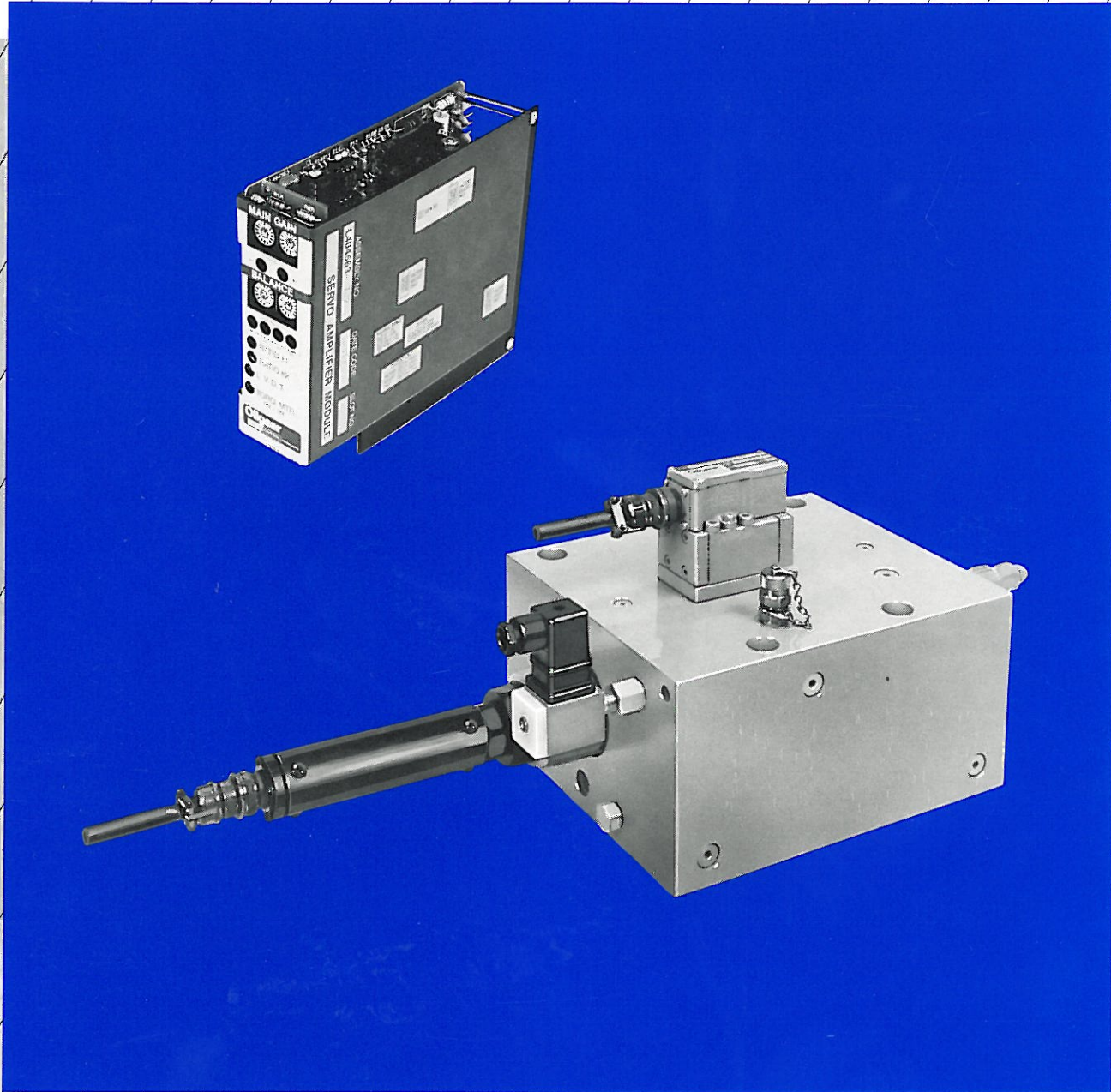




# 3-WAY SERVO VALVE SCVS





# SCVS 3-WAY SERVO VALVE

## Pilot pressure sensing switch

- Senses when pilot pressure is low and will sense plugged contamination fuse.
- Can be incorporated in PLC logic and or processor diagnostics.
- Cartridge construction for easy servability.

1

## Amplifier

- Digital setting of gain and balance for stability and repeatability.
- On board diagnostic indicator lights.
- LVDT and torque motor output test points.
- Multiple inputs with separate gain adjustments.
- High response demodulator and power output stages.

3

## Pilot servo valve

- Variety of pressure ranges available to optimize performance.

2

## Built-in pressure reducing valve

- Maintains constant pilot pressure to sustain consistent performance.
- Reduces pilot valve null drift.
- Cartridge type construction provides easy inspection, service or replacement.

4

5

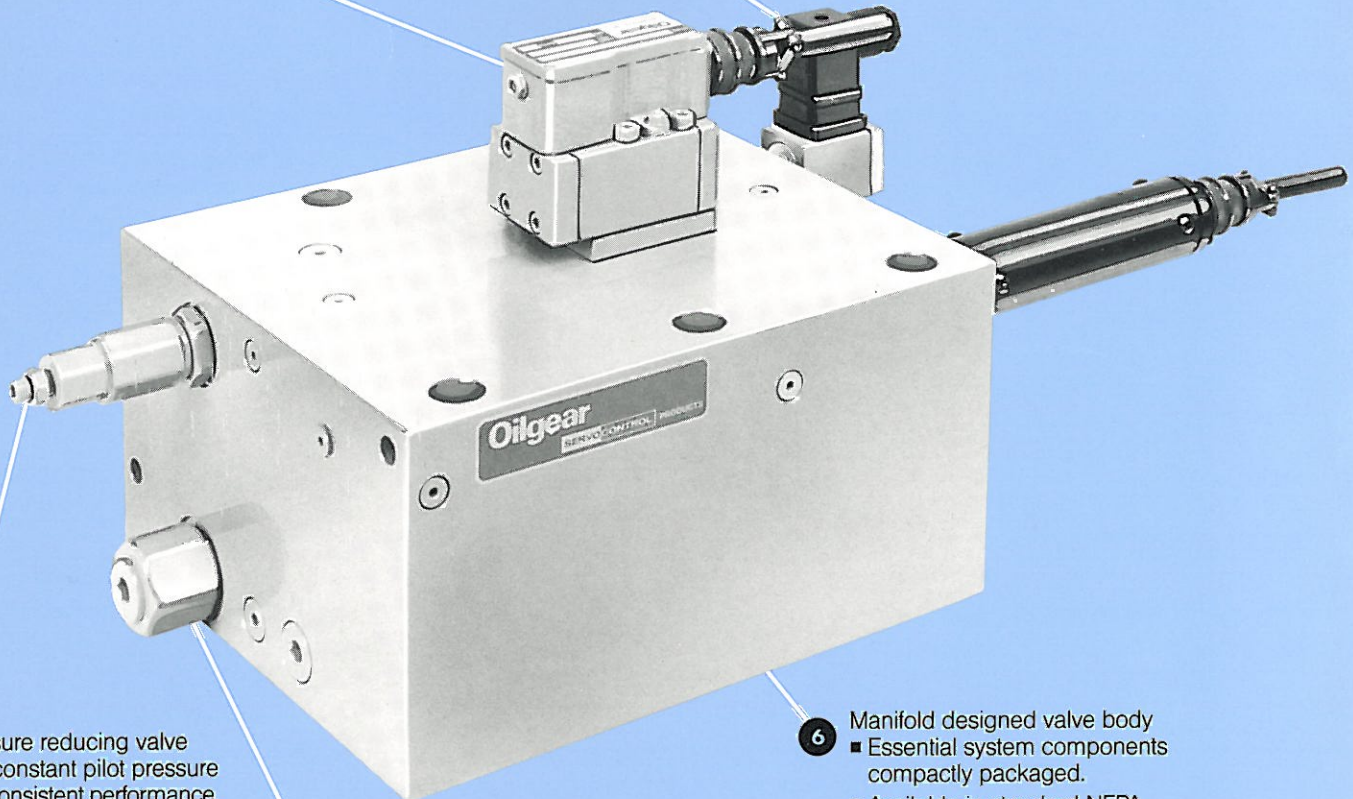
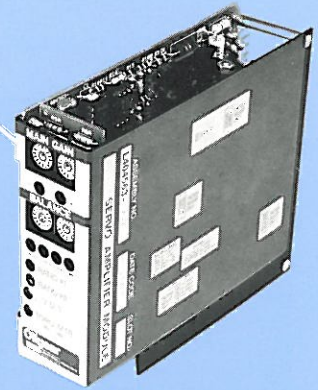
## Exclusive contamination fuse

