

# Servomotors and Drive Systems

Fastact H Series and Dx2020  
Systems Guide



**MOOG**

# Servomotors and Drive Systems

## Fastact H Series Servomotors Matched With Dx2020 Drives

The Moog Fastact H is a product line of DC permanent magnet servomotors that cover a broad range of torques and speeds. Matching these servomotors with Moog's Dx2020 (DM2020 and DS2020 series) servodrive product line provides the customer with combinations that can be readily selected for specific torque and speed requirements.

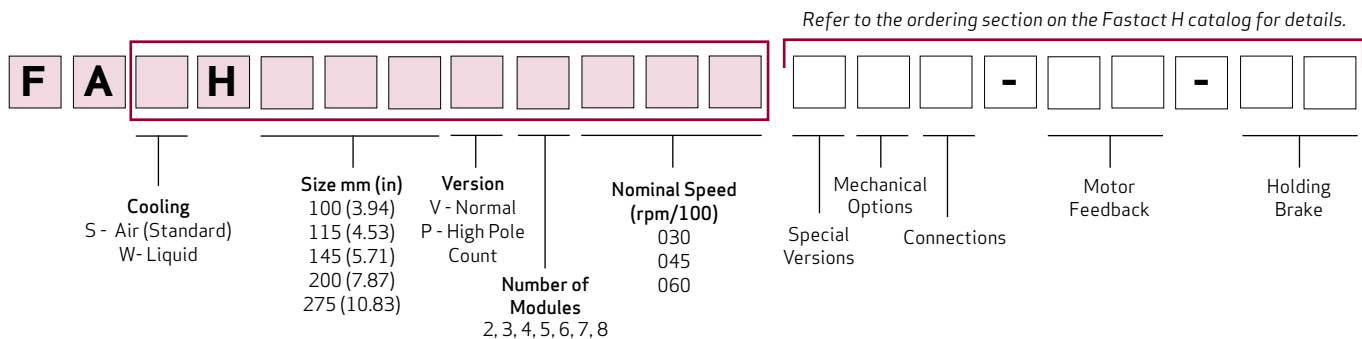
### Fastact H Series Motor Features:

- Comprised of air cooled (FASH) and liquid cooled (FAWH) motors
- Available in five frame sizes, each with multiple lengths and varying torques and speeds
- Normal and high pole count versions
- Integral feedback, including resolver or optional encoder
- Optional brake

### Dx2020 Servo Drive Features:

- EtherCAT®, CANopen® or analog control interfaces
- DS2020 product line integrates the power supply with the drive in one enclosure, therefore being self-contained per axis
  - Available in output currents up to 48 amps continuous and 96 amps peak
- DM2020 product line uses one power supply with multiple single and two axis drives
  - Available in output currents up to 128 amps continuous and 96 amps peak

## Motor Code Structure



### Fastact H - Air Cooling Motors

Motor Code	Rated Speed (rpm)	Rated Torque Nm (lb-ft) Locked Rotor	Peak Torque Nm (lb-ft) Locked Rotor	Square Flange mm (in)	DM2020 Suggested Size	DS2020 Suggested Size
H100V2-030	3000	2.9 (2.14)	12.5 (9.22)	100 (3.94)	04/08	02/04
H100V2-045	4500	2.9 (2.14)	12.5 (9.22)	100 (3.94)	04/08	04/08
H100V2-060	6000	2.9 (2.14)	12.5 (9.22)	100 (3.94)	04/08	04/08
H100V4-030	3000	5.3 (3.9)	24.5 (18.07)	100 (3.94)	08/16	06/12
H100V4-045	4500	5.3 (3.9)	24.5 (18.07)	100 (3.94)	08/16	08/16
H100V4-060	6000	5.3 (3.9)	24.5 (18.07)	100 (3.94)	08/16	08/16
H100V6-020	2000	7.7 (5.68)	36.5 (29.92)	100 (3.94)	08/16	06/12
H100V6-030	3000	7.7 (5.68)	36.5 (29.92)	100 (3.94)	08/16	06/12
H100V6-045	4500	7.7 (5.68)	36.5 (29.92)	100 (3.94)	08/16	08/16

