

HarmonicDrive®

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Flat, Hollow-Shaft AC Servo Actuator **FHA-C Series**

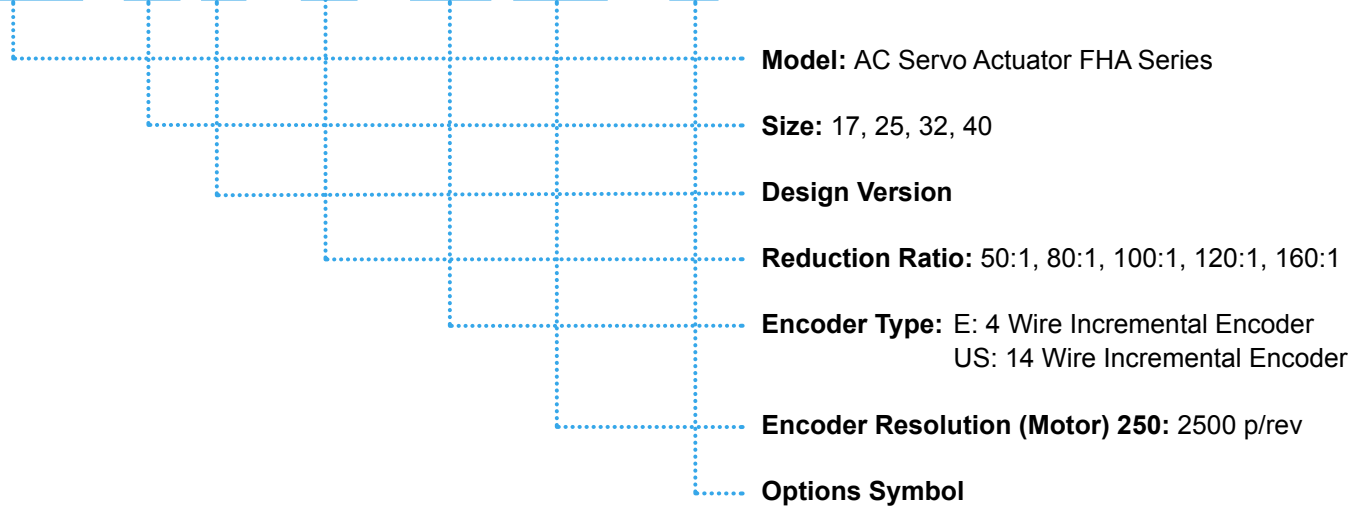
Two New Ratios have been added: 80:1 and 120:1



Two speed reduction ratios have been added to the FHA-C servo actuator product line; 80:1 and 120:1. The addition of these new ratios enhance the already successful FHA-C line of actuators.

Ordering Code

FHA - 17 C - 50 - US 250 - □



Options

Symbol	Option Descriptions
A	100VAC power supply (Available for size 17,25, and 32)
B	With Brake
L	Position Sensors
C	With connectors for motors (IP-20), for encoders (IP-40)
K	Rear Exiting Cable
F5	5 meter cables for each motor cable and encoder cable
E	24VDC power supply (Size 17 only)
PR	High-Positional Accuracy

Note: Contact us when using two or more options.

Specifications

* Input power supply voltage 200V

Item		Model		FHA-17C-□□-US250					FHA-25C-□□-US250				
				50:1	80:1	100:1	120:1	160:1	50:1	80:1	100:1	120:1	160:1
Reduction ratio				50:1	80:1	100:1	120:1	160:1	50:1	80:1	100:1	120:1	160:1
Maximum torque ^{*1}	Nm			39	51	57	60	64	150	213	230	247	260
Continuous torque ^{*12}	Nm			15	20	24	24	24	35	53	75	85	85
Maximum speed ^{*1}	rpm			96	60	48	40	30	90	56	45	37	28
Maximum current ^{*1}	A _{rms}			2.1	1.7	1.6	1.4	1.1	7.3	6.4	5.6	5.0	4.0
Continuous current ^{*12}	A _{rms}			0.93	0.82	0.74	0.63	0.51	2.1	2.1	2.1	2.0	1.6
Moment of inertia (GD ² /4) ³	kgm ²			0.17 (0.21)	0.43 (0.53)	0.67 (0.83)	0.97 (1.2)	1.7 (2.1)	0.81 (0.90)	2.1 (2.3)	3.2 (3.5)	4.7 (5.2)	8.3 (9.2)
Allowable moment load	Nm			188					370				
Moment stiffness	Nm/rad			220 x 10 ³					490 x 10 ³				
One-way positional accuracy	Second			60	40	40	40	40	40	30	30	30	30
Output shaft resolution (multiplied by 4) ⁴	Pulse/Revolution			500,000	800,000	1,000,000	1,200,000	1,600,000	500,000	800,000	1,000,000	1,200,000	1,600,000
Weight ^{*3}	kg			2.5 (2.8)					4.0 (4.7)				
Mounting direction	Can be installed in any direction												
Combined driver	HA-800*-3C-200												

