



YARWAY 9200 SERIES ARC® VALVES 10", 12" AND 14" INSTALLATION AND MAINTENANCE INSTRUCTIONS

Before installation these instructions must be fully read and understood



GENERAL

The 9200 Series Automatic Recirculation Control valve is designed to provide protection for low 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.

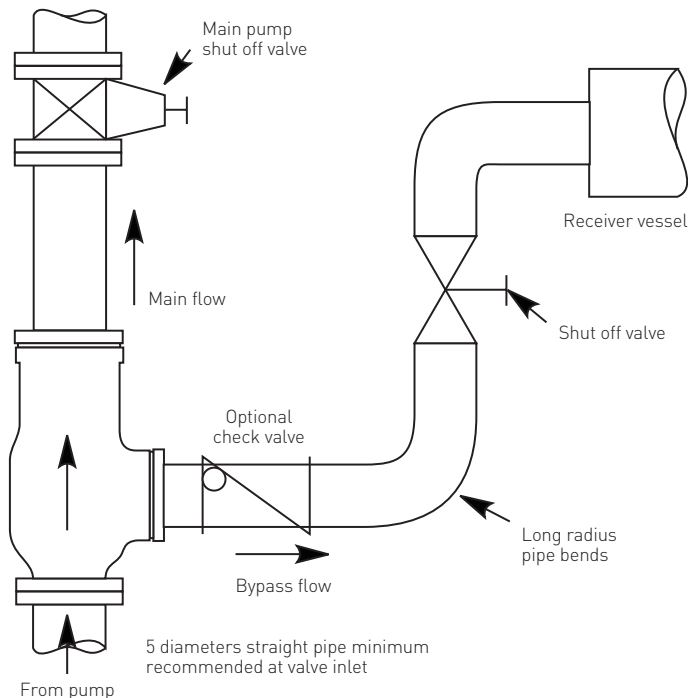
Bypass flow enters the disc stem passage through the slots and the round ports and around the annulus in the bypass bushing. It then continues through the bypass adapter where the helix element conditions the flow at the valve bypass outlet. The recirculation flow rate is controlled by the disc slot sizing. When the application requires the use of a Back Pressure Regulator (BPR) it will be furnished in its own body either attached directly to the 9200 body or installed downstream.

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FIGURE 1

3 diameters straight pipe minimum recommended at valve outlet



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 orienting the main vertically up.
2. Evenly unfasten the upper stop jacking screws (19) relieving spring compression until the upper stop is free. Remove the upper stop, inspect and replace seals if necessary.
3. Remove the spring (7) and inspect for damage.
4. Using the tapped hole located at the top of the disc, lift the disc assembly until it clears the valve body. Inspect the disc stem, slot surfaces and snubber seal (17) for damage or excessive wear.
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.
5. The flow conditioner (5) can be removed by removing the spiral ring (20). Inspect O-ring (18) for damage.
6. To remove the bypass bushing (6), evenly back out the set screws (10) until they are approximately flush with the top surface of the bushing retainer (8).

Note: for reassembly purposes, the ½" set screws should be lubricated with Never-Seez and tightened down in a crisscross fashion to a torque of 50 ft·lbs so that the bushing retainer (8) seats firmly against the spiral ring (9).
Next remove the spiral ring. This enables removal of both the bushing retainer and the bypass bushing. If necessary, use the two tapped holes provided on the top surface of the bypass bushing for removal. Observe that the opening in the bypass bushing (6) lines up with the bypass port. Inspect bypass bushing, O-rings and backup rings (13, 14, 15 and 16) for damage.

Inspect the condition of all the sealing surfaces. It is recommended that all O-rings and backup rings 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

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 two (2) of the tapped 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). Lift these valves using eye hooks in four (4) of the tapped holes provided for the flanged connection.*

