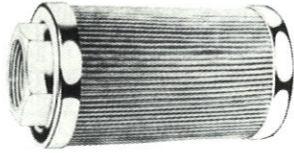


# MARVEL FILTERS

FOR SUCTION, RETURN AND LOW PRESSURE LINES

## SUMP TYPE FILTERS

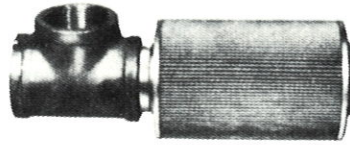
CLEANABLE BONDED  
SUMP TYPE



Up to 100 gpm —  
20 to 200 mesh

Pages 8, 9, 10

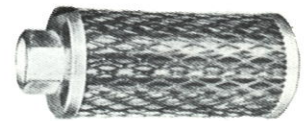
NEW SUMP TYPE WITH  
THROW-AWAY ELEMENTS



Up to 60 gpm  
3, 10 and 20 micron † paper

Page 11

CLEANABLE TAKE-APART  
SUMP TYPE



Up to 200 gpm —  
30 to 200 mesh

Pages 12, 13, 14, 15

†Now sometimes referred to as "micro-meter."

## LINE AND INLINE TYPES

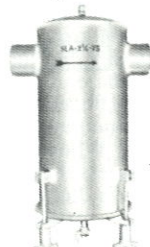
LINE TYPE  
Cleanable  
Take-Apart Element



Up to 150 gpm—  
30 to 200 mesh—  
¾" thru' 2" pipe  
sizes—Pressures  
to 80 psi.

Pages 16, 17

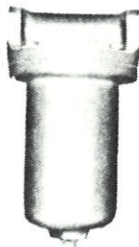
LINE TYPE  
Cleanable  
Take-Apart Element



Up to 300 gpm—  
30 to 200 mesh—  
2½" and 3" pipe  
sizes—Pressures  
to 80 psi.

Pages 16, 17

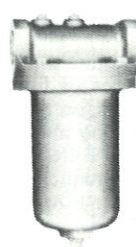
LINE TYPE  
Cleanable  
Bonded Element



FOR WATER &  
SPECIAL FLUIDS  
Up to 225 gpm—  
20 to 200 mesh—  
1" thru' 2½" pipe  
sizes—Pressures  
to 250 psi.

Pages 18, 19

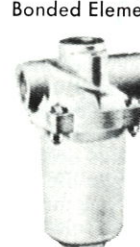
LINE TYPE  
Cleanable  
Bonded Element



Up to 225 gpm—  
20 to 200 mesh—  
1" thru' 2½" pipe  
sizes—Pressures  
to 250 psi.

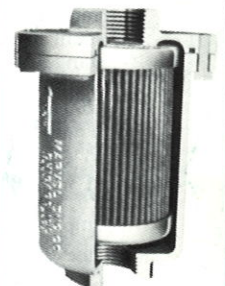
Pages 20-21

LINE TYPE  
Cleanable or  
Throw-Away  
Bonded Element



Up to 50 gpm—  
30 to 200 mesh and  
down to 10 micron  
paper—1" pipe size  
and 1½"—12 straight  
thread sizes.

Page 22



Up to 60 gpm—  
30 to 200 mesh—  
¾" thru' 2"  
sizes in pipe thread,  
straight thread and  
SAE flange ports.  
Pressures to 125 psi.

Page 23

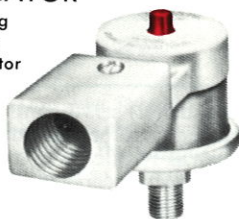
For Hydraulic Oils, Coolants, Lubricants, Fire-Resistant Hydraulic Fluids, Synthetic (Phosphate Ester Base) Fluids, Water and Aqueous Base (Water

Glycol) Fluids. Up to 300 gpm — 10, 25 and 40 Micron Paper — 200 to 20 Mesh — Pressures to 250 psi.

## ADDITIONAL FILTERING AIDS

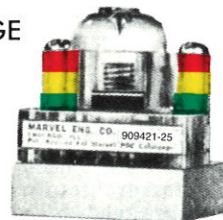
\* MARVINDICATOR

Vacuum Sensing  
Filter Element  
Condition Indicator  
Pages 24, 25



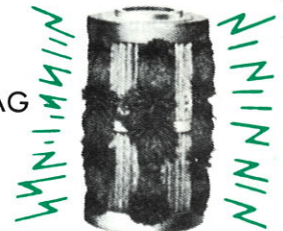
\* COLORGAGE

Filter Element  
Condition Indicator  
Pages 26, 27



\* MARVELMAG

Magnetic  
Shield for  
Filter Elements  
Page 10



Other Engineering and Application Data included in this Catalog . . .

Hydraulic Filters, General Types, Uses . . . Pages 2 & 3  
Pressure Drop, By-Pass Valves, Fluids, Magnets,  
Micron Data, Specials . . . . . Page 3  
Particle Characteristics Chart . . . . . Page 4

Mesh Sizes (Shown Actual Size) . . . . . Page 5  
Water Pressure Drop Chart . . . . . Page 6  
Hydraulic Oil Pressure Drop Chart . . . . . Page 7

Patents applied for \*Tradenames, Marvel Engineering Co.

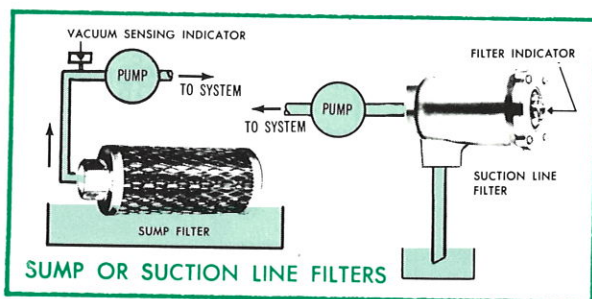
**MARVEL ENGINEERING COMPANY**

BULLETIN No. LS-101-E

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E-MAIL [marvelfilters@aol.com](mailto:marvelfilters@aol.com) [www.marvelengineering.com](http://www.marvelengineering.com)

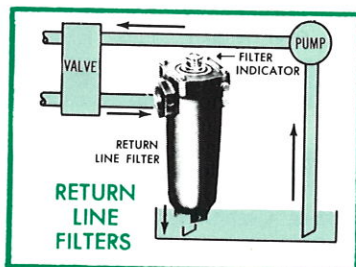


## HYDRAULIC FILTERS — GENERAL TYPES AND USES...



Sump or Suction Line Filters provide important, sometimes critical, initial protection for the pump as well as minimal protection for the rest of the hydraulic system. The filter selected should accept the flow of the pump(s) with minimum pressure drop. Many pumps have a maximum suction lift of 2½ to 3½ psi, which indicates pressure drop through filter and intake line should be carefully checked and held low enough to prevent pump cavitation, especially when the filter element has become partially clogged. A vacuum sensing device or other type of suction line element condition indicator should be used to pre-warn of dangerous clogging. (See pages 24 & 25) The pump manufacturer should be consulted to determine maximum tolerable pressure drop and required degree of filtration. The pressure drop tables for lines and fittings, on pages 6 & 7, can simplify analysis. Sump Filters can be manifolded where space problems exist. Tandem Sump Filters (pages 14, 15) provide longer life and require less frequent servicing. They are also recommended for higher flow rates in applications that can tolerate the higher pressure drops as shown in table, page 14. When Sump Filters are used, they should be mounted horizontally a minimum of two inches from bottom of reservoir and at end opposite to system return line. Because of their convenient accessibility for servicing and their easy adaptability to the use of integral element condition indicators, Suction Line Filters are recommended over Sump Filters.

Suction Line Filters are mounted outside of the reservoir to simplify cleaning and often employ visual integral indicators. A 200 mesh filter, which will remove particles .003" when clean and smaller when partially clogged, is generally recommended. If finer filtration is necessary (example: fuel transfer systems), finer micron filters should be used, but they must be amply sized to minimize pressure drop and avoid pump cavitation. By-pass valves should be used in sump and suction line filters to eliminate danger of pump cavitation in case filter servicing is neglected. This is true even of indicating type filters for unfortunately they sometimes are neglected. Because of this many such filters also employ an electric warning switch for a visual (light) or audible warning.



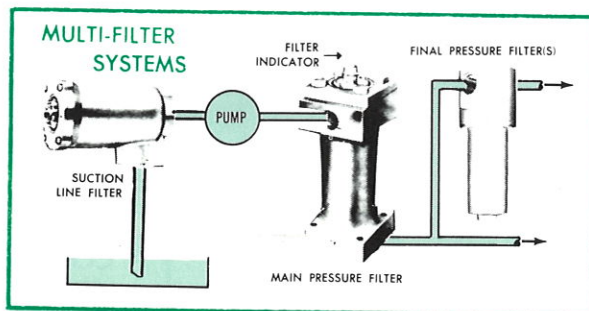
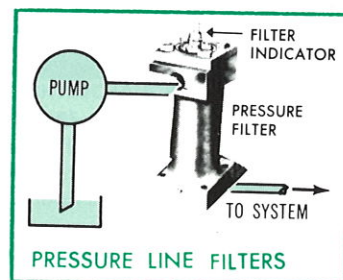
Return Line Filters are used in the main low pressure return lines through which the hydraulic fluid is returned to the reservoir by actuation of a directional control valve(s). The filters must be sized to accept actual return oil flow

and not simply on basis of pump capacity. A higher capacity filter will reduce pressure drop and back pressure on system components. Fine filtration is practical in Return Line Filters and a built-in by-pass valve is recommended to prevent element collapse in case filter servicing

is neglected. Element condition indicators, integral or non-integral with filter, are recommended to protect system by pre-warning of excessive element clogging (see pages 26 & 27). In sizing Return Line Filters, careful circuit analysis is essential where large high pressure actuators are used because sudden flow and shock due to actuator fluid decompression can cause immediate filter element failure.

In long-duration pressure holding applications (such as clamping, mold curing, etc.) where return line oil flow is infrequent, pressure and/or suction line filters are recommended in place of return line filters. This guarantees that filtration is taking place as long as the pump is running.

Filters are often used in the pump's main pressure line to assure the clean, contamination-free oil essential for the proper operation of high precision, extremely close-fitted components such as valves, actuators, etc. Although 25 micron filtration has been recommended in an industry "standard," finer filtration (10 microns or less) is recommended where maximum protection of precision components is required. When the filters are used in high pressure lines, greater pressure drop through the filter can be tolerated. Filter size is dictated by flow rate, degree of system contamination, maintenance intervals, space, weight (in some cases), and economy. Flow capacity of the filter should be as high as possible and, actually, is often sized 2 to 3 times pump capacity. A by-pass relief valve in the filter protects against element damage in case of delayed maintenance and an element condition indicator is a wise and economical precaution against "too soon" or "too late" filter servicing.



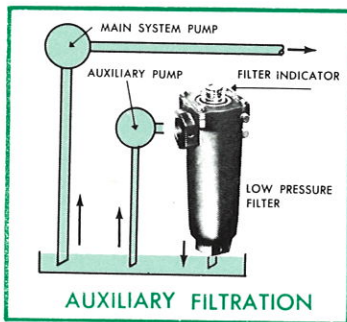
In many applications (such as servo-controlled systems) a suction line filter is inadequate because the extremely fine filtration required (such as 10 micron) is often impractical. In addition normal pump wear can generate harsh, cutting metal contaminants that can quickly damage or foul the precision servo-valve. To attempt to secure, from a single filter, the fine filtration (often 10 micron) necessary for such applications in most cases would be highly impractical from the standpoint of filter cost, size, and weight and could impose too great a load on the pump, with pump cavitation and/or priming problems highly probable. In such cases, the best, most practical solution has often been the use of several filters in the system.

For example: A 74 micron suction filter in the pump intake line for the protection of the pump and initial filtering and a 25 micron pressure filter in the pump pressure line for finer filtration cleanliness. Some systems



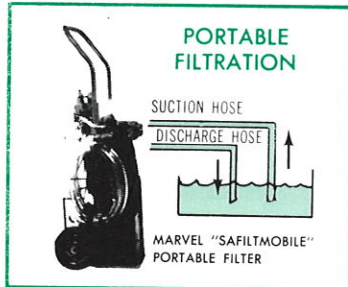
s provided to simplify filter selection and to aid in the selection of the right filter for the particular application.

where superior cleanliness is required employ a 74 micron suction line filter, a 25 micron pressure line filter and, after it in the line, one or more 10 micron pressure filters to protect servo-valve(s) or other precision components sensitive to even small amounts of contamination. Combinations of suction, return line and pressure filters are often the best answer to toughest contamination problems. By dividing the filtering load between them, each filter can do its own job better—a job for which it is specially designed—and its own operation is actually protected and made more efficient by the other filters in the system. Condition indicators and/or warning switches used with or on the filters are the best insurance of proper filter maintenance—by keeping your employees constantly alert to dangerous filter clogging.



Where normal filtration methods are impractical due to the size, weight, position, or environment of the main hydraulic system, an auxiliary system is often used to assure clean oil in the main system. In a common type of auxiliary system, a small,

low pressure circulating pump is continuously operated to force the main system oil through a low pressure filter. Finer filtration is practical and the auxiliary system enables the main system to be operated continuously—without shutdown for periodic filter cleaning and/or element replacement. This is especially beneficial for expensive machine tools and big-investment production lines where even minutes of downtime can be very costly.



The prime advantage of Portable Filtration units is that they can be quickly moved and put into operation wherever needed—indoors or outdoors—to perform a wide range of fluid filtering and transferring jobs such as: filling and filtering new systems to prevent run-in contami-

nation damage; cleaning old systems periodically and particularly after system repairs. The portable units are almost mandatory for filling and adding oil to servo-systems and are extensively used on missile systems, where flight weight must be kept to the very minimum and where clean systems are of vital importance.

## PRESSURE DROP

The ratio of open area to total area of various mesh sizes is practically the same. Consequently the pressure drop differences between the various mesh sizes are negligible and the pressure drop data on wire mesh elements, as given throughout this catalog, may be used for all 200 mesh and coarser elements. The wide range of mesh sizes available in Marvel Filters enables you to select a degree of filtration for maximum protection of your production equipment. When less than 200 mesh (74 micron) is required, finer wire cloth (which incidentally must be ultrasonically cleaned) and finer disposable paper elements are also available.

## BY-PASS VALVES

MARVEL internal by-pass valves for filters are designed to open within  $\pm 10\%$  of setting and provide almost full flow

with a minimum pressure drop. The by-pass valves are positioned axially in the flow path. Special settings are available on request and additional production time is incurred. In cases of special requirements, submit complete information to avoid delays. Wherever possible a 25 psi by-pass valve setting is recommended in return line and pressure filters to obtain longest element life.

## FLUIDS

The fluid listings shown herein are obviously general since a full compilation of all types, military specifications, brand names and manufacturers would be extremely lengthy. As a typical example, MARVEL filters can be used with more than 50 brands of fire resistant fluids. The number of petroleum base hydraulic fluids would be many times that number. The material used in MARVEL filters has been selected to handle an extremely wide range of fluids and it is often merely necessary to change static seal material for compatible operation. In case of doubt—submit fluid name, number, or identification, viscosity, and manufacturer's name. MARVEL filters can be manufactured for an extremely wide range of fluids such as—oils, coolants, lubricants, phosphate ester or aqueous base fire resistant fluids, water, gasoline, kerosene, turpentine, solvents, fuel oil, diesel fluid, and even paints and waxes. MARVEL filters have been used for preliminary sand exclusion on air systems.

## MAGNETS FOR FERRIC PARTICLE REMOVAL (See Page 10)

Better filtration, longer element life, hours saved in servicing . . . with amazing new MarvelMag elements. The harsh, cutting ferric contaminants (that do the most damage to system components) are instantly trapped by complete, outer MarvelMag Magnetic Shield BEFORE they can reach element, keeping it—and entire system—clean, undamaged and functioning at top efficiency for much longer periods without servicing. Ferric particles small enough to pass through element and on into system are most speedily trapped and retained by the all-encircling magnetic shield. Generous flow areas between magnetic rods remain uncluttered, greatly increasing filter efficiency and life. The magnetic rods do not increase element dimensions, providing complete interchangeability of MarvelMag elements with non-magnetic elements. Examples for specifying MarvelMag are given on appropriate pages.

## MICRON (MICRO-METER) DATA

General information is lacking on particle sizes and contaminants present in specific industrial systems, machining operations, and production processes. The variables are infinite. Filter users have a working knowledge of contaminants they encounter. This information is often restricted. Degree of filtration is often predicated on the basis of clearance of moving parts, especially valves or pumps, in the system.

The following chart on page 4, "CHARACTERISTICS OF PARTICLES AND PARTICLE DISPERSOIDS" prepared and reproduced through the permission of the STANFORD RESEARCH INSTITUTE provides a comprehensive summary of filtration and pertinent factors.

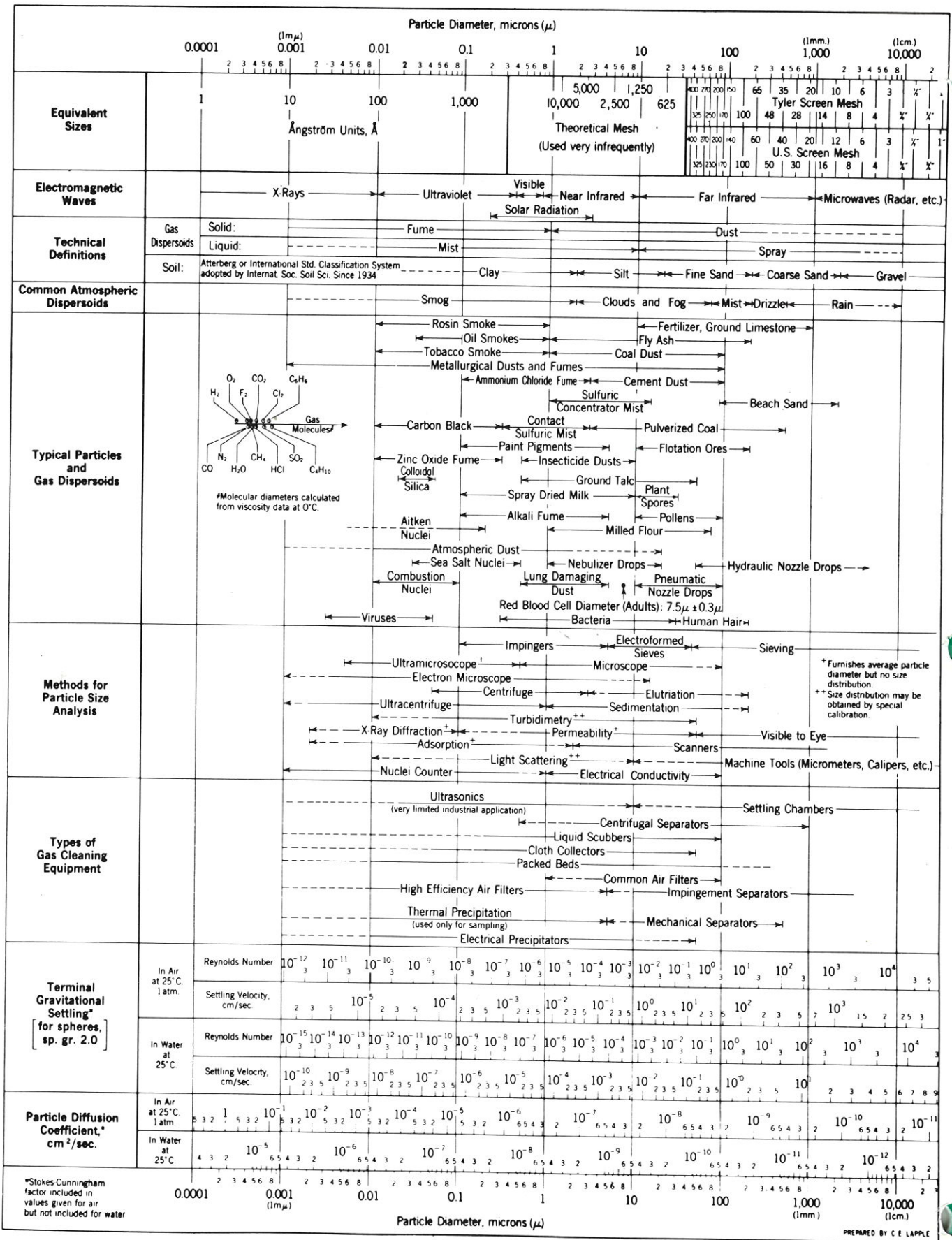
The actual mesh sizes available in MARVEL filters, along with the companion micron ratings, are shown. Obviously, the 150 and 200 mesh sizes are too small for reproduction, and would only appear as solid. (See Page 5).

## SPECIAL FILTERS

Quite often it is possible to utilize a filter element assembly or a combination of existing parts to obtain the desired results. Invariably, a complete exchange of all pertinent information is necessary to solve specials economically and expeditiously.



# CHARACTERISTICS OF PARTICLES AND PARTICLE DISPERSOIDS

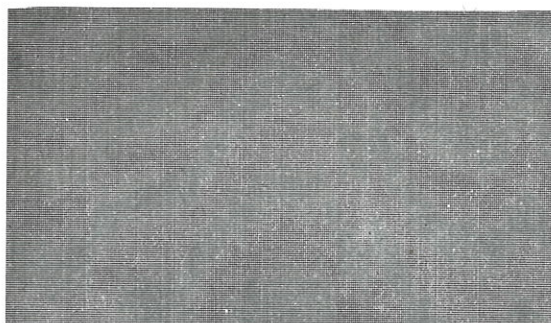


Reprinted from Stanford Research Institute Journal. Third Quarter, 1961. Single copies 8 1/2 by 11 inches. Both charts available from Dept. 300.

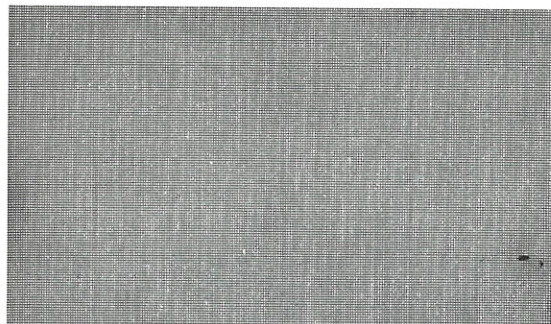


# ACTUAL SIZE MESH

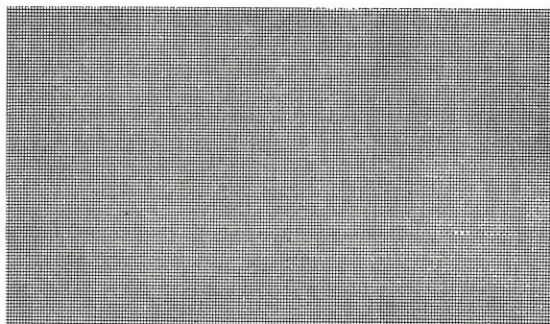
Marvel Cleanable Synclinal Filters are equipped with Stainless Steel or Monel Wire Cloth Elements. The filtering insert elements are available from a coarse 20 mesh up to a fine 200 mesh. To better illustrate mesh sizes, we have shown below the actual size mesh of the 100, 80, 60, 50, 40, and 30 wire cloth. 10, 15, 25 and 40 micron wire cloth is available. In addition 10, 25 and 40 micron pleated, specially treated paper elements, are available.



