



FRM SERIES

Tank top return filters

The FRM filters are available with various configurations:

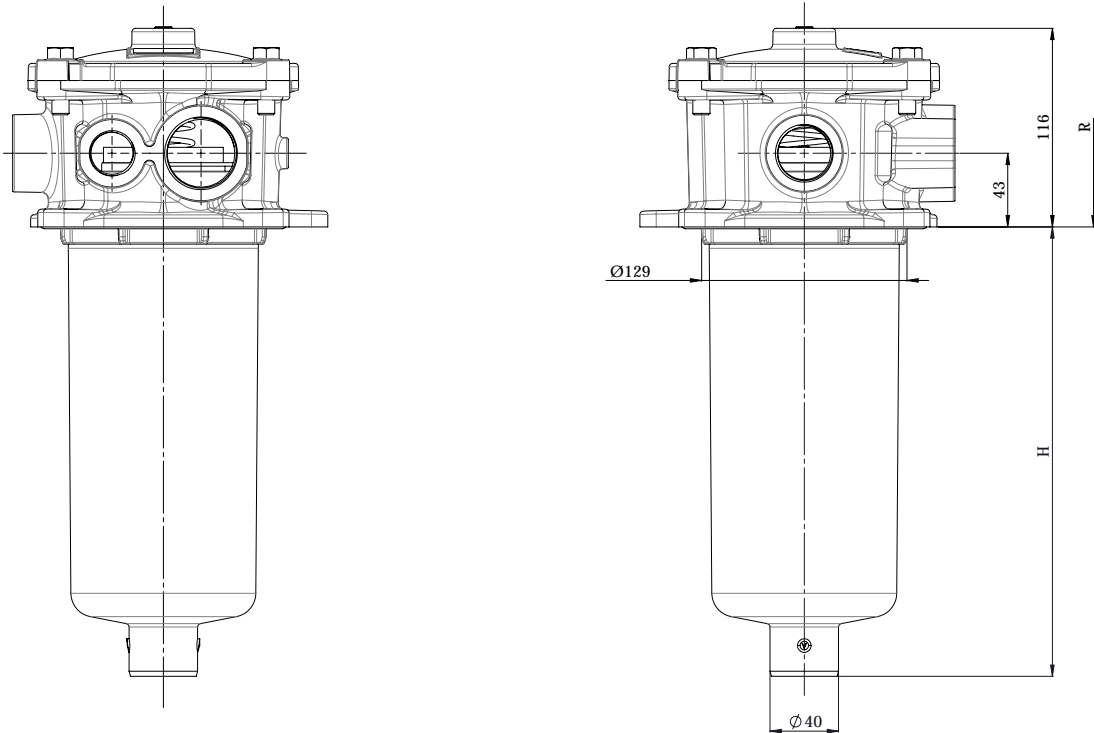
- with 3 or 4 tank mounting holes
- with supplementary inlet ports
- flow rate up to 400 l/min
- with quick service cover



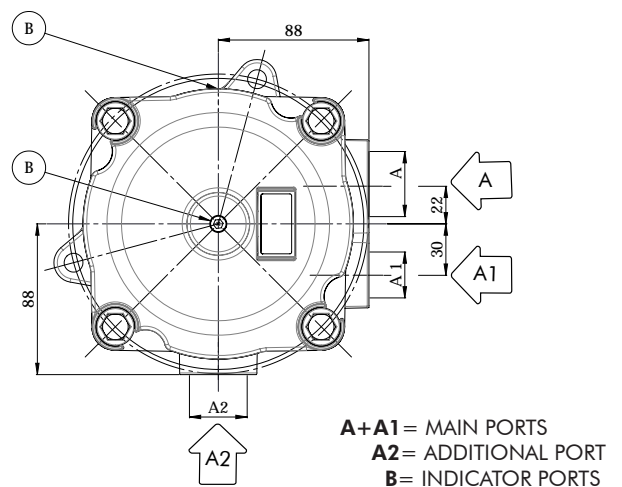
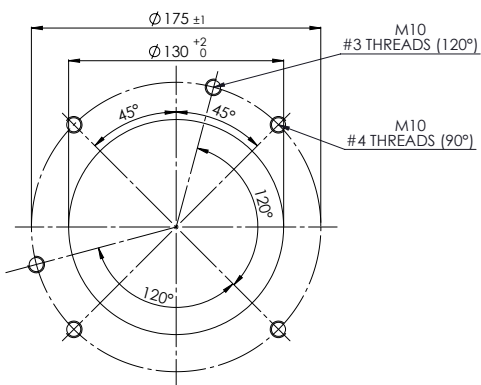
HOUSING	tested according to NFPA T3.10.5.1*, ISO 10771*, ISO 3968
PRESSURE:	Max operating: 10 bar
CONNECTIONS:	Main ports: G 1 1/4" + G 3/4" Additional port: G 1"
MATERIALS:	Head: aluminium alloy Bowl: PA6 reinforced Seal: NBR (FKM on request)
BYPASS VALVE:	Inbuilt in the filter element C version 3 bar B version 1,7 bar (on request)
ELEMENT	tested according to ISO 11170, 2941, 2942, 2943, 3724, 3968, 16889, 16908, 23181
FILTER MEDIA:	Inorganic microfiber G06 - G10 - G15 - G25 - G40 Synthetic M05 - M10 - M15 Other media and micron ratings on request.
COLLAPSE PRESSURE:	10 bar
TEMPERATURE RANGE:	-30°C + 100°C
FLUID COMPATIBILITY:	Full with HH-HL-HM-HV HETG-HEES (acc. to ISO 6743/4). For use with other fluid please contact Filtrec Customer Service (info@filtrec.it).

