

Hybrid Stepper Servo α STEP **AZ Series** with Neugart Gearheads

- High-Efficiency Closed Loop Combination with Neugart Planetary Gearheads
- Motor and Gearhead are Pre-assembled
- Ø40 - Ø80 mm up to 150 Nm



Planetary
Gearheads
Pre-assembled

Gearhead Features

Pre-assembled Motor and Gearhead



PLE & PLN Features

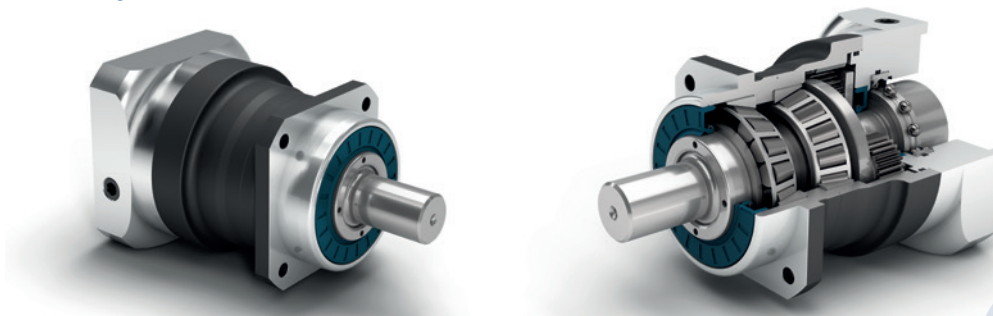
PLE Planetary



PLE Series employs optimized planetary gear mechanism and is composed of fully hardened gears. Sun gear and planetary gears are honed (precision final machining after heat treatment). This technology guarantees extremely high torque density, long life, low backlash, and so on.

- Low Backlash
- High Output Torque
Max. 150 Nm

PLN Planetary



PLN Series is high precision planetary gearhead for applications with very high precision requirements. Whether high torque density, minimal transmission error, low operating noise, lowest backlash or exceptional reliability... – the **PLN** series satisfies all these requirements in every application.

- Minimal Backlash
3 – 5 min
- High Output Torque
Max. 150 Nm

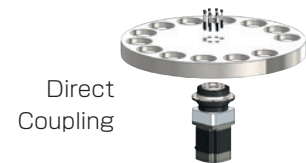
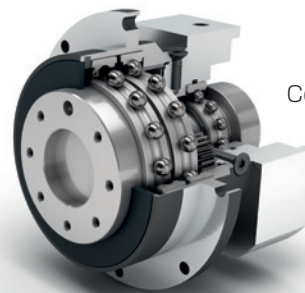
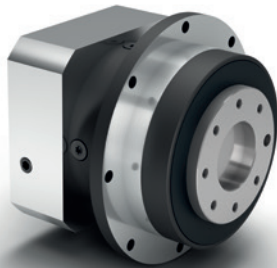
Gearhead Features

Pre-assembled Motor and Gearhead

PLFE & WPLE Features



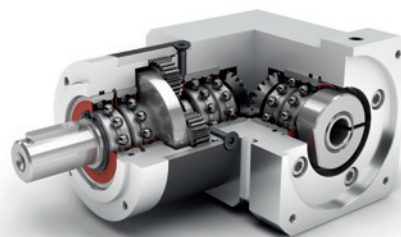
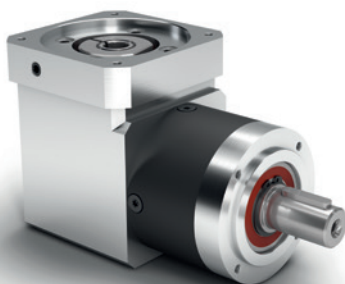
PLFE Planetary



PLFE Series employs optimized planetary gear mechanism and is composed of fully hardened gears. Equipment tables and arms can be installed directly on the output flange. This saves you the hassle and cost of designing an installation mechanism, arranging necessary mechanism parts, adjusting the belt tension, etc., when mechanical components such as a belt and pulley are used for installation.

- Flange Gearhead
- Low Backlash
- High Output Torque
Max. 150 Nm

WPLE Right Angle Planetary



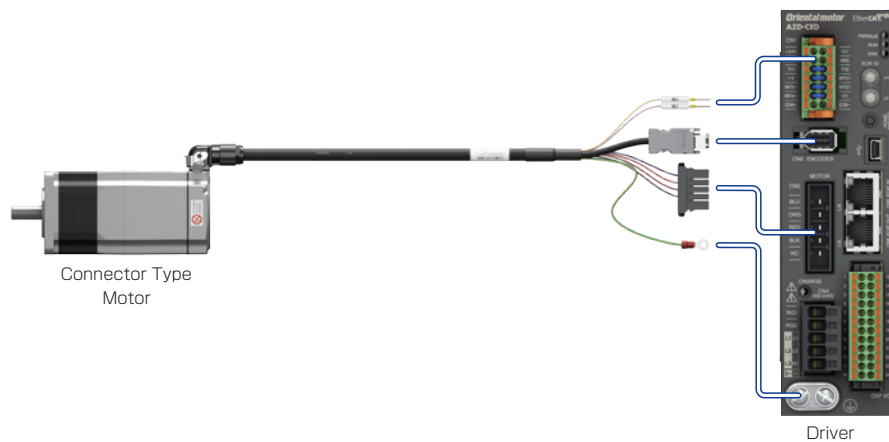
WPLE Series is the right angle gearhead of PLE series. This bevel gear was designed especially for space-saving installation in a right-angle position of the motor/gearbox combination. This provides solutions for a compact machine mechanism.

- Right Angle Planetary Gear
- Low Backlash
- High Output Torque
Max. 140 Nm

Direct Connection of Motor and Driver

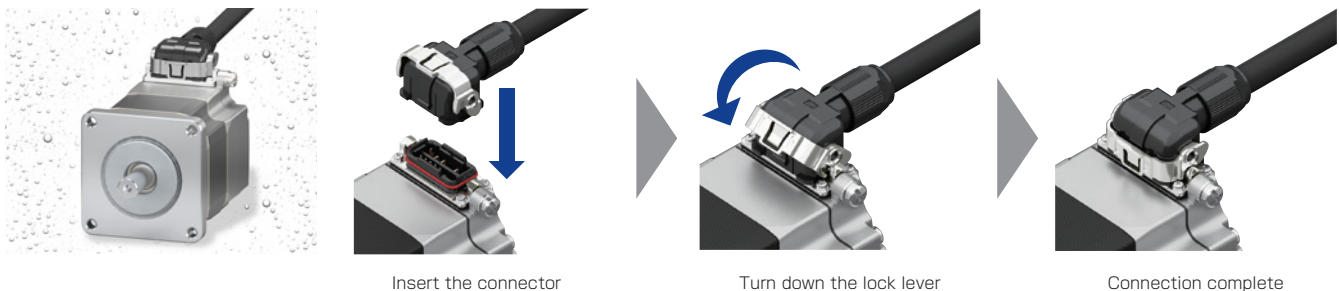
Without an extension cable, a connection of up to 10 m is possible. No extension cable is required.

The wiring process is more efficient thanks to the power line, signal line, electromagnetic brake line and ground wire all being consolidated into one cable.



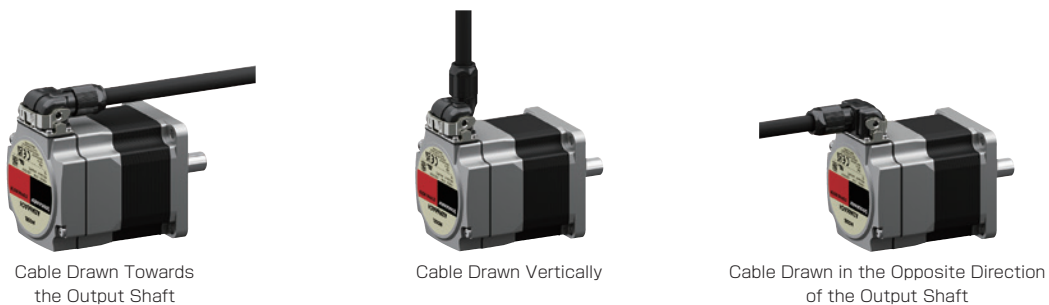
Lock Lever Connector with IP66 Specification

Connecting the cable is easy due to the lock lever that does not require screws.



Lock Lever Connector with IP66 Specification

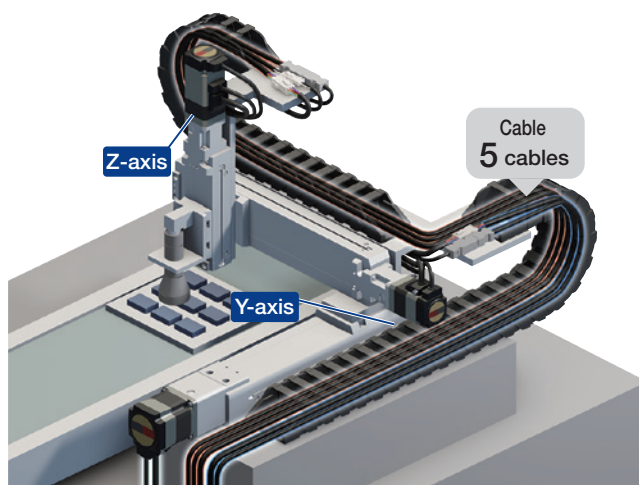
Select from three cable outlet directions. This increases the degree of cable outlet freedom around the motor.



Use of a Single Cable Reduces Routing Work and Smaller Cable Holders

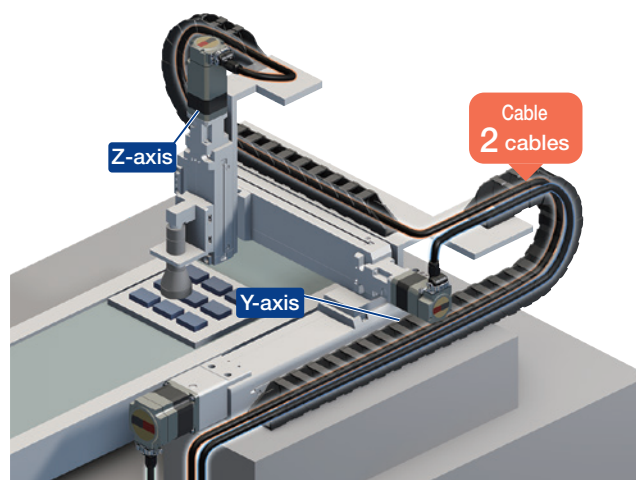
● Conventional Product (Cable type)

Z-axis (Electromagnetic brake motor): 3 cables
Y-axis (Standard motor): 2 cables



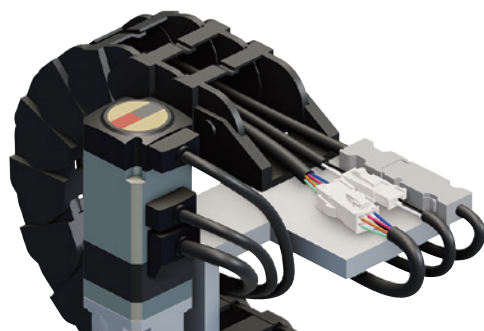
● Connector Type

Z-axis (Electromagnetic brake motor): 1 cable
Y-axis (Standard motor): 1 cable

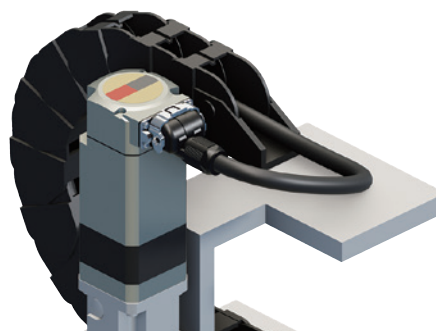


Direct Connection Leads to Quicker Replacement of Motors and Cables

● Conventional Product (Cable type)