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## Fastact H - Air Cooling Motors

Motor Code	Rated Speed (rpm)	Rated Torque Nm (lb-ft) Locked Rotor	Peak Torque Nm (lb-ft) Locked Rotor	Square Flange mm (in)	DM2020 Suggested Size	DS2020 Suggested Size
H100V8-020	2000	10.2 (7.52)	49 (36.14)	100 (3.94)	08/16	08/16
H100V8-030	3000	10.2 (7.52)	49 (36.14)	100 (3.94)	08/16	08/16
H100V8-045	4500	10.2 (7.52)	49 (36.14)	100 (3.94)	16/32	12/22
H115V2-030	3000	4.1 (3.02)	15.9 (11.73)	115 (4.53)	04/08	04/08
H115V2-045	4500	4.1 (3.02)	15.9 (11.73)	115 (4.53)	04/08	04/08
H115V2-060	6000	4.1 (3.02)	15.9 (11.73)	115 (4.53)	04/08	04/08
H115V4-020	2000	8 (5.9)	32.1 (29.67)	115 (4.53)	04/08	04/08
H115V4-030	3000	8 (5.9)	32.1 (29.67)	115 (4.53)	08/16	06/12
H115V4-045	4500	8 (5.9)	32.1 (29.67)	115 (4.53)	08/16	08/16
H115V6-020	2000	11.4 (8.4)	48.3 (35.62)	115 (4.53)	08/16	06/12
H115V6-030	3000	11.4 (8.4)	48.3 (35.62)	115 (4.53)	08/16	06/12
H115V6-045	4500	11.4 (8.4)	48.3 (35.62)	115 (4.53)	16/32	12/22
H145V2-020	2000	10.7 (7.89)	36.7 (27.07)	145 (5.71)	08/16	06/12
H145V2-030	3000	10.7 (7.89)	36.7 (27.07)	145 (5.71)	08/16	08/16
H145V2-045	4500	10.7 (7.89)	36.7 (27.07)	145 (5.71)	16/32	12/22
H145V4-020	2000	19.1 (14.09)	73.4 (54.14)	145 (5.71)	08/16	08/16
H145V4-030	3000	19.1 (14.09)	73.4 (54.14)	145 (5.71)	16/32	16/32
H145V6-020	2000	26.9 (19.84)	110.1 (81.2)	145 (5.71)	16/32	12/22
H145V6-030	3000	26.9 (19.84)	110.1 (81.2)	145 (5.71)	16/32	16/32
H145V6-040	4000	26.9 (19.84)	110.1 (81.2)	145 (5.71)	24/48	24/48
H145V8-020	2000	33.5 (24.7)	146.8 (108.27)	145 (5.71)	16/32	16/32
H145V8-030	3000	33.5 (24.7)	146.8 (108.27)	145 (5.71)	24/48	24/48
H145V8-040	4000	33.5 (24.7)	146.8 (108.27)	145 (5.71)	24/48	24/48
H200V2-020	2000	34 (25.08)	95 (70.07)	200 (7.87)	16/32	16/32
H200V2-030	3000	34 (25.08)	95 (70.07)	200 (7.87)	24/48	24/48
H200V2-045	4500	34 (25.08)	95 (70.07)	200 (7.87)	32/64	32/64
H200P2-014	1400	45.5 (33.56)	174 (128.33)	200 (7.87)	24/48	24/48
H200P2-030	3000	45.5 (33.56)	174 (128.33)	200 (7.87)	48/96	48/96
H200V3-020	2000	49 (36.14)	146 (107.68)	200 (7.87)	24/48	24/48
H200V3-030	3000	49 (36.14)	146 (107.68)	200 (7.87)	32/64	32/64
H200V3-039	3900	49 (36.14)	146 (107.68)	200 (7.87)	48/96	48/96
H200P3-014	1400	65 (47.94)	267 (196.93)	200 (7.87)	32/64	32/64
H200P3-018	1800	65 (47.94)	267 (196.93)	200 (7.87)	32/64	32/64
H200P3-022	2200	65 (47.94)	267 (196.93)	200 (7.87)	48/96	48/96
H200V4-014	1400	63.4 (46.76)	196 (144.56)	200 (7.87)	24/48	24/48
H200V4-020	2000	63.4 (46.76)	196 (144.56)	200 (7.87)	32/64	32/64
H200V4-030	3000	63.4 (46.76)	196 (144.56)	200 (7.87)	48/96	48/96
H200P4-014	1400	82.5 (60.85)	360 (255.52)	200 (7.87)	32/64	32/64
H200P4-018	1800	82.5 (60.85)	360 (255.52)	200 (7.87)	48/96	48/96
H200P4-020	2000	82.5 (60.85)	360 (255.52)	200 (7.87)	64/128	48/96