- Protects pilot valve from contamination failure.
- Can withstand 5000 psi (345 bar) pressure drop without collapsing.
- Cartridge type construction makes it easy to replace elements.

6

## Manifold designed valve body

- Essential system components compactly packaged.
- Available in standard NFPA (GETOP) mounting pattern configuration.





# PERFORMANCE ASSURANCE IS STANDARD WITH EVERY OILGEAR COMPONENT

7

## Power valve & LVDT assembly

- Designed for fast response, greater sensitivity and higher accuracy.
- Cartridge type construction is easy to maintain. Components screw-in with ease for inspection, service or replacement.
- Rated for 5000 psi (345 bar).

## Competitively priced

- Modern manufacturing methods and cartridge construction reduces cost.

## Oilgear's extensive application experience

- Oilgear is a hydraulics manufacturer totally dedicated to micro-electronics systems, designed and manufactured in its own factories.
- Electronics is integrated in Oilgear's hydraulic engineering as an integral part of the engineering department. CAD/CAM insures optimal system design incorporating the latest developments.
- Oilgear has been an *electro*/hydraulic manufacturer since 1954 and will be there when you need help in the future.

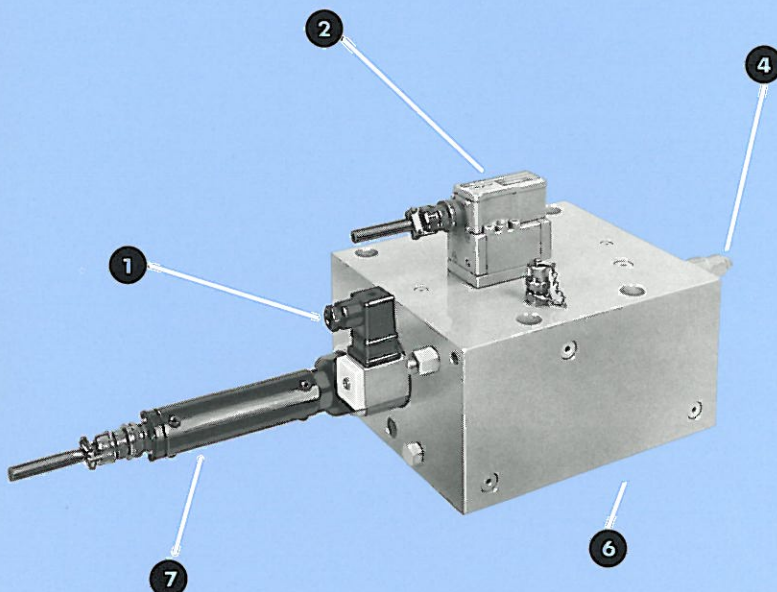
Every Oilgear servo valve is shipped with a corporate commitment to support the component until it performs as specified.

This total dedication to performance is based upon experience gained since 1921 in matching fluid power equipment to a tremendous variety of machines and applications.

Oilgear's Performance Assurance is made possible because of experience gained over the years in supplying machinery builders and users with unique solutions to thousands of unusual fluid power problems.

Historically, Oilgear has concentrated its energies on hydraulics and electrohydraulic equipment and systems. Every Oilgear facility is staffed with factory trained and field experienced application engineers.

Performance Assurance doesn't stop with the design of the system or the sale of the component. Oilgear engineers will be there—when they are needed—supplying the technical support, field service, parts and repairs, to make sure each component operates correctly.



## CONTENTS

| Item                              | Page No. |
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| Features and Benefits . . . . .   | 2        |
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# SPECIFICATIONS

## PILOT VALVE

| MODEL SERIES                    | 800  | 1200 |      |      | 1600 |      | 2000 |      | 2400 |      |
|---------------------------------|------|------|------|------|------|------|------|------|------|------|
| PILOT VALVE OPTION*             | **C  | **A  | B    | C*   | **A  | B    | **A  | B    | **A  | B    |
| USgpm (Rated at 1000 psi)       | 0.3  | 0.7  | 0.7  | 0.4  | 1.3  | 1.3  | 2.6  | 2.6  | 2.6  | 2.6  |
| lpm (Rated at 69 bar)           | 1.0  | 2.5  | 2.5  | 1.5  | 5.0  | 5.0  | 10.0 | 10.0 | 10.0 | 10.0 |
| Maximum Pressure—psi            | 1000 | 3000 | 1000 | 1000 | 3000 | 1000 | 3000 | 1000 | 3000 | 1000 |
| —bar                            | 69   | 207  | 69   | 69   | 207  | 69   | 207  | 69   | 207  | 69   |
| Rated input (parallel coils) ma | ±160 | ±260 | ±260 | ±160 | ±260 | ±260 | ±260 | ±260 | ±260 | ±260 |

\* In cases where the system response will be mass limited it may be advantageous to use a pilot valve with a smaller flow rating. Consult factory for other options.

