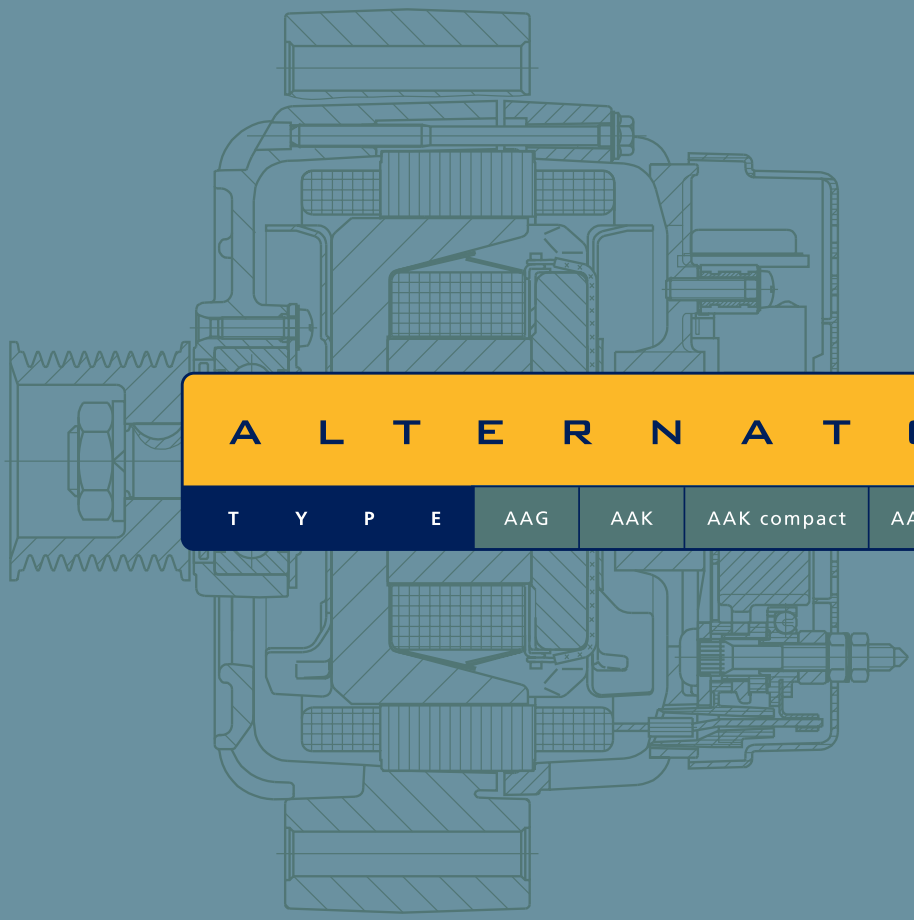


ALTERNATORS

TYPE	AAG	AAK	AAK compact	AAN compact	AAT

Iskra

Iskra Avtoelektrika d.d.

AAG

AAK

AAK compact

AAN compact

AAT

The technical performance of Iskra alternators is based on long-term relationships with the customers, their high requirements and expectations and our own long-standing experience in development and production. We control quality using ISO 9001 and QS-9000 standards. The entire process from customer requirement and expectation, through development and production is planned and controlled in detail. High operating reliability is assured by optimising the design for use in different operating conditions, together with numerous validations of different alternators in Iskra's own laboratories and on vehicles.

Alternators are air-cooled synchronous three-phase generators with claw poles and a built-in semiconductor rectifier. A three-phase stator winding is connected to the three-phase rectifier bridge with power rectifier or Zener diodes. The rotor coil is connected to the slip rings with brushes that conduct the excitation current. Alternators are self-excited through excitation diodes or they are excited directly by the battery. The voltage regulator can be either built-in or separately mounted. The negative terminal is normally connected to the chassis.

Iskra Avtoelektrika keeps abreast of all technical innovations in the field of alternators. Its staff are aware that energy conservation in vehicles is an absolute necessity. The results are different families of alternators designed in modern compact versions with internal fans in parallel with families of conventional design using external fans. Modern versions of rectifiers and specific multifunction regulators are also available.

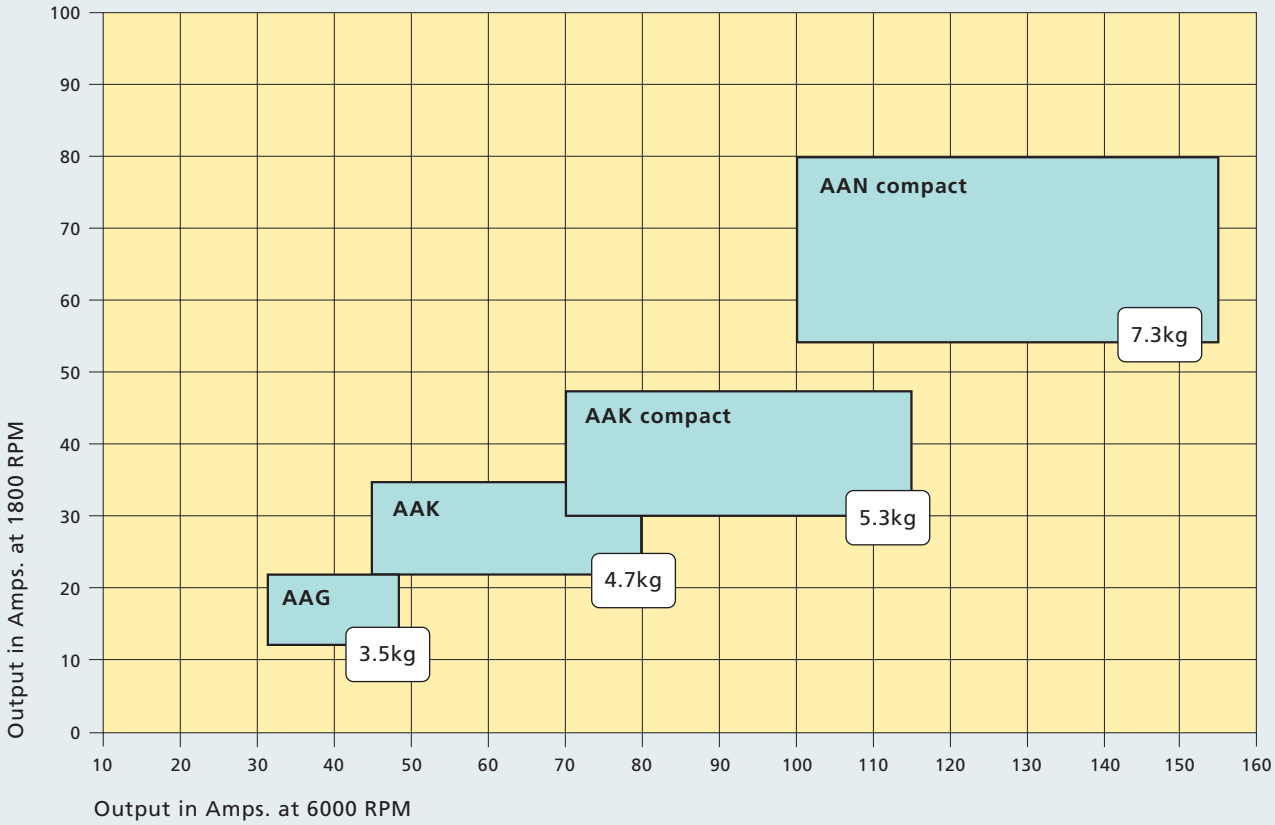
Different versions of alternators meet very high specifications in terms of resistance to salt spray, humidity, water, mud, dust, vibrations, high and low temperatures and aggressive liquids. They are also designed to meet electromagnetic compatibility and other international directives and standards. They are produced using ecologically sound technologies and environmentally friendly materials.

