WPF2 Reusable Core | 941176 |
| | WPF4 Reusable Core | 941178 |
| | WPF5 Reusable Core | 941179 |
| 5 | WPF2 Bowl O-ring | V92144 |
| | WPF4 Bowl O-ring | V92157 |
| | WPF5 Bowl O-ring | V92157 |
| 6 | WPF2 Anti-extrusion Ring | 934798 |
| | WPF4 Anti-extrusion Ring | 941187 |
| | WPF5 Anti-extrusion Ring | 941187 |
| 7 | WPF2 Bowl | 941154 |
| | WPF4 Bowl | 941156 |
| | WPF5 Bowl | 941157 |
| 8 | Drain Plug | 934320 |
| 9 | Vent Plug | 928882 |
| 10 | WPF Indicator Plug | 941172 |
| 11 | Electrical Indicator | 941173 |
| 12 | Visual Indicator | 941174 |
| Not Shown | Name Plate | 920928 |
| Not Shown | Drive Screw (2 required) | 900028 |



WPF Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| WPF | 2 | 10QE | V | M2 | K | S12 | 1 |

| BOX 1: Filter Series | |
|----------------------|----------------------|
| Symbol | Description |
| WPF | High Pressure Filter |

| BOX 2: Model | |
|--------------|----------------------|
| Symbol | Description |
| 1 | 1/2" Nominal ports |
| 2 | 3/4" Nominal ports |
| 3 | 1" Nominal ports |
| 4 | 1 1/4" Nominal ports |
| 5 | 1 1/2" Nominal ports |

| BOX 3: Media Code | |
|-------------------|---------------------------------|
| Symbol | Description |
| 02QE | Ecoglass III (bypass only) |
| 05QE | Ecoglass III (bypass only) |
| 10QE | Ecoglass III (bypass only) |
| | High Collapse |
| 02QH | Microglass III (no bypass only) |
| 10QH | Microglass III (no bypass only) |

| BOX 4: Seals | |
|--------------|--------------------|
| Symbol | Description |
| B | Nitrile (NBR) |
| E | Ethylene Propylene |
| V | Fluorocarbon (FKM) |

| BOX 5: Indicator | |
|---|---|
| Symbol | Description |
| P | Plugged indicator port |
| M2 | Visual Automatic Reset |
| E2 | Electrical/ Visual (DIN43650 style connection) |
| Note: When the "M2" or "E2" option is selected, the indicator port is plugged and the indicator is shipped as a loose part. | |

| BOX 6: Bypass | |
|---|---|
| Symbol | Description |
| K | 50 PSID (3.5 bar) |
| X | No Bypass and No Indicator (port plugged) |
| Note: When an indicator and no bypass ("2" in Box 8) is selected, the indicator setting is 50 psid (3.5 bar). | |

Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.

| BOX 7: Ports | |
|--------------|--------------------------------|
| Symbol | Description |
| | WPF1 |
| S08 | SAE-8 Ports |
| | WPF2 |
| S12 | SAE-12 Ports |
| Y12 | 3/4" SAE Code 62 Flange face |
| X12 | Manifold |
| | WPF3 |
| S16 | SAE-16 Ports |
| Y16 | 1" SAE Code 62 Flange face |
| | WPF4 |
| S20 | SAE-20 Ports |
| Y20 | 1 1/4" SAE Code 62 Flange face |
| X20 | Manifold |
| | WPF5 |
| S24 | SAE-24 Ports |
| Y24 | 1 1/2" SAE Code 62 Flange face |
| X24 | Manifold |

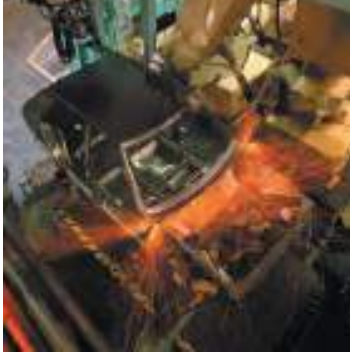
| BOX 8: Options | |
|----------------|--|
| Symbol | Description |
| 1 | With Bypass (for use with standard element only) |
| 2 | No Bypass (for use with high collapse element only) |

Replacement Elements:

| | Media | WPF1 | WPF2 | WPF3 | WPF4 | WPF5 |
|--|----------------------|---------|---------|---------|---------|---------|
| Standard Collapse (300 psid/21 bar) | Ecoglass III, 02QE | 941029Q | 941032Q | 941035Q | 941038Q | 941041Q |
| | Ecoglass III, 05QE | 941030Q | 941033Q | 941036Q | 941039Q | 941042Q |
| | Ecoglass III, 10QE | 941031Q | 941034Q | 941037Q | 941040Q | 941043Q |
| High Collapse (2000 psid/138 bar) | Microglass III, 02QH | 941044Q | 941046Q | 941048Q | 941050Q | 941052Q |
| | Microglass III, 10QH | 941045Q | 941047Q | 941049Q | 941051Q | 941053Q |

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.





aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



12S Series

High Pressure Filters



ENGINEERING YOUR SUCCESS.

12S Series

Applications

- Offshore – High pressure and aggressive environment
- DI Water – Water fogging
- Food Processing – Caustic washdown (poultry, etc.)
- Test Stands – High pressure

| Feature | Advantage | Benefit |
|---|--|---|
| Lightweight | Ease of service and installation | Reduced installation cost |
| Porting | Flexibility | Reduction in piping and use of adaptors |
| Multipass tested elements (per ANSI/NFPA T3.10.8.8 R1-1990) | Filter performance backed by recognized and accepted laboratory test standards | Filters you select have known performance levels |
| Optional visual and electrical indicators | Know exactly when to service elements | Keeps system clean |
| Drain port | Drain all oil from assembly prior to servicing | Eliminates cross contamination |
| Optional upstream & downstream sensing ports | Add additional instrumentation | Product flexibility |
| High strength Microglass III elements | 2000 psid collapse strength Multi-layer media Wire reinforced pleats | High capacity with high efficiency No performance loss from pleat bunching |
| 100% pressure tested | Quality | Reliability |

12S Series

Specifications

12SMP (10,000 psi)

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 10,000 psi (690 bar)
 Proof: 15,000 psi (1035 bar)

Operating Temperatures:

Fluorocarbon (FKM) -15°F (-26°C) to 275°F (-135°C)
 Ethylene Propylene (EPR) -40°F (-40°C) to 225°F (-107°C)
 Perfluoroelastomer (FFKM) 5°F (-15°C) to 536°F (280°C)*

* Consult factory when requesting this seal. A special element may be required to withstand operating temperature.

Element Collapsing Rate:

High Collapse "H" option: 2,000 psi (138 bar)

Materials:

Head: Stainless Steel 316L
 Bowl: Stainless Steel 316L

Weight (approximate):

| Model | Single Length | Double Length |
|-------|--------------------|--------------------|
| 12SMP | 14 lbs. (6.35 kg.) | 17 lbs. (7.71 kg.) |

12SHP (20,000 psi)

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 20,000 psi (1,380 bar)
 Proof: 30,000 psi (2,070 bar)

Operating Temperatures:

Fluorocarbon (FKM) -15°F (-26°C) to 275°F (-135°C)
 Ethylene Propylene (EPR) -40°F (-40°C) to 225°F (-107°C)
 Perfluoroelastomer (FFKM) 5°F (-15°C) to 536°F (-280°C)*

* Consult factory when requesting this seal. A special element may be required to withstand operating temperature.

Element Collapsing Rate:

High Collapse "H" option: 2,000 psi (138 bar)

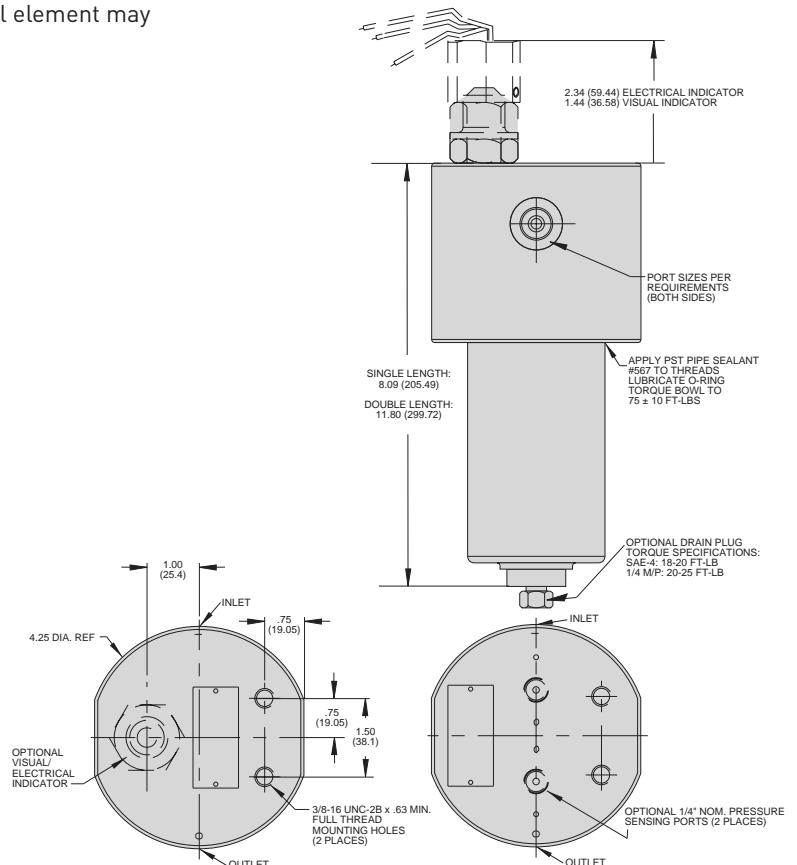
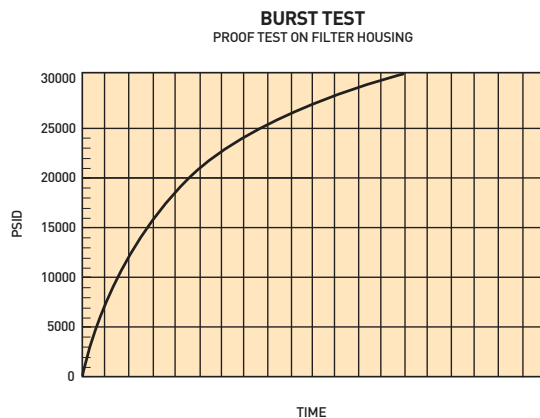
Materials:

Head: Stainless Steel 17-4
 Bowl: Stainless Steel 17-4

Weight (approximate):

| Model | Single Length | Double Length |
|-------|--------------------|--------------------|
| 12SHP | 14 lbs. (6.35 kg.) | 17 lbs. (7.71 kg.) |

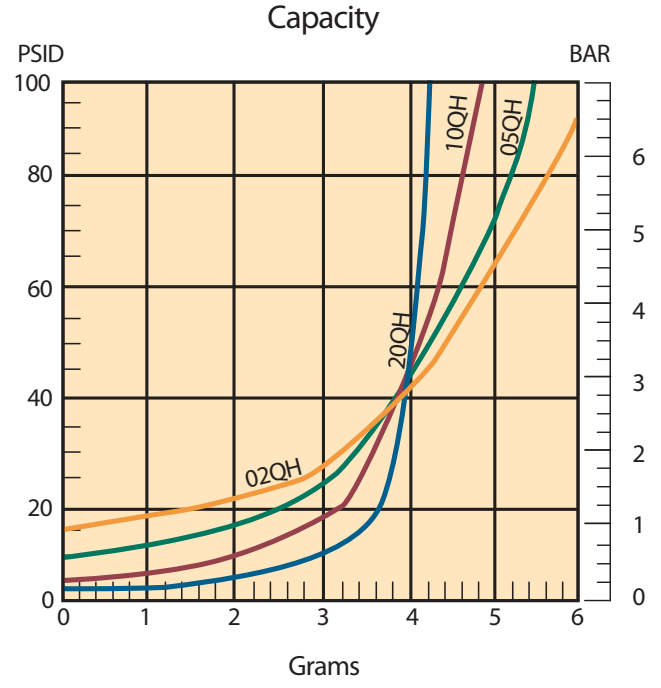
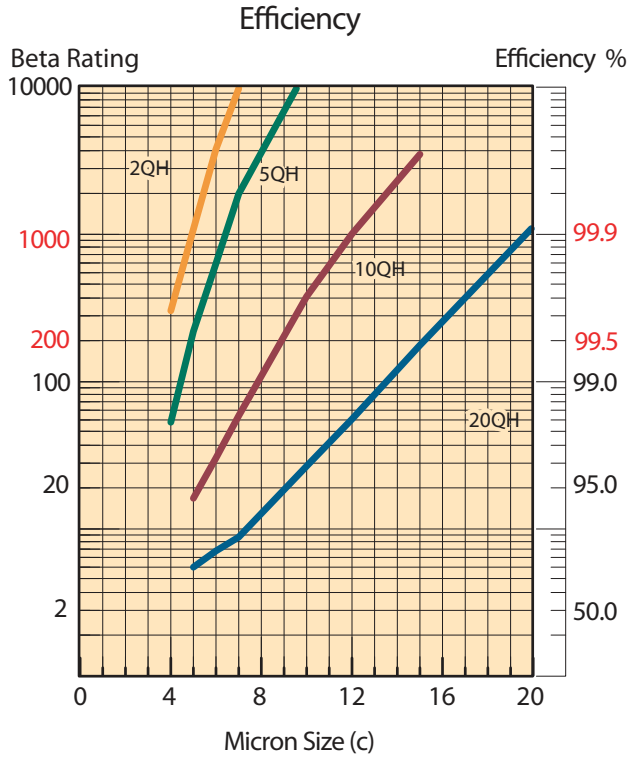
Dimensions



Drawings are for reference only.
 Contact factory for current version.

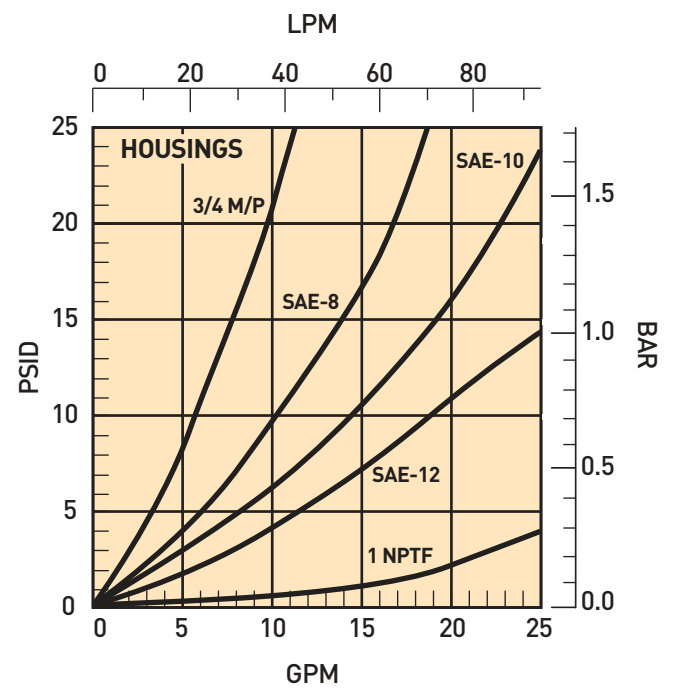
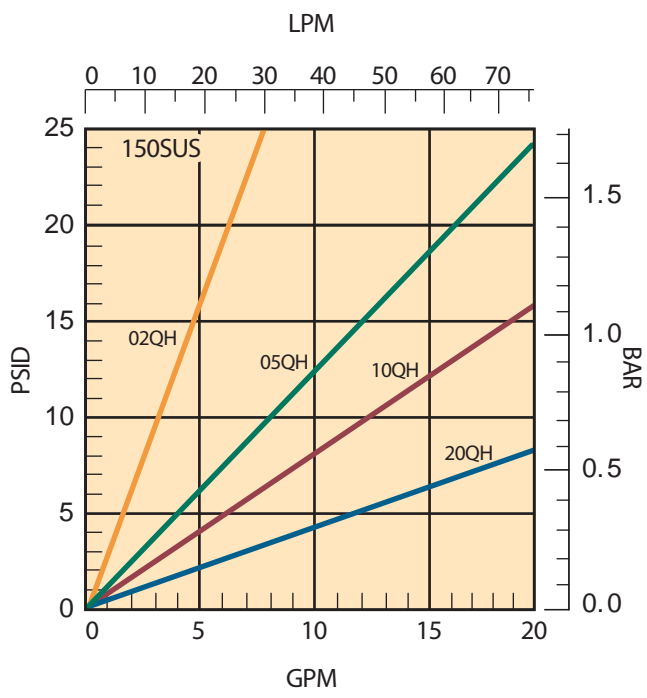
12S Series

12S-1 Element Performance



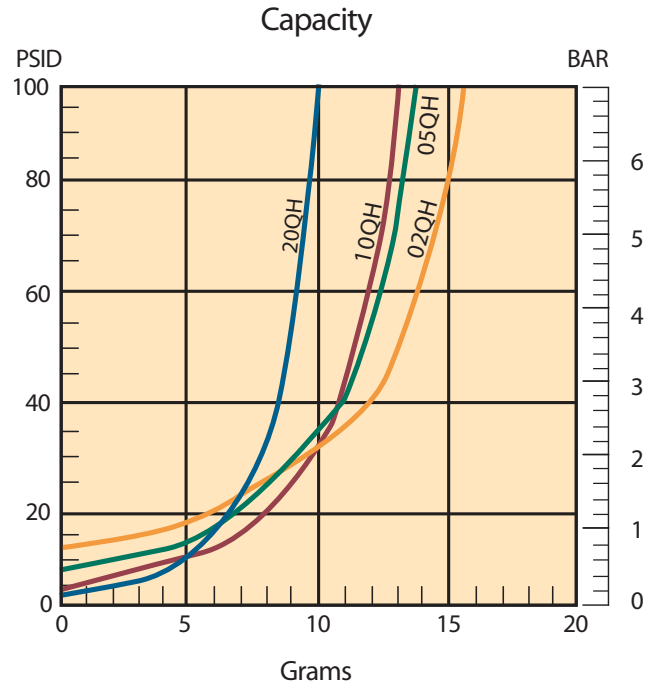
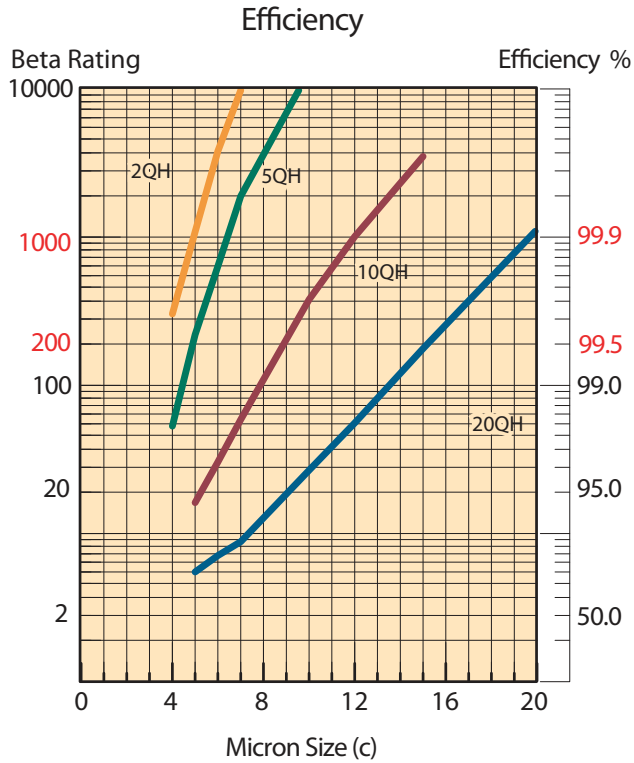
Multipass tests run @ 10 gpm to 100 psid terminal - 5mg/L BUGL

Flow vs. Pressure Loss



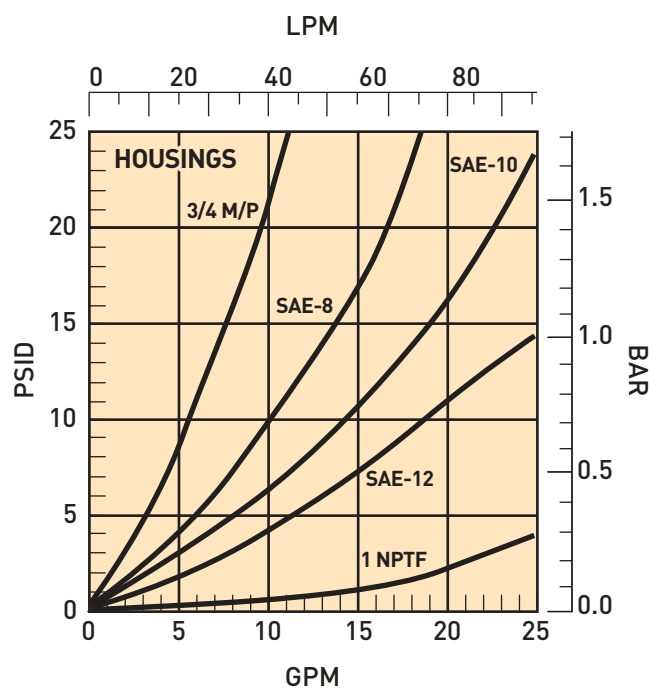
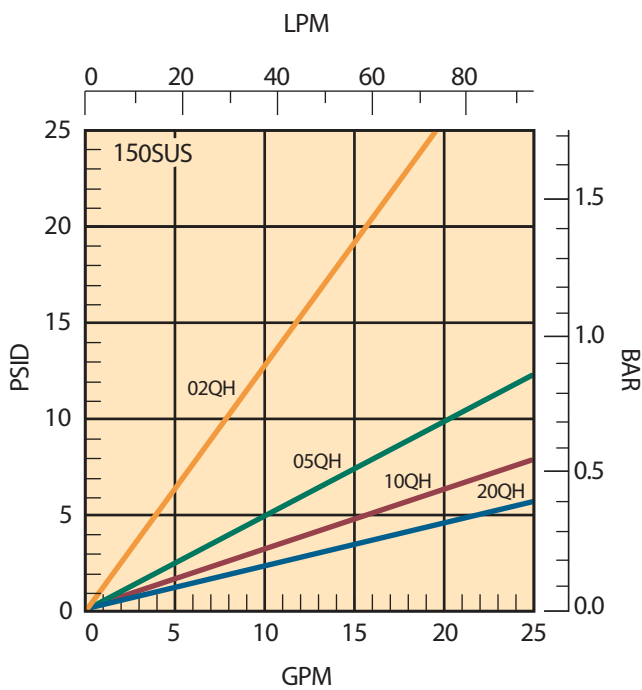
12S Series

12S-2 Element Performance



Multipass tests run @ 15 gpm to 100 psid terminal - 5mg/L BUGL

Flow vs. Pressure Loss



12S Series

How to Order

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 12SHP | 1 | 10QH | V | SP | HP | 10 | 11 |

| BOX 1: Basic Assembly | |
|-----------------------|-----------------------------|
| Symbol | Description |
| 12SMP | 10,000 psi MAOP (316 S.S.) |
| 12SHP | 20,000 psi MAOP (17-4 S.S.) |

| BOX 2: Length | |
|---------------|-------------|
| Symbol | Description |
| 1 | Single |
| 2 | Double |

| BOX 3: Element Media | |
|----------------------|---|
| Symbol | Description |
| 20QH | 20µm Microglass III, 2000 psid collapse |
| 10QH | 10µm Microglass III, 2000 psid collapse |
| 05QH | 5µm Microglass III, 2000 psid collapse |
| 02QH | 2µm Microglass III, 2000 psid collapse |

| BOX 4: Seals | |
|----------------|--------------------------|
| Symbol | Description |
| V | Fluorocarbon (FKM) |
| E ¹ | Ethylene Propylene (EPR) |
| P | Perfluorocarbon (FFKM) |

Note: 1.Recomended for DI Water applications

| BOX 5: Indicator | |
|-------------------|--|
| Symbol | Description |
| N | No Indicator, no pressure port |
| SP ¹ | 1/4" pressure ports only |
| 4L35 ² | Visual manual reset, 50 psid setting |
| 5T35 ² | Electrical (DIN 43650-A/ISO 4400), 50 psid setting |

Note: 1.Pressure ports will match port type selected in BOX 6
2.Available for operating pressure <10,000 psi only

| BOX 6: Port Type ¹ | |
|-------------------------------|---|
| Symbol | Description |
| S ² | SAE O-ring port |
| N ³ | NPTF port |
| MP | Medium pressure Autoclave (M/P) type port |
| HP | High pressure Autoclave (H/P) type port |

Notes: 1. For other options, please contact HFD
2. Available for operating pressure <6,000 psi only
3. Available for operating pressure <10,000 psi only

| BOX 7: Port Size | |
|------------------|---------------------------------|
| Symbol | Description (Port Type Options) |
| 4 | 1/4" Nominal (N, MP) |
| 6 | 3/8" Nominal (N, MP) |
| 8 | 1/2" Nominal (N) |
| 10 | 9/16" Nominal (MP, HP) |
| 12 | 3/4" Nominal (S,N) |
| 16 | 1" Nominal (S,N) |

| BOX 8: Options | |
|-----------------|--------------------------------|
| Symbol | Description |
| 1 | Bypass (60 psid) |
| 11 | No Bypass (standard) |
| 19 ¹ | Bypass with 1/4" drian port |
| 21 ¹ | No bypass with 1/4" drain port |

Note: 1.Drain port will be SAE or M/P Autoclave plug as required. Plug is included.

REPLACEMENT ELEMENTS

| | Media | Microglass III (Fluorocarbon) | | Microglass III (Ethylene Propylene -EPR) | |
|-----------|-------|-------------------------------|--------|--|-------------------|
| | | Single | Double | 12SMP-1 / 12SHP-1 | 12SMP-2 / 12SHP-2 |
| No-Bypass | 20QH | 403400 | 403404 | 403485 | 403488 |
| | 10QH | 403399 | 403403 | 403484 | 403487 |
| | 05QH | 403398 | 403402 | 403483 | 403486 |
| | 02QH | 403397 | 403401 | 403482 | 403417 |
| | | | | | |
| Bypass | 20QH | 937442 | 937446 | 937474 | 937478 |
| | 10QH | 937441 | 937445 | 937473 | 937477 |
| | 05QH | 937440 | 937444 | 937472 | 937476 |
| | 02QH | 937439 | 937443 | 937471 | 937475 |
| | | | | | |



aerospace
 climate control
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Portable Filter Carts

Models 5MFP & 10MFP with Moduflow™ *Plus*
 and Intelli-Cart™



ENGINEERING YOUR SUCCESS.

Portable Filter Carts

Applications

- **Filtering new fluid before putting into service**
- **Transferring fluid from drums or storage tanks to system reservoirs**
- **Conditioning fluid that is already in use**
- **Complimenting existing system filtration**
- **Removing free and emulsified water from a system**
- **For use with fluids such as hydraulic, gear and lube oils**

Parker portable filter carts are the ideal way to prefilter and transfer fluids into reservoirs or to clean up existing systems.

Fluid should always be filtered before being put into use. New fluid is not necessarily clean fluid. Most new fluids (right out of the drum) are unfit for use due to high initial contamination levels. Contamination, both particulate and water, may be added to a new fluid during processing, mixing, handling and storage.

Water is removed by installing Par-Gel™ elements in the outlet filter. Par-Gel™ elements are made from a polymer which has a very high affinity for free water.

Once water comes into contact with this material, it is removed from the system.

The Parker portable filter cart uses two high capacity ModuFlow™ Plus filters for long element life and better system protection. The first stage (inlet) filter captures larger particles, while the second stage (outlet) filter captures finer particles or removes water. A rugged industrial quality gear pump gets the job done fast.

Using a Parker portable filter cart is the most economical way to protect your system from the harm that can be caused by contamination.

| Features | Advantages | Benefits |
|---|---|--|
| <ul style="list-style-type: none"> • Two filters instead of one w/ 2.5 times increased dirt holding capacity | <ul style="list-style-type: none"> • Pump protection and long element life | <ul style="list-style-type: none"> • Element cost savings and trouble-free service |
| <ul style="list-style-type: none"> • Wide variety of particulate elements available | <ul style="list-style-type: none"> • Capable of getting a fluid to a desired cleanliness level | <ul style="list-style-type: none"> • Extends fluid life and system performance |
| <ul style="list-style-type: none"> • Par-Gel™ water removal elements available | <ul style="list-style-type: none"> • Removes “free water” from a system | <ul style="list-style-type: none"> • Gets dirt and water out of system with one process |
| <ul style="list-style-type: none"> • Heavy duty frame | <ul style="list-style-type: none"> • Rugged and durable | <ul style="list-style-type: none"> • Built to last |
| <ul style="list-style-type: none"> • Lightweight and portable | <ul style="list-style-type: none"> • Easy to move from place-to-place | <ul style="list-style-type: none"> • One person operation |
| <ul style="list-style-type: none"> • Two flow rates available: 5 gpm or 10 gpm | <ul style="list-style-type: none"> • Enables use in low or high viscosity applications | <ul style="list-style-type: none"> • Matched to your needs |
| <ul style="list-style-type: none"> • Eleven-foot hose and wand assemblies included | <ul style="list-style-type: none"> • Additional hardware not necessary | <ul style="list-style-type: none"> • Ready to use as received |

Portable Filter Carts

Applications

Hose & wand assembly

- Ready to use; no additional hardware needed
- Flexible hoses for tight spots
- Kink-resistant hose prevents pump cavitation

Visual indicator

- Tells you when to change element

Heavy Duty frame

- Rugged and built to last

Dual filters

- Two stage, double length filtration for long element life and pump protection

Elements (not shown)

- Available for both particulate and Water Removal (WR) in double length w/ 2.5 times increased dirt holding capacity

icountPD (Intelli-Cart™ option)

- Early warning LED or digital display indicators for Low, Medium and High contamination levels
- Self diagnostic software

Service cover

- Top-accessible for easy changing of elements

Electrical Cord

- 6 ft. with ON/OFF switch
- Optional 20 ft. cord with retractable reel & mounted power switch with thermal overload protection

110V/220V AC motor

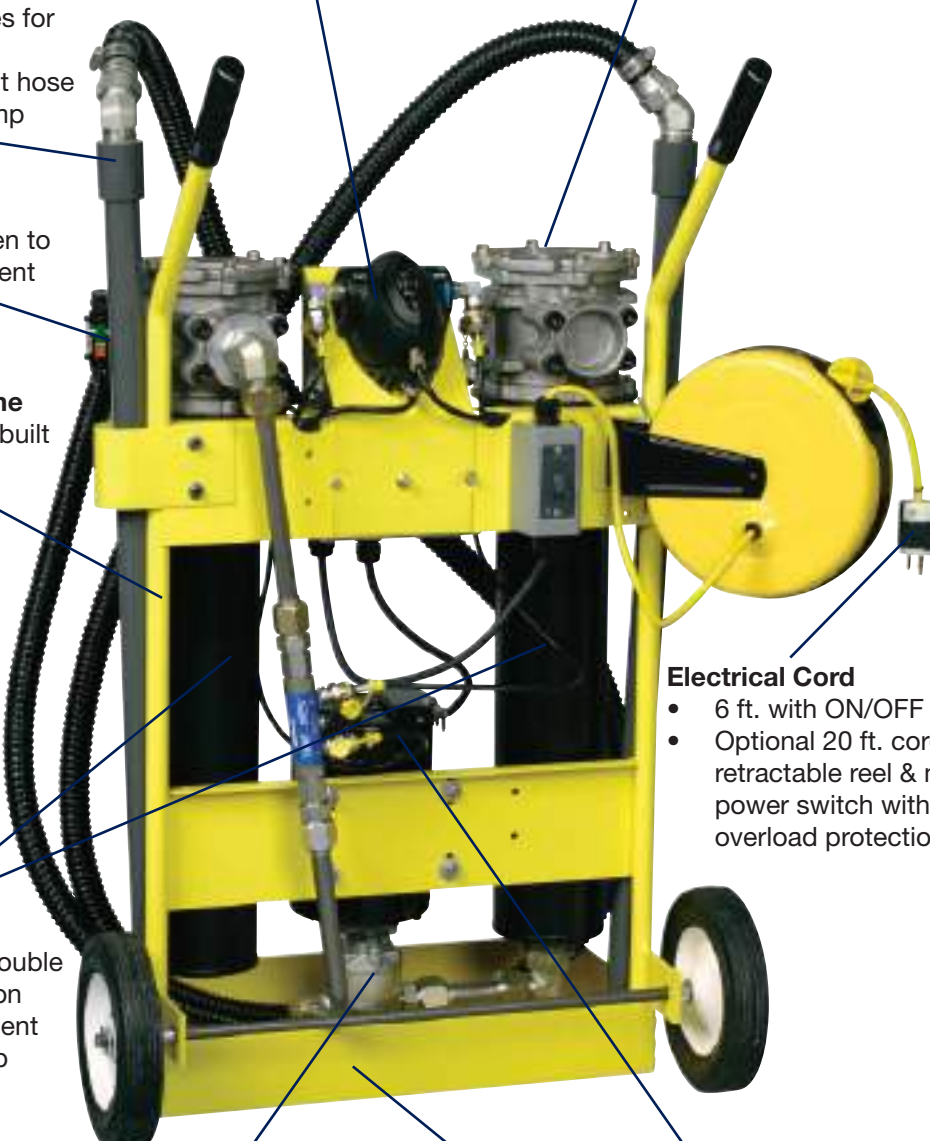
- Industrial brand name

Gear pump

- Industrial quality
- Quiet operation
- Dependable, long life

Drip tray

- Helps keep the work area safe and clean



Portable Filter Carts

Specifications

Maximum Recommended Fluid

Viscosity:

5MFP – 3000 SUS (647cSt)
0.85 specific gravity

10MFP – 500 SUS (108 cSt)
0.85 specific gravity

Visual Indicator (outlet filter):

Visual differential type
3-band (clean, change, bypass)

Filter Bypass Valve Settings

(Integral to Element):

Inlet – 3 psid (0.2 bar)
Outlet – 35 psid (2.4 bar)

Operating Temperature:

Seal option “B” (standard)
-40°F to +150°F (-40°C to +66°C)

Electrical Service Required:

5MFP – 110/220 volts, 60/50
Hz, single phase, 8/4 amps
10MFP – 110/220 volts, 60/50
Hz, single phase, 10/5 amps

Electrical Motor:

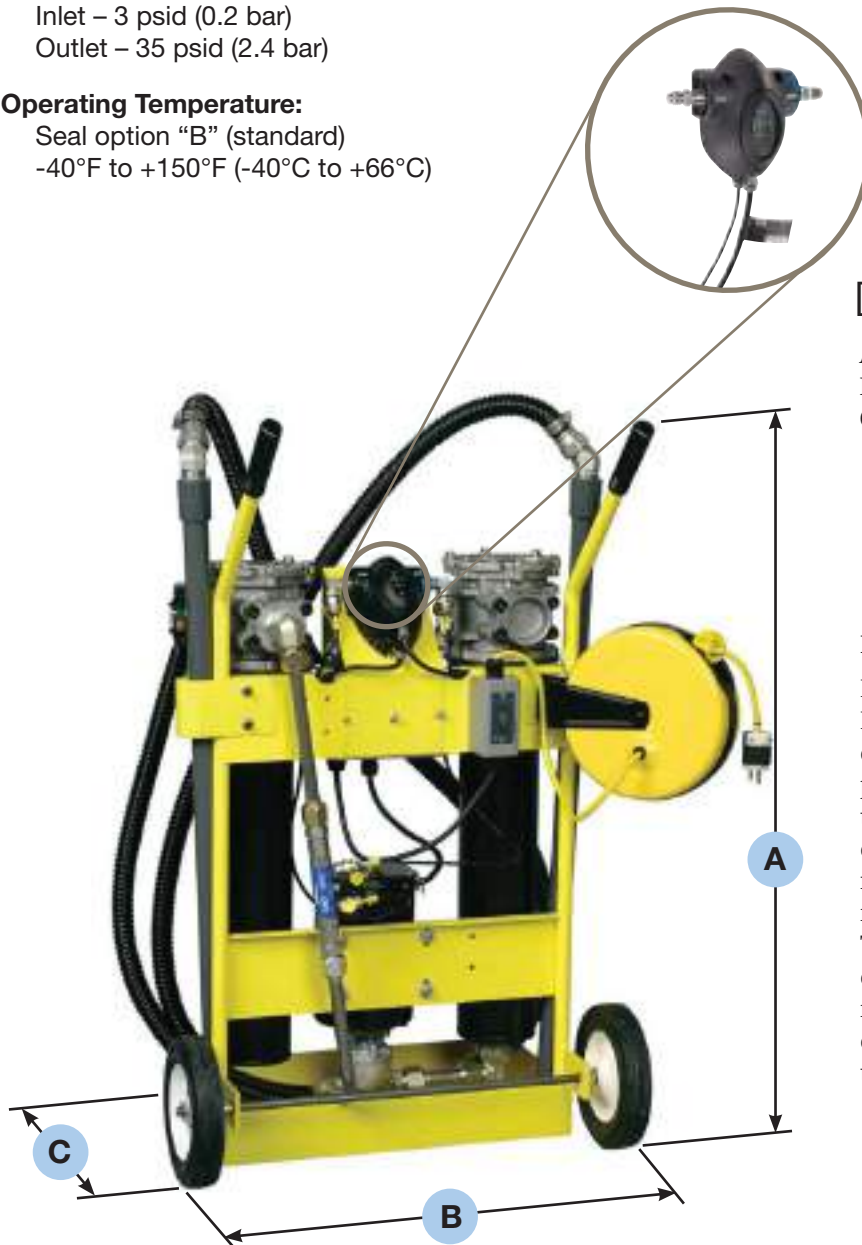
5MFP – ½ hp @ 1725 rpm,
Open, Drip Proof
10MFP – ¾ hp @ 3450 rpm,
Open, Drip Proof
Thermal overload protection

Construction:

Cart frame – Steel
Filter head – Aluminum
Filter bowl – Steel
Hoses – PVC (Std.)
EPDM (high temp option)
Wands – PVC (Std.)
Steel tube (high temp
option)

Weight:

110 lbs. (45.4kg)



Dimensions:

A = Height: 1034mm (40.7 in.)

