

Hydramotor® Actuators

H10/H25 Hydramotor® Fail-Safe Electrohydraulic Linear Actuators

INTRODUCTION

H10/H25 Hydramotors are electrohydraulic, linear actuators. They feature a completely self-contained, sealed, hydraulic motor/pump power unit coupled to a hydraulic cylinder containing both the piston/shaft assembly and return-spring.

These positive, firm-positioning actuators are ideal for providing efficient, precise, reliable linear control of valves, dampers, louvers, and a wide variety of other equipment requiring an operating thrust of up to 500 lbs (227 kg) and an output shaft extension of up to 1.25 in (3.18 cm).

PRINCIPLE OF OPERATION

H10/H25 Series Hydramotors are the result of over 50 years of experience in designing, testing, manufacturing, and servicing electrohydraulically powered actuators.

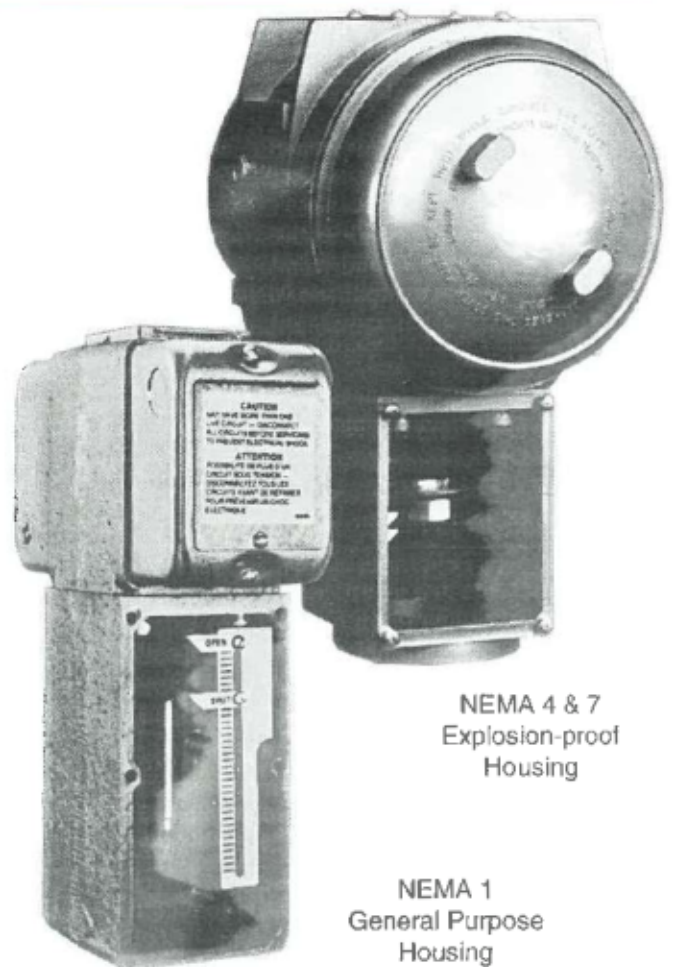
Units are available in both push and pull power stroke, with a choice of either spring-return or lock-in-last position upon loss of power. Spring-return provides "fail-safe" operation – a spring within the cylinder returns the actuator shaft to its deenergized position upon power interruption. Valves provided with lock-in-last position allow the user to independently control spring-return of the actuator shaft to its deenergized position after loss of supply power.

Considerable field experience has proven the H10/H25 Series to be extremely reliable, with minimum service requirements and a prolonged service life. The need for gears has been eliminated in favor of a modular design using fewer moving internal components and industry proven heat-resistant seals – immersed in oil for continuous lubrication.

An enamel-finished, die-cast aluminum exterior housing and corrosion-resistant steel output shaft components have been selected to allow the H10/H25 Series to perform reliably in the most demanding, rugged, and hostile industrial environments.

FEATURES

- Application Versatility, Push- or Pull-Type
- Gross Shaft Force Output from 200 to 500 lbs.
- Fail-Safe Operation –
(Spring-Return or Lock-in-Last Position)
- Completely Self-Contained, Sealed Unit
- Travel or Force Limit Control
- Continuous Duty Cycle
- Wide Array of Mountings and Options
- Two-Wire Control Power



NEMA 4 & 7
Explosion-proof
Housing

NEMA 1
General Purpose
Housing

H10/H25 Series Hydramotor Actuator

HOW TO ORDER

First determine the required operating conditions:

- Maximum stem forces at significant stem positions
- Available power supply
- Control mode – pressure limit, travel limit, or modulating (proportional control)
- Closure mode – push or pull to close
- Power failure mode – open, closed, or remaining in last position
- Valve interface dimensions
- Operating environment
- Feedback instrumentation to be used

The output force of the selected actuator should exceed the PCD stem force requirements at the end of the stroke in both the hydraulic power direction and the spring-return direction. A technical paper entitled *H10 and H30 Hydramotor Actuator Hydraulic Force and Spring Force Charts* is available from ASCO General Controls to aid in selecting the appropriate actuator for your application.