Item		Model		FHA-32C-□□-US250					FHA-40C-□□-US250				
				50:1	80:1	100:1	120:1	160:1	50:1	80:1	100:1	120:1	160:1
Reduction ratio				50:1	80:1	100:1	120:1	160:1	50:1	80:1	100:1	120:1	160:1
Maximum torque ^{*1}	Nm			281	364	398	432	453	500	659	690	756	820
Continuous torque ^{*12}	Nm			60	95	130	155	200	85	145	190	225	300
Maximum speed ^{*1}	rpm			80	50	40	33	25	70	43	35	29	22
Maximum current ^{*1}	A _{rms}			11.4	9.2	8.0	7.4	5.9	17.3	14.0	11.8	10.9	9.0
Continuous current ^{*12}	A _{rms}			3.1	3.1	3.1	3.1	3.0	4.0	4.0	4.0	3.9	3.8
Moment of inertia (GD ² /4) ³	kgm ²			1.8 (2.1)	4.5 (5.3)	7.1 (8.2)	10.2 (12)	18.1 (21)	4.9 (5.5)	12.5 (14)	19.5 (22)	28.1 (32)	50 (56)
Allowable moment load	Nm			530					690				
Moment stiffness	Nm/rad			790 x 10 ³					1400 x 10 ³				
One-way positional accuracy	Second			40	30	30	30	30	40	30	30	30	30
Output shaft resolution (multiplied by 4) ⁴	Pulse/Revolution			500,000	800,000	1,000,000	1,200,000	1,600,000	500,000	800,000	1,000,000	1,200,000	1,600,000
Weight ^{*3}	kg			6.5 (7.1)					12 (13.6)				
Mounting direction	Can be installed in any direction												
Combined driver	HA-800*-6C-200												

The values in the table above show typical values for the output shaft.

*1: They are typical characteristics in the case of combinations with our driver (driven with the ideal sine wave). (Ambient temperature: 25°C)