# Servomotors and Drive Systems

## Fastact H - Air Cooling Motors

Motor Code	Rated Speed (rpm)	Rated Torque Nm (lb-ft) Locked Rotor	Peak Torque Nm (lb-ft) Locked Rotor	Square Flange mm (in)	DM2020 Suggested Size	DS2020 Suggested Size
H200V6-012	1200	89.7 (66.16)	297 (219.05)	200 (7.87)	24/48	24/48
H200V6-020	2000	89.7 (66.16)	297 (219.05)	200 (7.87)	32/64	32/64
H200V6-025	2500	89.7 (66.16)	297 (219.05)	200 (7.87)	48/96	48/96
H200P6-011	1100	117.8 (86.88)	545 (401.97)	200 (7.87)	32/64	32/64
H200P6-015	1500	117.8 (86.88)	545 (401.97)	200 (7.87)	48/96	48/96
H200P6-018	1800	117.8 (86.88)	545 (401.97)	200 (7.87)	64/128	48/96
H200V8-012	1200	115.2 (84.97)	398 (293.55)	200 (7.87)	32/64	32/64
H200V8-016	1600	115.2 (84.97)	398 (293.55)	200 (7.87)	48/96	48/96
H200V8-020	2000	115.2 (84.97)	398 (293.55)	200 (7.87)	64/128	*
H200P8-008	800	148.2 (109.31)	725 (534.73)	200 (7.87)	48/96	48/96
H200P8-010	1000	148.2 (109.31)	725 (534.73)	200 (7.87)	64/128	*
H200P8-014	1400	148.2 (109.31)	725 (534.73)	200 (7.87)	96/192	*
H275V3-012	1200	192 (141.61)	455 (335.59)	275 (10.83)	48/96	48/96
H275V4-010	1000	260 (191.77)	617 (455.07)	275 (10.83)	64/128	*
H275V4-015	1500	260 (191.77)	617 (455.07)	275 (10.83)	64/128	*
H275V5-010	1000	328 (241.92)	781 (576.03)	275 (10.83)	64/128	*

\*Symbol indicates that the DS2020 is limited to 48/96 Arms; with those drives, motor performances are limited. Drive sizes larger than suggested can be used with every motor due to the drives internal resolution and fast-loop closing.

