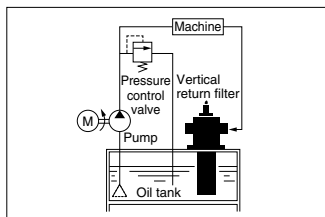


Vertical Return Filter **FHBA Series**

RoHS

The vertical return filters are designed for mounting directly on top of oil tanks for hydraulic systems. They prevent dust generated within the circuit from entering the tank and help keep the oil clean. This efficient configuration reduces the total number of filters required.



Compact design that does not clutter the top of the oil tank

Since most of the filter case is inside the oil tank, very little space is occupied on the top of the tank.

No need for an OUTLET pipe

The filter case also functions as a fluid return pipe, so there is no need to attach a separate OUTLET pipe.

Easy maintenance

Simply open the cover and extract the element from the top of the filter. Replacement is quick and easy.

Designed to prevent collected dust from falling into the oil tank

The collected dust remains inside the element, so it cannot flow out when the relief valve is opened and all collected dust is removed from the case.

Two INLET ports

The filter has two INLET ports, oriented 180° from each other to provide more flexibility when routing pipes.



Specifications

Operating pressure		Max. 1.6 MPa
Operating temperature		Max. 80°C
Main material	Cover	Aluminum die-cast
	Body	Aluminum die-cast
	Case	Steel plate
	O-ring/Seal	NBR or FKM ^(Note)
Element	Material	Paper, Stainless steel, Carbon steel, Aluminum, Epoxy resin
	Nominal filtration[*]	5, 10, 20 μm
	Differential pressure resistance	0.6 MPa
Differential pressure indicator operating pressure (Element replacement differential pressure)		0.18 MPa
Relief valve open pressure		0.25 MPa

* Micromesh elements with other than the standard filtration are available.

* The paper elements for water-glycol is 10 μm only.

Note) The material of the O-rings differs depending on the hydraulic fluid used.
Petroleum, Water-glycol, Emulsion: NBR; Phosphoric ester: FKM

Model/Rated Flow Rate

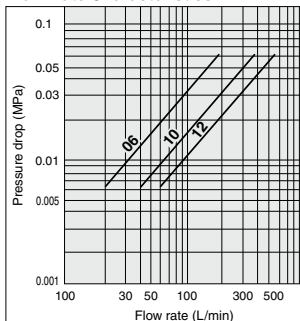
Model	Port size (Rc)	Max. flow rate (L/min)	Weight (kg)	Applicable hydraulic fluid
FHBA□-06	3/4	150	1.7	N : Petroleum W : Water-glycol Emulsion V : Phosphoric ester
FHBA□-10	1 1/4	300	3.7	
FHBA□-12	1 1/2	400	5	

The symbol represented by □ indicates the type of applicable hydraulic fluid (N, W, V).

Accessory/Option

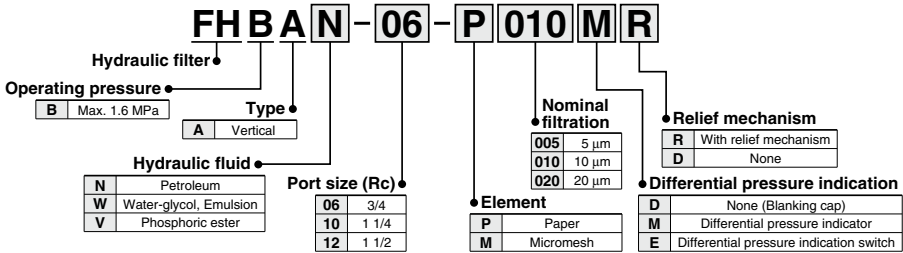
Description	Part no.	Note
Differential pressure indicator	CB-58H	Petroleum, Water-glycol, Emulsion
	CB-58H-V	Phosphoric ester
Differential pressure indication switch (N.C. and N.O. common)	CB-59H	Petroleum, Water-glycol, Emulsion
	CB-59H-V	Phosphoric ester
Blanking cap (for differential pressure indication part)	AG-12H	Petroleum
	AG-12H-W	Water-glycol, Emulsion
	AG-12H-V	Phosphoric ester

Flow Rate Characteristics



Conditions Fluid: Turbine oil Class 2 VG56
Measured pressure: 1.6 MPa
Viscosity: 45 mm²/s
Filter material: Paper
Nominal filtration: 10 μm

