Norman
4500, 14500, 34500 & 54500 Series
Tee-Type Filters

Up to 20,000 PSI

- Aluminum or Stainless Steel Housings
- Single or Dual Stage
- Stainless, Glass Fiber, Sintered or Cellulose Elements
NORMAN TEE-TYPE FILTERS

FLUID CONDITIONERS

Norman Tee-Type filters are used to condition a wide variety of fluids. Whether your application is hydraulic, pneumatic, chemical processing, compressed gases or industrial fluid clarification, Norman filters will remove particulate contaminants from your system to keep it running longer. Filters increase the life of the pumps, valves, regulators and other components in your system, with pay-backs of longer system life, reduced down-time, and improved productivity. Norman offers the broadest filter line in the industry. This wide variety of sizes, materials, filtration media and optional accessories, all available from stock, allows you to select the model with the best price/performance value for your application.

HOUSINGS

Norman Tee-Type filter housings are made of either aluminum or stainless steel. Aluminum pressure vessels are rated at 5000 PSI (operating), and offer light weight and low cost; our stainless steel housings have higher operating pressures (up to 20,000 PSI) and excellent corrosion resistance. These housings come in five basic sizes, with flow rates up to 50 GPM (with 100 SSU oil), or 4000 SCFM @ 3000 PSI, GN2). Port sizes range from 1/4” to 1 1/2” female pipe thread (FPT), or 1/2” to 1 1/2” female O-ring thread (SAE). High-pressure portings and weldments are available on 10,000, 15,000 and 20,000 PSI models. NOTE: All pressure ratings are static, for applications calling for pulsating or pressure spikes, consult factory.

ELEMENTS

The replacement element is the heart of the filter. Norman offers four media types in a variety of micron ratings, with both low and high-collapse construction. In addition, six O-ring materials are available, most at no additional charge, to assure compatibility with virtually any fluid.

CELLULOSE: Resin-impregnated cellulose media has low cost and disposable convenience. Being a depth-type filter, it has high dirt-holding capacity for long life. Available in 3, 10 and 25 micron efficiency ratings with collapse pressures of 150 and 300 PSID. All Norman cellulose elements are bonded with epoxy for excellent fluid compatibility.

GLASS FIBER: Multi-layered glass fiber elements use aerospace technology to produce high efficiency silt-control filtration. Available in 1, 3, 5, 10 and 25 micron ratings, absolute (Beta, = 200), with collapse ratings of 300 and 3250 PSID. All are epoxy bonded. Its low flow restrictions and extremely long life (200 to 300% greater then cellulose) provide for extended service intervals and reduced maintenance cost.

STAINLESS STEEL: Our precision woven 304 stainless steel wire mesh elements provide absolute size discrimination and freedom from media migration. Available in nine micron ratings from 2X to 200µ, absolute (Beta, = 75), all-welded construction, with collapse rating of 4500 PSID. These elements are most suited to extreme temperature ranges and corrosive conditions. Stainless steel elements are reusable, with proper cleaning they can be reused almost indefinitely.

316 SINTERED METAL: Now available in .5, 1, 3 and 7 micron absolute, 316 sintered metal elements. These elements are perfectly suited for low viscosity fluid and all gas applications.

DUAL ELEMENTS

Norman Tee-Type filters are available in a unique dual-element configuration. The outer element is low-cost disposable cellulose for inexpensive system clean-up, and the inner element is reusable stainless steel for absolute particulate retention. Dual-element filters combine very high dirt holding capacity and positive non-bypass filtration with the convenience of a low-cost replacement element.

OPTIONAL ACCESSORIES

Norman Tee-Type filters have a number of optional accessories in stock to modify our standard housings to meet your specific application requirements:

Visual Indicator: Signals when the element needs changing. Reduces maintenance costs caused by premature element change-out.

Electrical Switch: Similar to visual indicator, above, but with a microswitch (normally open) and standard conduit connection. Used to actuate warning light, buzzer, etc., to signal element clogging.

Bypass Relief Valve: Internal valve relieves pressure during flow surges or cold start-up. Recommended with low-collapse elements.

Pressure Taps: Gauge ports on the inlet and outlet of the filter for external differential pressure sensing devices.

