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## PRODUCT DATA SHEET

# Hydraulic Controller Dynaguide® GPE 13120

### Description

The Model 13120 Hydraulic Controller (servo valve) is specifically designed for any control system applications that require high performance hydraulic control or continuous servo valve actuation.

The Dynaguide\* Hydraulic Controller accepts electrical or pneumatic signal inputs from primary sensors. This signal is converted into a powerful hydraulic signal, through the use of an integrally mounted moving coil or diaphragm assembly and a jet pipe nozzle.

The Dynaguide controller is also available with hydraulic boosters to extend the power range of the jet pipe controller. The booster is a spool type servo in which the spool is hydraulically servoed to follow the jet pipe motion to also provide proportional speed control. GPE boosters have an adjustable gain feature that allows optimum matching to the specific hydraulic system.

Model 13120 features a unique dual bearing jet pipe suspension that minimizes any friction effects and practically eliminates dead band. Also, hydraulic pressure forces are counterbalanced and this allows hydraulic pressures up to 800 psi for jet pipe and 1000 or 2000 psi for controllers with 3/8" or 3/4" boosters.

### Principle of Operation

Model 13120 Dynaguide Hydraulic Controller operates on the basic jet pipe principle, whereby a small signal impulse is amplified into a powerful control force. The jet pipe consists of a nozzle that swings freely on a pivot through which oil or other hydraulic fluid is pumped at a pressure of up to 800 psi, depending on the type of controller.

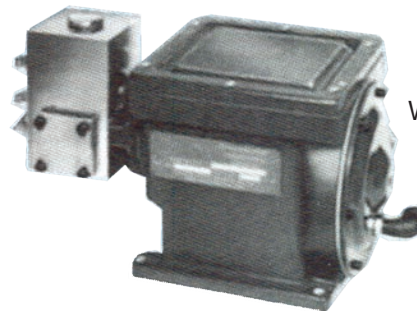
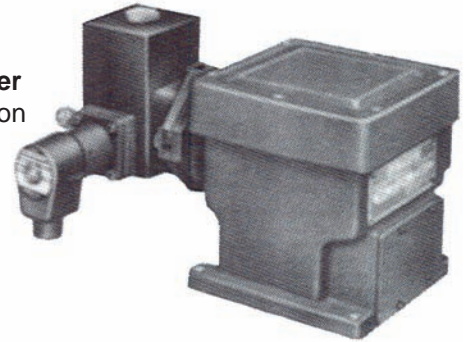
The oil discharge from the nozzle is directed at two adjacent receiving orifices in a distributor block or booster. The orifices, in turn, are connected to opposite sides of a piston in the power cylinder or actuating device.

Since the jet pipe is supported on a pivot and its upper bearing actually floats in oil, its movement is almost frictionless. In operation, when the nozzle is positioned midway between the two receiving orifices, equal pressure is exerted on each side of the piston and it remains stationary. The slightest movement of the jet pipe, resulting from a signal, causes one of the orifices to receive more of the oil discharge than the other. The resulting pressure differential moves the piston one direction or the other. This movement is at a rate proportional to the deflection of the jet pipe. The piston actuates the final control element.

The signal impulse to the moving coil or diaphragm exerts a force on the jet pipe. The countering force is a spring, calibrated at the set point for the control condition.

\* Trademark of GPE Controls

**Model 13120  
Hydraulic Controller  
With Electric Actuation  
and Solenoid  
Operated Shutoff  
Valve.**



**Model 13120  
Hydraulic Controller  
With Pneumatic Actuation  
and Pressure Operated  
Shutoff Valve.**

#### ■ Jet Pipe Design

Pioneered by GPE Controls, the jet pipe principle of hydraulic control is the most reliable, high performance, trouble-free, stable and accurate method of control yet conceived.

#### ■ Accurate

Control speed is proportional to error, thus providing smooth, accurate performance.

#### ■ Flexible

Designed to suit any process application ... usable with any hydraulic supply up to 2000 psi when used with special boosters.