* as reference method only for verifying the pressure fatigue resistance and establishing the burst pressure ratings.

OVERALL DIMENSIONS



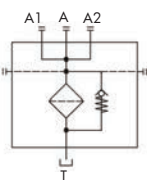
TANK MOUNTING PATTERN



NOMINAL SIZE

MODEL	A	A1	A2	H	R	WEIGHT
FRM R140				217	300	2,1 Kg
FRM R143	G 1 1/4"	G 3/4"	G 1"	263	350	2,2 Kg
FRM R145				430	520	2,4 Kg

HYDRAULIC SYMBOL



ORDERING INFORMATION

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
	FRM	R1	43	G10	C	B	B6B4	B5	0	D	PDC
SPARE ELEMENT		R1	43	G10	C						

1. FILTER SERIES	FRM	
2. FILTER ELEMENT SERIES	R1	
3. FILTER SIZE	40	
	43	
	45	
4. FILTER MEDIA	000	no element
	G06	glassfiber $\beta_{7\mu m(c)} > 1.000$
	G10	glassfiber $\beta_{12\mu m(c)} > 1.000$
	G15	glassfiber $\beta_{17\mu m(c)} > 1.000$
	G25	glassfiber $\beta_{22\mu m(c)} > 1.000$
	G40	glassfiber $\beta_{35\mu m(c)} > 1.000$
	M05	synthetic $\beta_{10\mu m(c)} > 1.000$
	M10	synthetic $\beta_{15\mu m(c)} > 1.000$
	M15	synthetic $\beta_{20\mu m(c)} > 1.000$
5. BYPASS VALVE	C	3 bar
6. SEALS	*B	NBR
*omitted for spare element	V	FKM
7. MAIN PORTS	B6B4	G 1 1/4" + G 3/4"
8. ADDITIONAL PORT	B5	G 1"
9. FILLING PLUG	0	no filling plug
10. INDICATOR PORTS	D	1/8" plugged (standard)
*on request	*R	additional 1/8" plugged on cover
11. CLOGGING INDICATORS	000	without indicator
	MPC	pressure gauge rear connection for "C" by-pass
	MRC	pressure gauge radial connection for "C" by-pass
	PDC	pressure switch for "C" by-pass

ACCESSORIES	LC24	LED connector for pressure switch
The accessories must be ordered separately	ET2250	extension tube 250 mm long
	ET2500	extension tube 500 mm long
	CT2250	connection tube 250 mm long
	DF040	diffuser Ø 40 mm

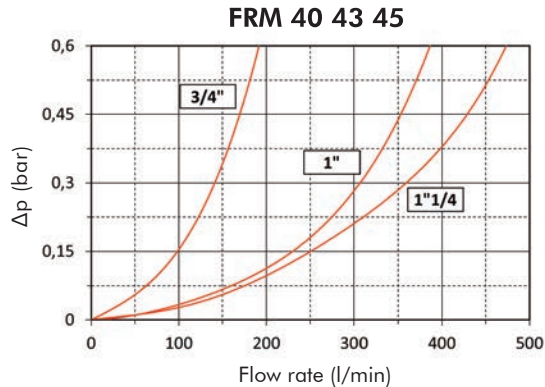
PRESSURE DROP (Δp) INFORMATION FOR FILTER SIZING

The total Delta P through a filter assembly is given from Housing Δp + Element Δp .
The max recommended total Δp for return filters is 0,4 – 0,6 bar with clean element.

N.B. All the reported data have been obtained at our laboratory, according to specification ISO3968 with mineral oil having 32 cSt viscosity at 40°C and density 0,875 kg/dm³.

HOUSING PRESSURE DROP

The housing Δp is given by the curve of the considered model and port, in correspondence of the flow rate value.



ELEMENT PRESSURE DROP

The element Δp (bar) is given by the flow rate (l/min) multiplied by the factor in the table here below corresponding to the selected media and divided by 1000.

If the oil has a viscosity V_x different than 32 cSt a corrective factor $V_x/32$ must be applied.