Iskra alternators are designed to meet a wide range of engineering specifications and applications. They are used on petrol and diesel engines in the automotive industry, on trucks, buses, tractors, construction machinery and in other applications. Different solutions of our alternators are defined taking into account the demands of each application and are designed for long life, maintenance free operation under extreme conditions.

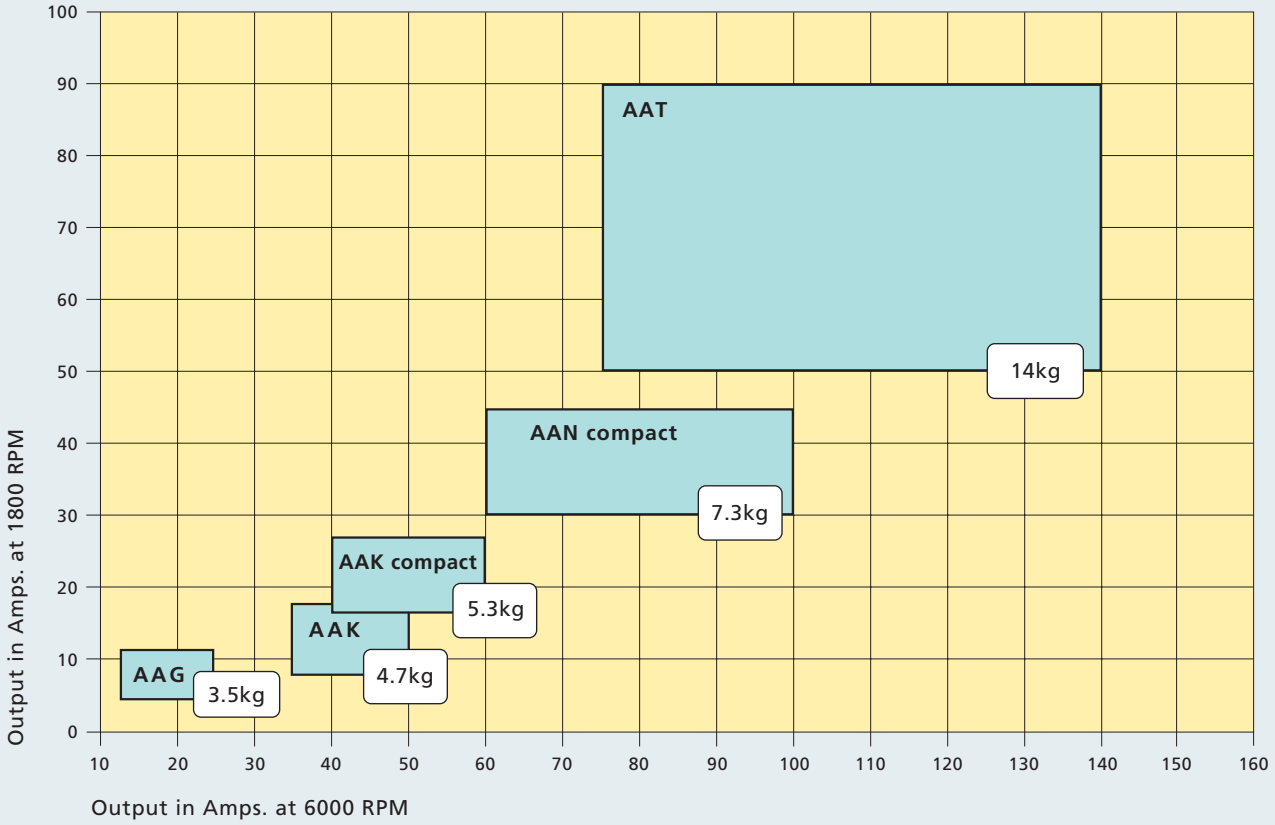
CLASSIFICATION OF ALTERNATORS

Alternators type AAG	stator diameter 108 mm
Alternators type AAK	stator diameter 125 mm
Alternators type AAK compact	stator diameter 125 mm
Alternators type AAN compact	stator diameter 142 mm
Alternators type AAT	stator diameter 165 mm

ALTERNATORS 14V



ALTERNATORS 28V



MAIN TECHNICAL DATA

Type	AAG	
Nominal voltage	14V	28V
Nominal current	33A - 50A	18A
Stator diameter	108 mm	
Weight	~3.5 kg without pulley	
Max. speed	18,000 RPM	
Regulator	Built-in or separate Hybrid technology	
Pulleys and drive end brackets	Different types according to customers' requirements	
Terminals	Screw and/or blade terminal	
Drive end bearings	Type 6203 – 2RS	
Rear end bearing	Type 63001	
Power diodes	Press fit rectifier diodes or Zener diodes	
Protection of the slip rings and brushes	Protected against access by a wire or splashing water (IP 44) Protected against ingress of solid foreign matter and powerful water jets (IP 56)	
Ambient temperature	From - 40°C to + 110°C	

APPLICATIONS

Low output powers make it possible for the alternators to be built into systems with low electrical requirements. Small dimensions allow installation on all types of combustion engines used on small tractors, small agricultural machinery, stationary engines and some other applications.

