

Actuator

FD20

FD20 is a compact and quiet actuator designed for use in furniture, home care and fitness equipment. To meet various application needs, there are several models with different speed and load for customer to choose. It is able to connect with hand control and power supply to make up a simple system without control box.



Features and Options

Main applications: Furniture, Home care, Fitness equipment

Standard features:

- Input voltage: 24V DC
- Max. load: 2000N (Push/Pull)
- Max. speed at no load: 33.3mm/sec (Typical value)
- Speed at full load: 5.6mm/sec (Typical value @2000N Loaded)
- Stroke: 50 ~ 300mm
- Noise level: ≤ 53 dB
- IP level: IP42 (Static; non-action)
- Preset limit switches
- Duty cycle: 10%, max. 2 min. continuous operation in 20 min.
- Operating ambient temperature: -20°C ~ +65°C
- Certified: UL 962 Standard for Household and Commercial Furnishings
- Compliant with CE Marking, EMC Directive 2014/30/EU

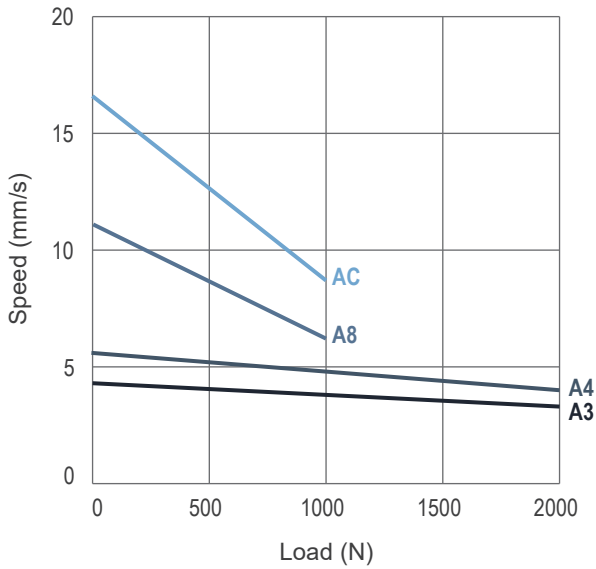
Options:

- Positioning signal feedback with Hall effect sensor x 1
- Positioning signal feedback with Hall effect sensor x 2
- Mechanical push only extension tube
- Mechanical brake

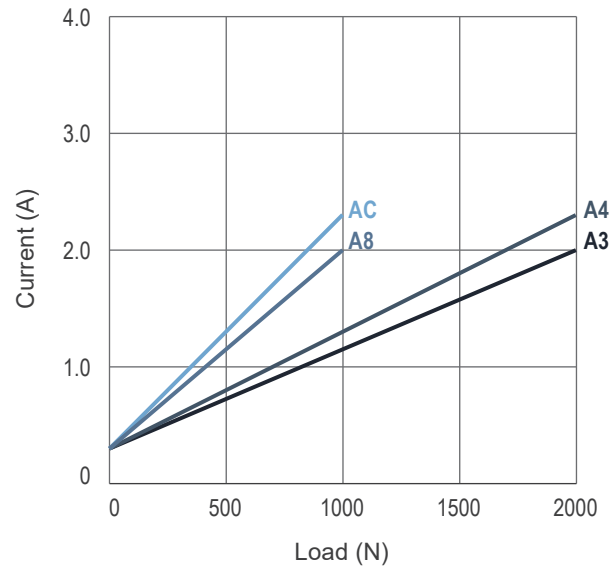
Performance Data

Model No.	Push / Pull Max. (N)	Self-locking ability (N) *	Typical speed (mm/s) **		Typical current (A) @ 24V **	
			No load	Full load	No load	Full load
FD20-24-A3-XXX.XXX-CXX-XXX	2000	2000	4.3	3.3	0.3	2.0
FD20-24-A4-XXX.XXX-CXX-XXX	2000	1500	5.6	4.0	0.3	2.3
FD20-24-A8-XXX.XXX-CXX-XXX	1000	700	11.1	6.2	0.3	2.0
FD20-24-AC-XXX.XXX-CXX-XXX	1000	500	16.6	8.7	0.3	2.3
FD20-24-K4-XXX.XXX-CXX-XXX	2000	1000	11.1	5.6	0.3	2.5
FD20-24-K8-XXX.XXX-CXX-XXX	1000	700	22.2	11.5	0.3	2.5
FD20-24-KC-XXX.XXX-CXX-XXX	500	300	33.3	21.0	0.3	2.0

