



YARWAY 9200 SERIES ARC® VALVES 2", 3" AND 4" INSTALLATION AND MAINTENANCE INSTRUCTIONS

Before installation these instructions must be fully read and understood



GENERAL

These sizes in the 9200 ARC® (Automatic Recirculation Control) valve series are designed to provide protection for low to moderate pressure (ASME/ANSI 150 and 300 Class) centrifugal pumps against overheating and possible unstable operation during low load periods. The valve functions simultaneously as (1) a check valve - to prevent reverse flow through the pump and as (2) a bypass control valve - to maintain the minimum required pump flow and provide pressure letdown.

OPERATION

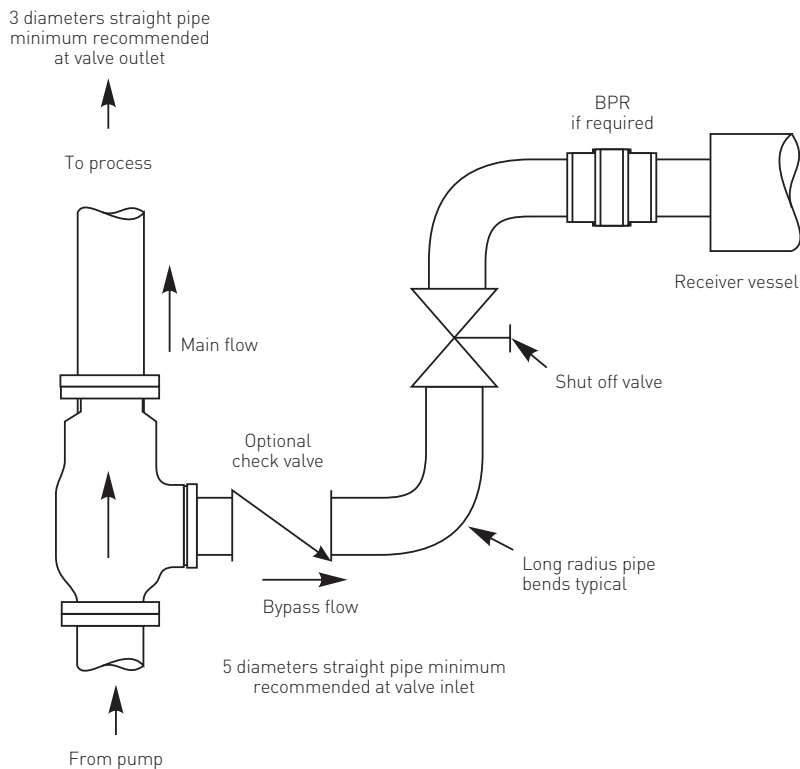
Flow through the check valve overcomes the spring force to open the main check valve element. When the disc lifts in response to an increase in main flow, the bypass flow is decreased as the port openings in the disc stem begin to close. Conversely, as the pump flow is reduced, the check disc moves downward and at a designated point starts to uncover the disc stem ports allowing bypass flow to begin. The sizing of the main check/trim is such that the bypass flow starts before the main flow drops below the minimum pump flow specified. The combined main and bypass flows provide a total greater than the minimum pump flow requirement.

Bypass flow enters the disc stem passage through the slots and the round ports and around the annulus in the bypass bushing. It then continues through the bypass where the helix element conditions the flow at the valve bypass outlet. The recirculation flow rate is controlled by the disc slot sizing. Occasionally higher pressure applications may require the use of a Back Pressure Regulator (BPR) in the bypass line for proper pressure letdown.

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FIGURE 1



INSTALLATION (REFER TO FIGURE 1)

The 9200 Series valve is sized and configured based on specifications provided by the user. Make certain that these conditions are still applicable. Changes in pressure, temperature, normal main flow and minimum flow requirements could result in unsatisfactory performance. If operating conditions have changed, contact Yarway; modifications may be required prior to installation.

Remove all packing material. Place the valve on wooden blocks with the flow arrow pointed down. Push the disc from its seat and flush away any packing materials with compressed air or high pressure water. The disc should move freely (against the spring load) through the entire stroke length until contacting the upper stop. This may not be practical on larger sizes.

The valve may be installed with the main flow direction either horizontal or vertically up. The direction of bypass flow may be selected to suit the installation.

