

# Стартеры серии AZE

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# AZE Permanent magnet direct drive starter motors

## Features

- High specific power output and efficiency.
- Excellent cold crank capability with low current drain from the battery.
- Reduced weight and size in comparison to starter motors with field windings.
- Highly efficient drive assembly for idle run of the pinion.

## Options

- Pinion, flange, electrical terminals and direction of rotation are customized for specific engines.
- Dust protection of bushing in drive end bracket.
- Special versions are available on request.
- Drain holes on request.

## Design

- Pre-engaged style of a starter motor.
- Excitation by high quality 6-pole ferrite permanent magnets for high torque output.
- Magnetic shunts improve the output power and enable high stability and resistance to demagnetisation.
- Pinion shift mechanism with solenoid, fork lever and helix.
- Drive assembly with a five roller clutch.
- Solenoid switch with pull-in and hold-in windings.
- High quality thermally resistant materials.
- Drive end brackets from die cast aluminum.
- End-of-life Directive 2000/53/EC respected, and also free from asbestos, beryllium and ammonia.

## Applications

Petrol engines of up to 1.5 litre displacement for passenger cars. Small diesel engines with up to 0.5 litre displacement, for marine and agricultural applications.

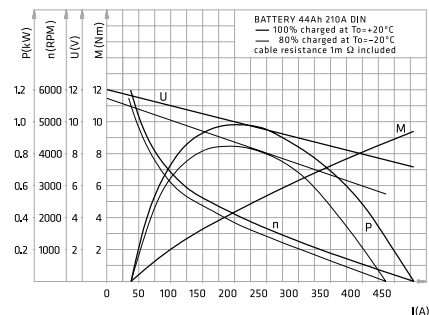


## Main technical data

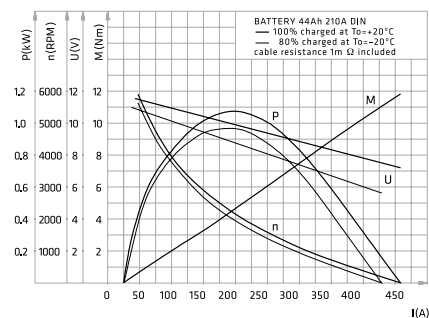
Type	AZE12.. / AZE15..		
Nominal voltage (V)	12		24
Rated power (kW)	0.9	1.0	1.6
Length-nose (mm)	< 157	< 170	<157
Length-noseless (mm)			
Weight-nose (kg)	3.8 to 4.0	3.5	3.8 to 4.0
Weight-noseless (kg)			
Yoke diameter (mm)	80		
Stator	6 permanent magnets		
Drive assembly	5 rollers		
Control signal (T50) (+20°C)	pull-in current < 50A hold-in current < 10A		
Solenoid 12V			
Solenoid 24V	pull-in current < 30A hold-in current < 7.5A		
Terminals	30 – M8 31 – M8 50 – M4, M5 or M6, Blade 6.3 x 0.8 Integrated VW connector with blade 4.7x0.7 15a – 6.3 x 0.8, M5 (option)		
Basic protection	Protected against ingress of dust, solid foreign objects and splashing water (IP 56)		
Operating temperature	-30°C to +100°C		
Ambient temperature	- 40°C to + 130°C		

