H-Track – Technical Features

Standard Features

- Electro-hydraulic actuator combining the best from the hydraulic and electric worlds.
- Integrated electrically powered power pack consisting of a hydraulic pump, valves and a fluid reservoir.
- Robust hydraulic cylinder with a solid extension tube allowing for increased resistance to buckling.
- High power density.
- Very compact and short pin-to-pin versus stroke length relationship.
- Immune to vibrational drifting and hydraulically self-locks.
- High shock load and vibration resistance.
- Fluid reservoir is vented and isolated from the atmosphere with a flexible lid, allowing actuator and pump operation in any orientation without entraining or cavitation.
- Standard strokes up to 16 in (406 mm).
- Designed for harsh outdoor conditions.
- Reliable and maintenance free.

General Specifications

Cylinder type	hydraulic
Pump type	internal electric gear pump
Manual override	yes (can be used one time only)
Anti-rotation	no
Motor protection	built-in auto reset thermal switch
Static load holding brake	no (self-locking)
Pressure relief valve	yes (for both directions)
Electrical connections 240 W motor 560 W motor	flying leads + Packard 56 male connector flying leads + ring terminals
Compliance	CE, RoHs, REACH, Prop65

Optional Mechanical Features

Mechanical options	Alternative front adapter ends
	Alternative rear adapter orientation

H-Track – Technical Specifications
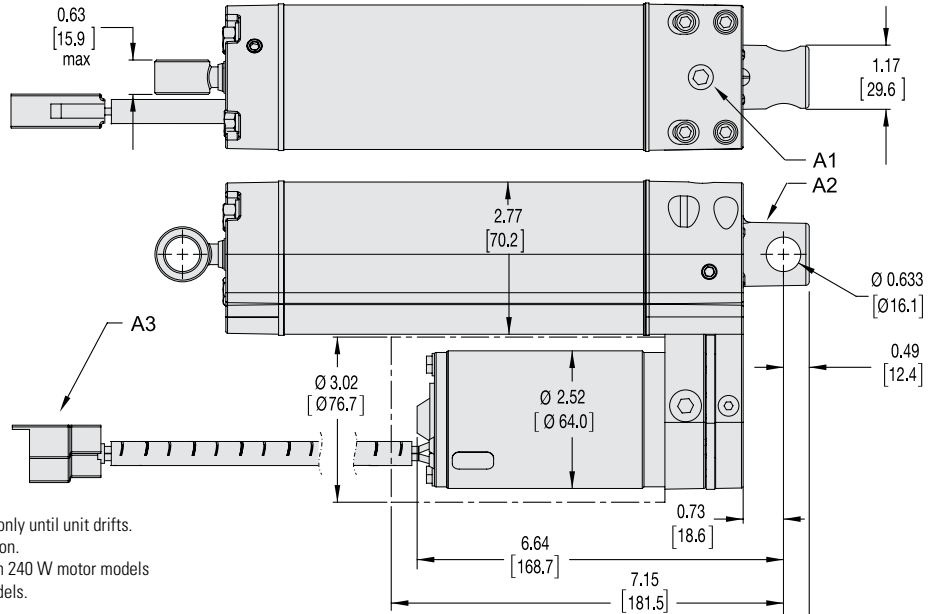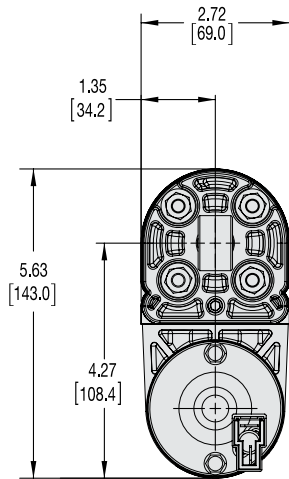
Mechanical Specifications

Max. static compression load (Fx)	lbf (N)	5000 (22241)
Max. dynamic load (Fx)	lbf (N)	see matrix page 125
Speed retract @ no load/max. load	[in/s (mm/s)]	see matrix page 125
Speed extend @ no load/max. load	[in/s (mm/s)]	see matrix page 125
Min. ordering stroke (S) length	[in]	2
Max. ordering stroke (S) length	[in]	16
Ordering stroke length increments	[in]	2
Operating temperature limits	[F (°C)]	- 20 – 150 (- 26 – 65)
Full load duty cycle @ 25 °C (77 °F)	[%]	25
End play, maximum	[in (mm)]	0.015 (0.4)
Restraining torque	[lbf-in (Nm)]	0.89 (0.1)
Protection class - static		IP67/IP69K
Protection class - dynamic		IP65
Salt spray resistance	[h]	200
Weight	[lb (kg)]	see table page 119

Electrical Specifications

Available input voltages	[Vdc]	12, 24, 48

Input voltage tolerance
  12 Vdc models
  24 Vdc models
  48 Vdc models
	[Vdc]	
		9 - 16
		18 - 32
		36 - 64

Current draw @ no load/max. load	[A]	see matrix page 125

Motor leads cross section
  240 W motor models
  560 W motor models
	[AWG (mm^2)]	
		14 (2)
		12 (3)

Motor ring terminals cross section
  240 W motor models
  560 W motor models
	[AWG (mm^2)]	
		-
		10

Motor lead length, standard	[in (mm)]	10 (254)

H-Track – Dimensions

2.72 [69.0]

1.35 [34.2]

5.63 [143.0]

4.27 [108.4]

0.63 [15.9] max

1.17 [29.6]