Can be integrally mounted to a Dynaguide Hydraulic Pump unit ... mounted separately in one or multiple units ... supplied by a common or Dynaguide Hydraulic supply.

#### ■ Versatile

Construction allows controller to operate interchangeably with mineral or ester base fluids. Available with booster, solenoid operated shut-off valve or transfer valve.

#### ■ Simple

For a complete Dynaguide Control System, merely add hydraulic pump unit, hydraulic cylinder and electric sensor for web guide applications . . . amplifier and transmitter for process control.



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### Specifications

<b>Input Signals</b>	0-3V into 22 ohms, -10V, 0, + 10V into 320 ohms, 1-10" W.C.
<b>Output</b>	Differential oil pressure 0-800 psi for jet pipe
<b>Hydraulic Recovery Pressure</b>	Approximately 95% of supply pressure for jet pipe and 100% for booster.
<b>Maximum Supply Pressure</b>	80 - 800 psi, Jet Pipe 80 - 1000 psi, Booster 80 - 2000 psi. Special Boosters
<b>Maximum Flow</b>	5GPM, no load flow with 800 psi supply pressure, with 2.0 mm Jet Pipe. 20GPM, no load flow with 1000 psi supply pressure, with 3/8" Booster. 70GPM, no load flow with 1000 psi supply pressure, with 3/4" Booster.
<b>Maximum Return Pressure</b>	20 psi - Plastic Cover 50 psi - Aluminum Cover
<b>Fluid Filtration</b>	None in unitized Dynaguide System 40 micron in Central Hydraulic System
<b>Integral Accessories</b>	Booster or either pressure or solenoid operated shutoff valves can be supplied manifolded to the controller.

### How to Order

#### Specify:

- Model 13120 Hydraulic Controller** with moving coil signal system, or pneumatic signal system.
- Capacity** - 1.2 mm or 2.0 mm Jet Pipe 3/8" or 3/4" booster
- Type of switching required.**
  - No switching required
  - Pressure operated or solenoid operated transfer valve
  - Pressure operated or solenoid operated shut-off valve
  - GP or XP solenoids
- Type of actuation required** - electric or pneumatic
- Type of mounting required.**
- Type of operating fluid.**
- For **edge guide** or **centerguide** applications.

For other related system components see Product Data Sheet for Pump Supply Units, Sensors, and Hydraulic Actuators.

<b>Physical Characteristics</b>	<b>Body</b>	Cast Aluminum	<b>Jet Pipe</b>	Stainless Steel
	<b>Cover</b>	Diallyl Plastic or Aluminum	<b>Coil</b>	Epoxy Encapsulated
	<b>Seals</b>	Viton "O" Rings	<b>Weight</b>	10 lbs.

### Model Options



#### Capacity Selection

- 01 1.2 MM Jet Pipe
- 02 2.0 MM Jet Pipe
- 04 3/8" Booster
- 05 3/4" Booster

#### Type of Switching

- 00 None
- 01 Transfer Valve Pressure Operated
- 02 Transfer Valve Solenoid Operated - GP
- 03 Transfer Valve Solenoid Operated - XP
- 04 Shutoff Valve Pressure Operated
- 05 Shutoff Valve Solenoid Operated - GP
- 06 Shutoff Valve Solenoid Operated - XP

#### Type of Mounting

- 01 Mount on 19140 Pump Unit, Electric Actuation
- 02 Mount Separately, Electric Actuation, with Aluminum Cover
- 10 Mount 19140 Pump Unit, Pneumatic Actuation
- 12 Mount Separately, Pneumatic Actuation, with Aluminum Cover

#### Type of Actuation

- 26 Pneumatic Edge Guide
- 27 Pneumatic Centerguide
- 73 Moving Coil - 22 Ohms
- (73) Specify Resistance other than 22 Ohms
- 74 Moving Coil - 320 Ohms



