



FRI

TANK TOP FILTER WITH IMMERSED PORTS, FOR RETURN LINE

SERIES 10

p max **10** bar
Q max (see performance table)

OPERATING PRINCIPLE

- FRI filters are designed to be flange-mounted on the tank top; the BSP threaded ports are immersed.
- The inspection cover fixed with screws allows easy maintenance; the filter element is supplied with a screw, which makes its removal together with the container easier. In this way, by replacing the filter element, it is possible to clean the contamination present in the bowl of the filter.
- The filter element is made of high efficiency filtering materials and is able to hold high quantities of contamination material. It is available with three different filtration degrees:
 - F10 = 10 μm absolute ($\beta_{10} > 100$) - ISO 4406:1999 class 18/16/13
 - F25 = 25 μm absolute ($\beta_{25} > 100$) - ISO 4406:1999 class 19/17/14
 - P10 = 10 μm nominal ($\beta_{10} > 2$) - ISO 4406:1999 class 21/19/16
- FRI filters are always supplied with a by-pass valve.
- All the FRI filters are designed to incorporate an electric or visual clogging indicator, to be ordered separately (see point 5).

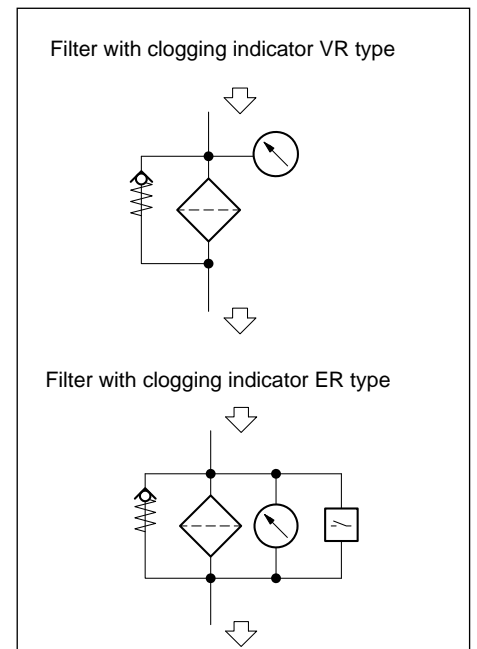
PERFORMANCES

Filter code	BSP port dimensions	Mass [kg]	Rated flow (indicative) [l/min]
			F10
FRI-TB100	1"	1.85	125
FRI-TB114	1 1/4"	4.60	250

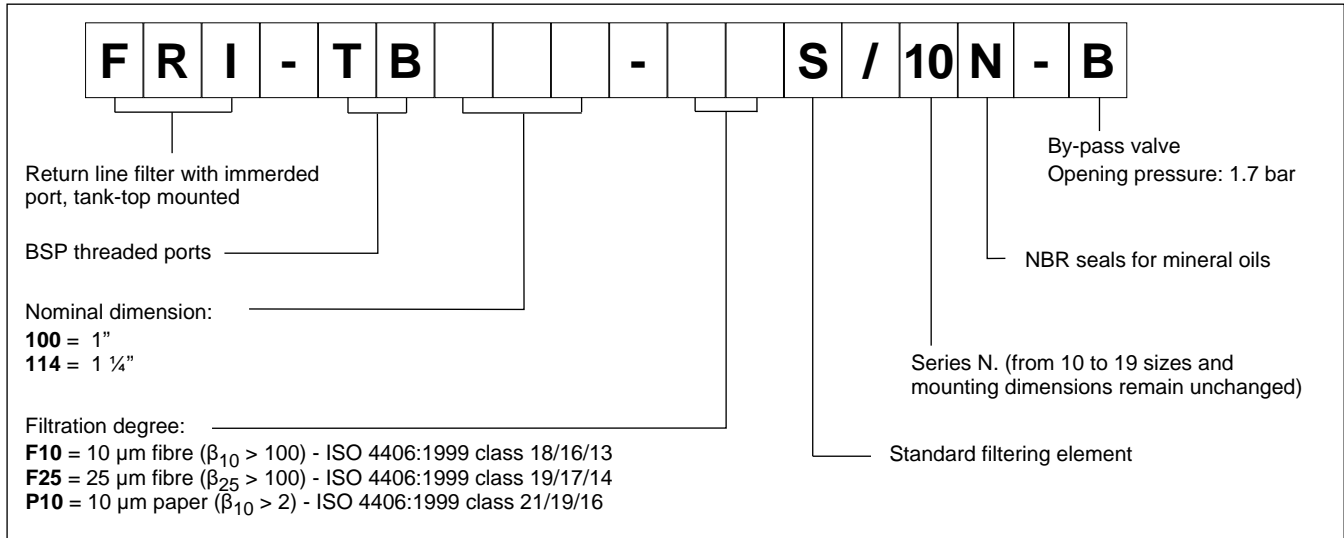
NOTE 1: the flow rates stated in the table correspond to a 0.5 bar pressure drop measured with mineral oil of viscosity 36 cSt at 50 °C.
As for a different viscosity range, see **NOTE 2** - point 2.2.