## Characteristics

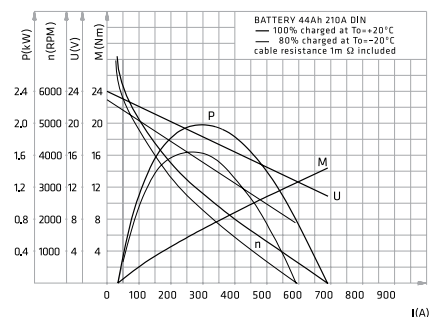
12 V 0.9 kW



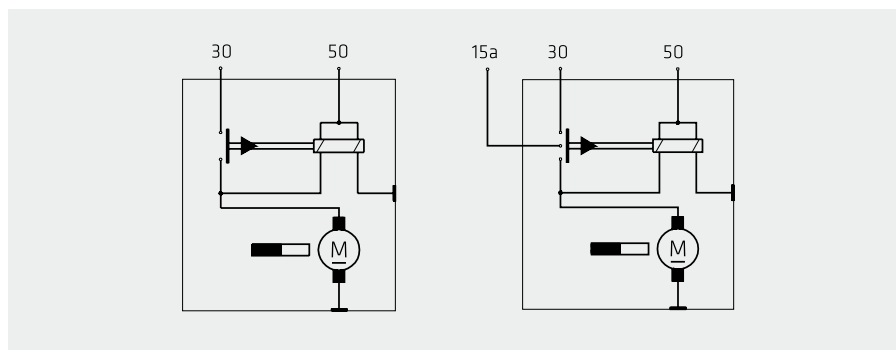
12 V 1 kW



24 V 1.6 kW



## Connection diagrams



# AZE Permanent magnet reduction gear starter motors

These are starter motors for starting diesel engines in light commercial vehicles, small tractors and agricultural machinery, ships, stationary generator sets, and other applications.

## Features

- High specific power output and efficiency.
- Excellent cold crank capability with low current drain from battery.
- Reduced weight and size in comparison to direct drive starter motors.
- Highly efficient drive assembly for idle run of the pinion.
- High reliability and long life operation.

## Design

- Pre-engaged style of a starter motor.
- Nosed or noseless versions for specific engine applications.
- Excitation by high quality 6-pole ferrite permanent magnets for high torque output.
- Magnetic shunts improve the output power and enable high stability and resistance to demagnetisation.
- Plastic or metallic low-noise planetary reduction gear using a coaxial pinion with an armature.
- Drive assembly with a five or six-roller clutch.
- Pinion shift mechanism with solenoid, fork lever and helix.
- Solenoid switch with pull-in and hold-in winding.
- High quality thermally resistant materials.
- Drive end brackets made of die cast aluminum.
- End-of-life Directive 2000/53/EC respected, and also free from asbestos, beryllium and ammonia.

## Applications

Petrol engines of 1 to 5 litre and diesel engines of 1 to 3 litre displacement. Passenger cars, light commercial vehicles, agricultural equipment, marine applications.

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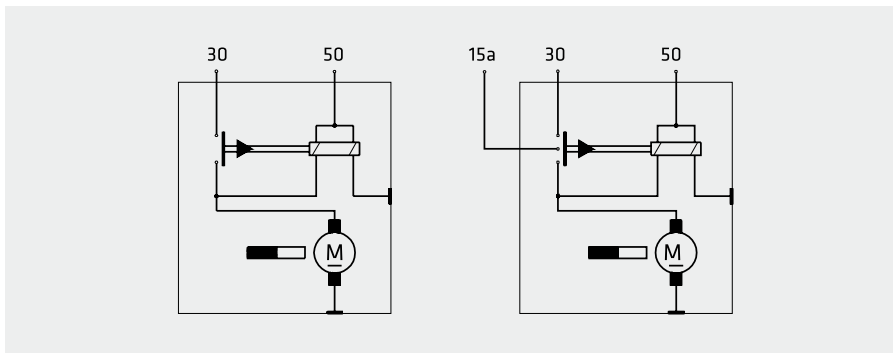
AZE 21 / AZE 26



