

OPERATING AND SERVICING
INSTRUCTIONS FOR
PLENTY DUPLEX FILTER 10" - 20"

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SECTION 1 - GENERAL DESCRIPTION

PLENTY DUPLEX FILTER

- 1-1 Duplex filters incorporates in one body, two filtration chambers and integral isolating valves. Flow passes through either side, thus enabling the baskets to be cleaned without interruption to continuous flow.
- 1-2 A position indicator is provided, marked 'A' and 'B' to show which chamber is on flow. Cast on top of the filter body are letters 'A' and 'B'. These letters indicate the two chambers of the filter, each of which contain two filter baskets.
- 1-3 The changeover valves are operated by a handwheel situated on the side of the filter.
- 1-4 The filter incorporates quick release closures requiring no tools for basket removal. The cover seal is made with an 'O' ring which fits into a groove in the top of the filter body.
- 1-5 Each basket is fitted with a handle for lifting out of the filter body.

SECTION 2 - STORAGE AND INSTALLATION

PLENTY DUPLEX FILTER

2-1 Storage

2-2 When storing the Duplex filter, ensure the covers on the body, the spindles are well greased and the body branches are sealed off.

2-3 Installation

2-4 Check the size and height of the filter flanges before fitting in place, as the weight of the filter or flow pipes must not be taken on the filter branches.

2-5 Ensure the filter is installed the correct way round as it is essential that the liquid flows from the inside of the basket to the outside. A direction arrow is on the filter body.

2-6 Sufficient clearance must be available above the filter to allow the covers and baskets to be withdrawn. Lifting facilities are important for installing the filter in the pipeline.

2-7 Ensure sufficient access is available to operate the valve changeover handwheel, air vent valves, pressure equalising valve and D.P. gauge valves (if fitted).

2-8 Provision must be made for isolating the filter from the flow line and for draining the body.

SECTION 3 - COMMISSIONING AND OPERATING INSTRUCTIONS

PLENTY DUPLEX FILTERS

3-1 Commissioning

3-2 When commissioning a filter after an extended period of storage it is possible for the cover 'O' seal to leak due to the seal having deformed after prolonged compression. The problem can be rectified by replacement of the seal. The 'O' ring grooves must be kept free of grit which can cause leakage on commissioning if the filter is stored in a dusty area with covers not in position.

3-3 Before putting the filter on flow check:-

3-4 That two straining baskets are fitted in each filter chamber, the covers, bridges and drop nose bolts are correctly positioned and the 'T' spindles are tight.

3-5 The changeover valve is set to put the flow in the selected chamber and the pressure equalising valve is open.

3-6 The drain valves are closed on the body.

3-7 The flow line valves are open.

3-8 The air vent valves are closed after releasing any trapped air in the filter.

3-9 Open the pressure gauge valves (if fitted) and check the gauge reading is the required working pressure.

3-10 Check the cover seals, flange joints and valves for leaks.

3-11 After commissioning the filter, it is advisable to change over the flow through the filter chambers and clean the baskets at fairly frequent intervals in order to remove any construction debris that may be in the system.

3-12 Operating

3-13 The Duplex filter requires very little attention during operation.

3-14 Twin filtration chambers and integral isolating valves permit changing the straining baskets without interruption to the flow. The design is such that hand pressure is enough to turn the 'T' spindles in the bridges to open or close the covers against the 'O' ring seals. No special tools are required.

3-15 If the plant has been out of service for some considerable time it is possible for the filtrant to solidify in the baskets, the baskets should be removed and cleaned, see Section 4-52.

3-16 The chamber changeover valve drive gear should be cleaned and lubricated then rotated to ensure the disc valves are free to travel across the body and are seating correctly.

- 3-17 When the filter is in operation check:-
- 3-18 The changeover valve indicator shows the flow is through the selected chamber.
- 3-19 The pressure gauge reading is the correct working pressure, in the event of the differential pressure across the filter rising the chamber with the blocked baskets should be isolated by putting the flow through the other chamber, the baskets removed and cleaned, see Section 4-52.

