

# 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

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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 1.0 %

## Construction

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

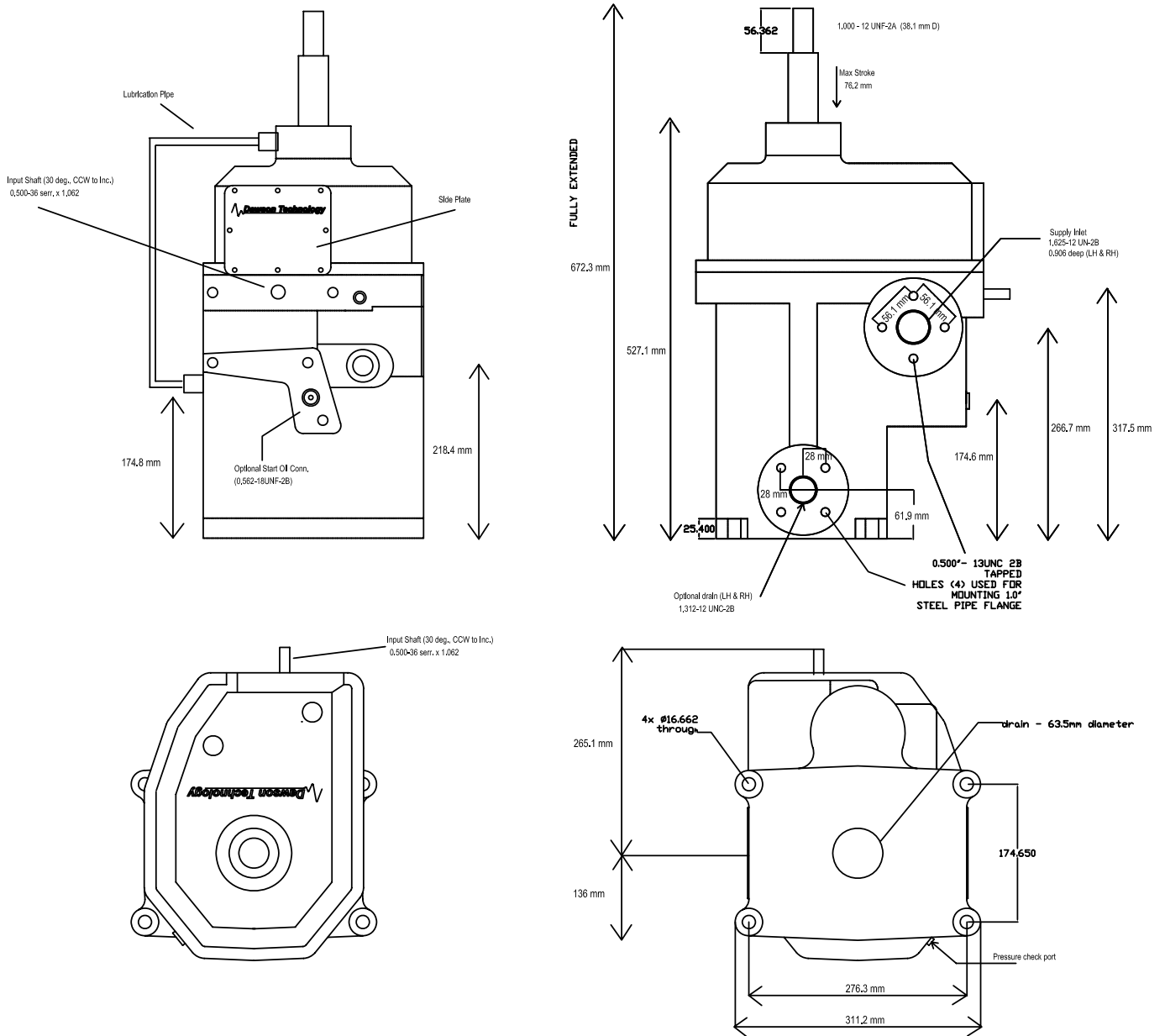
## Hydraulic fittings

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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



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