\*\* Standard pilot valve

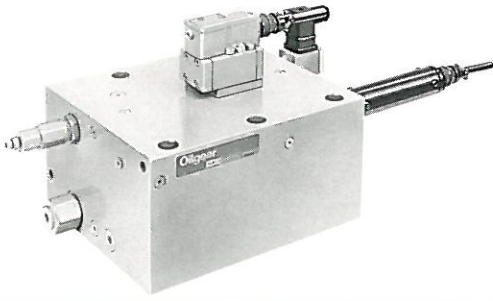
## POWER VALVE

| MODEL SIZE   | 800               | 1200              | 1600               | 2000                | 2400                |
|--|-------------------|-------------------|--------------------|---------------------|---------------------|
| Flow gain at 1000 psi $\frac{\text{in}^3/\text{sec}}{\text{in}}$   | $1.4 \times 10^3$ | $3.2 \times 10^3$ | $3.85 \times 10^3$ | $6.125 \times 10^3$ | $6.125 \times 10^3$ |
| Flow gain at 1000 psi $\frac{\text{in}^3/\text{sec}}{\text{volt}}$ | 13.4              | 48.1              | 77                 | 135                 | 135                 |
| Spool Stroke (in)  | ±.062             | ±.125             | ±.188              | ±.203               | ±.203               |

## RECOMMENDED GAINS

| MODEL SIZE  | 800  | 1200 | 1600 | 2000 | 2400 |
|---|------|------|------|------|------|
| LVDT gain in/VDC  | .010 | .015 | .020 | .022 | .022 |
| Inner loop gain ma/VDC                                      | 120  | 100  | 160  | 700  | 700  |
| Pilot valve gain $\frac{\text{in}^3/\text{sec}}{\text{ma}}$ | .012 | .013 | .025 | .051 | .051 |





## RATED OUTPUT

| MODEL SIZE                         | 800  | 1200  | 1600  | 2000  | 2400  |
|------------------------------------|------|-------|-------|-------|-------|
| Nominal Flow Rate                  |      |       |       |       |       |
| At 1000 psi $\Delta P$ drop—USgpm  | 18   | 60    | 135   | 250   | 275   |
| At 69 bar $\Delta P$ drop—lpm      | 68   | 227   | 511   | 947   | 1040  |
| Internal Leakage—USgpm             | <.75 | <1.0  | <1.5  | <2.0  | <2.0  |
| —lpm at 345 bar                    | <2.8 | <3.8  | <5.7  | <7.6  | <7.6  |
| Recommended Pilot Supply Pressures |      |       |       |       |       |
| Standard pilot valves—psi          | 1000 | 2500* | 2500* | 2500* | 2500* |
| —bar                               | 69   | 172   | 172   | 172   | 172   |
| Minimum —psi                       | —    | 1500  | 1500  | 1500  | 1500  |
| —bar                               | —    | 103   | 103   | 103   | 103   |
| Maximum —psi                       | —    | 3000  | 3000  | 3000  | 3000  |
| —bar                               | —    | 207   | 207   | 207   | 207   |

Power stage = 5000 psi (345 bar).  
 Operating temperature = 20° to 90°C.  
 Pilot valve filtration = Beta 10 of 15.  
 Power valve filtration = Beta 10 of 4.  
 \* 1000 psi (69 bar) pilots available—  
 See HOW TO ORDER on page 12

## PERFORMANCE SUMMARY

| MODEL SIZE  | 800    | 1200  | 1600  | 2000  | 2400  |
|---|--------|-------|-------|-------|-------|
| Linear Flow Range   |        |       |       |       |       |
| At 1000 psi $\Delta P$ —USgpm*  | 15     | 50    | 125   | 200   | 250   |
| At 69 bar $\Delta P$ —lpm   | 57     | 189   | 473   | 758   | 947   |
| Flow Symmetry   | ±5%    | ±5%   | ±5%   | ±5%   | ±5%   |
| Typical Blocked Port Pressure Gain<br>from 40% to 60% supply pressure |        |       |       |       |       |
| Spool Travel (volts)  | .04    | .04   | .03   | .03   | .03   |
| Spool Travel (inch)   | .0004  | .0006 | .0006 | .0007 | .0007 |
| Null Shift  |        |       |       |       |       |
| 500 psi (35 bar) Change in pilot<br>pressure                          | —      | ±2%   | ±2%   | ±1%   | ±1%   |
| 50°C change in fluid temperature                                      | ±3%    | ±3%   | ±2%   | ±2%   | ±2%   |
| Dynamic Response**  |        |       |       |       |       |
| At ±100% linear flow command  | 65 Hz  | 35 Hz | 35 Hz | 30 Hz | 30 Hz |
| At ± 10% linear flow command  | 200 Hz | 90 Hz | 90 Hz | 85 Hz | 85 Hz |

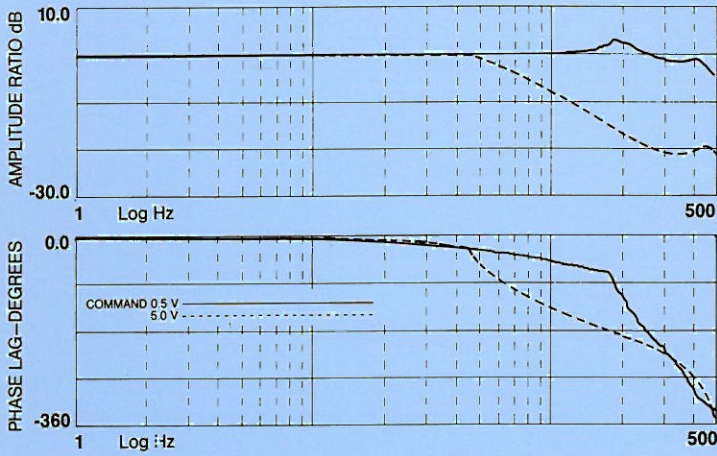
\* For linearity refer to curves/frequency response on page 6.

\*\* Frequency Response at 90% Phase Lag.