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OPERATING MODES

- H10** *Two-Position, Spring-Return, Pull-Type.*
Shaft retracts on application of power; spring-return on loss of power.
- H11** *Two-Position, Spring-Return, Push-Type.*
Shaft extends on application of power; spring-return on loss of power.
- H24** *Two-Position, Lock-in-Last Position, Pull-Type.*
Shaft retracts on application of power; lock-in-last position on power failure, spring-return when relief valve is energized. (Normally-closed relief valve wired independently of motor circuit.)
- H25** *Two-Position, Lock-in-Last Position, Push-Type.*
Shaft extends on application of power; lock-in-last position on power failure, spring-return when relief valve is energized. (Normally-closed relief valve wired independently of motor circuit.)

Other Actuator Ratings See the H30 and AH90 Technical Data Sheets for larger linear actuators:

Hydramotor Family	Max. Stroke inch (cm)	Maximum Gross Stem Force lbs (kg)
H30/H35	2 5/8 (66.8)	2,600 (1,179)
AH91/AH96	4 (10.2)	4,000 (1,818)

HYDRAULIC SYSTEM

- Control Valve** Spring-Return (H10 and H11)
normally-open dump valve
Lock-In-Last Position (H24 and H25)
normally-closed dump valve
- Hydraulic Oil** MIL-H-5606
- Capacity** H10/H11 – one pint
H24/H25 – three pints
- Pump** Single piston, positive displacement with integral check valve
- Seals** Nitrile – 70 shore durometer

ELECTRICAL

- Voltages (168 VA)** Single-phase voltages include:
120V 50/60 Hz and 240V 50/60 Hz
Consult factory for other voltages.
- Motor** 2-Pole, Single-Phase
(Shaded Pole)
- Wiring** Class B 105°C (220° F)
- Duty Cycle** 80%
- Power Stroke Timing** 200 lb. Units: up to 140 seconds
500 lb. Units: up to 60 seconds
- Spring Stroke Timing** 200 lb. Units: up to 20 seconds
500 lb. Units: up to 120 seconds

ENCLOSURE (CSA Listed)

- Standard** Type 1 – Meets general purpose indoor requirements
- Optional** Type 4 & 7 – Meets watertight and hazardous location requirements; Class I, Division 1, Groups C & D

VALVE STEM NUT

A valve stem nut is normally required when installing an H10/H25 Series actuator on a linear-motion valve. If so, contact your ASCO General Controls distributor, and specify both actuator catalog number and valve stem dimensions.

MATERIALS

- Electrical Housing** Type 1: Sheet Steel - AISI 1010 (UNS G10100)
Type 4 & 7: Cast Aluminum - AA 356-T6 (UNS A13560)
- Cylinder Housing** Cast Aluminum - AA 356-T6 (UNS A13560)
- Power Unit** Sheet Steel - AISI 1010 (UNS G10100)
- Output Shaft** Stainless Steel AISI 440 (UNS S31600)
- Yoke** Cast Aluminum - AA 356-T6 (UNS A13560)
Cast Iron - ASTM (A48) (UNS F12101)
- Standard Finish** Hammertone blue enamel

STORAGE ENVIRONMENT

- Temperature** -65°F to +150°F (-54°C to +66°C)

OPERATING ENVIRONMENT

- Temperature** -40°F to +150°F (-40°C to +66°C)
- Atmosphere** Industrial applications, including hazardous (see ENCLOSURE)
- Humidity Range** 0-100% RH
- Mounting** Yoke Mount – Locknut or 4-bolts
- Sub-Zero Ambient Start-up** The actuator will operate at sub-zero temperature, but the stroke time will increase.

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OPERATING MODE^a

- H10** Pull-Type, Spring-Return on Power Failure
H11 Push-Type, Spring-Return on Power Failure

- H24^b** Pull-Type, Lock-in-Last Position
H25^b Push-Type, Lock-in-Last Position

POWER UNIT

	Force	Power Stroke ^c	Return Stroke ^c
A01	200 lbs.	140 sec.	20 sec.
A02	200 lbs.	22 sec.	1 sec.
A03	500 lbs.	60 sec.	8 sec.
A05	200 lbs.	Adj. 22-35 sec.	1 sec.
A10	500 lbs.	40 sec.	20 sec.
A32	500 lbs.	40 sec.	1 sec.
A35	500 lbs.	40 sec.	adj. 3-6 sec.
A47	500 lbs.	Adj. 40-60 sec.	1 sec.