How to Order

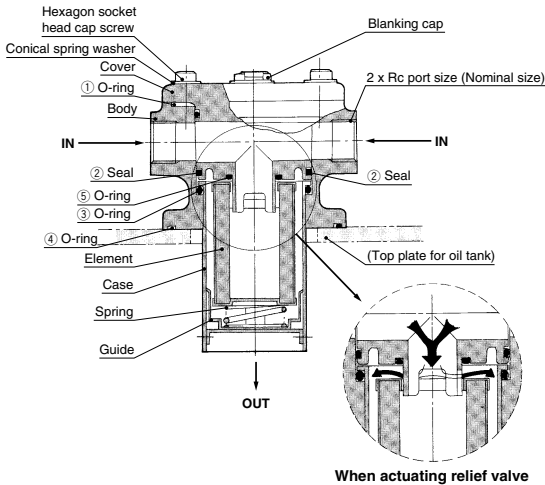


Replacement Element Part No.

Port size (Nominal size)	Paper			Micromesh			Element size
	5 μm	10 μm	20 μm	5 μm	10 μm	20 μm	
06 (3/4 ^P)	EP001H-005N	EP001H-010N	EP001H-020N	EM601H-005N	EM601H-010N	EM601H-020N	ø56 x 180
10 (1 1/4 ^P)	EP101H-005N	EP101H-010N	EP101H-020N	EM701H-005N	EM701H-010N	EM701H-020N	ø76 x 190
12 (1 1/2 ^P)	EP201H-005N	EP201H-010N	EP201H-020N	EM801H-005N	EM801H-010N	EM801H-020N	ø76 x 290

Note 1) The symbol at the end of the element part no. indicates the hydraulic fluid type: N: Petroleum, Phosphoric ester, W: Water-glycol, Emulsion.
 Note 2) Above elements require one element per filter.

Construction/Seal List



Handling Precautions

① Mounting

- Confirm the IN orientation before mounting. Then connect so that the case is oriented downward. For maintenance, make sure to provide sufficient space above the filter for removing the element.
- The filter has two IN ports. If one is not used, it must be covered with a plug or the like.
- Before mounting the filter on the oil tank, confirm that ④ the O-ring (see "Construction") is installed on the body.
- Ensure that the opening in the case (OUT) is always below the fluid surface. Air could leak into the system if the fluid level drops below the outlet opening.

② Operation

- The hydraulic fluid used becomes high viscosity when the temperature is low during the winter, etc., and the differential pressure indicator or the switch may activate. If this occurs, wait until the oil temperature rises by a warm-up operation, then check if this is caused by clogging.
- Once the differential pressure indicator is triggered, the indication continues to be displayed until the indicator is reset (by depressing the reset button), even if the pump stops operating. Reset after replacing the element and restarting operation, or after normal operation starts in cold weather such as during winter.
- When using a differential pressure indication switch and if a filter clogged signal is incorporated into the sequence circuit of the machine, make sure to design the system so the filter clogged signal does not operate until normal operation starts.

③ Element replacement

- When the pressure difference reaches 0.18 MPa during filter operation (actuating the differential pressure indicator), stop operation, and replace the paper element or wash the micromesh element. If the micromesh element has reached the end of its service life, replace it.
- When replacing the element, check the O-rings and replace them if they are damaged.
- When washing the micromesh element, do not wipe it using a stiff brush or rag.

Replacement O-ring/Seal List (Only 1 O-ring is required per filter for options ①, ③, ④, and ⑤ below; however, for option ②, 2 seals are required.)