## Fastact W H - Liquid Cooling Motors

Motor Code	Rated Speed (rpm)	Rated Torque Nm (lb-ft) Locked Rotor	Peak Torque Nm (lb-ft) Locked Rotor	Square Flange mm (in)	DM2020 Suggested Size	DS2020 Suggested Size
WH100V2-030	3000	5.5 (4.06)	12.5 (9.22)	100 (3.94)	04/08	04/08
WH100V2-045	4500	5.5 (4.06)	12.5 (9.22)	100 (3.94)	08/16	06/12
WH100V2-060	6000	5.5 (4.06)	12.5 (9.22)	100 (3.94)	08/16	08/16
WH100V4-030	3000	11 (8.11)	24.5 (18.07)	100 (3.94)	08/16	08/16
WH100V4-045	4500	11 (8.11)	24.5 (18.07)	100 (3.94)	16/32	12/22
WH100V4-060	6000	11 (8.11)	24.5 (18.07)	100 (3.94)	16/32	16/32
WH100V6-020	2000	16.6 (12.24)	36.5 (26.92)	100 (3.94)	08/16	08/16
WH100V6-030	3000	16.6 (12.24)	36.5 (26.92)	100 (3.94)	16/32	12/22
WH100V6-045	4500	16.6 (12.24)	36.5 (26.92)	100 (3.94)	16/32	16/32
WH100V8-020	2000	22.6 (16.67)	49 (36.14)	100 (3.94)	16/32	12/22
WH100V8-030	3000	22.6 (16.67)	49 (36.14)	100 (3.94)	16/32	16/32
WH100V8-045	4500	22.6 (16.67)	49 (36.14)	100 (3.94)	24/48	24/48
WH145V2-020	2000	18.5 (13.64)	36.7 (27.07)	145 (5.71)	08/16	8/16
WH145V2-030	3000	18.5 (13.64)	36.7 (27.07)	145 (5.71)	16/32	12/22
WH145V2-045	4500	18.5 (13.64)	36.7 (27.07)	145 (5.71)	32/64	24/48

## Fastact WH - Liquid Cooling Motors

Motor Code	Rated Speed (rpm)	Rated Torque Nm (lb-ft) Locked Rotor	Peak Torque Nm (lb-ft) Locked Rotor	Square Flange mm (in)	DM2020 Suggested Size	DS2020 Suggested Size
WH145V4-020	2000	37.9 (27.95)	73.4 (54.14)	145 (5.71)	16/32	16/32
WH145V4-030	3000	37.9 (27.95)	73.4 (54.14)	145 (5.71)	24/48	24/48
WH145V4-040	4000	37.9 (27.95)	73.4 (54.14)	145 (5.71)	32/64	32/64
WH145V6-020	2000	58.3 (43)	110.1 (81.21)	145 (5.71)	24/48	24/48
WH145V6-030	3000	58.3 (43)	110.1 (81.21)	145 (5.71)	32/64	32/64
WH145V6-040	4000	58.3 (43)	110.1 (81.21)	145 (5.71)	48/96	48/96
WH145V8-020	2000	77.5 (57.16)	146.8 (108.27)	145 (5.71)	32/64	32/64
WH145V8-030	3000	77.5 (57.16)	146.8 (108.27)	145 (5.71)	48/96	48/96
WH145V8-040	4000	77.5 (57.16)	146.8 (108.27)	145 (5.71)	64/128	*
WH200V2-020	2000	48.2 (35.55)	95 (70.07)	200 (7.87)	24/48	24/48
WH200V2-030	3000	48.2 (35.55)	95 (70.07)	200 (7.87)	32/64	32/64
WH200V2-045	4500	48.2 (35.55)	95 (70.07)	200 (7.87)	48/96	48/96
WH200P2-014	1400	69.5 (51.26)	174 (125.33)	200 (7.87)	24/48	24/48
WH200P2-022	2200	69.5 (51.26)	174 (125.33)	200 (7.87)	32/64	32/64
WH200P2-035	3500	69.5 (51.26)	174 (125.33)	200 (7.87)	48/96	48/96
WH200V3-020	2000	75.5 (55.78)	146 (107.68)	200 (7.87)	32/64	32/64
WH200V3-030	3000	75.5 (55.78)	146 (107.68)	200 (7.87)	48/96	48/96
WH200V3-039	3900	75.5 (55.78)	146 (107.68)	200 (7.87)	64/128	*
WH200P3-018	1800	107.4 (79.21)	267 (196.93)	200 (7.87)	32/64	32/64
WH200P3-022	2200	107.4 (79.21)	267 (196.93)	200 (7.87)	48/96	48/96
WH200P3-035	3500	107.4 (79.21)	267 (196.93)	200 (7.87)	64/128	*
WH200V4-014	1400	103.4 (76.26)	196 (144.56)	200 (7.87)	32/64	32/64
WH200V4-020	2000	103.4 (76.26)	196 (144.56)	200 (7.87)	48/96	48/96
WH200V4-030	3000	103.4 (76.26)	196 (144.56)	200 (7.87)	64/128	*
WH200P4-014	1400	146 (107.68)	360 (265.52)	200 (7.87)	48/96	48/96
WH200P4-018	1800	146 (107.68)	360 (265.52)	200 (7.87)	48/96	48/96
WH200P4-027	2700	146 (107.68)	360 (265.52)	200 (7.87)	64/128	64/128
WH200V5-020	2000	131.5 (96.99)	248 (182.91)	200 (7.87)	48/96	48/96
WH200V5-025	2500	131.5 (96.99)	248 (182.91)	200 (7.87)	64/128	*
WH200V5-033	3300	131.5 (96.99)	248 (182.91)	200 (7.87)	96/192	*
WH200P5-014	1400	189 (139.4)	456 (336.33)	200 (7.87)	48/96	48/96
WH200P5-018	1800	189 (139.4)	456 (336.33)	200 (7.87)	64/128	*
WH200P5-026	2600	189 (139.4)	456 (336.33)	200 (7.87)	96/192	*
WH200V6-012	1200	156.3 (115.28)	297 (219.05)	200 (7.87)	48/96	48/96
WH200V6-020	2000	156.3 (115.28)	297 (219.05)	200 (7.87)	64/128	*
WH200V6-025	2500	156.3 (115.28)	297 (219.05)	200 (7.87)	96/192	*
WH200P6-011	1100	227.3 (167.65)	545 (401.97)	200 (7.87)	48/96	48/96
WH200P6-016	1600	227.3 (167.65)	545 (401.97)	200 (7.87)	64/128	*
WH200P6-022	2200	227.3 (167.65)	545 (401.97)	200 (7.87)	96/192	*