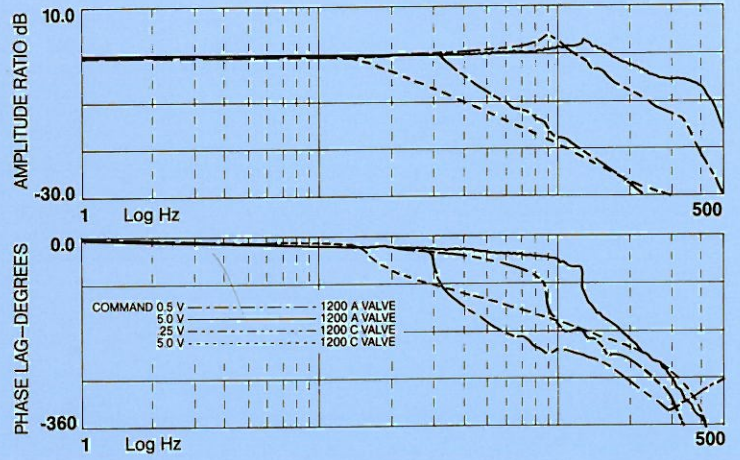


# FREQUENCY RESPONSE CURVES

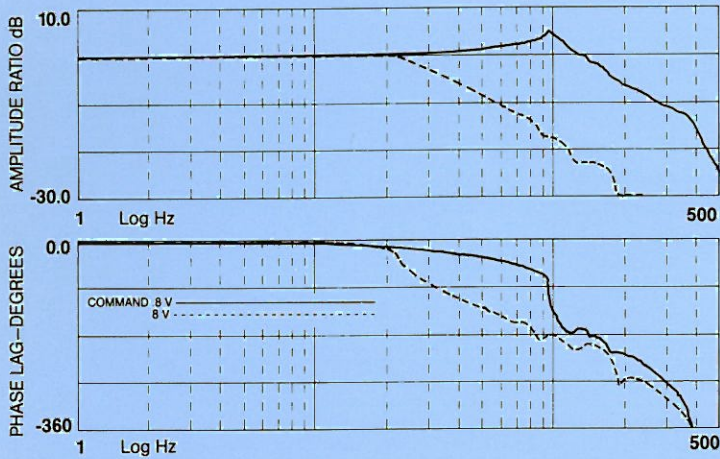
800



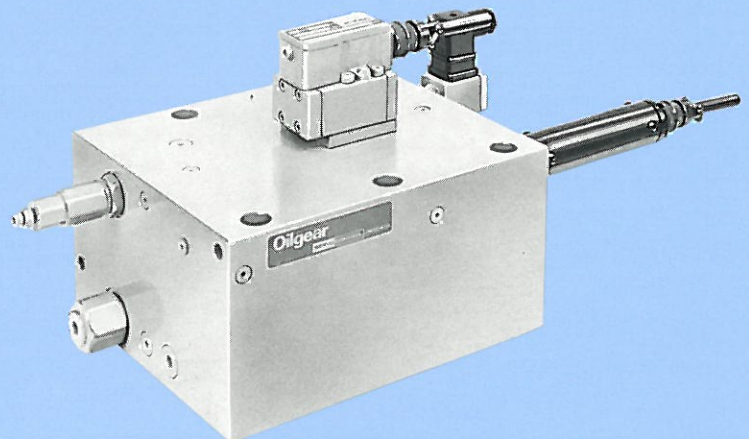
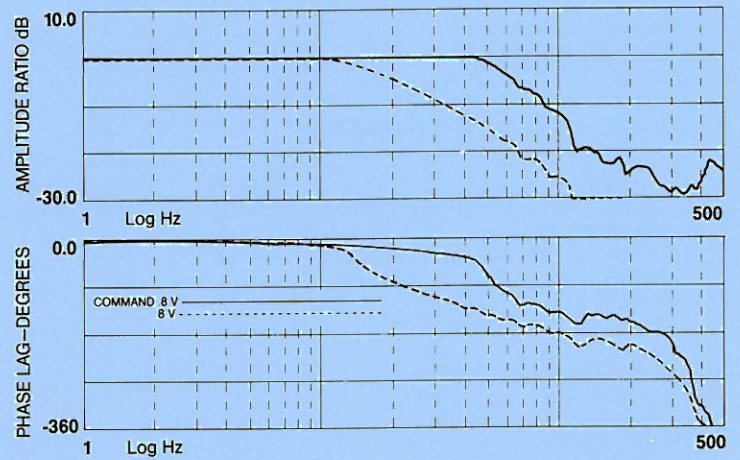
1200