A1
A2

2.77 [70.2]

A3

Ø 0.633 [Ø16.1]

0.49 [12.4]

Ø 3.02 [Ø76.7]

Ø 2.52 [Ø 64.0]

0.73 [18.6]
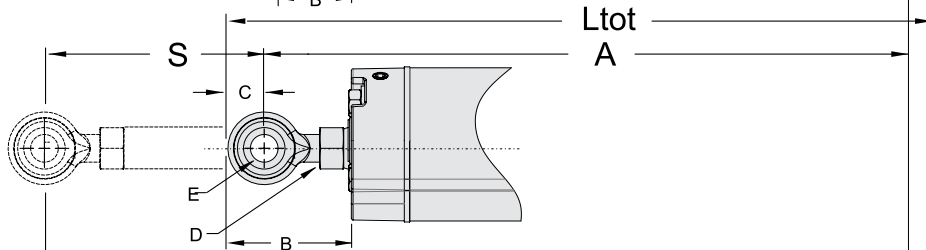
6.64 [168.7]

7.15 [181.5]

A1: Manual release. Do not remove. Rotate CCW only until unit drifts.
A2: Rear adapter hole shown in standard orientation.
A3: Flying leads and male Packard 56 connector on 240 W motor models
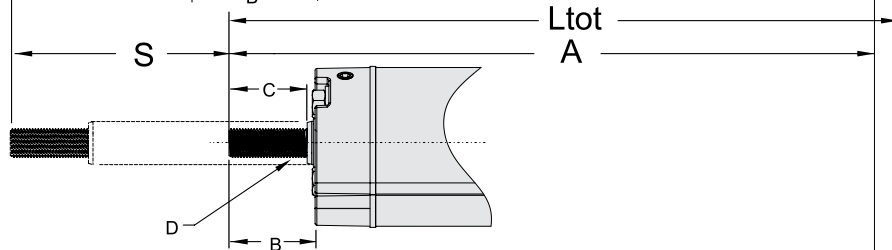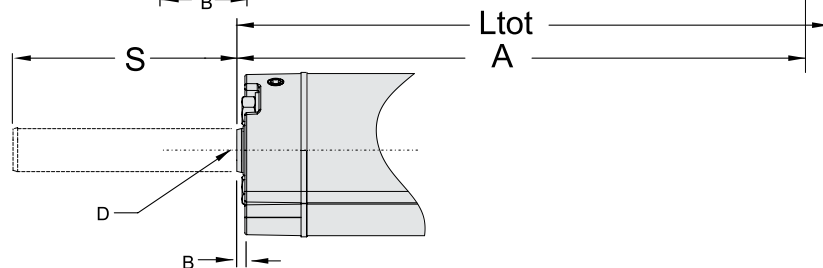   and ¼ inch ring terminals on 560 W motor models.

Type A front adapter
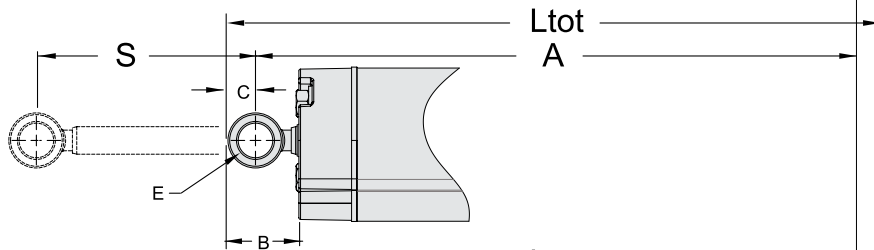
Ltot
S
A
C
E
B

Type B front adapters

Ltot
S
A
C
E
D
B

Type C front adapters

Ltot
S
A
C
D
B

Type D front adapters

Ltot
S
A
D
B

118

H-Track – Dimensions

Dimensions

Front Adapter		Type A	Type B	Type C	Type D
Standard Ordering Strokes (S)	[in]	2, 4, 6, 8, 10, 12, 14, 16			
Total Length (Ltot)	[in]	Ltot = A + C + 0.49	Ltot = A + C + 0.49	Ltot = A + 0.49	Ltot = A + 0.49
Retracted Length (A) [in] Bore Size H1 Bore Size H2 Bore Size H3		A = S + 4.8 A = S + 4.8 A = S + 4.8	A = S + 5.5 A = S + 5.4 A = S + 5.7	A = S + 5.1 A = S + 5.2 A = S + 5.5	A = S + 4.2 A = S + 4.2 A = S + 4.2
Dimension B [in] Bore Size H1 Bore Size H2 Bore Size H3		1.31 1.31 1.31	1.58 1.66 1.89	1.13 1.31 1.50	0.14 0.14 0.14
Dimension C [in] Bore Size H1 Bore Size H2 Bore Size H3		0.52 0.52 0.52	0.50 0.56 0.66	0.99 1.17 1.36	- - -
Dimension D [in] Bore Size H1 Bore Size H2 Bore Size H3		- - -	3/8-24 THREADS 7/16-20 THREADS 1/2-20 THREADS	3/8-24 THREADS 7/16-20 THREADS 1/2-20 THREADS	3/8-24 THREADS x 0.88 7/16-20 THREADS x 0.88 1/2-20 THREADS x 0.88
Dimension E [in] Bore Size H1 Bore Size H2 Bore Size H3		Ø 0.631 Ø 0.631 Ø 0.631	Ø 0.38THRU Ø 0.44 THRU Ø 0.50 THRU	- - -	- - -