Example: 200 l/min with R143G10C and oil viscosity 46 cSt > $(200 \times 1,21)/1000 \times (46/32) = 0,35$ bar

	G06	G10	G15	G25	G40	M05	M10	M15
R140	2,43	1,31	1,25	1,10	0,43	0,95	0,82	0,62
R143	2,25	1,21	1,15	1,00	0,39	0,88	0,75	0,57
R145	1,35	0,55	0,52	0,50	0,17	0,52	0,44	0,32

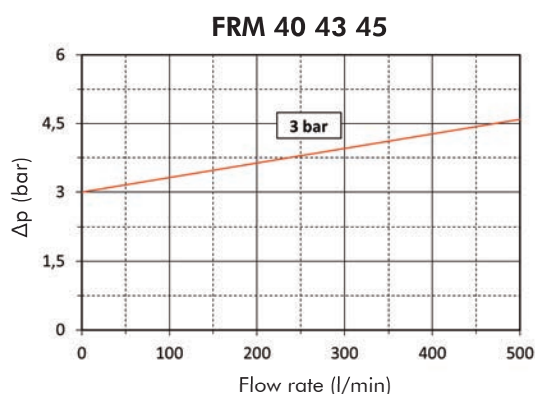
EXAMPLE OF TOTAL Δp CALCULATION

FRMR143G10CBB6B4B50DPDC with **200** l/min and oil **46** cSt (for port 1" 1/4):

Housing Δp 0,10 bar + element Δp 0,35 bar $(200 \times 1,21)/1000 \times (46/32) =$ total assembly Δp 0,45 bar

BYPASS VALVE PRESSURE DROP

The bypass valve Δp is given by the curve of the considered model and setting, in correspondence of the flow rate value.



ACCESSORIES

These accessories fit all our standard models and must be ordered separately.



A EXTENSION TUBE

The flow from the filter must come out below the oil level to avoid possible generation of free air or foam. When necessary an extension tube can be fitted onto the knobs of the bowl end.

ET2250	extension tube 250 mm long
ET2500	extension tube 500 mm long

B CONNECTION TUBE

Connection tube is the necessary device between filter bowl and extension tubes (ET2250/ET2550) and/or diffuser (DF040). Its plug and play option makes it easy to install and versatile.

CT2250	connection tube 250 mm long
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C DIFFUSER

Diffuser is an effective way to reduce foaming and turbulence normally caused by return lines. Plug and play option to be directly installed on the filter bowl or to connection tube (CT2250). Installation of a diffuser in the hydraulic tank is an easy way to ensure the reliability of the overall system.

Diffuser must always be installed below the minimum oil level.

DF040	diffuser Ø 40 mm
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USER TIPS



- 1 FILTER HEAD
- 2 SCREWS
- 3 FIXING HOLES
- 4 FILTER ELEMENT
- 5 SEAL KIT
- 6 FILTER BOWL
- 7 IDENTIFICATION LABEL
- 8 SPRING
- 9 COVER

INSTALLATION

1. the filter head (1) must be properly positioned and well secured on the tank lid through the fixing holes
2. the hose must be properly connected to the IN port
- ⚠ 3. the OUT port must be clear (an extension tube could be fitted, if needed for having the outlet below the oil level)
4. verify that no tension is present on the filter after mounting
5. enough space must be available for filter element replacement
6. the visual clogging indicator must be in a easily viewable position
7. when a electrical indicator is used, make sure that it is properly wired
8. keep in stock a spare FILTREC filter element for timely replacement when required

SPARE SEALS KIT

	NBR	FKM
FRM 40 43 45	06.021.00282	06.021.00283

COVER SCREWS TIGHTENING TORQUE

M10	30 Nm
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INDICATOR TIGHTENING TORQUE

10 Nm

OPERATION

- ⚠ 1. the filter must work within the operating conditions of pressure, temperature and compatibility given in the first page of this data sheet
2. the filter element must be replaced as soon as the clogging indicator signals at working temperature
3. If no clogging indicator is mounted, replace the element according to the system manufacturer's recommendations

MAINTENANCE

- ⚠ 1. before removing the top cover from the head, ensure that the system is switched off and there is no residual pressure in the filter
2. loosen the cover fixing bolts and rotate for element removal.
3. remove the spring (8) first, then the dirty element (4) and the bowl (6)
4. clean the bowl (6) and fit a new FILTREC element (4), verifying the part number, particularly concerning the micron rating
5. when fitting the new element (4), open its plastic protection on the open end side and insert it onto the spigot in the filter bowl, then remove completely the plastic protection
6. check the top cover O-ring conditions and replace if necessary
7. put the spring (8) in its position on the filter element (4)
8. mount the top cover onto the head and fix it screwing the fixing bolts
- ⚠ 9. the used filter elements cannot be cleaned and re-used

WARNING

- ⚠ Make sure that Personal Protective Equipment (PPE) is worn during installation and maintenance operation.

DISPOSAL OF FILTER ELEMENT

- ⚠ The used filter elements and the filter parts dirty of oil are classified as "Dangerous waste material": they must be disposed according to the local laws by authorized Companies.



Technical information may change without notice.
CT91-rev. 04/22