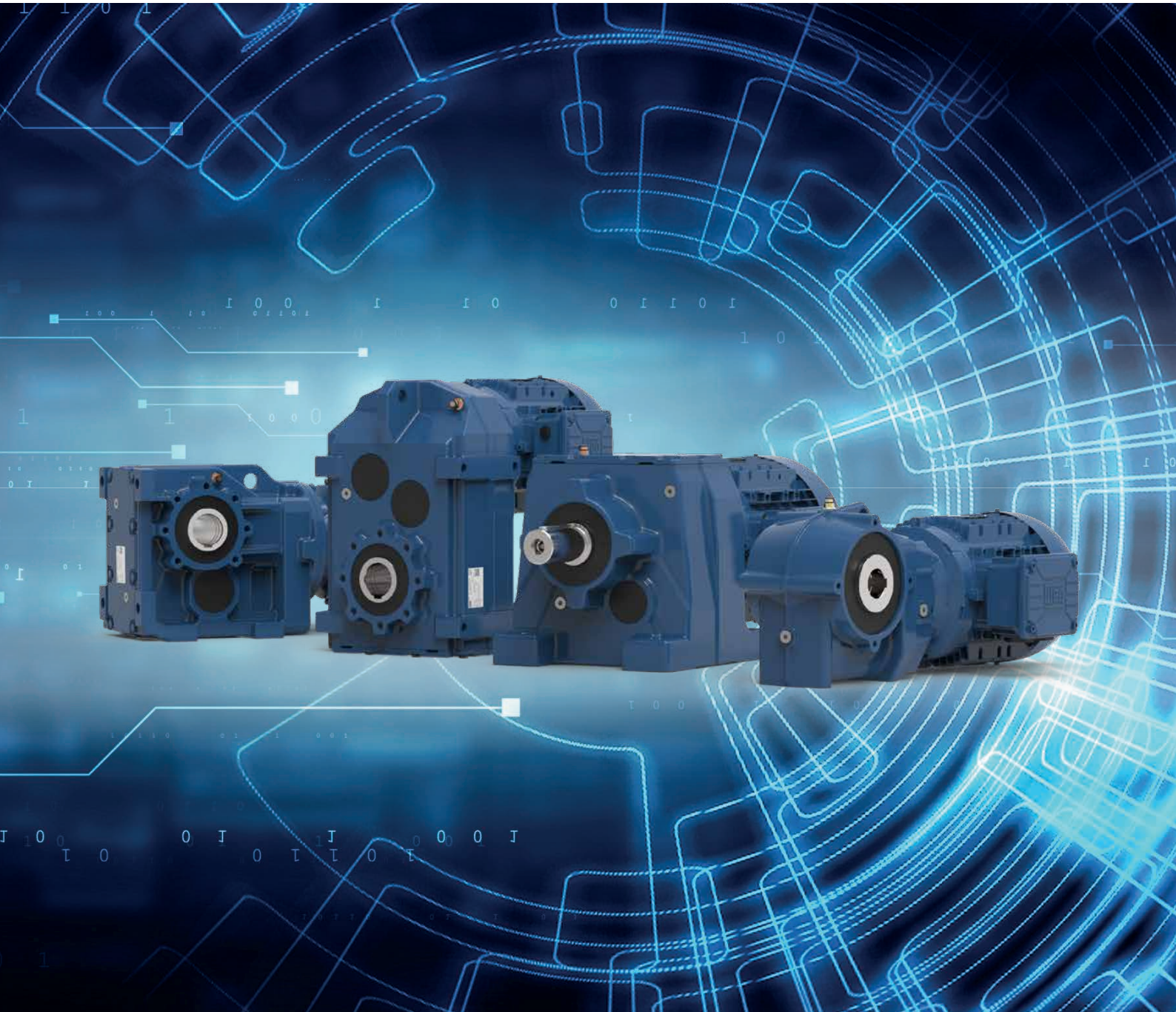
WHITE PAPER

Future-proof geared motors for industry

20 reasons for choosing WG20 geared motors



Geared motors are one of the most important types of drive in the processing and manufacturing industry and are used in a wide variety of applications, machines and systems. Yet, the more varied the applications, the more varied the demands are on the drive. Can one geared motor series cover all requirements? The answer lies in the WG20 geared motor range from WEG.