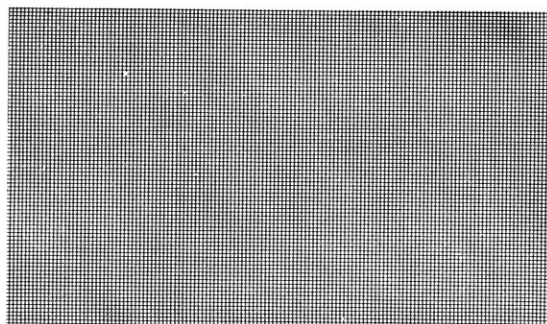
**100 MESH**  
Wire Diameter .0045  
Width of Opening .0055 = 141 Microns



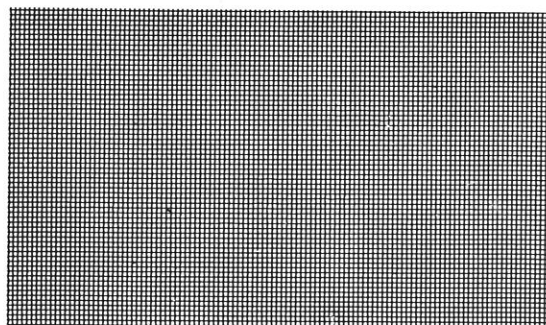
**80 MESH**  
Wire Diameter .0055  
Width of Opening .0070 = 180 Microns



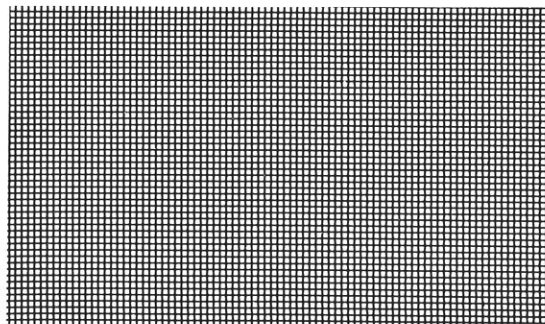
**60 MESH**  
Wire Diameter .0065  
Width of Opening .0102 = 262 Microns



**50 MESH**  
Wire Diameter .0080  
Width of Opening .0120 = 308 Microns



**40 MESH**  
Wire Diameter .0100  
Width of Opening .0150 = 385 Microns



**30 MESH**  
Wire Diameter .0120  
Width of Opening .0213 = 546 Microns

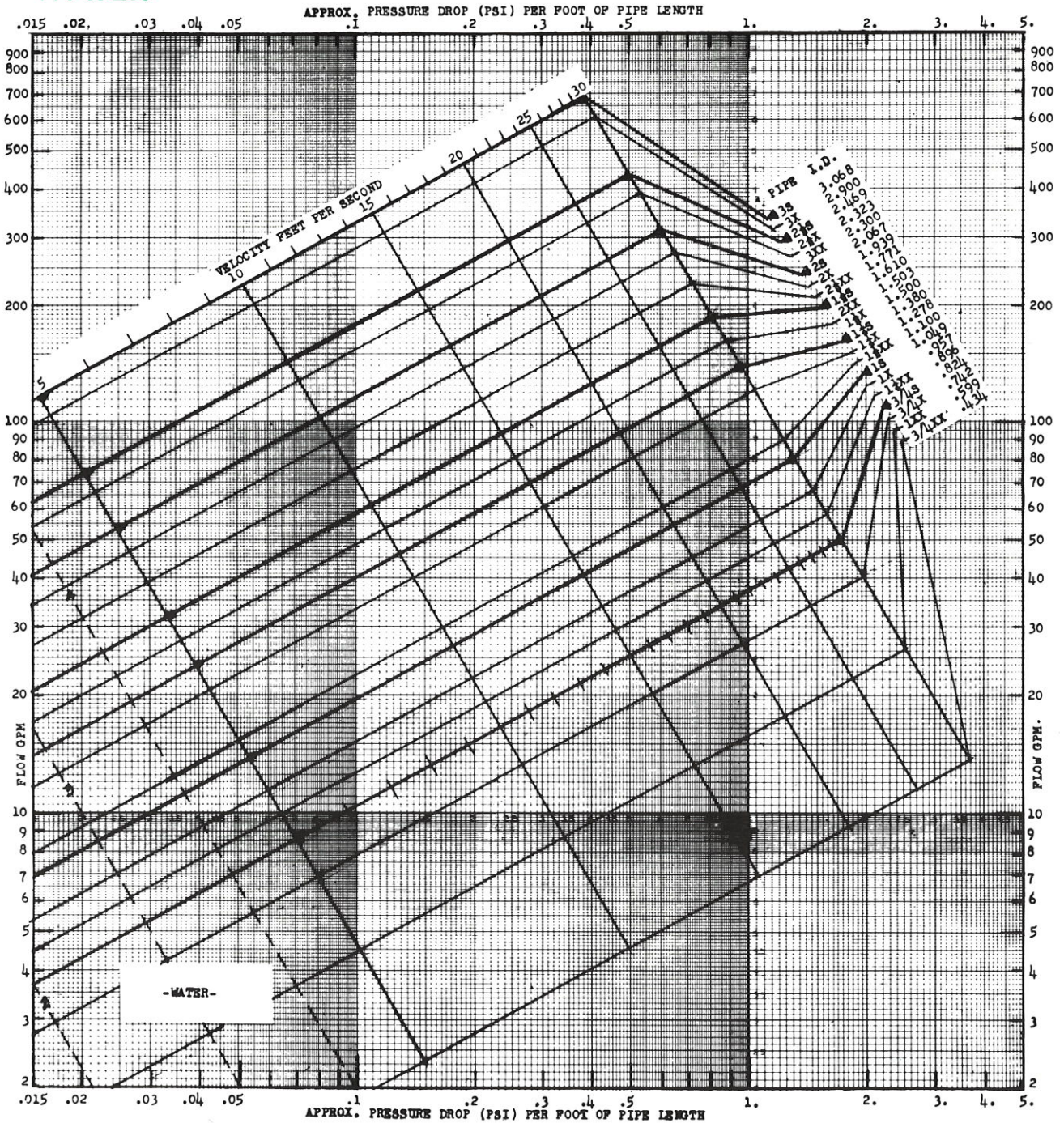
**150 MESH**  
Wire Diameter .0026  
Width of Opening .0041  
Microns = 105

**200 MESH**  
Wire Diameter .0021  
Width of Opening .0029  
Microns = 74



# PRESSURE DROP CHARTS

## WATER



TYPICAL SUCTION LINE CALCULATIONS

1. FLUID	WATER	PETROLEUM OIL 225 SSU @ 100°F	PHOSPHATE ESTER BASE 225 SSU @ 100°F
2. SPECIFIC GRAVITY @ 60°F	1.000	.865	1.210
3. PUMP RATING—GALLONS PER MINUTE	5	5	5
4. SUMP FILTER—GALLONS PER MINUTE	10	10	10
5. MARVEL FILTER MODEL NUMBER (PAGE 13)	C-1-10W-100	C-1-10-100	C-1-10S-100
6. LINE SIZE—STANDARD PIPE	1"	1"	1"
7. STANDARD 90° ELBOWS	2	2	2
8. FEET OF PIPE EQUIVALENT 2 ELBOWS	5.26 Ft.	5.26 Ft.	5.26 Ft.
9. LENGTH OF SUCTION LINE—MAX.	2.00 Ft.	2.00 Ft.	2.00 Ft.
10. TOTAL EQUIVALENT LINE LENGTH (8 & 9)	7.26 Ft.	7.26 Ft.	7.26 Ft.
11. PRESSURE DROP PER FOOT OF PIPE LENGTH AT MAXIMUM PUMP RATING (FROM CHARTS)	.01 PSI	.03 PSI	.042 PSI (.03 x 1.21 / .865 = .042)
12. SUCTION LINE PRESSURE DROP (LINES 10 TIMES 11 ABOVE)	.073 PSI	.218 PSI	.305
13. PRESSURE DROP THROUGH FILTER AT MAX. PUMP RATING	.075 PSI	.130 PSI	.190 PSI
14. TOTAL PRESSURE DROP IN SUCTION LINE	.148 PSI	.348 PSI	.495 PSI

S = Standard weight pipe. X = Extra strong. XX = Double extra strong.

(PX) = Pressure drops have been derived from the rational formula —  $P\lambda = \frac{.323}{SLV^2}$

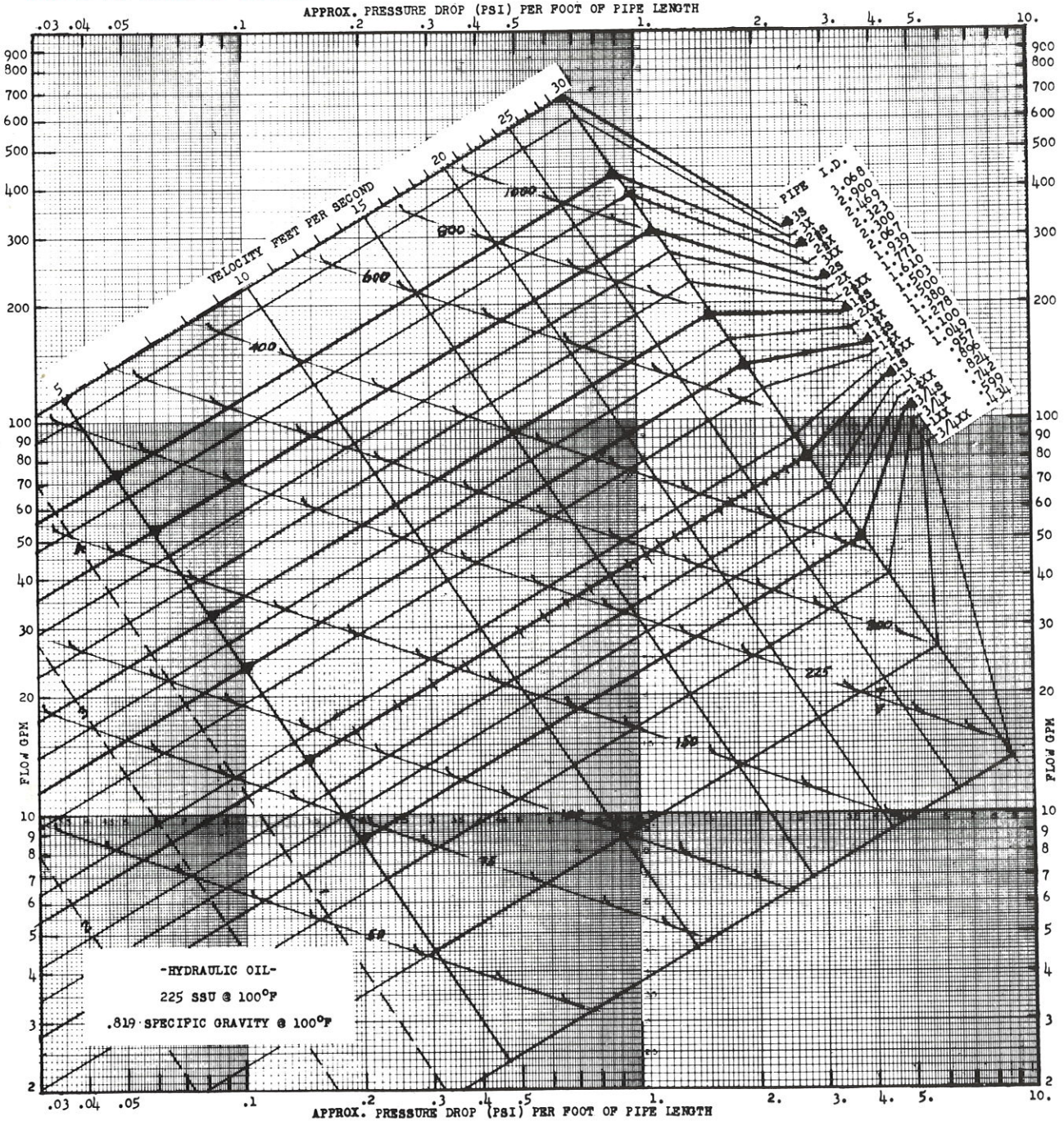
(G.P.M.) = Gallons per minute have been derived from the rational formula —  $G = .431\sqrt{\frac{P\lambda d^5}{SL}}$

(f) = Friction factors from "Piping Handbook"; 4th Ed., Fig. 15a  $\frac{dvs}{Z}$

Data shown is for butt welded clean steel pipe. Use line I.D. interpolation for steel tubing. The numbered lines indicate the demarcation zone between viscous and turbulent flow for the stated SSU. Viscous flow for each SSU is below that line and turbulent flow above it. The pressure drops for 75 SSU and higher viscous flow is in direct proportion to SSU and Specific Gravity. Example—150 SSU oil in viscous flow zone will give pressure drops of 150/225 or two thirds of the values shown on Page 11. Turbulent pressure drops will be greater than the direct proportion. (See Piping Handbook, Crocker, McGraw-Hill Book Co.)



## HYDRAULIC OILS



Pressure drop can be minimized by using short large lines with a minimum number of fittings. Check with pump and valve manufacturers to determine the proper SSU to avoid cavitation and excessive pressure drop on cold starts and give adequate lubrication when the fluid reaches maximum system temperature. Fluid manufacturer's temperature-viscosity charts can be very helpful to determine viscosity changes.

APPROXIMATE SPECIFIC GRAVITY VARIOUS FLUIDS @ VARIED TEMPERATURES

FLUID	60°F	100°F	150°F	200°F
PETROLEUM OIL	.865	.819	.762	.705
WATER-OIL EMULSION	.925	.904	.877	.850
WATER	1.000	.990	.980	.963
WATER-GLYCOL	1.050	1.036	1.018	1.000
PHOSPHATE ESTER	1.210	1.190	1.165	1.140
CHLORINATED HYDROCARBON	1.450	1.427	1.398	1.370

PRESSURE DROP IN EQUIVALENT FEET OF PIPE LENGTH

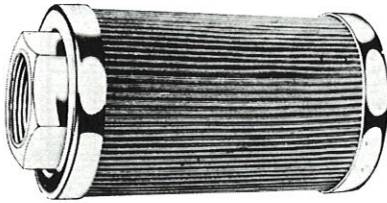
PIPE				ELBOWS				TEES	
Standard	Extra Strong	Double Extra Strong	I.D.	90° Standard	45° Standard	90° Street	45° Street	Through	Branch
3/4	3/4	3/4	.434	1.09	.58	1.80	.94	.72	2.17
			.599	1.50	.80	2.50	1.30	1.00	3.00
			.742	1.86	.98	3.09	1.60	1.24	3.71
1	1	1 1/4	.824	2.06	1.10	3.43	1.78	1.37	4.12
			.896	2.24	1.19	3.73	1.95	1.49	4.48
			.957	2.40	1.28	4.00	2.07	1.60	4.79
1 1/4	1 1/4	1 1/2	1.049	2.63	1.40	4.38	2.17	1.75	5.25
			1.100	2.75	1.46	4.58	2.38	1.83	5.50
			1.278	3.20	1.67	5.30	2.76	2.13	6.39
1 1/2	1 1/2	2	1.380	3.45	1.83	5.75	2.98	2.30	6.90
			1.500	3.75	2.00	6.25	3.25	2.50	7.50
			1.593	3.76	2.00	6.36	3.26	2.51	7.52
2	2	2 1/2	1.610	4.03	2.13	6.70	3.50	2.68	8.05
			1.771	4.42	2.35	7.38	3.83	2.95	8.86
			1.939	4.85	2.58	8.08	4.20	3.23	9.70
2 1/2	2 1/2	3	2.067	5.17	2.75	8.60	4.48	3.45	10.34
			2.300	5.75	3.06	9.58	4.98	3.83	11.50
			2.323	5.81	3.08	9.68	5.03	3.87	11.62
3	3	3	2.469	6.18	3.28	10.25	5.35	4.12	12.35
			2.900	7.25	3.85	12.10	6.28	4.83	14.50
			3.068	7.65	4.08	12.80	6.63	5.11	15.34



# BONDED SUMP TYPE — UP TO 100 GPM — 1" THRU 3" PIPE SIZES

## WITH OR WITHOUT BY-PASS VALVE

For Use With Hydraulic Oils, Coolants, Lubricants and Fire Resistant Fluids.



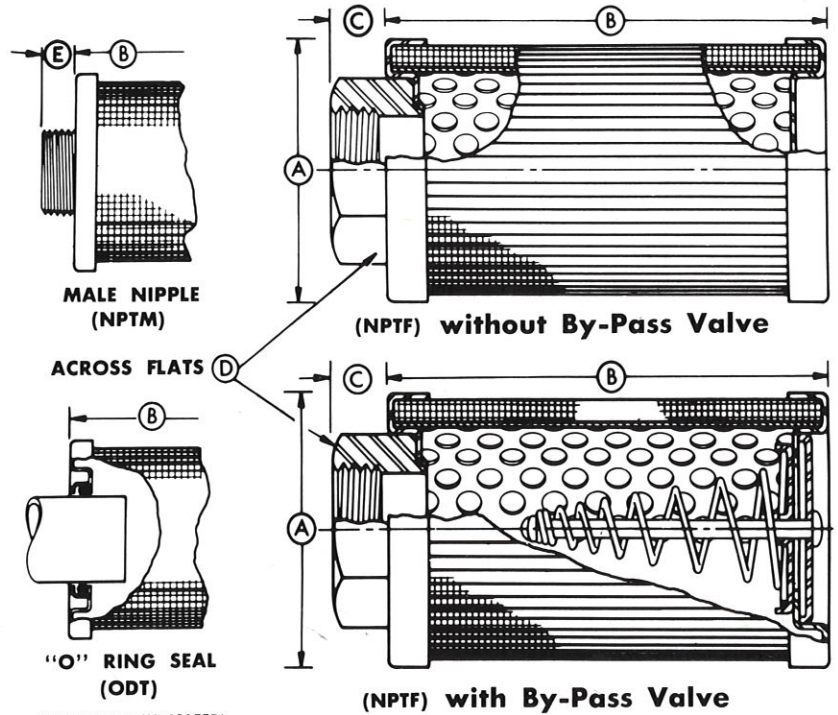
For use with regular petroleum base Hydraulic Oils, Coolants, Lubricants and all types of Fire-resistant Hydraulic Fluids and water.

**CAPACITIES:**  
10 — 20 — 30 — 50 — 75 — and 100 GPM.

**PIPE SIZES:**  
1" — 1 1/4" — 1 1/2" — 2" — 2 1/2" and 3" NPT male and female as well as "O" ring seal.

**OPERATING TEMPERATURES:**  
Up to 300° F.

**HOW TO CLEAN:**  
Remove Filter Element from suction line, swish element in any non-caustic clean solvent for a short period of time (Caution: Do not leave element in solvent). A stiff fibre brush may be used, if necessary, to remove impacted deposits between wire cloth serrations. Shake off excess solvent. If compressed air is available, blow dry from inside out.



"O" RING SEAL (ODT)  
(TUBING OD INDICATED)

By-Pass Valve is designed to open within  $\pm 10\%$  of its setting.

### ENGINEERING DATA & MOUNTING DIMENSIONS

SIZE	10 GPM			20 GPM			30 GPM			50 GPM			50 GPM			75 GPM			100 GPM
	1" NPTF	1 1/4" ODT	1" NPTM	1 1/4" NPTF	1 1/2" ODT	1 1/2" NPTM	1 1/2" NPTF	1 3/4" ODT	1 1/2" NPTM	1 1/2" NPTF	1 3/4" ODT	1 1/2" NPTM	2" NPTF	2 3/8" ODT	2" NPTM	2 1/2" NPTF	2 3/4" ODT	2 1/2" NPTM	3" NPTF
<b>PRESSURE DROP PSI</b>																			
St'd	.22	.23	.22	.16	.17	.16	.21	.22	.21	.46	.56	.46	.21	.22	.21	.24	.25	.24	.24
S	.32	.37	.32	.35	.36	.35	.36	.39	.36	.80	.97	.80	.33	.34	.33	.41	.43	.41	.35
N	.28	.29	.28	.19	.21	.19	.26	.27	.26	.58	.71	.58	.25	.26	.25	.28	.30	.28	.27
<b>APPROX. WT. LBS.</b>																			
	3/4	1/2	1/2	1	3/4	3/4	1 1/2	1	1	2	1 1/4	1 1/4	2	1 1/4	1 1/4	2	1 3/4	1 3/4	3
<b>DIMENSIONS INCHES</b>																			
A	2.62	2.62	2.62	3.09	3.09	3.09	3.38	3.38	3.38	3.94	3.94	3.94	3.94	3.94	3.94	4.38	4.38	4.38	6.00
B	4.56	4.56	4.56	7.06	7.06	7.06	8.06	8.06	8.06	9.06	9.06	9.06	9.06	9.06	9.06	9.62	9.62	9.62	10.91
C	.56			.56			.75			.75			.81			1.12			1.23
D	1.62			2.00			2.25			2.25			2.75			3.38			4.12
E			.44			.44			.44			.44			.50			.88	

St'd — HYDRAULIC OILS — COOLANTS — LUBRICANTS — 225 SSU  
 S — PHOSPHATE ESTER BASE FIRE RESISTANT FLUIDS — 225 SSU  
 N — AQUEOUS BASE (WATER GLYCOL) FIRE RESISTANT FLUIDS — 225 SSU



**NOTE:** The "Marvindicator" Vacuum Sensing and Signalling Element Condition Indicator (see Pages 24 & 25) is strongly recommended for use with Sump Type Filters.