DESIGN

The alternator is a three-phase, 12-pole synchronous self-excited generator with built-in rectifier and regulator and cooled by an external fan. Various design solutions are available depending upon the application: insulated, marine, dustproof and other versions.

Cooling

The integral fan provides effective through cooling of the alternator. Two different fans are available, for CW and CCW direction of rotation.

Rotor

The rotor winding fixed between the claw poles provides excitation of the alternator through slip rings. For particularly dusty environments slip rings and brushes are additionally protected.

Rectifier

Press fit rectifier diodes or Zener diodes are mounted into protected heat sinks. Zener diodes protect the loads on the vehicle against overvoltages from the alternator.

Regulator

The regulator incorporating the brush holder is built into the alternator. The regulator is produced using thin-film hybrid or microelectronic technology. Monofunction or multifunction is available depending upon the requirements of the application. The highest quality brushes ensure long life of the alternator.

Brackets - Bearings - Pulleys

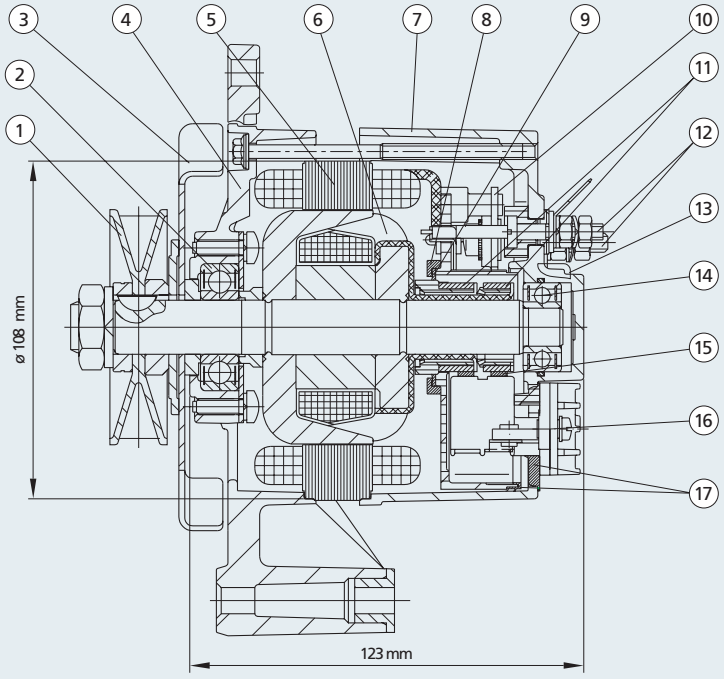
Brackets, bearings and pulleys are made according to the customers' requirements. A range of special sealed bearings makes it possible to design alternators for specific installations, operating in the harshest conditions whilst achieving long, maintenance free life.

Electrical terminals

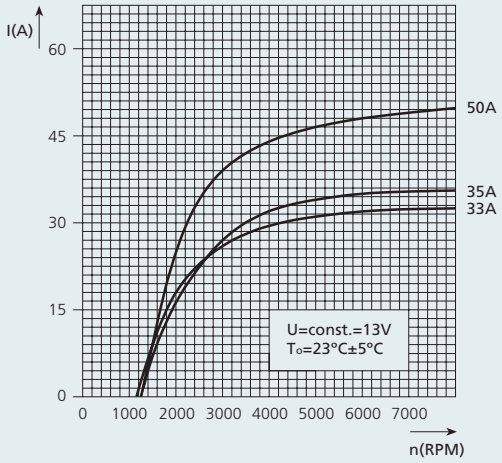
Electrical terminals are according to the customers' requirements.

CROSS SECTION

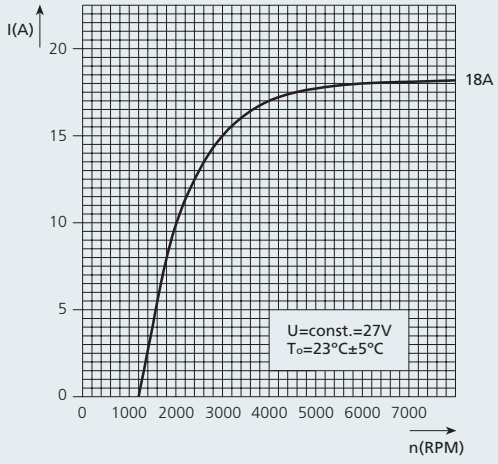
Pos 1 ... Pulley
Pos 2 ... Drive end bearing
Pos 3 ... Fan
Pos 4 ... Drive end bracket
Pos 5 ... Stator
Pos 6 ... Rotor
Pos 7 ... Rear bracket
Pos 8 ... Snap ring
Pos 9 ... Sealing felt
Pos 10 ...Rectifier
Pos 11 ...Slip rings
Pos 12 ...Terminals B+, W, D+
Pos 13 ...Capacitor
Pos 14 ...Rear bearing
Pos 15 ...Brush
Pos 16 ...Brush holder with voltage regulator
Pos 17 ...Rubber gaskets