H-Track – Weight

Actuator Weight [lb (kg)]

| Actuator Type	Ordering Stroke (S) [in]							
	2	4	6	8	10	12	14	16
H1x-xx-1	6.4 (2.9)	7.2 (3.3)	8.0 (3.6)	8.8 (4.0)	9.6 (4.4)	10.4 (4.7)	11.2 (5.1)	12.0 (5.4)
H2x-xx-1	6.9 (3.1)	7.8 (3.5)	8.7 (3.9)	9.6 (4.4)	10.5 (4.8)	11.4 (5.2)	12.3 (5.6)	13.2 (6.0)
H3x-xx-1	7.1 (3.2)	8.2 (3.7)	9.3 (4.2)	10.4 (4.7)	11.5 (5.2)	12.6 (5.7)	13.7 (6.2)	14.8 (6.7)
H1x-xx-2	8.0 (3.6)	8.8 (4.0)	9.6 (4.4)	10.4 (4.7)	11.2 (5.1)	12.0 (5.4)	12.8 (5.8)	13.6 (6.2)
H2x-xx-2	8.5 (3.9)	9.4 (4.3)	10.3 (4.7)	11.2 (5.1)	12.1 (5.5)	13.0 (5.9)	13.9 (6.3)	14.8 (6.7)
H3x-xx-2	8.7 (3.9)	9.8 (4.4)	10.9 (4.9)	12.0 (5.4)	13.1 (5.9)	14.2 (6.4)	15.3 (6.9)	16.4 (7.4)

Determining Load Configuration

There are three main types of load and gravity configurations, which will determine the performance of the actuator. Please refer to the configurations below and choose the one that best corresponds to your application. Contact Thomson customer support if you are unable to determine a valid configuration for your application.
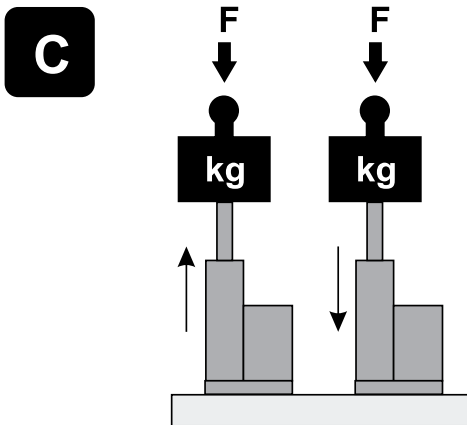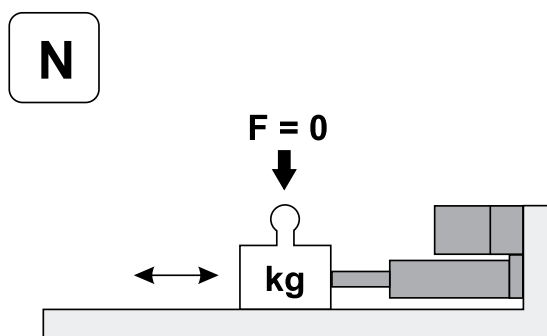

Configuration C
The gravity resists the load being moved when the actuator extends and helps it when retracting.
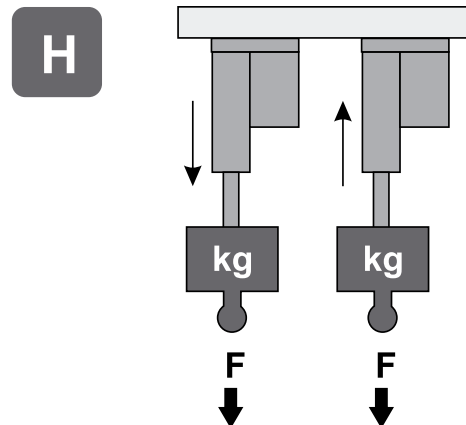
Configuration H
The gravity helps the load being moved when the actuator extends and resists it when retracting.

Configuration N
The gravity does not affect the load in any direction.

Sizing of Bore and Extension Tube

The maximum load in each direction and the required stroke length determine the minimum bore and extension tube size needed for the actuator. Refer to the diagram below to determine which bore size your application requires. If no solution exists, the stroke and/or load must be reduced. Contact Thomson customer support if you are unable to determine a valid combination for your application.