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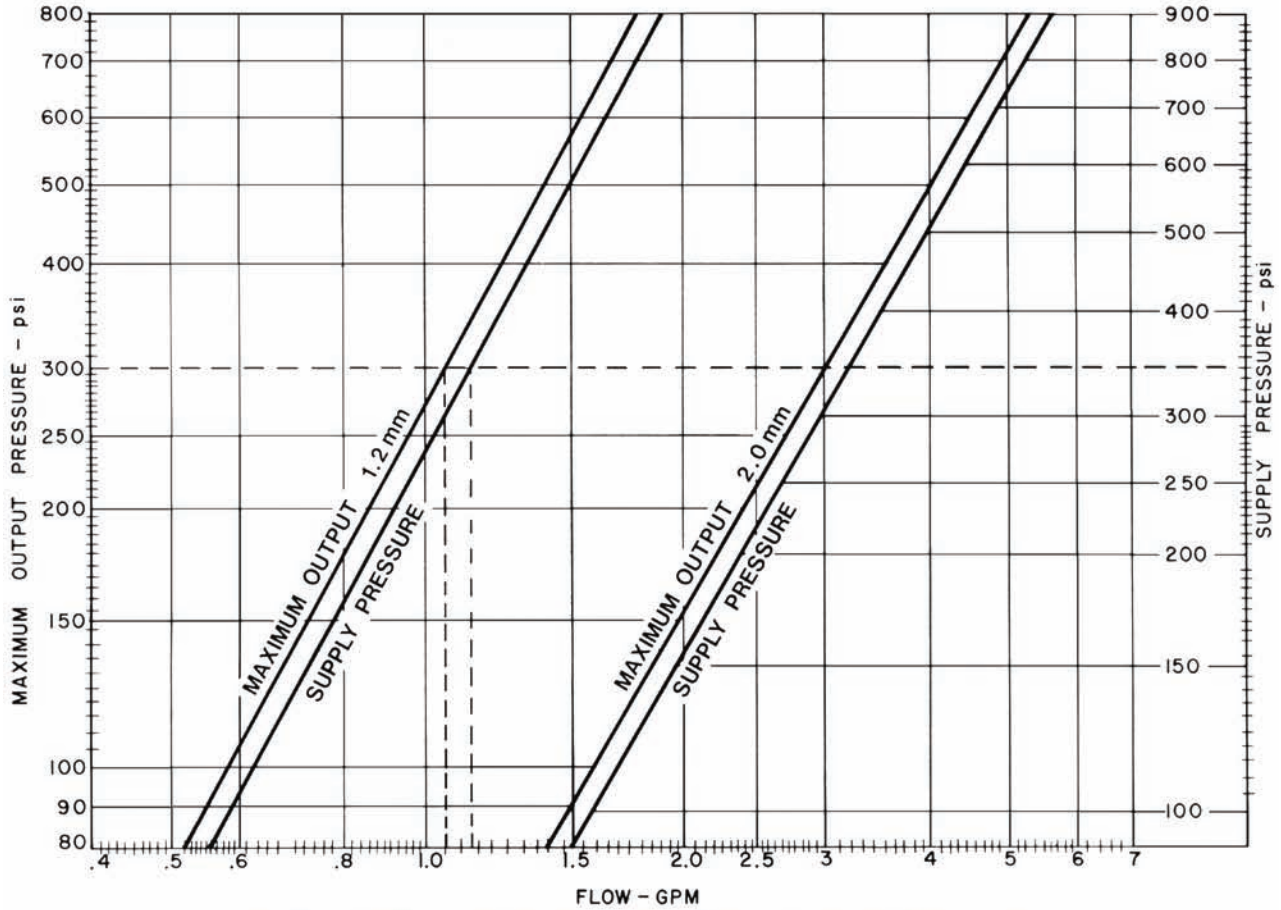
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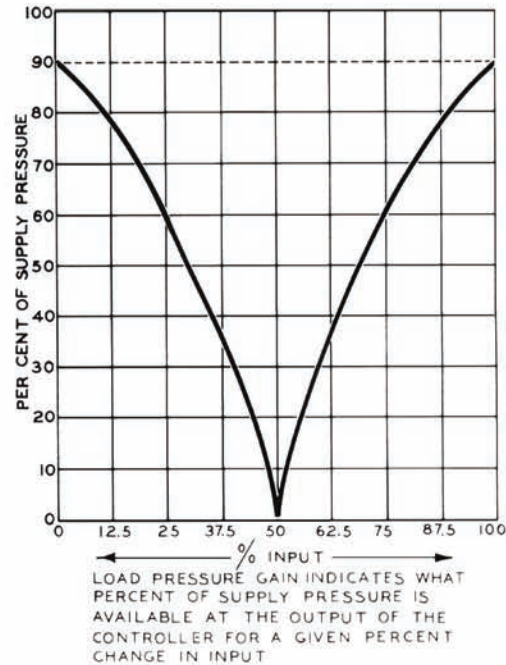
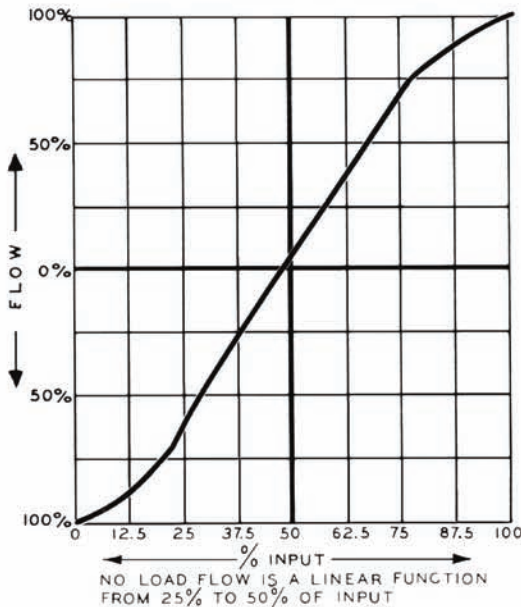