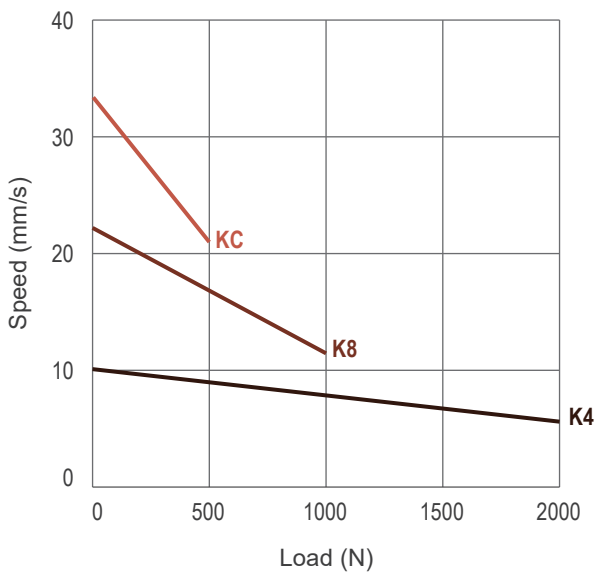
Speed VS. Load



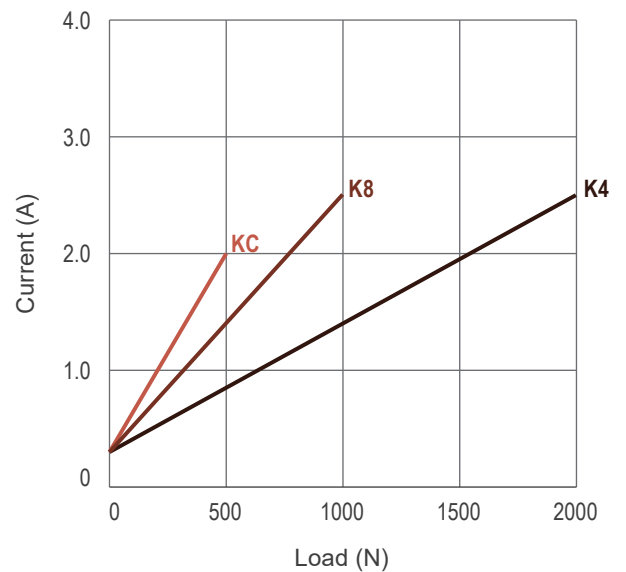
Current VS. Load



Speed VS. Load

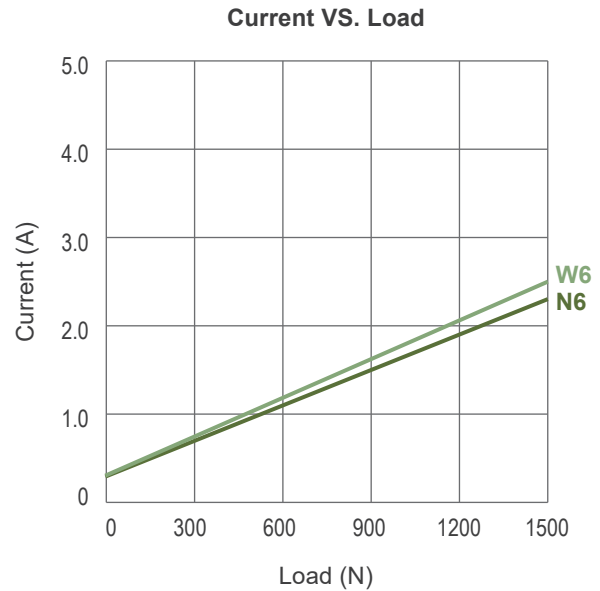
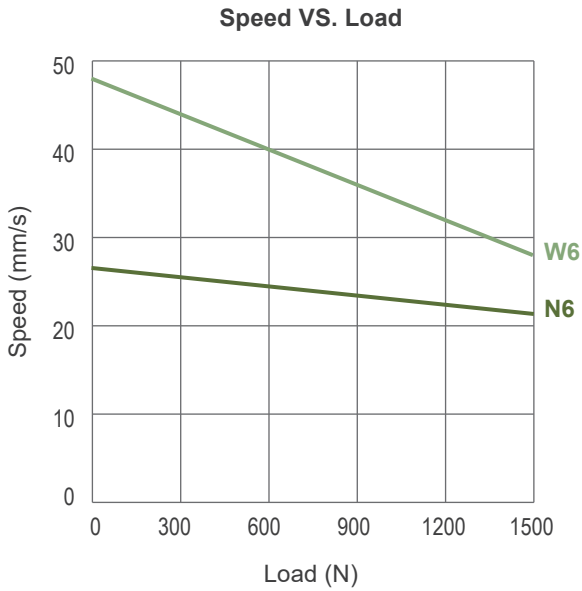


