

Background Information

GASWorkS supports pressure reducing devices using the Regulator *Hydraulic Type*. A regulator is a uni-directional device that reduces pressure from a higher to lower pressure. In GASWorkS, a regulator is essentially considered to be a “black box” where the inlet pressure must always be greater than the outlet pressure - something happens inside the box but it is not necessarily important to the model. A regulator is used to separate pressure zones or districts. It allows gas to be supplied from a higher pressure system to a lower pressure system.

Summary

In this example, a new regulator will be added to an existing model.

Steps

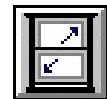
The following assumes that GASWorkS has already been started. If a model is already open, close it by selecting the *Close* menu item from the *File* menu list. Use the following procedure to work this example...

1) Open A Model

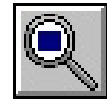
- From the *File* menu list, select the *Open* menu item. The File Selection screen will be displayed. Use the *Drives* and *Directories* lists to navigate to the directory containing the desired file - **distdemo_10.hdr**. Select the file, then select the *Continue* command button.
- The Graphic Data Interface (GDI) Window will be displayed. *Note* - If the GDI Window is not automatically displayed, select the *View/Edit* menu item from the *Graphics* menu list to display the GDI Window.

2) Save Model To A New Name

- From the *File* menu list, select the *Save As* menu item. The File Selection screen will be displayed. Enter a *Filename* for the new model, then select the *Continue* command button.
- Resize the GDI Window using the *Maximize GDI Window* icon from the *GDI Window Controls* *Toolbar*.

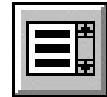


- Zoom the GDI Image to fill the display using the *Zoom To Fit* icon from the lower-left corner of the GDI Window.



3) Add The New Regulator

- Select the *Add Regulator* item from the GDI Command List.



- For the *From Node Location*, move the mouse crosshairs to a location to the upper-left of the **Node TBS** and left-click the mouse.

- The Node Data will be displayed in the Data Panel. Set the following data values:

Pressure = **100**

Pressure Units = **Psi**

Pressure Known = **Yes** (*Note - The Base Load Known should automatically be set to No.*)

Base Load = (Empty)

- Select the *Apply Data Values* command button to save the changes.
- For the *To Node Location*, hold down the *Shift* key and left-click the mouse at **Node TBS**.
- For the *Regulator Size & Type*, select **FC 1-1098** from the list and press the *Enter* key.
- For the *Set Pressure Units*, select **Psi** from the list and press the *Enter* key.
- For the *Set Pressure*, type **20** and press the *Enter* key.
- For the *Facility Type*, select **UnSpecified** from the list and press the *Enter* key.
- The Pipe Data will be displayed in the Data Panel. Right-click the mouse.

4) Review The From Node Data

- Left-click the mouse on **Node 30**. *Note - If you cannot select the node, use the *Edit Node Data* command. The Node Data will be displayed in the Data Panel. In the *Hydraulic Data Items* section, set the following values:*

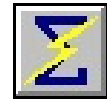


Pressure Known to **Yes** (*Note - The Base Load Known should automatically be set to No.*)

- Select the *Apply Data Values* command button to save the changes.



- Select the *Quick Solve* icon from the lower-right corner of the GDI Window to solve the model. The Solution Log will be displayed. The last line of the Solution Log should indicate that the Solution is complete. If it does not, double check the known/unknown settings for the From Node and To Node - revise as appropriate and try to solve the model again until the Solution is complete.



5) Edit The To Node Data

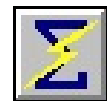
- Left-click the mouse on **Node TBS**. *Note* - If you cannot select the node, use the *Edit Node Data* command. The Node Data will be displayed in the Data Panel. In the *Hydraulic Data Items* section, set the following values:



Pressure Known = **Yes**
Base Load = **0**
Base Load Known = **Yes**

- Select the *Apply Data Values* command button to save the changes. A message will be displayed - select the *Yes* command button to continue.

- Select the *Quick Solve* icon from the lower-right corner of the GDI Window to solve the model. The Solution Log will be displayed. The last line of the Solution Log should indicate that the Solution is complete. If it does not, double check the known/unknown settings for the From Node and To Node - revise as appropriate and try to solve the model again until the Solution is complete.



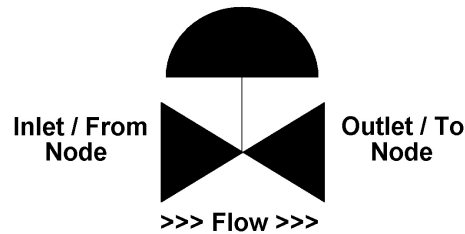
6) Review The Results

- From the *Report* menu list, select the *System Summary* menu item. The System Summary Report Options screen will be displayed. Select (check) only the *Regulator Summary* item. Select the *Continue* command button.
- The System Summary Report will be displayed. Use the scroll bars to browse the contents of the report. The various values associated with the regulator will be listed. When finished, select the *Close* command button.

Notes & Considerations

- The From Node of a regulator must be connected to the high pressure side of the piping system and the To Node must be connected to the low pressure side of the piping system.





- Although not required, it is best to attach a single pipe segment immediately upstream and downstream of a regulator.
- The From Node and To Node elevation of the pipe segments immediately upstream and downstream of a regulator must have the same value.
- The known/unknown settings of the nodes associated with a regulator are generally set as follows:

From Node -

When upstream piping is not present:

Pressure = Known

Load = Unknown

When upstream piping is present:

Pressure = Unknown

Load = Known and set to (0) zero

To Node -

When downstream piping is not present:

Pressure = Known

Load = Known and set to appropriate demand value

When downstream piping is present:

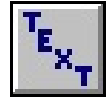
Pressure = Known

Load = Known and set to (0) zero

- If the outlet pressure of a regulator is set as “unknown”, and the calculated inlet pressure is less than the Set Pressure plus the minimum differential, the outlet pressure will be calculated based on the hydraulic properties of the regulator. This option works well if a single regulator is present, but it has difficulty when multiple regulators feed the same section of piping and their outlet pressure is also set as “unknown”.



- To turn the display of the pipe text items for non-pipe hydraulic elements either “on” or “off”, select (check) or unselect (uncheck) the *Display For Pipe Elements Only* option on the *Pipe Items* data tab of the Text Display Settings screen.



- To turn the display of the piping symbols for non-pipe hydraulic elements either “on” or “off”, select the *Display Piping Symbols* icon from the *Display Controls Toolbar*.