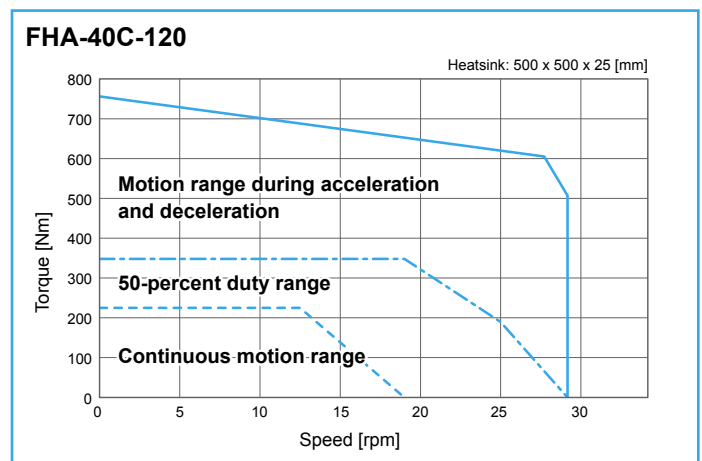
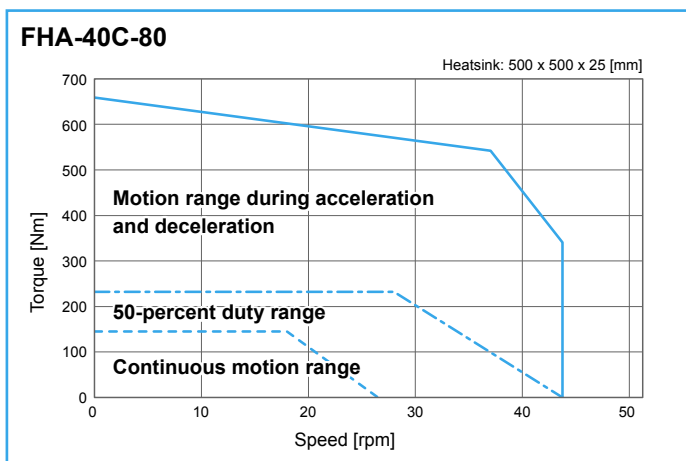
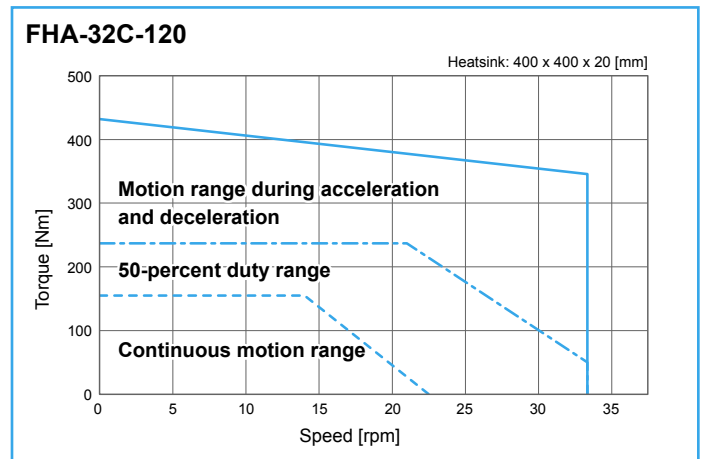
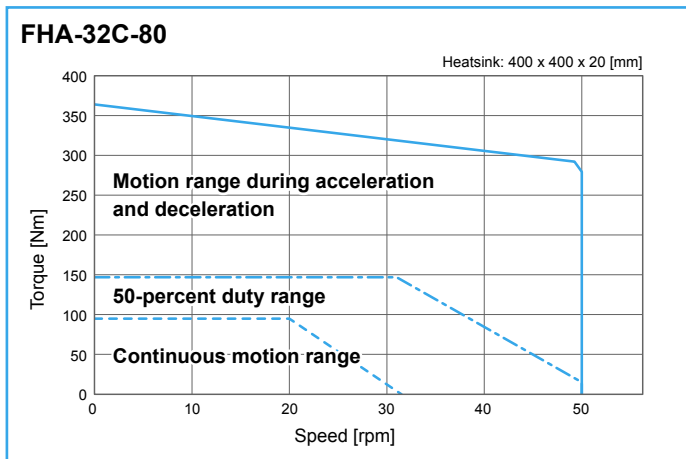
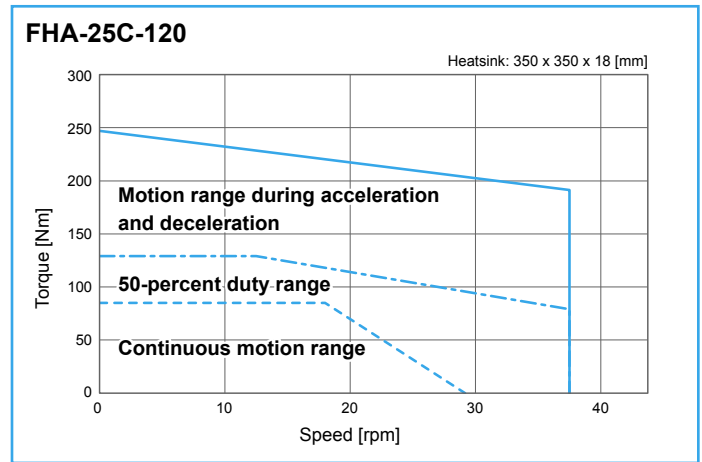
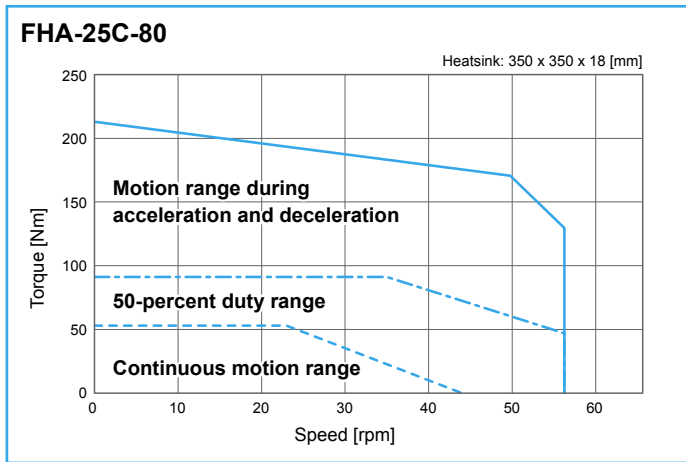
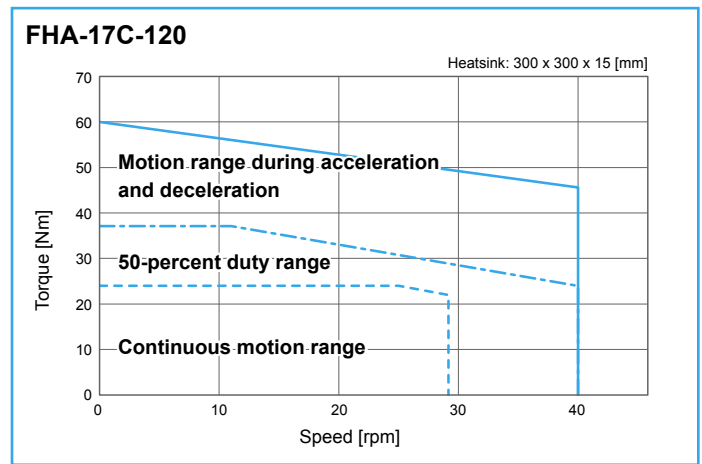
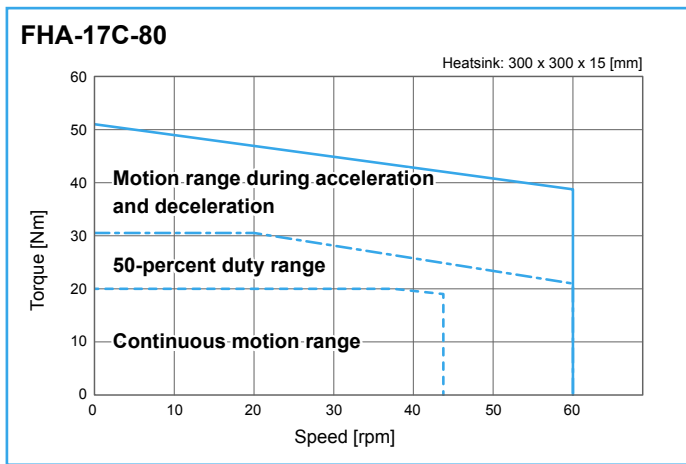
*2: The values for saturated temperature were obtained when installed on an aluminum heatsink (17C: □300 x 15t, 25C: □350 x 18t, 32C: □400 x 20t, 40C: □500 x 25t [mm])