Current VS. Load



The below 2 models are suitable for recliner application, with Direct-Cut power cable DL1.

Model No.	Push / Pull Max. (N)	Self-locking ability (N) *	Typical speed (mm/s) **		Typical current (A) @ 29V **	
			No load	Full load	No load	Full load
FD20-24-N6-XXX.XXX-CXX-XXX	1500	1500	26.7	21.3	0.3	2.3
FD20-24-W6-XXX.XXX-CXX-XXX	1500	1500	48.0	28.0	0.3	2.5



Remarks:

* The self-locking ability is performed by short circuit the motor terminals when the actuator is powered off. All MOTECK compatible control boxes are designed with this feature. Mechanical brake in push direction is available upon request, to further enhance the self-locking ability to maximum load.

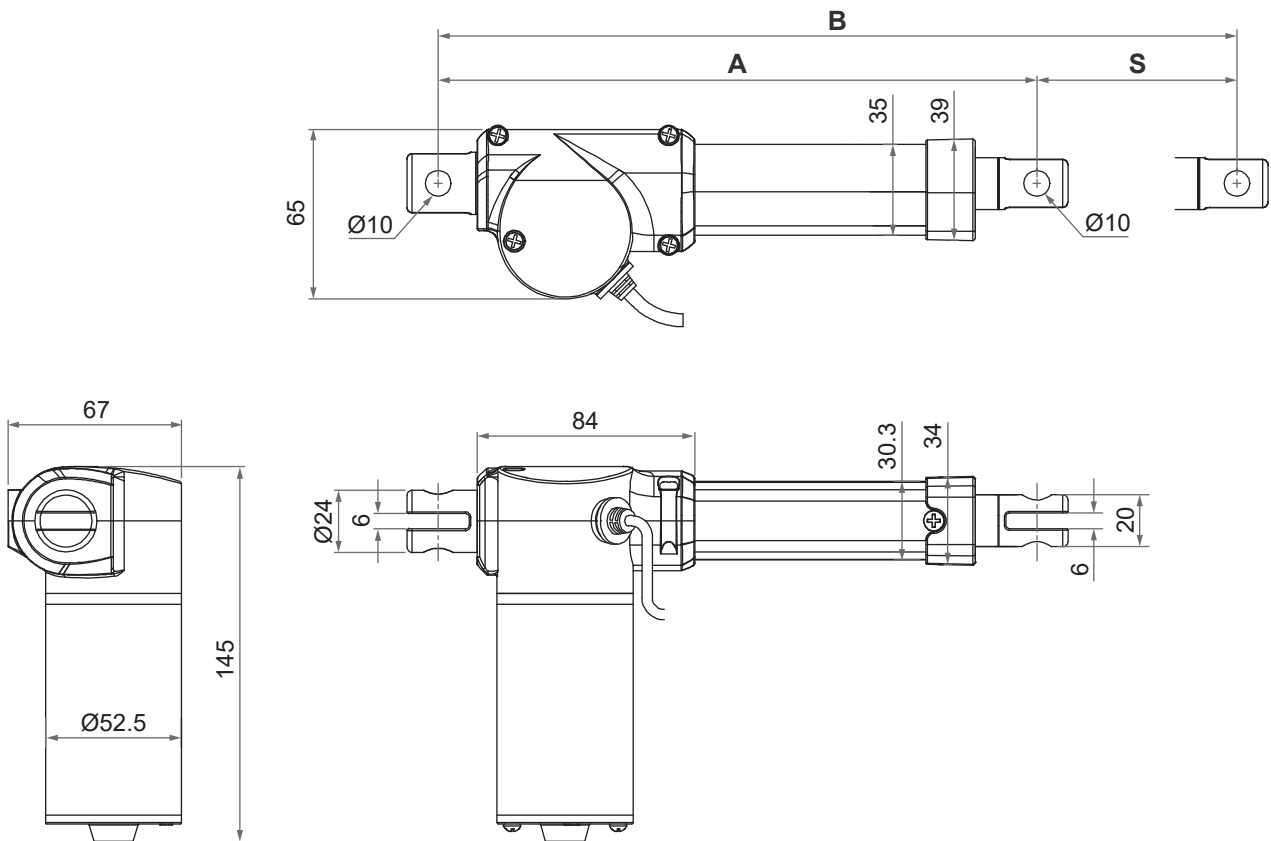
** The typical speed or typical current means the average value neither upper limit nor lower limit, which measured under room temperature and stable power. The performance curves are made with typical values.