## MODEL NUMBERS FOR BONDED SUMP FILTERS ON PAGE 8

		10 GPM			20 GPM			30 GPM		
		1" NPTF	1 1/8" ODT	1" NPTM	1 1/4" NPTF	1 1/8" ODT	1 1/4" NPTM	1 1/2" NPTF	1 1/8" ODT	1 1/2" NPTM
By-Pass	Mesh	MODEL NUMBERS								
No	*100	110-100	210-100	310-100	120-100	220-100	320-100	130-100	230-100	330-100
No	80	110-80	210-80	310-80	120-80	220-80	320-80	130-80	230-80	330-80
No	60	110-60	210-60	310-60	120-60	220-60	320-60	130-60	230-60	330-60
No	50	110-50	210-50	310-50	120-50	220-50	320-50	130-50	230-50	330-50
No	40	110-40	210-40	310-40	120-40	220-40	320-40	130-40	230-40	330-40
No	30	110-30	210-30	310-30	120-30	220-30	320-30	130-30	230-30	330-30
No	20	110-20	210-20	310-20	120-20	220-20	320-20	130-20	230-20	330-20
No	150	110-150	210-150	310-150	120-150	220-150	320-150	130-150	230-150	330-150
No	200	110-200	210-200	310-200	120-200	220-200	320-200	130-200	230-200	330-200
**3 PSI	*100	410-100	510-100	610-100	420-100	520-100	620-100	430-100	530-100	630-100
3 PSI	80	410-80	510-80	610-80	420-80	520-80	620-80	430-80	530-80	630-80
3 PSI	60	410-60	510-60	610-60	420-60	520-60	620-60	430-60	530-60	630-60
3 PSI	50	410-50	510-50	610-50	420-50	520-50	620-50	430-50	530-50	630-50
3 PSI	40	410-40	510-40	610-40	420-40	520-40	620-40	430-40	530-40	630-40
3 PSI	30	410-30	510-30	610-30	420-30	520-30	620-30	430-30	530-30	630-30
3 PSI	20	410-20	510-20	610-20	420-20	520-20	620-20	430-20	530-20	630-20
5 PSI	*100	410-5-100	510-5-100	610-5-100	420-5-100	520-5-100	620-5-100	430-5-100	530-5-100	630-5-100
5 PSI	80	410-5-80	510-5-80	610-5-80	420-5-80	520-5-80	620-5-80	430-5-80	530-5-80	630-5-80
5 PSI	60	410-5-60	510-5-60	610-5-60	420-5-60	520-5-60	620-5-60	430-5-60	530-5-60	630-5-60
5 PSI	50	410-5-50	510-5-50	610-5-50	420-5-50	520-5-50	620-5-50	430-5-50	530-5-50	630-5-50
5 PSI	40	410-5-40	510-5-40	610-5-40	420-5-40	520-5-40	620-5-40	430-5-40	530-5-40	630-5-40
5 PSI	30	410-5-30	510-5-30	610-5-30	420-5-30	520-5-30	620-5-30	430-5-30	530-5-30	630-5-30
5 PSI	20	410-5-20	510-5-20	610-5-20	420-5-20	520-5-20	620-5-20	430-5-20	530-5-20	630-5-20
**3 PSI	150	410-150	510-150	610-150	420-150	520-150	620-150	430-150	530-150	630-150
3 PSI	200	410-200	510-200	610-200	420-200	520-200	620-200	430-200	530-200	630-200
5 PSI	150	410-5-150	510-5-150	610-5-150	420-5-150	520-5-150	620-5-150	430-5-150	530-5-150	630-5-150
5 PSI	200	410-5-200	510-5-200	610-5-200	420-5-200	520-5-200	620-5-200	430-5-200	530-5-200	630-5-200

		50 GPM			50 GPM			75 GPM			100 GPM
		1 1/2" NPTF	1 1/8" ODT	1 1/2" NPTM	2" NPTF	2 3/8" ODT	2" NPTM	2 1/2" NPTF	2 1/8" ODT	2 1/2" NPTM	3" NPTF
By-Pass	Mesh	MODEL NUMBERS									
No	*100	150-1 1/2-100	250-1 1/2-100	350-1 1/2-100	150-100	250-100	350-100	175-100	275-100	375-100	051481-1210
No	80	150-1 1/2-80	250-1 1/2-80	350-1 1/2-80	150-80	250-80	350-80	175-80	275-80	375-80	051481-1208
No	60	150-1 1/2-60	250-1 1/2-60	350-1 1/2-60	150-60	250-60	350-60	175-60	275-60	375-60	051481-1206
No	50	150-1 1/2-50	250-1 1/2-50	350-1 1/2-50	150-50	250-50	350-50	175-50	275-50	375-50	051481-1205
No	40	150-1 1/2-40	250-1 1/2-40	350-1 1/2-40	150-40	250-40	350-40	175-40	275-40	375-40	051481-1204
No	30	150-1 1/2-30	250-1 1/2-30	350-1 1/2-30	150-30	250-30	350-30	175-30	275-30	375-30	051481-1203
No	20	150-1 1/2-20	250-1 1/2-20	350-1 1/2-20	150-20	250-20	350-20	175-20	275-20	375-20	051481-1202
No	150	150-1 1/2-150	250-1 1/2-150	350-1 1/2-150	150-150	250-150	350-150	175-150	275-150	375-150	051481-1215
No	200	150-1 1/2-200	250-1 1/2-200	350-1 1/2-200	150-200	250-200	350-200	175-200	275-200	375-200	051481-1220
**3 PSI	*100	450-1 1/2-100	550-1 1/2-100	650-1 1/2-100	450-100	550-100	650-100	475-100	575-100	675-100	051481-1210-03
3 PSI	80	450-1 1/2-80	550-1 1/2-80	650-1 1/2-80	450-80	550-80	650-80	475-80	575-80	675-80	051481-1208-03
3 PSI	60	450-1 1/2-60	550-1 1/2-60	650-1 1/2-60	450-60	550-60	650-60	475-60	575-60	675-60	051481-1206-03
3 PSI	50	450-1 1/2-50	550-1 1/2-50	650-1 1/2-50	450-50	550-50	650-50	475-50	575-50	675-50	051481-1205-03
3 PSI	40	450-1 1/2-40	550-1 1/2-40	650-1 1/2-40	450-40	550-40	650-40	475-40	575-40	675-40	051481-1204-03
3 PSI	30	450-1 1/2-30	550-1 1/2-30	650-1 1/2-30	450-30	550-30	650-30	475-30	575-30	675-30	051481-1203-03
3 PSI	20	450-1 1/2-20	550-1 1/2-20	650-1 1/2-20	450-20	550-20	650-20	475-20	575-20	675-20	051481-1202-03
5 PSI	*100	450-1 1/2-5-100	550-1 1/2-5-100	650-1 1/2-5-100	450-5-100	550-5-100	650-5-100	475-5-100	575-5-100	675-5-100	051481-1210-05
5 PSI	80	450-1 1/2-5-80	550-1 1/2-5-80	650-1 1/2-5-80	450-5-80	550-5-80	650-5-80	475-5-80	575-5-80	675-5-80	051481-1208-05
5 PSI	60	450-1 1/2-5-60	550-1 1/2-5-60	650-1 1/2-5-60	450-5-60	550-5-60	650-5-60	475-5-60	575-5-60	675-5-60	051481-1206-05
5 PSI	50	450-1 1/2-5-50	550-1 1/2-5-50	650-1 1/2-5-50	450-5-50	550-5-50	650-5-50	475-5-50	575-5-50	675-5-50	051481-1205-05
5 PSI	40	450-1 1/2-5-40	550-1 1/2-5-40	650-1 1/2-5-40	450-5-40	550-5-40	650-5-40	475-5-40	575-5-40	675-5-40	051481-1204-05
5 PSI	30	450-1 1/2-5-30	550-1 1/2-5-30	650-1 1/2-5-30	450-5-30	550-5-30	650-5-30	475-5-30	575-5-30	675-5-30	051481-1203-05
5 PSI	20	450-1 1/2-5-20	550-1 1/2-5-20	650-1 1/2-5-20	450-5-20	550-5-20	650-5-20	475-5-20	575-5-20	675-5-20	051481-1202-05
**3 PSI	150	450-1 1/2-150	550-1 1/2-150	650-1 1/2-150	450-150	550-150	650-150	475-150	575-150	675-150	051481-1215-03
3 PSI	200	450-1 1/2-200	550-1 1/2-200	650-1 1/2-200	450-200	550-200	650-200	475-200	575-200	675-200	051481-1220-03
5 PSI	150	450-1 1/2-5-150	550-1 1/2-5-150	650-1 1/2-5-150	450-5-150	550-5-150	650-5-150	475-5-150	575-5-150	675-5-150	051481-1215-05
5 PSI	200	450-1 1/2-5-200	550-1 1/2-5-200	650-1 1/2-5-200	450-5-200	550-5-200	650-5-200	475-5-200	575-5-200	675-5-200	051481-1220-05

\*100 MESH STANDARD  
\*\*STANDARD BY-PASS

**NOTE:** To specify MarvelMag Magnetic Filters, insert "M" in Model No. Example: 410-100 becomes "410M100." To order Replacement Element only pleated for magnets but less the magnets, change "M" in Number to "MN", making it, in example, "410MNM100."



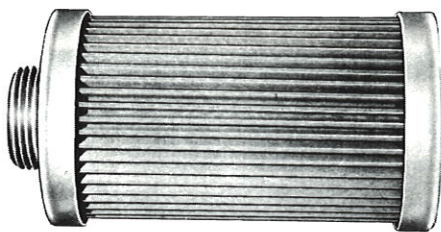
# BONDED SUMP TYPE — ALL STAINLESS STEEL

# MARVEL FILTERS

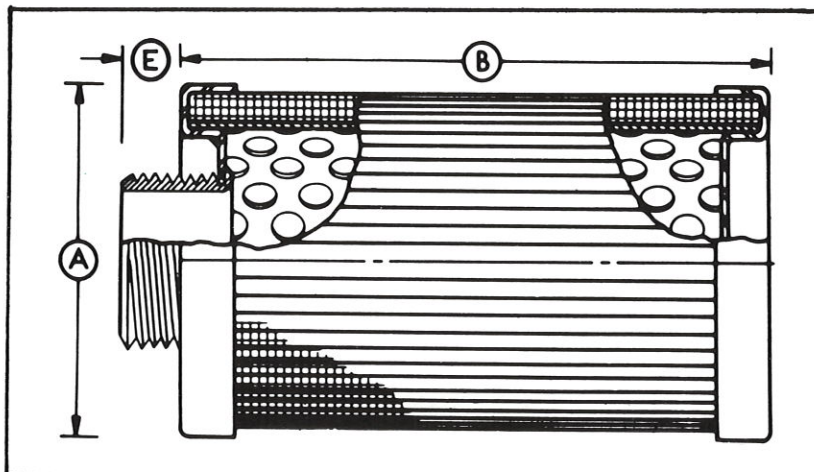
FOR WATER AND SPECIAL FLUIDS — 1000 SERIES — (NO BY-PASS) — Operating Temperatures: Up to 300°F

**CAPACITIES:**  
Up to 75 GPM

**PIPE SIZES:**  
1" through 2½"



To Clean:  
Follow same simple cleaning procedures as described on page 8.



## UNIQUE MARVELMAG MAGNETIC SHIELD

protects entire hydraulic system from those everpresent ferric contaminants

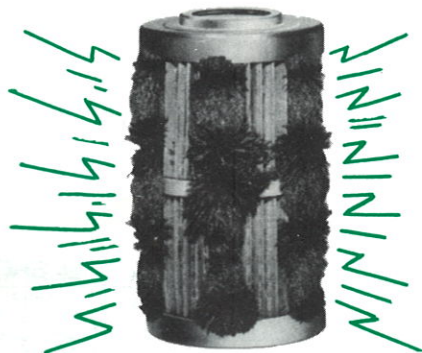


Photo shows amazing effectiveness of MarvelMag magnetic rods in trapping ferric particles, yet leaving large element flow areas that assure continuous full-flow filtration.

### ENGINEERING DATA — MOUNTING DIMENSIONS — MODEL NUMBERS

SIZE	10 GPM	20 GPM	30 GPM	50 GPM	75 GPM
PORT	1" NPTM	1¼" NPTM	1½" NPTM	2" NPTM	2½" NPTM
<b>PRESSURE DROP PSI</b>					
W only	.13	.10	.15	.15	.18
<b>APPROX. WT. LBS.</b>					
1000 SER.	¾	1	1-1/4	1-1/2	2
<b>DIMENSIONS INCHES</b>					
A	2.62	3.09	3.38	3.94	4.38
B	4.56	7.06	8.06	9.06	9.62
E	.44	.44	.44	.50	.88
<b>MESH</b>					
<b>MODEL NUMBERS</b>					
100	1010-100	1020-100	1030-100	1050-100	1075-100
80	1010-80	1020-80	1030-80	1050-80	1075-80
60	1010-60	1020-60	1030-60	1050-60	1075-60
50	1010-50	1020-50	1030-50	1050-50	1075-50
40	1010-40	1020-40	1030-40	1050-40	1075-40
30	1010-30	1020-30	1030-30	1050-30	1075-30
20	1010-20	1020-20	1030-20	1050-20	1075-20
150	1010-150	1020-150	1030-150	1050-150	1075-150
200	1010-200	1020-200	1030-200	1050-200	1075-200

NOTE: To specify MarvelMag Magnetic Filters, insert "M" in Model Number. Example: 1010-60 becomes "1010M60." To order Replacement Element pleated for magnets but less the magnets, simply change "M" in Number to "MN", making it, in example "1010MN60."

Better filtration, longer element life, hours saved in servicing . . . with amazing new MarvelMag elements. The harsh, cutting ferric contaminants (that do the most damage to system components) are instantly trapped by complete, outer MarvelMag Magnetic Shield BEFORE they can reach element, keeping it—and entire system—clean, undamaged and functioning at top efficiency for much longer periods without servicing. Ferric particles small enough to pass through element and on into system are most speedily trapped and retained by the all-encircling magnetic shield. Generous flow areas between magnetic rods remain uncluttered, greatly increasing filter efficiency and life. The magnetic rods do not increase element dimensions, providing complete interchangeability of MarvelMag elements with non-magnetic elements. **Examples for specifying MarvelMag are given on appropriate pages.**

### OVERLAPPING MAGNETIC FIELDS

The individual magnetic rods are full filter element length and their unique design provides powerful magnetic fields along entire length of element. The rods are equally spaced around exterior surface of element so that their magnetic fields overlap to cover full element circumference. This provides a complete magnetic shield around the outer (upstream) side of element in the area of lowest fluid velocity—where ferric particles are most effectively trapped and retained and where overall filtering efficiency is at maximum.



### SO EASY TO SERVICE!

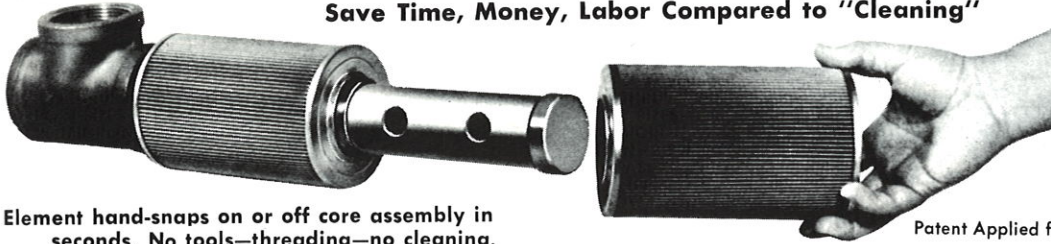
"Lay-in . . . Lift-out" Magnetic rods. MarvelMag Shield is formed by individual magnetic rods placed in grooves on outer surface of Synclinal element. To clean rods, just lift out, wipe off, and lay them back in grooves. Slip-on spring clip keeps rods from being magnetically dislodged accidentally.



# MARVEL FILTERS

## NEW SUMP FILTERS with QUICK-CHANGE THROW-AWAY ELEMENTS

Save Time, Money, Labor Compared to "Cleaning"



UP TO 60 GPM (Max.)-  
1"-1 1/2" THRU' 2"-1 1/2"  
NPTF PORT SIZES -  
3, 10, 20 MICRON  
FILTRATION - 2 PSI, 3 PSI,  
5 PSI BY-PASS OR NO  
BY-PASS - TEE, CROSS,  
AND ELBOW FITTING  
TYPES

Element hand-snaps on or off core assembly in seconds. No tools—threading—no cleaning.

Patent Applied for

Says the maintenance supervisor of a large industrial plant: "We don't clean our sump filters. We just throw them away because the labor costs (not to mention the time loss) of cleaning are substantially higher than our costs for whole new filters. In this way, too, we are always sure of starting anew with a 100% contamination-free element."

Even if you don't throw away your cleanable sump filters, Marvel's new Sump Filters with Throw-Away Elements assure substantial savings. No need to waste time, money, and labor in removing, cleaning and re-installing entire filter. You just throw away the used element and hand-snap on a new, fresh element—all in few seconds. And the cost of these Marvel

Throw-Away Elements is a small fraction of the cost of cleanable elements. The Throw-Away elements are "O" ring sealed in place and provide 20 micron and finer filtration. Compare this fine filtration with the 141 micron filtration common to sump strainers. Very low pressure drop and generous size By-Pass Valve of New Filter assure long element life with elimination of pump cavitation danger.

Filters available in standard length, extended length, and double length element models. Recommended for use with Marvelindicator as shown in circuits, page 13.

NOTE: Quick-Change Cleanable Elements (hand-snap on and off) also available.

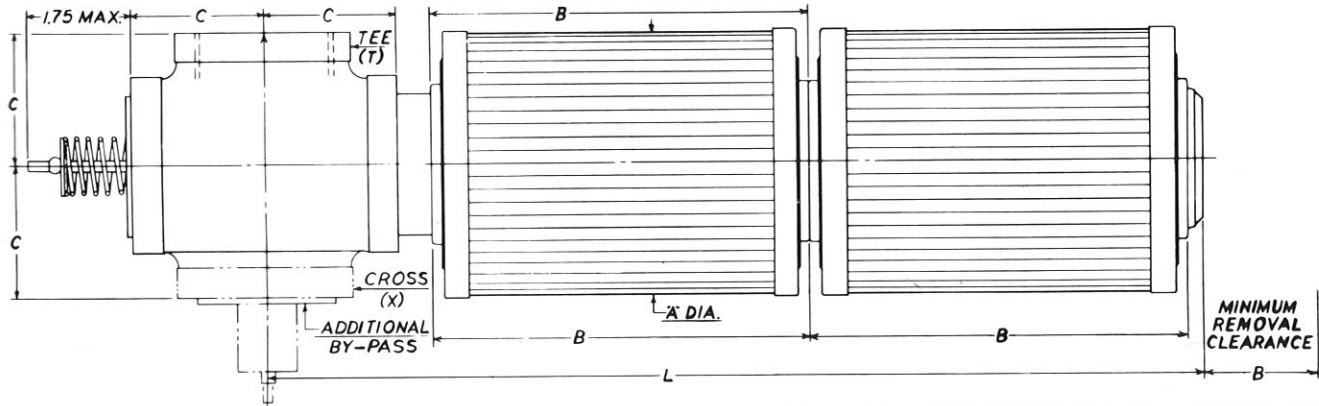


TABLE I—GPM CAPACITIES										TABLE II FILTER MODEL NOS.				TABLE III—DIMENSIONS						
at Different By-Pass Settings and Micron Ratings—based on 1 psi or less pressure drop with clean element and 225 SUS Petroleum Oil. For Phosphate Ester Fluid, use 66% of GPM capacities shown; 80% for Water Glycol.										Core Assembly Nos.				For Single, Extended Length and Double Element Filters.						
MAX. GPM RATINGS	2 PSI BY-PASS			3 PSI BY-PASS			5 PSI BY-PASS			④	⑤	⑥	⑦	Port Size NPTF	No. of Elements per Filter	Element Length	DIMENSIONS (NO MINIMAL INCHES)			
	10 Micron	25 Micron	40 Micron	10 Micron	25 Micron	40 Micron	10 Micron	25 Micron	**TEE FITTING TYPE	**CROSS FITTING TYPE	Hyd. Oils, Coolants, Lubricants, Water Glycols	Phosphate Ester Base Fluids	A				B	C	L	
	2.3	4.6	9.2	3.4	6.9	13.8	5.1	10.2	061161T*	061161X*	629206-†	630206-†	1-11/2	1	Standard	2.62	5.00	1.50	7.38	
	3.5	7.0	14.0	5.2	10.4		7.9	15.8	063161T*	063161X*	660206-†	661206-†		1	Extended		7.50		9.88	
	4.6	9.2		6.8	13.8		10.2		066161T*	066161X*	629206-†	660206-†		2	††Double		5.00 (ea.)		12.38	
	4.8	9.6	19.2	7.6	14.4	28.8	10.6	21.2	061201T*	061201X*	664266-†	665266-†	1 1/4-11 1/2	1	Standard	3.0	7.50	1.75	10.12	
	6.5	13.0	26.0	9.8	19.6		14.4		063201T*	063201X*	666266-†	667266-†		1	Extended		10.00		12.62	
	9.6	19.2		14.4	28.8		21.2		066201T*	066201X*	664266-†	665266-†		2	††Double		7.50 (ea.)		17.62	
	5.7	11.4	22.8	8.5	17.0	34.0	12.6	25.2	061241T*	061241X*	668306-†	669306-†	1 1/2-11 1/2	1	Standard	3.38	7.50	1.94	10.31	
	7.8	15.6	31.2	11.5	23.0		16.9		063241T*	063241X*	670306-†	671306-†		1	Extended		10.00		12.81	
11.4	22.8		17.0	34.0		25.0		066241T*	066241X*	668306-†	669306-†		2	††Double		7.50 (ea.)		17.81		
10.0	20.0	40.0	15.0	30.0	60.0	22.0	45.0	061321T*	061321X*	676386-†	677386-†	2-11 1/2	1	Standard		7.50		10.62		
13.0	27.0	53.0	20.0	40.0		29.0		063321T*	063321X*	678386-†	679386-†		1	Extended		10.00	2.25	13.12		
20.0	40.0		30.0	60.0		45.0		066321T*	066321X*	676386-†	677386-†		2	††Double		7.50 (ea.)		18.12		

\*Insert By-Pass setting (from Table IV).  
†Insert Filter Element Media No. (from Table V).

\*\*For Elbow Outlet (no By-Pass), change "T" or "X" to "E."  
††For No-Outlet Fitting, change "T" or "X" to a dash (-).

††Two Standard Length Elements in Tandem.

**HOW TO ORDER:** In Table I, beginning at top of Table, read down to your desired (or next larger) GPM under your desired By-Pass and Microns (Col. 1, 2 or 3). Then make up your Filter No. from the following:

- Core Assembly No., Table II, Col. 4 or 5, in same horizontal line as desired GPM.
- By-Pass No., from Table IV.
- Element No. (for fluid to be filtered), from Table II, Col. 6 or 7 in same horizontal line as Core Assembly No.
- Element Media No. (for desired micron filtration), from Table V.

**EXAMPLE:** A 25 gpm, 2 psi By-Pass, 20-micron Filter, Tee Fitting Type for Petroleum Oil is specified by the following:

(a) (b) (c) (d)  
063201T0200-666266-7120

Reading horizontally to right from Element No. in Table II to Table III gives you the Port Sizes and Dimensions of Filter. To specify above filter with Magnetic Element, change dash in Element No. to "M", making it "666266M7120." To order Replacement Elements only, specify Element and Media Nos. (c & d) only. To order Replacement Element pleated for magnets but less the magnets, change "M" in Magnetic Element Number to "MN", making it, in above example, "666266MN7120."

