APOLLO

58B SERIES

FIXED ORIFICE, DOUBLE REGULATING AND COMMISSIONING VALVE

GUIDE TO INSTALLATION, OPERATION AND MAINTENANCE

1. PRESSURE and TEMPERATURE RATING

CONNECTION	NON-SHOCK PRESSURE	MAXIMUM TEMPERATURE
Flange ANSI Class 125/150	230 CWP	250°F

Valves can only be installed in a piping system with normal pressures and temperatures that do not exceed these indicated ratings.

The maximum allowable pressure in the valves, as specified in the standards, is for **non-shock** conditions. Water Hammer and Impact should be avoided.

If system testing will subject the valve to pressure in excess of the working pressure rating, this should be within the "shell test pressure" for the body, to a maximum of 1.5 times the pressure rating, carried out with the valve fully open.

It may be hazardous to use these valves outside their specified pressure and temperature limitations and also when not used for the correct application.

Technical Performance Specification

- 2½" to 12" Double Regulating Valve
- Fixed Orifice with DZR Test Points
- Ductile Iron Body and Bonnet
- Flanges to ANSI Class 125/150
- Non-Rising Stem
- Face to Face dimensions to ANSI B16.10.
- Temperature range 15°F to 250°F

2. INSTALLATION

Heat Free

Apollo 58B Double Regulating Valves offer heat free jointing across the whole range with flanged connection technology. These connections must not be brazed.

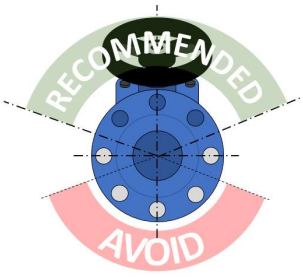
Insulation

Consideration must be given to Commissioning and Hand Wheel operation when fitting insulation to the valve.

Valve Orientation

Double Regulating Valves (DRVs) are designed for Isolation and Regulation (throttling) of flow.

The 58B will perform best when installed with the Valve Stem in a generally upright position. Installing the valve upside down should be avoided.



To function correctly the system fluid must flow through the Orifice and then through the Valve Seat: Flow Direction Arrows are provided on the Valve Body to aid orientation.

Location/End of Line Service

To ensure ease of operation, adjustment, maintenance and repair, valve siting should be decided during the system design phase.

When DRVs are needed for end of line service a blanking flange must be fitted to the downstream end of the valve.

Pre-Installation - Health and Safety

Before starting work on any installation, a risk assessment must be made to consider the possibility of operational limits being exceeded and reduction or elimination of any potential hazards.

1. Protective clothing and safety equipment must be used, as appropriate to the hazard presented by the nature of the process, into which the valve is being installed or maintained.
2. Before installing or removing a valve the pipeline circulating pumps (when fitted) must be turned off. The pipeline must be depressurized, drained and vented. Valves must be fully opened to ensure release of any pipeline or valve pressure.
3. Fitters must be trained in manual and mechanical handling to enable them to safely lift and install valves.
4. The valve selected must be suitable for the required service conditions. The pressure and temperature

limitations are shown on the valve nameplates, body or data plate. They must not be exceeded.
5. Valve seats, seals and internal components can be damaged by system debris. Protective devices may need to be fitted and system flushing may be required.
6. Any flushing fluid used to clean the pipeline must not cause any damage to the valve and its components.
7. Apollo valves must not be misused by lifting them by their hand wheels, levers or valve stems.
8. Apollo valves are not suitable for fatigue loading, creep conditions, fire testing, fire hazard environment, corrosive or erosive service, or for carrying fluids containing abrasive solids. There is no allowance for corrosion in the design of these valves. Design for this valve does not allow for decomposition of unstable fluids and must not be used where this could occur.
9. Apollo valves are not designed to withstand the effects of fire, wind, earthquakes and traffic.
10. All Health and Safety Rules must be followed when installing and maintaining valves.

Flange Material Specification

Flange components have their own design limitations and correct selection and compatibility is vital.

1. Pressure and temperature must not exceed its rating
2. Gasket selection must be in line with the rating of the flange. The fluid being handled will affect the gasket selection.
3. All bolts must be compatible with the mating flange being used.
4. Pipe and its mating flange should be cleaned and made ready for assembly.
5. A clean and appropriate gasket should be selected for the flange type being used.
6. Flat face and raised faces flanges should not be mixed.
7. Piping should be properly supported with the use of correctly sized hanging or securing brackets.
8. All pipes need to be aligned correctly to ensure that the valve integrity is maintained, avoiding twisting and distortion of the valves structure and valve damage.
9. As the valve is assembled in the pipeline ensure that the bolts are placed and secured with nuts at hand tightness employing the crossover method of tightening to secure a sound and leak tight joint.