CHARACTERISTICS

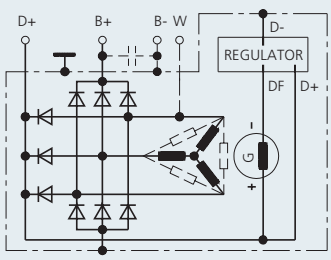


	n_o (RPM)	I (A) at 1800 RPM	I (A) at 6000 RPM
14V 33A	1150	15	32
14V 35A	1250	13	35
14V 50A	1250	20	48



	n_o (RPM)	I (A) at 1800 RPM	I (A) at 6000 RPM
28V 18A	1200	8	18

CONNECTION DIAGRAM



MAIN TECHNICAL DATA

Type	AAK	
Nominal voltage	14V	28V
Nominal current	45A-80A	35A – 50A
Stator diameter	125 mm	
Weight	~4.7 kg without pulley	
Max. speed	18,000 RPM	
Regulator	Built-in or separate Mono or multifunction Hybrid or microelectronic monochip technology	
Pulleys and drive end brackets	Different types according to customers' requirements.	
Terminals	Screw and/or blade terminal	
Drive end bearings	Type 6203 / 6303 / 6304E / 6403-2RS	
Rear end bearing	Type 6201-2RS	
Power diodes	Rectifier or Zener diodes	
Protection of the slip rings and brushes	Protected against access by a wire or splashing water (IP 44) Protected against ingress of solid foreign matter and powerful water jets (IP 56)	
Ambient temperature	From - 40°C to + 110°C	

APPLICATIONS

High output power alternators to satisfy the needs for electrical energy in a wide range of applications:

- for cars
- for commercial vehicles
- for heavy-duty applications
- for special applications

DESIGN

The alternator is a three-phase 12-pole synchronous self-excited generator with built-in rectifier and regulator and cooled by an external fan. Depending upon the purpose of the installation, various versions can be supplied: insulated, marine and other versions according to special requirements.

Cooling

An integral fan provides effective through cooling of the alternator. Two different fans are used depending upon the required direction of rotation.

Rotor

With regard to the requirements of the installation and the operating conditions, different protection levels are provided for the slip rings and brush compartment.

Rectifier

A three-phase bridge circuit with power rectifier diodes and excitation diodes provides D.C. output currents and excitation of the alternator. It is possible to use Zener power diodes to protect loads on the vehicle against alternator overvoltages.

Regulator

Regulator with brush holder is fitted to the alternator. They are made in thin-film hybrid or microelectronic technology. With regard to the requirements of the application they may be monofunction or multifunction. The highest quality brushes ensure long life of the alternator.

Brackets - Bearings - Pulleys

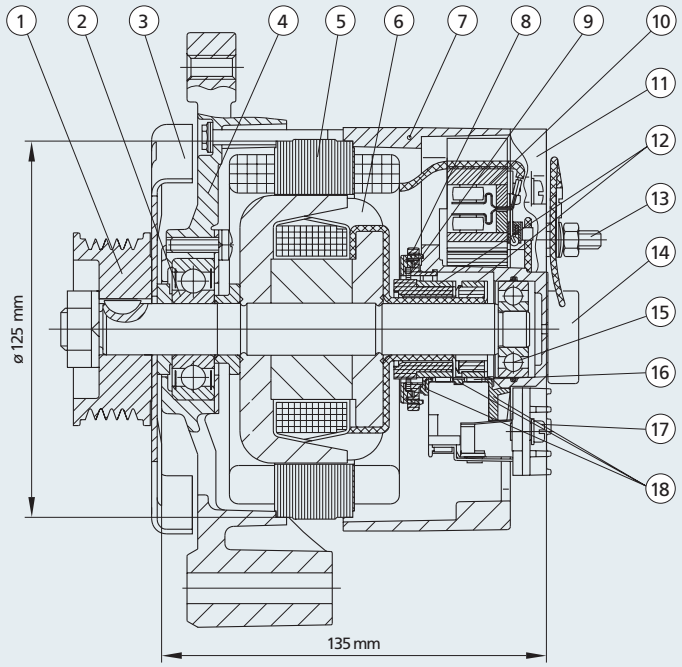
Brackets, bearings and pulleys are made according to the customers' requirements. A range of special sealed bearings makes it possible to design alternators for specific installations, operating in the harshest conditions whilst achieving long, maintenance free life.

Electrical terminals

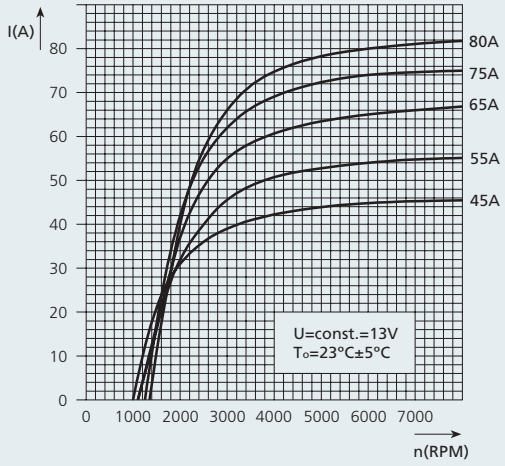
Electrical terminals are according to the customers' requirements.

CROSS SECTION

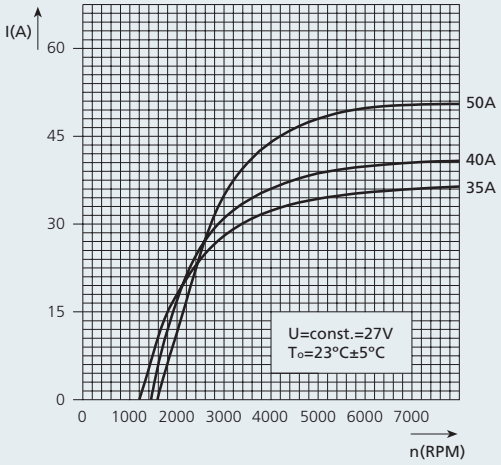
Pos 1 ... Pulley
Pos 2 ... Drive end bearing
Pos 3 ... Fan
Pos 4 ... Drive end bracket
Pos 5 ... Stator with winding
Pos 6 ... Rotor
Pos 7 ... Rear bracket
Pos 8 ... Snap rings
Pos 9 ... Sealing felt
Pos 10 ... Rectifier with diodes
Pos 11 ... Protective cover
Pos 12 ... Slip rings
Pos 13 ... Terminals B+, D+, W
Pos 14 ... Capacitor
Pos 15 ... Rear bearing
Pos 16 ... Brush
Pos 17 ... Brush holder with voltage regulator
Pos 18 ... Rubber gaskets