1600



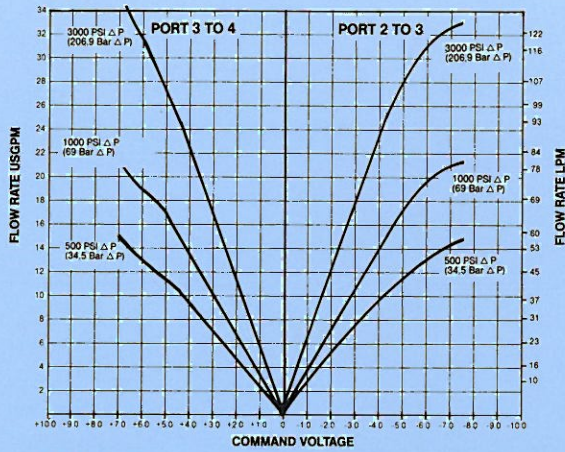
2000 & 2400



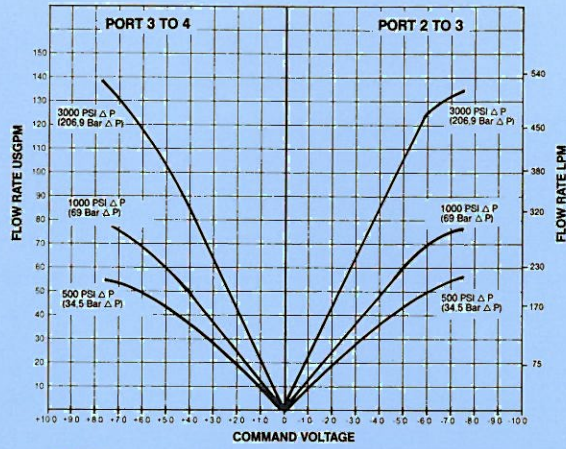


# FLOW VS COMMAND

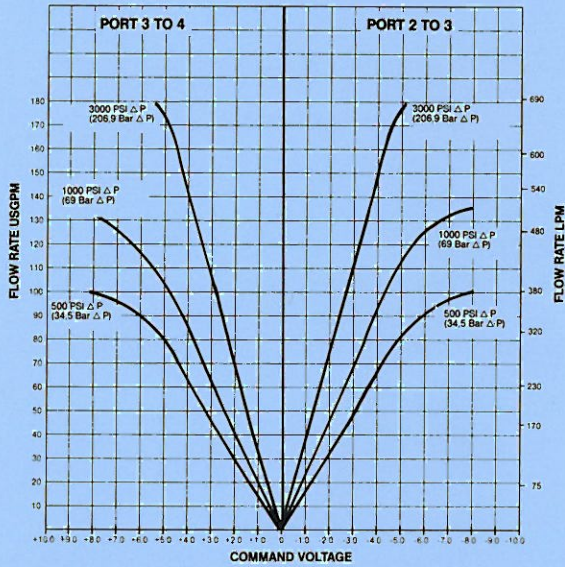
800



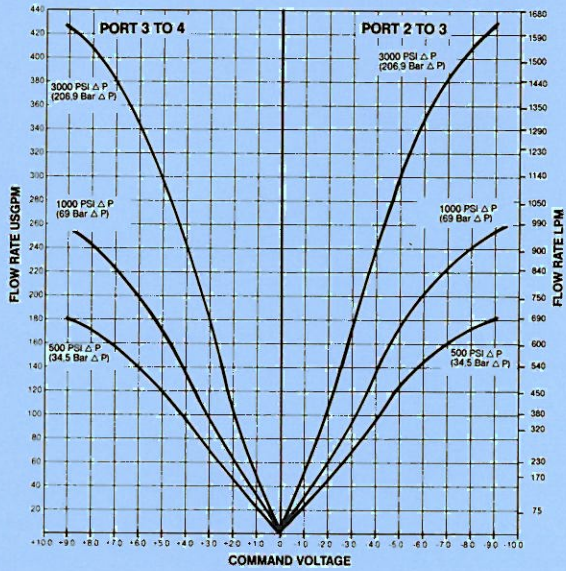
1200



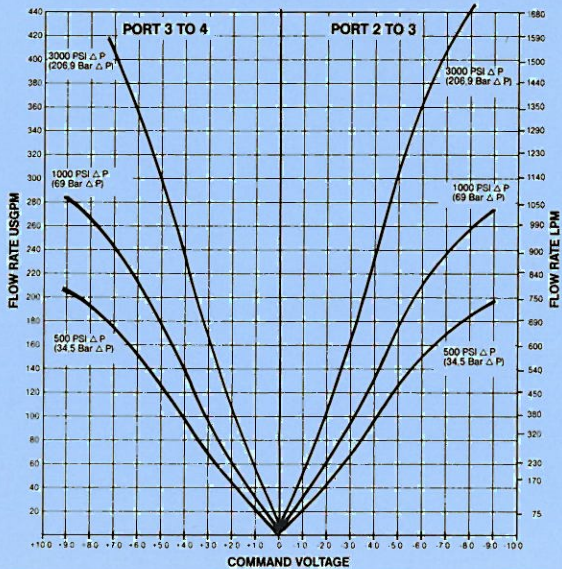
1600



2000

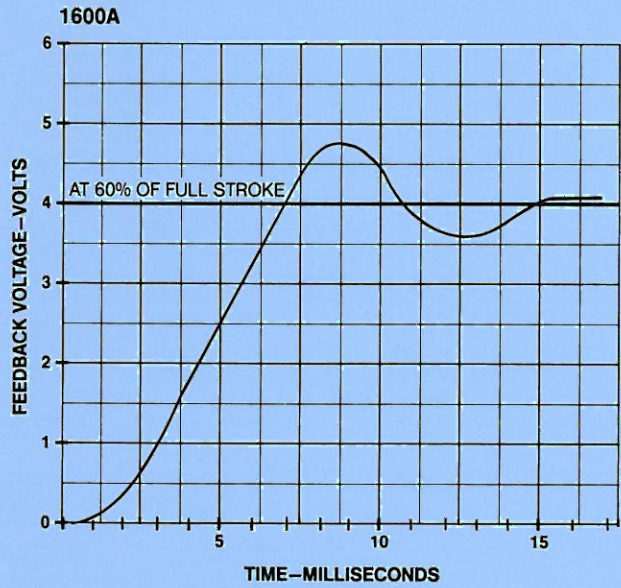
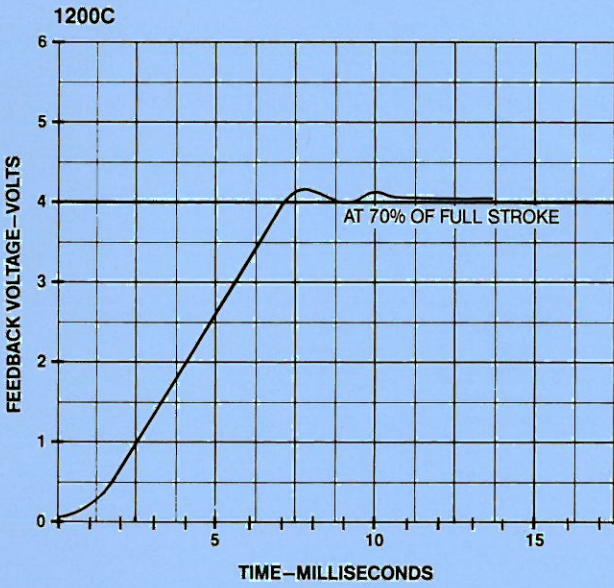
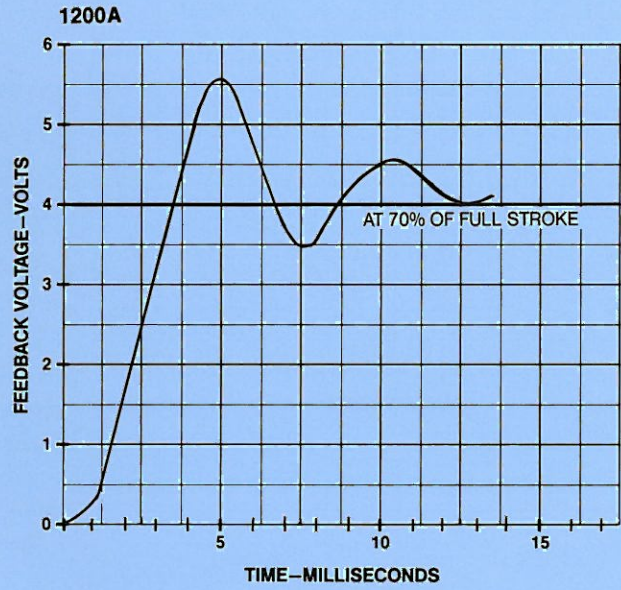
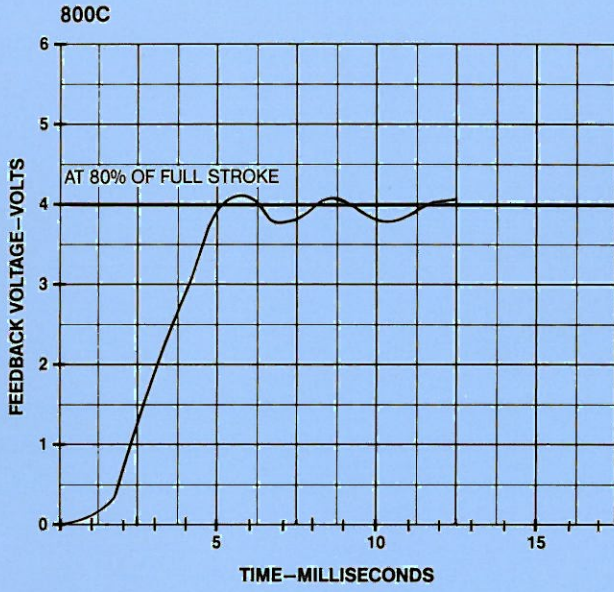


