



800 SERIES

VALVES

Rate-of-Flow

# Installation and Initial Start-up Guide

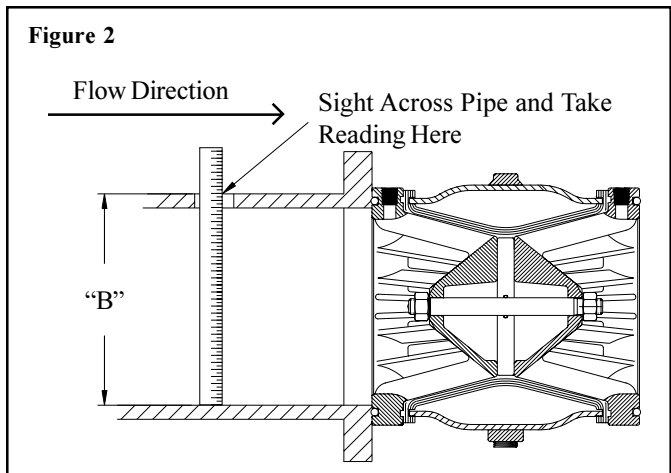
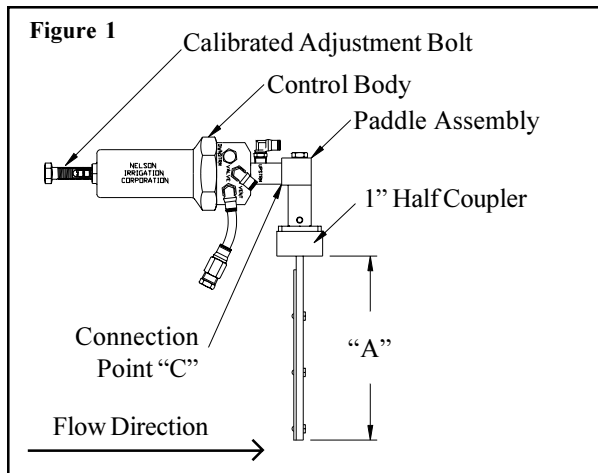
## Installation

Proper installation is essential to the longevity and accuracy of the Rate-of-Flow Control. First take into account the location where the Rate-of-Flow is to be installed. For best operation avoid pipe diameter changes, flow meters, pumps and elbows immediately upstream of the Rate-of-Flow valve. In close proximity remote-mount situations, place the Rate-of-Flow Control with 2/3 of the available pipe upstream and 1/3 of the length downstream before the valve. Do not mount the Paddle Assembly downstream of valve. For an in-valve Rate-of-Flow installation (available in 6" & 8" only), install the valve and proceed to the Rate-of-Flow Body installation and plumbing instructions at the bottom of the page. (Be careful not to use the Rate-of-Flow Control Body as a handle. Damage may occur.)

After selecting an installation location cut a hole in the top of the steel pipe so that a 1" half coupler can be welded to it. The hole should be 1.25-1.5" in diameter, with no burrs or obstructions. (If the pipe is not steel call Nelson for further and/or alternate instructions.) The Nelson remote-mount Rate-of-Flow kit comes with two 1" half couplers of different length, only one is needed. These different lengths allow the Rate-of-Flow unit to be used on many different sizes of pipe. After cutting a hole in the pipe insert a measuring tape into the hole and measure from the bottom inside of the pipe to the top outside edge of the pipe (Distance B in Figure 2). Thread the shorter of the included couplers onto the Paddle Assembly and measure from the bottom edge of the coupler to the end of the paddle (Distance A in Figure 1). If this measurement is less than Distance B in Figure 2, use the short coupler. If "A" is longer than "B" then go through the same process with the longer half coupler just to make sure it will work. If the paddle is too long check to make sure the correct size was ordered. The unit size can be verified by reading the label on the adjustment bolt. **Before welding the half coupler to the pipe be sure the correct one is used. Discard the unused half coupler. Also be sure to remove the coupler from the Rate-of-Flow unit before welding. Heat from welding may damage the Rate-of-Flow Control.**

### Installation Outline

1. Prepare Installation Site
2. Thread Paddle Assembly into 1" Coupler
3. Align Control Body to Point Toward Flow Source
4. Connect Control Tubes
5. Set Flow Rate to 10-20% Above Operating Flow
6. Verify Operation



**Installation of the Rate-of-Flow unit.** Unthread the Control Body from the Paddle Assembly at point "C" and thread the Paddle Assembly into the coupler (after it has cooled from welding). Take care not to lose the rubber washer that acts as a tension spacer between the Control Body and the Paddle Assembly. Be sure that the threaded hole for the Control Body on the Paddle Assembly faces directly upstream when giving the Paddle Assembly a final tightening. See Figure 3. It is imperative that the Control Body be parallel with the pipeline in the upstream direction. Avoid damaging the threads for the Control Body, when tightening the Paddle Assembly, by using proper wrench positioning shown in Figure 4. Reattach the Control Body and plumb in the two control tubes from the ports labeled "VALVE" and "UPSTREAM" into their respective ports.