### \*TABLE IV—BY-PASS OPTIONS

2 PSI BY-PASS, ADD 0200 TO CORE NUMBER
3 PSI BY-PASS, ADD 0300 TO CORE NUMBER
5 PSI BY-PASS, ADD 0500 TO CORE NUMBER
NO PSI BY-PASS, ADD 0000 TO CORE NUMBER

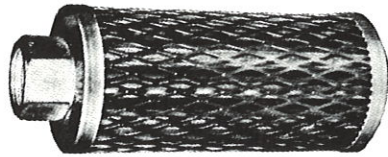
### †TABLE IV—ELEMENT MEDIA NUMBERS

NUMBER	(NOM.) MICRON	MEDIA
7103	3	3 MICRON PAPER
7110	10	10 MICRON PAPER
7120	20	20 MICRON PAPER



# TAKE-APART SUMP TYPE — UP TO 100 GPM — 3/4" THRU 3" PIPE SIZES

Use with "Marvindicator" Element Condition Indicator (See pages 24 & 25)



**CAPACITIES:**

5—8—10—20—30—50—75 and 100 G.P.M.

**PIPE SIZES:**

3/4"—1"—1 1/4"—1 1/2"—2"—2 1/2" and 3"

**CONNECTIONS:**

Coupling—Male Nipple.

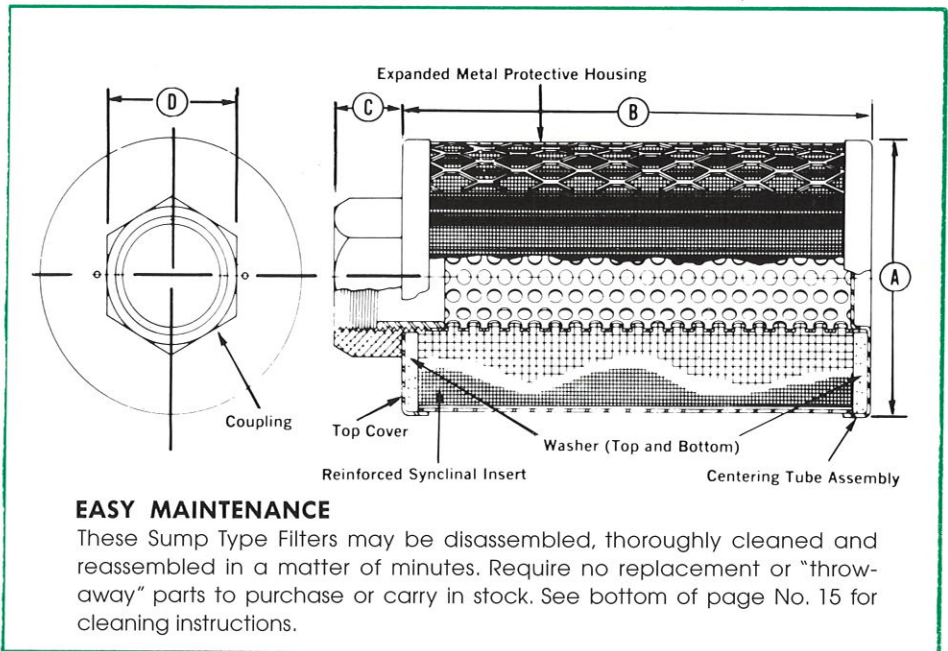
**BY-PASS VALVE:**

Not available.

**OPERATING TEMPERATURES:**

Up to 150° F. Also available on special order for higher temperatures.

For use with regular petroleum base Hydraulic Oils, Coolants, Lubricants, all types of Fire-resistant Hydraulic Fluids and Water.



**EASY MAINTENANCE**

These Sump Type Filters may be disassembled, thoroughly cleaned and reassembled in a matter of minutes. Require no replacement or "throw-away" parts to purchase or carry in stock. See bottom of page No. 15 for cleaning instructions.

**ENGINEERING DATA—MOUNTING DIMENSIONS—PART NUMBERS**

SIZE	5 GPM	8 GPM	10 GPM	20 GPM	30 GPM	50 GPM	50 GPM	75 GPM	100 GPM
PORT	3/4 NPTF	3/4 NPTF	1" NPTF	1 1/4 NPTF	1 1/2 NPTF	1 1/2 NPTF	2" NPTF	2 1/2 NPTF	3" NPTF
* PRESSURE DROP PSI									
St'd.	.20	.35	.26	.20	.27	.63	.26	.27	.24
S only	.25	.63	.38	.41	.45	1.10	.39	.47	.35
N only	.23	.43	.31	.23	.32	.79	.30	.32	.27
W only	.10	.18	.15	.13	.21	.50	.19	.19	.15
APPROX. WT. LBS.									
St'd. - S - N	1	1 1/2	1 1/2	2 1/2	3	3	4	4 1/2	5 1/2
W only	1 1/4	1 1/2	2	3	4	4	5	6 3/4	8 3/4
DIMENSIONS INCHES									
A	2.75	2.75	3.25	4.06	4.75	4.75	5.25	6.00	6.50
B	4.50	6.50	6.62	8.62	8.62	8.62	9.62	10.62	11.62
C	1.00	1.00	1.12	1.25	1.25	1.25	1.50	2.00	2.00
D	1.44	1.44	1.75	2.12	2.38	2.38	3.00	3.25	4.00
COUPLING PART NUMBERS									
St'd. - S - N	P001	P001	P002	P003	P004	P004	P005	P006	P007
W only	P008	P008	P009	P010	P011	P011	P012	P013	P014
TOP COVER PART NUMBERS									
St'd.	P015	P016	P017	P018	P019	P020	P021	P022	P023
S only	P024	P025	P026	P027	P028	P029	P030	P031	P032
N only	P033	P034	P035	P036	P037	P038	P039	P040	P041
W only	P042	P043	P044	P045	P046	P047	P048	P049	P050
# REINFORCED SYNCLINAL INSERT PART NUMBERS									
St'd. & S	P051-100	P052-100	P053-100	P054-100	P055-100	P056-100	P057-100	P058-100	P059-100
N only	P060-60	P061-60	P062-60	P063-60	P064-60	P065-60	P066-60	P067-60	P068-60
W only	P069-100	P070-100	P071-100	P072-100	P073-100	P074-100	P075-100	P076-100	P077-100
CENTERING TUBE ASSEMBLY PART NUMBERS									
St'd. - S - N	P078	P079	P080	P081	P082	P082	P083	P084	P085
W only	P086	P087	P088	P089	P090	P090	P091	P092	P093
EXPANDED METAL PROTECTIVE HOUSING PART NUMBERS									
St'd. - S - N	P094	P095	P096	P097	P098	P098	P099	P100	P101
W only	P102	P103	P104	P105	P106	P106	P107	P108	P109
WASHER (TOP AND BOTTOM) PART NUMBERS									
St'd. - N - W	P111	P111	P112	‡P113	P114	P114	P115	P116	P117
S only	P118	P118	P119	P121	P122	P122	P123	P124	P125

\*St'd.—HYDRAULIC OILS—COOLANTS—LUBRICANTS—225 SSU @ 100° F  
 S—PHOSPHATE ESTER BASE FIRE RESISTANT FLUIDS—225 SSU @ 100° F  
 N—AQUEOUS BASE (WATER GLYCOL) FIRE RESISTANT FLUIDS—225 SSU @ 100° F  
 W—WATER—60° F ‡PART NUMBER FOR "W" FILTERS IS P307  
 #PART NUMBERS FOR STANDARD MESH—CHANGE SUFFIX TO CORRESPOND FOR OTHER MESH SIZES



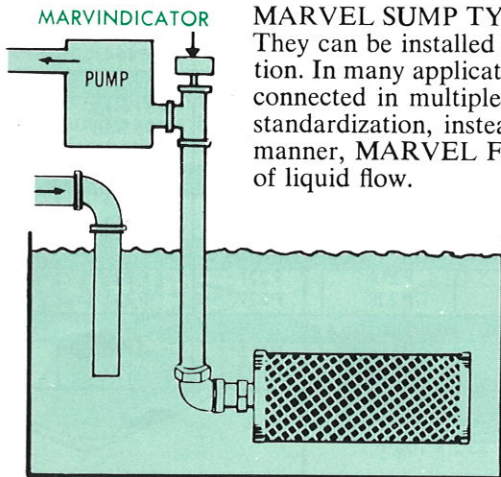
## MARVEL MODEL NUMBERS — TAKE-APART SUMP TYPE FILTERS SHOWN ON PAGE 12

MESH	5 GPM	8 GPM	10 GPM	20 GPM	30 GPM	50 GPM	50 GPM	75 GPM	100 GPM
	3/4 NPTF	3/4 NPTF	1" NPTF	1 1/4 NPTF	1 1/2 NPTF	1 1/2 NPTF	2" NPTF	2 1/2 NPTF	3 NPTF
<b>MODEL NUMBERS</b>									
<b>HYDRAULIC OILS — COOLANTS — LUBRICANTS</b>									
100*	E-3/4-5-100	D-3/4-8-100	C-1-10-100	B-1 1/4-20-100	A-1 1/2-30-100	A-1 1/2-50-100	A-2-50-100	A-2 1/2-75-100	A-3-100-100
80	E-3/4-5-80	D-3/4-8-80	C-1-10-80	B-1 1/4-20-80	A-1 1/2-30-80	A-1 1/2-50-80	A-2-50-80	A-2 1/2-75-80	A-3-100-80
60	E-3/4-5-60	D-3/4-8-60	C-1-10-60	B-1 1/4-20-60	A-1 1/2-30-60	A-1 1/2-50-60	A-2-50-60	A-2 1/2-75-60	A-3-100-60
50	E-3/4-5-50	D-3/4-8-50	C-1-10-50	B-1 1/4-20-50	A-1 1/2-30-50	A-1 1/2-50-50	A-2-50-50	A-2 1/2-75-50	A-3-100-50
40	E-3/4-5-40	D-3/4-8-40	C-1-10-40	B-1 1/4-20-40	A-1 1/2-30-40	A-1 1/2-50-40	A-2-50-40	A-2 1/2-75-40	A-3-100-40
30	E-3/4-5-30	D-3/4-8-30	C-1-10-30	B-1 1/4-20-30	A-1 1/2-30-30	A-1 1/2-50-30	A-2-50-30	A-2 1/2-75-30	A-3-100-30
<b>"S" SERIES — PHOSPHATE ESTER BASE FIRE RESISTANT FLUID</b>									
100*	E-3/4-5S-100	D-3/4-8S-100	C-1-10S-100	B-1 1/4-20S-100	A-1 1/2-30S-100	A-1 1/2-50S-100	A-2-50S-100	A-2 1/2-75S-100	A-3-100S-100
80	E-3/4-5S-80	D-3/4-8S-80	C-1-10S-80	B-1 1/4-20S-80	A-1 1/2-30S-80	A-1 1/2-50S-80	A-2-50S-80	A-2 1/2-75S-80	A-3-100S-80
60	E-3/4-5S-60	D-3/4-8S-60	C-1-10S-60	B-1 1/4-20S-60	A-1 1/2-30S-60	A-1 1/2-50S-60	A-2-50S-60	A-2 1/2-75S-60	A-3-100S-60
50	E-3/4-5S-50	D-3/4-8S-50	C-1-10S-50	B-1 1/4-20S-50	A-1 1/2-30S-50	A-1 1/2-50S-50	A-2-50S-50	A-2 1/2-75S-50	A-3-100S-50
40	E-3/4-5S-40	D-3/4-8S-40	C-1-10S-40	B-1 1/4-20S-40	A-1 1/2-30S-40	A-1 1/2-50S-40	A-2-50S-40	A-2 1/2-75S-40	A-3-100S-40
30	E-3/4-5S-30	D-3/4-8S-30	C-1-10S-30	B-1 1/4-20S-30	A-1 1/2-30S-30	A-1 1/2-50S-30	A-2-50S-30	A-2 1/2-75S-30	A-3-100S-30
<b>"N" SERIES — WATER GLYCOL FIRE RESISTANT FLUID</b>									
60	E-3/4-5N-60	D-3/4-8N-60	C-1-10N-60	B-1 1/4-20N-60	A-1 1/2-30N-60	A-1 1/2-50N-60	A-2-50N-60	A-2 1/2-75N-60	A-3-100N-60
50	E-3/4-5N-50	D-3/4-8N-50	C-1-10N-50	B-1 1/4-20N-50	A-1 1/2-30N-50	A-1 1/2-50N-50	A-2-50N-50	A-2 1/2-75N-50	A-3-100N-50
40	E-3/4-5N-40	D-3/4-8N-40	C-1-10N-40	B-1 1/4-20N-40	A-1 1/2-30N-40	A-1 1/2-50N-40	A-2-50N-40	A-2 1/2-75N-40	A-3-100N-40
30	E-3/4-5N-30	D-3/4-8N-30	C-1-10N-30	B-1 1/4-20N-30	A-1 1/2-30N-30	A-1 1/2-50N-30	A-2-50N-30	A-2 1/2-75N-30	A-3-100N-30
<b>"W" SERIES — WATER</b>									
100*	E-3/4-5W-100	D-3/4-8W-100	C-1-10W-100	B-1 1/4-20W-100	A-1 1/2-30W-100	A-1 1/2-50W-100	A-2-50W-100	A-2 1/2-75W-100	A-3-100W-100
80	E-3/4-5W-80	D-3/4-8W-80	C-1-10W-80	B-1 1/4-20W-80	A-1 1/2-30W-80	A-1 1/2-50W-80	A-2-50W-80	A-2 1/2-75W-80	A-3-100W-80
60	E-3/4-5W-60	D-3/4-8W-60	C-1-10W-60	B-1 1/4-20W-60	A-1 1/2-30W-60	A-1 1/2-50W-60	A-2-50W-60	A-2 1/2-75W-60	A-3-100W-60
50	E-3/4-5W-50	D-3/4-8W-50	C-1-10W-50	B-1 1/4-20W-50	A-1 1/2-30W-50	A-1 1/2-50W-50	A-2-50W-50	A-2 1/2-75W-50	A-3-100W-50
40	E-3/4-5W-40	D-3/4-8W-40	C-1-10W-40	B-1 1/4-20W-40	A-1 1/2-30W-40	A-1 1/2-50W-40	A-2-50W-40	A-2 1/2-75W-40	A-3-100W-40
30	E-3/4-5W-30	D-3/4-8W-30	C-1-10W-30	B-1 1/4-20W-30	A-1 1/2-30W-30	A-1 1/2-50W-30	A-2-50W-30	A-2 1/2-75W-30	A-3-100W-30
<b>HYDRAULIC OILS — COOLANTS — LUBRICANTS</b>									
150	E-3/4-5-150	D-3/4-8-150	C-1-10-150	B-1 1/4-20-150	A-1 1/2-30-150	A-1 1/2-50-150	A-2-50-150	A-2 1/2-75-150	A-3-100-150
200	E-3/4-5-200	D-3/4-8-200	C-1-10-200	B-1 1/4-20-200	A-1 1/2-30-200	A-1 1/2-50-200	A-2-50-200	A-2 1/2-75-200	A-3-100-200
<b>"S" SERIES — PHOSPHATE ESTER BASE FIRE RESISTANT FLUID</b>									
150	E-3/4-5S-150	D-3/4-8S-150	C-1-10S-150	B-1 1/4-20S-150	A-1 1/2-30S-150	A-1 1/2-50S-150	A-2-50S-150	A-2 1/2-75S-150	A-3-100S-150
200	E-3/4-5S-200	D-3/4-8S-200	C-1-10S-200	B-1 1/4-20S-200	A-1 1/2-30S-200	A-1 1/2-50S-200	A-2-50S-200	A-2 1/2-75S-200	A-3-100S-200
<b>"W" SERIES — WATER</b>									
150	E-3/4-5W-150	D-3/4-8W-150	C-1-10W-150	B-1 1/4-20W-150	A-1 1/2-30W-150	A-1 1/2-50W-150	A-2-50W-150	A-2 1/2-75W-150	A-3-100W-150
200	E-3/4-5W-200	D-3/4-8W-200	C-1-10W-200	B-1 1/4-20W-200	A-1 1/2-30W-200	A-1 1/2-50W-200	A-2-50W-200	A-2 1/2-75W-200	A-3-100W-200

\* STANDARD MESH

**NOTE:** To specify MarvelMag Magnetic Filters, insert letter "M" in Model Number. Example: A-2 1/2-75-100 becomes "A-2 1/2-75M100"

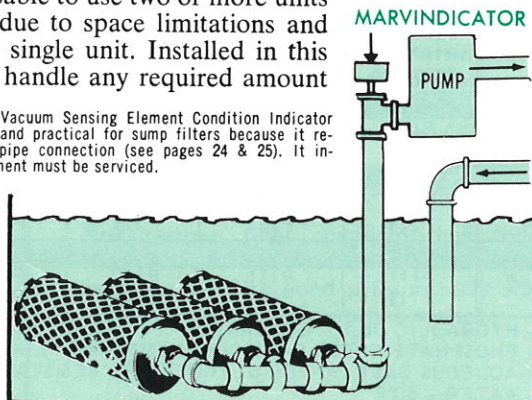
## TYPICAL SUMP TYPE INSTALLATION



TYPICAL SINGLE UNIT INSTALLATION

MARVEL SUMP TYPE FILTERS are not limited to their individual capacities. They can be installed and will work efficiently in a multiple or manifold application. In many applications it is advisable to use two or more units connected in multiple installation, due to space limitations and standardization, instead of a larger single unit. Installed in this manner, MARVEL FILTERS can handle any required amount of liquid flow.

"Marvindicator" Vacuum Sensing Element Condition Indicator most convenient and practical for sump filters because it requires only one pipe connection (see pages 24 & 25). It indicates when element must be serviced.

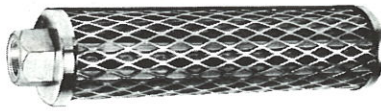


TYPICAL MULTIPLE UNIT INSTALLATION



# TANDEM TAKE-APART SUMP TYPE — UP TO 200 GPM — 3/4" THRU 3" PIPE SIZES

Use with "Marvindicator" Element Condition Indicator (See pages 24 & 25)



The tandem sump filters can be used at rated flow where the pressure drop is not excessive. Where pressure drop is high the tandem units should only be used at reduced flow and consequent reduced pressure drop, but obtaining extended time intervals between cleaning operations.

**PIPE SIZES:**

3/4" — 1" — 1 1/4" — 1 1/2" — 2" — 2 1/2" and 3"

**CONNECTIONS:**

Coupling—Male Nipple.

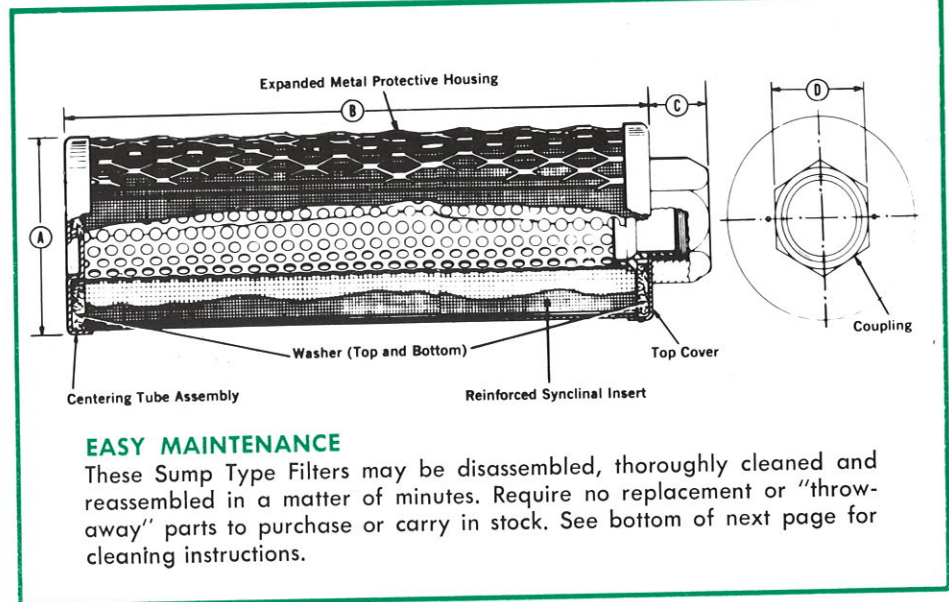
**BY-PASS VALVE:**

Not Available.

**OPERATING TEMPERATURES:**

Up to 150° F. Also available on special order for higher temperatures.

For use with regular petroleum base Hydraulic Oils, Coolants, Lubricants and all types of Fire-resistant Hydraulic Fluids and water.



**EASY MAINTENANCE**

These Sump Type Filters may be disassembled, thoroughly cleaned and reassembled in a matter of minutes. Require no replacement or "throw-away" parts to purchase or carry in stock. See bottom of next page for cleaning instructions.