### Main technical data

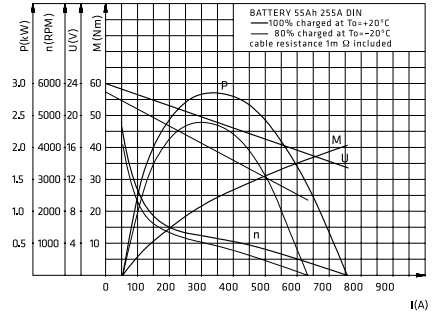
Type	AZE21.. / AZE22.. / AZE25..- nose AZE26..- noseless			
Nominal voltage (V)	12			24
Rated power (kW)	1.2	1.4	2.1	2.5
Length-nose (mm)	< 161	< 175	<186	<186
Length-noseless (mm)	< 196	< 210	< 221	< 221
Weight-nose (kg)	3.3	3.75	4.05	4.05
Weight-noseless (kg)	3.6	3.9	4.2	4.2
Yoke diameter (mm)	80			
Stator	6 permanent magnets			
Drive assembly	5 rollers or 6 rollers			
Control signal (T50) (+20°C) Solenoid 12V	pull-in current < 50A hold-in current < 10A			
Solenoid 24V	pull-in current < 30A hold-in current < 7.5A			
Terminals	30 - M8 50 - M8 50 - M4,M5 or M6, Blade 6.3 x 0.8 Integrated VW connector with blade 4.7x0.7 15a - 6.3 x 0.8, M5 (option)			
Basic protection	protected against ingress of dust, solid foreign objects and splashing water (IP56)			
Operating temperature	- 30°C to + 100°C			
Ambient temperature	- 40°C to + 130°C			

### Connection diagrams

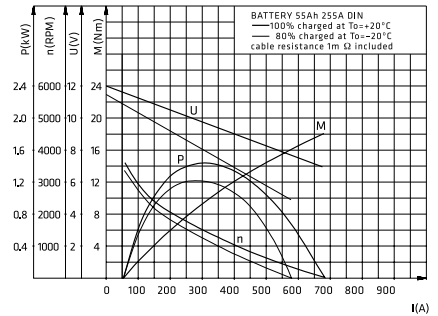


### Characteristics

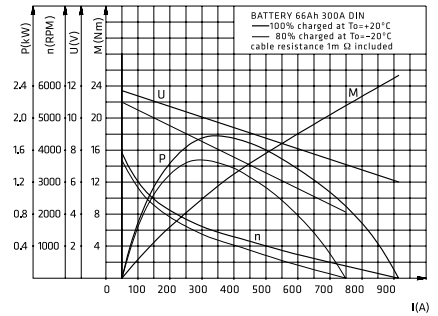
24 V 2.5 kW



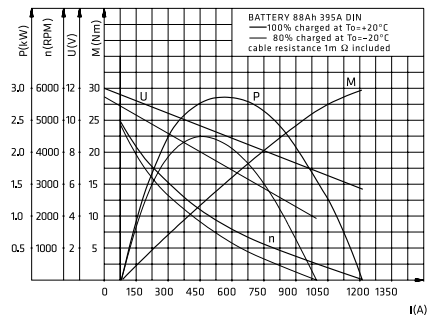
12 V 1.2 kW



12 V 1.4 kW



12 V 2.1 kW



## AZE Field coil reduction gear starter motors - Light Duty (NEW FAMILY)

These are starter motors for starting diesel engines in light commercial vehicles, small tractors and agricultural machinery, ships, stationary generator sets, and other applications.

### Features

- High specific power output and efficiency.
- Excellent cold crank capability with low current drain from battery.
- Reduced weight and dimensions in comparison to direct drive starter motors.
- Highly efficient drive assembly for idle run of the pinion.
- High reliability and long life operation.

### Design

- Pre-engaged system of starter motor.
- Nose or noseless versions for specific applications of the engine.
- Metallic low-noise planetary reduction gear using a coaxial pinion with an armature.
- Drive assembly with six-rollers clutch.
- Pinion shift mechanism with solenoid, fork lever and helix.
- Solenoid switch with pull-in and hold-in winding designed to effectively break off main contact.
- High quality thermal resistant materials.
- Drive end brackets made of die cast aluminum.
- End-of-life Directive 2000/53/EC respected and also free of asbestos, beryllium and ammonia.

### Applications

Petrol engines of 1 to 5 litre and diesel engines of 1 to 3 litre displacement. Passenger cars, light commercial vehicles, agricultural equipment, marine applications.

