Burner Components

Burner fuel pump type BFP

Catalogue 1

Contents

Quality- and Environmental Management System

ISO 9001 ISO 14001

Danfoss A/S Burner Components Division operates a Quality- and Environmental Management System which has been certified to ISO 9001 and ISO 14001.

Application

BFP pumps are for burners with capacities up to 400 kW. The size and weight of the pumps makes them particularly suitable on small domestic burners where space is restricted. BFP pumps are of course also very suitable as replacement units for existing systems.

To meet different requirements as regards location on burners, space restrictions on boiler units, and port positions, the BFP series consists of different types and offers the possibility of building up variants of each type.

The BFP-system ensures easy and simple filter change during servicing. Because of the options available from the system, adjustment and measuring of nozzle pressure and suction pressure are easy.

The BFP-pump are available in two different sizes with following nozzle capacity at 10 bar, 4.3 mm^2/s and 2800 min^{-1}.

- Type 3 with an output up to 240 kW
- Type 5 with an output up to 400 kW

BFP pumps can be used on both 1-pipe and 2-pipe systems with either overlaying or underlying tank.

An explanation of the pump types is given below!

Type system

BFP X X X X

- **3** Capacity 240 kW
- **5** Capacity 400 kW

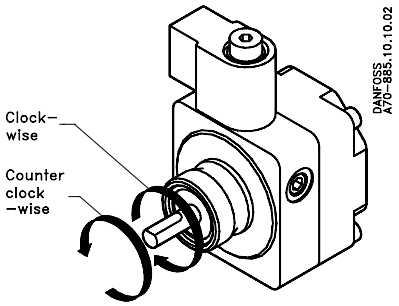
- **R** Clockwise
- **L** Counterclockwise

- **0** Without solenoid valve
- **1** With NC-solenoid valve

- **1** Side regulaltion, ring filter
- **2** Front regulation, cartridge filter
- **4** Front regulation, cartridge filter, NC-solenoid valve on side (see page 6)

Note!
Clockwise and counterclockwise indication is always given when looking on the shaft end.

This applies to:
- Direction of rotation
- Location of valve
- Connections



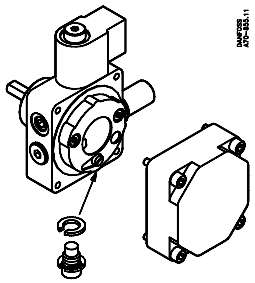
Build up

The pump is designed to give a wide choice of pump build-up, i.e. location of regulating system, solenoid valve location, port positions (see page 6).
The pump gear wheel set is our well known trochoide gear wheel. As with the BFP-types, they are now in a specially designed recess in the pump housing. This ensures optimal positioning of the gear wheel set and therefore minimum wear.
The regulating system is based on the diaphragm principle.

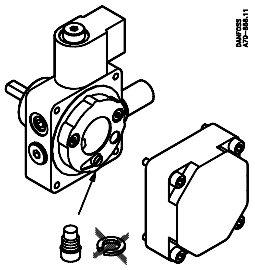
The shaft gland is our familiar carbon ring type which gives max. protection against leaking oil, both with dynamic and static load.
The pump pressure range depends on the pump type, see technical data.
The solenoid coils are supplied for plug connection.
The pump is equipped with a manual changeover screw for changing between 1-pipe and 2-pipe operation.