The WG20 type series is available in helical, parallel shaft, helical bevel and helical worm gear designs, offering you the perfect gear type for any application in a whole host of application and installation situations. Take a look at the **20 points** below to discover how you can benefit as a machine manufacturer and plant operator from incorporating a WG20 geared motor into your drive solutions.

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Responsible for content: WEG Gear Systems GmbH
Picture credit: WEG Gear Systems GmbH, Adobe Stock

1 Which WG20 geared motor is the right one for your application?

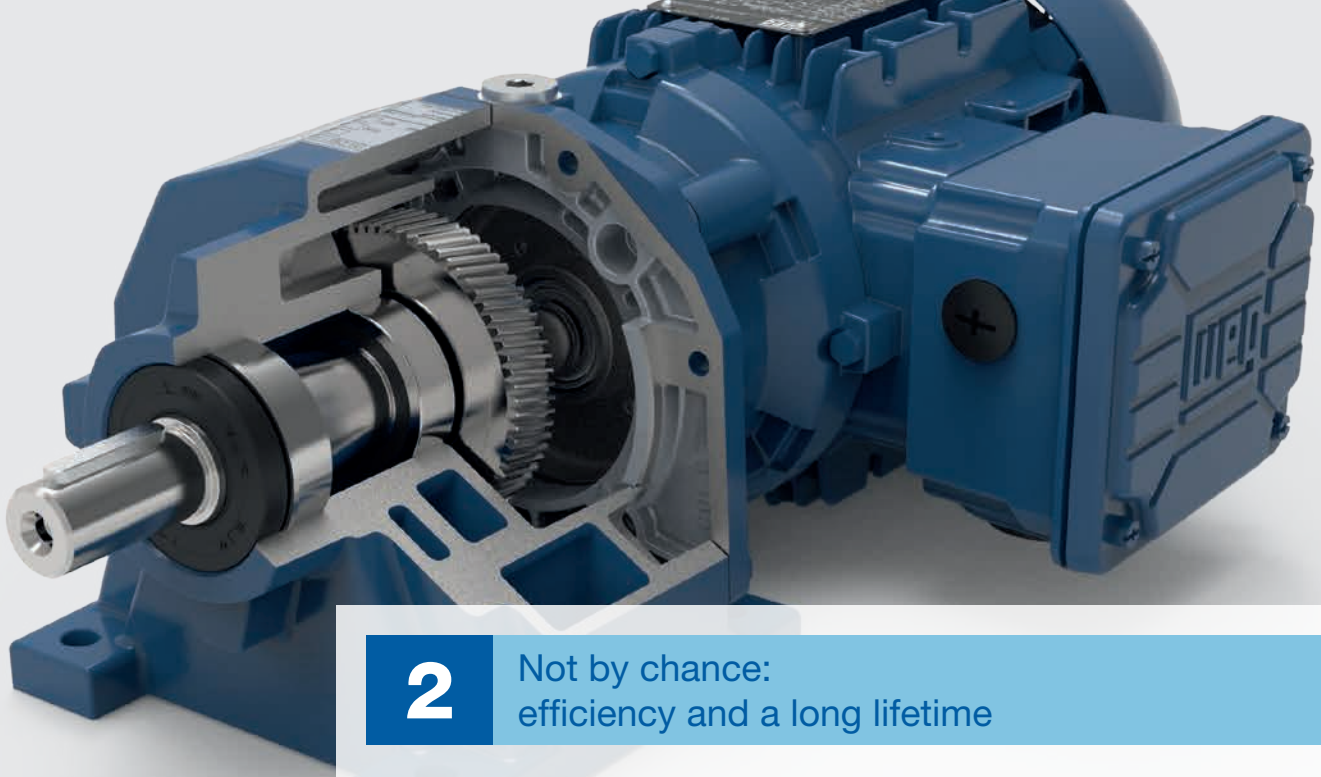
Do you work with conveying or environmental technology, in intralogistics, or maybe in the food, steel or mining industry? No matter which sector, machine manufacturers and plant operators can only benefit from these highly reliable WG20 series geared motors – after all, system availability is absolutely paramount for any application. If you are looking for a geared motor that is not only robust, durable and resistant to environmental factors, but is also easy to clean, WG20 geared motors are the answer.