Stroke vs. Load and Bore Size
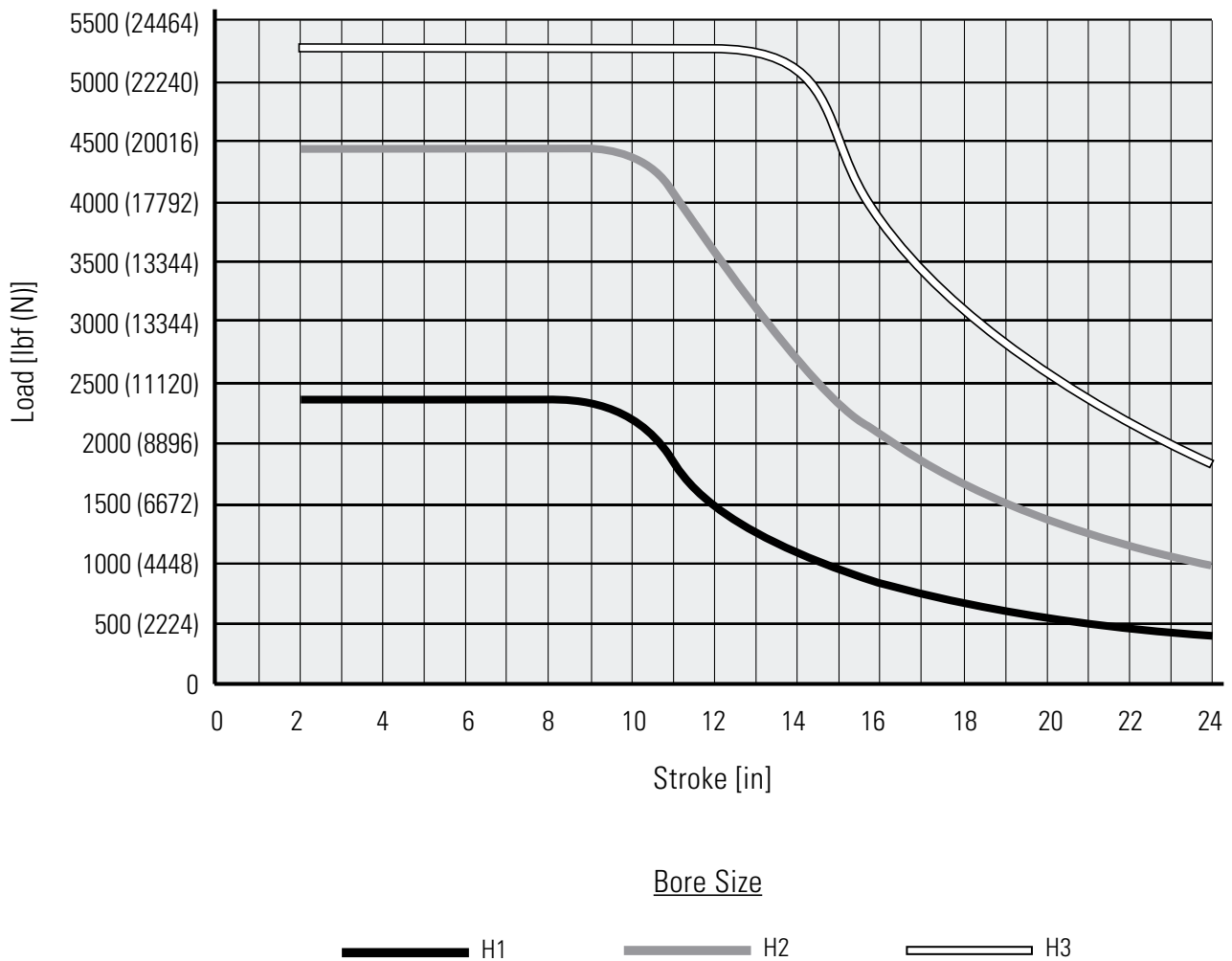
Sizing of Motor, Pump and Power Supply

C

Load vs. Speed @ Extension

Load vs. Speed @ Retraction

Speed [in/s (mm/s)]

5 (127)
4 (101)
3 (76)
2 (51)
1 (25)
0 (0)

| 0 (0) | 1000 (4448) | 2000 (8896) | 3000 (13344) | 4000 (17792) | 5000 (22240) |

| 0 (0) | 1000 (4448) | 2000 (8896) | 3000 (13344) | 4000 (17792) | 5000 (22240) |

Load [lbf (N)]

Bore Size H1

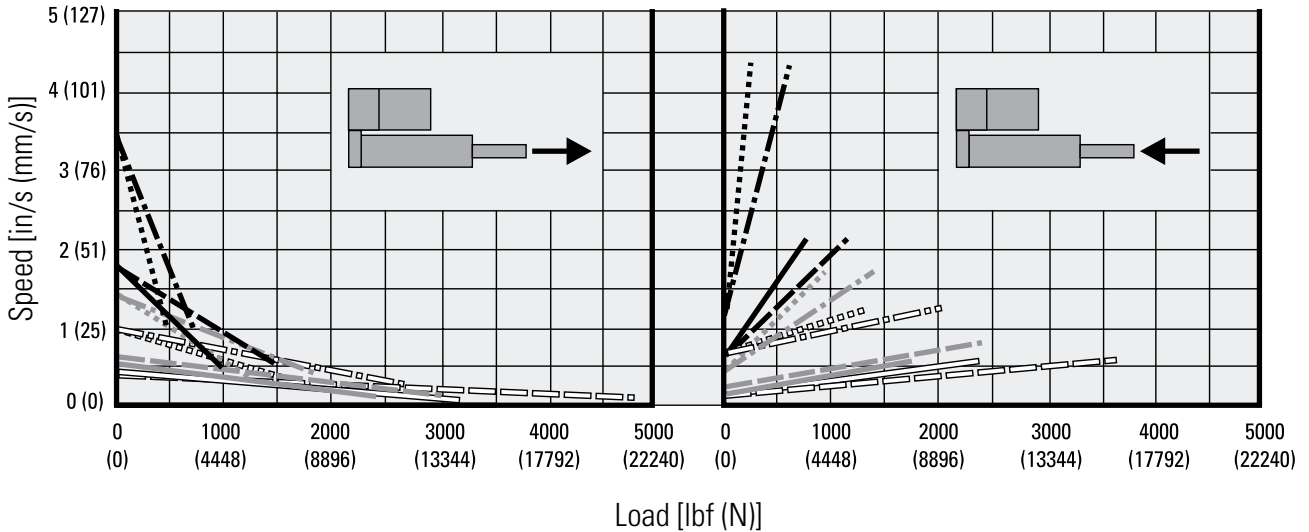|	
———	H1C-xx-1B11
··········	H1C-xx-1B41
– – – –	H1C-xx-2B11
–·–·–·–	H1C-xx-2B41