\*Symbol indicates that the DS2020 is limited to 48/96 Arms; with those drives, motor performances are limited. Drive sizes larger than suggested can be used with every motor due to the drives internal resolution and fast-loop closing.



# Servomotors and Drive Systems

## Fastact W H - Liquid Cooling Motors

Motor Code	Rated Speed (rpm)	Rated Torque Nm (lb-ft) Locked Rotor	Peak Torque Nm (lb-ft) Locked Rotor	Square Flange mm (in)	DM2020 Suggested Size	DS2020 Suggested Size
WH200V8-012	1200	213.6 (157.54)	398 (293.55)	200 (7.87)	64/128	*
WH200V8-016	1600	213.6 (157.54)	398 (293.55)	200 (7.87)	64/128	*
WH200V8-020	2000	213.6 (157.54)	398 (293.55)	200 (7.87)	96/192	*
WH200P8-010	1000	305.8 (225.55)	725 (594.73)	200 (7.87)	64/128	*
WH200P8-014	1400	305.8 (225.55)	725 (594.73)	200 (7.87)	96/192	*
WH200P8-018	1800	305.8 (225.55)	725 (594.73)	200 (7.87)	96/192	*
WH275V3-012	1200	340 (250.77)	457 (337.07)	275 (10.83)	96/192	*
WH275V3-020	2000	340 (250.77)	457 (337.07)	275 (10.83)	128/256	*
WH275P3-080	800	367 (270.68)	721 (531.78)	275 (10.83)	64/128	*
WH275P3-011	1100	367 (270.68)	721 (531.78)	275 (10.83)	96/192	*
WH275V4-010	1000	461 (340)	617 (455.07)	275 (10.83)	96/192	*
WH275V4-015	1500	461 (340)	617 (455.07)	275 (10.83)	128/256	*
WH275P4-011	1100	490 (361.4)	974 (718.38)	275 (10.83)	96/192	*
WH275V5-010	1000	583 (430)	781 (576.04)	275 (10.83)	128/256	*
WH275V5-015	1500	583 (430)	781 (576.04)	275 (10.83)	128/256	*
WH275P5-008	800	602 (444)	1232 (908.68)	275 (10.83)	128/256	*
WH275P7-008	800	831 (612.91)	1712 (1262.71)	275 (10.83)	128/256	*