*3: The values of the moment of inertia and weight were obtained while the product is not equipped with a brake. The values in parenthesis are for -PR option.

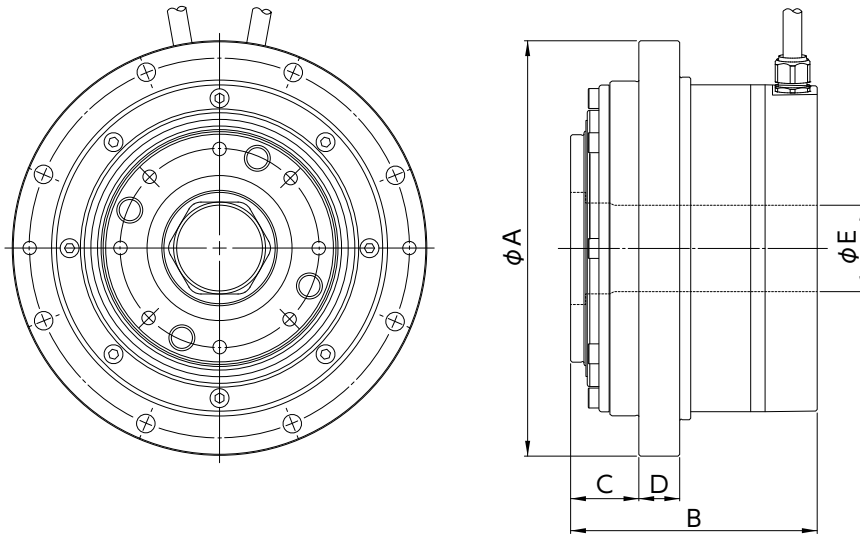
*4: The output axis resolution is obtained by (Motor shaft encoder resolution multiplied by four) x (Reduction ratio).