Conversion between 2- and 1-pipe operation

BFP 11

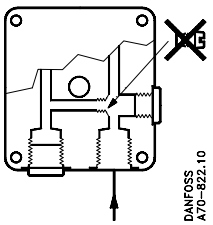


1-pipe operation: screw with horseshoe washer

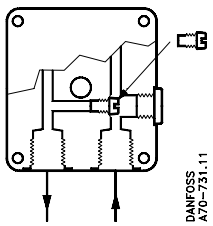


2-pipe operation: screw without horseshoe washer

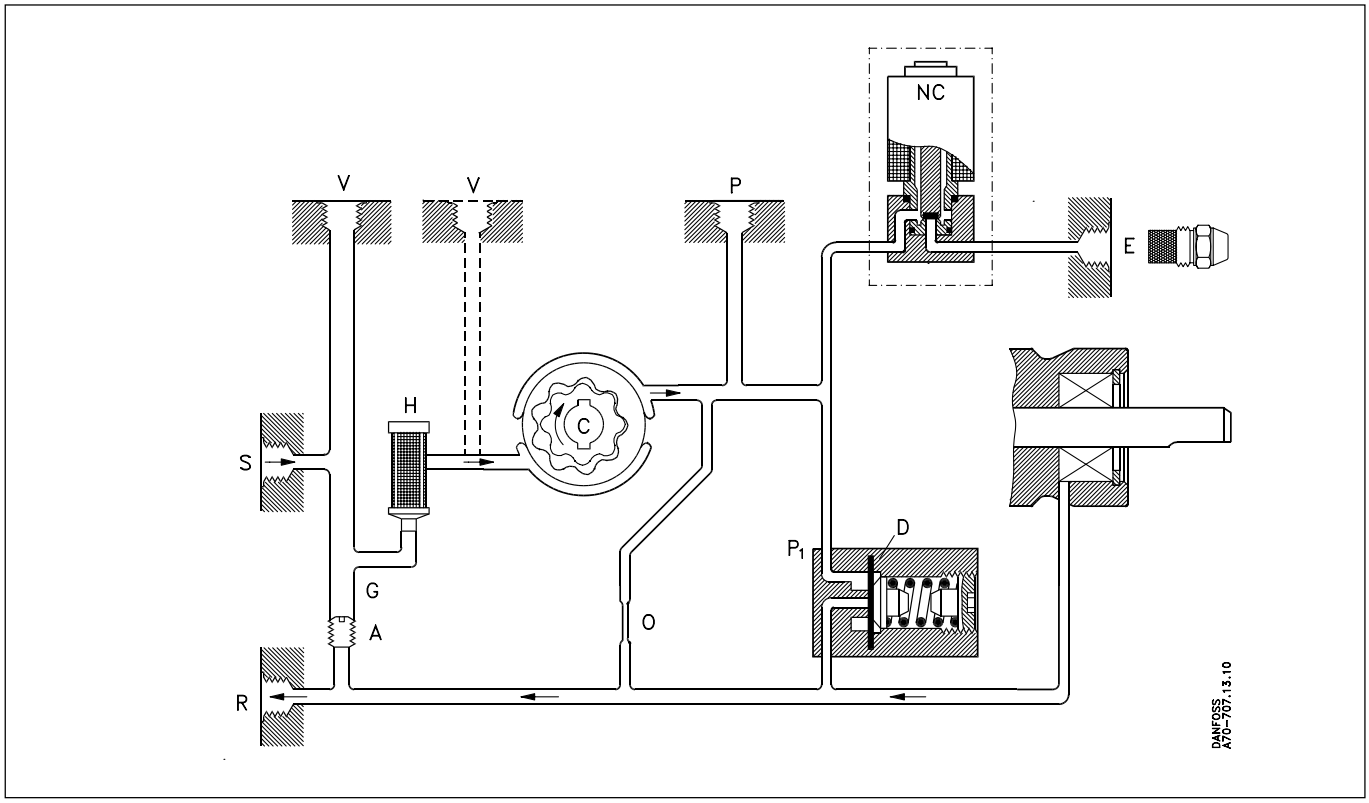
BFP 20 / 21 / 41



1-pipe operation: without screw



2-pipe operation: screw fitted



Function
When the oil pump is started, oil is sucked into the suction port (S), through the filter (H) to the inlet side of the gear set.
The gear set then pumps the oil to the pressure side of the pump, simultaneously subjecting the oil to pressure. This pressure is controlled and kept constant by setting the regulating valve (P_1) by means of the diaphragm (D). The regulating valve (P_1) distributes the oil delivered by the gear set (C), between the nozzle port (E) and the return side (R) of the pump. The amount of oil used is determined by the set pressure on the regulating valve (P_1) and the size of the oil nozzle fitted on the oil nozzle line.