Maximum pressure	bar	10
Collapsing differential pressure of the filter element	Δp bar	3
Differential pressure for the opening of the by-pass valve ($\pm 10\%$)	bar	1.7
Ambient temperature range	°C	-25 / +50
Fluid temperature range	°C	-25 / +90
Fluid viscosity range	cSt	10 ÷ 400

HYDRAULIC SYMBOL



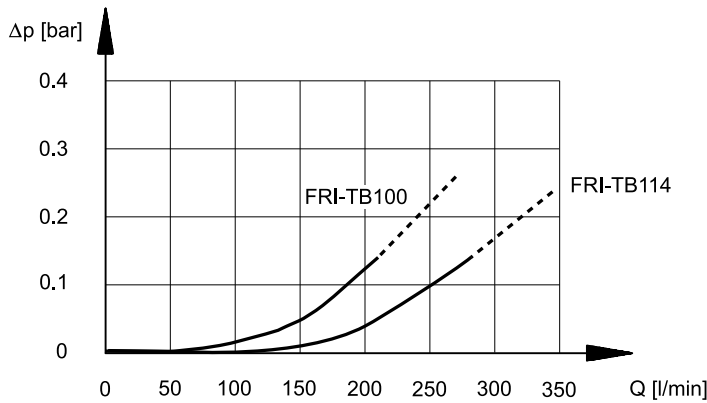
1 - IDENTIFICATION CODE



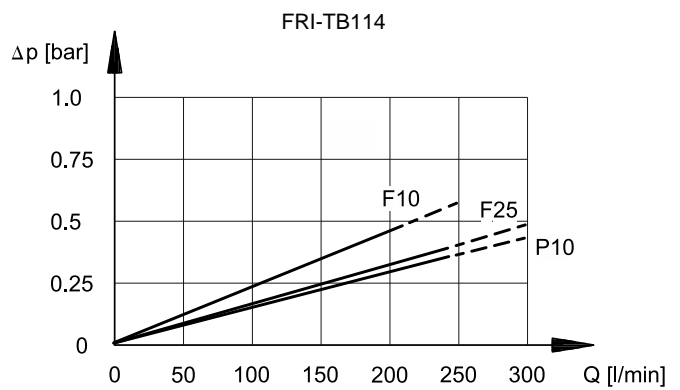
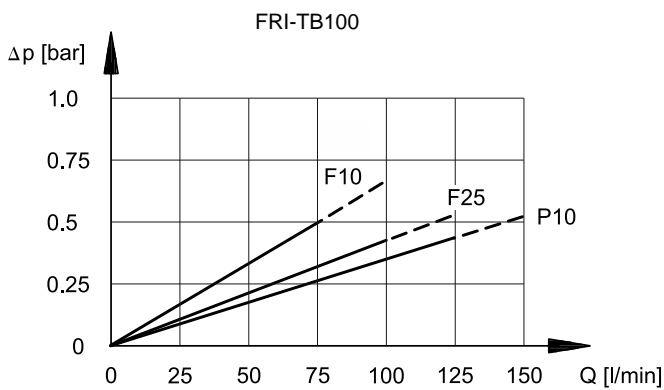
2 - CHARACTERISTIC CURVES

(values measured with viscosity of 36 cSt at 50°C)

2.1 - Pressure drops through the filter body



2.2 - Pressure drops through the FRTE filtering element



NOTE 2: the filter size has to be calculated so that with the nominal flow rate the pressure drop is lower than 0.5 bar.