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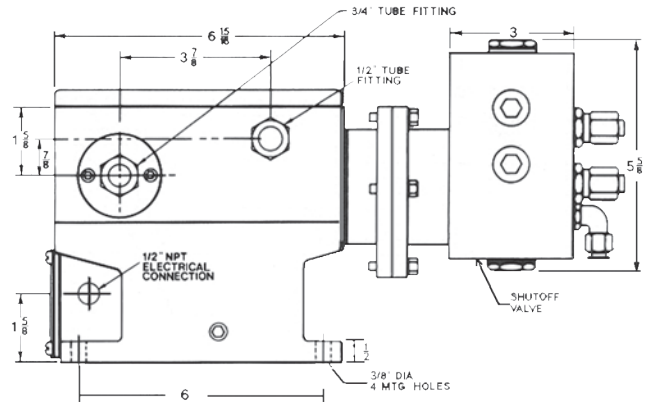
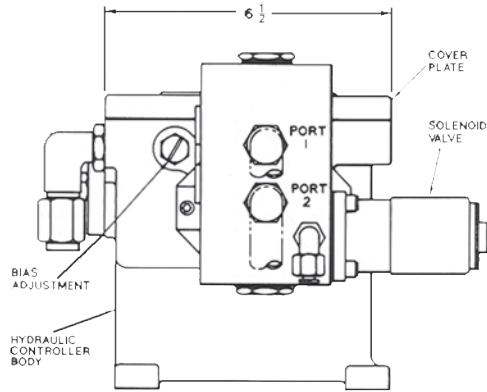
#### Flow Curves - Model 13120 Hydraulic Controller - Jet Pipe Only



