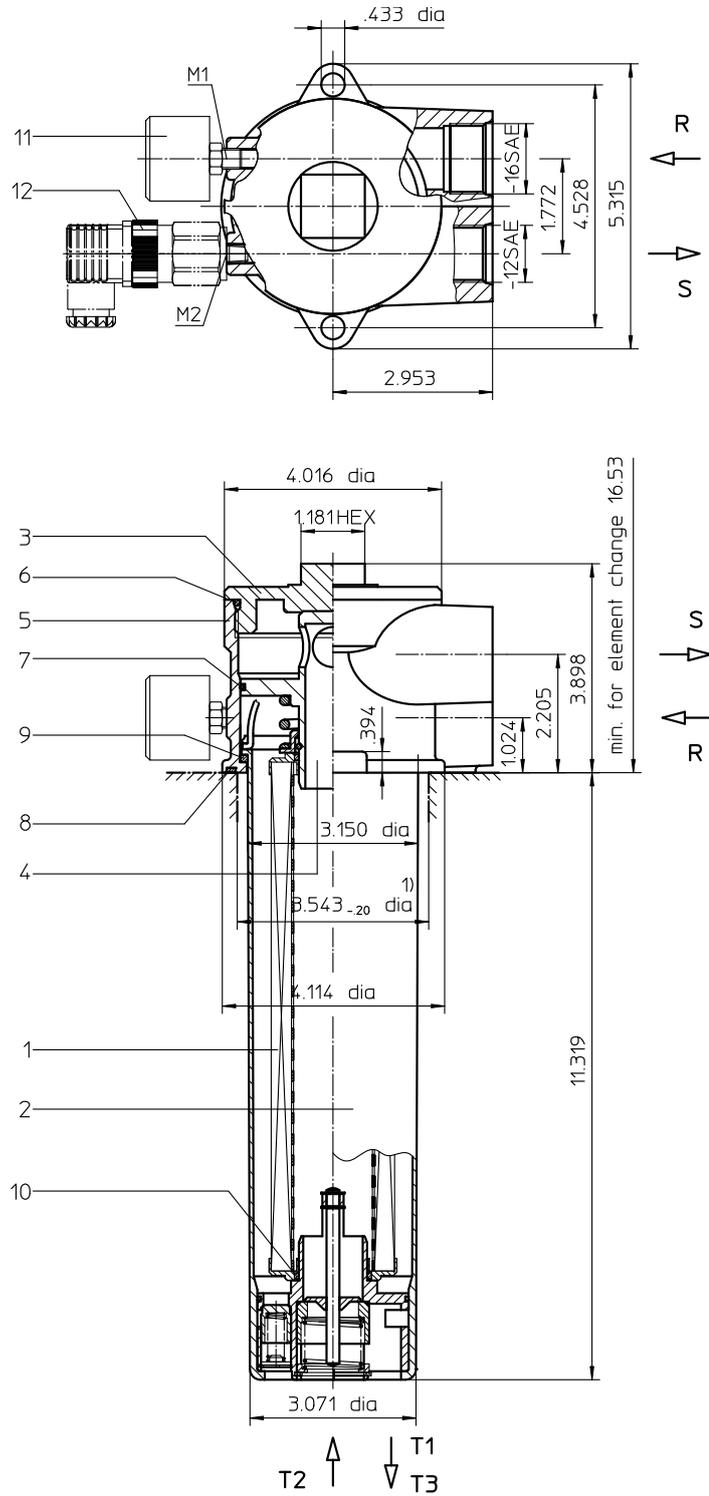


Series TNRS 101

145 PSI



¹⁾ tank cutout according to DIN 24550, T5

Weight: approx. 4.62 lbs.

Dimensions: inches

Designs and performance values are subject to change.

Return Line Filter

Series TNRS 101

145 PSI

Description:

Return-line filter series TNRS 101 have a working pressure up to 145 PSI. Pressure peaks will be absorbed by a sufficient margin of safety.

TNRS series are tank-top mounted in-line filters. In addition to the return-line connection, they have a suction connection on the clean-side. This suction connection has a preload pressure (fitting pressure) of ≥ 7.25 PSI.

This combination, return-line and suction filter, is for hydraulic circuits which are equipped with a minimum 2 feed pumps (2 hydraulic circuits). The preload suction connection is for the full volume flow filtration of the pump with the smaller volume flow.

The operating status in general wherein the preload pressure is effecting the Q_R (return-line flow) $> Q_S$ (suction flow). When the operating status is $Q_R = Q_S$ no preload pressure is effective.

During the operating status $Q_R < Q_S$ the suction valve is effective operates at the connection T2, what makes a feeding out of the receptacle possible without preload pressure and without filter efficiency.