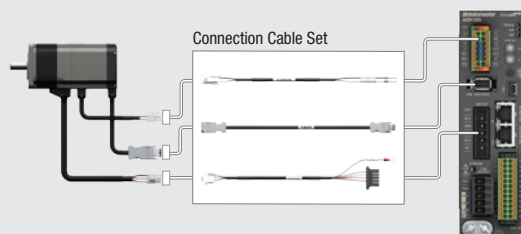
● Connector Type



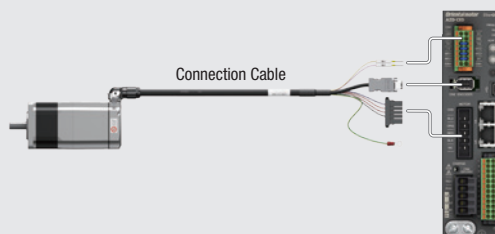
Reference: Comparison of Connection Cable Diameters, Cross-Section Areas and Masses

For electromagnetic brake motor, single-axis driver and flexible connection cable (5 m in length)

● Cable Type



● Connector Type



	Cable Type (3 cables*)	Connector Type (1 cable)
Diameter [mm]	• Ø8 for motors • Ø6 for electromagnetic brakes • Ø6.5 for encoders	Ø8.9
Cross-Sectional Area [mm ²]	111.7	62.2
	44.3% reduction	
Mass [kg]	1.19	0.53
	55.5% reduction	

*3 cables: one for motor, one for encoder and one for electromagnetic brake

Single-Axis Drivers

Network Compatible Driver

The driver can be controlled directly from the host control device via the FA network.

EtherCAT[®]
EtherNet/IP[®]
PROFI
NET
MECHATROLINK
SSCNET III/H
Modbus (RTU)



AC Input



DC Input

Built-In Positioning Function Type

Set the positioning data in the driver (256 points). Capable of FA network control when a network converter (sold separately) is used.

Modbus (RTU)



AC Input



DC Input

Pulse Input Type with RS-485 Communication

Control the motor from a positioning module (pulse generator). Monitor the motor's position, speed, torque, alarms and temperature via RS-485 communication.



AC Input



DC Input

Pulse Input Type

The motor is controlled from the positioning module (pulse generator).



AC Input



DC Input

mini Drivers

More compact and lightweight than single-axis drivers. They are also compatible with FA network.



Ethernet Type
Modbus (TCP, UDP)



Network Compatible
EtherCAT[®] EtherNet/IP[®] PROFI
NET



RS-485 Communication Type
Modbus (RTU)



Pulse Input Type with
RS-485 Communication

Connection Cables/Flexible Connection Cables

Use a flexible connection cable in applications where the cable is bent and flexed.



Single-Axis Driver for AC Input
(1 to 10 m)



Single-Axis Driver for DC Input
(0.5 to 10 m)



For mini Driver
(0.2 to 10 m)

- EtherCAT[®] is a patented technology licensed from Beckhoff Automation GmbH (Germany) and is a registered trademark of that company.
- EtherNet/IP[®] is a registered trademark of ODVA, MECHATROLINK is a registered trademark of MECHATROLINK Members Association, [CC-Link] is a registered trademark of CC-Link Partner Association, and Modbus (RTU) is a registered trademark of Schneider Automation Inc.
- PROFI NET is a registered trademark or trademark of PROFIBUS Nutzerorganisation e.V.(PNO) and SSCNET III/H is a registered trademark or trademark of Mitsubishi Electric Corporation.

What is FLEX?

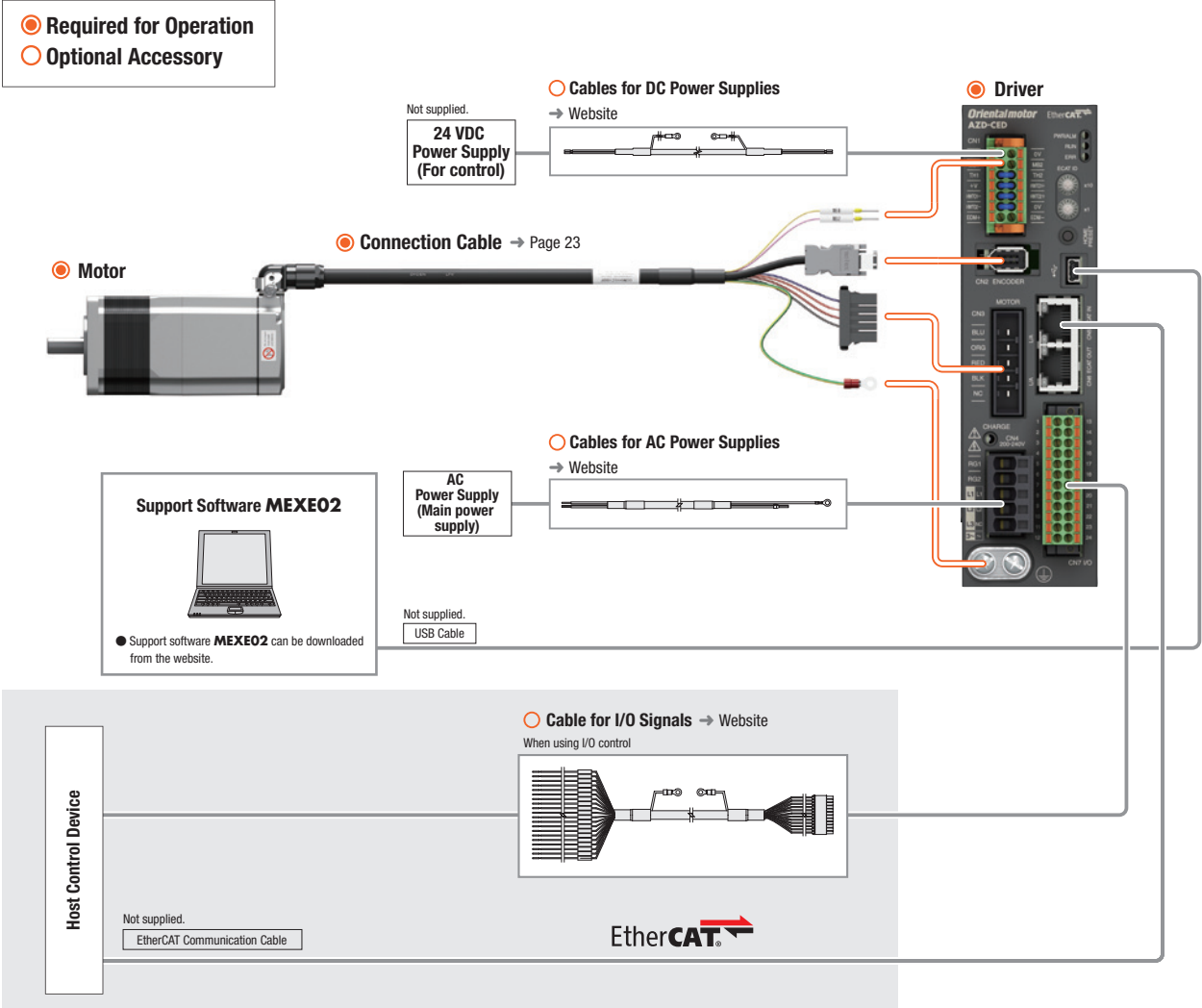
FLEX is the collective name for products that support I/O control, Modbus (RTU) control and FA network control via network converters.

αSTEP
AZ Series AC Input Connector Type

System Configuration

Combination of Connector Type Electromagnetic Brake Motor and Network-Compatible Driver

An example of a configuration using I/O control with EtherCAT-compatible driver or EtherCAT is shown below.
Motors, drivers, and connection cables/flexible connection cables must be ordered individually.



Example of System Configuration

Motor		Driver		Cable	
Cable Outlet Direction Output Shaft Side (1 m)		I/O Signal Cable Connector Type (1 m)			
CCM010Z1BFF		CC24D010C-1			

The system configuration shown above is an example. Other combinations are also available.

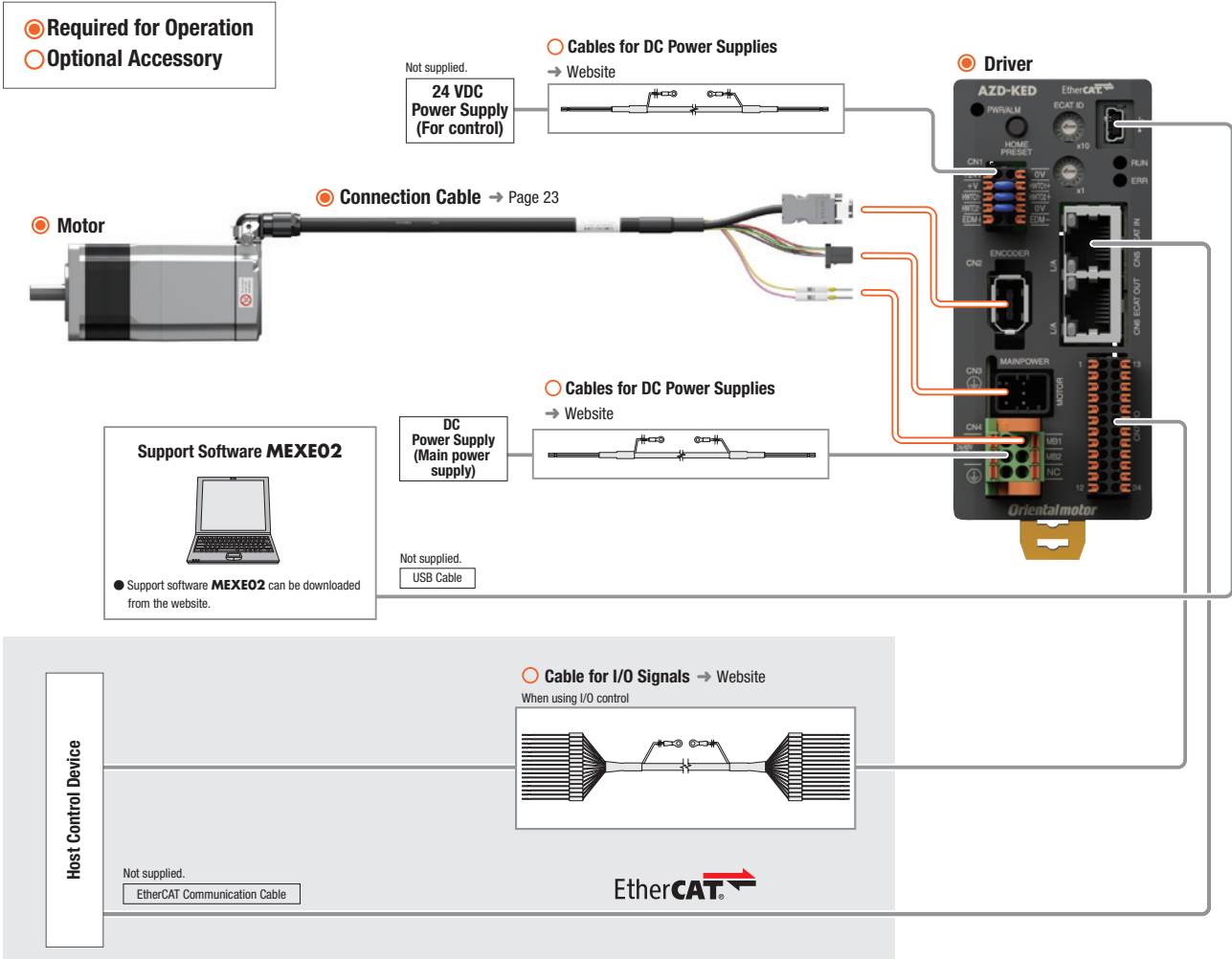
αSTEP
AZ Series DC Input Connector Type

System Configuration

Combination of Connector Type Electromagnetic Brake Motor and Network-Compatible Driver

An example of a configuration using I/O control with EtherCAT-compatible driver or EtherCAT is shown below.