Bore Size H2

———	H2C-xx-1A12
··········	H2C-xx-1B32
– – – –	H2C-xx-2A22
–·–·–·–	H2C-xx-2B32

Bore Size H3

———	H3C-xx-1A13
□□□□□□□	H3C-xx-1B23
▭ ▭ ▭ ▭	H3C-xx-2A13
▭□▭□▭	H3C-xx-2B23

Load vs. Current

Current [A]

80
70
60
50
40
30
20
10
0

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

Percent of Maximum Permissible Load [%]

12 Vdc Actuators

▭▭▭▭	HxC-12-1xxx
□□□□□□□	HxC-12-2xxx

24 Vdc Actuators

———	HxC-24-1xxx
··········	HxC-24-2xxx

48 Vdc Actuators

———	HxC-48-1xxx
········	HxC-48-2xxx

Sizing of Motor, Pump and Power Supply

H

Load vs. Speed @ Extension

Load vs. Speed @ Retraction

Speed [in/s (mm/s)]

5 (127)
4 (101)
3 (76)
2 (51)
1 (25)
0 (0)

| 0 (0) | 1000 (4448) | 2000 (8896) | 3000 (13344) | 4000 (17792) | 5000 (22240) |

Load [lbf (N)]
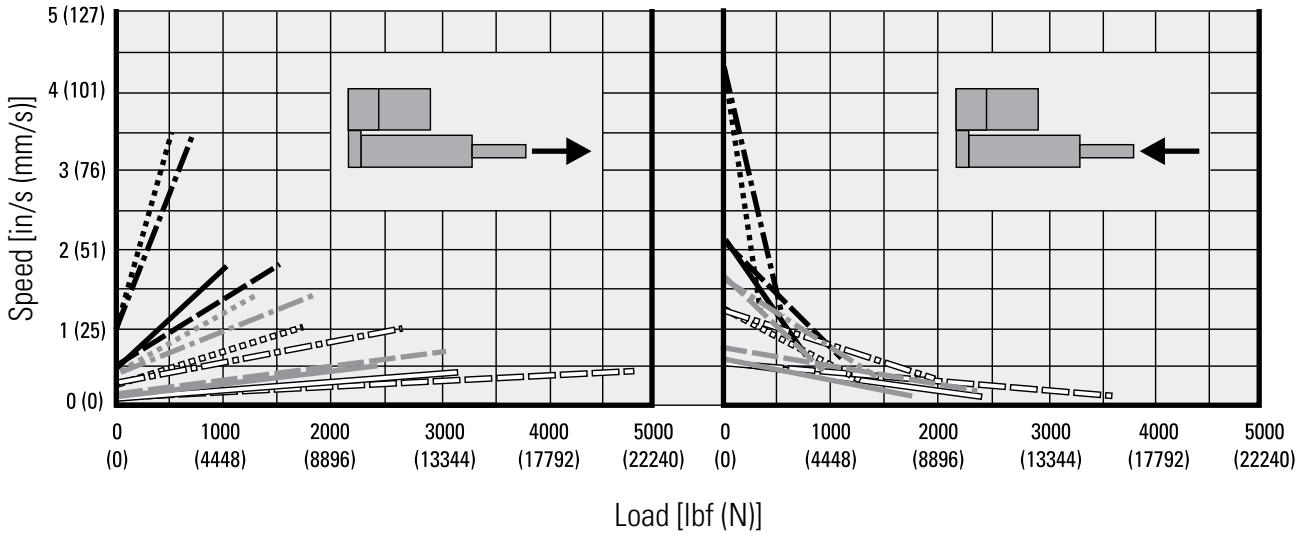
Bore Size H1

———————	H1H-xx-1B11
····················	H1H-xx-1B41
— — — — —	H1H-xx-2B11
—·—·—·—·—	H1H-xx-2B41

Bore Size H2

———————	H2H-xx-1A12
····················	H2H-xx-1B32
— — — — —	H2H-xx-2A22
—·—·—·—·—	H2H-xx-2B32

Bore Size H3

———————	H3H-xx-1A13
▫▫▫▫▫▫▫▫▫▫▫▫▫	H3H-xx-1B23
▭▭▭▭▭▭	H3H-xx-2A13
▭▫▭▫▭▫	H3H-xx-2B23

Load vs. Current

Current [A]

80
70
60
50
40
30
20
10
0

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

Percent of Maximum Permissible Load [%]

12 Vdc Actuators

———————	HxH-12-1xxx
▫▫▫▫▫▫▫▫▫▫▫▫▫	HxH-12-2xxx

24 Vdc Actuators

———————	HxH-24-1xxx
····················	HxH-24-2xxx

48 Vdc Actuators

———————	HxH-48-1xxx
··············	HxH-48-2xxx

Sizing of Motor, Pump and Power Supply

N

Load vs. Speed @ Extension

Load vs. Speed @ Retraction

Speed [in/s (mm/s)]

5 (127)
4 (101)
3 (76)
2 (51)
1 (25)
0 (0)

0 (0)   1000 (4448)   2000 (8896)   3000 (13344)   4000 (17792)   5000 (22240)

