

Orientalmotor

Hybrid Control System α STEP

AR Series

FR Geared Type

DC Input

90 mm (3.54 in.) Frame Size

NEW
PRODUCTS



Specifications & Dimensions Summary

Product Line

● Motor

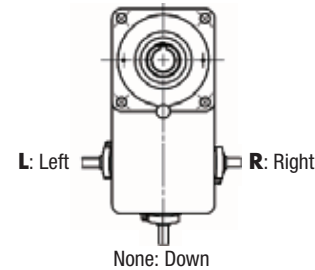
◇ FR Geared Type

ARM 9 8 A K - FR 10 R

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Motor Type	ARM: AR Series Motor
②	Motor Frame Size	9: 90 mm
③	Motor Case Length	
④	Output Shaft Type	A: Single Shaft M: with Electromagnetic Brake
⑤	Motor Type	K: DC Input Specification
⑥	Geared Type	FR: FR Geared Type
⑦	Gear Ratio	
⑧	Cable Outlet Direction*	None: Down R: Right L: Left

*The cable outlet direction is indicated when viewed from the output shaft side of the motor, with the output shaft at the top.



Product Number

● Motor

◇ FR Geared Type

Frame Size	Product Name	List Price
90 mm	ARM98AK-FR10	\$560.00
	ARM98AK-FR10R	\$560.00
	ARM98AK-FR10L	\$560.00
	ARM98AK-FR20	\$560.00
	ARM98AK-FR20R	\$560.00
	ARM98AK-FR20L	\$560.00
	ARM98AK-FR30	\$572.00
	ARM98AK-FR30R	\$572.00
	ARM98AK-FR30L	\$572.00
	ARM98AK-FR50	\$572.00
	ARM98AK-FR50R	\$572.00
	ARM98AK-FR50L	\$572.00

◇ FR Geared Type with Electromagnetic Brake

Frame Size	Product Name	List Price
90 mm	ARM98MK-FR10	\$790.00
	ARM98MK-FR10R	\$790.00
	ARM98MK-FR10L	\$790.00
	ARM98MK-FR20	\$790.00
	ARM98MK-FR20R	\$790.00
	ARM98MK-FR20L	\$790.00
	ARM98MK-FR30	\$802.00
	ARM98MK-FR30R	\$802.00
	ARM98MK-FR30L	\$802.00
	ARM98MK-FR50	\$802.00
	ARM98MK-FR50R	\$802.00
	ARM98MK-FR50L	\$802.00

Included Items

- Surge Suppressor (Electromagnetic brake type only).....QTY: 1
- Hexagonal Socket Head Screws for Mounting
 - Parallel Key.....QTY: 1
 - Bolts, Hexagonal Nuts, Flat Washer, Spring Washer.....QTY: 4 of each
- Safety Cover.....QTY: 1
- Safety Cover Installation Screws (M3).....QTY: 2
- APPENDIX UL Standards for
 - AR Series DC power input type**.....QTY: 1

For details on Drivers, Cables and System Configurations, visit www.orientalmotor.com, the **AR Series Closed Loop Stepper Motor Drivers (DC Input)**.

Specifications



Motor Product Name	Single Shaft	ARM98AK-FR10	ARM98AK-FR20	ARM98AK-FR30	ARM98AK-FR50	
	with Electromagnetic Brake	ARM98MK-FR10	ARM98MK-FR20	ARM98MK-FR30	ARM98MK-FR50	
Driver Product Name	Built-in Controller	ARD-KD				
	Pulse Input	ARD-K				
Maximum Holding Torque	N-m (lb-in)	14 (123)	28 (247)	42 (371)	50 (442)	
Rotor Inertia	J: kg·m ² (oz-in ²)	1100×10 ⁻⁷ (6) [1220×10 ⁻⁷ (6.7)]*1				
Gear Ratio		10	20	30	50	
Resolution	Resolution setting: 1000 P/R	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse	0.0072°/Pulse	
Permissible Torque	N-m (lb-in)	14 (123)	28 (247)	42 (371)	50 (442)	
Maximum Instantaneous Torque	N-m (lb-in)	20 (177)	40 (354)	60 (531)	68 (601)	
Holding Torque at Motor Standstill	Power ON	N-m (lb-in)	10 (88)	20 (177)	30 (265)	50 (442)
	Electromagnetic Brake	N-m (lb-in)	10 (88)	20 (177)	30 (265)	50 (442)
Speed Range	r/min	0~200	0~100	0~66	0~40	
Power Supply Input	Voltage	24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3				
	Input Current	A	2.5 (3.1)*2			
Electromagnetic Brake*4	Power Supply Input	24 VDC±5%*5 0.25A				

● A letter indicating the cable outlet direction (**R**: right, **L**: left) is specified where the box □ is located in the product name. No letter is entered in the box □ if the outlet direction is down.