Final Check

Check that the valve is appropriate for its intended use.

Before valve installation the pipe work to which the valve is to be connected should be inspected for cleanliness and be free from debris.

Check that the flow paths are clear and that threads and flange faces are clean and free from debris.

Ensure that the valve is **fully open** during installation.

3. SELECTION and OPERATION

Valve Selection

Valves must be properly selected for their intended service conditions. Provided it is installed correctly and receives adequate preventative maintenance the 58B should give years of trouble free service.

The 58B must be compatible with the system design, pressure and temperature requirements and be suitable for the fluids that the system will carry. Interactions between metals in the pipe system must be considered as part of valve selection.

Balancing valves should be selected based on a desired flow rate, not pipeline size. The table below shows the practical range of flow rates for each size of Apollo 58B Series FODRV.

Model	Size	Min (GPM)	Max (GPM)
58B209F	2½”	46	102
58B200F	3”	51	111
58B20AF	4”	94	159
58B20BF	5”	147	250
58B20CF	6”	209	330
58B20EF	8”	338	527
58B20GF	10”	508	1082
58B20HF	12”	767	1564

Before operating the system, all pipework must be thoroughly flushed to remove any remaining construction debris.

To **OPEN** the valve, rotate the Wheel Handle **counter-clockwise.** To avoid seizing, when the handle reaches the upper end stop rotate clockwise approximately ½ a turn.

As the handle is turned to achieve a flow rate, regulating positions can be read from the scale on the valve stem.

To **CLOSE** the valve, rotate the Wheel Handle **clockwise**. Closure will be confirmed when the wheel can be turned no further.

Setting a Flow - **Using a Chart**

1. Use **CHART A** to determine what **Pressure Drop corresponds to the Flow Rate** required

2. Unscrew the Caps on the Test Points and insert Manometer Probes with their corresponding colors. Ensure the Valve Control Handle is fully open. **Observe the Pressure Drop displayed**

3. Turn the Hand Wheel (close the Valve) until the desired Pressure Drop is displayed on the Manometer

Setting a Flow – **Using Cvs Calculation**

1. Connect a Manometer to the Test Points on the Valve. Observe the Pressure Drop displayed

2. Use the Manometer reading and the Cvs Value* for the Valve with the following calculation to establish Flow Rate

3. Adjust the Control Handle and repeat the calculation with subsequent Pressure Drop values until the desired Flow Rate is achieved.

**The Cvs value for the valve can be found on Nameplate fixed to the side of the Valve.*

Flow Rate Calculation

$$\text{GPM} = Cvs\sqrt{\Delta P \,/\, SG}$$

GPM	Flow Rate in Gallons Per Minute
Cvs	Flow Coefficient
ΔP	Differential Pressure in PSi
SG	Specific Gravity of Fluid (Water = 1.0)

Models	Size	Cv	Cvs
58B209F	2½"	120	**120**
58B200F	3"	130	**134**
58B20AF	4"	187	**246**
58B20BF	5"	294	**385**
58B20CF	6"	387	**550**
58B20EF	8"	619	**888**
58B20GF	10"	1271	**1333**
58B20HF	12"	1836	**2015**

NOTE

Greater flow setting accuracy can be achieved by using the calculation method in preference to the Look Up Chart.

Using a digital manometer with a Cvs setting can speed up the setting process.

Most leading Manometer brands carry pre-set Cvs tables for commonly used Valves.

Setting the Maximum Flow Limit

- Loosen the two Grub Screws on the Locking Collar
- Lift the Collar into contact with the scale
- Tighten both Grub Screws

The Valve can now be closed fully, and returned to the set flow condition without the need for further manometer readings or calculations.

Caution
Applications with extremes of temperature may cause the disk to become tight in the valve aperture; the Hand Wheel may become stiff to operate in these circumstances.

Suitable hand protection should be worn when operating valves used in extreme temperature applications.

4. MAINTENANCE

A regular maintenance program is the most efficient method of ensuring long term operational efficiency of the selected valve. Such a program should include a risk assessment and a planned procedure for how the maintenance will be carried out. The possibility of operational limits being exceeded and the potential hazards ensuing must be considered as part of this assessment.

This should be implemented to include visual checks on the valve's condition and any development of unforeseen conditions, which could lead to failure.