B = Width: 648mm (25.5 in.)

C = Depth: 503mm (19.8 in.)

New feature!

Intelli-Cart™

Parker is pleased to announce its R&D effort to offer a diagnostic filter cart - the Intelli-Cart. The icountPD particle detector, the most up-to-date technology in solid particle detection, can be mounted to the standard frame of the filter cart for enhanced monitoring of your hydraulic system. The icountPD, coupled with the filter cart is a cost effective solution to fluid management and contamination control. Ask your sales representative today for more information.

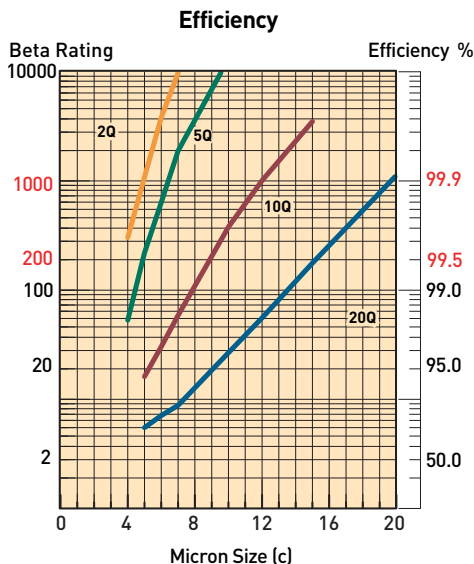
Typical Fluid Cleanliness Level Requirements

Many manufacturers of hydraulic components have established fluid cleanliness levels for their components. Using a portable filter cart can be a very effective way to reach and maintain these cleanliness levels.

| Component | ISO Cleanliness Level |
|---|-----------------------|
| Servo control valves | 16/14/11 |
| Proportional valves | 17/15/12 |
| Vane and piston pumps/motors | 18/16/13 |
| Directional and pressure control valves | 18/16/13 |
| Gear pumps/motors | 19/17/14 |
| Flow control valves cylinders | 20/18/15 |
| New fluid | 20/18/15 |

Filter Cart Element Performance

| Media Code | Filter Media | Capacity (Grams) |
|------------|----------------|------------------|
| 40W | Woven Wire | * |
| 40SA | Synthetic | * |
| 20Q | Microglass III | 140 |
| 10Q | Microglass III | 135 |
| 05Q | Microglass III | 130 |
| 02Q | Microglass III | 110 |



Notes: Multipass test run @ 80 gpm to 50 psid terminal - 5 mg/l BUGL.

Filter Cart Performance

Fluid cleanliness levels are a function of initial contamination levels, contamination ingress rates, reservoir size and filter element efficiency. The chart below lists approximate time requirements to achieve certain cleanliness levels based on the assumptions noted.

| Reservoir Capacity (Gallons) | Time Required (Hours) | Projected Cleanliness Level (ISO) |
|------------------------------|-----------------------|-----------------------------------|
| 50 | 0.5 | 20/18/15 |
| 50 | 1.0 | 17/15/12 |
| 50 | 2.5 | 16/14/11 |
| 100 | 1.5 | 18/16/13 |
| 100 | 2.5 | 17/15/12 |
| 100 | 4.0 | 16/14/11 |
| 200 | 2.5 | 19/17/14 |
| 200 | 3.5 | 18/16/13 |
| 200 | 5.0 | 17/15/12 |

Notes:

The results in the chart are based on the following assumption:

1. Initial contamination level is 500,000 particles greater than 10 micrometers per 100 ml of fluid (10MFP cart).
2. Inlet filter fitted with 40SA element; outlet with 20Q element.
3. System ingress rate equal to 1×10^6 particles greater than 10 micrometers entering the system per minute.

The Intelli-Cart™ with particle detector provides an excellent method for filtering and trending contamination levels.

For optimum particle detector performance results when monitoring contamination levels, fluid viscosity range should be 50 - 250 SUS.

Par-Gel™ Media Water Capacity

| Model | Fluid Viscosity | Capacity |
|-------|-----------------|----------|
| 5MFP | 75 SUS | 600 ml |
| | 200 SUS | 420 ml |
| 10MFP | 75 SUS | 500 ml |
| | 200 SUS | 300 ml |

Notes:

1. Par-Gel™ elements are designed to remove “free water”, which is defined as water that is above a particular fluid’s saturation level.
2. Capacity is very dependent on flow rate and viscosity. Not recommended with fluids in excess of 500 SUS.

Assembly

1. Install hoses to inlet and outlet filters by threading the hose end with the straight thread o-ring seal fitting into the filter flange.
2. Connect the PVC tube wands to the swivel fitting on the hose end. When servicing the PVC tube wand, do not over-torque the metal fittings going into the PVC coupling. Over-torque will result in cracking the coupling. Generally, 1/4 turn beyond hand-tight is sufficient.
3. The Intelli-Cart™ is shipped with a bag that contains user manuals, iPD programming disk, and accessory parts.
4. The iPD is shipped with the factory default setting. Users can reprogram the iPD with the cable located in the attached bag, the program disk and the iPD owners manual.

Operating Instructions

1. Insert the inlet wand assembly into the supply fluid receptacle (drum/reservoir). The RFP filter is the inlet filter.
2. Insert the outlet wand assembly into the clean fluid receptacle (drum/reservoir). The ILP filter is the outlet filter.
3. Verify that the ON/OFF switch is OFF and plug the cord into the proper grounded power source (3 wire).
4. Turn switch to ON position and check outlet wand for oil flow. Allow 30 to 60 seconds for filters to fill with oil. If repeated attempts to obtain oil flow fail, check pump inlet fittings for tightness, remove inlet filter access cover and verify the cover sealing o-ring is in place. For very viscous fluids it may be necessary to pour 1 or 2 quarts of fluid into the RFP inlet filter housing to prime pump initially.
5. The condition of the filter element should be monitored by observing the cleanliness indicator on the outlet filter. When the indicator is in the CHANGE position, both inlet

and outlet filter elements MUST be replaced to prevent fluid from going through the bypass in the filters.

6. The inlet filter element is provided with a 3PSI bypass spring, and prevents the pump from cavitating if the element is not changed. The outlet filter element is provided with a 35PSI bypass spring to prevent excessive pressure which may be harmful to personnel or to the filter cart.

Warning: The filter bypass spring acts as a relief valve for the pump. Do not restrict the outlet hose with a shut-off valve which will defeat the function of the bypass valve, causing excessive pressure, which may be harmful to personnel or to the filter cart.

7. The cleanliness indicator works on differential pressure and will indicate the condition of the element (CLEAN, CHANGE, or BYPASS).

NOTE: The filter cart must be in operation for the indicator to read properly.

Maintenance Instructions

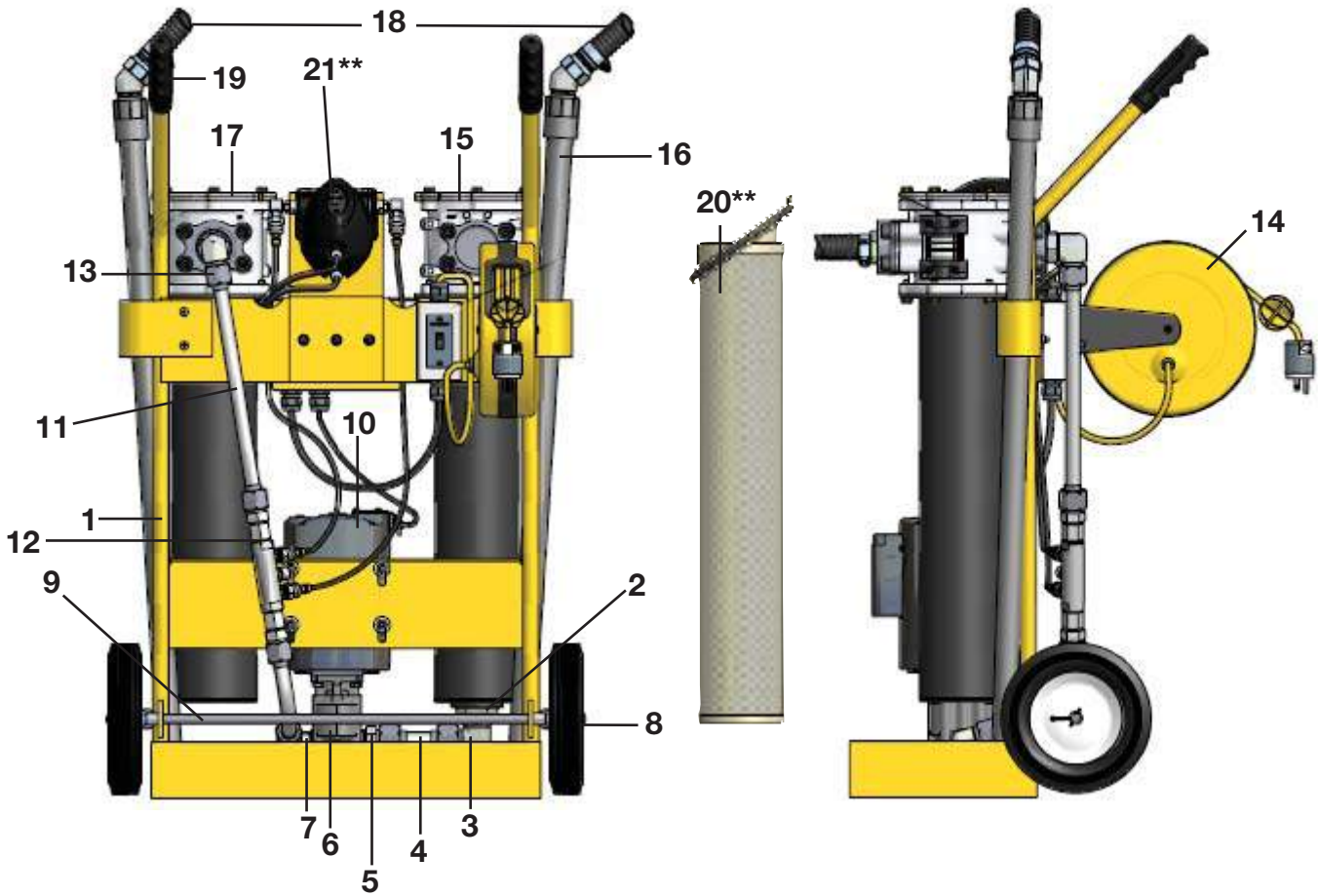
1. Turn switch to OFF position and unplug cord from electrical outlet.

2. Remove tube wands from oil to prevent siphoning.
3. Loosen hex head screws on filter cover. Turn cover to clear screws, remove cover.
4. Pull filter element from the filter head.
 - a) Replace the synthetic or Microglass III elements. Verify correct element replacement.
 - b) Wire mesh elements can be cleaned. Ultrasonic cleaners provide best results.
5. Install element in filter housing. Make sure element o-rings seat properly into the head, making sure that the notch on the element lines up with the notch in the head.
6. Inspect the cover o-ring and replace if necessary.
7. Replace cover and tighten hex head screws until they are snug. Do not over-torque (16 - 19 Ft. Lbs.) these screws. Do not interchange the inlet filter cover with the outlet filter cover. (The inlet filter has a "RFP" prefix, the outlet filter has a "ILP" prefix).
8. Contact the HFD service department at 419-644-0259 regarding iPD calibration.
9. iPD removal: remove oil lines from the iPD at the two fittings closest to the iPD. Disconnect the two cables from the iPD. Remove iPD from cart via two screws. The cart can be used without the iPD as long as the sample hoses are removed from the System 20. Protect sampling connectors from contamination.

Trouble Shooting

| Problem | Cause | Solution |
|-----------------------------------|--|--|
| Does not start | ON/OFF Switch No electrical power Defective motor | Turn switch ON, replace switch if defective Plug in cart Replace |
| No oil flow or erratic pump noise | Filter housing not filled with oil Suction leak Defective pump | Allow pump to run 30 to 60 seconds Check tightness of inlet fittings Check o-ring in inlet filter cover for nicks Kink or restriction in inlet hose Add 1 or 2 quarts of oil to inlet filter Replace pump |
| Indicator reads CHANGE or BYPASS | Element dirty Oil extremely cold or viscous | Replace or clean elements (both filters) Change element to coarser micron rating |
| Indicator does not seem to move | No outlet element 40 micron element installed in outlet filter | Install element Check cart model number to verify correct element. The inlet filter has a rating RFP prefix; the outlet filter has an ILP prefix |

Filter Cart Replacement Parts



| Item No. | Part No. | Description | Qty |
|----------|--------------|---------------------------------------|-----|
| 1 | 928690 | Frame | 1 |
| 1 | 941468 | Frame (Intelli-Cart™) | 1 |
| 2 | 940980 | Pipe Reducer Fitting | 1 |
| 3 | 940979 | Tube Fitting | 1 |
| 4 | 937526 | Suction Tube Assy. | 1 |
| 5 | 928652 | Adapter Fitting | 1 |
| 6 | 928731 | Pump | 1 |
| 7 | 940977 | Adapter Fitting | 1 |
| 8 | 928650 | Wheel | 2 |
| 9 | 928653 | Axle | 1 |
| 10 | 928678 | Motor 10MFP | 1 |
| 10 | 929692 | Motor 5MFP | 1 |
| 11 | 937527 | Discharge Tube Assy. | 1 |
| 12 | 941467 | Discharge Tube Top (Intelli-Cart™) | 1 |
| | 941466 | Discharge Tube Bottom (Intelli-Cart™) | 1 |
| | STI.0144.100 | System 20 (Intelli-Cart™) | 1 |
| | 3/8-8F40HG5S | System 20 Fitting 1 (Intelli-Cart™) | 2 |
| | 12/8 F50X-S | System 20 Fitting 2 (Intelli-Cart™) | 2 |

| Item No. | Part No. | Description | Qty |
|----------|--------------|----------------------------------|-----|
| 13 | 940978 | Tube Fitting | 1 |
| 14 | 928623 | Cord Reel | 1 |
| 15 | 940960 | Inlet Filter – Nitrile | 1 |
| 15 | 941024 | Inlet Filter – Fluorocarbon | 1 |
| 16 | 928784 | Tube Wand Assy. – Seal Option B | 2 |
| 17 | 940961 | Outlet Filter – Nitrile | 1 |
| 17 | 941025 | Outlet Filter – Fluorocarbon | 1 |
| 18 | 928663 | Hose Assy. – Seal Option B | 2 |
| 19 | 928651 | Handle Grip | 2 |
| 20 | See Chart** | Element, (1) Inlet & (1) Outlet | 2 |
| 21 | See Chart** | icountPD (Intelli-Cart™) | 1 |
| | B84654 | icount Cable (Intelli-Cart™) | 1 |
| | B84224 | icount Hoses (Intelli-Cart™) | 2 |
| | 2/2A40EG4M-S | icount Fitting 1 (Intelli-Cart™) | 2 |
| | EMA3/1/8ED | icount Fitting 2 (Intelli-Cart™) | 2 |

**Refer to chart on How to Order page.

Portable Filter Carts

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 10MFP | 2 | 40SA | 10Q | B | VP | I | 1 |

| BOX 1: Basic Assembly | |
|-----------------------|-----------------------|
| Symbol | Description |
| 5MFP | 5 GPM (3000 SUS MAX.) |
| 10MFP | 10 GPM (500 SUS MAX.) |

| BOX 2: Length | |
|---------------|-------------|
| Symbol | Description |
| 2 | Double |

| BOX 3: Inlet Filter Element | |
|-----------------------------|---|
| Symbol | Description |
| 40SA | Synthetic, 40 micron |
| 40W | Stainless Steel Mesh, 40 micron nominal |
| 20Q | Microglass III, 20 micron |

Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.

| BOX 4: Outlet Filter Element | |
|------------------------------|----------------------------------|
| Symbol | Description |
| 02Q | Microglass III, 2 micron |
| 05Q | Microglass III, 5 micron |
| 10Q | Microglass III, 10 micron |
| 20Q | Microglass III, 20 micron |
| WR | Par-Gel™ Water Removal |

| BOX 5: Seals | |
|--------------|----------------------|
| Symbol | Description |
| B | Nitrile (NBR) |

| BOX 6: Indicator | |
|------------------|---|
| Symbol | Description |
| VP | Visual indicator, 3-band (mounted on Outlet Filter only) |

| BOX 7: Bypass | |
|---------------|--|
| Symbol | Description |
| I | 35 PSID (2.4 bar) (outlet filter element) |

| BOX 8: Options | |
|----------------|---|
| Symbol | Description |
| 1 | None |
| 6* | 20' electrical cord (retractable reel) |
| 9 | Visual indicator on Inlet Filter |
| PD** | iPD with standard LED Display |
| PDL** | iPD with LCD display and integrated Moisture Sensor |

* standard with option PD or PDL
** only available in 10MFP configuration

Replacement Elements

| Media | Nitrile Seals | | Fluorocarbon Seals | |
|-------|---------------------------------------|---|---------------------------------------|---|
| | Inlet Filter (3 psid integral bypass) | Outlet Filter (35 psid integral bypass) | Inlet Filter (3 psid integral bypass) | Outlet Filter (35 psid integral bypass) |
| 02Q | N/A | 937397Q | N/A | 937405Q |
| 05Q | N/A | 937398Q | N/A | 937406Q |
| 10Q | N/A | 937399Q | N/A | 937407Q |
| 20Q | 940971Q | 937400Q | 940974Q | 937408Q |
| 40SA | 940802 | N/A | 940972 | N/A |
| 40W | 940803 | N/A | 940973 | N/A |
| WR | N/A | 940734 | N/A | 940736 |

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.





aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Guardian®

Portable Filtration System



ENGINEERING YOUR SUCCESS.



Ground Support



Hydraulic Service



Mining



The Guardian portable filtration system is a unique pump/motor/filter combination designed for conditioning and transferring petroleum-based and water emulsion fluids. It protects your system from contamination added with new fluid because new fluid is not necessarily clean fluid. Most new fluids right out of the drum are unfit for use due to high initial concentrations of contaminants. Contamination may be added to a new fluid during processing, mixing, handling, and storage.

The Guardian also circulates and “polishes” fluid in your existing systems to reduce the contamination to an acceptable level.

There are literally hundreds of applications that the Guardian is suited for, with more being discovered each day. If your system is sensitive to the harmful effects of contamination, then the Guardian may be ideal for you.

| Features | Advantages | Benefits |
|--|--|--|
| Lightweight, hand held, compact design (less than 24 lbs 16" X 8" approximate foot print). | Easy to carry and fits easily on top of 55 gallon drums. | One person operation, capable of getting to hard to reach areas. |
| Flow rate to 4 gpm. | Filters and transfers simultaneously. | One step operation. |
| Powerful pump/motor combination with Carboxylated Nitrile seals standard. | Handles fluids up to 16,000 SUS viscosity (11,000 SUS -24 VDC). | Reliable performance in a wide variety of operating conditions. |
| Built-in relief valve with no downstream fluid bypass. | Only filtered fluid reaches downstream components. | 100% filtration ensured, even when unattended. |
| Wide variety of filter elements available. | High capacity 2 micron absolute disposable microglass to 74 micron cleanable wire and water removal. | Maximizes element life between changes. |
| Clear, wire-reinforced 5' hose assemblies with wand attachments. | No additional hardware required. | Ready to use and easy to maneuver. |
| Optional quick disconnect hose connections. | Fast, easy setup and tear-down. | Eliminates messy drips. |
| Heavy-duty ¼ HP, 115 VAC (230 VAC, 24 VDC- optional) motor with thermal overload protection. | UL recognized and CSA listed, with replaceable brushes. | Safe, reliable performance; field serviceable. |
| Geroter pump with visible serviceable inlet strainer. | Dirt tolerant design with added protection. | Pump reliability in highly contaminated fluids. |
| Quiet operation. | Less than 70dB noise level @ 3 feet. | Can be used most anywhere with minimal disturbance. |
| Convenient inlet-to-outlet hose connection. | Contains fluids when transporting. | Clean and safe operation. |
| Low center of gravity. | Guardian stability. | Unattended reliability. |
| Dual motor seals. | Added motor protection. | Longer motor life. |
| Auxiliary inlet/outlet ports. | Used in place of, or in addition to, standard ports. The outlet can also be used as a sampling port. | Flexibility. |



Mobile



Industrial



Marine

Guardian Series

Installation and Specification Data

Maximum Allowable Operating Pressure (MAOP): 50 psi (3.4 bar)

Flow Capacity: Up to 4 gpm (15 lpm)

Maximum Recommended Fluid Viscosity: (.85 specific gravity)
110-120 VAC and
220-240 VAC 16,000 SUS
24VDC 11,000 SUS

Warning: Explosion hazard. Do not pump flammable liquids such as gasoline, alcohol, solvents, etc.

Operating Temperatures:
Unit: -15°F to 180°F (-26°C to 82°C)

Wand/Hose: 25°F to 120°F (-4°C to 49°C)

Visual Indicator: Differential pressure type, set at 25 psid

Recommended Fluids: petroleum based oils, water emulsions, and diesel fuels

Integral Relief Valve: set at 50 psi for motor protection.

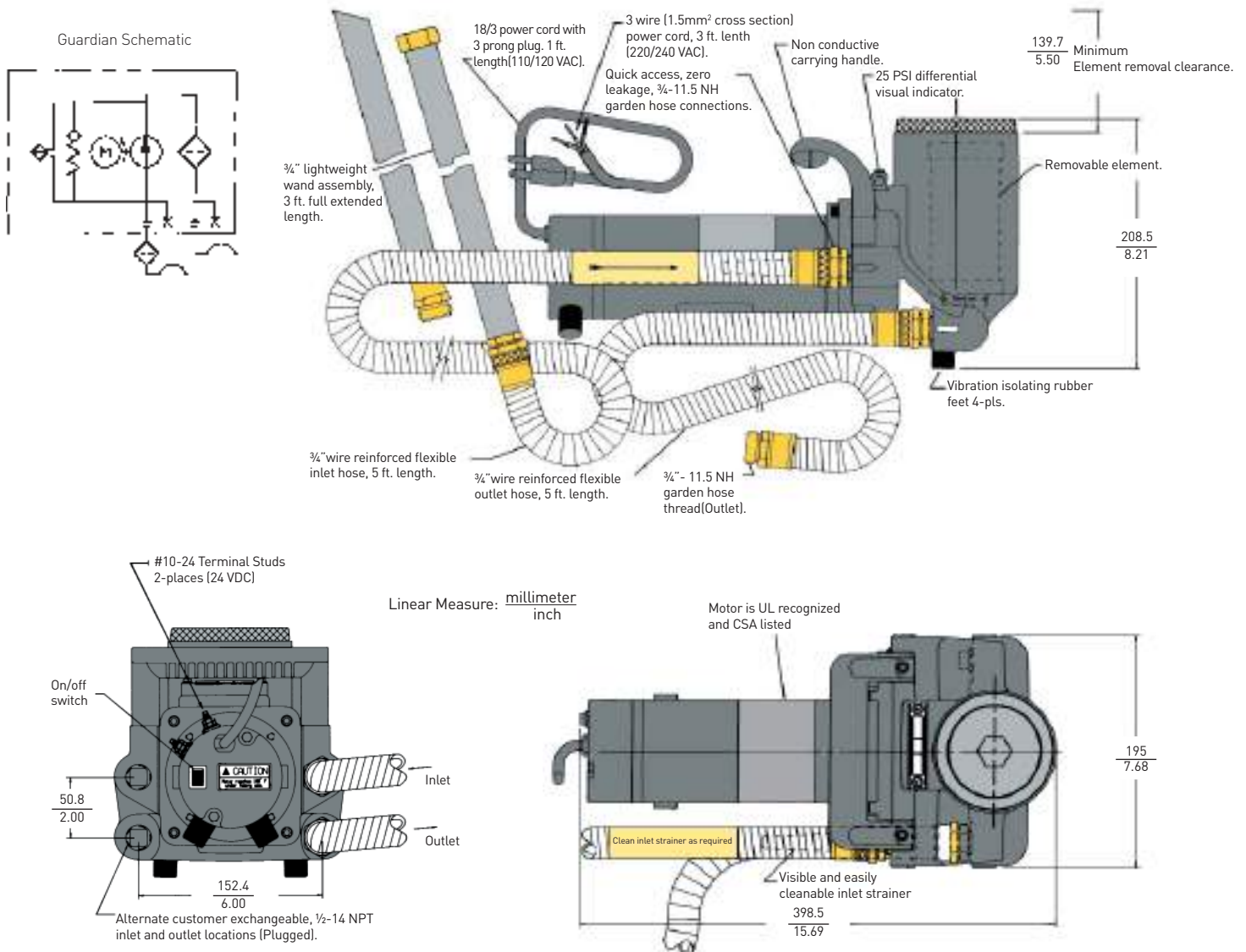
Noise Level: <70db at 3 ft.

Electrical Motor: ¼ hp@2500 rpm.
24 VDC; 10A max.
110-120 VAC; 50/60 Hz; 3A max.
220-240 VAC; 50/60 Hz; 1.5A max.
Thermal overload protected.
Replaceable brushes (500 hours).

Weight: approximately 23 lbs. 5 oz.

Materials:

Housing: cast aluminum
Cover: die cast aluminum
Handle and Indicator: nylon
Wands and Hose: PVC
Fittings: brass
Seals: fluorocarbon/
carboxylated nitrile



Guardian Series

Element Performance

| Media Code | Filter Media | Time Averaged Beta $x/y/z = 2/20/75$ Where $x/y/z$ is: | Dirt Capacity (Grams) |
|------------|----------------|---|-----------------------|
| 74W | Woven Wire | 74 micron ¹ | * |
| 40W | Woven Wire | 40 micron ¹ | * |
| 25W | Woven Wire | 25 micron ¹ | * |
| 20C | Cellulose | 20 micron ¹ | * |
| 10C | Cellulose | 5/8/16 | 4 |
| 20Q | Microglass III | 7.1/13.7/17.3 | 16.2 |
| 10Q | Microglass III | 2.7/7.3/10.3 | 14.4 |
| 05Q | Microglass III | <2/2.1/4.0 | 14.9 |
| 02Q | Microglass III | <2/<2/<2 | 14.3 |

| Beta Rating | Efficiency at x Particle Size |
|--------------|-------------------------------|
| $B_x = 2$ | 50.0% |
| $B_x = 20$ | 95.0% |
| $B_x = 75$ | 98.7% |
| $B_x = 200$ | 99.5% |
| $B_x = 1000$ | 99.9% |

Multipass test run at 4 gpm to 35 psid

¹Reference ratings only. Not multipass tested due to coarseness.

* Not applicable

Estimated Guardian Element Life and Cleanliness Levels

The following chart shows typical element life (in gallons of oil passed) and cleanliness levels

achieved by standard Parker elements available with the Guardian. Some assumptions have been made.*

| Media Code | New Oil ISO | ISO Achieved | Element Life | Elements Used per 250 gallons |
|------------|-------------|--------------|--------------|-------------------------------|
| 10C | 22/20/16 | 21/19/15 | 120 gallons | 2.08 |
| 20Q | 22/20/16 | 21/19/15 | 486 gallons | .51 |
| 10Q | 22/20/16 | 19/16/14 | 407 gallons | .61 |
| 05Q | 22/20/16 | 17/15/12 | 330 gallons | .75 |
| 02Q | 22/20/16 | 15/13/10 | 316 gallons | .79 |

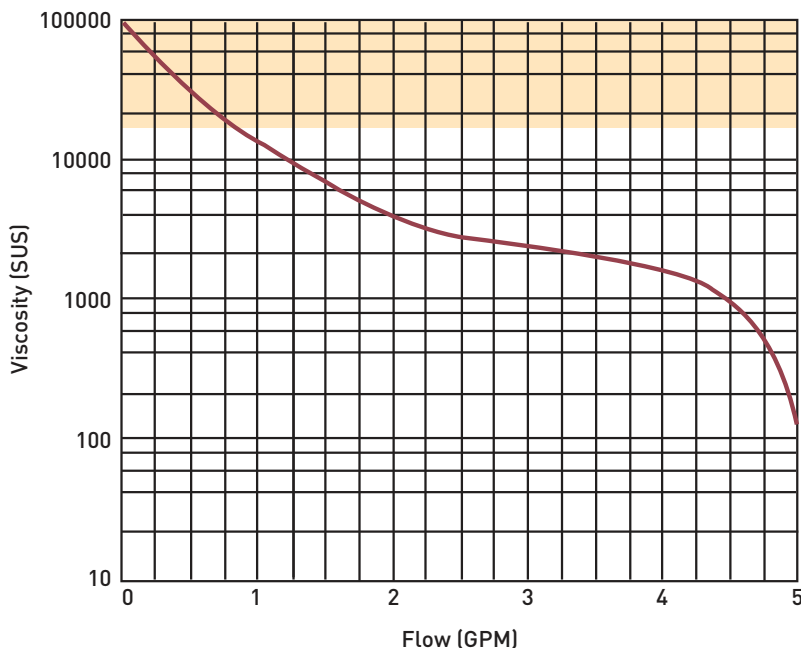
* 1. New oil is at ISO 22/20/16.

2. No environment or work ingress.

3. Single pass oil transfer.

NOTE: Data for fluid transfer only. For continuous fluid polishing, lower ISO cleanliness levels will be achieved.

Guardian Flow vs. Viscosity Performance



Note 1: Guardian not recommended for fluid viscosities greater than 16,000 SUS (11,000 SUS; 24VDC)

Note 2: Flows based on Guardian with no element installed

Guardian Operation

- A. Remove all shipping plugs from the hoses and fittings.
- B. Connect the inlet and outlet hose assemblies to the unit.
- C. Connect the wand assemblies, if required.
- D. Place the inlet hose wand assembly into the fluid to be filtered and/or transferred.
- E. Place the outlet hose/wand assembly into the container where the fluid discharge is desired.
- F. Plug in the unit.
- G. Flip the switch on the end of the unit to the “on” position.

NOTE: For no-mess transportation, the inlet and outlet hose assemblies can be screwed together by removing the wand assembly.

Guardian Element Servicing

- A. Flip the switch on the end of the unit to the “off” position and disconnect the electrical plug.
- B. Rotate the cover counter-clockwise and remove.
- C. Remove the element from the housing. Discard all disposable elements. These elements are not cleanable.
- D. Place the new element in the housing, fitting the o-ring neck into the large hole at the bottom.
- E. Inspect the cover o-ring and replace if necessary.
- F. Replace the cover and hand-tighten.

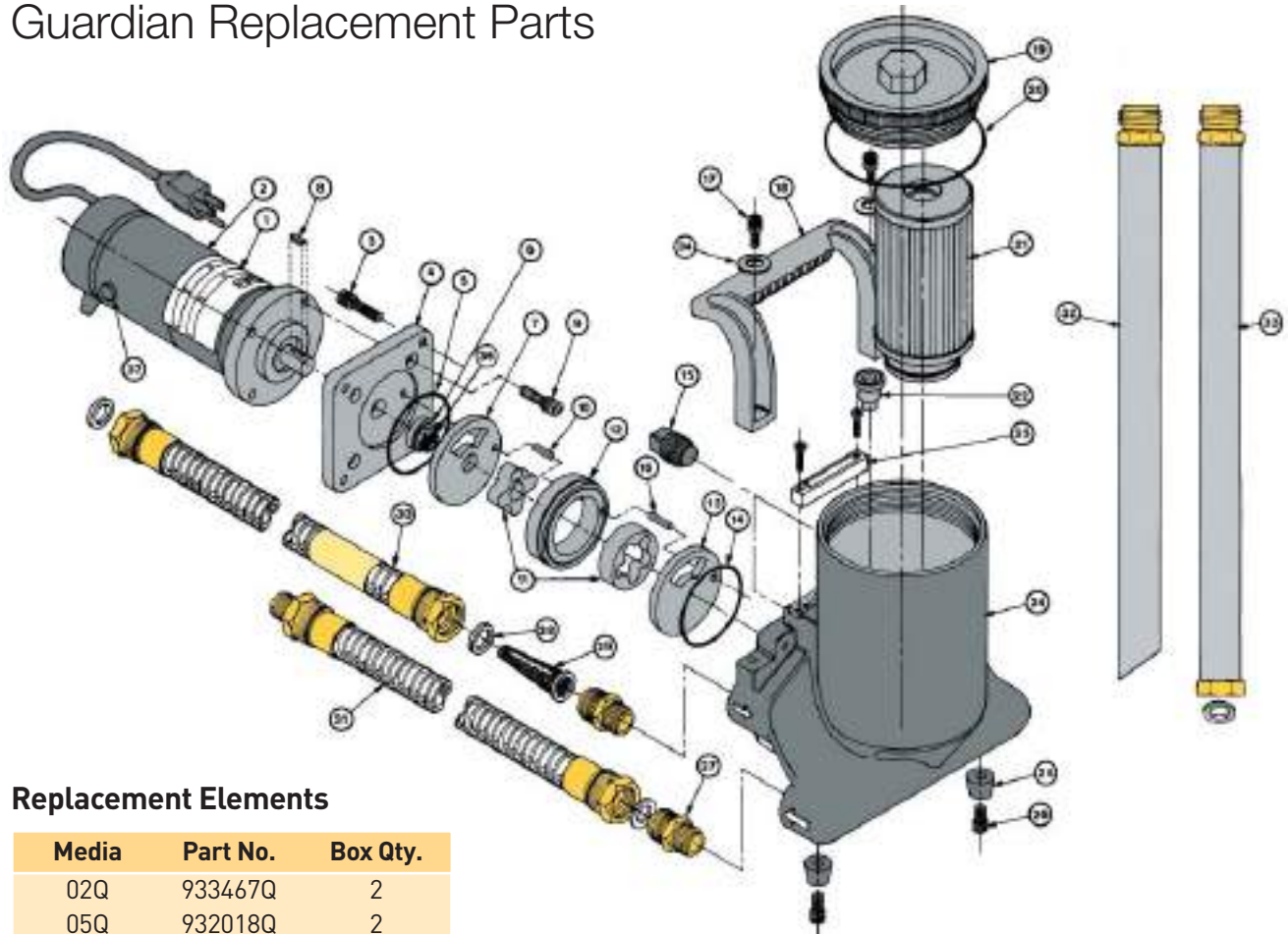
NOTE 1: It is recommended that the Guardian be cleaned and flushed between uses with dissimilar fluids to prevent fluid mixing.