Motors, drivers, and connection cables/flexible connection cables must be ordered individually.



Example of System Configuration

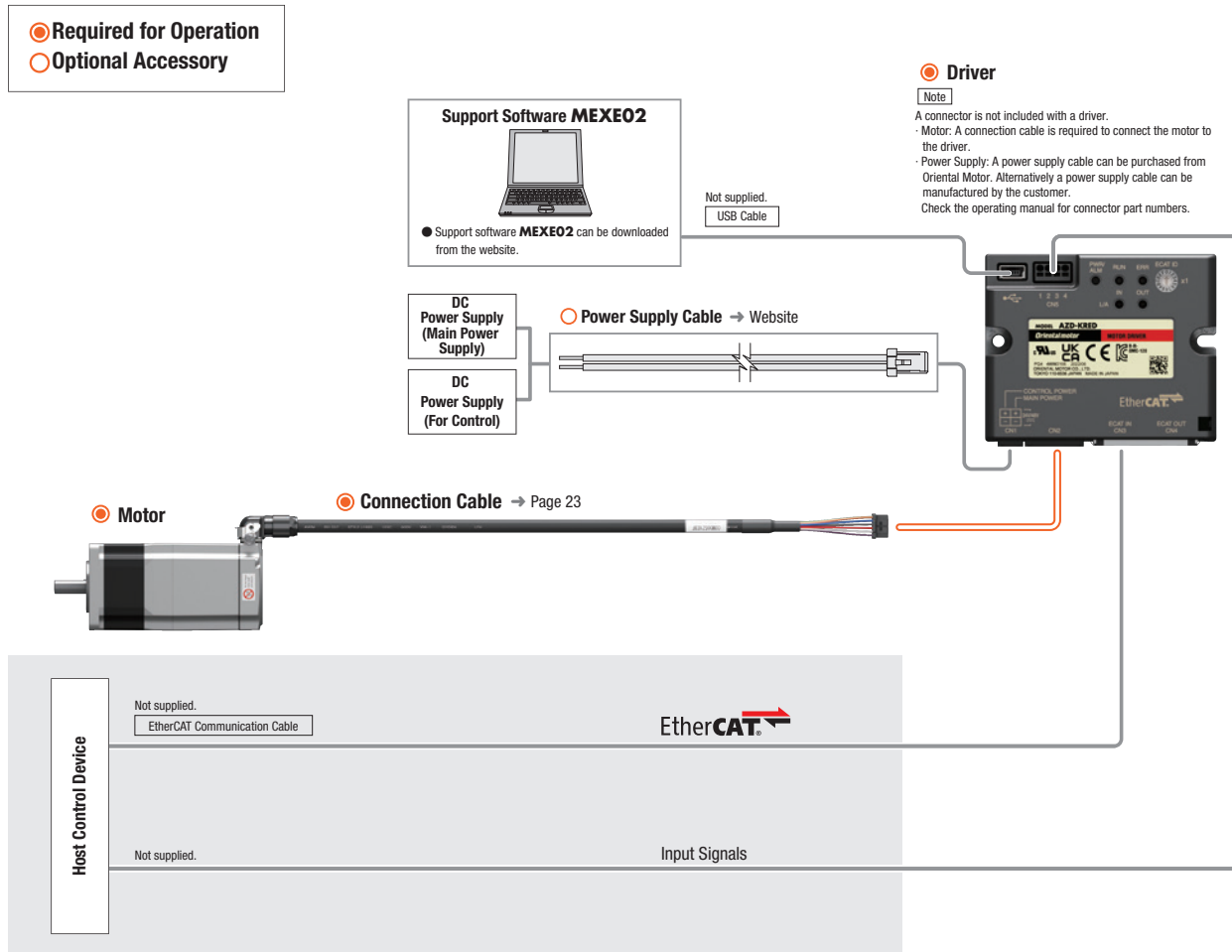
Motor		Driver		Cable	
				Connection Cable Cable Outlet Direction Output Shaft Side (1 m)	I/O Signal Cable General Purpose Type (1 m)
AZM66MKH		AZD-KED		CCM010Z1DFF	CC16D010B-1
○		○		○	○

● The system configuration shown above is an example. Other combinations are also available.

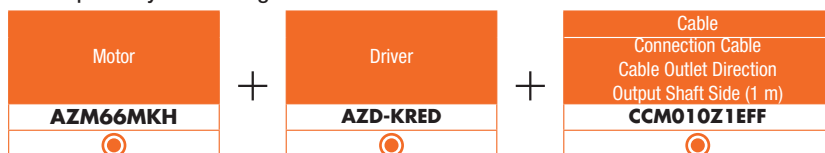
● Combination of Connector Type Electromagnetic Brake Motor and mini Driver Network-Compatible Driver

An example of a configuration using I/O control with EtherCAT-compatible driver or EtherCAT is shown below.

Motors, drivers, and connection cables/flexible connection cables must be ordered individually.



● Example of System Configuration



● The system configuration shown above is an example. Other combinations are also available.

Product Number

- Motor
- ◇ Standard

AZM 6 9 A C H

① ② ③ ④ ⑤ ⑥

◇ Motor with **PLE, PLN** or **PLFE**, Neugart Gearhead

AZM 6 9 A C H - PLN 70 - 10

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

◇ Motor with **WPLE** Neugart Gearhead

AZM 6 9 A C H - WPLE 60 - 10 - D

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①	Motor	AZM: AZ Series Motor	
②	Motor Frame Size	4: 42 mm 6: 60 mm 9: 85 mm	
③	Motor Case Length		
④	Configuration	A: Single Shaft M: With Electromagnetic Brake* ¹	
⑤	Winding Type	C: AC Power Supply Input Specifications K: DC Power Supply Input Specifications	
⑥	Motor Connection Method	H: Connector Type	
⑦	Geared Type	PLE: PLE Series PLN: PLN Series PLFE: PLFE Series	
⑧	Gear Size	40: PLE40 70: PLN70 64: PLFE64	60: PLE60 90: PLN90* ² 90: PLFE90
⑨	Gear Ratio	5, 10, 20, 40	

*¹ Only for the motor size of 46/69. See product line.

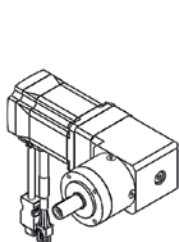
*² Only for gear ratio 40. See product line.

①	Motor	AZM: AZ Series Motor	
②	Motor Frame Size	6: 60 mm 9: 85 mm	
③	Motor Case Length		
④	Configuration	A: Single Shaft M: With Electromagnetic Brake* ¹	
⑤	Winding Type	C: Single-Phase 200-240 VAC K: 24/48 VDC Input* ¹	
⑥	Motor Connection Method	H: Connector Type	
⑦	Geared Type	WPLE: WPLE Series	
⑧	Gear Size	60: WPLE60	80: WPLE80
⑨	Gear Ratio	5, 10, 20, 40	
⑩	Cable Direction* ²	D: Down, U: Up, R: Right, L: Left	

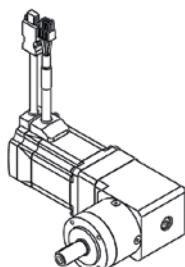
*¹ Only for the motor size of 69. See product line.

*² See diagram (Cable direction) on the bottom.

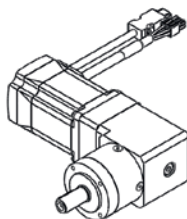
● Cable Direction – Only for **WPLE** Neugart geared type.



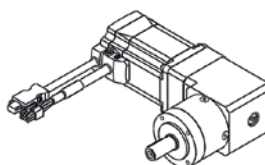
D: Down



U: Up



R: Right



L: Left

● Driver

AZD - C D

① ② ③

①	Driver Type	AZD: AZ Series
②	Power Supply Input	K: 24/48 VDC C: Single-Phase, Three-Phase 200-240 VAC*
③	Type	Blank: Pulse Input D: Built-in Controller X: Pulse Input with RS-485 Communication ED: With EtherCAT interface EP: With Ethernet/IP interface PN: With PROFINET interface

*¹ WARNING: The **AZ** Series is not suitable for operation on 3 × 400 VAC.

AZD - K R 2 D

① ② ③ ④ ⑤

①	Driver Type	AZD: AZ Series Driver
②	Power Supply Input	K: 24 VDC/48 VDC
③	Driver Figure	R: Compact
④	Reference Number	
⑤	Type	ED: EtherCAT Drive Profile-Compatible EP: EtherNet/IP PN: PROFINET EN: Ethernet Type D: RS-485 Communication Type X: Pulse Input Type with RS-485 Communication

● Connection Cables/Flexible Connection Cables

CCM 010 Z1 A F F

① ② ③ ④ ⑤ ⑥

For AC Input Motors/Drivers

①		CCM: Cable
②	Length	010: 1 m, 020: 2 m, 030: 3 m, 050: 5 m, 070: 7 m, 100: 10 m
③	Applicable Model	Z1: AZ Series Connector Type
④	Description	A: AC Input for Motor/Encoder B: AC Input For Motor/Encoder/ Electromagnetic Brake Type
⑤	Cable Outlet Direction*	F: Output Shaft Direction V: Vertical B: Opposite to Output Shaft Direction
⑥	Cable Type	F: Connection Cable R: Flexible Connection Cable

*Three types of the connection cables with different cable outlet directions are available.
Please select the cable outlet direction needed for the installation.



F: Output Shaft Direction



V: Vertical



B: Opposite to Output Shaft Direction

CCM 010 Z1 C F F

① ② ③ ④ ⑤ ⑥

For DC Input Motors/Drivers

①		CCM: Cable
②	Length	002: 0.2 m, 005: 0.5 m, 010: 1 m, 020: 2 m, 030: 3 m, 050: 5 m, 070: 7 m, 100: 10 m
③	Applicable Model	Z1: AZ Series Connector Type
④	Description	C: Single-Axis Driver for DC Input (For motor/encoder) D: Single-Axis Driver for DC Input (For motor/encoder/type with an electromagnetic brake) E: For mini Driver
⑤	Cable Outlet Direction*	F: Output Shaft Direction V: Vertical B: Opposite to Output Shaft Direction
⑥	Cable Type	F: Connection Cable R: Flexible Connection Cable

*Three types of the connection cables with different cable outlet directions are available.
Please select the cable outlet direction needed for the installation.