**ENGINEERING DATA—MOUNTING DIMENSIONS—PART NUMBERS**

SIZE PORT	10 GPM 3/4"NPTF	16 GPM 3/4"NPTF	20 GPM 1" NPTF	40 GPM 1 1/4"NPTF	60 GPM 1 1/2"NPTF	100 GPM 1 1/2"NPTF	100 GPM 2"NPTF	150 GPM 2 1/2"NPTF	200 GPM 3" NPTF
<b>* PRESSURE DROP PSI</b>									
St'd.	.46	1.09	.69	.66	.92	2.10	.83	.71	.69
S only	.86	2.24	1.25	1.11	1.42	3.68	1.30	1.53	1.45
N only	.59	1.41	.88	.84	1.15	2.69	1.07	.89	.87
W only	.23	.55	.38	.43	.74	1.68	.62	.50	.45
<b>APPROX. WT. LBS.</b>									
St'd. • S • N	1 1/4	1 3/4	2	4	4 3/4	4 3/4	6	8 1/4	10
W only	1 1/2	2	2 1/2	4 1/2	5 3/4	5 3/4	7	10 1/2	13 1/4
<b>DIMENSIONS INCHES</b>									
A	2.75	2.75	3.25	4.06	4.75	4.75	5.25	6.00	6.50
B	8.38	12.62	12.75	17.12	16.75	16.75	18.62	20.62	22.62
C	1.00	1.00	1.12	1.25	1.25	1.25	1.50	2.00	2.00
D	1.44	1.44	1.75	2.12	2.38	2.38	3.00	3.25	4.00
<b>COUPLING PART NUMBERS</b>									
St'd. • S • N	P001	P001	P002	P003	P004	P004	P005	P006	P007
W only	P008	P008	P009	P010	P011	P011	P012	P013	P014
<b>TOP COVER PART NUMBERS</b>									
St'd.	P126	P127	P128	P129	P131	P132	P133	P134	P135
S only	P136	P137	P138	P139	P141	P142	P143	P144	P145
N only	P146	P147	P148	P149	P151	P152	P153	P154	P155
W only	P156	P157	P158	P159	P161	P162	P163	P164	P165
<b># REINFORCED SYNCINAL INSERT PART NUMBERS</b>									
St'd. • & S	P166-100	P167-100	P168-100	P169-100	P171-100	P172-100	P173-100	P174-100	P176-100
N only	P177-60	P178-60	P179-60	P181-60	P182-60	P183-60	P184-60	P185-60	P186-60
W only	P187-100	P188-100	P189-100	P191-100	P192-100	P193-100	P194-100	P195-100	P196-100
<b>CENTERING TUBE ASSEMBLY PART NUMBERS</b>									
St'd. • S • N	P197	P198	P199	P201	P202	P202	P203	P204	P205
W only	P206	P207	P208	P209	P211	P211	P212	P213	P214
<b>EXPANDED METAL PROTECTIVE HOUSING PART NUMBERS</b>									
St'd. • S • N	P215	P216	P217	P218	P219	P219	P221	P222	P223
W only	P224	P225	P226	P227	P228	P228	P229	P231	P232
<b>WASHER (TOP AND BOTTOM) PART NUMBERS</b>									
St'd. • N • W	P111	P111	P112	P113	P114	P114	P115	P116	P117
S only	P118	P118	P119	P121	P122	P122	P123	P124	P125

\* St'd. — HYDRAULIC OILS — COOLANTS — LUBRICANTS — 225 SSU @ 100°F  
 S — PHOSPHATE ESTER BASE FIRE RESISTANT FLUIDS — 225 SSU @ 100°F  
 N — AQUEOUS BASE (WATER GLYCOL) FIRE RESISTANT FLUIDS — 225 SSU @ 100°F  
 W — WATER — 60°F

# PART NUMBERS FOR STANDARD MESH — CHANGE SUFFIX TO CORRESPOND FOR OTHER MESH SIZES



## MODEL NUMBERS — TAKE-APART SUMP TYPE FILTERS SHOWN ON PAGE 14

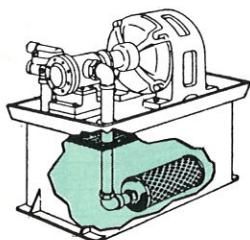
	10 GPM 3/4" NPTF	16 GPM 3/4" NPTF	20 GPM 1" NPTF	40 GPM 1 1/2" NPTF	60 GPM 1 1/2" NPTF	100 GPM 1 1/2" NPTF	100 GPM 2" NPTF	150 GPM 2 1/2" NPTF	200 GPM 3" NPTF
<b>MESH</b>	<b>MODEL NUMBERS HYDRAULIC OILS — COOLANTS — LUBRICANTS</b>								
100*	9010-100	9016-100	9020-100	9040-100	9060-100	90100-100	90102-100	90150-100	90200-100
80	9010-80	9016-80	9020-80	9040-80	9060-80	90100-80	90102-80	90150-80	90200-80
60	9010-60	9016-60	9020-60	9040-60	9060-60	90100-60	90102-60	90150-60	90200-60
50	9010-50	9016-50	9020-50	9040-50	9060-50	90100-50	90102-50	90150-50	90200-50
40	9010-40	9016-40	9020-40	9040-40	9060-40	90100-40	90102-40	90150-40	90200-40
30	9010-30	9016-30	9020-30	9040-30	9060-30	90100-30	90102-30	90150-30	90200-30
	<b>"S" SERIES — PHOSPHATE ESTER BASE FIRE RESISTANT FLUIDS</b>								
100*	9010S-100	9016S-100	9020S-100	9040S-100	9060S-100	90100S-100	90102S-100	90150S-100	90200S-100
80	9010S-80	9016S-80	9020S-80	9040S-80	9060S-80	90100S-80	90102S-80	90150S-80	90200S-80
60	9010S-60	9016S-60	9020S-60	9040S-60	9060S-60	90100S-60	90102S-60	90150S-60	90200S-60
50	9010S-50	9016S-50	9020S-50	9040S-50	9060S-50	90100S-50	90102S-50	90150S-50	90200S-50
40	9010S-40	9016S-40	9020S-40	9040S-40	9060S-40	90100S-40	90102S-40	90150S-40	90200S-40
30	9010S-30	9016S-30	9020S-30	9040S-30	9060S-30	90100S-30	90102S-30	90150S-30	90200S-30
	<b>"N" SERIES — WATER GLYCOL FIRE RESISTANT FLUIDS</b>								
60*	9010N-60	9016N-60	9020N-60	9040N-60	9060N-60	90100N-60	90102N-60	90150N-60	90200N-60
50	9010N-50	9016N-50	9020N-50	9040N-50	9060N-50	90100N-50	90102N-50	90150N-50	90200N-50
40	9010N-40	9016N-40	9020N-40	9040N-40	9060N-40	90100N-40	90102N-40	90150N-40	90200N-40
30	9010N-30	9016N-30	9020N-30	9040N-30	9060N-30	90100N-30	90102N-30	90150N-30	90200N-30
	<b>"W" SERIES — WATER</b>								
100*	9010W-100	9016W-100	9020W-100	9040W-100	9060W-100	90100W-100	90102W-100	90150W-100	90200W-100
80	9010W-80	9016W-80	9020W-80	9040W-80	9060W-80	90100W-80	90102W-80	90150W-80	90200W-80
60	9010W-60	9016W-60	9020W-60	9040W-60	9060W-60	90100W-60	90102W-60	90150W-60	90200W-60
50	9010W-50	9016W-50	9020W-50	9040W-50	9060W-50	90100W-50	90102W-50	90150W-50	90200W-50
40	9010W-40	9016W-40	9020W-40	9040W-40	9060W-40	90100W-40	90102W-40	90150W-40	90200W-40
30	9010W-30	9016W-30	9020W-30	9040W-30	9060W-30	90100W-30	90102W-30	90150W-30	90200W-30
	<b>HYDRAULIC OILS — COOLANTS — LUBRICANTS</b>								
150	9010-150	9016-150	9020-150	9040-150	9060-150	90100-150	90102-150	90150-150	90200-150
200	9010-200	9016-200	9020-200	9040-200	9060-200	90100-200	90102-200	90150-200	90200-200
	<b>"S" SERIES — PHOSPHATE ESTER BASE FIRE RESISTANT FLUIDS</b>								
150	9010S-150	9016S-150	9020S-150	9040S-150	9060S-150	90100S-150	90102S-150	90150S-150	90200S-150
200	9010S-200	9016S-200	9020S-200	9040S-200	9060S-200	90100S-200	90102S-200	90150S-200	90200S-200
	<b>"W" SERIES — WATER</b>								
150	9010W-150	9016W-150	9020W-150	9040W-150	9060W-150	90100W-150	90102W-150	90150W-150	90200W-150
200	9010W-200	9016W-200	9020W-200	9040W-200	9060W-200	90100W-200	90102W-200	90150W-200	90200W-200

\* STANDARD MESH

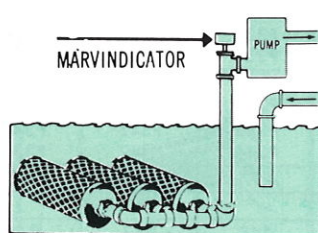
**NOTE:** To specify MarvelMag Magnetic Filters, insert letter "M" in Model Number. Example: 90100-100 becomes "90100M100".

### TYPICAL SUMP TYPE INSTALLATIONS

Recommended to be installed on suction intake pipe in reservoir in a horizontal position with outer diameter of filter approximately 2 inches above bottom. Two or more units may be used by multiple or manifold installation where space limitations prevent use of a larger single unit to handle greater capacities.



TYPICAL SINGLE UNIT INSTALLATION



TYPICAL MULTIPLE UNIT INSTALLATION

### WHEN TO CLEAN FILTER

Recommended practice is to use a vacuum sensing device, such as the "Marvindicator" which provides a Red "Pop-Up" Button plus (if desired) warning lights and/or audible alarms, activation of which means "clean or replace element at once."

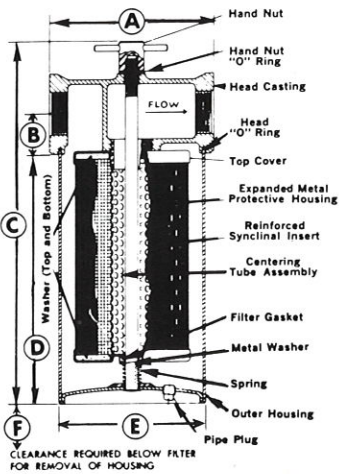
#### To Clean Filter Elements:

First remove filter coupling—then follow steps 4, 5, 6, and 7 of cleaning instructions on page 17. Use hand pressure only when replacing coupling. Do not use wrench.



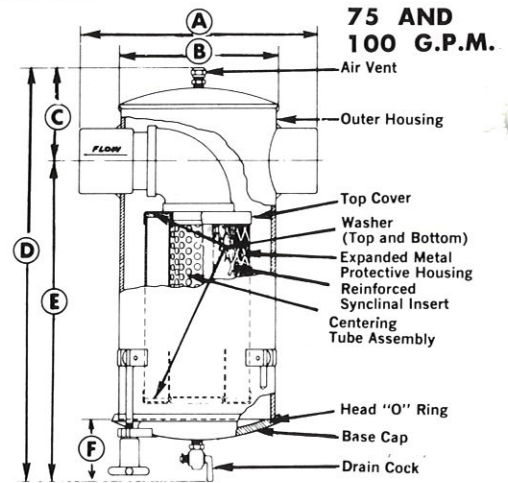
# LINE TYPE WITH TAKE-APART ELEMENT — UP TO 300 GPM — PRESSURES TO 80 PSI

5 TO  
50 GPM



**BY-PASS VALVE:**  
Not available.  
**OPERATING PRESSURES:**  
Up to 80 p.s.i.  
**OPERATING TEMPERATURES:**  
Up to 150°F. Available on special order for higher temperatures.

(For gallon capacities see Note 1 on page 17)



## ENGINEERING DATA—MOUNTING DIMENSIONS—PART NUMBERS

	SIZE	5 GPM	8 GPM	10 GPM	20 GPM	30 GPM	50 GPM	75 GPM	100 GPM	
	PORT	3/4 NPTF	3/4 NPTF	1" NPTF	1 1/4 NPTF	1 1/2 NPTF	2" NPTF	2 1/2 NPTF	3" NPTF	
<b>HELPFUL HINT:</b> Eliminate guesswork and high cost of too soon and too late filter cleaning by using a Colorgage Pressure Differential Element Condition Indicator. (See pages 26 and 27). It keeps you fully informed on exact condition of filter element at all times.	<b>*PRESSURE DROP PSI</b>									
	St'd	.26	.50	.48	.50	.53	.98	.41	.32	
	S only	.53	.84	.90	.90	.88	1.64	.65	.51	
	N only	.33	.68	.65	.67	.71	1.33	.55	.41	
	W only	.13	.25	.26	.32	.43	.74	.29	.23	
<b>APPROX. WT. LBS.</b>										
St'd - S - N	6	7	8	12 1/2	14	14	70	82		
W only	8	9	11	16	19	20	70	82		
<b>DIMENSIONS INCHES</b>										
A	5.00	5.00	5.00	6.00	6.75	6.75	14.00	14.50		
B	1.25	1.25	1.25	1.44	1.69	1.69	9.19	9.69		
C	8.75	10.25	11.75	14.38	14.88	14.88	5.50	5.75		
D	4.88	6.25	7.88	10.12	10.25	10.25	24.00	25.25		
E	4.25	4.25	4.25	5.25	6.00	6.00	18.50	19.50		
F	7.50	8.25	10.75	13.38	13.88	13.88	11.12	12.00		
<b>PART NUMBERS</b>										
TOP COVER	St'd - S - N	P233	P233	P233	P234	P235	P235	P236	P237	
	W only	P238	P238	P238	P239	P241	P241	P242	P243	
# REINFORCED SYNCLINAL INSERT	St'd & S	P244-100	P245-100	P053-100	P054-100	P055-100	P056-100	P058-100	P059-100	
	N only	P246-60	P247-60	P062-60	P063-60	P064-60	P065-60	P067-60	P068-60	
	W only	P248-100	P249-100	P071-100	P072-100	P073-100	P074-100	P076-100	P077-100	
CENTERING TUBE ASSEMBLY	St'd - S - N	P251	P252	P253	P254	P255	P255	P084	P085	
	W only	P256	P257	P258	P259	P261	P261	P092	P093	
EXPANDED METAL PROTECTIVE HOUSING	St'd - S - N	P262	P263	P096	P097	P098	P098	P100	P101	
	W only	P264	P265	P104	P105	P106	P106	P108	P109	
WASHERS (TOP AND BOTTOM)	St'd - N - W	P112	P112	P112	‡P113	P114	P114	P116	P117	
	S only	P119	P119	P119	P121	P122	P122	P124	P125	
OUTER HOUSING	St'd - S - N	P266	P267	P268	P269	P271	P271	P272	P273	
	W only	P274	P275	P276	P277	P278	P278	P279	P281	
HEAD CASTING FOR 5-50 GPM OR BASE CAP FOR 75 & 100 GPM	St'd	P282	P283	P284	P285	P286	P287	P288	P289	
	S only	P291	P292	P293	P294	P295	P296	P288	P289	
	N only	P299	P301	P302	P303	P304	P305	P288	P289	
	W only	P308	P309	P311	P312	P313	P314	P315	P316	
SPRING	St'd - S - N	P317	P317	P317	P318	P318	P318			
	W only	P319	P319	P319	P321	P321	P321			
METAL WASHER	St'd - S - N	P322	P322	P322	P323	P323	P323			
	W only	P324	P324	P324	P325	P325	P325			
FILTER GASKET	St'd - N - W	P326	P326	P326	P327	P327	P327			
	S only	P328	P328	P328	P329	P329	P329			
HEAD "O" RING	St'd - N - W	P331	P331	P331	P332	P333	P333	P334	P335	
	S only	P336	P336	P336	P337	P338	P338	P339	P341	
HAND NUT "O" RING	St'd - N - W	P342	P342	P342	P342	P342	P342			
	S only	P343	P343	P343	P343	P343	P343			
HAND NUT	St'd - S - N	P344	P344	P344	P345	P345	P345			
	W only	P346	P346	P346	P347	P347	P347			
PIPE PLUG		297	297	297	297	297				
DRAIN COCK								298	298	
AIR VENT		348	348	348	348	348	348	348	348	

\* St'd. - HYDRAULIC OILS - COOLANTS - LUBRICANTS - 225 SSU @ 100°F  
 S - PHOSPHATE ESTER BASE FIRE RESISTANT FLUIDS - 225 SSU @ 100°F  
 N - AQUEOUS BASE (WATER GLYCOL) FIRE RESISTANT FLUIDS - 225 SSU @ 100°F  
 W - WATER - 60°F ‡PART NUMBER FOR "W" FILTERS IS P307

# PART NUMBERS FOR STANDARD MESH - CHANGE SUFFIX TO CORRESPOND FOR OTHER MESH SIZES



## FOR SUCTION, RETURN, AND LOW PRESSURE LINES

For Use With Hydraulic Oils, Coolants, Lubricants, Fire Resistant Fluids and Water

### MODEL NUMBERS—TAKE-APART LINE TYPE FILTERS (NO BY-PASS) SHOWN ON PAGE 16

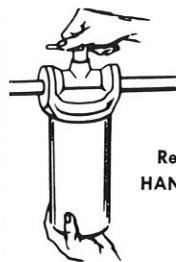
	5 GPM 3/4" NPTF	8 GPM 3/4" NPTF	10 GPM 1" NPTF	20 GPM 1 1/4" NPTF	30 GPM 1 1/2" NPTF	50 GPM 2" NPTF	75 GPM 2 1/2" NPTF	100 GPM 3" NPTF
<b>MODEL NUMBERS</b>								
<b>HYDRAULIC OILS—COOLANTS—LUBRICANTS</b>								
MESH	SLE-3/4-5-100	SLD-3/4-8-100	SLC-1-10-100	SLB-1 1/4-20-100	SLA-1 1/2-30-100	SLA-2-50-100	SLA-2 1/2-75-100	SLA-3-100-100
100*	SLE-3/4-5-80	SLD-3/4-8-80	SLC-1-10-80	SLB-1 1/4-20-80	SLA-1 1/2-30-80	SLA-2-50-80	SLA-2 1/2-75-80	SLA-3-100-80
80	SLE-3/4-5-60	SLD-3/4-8-60	SLC-1-10-60	SLB-1 1/4-20-60	SLA-1 1/2-30-60	SLA-2-50-60	SLA-2 1/2-75-60	SLA-3-100-60
60	SLE-3/4-5-50	SLD-3/4-8-50	SLC-1-10-50	SLB-1 1/4-20-50	SLA-1 1/2-30-50	SLA-2-50-50	SLA-2 1/2-75-50	SLA-3-100-50
50	SLE-3/4-5-40	SLD-3/4-8-40	SLC-1-10-40	SLB-1 1/4-20-40	SLA-1 1/2-30-40	SLA-2-50-40	SLA-2 1/2-75-40	SLA-3-100-40
40	SLE-3/4-5-30	SLD-3/4-8-30	SLC-1-10-30	SLB-1 1/4-20-30	SLA-1 1/2-30-30	SLA-2-50-30	SLA-2 1/2-75-30	SLA-3-100-30
30	<b>"S" SERIES—PHOSPHATE ESTER BASE FIRE RESISTANT FLUIDS</b>							
100*	SLE-3/4-5S-100	SLD-3/4-8S-100	SLC-1-10S-100	SLB-1 1/4-20S-100	SLA-1 1/2-30S-100	SLA-2-50S-100	SLA-2 1/2-75S-100	SLA-3-100S-100
80	SLE-3/4-5S-80	SLD-3/4-8S-80	SLC-1-10S-80	SLB-1 1/4-20S-80	SLA-1 1/2-30S-80	SLA-2-50S-80	SLA-2 1/2-75S-80	SLA-3-100S-80
60	SLE-3/4-5S-60	SLD-3/4-8S-60	SLC-1-10S-60	SLB-1 1/4-20S-60	SLA-1 1/2-30S-60	SLA-2-50S-60	SLA-2 1/2-75S-60	SLA-3-100S-60
50	SLE-3/4-5S-50	SLD-3/4-8S-50	SLC-1-10S-50	SLB-1 1/4-20S-50	SLA-1 1/2-30S-50	SLA-2-50S-50	SLA-2 1/2-75S-50	SLA-3-100S-50
40	SLE-3/4-5S-40	SLD-3/4-8S-40	SLC-1-10S-40	SLB-1 1/4-20S-40	SLA-1 1/2-30S-40	SLA-2-50S-40	SLA-2 1/2-75S-40	SLA-3-100S-40
30	SLE-3/4-5S-30	SLD-3/4-8S-30	SLC-1-10S-30	SLB-1 1/4-20S-30	SLA-1 1/2-30S-30	SLA-2-50S-30	SLA-2 1/2-75S-30	SLA-3-100S-30
<b>"N" SERIES—WATER GLYCOL FIRE RESISTANT FLUIDS</b>								
60	SLE-3/4-5N-60	SLD-3/4-8N-60	SLC-1-10N-60	SLB-1 1/4-20N-60	SLA-1 1/2-30N-60	SLA-2-50N-60	SLA-2 1/2-75N-60	SLA-3-100N-60
50	SLE-3/4-5N-50	SLD-3/4-8N-50	SLC-1-10N-50	SLB-1 1/4-20N-50	SLA-1 1/2-30N-50	SLA-2-50N-50	SLA-2 1/2-75N-50	SLA-3-100N-50
40	SLE-3/4-5N-40	SLD-3/4-8N-40	SLC-1-10N-40	SLB-1 1/4-20N-40	SLA-1 1/2-30N-40	SLA-2-50N-40	SLA-2 1/2-75N-40	SLA-3-100N-40
30	SLE-3/4-5N-30	SLD-3/4-8N-30	SLC-1-10N-30	SLB-1 1/4-20N-30	SLA-1 1/2-30N-30	SLA-2-50N-30	SLA-2 1/2-75N-30	SLA-3-100N-30
<b>"W" SERIES—WATER</b>								
100*	SLE-3/4-5W-100	SLD-3/4-8W-100	SLC-1-10W-100	SLB-1 1/4-20W-100	SLA-1 1/2-30W-100	SLA-2-50W-100	SLA-2 1/2-75W-100	SLA-3-100W-100
80	SLE-3/4-5W-80	SLD-3/4-8W-80	SLC-1-10W-80	SLB-1 1/4-20W-80	SLA-1 1/2-30W-80	SLA-2-50W-80	SLA-2 1/2-75W-80	SLA-3-100W-80
60	SLE-3/4-5W-60	SLD-3/4-8W-60	SLC-1-10W-60	SLB-1 1/4-20W-60	SLA-1 1/2-30W-60	SLA-2-50W-60	SLA-2 1/2-75W-60	SLA-3-100W-60
50	SLE-3/4-5W-50	SLD-3/4-8W-50	SLC-1-10W-50	SLB-1 1/4-20W-50	SLA-1 1/2-30W-50	SLA-2-50W-50	SLA-2 1/2-75W-50	SLA-3-100W-50
40	SLE-3/4-5W-40	SLD-3/4-8W-40	SLC-1-10W-40	SLB-1 1/4-20W-40	SLA-1 1/2-30W-40	SLA-2-50W-40	SLA-2 1/2-75W-40	SLA-3-100W-40
30	SLE-3/4-5W-30	SLD-3/4-8W-30	SLC-1-10W-30	SLB-1 1/4-20W-30	SLA-1 1/2-30W-30	SLA-2-50W-30	SLA-2 1/2-75W-30	SLA-3-100W-30
<b>HYDRAULIC OILS—COOLANTS—LUBRICANTS</b>								
150	SLE-3/4-5-150	SLD-3/4-8-150	SLC-1-10-150	SLB-1 1/4-20-150	SLA-1 1/2-30-150	SLA-2-50-150	SLA-2 1/2-75-150	SLA-3-100-150
200	SLE-3/4-5-200	SLD-3/4-8-200	SLC-1-10-200	SLB-1 1/4-20-200	SLA-1 1/2-30-200	SLA-2-50-200	SLA-2 1/2-75-200	SLA-3-100-200
<b>"S" SERIES—PHOSPHATE ESTER BASE FIRE RESISTANT FLUIDS</b>								
150	SLE-3/4-5S-150	SLD-3/4-8S-150	SLC-1-10S-150	SLB-1 1/4-20S-150	SLA-1 1/2-30S-150	SLA-2-50S-150	SLA-2 1/2-75S-150	SLA-3-100S-150
200	SLE-3/4-5S-200	SLD-3/4-8S-200	SLC-1-10S-200	SLB-1 1/4-20S-200	SLA-1 1/2-30S-200	SLA-2-50S-200	SLA-2 1/2-75S-200	SLA-3-100S-200
<b>"W" SERIES—WATER</b>								
150	SLE-3/4-5W-150	SLD-3/4-8W-150	SLC-1-10W-150	SLB-1 1/4-20W-150	SLA-1 1/2-30W-150	SLA-2-50W-150	SLA-2 1/2-75W-150	SLA-3-100W-150
200	SLE-3/4-5W-200	SLD-3/4-8W-200	SLC-1-10W-200	SLB-1 1/4-20W-200	SLA-1 1/2-30W-200	SLA-2-50W-200	SLA-2 1/2-75W-200	SLA-3-100W-200

\*STANDARD MESH.