NOTE 2: Motor brushes may require changeout every 500 service hours

Troubleshooting Guide

| Problem | Cause | Solution |
|---|--|---|
| Does not start. | ON/OFF switch. No electrical power. Rectifier. Motor overheats (160°F). Defective motor. | Turn switch on, replace switch if defective. Plug in Guardian, check for tripped circuit breakers, check for blown fuses. Replace if defective. Allow motor to cool, thermal overload will automatically reset. Replace motor. |
| Does not start or erratic motor noise. | Worn motor brushes. | Replace motor brushes. |
| Intermittent start/stop operation. | High viscosity fluids. Worn motor brushes. Defective motor. | High viscosity fluids can cause the motor to overheat and cycle intermittently. Replace motor brushes. Replace motor. |
| Hot motor. | Pumping under heavy load. Defective motor. | It is normal, under a heavy pumping load for the motor to reach 160°F. Replace motor if shell temperature reaches greater than 170°F. |
| No flow or erratic pump noise. | Filter housing not filled with oil. Suction leak. Obstructed outlet. Element dirty. Sheared pump key. Defective Guardian. | Allow Guardian to run a few seconds. Check tightness of inlet fittings and hoses. Check gaskets are in place and are not damaged. Kink or restriction in the inlet hose. Clear outlet. Replace or clean element. Replace woodruff key. Replace unit. |
| No flow, erratic pump noise, motor overheats. | Gears binding. | Disassemble Guardian and thoroughly clean the gear set. Always use the inlet strainer provided to protect the unit. Replace defective gears. |
| No suction. | Plugged strainer. | Clean or replace the inlet strainer as required. Clean relief valve. Check for damaged internal o-rings. |
| Reduced oil flow. | High viscosity fluids. Element dirty. Relief valve sticks or is lodged open. Partially obstructed inlet or outlet hose. Suction leak. Worn gears. | High viscosity fluids can cause reduced flow, which is normal. Replace or clean element. Clean relief valve or replace if defective. Clear the hose obstruction. Check tightness of inlet fittings and hose. Replace gear set. |
| Indicator moves to RED Area. | Element dirty. Oil extremely cold or viscous. Obstructed outlet. Defective indicator. | Replace or clean element. Change element to coarser micron rating. Clear outlet obstruction. Replace indicator. |
| Indicator does not seem to move. | No element. Defective indicator. | Install element. Replace indicator. |
| Hoses discolor or are hard. | Fluid compatibility. | Certain fluids, over time, will cause the hoses to discolor. This does not impair their performance. But, some fluids will cause the hoses to become brittle, requiring replacement. |
| Oil formation under unit. | Defective shaft seal. | Replace the motor shaft seal. |

Guardian Replacement Parts



Replacement Elements

| Media | Part No. | Box Qty. |
|-------|----------|----------|
| 02Q | 933467Q | 2 |
| 05Q | 932018Q | 2 |
| 10Q | 932017Q | 2 |
| 20Q | 933468Q | 2 |
| 10C | 932016 | 2 |
| 20C | 932020 | 2 |
| 25W | 922627 | 1 |
| 40W | 922628 | 1 |
| 74W | 922626 | 1 |
| WR | 932019 | 2 |

Parts List

| | | | |
|-------------------------------------|-----------------|--|-------------|
| 1. Label..... | Consult Factory | | |
| 2. Motor, 110-120 VAC..... | 931913 | | |
| 220-440 VAC..... | 932381 | | |
| 24 VDC..... | 932759 | | |
| 3. SHCS(4), 1/4-20x1..... | 902734 | | |
| 4. Adapter Plate..... | 931890 | | |
| 5. Housing O-Ring..... | V72041 | | |
| 6. Polypak Seal..... | 931921 | | |
| 7. Shadow Plate..... | 931899 | | |
| 8. Woodruff Key 1/8x3/8..... | 931877 | | |
| 9. SHCS(4), 1/4-20 x 3/4..... | 902679 | | |
| 10. Roll Pin 1/8 x 3/4..... | 903630 | | |
| 11. Geroter Set..... | 931873 | | |
| 12. Geroter Ring..... | 931903 | | |
| 13. Outlet Plate..... | 931900 | | |
| 14. Geroter O-ring..... | V72135 | | |
| 15. Brass Pipe Plug (2) 1/2-14..... | 931920 | | |
| 16. Roll Pin 1/8 x 5/8..... | 903426 | | |
| 17. SHCS (2), 1/4-20 x 5/8..... | 931889 | | |
| 18. Handle..... | 931897 | | |
| 19. Cover..... | 931892 | | |
| 20. Cover O-Ring..... | V72237 | | |
| 21. Element..... | | | |
| 22. Relief Valve..... | 928981 | | |
| 23. Indicator Kit..... | 927422 | | |
| 24. Housing..... | 931838 | | |
| 25. Rubber Bumpers (2)..... | 931888 | | |
| 26. SHCS(2), 1/4-20 x 1/2..... | 902907 | | |
| 27. Brass Fitting (2)..... | 931928 | | |
| 28. Gasket (4)..... | 931956 | | |
| 29. Inlet Screen..... | 931927 | | |
| 30. Inlet Hose Assembly..... | 931936 | | |
| 31. Outlet Hose Assembly..... | 931937 | | |
| 32. Wand Crevice Assembly..... | 931965 | | |
| 33. Wand Adapter Assembly..... | 931966 | | |
| 34. Washer (2)..... | 926106 | | |
| 35. Quick Disconnect Kit..... | 932097 | | (Not Shown) |
| 36. Washer..... | 932085 | | |
| 37. Brush Kit (110/120)..... | 934329 | | |
| (220/240 VAC)..... | 934327 | | |
| (24 VDC)..... | 932761 | | |
| Seal Kit..... | 932263 | | |
| Bowl Extension Kit..... | 932081 | | |

NOTE: SHCS denotes "socket head cap screw"

Guardian Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 |
|-------|-------|-------|-------|
| | GT4 | 10C | 1 |

| BOX 1: Seals | |
|--|--|
| Symbol | Description |
| None | Carboxylated Nitrile (Standard) |
| Note: Consult factory for fluids not compatible with fluorocarbon. | |

| BOX 2: Model | |
|--------------|------------------------------|
| Symbol | Description |
| GT4 | Guardian® 110/120 VAC |
| GT4D | 24VDC |
| GT4E | 220/240 VAC |

| BOX 3: Media | |
|--------------|------------------|
| Symbol | Description |
| 74W | Wire Mesh |
| 40W | Wire Mesh |
| 25W | Wire Mesh |
| 10C | Cellulose |
| 20Q | Microglass III |
| 10Q | Microglass III |
| 05Q | Microglass III |
| 02Q | Microglass III |
| WR | Water Removal |

| BOX 4: Options | |
|----------------|-----------------------------------|
| Symbol | Description |
| 1 | None |
| 6 | Quick disconnect hose connections |

Please note the bolded options reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.





aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Portable Purification Systems

Models PVS 185, 600, 1200, 1800, 2700



ENGINEERING YOUR SUCCESS.

PVS Series

Principles of Operation

Contaminated oil is drawn into the Parker Portable Purification System by a vacuum of 25 In/Hg. The oil passes through the in-line low watt density heater where the oil is heated to an optimum temperature of 150° F (66°C).

The oil then enters the distillation column where it is exposed to the vacuum through the use of special dispersal elements. This increases the exposed surface area of the oil and converts the water to vapor form, which is then drawn through the condenser by the vacuum pump.

The water-free oil falls to the bottom of the column and is removed by a heavy duty lube oil pump. This pump forces the dry oil through a final particulate removal filter. Clean oil passes out of the unit, back to the reservoir — and into the system.

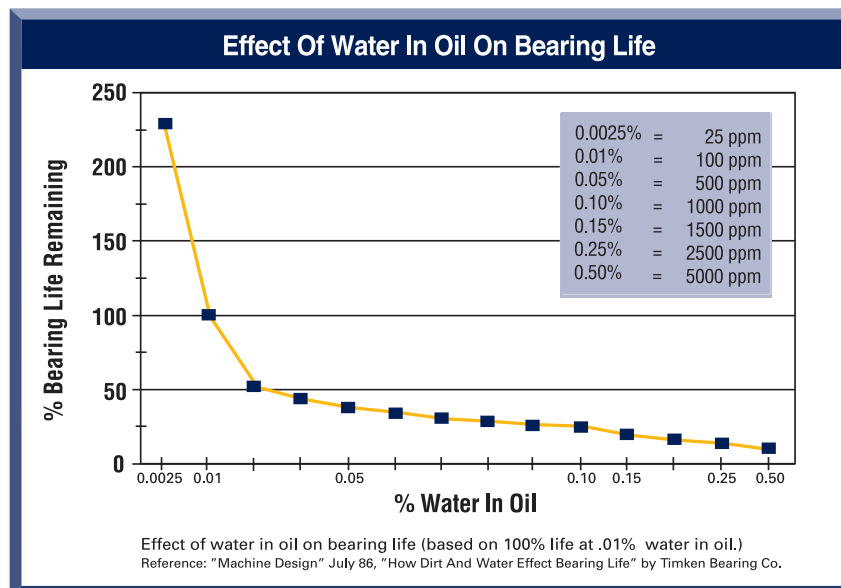
Effects of Water Contamination

Water is one of the most common contaminants in a fluid system and one of the most damaging. When water contaminates a system, it can cause serious problems such as:

- Corrosion by etching metal
- Fluid breakdown, reduction of lubricating properties, additive precipitation, and oil oxidation
- Reduced dielectric strength
- Abrasive wear in hydraulic components

| Typical Saturation Points | | |
|---------------------------|-----|-------|
| Fluid Type | PPM | % |
| Hydraulic Fluid | 300 | .03% |
| Lubrication Fluid | 400 | .04% |
| Transformer Fluid | 50 | .005% |

Free water occurs when oil becomes saturated and cannot hold any more water. This water is usually seen as cloudy oil or puddles of water at the bottom of an oil reservoir. Water which is absorbed into the oil is called dissolved water. At higher temperatures, oil has the ability to hold more water in the dissolved stage due to the expansion of oil molecules. As the oil cools, this ability reverses and free water will appear where not visible before. In addition to temperature, fluid type also determines the saturation point for your system (see chart above).



PVS Series

Applications

- Hydraulic Systems
- Lubrication Systems
- Turbine Oil
- Transformer Oil
- New Oil (oil storage)
- Seal Oil
- Explosion Proof

Environments



NEMA 7 Explosion Proof

Markets

- Power Generation
- Pulp and Paper
- Primary Metals
- Mining
- Plastic Injection Molding
- Oil Exploration
- Petrochemical
- Automotive
- Aerospace
- Refineries
- Transportation

| Standard Features | Advantages | Benefits |
|---|--|--|
| Variable flow circuit | <ul style="list-style-type: none"> • Allows oil to heat more quickly so water is removed faster | <ul style="list-style-type: none"> • Time savings |
| Moisture sensor | <ul style="list-style-type: none"> • Real-time water content indication in % saturation | <ul style="list-style-type: none"> • At-a-glance visual confirmation |
| Automatic operation | <ul style="list-style-type: none"> • Unattended use • Designed for 24/7 operation | <ul style="list-style-type: none"> • Reduces labor costs • Increases operation time |
| 316 Stainless steel used for primary wetted surfaces | <ul style="list-style-type: none"> • No corrosion | <ul style="list-style-type: none"> • Product reliability |
| Ecoglass particulate element | <ul style="list-style-type: none"> • Coreless, non-metallic construction | <ul style="list-style-type: none"> • Environmentally friendly, easy disposal |
| Clear plexiglass covers on the condensate tank and vacuum chamber | <ul style="list-style-type: none"> • See the vacuum dehydration process work | <ul style="list-style-type: none"> • Visual verification of water removal |
| Desiccant breather | <ul style="list-style-type: none"> • Insures dry, clean intake air | <ul style="list-style-type: none"> • More efficient operation |
| Reverse phase switch | <ul style="list-style-type: none"> • Enables easy changing of motor rotation if out-of-phase | <ul style="list-style-type: none"> • Ease of maintenance • Prevents incorrect rotation |
| Condensate holding tank with optional auto drain | <ul style="list-style-type: none"> • Large volume for infrequent servicing intervals | <ul style="list-style-type: none"> • Reduces maintenance costs |
| Programmable thermostat | <ul style="list-style-type: none"> • Maintains oil within 1°F • Prevents overheating the oil | <ul style="list-style-type: none"> • Unattended operation |
| Forklift guides and lifting eyes | <ul style="list-style-type: none"> • Provides safe and secure method of lifting the unit | <ul style="list-style-type: none"> • Employee safety |
| Coalescing or packed tower oil dispersal elements | <ul style="list-style-type: none"> • Flexibility with various fluid viscosities | <ul style="list-style-type: none"> • Greater efficiency in removing moisture |

PVS Series

Vacuum Dehydration Performance

| Potential Contaminant | PVS Performance |
|-----------------------|--|
| Solid particulate | ISO Cleanliness Code* 14/13/10 Attainable |
| Water | Removes 100% of free water, 90% of dissolved water |
| Air/Gases | Removes 100% of free air and gases, 90% of dissolved air and gases |

*When utilizing 02Q media.

| Typical Performance | |
|---------------------|---|
| Tank Size | 60 Gallons (227 liters) |
| Run Time | 62 minutes |
| Parker Model | PVS 600 (10 GPM) |
| Water Content (ppm) | Start: 10,000 PPM (1.0%) Stop: 50 PPM (0.005%) |
| Contamination Level | Start: ISO 21/18/16 Stop: ISO 16/14/11 |



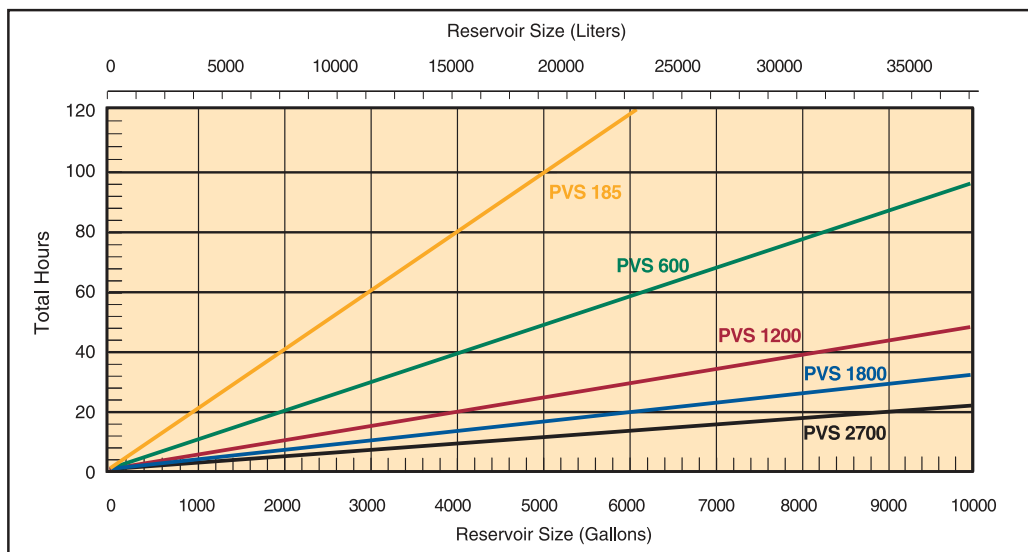
PVS (Vacuum Dehydration) Compared to Other Technologies

Centrifuge units – Removes free water only; has difficulty breaking stable emulsions; larger envelope dimensions but lower flows; higher initial and operating costs.

Desiccant units – Have limited water removal capability due to absorbing material; only removes air ingressed particles; expensive compared to the volume of water removed.

Coalescer units – Removes free water only; has difficulty breaking stable emulsions; does not work well in viscous fluids (>100 sus); much larger in size compared to PVS.

**Estimated Water Removal Time
5000 ppm (0.5%) to 150 ppm (0.015%)**



PVS 185 Series

Specifications

| | |
|----------------------------|---|
| Flow rate | 5 gpm (18.9 lpm) |
| Dimensions | 65" H x 33" W x 48" L (1651mm x 838mm x 1219mm) |
| Weight | 650 lbs. (295 kg) |
| Seal material | Fluorocarbon (EPR optional) |
| Condensate tank | 4.1 gal (15.5 ltrs) |
| Dispersal elements | 1 |
| Minimum operating capacity | 5 gal (18.9 ltrs) |
| Vacuum (max) | 25 In/Hg |
| Viscosity (max) | 500 sus (108 cSt)-Disposable 2150 sus (460 cSt)-Packed Tower |
| Outlet pressure (max) | 60 psi (4.1 bar) |
| Ports | 3/4" JIC (male) inlet 3/4" JIC (male) outlet |
| FLA (full load amps) | 15-41 amps (Depending on options & voltages) |
| Shipping Weight | 1400 lbs. (635 kg) maximum |
| Shipping Dimensions | 70" H x 48" W x 60" L (1778mm x 1219mm x 1524mm) |



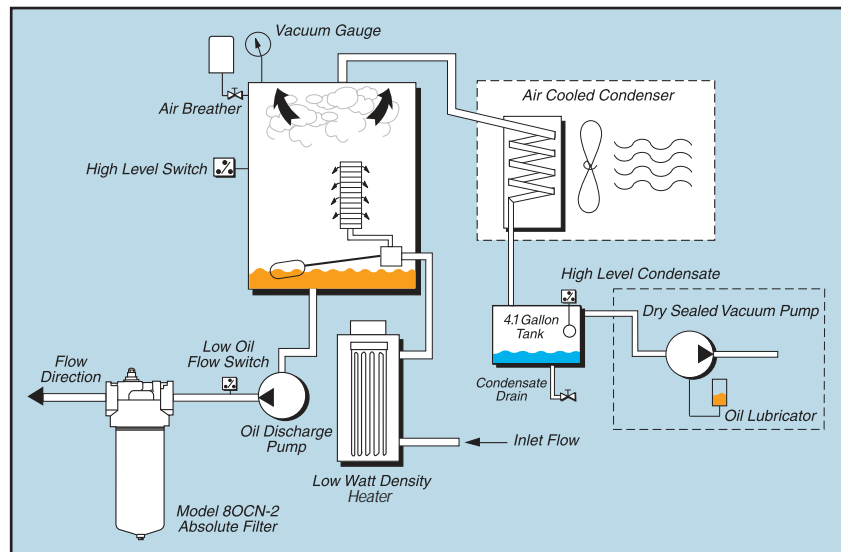
Note: Dimensions and weights are approximate and for reference only.

UL and CUL Marked

Replacement Elements

| Standard Coreless Particulate (80CN-2) | |
|--|---------|
| 02QE (2 micron) | 936716Q |
| 05QE (5 micron) | 936717Q |
| 10QE (10 micron) | 936718Q |
| 20QE (20 micron) | 936719Q |
| Optional Coreless Particulate (IL8-3) | |
| 02QE (2 micron) | 933734Q |
| 05QE (5 micron) | 933612Q |
| 10QE (10 micron) | 933735Q |
| 20QE (20 micron) | 933736Q |
| Dispersal | |
| Disposable (Coalescing) | 933180 |
| Packed tower (Cleanable) | 933553 |

PVS 185 Flow Diagram



PVS 600 Series

Specifications

| | |
|----------------------------|---|
| Flow rate | 10 gpm (37.9 lpm) |
| Dimensions | 65" H x 33" W x 48" L (1651mm x 838mm x 1219mm) |
| Weight | 900 lbs. (408.2 kg) |
| Seal material | Fluorocarbon (EPR optional) |
| Condensate tank | 4.1 gal (15.5 ltrs) |
| Dispersal elements | 2 |
| Minimum operating capacity | 6 gal (22.7 ltrs) |
| Vacuum (max) | 25 In/Hg |
| Viscosity (max) | 500 sus (108 cSt)-Disposable 2150 sus (460 cSt)-Packed Tower |
| Outlet pressure (max) | 60 psi (4.1 bar) |
| Ports | 1" JIC (male) inlet 1" JIC (male) outlet |
| FLA (full load amps) | 24-38 amps (Depending on options & voltages) |
| Shipping Weight | 1500 lbs. (680 kg) maximum |
| Shipping Dimensions | 70" H x 48" W x 60" L (1778mm x 1219mm x 1524mm) |



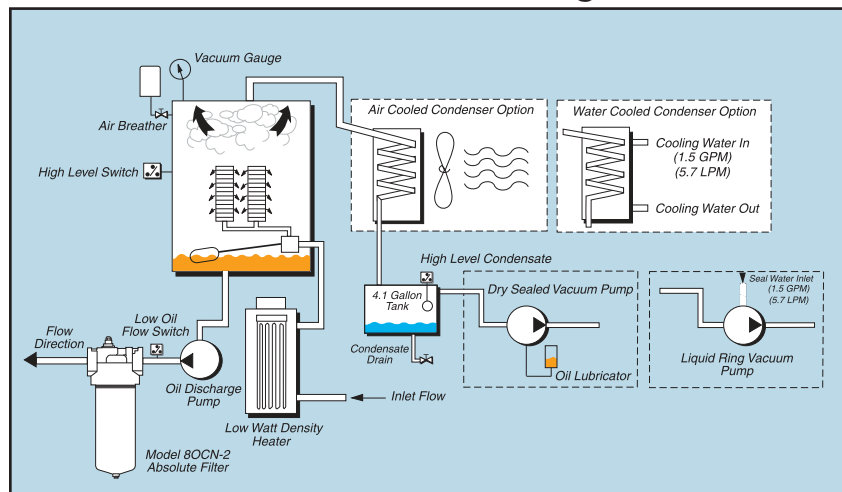
Note: Dimensions and weights are approximate and for reference only.

Replacement Elements

| Standard Coreless Particulate (80CN-2) | |
|--|---------|
| 02QE (2 micron) | 936716Q |
| 05QE (5 micron) | 936717Q |
| 10QE (10 micron) | 936718Q |
| 20QE (20 micron) | 936719Q |
| Optional Coreless Particulate (IL8-3) | |
| 02QE (2 micron) | 933734Q |
| 05QE (5 micron) | 933612Q |
| 10QE (10 micron) | 933735Q |
| 20QE (20 micron) | 933736Q |
| Dispersal | |
| Disposable (Coalescing) | 933180 |
| Packed tower (Cleanable) | 933553 |

UL and CUL Marked

PVS 600 Flow Diagram



PVS 1200 Series

Specifications

| | |
|----------------------------|---|
| Flow rate | 20 gpm (75.7 lpm) |
| Dimensions | 65" H x 44" W x 61" L (1651mm x 1118mm x 1549mm) |
| Weight | 1550 lbs. (703 kg) |
| Seal material | Fluorocarbon (EPR optional) |
| Condensate tank | 8.3 gal (31.4 ltrs) |
| Dispersal elements | 4 |
| Minimum operating capacity | 11 gal (41.6 ltrs) |
| Vacuum (max) | 25 In/Hg |
| Viscosity (max) | 500 sus (108 cSt)-Disposable 2150 sus (460 cSt)-Packed Tower |
| Outlet pressure (max) | 60 psi (4.1 bar) |
| Ports | 1½" JIC (male) inlet 1" JIC (male) outlet |
| FLA (full load amps) | 30-48 amps (Depending on options & voltages) |
| Shipping Weight | 2300 lbs. (1043 kg) maximum |
| Shipping Dimensions | 70" H x 48" W x 65" L (1778mm x 1651mm x 1524mm) |



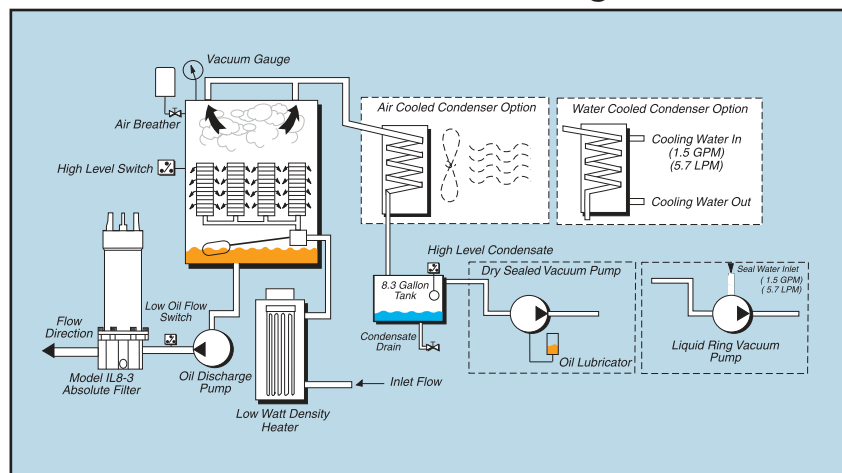
Note: Dimensions and weights are approximate and for reference only.

UL and CUL Marked

Replacement Elements

| Standard Coreless Particulate (IL8-3) | |
|---------------------------------------|---------|
| 02QE (2 micron) | 933734Q |
| 05QE (5 micron) | 933612Q |
| 10QE (10 micron) | 933735Q |
| 20QE (20 micron) | 933736Q |
| Dispersal | |
| Disposable (Coalescing) | 933180 |
| Packed tower (Cleanable) | 933553 |

PVS 1200 Flow Diagram



PVS 1800 Series

Specifications

| | |
|----------------------------|---|
| Flow rate | 30 gpm (113.6 lpm) |
| Dimensions | 68" H x 42" W x 75" L (1727mm x 1067mm x 1905mm) |
| Weight | 2550 lbs. (1157 kg) |
| Seal material | Fluorocarbon (EPR optional) |
| Condensate tank | 8.3 gal (31.4 ltrs) |
| Dispersal elements | 8 |
| Minimum operating capacity | 18 gal (68.1 ltrs) |
| Vacuum (max) | 25 In/Hg |
| Viscosity (max) | 500 sus (108 cSt)-Disposable 2150 sus (460 cSt)-Packed Tower |
| Outlet pressure (max) | 60 psi (4.1 bar) |
| Ports | 2" JIC (male) inlet 1.5" JIC (male) outlet |
| FLA (full load amps) | 40-65 amps @ 460 V/60hz |
| Shipping Weight | 3000 lbs. (1361 kg) maximum |
| Shipping Dimensions | 70" H x 48" W x 80" L (1778mm x 1219mm x 2032mm) |

Note: Dimensions and weights are approximate and for reference only.

Replacement Elements

| Standard Coreless Particulate (IL8-3) | |
|---------------------------------------|---------|
| 02QE (2 micron) | 933734Q |
| 05QE (5 micron) | 933612Q |
| 10QE (10 micron) | 933735Q |
| 20QE (20 micron) | 933736Q |
| Dispersal | |
| Disposable (Coalescing) | 933180 |
| Packed tower (Cleanable) | 933553 |



UL and CUL Marked

PVS 2700 Series

Specifications

| | |
|----------------------------|---|
| Flow rate | 45 gpm (170.3 lpm) |
| Dimensions | 65" H x 42" W x 75" L (1727mm x 1067mm x 1905mm) |
| Weight | 2550 lbs. (1157 kg) |
| Seal material | Fluorocarbon (EPR optional) |
| Condensate tank | 8.3 gal (31.4 ltrs) |
| Dispersal elements | 8 |
| Minimum operating capacity | 18 gal (68.1 ltrs) |
| Vacuum (max) | 25 In/Hg |
| Viscosity (max) | 500 sus (108 cSt)-Disposable 2150 sus (460 cSt)-Packed Tower |
| Outlet pressure (max) | 60 psi (4.1 bar) |
| Ports | 3" JIC (male) inlet 2" JIC (male) outlet |
| FLA (full load amps) | 50-70 amps @ 460 V/60hz |
| Shipping Weight | 3000 lbs. (1361 kg) maximum |
| Shipping Dimensions | 70" H x 48" W x 80" L (1778mm x 1219mm x 2032mm) |

Replacement Elements

| Standard Coreless Particulate (IL8-3) | |
|---------------------------------------|---------|
| 02QE (2 micron) | 933734Q |
| 05QE (5 micron) | 933612Q |
| 10QE (10 micron) | 933735Q |
| 20QE (20 micron) | 933736Q |
| Dispersal | |
| Disposable (Coalescing) | 933180 |
| Packed tower (Cleanable) | 933553 |

Note: Dimensions and weights are approximate and for reference only.



UL and CUL Marked

PVS Series

Specification Worksheet

1. Application: _____
2. Fluid Type: _____ Brand: _____
Grade: _____ Specific Gravity: _____
3. Viscosity: Min _____ SUS/cSt @ _____ °F/°C
 Max _____ SUS/cSt @ _____ °F/°C
 Normal _____ SUS/cSt @ _____ °F/°C
4. Contamination level: Current ISO level _____/_____/_____
 Desired ISO level _____/_____/_____
5. Water concentration: Current PPM level _____
 Desired PPM level _____
6. Suction head: Positive/Negative _____ Ft./meters _____
7. Operating distance: _____ Ft./meters _____
8. System fluid operating temperature: _____ °F/°C Is there a cooler? _____
9. Operating environment air temperature: (air cooled model)
 Min _____ °F/°C
 Max _____ °F/°C
 Normal _____ °F/°C
10. Water supply temperature: (liquid ring model)
 Min _____ °F/°C
 Max _____ °F/°C
 Normal _____ °F/°C
11. Operating environment above/below sea level: _____ Ft./meters
12. Voltage options: • 230VAC, 3P, 60Hz (185, 600)
 • 380VAC, 3P, 50Hz (185, 600, 1200, 1800, 2700)
 • 460VAC, 3P, 60Hz (185, 600, 1200, 1800, 2700)
 • 575VAC, 3P, 60Hz (185, 600, 1200, 1800, 2700)
13. Available amperage: _____
14. Reservoir volume: _____
15. Special requirements: _____

16. Any previous filtration problems with the application: _____
17. PVS model selected: _____

NOTE: Specification sheet must be completed before order can be entered.

PVS Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | STD | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 | BOX 9 |
|-------|-----|-------|-------|-------|-------|-------|-------|-------|---------------|
| | PVS | 600 | 460 | DS | D | 10QE | 12 | AC | ACD DFL CR |

| BOX 1: Seals | |
|--------------|--------------|
| Symbol | Description |
| None | Fluorocarbon |
| E8 | EPR |

| BOX 2: Base Unit Flow rate | |
|----------------------------|--------------------|
| Symbol | Description |
| 185 | 5 GPM (18.9 lpm) |
| 600 | 10 GPM (37.9 lpm) |
| 1200 | 20 GPM (75.7 lpm) |
| 1800 | 30 GPM (113.6 lpm) |
| 2700 | 45 GPM (170.3 lpm) |

| BOX 3: POWER SUPPLY * | | |
|-----------------------|--------|------------------|
| Model | Symbol | Description |
| 185 | 230 | 230VAC, 3P, 60HZ |
| | 380 | 380VAC, 3P, 50HZ |
| | 460 | 460VAC, 3P, 60HZ |
| | 575 | 575VAC, 3P, 60HZ |
| 600 | 380 | 380VAC, 3P, 50HZ |
| | 460 | 460VAC, 3P, 60HZ |
| | 575 | 575VAC, 3P, 60HZ |
| 1200 | 380 | 380VAC, 3P, 50HZ |
| | 460 | 460VAC, 3P, 60HZ |
| | 575 | 575VAC, 3P, 60HZ |
| 1800 | 380 | 380VAC, 3P, 50HZ |
| | 460 | 460VAC, 3P, 60HZ |
| | 575 | 575VAC, 3P, 60HZ |
| 2700 | 380 | 380VAC, 3P, 50HZ |
| | 460 | 460VAC, 3P, 60HZ |
| | 575 | 575VAC, 3P, 60HZ |

*Consult factory for special voltages.

| BOX 4: Vacuum Pump | |
|--------------------|------------------------|
| Symbol | Description |
| DS | Dry sealed |
| LR ¹ | Stationary liquid ring |
| ALR ² | Portable liquid ring |

| BOX 5: Dispersal Element | |
|--------------------------|--------------------------|
| Symbol | Description |
| D | Coalescing (disposable) |
| P | Packed tower (cleanable) |

| BOX 6: Particulate Element | |
|----------------------------|-------------------------|
| Symbol | Pressure Setting |
| 02QE | Ecoglass III, 2 micron |
| 05QE | Ecoglass III, 5 micron |
| 10QE | Ecoglass III, 10 micron |
| 20QE | Ecoglass III, 20 micron |

Note: Above elements are rated for Beta 200+ (99.5% efficiency)

| BOX 7: Heater | | |
|---------------|--------|---------------|
| Model | Symbol | Description |
| 185 | 12 | 12 KW/3 phase |
| | 24 | 24 KW/3 phase |
| | 36 | 36 KW/3 phase |
| 600 | 12 | 12 KW/3 phase |
| | 24 | 24 KW/3 phase |
| | 36 | 36 KW/3 phase |
| 1200 | 24 | 24 KW/3 phase |
| | 36 | 36 KW/3 phase |
| | 48 | 48 KW/3 phase |
| 1800 | 36 | 36 KW/3 phase |
| | 48 | 48 KW/3 phase |
| 2700 | 48 | 48 KW/3 phase |

| BOX 8: Condenser | |
|------------------|----------------------|
| Symbol | Description |
| AC | Air cooled |
| LC | Liquid cooled |
| BC | Air and water cooled |

| BOX 9: Options* | |
|-----------------|---|
| Symbol | Description |
| 3HP | 3HP High Viscosity Circuit |
| 5DW | 5" Diameter Wheels |
| ACD | Auto Condensate Drain |
| CDC | Condensate Drain Counter |
| CE | CE Marked |
| CF | Carbon Exhaust Filter |
| CR | Cable Reel |
| DFL | Dirty Filter Light |
| DPG | Differential pressure gauge |
| EX1 | Explosion Proof (Class I, Division I, Zone I and II) |
| EX2 | Explosion Proof (Class I, Division II, Zone I and II) |
| NM7 | NEMA 7 Explosion Proof |
| MBV | Motorized Ball Valve |
| IL8 | Upgrade to IL8-3 coreless filter |
| PNW | Pneumatic Wheels |
| RHM | Resetable Hour Meter |
| SFI | Sight Flow Indicator |
| PD | LED Particle Detector |
| PDL | LCD Particle Detector |
| NYM | No Yellow Metals |

Notes:

1. External water source.
2. Onboard water source.

* Consult factory for other options.

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.





aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



SMR Series

Submicronic Removal
Fluid Purification Systems



ENGINEERING YOUR SUCCESS.

SMR Series

Applications

The SMR Series is the smart purification solution for fluid flow in the 2-10 GPM (8 - 38 LPM) range. The SMR contains patented Balanced Charge Agglomeration (BCA™) technology, which maintains hydraulic and lubricating fluids in optimum condition while preventing/removing the build-up of sludge and varnish. The system is available in a PLC or simplified control version.

Balanced Charge Agglomeration (BCA™) technology does not remove water, however with the removal of thousands of sub-micron particles, the majority of sites where water can readily attach are mitigated. Water is more easily separated and removed, improving demulsibility.