The filter element according to DIN 24550, T4 consists of star-shaped, pleated filter material, which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.

For cleaning the stainless steel mesh element or changing the filter element, remove the cover and take out the element. The mesh elements are not guaranteed to maintain 100% performance after cleaning.

Filters finer than $40 \mu\text{m}$ use the disposable elements made of paper or microglass. Filter elements as fine as $5 \mu\text{m(c)}$ are available; finer filter elements on request.

Eaton filter elements are known as stable elements which have excellent filtration capabilities and a high dirt retaining capacity, therefore having a long service life. Due to its practical design, the return-line filter is easy to service.

Eaton filter can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.

When changing the filter element, a detachable connection between the filter head and the filter bowl prevents dirty oil from flowing into the tank.

1. Type index:

1.1. Complete filter: (ordering example)

TNRS. 101. 10VG. 10. B. P. -. UG. 5. -.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|----|

S2,5. Z. O. E2

| | | | |
|----|----|----|----|
| 11 | 12 | 13 | 14 |
|----|----|----|----|

- 1 | **series:**
TNRS = tank-mounted return-line filter with suction connection
- 2 | **nominal size:** 101
- 3 | **filter-material:**
80G, 40G, 25G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
10P paper
- 4 | **filter element collapse rating:**
10 = Δp 145 PSI
- 5 | **filter element design:**
B = both sides open
- 6 | **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 | **filter element specification:**
- = standard
- 8 | **process connection:**
UG = thread connection
- 9 | **process connection size:**
5 = -16 SAE
- 10 | **filter housing specification:**
- = standard
- 11 | **internal valve:**
S2,5 = with by-pass valve Δp 36 PSI
- 12 | **suction valve:**
Z = with suction valve
- 13 | **clogging indicator at M1:**
- = without
O = visual, see sheet-no. 1616
E1 = pressure switch, see sheet-no. 1616
E2 = pressure switch, see sheet-no. 1616
E5 = pressure switch, see sheet-no. 1616
- 14 | **preload pressure indicator at M2:**
- = without
E2 = pressure switch, see sheet-no. 1616

To add an indicator to your filter, use the corresponding indicator data sheet to find the indicator details and add them to the filter assembly model code.

1.2. Filter element: (ordering example)

01NR. 100. 10VG. 10. B. P. -

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|

- 1 | **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4
- 2 | **nominal size:** 100
- 3 | - | 7 | see type index-complete filter

Technical data:

| | |
|---------------------------------|--|
| design temperature: | 14 °F to +212 °F |
| operating temperature: | 14 °F to +176 °F |
| operating medium | mineral oil, other media on request |
| max. operating pressure: | 145 PSI |
| opening pressure by-pass valve: | 36 PSI |
| opening pressure preload valve: | 7.25 PSI |
| opening pressure suction valve: | .72 PSI |
| line adapter: | thread connection -16 SAE and -12 SAE |
| housing material: | Al-casting, glass fiber reinforced polyamide (filter bowl) |
| sealing material: | Nitrile (NBR) or Viton (FPM), other materials on request |
| installation position: | vertical |
| volume tank: | .35 Gal. |

Classified under the Pressure Equipment Directive 2014/68/EU for mineral oil (fluid group 2), Article 4, Para. 3.
 Classified under ATEX Directive 2014/34/EU according to specific application (see questionnaire sheet-no. 34279-4).

Pressure drop flow curves:

Filter calculation/sizing

The pressure drop of the assembly at a given flow rate Q is the sum of the housing Δp and the element Δp and is calculated as follows:

$$\Delta p_{assembly} = \Delta p_{housing} + \Delta p_{element}$$

$$\Delta p_{housing} = (\text{see } \Delta p = f(Q) \text{ - characteristics})$$

$$\Delta p_{element} (PSI) = Q (GPM) \times \frac{MSK}{1000} \left(\frac{PSI}{GPM} \right) \times \nu (SUS) \times \frac{\rho}{0.876} \left(\frac{kg}{dm^3} \right)$$

For ease of calculation our Filter Selection tool is available online at www.eatonpowersource.com/calculators/filtration/