CHARACTERISTICS



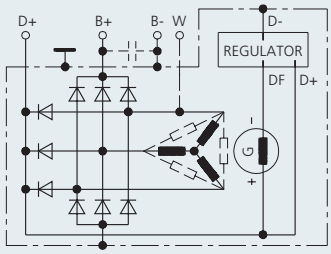
	n₀ (RPM)	I (A) at 1800 RPM	I (A) at 6000 RPM
14V 45A	1000	28	45
14V 55A	1100	27	54
14V 65A	1100	30	65
14V 75A	1250	34	74
14V 80A	1350	29	80



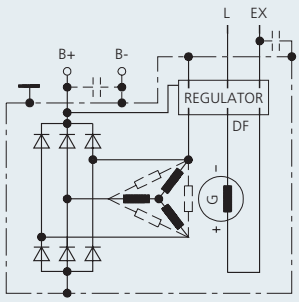
	n₀ (RPM)	I (A) at 1800 RPM	I (A) at 6000 RPM
28V 35A	1200	15	35
28V 40A	1450	12	40
28V 50A	1550	5	50

CONNECTION DIAGRAMS

Monofunction regulator



Multifunction regulator



MAIN TECHNICAL DATA

Type	AAK Compact	
Nominal voltage	14V	28V
Nominal current	70A-120A	40A – 60A
Stator diameter	125 mm	
Weight	~5.3 kg without pulley	
Max. speed	20,000 RPM	
Regulator	Built-in or separate Monofunction or multifunction Microelectronic technology	
Pulleys and drive end brackets	Different types according to customers' requirements.	
Terminals	Screw and/or blade terminal	
Drive end bearings	Type 6303, 6304E, 62304E	
Rear end bearing	Type 6003	
Power diodes	Press fit Zener diodes	
Protection of the slip rings and brushes	Protected against ingress of solid foreign matter and powerful water jets (IP 56)	
Ambient temperature	From - 40°C to + 110°C	

APPLICATIONS

- for passenger cars
- for commercial vehicles
- for heavy-duty applications
- for special applications

Features

- high specific power and efficiency
- small dimensions
- low weight
- low noise level
- higher protection against accidental contact
- long life operation

DESIGN

The alternator is a three-phase, 12-pole synchronous self-excited generator with two internal fans and built-in regulator and rectifier. The compact construction and carefully selected materials assure improved technical characteristics and long life, service free, operation even under the harshest conditions of high and low temperatures, salt spray, humidity, water, dust, vibrations, aggressive liquids.

Stator

The stator has a three-phase winding on a laminated pack. The selected design and high filling factor of the stator slots provides improved cooling, low noise and high output characteristics.

Cooling

Two internal fans positioned on the claw poles provide more effective cooling with lower noise and higher protection against accidental contact as well as higher output.

Rotor

Smaller slip rings provide higher brush durability, even at high speeds. Encapsulated slip rings offer increased durability of the alternator.

Rectifier

Sandwich construction of the rectifier with press fit Zener diodes provides the low temperatures of the rectifier diodes, high resistance to vibrations and protection of loads on the vehicle against alternator overvoltages. The installation of the rectifier on the outer side of the rear end bracket ensures flexible arrangement of all types of terminals.

Regulator

The regulator together with the brush holder is assembled on the rear end bracket. Regulators use microelectronic technology and are mono or multifunction. The highest quality of brushes ensure long life of the alternator.

Brackets - Bearings - Pulleys

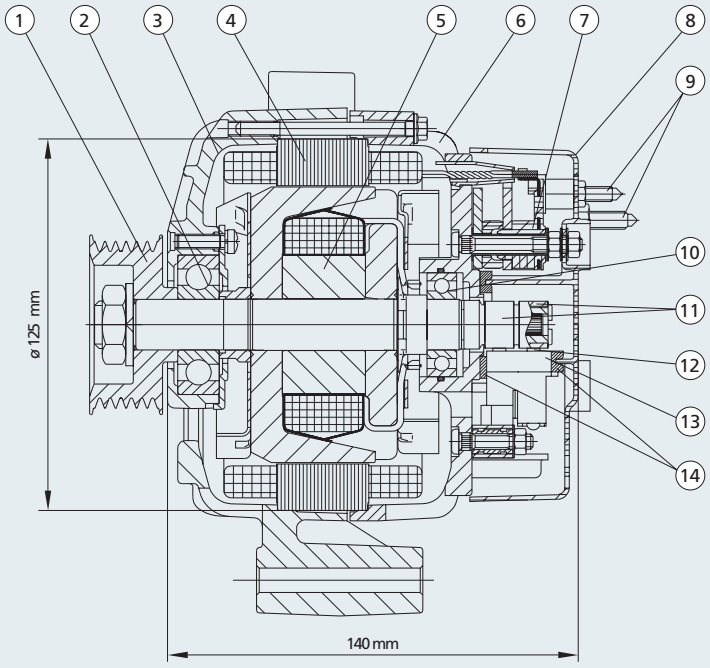
Brackets, bearings and pulleys are made according to the customers' requirements. A range of special sealed bearings makes it possible to design alternators for specific installations, operating in the harshest conditions whilst achieving long, maintenance free life.

Electrical terminals

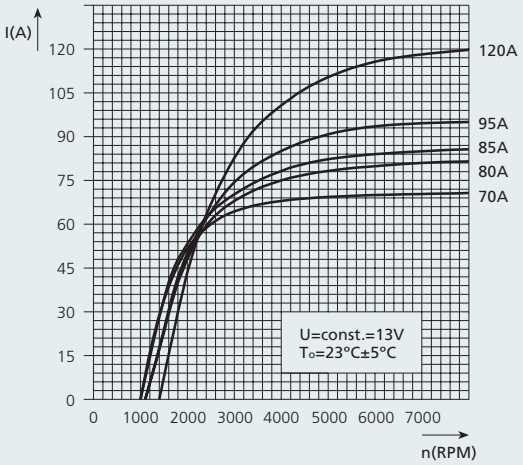
Electrical terminals are according to the requirements of the customers.