OPERATIONAL CHECK

When the valve is properly installed the combined main and bypass flows should equal or exceed that of the specified minimum pump flow. If operational checks indicate a deviation from the original specifications and field adjustments are necessary, contact Yarway for additional information.

VALVE MAINTENANCE

Except for periodic operational checks the valve requires little maintenance. The disc assembly, spring, bypass bushing and flow conditioner should be inspected coincident with other annual inspections. Make certain that all pressure is relieved and the pipeline is secured against pressurization before attempting disassembly for inspection purposes.

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DISASSEMBLY AND INSPECTION (REFER TO FIGURE 2)

1. Remove the valve from the line and orient the main vertically up.
2. Evenly unfasten the upper stop jacking screws (10) relieving spring compression until the upper stop is free. Remove the upper stop, inspect and replace gasket (8) and snubber seal (9).
3. Remove the spring (7) and inspect for damage.
4. Lift the disc assembly until it clears the valve body. Inspect the disc stem, slot surfaces and snubber seal (9) for damage or excessive wear.
Note: if substantial flow and pressure related damage is found on the disc, special attention should also be given to the bypass bushing during inspection to assure it is undamaged.
5. Examine the check valve seat for evidence of wear. This surface can be reconditioned by lapping the disc to the body. First use 180 grit (medium-coarse) followed by 360 grit (fine). The finished surface should be 360 degrees and a minimum of ½ the available seat width. Clean thoroughly after each lapping operation.
6. The bypass bushing (6) is press fitted in place. This is not considered a field replaceable component. If excessive wear is apparent, please consult with factory for repair.
7. If the flow conditioner (5) shows excessive wear it can be removed by pencil grinding the tack welds and lifting the worn part from the body (1). A replacement flow conditioner can then be installed and re-tack welded in place using ER-309 weld wire.

Inspect the condition of all the sealing surfaces. It is recommended that all O-rings and seals be replaced at each disassembly. Use an appropriate O-ring lube for the specified elastomer taking care not to pinch or shear the seals during installation. Supply the following information when ordering spare parts:

- (1) Figure number
- (2) Serial number
- (3) Type of fluid

REASSEMBLY (REFER TO FIGURE 2)

Reassemble the valve by reversing the above disassembly procedure taking care not to damage the snubber seal when lowering the upper stop into the disc.