F: Output Shaft Direction



V: Vertical



B: Opposite to Output Shaft Direction

Product Line

◇ PLE Geared (AC Power Supply Input)

Product Name	Gear Ratio
AZM46ACH-PLE40- □	5, 10 20, 40
AZM48ACH-PLE40- □	5, 10 20, 40
AZM69ACH-PLE60- □	5, 10 20, 40
AZM911ACH-PLE80- □	5, 10 20, 40

◇ PLE Geared (DC Power Supply Input)

Product Name	Gear Ratio
AZM46AKH-PLE40- □	5, 10 20, 40
AZM48AKH-PLE40- □	5, 10 20, 40
AZM69AKH-PLE60- □	5, 10 20, 40

◇ PLN Geared (AC Power Supply Input)

Product Name	Gear Ratio
AZM69ACH-PLN70- □	5, 10 20, 40
AZM911ACH-PLN70- □	5, 10 20
AZM911ACH-PLN90- □	40

◇ PLN Geared (DC Power Supply Input)

Product Name	Gear Ratio
AZM69AKH-PLN70- □	5, 10 20, 40

◇ PLFE Geared (AC Power Supply Input)

Product Name	Gear Ratio
AZM69ACH-PLFE64- □	5, 10 20, 40
AZM911ACH-PLFE90- □	5, 10 20, 40

◇ PLFE Geared (DC Power Supply Input)

Product Name	Gear Ratio
AZM69AKH-PLFE64- □	5, 10 20, 40

◇ WPLE Geared (AC Power Supply Input)

Product Name	Gear Ratio
AZM69ACH-WPLE60- □-◇	5, 10 20, 40
AZM911ACH-WPLE80- □-◇	5, 10 20, 40

◇ WPLE Geared (DC Power Supply Input)

Product Name	Gear Ratio
AZM69AKH-WPLE60- □-◇	5, 10 20, 40

◇ PLE Geared (AC Power Supply Input) with Electromagnetic Brake

Product Name	Gear Ratio
AZM46MCH-PLE40- □	5, 10 20, 40
AZM69MCH-PLE60- □	5, 10 20, 40

◇ PLE Geared (DC Power Supply Input) with Electromagnetic Brake

Product Name	Gear Ratio
AZM46MKH-PLE40- □	5, 10 20, 40
AZM69MKH-PLE60- □	5, 10 20, 40

◇ PLN Geared (AC Power Supply Input) with Electromagnetic Brake

Product Name	Gear Ratio
AZM69MCH-PLN70- □	5, 10 20, 40

◇ PLN Geared (AC Power Supply Input) with Electromagnetic Brake

Product Name	Gear Ratio
AZM69MKH-PLN70- □	5, 10 20, 40

◇ PLFE Geared (AC Power Supply Input) with Electromagnetic Brake

Product Name	Gear Ratio
AZM69MCH-PLFE64- □	5, 10 20, 40

◇ PLFE Geared (AC Power Supply Input) with Electromagnetic Brake

Product Name	Gear Ratio
AZM69MKH-PLFE64- □	5, 10 20, 40

◇ WPLE Geared (AC Power Supply Input) with Electromagnetic Brake

Product Name	Gear Ratio
AZM69MCH-WPLE60- □-◇	5, 10 20, 40

◇ WPLE Geared (DC Power Supply Input) with Electromagnetic Brake

Product Name	Gear Ratio
AZM69MKH-WPLE60- □-◇	5, 10 20, 40

3D CAD

3D data for all combination are available.
Please contact your nearest Oriental Moto sales office.
Or please contact us via: tech-support@orientalmotor.de

- A number indicating the gear ratio is entered where the box □ is located in the product name.
- Cable direction is entered where the box ◇ is located in the product name.

Product Line (200-240 VAC)

Stepper Motor

Standard



Frame Size	Product Name
42 mm	AZM46ACH
60 mm	AZM48ACH
60 mm	AZM69ACH
85 mm	AZM911ACH

Standard with Electromagnetic Brake



Frame Size	Product Name
42 mm	AZM46MCH
60 mm	AZM69MCH

Driver



Type	Power Supply Input	Product Name
Pulse-Input	Single-Phase 200-240 VAC	AZD-C
Built-in Controller		AZD-CD
Pulse Input with RS-485 Communication		AZD-CX

Type	Power Supply Input	Product Name
EtherCAT	Single-Phase 200-240 VAC	AZD-CED
Ethernet/IP		AZD-CEP
PROFINET		AZD-CPN

Product Line (24 VDC / 48 VDC)

Stepper Motor

Standard



Frame Size	Product Name
42 mm	AZM46AKH
60 mm	AZM48AKH
60 mm	AZM69AKH

Standard with Electromagnetic Brake



Frame Size	Product Name
42 mm	AZM46MKH
60 mm	AZM69MKH

Driver



Type	Power Supply Input	Product Name
Pulse-Input	24 VDC / 48 VDC	AZD-K
Built-in Controller		AZD-KD
Pulse Input with RS-485 Communication		AZD-KX

Type	Power Supply Input	Product Name
EtherCAT	24 VDC / 48 VDC	AZD-KED
Ethernet/IP		AZD-KEP
PROFINET		AZD-KPN



Type	Power Supply Input	Product Name
Built-in Controller	24 VDC / 48 VDC	AZD-KR2D
Pulse Input with RS-485 Communication		AZD-KRX



Type	Power Supply Input	Product Name
PROFINET	24 VDC / 48 VDC	AZD-KRPN
EtherCAT		AZD-KRED
Ethernet/IP		AZD-KREP
Ethernet Type		AZD-KREN

Holding Torque

Motor Size	Gear Series	Gear Ratio	Holding Torque at Motor Standstill [Nm]	
			Power ON	Electromagnetic Brake
AZM46/48	PLE	5	0.75 / 1.8	0.75 / —
		10	1.5 / 3.6	1.5 / —
		20	3 / 7.2	3 / —
		40	6 / 14	6 / —
AZM69	PLE/PLN/PLFE/WPLE	5	5	5
		10	10	10
		20	20	20
		40	40	40
AZM911	PLE/PLN/PLFE/WPLE	5	10	—
		10	20	—
		20	40	—
		40	80	—

PLE Geared Type

Specifications

Type	PLE40 ⁽¹⁾				PLE60 ⁽¹⁾				PLE80 ⁽¹⁾			
Stage	1		2		1		2		1		2	
Reduction ratio	5	10	20	40	5	10	20	40	5	10	20	40
Backlash [arcmin]	15		19		10		12		7		9	
Nominal output torque [Nm] ⁽²⁾⁽³⁾	14	5	20	18	40	15	44	40	110	38	120	110
Max. output torque [Nm] ⁽²⁾⁽³⁾⁽⁴⁾	22	8	32	29	64	24	70	64	176	61	192	176
Emergency stop torque [Nm] ⁽⁵⁾	36	27	40	36	80	80	88	80	220	200	240	220
Max. input speed [r/min] ⁽⁶⁾	18000				13000				7000			
Running noise [dB (A)] ⁽⁷⁾	58				58				60			
Permitted radial load for 30000h (Fa=0) [N] ⁽²⁾⁽⁸⁾	160				340				650			
Permitted axial load for 30000h (Fr=0) [N] ⁽²⁾⁽⁹⁾	160				450				900			
Permitted radial load for 20000h (Fa=0) [N] ⁽²⁾⁽⁸⁾	200				400				750			
Permitted axial load for 20000h (Fr=0) [N] ⁽²⁾⁽⁹⁾	200				500				1000			
Degree of protection					IP54							
Lifetime [h]					30000							

(1) These values refer only to the Gearhead. The actual value depends on the motor combination.

(2) These values refer to a speed of the output shaft of $n_2=100$ r/min on duty cycle KA=1 and S1-mode for electrical machines and $T=30^\circ\text{C}$.

(3) With key, at tumescent load.

(4) Allowable for 30000 revolutions at the output shaft.

(5) Allowed 1000 times.

(6) Allowed operating temperature must be kept; other input speeds on inquiry.

(7) Sound pressure level; distance 1 m; measured on idle running with an input speed of $n_1=3000$ r/min, ratio=5.

(8) Half way along the output shaft.

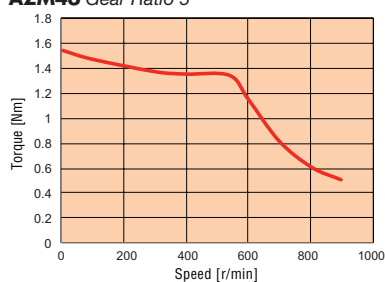
(9) With respect to center of output shaft.