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AZE 65

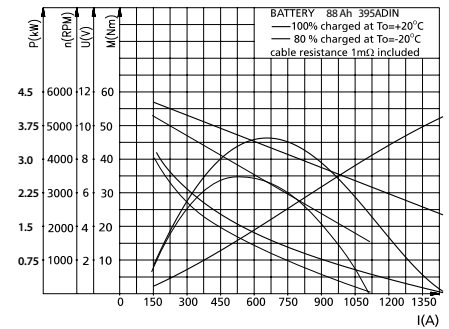


## Main technical data

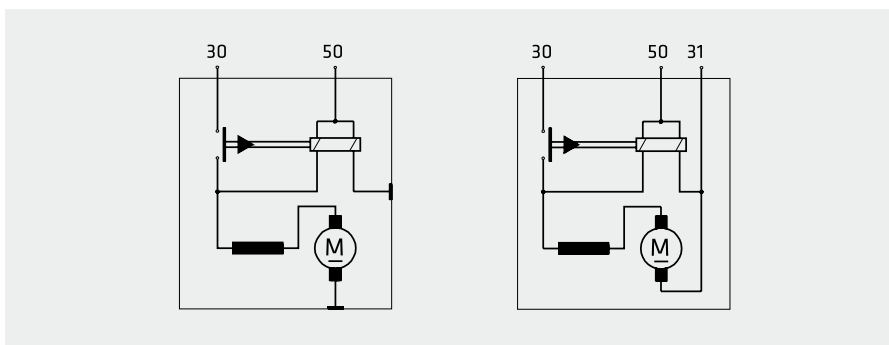
Type	AZE65..- nose AZE66..- noseless	
Nominal voltage (V)	12	24
Rated power (kW)	2.4	2.8
Length-nose (mm)	< 216	< 216
Length-noseless (mm)	< 251	< 251
Weight-nose (kg)	5.1	5.1
Weight-noseless (kg)	5.3	5.3
Yoke diameter (mm)	82	
Stator	4-pole windings	
Drive assembly	6 rollers	
Control signal (T50) (+20°C) Solenoid 12V	pull-in current < 50 A hold-in current < 10A	
Solenoid 24V	pull-in current < 30 A hold-in current < 7.5 A	
Terminals	30 - M8 31 - M8 50 - M4,M5 or M6, Blade 6.3 x 0.8 Integrated VW connector with blade 4.7x0.7 15a - 6.3 x 0.8, M5 (option)	
Basic protection	protection against ingress of dust, solid foreign objects and splashing water (IP56)	
Operating temperature	- 30°C to + 100°C	
Ambient temperature	- 40°C to + 130°C	

## Characteristics

12 V 2.4 kW



## Connection diagrams



# AZE Field coil reduction gear starter motors - Light Duty

These are starter motors for starting diesel engines in light commercial vehicles, small tractors and agricultural machinery, ships, stationary generator sets, and other applications.

## Features

- High specific power output and efficiency.
- Excellent cold crank capability with low current drain from battery.
- Reduced weight and size in comparison to direct drive starter motors.
- Different pinions, flanges, and electrical connections adjusted to the specific engines.
- Special versions are available on request for harsh ambient condition

## Options

- Pinion, flange, electrical terminals and the direction of rotation are customized for specific engines.
- Can be equipped with an auxiliary electro-mechanical start relay which enables low current ( $< 2A$ ) triggering of the starter motor.
- Additional dust protection is available with a lip seal on the pinion.
- Noseless version is oil-proof for wet clutch applications.
- Insulated ground return version.

## Design

- Pre-engaged style of a starter motor.
- Nosed or noseless versions for specific engine applications.
- Electrical excitation of the motor part.
- Rubber shock absorber, low-noise metallic planetary reduction gear using a coaxial pinion with an armature.
- Drive assembly with a six roller clutch.
- Pinion shift mechanism with solenoid, fork lever and helix.
- Solenoid switch with pull-in and hold-in winding is designed for effective breaking of the main contacts.
- High quality thermally resistant materials.
- Drive end brackets of die cast aluminium.
- Water protection is achieved using drain holes, O-rings and a rubber boot.
- End-of-life Directive 2000/53/EC respected, and also free from asbestos, beryllium and ammonia.