*1 The brackets [] indicate the value including electromagnetic brake inertia.

*2 The parentheses () indicate the specifications for the built-in controller type.

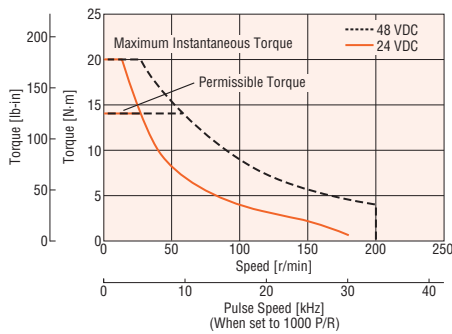
*3 When the motor is operated from 48 VDC input, as a reference, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

*4 For the pulse input type, a separate power supply for the electromagnetic brake is also required.

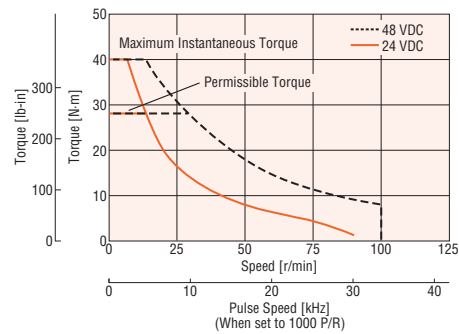
*5 For the electromagnetic brake type, the 24 VDC±4% specification applies if the cable is extended to 20~30 m (65.6~98.5 ft.).

Speed – Torque Characteristics (Reference Values)

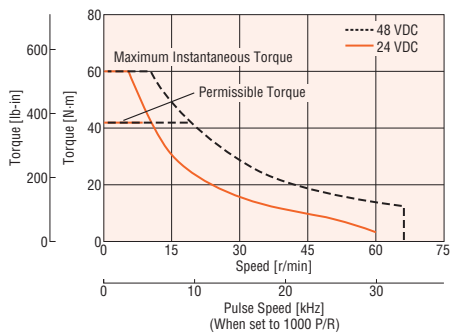
ARM98 Gear Ratio 10



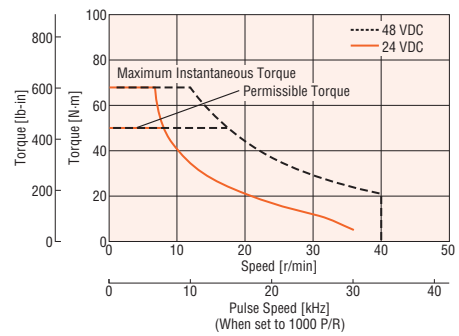
ARM98 Gear Ratio 20



ARM98 Gear Ratio 30



ARM98 Gear Ratio 50



Note

● Data for the speed – torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) or less.

(When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C (167°F) or less, since the motor is recognized as heat-resistant class A.)

Specifications

	Motor	Driver	
		Built-in Controller Type	Pulse Input Type
Thermal Class	130 (B) [UL 105 (A) certified]	-	
Insulation Resistance	100 MΩ or more when a 500 VDC megger is applied between the following places: -Case-Motor and Sensor Windings -Case-Electromagnetic Brake Windings	100 MΩ or more when a 500 VDC megger is applied between the following places: -FG Terminal-Power Input Terminal	-
Dielectric Strength	Sufficient to withstand the following for 1 minute: -Between the case and motor sensor windings: 1.0 kVAC, 50 Hz or 60 Hz -Between the case and electromagnetic brake windings: 1.0 kVAC, 50 Hz or 60 Hz	Sufficient to withstand the following for 1 minute: -FG Terminal-Power Input Terminal 500 VAC, 50 Hz or 60 Hz	-
Operating Environment (In operation)	Ambient Temperature	0~+50°C (32~+122°F) (Non-freezing)*	
	Ambient Humidity	85% or less (Non-condensing)	
	Atmosphere	No corrosive gases or dust. The product should not be exposed to water, oil or other liquids.	
Degree of Protection	IP65	IP10	IP20

*When a heat sink of a capacity at least equivalent to an aluminum plate with a size of 100×100 mm and 6 mm (3.94×3.94 in. and 0.24 in.) thickness.