Speed – Torque Characteristics

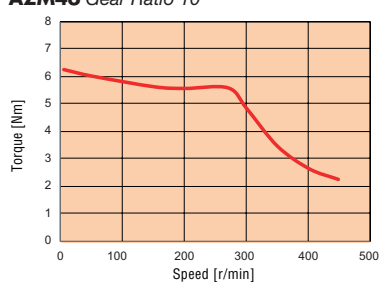
Single-Phase 200-240VAC

◇ AZM46ACH-PLE40 / AZM46MCH-PLE40 (Reference value)*

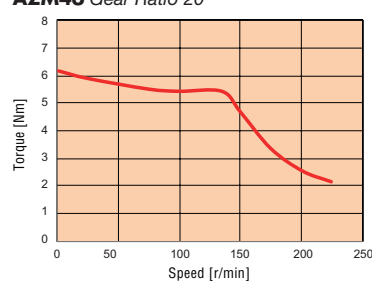
AZM46 Gear Ratio 5



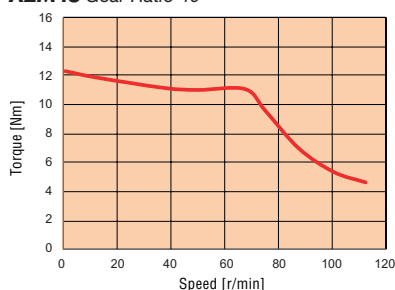
AZM46 Gear Ratio 10



AZM46 Gear Ratio 20

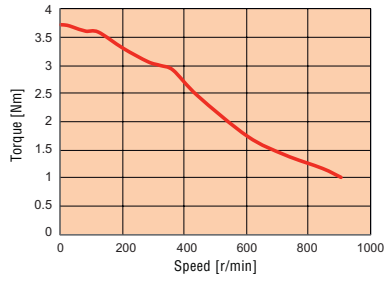


AZM46 Gear Ratio 40

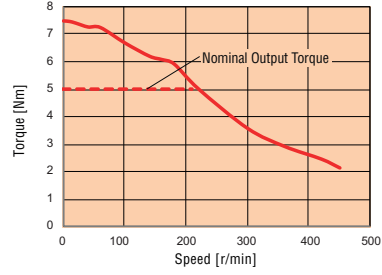


◇ **AZM48ACH-PLE40** (Reference value)*

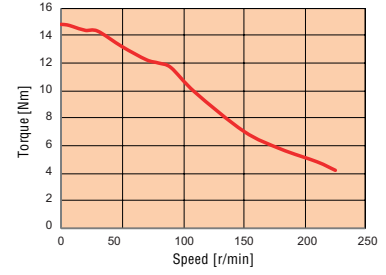
AZM48 Gear Ratio 5



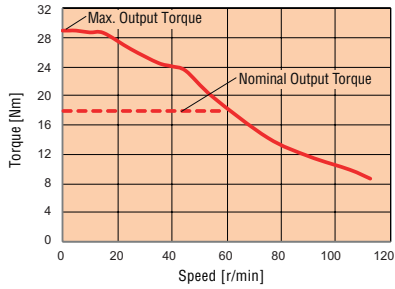
AZM48 Gear Ratio 10



AZM48 Gear Ratio 20

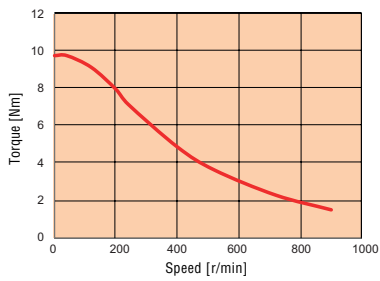


AZM48 Gear Ratio 40

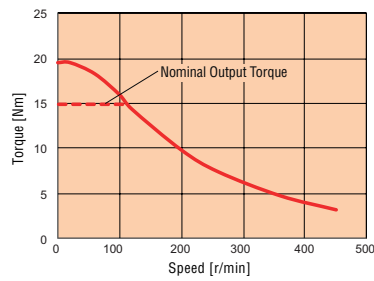


◇ **AZM69ACH-PLE60 / AZM69MCH-PLE60** (Reference value)*

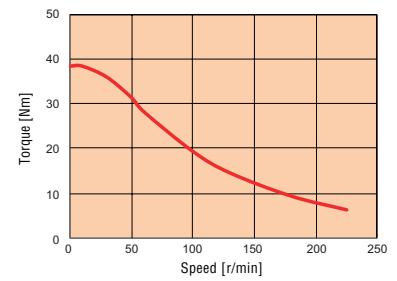
AZM69 Gear Ratio 5



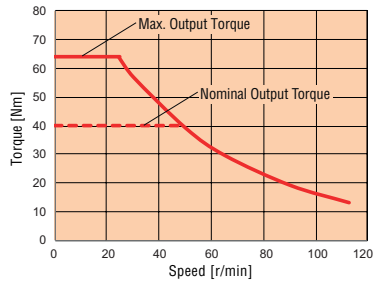
AZM69 Gear Ratio 10



AZM69 Gear Ratio 20

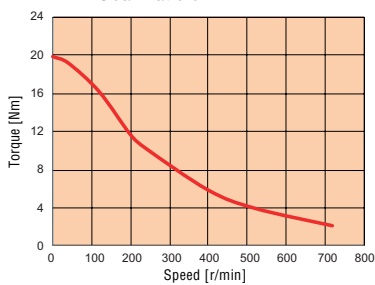


AZM69 Gear Ratio 40

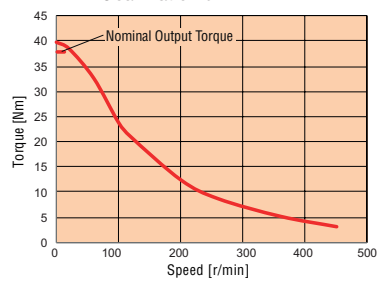


◇ **AZM911ACH-PLE80** (Reference value)*

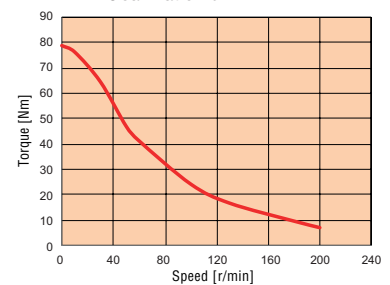
AZM911 Gear Ratio 5



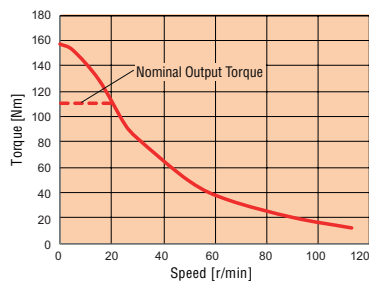
AZM911 Gear Ratio 10



AZM911 Gear Ratio 20



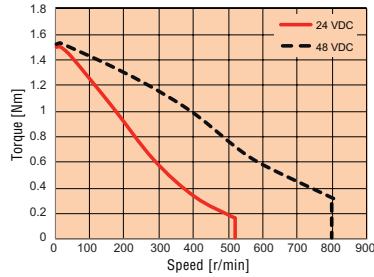
AZM911 Gear Ratio 40



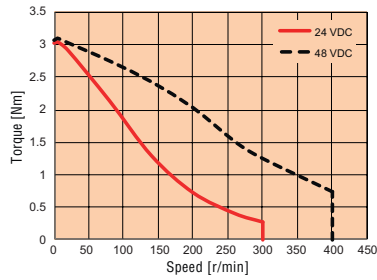
● 24/48 VDC

◇ **AZM46AKH-PLE40 / AZM46MKH-PLE40** (Reference value)*

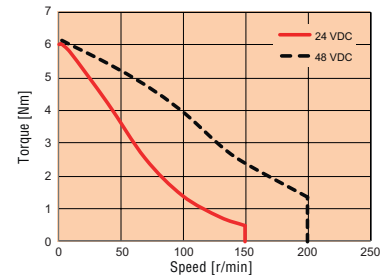
AZM46 Gear Ratio 5



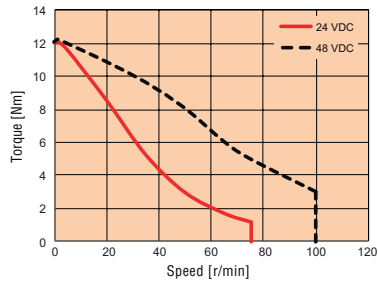
AZM46 Gear Ratio 10



AZM46 Gear Ratio 20

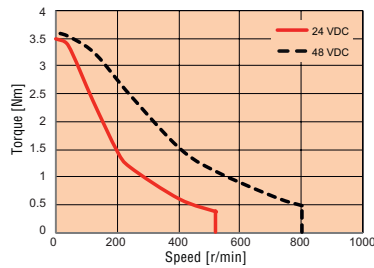


AZM46 Gear Ratio 40

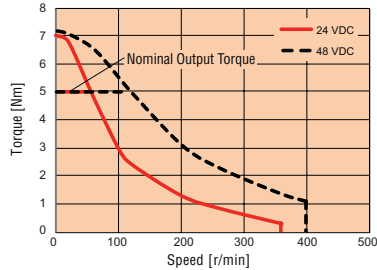


◇ **AZM48AKH-PLE40** (Reference value)*

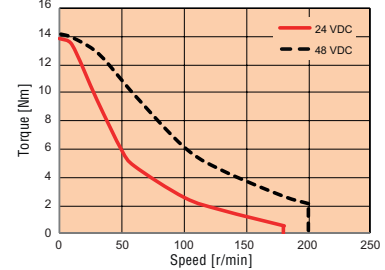
AZM48 Gear Ratio 5



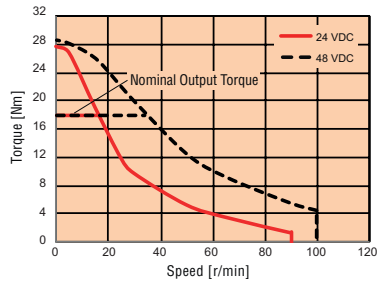
AZM48 Gear Ratio 10



AZM48 Gear Ratio 20

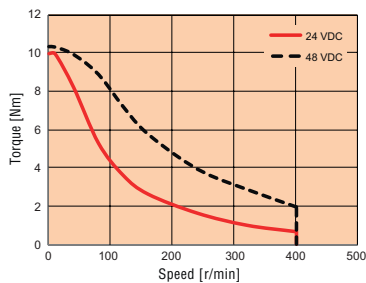


AZM48 Gear Ratio 40

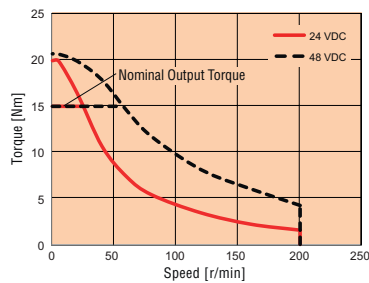


◇ **AZM69AKH-PLE60 / AZM69MKH-PLE60** (Reference value)*

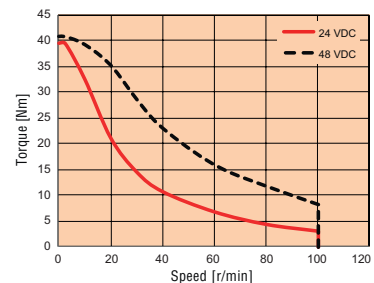
AZM69 Gear Ratio 5



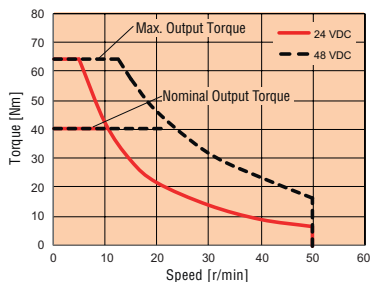
AZM69 Gear Ratio 10



AZM69 Gear Ratio 20



AZM69 Gear Ratio 40



*There is condition for using nominal output torque or max. output torque(see specification of gearhead)

*Speed-Torque Characteristics vary depending on conditions.

PLN Geared Type

Specifications

Type	PLN70 ⁽¹⁾				PLN90 ⁽¹⁾
Stage	1		2		2
Reduction ratio	5	10	20	40	40
Backlash [arcmin]	3		5		5
Nominal output torque [Nm] ⁽²⁾	65	27	77	65	140
Max. output torque [Nm] ⁽²⁾⁽³⁾	104	43	123	104	224
Emergency stop torque [Nm] ⁽⁴⁾	130	90	150	150	300
Max. input speed [r/min] ⁽⁵⁾	14000				10000
Running noise [dB (A)] ⁽⁶⁾	68				70
Permitted radial load for 30000h (Fa=0) [N] ⁽²⁾⁽⁷⁾	3200				4800
Permitted axial load for 30000h (Fr=0) [N] ⁽²⁾⁽⁸⁾	3900				5700
Permitted radial load for 20000h (Fa=0) [N] ⁽²⁾⁽⁷⁾	3200				5500
Permitted axial load for 20000h (Fr=0) [N] ⁽²⁾⁽⁸⁾	4400				6400
Degree of protection	—				
Lifetime [h]	20000				
Lifetime [h] (at Nominal output torque x 0.88)	30000				

(1) These values refer only to the Gearhead. The actual value depends on the motor combination.

(2) These values refer to a speed of the output shaft of $n_2=100$ r/min on duty cycle KA=1 and S1-mode for electrical machines and $T=30^\circ\text{C}$.

(3) Allowable for 30000 revolutions at the output shaft.

(4) Allowed 1000 times.

(5) Allowed operating temperature must be kept; other input speeds on inquiry.

(6) Sound pressure level; distance 1 m; measured on idle running with an input speed of $n_1=3000$ r/min, ratio=5.

(7) Half way along the output shaft.

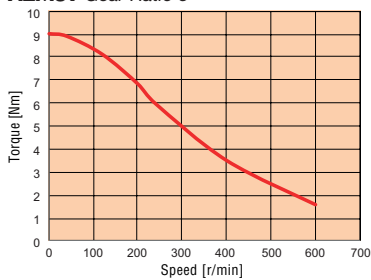
(8) With respect to center of output shaft.