Your application and available space solely determine whether you opt for a helical, parallel shaft, bevel or worm gear unit.

The gear housing of the smaller sizes in the WG20 range up to 600 Nm are made of lightweight aluminium; larger ones upwards of 820 Nm are made of grey cast iron. Both of these materials have their own particular advantages: For higher torques, grey cast iron is the better choice, as the material is particularly torsion-resistant and vibration-damping. The smooth surface is easy to clean, making the geared motors especially suitable for applications requiring plenty of cleaning, such as in the food industry. With rated torques of up to 18,000 Nm, the powerful geared motors made of grey cast iron are the obvious choice for demanding applications in heavy industry, for example, in steelworks or mining. On the other hand, a die-cast aluminium housing is significantly lighter than a grey cast iron housing with similar strength. One of the main benefits of this lower weight is that it can be used in weight-optimised systems. Aluminium is also less sensitive to environmental factors and corrosion.

Which gear type is ultimately used in an application not only depends on the torque transmission characteristics and available speeds, but primarily on the space available. For example, a helical gear unit with its longer design is used where sufficient space is available, while parallel shaft gear units are ideal for use in limited installation space. If the axial installation space is limited, a bevel gear unit is typically used, while worm gears are particularly suitable for large ratios. In addition to the dynamic characteristics, installation space or amount of space available, centre of gravity and efficiency are further key factors that determine the choice of gear unit. The WG20 geared motor series offers you the right gear units and gear unit sizes with standard fitting dimensions for all these requirements.





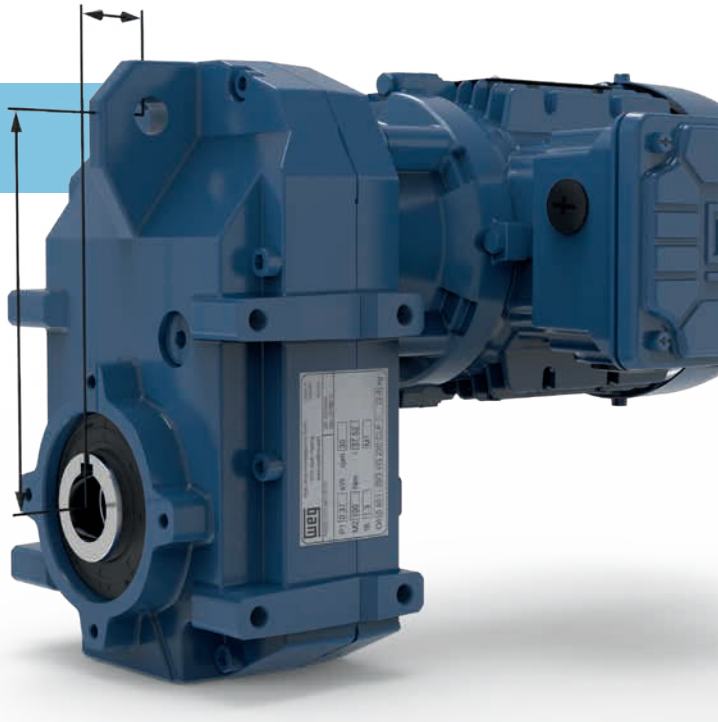
2 Not by chance: efficiency and a long lifetime

Are you looking for a geared motor with a high degree of efficiency? WG20 geared motors not only have optimised gearing and electric motors up to IE4 to thank for their great efficiency, but also a smaller number of gear stages. WEG has optimised the housing and gearing by means of FEM simulations to produce a high level of design safety. The result is an efficient geared motor with a long service life. The WG20 type series for torques up to 600 Nm is maintenance-free thanks to its lifetime lubrication. In WG20 geared motors, low peripheral speeds in the input stage and reduced splashing losses due to optimising the lubricant quantity mean that the gearboxes used have low energy losses.

With these WG20 geared motors, WEG can achieve maximum reductions of 100 with two gear stages as well as a high degree of efficiency. This means a smaller number of moving parts. The advantages? Less warming, greater efficiency, less wear and a longer life. Reduce your operating costs by using an energy efficient drive system. Our solution comprises a WG20 gearbox combined with a WEG electric motor and an efficiency class up to IE4 – ensuring that you meet the legal requirements.