SECTION 4 - MAINTENANCE INSTRUCTIONS

PLENTY DUPLEX FILTER

- 4-1 The bridge spindles and drop nose bolts must be clean and well greased, also the spindles in way of the position indicator and handwheel.
- 4-2 Check all valves are in good working order.
- 4-3 Compartment changeover operating gear to be lubricated.
- 4-4 The Duplex filters employ a simple rugged and positive method of changeover, using two disc valves operated by screwed shafts, ensuring positive sealing when isolating each chamber.
- 4-5 The screwed portion of the operating shafts are sleeved, totally enclosed and protected from the liquid. They are packed with grease and sealed with 'O' rings at the ends giving long service without attention.
- 4-6 The operating shafts are interconnected for simultaneous operation by a chain drive enclosed by a guard, fitted with a valve position indicator.
- 4-7 To Lubricate the Chain
- 4-8 Remove the crank handle and the valve indicator nut screw, then remove the chain guard. DO NOT remove the chain as the two screwed shafts are timed to close the disc valves together to ensure positive sealing.
- 4-9 To Check the Changeover Valve Setting
- 4-10 Turn the crank handle to bring the changeover valves to close off chamber 'A', the indicator should read 'A' shut, turn the handle to bring the valves across to close off chamber 'B', the indicator should read 'B' shut.
- 4-11 To Check the Changeover Valve Efficiency
- 4-12 Close off one chamber of the filter from the flow, with the position indicator at 'B' the flow should be closed off from chamber 'B'.
- 4-13 Close the pressure equalising valve.
- 4-14 Open the air vent valves on chamber 'B' to release the pressure; remove the covers, there should be very little movement of the liquid level in this chamber if the valves are sealing against the valve seats.
- 4-15 Replace the covers on chamber 'B' and close the air vent valves.
- 4-16 Open the pressure equalising valve, move the disc valves across to indicate position 'A' close the pressure equalising valve and check chamber 'A'.

- 4-17 If the liquid level rises rapidly in the chambers, the filter should be taken out of service and the disc valves inspected, to do this see Section 4-18.
- 4-18 To Remove the Disc Valves and Screwed Shafts from the Body
- 4-19 To remove the disc valves and screwed shafts from the filter body, the filter must be lifted out of the pipeline as the valves and valve seats are fitted through the branch bore.
- 4-20 The following instructions should be applied for safety and speed of the operation.
- 4-21 Close the isolating valves in the main pipeline and open the air vent valves to release any pressure in the body, open the drain valves on the body, remove the bolts from the branch flanges on the body.
- 4-22 Remove the holding down bolt, walkways, hand rails etc. which may impair the lifting, lift the filter out of the pipeline and set the filter down on a firm base with sufficient space to allow the disc valve shafts to be withdrawn from the end of the filter.
- 4-23 Remove the drop nose bolts, bridges, top covers and baskets from the body, the changeover valve handle, the bolt from the valve position indicator tube, the chain guard and chain.
- 4-24 Turn the sprocket on the shaft to move the valve to the centre of the port, remove the bolts from the valve end plate, slide the valve off the hub and support the weight of the valve.
- 4-25 Remove the bolts from the drive end cover and slide the shaft assembly out of the body, remove the disc valve through the branch bore.
- 4-26 Repeat Sections 4-24 and 4-25 for the driven shaft and valve.
- 4-27 To Dismantle the Valve Shaft Assemblies
- 4-28 Dismantle the two assemblies as follows:-
- 4-29 Remove the extension shaft and chain sprocket from the driving shaft.
- 4-30 Remove the thrust washer, cover, 'O' ring seal and collar from the shaft.
- 4-31 Remove the two 'O' ring seals from the valve hub, the hexagon sleeve end from the driving end of the assembly, slide the valve end plate off and unscrew the shafts out of the valve hub.
- 4-32 Clean and inspect the components for damage or excessive wear, replace any suspect items.
- 4-33 For the driven shaft assembly remove the chain sprocket and repeat Sections 4-30 and 4-32.
- 4-34 To Re-assembly the Valve Hub and Shaft.
- 4-35 The driving shaft and valve hub assembly, replace the 'O' ring seal in the sleeve end on the tube, grease the non-drive end of the shafts and the threaded portion, slide the hub assembly onto the shaft and screw the shaft into the hub until the hub is in the centre of the shaft, slide the valve end plate over the sleeve, pack the open end of the sleeve with grease and refit the sleeve end complete with new 'O' ring seal.