## Applications

For diesel engines from 2 to 3.5 litre of capacity.

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AZE 65 / AZE 66

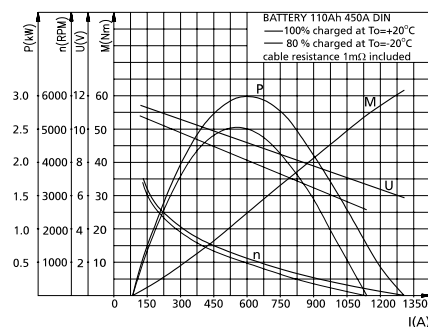


## Main technical data

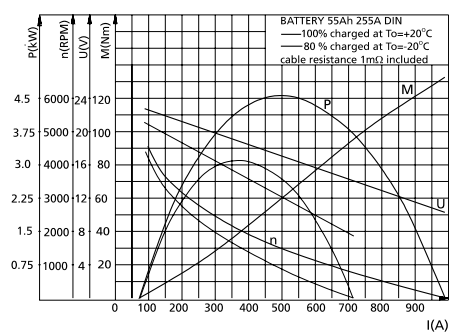
Type	AZE65..- nose AZE66..- noseless	
Nominal voltage (V)	12	24
Rated power (kW)	2.6	3.0
Length-nose (mm)	< 205	< 205
Length-noseless (mm)	< 243	< 243
Weight-nose (kg)	5.2	5.2
Weight-noseless (kg)	5.5	5.5
Yoke diameter (mm)	90	
Stator	4-pole windings	
Drive assembly	6 rollers $\varnothing$ 58 mm	
Control signal (T50) (+20°C) Solenoid 12V	pull-in current < 50A hold-in current < 10A	
Solenoid 24V	pull-in current < 30A hold-in current < 7,5A	
Terminals	30 - M8, M10 31 - M8 50 - M4, M5, M6, Blade 6.3 x 0.8 Integrated VW connector with blade 4.7x0.7	
Basic protection	protected against ingress of dust, solid foreign objects and splashing water (IP56)	
Operating temperature	- 30°C to + 100°C	
Ambient temperature	- 40°C to + 130°C	

## Characteristics

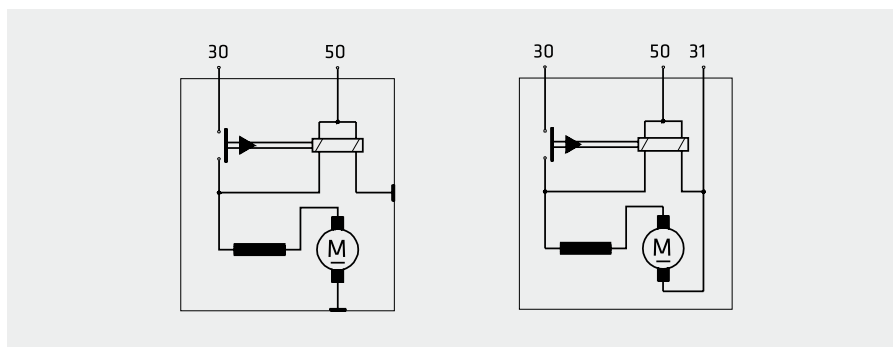
12 V 2.6 kW



24 V 3 kW



## Connection diagrams



# AZE Field coil reduction gear starter motors - Medium Duty

## Features

- High specific power output and efficiency.
- Excellent cold crank capability with low current drain from battery.
- Reduced weight and size in comparison to direct drive starter motors.
- Highly efficient drive assembly for idle run of the pinion.

## Applications

Diesel engines of 2 to 6 litre displacement.

## Options

- Pinion, flange, electrical terminals and sense of rotation are customized to the specific engines.
- Can be equipped with an auxiliary electro-mechanical start relay which enables low current ( $< 2A$ ) triggering of the starter motor.
- Additional dust protection is available with a lip seal on the pinion.
- Oil-proof versions for wet clutch applications.
- Insulated return versions are available.

