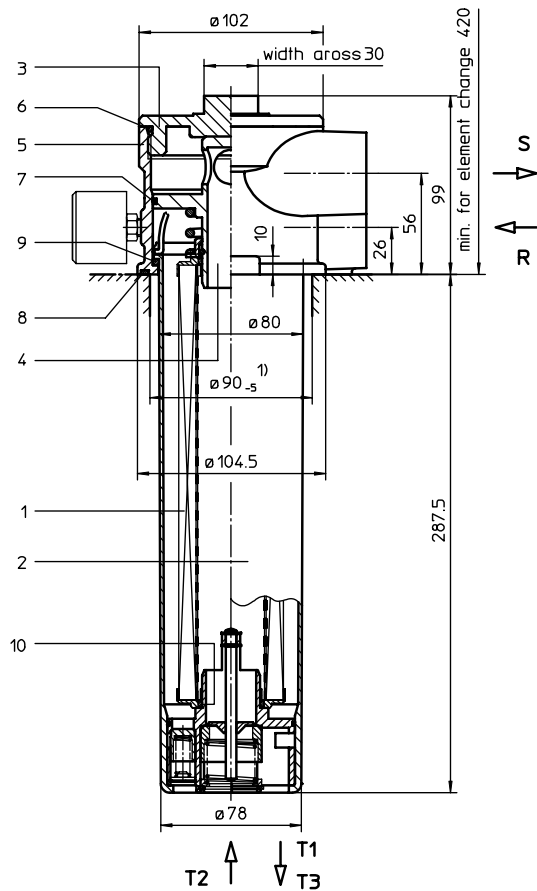


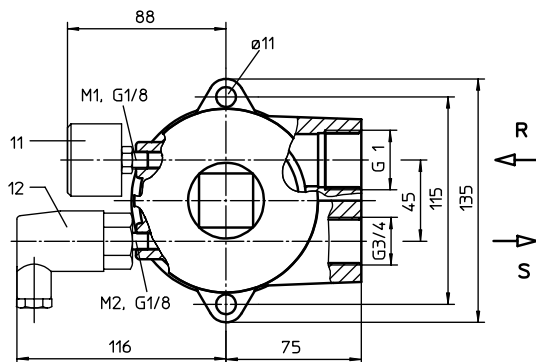
RETURN LINE FILTER, with suction connection

Series TNRS 101 DN 25 PN 10

Sheet No.
1070 F



1) tank cutout according to DIN 24550, T5



1. Type index:

1.1. Complete filter: (ordering example)

TNRS.101.10VG.10.B.P. - G.5. - S2,5.Z.O.E2

1	2	3	4	5	6	7	8	9	10	11	12	13	14
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1 series:

TNRS = tank-mounted return-line filter according to DIN 24550, T5 with suction connection

2 nominal size: 101

3 filter-material and filter-fineness:

80 G = 80 μm , 40 G = 40 μm , 25 G = 25 μm
stainless steel wire mesh
25 VG = 20 $\mu\text{m}_{(c)}$, 16 VG = 15 $\mu\text{m}_{(c)}$, 10 VG = 10 $\mu\text{m}_{(c)}$,
6 VG = 7 $\mu\text{m}_{(c)}$, 3 VG = 5 $\mu\text{m}_{(c)}$ Interpor fleece (glass fibre)
25 P = 25 μm , 10 P = 10 μm paper

4 resistance of pressure difference for filter element:

10 = Δp 10 bar

5 filter element design:

B = both sides open

6 sealing material:

P = Nitrile (NBR)
V = Viton (FPM)

7 filter element specification:

- = standard
VA = stainless steel

8 connection:

G = thread connection according to DIN 3852, T2

9 connection size:

5 = G1

10 filter housing specification:

- = standard

11 internal valve:

S2,5 = with by-pass valve Δp 2,5 bar

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

1.2. Filter element: (ordering example)

01NR. 100.10VG.10.B.P. -

1	2	3	4	5	6	7
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1 series:

01NR. = standard-return-line filter element according to DIN 24550, T4

2 nominal size: 100

3 - 7 | see type index-complete filter

weight: approx. 2,1 kg

EDV 01/10

Changes of measures and design are subject to alteration!

2. Spare parts:

item	qty.	designation	dimension	article-no.	
1	1	filter element	01.NR 100		
2	1	filter bowl with valve combination	TNRS 101		
3	1	screw plug	M 92 x 3	317014	
4	1	centering pivot	TNRS 63-100		
5	1	filter head	TNRS 101		
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	clogging indicator at M2	E2	see sheet-no. 1616	

3. Description:

The filters of the series TNRS 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 $\geq 0,5$ bar.

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

The operating status in general wherein the preload pressure and the full stream filtration are 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.

Return-line filters in the TNRS series are suitable for a working pressure up to 10 bar. Pressure peaks will be absorbed by a sufficient margin of safety.

The filter element according to DIN 24550, T4 consists of a 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 is from outside to inside. Filter finer than $40 \mu\text{m}$ should use throw-away elements made of paper or Interpor fleece (glass fibre). Filter elements as fine as $5 \mu\text{m}_{(c)}$ are available; finer filter elements on request.

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

INTERNORMEN-Filters 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.

When changing the filter element a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

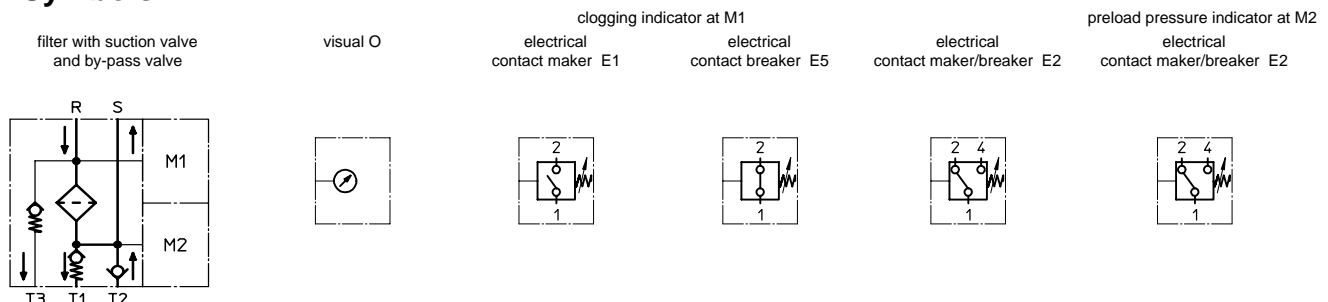
4. Technical data:

temperature range:	- 10 °C to + 80 °C (for a short time + 100 °C)
operating medium:	mineral oil, other media on request
max. operating pressure:	10 bar
opening pressure by-pass valve:	2,5 bar
opening pressure preload valve:	0,5 bar
opening pressure suction valve:	0,05 bar
line adapter:	G 1 and G ¾ according to DIN 3852, T2
housing material:	Al-casting, polyamide 6
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
volume tank:	1,3 l

Classified under the Pressure Equipment Directive 97/23/EC for mineral oil (fluid group 2), Article 3, Para. 3.

Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

5. Symbols:



6. Pressure drop flow curves:

Precise flow rates see 'INT-Expert-System Filter' respectively Δp -curves ; depending on filter fineness and viscosity.

7. 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 characteristi
- ISO 3968 Evaluation of pressure drop versus flow characteristics
- ISO 16889 Multi-pass method for evaluating filtration performance