Pressure regulating valve P_1
The valve (P_1) functions in the following manner:
- When the oil opening pressure has been reached, flow to the return side is established.
- The diaphragm and spring maintain a constant pump pressure as set on the regulating valve.
- If the pump is overloaded, i.e. when trying to obtain more oil than the gear wheel set can supply under these conditions the oil pressure falls below the set value and the diaphragm valve (D) closes the return side (R).

This can be remedied by:
- Reducing the pump pressure.
- Reducing the output, i.e. changing to a smaller nozzle.
- Changing to a pump with a higher output.

Solenoid valve (NC)
When the shut-off valve (NC - normally closed) is energised, it opens for oil flow to the nozzle (E). Excess oil is led from the regulating valve to the return side (R) of the pump.
When the oil burner stops operating, the shut-off valve is de-energised and stops the oil supply to the nozzle.
BFP 20 does not have a built-in solenoid valve. In systems utilising this pump, a shut-off valve must be fitted in the nozzle line.

1 - 2-pipe systems
In 2-pipe systems, the oil is diverted back to the oil tank.
In 1-pipe systems, the 2-pipe screw (A) must be removed to allow the oil to recirculate through the return (G). The return port (R) must be blanked off.
On BFP 20, 21 and 41, the 2-pipe screw is removed through the vacuum port on the left side. On BFP 11, a horseshoe-formed washer must be fitted under the lower screw in the cover plate, see page 3.

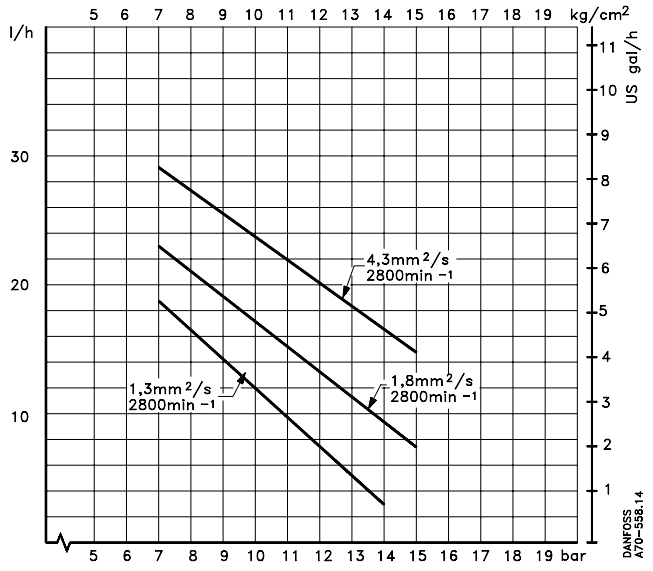
Bleeding
In 2-pipe systems the pump is automatically bled. Air is led through the constriction (O) to the tank.
In 1-pipe systems where the return port is closed, bleeding must be through port P (P).

