



**Before installation these instructions must be fully read and understood.**

**General**

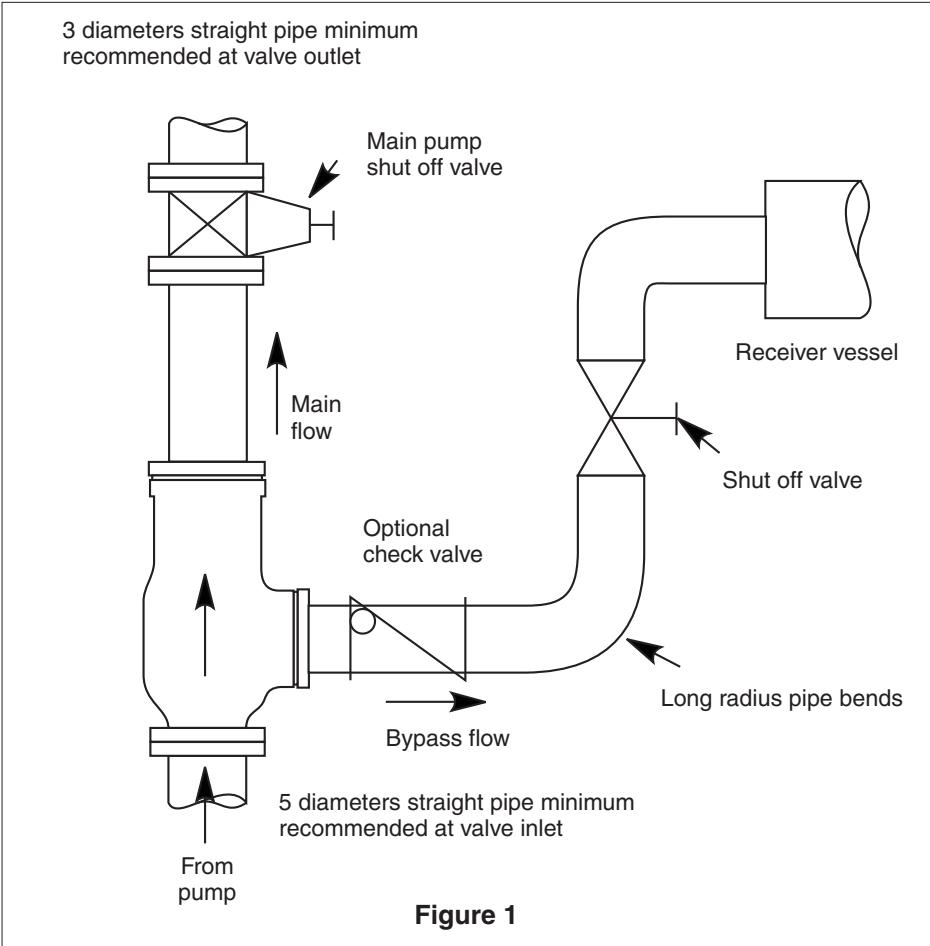
The 9200 Series Automatic Recirculation Control Valve is designed to provide protection for low pressure (ASME/ANSI 150 and 300 Class) centrifugal pumps against overheating and possible unstable operation during low load periods. The valve functions simultaneously as (1) a check valve — to prevent reverse 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.



**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 (item #2). 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.



**Total Flow Control Solutions™**

### 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 Corporation for additional information.

### Valve Maintenance

Except for periodic operational checks the valve requires little maintenance. The disc assembly, spring, bypass bushing and bypass adapter 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.

### 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 (item #19) relieving spring compression until the upper stop is free. Remove the upper stop, inspect and replace seals if necessary.
3. Remove the spring (item #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 (item #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 1/2 the available seat width. Clean thoroughly after each lapping operation.

5. The flow conditioner (item #5) can be removed by removing the spiral ring (item #20). Inspect O-ring (item #18) for damage.
6. To remove the bypass bushing (item #6), evenly back out the set screws (item #10) until they are approximately flush with the top surface of the bushing retainer (item #8).  
*NOTE: for reassembly purposes, the 1/2 inch 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 (item #8) seats firmly against the spiral ring (item #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 (item #6) lines up with the bypass port. Inspect bypass bushing, O-rings and backup rings (items #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

### Dimensions and weights

Valve Size	Dimensions in. [mm]						Bypass Size	Weight	
	A	B	C			lb		[kg]	
10"	13	[330]	16	[406]	41 1/2	[1054]	8"	1600	[726]
12"	15	[381]	19	[483]	50	[1270]	10"	2650	[1200]
14"	16 1/2	[419]	21	[533]	57 1/2	[1461]	10"	3350	[1520]

### CAUTION!

*Do not attempt to lift these valves using a strap or chains around the webs on the upper stop (item #2). These screws (item #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 (item #5). Lift these valves using eye hooks in four (4) of the tapped holes provided for the flanged connection.*

Parts and materials

Item	Part	Material	Item	Part	Material	Item	Part	Material
1	Body	SS CS	8	Bushing Retainer	SS	17*	Seal, Snubber	PTFE/SS
2	Upper Stop	SS CS	9	Spiral Ring	SS	18*	O-ring	Elastomer
3	Orifice	SS	10	Set Screw	SS	19	Screw	SS
4*	Disc Assembly	SS	11*	O-ring	Elastomer	20	Spiral Ring	SS
5	Flow Conditioner	SS	12*	Back-up Ring	Reinforced PTFE	21	Snubber Ring	SS
6*	Bypass Bushing	SS	13*	O-ring	Elastomer	22	Washer	SS
7*	Spring	SS	14*	Back-up Ring	Reinforced PTFE	23	Spiral Ring	SS
			15*	O-ring	Elastomer			
			16*	Back-up Ring	Reinforced PTFE			

\* Recommended spare parts.