- 4-36 Refit the thrust collar, and a new 'O' ring seal on the shaft, lightly grease the bush in the end cover and slide over the 'O' ring, fit the thrust washer and chain sprocket, ensure the sprocket is fitted to line up with the tapped holes in the shafts.
- 4-37 Refit the extension shaft to the sprocket on the driving shaft assembly.
- 4-38 For the driven shaft assembly repeat Sections 4-35 and 4-36.
- 4-39 To Fit Disc Valves and Shaft Assemblies in the Filter Body.
- 4-40 Remove the blank end covers, clean and inspect the four valve seats, replace the seats if damaged.
- 4-41 When fitting new valve seats the two opposing seat faces must be parallel in all planes, also the width between the two sets of valve seats must be the same to ensure the two valves seat at the same time.
- 4-42 Clean the gasket seal faces on the body and blank end covers, check the bushes in the covers and replace if necessary, fit the covers on the body using new gaskets, the procedure for fitting the driving shaft assembly and the driven shafts is identical.
- 4-43 Replace the gaskets on the drive end covers and new 'O' ring seals on the valve hubs, lightly grease the 'O' ring seals.
- 4-44 Place the valve the correct way round in the body with the slot over the guide strip, taking care not to damage the seal faces, slide the shaft assembly into the body, through the valve and into the end cover bush, bolt the drive end cover in position.
- 4-45 Slide the valve over the 'O' ring seals on the hub and bolt the end plate to the valve.
- 4-46 Turn the chain sprocket by hand to ensure the shafts are free to turn.
- 4-47 To Set the Disc Valves and Valve Position Indicator
- 4-48 To reset the disc valves and valve position indicator after servicing the filter, with the handle, indicator bolt, chain guard and chain removed turn the two chain sprockets by hand until the valves are pressed against the valve seats closing off chamber 'A', fit the chain over the sprockets.
- 4-49 Refit the chain guard and the handle, move the indicator nut along the spindle to position 'A' shut and screw the bolt into the nut.
- 4-50 Turn the handle to move the two disc valves across the filter body to seal off the chamber marked 'B', the indicator should read position 'B' shut.
- 4-51 Replace the baskets in the body, see Sections 4-60 to 4-66.
- 4-52 To Remove the Baskets from the Filter Body.
- 4-53 The following procedure should be followed for safety and speed of basket changing.
- 4-54 Assuming that the filter baskets in chamber 'A' require servicing.

- 4-55 Open the pressure equalising valve and turn the changeover valve handle in the direction to position the indicator to read 'A' shut, close the pressure equalising valve.
- 4-56 Open the air vent valves on chamber 'A' and drain the chamber.
- 4-57 To remove the selected basket for servicing turn the 'T' spindle in the bridge in an anti-clockwise direction releasing the load on the cover sufficiently to allow one drop nose bolt to be removed, hinge the bridge back and lift the cover off the body by inserting the flat end of the drop nose bolt under the lug on the side of the cover, lift the basket out of the filter body utilising the basket handle, replace the cover on the body to prevent ingress dirt during the basket servicing.
- 4-58 The basket should be handled carefully during the cleaning operation. It should be cleaned by using high pressure steam, water or air. Carefully examine the basket, and insert if fitted, for damage, renew any suspect items.
- 4-59 Repeat Sections 4-57 and 4-58 for each basket to be serviced in chamber 'A'.
- 4-60 To Replace the Baskets in the Filter Body.
- 4-61 Lift the cover off the body and remove the 'O' ring seal from the groove in top of the body: clean the groove, ensure the basket seating ring in the chamber is clean, check that the basket seat ring is clean, carefully lower the basket assembly in the filter chamber.
- 4-62 Lightly smear the 'O' ring groove with grease and fit the 'O' ring seal, examine the underside sealing face of the cover to ensure it is perfectly clean, lightly smear with grease in way of the 'O' ring seal, place the cover in position on the chamber, hinge the bridge back over the cover, replace the drop nose bolt, tighten the 'T' spindle, hand tightness is all that is required.
- 4-3 Repeat Sections 4-61 and 4-62 for each basket replaced in chamber 'A'.
- 4-64 Close the drain valve, open the pressure equalising valve, turn the handle to put the flow through chamber 'A' and close the air vent valves after releasing any trapped air in the chamber.
- 4-65 Check the filter covers to ensure they are properly seated and no leaks are occurring.
- 4-66 The procedure for changing the baskets in chamber 'B' is exactly the same as for chamber 'A'.