CROSS SECTION

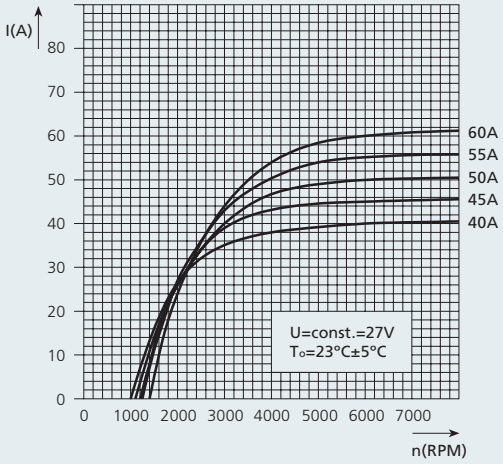
Pos 1 ... Pulley
Pos 2 ... Drive end bearing
Pos 3 ... Drive end bracket
Pos 4 ... Stator with winding
Pos 5 ... Rotor
Pos 6 ... Rear bracket
Pos 7 ... Rectifier with diodes
Pos 8 ... Protective cover
Pos 9 ... Terminals B+, D+, W
Pos 10 ...Rear bearing
Pos 11 ...Slip rings
Pos 12 ...Brush
Pos 13 ...Brush holder with voltage regulator
Pos 14 ...Rubber gaskets



CHARACTERISTICS

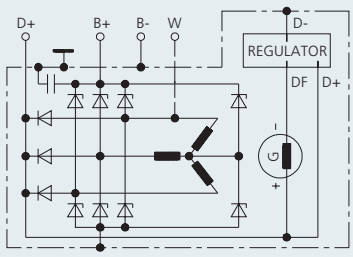


	n₀ (RPM)	I (A) at 1800 RPM	I (A) at 6000 RPM
14V 70A	1000	47	70
14V 80A	1100	40	80
14V 85A	1000	47	84
14V 95A	1100	42	94
14V 120A	1400	30	115



	n₀ (RPM)	I (A) at 1800 RPM	I (A) at 6000 RPM
28V 40A	1000	23	40
28V 45A	1100	22	45
28V 50A	1200	22	50
28V 55A	1250	21	55
28V 60A	1400	18	60

CONNECTION DIAGRAM



MAIN TECHNICAL DATA

Type	AAN Compact	
Nominal voltage	14V	28V
Nominal current	100A-150A	60A – 100A
Stator diameter	142 mm	
Weight	~7.3 kg without pulley	
Max. speed	20,000 RPM	
Regulator	Built-in or separate Monofunction or multifunction Microelectronic technology	
Pulleys and drive end brackets	Different types according to customers' requirements.	
Terminals	Screw and/or blade terminal	
Drive end bearings	Type 6304E, 62304E	
Rear end bearings	Type 6203	
Power diodes	Press fit Zener diodes	
Protection of the slip rings and brushes	Protected against ingress of solid foreign matter and powerful water jets (IP 56)	
Ambient temperature	From - 40°C to + 110°C	

APPLICATIONS

- for passenger cars and commercial vehicles with higher electrical demand
- for heavy-duty applications
- for special applications

Features

- high specific power and efficiency
- small dimensions
- low weight
- low noise level
- higher protection against accidental contact
- long life operation

DESIGN

The alternator is a three-phase, 12-pole synchronous self-excited generator with two internal fans and built-in regulator and rectifier. The compact construction and carefully selected materials assure improved technical characteristics and long life, service free, operation even under the harshest conditions of high and low temperatures, salt spray, humidity, water, dust, vibrations, aggressive liquids.

Stator

The stator has a three-phase winding on a laminated pack. The selected design and high filling factor of the stator slots provides improved cooling, low noise and high output characteristics.

Cooling

Two internal fans positioned on the claw poles provide more effective cooling with lower noise and higher protection against accidental contact as well as higher output.

Rotor

Smaller slip rings assure higher brush durability, even at high speeds. Encapsulated slip rings offer increased durability of the alternator.

Rectifier

Sandwich construction of the rectifier with press fit Zener diodes provides for low temperatures of the rectifier diodes, high resistance to vibrations and protection of loads on the vehicle against alternator overvoltages. The installation of the rectifier on the outer side of the rear end bracket ensures flexible arrangement of all types of terminals.

Regulator

The regulator together with the brush holder is assembled on the rear end bracket. Regulators use microelectronic technology and are mono or multifunction. The highest quality of brushes ensure long life of the alternator.

Bearings - Brackets - Pulleys

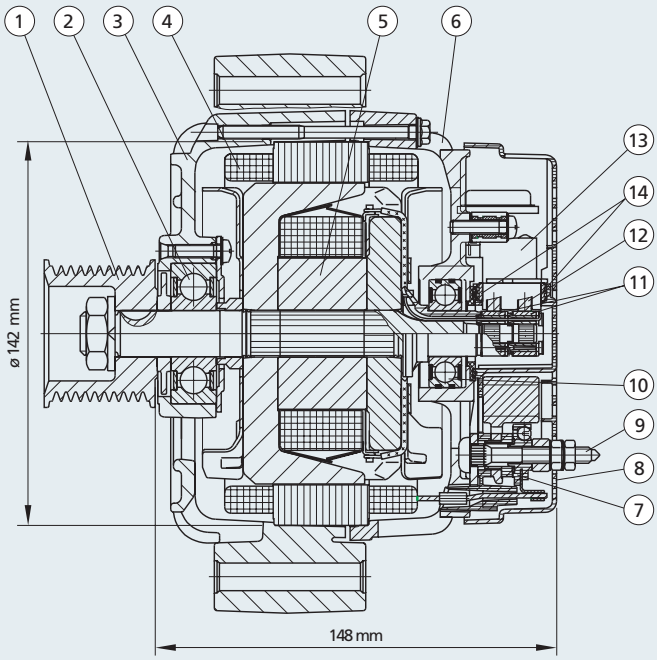
Brackets, bearings and pulleys are made according to the customers' requirements. A range of special sealed bearings makes it possible to design alternators for specific installations, operating in the harshest conditions whilst achieving long, maintenance free life.