2400



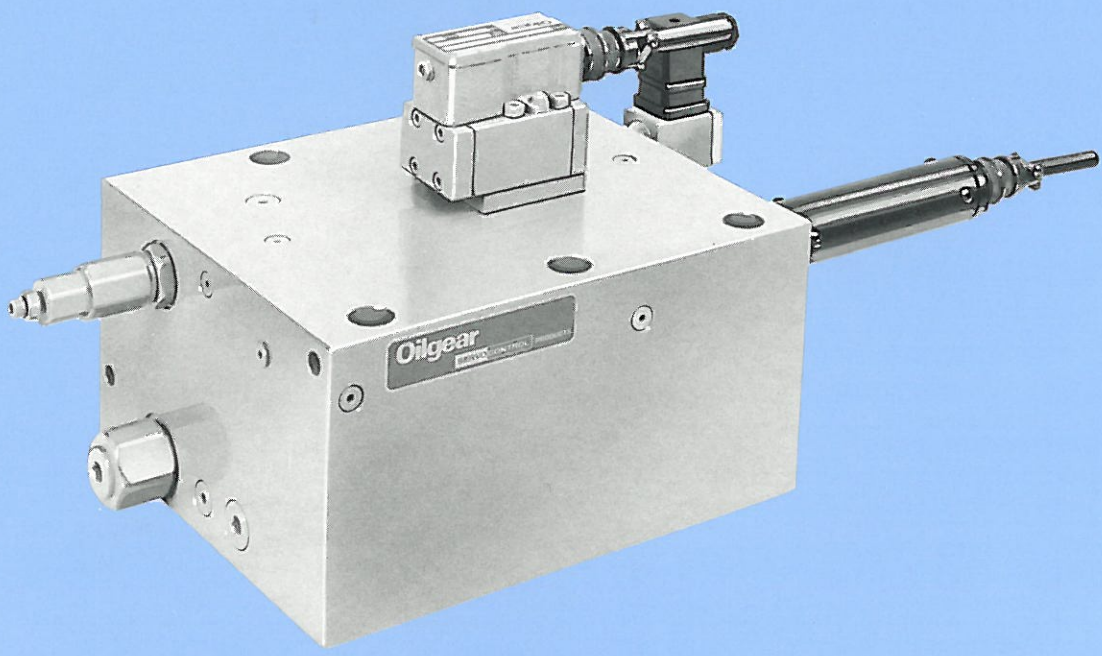
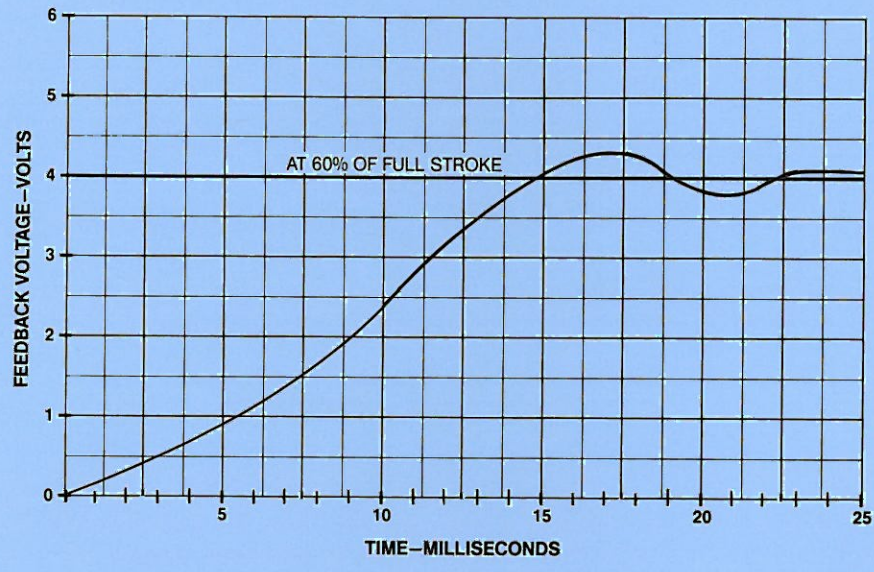


# STEP RESPONSE





2000A & 2400A





# INSTALLATION DIMENSIONS

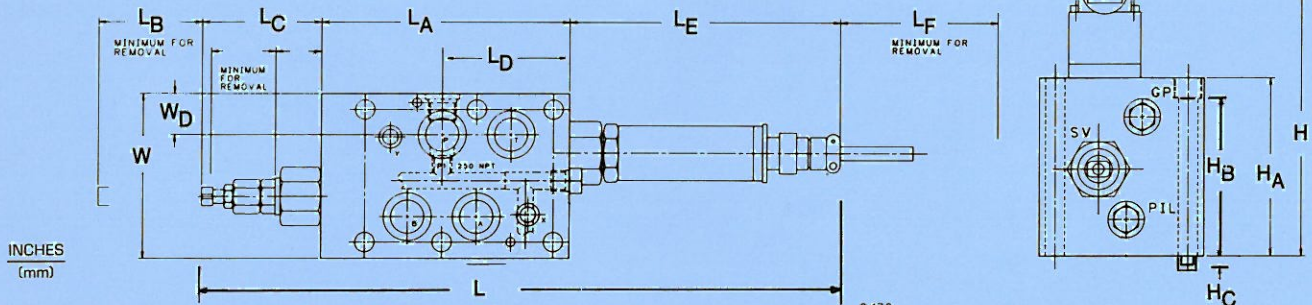
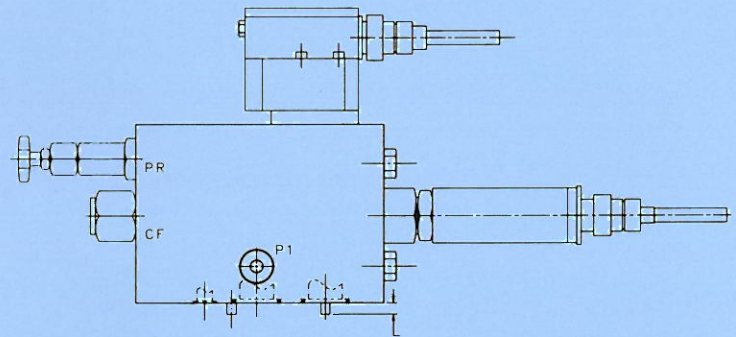
## DIMENSIONS

