



**DIPLOMATIC**  
HYDRAULICS

95 160/102 ED



# FRC

## RETURN LINE FILTER FOR TANK TOP OR LINE MOUNTING

### SERIES 10

**p** max 7 bar  
**Q** max (see table of performances)

#### OPERATING PRINCIPLE

By-pass valve

Cartridge filter element

Filter body

- FRC filters can be mounted both on the tank cover by using a 4-hole flange fixing system with a direct bottom discharge, or on the return line.
- The filter element with a screw on cartridge allows easy and practical replacement; a suitable membrane inside the cartridge prevents the residual oil from coming out.
- The filter element is made of high efficiency filtering materials and is able to accumulate high quantities of contamination material. It is available with three different filtration degrees:
  - 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
  - P25 = 25 µm: nominal ( $\beta_{25} > 2$ ) - ISO 4406:1999 class 24/22/19
- FRC filters are always supplied with a by-pass valve.
- All the FRC filters are designed to incorporate an electric or visual clogging indicator, to be ordered separately (see paragraph 5).

#### PERFORMANCES

Filter code	BSP port dimensions	Mass [Kg]	Rated flow (indicative) [l/min]				
			F25L	P10S	P10L	P25S	P25L
<b>FRC-TB034</b>	3/4"	1.6	65	65	70	70	75
<b>FRC-TB112</b>	1 1/2"	2.2	180	150	200	200	200

**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 - par. 2.2.

Maximum pressure	bar	7
Collapsing differential pressure of the filter element	bar	3.0
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 / +110
Fluid viscosity range	cSt	10 ÷ 400