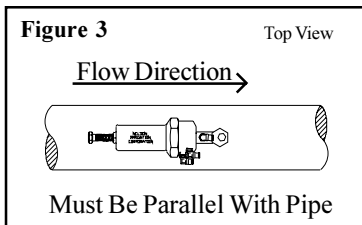


Figure 4



Proper Wrench Positioning

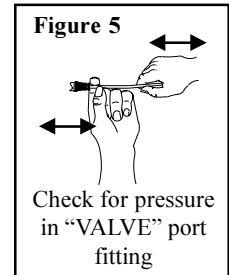
# Initial Start-up

First estimate the operating flowrate of the system the Rate-of-Flow will be installed in. Then set the calibrated adjustment bolt on the control body to approximately 10-20% above the estimated flowrate. This allows the system to fill in a timely manner, without inducing water hammer at the end of the line or taking water from other zones.

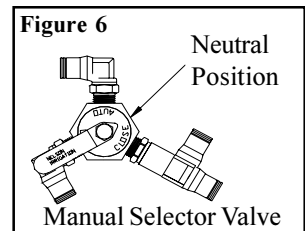
Now start the system and allow it to fill. **Caution: If starting a new system that is completely full of air, do not start valve in AUTO position as it may quickly exhaust air past the paddle and, when high speed water arrives, damage the paddle.** Be sure the valve has not

Size	Amount Vented to Full Open
8"	4 Quarts
6"	2 Quarts
4"	1 Pint
3"	1 Cup
2"	1/2 Cup

opened up all the way when the system is still filling. There are two ways to check this. One is to place your hands on the fitting coming from the port marked "VALVE" on the Rate-of-Flow Control Body and press it in to see if there is any pressure against it, as shown in Figure 5. The other is to catch the water vented off the sleeve and measure it.



By comparing the amount collected with Table 1 it can be determined how much the sleeve has opened. If no pressure was felt when pressing against the fitting, or all the water vented off the sleeve, or if only air is vented; shutdown the valve by turning the manual selector valve to CLOSE. Allow the valve to reopen only slightly, then turn the manual selector valve to a "neutral" position (point arrow on handle of selector between ports, see Figure 6). Be sure no air or water is leaving the 6RN vent nozzle to know selector is in "neutral" position. This will restrict the valve and prevent damage when the water reaches the Rate-of-Flow and valve. Once water has passed the valve turn the selector to AUTO and proceed with the Fine Tuning instructions outlined below.



## Fine Tuning

### Flowmeter Assisted Procedure

An in-line flowmeter will reduce setup time. If the flowmeter shows the flowrate is higher or lower than desired, turn the adjustment bolt one quarter turn in the proper direction. Then follow the directions in the Resetting Procedure below. Remember to read the calibrated bolt with the jam nut out of the way. Also remember the calibrated bolt is for approximation.

### Trial and Error Procedure

In this setup the flow calculation becomes very necessary to give a general window to set the Rate-of-Flow Control adjustment bolt for. Remember to read the calibrated adjustment bolt with the jam nut out of the way. If the system never reaches full operating pressure the calibrated bolt is probably set too low and it should be turned in 1/4 turn, then follow the instructions in the Resetting Procedure below. If system still does not reach operating pressure, repeat preceding procedure until full pressure is allowed by Rate-of-Flow. (Check upstream pressure to be sure that the desired operating pressure can be supplied by the system pump. No amount of adjustment of the Rate-of-Flow will rectify that problem.) The rest of the adjustment is based on personal preference. Such as, if the system is not filling fast enough and it is allowable to let the water hit the end of the system with higher velocity, the flowrate can be increased and vice versa. **Caution: High velocity water can cause water hammer and induce system damage. Adjusting a Rate-of-Flow too high can have the same effect as letting a system fill unchecked. Be careful when making adjustments to the Rate-of-Flow.**

### Resetting Procedure

Move the manual selector valve to CLOSE until the valve closes approximately halfway (gauge this by sound), then return to AUTO position. This closing and reopening allows the Rate-of-Flow to reset itself. Without turning the selector valve to CLOSE and back to AUTO, several turns of the adjustment bolt may be made without any noticeable change until the next start-up (if many turns of the adjustment bolt have been made the new flowrate could be high enough to cause system damage at next start-up). Please note that not following the Resetting Procedure could cause the Rate-of-Flow to be misadjusted by 20%.



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