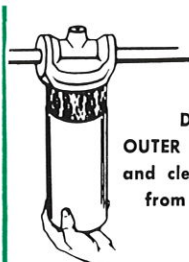
NOTE (1): GPM capacities shown are maximum rating for suction applications only. For return and low pressure line applications, the filters may be used at 2 to 3 times the capacities shown depending upon allowable pressure drop.

NOTE (2): To specify MarvelMag Magnetic Rods in filter, insert "M" in Model Number, Example: SLA-1 1/2-30-60 becomes "SLA-1 1/2-30M60."

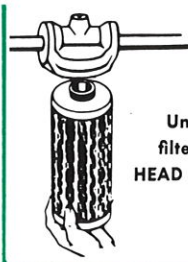
**EASY TO CLEAN**  
Requires No Throw-Away Parts to Purchase or Carry in Stock



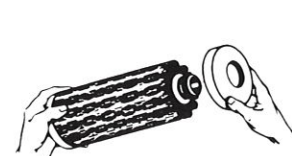
1 Remove HAND NUT



2 Drop OUTER HOUSING and clean sludge from bottom



3 Unscrew filter from HEAD CASTING



4 Remove TOP COVER



5 Remove EXPANDED METAL PROTECTIVE HOUSING



6 Remove SYNCLINAL INSERT



7 To Clean SYNCLINAL INSERT  
Immerse and swish in any noncaustic cleaning solvent for a short period of time. Shake off excess solvent or blow dry from inside out with compressed air.

TO REASSEMBLE—SIMPLY REVERSE PROCEDURE

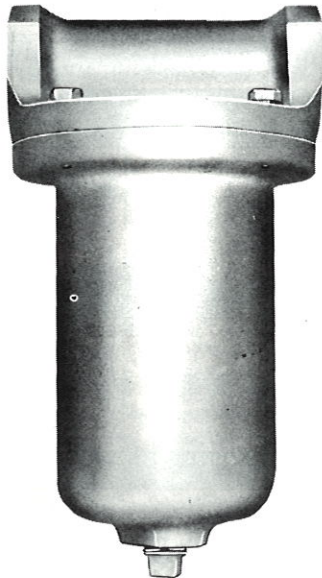
**CAUTION!**

Check "O" RINGS, WASHERS and FILTER GASKET for wear and replace with new parts if necessary. Be sure TENSION SPRING, METAL WASHER and FILTER GASKET are replaced in proper sequence on outer housing center rod. (See cutaway drawing). USE HAND PRESSURE ONLY when replacing HAND NUT. DO NOT USE WRENCH!



**1300 SERIES - FOR SUCTION, RETURN AND LOW PRESSURE LINES**

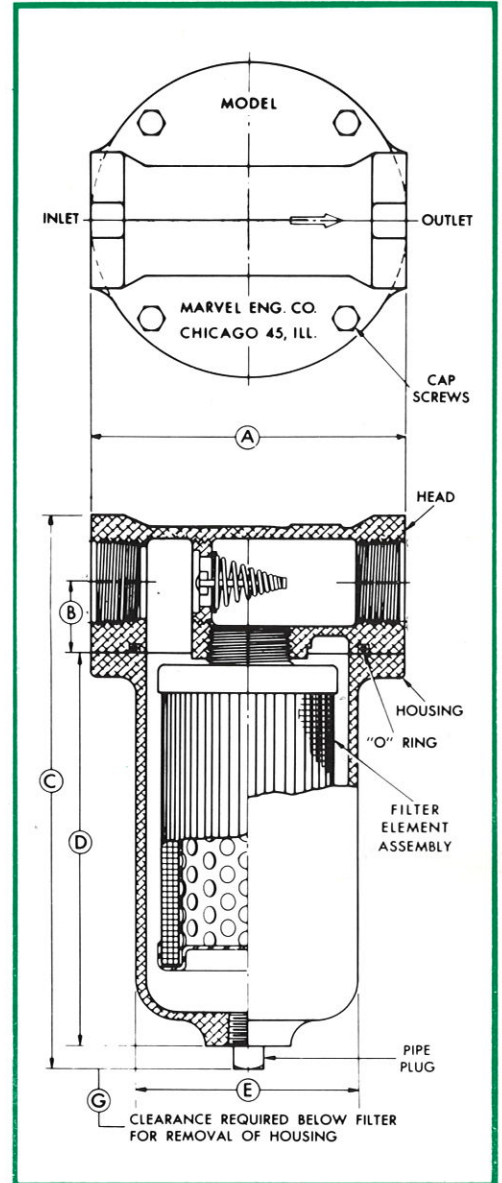
**For Use With Water or Special Fluids**



(For gallon capacities see Note 1 on page 19)

**BRASS HEAD AND HOUSING — ALL STAINLESS STEEL WIRE CLOTH FILTER ELEMENT — ALL STAINLESS STEEL BY-PASS OPTIONAL.**

**CAPACITIES:** 10—20—30—50 and 75 G.P.M.  
**PIPE SIZES:** 1"—1¼"—1½"—2" and 2½".  
**BY-PASS VALVE:** Available with or without.  
**OPERATING PRESSURE:** Up to 250 p.s.i.  
**OPERATING TEMPERATURES:** Up to 275° F.



**ENGINEERING DATA—MOUNTING DIMENSIONS—PART NUMBERS**

CAPACITY	10 GPM	20 GPM	30 GPM	50 GPM	75 GPM
SIZE PORT	1" NPTF	1¼ NPTF	1½ NPTF	2" NPTF	2½ NPTF
Water @ 60° F	<b>PRESSURE DROP PSI</b>				
	.37	.52	.72	.89	1.25
	<b>APPROX. WT. LBS.</b>				
	8½	14	20	25½	37
A	<b>DIMENSIONS INCHES</b>				
	4.69	5.25	5.88	6.56	7.19
B	1.09	1.28	1.50	1.81	2.12
C	8.50	12.25	13.50	15.50	17.50
D	5.88	9.12	10.12	11.38	12.62
E	3.31	3.88	4.38	5.06	5.56
G	4.75	7.62	8.25	9.38	10.12

PORT SIZE	PART NUMBERS				
	1" NPTF	1¼" NPTF	1½" NPTF	2" NPTF	2½" NPTF
HOUSING	1310-1	1320-1	1330-1	1350-1	1375-1
HEAD WITHOUT BY-PASS	1310-2	1320-2	1330-2	1350-2	1375-2
HEAD WITH 3 PSI BY-PASS	1310-HB-2	1320-HB-2	1330-HB-2	1350-HB-2	1375-HB-2
HEAD WITH 5 PSI BY-PASS	1310-HB5-2	1320-HB5-2	1330-HB5-2	1350-HB5-2	1375-HB5-2
HEAD WITH 25 PSI BY-PASS	1310-HB25-2	1320-HB25-2	1330-HB25-2	1350-HB25-2	1375-HB25-2
#FILTER ELEMENT ASSEMBLY	1010-100	1020-100	1030-100	1050-100	1075-100
"O" RING	1510-3	1520-3	1530-3	1550-3	1575-3
NOMINAL SIZE	3½x3¼	4x3¾	4½x4¼	5¼x5	5¾x5½
DRAIN PIPE PLUG	1310-4	1320-4	1320-4	1350-4	1350-4
CAP SCREWS	1310-8	1320-8	1330-8	1350-8	1375-8

#100 MESH TYPE — USE MESH SIZES AS SUFFIX FOR OTHER MESH SIZES **EXAMPLE:** To order a 200 mesh element specify Element Number 1010-200 in place to 1010-100.



**MODEL NUMBERS—1300 SERIES LINE TYPE FILTERS SHOWN ON PAGE 18  
FOR WATER & SPECIAL FLUIDS**

BY-PASS	MESH	10 GPM	20 GPM	30 GPM	50 GPM	75 GPM
		1" NPTF	1 1/4" NPTF	1 1/2" NPTF	2" NPTF	2 1/2" NPTF
MODEL NUMBERS						
No	100*	1310-100	1320-100	1330-100	1350-100	1375-100
No	80	1310-80	1320-80	1330-80	1350-80	1375-80
No	60	1310-60	1320-60	1330-60	1350-60	1375-60
No	50	1310-50	1320-50	1330-50	1350-50	1375-50
No	40	1310-40	1320-40	1330-40	1350-40	1375-40
No	30	1310-30	1320-30	1330-30	1350-30	1375-30
No	20	1310-20	1320-20	1330-20	1350-20	1375-20
No	150	1310-150	1320-150	1330-150	1350-150	1375-150
No	200	1310-200	1320-200	1330-200	1350-200	1375-200
3 PSI	100*	1310-HB-100	1320-HB-100	1330-HB-100	1350-HB-100	1375-HB-100
3 PSI	80	1310-HB-80	1320-HB-80	1330-HB-80	1350-HB-80	1375-HB-80
3 PSI	60	1310-HB-60	1320-HB-60	1330-HB-60	1350-HB-60	1375-HB-60
3 PSI	50	1310-HB-50	1320-HB-50	1330-HB-50	1350-HB-50	1375-HB-50
3 PSI	40	1310-HB-40	1320-HB-40	1330-HB-40	1350-HB-40	1375-HB-40
3 PSI	30	1310-HB-30	1320-HB-30	1330-HB-30	1350-HB-30	1375-HB-30
3 PSI	20	1310-HB-20	1320-HB-20	1330-HB-20	1350-HB-20	1375-HB-20
5 PSI	100*	1310-HB5-100	1320-HB5-100	1330-HB5-100	1350-HB5-100	1375-HB5-100
5 PSI	80	1310-HB5-80	1320-HB5-80	1330-HB5-80	1350-HB5-80	1375-HB5-80
5 PSI	60	1310-HB5-60	1320-HB5-60	1330-HB5-60	1350-HB5-60	1375-HB5-60
5 PSI	50	1310-HB5-50	1320-HB5-50	1330-HB5-50	1350-HB5-50	1375-HB5-50
5 PSI	40	1310-HB5-40	1320-HB5-40	1330-HB5-40	1350-HB5-40	1375-HB5-40
5 PSI	30	1310-HB5-30	1320-HB5-30	1330-HB5-30	1350-HB5-30	1375-HB5-30
5 PSI	20	1310-HB5-20	1320-HB5-20	1330-HB5-20	1350-HB5-20	1375-HB5-20
25 PSI	100*	1310-HB25-100	1320-HB25-100	1330-HB25-100	1350-HB25-100	1375-HB25-100
25 PSI	80	1310-HB25-80	1320-HB25-80	1330-HB25-80	1350-HB25-80	1375-HB25-80
25 PSI	60	1310-HB25-60	1320-HB25-60	1330-HB25-60	1350-HB25-60	1375-HB25-60
25 PSI	50	1310-HB25-50	1320-HB25-50	1330-HB25-50	1350-HB25-50	1375-HB25-50
25 PSI	40	1310-HB25-40	1320-HB25-40	1330-HB25-40	1350-HB25-40	1375-HB25-40
25 PSI	30	1310-HB25-30	1320-HB25-30	1330-HB25-30	1350-HB25-30	1375-HB25-30
25 PSI	20	1310-HB25-20	1320-HB25-20	1330-HB25-20	1350-HB25-20	1375-HB25-20
3 PSI	150	1310-HB-150	1320-HB-150	1330-HB-150	1350-HB-150	1375-HB-150
3 PSI	200	1310-HB-200	1320-HB-200	1330-HB-200	1350-HB-200	1375-HB-200
5 PSI	150	1310-HB5-150	1320-HB5-150	1330-HB5-150	1350-HB5-150	1375-HB5-150
5 PSI	200	1310-HB5-200	1320-HB5-200	1330-HB5-200	1350-HB5-200	1375-HB5-200
25 PSI	150	1310-HB25-150	1320-HB25-150	1330-HB25-150	1350-HB25-150	1375-HB25-150
25 PSI	200	1310-HB25-200	1320-HB25-200	1330-HB25-200	1350-HB25-200	1375-HB25-200

\* 100 MESH STANDARD

NOTE (1): GPM capacities shown are maximum rating for suction applications only. For return and low pressure line applications, the filters may be used at 2 to 3 times the capacities shown depending upon allowable pressure drop.

NOTE (2): To specify MarvelMag Magnetic Rods in Filter, insert "M" in Model Number. Example: 1320-HB-100 becomes "1320-HBM100." To order Standard Replacement Element, specify No. 1020-100 (see part numbers—page 18). To order Element with Magnets, specify No. 1020M100. To order Replacement Element only, pleated for magnets but less the magnets, change "M" in Number to "MN", making it, in example "1020MN100."

**WHEN TO CLEAN FILTER**

A filter element condition indicator (such as the "Colorgage" Indicator, pages 26 & 27) is recommended for use with non-indicating filters to advise when cleaning is required. Caution: Make sure the operating fluid is compatible with Colorgage. If no indicator is used, proper maintenance of non-indicating filter becomes more difficult and must be based on trial and error guesswork methods, bearing in mind the following considerations:

Frequency of filter cleaning varies and is dependent upon the conditions under which equipment is operating. Recommended procedure is to establish a filter maintenance schedule based on your experience. Once this schedule is established, it should be adhered to without deviation. The little time required to clean the filter pays off in the efficient operation of your equipment and provides constant protection to the hydraulic system.



**1500 SERIES - FOR SUCTION, RETURN AND LOW PRESSURE LINES**

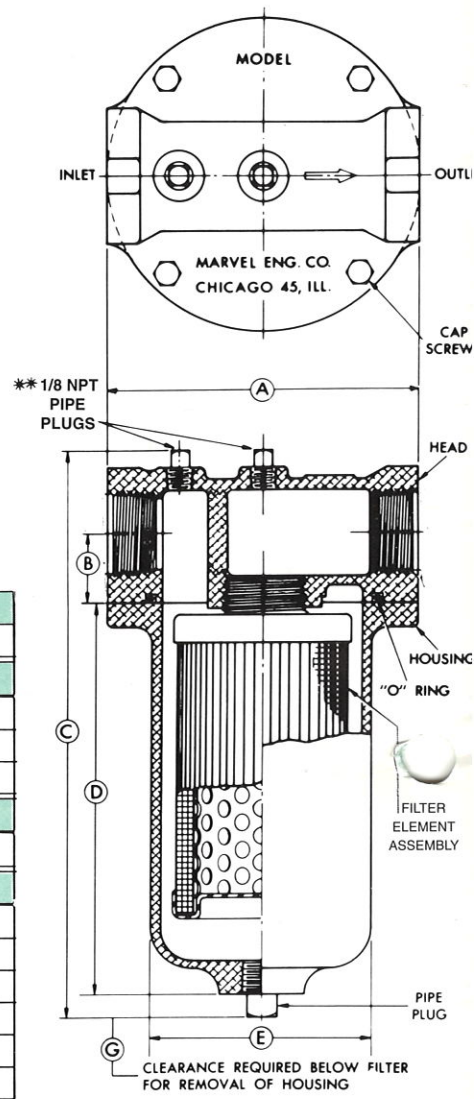


For use with regular petroleum base Hydraulic Oils, Coolants, Lubricants and all types of Fire-resistant Hydraulic Fluids and water.

**ALUMINUM HEAD  
ALUMINUM HOUSING  
MONEL FILTER ELEMENT**

CAPACITIES: 10—20—30—50 and 75 G.P.M.  
PIPE SIZES: 1"—1¼"—1½"—2" and 2½".  
BY-PASS VALVE: Available with or without.  
OPERATING PRESSURE: Up to 250 p.s.i.  
OPERATING TEMPERATURES: Up to 300° F.

(For gallon capacities see Note 1 on page 21)



**ENGINEERING DATA—MOUNTING DIMENSIONS—PART NUMBERS**

CAPACITY	10 GPM	20 GPM	30 GPM	50 GPM	75 GPM
PORT SIZE	1" NPTF	1¼" NPTF	1½" NPTF	2" NPTF	2½" NPTF
<b>PRESSURE DROP PSI</b>					
*St'd.	.69	.81	.93	1.18	1.39
S only	1.03	1.27	1.27	1.52	1.84
N only	.80	.95	1.10	1.39	1.65
<b>APPROX. WT. LBS.</b>					
St'd.—S-N	3	5½	7¼	9¼	13¾
<b>DIMENSIONS INCHES</b>					
A	4.69	5.25	5.88	6.56	7.19
B	1.09	1.28	1.50	1.81	2.12
C	8.75	12.62	13.88	15.94	17.94
D	5.88	9.12	10.12	11.38	12.62
E	3.31	3.88	4.38	5.06	5.56
G	4.75	7.62	8.25	9.38	10.12

PORT SIZE	1" NPTF	1¼" NPTF	1½" NPTF	2" NPTF	2½" NPTF
<b>PART NUMBERS</b>					
HOUSING	1510-1	1520-1	1530-1	1550-1	1575-1
HEAD WITHOUT BY-PASS	1510-2	1520-2	1530-2	1550-2	1575-2
HEAD WITH 3 PSI BY-PASS	1510-HB-2	1520-HB-2	1530-HB-2	1550-HB-2	1575-HB-2
HEAD WITH 5 PSI BY-PASS	1510-HB5-2	1520-HB5-2	1530-HB5-2	1550-HB5-2	1575-HB5-2
HEAD WITH 25 PSI BY-PASS	1510-HB25-2	1520-HB25-2	1530-HB25-2	1550-HB25-2	1575-HB25-2
#FILTER ELEMENT ASSEMBLY	310-100	320-100	330-100	350-100	375-100
"O" RING NOMINAL SIZE	1510-3 3½x3¼	1520-3 4x3¾	1530-3 4½x4¼	1550-3 5¼x5	1575-3 5¾x5½
DRAIN PIPE PLUG	1510-4	1520-4	1520-4	1550-4	1550-4
CAP SCREWS	1510-8	1520-8	1530-8	1550-8	1575-8
TOP PIPE PLUGS	1510-9	1510-9	1510-9	1510-9	1510-9

\*St'd. - HYDRAULIC OILS - COOLANTS - LUBRICANTS - 225 SSU @ 100°F  
S - PHOSPHATE ESTER BASE FIRE RESISTANT FLUIDS - 225 SSU @ 100°F  
N - AQUEOUS BASE (WATER GLYCOL) FIRE RESISTANT FLUIDS - 225 SSU  
# 100 MESH TYPE - USE MESH SIZE AS SUFFIX FOR OTHER MESH SIZES  
\*\*FOR USE WITH VACUUM OR PRESSURE DIFFERENTIAL INDICATOR, SEE PAGES 24, 25, 26 AND 27.



**MODEL NUMBERS — 1500 SERIES LINE TYPE FILTERS SHOWN ON PAGE 20**

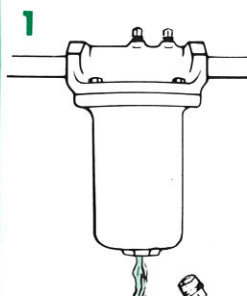
**HYDRAULIC OILS — COOLANTS — LUBRICANTS — ALL FIRE RESISTANT FLUIDS**

BY-PASS	MESH	10 GPM	20 GPM	30 GPM	50 GPM	75 GPM
		1" NPTF	1 1/4" NPTF	1 1/2" NPTF	2" NPTF	2 1/2" NPTF
MODEL NUMBERS						
No	100	1510-100	1520-100	1530-100	1550-100	1575-100
No	80	1510-80	1520-80	1530-80	1550-80	1575-80
No	60	1510-60	1520-60	1530-60	1550-60	1575-60
No	50	1510-50	1520-50	1530-50	1550-50	1575-50
No	40	1510-40	1520-40	1530-40	1550-40	1575-40
No	30	1510-30	1520-30	1530-30	1550-30	1575-30
No	20	1510-20	1520-20	1530-20	1550-20	1575-20
No	150	1510-150	1520-150	1530-150	1550-150	1575-150
No	200	1510-200	1520-200	1530-200	1550-200	1575-200
3 PSI	100	1510-HB-100	1520-HB-100	1530-HB-100	1550-HB-100	1575-HB-100
3 PSI	80	1510-HB-80	1520-HB-80	1530-HB-80	1550-HB-80	1575-HB-80
3 PSI	60	1510-HB-60	1520-HB-60	1530-HB-60	1550-HB-60	1575-HB-60
3 PSI	50	1510-HB-50	1520-HB-50	1530-HB-50	1550-HB-50	1575-HB-50
3 PSI	40	1510-HB-40	1520-HB-40	1530-HB-40	1550-HB-40	1575-HB-40
3 PSI	30	1510-HB-30	1520-HB-30	1530-HB-30	1550-HB-30	1575-HB-30
3 PSI	20	1510-HB-20	1520-HB-20	1530-HB-20	1550-HB-20	1575-HB-20
5 PSI	100	1510-HB5-100	1520-HB5-100	1530-HB5-100	1550-HB5-100	1575-HB5-100
5 PSI	80	1510-HB5-80	1520-HB5-80	1530-HB5-80	1550-HB5-80	1575-HB5-80
5 PSI	60	1510-HB5-60	1520-HB5-60	1530-HB5-60	1550-HB5-60	1575-HB5-60
5 PSI	50	1510-HB5-50	1520-HB5-50	1530-HB5-50	1550-HB5-50	1575-HB5-50
5 PSI	40	1510-HB5-40	1520-HB5-40	1530-HB5-40	1550-HB5-40	1575-HB5-40
5 PSI	30	1510-HB5-30	1520-HB5-30	1530-HB5-30	1550-HB5-30	1575-HB5-30
5 PSI	20	1510-HB5-20	1520-HB5-20	1530-HB5-20	1550-HB5-20	1575-HB5-20
25 PSI	100	1510-HB25-100	1520-HB25-100	1530-HB25-100	1550-HB25-100	1575-HB25-100
25 PSI	80	1510-HB25-80	1520-HB25-80	1530-HB25-80	1550-HB25-80	1575-HB25-80
25 PSI	60	1510-HB25-60	1520-HB25-60	1530-HB25-60	1550-HB25-60	1575-HB25-60
25 PSI	50	1510-HB25-50	1520-HB25-50	1530-HB25-50	1550-HB25-50	1575-HB25-50
25 PSI	40	1510-HB25-40	1520-HB25-40	1530-HB25-40	1550-HB25-40	1575-HB25-40
25 PSI	30	1510-HB25-30	1520-HB25-30	1530-HB25-30	1550-HB25-30	1575-HB25-30
25 PSI	20	1510-HB25-20	1520-HB25-20	1530-HB25-20	1550-HB25-20	1575-HB25-20
3 PSI	150	1510-HB-150	1520-HB-150	1530-HB-150	1550-HB-150	1575-HB-150
3 PSI	200	1510-HB-200	1520-HB-200	1530-HB-200	1550-HB-200	1575-HB-200
5 PSI	150	1510-HB5-150	1520-HB5-150	1530-HB5-150	1550-HB5-150	1575-HB5-150
5 PSI	200	1510-HB5-200	1520-HB5-200	1530-HB5-200	1550-HB5-200	1575-HB5-200
25 PSI	150	1510-HB25-150	1520-HB25-150	1530-HB25-150	1550-HB25-150	1575-HB25-150
25 PSI	200	1510-HB25-200	1520-HB25-200	1530-HB25-200	1550-HB25-200	1575-HB25-200

Note (1): GPM capacities shown are for suction applications only. For return and low pressure line applications, the filters may be used at 2 to 3 times the capacities shown depending upon allowable pressure drop.