| MODEL SIZE | WIDTH |       |                  |      | LENGTH |       |                |       |                |      |                |       |                  |       |                |       |                |       | WEIGHT |     |
|------------|-------|-------|------------------|------|--------|-------|----------------|-------|----------------|------|----------------|-------|------------------|-------|----------------|-------|----------------|-------|--------|-----|
|            | W     |       | W <sub>D</sub> * |      | L      |       | L <sub>A</sub> |       | L <sub>B</sub> |      | L <sub>C</sub> |       | L <sub>D</sub> * |       | L <sub>E</sub> |       | L <sub>F</sub> |       | lbs.   | kg. |
|            | in.   | mm    | in.              | mm   | in.    | mm    | in.            | mm    | in.            | mm   | in.            | mm    | in.              | mm    | in.            | mm    | in.            | mm    |        |     |
| 800        | 4.50  | 114,3 | 2.50             | 63,5 | 14.32  | 363,7 | 4.62           | 117,3 | 1.88           | 47,8 | 3.50           | 88,9  | 2.25             | 57,2  | 6.20           | 157,5 | 2.88           | 73,2  | 22     | 10  |
| 1200       | 4.50  | 114,3 | 1.12             | 28,4 | 18.13  | 460,5 | 6.75           | 171,4 | 2.88           | 73,2 | 4.06           | 103,1 | 3.47             | 88,1  | 7.32           | 185,9 | 4.31           | 109,5 | 40     | 18  |
| 1600       | 7.75  | 196,8 | 2.13             | 54,1 | 22.72  | 577,1 | 9.50           | 241,3 | 2.94           | 74,7 | 4.06           | 103,1 | 5.25             | 133,4 | 9.16           | 232,7 | 6.31           | 160,3 | 144    | 65  |
| 2000       | 7.75  | 196,8 | 2.12             | 53,8 | 24.62  | 625,3 | 11.00          | 279,4 | 2.94           | 74,7 | 4.06           | 103,1 | 6.19             | 157,2 | 9.56           | 242,8 | 8.69           | 220,7 | 150    | 68  |
| 2400       | 9.00  | 228,6 | **               | **   | 23.97  | 608,8 | 10.50          | 266,7 | 2.88           | 73,2 | 4.06           | 103,1 | **               | **    | 9.41           | 239,0 | 8.69           | 220,7 | 155    | 70  |

\* W<sub>D</sub> & L<sub>D</sub> = Location of center of "P" port

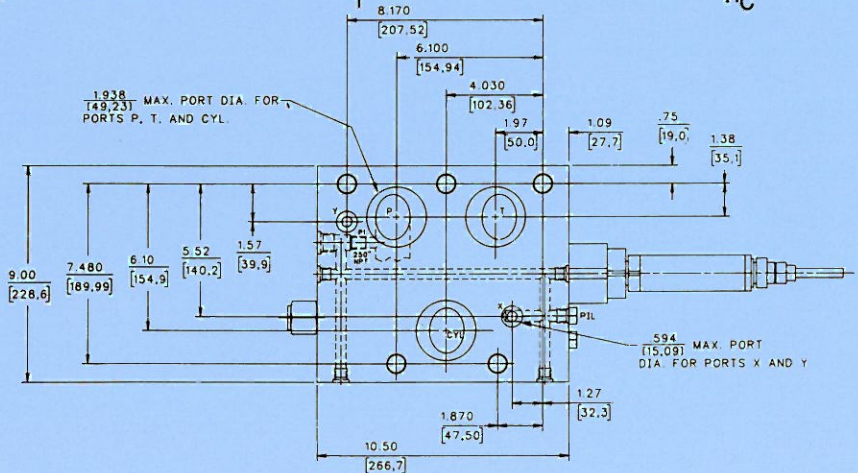
\*\* See dimensional drawings.

| MODEL SIZE | HEIGHT |       |                |       |                |       |                |      |
|------------|--------|-------|----------------|-------|----------------|-------|----------------|------|
|            | H      |       | H <sub>A</sub> |       | H <sub>B</sub> |       | H <sub>C</sub> |      |
|            | in.    | mm    | in.            | mm    | in.            | mm    | in.            | mm   |
| 800        | 5.55   | 141,0 | 3.38           | 85,9  | 2.62           | 66,5  | .38            | 9,7  |
| 1200       | 7.68   | 195,1 | 4.50           | 114,3 | 4.50           | 114,3 | 1.00           | 25,4 |
| 1600       | 8.06   | 204,7 | 4.88           | 124,0 | 4.63           | 117,6 | 1.38           | 35,1 |
| 2000       | 9.06   | 230,1 | 5.88           | 149,4 | 5.63           | 143,0 | 1.38           | 35,1 |
| 2400       | 8.81   | 223,8 | 5.62           | 142,7 | 5.62           | 142,7 | 1.38           | 35,1 |



## MOUNTING PATTERN

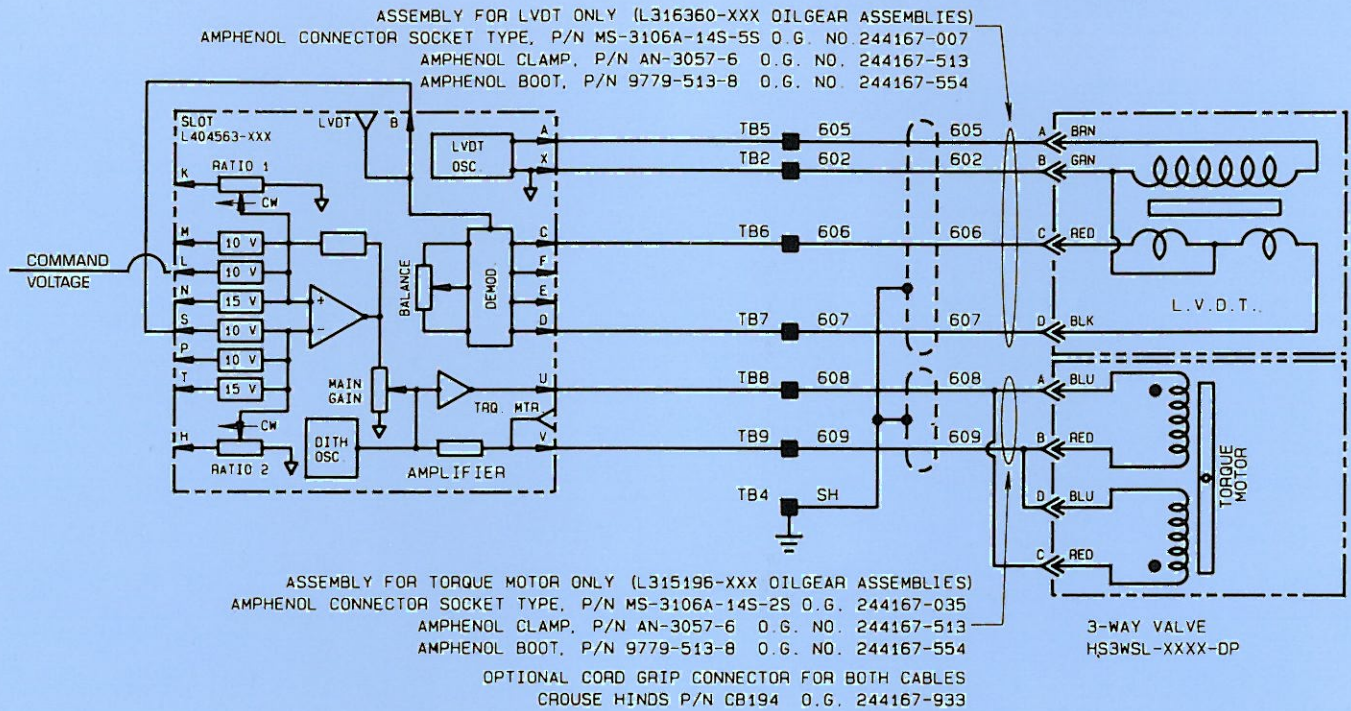
| MODEL SIZE | MOUNTING PATTERN |       | MAX. PORT DIAMETER |       |       |       |
|------------|------------------|-------|--------------------|-------|-------|-------|
|            |                  |       | A, P & T           |       | X & Y |       |
|            | NFPA             | CETOP | in.                | mm    | in.   | mm    |
| 800        | D02              | 5     | —                  | —     | —     | —     |
| 1200       | D06              | 8     | —                  | —     | —     | —     |
| 1600       | D10              | 10    | —                  | —     | —     | —     |
| 2000       | D10              | 10    | 1.5                | 38,10 | .438  | 11,3  |
| 2400       | See Drawing      |       | 1.938              | 49,23 | .594  | 15,09 |