Technical data

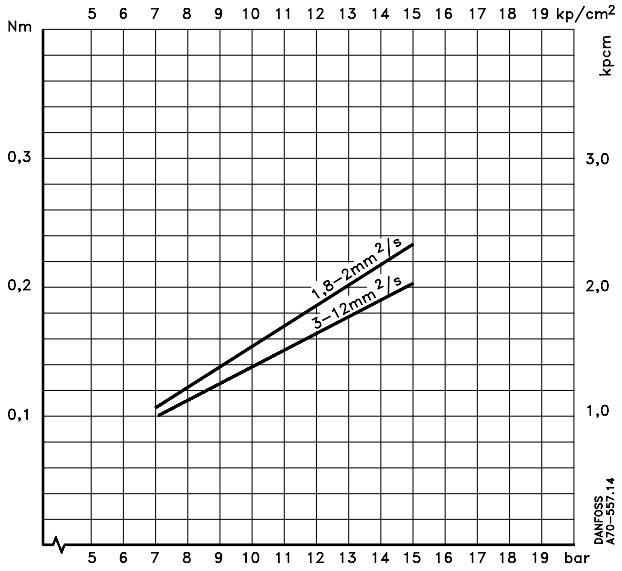
			BFP 20		BFP 11		BFP 21/41	
			3	5	3	5	3	5
Oil types: Viscosity measured in suction port		mm² /s	1.3-12.0					
Cartridge filter	Filter area	cm²	11				11	
	Mesh	µm	200				200	
Ring filter	Filter area	cm²			13			
	Mesh	µm			200			
Gear wheel capacity *)		l/h	45	70	45	70	45	70
Max. starting torque		Nm	0.1	0.12	0.1	0.12	0.1	0.12
Pressure range diaphragm 1-pipe		bar	7-20		7-15		7-20	
Pressure range diaphragm 2-pipe		bar	7-20		7-15		7-20	
Factory setting		bar	10 ± 1					
Max. permissible pres. on suction/return side		bar	2.0					
Speed		min⁻¹	Type 3: 2400-3600 min⁻¹ Type 5: 1400-3600 min⁻¹					
Power consumption *)		Max. watt	40	70	40	70	40	70
Ambient and transport temperature		°C	–20 to +70					
Media temperature		°C	0 to +70					
Coil operating range		V			187-264			
Coil consumption		Watt			9			
Rated voltage					220/240 V 50/60 Hz			
Coil, grade of enclosure					IP 40			
Shaft / Neck			EN 225					