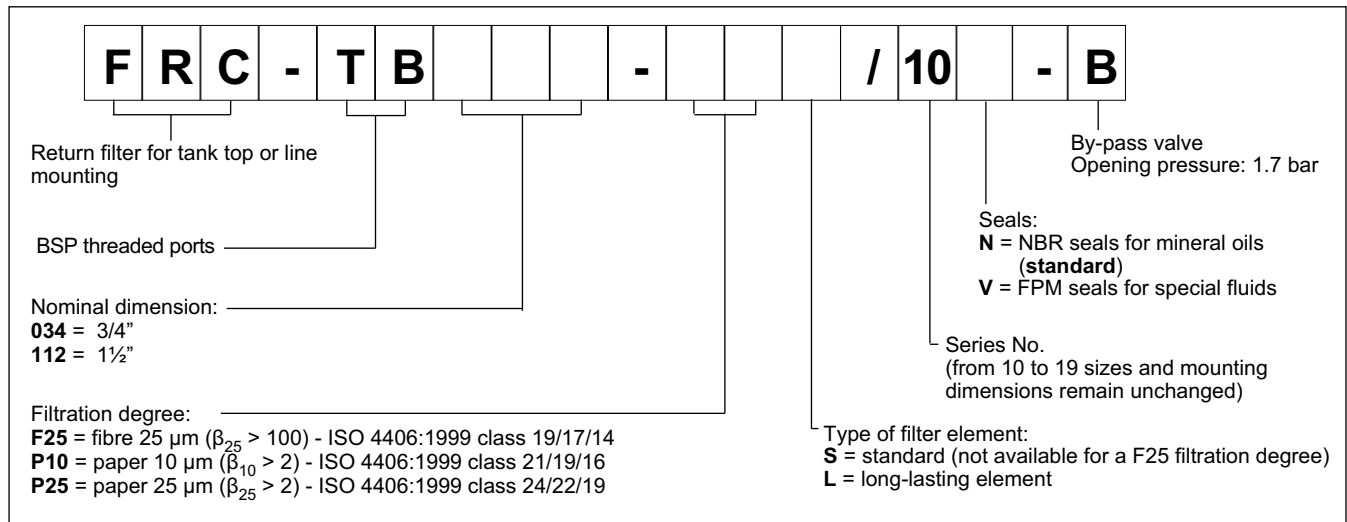
#### HYDRAULIC SYMBOL

Filter with indicator VR type

Filter with indicator ER type

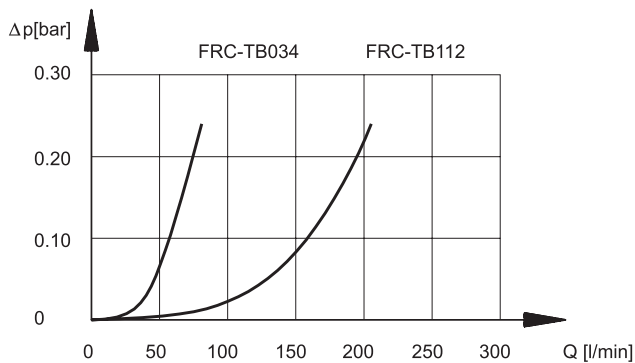


## 1 - IDENTIFICATION CODE

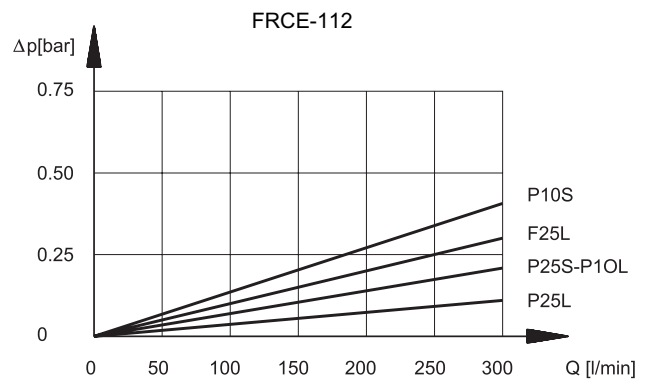
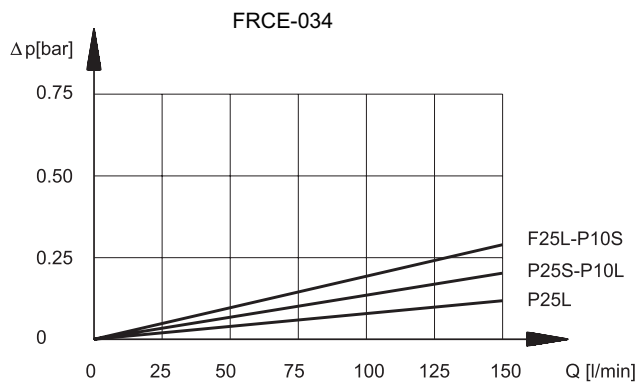


## 2 - CHARACTERISTIC CURVES (values measured with viscosity of 36 cSt at 50°C)

### 2.1 - Pressure drops through the filter body



### 2.2 - Pressure drops through the FRCE filter element





**NOTE 2: The filter size has to be selected 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:

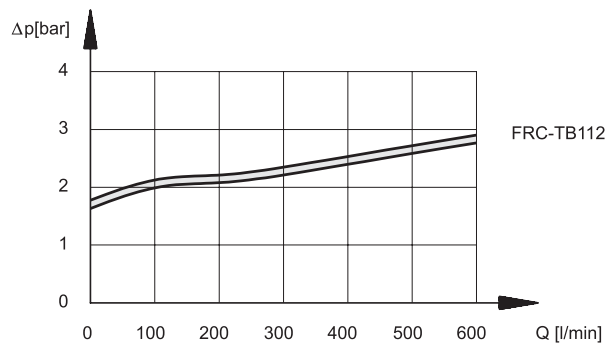
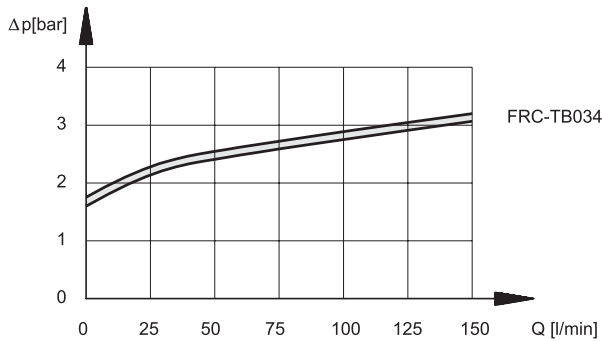
$$\text{total } \Delta p_l \text{ value} = \text{body } \Delta p \text{ value} + (\text{real } \Delta p \text{ value of the filter element} \times \text{real viscosity value (cSt)} / 36)$$