3 Standard mounting dimensions are a crucial factor

Market standards have dictated certain fitting dimensions, making them an important factor in the selection of a suitable geared motor. Drives like the WG20 range need to be fully compatible with these standards so that they can be fitted without customers having to modify their systems. This allows machine manufacturers and plant operators to retrofit their existing applications easily without any great modification efforts and expense. The secured **Supply Chain 18** ensures that WG20 geared motors are always available worldwide, making larger scale retrofits possible at any time.



4 Global certifications ensure standard-compliant use

Are you keen to ensure that the geared motors you use comply with all global standards and can be used anywhere? Rest assured, WEG geared motors can be used anywhere in the world: Our WG20 type series is certified standard-compliant to CE and UKCA (Europe), CSA (Canada), UL (USA) and EAC (Eurasia). If requested, WEG can also supply your WG20 with other certifications, for example, CEL and CCC (China), SASO (Saudi Arabia), and INMETRO (Brazil). This is also ensured by the universal voltage switching option for the electric motors installed in the WG20 geared motors.

5 Worldwide application simplifying your processes

Voltages and mains frequencies vary greatly around the world. With a WG20 gear unit, in conjunction with the modular system motors (EUSAS), there is no need to worry, as it can be used with most of these voltages and mains frequencies. EUSAS motors feature a wide voltage range and the option of voltage switching. This allows a wide scope of applications for voltages and frequencies ranging from 110 to 690 V at 50 and 60 Hz. In addition to the requirements of the Energy Efficiency Directive for Europe, the motors also meet further requirements of other markets, such as the USA (Nema Efficiency) or China (China Energy Label). This means a system you can use worldwide from a single source: A EUSAS motor can be used in EUrope, the USA or in ASia and delivered fast at any time. Not only is this crucial for simplifying your processes such as ordering and logistics, but this will also increase your flexibility, while reducing costs.

The EUSAS motor has a special wide-range winding, which allows the separation of each motor winding into two partial windings with a total of twelve connecting wires; in turn, this allows a wide range of circuit options on the nine-bolt terminal board. This feature, which allows switching to up to four different voltage levels (star, delta, double star and double delta), makes it highly flexible on the global market.



Asynchronous motors have previously been severely limited in terms of voltage switchability due to their winding design. For each level deviating from IEC 60038, the motor had to be manufactured separately, resulting in considerable additional costs and longer delivery times, especially for small quantities. The special winding of the EUSAS motors finally puts an end to this, making this a versatile all-in-one solution. If occasionally the required voltage cannot be achieved by a standard motor, WEG can offer you the right winding. WEG EUSAS motors are not only a great choice for applications on all continents, but also for use in a wide temperature range. Covering temperatures from -20 to +40 °C, WEG motors also enable you to operate applications in regions where high temperatures occur.

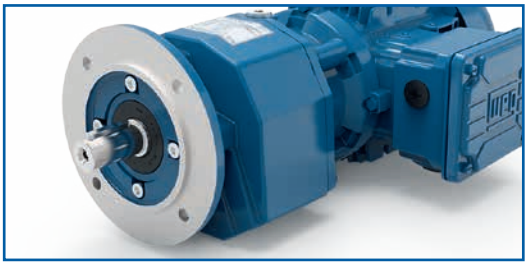
6 Modularity of gear units for maximum flexibility

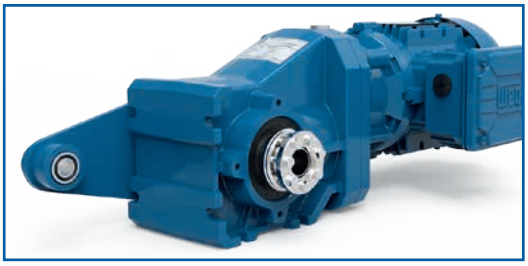
For many applications, machine manufacturers and plant operators require maximum flexibility when it comes to the use of geared motors. The WG20 range is both standardised and modular, which allows you to put together a geared motor perfectly adapted to your requirements. Even for special and demanding installation situations, WEG has the right solution for your application with the different gear types in the WG20 range, the various housing forms, right through to its shaft designs. The secure supply chain allows you to plan with global flexibility using modularity that covers all customer needs.