Bowl Drain: Allows liquid to be drained from the bowl to facilitate element change-out.
and density fluid, use the following conversion factor:

535 SIZE

10 GPM / 300 SCFM

**SPECIFICATIONS**

Rated Flow @ 10 PSID, clean (max.):
10 GPM (w/100 SSU oil)
300 SCFM (w/3,000 PSI, GNu)

Housing Material:
- 2,000 PSI Units: 7075T6 Aluminum
- 6,000 PSI Units: 303 & 316 Stainless Steel
- 10,000 PSI Units: 17-4 PH, 316LSS
- 20,000 PSI Units: 17-4 PH

Pressure Ratings:
- 5,000 PSI Units: 5,000 PSI Operating
- 7,500 PSI Proof
- 20,000 PSI Burst
- 6,000 PSI Units: 6,000 PSI Operating
- 9,000 PSI Proof
- 24,000 PSI Burst
- 10,000 PSI Units: 10,000 PSI Operating
- 15,000 PSI Proof
- 40,000 PSI Burst
- 15,000 PSI Units: 15,000 PSI Operating
- 22,500 PSI Proof
- 80,000 PSI Burst

Pressure Ratings (continued):
- 20,000 PSI Units:
  - 20,000 PSI Operating
  - 30,000 PSI Proof
  - 80,000 PSI Burst

O-Ring Temperature Range:
- Buna-N: -60°F to +250°F
- Viton: -70°F to +350°F
- Ethylene Propylene: -65°F to +350°F
- Teflon*: -320°F to +400°F
- Kalrez*: -40°F to +600°F

Element Temperature Range:
- Cellulose: -65°F to +275°F
- Glass Fiber: -70°F to +350°F
- 304 Stainless: -425°F to 1,000°F

Options:
- Relief Valve Setting: 50 PSI
- Visual Indicator Setting: 40 PSI
- Electrical Indicator Setting: 40 PSI
- Electrical Indicator Current Rating: 0.5 Ams Resistive

Total Assembly Weight:
- Aluminum 414 Lbs.
- Stainless Steel 12 Lbs.

**FLOW DATA** (PRESSURE DROP vs. FLOW)

**NOTE:** Add pressure drop of the housing to that of the element to obtain total initial clean pressure drop of the assembly. To determine pressure drop for a different viscosity and density fluid, use the following conversion factor:

\[ \Delta P = \Delta P @ 100 \text{ SSU} \times \frac{\text{new viscosity, SSU}}{100 \text{ SSU}} \times \frac{\text{new spec. gravity}}{0.9} \]
and density fluid, use the following conversion factor:

\[ \text{New \( \Delta P \) = \( \text{Old \( \Delta P \)} \times \frac{\text{new viscosity, SSU}}{100 \text{ SSU}} \times \frac{\text{new spec gravity}}{0.9} \]}

**SPECIFICATIONS**

Rated Flow @ 10 PSI, clean (max.):
- 16 GPM (w/100 SSU oil)
- 600 SCFM (@ 3,000 PSI, GN2)

Housing Material:
- 2000 PSI Units: 7075T6 Aluminum
- 6000 PSI Units: 303 & 316 Stainless Steel
- 10,000 PSI Units: 17.4 PH, 316LSS
- 15,000 PSI Units: 17.4 PH, 316LSS
- 20,000 PSI Units: 17.4 PH

Pressure Ratings:
- 5,000 PSI Units:
  - 5,000 PSI Operating
  - 7,500 PSI Proof
  - 20,000 PSI Burst
- 6,000 PSI Units:
  - 6,000 PSI Operating
  - 9,000 PSI Proof
  - 24,000 PSI Burst
- 10,000 PSI Units:
  - 10,000 PSI Operating
  - 15,000 PSI Proof
  - 40,000 PSI Burst
- 15,000 PSI Units:
  - 15,000 PSI Operating
  - 22,500 PSI Proof
  - 60,000 PSI Burst

**FLOW DATA (PRESSURE DROP vs. FLOW)**

**HOW-TO-ORDER**

**FLOW DATA (PRESSURE DROP vs. FLOW)**

**NOTE:** Add pressure drop of the housing to that of the element to obtain total initial clean pressure drop of the assembly. To determine pressure drop for a different viscosity and density fluid, use the following conversion factor:

\[ \text{New \( \Delta P \) = \( \text{Old \( \Delta P \)} \times \frac{\text{new viscosity, SSU}}{100 \text{ SSU}} \times \frac{\text{new spec gravity}}{0.9} \]}

**PHOTO**

**536 SIZE**

**16 GPM / 600 SCFM**
586 SIZE

24 GPM / 1200 SCFM

SPECIFICATIONS
Rated Flow @ 10 PSID, clean (max.): 24 GPM (w/100 SSU oil)
1200 SCFM (@ 3,000 PSI, GN2)
Housing Material:
2,000 PSI Units:
7075T6 Aluminum
6,000 PSI Units:
303 & 316 Stainless Steel
15,000 & 20,000 PSI Units:
17-4 PH, 316LSS