Dimensions

- Available stroke (S) range = 50 ~ 300mm (±3mm)
- Extended length (B) = Retracted length (A) + Stroke (S)
- Retracted length (A)

Front connector code	Stroke (S)		
	≤ 200mm	201~250mm	251~300mm
2, 4	$A \geq S+135\text{mm} (\pm 3\text{mm})$	$A \geq S+145\text{mm} (\pm 3\text{mm})$	$A \geq S+155\text{mm} (\pm 3\text{mm})$
3, 6	$A \geq S+150\text{mm} (\pm 3\text{mm})$	$A \geq S+160\text{mm} (\pm 3\text{mm})$	$A \geq S+170\text{mm} (\pm 3\text{mm})$

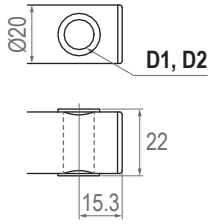
• Drawing



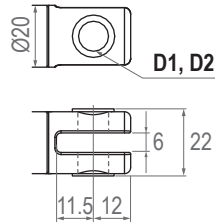
Unit: mm

● **Front connector**

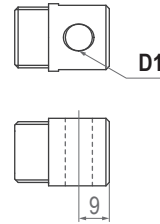
2: Drilled hole



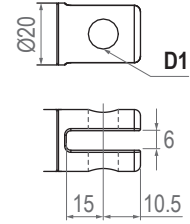
3: Metal slot



4: Plastic solid



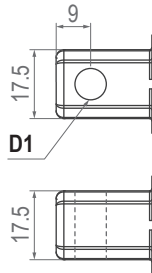
6: Plastic slot



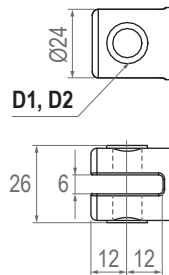
Front connector code	Diameter of pivot without bushing (D1)	Diameter of pivot with bushing (D2)
2	Ø8, Ø10	Ø8
3	Ø8, Ø10	Ø8
4	Ø8, Ø10	N/A
6	Ø8, Ø10	N/A