Load [lbf (N)]
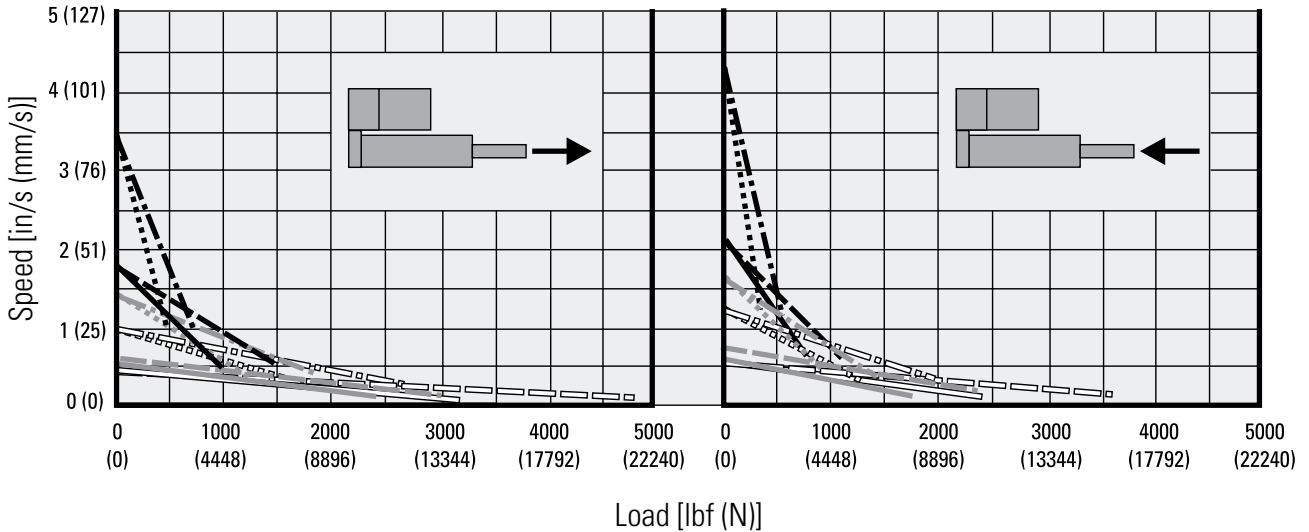
Bore Size H1	Bore Size H2	Bore Size H3
H1N-xx-1B11	H2N-xx-1A12	H3N-xx-1A13
H1N-xx-1B41	H2N-xx-1B32	H3N-xx-1B23
H1N-xx-2B11	H2N-xx-2A22	H3N-xx-2A13
H1N-xx-2B41	H2N-xx-2B32	H3N-xx-2B23

Load vs. Current

Current [A]

80
70
60
50
40
30
20
10
0

0   10   20   30   40   50   60   70   80   90   100

Percent of Maximum Permissible Load [%]
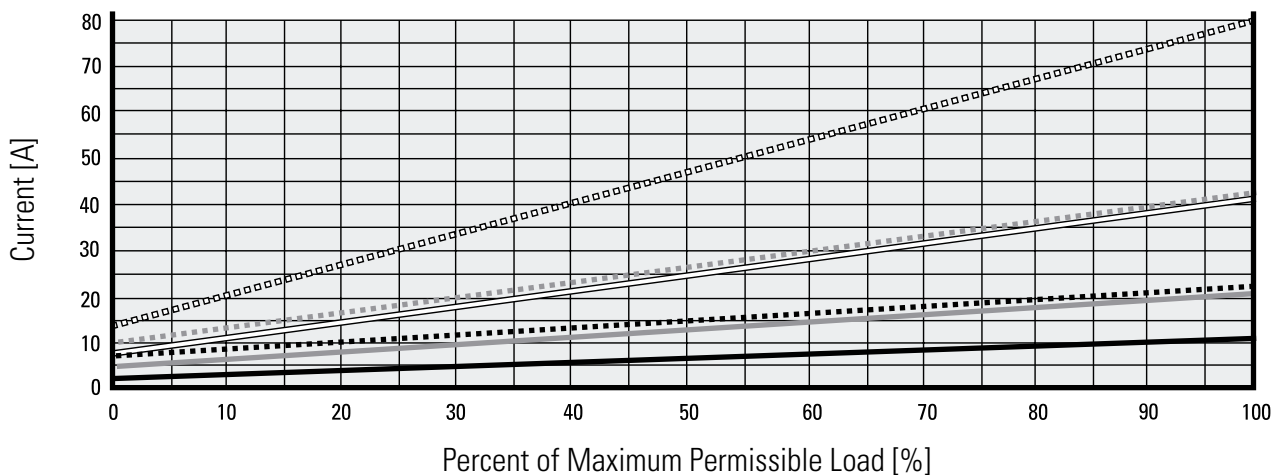
12 Vdc Actuators	24 Vdc Actuators	48 Vdc Actuators
HxN-12-1xxx	HxN-24-1xxx	HxN-48-1xxx
HxN-12-2xxx	HxN-24-2xxx	HxN-48-2xxx

