



Automatic Recirculation Valve *Series 6600*

Valve Size	A	B	C	D	E	F
DN65 (2½")	360	143	211	208	264	400
DN80 (3")	360	143	211	208	264	400
DN100 (4")	440	184	286	229	264	440
DN150 (6")	500	187	302	229	370	560
DN200 (8")	552	222	378	254	435	625
DN250 (10")	1000	350	575			
DN300 (12")	1050	350	600			
DN350 (14")	1200	394	686			
DN400 (16")	1250	394	699			
DN450 (18")	1300	394	699			

Ref	Component	Material	British Standard
1	Cover	Carbon Steel	BS970 - 70 M20
2	"O" - Ring Seal	Viton "A"	-
3	Top Bush	HT Brass	BS 2874 - CZ114
4	Spindle	Stainless Steel	BS 970 - 431S29
5	Stopper Spring	Stainless Steel	BS 2056 - 316S42
6	Stopper Nut	Stainless Steel	BS 970 - 304S15
7	Stopper	Carbon Steel Stellite 6 Faced	BS 970 - 070M20
8	Seat	Carbon Steel Stellite 6 Faced	BS 970 - 070M20
9	Adjusting Washer	Stainless Steel	BS 970 - 304S15
10	1 st Stage Nozzle	Stainless Steel	BS 970 - 420S29
11	By - Pass Valve	Aluminium Bronze	BS 2874 - CA104
12	Lever	Stainless Steel	BS 970 - 431S29
13	Grubscrew	Stainless Steel	BS 4168 GrA2
14	Lever Bush	Aluminium Bronze	BS 2874 - CA104
15	Bottom Bush	H.T. Brass	BS 2874 - CZ114
16	Body	Cast Steel	BS 1504 - 161 - 480
17	Dowel Pin	Stainless Steel	BS 970 - 304S15
18	By - Pass Housing	Cast Steel	BS 1504 - 161 - 480
19	NRV Spring	Stainless Steel	BS 2056 - 316S42
20	Capscrews	High Tensile Steel	BS 2470 Gr12.9
21	Capscrews	High Tensile Steel	BS 2470 Gr12.9
22	2 nd Stage Nozzle	Stainless Steel	BS 970 - 420S29
23	Non - Return Valve	Aluminium Bronze	BS 2874 - CA104
24	Final Stage Nozzle	Stainless Steel	BS 970 - 420S29

Features

The Blackhall range of Automatic Recirculation Valves have been design to give absolute reliability with maintenance requirements minimised. Each Blackhall valve is designed specifically to suit the individual customers' requirements. The range includes both ON/OFF and Modulation options with options available in Angle or Straightway pattern design. The Angle pattern valve has additional feature of not requiring during maintenance "Shut Downs".

By - Pass Configuration ON/OFF

The Blackall ON/OFF Automatic Recirculation Valve is really a system which incorporates five functions in one:

1. **Non Return Valve:** preventing reverse flow through the centrifugal pump via the main line
2. **By - Pass Control Valve:** protecting the pump from overheating by regulating a passage of fluid through the pump during START UP, SHUT DOWN and when the pump is run against a closed outlet.
3. **Flow Sensing Capability:** which actuates the by - pass control Valve
4. **Pressure Reduction Nozzles:** which dissipate the pressure energy, and allows the line fluid to be delivered to the by - pass system quietly and safely.
5. **Non - Return Valve:** preventing reverse flow through the centrifugal pump via the by pass line

Operation

When the pump is started the stopper (7) initially remains closed, with the by - pass valve (11) fully open. The by - pass is individually sized to pass a fixed minimum quantity and at the same time reduce the pump outlet pressure to lower figure as determined by the by - pass system configuration. The pressure reduction within the by - pass is achieved by passing the flow through a series of opposed orifices. As the pump delivery pressure increases the spring (5) pre - load and any back pressure on the main valve outlet are overcome and stopper (7) starts open.

The stopper (7) is fitted with a parallel skirt which is designed to ensure a positive opening action; within the same action the by - pass valve (11) closes. The positive closure ensures the by - pass valve (11) is either fully open and never in a partially open position.

As the main flow continues to rise, so too does the stopper (7), until eventually normal running delivery is achieved. When the pump is shut down the reverse action takes place. To prevent "slamming", the bottom spindle bush has been fitted with a damping device which comprises of an orifice through which the line fluid has to be ejected.

If at any point the pump is run against a close outlet, the by - pass valve (11) remains fully open, thus ensuring minimum flow is always maintained.