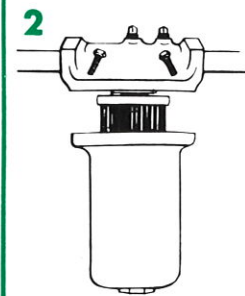
Note (2): To specify MarvelMag Magnet Rods in Filter, insert "M" in Model Number. Example: 1510-HB5-100 becomes "1510-HB5M100." To order Standard Replacement Element specify part No. 310-100. (See part no. table, page 20). To order Replacement Magnetic Element, specify No. 310M100. To order Replacement Element Pleated for Magnetic Rods but less the rods, simply change M in number to MN making it, in above example, Element No. 310MN100.

**1**



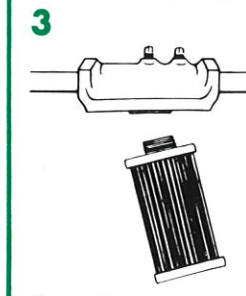
**Remove Drain Plug and Drain Housing**

**2**



**Remove Cap Screws and Separate Head from Housing**

**3**



**Unscrew Filter Element Assembly from Head**

**4 To Clean Filter Element Assembly**

Immerse and swish Filter Element Assembly in any non-caustic cleaning solvent for a short period of time. A stiff fibre brush may be used if necessary to remove impacted deposits between wire cloth serrations. If compressed air is available, blow dry from inside out.

**5 To reassemble filter, simply reverse procedure.**

**CAUTION**

When reassembling filter, be sure that "O" Ring is properly seated in groove in Head.



## BONDED LINE TYPE — WITH CLEANABLE OR THROW-AWAY ELEMENT

EXTRA OUTLET PORT (AT TOP) AND (OPTIONAL) 1/8" PORTS FOR "COLORGAGE" INDICATOR



Up to 50 GPM  
Up to 150 PSI  
1" NPTF and  
1 5/16" — 12  
Ports.

### OPTIONAL PORTS FOR "COLORGAGE"

For added convenience in protecting this filter with a Colorgage Element Condition Indicator (see pages 26, 27), you may order the filter with (optional) 1/8"—27 NPTF Gage Ports at "N" or "R" (see drawings at right) for connecting filter directly to Colorgage quickly and easily. To indicate this option on your filter order, simply replace the first dash (—) in filter model no. with the letter "N" (Normal) or "R" (Reverse). Example: Filter Model No. 151161-2500-529206-7110 becomes "151161N2500-529206-7110" (indicating upstream and downstream gage ports at "N" positions).

### TABLE II—BY-PASS OPTIONS

25 psi By-Pass Setting recommended for most applications.

25 psi By-Pass, ADD 2500 to Housing No.	
15 psi By-Pass, " 1500	"
10 psi By-Pass, " 1000	"
8 psi By-Pass, " 0800	"
5 psi By-Pass, " 0500	"
3 psi By-Pass, " 0300	"
No By-Pass, " 0000	"

TABLE I—MARVELINE-TB HOUSING & FILTER ELEMENT NUMBERS						
PORT POSITIONS	GROUP A HYDRAULIC OILS—COOLANTS—LUBRICANTS—WATER GLYCOL				GROUP B PHOSPHATE ESTER BASE FLUID	
	(1) NPTF	(2) SAE ST. TH'D.	(3) HOUSING NUMBERS	(4) FILTER ELEMENT NUMBERS	(5) HOUSING NUMBERS	(6) FILTER ELEMENT NUMBERS
① & ③	1-11 1/2		151161-†	529206-*	152161-†	530206-*
		1 5/16-12	151162-†	529206-*	152162-†	530206-*
① & ②	1-11 1/2		155161-†	529206-*	156161-†	530206-*
		1 5/16-12	155162-†	529206-*	156162-†	530206-*

†See Table II for By-Pass Settings. \*Insert Filter Element Media Number (See Table III).

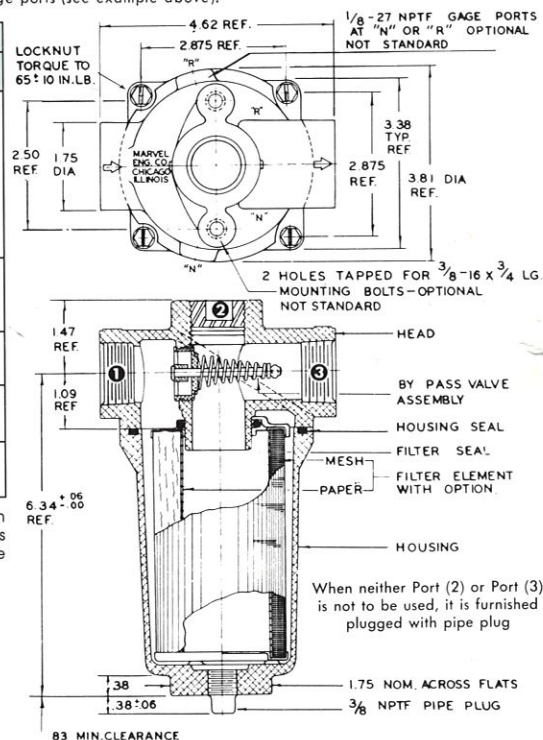
Note: To exercise option for Colorgage connecting ports in filter head, insert, in place of dash in Housing Number:

"N"—for normal gage ports; or "R"—for reverse gage ports (see example above).

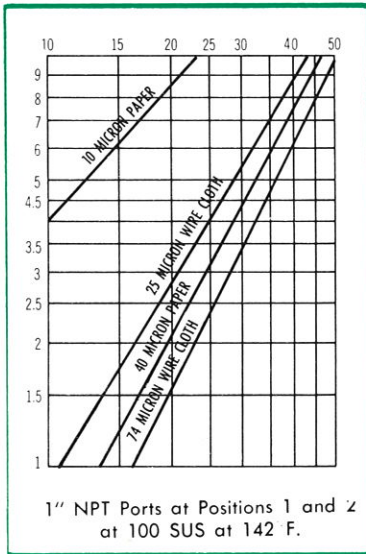
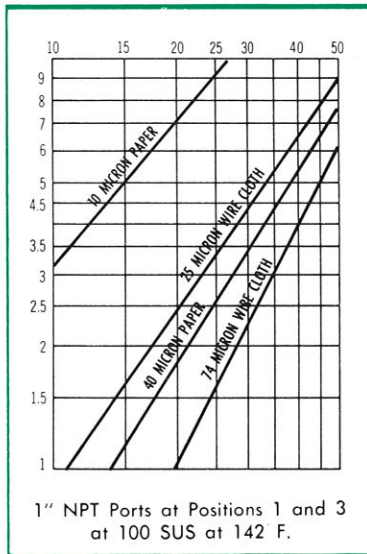
Table III — Filter Element Media Numbers

Number	Nom. Micron	Filter Element Media
1220	74	200 Mesh Stainless Steel
1215	105	150 Mesh Stainless Steel
1210	141	100 Mesh Stainless Steel
1208	180	80 Mesh Stainless Steel
1206	262	60 Mesh Stainless Steel
1205	308	50 Mesh Stainless Steel
1204	385	40 Mesh Stainless Steel
1203	546	30 Mesh Stainless Steel
1202	914	20 Mesh Stainless Steel
2210	10	8-10 Micron Stainless Steel
2215	15	10-15 Micron Stainless Steel
2225	25	25 Micron Stainless Steel
2240	40	40 Micron Stainless Steel
7103	3	3 Micron Paper
7110	10	10 Micron Paper
7120	20	20 Micron Paper
7203**	3	3 Micron Paper Mesh Inside
7210**	10	10 Micron Paper Mesh Inside
7220**	20	20 Micron Paper Mesh Inside
7303**	3	3 Micron Paper Mesh Outside
7310**	10	10 Micron Paper Mesh Outside
7320**	20	20 Micron Paper Mesh Outside

\*\* Mesh reinforcement recommended for shock return lines, for pressure installations where by-pass valve does not open, or for momentary reverse flow pressure applications.



### PRESSURE DROP CHARTS



### SELECTING FILTER NUMBER

Complete Filter Model Number consists of the following:

- Housing Number for fluid to be filtered. Select from Table 1 Column 3 or 5.
- By-pass Number, from Table II.
- Filter Element Number for fluid selected, from Table 1, Column 4 or 6.
- Filter Element Media Number for desired degree of filtration, from Table III.

### EXAMPLE:

A Filter with 1 5/16"—12 SAE Straight Thread Ports for Petroleum Oils, Return Line Installation, 200 Mesh Monel, Element and 25 psi By-pass... is specified by the following:

(a) (b) (c) (d)  
Filter No. 155162-2500-529206-1220  
(Housing Number) (Element No.)

To specify above filter with Magnetic Element, simply change dash in Element Number to "M", making it—"529206M1220".

Note: To order Replacement Elements only, simply specify Element Number only. To order Replacement Element plated for magnets but less the magnets, simply change the "M" in Magnetic Element Number to "MN", making it, in above example, "529206MN-1220".





## INLINE TYPE

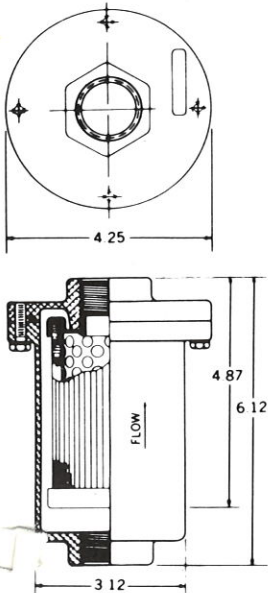
**CAPACITIES:**  
Up to 20 GPM Up to 125 PSI Max.

**PIPE SIZES:**  
(at both inlet and outlet) 3/4" and 1" NPTF.

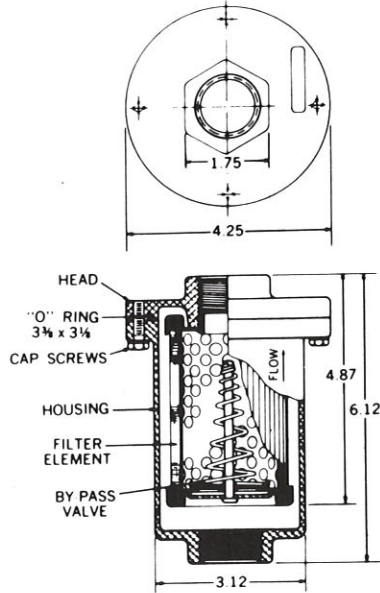
**BY-PASS VALVE:**  
Available with or without By-Pass Valve.

**OPERATING TEMPERATURES:**  
Up to 275° F.

2032 SERIES (No By-Pass Valve)



2032B SERIES (With By-Pass Valve)



PRESSURE DROP	
GPM	2032
10	.40
15	.72
20	1.17

NOTE: Pressure Drops at right based upon Petroleum Base Oil 225 SSU @ 100°F., 1/4" NPTF Filter.

When ordering parts, please specify part name and model number

BY-PASS	MESH /	10 -15 -20 GPM	
		2032-2032B SERIES	
		3/4" NPTF	1" NPTF
No	100	2032-3/4-100	2032-1-100
No	80	2032-3/4-80	2032-1-80
No	60	2032-3/4-60	2032-1-60
No	50	2032-3/4-50	2032-1-50
No	40	2032-3/4-40	2032-1-40
No	30	2032-3/4-30	2032-1-30
No	150	2032-3/4-150	2032-1-150
No	200	2032-3/4-200	2032-1-200
** 3 PSI	100	2032-3/4-B-100	2032-1-B-100
3 PSI	80	2032-3/4-B-80	2032-1-B-80
3 PSI	60	2032-3/4-B-60	2032-1-B-60
3 PSI	50	2032-3/4-B-50	2032-1-B-50
3 PSI	40	2032-3/4-B-40	2032-1-B-40
3 PSI	30	2032-3/4-B-30	2032-1-B-30
5 PSI	100	2032-3/4-B5-100	2032-1-B5-100
5 PSI	80	2032-3/4-B5-80	2032-1-B5-80
5 PSI	60	2032-3/4-B5-60	2032-1-B5-60
5 PSI	50	2032-3/4-B5-50	2032-1-B5-50
5 PSI	40	2032-3/4-B5-40	2032-1-B5-40
5 PSI	30	2032-3/4-B5-30	2032-1-B5-30
15 PSI	100	2032-3/4-B15-100	2032-1-B15-100
15 PSI	80	2032-3/4-B15-80	2032-1-B15-80
15 PSI	60	2032-3/4-B15-60	2032-1-B15-60
15 PSI	50	2032-3/4-B15-50	2032-1-B15-50
15 PSI	40	2032-3/4-B15-40	2032-1-B15-40
15 PSI	30	2032-3/4-B15-30	2032-1-B15-30
** 3 PSI	150	2032-3/4-B-150	2032-1-B-150
3 PSI	200	2032-3/4-B-200	2032-1-B-200
5 PSI	150	2032-3/4-B5-150	2032-1-B5-150
5 PSI	200	2032-3/4-B5-200	2032-1-B5-200
15 PSI	150	2032-3/4-B15-150	2032-1-B15-150
15 PSI	200	2032-3/4-B15-200	2032-1-B15-200

NOTE: To specify MarvelMag Magnetic Filters, insert letter "M" in Model Number. Example: 2032-1-100 becomes "2032-1M100".



## INLINE TYPE

**CAPACITIES:**  
Up to 60 GPM Up to 125 PSI Max.

**PIPE SIZES:**  
1 1/4", 1 1/2", and 2" NPTF sizes and 1 3/8"-12, 1 5/8"-12, and 1 7/8"-12 SAE sizes.

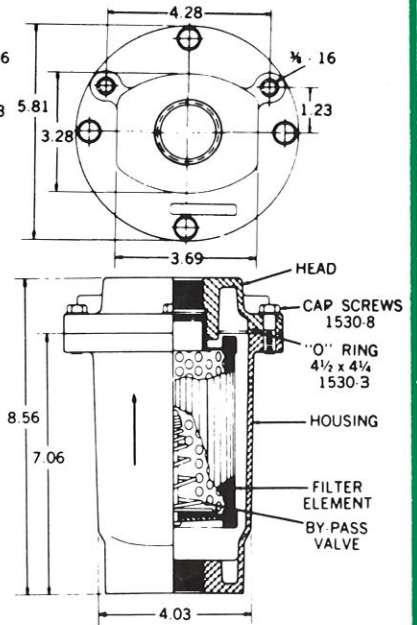
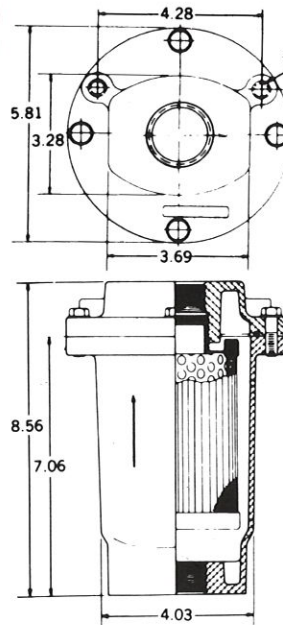
**FLANGE CONNECTIONS:**  
1 1/4" and 1 1/2" SAE

**BY-PASS VALVE:**  
Available with or without By-Pass Valve.

**OPERATING TEMPERATURES:** Up to 275° F.

700 SERIES (No By-Pass Valve)

800 SERIES (With By-Pass Valve)



NOTE: Pressure Drops at right based upon Petroleum Base Oil 225 SSU @ 100°F., 1/4" NPTF Filter.

capacity gpm	pressure drop* psi
20	.38
30	.64
40	.99
50	1.55
60	2.08

TO ORDER HEAD OR FILTER ELEMENT SPECIFY PART NAME AND MODEL NUMBER. ORDER OTHER PARTS BY PART NUMBERS.

BY-PASS	MESH	20 -30 -40 -50 -60 GPM							
		1 1/4 NPTF	1 1/4 SAE Flange	1 1/2 NPTF	1 1/2 SAE Flange	1 3/8-12 SAE	1 5/8-12 SAE	1 7/8-12 SAE	2 NPTF
		MODEL NUMBERS							
No	100	711	721	731	741	751	761	771	781
No	80	718	728	738	748	758	768	778	788
No	60	716	726	736	746	756	766	776	786
No	50	715	725	735	745	755	765	775	785
No	40	714	724	734	744	754	764	774	784
No	30	713	723	733	743	753	763	773	783
No	150	717	727	737	747	757	767	777	787
No	200	719	729	739	749	759	769	779	789
** 3 PSI	100	811	821	831	841	851	861	871	881
3 PSI	80	818	828	838	848	858	868	878	888
3 PSI	60	816	826	836	846	856	866	876	886
3 PSI	50	815	825	835	845	855	865	875	885
3 PSI	40	814	824	834	844	854	864	874	884
3 PSI	30	813	823	833	843	853	863	873	883
5 PSI	100	8115	8215	8315	8415	8515	8615	8715	8815
5 PSI	80	8185	8285	8385	8485	8585	8685	8785	8885
5 PSI	60	8165	8265	8365	8465	8565	8665	8765	8865
5 PSI	50	8155	8255	8355	8455	8555	8655	8755	8855
5 PSI	40	8145	8245	8345	8445	8545	8645	8745	8845
5 PSI	30	8135	8235	8335	8435	8535	8635	8735	8835
15 PSI	100	81115	82115	83115	84115	85115	86115	87115	88115
15 PSI	80	81815	82815	83815	84815	85815	86815	87815	88815
15 PSI	60	81615	82615	83615	84615	85615	86615	87615	88615
15 PSI	50	81515	82515	83515	84515	85515	86515	87515	88515
15 PSI	40	81415	82415	83415	84415	85415	86415	87415	88415
15 PSI	30	81315	82315	83315	84315	85315	86315	87315	88315
** 3 PSI	150	817	827	837	847	857	867	877	887
3 PSI	200	819	829	839	849	859	869	879	889
5 PSI	150	8175	8275	8375	8475	8575	8675	8775	8875
5 PSI	200	8195	8295	8395	8495	8595	8695	8795	8895
15 PSI	150	81715	82715	83715	84715	85715	86715	87715	88715
15 PSI	200	81915	82915	83915	84915	85915	86915	87915	88915

\*\*STANDARD BY-PASS.

NOTE: To specify MarvelMag Magnetic Filters, insert letter "M" in Model Number. Example: 831 becomes "831M".

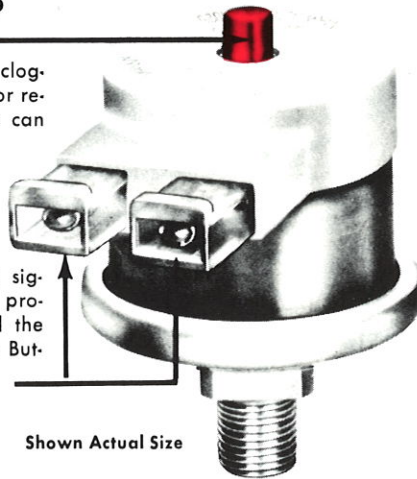


FOR USE WITH HYDRAULIC OILS, COOLANTS, LUBRICANTS, WATER GLYCOL FLUIDS, AND WATER

## RED BUTTON POPS UP

to indicate dangerous element clogging—allowing element cleaning or replacement BEFORE any damage can result.

Electrical Connections for audio signals and/or warning lights also provided (However, many users find the attention-compelling Red Pop-Up Button a sufficient warning signal).



**Eliminates "guesswork" in element servicing intervals.**

**Prevents damaging pump cavitation**

**Assures 100% oil filtration**

## MARVINDICATOR—VACUUM SENSING AND SIGNALLING INDICATOR

Too soon servicing of filter elements is costly in wasted maintenance, manpower, material, and downtime. Too late servicing can be even more costly, resulting in:

1. Dirty, unfiltered oil flooding entire system when filters with integral by-pass valves are employed.
2. Dangerous pump cavitation in systems employing filters without integral by-pass valves.
3. Expensive downtime for repairs and replacements.

Eliminate these problems by installing the Marvindicator in your sump and/or suction lines as illustrated below. Economical in cost and proven in years of field service, the Marvindicator takes the guesswork out of element servicing intervals. It tells precisely when servicing is needed by providing attention-compelling warning signals responsive to preordained degrees of vacuum, thus indicating any existing dangerous condition in both the filter and suction lines. Any excessive obstruction in either causes Marvindicator's highly visible Red Button to pop up to

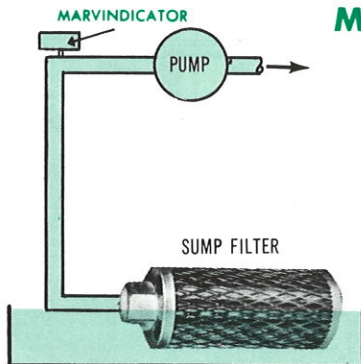
provide immediate warning. The Red Button always pops up at the proper time—whether or not other warning signals are operated from Marvindicator's electrical connections. These electrical connections, either direct terminal or conduit type, can be used to actuate warning lights, audio signals, or for shutting down the entire system. Other important features of the Marvindicator are:

- Installation requires only one pipe connection.
- Repetitive accuracy is fully dependable, highly precise.
- Operation unaffected by condition, nature or viscosity of hydraulic fluids.
- Operates in any position.
- Requires minimum mounting space.

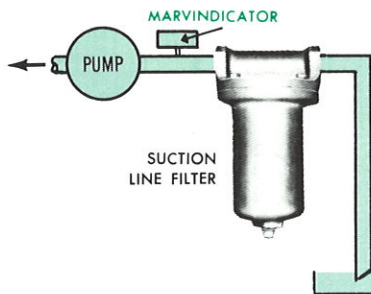
The Marvindicator is available for vacuums of \*2" through 9" Hg. and can be used with any voltage up to 110 AC or the equivalent in DC. As indicated on next page, models for Direct and Conduit Electrical Connections are offered.