Speed – Torque Characteristics

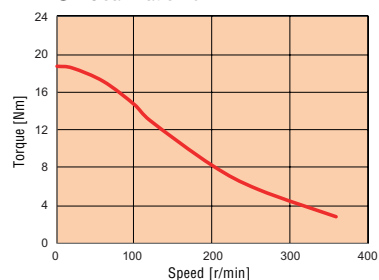
Single-Phase 200-240VAC

◇ AZM69ACH-PLN70 / AZM69MCH-PLN70 (Reference value)*

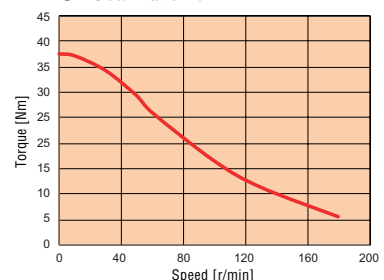
AZM69 Gear Ratio 5



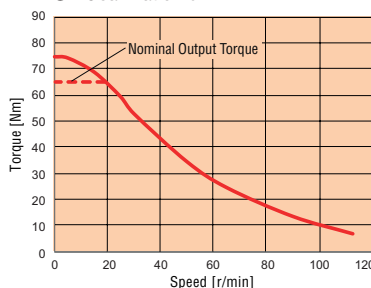
AZM69 Gear Ratio 10



AZM69 Gear Ratio 20

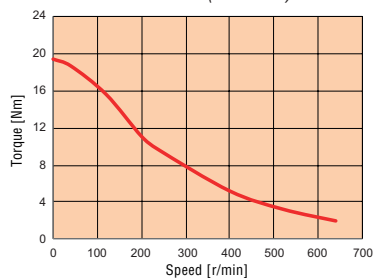


AZM69 Gear Ratio 40

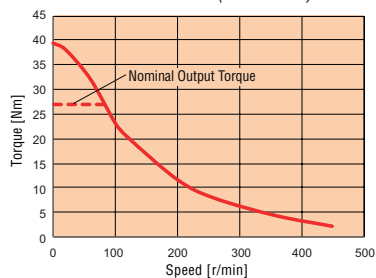


◇ **AZM911ACH-PLN70 / AZM911ACH-PLN90 (Reference value)***

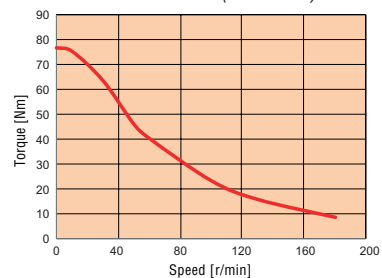
AZM911 Gear Ratio 5 (PLN70-5)



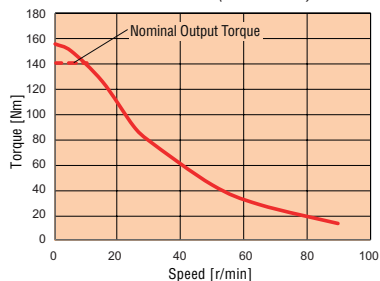
AZM911 Gear Ratio 10 (PLN70-10)



AZM911 Gear Ratio 20 (PLN70-20)



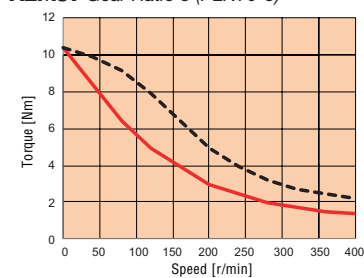
AZM911 Gear Ratio 40 (PLN90-40)



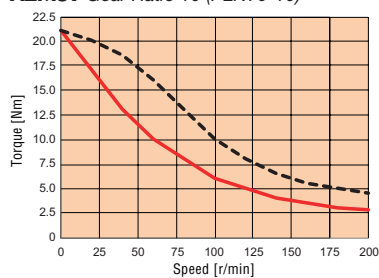
● **Single-Phase 24/48 VDC**

◇ **AZM69AKH-PLN70 / AZM69MKH-PLN70 (Reference value)***

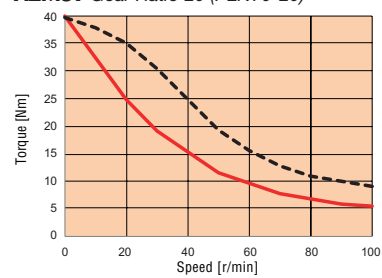
AZM69 Gear Ratio 5 (PLN70-5)



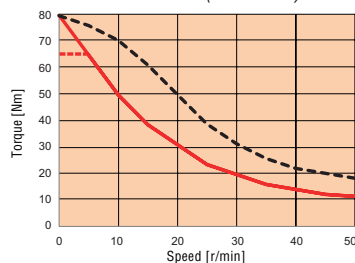
AZM69 Gear Ratio 10 (PLN70-10)



AZM69 Gear Ratio 20 (PLN70-20)



AZM69 Gear Ratio 40 (PLN90-40)



*There is condition for using nominal output torque or max. output torque (see specification of gearhead)

*Speed-Torque Characteristics vary depending on conditions.

PLFE Geared Type

PLFE Gearhead Specifications

Type	PLFE64 ⁽¹⁾				PLFE90 ⁽¹⁾			
Stage	1		2		1		2	
Reduction ratio	5	10	20	40	5	10	20	40
Backlash [arcmin]	10		12		7		9	
Nominal output torque [Nm] ⁽²⁾	40	15	44	40	110	38	120	110
Max. output torque [Nm] ⁽²⁾⁽³⁾	64	24	70	64	176	61	192	176
Emergency stop torque [Nm] ⁽⁴⁾	80	80	88	80	220	200	240	220
Max. input speed [r/min] ⁽⁵⁾	13000				7000			
Running noise [dB (A)] ⁽⁶⁾	58				60			
Permitted radial load for 30000h (Fa=0) [N] ⁽²⁾⁽⁷⁾	500				1200			
Permitted axial load for 30000h (Fr=0) [N] ⁽²⁾⁽⁸⁾	1200				3000			
Permitted radial load for 20000h (Fa=0) [N] ⁽²⁾⁽⁷⁾	550				1400			
Permitted axial load for 20000h (Fr=0) [N] ⁽²⁾⁽⁸⁾	1200				3000			
Degree of protection	IP54							
Lifetime [h]	30000							

(1) These values refer only to the Gearhead. The actual value depends on the motor combination.

(2) These values refer to a speed of the output shaft of $n_2=100$ r/min on duty cycle KA=1 and S1-mode for electrical machines and $T=30^\circ\text{C}$.

(3) Allowable for 30000 revolutions at the output shaft.

(4) Allowed 1000 times.

(5) Allowed operating temperature must be kept; other input speeds on inquiry.

(6) Sound pressure level; distance 1 m; measured on idle running with an input speed of $n_1=3000$ r/min, ratio=5.

(7) Half way along the output shaft.

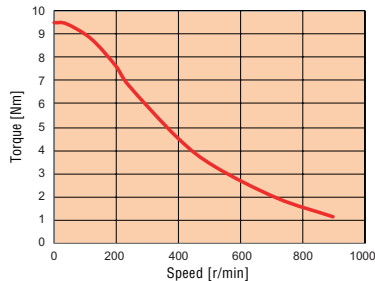
(8) With respect to center of output shaft.

Speed – Torque Characteristics

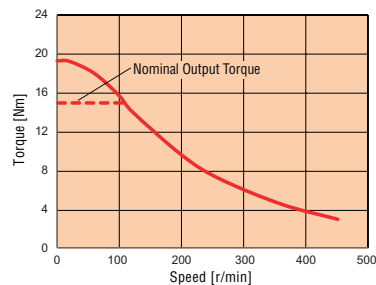
Single-Phase 200-240VAC

◇ AZM69ACH-PLFE64 / AZM69MCH-PLFE64 (Reference value)*

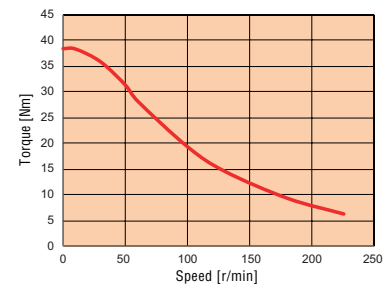
AZM69 Gear Ratio 5



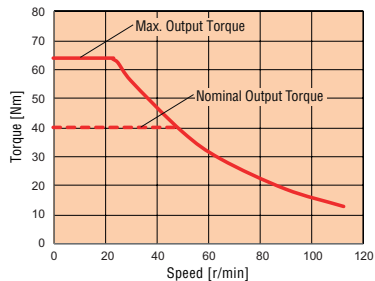
AZM69 Gear Ratio 10



AZM69 Gear Ratio 20

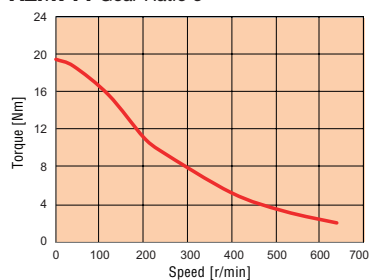


AZM69 Gear Ratio 40

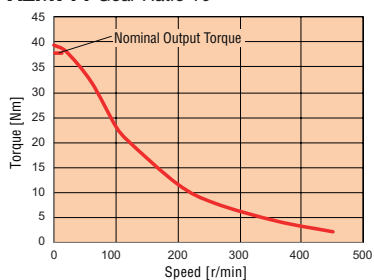


◇ **AZM911ACH-PLFE90** (Reference value)*

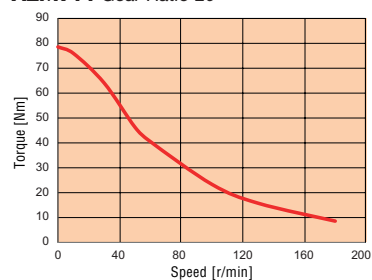
AZM911 Gear Ratio 5



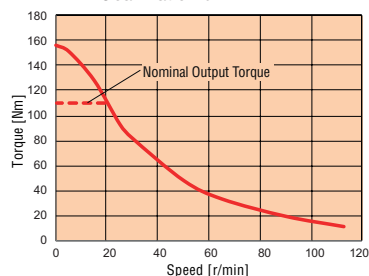
AZM911 Gear Ratio 10



AZM911 Gear Ratio 20



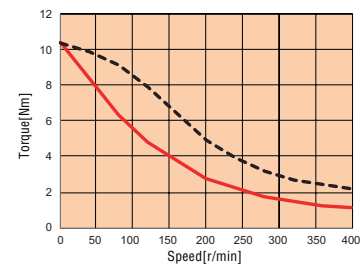
AZM911 Gear Ratio 40



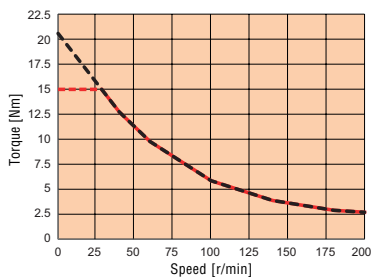
● Single-Phase 24/48 VDC

◇ **AZM69AKH-PLFE64 / AZM69MKH-PLFE64** (Reference value)*

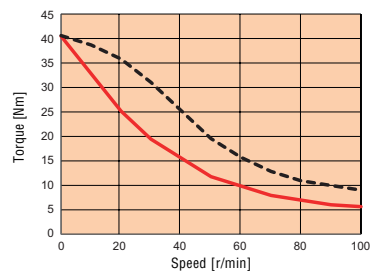
AZM69 Gear Ratio 5



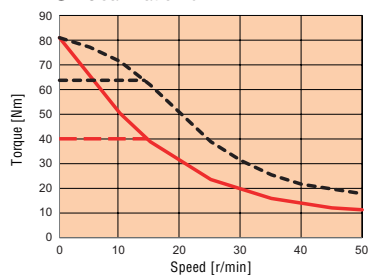
AZM69 Gear Ratio 10



AZM69 Gear Ratio 20



AZM69 Gear Ratio 40



*There is condition for using nominal output torque or max. output torque (see specification of gearhead)

*Speed-Torque Characteristics vary depending on conditions.