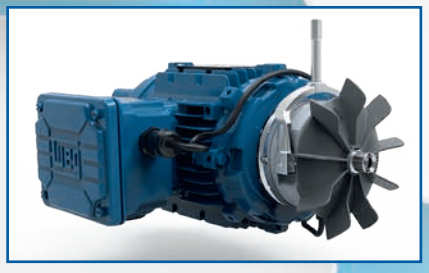
7 The modular system motor: a modular system for every customer requirement

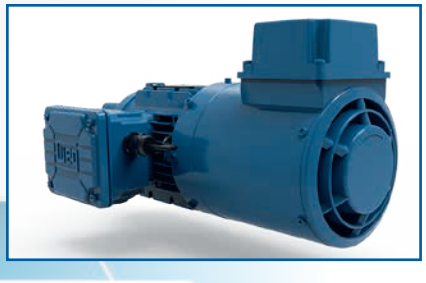
For any special requirements, our system kit of modular integral motors from 0.12 to 110 kW offers you major advantages: The respective standard version can be extended in many ways and adapted to your requirements. This allows you to plan and quickly implement the best possible solution for your application.
All integral motors feature a reinforced bearing to withstand the forces from the gearing. Our IEC asynchronous motors have versatile mountable feet making them suitable for any installation situation. The range of applications is further extended by optional motor modules such as brake and double brake systems, ventilation, extended terminal box systems, encoder systems inside or outside the fan cover, backstop, protection cap and hand wheel.
Thanks to our modular motor range, you will find exactly the drive you need from the wide variety available. This means maximum flexibility for the user: Each standard version offers a wide range of options for expansion and adaptation.

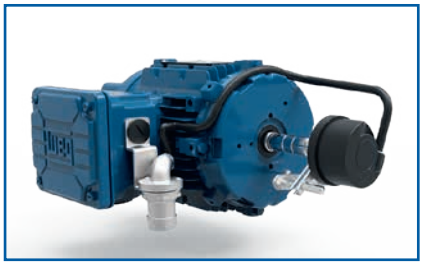












8 Predictive maintenance: WEG Motor Scan

Do you want an easy and cost-effective way of monitoring the condition of your WEG motor? Or a way of optimising your maintenance management? Then, we have the answer in the form of the 'WEG Motor Scan' – for remote monitoring the condition of your electric motors, while increasing both the reliability and availability of the WG20 geared motors. The compact, robust sensor is easy to mount as a retrofit on WEG electric motors of sizes 63 to 450 and enables real-time monitoring for the purpose of predictive maintenance.

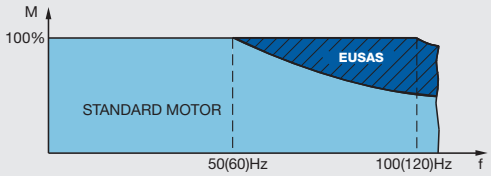
How does it work? The WEG Motor Scan not only measures the surface temperature and running time, but also motor vibrations, achieved by a 3-axis vibration measurement. In the process, the motor condition is determined by a frequency spectrum analysis (FFT). This sensor solution thus allows complete diagnosis of the motor condition, including temperature measurement, vibration analysis and data on running time, load, speed and lubrication intervals, while also measuring any imbalance or misalignment.

The likewise new WEG Motor Scan Gateway functions as a router detecting all installed sensors within a range of about 30 metres in an industrial environment. The collected data can then be transferred, as previously via app or Bluetooth, to a secure cloud by means of gateway technology. The user is then able to retrieve the data from the cloud using the app or the online portal 'WEG Motion Fleet Management'. This allows the monitored electric motor to be analysed in detail. The platform offers comprehensive analysis tools for misdiagnosis and enables the configuration of alarms when the set values are exceeded. Maintenance staff can call up the real-time data from anywhere at any time and act accordingly as required.
In short, WEG Motor Scan enables predictive maintenance in a simple and cost-effective way, resulting in extended motor life and increased system availability. Integrating WEG Motor Scan and Gateway provides considerable added value through its enhanced user-friendliness, optimised maintenance management and automation.