Electrical terminals

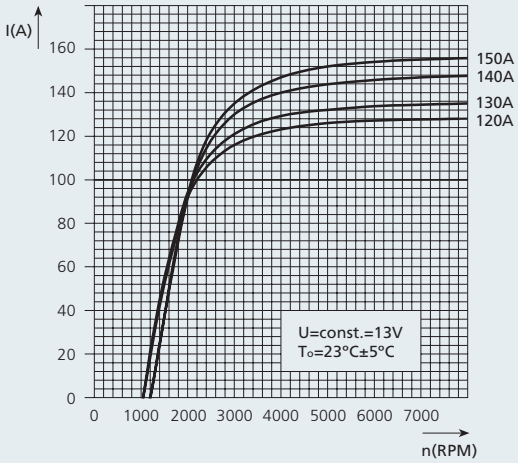
Electrical terminals are according to the requirements of the customers.

CROSS SECTION

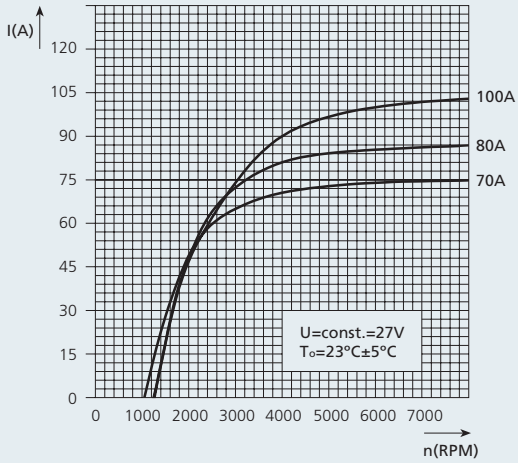
Pos 1 ... Pulley
Pos 2 ... Drive end bearing
Pos 3 ... Drive end bracket
Pos 4 ... Stator with winding
Pos 5 ... Rotor
Pos 6 ... Rear bracket
Pos 7 ... Rectifier with diodes
Pos 8 ... Protective cover
Pos 9 ... Terminals B+, D+, W
Pos 10 ...Rear bearing
Pos 11 ...Slip rings
Pos 12 ...Brush
Pos 13 ...Brush holder with voltage regulator
Pos 14 ...Rubber gaskets



CHARACTERISTICS

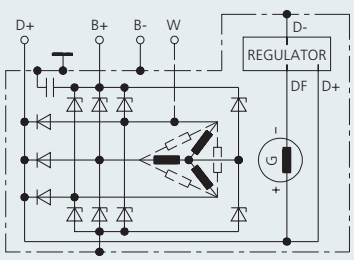


	n₀ (RPM)	I (A) at 1800 RPM	I (A) at 6000 RPM
14V 120A	1050	78	125
14V 130A	1050	80	134
14V 140A	1200	72	145
14V 150A	1200	74	154



	n₀ (RPM)	I (A) at 1800 RPM	I (A) at 6000 RPM
28V 70A	1050	41	74
28V 80A	1250	39	85
28V 100A	1250	38	100

CONNECTION DIAGRAM



MAIN TECHNICAL DATA	
Type	AAT
Nominal voltage	28V
Nominal current	75A-140A
Stator diameter	165 mm
Weight	~9.6 kg without pulley for 75A ~14.5 kg without pulley for 140A
Max. speed	9,000 RPM
Regulator	Built-in or separate Monofunction Hybrid technology
Pulleys and drive end brackets	Different types according to customers' requirements
Terminals	Screw and/or blade terminal
Drive end bearings	Type 62306-2RS
Rear end bearings	Type NU 202
Power diodes	Press fit Zener diodes
Protection of the slip rings and brushes	Protected against ingress of solid foreign matter and powerful water jets (IP 56)
Ambient temperature	From - 40°C to + 110°C

APPLICATIONS

These alternators provide very high output power and are designed to be built into applications requiring high consumption of electrical energy. They were all initially designed for installation on diesel engines in buses and some special purpose applications.

DESIGN

The alternators are three-phase, 16-pole synchronous generators, self-excited by a rotor consisting of claw poles using protected slip rings. They have a built-in rectifier and regulator and are cooled by an external fan. Design solutions and anticorrosion coatings as well as specially chosen bearings ensure long life without maintenance under normal operating conditions. For operation in extremely hard conditions - temperature, dust, water - it is advisable to ventilate the alternator using a special protection cover on the rear.

Cooling

The alternator has a built-in fan with axial - radial blades that allow rotation in both directions. It is also possible to use a low-noise fan with specially shaped blades.

Stator

A three-phase stator winding with a high filling factor of the slots and a special method of assembly provide better cooling and high output power.

Rotor

The rotor field winding provides excitation of the alternator through slip rings. With regard to the installation requirements, slip rings and brushes are protected in an enclosed environment sealed against dust and water.

Rectifier

The rectifier stack is a three-phase bridge circuit with built-in press fit power and excitation diodes. Press fit Zener diodes are used to protect alternator and loads on the vehicle against overvoltages.

Regulator

The regulator together with the brush holder is built into the rear end bracket of the alternator. Regulators are produced in thick-film hybrid technology. Monofunction versions of the regulator only are available.

Brackets - Bearings - Pulleys

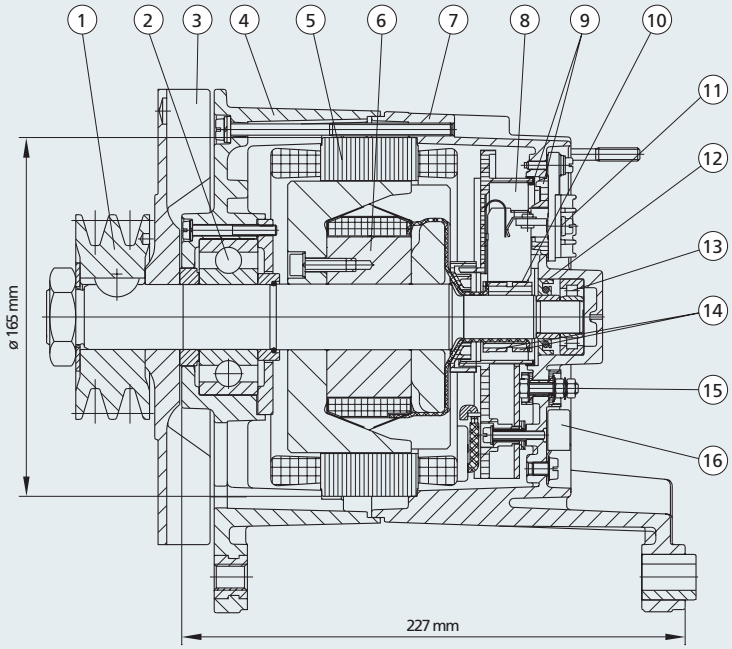
The high quality specially chosen bearings provide long service free life.