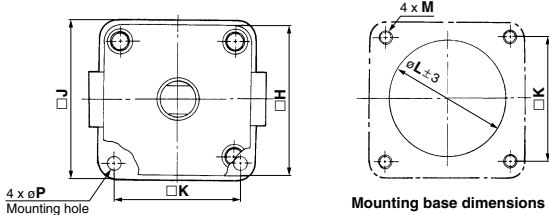
Port size	Applicable hydraulic fluid	Material	① O-ring	② Seal	③ O-ring	④ O-ring	⑤ O-ring
			order no. (Nominal size)	order no.	order no. (Nominal size)	order no. (Nominal size)	order no. (Nominal size)
06	Petroleum, Water-glycol, Emulsion	NBR -70	KA00465 (G80)	AL-206H	KA00463 (G65)	KA00465 (G80)	KA00470 (P28)
			KA00453 (G105)	AL-207H	KA00793 (G85)	KA00453 (G105)	KA00244 (P42)
06	Phosphoric ester	FKM-70 or EPDM-70	KA00702 (G80)	AL-206H-V	KA00614 (G65)	KA00702 (G80)	KA00717 (P28)
10 to 12			KA00688 (G105)	AL-207H-V	KA00703 (G85)	KA00688 (G105)	KA00723 (P42)

Note 1) The material of seals (AL-206H-V to AL-207H-V) is EPDM.

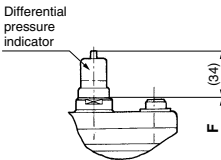
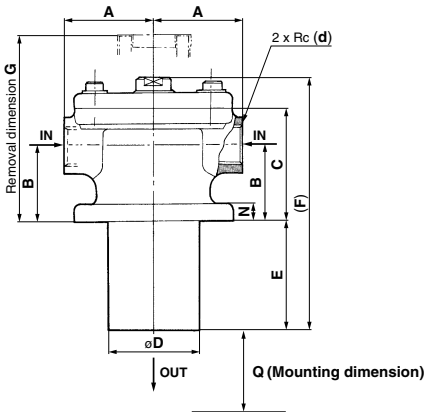
Note 2) The material and nominal size notations are based on JISB2401.

FHBA Series

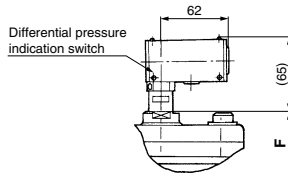
Dimensions



Mounting base dimensions



Differential pressure indicator



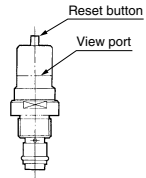
Differential pressure indication switch

Differential Pressure Indication

Two indication methods are available: differential pressure indicator and differential pressure indication switch. These can be mounted on all filter models.

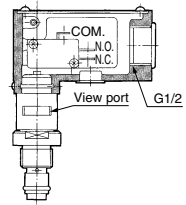
■ Differential pressure indicator

- Operating pressure—0.18 MPa
- Once a value is displayed, it will continue to be displayed until reset, even if the pump is stopped.
- Perform element replacement when the red ring floats up and covers the entire view port.



■ Differential pressure indication switch

- Operating pressure—0.18 MPa
- When a value has been displayed, it will be automatically reset when the pump is stopped. (Non-reset type)
- This is a visual dual-purpose. Perform element replacement when the switch has actuated (when the red ring floats up and covers the entire view port).
- N.C. and N.O. common



* Refer to page 529 for "Microswitch for differential pressure indication switch".

Port size Rc (d)	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
3/4	55	54	76	65	200	299	270	95	100	75	70	M8	12	10	15 or more
1 1/4	75	76	112	89.1	210	342	320	120	128	100	95	M10	14	12	21 or more
1 1/2					310	442	420								

(mm)

(1) Contact specifications

Table 1 Contact specifications

Item	Specifications
Inrush current	Max. 15 A
Minimum applicable load	5 VDC 160 mA

(2) Rating

Table 2 Rating

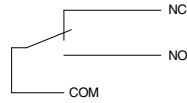
Rated voltage	Resistance load
250 VAC	5 A

(3) Other performance

Table 3 Other specifications

Item	Specifications	
Insulation resistance	100 MΩ or more (Measured by 500 VDC, insulation resistance tester.)	
Contact resistance	30 mΩ or less	
Withstand voltage	Between terminals with the same pole.	1,000 VAC 50/60 Hz 1 min
	Between charged metal part and ground	1,500 VAC 50/60 Hz 1 min
	Between each terminal and non-charged metal part	1,500 VAC 50/60 Hz 1 min

(4) Electric circuit



(N.C. and N.O. common)

Precautions

1. Connect desired wiring to the micro switch indication symbols 1 (COM.), 2 (N.C.), and 3 (N.O.).
2. When a protection mechanism is required, take appropriate considerations on the electric circuit since the micro switch is a type of non-reset.

(5) Terminal type

Soldering terminal