● **Rear connector**

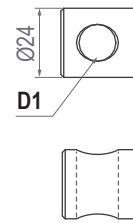
1: Plastic solid, square type



2: Metal slot



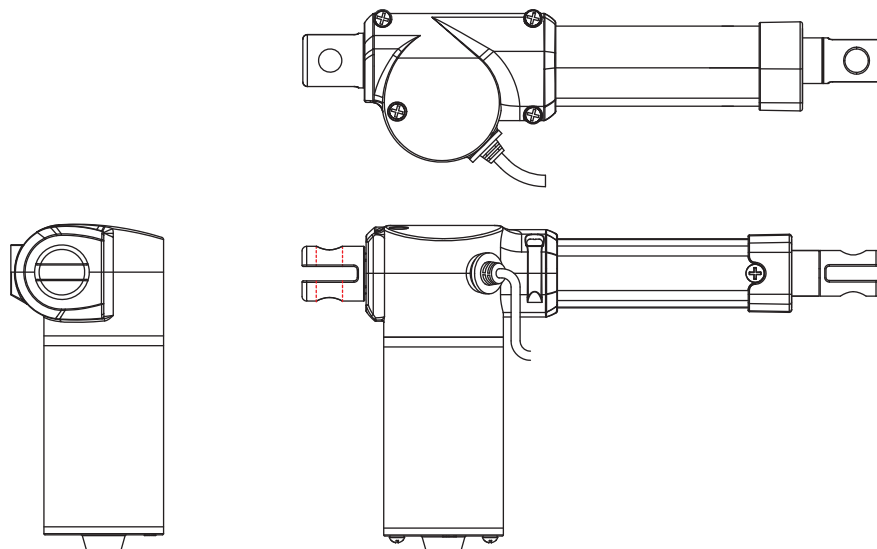
4: Plastic solid, round type



Rear connector code	Diameter of pivot without bushing (D1)	Diameter of pivot with bushing (D2)
1	Ø8	N/A
2	Ø8, Ø10	Ø8
4	Ø10	N/A

Unit: mm

● **Pivot orientation of rear connectors**



Note: As an example in 0° orientation for rear connector.

Compatibility

Product	Model	FD20 spec
Control box	T-control, CS1, CS2, CB3T, CB4M, CBT2	<ul style="list-style-type: none"> • Without positioning feedback • With Moteck F-type 4-pin DIN plug
	CF11H, CF12H	<ul style="list-style-type: none"> • Without positioning feedback • With Moteck L3-type minifit 6-pin plug
	CB3T-SY, CB4M-S, CB4M-B	<ul style="list-style-type: none"> • With dual Hall effect sensors for positioning • With Moteck F-type 6-pin DIN plug
	CF11S, CF12S	<ul style="list-style-type: none"> • With dual Hall effect sensors for positioning • With Moteck L3-type minifit 6-pin plug
	TX2A	<ul style="list-style-type: none"> • With Moteck direct-cut power cable DL1
Hand control	Depend on control box	<ul style="list-style-type: none"> • Powered by control box
	HS15	<ul style="list-style-type: none"> • With Moteck S-type DIN 41529 male plug ⁽¹⁾
	HB, TPSL, HS02, HZ02, HZ03, HZ04, HZ05, HZ06	<ul style="list-style-type: none"> • With Moteck direct-cut power cable DL1 ⁽²⁾
Accessory	Power adapter: DPA-58-2920-C8 (formerly TSW1), DPA-87-2930-C6 (formerly TSW3), WPA-29-2910-SR (formerly TSW4), DPA-87-2930-C8	<ul style="list-style-type: none"> • With Moteck direct-cut power cable DL1

Remarks:

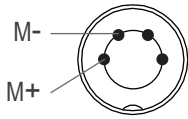
(1) The S-type DIN 41529 plug of the actuator is connected to the HS15 hand control directly, no control box.

(2) The actuator is connected to the hand control through the DL1 cable directly, no control box.