*) 10 bar, 4.3 mm²/s and 2850 min⁻¹

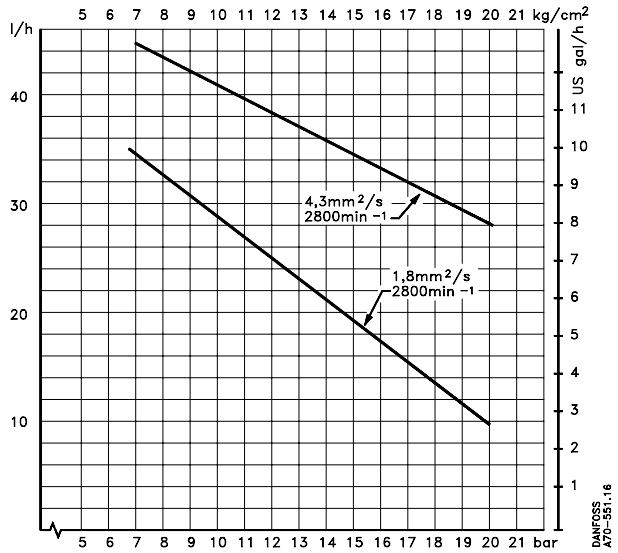
Nozzle capacity BFP type 3



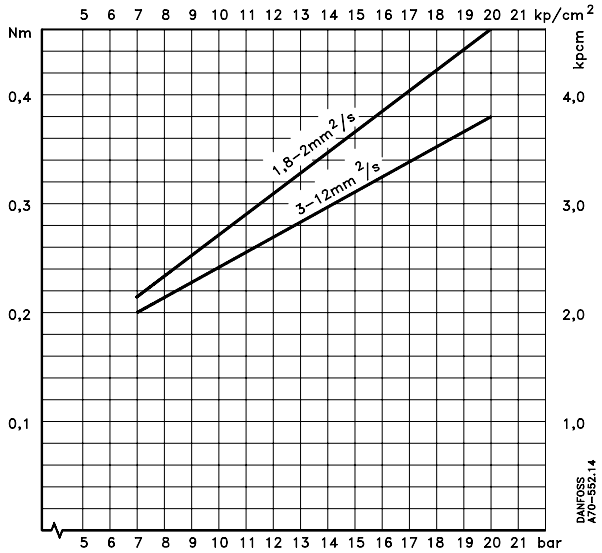
Operating torque BFP type 3



Nozzle capacity BFP type 5

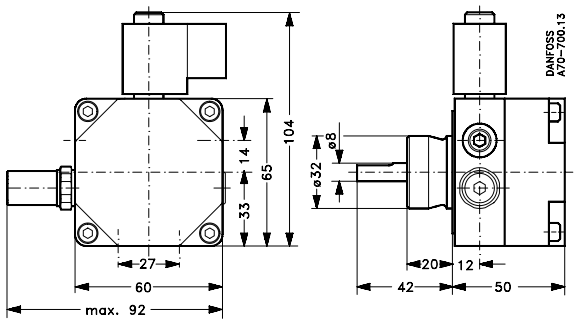


Operating torque BFP type 5

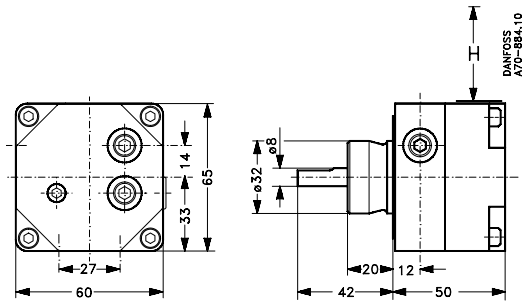


Dimensions

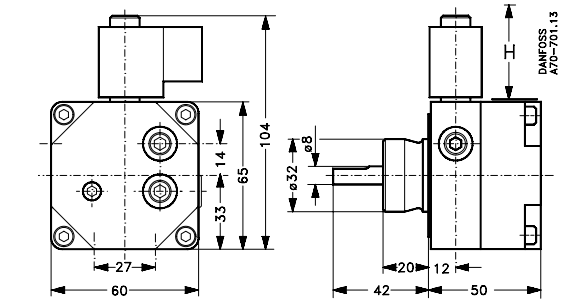
BFP 11
with side regulation



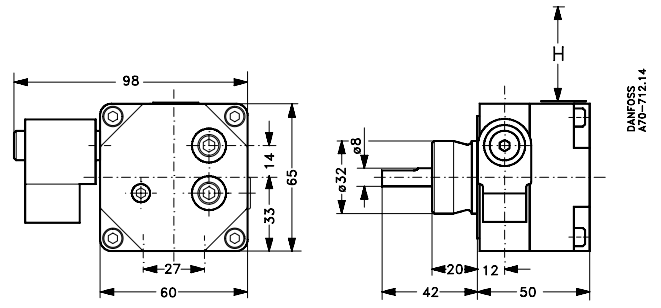
BFP 20



BFP 21
with front regulation



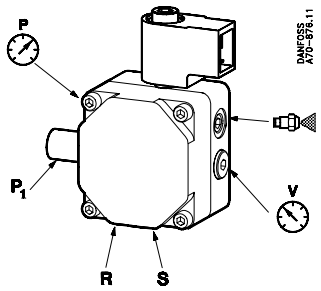
BFP 41 with front regulation
and NC valve on the side



In order to change the cartridge filter a free height H of min. 45 mm is required.

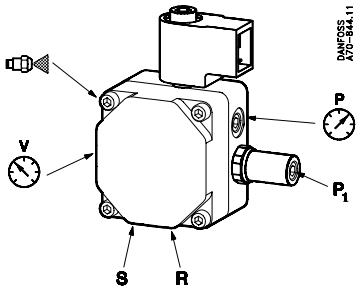
Connections

BFP 11
with right side
regulation



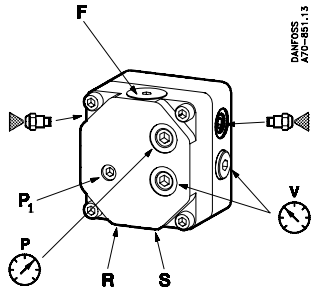
P_1 Pressure regulation
S Suction line G 1/4
P Return line G 1/4
Nozzle connection left G 1/8
P Pressure gauge connection right G 1/8
V Vacuum meter connection G 1/8

BFP 11 R
with left side
regulation



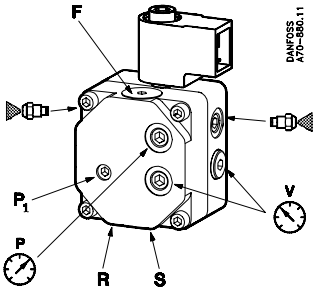
P_1 Pressure regulation
S Suction line G 1/4
P Return line G 1/4
Nozzle connection G 1/8
P Pressure gauge connection G 1/8
V Vacuum meter connection G 1/8