WPLE Geared Type

WPLE Gearhead Specifications

Type	WPLE60 ⁽¹⁾				WPLE80 ⁽¹⁾			
Stage	1		2		1		2	
Reduction ratio	5	10	20	40	5	10	20	40
Backlash [arcmin]	16		18		13		15	
Nominal output torque [Nm] ⁽²⁾⁽³⁾	24	15	44	40	67	38	120	110
Max. output torque [Nm] ⁽²⁾⁽³⁾⁽⁴⁾	38	24	70	64	107	61	192	176
Emergency stop torque [Nm] ⁽⁵⁾	80	70	88	80	220	170	240	220
Max. input speed [r/min] ⁽⁶⁾	13000				7000			
Running noise [dB (A)] ⁽⁷⁾	70				73			
Permitted radial load for 30000h (Fa=0) [N] ⁽²⁾⁽⁸⁾	340				650			
Permitted axial load for 30000h (Fr=0) [N] ⁽²⁾⁽⁹⁾	450				900			
Permitted radial load for 20000h (Fa=0) [N] ⁽²⁾⁽⁸⁾	400				750			
Permitted axial load for 20000h (Fr=0) [N] ⁽²⁾⁽⁹⁾	500				1000			
Degree of protection	IP40							
Lifetime [h]	20000							
Lifetime at Nominal output torque x 0.88 [h]	30000							

(1) These values refer only to the Gearhead. The actual value depends on the motor combination of motor.

(2) These values refer to a speed of the output shaft of $n_2=100$ r/min on duty cycle KA=1 and S1-mode for electrical machines and $T=30^\circ\text{C}$.

(3) With key, at tumescent load

(4) Allowable for 30000 revolutions at the output shaft.

(5) Allowed 1000 times.

(6) Allowed operating temperature must be kept; other input speeds on inquiry.

(7) Sound pressure level; distance 1 m; measured on idle running with an input speed of $n_1=3000$ r/min, ratio=5.

(8) Half way along the output shaft.

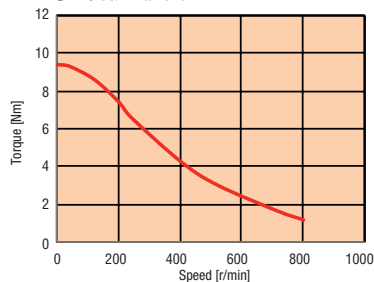
(9) With respect to center of output shaft.

Speed – Torque Characteristics

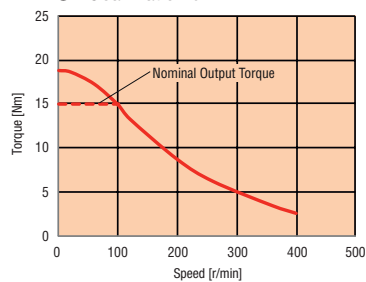
Single-Phase 200-240VAC

◇ AZM69ACH-WPLE60 / AZM69MCH-WPLE60 (Reference value)*

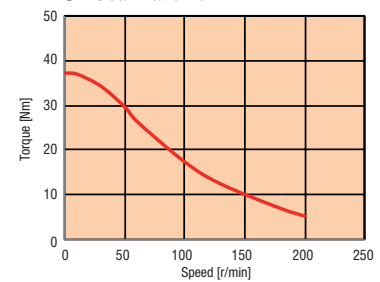
AZM69 Gear Ratio 5



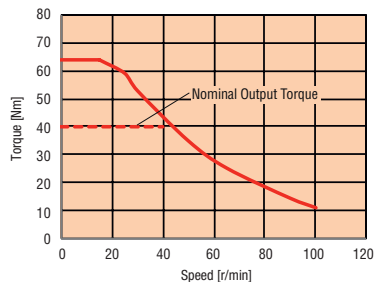
AZM69 Gear Ratio 10



AZM69 Gear Ratio 20

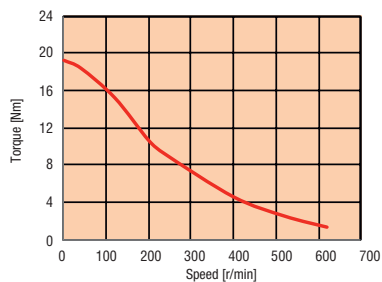


AZM69 Gear Ratio 40

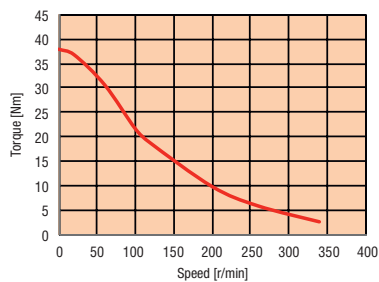


◇ **AZM911ACH-WPLE80** (Reference value)*

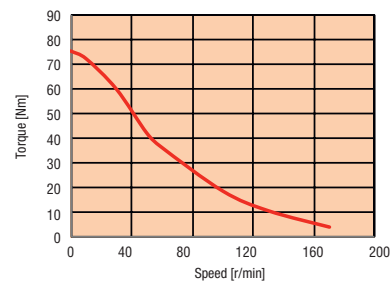
AZM911 Gear Ratio 5



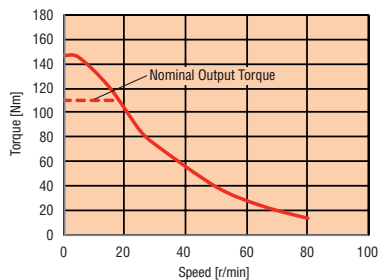
AZM911 Gear Ratio 10



AZM911 Gear Ratio 20



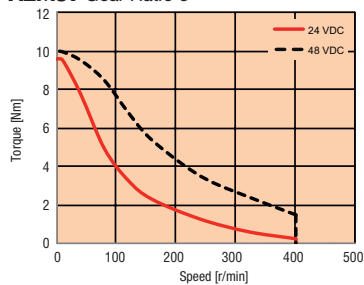
AZM911 Gear Ratio 40



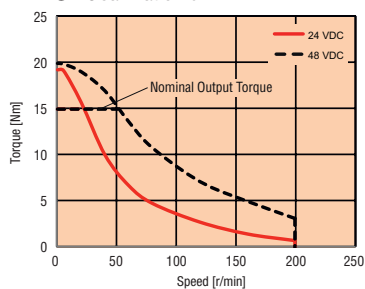
● **24/48 VDC**

◇ **AZM69AKH-WPLE60 /AZM69MKH-WPLE60** (Reference value)*

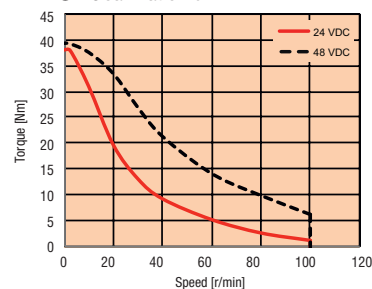
AZM69 Gear Ratio 5



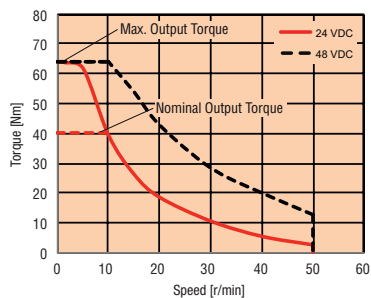
AZM69 Gear Ratio 10



AZM69 Gear Ratio 20



AZM69 Gear Ratio 40



*There is condition for using nominal output torque or max. output torque (see specification of gearhead)

*Speed-Torque Characteristics vary depending on conditions. Dimensions

Cable

Connection Cables/Flexible Connection Cables

These cables directly connect a motor and driver. Use a flexible connection cable in applications where the cable is bent and flexed.

Three types of cables with different drawing directions are available. Please select the cable outlet direction needed for the installation.

(The connection cable will vary depending on the driver used in combination. Check the product name of the driver before selecting the compatible cable.)



Cable Outlet Direction
Output Shaft Side



Cable Outlet Direction
Vertical



Cable Outlet Direction
Opposite Side of Output Shaft

Product Line

A letter indicating the driver type is specified where the box ■ is located in the driver's product name.

Connection Cable

[Single-axis driver for AC input (Driver product name: **AZD-A**, **AZD-A■**, **AZD-C**, **AZD-C■**)]

For Motor/Encoder



Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	1	CCM010Z1AFF
	2	CCM020Z1AFF
	3	CCM030Z1AFF
	5	CCM050Z1AFF
	7	CCM070Z1AFF
	10	CCM100Z1AFF
Vertical	1	CCM010Z1AVF
	2	CCM020Z1AVF
	3	CCM030Z1AVF
	5	CCM050Z1AVF
	7	CCM070Z1AVF
	10	CCM100Z1AVF
Opposite to Output Shaft Direction	1	CCM010Z1ABF
	2	CCM020Z1ABF
	3	CCM030Z1ABF
	5	CCM050Z1ABF
	7	CCM070Z1ABF
	10	CCM100Z1ABF

For Motor/Encoder/Type with Electromagnetic Brake



Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	1	CCM010Z1BFF
	2	CCM020Z1BFF
	3	CCM030Z1BFF
	5	CCM050Z1BFF
	7	CCM070Z1BFF
	10	CCM100Z1BFF
Vertical	1	CCM010Z1BVF
	2	CCM020Z1BVF
	3	CCM030Z1BVF
	5	CCM050Z1BVF
	7	CCM070Z1BVF
	10	CCM100Z1BVF
Opposite to Output Shaft Direction	1	CCM010Z1BBF
	2	CCM020Z1BBF
	3	CCM030Z1BBF
	5	CCM050Z1BBF
	7	CCM070Z1BBF
	10	CCM100Z1BBF

[Single-axis driver for DC input (Driver product name: **AZD-K**, **AZD-K■**)]

For Motor/Encoder



Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	0.5	CCM005Z1CFF
	1	CCM010Z1CFF
	2	CCM020Z1CFF
	3	CCM030Z1CFF
	5	CCM050Z1CFF
	7	CCM070Z1CFF
Vertical	0.5	CCM005Z1CVF
	1	CCM010Z1CVF
	2	CCM020Z1CVF
	3	CCM030Z1CVF
	5	CCM050Z1CVF
	7	CCM070Z1CVF
Opposite to Output Shaft Direction	0.5	CCM005Z1CBF
	1	CCM010Z1CBF
	2	CCM020Z1CBF
	3	CCM030Z1CBF
	5	CCM050Z1CBF
	7	CCM070Z1CBF

For Motor/Encoder/Type with Electromagnetic Brake



Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	0.5	CCM005Z1DFF
	1	CCM010Z1DFF
	2	CCM020Z1DFF
	3	CCM030Z1DFF
	5	CCM050Z1DFF
	7	CCM070Z1DFF
Vertical	0.5	CCM005Z1DVF
	1	CCM010Z1DVF
	2	CCM020Z1DVF
	3	CCM030Z1DVF
	5	CCM050Z1DVF
	7	CCM070Z1DVF
Opposite to Output Shaft Direction	0.5	CCM005Z1DBF
	1	CCM010Z1DBF
	2	CCM020Z1DBF
	3	CCM030Z1DBF
	5	CCM050Z1DBF
	7	CCM070Z1DBF

[For mini driver (Driver product name: **AZD-KR**)]

- For Motor/Encoder,
For Motor/Encoder/Electromagnetic Brake



Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	0.2	CCM002Z1EFF
	0.5	CCM005Z1EFF
	1	CCM010Z1EFF
	2	CCM020Z1EFF
	3	CCM030Z1EFF
	5	CCM050Z1EFF
	7	CCM070Z1EFF
	10	CCM100Z1EFF
Vertical	0.2	CCM002Z1EVF
	0.5	CCM005Z1EVF
	1	CCM010Z1EVF
	2	CCM020Z1EVF
	3	CCM030Z1EVF
	5	CCM050Z1EVF
	7	CCM070Z1EVF
	10	CCM100Z1EVF
Opposite to Output Shaft Direction	0.2	CCM002Z1EBF
	0.5	CCM005Z1EBF
	1	CCM010Z1EBF
	2	CCM020Z1EBF
	3	CCM030Z1EBF
	5	CCM050Z1EBF
	7	CCM070Z1EBF
	10	CCM100Z1EBF