Note

●When measuring insulation resistance or dielectric strength, please isolate the motor and driver.

Permissible Radial Load and Permissible Axial Load

Unit: N (lbs)

Frame Size	Product Name	Gear Ratio	Permissible Radial Load		Permissible Axial Load
			Distance (mm) from Installation Surface		
			10	20	
90 mm	ARM98	10	900 (202)	770 (173)	500 (112)
		20	1300 (292)	1110 (249)	
		30	1500 (337)	1280 (287)	
		50	1500 (337)	1280 (287)	

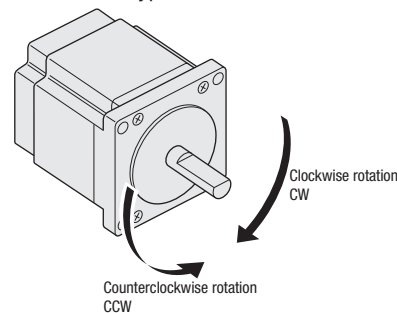
Rotation Direction

This indicates the rotation direction when viewed from the output shaft side of the motor.

Please check the following table for the rotation direction of the output gear shaft relative to the standard type motor output shaft.

Type	Gear Ratio	The rotation direction when viewed from the output shaft side of the motor
FR Geared Type	All Gear Ratios	Reverse Direction

●Standard Type Motor



Driver Specifications

RS-485 Communication Specifications

Electromagnetic Brake Specifications

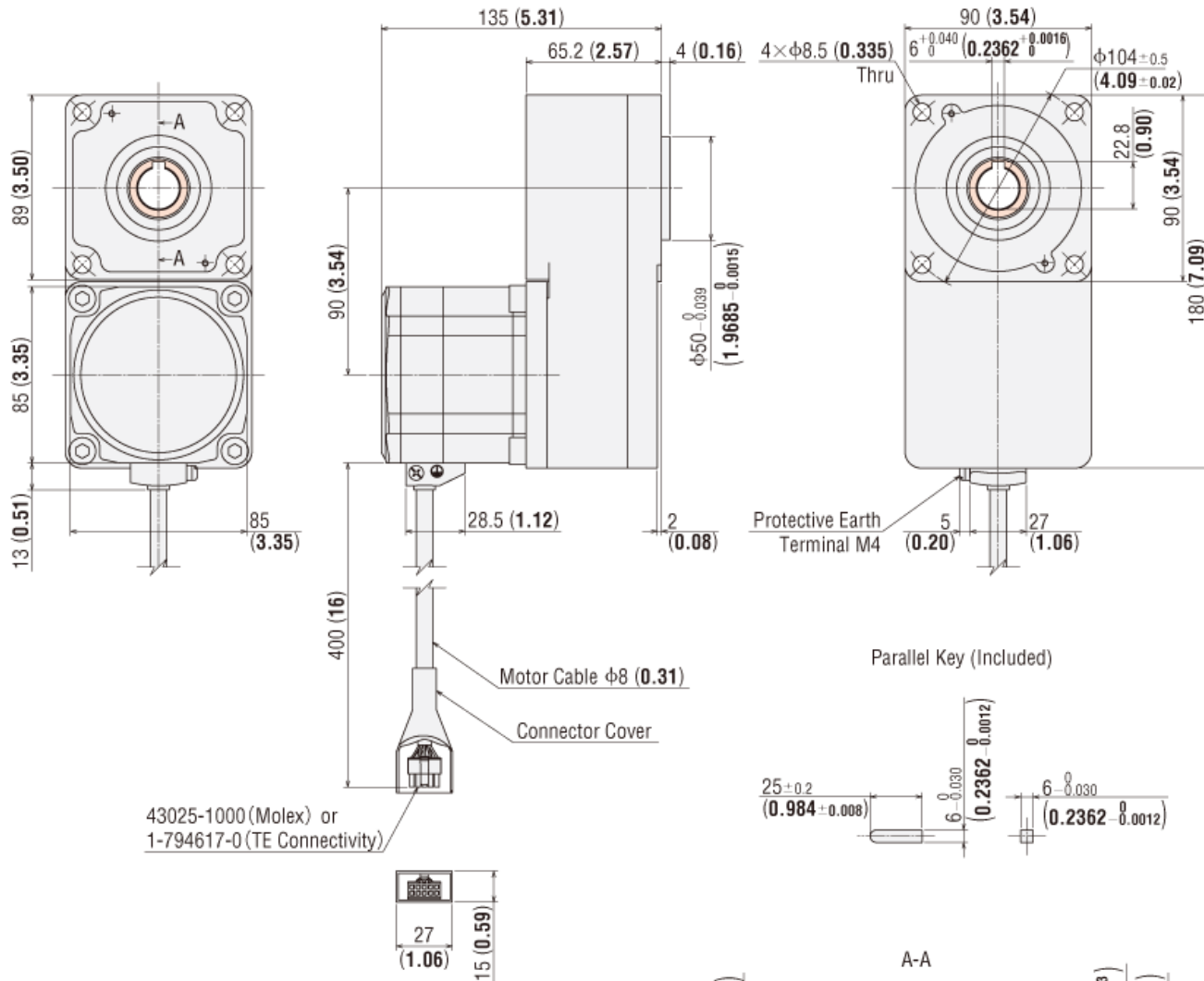
Load Torque –Driver Input Current Characteristics