real  $\Delta p$  value of the filter element = value obtainable through the diagrams in paragraph 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

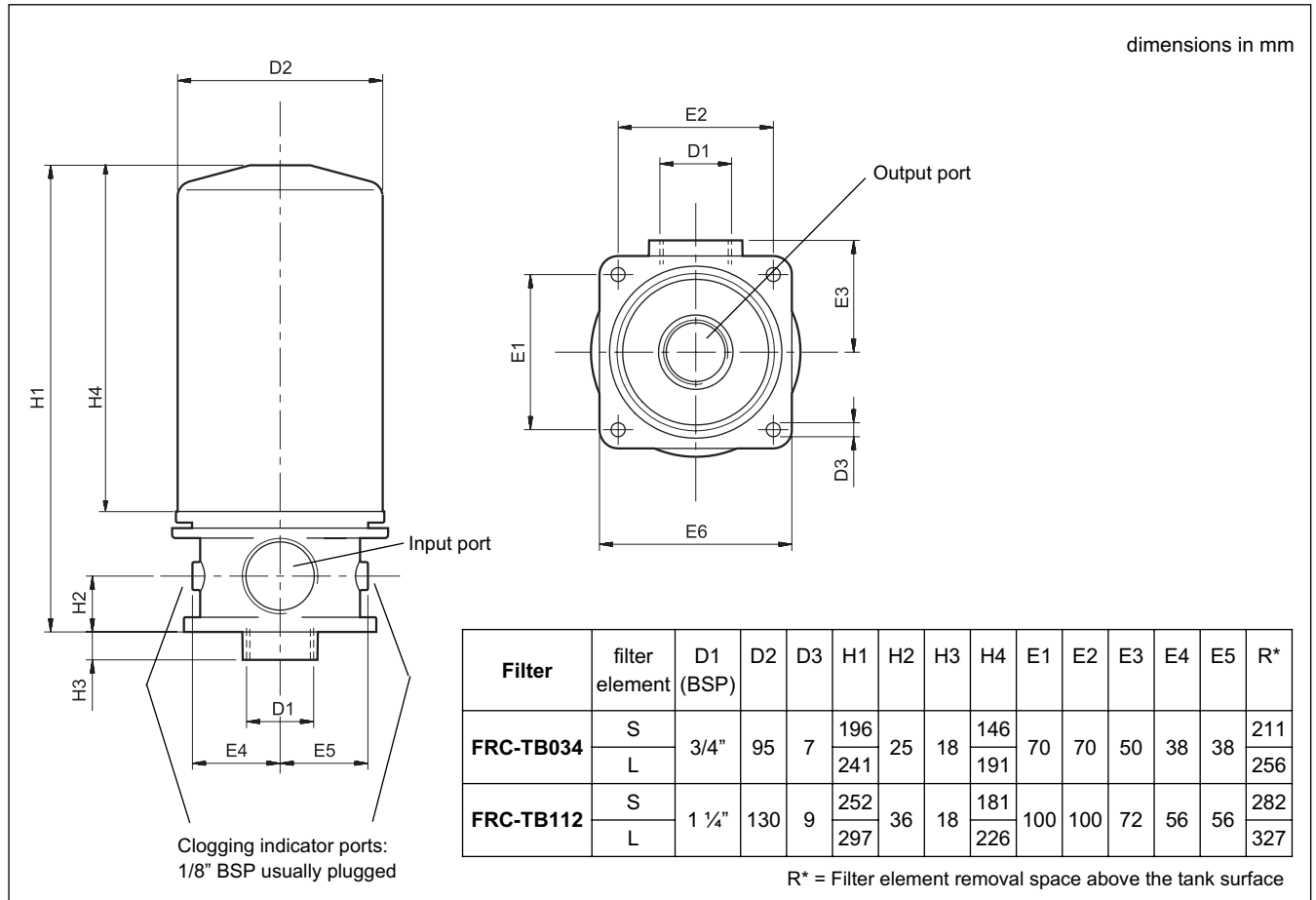


### 3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. 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



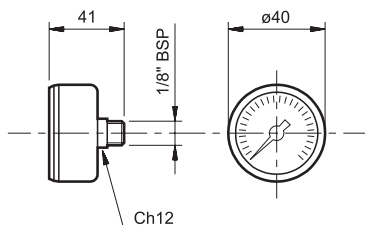


## 5 - CLOGGING INDICATORS

The filters are all 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.

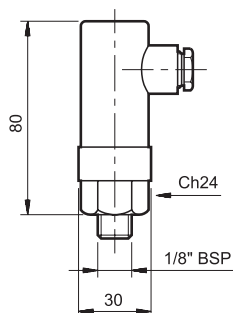
The indicator is supplied with a 0 ÷ 6 bar graduated scale and with a two-colour reading scale, which informs you about the clogging condition of the filter element:

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/10**



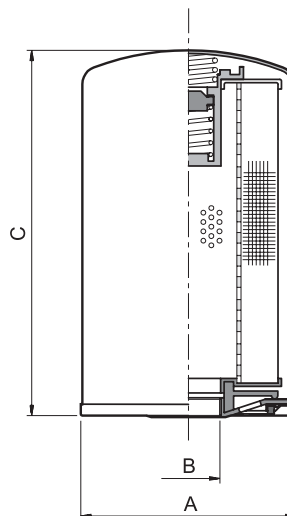
This indicator is a pressure switch sensitive to the filter input pressure, which switches an electric contact when the filter element has reached the clogging limit.

With an efficient filter, the contact is normally closed.

## TECHNICAL SPECIFICATIONS

Operating pressure	bar	1.5
Max operating voltage	V	220 50/60 Hz