BFP 20
with front regulation



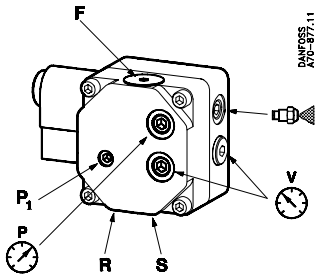
P_1 Pressure regulation
S Suction line G 1/4
P Return line G 1/4
Nozzle connection left G 1/8 (alternative right)
P Pressure gauge connection in front G 1/8 (alternative left)
V Vacuum meter connection G 1/8
F Cartridge filter

BFP 21
with front regulation



P_1 Pressure regulation
S Suction line G 1/4
P Return line G 1/4
Nozzle connection left G 1/8 (alternative right)
P Pressure gauge connection in front G 1/8 (alternative left)
V Vacuum meter connection G 1/8
F Cartridge filter

BFP 41
with front regulation

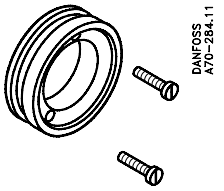


P_1 Pressure regulation
S Suction line G 1/4
P Return line G 1/4
Nozzle connection left G 1/8
P Pressure gauge connection in front G 1/8
V Vacuum meter connection G 1/8
F Cartridge filter

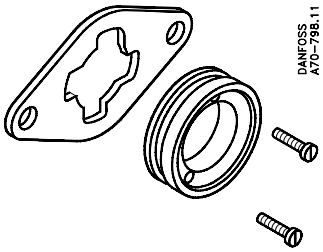
Note! With all connections it is possible to choose between using flat washers in connection with the recessed bearing surface or at the bottom of the port in question. This, however does not apply to the vacuum measuring port on the housing side. Here, it is only possible to use the external surface on the housing.

Accessories

Screws + bush
code no. 071B0011



Screws + bush + flange
code no. 071N0047



Spare parts

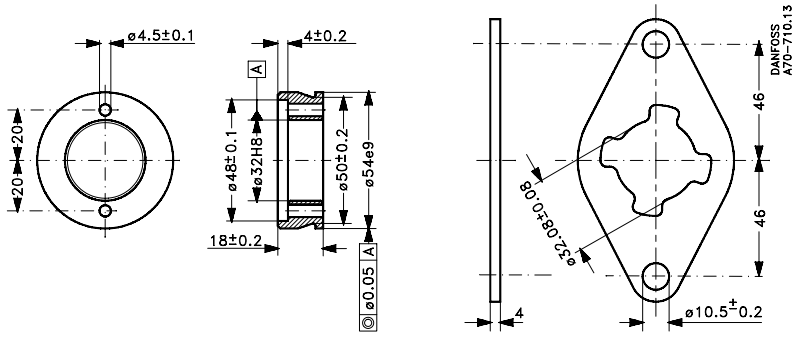
	Code number
Cable	See below
Coil 220/240 V a.c. 50/60 Hz + lockwasher + nut	**071N0010**
Coil 110/120 V a.c. 50/60 Hz + lockwasher + nut	**071N0061**
Coil 24 V a.c. 50/60 Hz + lockwasher + nut	**071N0062**
Filter set: filter + O-ring (25 pcs box)	**071N0063**
Cartridge filter + O-ring (25 pcs box)	**071N0064**
NC-valve + lockwasher + nut	**071N0050**
Filter plug (10-off pack)	**071N0074**
Changeover screw BFP 20, 21 and 41	**071N0041**
Changeover washer BFP 11	**071N0046**

Coil cables

Standard cables

Valve type	Code no.	Length in mm
NC	**071G0200**	500
NC	**071G0202**	280
NC	**071G0204**	710

Dimensions, bush and flange



Suction line lengths: See OEM-catalogue BK.18.A2.02 insert 1.