

Installation Operation and Maintenance Manual

G10 FLOW LIMITING VALVE.



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SCOPE

This manual covers most G10 models. It specifically relates to products supplied by BiS Wells from 2019 onwards. It will also apply to most G10 models supplied by previous manufacturers of Wells products, but the user is advised to take additional care to ensure that the instructions are applicable to their valve. If any doubt persists as to the applicability of these instructions, please contact BiS Wells with the exact model code and serial number of the valve.

PRESSURE RANGES

The exact maximum working pressure of the product will depend on the model code purchased and will be engraved onto the valve. Ensure that the valve is only operated within the ratings marked on the product.

INSTALLATION

The G10 Flow Limiting Valve is intended to prevent the dangerous, uncontrolled discharge of high-pressure gas in the event of a pipeline or component failure. It is designed to operate by sensing the increase in pressure drop across the valve that may be caused by a downstream failure. It is critical that it is installed in a position that will be subject to increased flow in the event of a system failure. If the type of failure being protected against will not cause a significant increase in flow, a different method of protection should be chosen.

The G10 Flow Limiting Valve may be installed in any orientation but has been designed to operate primarily in a horizontal position.

The valve is provided with an external flow adjuster. This allows the flow at which the valve shuts off (trips) to be adjusted. The trip flow may be decreased by turning clockwise (wind in) and increased by turning counter-clockwise (wind out). The trip flow should be set higher than the highest flow that is normally present in the system. The trip flow should be set high enough to avoid spurious trip events but not so high that a downstream failure does not result in sufficient increased flow and pressure drop to trip the valve. It is recommended that the valve be set as part of the installation and commissioning process.

The valve is supplied in a clean condition ready for installation. Contamination passing through the valve can cause malfunction. It is important to ensure that all connecting pipework and upstream components are clean before any gas or liquid is passed through the system to ensure that contaminant is not introduced to the valve.

This device is not recommended for use with oxygen.

A means of testing the valve on a regular basis should be incorporated in the system.

OPERATION

When a sudden drop in pressure is sensed across the valve resulting from a down stream failure it causes the spring biased Spool to close and shut off the flow. The valve is fitted with a spring giving a shut off at approximately 1 bar pressure drop, although the exact figure is model code dependent.

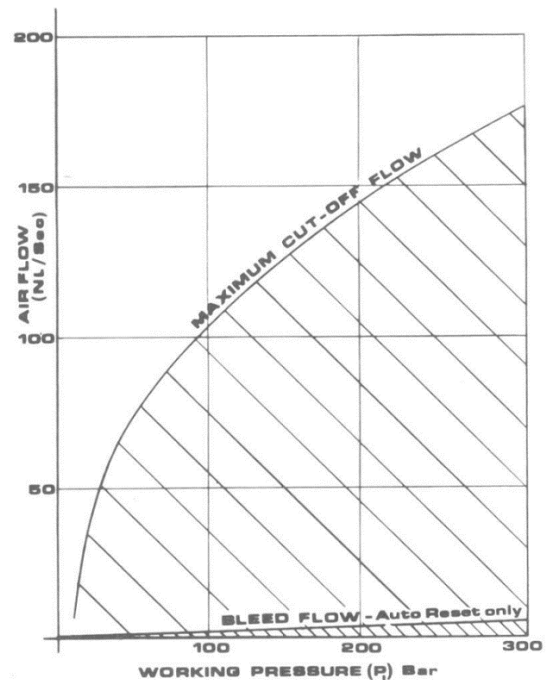
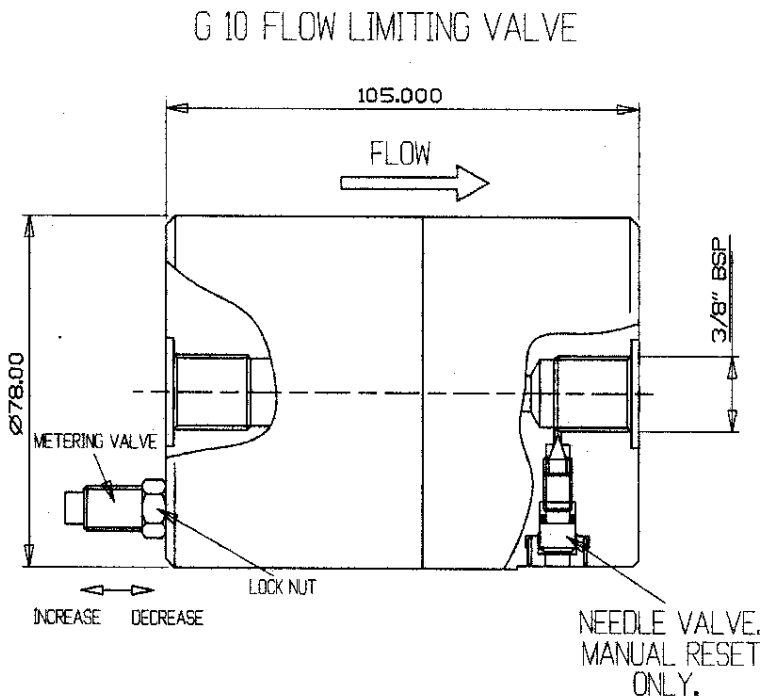
The G10 can be supplied with various reset features. The reset type determines how the valve can be returned to normal duty after it has been tripped by an increase in flow. The valve is reset by equalising the pressures upstream and downstream of the valve.