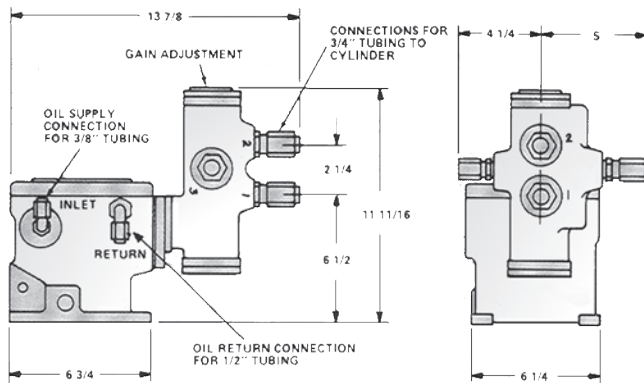
EXAMPLE: (DASHED LINES) OUTPUT PRESSURE OF 300 PSI DELIVERS A MAXIMUM OF 1.05 GPM TO THE CYLINDER UNDER NO LOAD AND REQUIRES A PUMP SUPPLY OF 1.14 GPM AT 340 PSI.



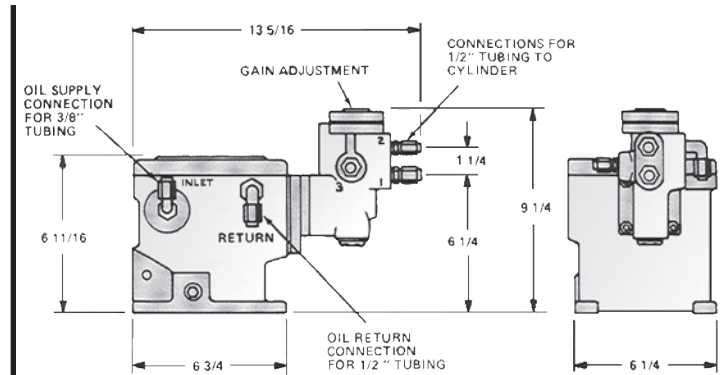
### Outline Dimensions



**Dynaguide Controller with Shutoff Valve**  
(Moving Coil Actuation)

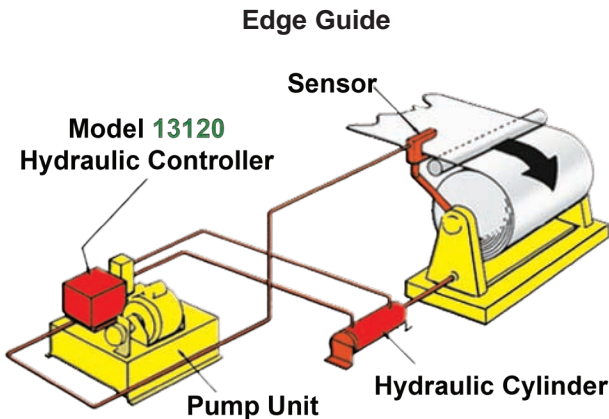


**Dynaguide Controller with 3/4\"**

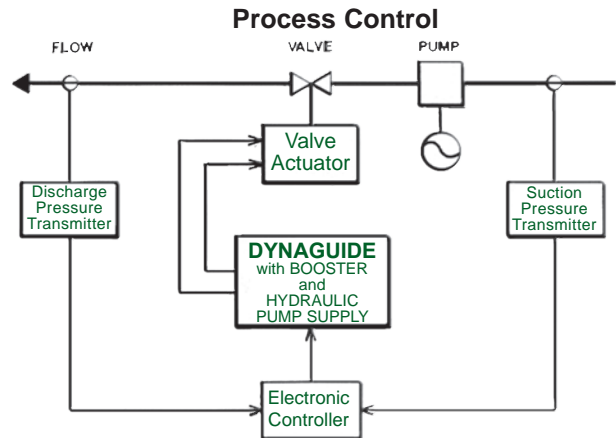


**Dynaguide Controller with 3/8\"**

### Typical Applications



**Edge Guide System**  
Using One Controller Mounted on Pump Unit



**Suction / Discharge Pipeline**  
Pressure Control System