H-Track – Performance Diagrams

Performance Matrix*

Load Configuration (see page 18)	Model	Max. Dynamic Load [lbf (N)]		Current Draw [A]						Extend Speed [in/s (mm/s)]		Retract Speed [in/s (mm/s)]	
		Extending	Retracting	@ Max. Load			@ No Load			@ Max. Load	@ No Load	@ Max. Load	@ No Load
				12 Vdc	24 Vdc	48 Vdc	12 Vdc	24 Vdc	48 Vdc				
C	H1C-xx-1B11	1000 (4448)	750 (3336)	8	4	3	18	13	5	0.50 (12.7)	1.75 (44.5)	2.19 (55.6)	0.63 (16.0)
	H1C-xx-1B41	500 (2224)	375 (1668)	8	4	3	18	13	5	1.00 (25.4)	3.50 (88.9)	4.38 (111.3)	1.25 (31.8)
	H1C-xx-2B11	1500 (6672)	1125 (5004)	18	9	5	38	26	13	0.50 (12.7)	1.75 (44.5)	2.19 (55.6)	0.63 (16.0)
	H1C-xx-2B41	750 (3336)	563 (2504)	18	9	5	38	26	13	1.00 (25.4)	3.50 (88.9)	4.38 (111.3)	1.25 (31.8)
	H2C-xx-1A12	2400 (10676)	1750 (7784)	8	4	3	18	13	5	0.15 (3.8)	0.50 (12.7)	0.60 (15.2)	0.18 (4.6)
	H2C-xx-1B32	1250 (5560)	992 (4413)	8	4	3	18	13	5	0.40 (10.2)	1.40 (35.6)	1.69 (42.9)	0.48 (12.2)
	H2C-xx-2A22	3000 (13345)	2380 (10587)	18	9	5	38	26	13	0.19 (4.8)	0.65 (16.5)	0.78 (19.8)	0.23 (5.8)
	H2C-xx-2B32	1875 (8340)	1488 (6619)	18	9	5	38	26	13	0.40 (10.2)	1.40 (35.6)	1.69 (42.9)	0.48 (12.2)
	H3C-xx-1A13	3200 (14234)	2400 (10676)	8	4	3	18	13	5	0.13 (3.3)	0.45 (11.4)	0.56 (14.2)	0.16 (4.1)
	H3C-xx-1B23	1750 (7784)	1313 (5841)	8	4	3	18	13	5	0.29 (7.4)	1.00 (25.4)	1.25 (31.8)	0.36 (9.1)
	H3C-xx-2A13	4800 (21351)	3600 (16014)	18	9	5	38	26	13	0.13 (3.3)	0.45 (11.4)	0.56 (14.2)	0.16 (4.1)
	H3C-xx-2B23	2625 (11677)	1969 (8759)	18	9	5	38	26	13	0.29 (7.4)	1.00 (25.4)	1.25 (31.8)	0.36 (9.1)
H	H1H-xx-1B11	1000 (4448)	750 (3336)	8	4	3	18	13	5	1.75 (44.4)	0.50 (12.7)	0.63 (16.0)	2.19 (55.6)
	H1H-xx-1B41	500 (2224)	375 (1668)	8	4	3	18	13	5	3.50 (88.9)	1.00 (25.4)	1.25 (31.8)	4.38 (111.3)
	H1H-xx-2B11	1500 (6672)	1125 (5004)	18	9	13	38	26	22	1.75 (44.4)	0.50 (12.7)	0.63 (16.0)	2.19 (55.6)
	H1H-xx-2B41	750 (3336)	563 (2504)	18	9	13	38	26	22	3.50 (88.9)	1.00 (25.4)	1.25 (31.8)	4.38 (111.3)
	H2H-xx-1A12	2400 (10676)	1750 (7784)	8	4	3	18	13	5	0.50 (12.7)	0.15 (3.8)	0.18 (4.6)	0.60 (15.2)
	H2H-xx-1B32	1250 (5560)	992 (4413)	8	4	3	18	13	5	1.40 (35.6)	0.40 (10.2)	0.48 (12.2)	1.69 (42.9)
	H2H-xx-2A22	3000 (13345)	2380 (10587)	18	9	13	38	26	22	0.65 (16.5)	0.19 (4.8)	0.23 (5.8)	0.78 (19.8)
	H2H-xx-2B32	1875 (8340)	1488 (6619)	18	9	13	38	26	22	1.40 (35.6)	0.40 (10.2)	0.48 (12.2)	1.69 (42.9)
	H3H-xx-1A13	3200 (14234)	2400 (10676)	8	4	3	18	13	5	0.45 (11.4)	0.13 (3.3)	0.16 (4.1)	0.56 (14.2)
	H3H-xx-1B23	1750 (7784)	1313 (5841)	8	4	3	18	13	5	1.00 (25.4)	0.29 (7.4)	0.36 (9.1)	1.25 (31.8)
	H3H-xx-2A13	4800 (21351)	3600 (16014)	18	9	13	38	26	22	0.45 (11.4)	0.13 (3.3)	0.16 (4.1)	0.56 (14.2)
	H3H-xx-2B23	2625 (11677)	1969 (8759)	18	9	13	38	26	22	1.00 (25.4)	0.29 (7.4)	0.36 (9.1)	1.25 (31.8)
N	H1N-xx-1B11	1000 (4448)	750 (3336)	42	21	10.5	8	5	2.5	0.50 (12.7)	1.75 (44.4)	0.63 (16.0)	2.19 (55.6)
	H1N-xx-1B41	500 (2224)	375 (1668)	42	21	10.5	8	5	2.5	1.00 (25.4)	3.50 (88.9)	1.25 (31.8)	4.38 (111.3)
	H1N-xx-2B11	1500 (6672)	1125 (5004)	80	43	22	14	10	7	0.50 (12.7)	1.75 (44.4)	0.63 (16.0)	2.19 (55.6)
	H1N-xx-2B41	750 (3336)	563 (2504)	80	43	22	14	10	7	1.00 (25.4)	3.50 (88.9)	1.25 (31.8)	4.38 (111.3)
	H2N-xx-1A12	2400 (10676)	1750 (7784)	42	21	10.5	8	5	2.5	0.15 (3.8)	0.50 (12.7)	0.18 (4.6)	0.60 (15.2)
	H2N-xx-1B32	1250 (5560)	992 (4413)	42	21	10.5	8	5	2.5	0.40 (10.2)	1.40 (35.6)	0.48 (12.2)	1.69 (42.9)
	H2N-xx-2A22	3000 (13345)	2380 (10587)	80	43	22	14	10	7	0.19 (4.8)	0.65 (16.5)	0.23 (5.8)	0.78 (19.8)
	H2N-xx-2B32	1875 (8340)	1488 (6619)	80	43	22	14	10	7	0.40 (10.2)	1.40 (35.6)	0.48 (12.2)	1.69 (42.9)
	H3N-xx-1A13	3200 (14234)	2400 (10676)	42	21	10.5	8	5	2.5	0.13 (3.3)	0.45 (11.4)	0.16 (4.1)	0.56 (14.2)
	H3N-xx-1B23	1750 (7784)	1313 (5841)	42	21	10.5	8	5	2.5	0.29 (7.4)	1.00 (25.4)	0.36 (9.1)	1.25 (31.8)
	H3N-xx-2A13	4800 (21351)	3600 (16014)	80	43	22	14	10	7	0.13 (3.3)	0.45 (11.4)	0.16 (4.1)	0.56 (14.2)
	H3N-xx-2B23	2625 (11677)	1969 (8759)	80	43	22	14	10	7	0.29 (7.4)	1.00 (25.4)	0.36 (9.1)	1.25 (31.8)