	Force	Power Stroke ^c	Return Stroke ^c
A34 ^b	200 lbs.	Adj. 22-35 sec.	Adj. 1-2 sec.
A36 ^b	500 lbs.	40 sec.	1 sec.
A39 ^b	500 lbs.	Adj. 40-60 sec.	Adj. 2-120 sec.
A40 ^b	500 lbs.	Adj. 40-60 sec.	2 sec.
A42 ^b	200 lbs.	22 sec.	1 sec.

NOTES

- ^a Some combinations of options may not be available. Consult factory to verify your selection.
- ^b Operating modes correspond to the Power Units.
- ^c Timing for Full Stroke (1 1/4") (31.75 mm). Timing is proportional to stroke length.

SUPPLY VOLTAGE (168VA)

- 2 120 VAC 50/60 Hz
 4 240 VAC 50/60 Hz

CONTROL MODE

- 0 Travel Limit (Available on H10 and H24 only)
 1 Force Limit (Available on H10, H11, H24, and H25)

YOKE AND STEM

	Length	Material	Yoke Mount (In)	Max. Stem Dia. (in)
X_	No yoke	- - - - -	- - - - - consult factory	- - - - -
B1	Standard	Aluminum	1 1/4 Dia.	5/16
B2	Standard	Aluminum	2 1/8 Dia.	5/16
B3	Extended	Cast Iron	1 1/4 Dia.	5/16
B4	Extended	Cast iron	2 1/8 Dia.	5/16
B5	Standard	Aluminum	4 Bolt, 3 1/8 Dia.	5/16
B6	Extended	Cast Iron	1 1/4 Dia.	7/16
B7	Extended	Cast Iron	4 Bolt, 3 1/8 Dia.	5/16
B8	Extended	Cast Iron	2 1/8 Dia.	7/16
B9	Extended	Cast Iron	4 Bolt, 3 1/8 Dia.	7/16

ENCLOSURE (CSA Listed)

- NO SYMBOL Type 1 - Standard General Purpose Enclosure
 C1 Type 4 - Dust-Proof, Drip-Proof, Weatherproof, Rainproof
 C2 Type 4 and Type 7 - Explosionproof
 C3 Type 4 and Type 7 - Explosionproof with Breather and drain

SPECIAL

- D1 3-wire (Series C)
 D2 Terminal board with four terminals
 D5 High-temperature insulation

RETURN-SPRING (Available only on H10 and H24 with extended yoke)

- NO SYMBOL Standard 10% Internal Spring
 E1 50% External Spring for 500 lb. Unit
 E2 50% External Spring for 200 lb. Unit
 E3 100% External Spring for 500 lb. Unit