- **Power Generation**

- Steam & Gas Turbine
- hydraulics & lubrication

- **Oil & Gas**

- Compressor/Turbine hydraulics & lubrication

- **Pulp & Paper**

- Lube oil
- Hydraulics

- **Manufacturing**

- Hydraulics
- Lubrication
- EDM
- Injection molders

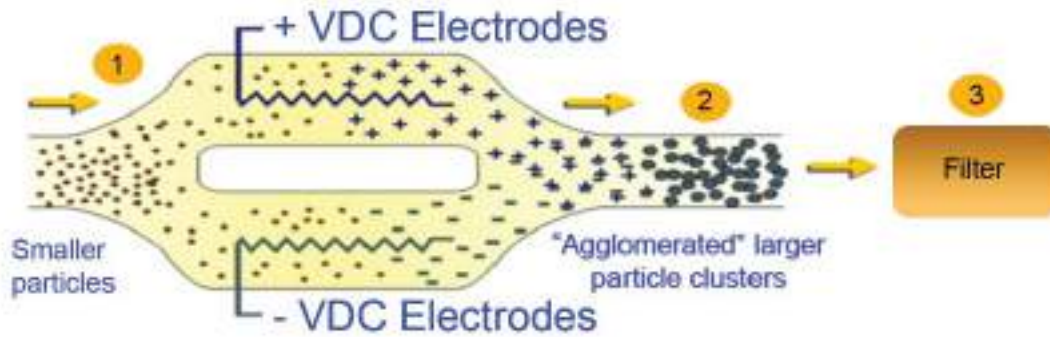
- **Others**

- Cooking oil
- Gear oil
- Fuels
- Bio fuels
- Steel
- Military



SMR Series

Balanced Charge Agglomeration (BCA™) - How the Technology Works



- 1 Particles are passed across high-voltage electrodes, inducing a charge on the particles (+) and (-) in separate paths.
- 2 Oppositely charged particles are mixed and are attracted to each other, forming larger particle clusters.
- 3 Particle clusters are more efficiently filtered.

Evaluation of the SMR Process - Actual Test Results

- Varnish is stripped from the hydraulic or lubrication system as fluid is processed through the SMR.
- The varnish is suspended in the hydraulic fluid as sub-micron particulate.
- BCA™ develops larger particles (see graphic above).
- The particulate is effectively removed from the hydraulic or lubrication fluid by high efficiency filters.



Result 1



Result 2



Result 3



Result 4



Result 5



Result 6



Result 7



Result 8



Result 9



Result 10

Results from a 10 month field trial

SMR Series

Features and Benefits

- Contaminant Removal to the Sub-Micron Level
- Prevention and Removal of Sludge and Varnish
- Removal of Oxidation Byproducts and Biological Contamination
- Removal of Ferrous and Non-Ferrous Contaminants

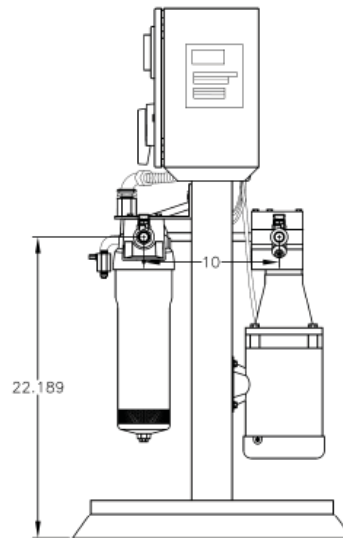
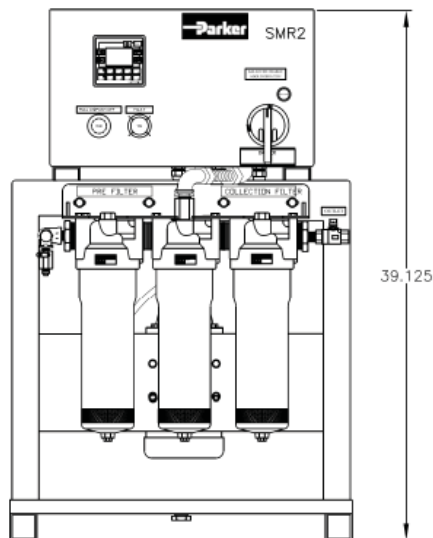
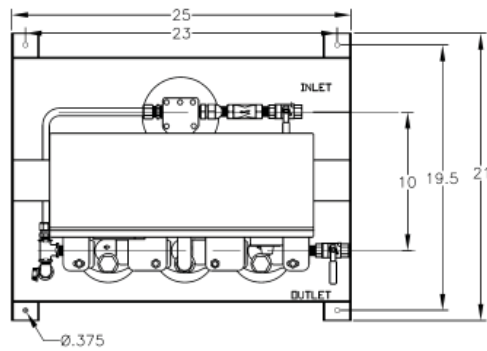
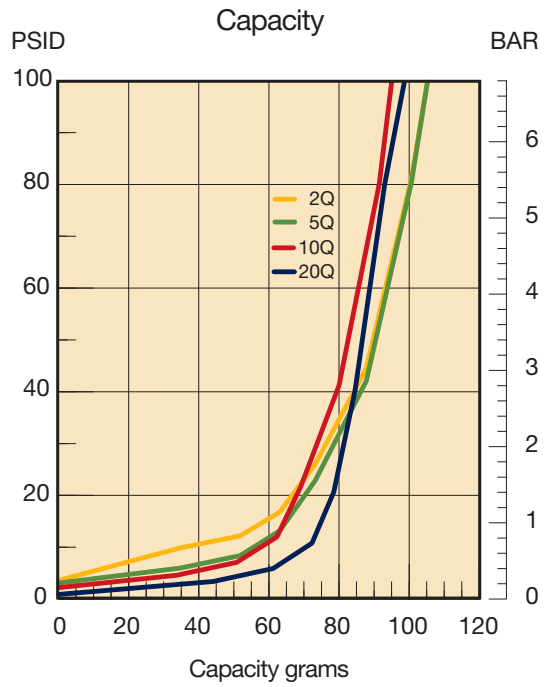
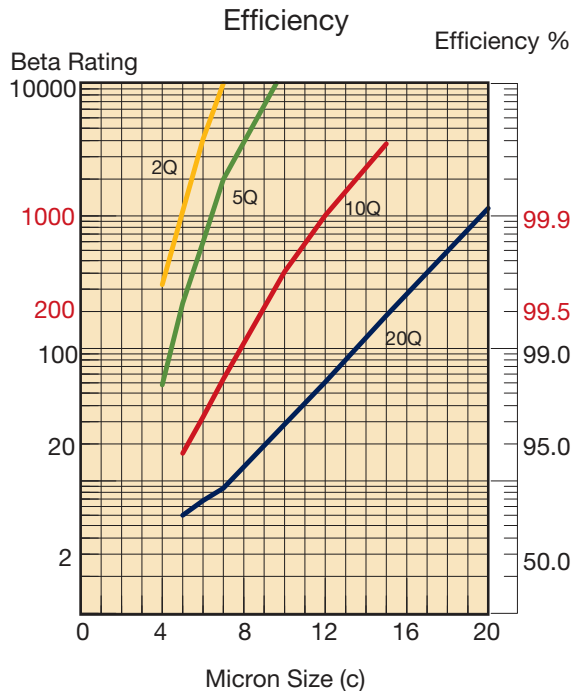
The Parker SMR Benefit

- Unmatched Fluid Purification & System Polishing
- Proven Varnish Removal
- PLC Control & Data Tracking
- OEM Approvals



SMR2

Element Performance



Dimensions are in inches.

Drawings are for reference only. Contact factory for current version.

SMR2

Specifications

Fluid

Viscosity: 1,020 SUS (220 cSt) maximum
Maximum Pressure: 50/80 PSI (operating/static)
Minimum Fluid Temperature: 65° F (18° C)
Maximum Fluid Temperature: 200° F (93° C)
Minimum Fluid Flash Point: >140° F (60° C)

Power

Customer Provided
Voltage: 110VAC/1Ph/60Hz, 230VAC/3Ph/60Hz, 460VAC/3Ph/60Hz
Phase: 1/3
Frequency 60Hz

Motor

Power: 0.5 HP
Voltage/Ph/Freq: 0-230/460/3/variable
RPM: 0 to 2000

Pump

Positive Displacement - Variable Frequency Drive (VFD)
Design Flow Rate: 0.5 - 2.5 GPM

| Parameter Settings | | | |
|---|--------------------------|-------------------|--------------------|
| Parameter | Default | Minimum | Maximum |
| Flow | 2 GPM [7.58 LPM] | 0.5 GPM [1.9 LPM] | 2.5 GPM [9.45 LPM] |
| Shutdown Pressure | 70 psi [4.82 bar] | 0 psi/bar | 75 psi [5.17 bar] |
| Max Operating Pressure | 50 psi [3.4 bar] | 0 psi/bar | 60 psi [4.13 bar] |
| Min Operating Pressure | 0 psi [0.0 bar] | 0 psi/bar | 5 psi [0.34 bar] |
| Maximum Temperature | 200° F [93.3°C] | 35° F [1.6°C] | 200° F [93.3°C] |
| Minimum Temperature | 35° F [1.5°C] | 35° F [1.6°C] | 200° F [93.3°C] |
| Upstream Filter Delta-P | 15 psi [1.0 bar] | 5 psi [0.34 bar] | 25 psi [1.7 bar] |
| Downstream Filter Delta-P | 10 psi [0.67 bar] | 5 psi [0.34 bar] | 25 psi [1.7 bar] |
| Auto-Restart after power loss | OFF | n/a | n/a |
| Auto-Restart after temperature shutdown | OFF | n/a | n/a |
| US or Metric units | US | | |

SMR2

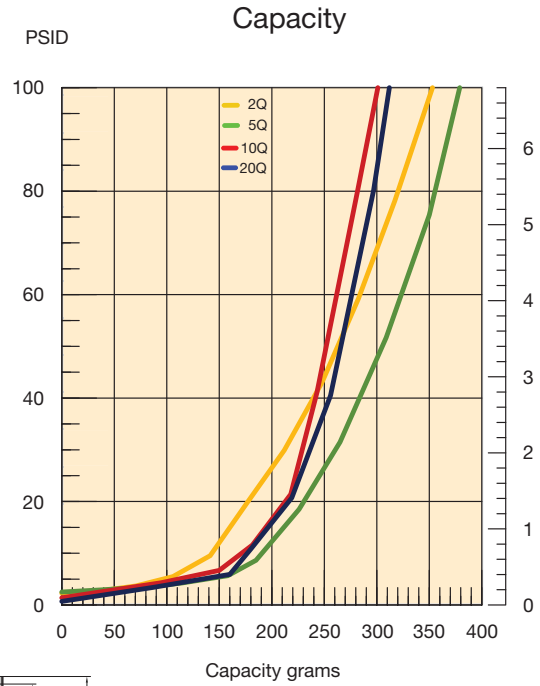
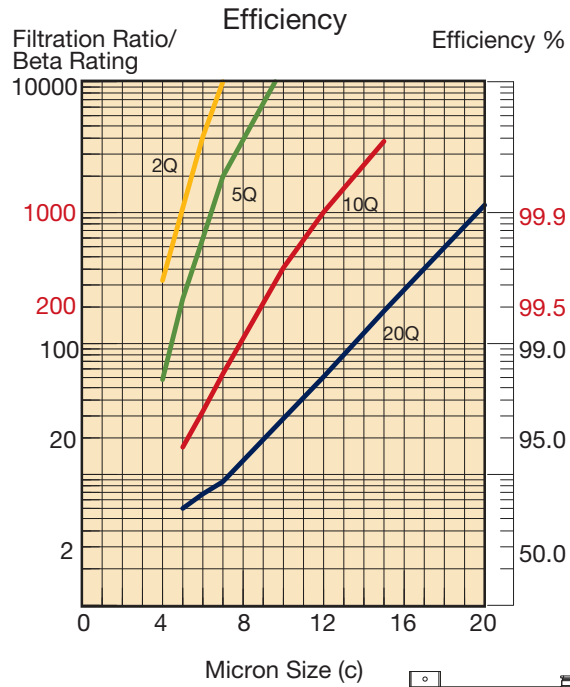
Parts List

| Quantity | Parker Part # | Description |
|----------|---------------|--------------------------------------|
| 1 | 165-00002 | Drive, AC, A/B .5 HP 240V 1 PH |
| | 165-00001 | Drive, AC, A/B .5 HP 480V 3 PH |
| | 165-00011 | Drive, Line Filter, 120V & 240V 1 PH |
| | 165-00014 | Drive, Line Filter, 460V 3 PH |
| 1 | 270-00006 | PLC/HMI |
| 1 | 275-00007 | Power Supply, H.V. |
| 1 | 275-00002 | Power Supply, A/B 24V 110-240V |
| 1 | 275-00006 | Power Supply, C/H 24V 380-480V |
| 1 | 290-00001 | Relay, H.V., A/B |
| 1 | 245-00006 | Light Module, A/B, Green |
| 1 | 245-00005 | Light Module, A/B, Yellow |
| 1 | 250-00005 | Motor, .5 HP, 230-380 STD |
| 1 | 280-00014 | Pump/Bypass, 2 GPM, STD |
| 1 | V72239 | O-Ring, vessel 1, 2 or 3 |
| 1 | 936623Q | 5 Micron Filter, Upstream |
| 1 | 936622Q | 2 Micron Filter, Downstream |
| 1 | 195-00001 | Feedthru, H.V. |
| 4 | 350-00001 | Transducer, pressure |

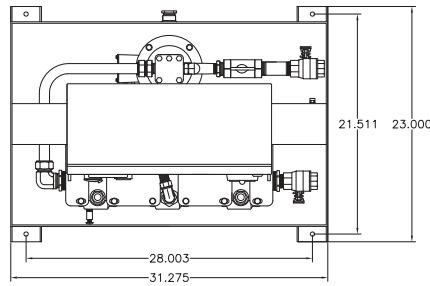


SMR10

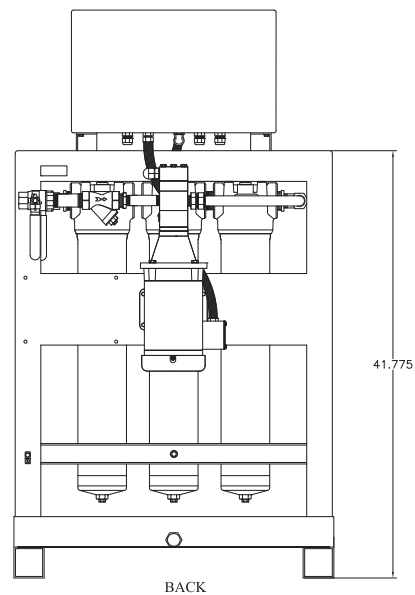
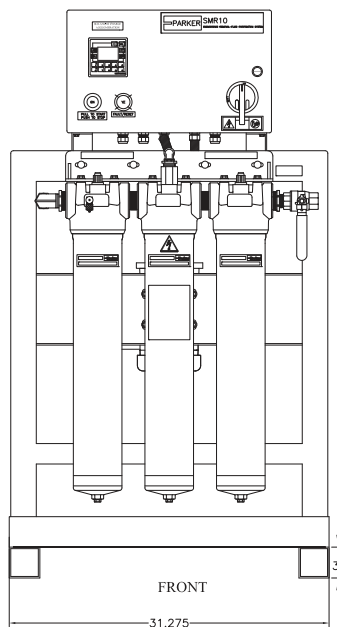
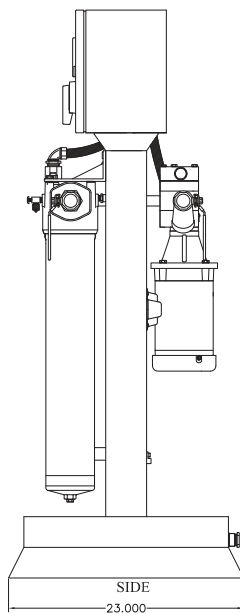
Element Performance



Dimensions are in inches.



Drawings are for reference only.
Contact factory for current version.



SMR10

Specifications

Fluid

Viscosity: 1,020 SUS (220 cSt) maximum
Maximum Pressure: 50/80 PSI (operating/static)
Minimum Fluid Temperature: 65° F (18° C)
Maximum Fluid Temperature: 200° F (93° C)
Minimum Fluid Flash Point: >140° F (60° C)

Power

Customer Provided
Voltage: 110VAC/1Ph/60Hz, 230VAC/3Ph/60Hz,
460VAC/3Ph/60Hz
Phase: 1/3
Frequency 60Hz

Motor

Power: 0.5 HP
Voltage/Ph/Freq: 0-230/460/3/variable
RPM: 0 to 2000

Pump

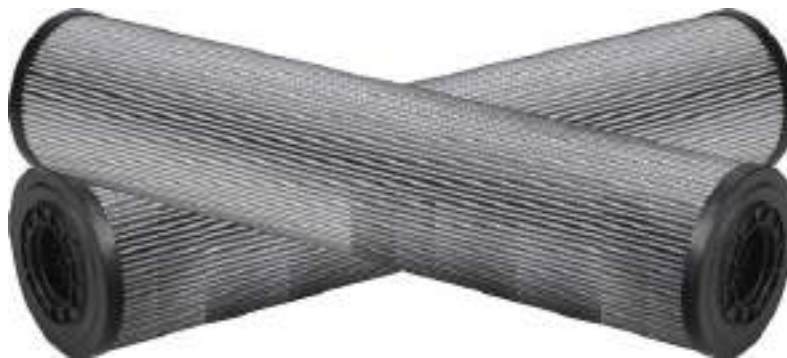
Positive Displacement - Variable Frequency Drive (VFD)
Design Flow Rate: 2.5 - 10 GPM

| Parameter Settings | | | |
|---|--------------------------|--------------------|--------------------|
| Parameter | Default | Minimum | Maximum |
| Flow | 10 GPM [37.9 LPM] | 2.5 GPM [9.45 LPM] | 10 GPM [37.85 LPM] |
| Shutdown Pressure | 70 psi [4.82 bar] | 0 psi/bar | 75 psi [5.17 bar] |
| Max Operating Pressure | 50 psi [3.4 bar] | 0 psi/bar | 60 psi [4.13 bar] |
| Min Operating Pressure | 0 psi [0.0 bar] | 0 psi/bar | 5 psi [0.34 bar] |
| Maximum Temperature | 200°F [93.3°C] | 35°F [1.6°C] | 200°F [93.3°C] |
| Minimum Temperature | 35°F [1.5°C] | 35°F [1.6°C] | 200°F [93.3°C] |
| Upstream Filter Delta-P | 15 psi [1.0 bar] | 5 psi [0.34 bar] | 25 psi [1.7 bar] |
| Downstream Filter Delta-P | 10 psi [0.67 bar] | 5 psi [0.34 bar] | 25 psi [1.7 bar] |
| Auto-Restart after power loss | OFF | n/a | n/a |
| Auto-Restart after temperature shutdown | OFF | n/a | n/a |
| US or Metric units | US | | |

SMR10

Parts List

| Quantity | Parker Part # | Description |
|----------|---------------|--------------------------------------|
| 1 | 165-00004 | Drive, AC, A/B 1 HP 240V 1 PH |
| | 165-00003 | Drive, AC, A/B 1 HP 480V 3 PH |
| | 165-00008 | Drive, AC, A/B 1 HP 120V 1 PH |
| | 165-00011 | Drive, Line Filter, 120V & 240V 1 PH |
| | 165-00014 | Drive, Line Filter, 460V 3 PH |
| 1 | 270-00006 | PLC/HMI |
| 1 | 275-00007 | Power Supply, H.V. |
| 1 | 275-00002 | Power Supply, A/B 24V 110-240V |
| 1 | 275-00006 | Power Supply, C/H 24V 380-480V |
| 1 | 290-00001 | Relay, H.V., A/B |
| 1 | 245-00006 | Light Module, A/B, Green |
| 1 | 245-00005 | Light Module, A/B, Yellow |
| 1 | 250-00022 | Motor, 1 HP, 230-380 STD |
| 1 | 280-00009 | Pump/Bypass, 10 GPM, STD |
| 1 | V72244 | O-Ring, vessel 1, 2 or 3 |
| 1 | 933219Q | 5 Micron Filter, Upstream |
| 1 | 933218Q | 2 Micron Filter, Downstream |
| 1 | 195-00001 | Feedthru, H.V. |
| 4 | 350-00001 | Transducer, pressure |



SMR Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 | BOX 9 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| SMR | 2 | 460 | 20QE | V | M2 | X | N08 | MS |

| BOX 1: Basic Assembly | |
|-----------------------|-------------------------------|
| Symbol | Description |
| SMR | Submicronic Filtration System |

| BOX 2: Flow Rate | |
|------------------|-----------------|
| Symbol | Description |
| 2 | 2 GPM (7.6 LPM) |
| 10 | 10 GPM (38 LPM) |

| BOX 3: Power | |
|--------------|-------------------|
| Symbol | Description |
| 120 | 120VAC, 1Ph, 60Hz |
| 230 | 230VAC, 3Ph, 60Hz |
| 380 | 380VAC, 3Ph, 50Hz |
| 460 | 460VAC, 3Ph, 60Hz |
| 575 | 575VAC, 3Ph, 60Hz |

| BOX 4: Element Media ¹ | |
|-----------------------------------|---------------------------|
| Symbol | Description |
| SMR2 | |
| 02QE | Ecoglass III, 2 micron |
| 05QE | Ecoglass III, 5 micron |
| 10QE | Ecoglass III, 10 micron |
| 20QE | Ecoglass III, 20 micron |
| SMR10 | |
| 02Q | Microglass III, 2 micron |
| 05Q | Microglass III, 5 micron |
| 10Q | Microglass III, 10 micron |
| 20Q | Microglass III, 20 micron |

| BOX 5: Seals | |
|--------------|--------------------------|
| Symbol | Description |
| V | Fluorocarbon (FKM) |
| E | Ethylene Propylene (EPR) |

| BOX 6: Indicator | |
|------------------|-------------------------|
| Symbol | Description |
| P | No Indicator |
| M2 | Analog Visual Indicator |

| BOX 7: Bypass | |
|---------------|-------------|
| Symbol | Description |
| X | No Bypass |

| BOX 8: Ports | |
|--------------|-----------------------|
| Symbol | Description |
| SMR2 | |
| N08 | ½" NPT threaded ports |
| SMR10 | |
| N16 | 1" NPT threaded ports |

| BOX 9: Options | |
|------------------|--|
| Symbol | Description |
| SS | Stainless steel wetted parts |
| EXP | Explosion proof (Class 1, Div. 2, Gp. C & D) |
| MS | Moisture Sensor |
| PD ² | Particle Detector |
| PDM ² | Particle Detector with Moisture Sensor |

Note:

1. Outlet polishing filter is always fitted with 02QE/02Q element.

2. icountPD not available when EXP option is selected.

Replacement Elements

Note: "CF" = Consult Factory

| SMR2 | | | SMR10 | | |
|--------------------|--------------|--------------------|----------------------|--------------|--------------------|
| Ecoglass III Media | Fluorocarbon | Ethylene Propylene | Microglass III Media | Fluorocarbon | Ethylene Propylene |
| 02QE | 936622Q | 940848Q | 02Q | 933218Q | CF |
| 05QE | 936623Q | 940847Q | 05Q | 933219Q | CF |
| 10QE | 936720Q | 940846Q | 10Q | 933220Q | CF |
| 20QE | 936721Q | 940845Q | 20Q | 933221Q | CF |



aerospace
 climate control
 electromechanical
filtration
 fluid & gas handling
 hydraulics
 pneumatics
 process control
 sealing & shielding



Stationary Offline System

SOS for Indoor/Outdoor Fluid Filtration Needs



ENGINEERING YOUR SUCCESS.

Stationary Offline System

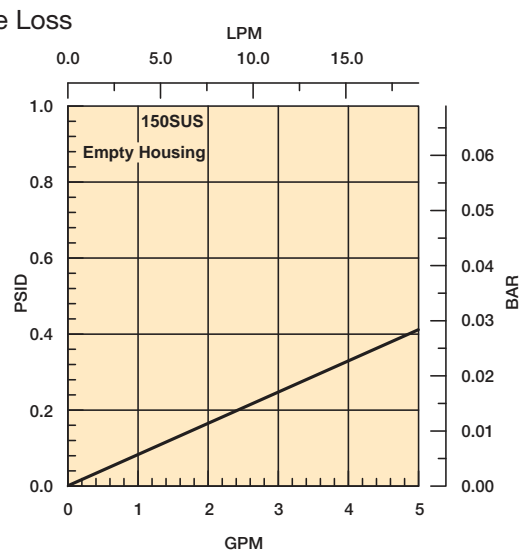
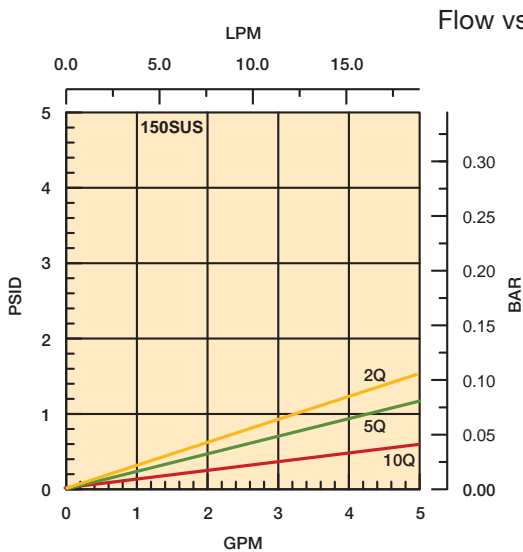
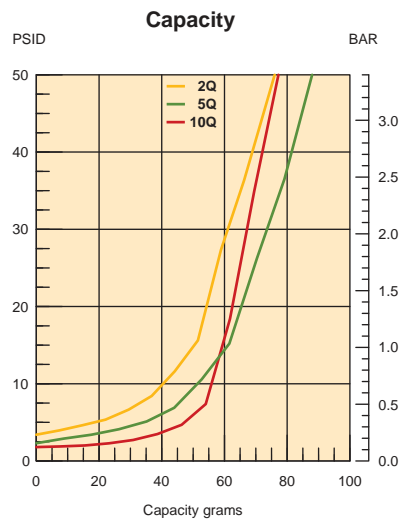
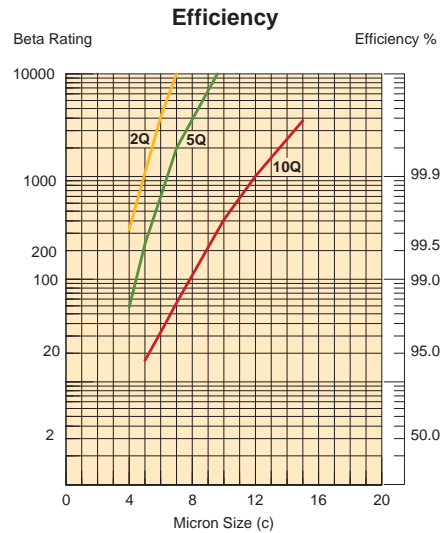
Performance Data



Parker's new patented Moduflow™ Plus element was designed with built-in diverter cone and bypass valve, to meet your application needs.

Applications

- Oil & Gas
- Plastic Injection Molding
- Die Casting
- Steel
- General Industrial
- Power Generation
 - Load Tap Changer
 - Wind Turbines
 - Transformer
- Mining
- Off-highway Equipment
- Food Processing
- Refining
- Paper Mills
- Aircraft Ground Support



Stationary Offline System

Specifications

Flow rate: 5 gpm

Filtration: High efficiency Microglass III
($B_x = 200+$).

Enclosure: Weatherproof NEMA 4 IP 65 with sealed safety glass window.

Electrical service required: 115V, 10A, single phase, 60 Hz

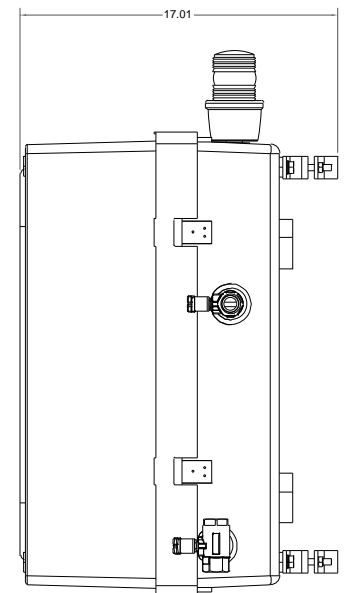
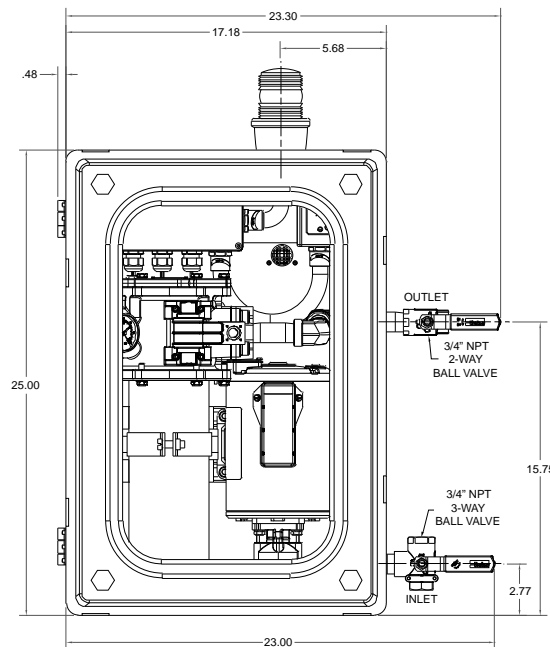
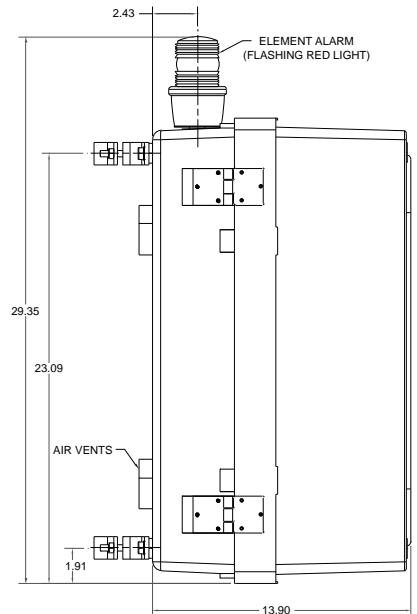
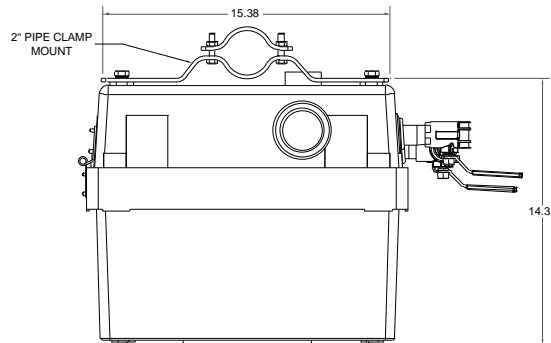
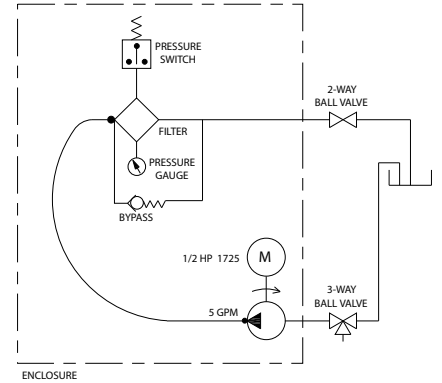
Electrical motor: 1/2 HP @ 1725 rpm w/ thermal overload protection.

Filter bypass alarm: Red strobe light indicates at 20 psid filter element pressure drop. Auto shut-down at 40 psid.

Seals: Nitrile

Weight: Approximately 80 lbs.

Compatible with most petroleum based fluids, including dielectric oils. Rated for continuous duty.



The Moduflow™ Plus filter is known for its performance and durability. It has been engineered to provide the highest level of performance for today's demanding filtration requirements.

Drawings are for reference only.
Contact factory for current version.

Dimensions are in inches.

Stationary Offline System

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | BOX 7 | BOX 8 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| SOS | 5 | 02Q | B | E | I | N12 | 1 |

| BOX 1: Filter Series | |
|----------------------|---------------------------|
| Symbol | Description |
| SOS | Stationary Offline System |

| BOX 2: Model | |
|--------------|-----------------|
| Symbol | Description |
| 5 | 5 gpm flow rate |

| BOX 3: Media Code | |
|-------------------|---------------------------|
| Symbol | Description |
| 02Q | Microglass III, 2 micron |
| 05Q | Microglass III, 5 micron |
| 10Q | Microglass III, 10 micron |
| WR | Water removal |

| BOX 4: Seals | |
|--------------|---------------|
| Symbol | Description |
| B | Nitrile (NBR) |

| BOX 5: Indicator | |
|------------------|--|
| Symbol | Description |
| E | Electrical with visual gauge (includes external lighted beacon) |

| BOX 6: Bypass | |
|---------------|-------------|
| Symbol | Description |
| I | 35 PSID |

| BOX 7: Ports | |
|--------------|-------------------------|
| Symbol | Description |
| N12 | ¾" NPT integral threads |

| BOX 8: Options | |
|----------------|---|
| Symbol | Description |
| 1 | With Bypass Heater (consult factory) |

Please note the **bolded options** reflect standard options with a reduced lead-time. Consult factory on all other lead-time options.

Replacement Elements

| Media | Nitrile Seals Part Number | Fluorocarbon Seals Part Number |
|-------|------------------------------|-----------------------------------|
| 02Q | 937393Q | 937401Q |
| 05Q | 937394Q | 937402Q |
| 10Q | 937395Q | 937403Q |
| WR | 940733 | — |



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Par-TestTM

Fluid Analysis



ENGINEERING YOUR SUCCESS.

Fluid Analysis

Par-Test™

Fluid analysis has proven to be a critical tool for any preventive maintenance program. Fluid analysis is able to identify potential problems that cannot be detected by human senses.

A comprehensive fluid analysis program can help prevent major hydraulic or lube oil system failures.

Par-Test is a complete laboratory analysis, performed on a small volume of fluid. The report you receive is a neatly organized three page format. One may quickly analyze the test results of an individual sample and/or look at a trend analysis for up to five different samples. Two types of services are offered through Par-Test, a water base fluid analysis kit or a petroleum base fluid analysis kit. For both types of services the Par-Test kit includes a pre-cleaned glass bottle, mailing container with pre-addressed label, sample information data sheet (to be completely filled out by end user) and the following analysis:

Petroleum Base Kit
 Particle Count
 Photomicrograph
 Free Water Analysis
 Spectrometric Analysis
 Viscosity Analysis
 Water Analysis (PPM)
 Neutralization Analysis

Water Base Kit
 Particle Count
 Photomicrograph
 Spectrometric Analysis
 Viscosity Analysis
 Neutralization Analysis

Fluid sampling for Par-Test involves important steps to insure you are getting a representative sample. Often, erroneous sample procedures will disguise the true nature of the system fluid. A

complete sampling procedure is detailed on the back of this brochure. There also is a National Fluid Power Association standard (NFPA T2.9.1-1972) and an American National Standards Institute Standard (ANSI B93.13-1972) for extracting samples from a fluid power system.



| How to Order Description | Part Number |
|---|-------------|
| Petroleum base fluid kit (single test bottle) | 927292 |
| Petroleum base fluid kit (Carton of 10 test bottles) | 927293 |
| Water base fluid kit (single test bottle) | 932995 |

Fluid Analysis

Par-Test™

FLUID ANALYSIS REPORT

| | | |
|---|----------------|---|
| SAMPLE CODE: 93844 Parker Hannifan 16810 Fulton Rd. Co #2 Metamora, OH, 43540 ATTN: Kevin Noe | DATE: 09/01/04 | PARTEST Fluid Analysis Service Parker Hannifan Corporation 1016 E. Airport Rd. Stillwater, OK 74075 Tele: (405)624-0400 Fax: (405)624-0401 |
|---|----------------|---|

| | |
|--|---|
| COMPANY NAME: ABC Corporation SYSTEM TYPE: Hydraulic EQUIPMENT TYPE: Press MACHINE ID: Machine #1 FILTER ID: Parker 10 micron | SAMPLE DATE: 7/12/2004 HOURS: (on oil) 948 (on unit) 2000 SYSTEM VOLUME: 200 Gallons FLUID TYPE: AW 46 ANALYSIS PERFORMED: N2,S,T,V4,W |
|--|---|

| AUTOMATIC PARTICLE COUNT ISO 11171 | | |
|------------------------------------|----------------|----------|
| Size | Counts per ml. | ISO Code |
| >4 µm(c) | 35000.0 | 22/21/19 |
| >6 µm(c) | 15498.0 | |
| >10 µm(c) | 6000.0 | |
| >14 µm(c) | 2600.0 | |
| >21 µm(c) | 1468.0 | |
| >38 µm(c) | 754.0 | |
| >50 µm(c) | 58.0 | |
| >70 µm(c) | 3.0 | |

| | |
|--|--|
| FREE WATER PRESENT <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | |
|--|--|

| PHOTO ANALYSIS | | |
|---|----------|----------------------|
| Mag.: 160x | Vol 20ml | Scale: 1 div = 20 µm |
| | | |
| ALARMS/REMARKS *The red line in the ISO chart graph indicates recommended cleanliness level. | | |

For our Par-Test™ customers, the analysis report is available online for your ease and convenience. Historical data is also available. Visit www.partestlab.com

Sample Data

Information supplied by the user regarding the fluid to be analyzed. Complete and accurate information is crucial for a useful analysis.