Pressure Ratings:
2,000 PSI Units:
5,000 PSI Operating
7,500 PSI Proof
20,000 PSI Burst
6,000 PSI Units:
6,000 PSI Operating
9,000 PSI Proof
24,000 PSI Burst
10,000 PSI Units:
10,000 PSI Operating
15,000 PSI Proof
40,000 PSI Burst
15,000 PSI Units:
15,000 PSI Operating
22,500 PSI Proof
60,000 PSI Burst

Pressure Ratings (continued):
20,000 PSI Units:
20,000 PSI Operating
30,000 PSI Proof
80,000 PSI Burst

O-Ring Temperature Range:
Buna-N: -40°F to +250°F
Viton: -20°F to +350°F
Ethylene Propylene: -65°F to +300°F
Teflon*: -320°F to +400°F
Kalrez*: -40°F to +600°F

Element Temperature Range:
Cellsless: -65°F to +275°F
Glass Fiber: -70°F to 350°F
304 Stainless: -425°F to 1,000°F

Options:
Relief Valve Setting: 50 PSI
Visual Indicator Setting: 40 PSI
Electrical Indicator Setting: 45 PSI
Electrical Indicator Current Rating: 0.5 Amps Resistive

Total Assembly Weight:
Aluminum 6.0 Lbs.
Stainless Steel: 15 Lbs.
10K, 15K & 20K Stainless: 45 Lbs.

NOTE:
Add pressure drop of the housing to that of the element to obtain total initial clean pressure drop of the assembly. To determine pressure drop for a different viscosity and density fluid, use the following conversion factor:
New \( \Delta P = \Delta P @ 100 \text{ SSU} \times \frac{\text{new viscosity, SSU}}{100 \text{ SSU}} \times \frac{\text{new spec. gravity}}{0.9} \)

HOW-TO-ORDER

FLOW DATA (PRESSURE DROP vs. FLOW)

NOTE: Add pressure drop of the housing to that of the element to obtain total initial clean pressure drop of the assembly. To determine pressure drop for a different viscosity and density fluid, use the following conversion factor:
**587 SIZE**

**35 GPM / 2500 SCFM**

### SPECIFICATIONS
- **Rated Flow @ 10 PSID, clean (max.):** 35 GPM (w/100 SSU oil)
- **Housing Material:** 5,000 PSI Units: 7075T6 Aluminum
- **Pressure Ratings:** 5,000 PSI Units: 5,000 PSI Operating
- **Element Temperature Range:** Cellulose: -65°F to +275°F
- **Pressure Ratings:** 5,000 PSI Units: 5,000 PSI Proof
- **Total Assembly Weight:** Aluminum 11.5 Lbs.
- **Electrical Indicator Setting:** 40 PSID
- **Visual Indicator Setting:** 40 PSID
- **Electrical Indicator Current Rating:** 0.5 Amps Resistive
- **Teflon™**
- **Kalrez™**
- **Viton**
- **Buna-N**

### HOW-TO-ORDER

- **Port Size, Type:**
  - A = 23 1/2" NPT
  - B = 68 1/2" SAE (1-24)
  - C = 77 1/4" SAE (1-20)
  - D = 78 1" SAE (1-6)
  - E = 87 1/8" FPT
  - F = 97 1/16" NPT

- **Housing Material:**
  - A = Aluminum™
  - B = 303 Stainless
  - C = 316 Stainless

- **Element Code:**
  - D = Celulose
  - E = Glass Fiber
  - F = Stainless Mesh
  - G = 316 Stainless

- **Movement Rating:**
  - H = 50
  - I = 100
  - J = 200
  - K = 300

- **Collapse Rating:**
  - L = 1000 Cellulose
  - M = 1000 Glass Fiber
  - N = Stainless Mesh
  - O = 316 Stainless

- **O-Ring Material:**
  - R = Buna-N
  - S = Viton
  - T = Ethylene Propylene
  - U = Teflon™
  - V = Kalrez™

- **Optional Accessories:**
  - W = 90 Durometer Nitrile
  - X = Teflon™
  - Y = Ethylene Propylene
  - Z = Kalrez™