If manual reset is specified, a reset needle valve is provided. This allows the user to move fluid from one side of the valve to the other in order to facilitate pressure equalisation after a trip event. To reset, ensure the system is set such that bypassing the valve will equalise the pressure (eg. block the downstream and / or upstream flowpaths) then turn the reset needle valve one full turn counter clockwise. Once equalised and reset, the needle valve should be returned to the closed position.

If auto reset is specified, the valve has a permanent small bleed hole through the spool that can be used to facilitate pressure equalisation. It is important to note that valves specified with the auto reset option still allow a small flow to pass after a trip event. If this is not acceptable, a different reset option should be chosen.

It is also possible to specify the valve with no reset option. In this case, an external method of equalising the pressure should be provided.

The exact reset procedure will depend on the architecture of the system and the user of the system should be provided with instructions on how to perform a reset safely.



MAINTENANCE

As a device intended to provide a safety function on demand, we recommend that the user adopt a regular testing routine to prove that the valve trips when a trigger event occurs. The user should set a test interval consistent with the criticality of the function in their system, but it is recommended that the valve should be tested at least annually.

Valve products contain elastomeric sealing materials such as o-rings which may degrade over time and other components such as valve seats that may degrade with wear. If the avoidance of leakage in the event of degradation is critical, a regular service routine should be adopted. Since every system is different, the actual service interval should be determined by the criticality of failure and monitoring of performance in the system. Regardless, we recommend that the valve is serviced by fitting a new service kit at least every 5 years.

When service is required, BiS Wells recommend return of the product for factory repair and refurbishment. However, if preferred, spares kits are available, which may be installed using these fitting instructions. Only personnel experienced in the service of high-pressure fluid power equipment should attempt service of these products. Incorrectly maintained pressure products can cause damage and fatal injury.

When ordering spares kits please state model and serial numbers of the valve and fluid in system.

These instructions are limited to the replacement of the spool filter, spring and elastomers only. Should the dismantling of the valve reveal damage to any other components the unit should be returned for repair.

Cleanliness during assembly is most important, particularly on all sealing surfaces.

It is recommended to lightly lubricate seals on installation. Threads should be lubricated to minimise the risk of seizure. This is particularly important when working with stainless steel valves. Ensure that any lubricant used in wetted areas of the valve are compatible with the system fluid. If in doubt, contact the factory for advice on suitable lubricants.

It is advisable to hold a Spares Kit for emergency situations.

SPARES KITS

The correct spares kit part number will depend on the exact model code of the valve being serviced. When ordering a Spares Kit, it is important to state the valve type, serial number and or the gas or fluid in the system.

For manual reset valves the spares kit includes the spring and sealing elements.

For auto reset valves the spares kit includes the spring, sealing elements and spool filter.

Replacement parts should only be sourced through BiS Wells. The use of any parts from any other source will invalidate any remaining warranty on the product.

Before commencing the valve refurbishment ensure there is no pressure present in the system. The valve should be removed from the line and work carried out in a clean environment.

DISMANTLING.

1. Unscrew the Socket Cap Screws '1' and separate the two Body parts '2 & 3'.
2. Remove the Spool sub-assembly 'A' and the Valve Spring '4' and Body Seal '5'.
3. Remove the Metering Valve Seat '6' and Seals '7 & 8'.
4. Remove the Lock Nut '9' and Metering Valve Spindle '10' by screwing it fully in through the Body. Note – although the valve should be reset via test after reinstallation in the system, approximately the same adjustment may be obtainable by measuring the position of the Metering Valve Spindle before removal and resetting it to the same position after reassembly.
5. Remove the Seal '11'.
For Manual Reset Valves.
6. Unscrew the Retaining Plug '12' and Needle Valve '13'
7. Remove Seal '14'.
8. Remove Seal '18' from Spool '19'.
For Auto Reset Valves.
9. Remove Circlip '15' and Filter Disc '16' from Spool '17'.
10. Check all components for damage or wear. Damaged or worn components should not be re-used. Return valve for refurbishment if spare parts are not available from the factory.

REASSEMBLY

1. **For Auto Reset Valves.**
Fit the Filter Disc '16' into the Spool '17' and retain with the Circlip '15'.
1. **For Manual Reset Valves.**
Fit the Seal '18' to the Spool '19'
2. Fit Seal '14' to the Needle Valve '13'.
3. Screw the Needle Valve into the Outlet Body '3' and nip tight.
4. Replace Retaining Plug '12'.
5. Fit the Seal '11' to the Metering Valve Spindle '10'.
6. Screw the Metering Valve into the Inlet Body '2' and fit the Lock Nut '9'.
7. Fit the Seals '7 & 8' to the Metering Valve Seat '6' and fit the assembly into the Inlet Body.
8. Fit the Spring into the Spool and fit the Spool into the Body. Ensure the Spool slides freely in the Body.
9. Fit the Seal '5' to the Body and assemble the two Body parts together in correct alignment for the Metering Valve.
10. Fit the Socket Cap Screws and torque as follows:

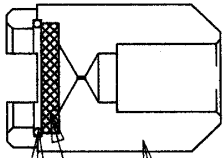
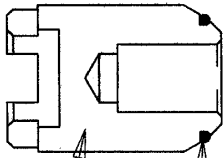
For M8 Bolts (6mm hex): 15 Nm
For M10 Bolts (8mm hex): 40 Nm
For M12 Bolts (10mm hex): 80 Nm

Note: Some versions include Back-Up Rings adjacent to the Seals.

G 10 FLOW LIMITOR

MANUAL RESET

AUTO RESET



19

18

A

15

16

17