Operable Range

* Input power supply voltage 200V



Outline Dimensions



(Unit: mm)

Dimension	FHA-17C	FHA-25C	FHA-32C	FHA-40C
φA	128	155	175	230
B	78 (93.5)	90.5 (110)	111.5 (132)	127 (148)
C	21	25	22	30
D	12	15	18	22
φE (hollow diameter)	18	32	35	45

* The value in parentheses indicates the option with brake.
 * Note that the B and C dimensions are different for -PR option, please refer to technical materials.
 * For other options, please contact us.

Mechanical Accuracy

The FHA-C series actuator output shaft and mechanical accuracy of the mounting flange are shown below:

(Unit: mm)

Accuracy Item	FHA-17C	FHA-25C	FHA-32C	FHA-40C
1. Output shaft surface runout	0.010	0.012	0.012	0.014
2. Output shaft radial runout	0.010	0.012	0.012	0.014
3. Parallelism between output shaft and mounted surface	0.040	0.050	0.050	0.060
4. Concentricity between output shaft and fitting part	0.040	0.050	0.050	0.060

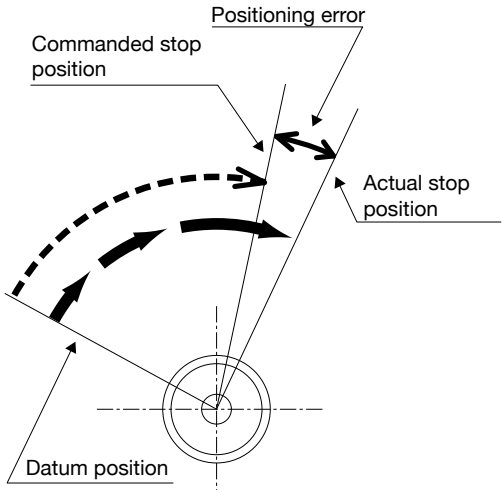
Note: For the measurement method, refer to the technical materials.
 Note: Values are based on the Total Indicator Reading (T.I.R.).



One-Way Positional Accuracy

The one-way positioning accuracy is defined as the maximum positional difference between the commanded position and the actual stop position when a series of positioning moves are performed in the same rotation direction. (Refer to JIS B-6201-1987).

The FHA-C mini actuator incorporates a Harmonic Drive® gear which inherently has high rotational position accuracy. Because of the gearing's high ratio, any rotational error at the input (i.e. motor shaft position error or motor feedback error) is reduced by a factor of the ratio (1/ratio) and typically becomes negligible at the output. Therefore most of the error is represented by the transmission error of the Harmonic Drive gear itself.



One-Way Positioning Accuracy

(Unit: sec.)

Ratio \ Model	FHA-17C	FHA-25C	FHA-32C	FHA-40C
50:1	60	40	40	40
80:1 or more	40	30	30	30

Compatible Servo Drives

Voltage	FHA-17C-xx-US250	FHA-25C-xx-US250	FHA-32C-xx-US250	FHA-40C-xx-US250
200VAC	RTL-230-18 REL-230-18 HA-800*-3C-200	RTL-230-18 REL-230-18 HA-800*-3C-200	RTL-230-18 REL-230-18 HA-800*-6C-200	Ratio 50 & 80:1 RTL-230-36 Ratio 50 & 80:1 REL-230-36 Ratio > 80:1 RTL-230-18 Ratio > 80:1 REL-230-18 HA-800*-6C-200
100VAC	RTL-230-18 REL-230-18 HA-800*-3C-100	Ratio 50 & 80:1 RTL-230-36 Ratio 50 & 80:1 REL-230-36 Ratio > 80:1 RTL-230-18 Ratio > 80:1 REL-230-18 HA-800*-6C-100	Ratio <120:1 RTL-230-36 Ratio <120:1 REL-230-36 Ratio >100:1 RTL-230-18 Ratio >100:1 REL-230-36 HA-800*-6C-100	-
24VDC	DDP-090-36 DEP-090-36	-	-	-

1. * HA-800A: I/O command type, HA-800B: MECHATROLINK-II type, HA-800C: CC-Link type.
2. For details on combined drives, refer to the drive manual.