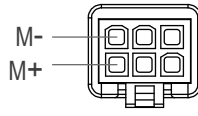
Cable Plug

A. Connecting control devices that provide power

- Without positioning feedback



With Moetck F-type 4-pin DIN plug

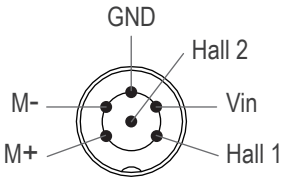


With Moetck L3-type Minifit 6-pin plug

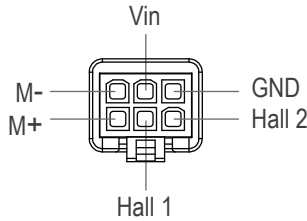


F-type plug

- Positioning feedback with dual Hall effect sensors



With Moetck F-type 6-pin DIN plug

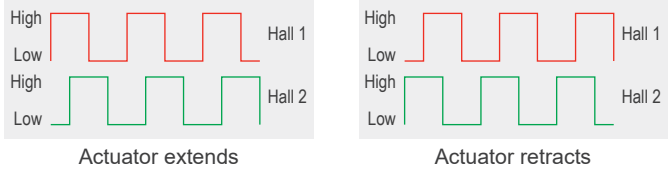


With Moetck L3-type Minifit 6-pin plug



L3-type plug

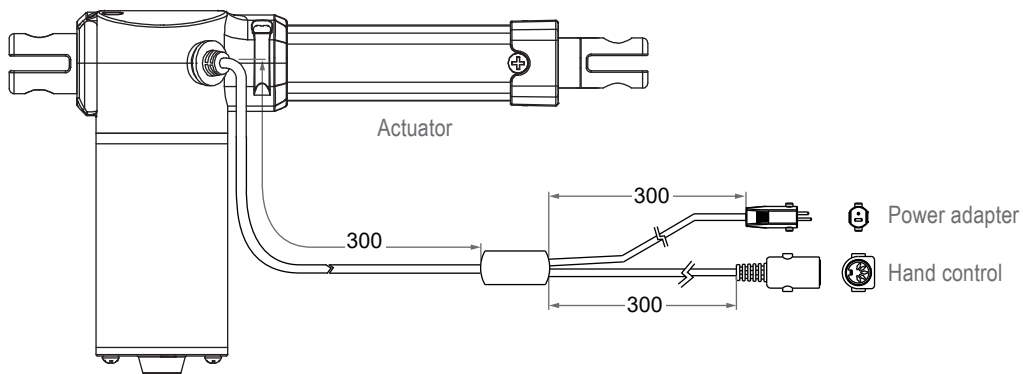
Note: Pin definition

	Definition	Descriptions																				
Power	M+	Connect M+ to "Vdc +" & M- to "Vdc -" of DC power to extend the actuator. Switch the polarity of DC input to retract it.																				
	M-																					
Signal	Vin	Voltage input range: 5 ~ 20V																				
	Hall 1 output	High= Input - 1.2V ($\pm 0.6V$) Low= GND Hall signal data:  Actuator extends Actuator retracts Hall effect sensor resolution: <table border="1" data-bbox="443 1541 1193 1989"> <thead> <tr> <th>Model No.</th> <th>Resolution (Pulses/mm)</th> </tr> </thead> <tbody> <tr> <td>FD20-24-A3-XXX.XXX-CXX-HSX</td> <td>10.00</td> </tr> <tr> <td>FD20-24-A4-XXX.XXX-CXX-HSX</td> <td>7.50</td> </tr> <tr> <td>FD20-24-A8-XXX.XXX-CXX-HSX</td> <td>3.75</td> </tr> <tr> <td>FD20-24-AC-XXX.XXX-CXX-HSX</td> <td>2.50</td> </tr> <tr> <td>FD20-24-K4-XXX.XXX-CXX-HSX</td> <td>7.50</td> </tr> <tr> <td>FD20-24-K8-XXX.XXX-CXX-HSX</td> <td>3.75</td> </tr> <tr> <td>FD20-24-KC-XXX.XXX-CXX-HSX</td> <td>2.50</td> </tr> <tr> <td>FD20-24-N6-XXX.XXX-CXX-HSX</td> <td>5.00</td> </tr> <tr> <td>FD20-24-W6-XXX.XXX-CXX-HSX</td> <td>5.00</td> </tr> </tbody> </table>	Model No.	Resolution (Pulses/mm)	FD20-24-A3-XXX.XXX-CXX- HSX	10.00	FD20-24-A4-XXX.XXX-CXX- HSX	7.50	FD20-24-A8-XXX.XXX-CXX- HSX	3.75	FD20-24-AC-XXX.XXX-CXX- HSX	2.50	FD20-24-K4-XXX.XXX-CXX- HSX	7.50	FD20-24-K8-XXX.XXX-CXX- HSX	3.75	FD20-24-KC-XXX.XXX-CXX- HSX	2.50	FD20-24-N6-XXX.XXX-CXX- HSX	5.00	FD20-24-W6-XXX.XXX-CXX- HSX	5.00
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FD20-24-N6-XXX.XXX-CXX- HSX	5.00																					
FD20-24-W6-XXX.XXX-CXX- HSX	5.00																					
Hall 2 output																						
	GND																					

B. Connecting control devices that DO NOT provide power

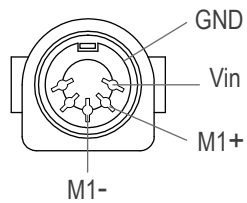
1. Cable solution

- With direct-cut power cable DL1



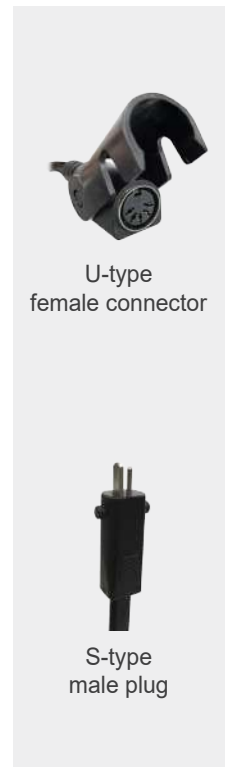
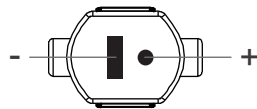
2. Hand control connector: Moteck U-type DIN 5-pin female connector

- 1 drive



Note: Connect M1+ to "Vdc +" & M1- to "Vdc -" of DC power to extend the M1 actuator. Switch the polarity of DC input to retract it.