Particle Count

Results are reported over 6 different particle size ranges and expressed as an ISO code (modified). The counts are per milliliter of fluid and the reporting is cumulative; ie. The particle count in the >2 micron row includes the number of particles greater than 5, 10, 15, 25 and 50 microns as well as particles between 2-5 microns in size. Particle resuspension method is utilized for water based fluid samples.

Free Water Analysis

Determines if the water present is beyond the saturation point of the fluid. At the saturation point, the fluid can no longer dissolve or hold any more water. Its appearance becomes cloudy or "milky". Many hydraulic oils saturate between 500 and 1000 PPM of water.

Photo Analysis

A photomicrograph of a small volume of fluid (20 ml) magnified 100X. This analysis gives a quick glance at the contamination present in the fluid. Each line of the graduated scale represents 20 microns in size.


The full color photomicrograph helps identify particles which would otherwise be grouped by class.

ISO Chart

Graphically illustrates the particle count on a graph. The recommended cleanliness code level, if given on the submittal form, is shown by a broken line on the ISO chart.

Fluid Analysis

Par-Test™

| FLUID ANALYSIS REPORT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|-------------------------------------|---|----------------------|---------------------------|---------------------|--------------------|------|-------|---|--------|-------|---|----------|-------|---|------|-------|---|-----------|-----|---|-----|-------|---|---------|-------|---|------|-------|---|-----------|-------|---|---------|-------|---|------------|------|---|--------|-----|---|-------|-------|---|--------|-------|---|------------|-------|---|--------|-------|---|--------|-------|---|----------|-------|---|-----------|-------|---|----------|-------|---|
| <p>SAMPLE CODE: 93844 DATE: 09/01/04</p> <p>Parker Hannifan 16810 Fulton Rd. Co #2 Metamora, OH, 43540 ATTN: Kevin Noe</p> |  | <p>PARTEST Fluid Analysis Service Parker Hannifin Corporation 1016 E. Airport Rd. Stillwater, OK 74075 Tele: (405)624-0400 Fax: (405)624-0401</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center; background-color: #e0e0e0;">SPECTROMETRIC ANALYSIS</th> </tr> <tr> <th style="text-align: center;">WEAR METALS AND ADDITIVES</th> <th style="text-align: center;">PPM BY WEIGHT</th> <th style="text-align: center;">STATUS*</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">IRON</td><td style="text-align: center;">120.0</td><td style="text-align: center;">H</td></tr> <tr><td style="text-align: center;">COPPER</td><td style="text-align: center;">510.0</td><td style="text-align: center;">H</td></tr> <tr><td style="text-align: center;">CHROMIUM</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">LEAD</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">ALUMINIUM</td><td style="text-align: center;">1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">TIN</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">SILICON</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">ZINC</td><td style="text-align: center;">423.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">MAGNESIUM</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">CALCIUM</td><td style="text-align: center;">540.0</td><td style="text-align: center;">H</td></tr> <tr><td style="text-align: center;">PHOSPHORUS</td><td style="text-align: center;">10.0</td><td style="text-align: center;">L</td></tr> <tr><td style="text-align: center;">BARIUM</td><td style="text-align: center;">1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">BORON</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">SODIUM</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">MOLYBDENUM</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">SILVER</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">NICKEL</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">TITANIUM</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">MANGANESE</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">ANTIMONY</td><td style="text-align: center;">< 1.0</td><td style="text-align: center;">N</td></tr> </tbody> </table> <p style="text-align: center; font-weight: bold;">L = LOW N = NORMAL H= HIGH</p> | | | SPECTROMETRIC ANALYSIS | | | WEAR METALS AND ADDITIVES | PPM BY WEIGHT | STATUS* | IRON | 120.0 | H | COPPER | 510.0 | H | CHROMIUM | < 1.0 | N | LEAD | < 1.0 | N | ALUMINIUM | 1.0 | N | TIN | < 1.0 | N | SILICON | < 1.0 | N | ZINC | 423.0 | N | MAGNESIUM | < 1.0 | N | CALCIUM | 540.0 | H | PHOSPHORUS | 10.0 | L | BARIUM | 1.0 | N | BORON | < 1.0 | N | SODIUM | < 1.0 | N | MOLYBDENUM | < 1.0 | N | SILVER | < 1.0 | N | NICKEL | < 1.0 | N | TITANIUM | < 1.0 | N | MANGANESE | < 1.0 | N | ANTIMONY | < 1.0 | N |
| SPECTROMETRIC ANALYSIS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WEAR METALS AND ADDITIVES | PPM BY WEIGHT | STATUS* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IRON | 120.0 | H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COPPER | 510.0 | H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CHROMIUM | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LEAD | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALUMINIUM | 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TIN | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SILICON | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ZINC | 423.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAGNESIUM | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CALCIUM | 540.0 | H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PHOSPHORUS | 10.0 | L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BARIUM | 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BORON | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SODIUM | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MOLYBDENUM | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SILVER | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NICKEL | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TITANIUM | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MANGANESE | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ANTIMONY | < 1.0 | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>The Spectrometric Analysis reports the ppm level of 20 different wear metals and additives in the sample. Generally the first 7 and last 5 elements are considered wear elements not normally present in hydraulic oil. Zinc through molybdenum (shaded) represent some common additives in oil. If a baseline oil sample (new oil out of a drum) is provide, then comments on the analyzed sample can be provided on whether the status of the elements are low, normal, or high.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center; background-color: #e0e0e0;">Viscosity Analysis - ASTM D445</th> </tr> </thead> <tbody> <tr> <td style="width: 50%;">CST@100C:</td> <td style="width: 50%;">SSU@210F:</td> </tr> <tr> <td>CST@40C: 46.25</td> <td>SSU@100F: 215.0</td> </tr> </tbody> </table> <p style="font-size: x-small;">Viscosity at 40C (100F) is reported in Centistokes (cSt) and SUS (Saybolt Universal Seconds). The test is conducted in accordance with ASTM D445 procedures for determining the kinematic viscosity of fluids</p> | | | Viscosity Analysis - ASTM D445 | | CST@100C: | SSU@210F: | CST@40C: 46.25 | SSU@100F: 215.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Viscosity Analysis - ASTM D445 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CST@100C: | SSU@210F: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CST@40C: 46.25 | SSU@100F: 215.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center; background-color: #e0e0e0;">Neutralization Analysis - ASTM D794</th> </tr> </thead> <tbody> <tr> <td style="width: 80%;">TAN:</td> <td style="width: 20%; text-align: right;">0.44</td> </tr> </tbody> </table> <p style="font-size: x-small;">The Total Acid Number (TAN) test measures the acidity of a hydraulic fluid. The higher the number, the more acidic the fluid. Over time this may mean the fluid is becoming oxidized.</p> | | | Neutralization Analysis - ASTM D794 | | TAN: | 0.44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Neutralization Analysis - ASTM D794 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TAN: | 0.44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center; background-color: #e0e0e0;">Water Analysis - ASTM D6304</th> </tr> </thead> <tbody> <tr> <td style="width: 80%;">WATER CONTENT (PPM):</td> <td style="width: 20%; text-align: right;">410.0</td> </tr> </tbody> </table> <p style="font-size: x-small;">The water analysis test shows the actual parts per million of water in a sample. This is known as the Karl Fischer titration test and is conducted in accordance with ASTM D6304.</p> | | | Water Analysis - ASTM D6304 | | WATER CONTENT (PPM): | 410.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Water Analysis - ASTM D6304 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WATER CONTENT (PPM): | 410.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Comments</th> </tr> </thead> <tbody> <tr> <td style="font-size: x-small;">*Please check spectrometric status for abnormal conditions.</td> </tr> </tbody> </table> | | | Comments | *Please check spectrometric status for abnormal conditions. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comments | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Please check spectrometric status for abnormal conditions. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Viscosity Analysis

Viscosity is a very important property of a fluid in terms of system performance. Viscosity expresses the internal friction between molecules in the fluid. Typically a breakdown in viscosity will be seen as an increase. Both SSU at 100° F and cSt at 40° C are reported.

Neutralization Analysis

Referred to as the Total Acid Number (TAN) this titration test measures the acid level of the sample fluid. The production of acidic material causes oxidation degradation or aging of most fluids. This activity is promoted by elevated temperatures, presence of entrained metal particles, and intimate contact with air. It is the rate of increase of the TAN during any given time period that is significant, not just the absolute value.

Water Analysis

Karl Fischer test gives accurate measure of water concentration in the sample fluid. The results are reported in parts per million (PPM) and allow for detection of water levels well below the saturation point.

Remarks

Quick statements or alerts about any unusual results from one of the tests reported on this page.

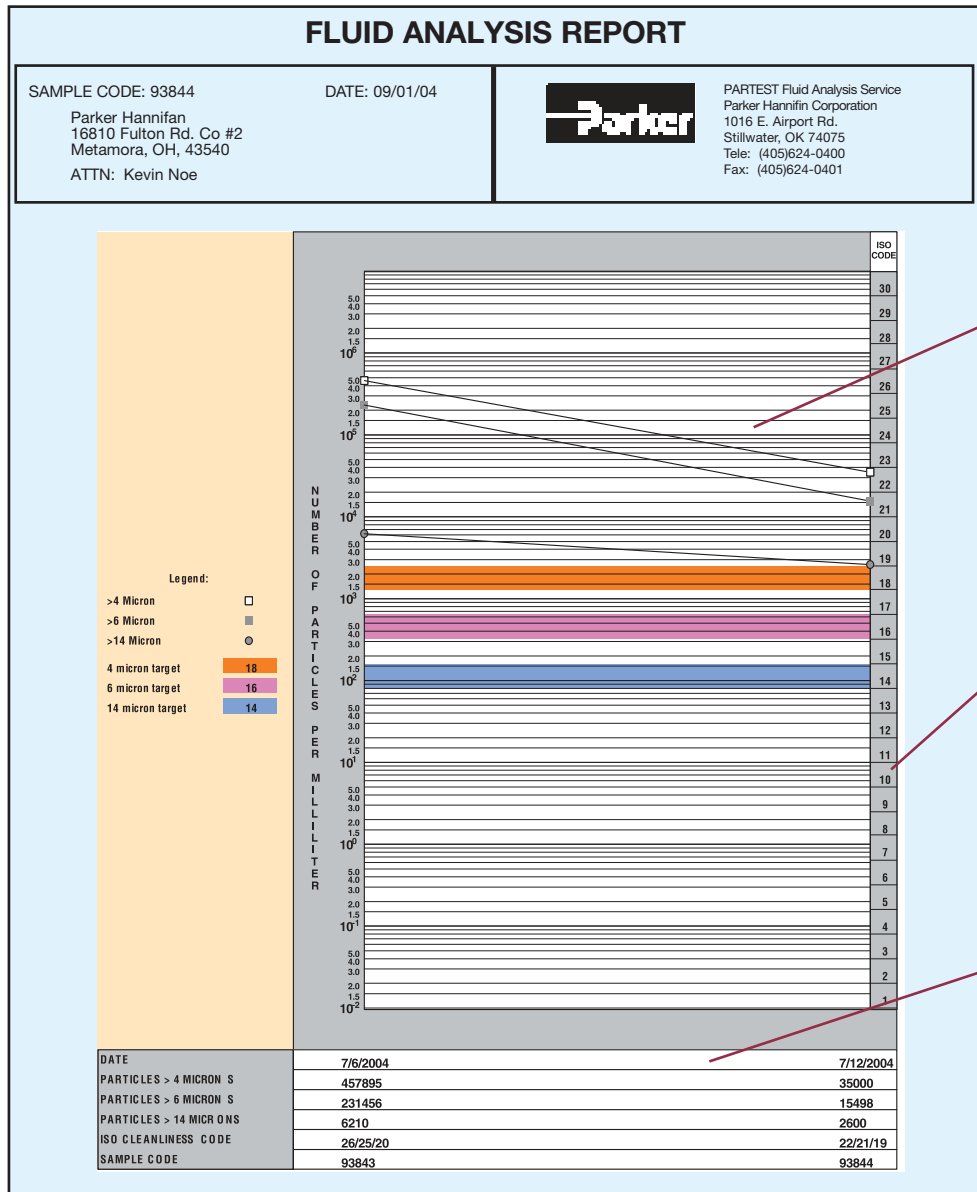
Spectrometric Analysis

Results obtained by Rotating Disk Electrode (ROE) Spectrometer and reported in terms of parts per million (PPM). Twenty different wear metals and additives are analyzed to help determine the condition of the fluid. The spectrometric test is limited to identifying particles below 5-7 micron in size. Base line (new) fluid samples should be sent in for each different fluid to be analyzed. This will be used to determine the status.

| WEAR METALS AND ADDITIVES | |
|---|---|
| <p>Iron: Ferrous wear particle typically from pumps, gears, cylinders, or rust</p> <p>Copper: Brass (copper/zinc) and bronze (copper/tin) in bearings and bushings</p> <p>Chromium: (white non ferrous metal) Chrome from cylinder rods, bearings, valve spools</p> <p>Lead: Babbitt or copper lead bearings</p> <p>Aluminum: White nonferrous metal from pump bodies, bushings, bearings, and grinding compounds</p> <p>Tin: Babbitt bearings, plating</p> <p>Silicon: Sand/dirt contamination or antifoaming additive in oil</p> <p>Zinc: Plating or anti-wear additive in oil</p> <p>Magnesium: Detergent, dispersive additive in oil, bearings, water</p> | <p>Calcium: Dispersant additive or acid neutralizer</p> <p>Phosphorous: Anti-wear or fire resistant additive in fluid</p> <p>Barium: Corrosion, rust inhibitor additive in oil</p> <p>Boron: Detergent, dispersive additive in oil</p> <p>Sodium: Detergent or coolant additive</p> <p>Molybdenum: Alloy metal or anti friction additive</p> <p>Silver: White non ferrous metal</p> <p>Nickel: Alloy metal</p> <p>Titanium: White non ferrous metal</p> <p>Manganese: White non ferrous metal</p> <p>Antimony: Babbit bearings, greases</p> |

Fluid Analysis

Par-Test™



For our Par-Test™ customers, the analysis report is available online for your ease and convenience. Historical data is also available. Visit www.partestlab.com

Trend Analysis

Graphical history for up to 5 samples plotted for 2, 5 and 15 micron and greater size particles. This analysis is a valuable tool for tracking the progress of a system over a given time period.

ISO Range Code

Index Number that is associated with a range of particles. Below is a list of the range numbers and the corresponding particle quantities.

Sample Code

Assigned to the test kit form for a ready reference. This code can be used to track the sample from start to finish.

| NUMBER OF PARTICLES PER ML | | | | | |
|----------------------------|-----------|---------------------|------------|-----------|---------------------|
| Range Code | More than | Up to and including | Range Code | More than | Up to and including |
| 30 | 5,000,000 | 10,000,000 | 18 | 1,300 | 2,500 |
| 29 | 2,500,000 | 5,000,000 | 17 | 640 | 1,300 |
| 28 | 1,300,000 | 2,500,000 | 16 | 320 | 640 |
| 27 | 640,000 | 1,300,000 | 15 | 160 | 320 |
| 26 | 320,000 | 640,000 | 14 | 80 | 160 |
| 25 | 160,000 | 320,000 | 13 | 40 | 80 |
| 24 | 80,000 | 160,000 | 12 | 20 | 40 |
| 23 | 40,000 | 80,000 | 11 | 10 | 20 |
| 22 | 20,000 | 40,000 | 10 | 5 | 10 |
| 21 | 10,000 | 20,000 | 9 | 2.5 | 5 |
| 20 | 5,000 | 10,000 | 8 | 1.3 | 2.5 |
| 19 | 2,500 | 5,000 | 7 | .64 | 1.3 |
| | | | 6 | .32 | .64 |

Fluid Analysis

Par-Test™

SAMPLING PROCEDURE

Obtaining a fluid sample for analysis involves important steps to make sure you are getting a representative sample. Often erroneous sampling procedures will disguise the true nature of system cleanliness levels. Use one of the following methods to obtain a representative system sample.

- I. For systems with a sampling valve
 - A. Operate system for at least 1/2 hour.
 - B. With the system operating, open the sample valve allowing 200 ml to 500 ml (7 to 16 ounces) of fluid to flush the sampling port. (The sample valve design should provide turbulent flow through the sampling port.)
 - C. Using a wide mouth, pre-cleaned sampling bottle, remove the bottle cap and place in the stream of flow from the sampling valve. Do NOT "rinse" out the bottle with initial sample.
 - D. Close the sample bottle immediately. Next, close the sampling valve. (Make prior provision to "catch" the fluid while removing the bottle from the stream.)
 - E. Tag the sample bottle with pertinent data; include date, machine number, fluid supplier, fluid number code, fluid type, and time elapsed since last sample (if any).
- II. Systems without a sampling valve

There are two locations to obtain a sample in a system without a sampling valve: in-tank and in the line. The procedure for both follows:

 - A. In the Tank Sampling
 1. Operate the system for at least 1/2 hour.
 2. Use a small hand-held vacuum pump to extract sample. Insert sampling device into the tank to one half of the fluid height. You will probably have to weight the end of the sampling tube. Your objective is to obtain a sample in the middle portion of the tank. Avoid the top or bottom of the tank. Do not let the syringe or tubing come in contact with the side of the tank.
 3. Put extracted fluid into an approved, pre-cleaned sample bottle as described in the previous sampling valve method.
 4. Cap immediately.
 5. Tag with information as described in sampling valve method.
 - B. In-line Sampling
 1. Operate the system for at least 1/2 hour.
 2. Locate a suitable valve in the system where turbulent flow can be obtained (ball valve is preferred). If no such valve exists, locate a fitting which can be easily opened to provide turbulent flow (tee or elbow).
 3. Flush the valve or fitting sample point with a filtered solvent. Open valve or fitting and allow adequate flushing. (Take care to allow for this step. Direct sample back to tank or into a large container. It is not necessary to discard this fluid.)
 4. Place in an approved, pre-cleaned sample bottle under the stream of flow per sampling valve methods.
 5. Cap sample bottle immediately.
 6. Tag with important information per the sampling valve method.
Note: Select a valve or fitting where the pressure is limited to 200 PSIG (14 bar) or less.

ON-SITE FLUID ANALYSIS PRODUCT





aerospace
 climate control
 electromechanical
filtration
 fluid & gas handling
 hydraulics
 pneumatics
 process control
 sealing & shielding



DuraClean™

Premium Hydraulic Fluid



ENGINEERING YOUR SUCCESS.

Parker DuraClean™

Applications

Together we can...

Preserve the environment.
Minimize waste and promote energy efficiency.

Achieve worldwide filtration solutions.
Build global confidence.

Redefine new limits.
Forge ahead with advanced technology.

Keep contamination under control.
Reduce maintenance costs.

Enhance total system reliability.
Focus on customer satisfaction.

Reach optimum potential.
Drill to greater depths.

...engineer your success.

DuraClean™ hydraulic fluid was developed with a totally unique 'Clean Technology.' This fluid innovation keeps harmful deposits from settling on components. These deposits can lead to system damage, component replacement, unanticipated downtime and compromised performance. Parker DuraClean™ makes it possible for hydraulic systems to 'Start Clean and Stay Clean.'

Durable performance allows the formulation to provide excellent protection of components even after the fluid has been used extensively. Varnish protection solutions provide proven performance and viscosity retention in wide temperature range, setting Parker DuraClean™ apart from competitive fluids.

Applications

- Drain-and-change for most industrial and mobile hydraulic systems specifying mineral-based oil
- Top-treat for replenishing hydraulic systems already using VG 32, 46, and 68 hydraulic oils
- Wide operating temperature range requirements
- High performance hydraulic power units and equipment
- Systems with high pressures and temperatures



Parker DuraClean™

Starts Clean. Stays Clean.

DuraClean™ is an ultra premium hydraulic oil provided exclusively by Parker. The fluid has a unique additive chemistry designed to maximize oil life while providing optimum anti-wear protection for the components of today's advanced hydraulic systems.

Performance Features

- ISO 46, all season, multigrade hydraulic fluid
- Replaces ISO 32, 46, and 68 monogrades
- API Group II base oil extends oil life
- High viscosity index for wide operating temperature ranges
- Outstanding oxidation life to maximize component life
- Prevents varnish formation
- Clean, as packaged, to ISO 17/15/12 cleanliness standard
- Special formulation that allows for rapid air release and water separation
- Excellent filterability to minimize filter blockage
- Outstanding acrylate anti-foam agent contains no silicones, which can lead to inaccurate particle counts
- Excellent shear stability for stable viscosity over time
- Superior thermal stability for uncompromised performance at high temperatures
- Parker gold dye for easy identification
- Formulated to help extend the life of hoses and seals

Performance Approvals

- Parker Hannifin HF-0 (Denison HF-0)
- Eaton Vickers brochure 03-401-2010 (M-2950-S and I-286-S)
- Cincinnati Machine P-70
- Meets DIN 51524 Part 3 requirements
- Meets US Steel 127



Parker DuraClean™

DuraClean™ vs. Varnish

| | Without DuraClean™ | With DuraClean™ |
|--------------------|---|--|
| Oil Flow | Leaves critical system components starved for lubrication and leads to part failure | Keeps system protected and extends component life |
| Filters | Develops plugged filters which forces fluids to bypass filters increasing contaminants and excessive wear and necessitates extra filter changes | Protects system from contaminants and plugged filters |
| Valves | Creates loss of system control which has a negative impact on productivity and results in downtime for cleaning and repairs | Maintains system cleanliness and keeps valves free from damaging varnish |
| Friction | Creates higher friction causing increases in fuel and energy consumption, component wear and lower productivity | Improves system efficiency, extends component life and maintains productivity |
| Thermal Stability | Promotes oxidation of fluid and thermal breakdown, creating varnish and increasing wear | Keeps system operating at cooler temperatures allowing the oil and the components to last longer |
| Varnish Protection | Increases the need for frequent cleaning and repairs | Minimizes the need for frequent cleaning and repairs |
| | Varnish | No Varnish |

Parker DuraClean™

DuraClean™ vs. Varnish

**Without
Parker DuraClean™ –
Varnish**

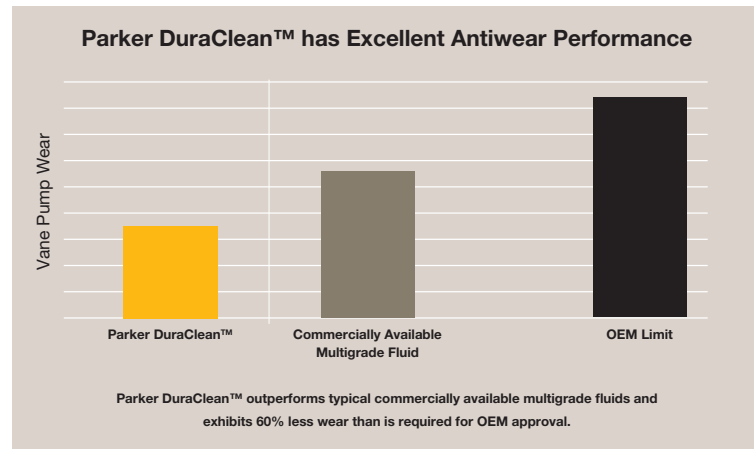
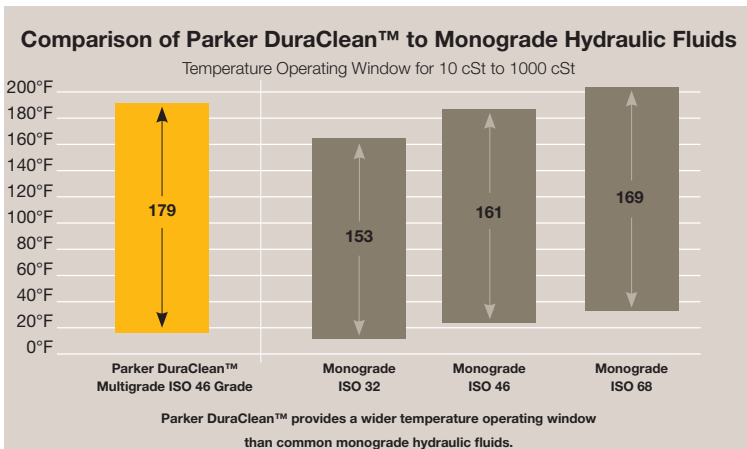


Varnish is attracted to metal surfaces, this results in an overall decrease in productivity.

**With
Parker DuraClean™ –
No Varnish**



Parker DuraClean™ prevents the harmful build-up of varnish, keeping systems clean and operating at peak efficiency.



If a hydraulic system is dirty, simply using Parker DuraClean will not clean it up, but it will effectively prevent the formation of varnish in a clean system and keep the delicate balance of additive performance intact.

Parker DuraClean™

Specifications

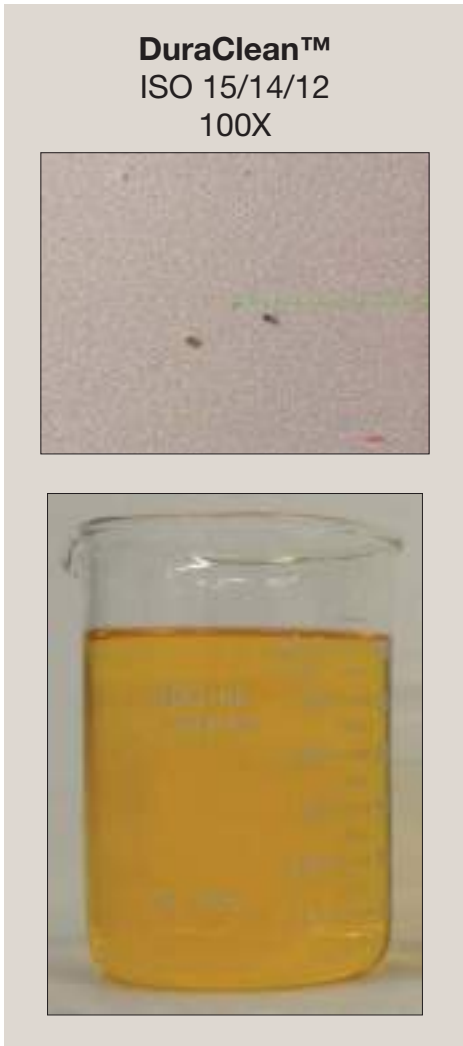
| Typical Properties | Test Method | |
|--------------------------------------|-------------|-------------------------------|
| ISO Grade | | Multigrade 46 |
| Appearance | | Parker Gold |
| Specific Gravity @ 15°C | D4052 | .867 |
| Flash Point (COC) °F(°C) | D92 | 413 (212) |
| Pour Point °F(°C) | D97 | -43 (-42) |
| Viscosity | D445 | |
| cSt @ 40°C | | 44.30 |
| cSt @ 100°C | | 7.65 |
| Viscosity Index | D2270 | 141 |
| Acid Number, mg KOH/g TAN | D664 | 0.6 |
| Oxidation, hrs. | D943 | 5500 - 6000 Typical |
| Rust Test | D665A/D665B | Pass |
| Denison Filterability | | |
| Dry, time in seconds | | 172 (600 maximum limit) |
| Wet, time in seconds | | 202 (344 maximum limit) |
| Thermal Stability, sludge in mg | | 2.5 (25 maximum limit) |
| Shear Stability | KRL | |
| % viscosity loss after 20 test hours | | 4.3 (15 maximum limit) |

Ordering Information

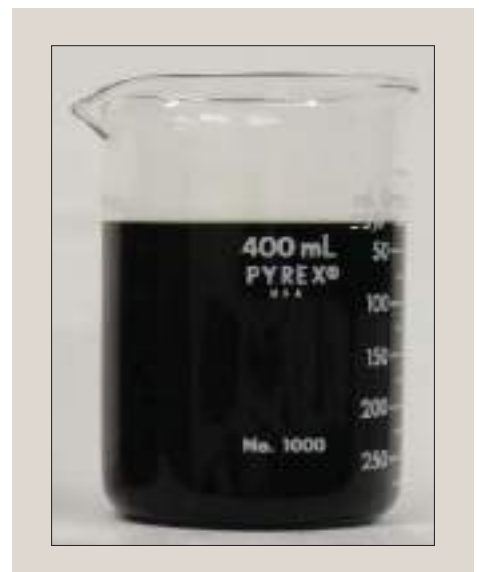
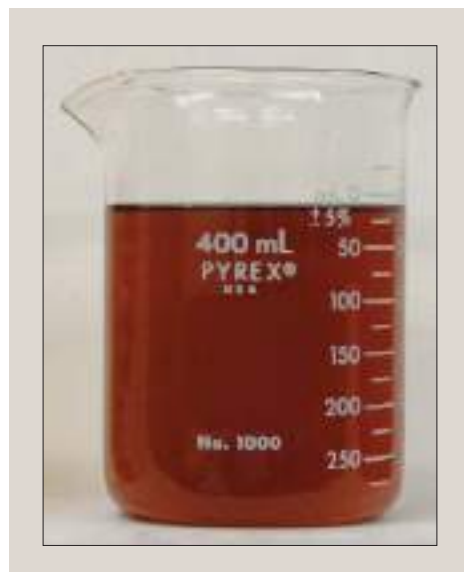
| Package Size | Part Number | Minimum Order Qty. |
|------------------|-------------|--------------------|
| Jug (2 1/2 gal.) | 942180 | 72 |
| Pail (5 gal.) | 941907 | 24 |
| Drum (55 gal.) | 942125 | 4 |
| Tote (275 gal.) | 942126 | 1 |

Other volumes may be available. Please consult factory.

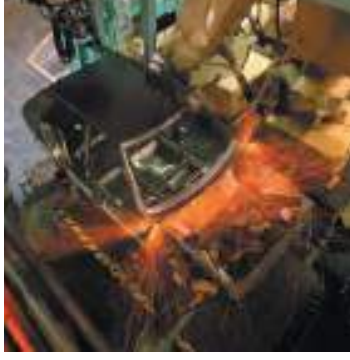
**Visual Representation of New Fluid Cleanliness
vs.
Fluid Oxidation After 1,300 Hours**



Initial samples taken directly from a 5 gallon pail



Same samples after 1,300 hours of exposure @ 200°F



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Reservoir Accessories

Filler Breathers, Strainers, Diffusers,
Fluid Level/Temperature Gauges



ENGINEERING YOUR SUCCESS.

Reservoir Accessories

Non-Metallic Filler Breathers

Anti-Splash Design!



Specifications:

Materials:

Body: Non-corrodible glass filled nylon

Valve: Nylon/Nitrile

Dipstick: ABS, acetal Hi/Lo indicators

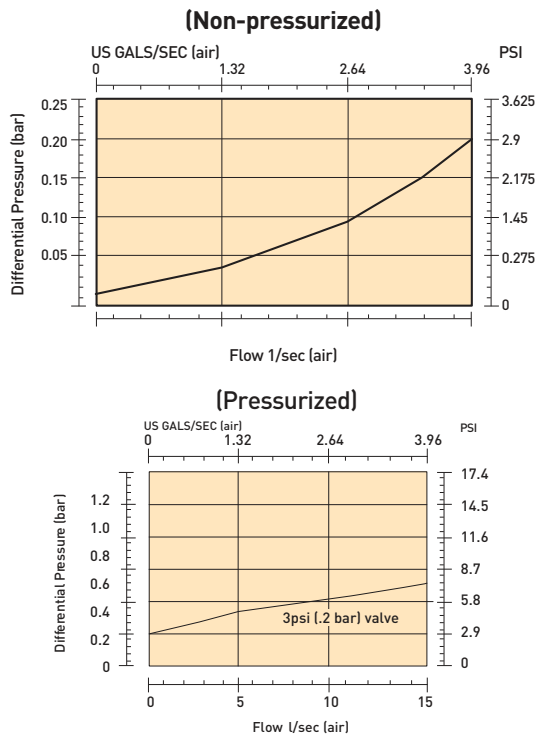
Filtration Element: Expanded polyurethane foam, 10 micron

Operating Temperatures: -22°F (-30°C) to 195°F (90°C)

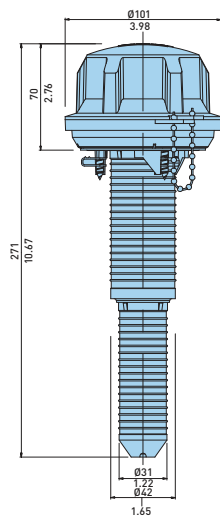
Seals: Nitrile (single-hole), cork gasket (six-hole)

Pressurization Options: 3 psi (0.2 bar)

Dipstick: (optional) 7.9 in. (200 mm) or 15.8 in. (400 mm) lengths with adjustable Hi/Lo indicators

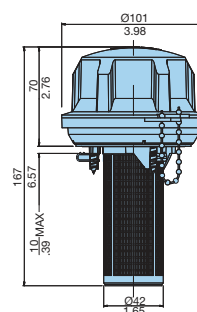


Telescopic Strainer

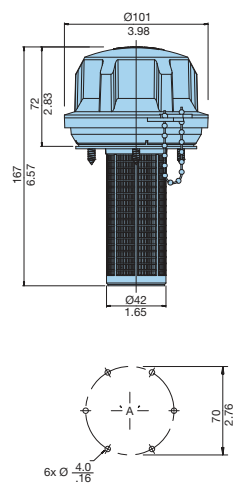


TANK MOUNTING HOLE Ø63
NOTE: REFER TO UCC PRODUCTION INSTRUCTIONS FOR ASSEMBLY DETAILS AND PACKING REQUIREMENTS

Single-Hole Option



Six-Hole Option



Linear Measurement = $\frac{\text{mm}}{\text{in}}$

Non-pressurized

| Single-Hole New Part No. | Single-Hole Obs. Part No. | Six-Hole New Part No. | Six-Hole Obs. Part No. | Micron Rating | Description | Screws* |
|--------------------------|---------------------------|-----------------------|------------------------|---------------|-----------------------------------|------------|
| AB.98210011.UC | FB1.A1A1B2P | AB.98810011.UC | FB1.D1A1B2P | 10 | Filler breather with 3.7" [95 mm] | (6)-#10x.5 |
| AB.98210021.UC | FB1.A1A1C2P | AB.98810021.UC | FB1.D1A1C2P | 10 | strainer | (6)-#10x.5 |

Filler breather with telescopic strainer

Pressurized

| Single-Hole Part No. | Six-Hole New Part No. | Six-Hole Obs. Part No. | Micron Rating | Description | Screws* |
|----------------------|-----------------------|------------------------|---------------|---|------------|
| Not Available | AB.98812021.UC | FB1.D1B1C2P | 10 | 3 psi (.2 bar) with telescopic strainer | (6)-#10x.5 |

Dipsticks

| New Part Number | Obsolete Part Number | Description |
|-----------------|----------------------|----------------------|
| B.68.206 | DIP.FB2 | Pack of (10) x 7.9" |
| B.68.207 | DIP.FB4 | Pack of (10) x 15.8" |

*Mounting screws for six-hole only

Drawings are for reference only.
Contact factory for current version.