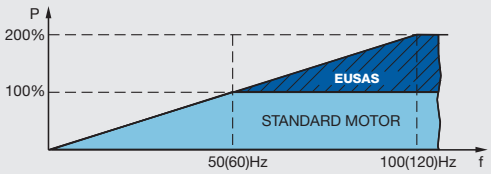


9 Frequency inverter operation: double the power with constant torque

Do you need a lot of power but only have limited space available? As with all geared motors of the WG20 series, the previously described **EUSAS Motor 7** can control each individual drive in frequency inverter mode with variable speed as the situation requires. However, EUSAS motors can do a lot more than that: They can be combined with modern frequency inverters to create variable speed high-performance drives. The result: Double the speed – double the power with constant torque!



Nominal torque up to twice the rated speed



Double the rated power at twice the rated speed

Thanks to the special winding, a drive with an EUSAS motor can operate at higher speeds and deliver higher power output at a constant magnetic flux (constant torque) without overloading the machine. This is achieved by simply re-connecting the windings on the terminal board and adjusting the controller parameters on the inverter. In this way, the EUSAS motors make better use of the capabilities of electronically controlled drive technology.

More flexibility: In terms of efficiency, power-to-weight ratio, dynamics and load capacity, this powerful combination offers you additional scope for configuration. The ability to work with twice the rated power in inverter mode creates more scope in tight installation situations and enables applications that require a wide control range (speed range) with constant torque up to 100 Hz. The use of smaller motors, even for demanding performance requirements, means lower weight and costs. For instance, a size 180 motor with 22 kW/50 Hz delivers 44 kW of power at 100 Hz. The perfect addition to the EUSAS motors is the frequency inverters of the WEG CFW type series. The **WEG Variable Speed Drive MW500 10** is the perfect choice for decentralised applications. To increase their versatility even more, the EUSAS motors are also equipped with rotatable terminal boxes, making them well equipped for any installation situation! WG20 with EUSAS motor and frequency inverter: the perfect solution for you when you need great power, but the available space is limited.

10 Compact decentralised drive solution

As a machine manufacturer, do you need complete freedom and flexibility in the design of your drive solution? As a plant operator, are you looking to use highly efficient, compact and decentralised drives? This is precisely what the combination of WG20 and decentralised MW500 frequency inverter can offer you! The MW500 is suitable for use with AC motors with power ranges of 0.37 to 9.2 kW and can be directly mounted on the electric motor.
Compared to centralised solutions, a decentralised drive system can be networked more easily with the usual bus systems. The great advantage of the decentralised solution is that several drives can be connected via different bus systems and the supply line is looped through, allowing for considerably shorter cable lengths.

In contrast to the switch cabinet solution, not every drive has to be wired to the inverter in the switch cabinet.

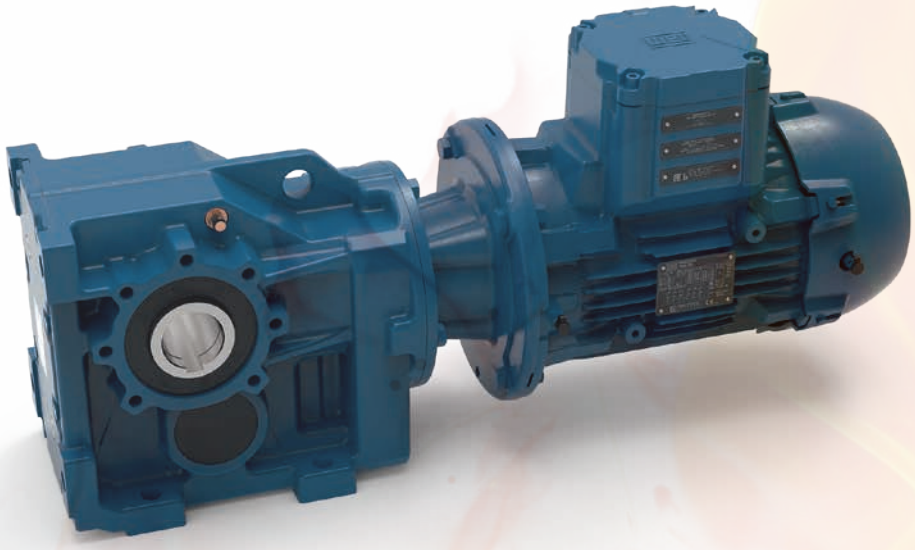
A decentralised drive is also easy to install and maintain. Combining your WG20 geared motor with a decentralised frequency inverter enables separate control of speed and torque – this not only saves you energy, but also means the power you need is available at all times.