Should a valve need replacing then the following should be taken into consideration

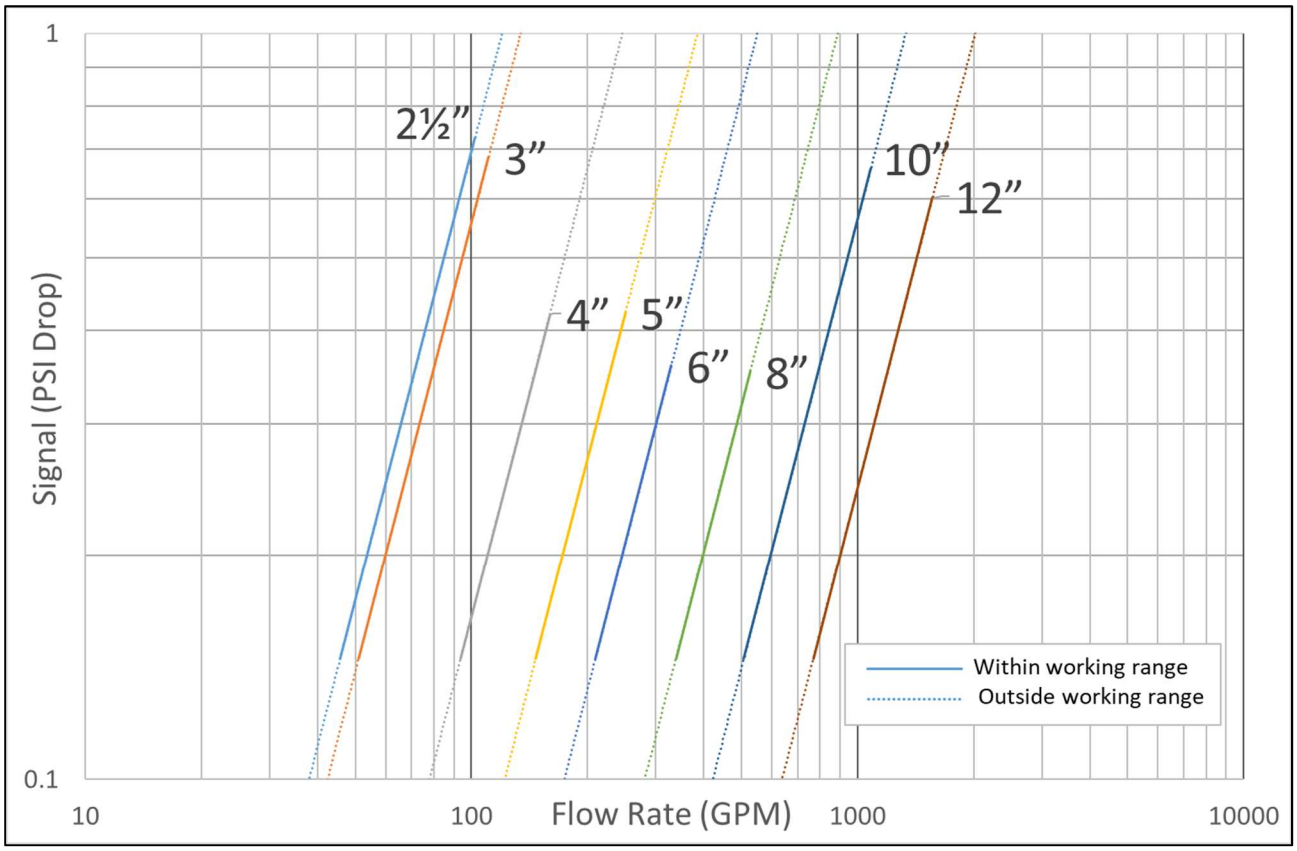
The valve should be at zero pressure and ambient temperature before any replacement is carried out.

The correct fitting tools and equipment should be used for valve replacement work.

Separate means of draining the pipe work must be provided when carrying out any replacement.

Where there may be any system debris this should be collected and /or filtered by installation of the appropriate protective device.

CHART A



5. PRODUCT LIFE

When a valve is properly selected for its service conditions it should give years of trouble-free service provided it is installed correctly and receives adequate preventative maintenance.

By not considering the compatibility of the system design and the pressure and temperature requirements the life expectancy of the valves can be adversely affected and valve failure may occur.

The nature of the fluid being carried through the valve could also affect the valve performance as this could lead to premature valve failure.

There may also be interactions between metals in the pipe system and the valve which need to be considered.

Appropriate flushing and cleaning of the pipe work installation should take place when commissioning the system; this will help extend the valve life.

It is strongly recommended to consult a Commissioning Engineer in conjunction with the Manufacturer prior to their use.

6. STORAGE

Valves should be stored off the ground in a clean, dry, indoor area. Where desiccant bags are included these should be changed after a period of six months.

Apollo valves are supplied in appropriate packaging to give adequate protection from damage and include end protection caps.