

# HA22M

## DATA SHEET

### Models

Mechanical Input, Single Acting  
(Spring Loaded) Servo

Mechanical Input, Double Acting  
(Differential) Servo



### Key features

Optimum transient &  
stead 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

### 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.

## Input

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- 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:

Supply pressure	Minimum torque
345 kPa (50 psi)	1.36 Nm
690 kPa (100 psi)	2.03 Nm
1725 kPa (250 psi)	4.07 Nm
3450 kPa (500 psi)	8.14 Nm

## Output

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- 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

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- Time constant: Around 0.025 seconds
- Hysteresis: Within 0.25 %

## Construction

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- Cover: Cast aluminium
- Case: Cast ductile iron
- Output rod: Hardened and ground steel
- Mass/weight: 106 kg (234 lbs)

## Mounting

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

## Hydraulic supply

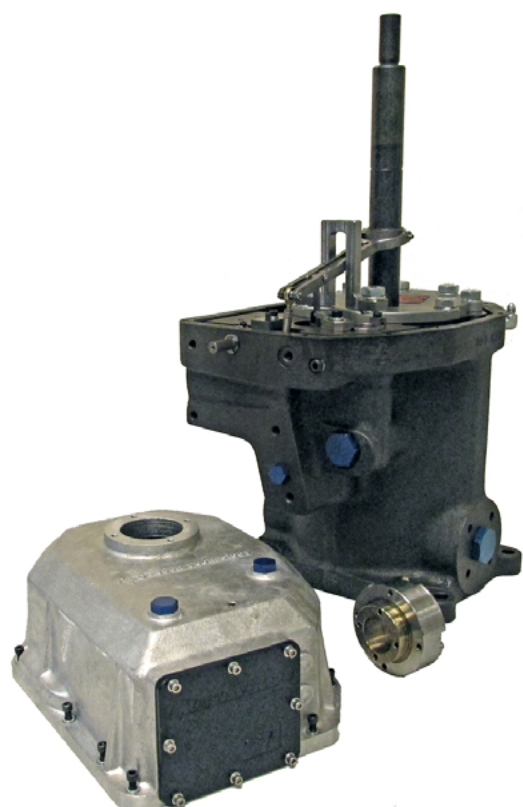
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- Type: Petroleum based oils
- Source: Prime mover lubricating system or external supply
- Operating supply pressure: 345 to 3450 kPa (50 to 500 psi)
- Flow rate: 760 L/min (200 gpm) during speed transients (requires accumulator 7.6 L/min.); less than 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

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- 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