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# Servomotors and Drive Systems

Fastact H and Fastact W H Motors Overview**	
Motor Type	Permanent Magnet Brushless Servomotor
Cooling	Air (IC 00 41) in compliance with CEI EN 60034-6 (1995), or liquid (0.2 liter/minute for output kW, from 25° to 40°C)
Protection	IP 65 protection, in compliance with IEC 60034-5 (2000)
Stall Torque	2.9 to 328 Nm (2.1 to 242 lb-ft) air cooling 5.5 to 831 Nm (4 to 613 lb-ft) liquid cooling
Peak Torque	12.5 to 781 Nm (9.2 to 576 lb-ft) air cooling, 12.5 to 1712 Nm (9.2 to 1263 lb-ft) liquid cooling
Number of Poles	6 or 8 (V version) 12 or 16 (P version)
Nominal Speed Values	High, medium and low, related to motor size
Shaft Diameters	19 mm/0.75 in (H100, WH100 and H115), 24 mm/0.94 in (H145 and WH145), 32 mm/1.26 in (H200 WH200 V2 and V3) 42 mm/1.65 in (H200 and WH200 V4, V5, V6, V8, WH200 P all models), 55 mm/2.16 in (H275 and WH275 all models)
Shaft Type	Smooth shaft with keyway
Thermal Protection	Via ptc, with 130°C threshold
Brake	Optional
Feedback	2 pole resolver (standard) Absolute single-turn and multi-turn encoder (optional)
Connection	Straight or rotating connectors
MTBF at + 20°C Ambient Temperature, Winding Temperature at ≤ +105°C, Locked Rotor Condition	100,000 hours
Insulation	Class F
Ambient Temperature	-25°C - +40°C (air cooling), 0°C - 40°C (liquid cooling)
Altitude	Not greater than 1,000 m or 3,280 ft above sea level (consult factory if ambient is above this maximum altitude)
Storage Temperature	-25°C - +70°C
Shock	30 g for 11 ms on the two axes, in compliance with IEC 68-2-27 (1987)
Vibration	0.3 mm peak-peak up to 57 Hz, 2 g from 57 Hz to 150 Hz, on the two axes, in compliance with IEC 68-2-6 (1995)

Dx2020 Drives Overview**		
	DM2020	DS2020
Description	Compact, digital multiaxis modular servodrive in one or two axis enclosures with separate power supply	Compact, digital single axis servodrive with integral power supply
Control Mode	Torque, velocity and position	Torque, velocity and position
Output Current Range (Continuous/Peak Arms)	2/4 to 128/256	2/4 to 48/96
Input Voltage (3 Phase AC)	200/240 VAC 50/60 Hz 380/420 VAC 50/60 Hz 460/510 VAC 50/60 Hz Input voltage to the power supply	200/240 VAC 50/60 Hz 380/420 VAC 50/60 Hz 460/510 VAC 50/60 Hz Integral power supply
Analog Input	2	2
Analog Output	2	2
Digital Input	2 + 3 (1)	2 + 3 (1)
Digital Output	3 + 3 (1)	3 + 3 (1)
Control Interfaces	EtherCAT®, CANopen®, analog (standard)	EtherCAT®, CANopen®, analog (standard)
Separate Power Supply Size 54 Cont/128 Peak Arms 128 Cont/256 Peak Arms	50 mm (1.97 in) width 150 mm (5.9 in) width	N/A

\*\*Refer to the motor and drive catalogs for additional specifications at [www.moog.com](http://www.moog.com): FastactH-Catalog-eng.pdf, DS2020-catalogue-eng.pdf and DM2020-catalogue-eng.pdf.

**Americas**  
1213 North Main Street  
Blacksburg, VA 24060  
United States

Tel: +1 540-552-3011  
Fax: +1 540-557-6400

**MOOG**

[www.moog.com](http://www.moog.com)

Email: [mcg@moog.com](mailto:mcg@moog.com)