

# HA14E

## DATA SHEET

### Model

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

*Electrical Input, Double Acting  
(Differential) Servo*



### Application

- ➔ HA 14E Hydraulic Amplifier provides the force to operate the control valve of steam turbines or fuel control linkages of large reciprocating engines.
- ➔ The electrically controlled HA 14E Amplifier is a pilot operated linear servo actuator, which is used in conjunction with the Si-TEC *Xtend* CGC/CGC-ET governor (0 – 200 mA output), Woodward electronic governors, etc..

### 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

Oil accumulator for internal actuator

High efficiency oil motor

Optional oil filter for internal actuator

## Input

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- Resistance: 30 – 35 Ohms at 20 °C (68 °F)
- Maximum allowable current: 400 mA
- Typical operating current range: 25 – 160 mA
- Plug receptacle: 4-pin MS-3102C-145-2P

## Output

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- Piston size: 133.4 mm (5.25") diameter
- Maximum stroke: 63.5 mm +/- 0.76 mm (2.50" +/- 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

- 20.2 P – (F1 + KX)  
P = supply pressure  
F1 = spring preload  
K = spring scale  
X = amplifier stroke

### Double Acting Servo

- 9.6 P  
where P = supply pressure
- Maximum side load on output shaft: 170 kg (375 lbs.)

## Typical calibration (min. & max. range)

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- 25 mA input: 0.64 mm (0.025") output travel
- 160 mA input: 55 mm (2.165") output travel

## 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: 81 kg (179 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: 1035 to 3790 kPa (150 to 550 psi)
- Flow rate: 320 L/min (85 gpm) during speed transients (requires accumulator 9.5 L/min.); less than 15 L/min at 1035 kPa (150 psi) steady state leakage
- Supply filters: 10 – 15 microns (nominal)
- Viscosity: Up to 3000 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: 1.062 – 12 UN 2B thread, 0.812 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.





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