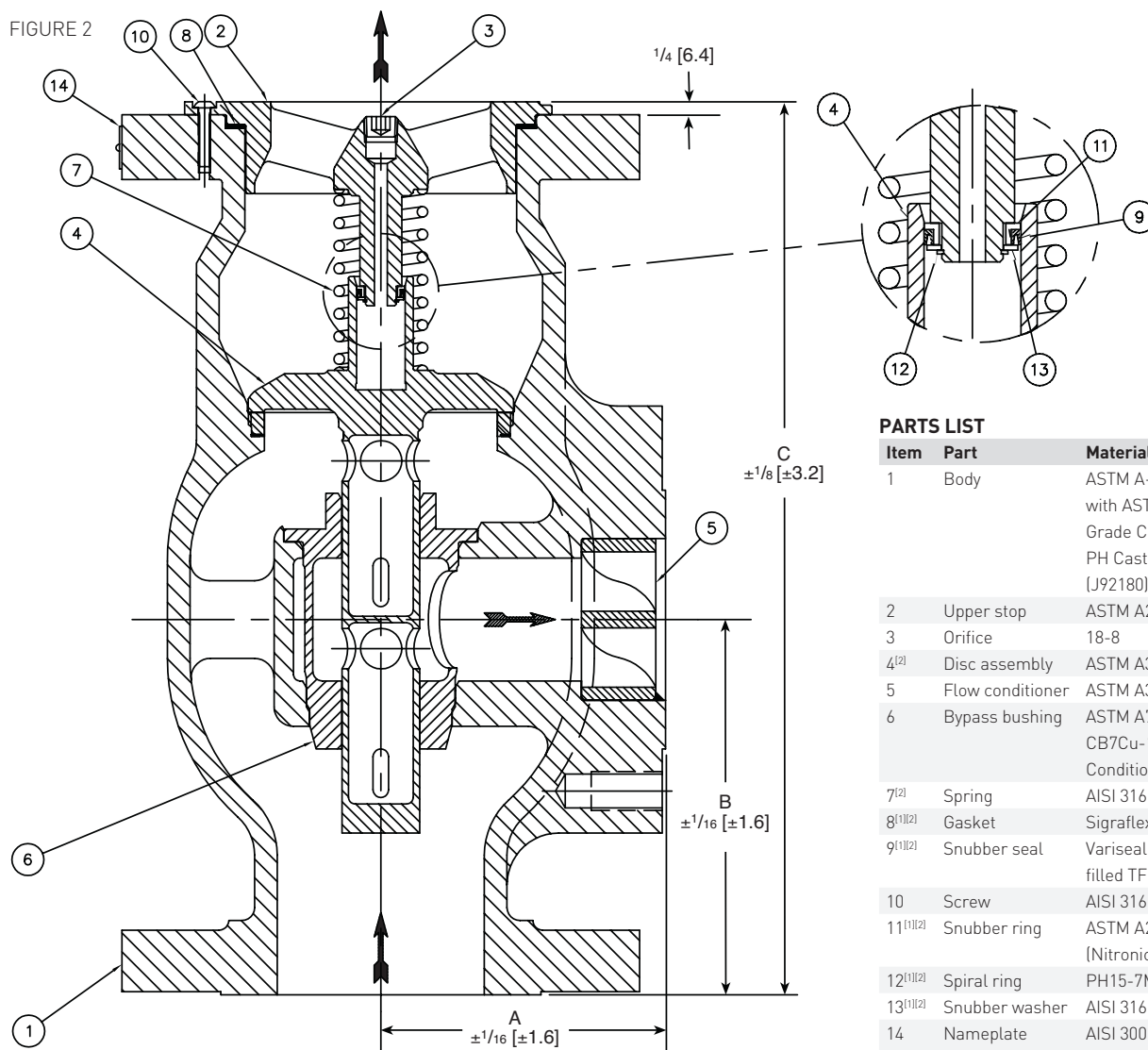
CAUTION

Do not attempt to lift these valves using a strap or chains around the webs on the upper stop (2). These screws (19) will not support the valve weight. Lift these valves using eye hooks in the holes provided for the flanged connection. If it becomes necessary to handle this valve from the bypass side, do not attempt to lift these valves using a strap through the helix on the flow conditioner (5). The tack welds are not intended to support valve weight. Lift these valves using eye hooks in the tapped holes provided for the flanged connection.

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FIGURE 2



PARTS LIST

Item	Part	Material
1	Body	ASTM A-216 Grade WCB with ASTM A747 Grade CB7Cu-1 (17-4 PH Cast) Condition H900 (J92180) seat ring
2	Upper stop	ASTM A216 WCB
3	Orifice	18-8
4 ⁽²⁾	Disc assembly	ASTM A351 type CF8M
5	Flow conditioner	ASTM A351 type CF8M
6	Bypass bushing	ASTM A747 Grade CB7Cu-1 (17-4 PH Cast) Condition H900 (J92180)
7 ⁽²⁾	Spring	AISI 316 stainless steel
8 ⁽¹⁾⁽²⁾	Gasket	Sigraflex BP (Graphite)
9 ⁽¹⁾⁽²⁾	Snubber seal	Variseal - Carbon filled TFE
10	Screw	AISI 316 stainless steel
11 ⁽¹⁾⁽²⁾	Snubber ring	ASTM A276-S21800A (Nitronic 60 bar)
12 ⁽¹⁾⁽²⁾	Spiral ring	PH15-7MO
13 ⁽¹⁾⁽²⁾	Snubber washer	AISI 316 stainless steel
14	Nameplate	AISI 300 series stainless steel

NOTES

1. Recommended spare parts for service inspection.
2. Recommended spare parts for service overhaul.

DIMENSIONS AND WEIGHTS

Valve size			Dimensions, inch (DN)				Bypass flange size		Weight	
inch	(DN)	Class ANSI	A	B	C	inch	(DN)	lb	(kg)	
2	(50)	150	4¼ (108.4)	4¾ (120.7)	11 (279.4)	1½	(40)	42	(19.0)	
		300						48	(20.9)	
3	(80)	150	4¾ (120.7)	5¾ (146.1)	13¾ (349.3)	2	(50)	73	(33.1)	
		300						81	(36.7)	
4	(100)	150	5½ (139.7)	7¾ (196.9)	17¾ (450.9)	3	(80)	125	(57.2)	
		300						147	(66.7)	