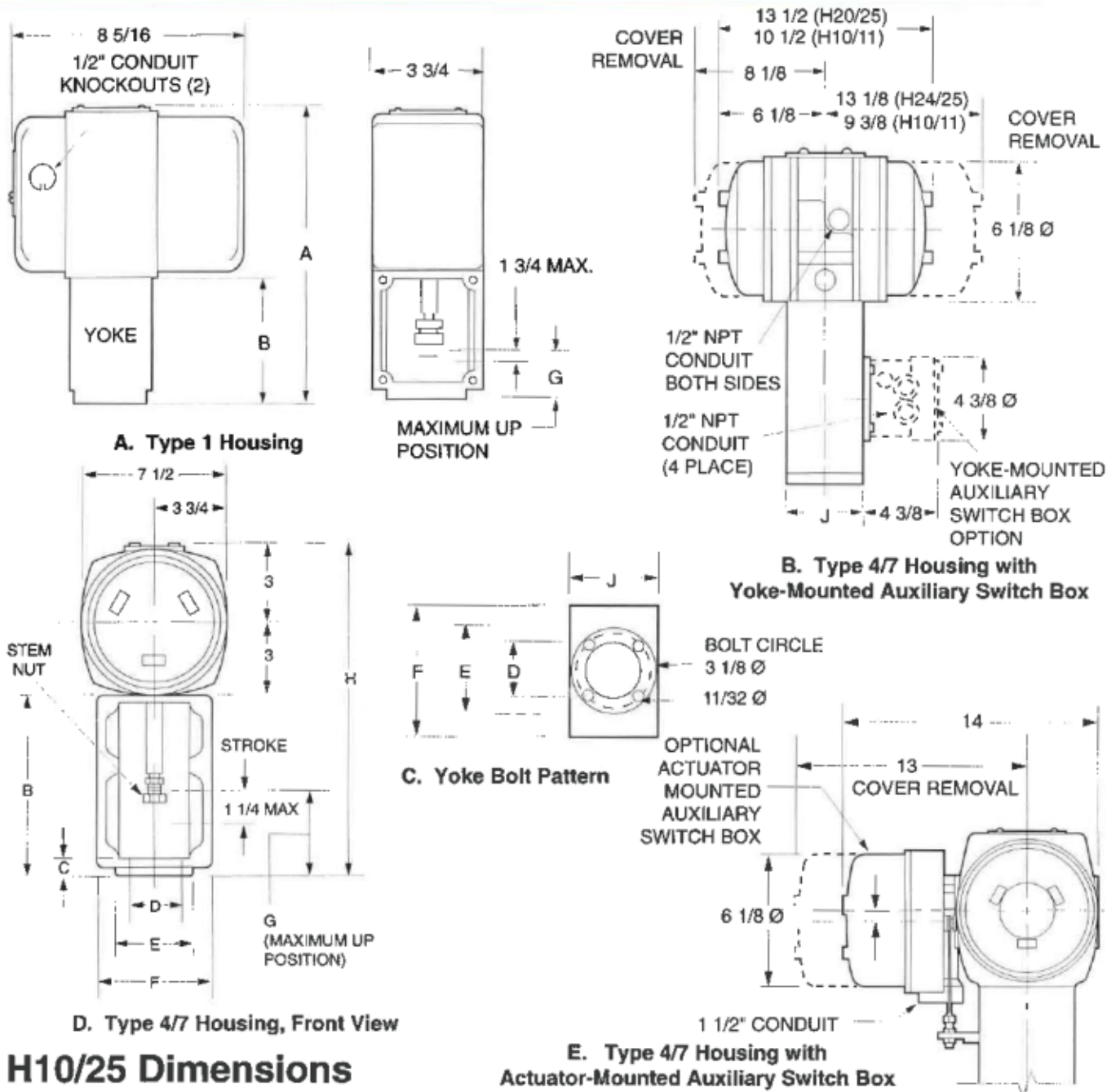
MISCELLANEOUS OPTIONS

- F1 Standard - Integral Auxiliary Switch (end of power stroke)
 F3 Dust Shields on Yoke
 F8 Dust Shields with FM Safety Wire
 F13 3 Auxiliary Switches, Yoke-Mounted
 F16 6 Auxiliary Switches, Yoke-Mounted
 F17 6 Auxiliary Switches, Actuator-Mounted
 F25 3 Auxiliary Switches, in Box
 F34 Epoxy Exterior Paint

H10A1 2 0 B3 C1 D2 E2 F13 [Example]

H10A120B1C1E2F13 = Pull-type H10 Hydramotor actuator, 200 lb. force output, spring-return on power failure, 120V 50/60 Hz, travel limit control, extended cast iron yoke, Type 4 enclosure, terminal board with four terminals, external 50% spring, three yoke-mounted auxiliary switches.

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H10/25 Dimensions

Yoke Option	Material	Stem Nut Diameter	DIMENSIONS (inch)								
			A	B	C	D	E	F	G	H	J
B1	AL	7/16	9 11/32	4 1/4	3/8	1 1/4	1 3/4	3 3/4	3 1/4	11 1/2	3
B2	AL	7/16	10 9/16	5 1/4	3/4	2 1/8	2 3/4	3 3/4	4 1/4	12 1/2	3
B3	CI	7/16	12 5/8	7 5/16	3/8	3 3/4	1 1/4	1 3/4	3 1/4	14 9/16	3
B4	CI	7/16	13 21/32	8 3/8	3/4	4 3/4	2 1/8	2 3/4	4 1/4	15 5/8	3 1/4
B5	AL	7/16	10 9/16	5 1/4	3/4	2 1/2	3 3/4	3 3/4	4 1/4	12 1/2	3
B6	CI	5/8	13 21/32	8 3/8	3/4	3 1/4	2 1/2	4 3/4	4 1/4	15 5/8	3 1/4
B7	CI	7/16	13 21/32	8 3/8	3/4	3 1/4	2 1/2	4 3/4	4 1/4	15 5/8	3 1/4
B8	CI	5/8	13 21/32	8 3/8	3/4	2 1/8	2 1/4	4 1/4	4 1/4	15 5/8	3 1/4
B9	CI	5/8	13 21/32	8 3/8	3/4	2 1/8	2 1/4	4 1/4	4 1/4	15 5/8	3 1/4