### FLOW DATA (PRESSURE DROP vs. FLOW)

#### Filter Assembly Less Element

#### 587A Reinforced Cellulose Elements

#### 587F Series Glass Fiber Elements

#### 587G Series Stainless Elements

**NOTE:** Add pressure drop of the housing to that of the element to obtain total initial clean pressure drop of the assembly. To determine pressure drop for a different viscosity and density fluid, use the following conversion factor:

$$\text{New } \Delta P = \Delta P @ 100 \text{ SSU} \times \frac{\text{new viscosity, SSU}}{100 \text{ SSU}} \times \frac{\text{new spec. gravity}}{0.9}$$
**588 SIZE**

**50 GPM / 4000 SCFM**

### SPECIFICATIONS
- Rated Flow @ 10 PSI, clean (max.): 50 GPM (w/100 SSU oil)
- 4000 SCFM (@ 3,000 PSI, GN)
- Housing Material: 5,000 PSI Units: 7075T6 Aluminum
- 6,000 PSI Units: 303 & 316 Stainless Steel
- Pressure Ratings:
  - 5,000 PSI Units: Operating 7,500 PSI Proof
  - 6,000 PSI Units: Operating 9,000 PSI Proof
  - Burst 20,000 PSI Burst
- O-Ring Temperature Range: Buna-N: 
  - -40°F to +250°F
  - Viton: -70°F to +350°F
- Ethylene Propylene: -55°F to +300°F
- Teflon*: -32°F to +400°F
- Kalrez™: -40°F to +600°F
- Element Temperature Range: Cellulose: -65°F to +275°F
- Glass Fiber: -70°F to +350°F
- 304 Stainless: -425°F to 1,000°F
- 316 Stainless: -425°F to 1,000°F

### HOW-TO-ORDER

**Atom Model**
- 24
- 76
- 80
- 88
- 98
- 99

**Socket weld ports available on special order.**

### FLOW DATA (PRESSURE DROP vs. FLOW)

**NOTE:** Add pressure drop of the housing to that of the element to obtain total initial clean pressure drop of the assembly. To determine pressure drop for a different viscosity and density fluid, use the following conversion factor:

\[ \text{New } \Delta P = \Delta P @ 100 \text{ SSU} \times \frac{\text{new viscosity, SSU}}{100 \text{ SSU}} \times \frac{\text{new spec. gravity}}{0.9} \]
# T-TYPE FILTER – OPTIONAL ACCESSORIES

**ByPass Relief Valve**
- At a predetermined setting, the system fluid bypasses the element assembly until the element either is cleaned or replaced. Standard setting 50 psi cracking pressure. Other settings from 15-150 psi available on special order.

**Visual Differential Pressure Indicator**
- Enables operator to read contaminated build up before the element is plugged. Indicator is mounted on head of filter unit. Automatic reset. Aluminum is anodized for corrosion. Also available in Stainless Steel. Standard setting is 40 psi. Other settings form 15-100 psi available on special order.

**Electrical Differential Pressure Indicator**
- Ideal for applications where visual inspections are difficult due to location or where centralized process equipment monitoring is desired. By wiring the indicator into a central control panel, filter may be remotely monitored quickly and easily. The indicator, made of anodized corrosion resistant aluminum or 303 stainless steel, is mounted on top of the filter unit. An adjustable electric, normally open, reed switch dP indicator operated signal devices. Contacts closed when dP increases, and automatically resets when dP decreases. 3/4" male pipe connection for electrical hook-up. Voltage requirements: 10W – DC resistive, 10 VA – AC resistive. Switch current 0.5 amps. Relay required for heavier loads.

**CODE DR**
- **Bowl Drain:**
  - 1/4" MP DRCT4 1/8" SAE DR-3
  - 3/8" MP DRCT6 1/4" SAE DR-4

**CODE S**
- **Differential Pressure Ports:**
  - 1/4" MP SCT4 1/8" SAE S-3
  - 3/8" MP SCT6 1/4" SAE S-4

**CODE VR**
- **Visual dP Indicator and Bypass Relief Valve**
  - Enables the operator to see red indicator before relief valve opens, providing ample time to change the element before dirty fluid bypasses the filter.

**CODE EER**
- **EE dP Indicator and Bypass Relief Valve**
  - This combination enables monitor to receive signal in advance of bypass relief valve actuation.

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## NORMAN FILTER COMPANY

**Continuous Product Improvement**

Manufactured in Bridgeview, Illinois by Norman Filter Company, the redesigned 15,000 psi filter housing offers five new exciting options:

- **316SS**
- **Bypass**
- **Visual indicator**
- **Explosion Proof Electrical Indicator**
- **Electrical Indicator**