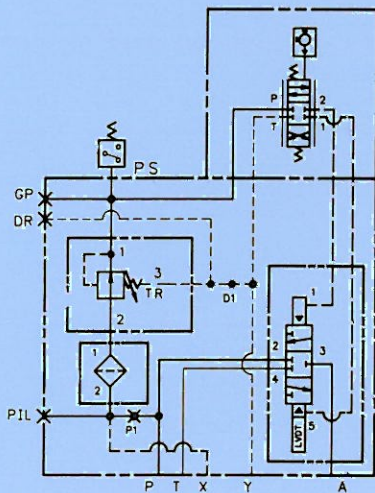


# ELECTRICAL

## ELECTRICAL DIAGRAM

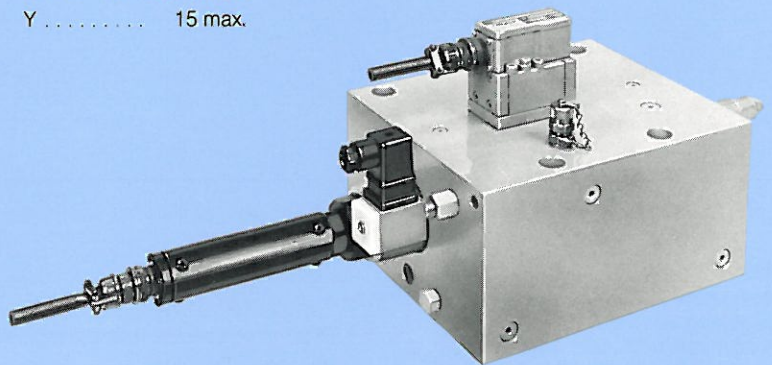


## CIRCUIT



## PORTS

- P & A ..... 5000 max.
- T ..... 500 max.
- X ..... 5000 max.
- Y ..... 15 max.





# ACCESSORIES AND PARTS

| Item   | MODEL SIZE                       |   |                                  |                                  |                                  |
|--|----------------------------------|---|----------------------------------|----------------------------------|----------------------------------|
|  | 800                              | 1200                                      | 1600                             | 2000                             | 2400                             |
| Subplate<br>Flushing Block                           | 05-10-01-D-X-N-C<br>03-70-37-A-C | 08-10-01-B-X-N-C<br>03-70-37-A-C          | 10-10-01-A-X-N-C<br>03-70-37-A-C | 10-10-01-A-X-N-C<br>03-70-37-A-C | 10-32-01-A-X-N-C<br>03-70-37-A-C |
| Seal Kit (Viton)<br>Bolt Kit                         | SCVS0800-SK<br>SCVS0800-BK       | SCVS1200-SK<br>SCVS1200-BK                | SCVS1600-SK<br>SCVS1600-BK       | SCVS2000-SK<br>SCVS2000-BK       | SCVS2400-SK<br>SCVS2400-BK       |
| Filter Fuse<br>Filter Fuse Element                   | HSCF600-25<br>HSCF600-E-25       | HSCF800-25<br>HSCF800-E-25                | HSCF800-25<br>HSCF800-E-25       | HSCF800-25<br>HSCF800-E-25       | HSCF800-25<br>HSCF800-E-25       |
| Power Valve*   | HS3WSL800-DP                     | HS3WSL1201-DP                             | HS3WSL1601-DP                    | HS3WSL2002-DP                    | HS3WSL2002-DP                    |
| Amplifier*<br>Model 800C & 1200C<br>All other models | L404563-709<br>—                 | L404563-709<br>L404563-708                | —<br>L404563-708                 | —<br>L404563-708                 | —<br>L404563-708                 |
| Pressure Switch                                      | 249438-001                       | 249438-001                                | 249438-001                       | 249438-001                       | 249438-001                       |
| Pilot Valve* A Style<br>B Style<br>C Style           | —<br>—<br>L248702-508            | L248702-501<br>L248702-506<br>L248702-508 | L248702-502<br>L248702-511<br>—  | L248702-503<br>L248702-512<br>—  | L248702-503<br>L248702-512<br>—  |

\* Note: Amplifier, power valve and pilot must be ordered as a matched set.

## HOW TO ORDER

| BLOCK NUMBER<br>EXPLANATION      | 1    | 2    | — | 3 | 4  | 5 | — | 6 | — | 7 | — | 8 | / | 9 |
|----------------------------------|------|------|---|---|----|---|---|---|---|---|---|---|---|---|
| THREE-WAY SERVO<br>VALVE EXAMPLE | SCVS | 1200 | — | A | 10 | X | — | V | — | S | — | C | / | A |

### 1 = UNIT

SCVS = 3-Way Servo Valve

### 2 = VALVE SIZE (Nominal rated flow)

800 = 18 gpm (68 lpm)

1200 = 60 gpm (227 lpm)

1600 = 135 gpm (511 lpm)

2000 = 250 gpm (947 lpm)

2400 = 275 gpm (1041 lpm)

### 3 = PILOT VALVE OPTION

Two Stage Pilot

A = 3000 psi (207 bar) maximum—  
Standard on sizes 1200 thru 2400

B = 1000 psi (69 bar) maximum—  
optional on sizes 1200 thru 2400

Single Stage Pilot

C = 1000 psi (69 bar) maximum—  
Standard for 800 only

Note: For special pilot valve options,  
consult factory

### 4 = PILOT PRESSURE SETTING

Order the pressure needed (except 800  
w/1000 is max.) i.e.:

10 = 1000 psi (69 bar)

25 = 2500 psi (172 bar)

### 5 = PILOT PRESSURE

X = External pilot, external drain.  
Standard.

N = Internal pilot, external drain.

### 6 = SEALS

V = Viton. Standard.

B = Buna —N

### 7 = MATERIALS

S = Steel Standard

C = Modular Iron

### 8 = DESIGN SERIES

C = Determined by Oilgear—Subject  
to change.

### 9 = AMPLIFIER TYPE

A = 19" rack style—Standard

### The Oilgear Company

2300 South 51st Street  
Milwaukee, WI USA 53219  
Call toll free 1-800-558-6636  
In WI call (414) 327-1700  
Fax (414) 327-0532  
Telex 2-69411