Same as **ARM98**. Please refer to the **AR** Series DC input at www.orientalmotor.com.

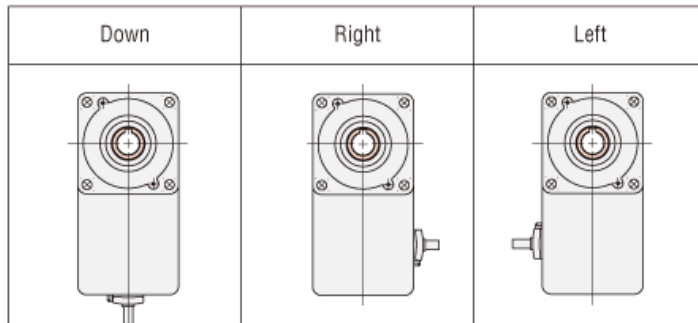
Dimensions Unit = mm (in.)

FR Geared Type

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg (lbs)
Down	ARM98AK-FR□	10, 20 30, 50	3.8 (8.4)
Right	ARM98AK-FR□R		
Left	ARM98AK-FR□L		

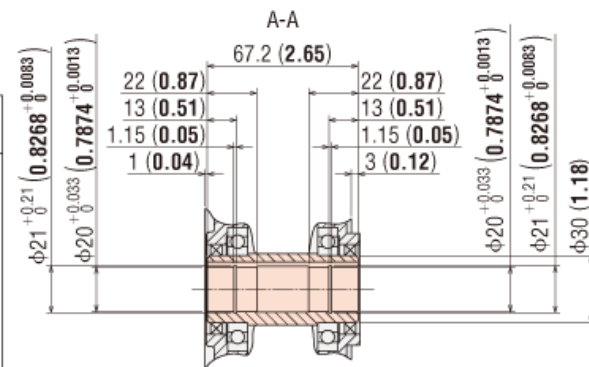


● Cable leading direction



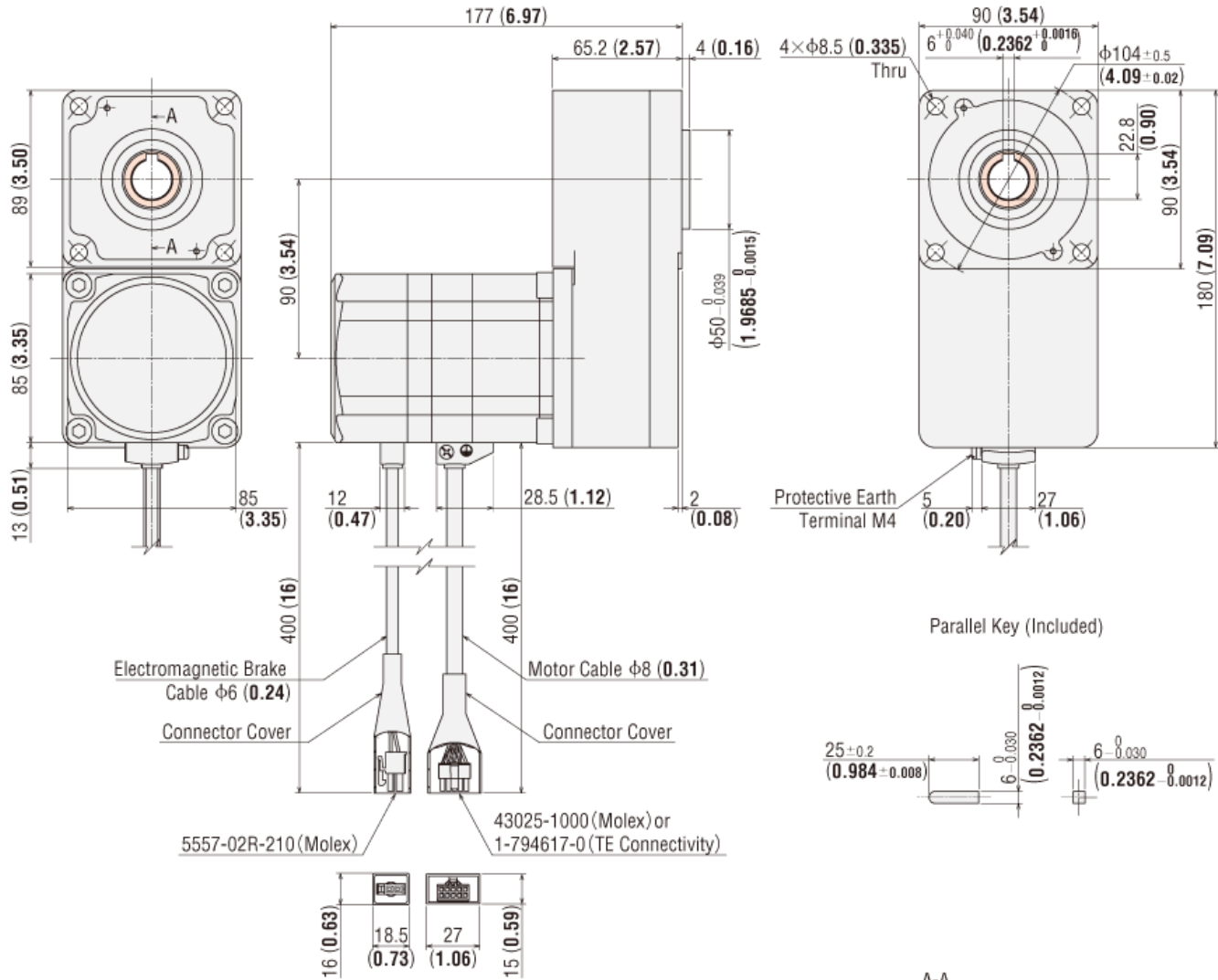
● The shaded areas are rotating parts.

● A number indicating the gear ratio is entered where the box ■ is located within the product name.

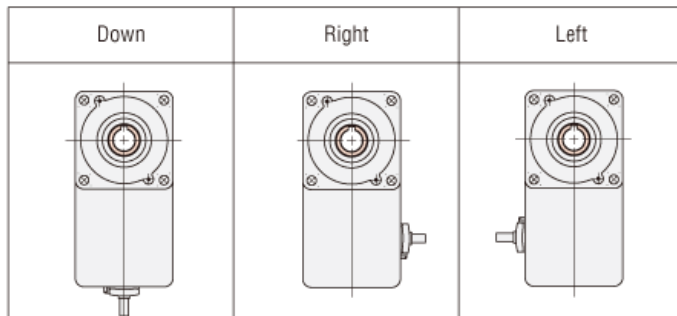


◇FR Geared Type with Electromagnetic Brake

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg (lbs)
Down	ARM98MK-FR □	10, 20 30, 50	4.2 (9.3)
Right	ARM98MK-FR □ R		
Left	ARM98MK-FR □ L		



● Cable leading direction



- The shaded areas are rotating parts.
- A number indicating the gear ratio is entered where the box ■ is located within the product name.