Max load on the contacts:		
- resistive	A	0.5
- inductive		0.25
Max commutable power	VA	100
Protection class according to CEI EN 60529 (atmospheric agents)		IP65

## 6 - FILTER ELEMENTS



filter element code	ØA	ØB	C	Average filtering surface [cm <sup>2</sup> ]
FRCE - 034 -P*S	96,5	3/4" BSP	146	3305
FRCE - 034 -P*L	96,5	3/4" BSP	191	4745
FRCE - 034 -F25L	96,5	3/4" BSP	191	3630
FRCE - 112 -P*S	129	1 1/4" BSP	181	5560
FRCE - 112 -P*L	129	1 1/4" BSP	226	7360
FRCE - 112 -F25L	129	1 1/4" BSP	226	5890

## FILTER ELEMENT IDENTIFICATION CODE

**F R C E - - - - - / 10**

Cartridge filter element for FRC filters

Nominal dimension  
**034** = 3/4"    **112** = 1 1/2"

Filtration degree : F25 = fibre 25 µm  
 P10 = paper 10 µm  
 P25 = paper 25 µm

Type of filter element:  
**S** = standard (not available with a F25 filtration degree)  
**L** = long-lasting element

Series No. (from 10 to 19 sizes and mounting dimensions remain unchanged)

**N** = NBR seals for mineral oils (**standard**)  
**V** = FPM seals for special fluids upon request

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