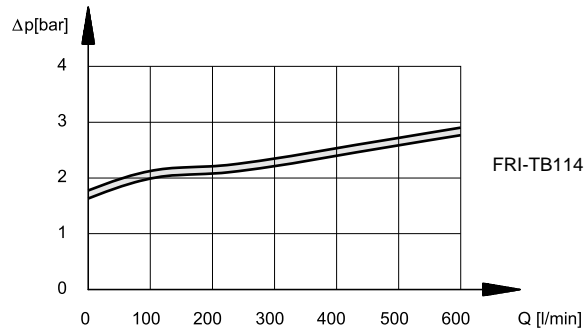
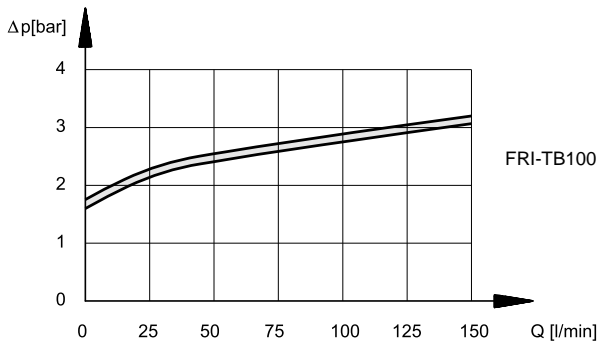
The total pressure drop through the filter is given by adding the body pressure drop values to those of the filter element. As for fluids whose viscosity degree at a specific operating pressure is different from 36 cSt, the filter total pressure drop has to be changed according to the following ratio:

$$\text{total } \Delta p \text{ value} = \text{body } \Delta p \text{ value} + (\text{real } \Delta p \text{ value of the filter element} \times \text{real viscosity value (cSt)} / 36)$$

$$\text{real } \Delta p \text{ value of the filter element} = \text{value obtainable through the diagrams in p. 2.2}$$

Such ratio is valid for a viscosity value up to 200 cSt. For a higher viscosity please consult our technical department.