11 Explosion-proof drives complying with ATEX 2014/34/EU

Do you use your geared motor in a hazardous environment? Where dust is generated, gases escape or solvents evaporate, it is vital that geared motors ensure safe operation. This is precisely why the ATEX directives exist. As a plant operator or machine manufacturer, do you need or want to put together a drive system to comply with the ATEX directives on explosion protection? Then look no further – WG20 geared motors in ATEX design fit this brief perfectly!

In accordance with Directive 2014/34/EU, the new ATEX-certified geared motors are suitable for use in explosion-protected areas for category 2 in zone 1/21 and category 3 in zone 2/22. For explosion-protected geared motors for zones 2 and 22 with ATEX motors, the motors can be mounted directly: This not only offers technical advantages, but also means there is no need for an adapter. For zones 1 and 21, an adapter can be used to combine the entire range of WG20 gear units with explosion-proof WEG IEC standard motors from the W22X series up to 110 kW. We can also supply you with the right encoders, brakes and ventilation systems to go with the ATEX designs.



12 Input variants for even more flexibility

Using IEC adapters, the WG20 gear units can be combined with WEG motors sizes 63 to 280 up to efficiency class IE5 of the B5 design specified in the IEC 60034-7 standard. This means that you can implement your drive solution even if the existing components you use are from different manufacturers – making you even more flexible in terms of time-critical procurement, while ensuring even greater global system availability. There is also a solution for the North American NEMA standard: A NEMA adapter is used to connect NEMA motors, sizes 56 to 364, to any of the gear units from the WG20 series.

The use of WG20 geared motors allows machine manufacturers to offer their customers highly efficient drives. When it comes to particularly energy-efficient geared motors, WEG W22 electric motors are used. The extensive W22 series is available in energy efficiency classes up to IE5 and has been developed for low energy consumption and reduced noise and vibration. The high availability and easy maintenance also reduce operating costs.

13 Servo gears for highly dynamic applications

Does your application require a particularly dynamic drive? Then using a WG20 gear unit with a servo adapter is the solution. The flexible servo coupling enables low-noise, backlash-free operation and is easy to maintain. Another advantage: When selecting servo motors for the WG20 gear units, your choice of manufacturer is entirely up to you, meaning that you can mount servo motors from different manufacturers on WG20 gear units.





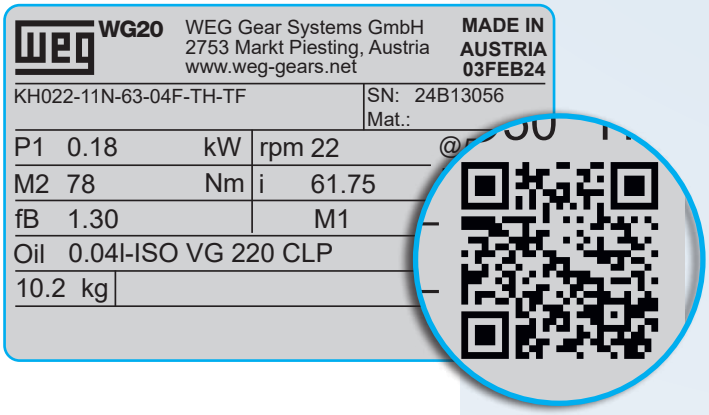




14 Nameplate with QR code provides a quick overview

The WG20 nameplate displays the key performance data of the geared motor and also includes a unique QR code that gives the user easy access to the full product data. This means that once the code is scanned, the data is available any time and anywhere. Data such as motor power and output torque, speed, mains frequency or reduction ratio are stored with the code.