## Design

- Pre-engaged style of a starter motor.
- Nosed or noseless versions for specific engine applications.
- Electrical excitation of the motor part.
- Rubber shock absorber, low-noise, metallic planetary reduction gear using a coaxial pinion with an armature.
- Drive assembly with a six roller clutch.
- Pinion shift mechanism with solenoid, fork lever and helix.
- Solenoid switch with pull-in and hold-in winding is designed for effective breaking of the main contacts.
- High quality thermally resistant materials.
- Drive end brackets made of grey cast iron (GCI), nodular cast iron (NCI) or die cast aluminium (DCA).
- Water protection is achieved using drain holes, O-rings and a rubber boot.
- End-of-life Directive 2000/53/EC respected, and also free from asbestos, beryllium and ammonia.

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AZE 45 / AZE 46

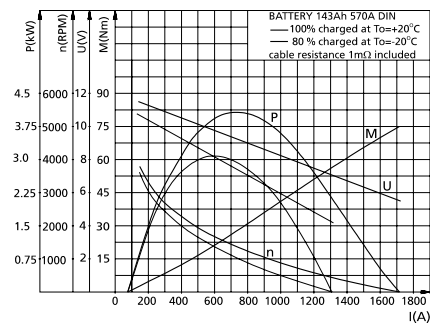


## Main technical data

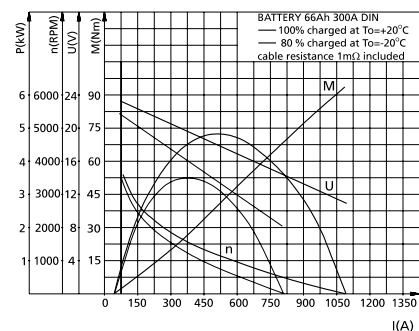
Type	AZE41 / AZE45..- nose AZE46..- noseless	
Nominal voltage (V)	12	24
Rated power (kW)	3.2	3.5
Length-nose (mm)	< 246	< 246
Length-noseless (mm)	< 274	< 274
Weight-nose (kg)	6.5 - 8.3	6.5 - 8.3
Weight-noseless (kg)	6.5 - 8.5	6.5 - 8.5
Yoke diameter (mm)	90	
Stator	4-pole windings	
Drive assembly	6 rollers 62 mm	
Control signal (T50) (+20°C) Solenoid 12V	pull-in current < 68A hold-in current < 20A	
Solenoid 24V	pull-in current < 30A hold-in current < 6A	
Terminals	30 - M8, M10 31 - M8, M10 50 - M4, M6, M5, 6.3 x 0.8	
Basic protection	protected against ingress of dust, solid foreign objects and splashing water (IP 56)	
Operating temperature	- 30°C to + 100°C	
Ambient temperature	- 40°C to + 130°C	

## Characteristics

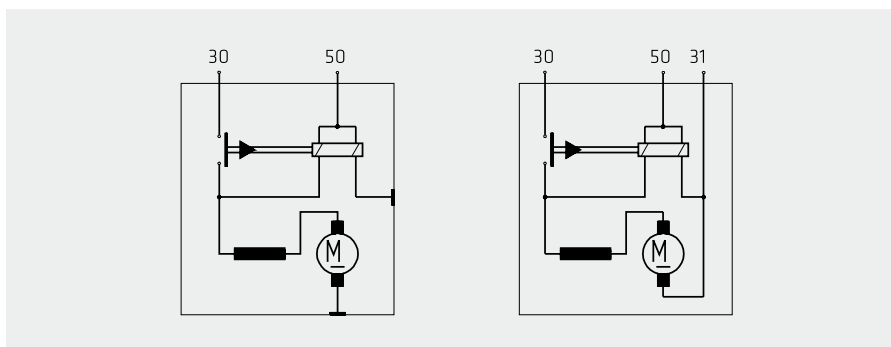
12 V 3.2 kW



24 V 3.5 kW



## Connection diagrams



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