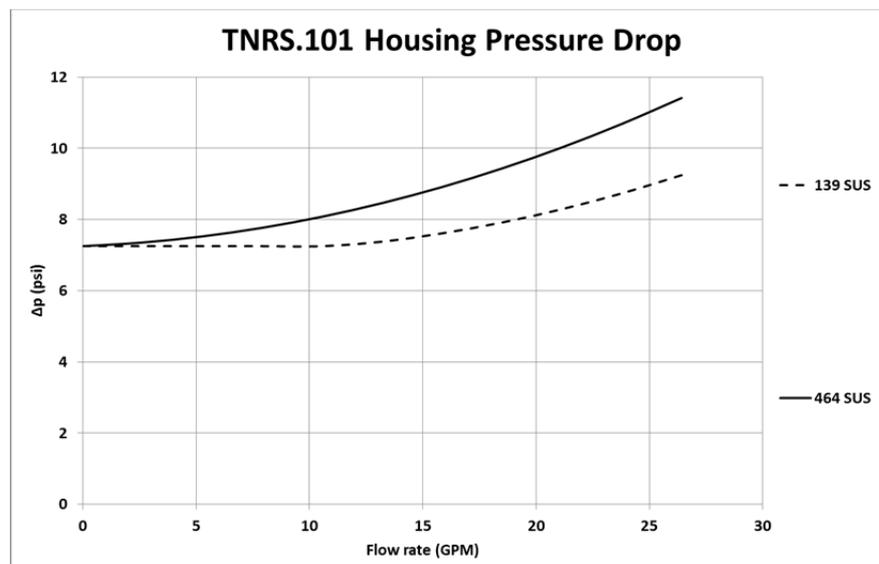
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

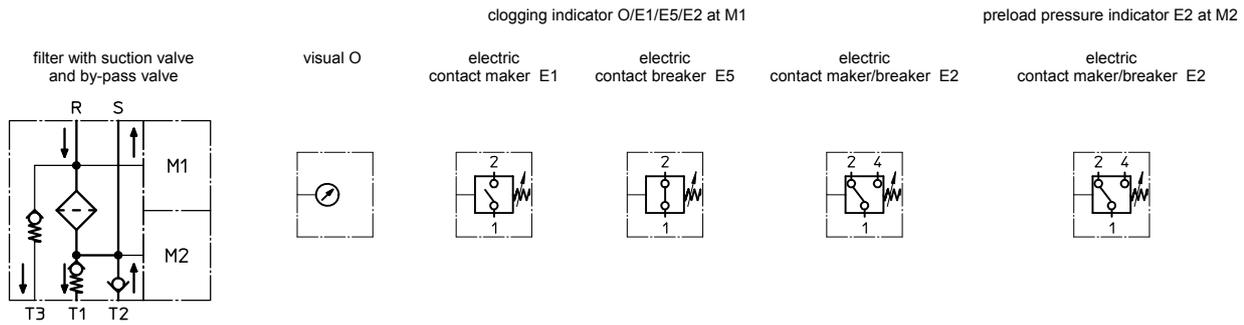
| TNRS | VG | | | | | G | | | P |
|------|-------|-------|-------|-------|-------|--------|--------|--------|-------|
| | 3VG | 6VG | 10VG | 16VG | 25VG | 25G | 40G | 80G | 10P |
| 101 | 2.021 | 1.403 | 0.898 | 0.782 | 0.534 | 0.0609 | 0.0568 | 0.0389 | 0.477 |

$\Delta p = f(Q)$ – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm³. The pressure drop changes proportionally to the density.



Symbols:



Spare parts:

| item | qty. | designation | dimension | article-no. | |
|------|------|------------------------------------|-----------------|--------------------|--------------|
| 1 | 1 | filter element | 01NR.100... | | |
| 2 | 1 | filter bowl with valve combination | | | |
| 3 | 1 | screw plug | M 92 x 3 | 313194 | |
| 4 | 1 | centering pivot | | | |
| 5 | 1 | filter head | | | |
| 6 | 1 | O-ring | 82 x 4 | 331337 (NBR) | 337365 (FPM) |
| 7 | 1 | O-ring | 80 x 2,5 | 313179 (NBR) | 314148 (FPM) |
| 8 | 1 | O-ring | 92 x 3 | 325584 (NBR) | 325585 (FPM) |
| 9 | 1 | O-ring | 75 x 3 | 302215 (NBR) | 304729 (FPM) |
| 10 | 2 | O-ring | 32 x 3,5 | 304378 (NBR) | 304401 (FPM) |
| 11 | 1 | clogging indicator at M1 | O, E1, E5 or E2 | see sheet-no. 1616 | |
| 12 | 1 | preload pressure indicator at M2 | E2 | see sheet-no. 1616 | |

Test methods:

Filter elements are tested according to the following ISO standards:

| | |
|-----------|---|
| ISO 2941 | Verification of collapse/burst resistance |
| ISO 2942 | Verification of fabrication integrity |
| ISO 2943 | Verification of material compatibility with fluids |
| ISO 3723 | Method for end load test |
| ISO 3724 | Verification of flow fatigue characteristics |
| ISO 3968 | Evaluation of pressure drop versus flow characteristics |
| ISO 16889 | Multi-pass method for evaluating filtration performance |