HA22M

DATA SHEET

**Model**

*Mechanical Input, Single Acting (Spring Loaded) Servo*

*Mechanical Input, Double Acting (Differential) Servo*

**Application**

- HA22M Hydraulic Amplifier provides the force to operate the control valve of steam turbines or fuel control linkages of large reciprocating engines.
- The mechanically controlled HA22M Amplifier is a pilot operated linear servo actuator, which interfaces with the actuator/governor output shaft via a mechanical linkage.

**Key features**

- Optimum transient & steady state response
- Minimal overshoot
- Shock resistant cast iron casing
- Billet power piston & output shaft
- Output shaft support bush (oil fed)
- Wear preventative coating for extended service life
**Input**

- **Shaft:** 0.500" diam. – 36 serrations x 27mm (1.062") long
- **Angle travel:** 30 degrees available for maximum output, CCW to increase
- **Actuator interface:** Compatible with StG 16 to StG 40 range of all-electric actuators (linkage not supplied)
- **Minimum torque required:**
<table>
<thead>
<tr>
<th>Supply pressure</th>
<th>Minimum torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>345 kPa (50 psi)</td>
<td>1.36 Nm</td>
</tr>
<tr>
<td>690 kPa (100 psi)</td>
<td>2.03 Nm</td>
</tr>
<tr>
<td>1725 kPa (250 psi)</td>
<td>4.07 Nm</td>
</tr>
<tr>
<td>3450 kPa (500 psi)</td>
<td>8.14 Nm</td>
</tr>
</tbody>
</table>

**Output**

- **Piston size:** 184.2 mm (7.25") diameter.
- **Maximum stroke:** 76.2 mm +/- 0.76 mm (3.00" +/- 0.03")
- **Rod size:** 38.1 mm (1.5") diam. width 1.00” – 12 UNF thread
- **Maximum stalling force (lbs.) in increase direction:**
  - **Single-Acting Servo**
    - 39.8P – (F1 + KX)
    - P = supply pressure
    - F1 = spring preload
    - K = spring scale
    - X = amplifier stroke
  - **Double-Acting Servo**
    - 24.5P
    - where P = supply pressure
- **Maximum side load on output shaft:** 170 kg (375 lbs.)

**Control quality**

- **Time constant:** Around 0.025 seconds
- **Hysteresis:** Within 1.0 %

**Construction**

- **Cover:** Cast aluminium
- **Case:** Cast ductile iron
- **Output rod:** Hardened and ground steel
- **Mass/weight:** 100 kg (220 lbs.)

**Mounting**

- **Attitude:** Vertical or horizontal with pilot valve above servo
- **Mounting bolts:** 0.625 diameter (4)

**Hydraulic supply**

- **Type:** Petroleum based oils
- **Source:** Prime mover lubricating system or external supply
- **Operating supply pressure:** 345 to 3450 kPa (50 to 500 psi)
- **Flow rate:** 760 L/min (200 gpm) during speed transients (requires accumulator 7.6 L/min.); less than 11.4 L/min (3 gpm) at 3450 kPa (500 psi) steady state
- **Supply filters:** 40 microns
- **Viscosity:** Up to 20,000 SSU, but the normal performance is based on 50 to 2000 SSU
- **Operating temperature:** -30 to +120 °C

**Hydraulic fittings**

- **Supply inlet:** 1.625 – 12 UN 2B thread, 0.906 deep
- **Drain:** Internal drain through case bottom. Optional 1.3121 – 12 UN 2B thread, each side of case are both normally plugged.
- **Starting oil inlet:** 0.562 – 18 UNF 2B thread. Inlet is normally plugged.
HA 22M Hydraulic Amplifier (mech. input) - dimensions & physical outline