Reservoir Accessories

Non-Metallic Breathers

Non-Metallic Breathers Threaded Type

Specifications:

Materials:

Body: Nylon 66

Valve: Nylon/Nitrile

Dipstick: ABS, acetal Hi/Lo indicators

Filtration Element: Expanded polyurethane foam, 10 micron

Operating Temperatures: -22°F (-30°C) to 195°F (90°C)

Seals: Nitrile

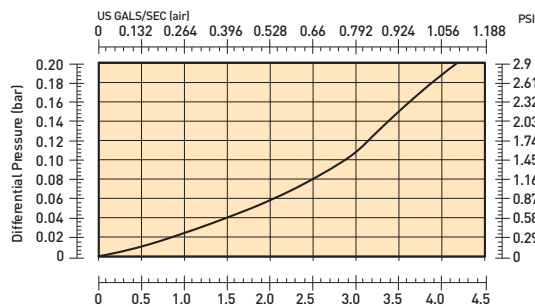
Pressurization Options: 3 psi (0.2 bar)

Dipstick: (optional) 7.9 in. (200 mm) or 15.8 in. (400mm) lengths with adjustable Hi/Lo indicators

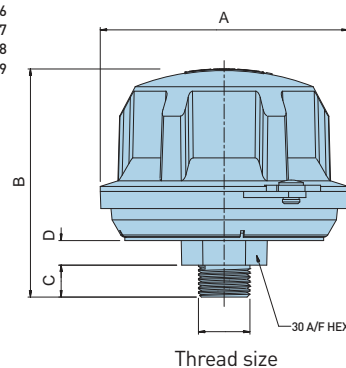
Anti-Splash Design!



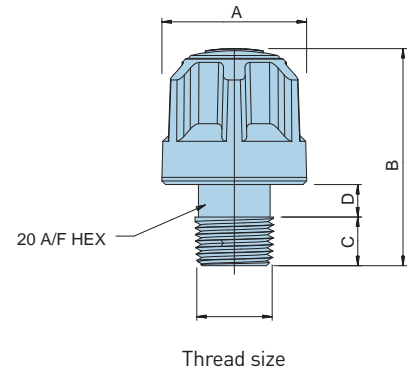
COMPACT THREADED



Standard Threaded



Compact Threaded



Compact Threaded

| New Part Number | Obs. Part Number | Micron Rating | Thread | Pressure | "A" | "B" | "C" | "D" |
|-----------------|------------------|---------------|----------|-----------------|--------------|--------------|----------------|-------------|
| AB.683102.UC* | SB1.A1A2P* | 10 | 1/4" NPT | non-pressurized | 1.6" (40 mm) | 2.2" (57 mm) | .55" (14 mm) | .24" (6 mm) |
| AB.68Y102.AA* | SB1.C1A2P* | 10 | 1/2" NPT | non-pressurized | 1.6" (40 mm) | 2.4" (60 mm) | .53" (13.5 mm) | .35" (9 mm) |
| 942642* | AB.68Z102.UC* | 10 | 3/4" NPT | non-pressurized | 1.6" (40 mm) | 2.4" (60 mm) | .55" (14 mm) | .35" (9 mm) |
| SB1.B1A2A | | 10 | 3/8" NPT | non-pressurized | | | | |

*Pack of (10) pieces.

Standard Threaded

| New Part Number | Obs. Part Number | Micron Rating | Thread | Pressure | "A" | "B" | "C" | "D" |
|-----------------|------------------|---------------|----------|-----------------|---------------|--------------|--------------|--------------|
| AB.98410201.UC | FB1.B1A3A2P | 10 | 3/4" NPT | non-pressurized | 4.0" (101 mm) | 3.8" (95 mm) | .63" (16 mm) | .39" (10 mm) |
| AB.98412201.UC | FB1.B1B3A2P | 10 | 3/4" NPT | 3 psi (.2 bar) | 4.0" (101 mm) | 3.8" (95 mm) | .63" (16 mm) | .39" (10 mm) |

Dipsticks

| New Part Number | Obs. Part Number | Description |
|-----------------|------------------|----------------------|
| B.68.206 | DIP.FB2 | Pack of (10) x 7.9" |
| B.68.207 | DIP.FB4 | Pack of (10) x 15.8" |

Drawings are for reference only.
Contact factory for current version.

Reservoir Accessories

Metal Filler Breathers

Flange Type

Specifications:

Materials:

Cap & Plate: Nickel chrome plated steel

Valve: Nylon/Nitrile

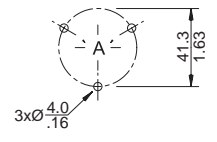
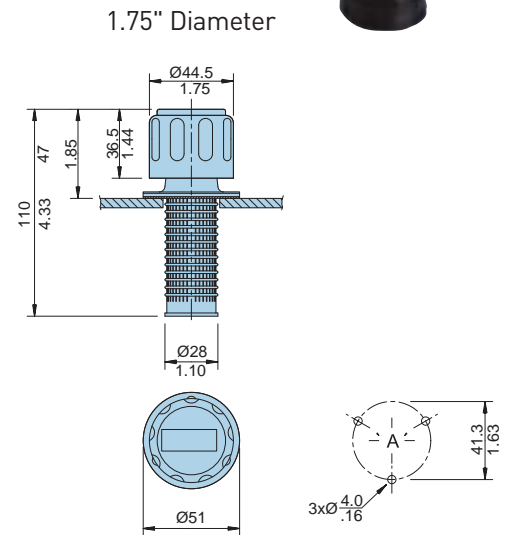
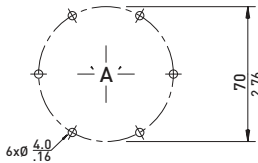
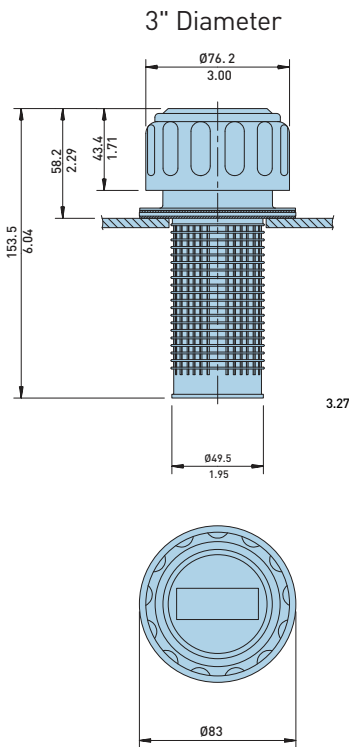
Gasket: Cork

Filtration Element: Expanded polyurethane foam, 10 micron

Operating Temperatures: -22°F (-30°C) to 195°F (90°C)

Seals: Nitrile

Pressurization Options: none, 5 psi (0.35 bar)



Linear Measurement = $\frac{\text{mm}}{\text{in}}$

Drawings are for reference only.
Contact factory for current version.

Flange Type, Non-pressurized

| New Part No. | Obs. Part No. | New Part (Cap As.) | Obs. Part (Cap As.) | Micron Rtg | Air Flow | Description | Screws |
|--------------|---------------|--------------------|---------------------|------------|--------------------------|----------------------------|------------|
| AB.1163.10 | MB1.D1A1B1P | CAP.1163.10 | CP1.D1A1A1P | 10 | 2 gal./sec. (7.5 l/sec.) | 3" (76 mm) dia. | (6)-#10x.5 |
| 5561 | MB1.D1A1B2P | Not Available | Not Available | 10 | 2 gal./sec. (7.5 l/sec.) | 3" (76 mm) dia., w/lck lug | (6)-#10x.5 |
| AB.1380.10 | MB1.A1A1B1P | CAP.1380.40 | CP1.A2A1A1P | 10 | 1.3 gal./sec. (5 l/sec.) | 1.75" (44.5 mm) dia. | (6)-#10x.5 |

Flange Type, Pressurized

| New Part No. | Obs. Part No. | New Part (Cap As.) | Obs. Part (Cap As.) | Micron Rtg. | Air Flow | Description | Screws |
|---------------|---------------|--------------------|---------------------|-------------|--------------------------|----------------------------------|------------|
| PAB.1730.10.5 | MB1.D1C1B1P | CAP.1730.40.5 | CP1.D1C1A1P | 10 | 2 gal./sec. (7.5 l/sec.) | 5 psi (.35 bar), 3" (76 mm) dia. | (6)-#10x.5 |

Reservoir Accessories

Metal Breathers

Threaded Type

Specifications:

Materials:

Cap & Plate: Nickel chrome plated steel

Valve: Nylon/Nitrile

Gasket: Cork

Filtration Element: Expanded polyurethane foam, 10 micron

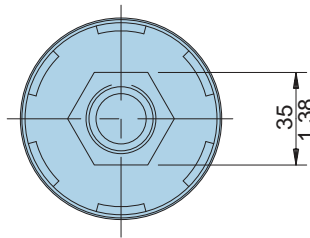
Operating Temperatures: -22°F (-30°C) to 195°F (90°C)

Seals: Nitrile

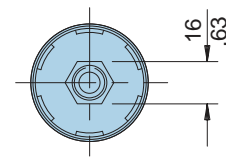
Pressurization Options: none, 5 psi (0.35 bar)



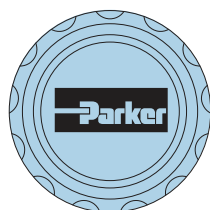
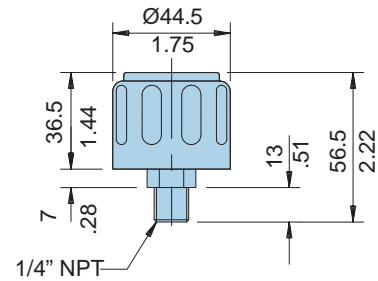
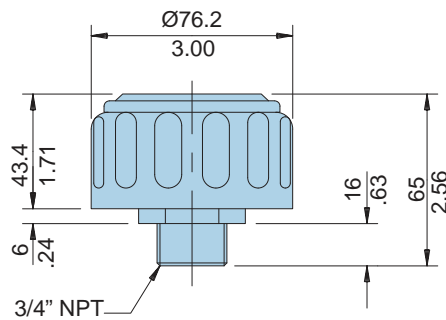
3/4" Threaded



1/4" Threaded



Linear Measurement = $\frac{\text{mm}}{\text{in}}$



Drawings are for reference only.
Contact factory for current version.

Threaded, Non-pressurized

| New Part Number | Obs. Part Number | Micron Rating | Air Flow | Thread | Description |
|-----------------|------------------|---------------|-----------------------------|----------|--------------------------|
| SAB.1562.10.NPT | MB1.B1A3A1P | 10 | 1.3 gallon/sec. (5 l/sec.) | 3/4" NPT | 3" (76 mm) diameter |
| SAB.1563.10.NPT | MB1.C1A3A1P | 10 | .7 gallon/sec. (2.5 l/sec.) | 1/4" NPT | 1.75" (44.5 mm) diameter |

Reservoir Accessories

Breathers

Desiccant Type

Specifications:

Materials:

Casing: Clarified copolymer polypropylene

Cap: Copolymer polypropylene

Stand pipe: PVC

Filtration Element: Polyester, silica gel

Operating Temperatures: -20°F (-29°C) to 250°F (121°C)

Seals: None

Maximum Allowable

Operating Pressure (MAOP): 5 psi (.34 bar)

Particle Removal Efficiency:

98.7% (beta 75) @ 3 micron

99.5% (beta 200) @ 4 micron

99.9% (beta 1000) @ 5.3 micron

Weight:

934330T 1.25 lbs. (.57 kg) each.

934331T 1.75 lbs. (.79 kg) each.

934332T 2.25 lbs. (1.02 kg) each.



Features

Foam Pads

Isolates the removal materials from contact with heavy reservoir mist and securely holds materials in place.

Filter Pads

Specially designed filter pads remove solid particulate on upstream side and then regenerate by releasing those particles when air flow reverses direction. Lower pad removes airborne contamination and second pad protects against any migration of desiccant.

Air Intakes

A total of eight air intakes may be exposed to allow air to freely flow in and out of the TriCeptor.

Silica Gel Desiccant

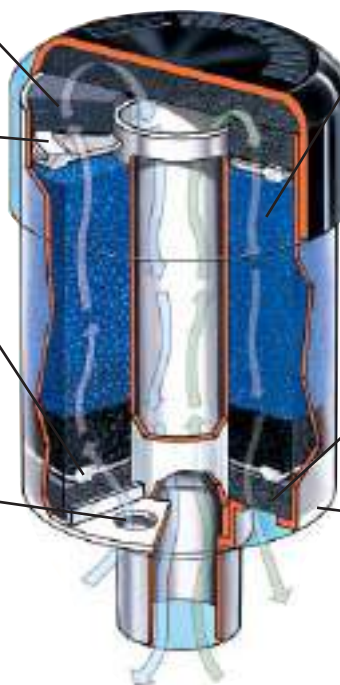
Has the highest removal capability by volume of any adsorption method. Indicates condition by changing color.

Foam pad

Insures filter pad is properly positioned and protects it from external damage.

Molded Housing

Durable shock absorbing casing provides reliable service and simple press in mounting.



Reservoir Accessories

Breathers

Installation

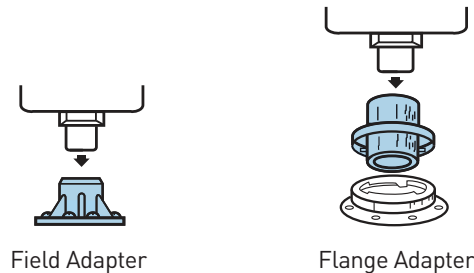
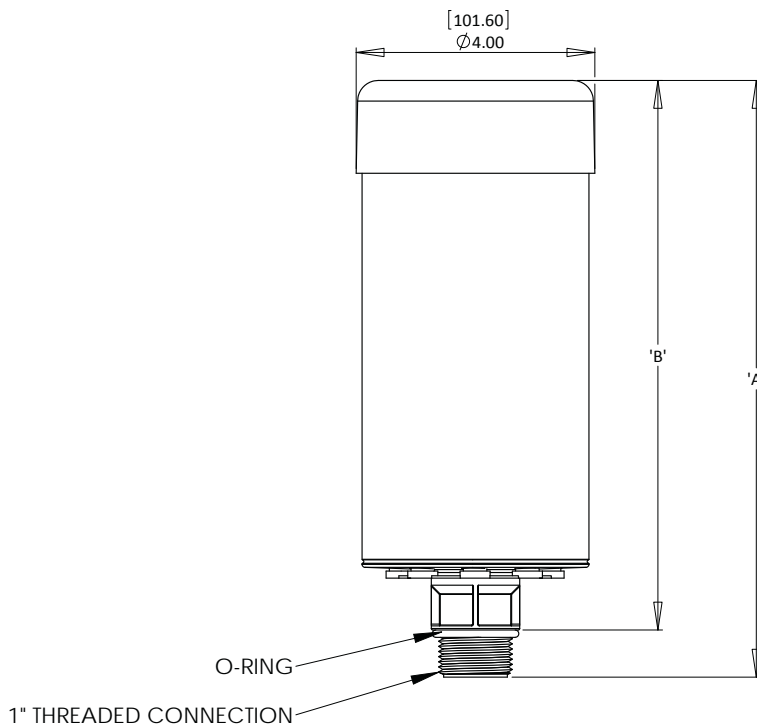
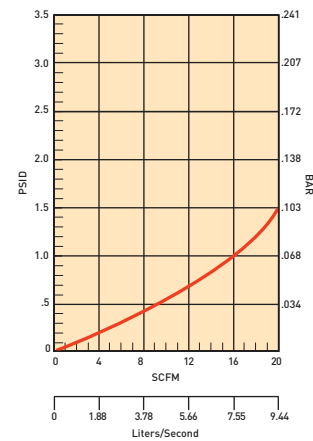
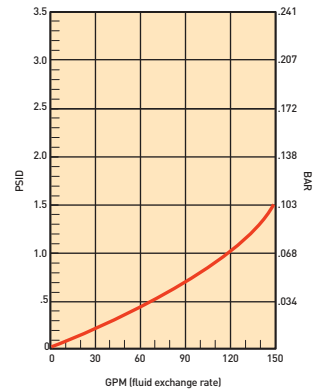
TriCeptor breathers are designed for simple installation on most equipment, regardless of mounting connection. Since TriCeptor breathers are disposable, the threaded connection allows for quick and easy maintenance. Several mounting adapters (shown below) are available to provide the desired mounting. The installation/replacement process consists of four easy steps:

1. Remove from protective plastic wrap.
2. Remove 1" blue cap from standpipe.
3. Remove foil label to expose the necessary amount of air intake holes.
4. Twist TriCeptor into mounting adapter.

Servicing the TriCeptor breather is also very easy. When the silica gel changes color from blue to a pink, the breather is no longer active and needs to be replaced. Simply remove the unit and discard properly.

Air Flow Performance

The curves below show the air flow performance of the three TriCeptor breathers. To insure the longest life possible, the initial clean pressure drop should not exceed 1.5 psid (.103 bar).



$$\text{Linear Measurement} = \frac{\text{mm}}{\text{in}}$$

Drawings are for reference only.
Contact factory for current version.

| Part Number | 'A' (mm/in) | 'B' (mm/in) | Quantity |
|-------------|----------------|---------------|----------|
| 934330T | 155.58/6.125 | 135.256/5.325 | 6 pcs. |
| 934331T | 206.38/8.125 | 186.06/7.325 | 6 pcs. |
| 934332T | 257.18/10.125 | 236.86/9.325 | 6 pcs. |
| 937546 | Field Adapter | 937546 | 1 pc. |
| 937463 | Flange Adapter | 937463 | 1 pc. |

Reservoir Accessories

Mobile Triceptor

New Design in Mobile Triceptor:

Parker's new mobile Triceptor desiccant filter breather incorporates a design that replaces both the spin-on can and the optional check valve adaptor.

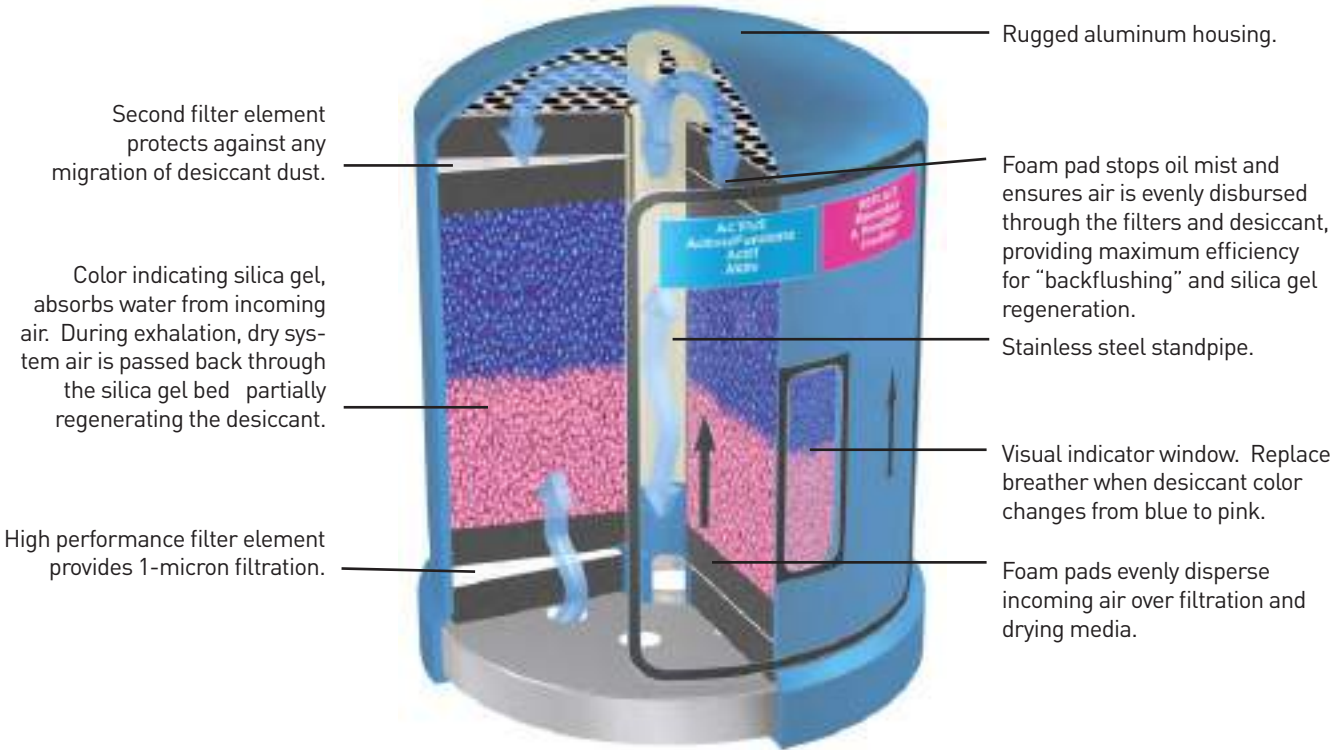
Optimized for mobile applications, the mobile Triceptor is equipped to handle high air flow surges as cylinders unload, while providing reliable protection from ingressed contaminants. Controlling rust-forming water vapor and airborne particulates, the breather protects against sludge deposits and water-contaminated oil resulting in longer oil and filter life while reducing operating costs.



941655



941747



*Patented technology

Reservoir Accessories

Mobile Triceptor

General Data

| | |
|-----------------------------|---|
| Amount of Silica Gel | 0.79 kg |
| | 1 lb. 12 oz. |
| Adsorption Capacity | 318 mL |
| | 1.34 cups |
| Net Weight of Unit | 1.8 kg |
| | 4 lbs. 3 oz. |
| Filtration Area | 31.1 in ² / 79 cm ² |
| Direction of Flow | Bidirectional |
| Operating Temperature Range | -20°F to 300°F / -29°C to 148.89°C |

Unit Material Data

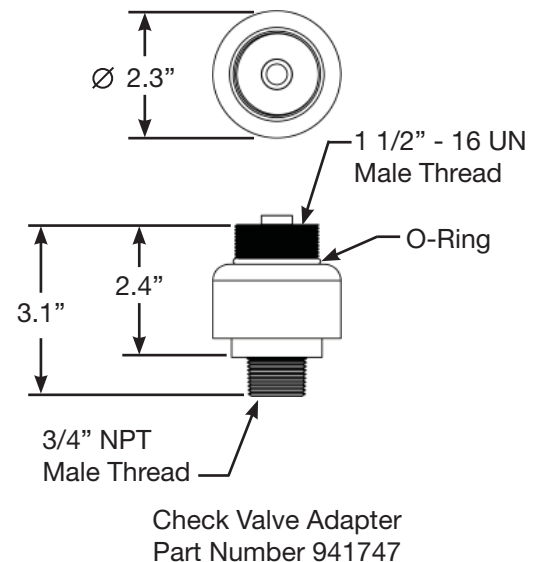
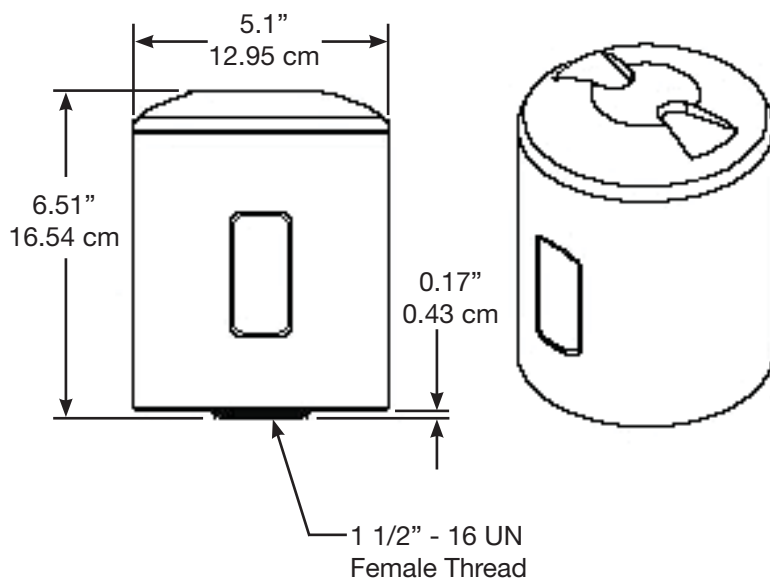
| | |
|-------------------------------|-------------------|
| Material | Nylon and MXD6 |
| Maximum Operating Temperature | 300°F / 148.89°C |
| Melting Point | 320°F / 160°C |
| Check Valve Adapter | Zinc Plated Steel |

Filter Media

| | |
|-----------------------|--|
| Material | EPTFE |
| Porosity | 3.5 - 7.5 Ft./min. @ 0.5 in. - H ₂ O (ASTM D 737) |
| Filtration Efficiency | 99.97% @ 0.3μ (IES-RP-CC021.1) |

Hygroscopic Agent (Silica Gel)

| | |
|---------------------------|-----------------------------|
| Apparent Bulk Density | 700 - 800 kg/m ³ |
| Average Particle Diameter | 0.145" / 3.68 mm |
| Specific Heat | 0.25 BTU/lb. F |
| Nominal Mesh Range | 4 x 8 |
| Average Crush Strength | 35 lbs. / 15.9 kg |



Note: Element removal clearance = 1"

Drawings are for reference only.
Contact factory for current version.

Reservoir Accessories

Breathers - Spin-on Type

Specifications:

Materials: Low carbon steel

Filtration Element: Cellulose

Operating Temperatures:

-40°F (-40°C) to 225°F (107°C)

Seals: Nitrile.

Weight: 12AT - 1.2 lbs(.54 kg) each
50AT - 2.3 lbs. (1.0 kg) each

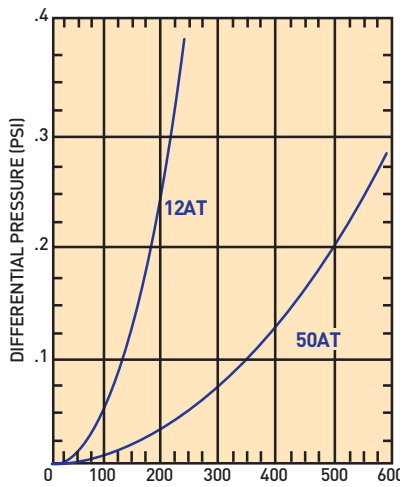
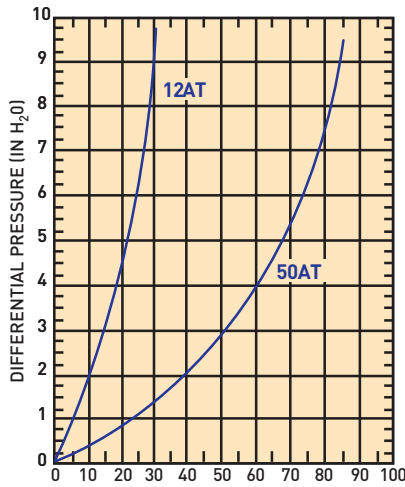
Sizing

Select the proper size cannister for the maximum rate of reservoir draw down or air exchange rate. As a rule of thumb, clean pressure drop should be limited to 0.18 psid (5" H₂O).

Recommended cannister change out is after 500 hours of operation. More frequent replacement may be required when operated in heavily contaminated areas such as grinding operations, primary metal mills, and on mobile equipment. Under such conditions, increase replacement frequency to every 250 hours.

Graphs are for 03C cannisters only. Total pressure drop across cannister, adaptor, and pipe may be found by adding pressure drops below:

- + 1.5% for each inch of 12AT adapter or 3/4" pipe used.
- + 3.0% for each 3/4" elbow used.
- + 1.0% for each inch of 50AT adapter or 1-1/4" pipe used.
- + 2.0% for each 1-1/4" elbow used.

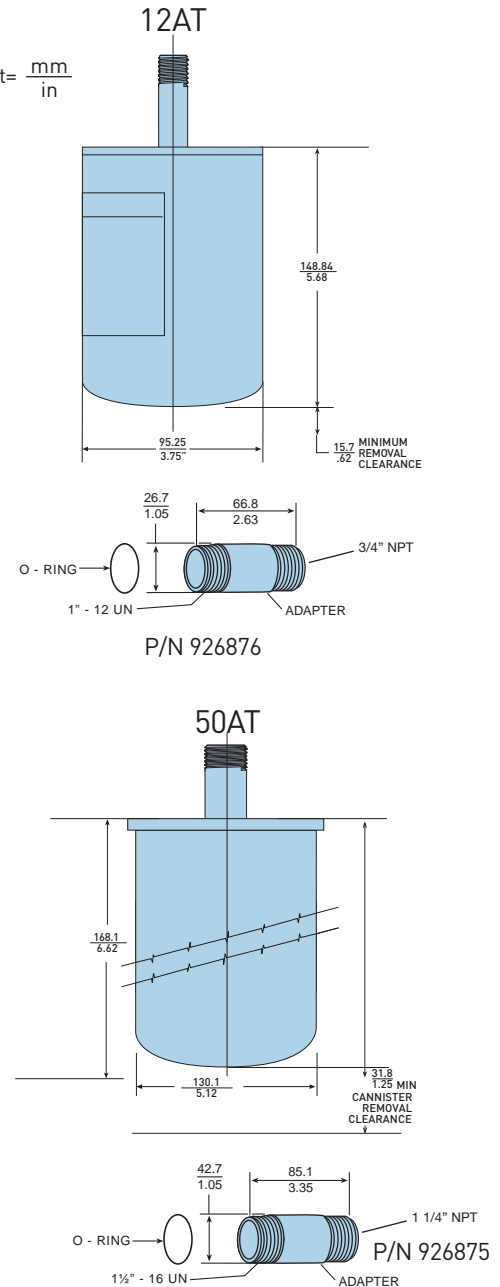


| Element | Air Rating* | Diameter | Adaptor Kit |
|---------|-------------|----------|-------------|
| 926543 | 1 micron | 3.75" | 926876 |
| 921999 | 2 micron | 3.75" | 926876 |
| 925023 | 5 micron | 3.75" | 926876 |
| 926541 | 1 micron | 5.1" | 926875 |
| 926169 | 2 micron | 5.1" | 926875 |
| 926170 | 5 micron | 5.1" | 926875 |

*99% removal efficiency for particles larger than stated size in air.



$$\text{Linear Measurement} = \frac{\text{mm}}{\text{in}}$$



Reservoir Accessories

Diffusers

Specifications:

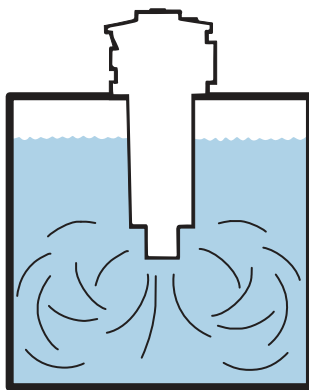
Operating Temperatures: 195°F (90°C) maximum

Materials: Body & end cap: Zintec
Head: glass-filled nylon

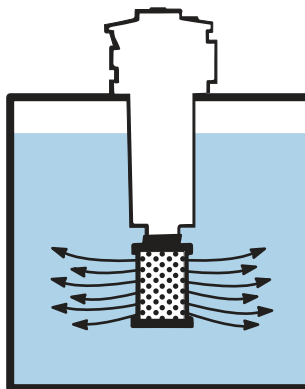
Weight: See chart below

Benefits:

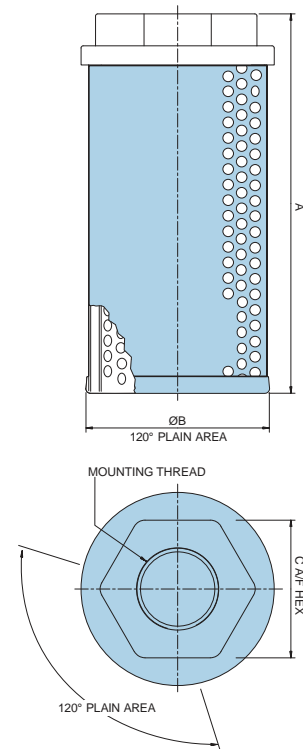
Installing a diffuser in a hydraulic reservoir is a simple change that can make a dramatic difference in system efficiency. With special concentric tubes designed with discharge holes 180° opposed, fluid aeration, foaming and reservoir noise are reduced. Pump life is also extended by reducing cavitation to the pump inlet. The effects of fitting a system with a diffuser are shown below.



Flow without diffuser



Flow with diffuser fitted



| New Part Number | Obs. Part Number | Thread (NPT) | Nominal Flow GPM (LPM) | Length "A" Inch (mm) | Diameter "B" Inch (mm) | HEX "C" Inch (mm) | Weight Lbs. (kg) |
|-----------------|------------------|--------------|------------------------|----------------------|------------------------|-------------------|------------------|
| 2250 | DF1.A2BP | 3/4" | 13 (50) | 4.7 (120) | 2.4 (62) | 1.81 (46) | .60 (0.27) |
| 2251 | DF1.B4BP | 1" | 30 (114) | 5.0 (127) | 3.4 (86) | 2.17 (55) | .93 (0.42) |
| 2252 | DF1.B6BP | 1 1/2" | 60 (227) | 7.0 (178) | 3.4 (86) | 2.56 (65) | 1.23 (0.56) |
| 2253 | DF1.B9BP | 2" | 120 (454) | 9.5 (242) | 3.4 (86) | 2.95 (75) | 1.52 (0.69) |

Reservoir Accessories

Fluid Level/Temperature Gauges

Specifications:

Materials:

Lens: Transparent polyamide

Lens base: Nylon 66

Shroud: High impact polystyrene (no aluminum content)

Seals: Nitrile

Maximum Operating Pressure: 14.7 psi (1 bar)

Operating Temperatures: -22°F (-30°C) to 195°F (90°C)

Thermometer Range: 90°F to 210°F (30°C to 90°C)

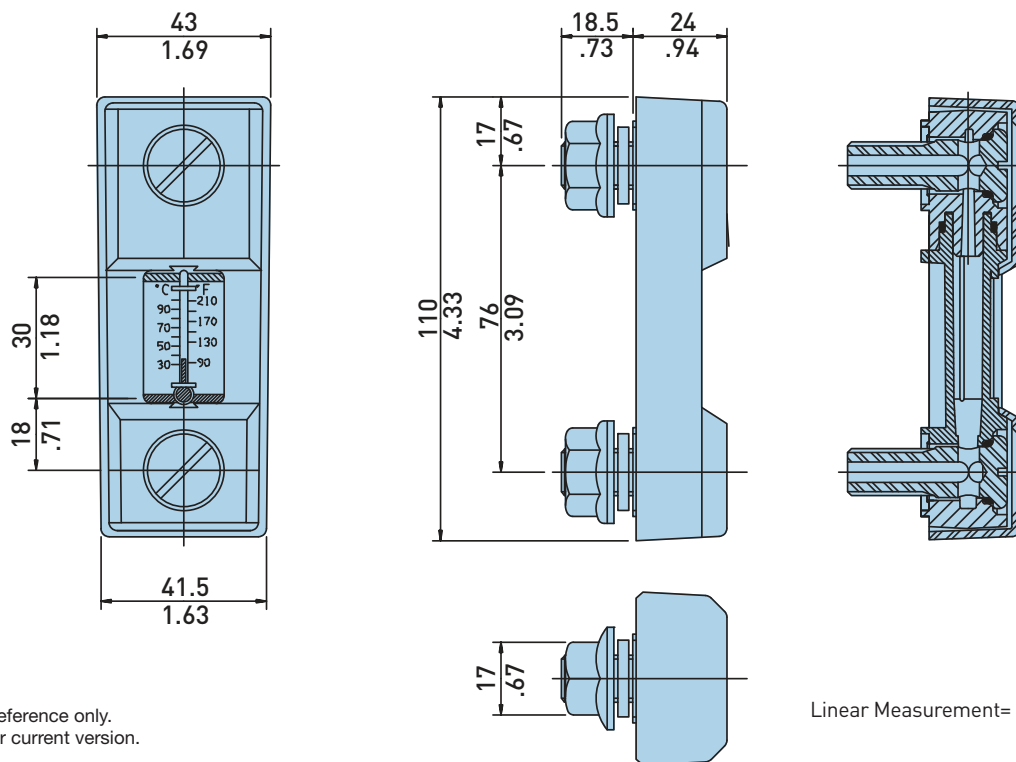
Indicator: Blue alcohol

Fluid Compatibility: Mineral and petroleum based fluids

Mounting: Front or rear fixing, two holes (M10)



Length 3



Drawings are for reference only.
Contact factory for current version.