* The table above is valid for the temperature span of 40 – 120°F (4 – 50°C). H-Track can operate in the larger range of -20 – 150°F (-26 – 65°C), but at temperatures below 40°F (4°C), force and current begin to increase, while speed decreases. At temperatures above 120°F (50°C), speed will decrease slightly. The exact amount of performance change is difficult to calculate. Also, when it comes to the lower temperature span, the performance will move towards what is stated above as the temperature rises in the actuator due to the heat generated by its work. Please consult Thomson customer service for more information.

H-Track – Ordering Key

Ordering Key

1	2	3	4	5	6	7	8	9
H1	C-	12-	1	A2	2-	A-	06	

1. Bore size [1]
H1 = 1.000 in
H2 = 1.375 in
H3 = 1.500 in

2. Load configuration
C- = gravity push on the load/extension tube
H- = gravity pull on the load/extension tube
N- = gravity does not affect the load/extension tube

3. Input voltage
12- = 12 Vdc
24- = 24 Vdc
48- = 48 Vdc

4. Motor power [1]
1 = 240 W
2 = 560 W

5. Pump size [1]
A1 = gear tooth 16, thickness 0.125 in
A2 = gear tooth 16, thickness 0.156 in
A3 = gear tooth 16, thickness 0.188 in
A4 = gear tooth 16, thickness 0.250 in
B1 = gear tooth 12, thickness 0.125 in
B2 = gear tooth 12, thickness 0.156 in
B3 = gear tooth 12, thickness 0.188 in
B4 = gear tooth 12, thickness 0.250 in

6. Extension tube diameter [2]
1- = 0.500 in (always with bore size H1)
2- = 0.625 in (always with bore size H2)
3- = 0.750 in (always with bore size H3)

7. Extension tube front adapter
A = Standard
B = Spherical [1]
C = Male Thread [1]
D = Female Thread [1]

8. Stroke length [3]
02 = 2 in (50 mm) [1]
04 = 4 in (100 mm)
06 = 6 in (150 mm)
08 = 8 in (200 mm)
10 = 10 in (254 mm) [1]
12 = 12 in (300 mm)
14 = 14 n (356 mm)
16 = 16 in (406 mm) [1]

9. Rear adapter orientation
blank = standard
R90 = 90° position

(1) See the Performance Matrix for the possible combinations of bore size, motor power and pump size and their performance.
(2) Other rod/bore combinations available. Contact factory for options.
(3) Other stroke lengths available upon request. Please contact customer support.

H-Track – Electrical Connections

Electrical Data

Actuator supply voltage	[Vdc]	
Hxx-12		9 - 16
Hxx-24		18 - 32
Hxx-48		36 - 64
Current draw @ no load/max. load	[A]	see matrix page 125
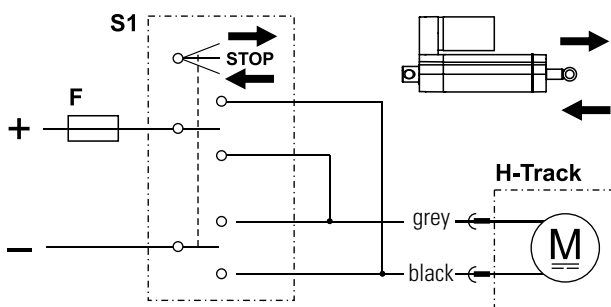
F   Fuse
S1   Double pole double throw switch

To extend the actuator, apply +Vdc to black and -Vdc to grey. To retract, apply -Vdc to black and +Vdc to grey. Avoid running the actuator in to the ends.