◇ Flexible Connection Cable

[Single-axis driver for AC input (Driver product name: **AZD-A**, **AZD-A**, **AZD-C**, **AZD-C**)]

- For Motor/Encoder



Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	1	CCM010Z1AFR
	2	CCM020Z1AFR
	3	CCM030Z1AFR
	5	CCM050Z1AFR
	7	CCM070Z1AFR
	10	CCM100Z1AFR
Vertical	1	CCM010Z1AVR
	2	CCM020Z1AVR
	3	CCM030Z1AVR
	5	CCM050Z1AVR
	7	CCM070Z1AVR
	10	CCM100Z1AVR
Opposite to Output Shaft Direction	1	CCM010Z1ABR
	2	CCM020Z1ABR
	3	CCM030Z1ABR
	5	CCM050Z1ABR
	7	CCM070Z1ABR
	10	CCM100Z1ABR

- For Motor/Encoder/Type with Electromagnetic Brake



Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	1	CCM010Z1BFR
	2	CCM020Z1BFR
	3	CCM030Z1BFR
	5	CCM050Z1BFR
	7	CCM070Z1BFR
	10	CCM100Z1BFR
Vertical	1	CCM010Z1BVR
	2	CCM020Z1BVR
	3	CCM030Z1BVR
	5	CCM050Z1BVR
	7	CCM070Z1BVR
	10	CCM100Z1BVR
Opposite to Output Shaft Direction	1	CCM010Z1BBR
	2	CCM020Z1BBR
	3	CCM030Z1BBR
	5	CCM050Z1BBR
	7	CCM070Z1BBR
	10	CCM100Z1BBR

[Single-axis driver for DC input (Driver product name: **AZD-K**, **AZD-K**)]



● For Motor/Encoder

Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	0.5	CCM005Z1CFR
	1	CCM010Z1CFR
	2	CCM020Z1CFR
	3	CCM030Z1CFR
	5	CCM050Z1CFR
	7	CCM070Z1CFR
	10	CCM100Z1CFR
Vertical	0.5	CCM005Z1CVR
	1	CCM010Z1CVR
	2	CCM020Z1CVR
	3	CCM030Z1CVR
	5	CCM050Z1CVR
	7	CCM070Z1CVR
	10	CCM100Z1CVR
Opposite to Output Shaft Direction	0.5	CCM005Z1CBR
	1	CCM010Z1CBR
	2	CCM020Z1CBR
	3	CCM030Z1CBR
	5	CCM050Z1CBR
	7	CCM070Z1CBR
	10	CCM100Z1CBR



● For Motor/Encoder/Type with Electromagnetic Brake

Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	0.5	CCM005Z1DFR
	1	CCM010Z1DFR
	2	CCM020Z1DFR
	3	CCM030Z1DFR
	5	CCM050Z1DFR
	7	CCM070Z1DFR
	10	CCM100Z1DFR
Vertical	0.5	CCM005Z1DVR
	1	CCM010Z1DVR
	2	CCM020Z1DVR
	3	CCM030Z1DVR
	5	CCM050Z1DVR
	7	CCM070Z1DVR
	10	CCM100Z1DVR
Opposite to Output Shaft Direction	0.5	CCM005Z1DBR
	1	CCM010Z1DBR
	2	CCM020Z1DBR
	3	CCM030Z1DBR
	5	CCM050Z1DBR
	7	CCM070Z1DBR
	10	CCM100Z1DBR

[For mini driver (Driver product name: **AZD-KR**)]

● For Motor/Encoder,
For Motor/Encoder/Electromagnetic Brake

Cable Outlet Direction	Length L [m]	Product Name
Output Shaft Direction	0.5	CCM005Z1EFR
	1	CCM010Z1EFR
	2	CCM020Z1EFR
	3	CCM030Z1EFR
	5	CCM050Z1EFR
	7	CCM070Z1EFR
	10	CCM100Z1EFR
Vertical	0.5	CCM005Z1EVR
	1	CCM010Z1EVR
	2	CCM020Z1EVR
	3	CCM030Z1EVR
	5	CCM050Z1EVR
	7	CCM070Z1EVR
	10	CCM100Z1EVR
Opposite to Output Shaft Direction	0.5	CCM005Z1EBR
	1	CCM010Z1EBR
	2	CCM020Z1EBR
	3	CCM030Z1EBR
	5	CCM050Z1EBR
	7	CCM070Z1EBR
	10	CCM100Z1EBR

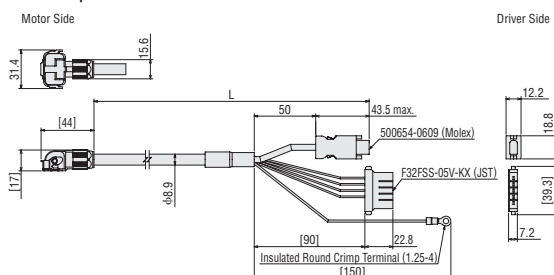
● Dimensions (Unit: mm)

● An alphabet indicating the driver type is specified where the box ■ is located in the driver's product name.

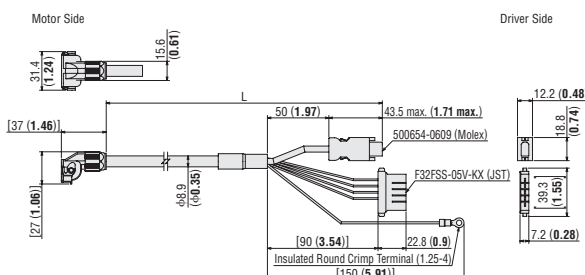
[Single-axis driver for AC input (Driver product name: **AZD-A**, **AZD-A■**, **AZD-C**, **AZD-C■**)]

● For Motor/Encoder

- Cable drawn on output shaft direction, Cable drawn on opposite to output shaft direction

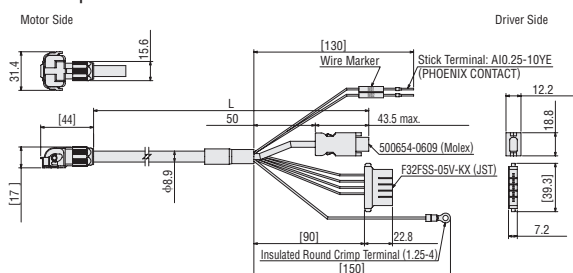


- Cable drawn vertically

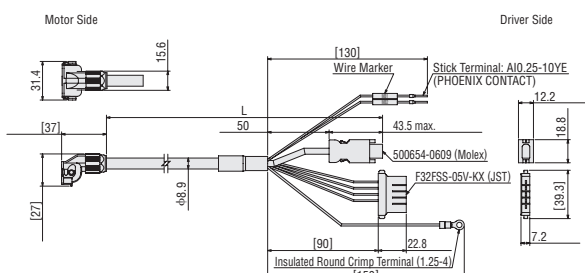


● For Motor/Encoder/Type with Electromagnetic Brake

- Cable drawn on output shaft direction, Cable drawn on opposite to output shaft direction



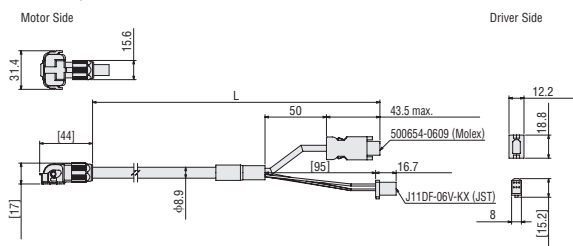
- Cable drawn vertically



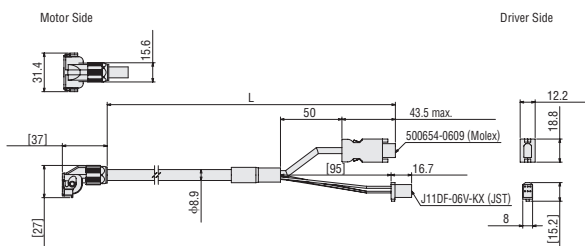
[Single-axis driver for DC input (Driver product name: **AZD-K**, **AZD-K■**)]

● For Motor/Encoder

- Cable drawn on output shaft direction, Cable drawn on opposite to output shaft direction

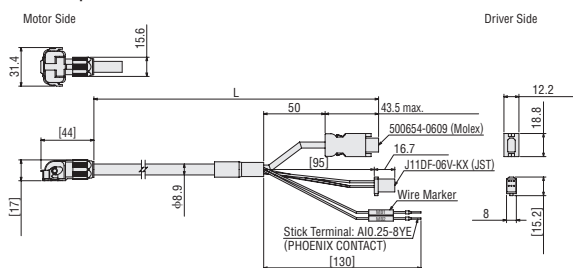


- Cable drawn vertically

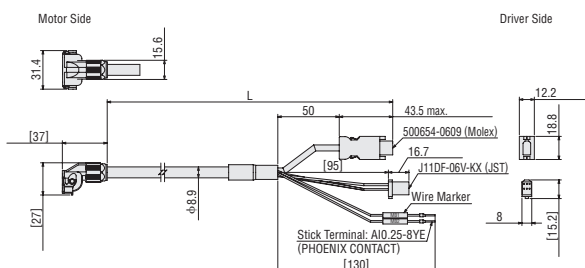


● For Motor/Encoder/Type with Electromagnetic Brake

- Cable drawn on output shaft direction, Cable drawn on opposite to output shaft direction



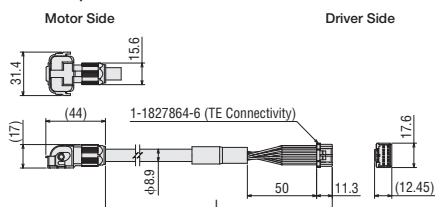
- Cable drawn vertically



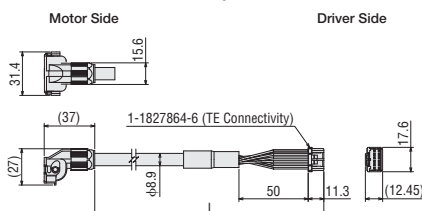
[For mini driver (Driver product name: **AZD-KR■**)]

● For Motor/Encoder, for Motor/Encoder/Type with Electromagnetic Brake

- Cable drawn on output shaft direction, Cable drawn on opposite to output shaft direction



- Cable drawn vertically



■ **Extension Cables/Flexible Extension Cables, Driver Side**

[For mini driver (Driver product name: **AZD-KR**■)]

These are cables to provide an extension between the connection cable and the driver. When using an extension, the total length of the cable must be less than 10 m.

Use the flexible connection cable in applications where the cable is bent and flexed repeatedly.

● **Product Line**

◇ **Extension Cable**

Length L [m]	Product Name
1	CCM010Z2ADFT
3	CCM030Z2ADFT
5	CCM050Z2ADFT

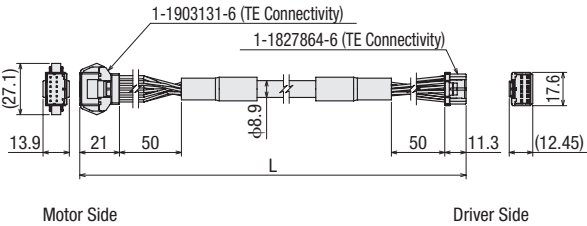


◇ **Flexible Extension Cable**

Length L [m]	Product Name
1	CCM010Z2ADRT
3	CCM030Z2ADRT
5	CCM050Z2ADRT



● **Dimensions (Unit: mm)**



Orientalmotor

These products are manufactured at plants certified with the international standards **ISO 9001** (for quality assurance) and **ISO 14001** for systems of environmental management).

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