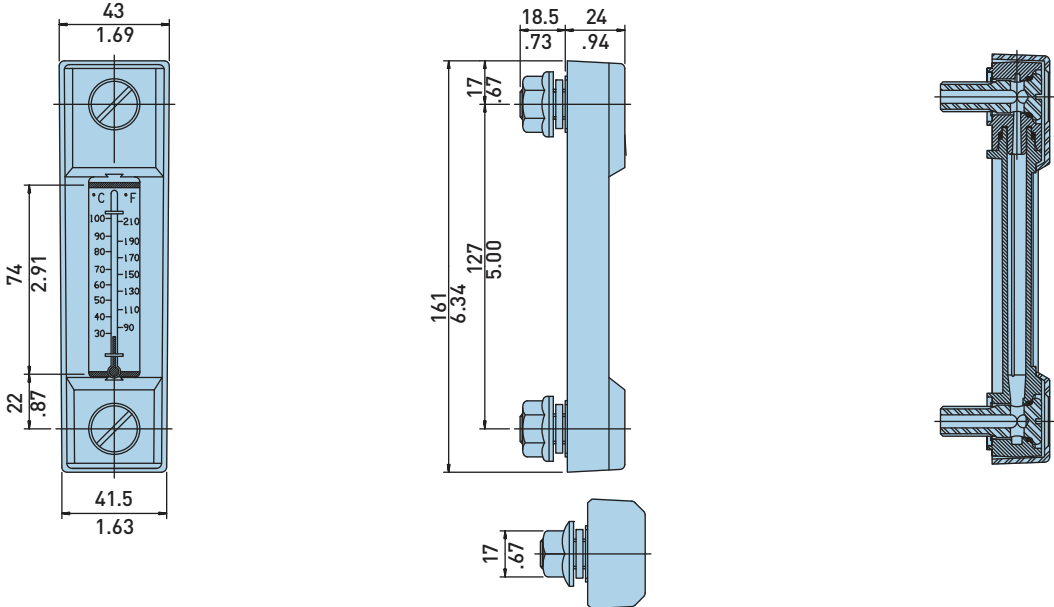
Linear Measurement= $\frac{\text{mm}}{\text{in}}$

| Part Number | Thread | Length | Description |
|-------------|--------|--------|-----------------------------|
| FL.69121 | M10 | 3 | Fluid level and temperature |
| FL.69221 | M10 | 5 | Fluid level and temperature |
| FL.69321 | M10 | 10 | Fluid level and temperature |

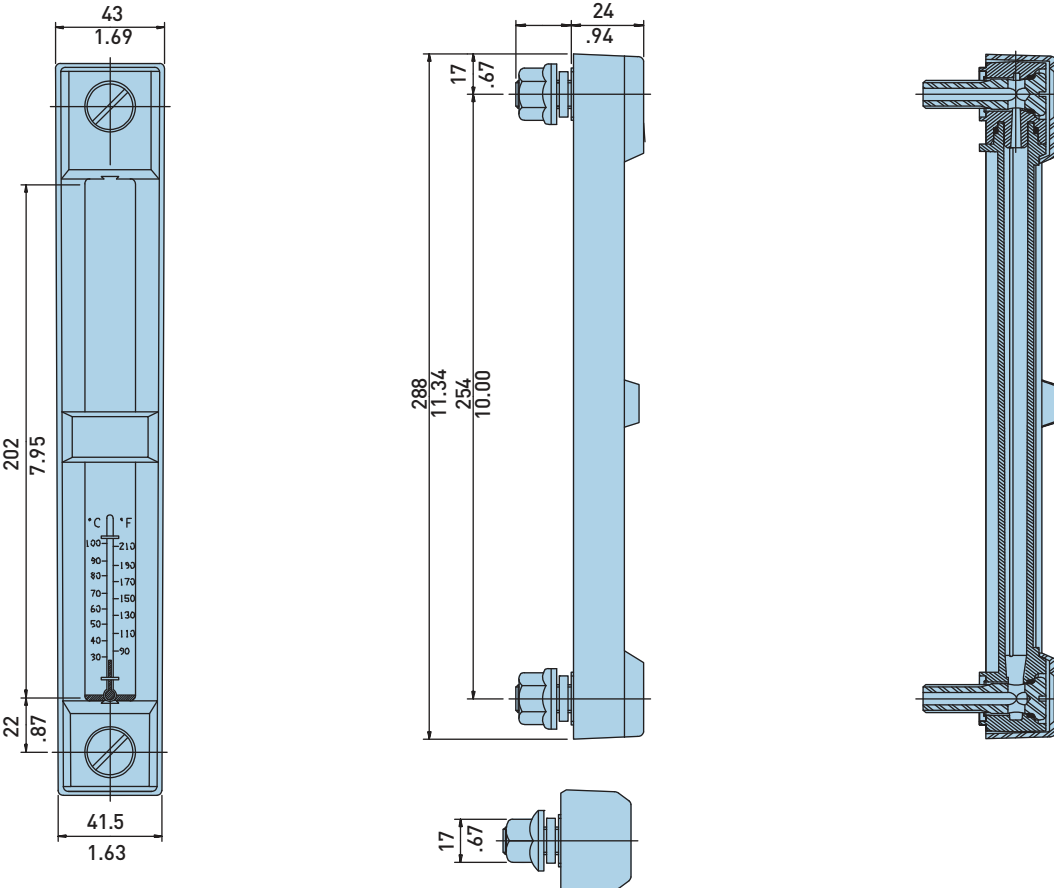
Reservoir Accessories

Fluid Level/Temperature Gauges

Length 5



Length 10



Linear Measurement = $\frac{\text{mm}}{\text{in}}$

Drawings are for reference only.
Contact factory for current version.

Reservoir Accessories

Suction Strainers

Specifications:

Materials:

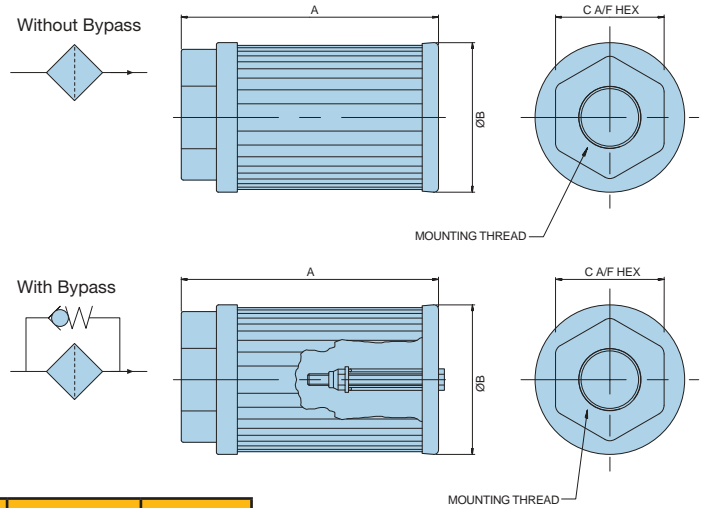
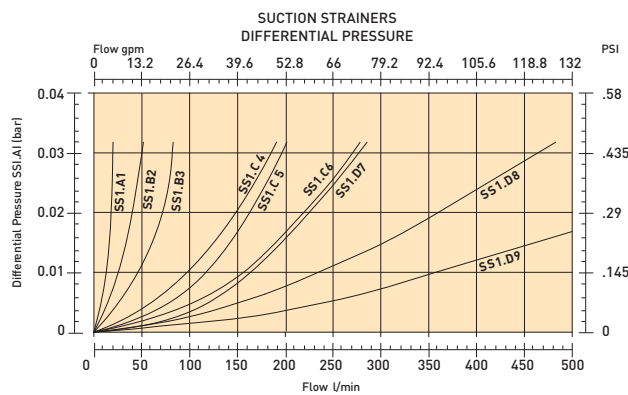
Media: Stainless steel
 Tube and endcap: Zintec
 Head: glass filled nylon

Filtration Element: 100 mesh (149 micron)

Operating Temperatures: 195°F (90°C) maximum

Bypass: None, 3 psi (0.2 bar)

Weight: See chart below



| New Part No. With Bypass | Bypass | Port (NPT) | Nominal Flow GPM (LPM) | Length "A" Inch (mm) | Diameter "B" Inch (mm) | BSPP Fitting |
|--------------------------|--------|------------|------------------------|----------------------|------------------------|--------------|
| 937480 | No | 1/2" | 5(19) | 4.125 | 1.90 | No |
| 937481 | Yes | 1/2" | 5(19) | 4.125 | 1.90 | No |
| 937482 | No | 3/4" | 8(30) | 3.55 | 2.67 | No |
| 937483 | Yes | 3/4" | 8(30) | 3.55 | 2.67 | No |
| 937484 | No | 1" | 10(38) | 5.25 | 2.67 | No |
| 937485 | Yes | 1" | 10(38) | 5.25 | 2.67 | No |
| 937488 | No | 1-1/2" | 30(114) | 8.01 | 3.47 | No |
| 937489 | Yes | 1-1/2" | 30(114) | 8.01 | 3.47 | No |
| 937490 | No | 1-1/2" | 50(189) | 9.85 | 4.00 | No |
| 937491 | Yes | 1-1/2" | 50(189) | 9.85 | 4.00 | No |
| 937492 | No | 2" | 50(189) | 9.85 | 4.00 | No |
| 937493 | Yes | 2" | 50(189) | 9.85 | 4.00 | No |
| 937494 | No | 2-1/2" | 75(284) | 10.10 | 5.17 | No |
| 937495 | Yes | 2-1/2" | 75(284) | 10.10 | 5.17 | No |
| 937496 | No | 3" | 100(378) | 11.50 | 5.17 | No |
| 937497 | Yes | 3" | 100(378) | 11.50 | 5.17 | No |

Reservoir Accessories

Magnetic Suction Strainers

Magnetic Suction Strainers

Now offer dual protection, without cavitation!

Parker's new magnetic suction strainers offer dual protection to the pump inlet without risk of cavitation.

Powerful ceramic magnets located parallel to the pleated mesh attract and protect against damaging ferrous particles of all sizes.

The pleated stainless steel screen provides additional filtration protection for larger particles that would result in catastrophic failure.

The generous open area of the stainless steel pleated mesh eliminates the possibility of pump cavitation.

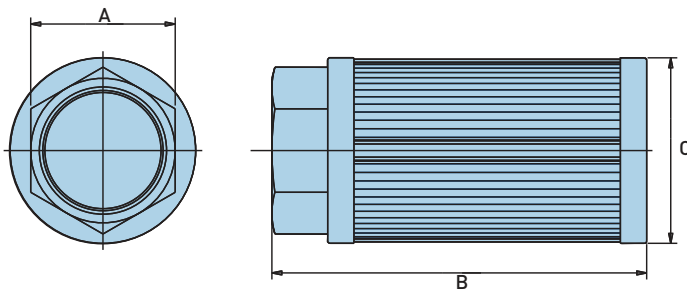
Ordering Information

The information below shows the part numbers, specifications and dimensions of available suction strainers, to help you meet the needs of your specific application.

NOTE: All sizes are standard with 30 mesh screen (560 micron).

| Part Number | NPT Connection | Flow GPM (LPM) | Dimensions | | | Approx. Shipping Weight lbs. (kg) |
|-------------|----------------|----------------|---------------|---------------|---------------|-----------------------------------|
| | | | A inches (mm) | B inches (mm) | C inches (mm) | |
| 936547 | 1.00" | 15 (55) | 1.88 (47.75) | 5.19 (131.83) | 3.09 (78.49) | 1.59 (0.72) |
| 936548 | 1.25" | 25 (95) | 2.38 (60.45) | 7.39 (187.71) | 3.53 (89.66) | 3.16 (1.43) |
| 936549 | 1.50" | 35 (135) | 2.38 (60.45) | 7.39 (187.71) | 3.53 (89.66) | 2.88 (1.31) |
| 936550 | 2.00" | 50 (190) | 2.75 (69.85) | 7.39 (187.71) | 3.53 (89.66) | 2.22 (1.01) |
| 936551 | 3.00" | 100 (380) | * | 9.35 (237.49) | 4.47 (113.54) | 3.91 (1.77) |

*Part number 936551 features a 3" half coupling, not a hex nut.

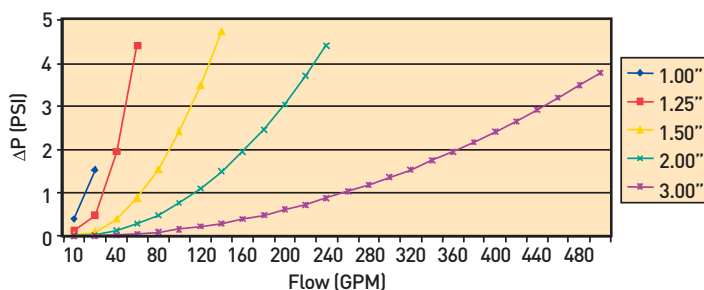


Parker's magnetic suction strainers are available in sizes ranging from one to three inches.



The rugged steel construction, combined with the generous filtration area, ensures reliable performance for suction applications.

Flow Vs. Pressure Loss





aerospace
 climate control
 electromechanical
filtration
 fluid & gas handling
 hydraulics
 pneumatics
 process control
 sealing & shielding



PAR◇GELTM
 Water Removal Filter Elements



ENGINEERING YOUR SUCCESS.

PAR◇GEL™

Water Removal Filter Elements

Par-Gel filter elements are an effective tool in controlling water related problems in hydraulic power and lubrication systems.

There is more to proper fluid maintenance than just removing particulate matter. You need to remove water as well. Parker has developed Par-Gel water removal elements to be used in combination with particulate filters to provide significant benefits.

Less component wear, consequently less component generated contaminants.

Significant reduction of costly downtime and replacement of failed components.

Increased efficiency of the system, thereby improving machine productivity.

Less frequent replacement and disposal of contaminated fluid.

Reduced chance of catastrophic failure.

Water as a contaminant.

Whether you use a mineral-base or synthetic fluid, each will have a water saturation point. Above this point, the fluid cannot dissolve or hold any more water. This excessive water is referred to as 'free' or emulsified water. As little as .03% (300 ppm) by volume can saturate a hydraulic fluid.

Many mineral-base and synthetic fluids, unless specifically filtered or treated in some way, will contain levels of water above their saturation point.

Water is everywhere!

Storage and handling. Fluids are constantly exposed to water and water vapor while being handled and stored. For

instance, outdoor storage of tanks and drums is common. Water settles on top of tanks and drums and infiltrates the container, or is introduced when the container is opened to add or remove fluid.

In-service. Water can get by worn cylinder and actuator seals, or through reservoir openings. Water can come in contact with these entry points through water based cutting fluids or when water and/or steam are used for cleaning.



PAR◇GEL™

Water Removal Filter Elements



Typical results of wear due to presence of particulate and water contamination.

Condensation is also a prime water source. As fluid cools in a reservoir, temperature drop condenses water vapor on inside surfaces, which in turn causes rust. Rust scale in the reservoir eventually becomes particulate contamination in the system.

Microbial growth as a contaminant.

Once water enters a system, growth of microorganisms begins. Since water is one of the end products of the breakdown of hydrocarbon fluid, once started, the process is somewhat self-sustaining.

Slime is evidence of microbial growth, as is the apparent increase in viscosity of the fluid, obnoxious odor and discolored fluid. The results are: short fluid life, degraded surface finish and rapid corrosion.

Water generated damage and operating problems

- Corrosion
- Accelerated abrasive wear
- Bearing fatigue
- Additive breakdown
- Increased acid level
- Viscosity variance
- Electrical conductivity

Forms of water in fluid

- Dissolved water— below saturation point.
- Free water—emulsified or in droplets*.

Water in the system creates oxides, slimes and resins. Corrosion is an obvious by-product and creates further contaminants in the system.

The effect is compounded, as you now have both particulate contaminant and water working together.

The particulate contamination can be as simple as rust flaking from reservoir walls. Anti-wear additives break down in the presence of water and form acids. The combination of water, heat and dissimilar metals encourages galvanic action. Pitted and corroded metal surfaces and finishes result.

Further complications occur as temperature drops and the fluid has less ability to hold water. As the freeze point is reached, ice crystals form, adversely affecting total system function. Operating functions may become slowed or erratic.

Electrical conductivity becomes a problem when water contamination weakens insulating properties of fluid (decreases dielectric kV strength).

Testing your fluid for water.

A simple 'crackle test' will tell you if there is water in your fluid. Simply take a metal dish or spoon with a small amount of fluid. Apply a flame under the container with a match. If bubbles rise and 'crackle' from the point of applied heat, you have free water.

ParTest™ fluid analysis. For complete analysis,



Parker offers Par-Test fluid analysis. Your Parker representative can supply you with a fluid container, mailing carton and appropriate forms to identify your fluid and its use. An independent lab performs complete spectrometric analysis, particle counts, viscosity and water content.

Results are sent directly to the requester.

* Excessive free water must be removed from the system before filtering is attempted. In systems with gross amounts of water (1% to 2% by volume), settling or vacuum dehydration should be considered before using Par-Gel filter elements.

PAR GEL™

Water Removal Filter Elements

Removing water. Using a Par-Gel water removal element is an effective way of removing free water contamination from your hydraulic system. It is highly effective at removing free water from mineral-base and synthetic fluids.

The Par-Gel filter media is a highly absorbent copolymer laminate with an affinity for water. However, hydraulic or lubrication fluid passes freely through it. The water is bonded to the filter media and forever removed from the system. It cannot even be squeezed out.

Parker technology and



Photo above shows 'dry' Par-Gel filter media and the same media swollen with absorbed water.

expertise at your disposal.

Choosing the correct filters can save money and minimize problems caused by particulate and water contaminants in hydraulic and lubricating fluids.

Parker provides hard data and advice on choosing from a wide range of filter configurations, flow patterns and flow pressure capabilities.

How many filter elements will I need? Suppose you would like to remove water from contaminated oil stored in a 200 gallon tank. The tank is found to have 1000 ppm of water (very contaminated). The circulation rate will be 10 gpm for the 200 SUS fluid.

Example: How many single length Moduflow™ elements will be needed to reduce the water to normal saturation levels. To find the answer, use the conversion charts and capacity curves for the Moduflow element.

1. 1000ppm start - 300ppm finish = 700ppm removed
2. 700ppm water x .0001 = .07%
.07% x 200 gallons = .14 gallons water total
3. Use the capacity curve for Moduflow element P/N 927584. Capacity = 80cc at 200 SUS & 10 gpm to pressure drop of 25 psid. (See graph)
 $80\text{cc} \times 0.000264 \frac{\text{gal}}{\text{cc}} = 0.02 \text{ gallons/element}$
4. $\frac{0.14 \text{ gallons total water}}{0.02 \text{ gallons/element}} = 7 \text{ elements}^*$

*The replacement value of this fluid may range from \$600.00 to \$1400.00 (\$3 to \$7 gallon). At an estimated element cost of \$50.00 each, the savings realized would be from \$250.00 to \$1050.00!

Using Par-Gel filter elements saves money in fluid and replacement component costs. Also, the frequency of fluid disposal and the problems associated with it are greatly reduced.

Filter capacity. There are no accepted and approved water capacity testing or reporting standards. Consequently, there is virtually no way to compare one element capacity with another. It is also difficult to simulate a specific application in testing . . . making it hard to predict field performance.

Why the discrepancies? Water removal media capacity is the result of the interplay among four variables: flow rate, viscosity, bypass setting and the media itself.

Here's an example: two identical elements, testing the same fluid, varying only the flow rate.

This is a 15% reduction in capacity, due to changing only the flow rate! Now, look at what happens when the test flow rate is the same and the viscosity is changed.

| | Element A | Element A' |
|----------------|-----------|------------|
| Flow Rate: | 3 gpm | 10 gpm |
| Viscosity: | 75 SUS | 75 SUS |
| Test Capacity: | 425 ml | 360 ml |

Twice the capacity can be achieved just by manipulating the test viscosity!

Naturally, having a lower bypass valve setting limits the capacity. Since the life

| | Element B | Element B' |
|----------------|-----------|------------|
| Flow Rate: | 20 gpm | 20 gpm |
| Viscosity: | 200 SUS | 75 SUS |
| Test Capacity: | 250 ml | 550 ml |

of the element is measured in pressure drop, using higher bypass valve settings will increase apparent life (all other conditions equal).

We recommend 25 psid bypass valves to get adequate life from Par-Gel filter elements.

Capacity also depends on the media itself. That's why Parker spent two years researching the media used in Par-Gel filter elements. We tested all known media, and worked closely with our suppliers to achieve maximum water absorbency.

PAR◇GEL™

Water Removal Filter Elements

How we report: Our goal is to give our customers usable data. Why show test results at a lower viscosity (65 SUS for example), if the typical application uses 200 SUS fluid? So, we report at 200 SUS to give typical field application capacity, and 75 SUS for competitive comparisons. But keep in mind when comparing, you still have to consider flowrate.

What it all means: You deserve to know how an element will work for you in your applications. So, we test and report our data in such a way that it helps you predict element performance and life.

Be wary of claims that say... "this element holds one quart (or one gallon) of water." What was the test flow rate? fluid viscosity? bypass valve setting? Was it run as a 'single pass' or 'multipass' test?

Rely on Parker to give you the facts and data you need. Our goal is to better protect your systems and components... and we start up-front by telling you what you need to know. Is there any other way to do business?

Add it all up. Broad selection, competitive prices, off-the-shelf availability, on-time delivery, high-efficiency filter media, reduced system contaminant and longer component life. When you add it all up, we think you'll agree...

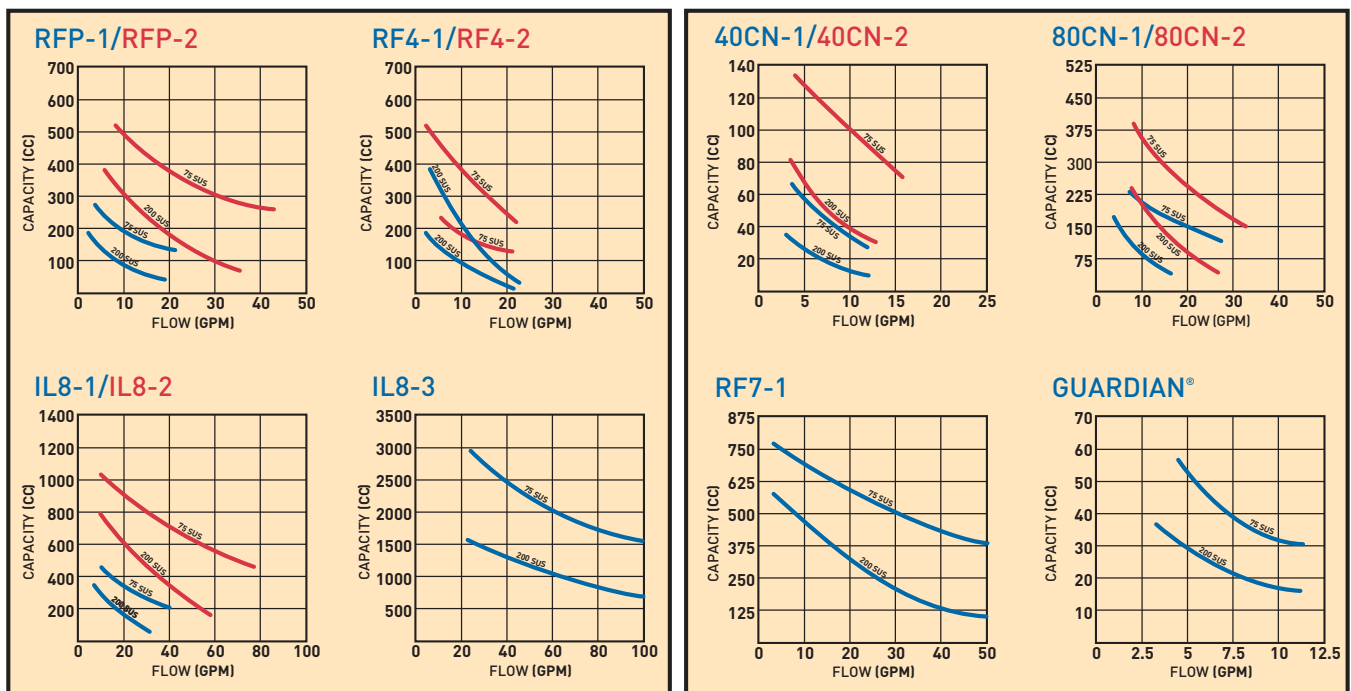
Conversion Factors

| If you Have: | Multiply By: | To Get: |
|--------------|--------------|--------------|
| mg/l | 0.00009 | % |
| ppm | 0.0001 | % |
| ml | 1.0 | cc |
| cc | 0.0338 | fluid ounces |
| cc | 0.00106 | quarts |
| cc | 0.000264 | gallons |

Typical Saturation Points

| Fluid | PPM | % |
|-------------|-----|--------|
| Hydraulic | 300 | 0.03% |
| Lubrication | 400 | 0.04% |
| Transformer | 50 | 0.005% |

MULTI-PASS WATER CAPACITY



PAR◇GEL™

Water Removal Filter Elements

Parker Par-Gel water removal filter elements are available in these standard Parker filter housings:

| Filter Model Series | Length | Element Part Number |
|---------------------|--------|---------------------|
| RFP-1 | Single | 927584 |
| RFP-2 | Double | 927585 |
| RF4-1 | Single | 930156 |
| RF4-2 | Double | 928557 |
| RF7-1 | Single | 933853 |
| RF7-2 | Double | 932506 |
| IL8-1 | Single | 929103 |
| IL8-2 | Double | 929109 |
| IL8-3 | Triple | 932006 |
| 40CN-1 | Single | 931412 |
| 40CN-2 | Double | 931414 |
| 80CN-1 | Single | 931416 |
| 80CN-2 | Double | 931418 |
| Guardian® | Single | 932019 |

Ideal applications for Par-Gel filter elements:



Guardian® Portable Filtration System



Filter Cart



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



PAR FIT TM Elements

Competitive Interchanges



ENGINEERING YOUR SUCCESS.

PAR◊FIT™ Elements

Competitive Interchanges

An extensive range of competitively priced Parker quality replacement filter elements, PAR◊FIT interchange elements allow the users to acquire all their replacement elements from one quality source regardless of the original equipment manufacturer.

PAR◊FIT competitive interchange elements must conform to all the same rigorous tests as the standard Parker replacement elements. The elements meet or exceed all specifications for the following tests:

| | |
|------------------|-----------------------------------|
| ISO2941 | Element Collapse/Burst Resistance |
| ISO2942 | Fabrication Integrity |
| ISO2943 | Material Compatibility |
| ISO3724 | Flow Fatigue Resistance |
| ISO4572/ISO16889 | Multipass Test |

In addition to price and quality, the range of interchange elements available is key to a successful program for the user. Parker has worked diligently over the years to develop a range of elements that will meet this challenge. You can view the current list of PAR◊FIT interchange elements at www.parker.com/parfit or www.parkerhfde.com/parfit.



26,000+ interchanges for a variety of competitors, including:

- Pall
- Hy-Pro
- Hydac
- Internorman
- Schroeder
- Mahle
- MP Filtri
- PTI
- Donaldson
- Separation Technologies
- Stauff
- Eaton Vickers
- Cummins Filtration
- Zinga
- EPE
- Many Others
- Fleetguard

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.





aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Static Control Filter Elements

The Latest Innovation from Parker Hannifin



ENGINEERING YOUR SUCCESS.

Static Control Filter Elements

Together we can...

Preserve the environment.
Minimize waste and promote energy efficiency.

Achieve worldwide filtration solutions.
Build global confidence.

Redefine new limits.
Forge ahead with advanced technology.

Keep contamination under control.
Reduce maintenance costs.

Enhance total system reliability.
Focus on customer satisfaction.

Reach optimum potential.
Drill to greater depths.

...engineer your success.

Studies have suggested that varnish is formed due to the thermal and oxidative degradation of oil. It also has been suggested that the localized heat generated from a static charge discharge can reach several thousand degrees. Hot enough to cause localized thermal degradation of the oil. The static discharge can also cause pitting of metallic surfaces in a system.

Manufacturers of combustion turbines have recognized the relationship of static discharge causing thermal degradation and subsequent varnish formation to the extent that they have suggested turbine users to choose coarser filtration, including switching from

Micro-glass to less efficient Cellulose filter media and also to decrease flow density by operating duplexing filter changeover valves in the center position. Parker Static Control filter elements eliminate these compromises and ensure proper system filtration performance.

What can Varnish do to a System

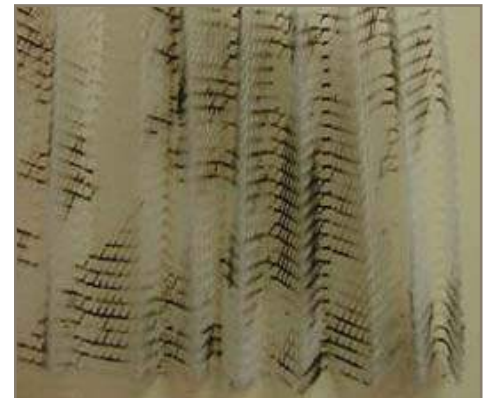
- Sticking servo-valves
- Plugged filters
- Build up on surfaces, heat exchangers, reservoir walls, and bearing surfaces



Pitting on filter end-cap



Varnish is attracted to metal surfaces, this results in an overall decrease in productivity.



Burnt polymer pleat support mesh from arcing

Static Control Filter Elements

Applications

Parker has developed a unique modified filter media technology to aid industry in controlling static build-up in non-conductive hydraulic and lubricating fluids.

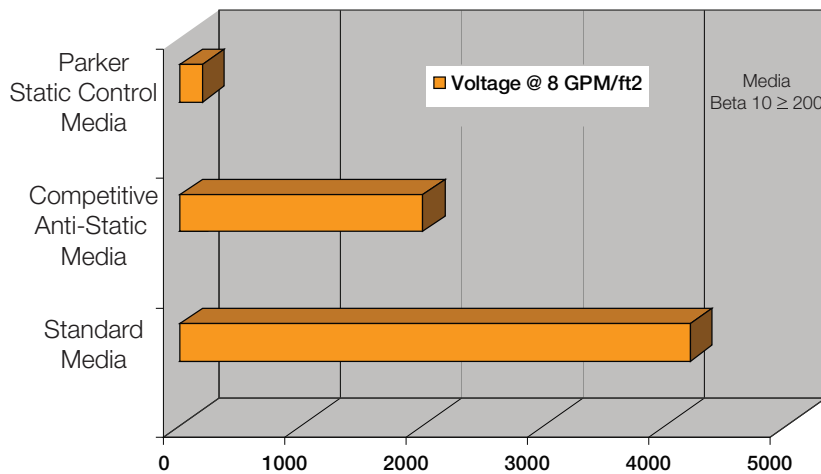
Parker's new patent-pending, static control filter media reduces triboelectric charging that occurs in a fluid system equipped with typical filtration materials. Triboelectric charging

can result in a sudden static discharge (sparks in the oil) that eventually causes varnish, and damages oil and system components. The discharge can also damage the filter element by burning and pitting the filter media. The static control filter material can be made available in a wide variety of element configurations.

Typical Applications

- Turbine Lube Oil
- Control Systems
- High Flow Hydraulic Circuits
- Test Equipment
- Kidney Loops

LABORATORY TEST RESULTS



MEASURED DISCHARGE VOLTAGE

Test Parameters for above Results

Fluid Type: ISO 46 Ashless Hydraulic Oil
 Fluid Conductivity: < 100 pS/m
 Test Temperature: 40°C (100°F)
 Filter Type: In-Line T-type Pressure
 Media Flow Density: 8 GPM/FT² (320 LPM/M²)

Why Use Parker Static Control Filter Elements

- No compromise in efficiency, dirt holding capacity, or flow pressure drop
- No vessel modifications required - drop in solution
- Available in a wide variety of element configurations

| Filter | 2 Micron | 10 Micron |
|------------|----------|-----------|
| RF4/50P-1 | 932668A | 932670A |
| RF4/50P-2 | 932677A | 932679A |
| IL8-2 | 933044A | 933046A |
| IL8-3 | 932872A | 932874A |
| 15CN/15P-1 | 932610A | 932612A |
| 15CN/15P-2 | 932616A | 932618A |
| 40CN-2 | 932653A | 932655A |
| 40CN-3 | 926698A | 926893A |
| 80CN-1 | 932659A | 932661A |
| 80CN-2 | 932665A | 932667A |
| 80CN-3 | 933218A | 933220A |
| 30P-1 | 932622A | 932624A |
| 30P-2 | 932628A | 932630A |
| 30P-1-AX | 933580A | 933581A |
| 30P-2-AX | 933582A | 933583A |
| MPD-1 | 935516A | 935518A |
| MPD-2 | 935488A | 933520A |
| 15P-1-AX | 933576A | 933577A |
| 15P-2-AX | 933578A | 933579A |
| 718 | 934179A | 933913A |
| 736 | 934180A | 933920A |

Note:

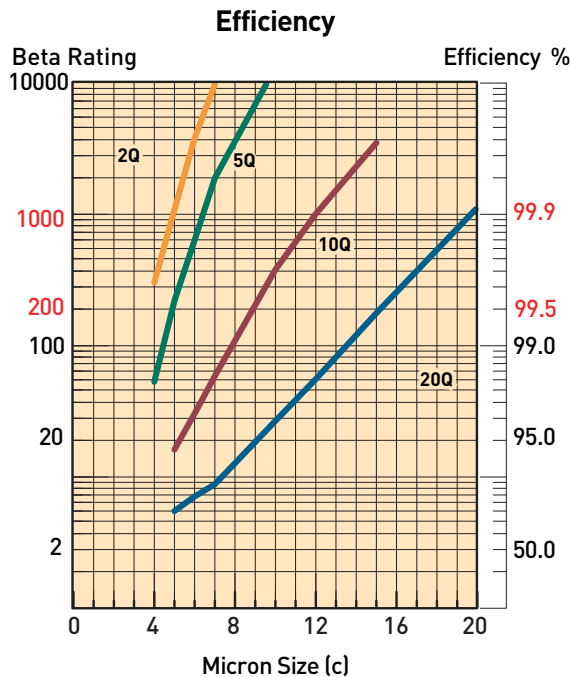
Replace "Q" with "A" when model coding an assembly with above static control filter elements in Catalog 2300-14.

Appendix

Interpreting Data

Element Efficiency

For each configuration Parker reports on a log micron chart the actual test results for each Microglass III media grade available. The information that can be obtained from reporting in this manner far exceeds previous methods. To read the charts simply follow a few quick steps as shown below.



To determine efficiency/beta rating at a Particular micron size:

1. Choose micron size from horizontal axis.
2. Follow line upward until it intersects the media grade of interest.
3. For the beta rating move left perpendicular until you intersect the vertical beta rating axis and record number.
4. For the efficiency rating just follow line across to the right until it intersects the efficiency axis and record number.