2.3 - Pressure drops through the by-pass valve

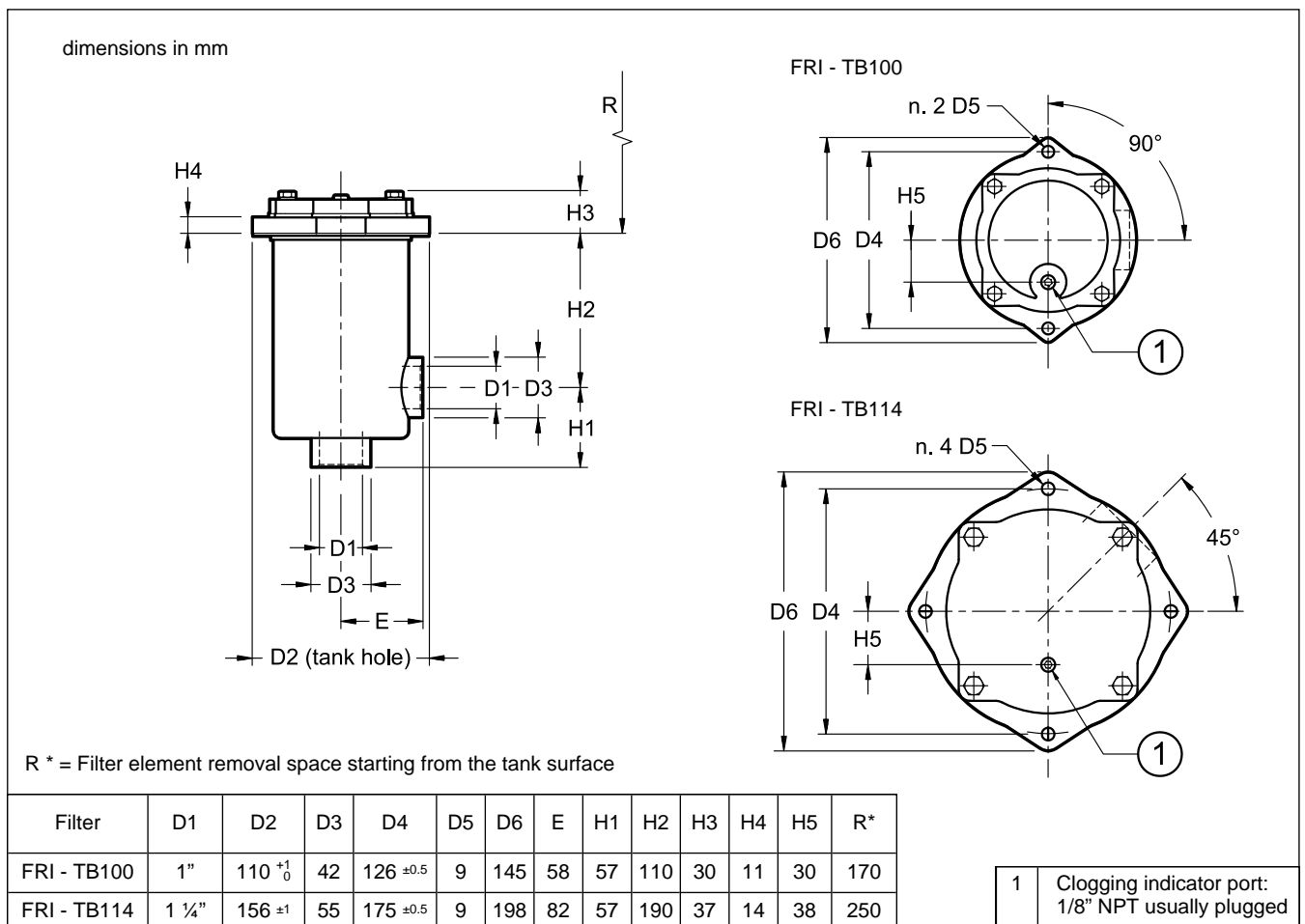


3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS

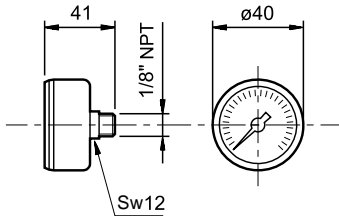


5 - CLOGGING INDICATORS

The filters are designed to incorporate clogging indicators, which have to be ordered separately.

5.1 - Visual indicator for return filters

Identification code: VR/10



This indicator is a pressure gauge sensitive to the filter input pressure.

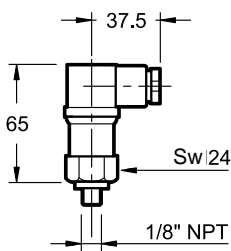
The indicator is supplied with a 0 ÷ 6 bar graduated scale and with a two-colour reading scale, which informs you about the clogging condition of the filter element:

GREEN: efficient filter element (0 ÷ 1.7 bar)

RED: the filter element has to be replaced (> 1.7 bar)

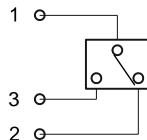
5.2 - Electric indicator for return filters

Identification code: ER/11



This indicator is a pressure switch sensitive to the filter input pressure, which switches an electrical contact when the filter element has reached the clogging limit.

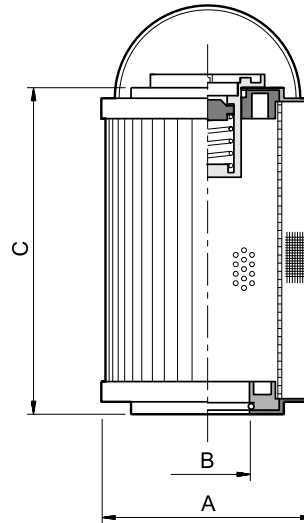
The contact can be wired in an open or closed condition (see the hydraulic symbol).



TECHNICAL SPECIFICATIONS

		AC	DC
Operating pressure	bar	1.5	
Supply voltage	V	250	110
Max load on the contacts	A	0.5	0.15
Electric connector		EN 175301-803 (ex DIN 43650)	
Class of protection according to IEC EN 60529 (atmospheric agents)		IP65	
ATEX classification: - gases - dusts		II 3G Ex nc IIB T5 Gc IP65 II 3D Ex nc IIIB T100°C Dc IP65	

6 - FILTER ELEMENTS



Filter element code	ØA	ØB	C	Average filtering surface [cm²]	
				P10	F10/F25
FRTE - 034	70	28	130	1600	1000
FRTE - 114	99	40	211	2480	3800

FILTER ELEMENT IDENTIFICATION CODE

F R T E - - - S / 10 N

Filter element for FRI filter

Nominal dimension:

034 = 3/4" for FRI-TB100

114 = 1 1/4" for FRI-TB114

Filtration degree: **F10** = fibre 10 µm
F25 = fibre 25 µm
P10 = paper 10 µm

Standard filter element

Series N. (from 10 to 19 sizes and mounting dimensions are unchanged)

NBR seals for mineral oils