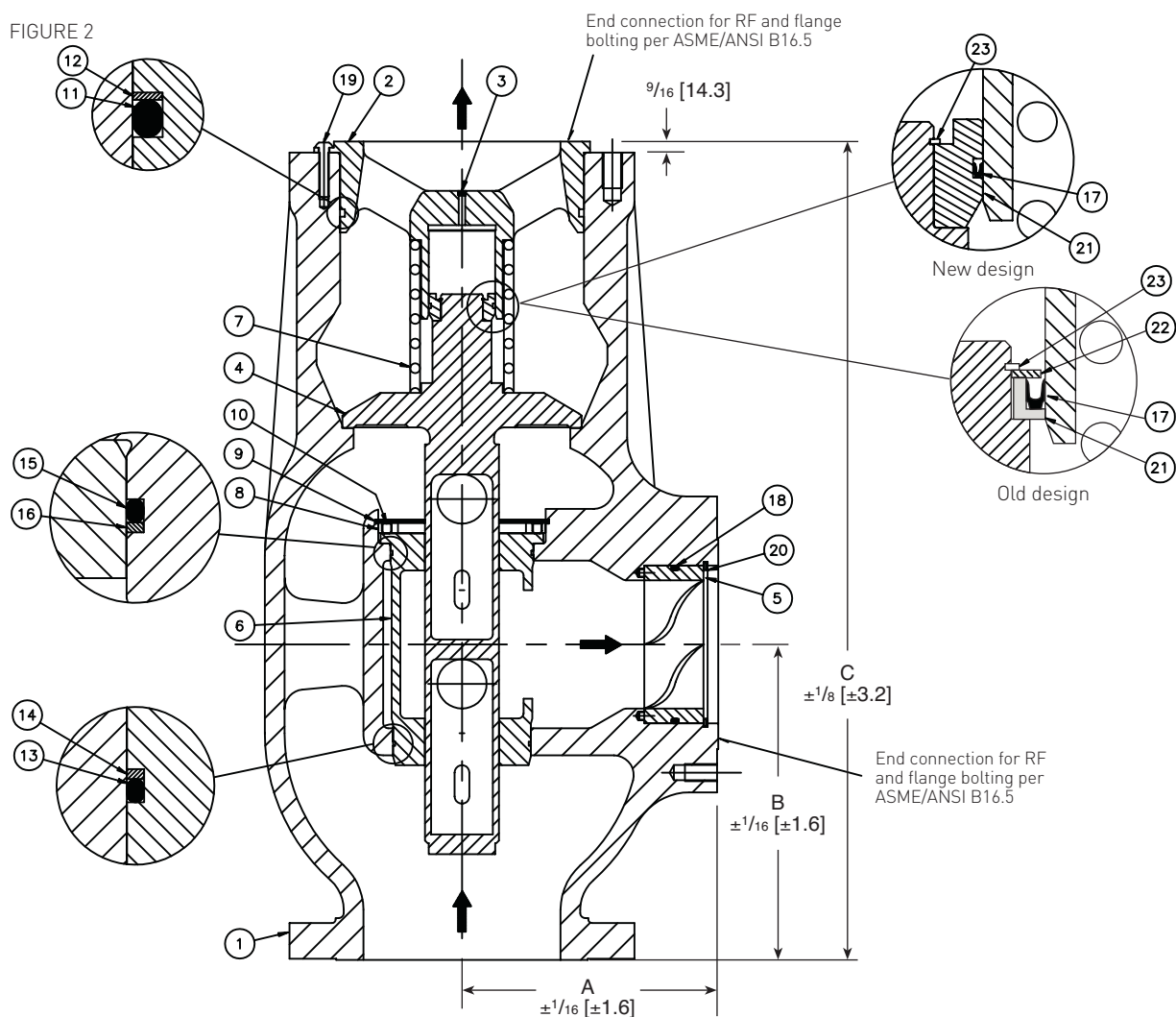
DIMENSIONS AND WEIGHTS

Valve size	Dimensions, inch (DN)						Bypass size	Weight	
	A		B		C			lb	(kg)
10"	13	(330)	16	(406)	41½	(1054)	8"	1600	(726)
12"	15	(381)	19	(483)	50	(1270)	10"	2650	(1200)
14"	16½	(419)	21	(533)	57½	(1461)	10"	3350	(1520)

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FIGURE 2



PARTS LIST

Item	Part	Material	Item	Part	Material
1	Body	ASTM A-216 Grade WCB	11 ^{[1][2]}	O-ring	EPDM
2	Upper stop	ASTM A-216 Grade WCB	12 ^{[1][2]}	Backup ring	Carbon/Graphite reinforced PTFE (Turcite 51)
3	Orifice	Stainless steel 18-8	13 ^{[1][2]}	O-ring	EPDM
4 ^[2]	Disc assembly	ASTM A351 type CF8M disc with ASTM A479 Type A21800A stem	14 ^{[1][2]}	Backup ring	Carbon/Graphite reinforced PTFE (Turcite 51)
5	Flow conditioner	ASTM A351 type CF8M	15 ^{[1][2]}	O-ring	EPDM
6 ^[2]	Bypass bushing	ASTM A747 Grade CB7Cu-1 (17-4 PH Cast) Condition H900 (J92180)	16 ^{[1][2]}	Backup ring	Carbon/Graphite reinforced PTFE (Turcite 51)
7 ^[2]	Spring	17-7 PH Condition CH-900	17 ^{[1][2]}	Snubber seal	Variseal Turcon 10
8	Bushing retainer	ASTM A479 type 410	18 ^{[1][2]}	O-ring	EPDM
9 ^{[1][2]}	Spiral ring	ASTM A564 type 631 (17-7 PH)	19	Screw	Stainless steel 316
10	Set screw	ASTM A286 UNS S66286	20	Spiral ring	ASTM A564 type 631 (17-7 PH)
			21 ^[2]	Snubber ring	ASTM A479 type S21800A (Nitronic 60 bar)
			23 ^{[1][2]}	Spiral ring	ASTM A564 type 631 (17-7 PH)
			24	Nameplate	300 series stainless steel

NOTES

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