\* Marvindicator vacuum settings are pre-set at the factory and the Marvindicator itself is outwardly designed as apparently un-adjustable as a precaution against tampering. However, the vacuum settings can be changed, if desired, by removing the Marvindicator cover.

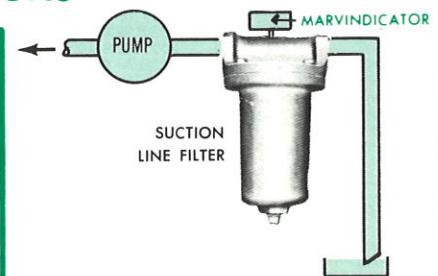
## MARVINDICATOR INSTALLATIONS



In Suction Line, Between Sump Filter and Pump



In Suction Line, Between Suction Line Type Filter and Pump

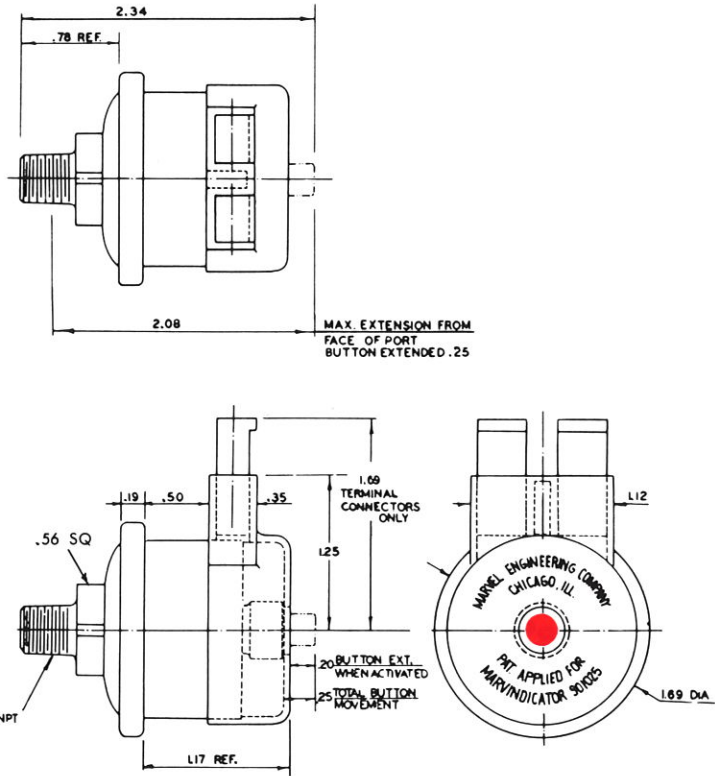
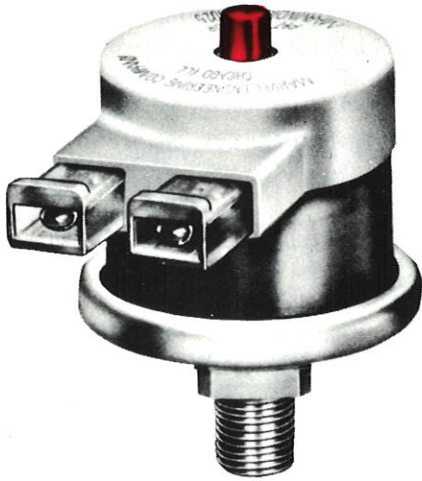


Directly in Head of Suction Filter (when 1/8" NPTF port is provided in Filter Head, on the downstream side of filter element)



**DIRECT TERMINAL CONNECTIONS**

MODEL NO. 901021 \*



**HOW TO ORDER MARVINDICATOR**

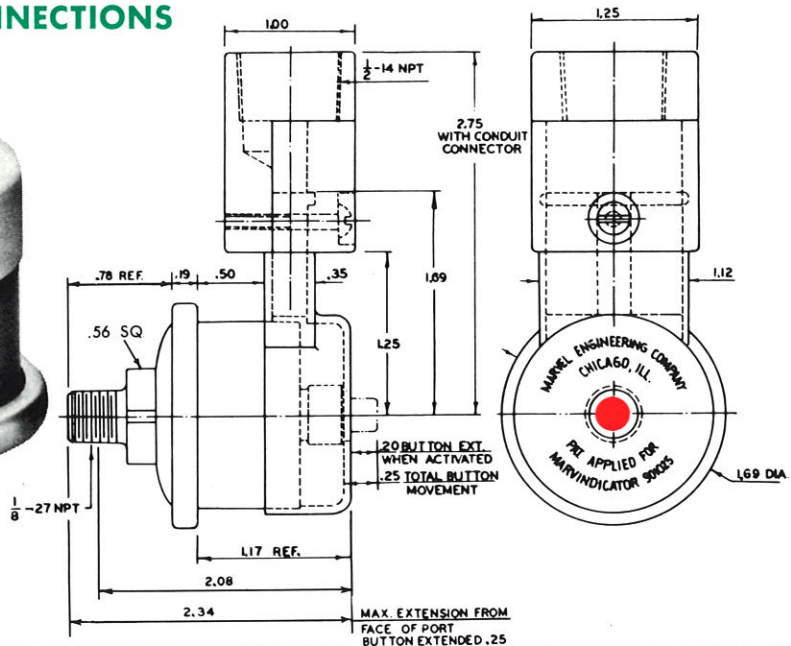
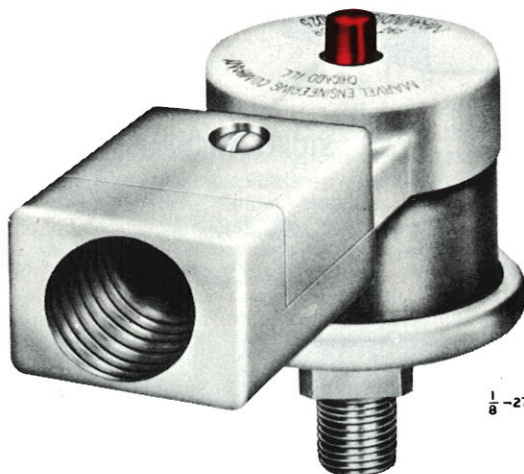
To order, merely specify Marvindicator Model No. followed by the code number of your selected vacuum setting. Example: A Marvindicator set for 4" Hg. and with Direct Terminal Connections would be specified by "Model No. 901021-04."

**\*VACUUM SETTINGS CODE NUMBERS**

VACUUM SETTINGS (Inches of Hg.)	2	3	4	5	6	7	8	9
VACUUM SETTINGS (Code No.)	02	03	04	05	06	07	08	09

**CONDUIT ELECTRICAL CONNECTIONS**

MODEL NO. 901021C \*





# MARVEL "PDC" COLORGAGE ELEMENT CONDITION INDICATOR

*For Suction, Return and Pressure Line Type Filters*

## Helps assure longer element life — better filtration . . . Guards against element collapse . . .

Now—at small cost—any of the \*suction, return and pressure line types filters in this catalog can have the remarkable protection against excessive element contamination and malfunction, provided by this ultra-modern, reliable warning system . . . the Marvel PDC Colorgauge. It provides a progressive, day-in, day-out indication of precise condition of element—from full clean through clogged, assuring 100% filtration at all times and permitting preventive maintenance in advance of actual need and at a convenient time (such as the next machine shutdown). Thus, the "guesswork" resulting in

costly "too soon" and dangerous "too late" maintenance is eliminated.

The "pressure differential" operating feature of Colorgauge is so dependable and so sensitive, it accurately indicates even the slightest changes in upstream-downstream pressure differential. With nothing to adjust or reset in the Colorgauge, there's no chance for error—no need for maintenance. And, because of its neat, compact size (1 3/4" x 1 3/4" x 2" high), Colorgauge fits most anywhere without adding appreciable weight or bulk (weighs only 2 1/2 ozs.).

### STURDY, LONG-LIVED CONSTRUCTION

Entire unit completely weatherproof, corrosionproof — encased in protective, all-weather, clear, see-through plastic housing that's extra-tough and shock resistant.

SCREWS fasten PDC Colorgauge directly to Marvel Filter or to Mounting Subplate.

### DUAL SET OF COLORATOR INDICATING BANDS

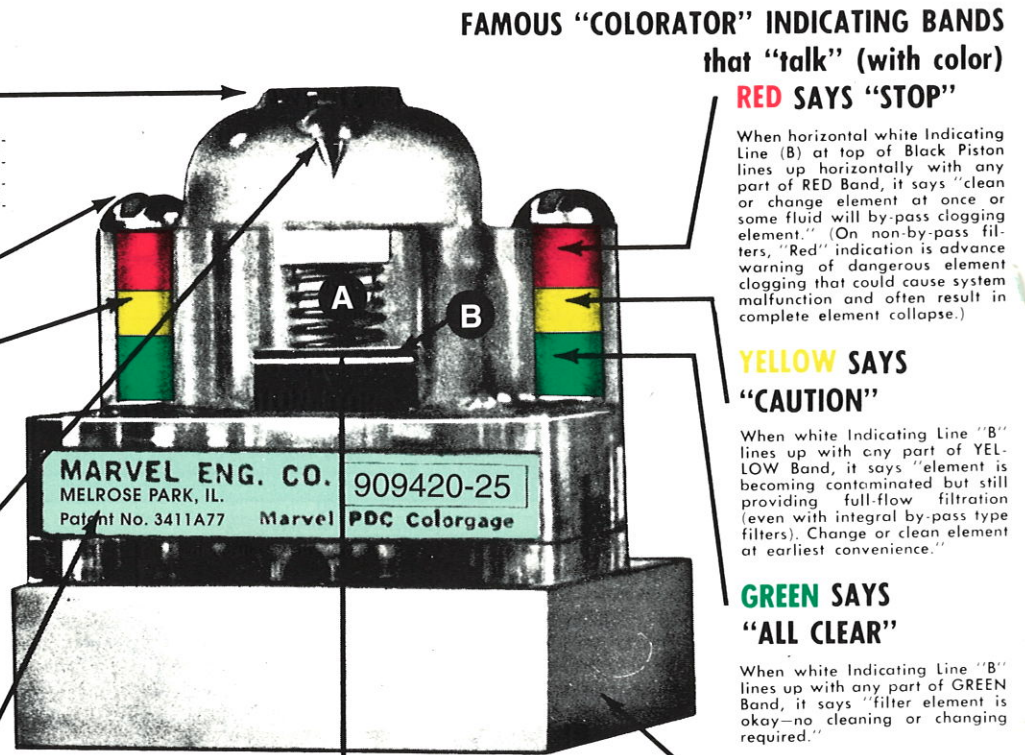
(180° apart) in clear plastic housing assure full, instant visibility from front, left and right at all times.

### FLOW DIRECTION ARROW

Permanently molded in (opposite side.) Prevents improper installation when PDC Colorgauge Indicator is used as a "remote" indicator.

### NAMEPLATE

completely protected and always visible through clear plastic housing.



### FAMOUS "COLORATOR" INDICATING BANDS that "talk" (with color)

#### RED SAYS "STOP"

When horizontal white Indicating Line (B) at top of Black Piston lines up horizontally with any part of RED Band, it says "clean or change element at once or some fluid will by-pass clogging element." (On non-by-pass filters, "Red" indication is advance warning of dangerous element clogging that could cause system malfunction and often result in complete element collapse.)

#### YELLOW SAYS "CAUTION"

When white Indicating Line "B" lines up with any part of YELLOW Band, it says "element is becoming contaminated but still providing full-flow filtration (even with integral by-pass type filters). Change or clean element at earliest convenience."

#### GREEN SAYS "ALL CLEAR"

When white Indicating Line "B" lines up with any part of GREEN Band, it says "filter element is okay—no cleaning or changing required."

### SIMPLE OPERATION

With clean filter, horizontal white Indicating Line (B) stays lined up horizontally with Green Band. When filter element contamination causes pressure drop at filter "out" port, pressure differential between "in" and "out" ports causes white indicator (B) to move up against spring (A) and line up either with Yellow or Red Band, depending upon degree of contamination.

### STURDY MOUNTING BASE OPT.

Solid aluminum mounting subplate with "in" and "out" ports (1/8" N. P. T.) for "in-line" (in parallel with filter) mounting of PDC Colorgauge. Four threaded and two drilled holes are provided in subplate for remote control panel mounting of PDC Colorgauge (See drawings at top of next page.)

TEMPERATURES—up to 200° F.

PRESSURES—150 psi and 1000 psi models with either 25, 15, 10, 8, 5 or 3 psi Indicator Spring Settings as desired.

FLUIDS—For use with petroleum base oils and lubricants. For other fluids, consult our engineering department. Always specify fluid to be used, on your order. Caution: Chlorinated Hydrocarbons not acceptable.

\*For Sump Type filter applications, a Marvel Indicator Vacuum Sensing Indicator is recommended. See pages 24 and 25 for details.



## HOW TO SELECT YOUR COLORGAGE

### ... For Filters WITH By-Pass Valves

1. Never select a Colorgage Spring Setting greater than your Filter By-Pass Valve Setting "cracking point" (when Valve begins to open). Marvel Return Line Filter By-Pass Valve Settings are "cracking point" settings (psi).
2. Where practical, we recommend the Colorgage Spring Setting equal to the "cracking point" setting of your Filter By-Pass Valve.
3. For earlier warning of element contamination, simply select the next lower Colorgage setting from Col. 1 of Table at right. Example: If your cracking point is 15 psi, use a 10 psi Colorgage; if 20, use a 15 psi, Colorgage. If your By-Pass Valve Setting (cracking point) does not correspond exactly with the 10, 15, or 25 psi Colorgage Settings (in Table at right), simply select the next lower Colorgage Setting. Example: if your cracking point is 20 psi, use a 15 psi Colorgage; if 30, use a 25 psi Colorgage.

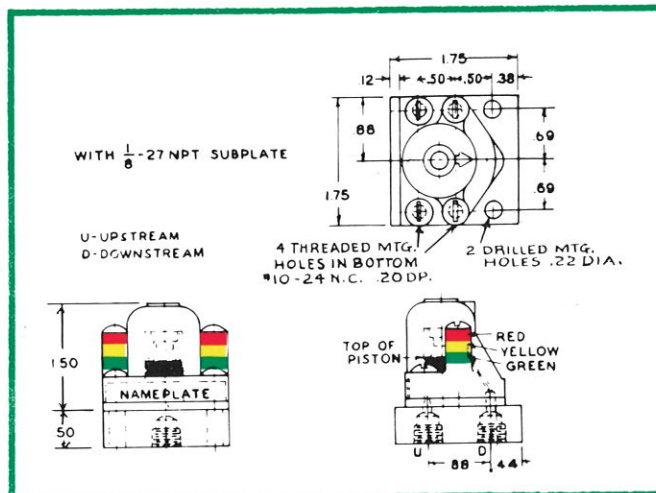
### ... For Marvel or Other Make Filters Without By-Pass Valves

With Marvel Filters, you can automatically select the 25 psi Colorgage because all Marvel Filters can be operated at this pressure differential without any danger of filter element collapse. However, where your pressure differential through "clean condition" filter is quite low, Colorgage with a lower setting can be used to provide earlier warning of element contamination and to limit the maximum pressure drop through filter (See Col. 3 in Table at right for recommended selections).

## SELECTION AND INSTALLATION

Merely select your desired Colorgage Model from Col. 2 of Table at right. Example: for 150 psi Colorgage with 10 psi spring setting, specify "Colorgage Model No. 909221-10."

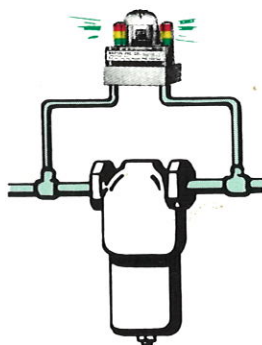
The sturdy, solid aluminum mounting subplate of the Colorgage has two 1/8" NPT ports and six mounting holes (two drilled through holes and four threaded holes), as illustrated in dimension drawings at top right. A versatile choice of mounting methods and locations is available as indicated by Figures 1, 2, 3, and 4 below.



SELECTOR TABLE — MARVEL PDC COLORGAGE INDICATORS			
†† For Hydraulic oils, coolants, lubricants, water glycol			
Col. 1	Col. 2	Col. 3	
PDC Colorgage Indicator Spring Settings	PDC COLORGAGE MODEL NUMBER**		*Max. Recommended "Clean Condition" Filter Pressure Drop PSI (The Greater the difference between figures in Col. 1 & 3, the longer the filter element life)
	Separate or Remote Use (With Subplate)		
	*Max. Operating Pressure		
	1000 PSI		
25 PSI	909421-25	8 to 12 PSI	
15 PSI	909421-15	6 to 7 PSI	
10 PSI	909421-10	4 to 5 PSI	
8 PSI	909421-08	3 to 4 PSI	
5 PSI	909421-05	2 to 2½ PSI	
3 PSI	909421-03	1 to 1½ PSI	

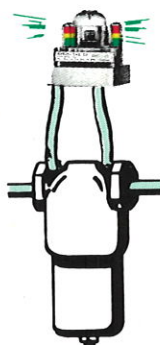
\* 4 to 1 Safety Factor.  
 \*\* Determined by highest flow rate to filter at normal operating viscosity. When Colorgage is used on out-of-doors equipment, white indicating Line (B) in picture, page 26, must be read at normal operating temperatures rather than at "cold start" oil viscosity.  
 † Pressure (PSI) at which White indicating Line (B) enters red band.  
 †† When used with Phosphate Ester Base Fluids, simply change dash (-) in Model No. to "X". Example: Colorgage Model No. 909221-25 becomes "909221X25."

Figure 1



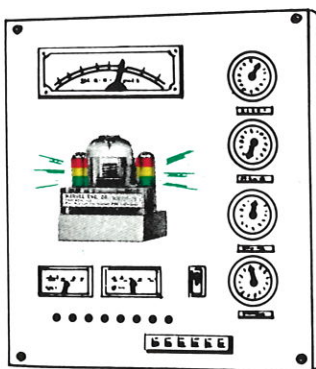
Installation of Colorgage in Suction, Return and Pressure Lines when 1/8" NPTF upstream and downstream ports are NOT provided in filter head.

Figure 2



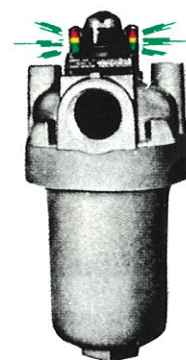
Installation of Colorgage in Suction, Return and Pressure Lines when 1/8" NPTF upstream and downstream ports ARE provided in filter head.

Figure 3



The Colorgage connection pipe lines in Figures 1 and 2 can be run to Colorgage mounted on remote control panel.

Figure 4



**COLORGAGE INTEGRALLY MOUNTED ON MARVEL FILTERS**

For a wide selection of Marvel Filters with INTEGRAL Colorgage Indicators, see Bulletin T-100. And for more information on Colorgage, see Bulletin CG-102.



# Other **MARVEL** **FILTERS**

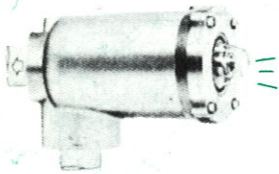
**matchless selections for eliminating downtime, repairs, replacements in every type of hydraulic circuit!**

Filters up to 200 gpm and 6,000 psi—down to 0.60 microns. Cleanable and throw-away elements. \*MarvelMag Magnets and advance-design Indicators for most models.

Quick Delivery! Marvel Filters available in threaded and flange-fitted ports in the most commonly used sizes.

## SUCTION

**LINE TYPE  
UP TO 150 GPM  
\*MARVELBO-S**



Most popular, dependable suction filter with famous Colorator Indicator (see below). 2-stage filtration plus MarvelMag. Lightweight, sturdy. Lowest pressure drop. MarvelMag optional.

INDICATOR RING



**GREEN SAYS  
"ALL CLEAR"**

Indicator Ring in green band says "filter element is clean"



**YELLOW SAYS  
"CAUTION"**

Ring in yellow band says "filter element is becoming contaminated but still providing full-flow filtration"



**RED SAYS "STOP"**

Ring in red band says "change (or clean) filter element at once or some liquid will bypass clogging element."

See Bulletin No L-0867-1

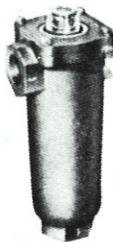
## RETURN LINE AND LOW PRESSURE

**TO 60 PSI and  
50 GPM—WITH  
"SPIN-ON" CARTRIDGE**



Cartridge Element changed in seconds—within 1/2" removal clearance. Money-saving price.

**UP TO 250 PSI  
AND 150 GPM  
\*MARVELBO-R**



Highest quality filtration plus famous Colorator Indicator and (optional) MarvelMag Magnets.

See Bulletin No. L-0867-1

**TO 350 PSI and 150 GPM  
FILTERS WITH INTERCHANGEABLE  
PORT ADAPTERS**

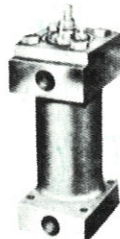


Change port sizes and types in minutes with ordinary socket wrench. \*Colorage or \*PDE Warning Switch (see below) and

MarvelMag optional. Reduces investment and inventory. Enables faster, easier, more versatile piping installations.

## HIGH PRESSURE

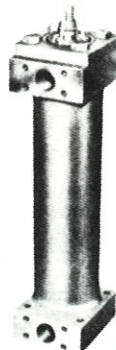
**UP TO 5000 PSI  
UP TO 150 GPM**



• With Standard Element

Extra sturdy, dependable, large capacity "R2" and "R5" models with famous Colorator Indicators and (optional) MarvelMag. Single and double element models standard; 3 & 4 element models also available.

See Bulletin No. L-0867-1



With Double Element

**UP TO 6000 PSI  
AND 30 GPM  
\*MARVEL MHP**

Powerfully built for fine filtration at extra-high pressures.

See Bulletin No. L-0668-1



## PORTABLE

**SAFILTMOBLE®**  
Unique new filter cart.

Wheel it anywhere, anytime—inside, out-side-to filter/ transfer oil, other liquids at up to 10 GPM.



Safe-all air-powered operates from any air line.

Also available as electric powered unit (Picture Shown)

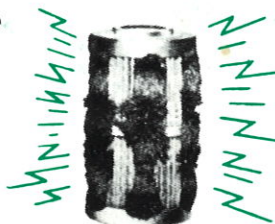
Triple Filtration action. Absolutely fail-safe operation.

See Bulletin L-8806

Most Filters shown above are available with...

## MAGNETIC FILTRATION

WITH  
UNIQUE MARVELMAG  
MAGNETIC SHIELD



See Page 10 for details

FILTERS FOR DEPENDABLE PROTECTION

## MARVEL ENGINEERING COMPANY

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E-MAIL [marvelfilters@aol.com](mailto:marvelfilters@aol.com) [www.marvelengineering.com](http://www.marvelengineering.com)



**NFFPA**

Solutions through motion technology

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