3. Power connector: Moteck S-type DIN 41529 2-pin male plug




Cable with Flying Leads

- Basic, without positioning feedback.

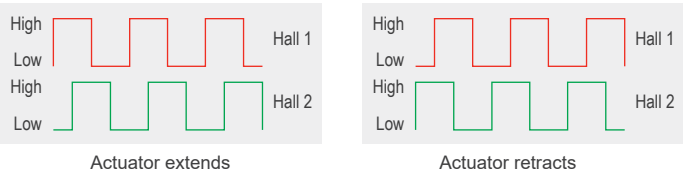
	Wire color	Definition	Descriptions
Power wires	White	DC Power	Connect white wire to "Vdc +" & black wire to "Vdc -" of DC power to extend the actuator. Switch the polarity of DC input to retract it.
	Black		

- With single Hall effect sensor for positioning

	Wire color	Definitions	Descriptions
Power wires	Blue	DC Power	Connect blue wire to "Vdc +" & brown wire to "Vdc -" of DC power to extend the actuator. Switch the polarity of DC input to retract it.
	Brown		
Signal wires	Yellow	Vin	Voltage input range: 5 ~ 20V
	Red	Hall output	High= Input - 1.2V ($\pm 0.6V$) Low= GND Hall signal data:
			
			Hall effect sensor resolution:
Black	GND		

Model No.	Resolution (Pulses/mm)
FD20-24-A3-XXX.XXX-CXX- HS1	10.00
FD20-24-A4-XXX.XXX-CXX- HS1	7.50
FD20-24-A8-XXX.XXX-CXX- HS1	3.75
FD20-24-AC-XXX.XXX-CXX- HS1	2.50
FD20-24-K4-XXX.XXX-CXX- HS1	7.50
FD20-24-K8-XXX.XXX-CXX- HS1	3.75
FD20-24-KC-XXX.XXX-CXX- HS1	2.50
FD20-24-N6-XXX.XXX-CXX- HS1	5.00
FD20-24-W6-XXX.XXX-CXX- HS1	5.00

• With dual Hall effect sensors for positioning

	Wire color	Definitions	Descriptions																				
Power wires	Blue	DC Power	Connect blue wire to "Vdc +" & brown wire to "Vdc -" of DC power to extend the actuator. Switch the polarity of DC input to retract it.																				
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FD20-24-W6-XXX.XXX-CXX- HS2	5.00																						
Green	Hall 2 output																						
Black	GND																						

Ordering Key

FD20- 24 - A4 - 230 - 330 - C 2 1 - HS2 - PO-BK - 0	
Input voltage	24: 24V DC
Motor and spindle type	A3: 2500rpm / 3mm pitch A4: 2500rpm / 4mm pitch A8: 2500rpm / 8mm pitch AC: 2500rpm / 12mm pitch K4: 2500rpm / 4mm pitch K8: 2500rpm / 8mm pitch KC: 2500rpm / 12mm pitch N6: 4500rpm / 6mm pitch W6: 6000rpm / 6mm pitch
Retracted length (Refer to Page 4)	XXX
Extended length (Refer to Page 4)	XXX
Front connector (Refer to Page 5)	2: Drilled hole 3: Metal slot 4: Plastic solid 6: Plastic slot
Rear connector (Refer to Page 5)	1: Plastic solid, square type 2: Metal slot 4: Plastic solid, round type
Positioning feedback	Blank: None HS1: Hall effect sensor x 1 HS2: Hall effect sensor x 2
Option (Note: Multiple choice is allowed)	Blank: None PO: Mechanical push only extension tube BK: Mechanical brake
Cable length	0: 300mm straight 1: 1000mm straight 2: 450mm with 300mm coiled A: Direct-cut power cable DL1 (Refer to Page 8)