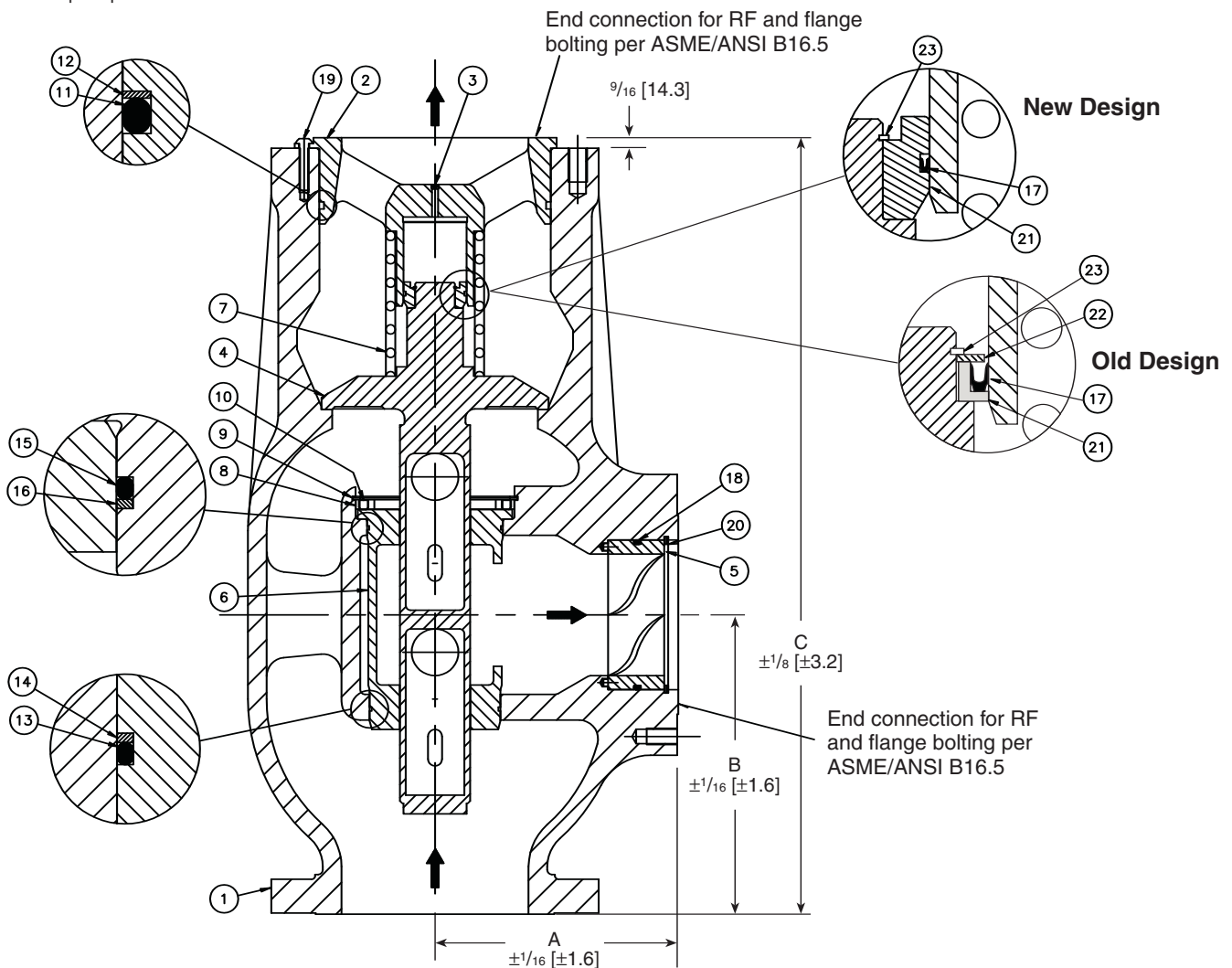


Figure 2

Stafford Facility Phone: 281-274-4400

**Tyco Valves & Controls**

www.tycovalves.com

Tyco Flow Control (TFC) provides the information herein in good faith but makes no representation as to its comprehensiveness or accuracy. This IOM is intended only as a guide to TFC products and services. Individuals using this data sheet must exercise their independent judgment in evaluating product selection and determining product appropriateness for their particular purpose and system requirements. TFC MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT(S) TO WHICH THE INFORMATION REFERS. ACCORDINGLY, TFC WILL NOT BE RESPONSIBLE FOR DAMAGES (OF ANY KIND OR NATURE, INCLUDING INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES) RESULTING FROM THE USE OF OR RELIANCE UPON THIS INFORMATION. Patents and Patents Pending in the U.S. and foreign countries. Tyco reserves the right to change product designs and specifications without notice.

Engineering Doc. #971281 Rev. A