To determine which media can provide a particular beta rating:

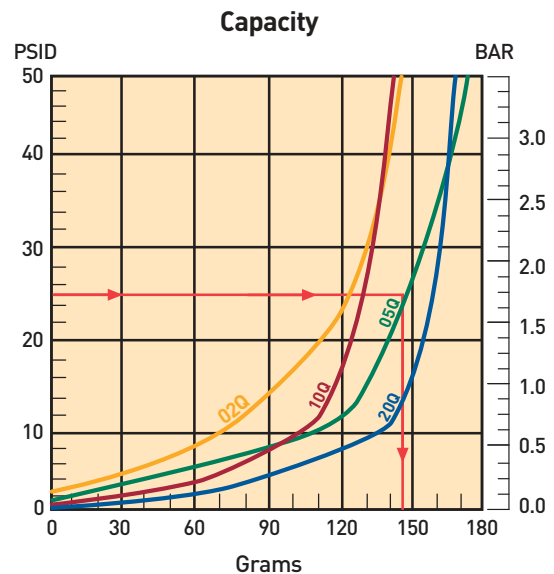
5. Choose beta rating desired on left vertical axis
6. Follow line horizontally across until it intersects media grade.
7. Move downward perpendicular until you intersect the horizontal "Micron Size" axis and record value. If micron value is too low repeat steps until a desired value is achieved.

Element Capacity

Typically element capacities have been plotted on a differential vs grams chart to allow for best comparisons between different indicator/bypass settings and also other manufacturers. Although the construction of a given element remains constant, the actual capacity obtained in a application depends on several variables

- Viscosity
- Flow rate
- Contaminant Type
- Changeout pressure

Since it is not possible to test every possible combination, Parker tests per ISO4572 and ISO16889 which specifies fluid type, contaminant type and flow rate. Therefore the only variable that can be accounted for by the specifier would be changeout pressure. To accomplish this simply determine what indicator setting will be used to signal service is required. If no indicator will be used then use the bypass value for the specified filter.



To determine element capacity

1. Starting along the vertical differential pressure axis choose changeout setting.
2. Move horizontally across until line intersects the media grade desired.
3. Move perpendicular downward until line intersects horizontal axis "Grams" and record value .

Appendix

Interpreting Data

Flow vs Pressure Loss

All performance curves are reported at a standard viscosity of 150 SUS (30 cSt) with element pressure curves independent of the housing. The purpose of reporting individually is to allow for adjustment to other operating viscosities. To adjust for a operating viscosity other than 150 SUS (30 cSt) please use the correction formula below.

| Viscosity Correction Formula | | |
|------------------------------|---|--|
| PSID Element | = | PSID from catalog \times $\frac{\text{New Viscosity}}{150}$ \times $\frac{\text{New Specific Gravity}}{.90}$ |
| PSID Housing | = | PSID from catalog \times $\frac{\text{New Specific Gravity}}{.90}$ |
| PSID Assembly | = | PSID Element + PSID Housing |

High Collapse Elements

In most cases, filter assemblies are equipped with an internal bypass valve to limit the differential pressure across the element. In some critical applications it may be necessary to equip the filter with a "no bypass" valve which forces all fluid flow to pass through the element. When a filter is equipped with a "no bypass" valve, the element must be able to withstand much higher differential pressures in the event it is not serviced when indicated. Parker high collapse elements are able to withstand 2000 psid ("H" option) or 3000 psid ("X" option) due to their special construction. The high collapse elements are rated for the same efficiencies as the standard elements but also have a higher clean pressure loss.

The increase in pressure loss from standard collapse "Q" elements to high collapse "Q" elements varies from media grade and series. To insure adequate element life, a correction factor should be applied to the standard pressure loss curves. Below are the factors that should be applied to the standard element performance curves shown in this catalog. The pressure loss of "H" option elements (2000 psid collapse) may increase as much as 40% over the standard, and the "X" option 3000 psid collapse) as much as 90%.

High Collapse Correction Factors

"QH" Elements (2000 psid) = 1.4 times reported loss

"QX" Elements (3000 psid) = 1.9 times reported loss

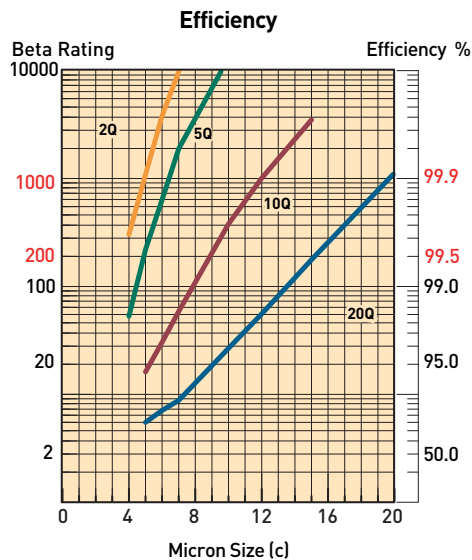
Appendix

Filter Media Types

Microglass III

The latest of our media lines, these elements have the highest capacity and efficiency available. The Microglass III is referenced by a "Q" after the micron size (i.e. 5Q). Complete information is available for each element size in the catalog. The efficiency is plotted on a beta value versus micron size chart to enable one to find the rating at a specific micron size. The capacity is plotted on a pressure differential versus grams capacity chart. This allows one to find the capacity of the element at the filter's specific bypass or indicator setting.

Flow data is performed at 150 SUS (32cSt) and plotted separately for the element and housing . Pressure loss for different viscosities can be calculated by using the formula on the opposite page.



Cellulose

An economical type of media (denoted by a "C") that provides nominal efficiency and capacity. The pore structure of paper media is not efficient for fine filtration or high capacity applications. The data provided for each individual element is limited to flow versus pressure loss. To the left is an efficiency chart which plots what would be considered typical for the various grades of cellulose media.

As shown in the chart, cellulose elements are not nearly as efficient as Microglass III elements. They are rated for nominal filtration, typically 50% efficient at rated size. Due to the low particle capture efficiency of 20C cellulose elements, it is not practical to plot on the chart. The 20C elements could be considered a $Beta_{20} = 2$ (50% efficient at 20 micron). The same limitations exist with the stainless steel mesh elements.

Stainless Steel Woven Wire

Commonly referred to as "wire mesh" this filtration medium is typically used in suction filters due to the low flow restriction. Wire mesh elements are unique in that they are designed to be cleaned and reused. These elements are rated for efficiency based on the pore size diameter of the mesh and are denoted by a "W" after the micron rating. For example a 74W element would have a nominal rating of 74 micron based on the diameter of the mesh pores. This should not be confused with "mesh" ratings which are the number of wire strands per inch. Mesh ratings can be correlated to micron ratings, see "Micrometer Conversions" on page 224.

| General Comparison Of Filter Media | | | | | |
|------------------------------------|--------------------|-----------------------|-----------------------|------------------|--------------|
| Media Material | Capture Efficiency | Dirt Holding Capacity | Differential Pressure | Life In a System | Initial Cost |
| Fiberglass | High | High | Moderate | High | Moderate |
| Cellulose | Moderate | Moderate | High | Moderate | Low |
| Wire Mesh | Low | Low | Low | Moderate | High |

Appendix

Definitions

Absolute Rating:

The diameter of the largest hard spherical particle that will pass through a filter under specified test conditions. This is an indication of the largest opening in the filter element. Hydraulic Filter Division defines absolute as 99.5% removal (beta 200) at a given particle size.

Absorb/Absorption:

The process of a fluid being taken into the pores of a solid.

Adsorb/Adsorption:

To collect and hold a fluid on the surface of a solid.

Beta Ratio:

The ratio of the number of particles of a given size and larger of a filter to the number of particles of the same size and larger downstream.

| Beta Ratios/Efficiencies | |
|--|---|
| Beta Ratio (at a given particle size) | Capture Efficiency (at same particle size) |
| 1.01 | 1.0% |
| 1.1 | 9.0% |
| 1.5 | 33.3% |
| 2.0 | 50.0% |
| 5.0 | 80.0% |
| 10.0 | 90.0% |
| 20.0 | 95.0% |
| 75.0 | 98.7% |
| 100 | 99.0% |
| 200 | 99.5% |
| 1000 | 99.9% |

Bubble Point:

Pressure drop in inches of water required to expel the first steady (continuous) stream of bubbles from a horizontal disc of wetted filter medium or a filter cartridge immersed in a liquid (usually alcohol). A bubble point test is used to test the integrity of cartridge construction to compare relative porosities of a filter media or monitor product consistency as a quality control method.

Bypass:

Fluid flowing through a passage other than the filter medium and/or leakage around filter media seals.

Burst:

An outward structural failure of the filter element caused by excessive differential pressure.

Cleanliness Codes:

A representation of a fluids contamination level based on a series of index numbers that refer to a table of concentration values.

| Cleanliness Level Correlation Table | | | | | |
|-------------------------------------|----------------------|----------------|-----------------|--------------------|-------------------------------|
| ISO Code | Particles/Millilitre | | | NAS 1638 (1964) | Disavowed SAE Level (1963) |
| | ≥2 Micrometers | ≥5 Micrometers | ≥15 Micrometers | | |
| 23/21/18 | 80,000 | 20,000 | 2,500 | 12 | |
| 22/20/18 | 40,000 | 10,000 | 2,500 | | |
| 22/20/17 | 40,000 | 10,000 | 1,300 | 11 | |
| 22/20/16 | 40,000 | 10,000 | 640 | | |
| 21/19/16 | 20,000 | 5,000 | 640 | 10 | |
| 20/18/15 | 10,000 | 2,500 | 320 | 9 | 6 |
| 19/17/14 | 5,000 | 1,300 | 160 | 8 | 5 |
| 18/16/13 | 2,500 | 640 | 80 | 7 | 4 |
| 17/15/12 | 1,300 | 320 | 40 | 6 | 3 |
| 16/14/12 | 640 | 160 | 40 | | |
| 16/14/11 | 640 | 160 | 20 | 5 | 2 |
| 15/13/10 | 320 | 80 | 10 | 4 | 1 |
| 14/12/9 | 160 | 40 | 5 | 3 | 0 |
| 13/11/8 | 80 | 20 | 2.5 | 2 | |
| 12/10/8 | 40 | 10 | 2.5 | | |
| 12/10/7 | 40 | 10 | 1.3 | 1 | |
| 12/10/6 | 40 | 10 | .64 | | |

Collapse Pressure:

An inward structural failure of the filter element caused by excessive differential pressure.

Contaminant:

Undesirable insoluble solid or gelatinous particles present in fluid.

Crest:

The outer fold of a pleat.

Differential Pressure/Pressure Drop:

Difference in pressure between two points in a system. In filters, this is typically measured between the inlet and outlet of the filter housing.

Dissolved Water:

Water capable of being held by the fluid in solution. The amount held must be below the saturation point.

Duplex Filter:

An assembly of two filters with valving for the selection of either element.

Efficiency:

The ability of the filter element to remove particles from the filter stream. Efficiency = (1-1/beta)100.

Appendix

Definitions

Effluent:

The fluid that has passed through the filter.

Filter Medium:

The permeable material used for a filter that separates particles from a fluid passing through it.

Flow Fatigue:

The ability of a filter element to withstand structural failure of the filter medium due to flexing of the pleats caused by cyclic differential pressure.

Free Water:

Water droplets or globules in a system that tend to accumulate at the bottom of a system's fluid because it exceeds the solubility of the fluid.

Influent:

Fluid entering the inlet of a filter.

In-Line Filter:

A filter in which the inlet, outlet and element are in a straight axis.

L-Type Filter:

A filter in which the inlet and outlet port axis are at right angles, and the filter element axis is parallel to either port axis.

Laminar Flow:

Flow rate at which liquid is in a nonturbulent state (10ft/sec) and should not exceeded to maintain filtration integrity and consistency.

Media Migration:

Contamination of the effluent by fibers or other material of which the filter is constructed.

Micron:

A unit of length. Correct term is micrometer (μm), which is .000039 inch. Human eye can see a 40 micrometer particle.

Neutralization Number:

A measure of the acidity or basicity of a fluid, this includes organic and inorganic acids or bases, or combination thereof.

Nominal Rating:

Micron size removed at a given efficiency under a manufacturer's defined test condition. An arbitrary term assigned by manufacturers which varies and has therefore depreciated in value.

Pinched Pleat:

A pleat closed off by excessive differential pressure or crowding, thus reducing the effective area of the filter element.

Pleats:

a series of folds in the filter medium usually of uniform height and spacing designed to maximize effective area.

Pressure Line Filter:

A filter located in a line conducting working fluid to a working device or devices.

Return Line Filter:

A filter located in the line which is conducting working fluid from working devices to a reservoir.

Root:

The inside fold of a pleat.

Suction Filter:

A filter located in the intake line of a pump where the fluid is below atmospheric pressure.

T-Type Filter:

A filter in which the inlet and outlet port axes are in a straight line, and the filter element axis is perpendicular to this line.

Varnish:

Materials generated by the hydraulic fluid due to oxidation, thermal instability, or other reactions. These materials are insoluble in the hydraulic fluid and are generally found as brownish deposits in the work surfaces.

Y-Type Filter:

A filter in which the inlet and outlet port axes are in a straight line, and the filter element is at an acute angle to this line.

Appendix

Micrometer Conversions

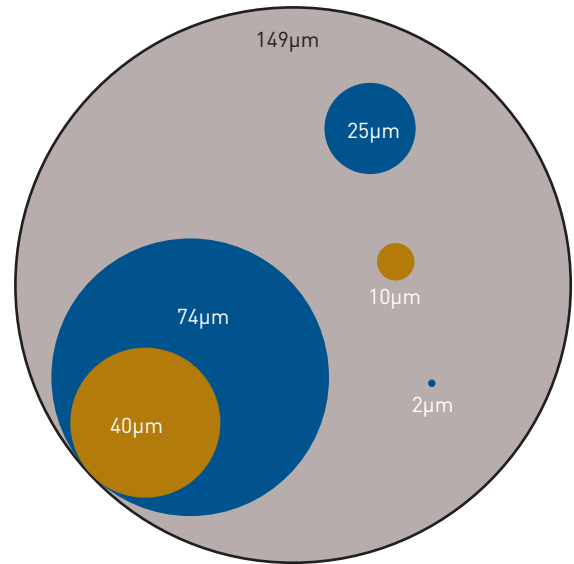
| US and ASTM Std Sieve Number | Actual Opening (in) | (μm) |
|------------------------------|---------------------|-------------------|
| 10 | 0.0787 | 2000 |
| 12 | 0.0661 | 1680 |
| 14 | 0.0555 | 1410 |
| 16 | 0.0469 | 1190 |
| 18 | 0.0394 | 1000 |
| 20 | 0.0331 | 840 |
| 25 | 0.0280 | 710 |
| 30 | 0.0232 | 590 |
| 35 | 0.0197 | 500 |
| 40 | 0.0165 | 420 |
| 45 | 0.0138 | 350 |
| 50 | 0.0117 | 297 |
| 60 | 0.0098 | 250 |
| 70 | 0.0083 | 210 |
| 80 | 0.0070 | 177 |
| 100 | 0.0059 | 149 |
| 120 | 0.0049 | 125 |
| 140 | 0.0041 | 105 |
| 170 | 0.0035 | 88 |
| 200 | 0.0029 | 74 |
| 230 | 0.0024 | 62 |
| 270 | 0.0021 | 53 |
| 325 | 0.0017 | 44 |
| 400 | 0.00142 | 36 |
| 550 | 0.00099 | 25 |
| 625 | 0.00079 | 20 |
| 1,250 | 0.000394 | 10 |
| 1,750 | 0.000315 | 8 |
| 2,500 | 0.00097 | 5 |
| 5,000 | 0.000099 | 2.5 |
| 12,000 | 0.0000394 | 1 |

Micrometer Comparisons

| Substance | (μm) |
|--------------------------|-------------------|
| Table Salt | 100 |
| Human Hair (average dia) | 50-70 |
| White Blood Cell | 25 |
| Talcum Powder | 10 |
| Cocoa | 8-10 |
| Red Blood Cell | 8 |
| Bacteria (cocci) | 2 |

Note: Lower limit of visibility (naked eye)—40 μm

Relative Size of Particles
Magnification 500x



Linear Equivalents

1 in = 25.4 mm = 25,400 μm
 1 mm = 0.0394 in = 1,000 μm
 1 μm = 1/25,400 in = 0.001 mm
 1 μm = 3.94 x 10⁻⁵ in = 0.000039 in

Formulas

Velocity (ft per sec) = $\frac{0.4085 \times \text{gpm}}{d^2 \text{ (ID in)}}$

Conversion Rates

1 cu ft = 7.48 gal
 1 gal = 231 cu in
 2 cu ft water = 62.42 lb
 1 gal water = 8.34 lb
 1 US gal = 0.833 lmp gal
 1 lb/in² = 2.31 ft of water = 2.036 in Hg
 °F = 9/5°C+32

Metric Conversion Formulas

mm = inches x 25.4
 m = feet x 0.3048
 cm³ = cu in x 16.39
 m³ = cu ft x 0.028
 kg = pounds x 0.454
 kPa = psi x 6.895
 lpm = gpm x 3.785
 °C = 5/9 (°F-32)

Appendix

Measurement Conversion Tables

| To Convert | Multiply by | To Obtain |
|---------------------|-------------|----------------------|
| A | | |
| atmospheres | 33.9 | ft of water (at 4×C) |
| atmospheres | 29.92 | in mercury (at 0×C) |
| B | | |
| barrels (US liquid) | 31.5 | gallons |
| barrels (oil) | 42 | gallons (oil) |
| bars | 0.9869 | atmospheres |
| bars | 14.5 | pounds/sq in |
| C | | |
| centimeters | 0.03281 | feet |
| centimeters | 0.3937 | inches |
| centimeters | 0.00001 | kilometers |
| centimeters | 0.01 | meters |
| centimeters | 0.01094 | yards |
| centimeters | 10,000 | microns |
| cubic centimeters | 0.00003531 | cubic feet |
| cubic centimeters | 0.06102 | cubic inches |
| cubic centimeters | 0.000001 | cubic meters |
| cubic centimeters | 0.001 | liters |
| cubic centimeters | 0.002113 | pints (US liquid) |
| cubic centimeters | 0.001057 | quarts (US liquid) |
| cubic feet | 28,320 | cubic centimeters |
| cubic feet | 1,728 | cubic inches |
| cubic feet | 0.02832 | cubic meters |
| cubic feet | 0.03704 | cubic yards |
| cubic feet | 7.48052 | gallons (US liquid) |
| cubic feet | 28.32 | liters |
| cubic feet | 59.84 | pints (US liquid) |
| cubic feet | 29.92 | quarts (US liquid) |
| cubic feet/min | 62.43 | pounds water/min |
| cubic feet/min | 1.698 | cubic meters/hr |
| cubic feet/sec | 448.831 | gallons/min |
| cubic inches | 16.39 | cubic centimeters |
| cubic inches | 0.0005787 | cubic feet |
| cubic inches | 0.00001639 | cubic meters |
| cubic inches | 0.00002143 | cubic yards |
| cubic inches | 0.004329 | gallons |
| cubic inches | 0.01639 | liters |
| cubic meters | 35.31 | cubic feet |
| cubic meters | 61,023 | cubic inches |
| cubic meters | 264.2 | gallons (US liquid) |
| cubic meters | 1000 | liters |
| cubic meters/hour | 4.4 | gallons (US)/min |
| cubic meters/hour | 0.588 | cubic feet/min |

| To Convert | Multiply by | To Obtain |
|----------------------|-------------|---------------------|
| F | | |
| feet | 30.48 | centimeters |
| feet | 0.0003048 | kilometers |
| feet | 0.3048 | meters |
| feet | 304.8 | millimeters |
| feet of water | 0.0295 | atmospheres |
| feet of water | 0.8826 | inches of mercury |
| feet of water | 62.43 | pounds/sq ft |
| feet of water | 0.4335 | pounds/sq in |
| feet/minute | 0.01667 | feet/second |
| G | | |
| gallons | 3,785 | cubic centimeters |
| gallons | 0.1337 | cubic feet |
| gallons | 231 | cubic inches |
| gallons | 3.785 | liters |
| gallons (liq br imp) | 1.20095 | gallons (US liquid) |
| gallons (US) | 0.83267 | gallons (Imp) |
| gallons of water | 8.337 | pounds of water |
| gallons/min | 0.002228 | cubic feet/sec |
| gallons/min | 0.06308 | liters/sec |
| gallons/min | 8.0208 | cubic feet/hr |
| grams | 0.001 | kilograms |
| grams | 0.002205 | pounds |
| grams/cm | 0.0056 | pounds/in |
| grams/sq in | 45.71 | ounces/sq yd |
| I | | |
| inches | 2.540 | centimeters |
| inches | 0.02540 | meters |
| inches | 25.4 | millimeters |
| inches of mercury | 0.03342 | atmospheres |
| inches of mercury | 1.133 | feet of water |
| K | | |
| kilograms | 2.2046 | pounds |
| kilograms | 0.009842 | tons (long) |
| kilograms | 0.001102 | tons (short) |
| kilograms/sq cm | 2,048 | pounds/sq ft |
| kilograms/sq cm | 14.22 | pounds/sq in |
| kilograms/sq meter | 0.00009678 | atmospheres |
| kilograms/sq meter | 0.00009807 | bars |
| kilograms/sq meter | 0.003281 | feet of water |
| kilograms/sq meter | 0.002896 | inches of mercury |
| kilograms/sq meter | 0.2048 | pounds/sq ft |
| kilograms/sq meter | 0.001422 | pounds/sq in |

Appendix

Measurement Conversion Tables

| To Convert | Multiply by | To Obtain |
|-------------------|--------------|---------------------|
| L | | |
| liters | 0.2642 | gallons (US liquid) |
| liters | 2.113 | pints (US liquid) |
| liters | 1.057 | quarts (US liquid) |
| liters/min | 0.0005886 | cubic ft/sec |
| liters/min | 0.004403 | gallons/sec |
| liters/hour | 0.004403 | gallons (US)/min |
| M | | |
| meters | 3.281 | feet |
| meters | 39.37 | inches |
| meters | 0.001 | kilometers |
| meters/min | 3.281 | feet/min |
| meters/min | 0.05468 | feet/sec |
| microns | 0.000001 | meters |
| mils | 0.00254 | centimeters |
| mils | 0.000083333 | feet |
| mils | 0.001 | inches |
| mils | 0.0000000254 | kilometers |
| O | | |
| ounces | 28.349 | grams |
| ounces | 0.0625 | pounds |
| ounces (fluid) | 1.805 | cubic inches |
| ounces (fluid) | 0.02957 | liters |
| ounces/sq in | 0.0625 | pounds/sq in |
| ounces/sq yard | 20.83 | pounds/3000 sq ft |
| P | | |
| pints (liquid) | 0.125 | gallons |
| pints (liquid) | 0.4732 | liters |
| pints (liquid) | 0.5 | quarts (liquid) |
| pounds | 453.59 | grams |
| pounds | 16 | ounces |
| pounds/sq ft | 0.0004725 | atmospheres |
| pounds/sq ft | 0.01602 | feet of water |
| pounds/sq ft | 0.01414 | inches of mercury |
| pounds/sq in | 0.06804 | atmospheres |
| pounds/sq in | 2.307 | feet of water |
| pounds/sq in | 2.036 | inches of mercury |
| pounds/sq in | 0.0145 | kilo pascals (kPa) |
| pounds/sq in | 27.684 | inches water column |
| pounds/3000 sq in | 0.048 | ounces/sq yard |

| To Convert | Multiply by | To Obtain |
|--------------------|-------------|---------------|
| Q | | |
| quarts (liquid) | 0.03342 | cubic feet |
| quarts (liquid) | 57.75 | cubic inches |
| quarts (liquid) | 0.0009464 | cubic meters |
| quarts (liquid) | 0.25 | gallons |
| quarts (liquid) | 0.9463 | liters |
| S | | |
| square centimeters | 0.001076 | square feet |
| square centimeters | 0.1550 | square inches |
| square centimeters | 0.0001 | square meters |
| square feet | 144 | square inches |
| square feet | 0.0929 | square meters |
| square inches | 0.006944 | square feet |
| square inches | 0.0007716 | square yards |
| square meters | 10.76 | square feet |
| square meters | 155 | square inches |
| square meters | 1.196 | square yards |
| square yards | 9 | square feet |
| square yards | 1,296 | square inches |
| square yards | 0.8361 | square meters |

Appendix

Changes to ISO Standards and their impact on Filter Performance Reporting and the Contamination Code.

The recent changes to ISO contamination and filtration standards were brought about to solve accuracy, traceability, and availability issues. It is important to remember that both real world hydraulic system cleanliness levels and actual system filter performance remain unchanged. However, the reporting of cleanliness levels and filter performance has changed due to the new particle counter calibration and multi-pass test procedures.

ISO 11171 is the new particle counter calibration method and utilizes calibration fluid made from ISO Medium Test Dust (ISO MTD) suspended in MIL-H-5606. The calibration fluid is traceable to the National Institute of Standards and Technology (NIST) and is designated by NIST as Standard Reference Material (SRM)2806. ISO 11171 is replacing ISO 4402 which is based on obsolete AC Fine Test Dust (ACFTD).

It is important to note that the ISO 11171 calibration method is based on a distribution of particles measured by their equivalent area diameter, whereas ISO 4402 is based on a distribution of particles measured by their longest chord. Also, the NIST work utilized scanning electron microscopy for particles below 10 um in size, whereas the sizing distribution on ACFTD utilized optical microscopy.

The new calibration method and resulting ISO code will typically produce a one to two level increase in the first digit (the >4um size range) of the three digit code. This is due to the greater number of particles in the small size range. The remaining two digits will typically remain unchanged between old and new calibration methods, and should not impact previously established ISO cleanliness standards.

Table 1 below shows the approximate particle size relationship between the calibration methods.

| ACTFD size (per ISO 4402:1991) um | NIST size (per ISO 11171:1999) um (c) |
|---|---|
| 1 | 4.2 |
| 2 | 4.6 |
| 3 | 5.1 |
| 5 | 6.4 |
| 7 | 7.7 |
| 10 | 9.8 |
| 15 | 13.6 |
| 20 | 17.5 |
| 25 | 21.2 |
| 30 | 24.6 |
| 40 | 31.7 |

The ISO cleanliness code reporting method will also be affected.

Example: Former two-digit ISO 4406:1987
5 um / 15 um
 14 11

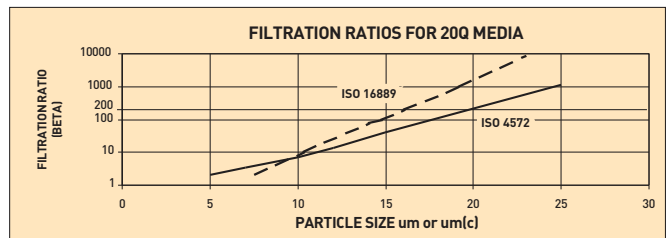
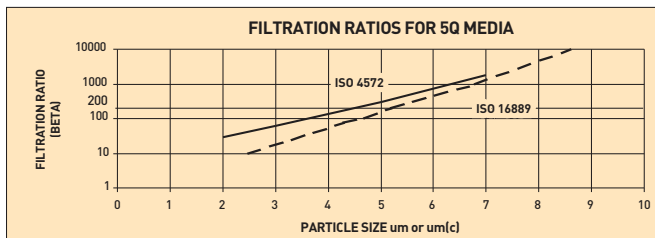
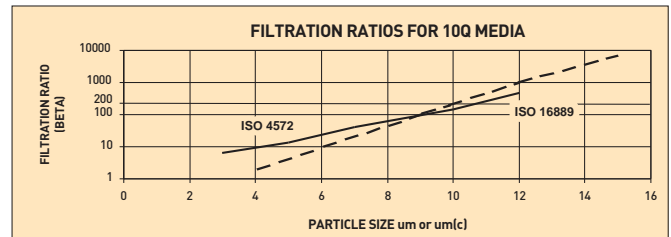
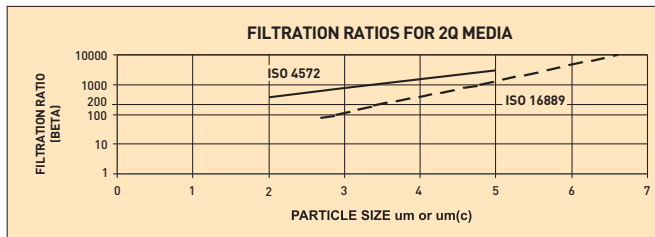
Former three-digit ISO code
2 um / 5 um / 15 um
 17 14 11

New three-digit **ISO 4406:1999**
4 um (c) / 6 um (c) / 14 um (c)
 18 14 11

Appendix

Changes to ISO Standards and their impact on Filter Performance Reporting and the Contamination Code, continued.

ISO 16889 is the new multi-pass test standard for measuring filter performance and utilizes ISO MTD as the contaminant challenge. This standard is replacing ISO 4572 which utilized ACFTD. See the following graphs below for filtration beta ratio comparisons on our 2Q, 5Q, 10Q, and 20Q Microglass III media. The graphs reflect multi-pass test results using ISO 4572 with ACFTD and the revised ISO 16889 using ISO MTD.





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18. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

19. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

20. Compliance with Law, U. K. Bribery Act and U.S. Foreign Corrupt Practices Act. Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.

Parker Hannifin Corporation

About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 500 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace markets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 12,000 distributors serving our customers around the world.

Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

Product Information

North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In the UK, a similar service is available by calling 0500-103-203.

The Aerospace Group

is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.



The Climate & Industrial Controls Group

designs, manufactures and markets system-control and fluid-handling components and systems to refrigeration, air-conditioning and industrial customers worldwide.



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designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.



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designs, produces and markets a full spectrum of hydraulic components and systems to builders and users of industrial and mobile machinery and equipment.



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Parker Hannifin Corporation
Filtration Group
Global Headquarters
 6035 Parkland Boulevard
 Cleveland, OH 44124-4141
 T 216 896 3000, F 216 896 4021
www.parker.com

North America

Compressed Air Treatment
Filtration & Separation/Balston
 242 Neck Road
 Haverhill, MA 01835-0723
 T 978 858 0505, F 978 858 0625
www.parker.com/balston

Filtration & Separation/Finite
 500 Glaspie Street, PO. Box 599
 Oxford, MI 48371-5132
 T 248 628 6400, F 248 628 1850
www.parker.com/finitefilter

Purification, Dehydration and Filtration Division
 4087 Walden Avenue
 Lancaster, NY 14086
 T 716 685 4040, F 716 685 1010
www.airtek.com
 Sales Office
 5900-B Northwoods Parkway
 Charlotte, NC 28269
 T 704 921 9303, F 704 921 1960
www.domnickhunter.com

Engine Filtration & Water Purification

Racor
 3400 Finch Road, PO Box 3208
 Modesto, CA 95353
 T 209 521 7860, F 209 529 3278
www.parker.com/racor

Racor
 850 North West St., PO Box 6030
 Holly Springs, MS 38635
 T 662 252 2656, F 662 274 2118
www.parker.com/racor

Racor
 302 Parker Drive
 Beaufort, SC 29906
 T 843 846 3200, F 843 846 3230
www.parker.com/racor

Racor -- Village Marine Tec.
 2000 West 135th Street
 Gardena, CA 90249
 T 310 516 9911, F 310 538 3048
www.villagemarine.com

Hydraulic Filtration

Hydraulic Filter
 16810 Fulton County Road #2
 Metamora, OH 43540-9714
 T 419 644 4311, F 419 644 6205
www.parker.com/hydraulicfilter

Process Filtration

Process Advanced Filtration
 2340 Eastman Avenue
 Oxnard, CA 93030
 T 805 604 3400, F 805 604 3401
www.parker.com/processfiltration

Europe

Compressed Air Treatment
domnick hunter Industrial
 Dukesway, Team Valley Trading Estate
 Gateshead, Tyne & Wear
 England NE11 OPZ
 T +44 (0) 191 402 9000,
 F +44 (0) 191 482 6296
www.domnickhunter.com

Hiross Zander
Padova Business Unit
 Strada Zona Industriale 4
 35020 S. Angelo di Piove Padova, Italy
 T +39 049 9712 111, F +39 049 9701 911
www.dh-hiross.com

Hiross Zander
Essen Business Unit
 Zander Aufbereitungstechnik GmbH
 Im Teelbruch 118
 D-45219 Essen, Germany
 T +49 2054 9340, F +49 2054 934164
www.zander.de

Parker Gas Separations
 Oude Kerkstraat 4
 P O Box 258
 4870 AG Etten- Leur, Netherlands
 T +31 76 508 5300, F +31 76 508 5333

Engine Filtration & Water Purification

Racor
 Shaw Cross Business Park
 Churwell Vale Dewsbury,
 WF12 7RD England
 T +44 (0) 1924 487000,
 F +44 (0) 1924 487038
www.parker.com/rfde

Racor Research & Development
 Parker Hannifin GmbH & Co KG
 Inselstrasse 3 - 5
 70327 Stuttgart Germany
 T +49 (0)711 7071 290-0,
 F +49 (0)711 7071 290 -70
www.parker.com/racor

Hydraulic Filtration

Hydraulic Filter
 Stieltjesweg 8, 6827 BV
 P.O. Box 5008 6802 EA
 Arnhem, Holland
 T +31 26 3760376, F +31 26 3643620
www.parker.com/eurofilt

Ujala Operation
 Salmentie 260
 31700 Ujala as Finland
 T +358 20 753 2500, F +358 20 753 2501
www.parker.com/fi

Condition Monitoring Center
 Brunel Way Thetford,
 Norfolk IP 24 1HP England
 T +44 1842 763299, F +44 1842 756300
www.parker.com/cmcc

Process Filtration

domnick hunter Process
 Durham Road, Birtley Co. Durham,
 DH3 2SF England
 T +44 (0) 191 410 5121,
 F +44 (0) 191 410 5312
www.domnickhunter.com

Asia Pacific

Australia
 9 Carrington Road, Castle Hill
 NSW 2154, Australia
 T +61 2 9634 777, F +61 2 9899 6184
www.parker.com/australia

China
 280 YunQiao Road
 JinQiao Export Processing Zone
 Shanghai 101206 China
 T +86 21 5031 2525, F +86 21 5834 3714
www.parker.com/china

India

Plot EL 26, MIDC, TTC Industrial Area
 Mahape, Navi Mumbai 400 709 India
 T +91 22 5613 7081, 82, 83, 84, 85
 F +91 22 2768 6618 6841
www.parker.com/india

Japan

626, Totsuka-cho, Totsuka-ku
 Yokohama-shi, 244-0003 Japan
 T +81 45 870 1522, F +81 45 864 5305
www.parker.com/japan

Korea

1-C Block, Industrial Complex of Jangan,
 615-1, Geumui-Ri Jangan-Myeon,
 Hwaseong-City Gyeonggi-Do, Korea
 T +82 31 359 0771, F +82 31 359 0770
www.parker.com/korea

Singapore

11, Fourth Chin Bee Road
 Singapore 619 702
 T +65 6887 6300, F +65 6261 4929
www.parker.com/singapore

Thailand

1023 3rd Floor, TPS Building
 Pattanakam Road, Suanluang,
 Bangkok 10250 Thailand
 T +66 2717 8140, F +66 2717 8148
www.parker.com/thailand

Latin America

Parker Comercio Ltda.

Filtration Division
 Estrada Municipal Joel de Paula
 900 Eugenio de Melo,
 Sao Jose dos Campos
 CEP 12225-390 SP Brazil
 T +55 12 4009 3500, F +55 12 4009 3529
www.parker.com/br

Pan American Division - Miami

7400 NW 19th Street, Suite A
 Miami, FL 33128
 T 305 470 8800 F 305 470 8808
www.parker.com/panam

Africa

Parker Hannifin Africa Pty Ltd
 Parker Place, 10 Berne Avenue,
 Aeroport Kempton Park,
 1620 South Africa
 T +27 11 9610700, F +27 11 3927213
www.parker.com/au