SECTION 5 - BASKET AND INSERT

PLENTY DUPLEX FILTER

- 5-1 The recommended method of inserting a mesh into a basket is as follows:-
- 5-2 Place mesh insert with the rim down on a clean flat surface.
- 5-3 Carefully lower the basket down over the mesh insert keeping the walls of the basket vertical and ensuring that the handle slots in the insert rim are aligned with the handle fastening pins on the basket. The larger the basket and mesh the greater the care needed.
- 5-4 When the basket has been lowered completely over the insert, lift the basket and mesh over so that the handle fixing pins are upwards.
- 5-5 Gently 'bounce' the basket and mesh on a flat surface so that the insert rim settles down over the basket rim. DO NOT ATTEMPT TO PUSH THE INSERT DOWN INTO THE BASKET WITH ANY IMPLEMENT WHICH COULD CAUSE DAMAGE TO THE MESH INSERT BASE.
- 5-6 Put handle onto retaining pins and tighten the nuts so that the basket and mesh can be safely lifted as an assembly.

PARTS LIST FOR
PLENTY DUPLEX FILTERS
10" - 12" - 16" - 18" - 20"

ITEM No.	DESCRIPTION	ITEM No.	DESCRIPTION
1	Body	20	Tee 3/8" BSPTTr.
2	Cover	21	Ball Valve 3/8" BSPTTr.
3	Bridge	22	—
4	Spindle	23	—
5	Drop Nose Bolt	24	—
6	—	25	Pipe 1/2" NB
7	End Cover Drive End	26	MSC 1/2" BSPTTr.
8	Gasket	27	Globe Valve 1/2" BSPTTr.
9	End Cover Non Drive End	28	Elbow 1/2" BSPTTr.
10	O' Ring (Cover)	29	Nipple 1/2" BSPTTr.
11	Bush	30	P.E.V. Nameplate
12	Stud 1/2" UNC x 2" Long	31	Driving Shaft
13	Hex. Nut 1/2" UNC	32	Valve Seat
14	Plug 3/8" BSPTTr.	33	Valve
15	Plug 2"	34	Valve Hub
16	Plug 1 1/2" BSPTTr.	35	'O' Ring (Valve Hub)
17	—	36	End Plate
18	—	37	Hex. Hd. Screw 5/16" UNC x 3/4" Lg.
19	Nipple 3/8" BSPTTr.	38	Spring Washer 5/16"
39	Sleeve	54	Valve Indicator Plate
40	Sleeve End	55	Rivet 1/8" Dia x 3/8" Long
41	'O' Ring (Sleeve End)	56	Crank Direction Plate
42	'O' Ring (Driving Shaft)	57	—
43	Collar	58	Extension Shaft
44	Chain Cover	59	Chain
45	Hex. Hd. Screw 1/4" UNC x 1/2" Long	60	Skt. Hd. Cap Screw 1/4" UNC x 7/8" Long
46	Thrust Washer	61	Crank c/w Spindle

47	Chain Pinion	62	Handle
48	Indicator Rod	63	Clip for Handle
49	3/8" UNF Hex Nut	64	Cotter Pin
50	Indicator Nut	65	Chain Pinion (For 10" & 12" Only)
51	Hex Hd Screw 5/16" UNC x 3/4" Long	66	Basket
52	Skt Set Screw 1/4" UNC x 3/4" Long	67	Handle
53	Chain Cover Indicator Tube	68	Insert - If Fitted