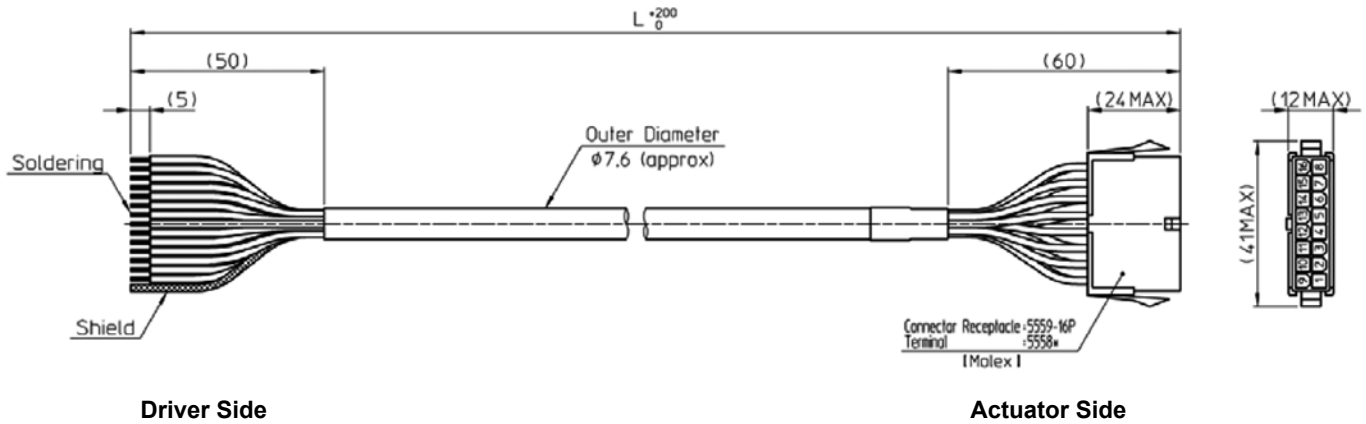
Extension Cables

This extension cable is used to connect the FHA-C actuator to the HDLLC driver.

- Extension cable (** indicates the cable length of 3 m, 5 m or 10 m.)

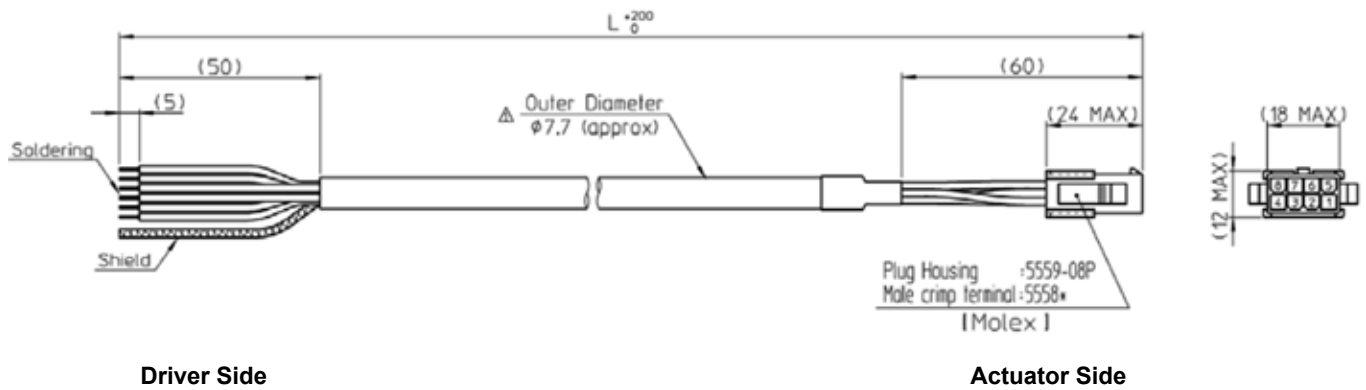
Encoder:

EWA-E**-M16-SP



Motor:

EWC-MB**-M08-SP



Connector Kit: Ordering Code depends on the driver; please refer to the Data sheet.

Communication Cable: Communication between driver and PC Via RS-232C

Ordering Code: SER-CK

Harmonic Drive LLC

Boston US Headquarters

247 Lynnfield Street
Peabody, MA 01960

T: 800.921.3332

T: 978.532.1800

F: 978.532.9406

www.HarmonicDrive.net

New York Sales Office

100 Motor Parkway, Suite 116
Hauppauge, NY 11788

California Sales Office

333 W. San Carlos Street, Suite 1070
San Jose, CA 95110

Chicago Sales Office

137 N. Oak Park Ave.,
Suite 410
Oak Park, IL 60301

Group Companies

Harmonic Drive Systems, Inc.
6-25-3 Minami-Ohi, Shinagawa-ku
Tokyo 141-0013, Japan

Harmonic Drive AG

Hoenbergstrasse, 14, D-6555
Limburg/Lahn Germany

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