Electrical terminals

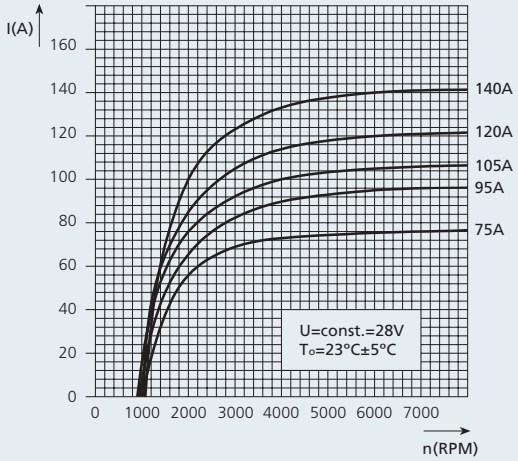
Electrical terminals are according to the customers' requirements.

CROSS SECTION

Pos 1 ... Pulley
Pos 2 ... Drive end bearing
Pos 3 ... Fan
Pos 4 ... Drive end bracket
Pos 5 ... Stator
Pos 6 ... Rotor
Pos 7 ... Rear bracket
Pos 8 ... Rectifier
Pos 9 ... Rubber gaskets
Pos 10 ... Brush
Pos 11 ... Brush holder with voltage regulator
Pos 12 ... Oil seal
Pos 13 ... Rear bearing
Pos 14 ... Slip rings
Pos 15 ... Terminals D+, B+, W
Pos 16 ... Capacitor

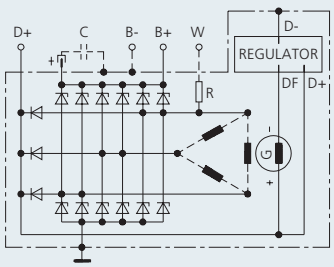


CHARACTERISTIC



	n_o (RPM)	I (A) at 1800 RPM	I (A) at 6000 RPM
28V 75A	1000	50	75
28V 95A	950	60	95
28V 105A	900	70	105
28V 120A	1020	78	120
28V 140A	1080	90	140

CONNECTION DIAGRAM



1. CUSTOMER

Company: _____

Address: _____ Country: _____

Responsible person: _____

Phone: _____ Fax: _____ E-mail: _____

2. ENGINE DATA

PROJECT

Name: _____ ☐ inquiry ☐ new project ☐ modification

Brief description: _____

_____

Quantity in next years: 1st _____ 2nd _____ 3rd _____ 4th _____ 5th

APPLICATION

☐ cars ☐ trucks ☐ buses ☐ agriculture ☐ road industry ☐ railway ☐ marine

☐ other applications _____

ENGINE DATA

☐ petrol ☐ diesel 2/4 stroke _____ No. of valves _____

No. of cylinders _____ Compression _____ Displacement _____ Ltr.

Rated output _____ kW Min. speed _____ RPM Max. speed _____ RPM

PREDECESSOR / EQUIVALENT TYPE OF ALTERNATOR

Supplier _____ Type _____ Mark _____

Drawing _____ Release number _____

3. ALTERNATOR REQUIREMENTS

ELECTRICAL REQUIREMENTS

Voltage _____ V Current _____ A (1800 min^{-1}) _____ A (6000 min^{-1})

Power _____ kW Isolated ground ☐ NO ☐ YES

Electrical connections

B+ type of terminal _____ **D+** type of terminal _____

W type of terminal _____ **B-** type of terminal _____

Other connection - terminals _____

_____

Regulator voltage Ur = _____ V

Regulator: ☐ monofunction ☐ multifunction

Description of function _____

_____

MECHANICAL REQUIREMENTS FOR ALTERNATOR

Direction of alt. rotation: ☐ clockwise ☐ counterclockwise ☐ both directions

Ratio between engine and alternator: 1: _____

Type of driving belt/ pulley:

☐ one groove, belt width _____ mm angle _____

☐ two groove, belt width _____ mm dimension between belt _____ angle _____

☐ poly V belt, number of grooves _____ dimension between grooves _____ angle _____

Diameter of the pulley _____ mm Belt line dimension _____

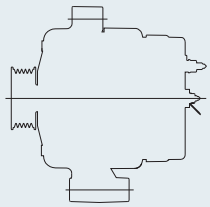
Type of pulley bearing _____

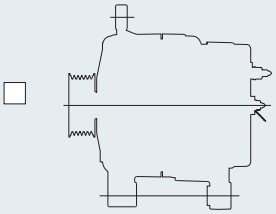
DESIGN REQUIREMENTS

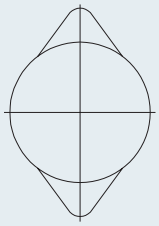
Max. diameter: _____ mm Max. length: _____ mm Max. weight: _____ kg

Type of installation

Please draw direction, position of cables, terminals (back side view)

☐ 

☐ 



Other design requirements: _____

Grade of protection according IP (DIN 40050): IP _____

Environmental conditions: ☐ salt spray ☐ high temperature ☐ low temperature

☐ humidity ☐ others _____

Mounting requirements: (to specify/sketch) or enclose drawing _____

Special requirements:

Customer test specification No.: _____

Safety standards: _____

Other standards: _____

Vehicle test or bench test (duration/conditions/number of samples): _____

Date: _____ Signature: _____