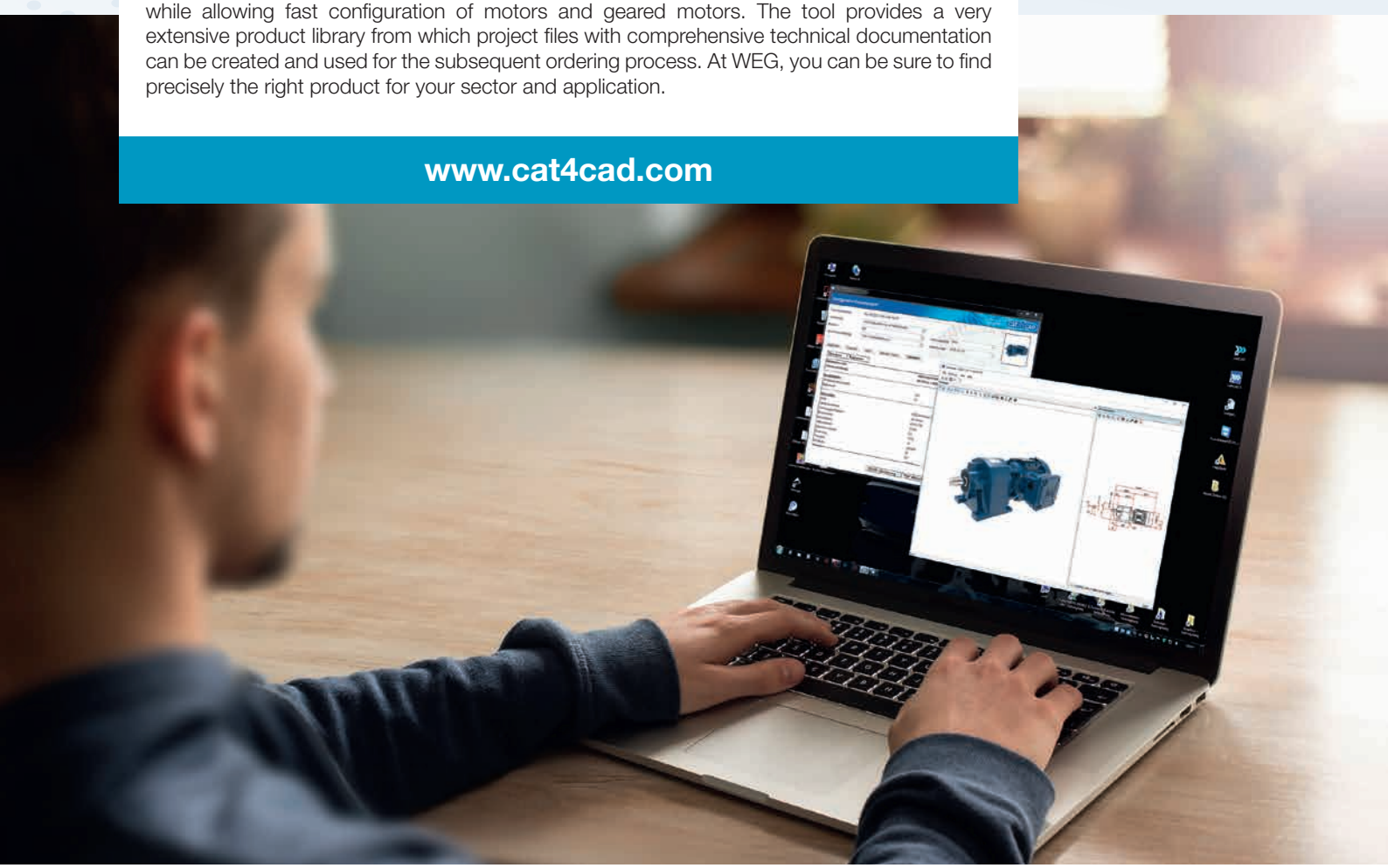
Data for practical use, such as the quantity and type of lubricant or the installation position, can also be conveniently called up. In addition, a link takes the user directly from the product information to the operating instructions of the geared motor. It couldn't get any easier and faster than that.



15 "cat4CAD" Innovative product configurator

The easy way to select powerful solutions: Our online product configurator "cat4CAD" provides you with a quick overview of our range of products. This tool helps you put together perfectly matched components with the help of comprehensive wizards and user-friendly navigation, while allowing fast configuration of motors and geared motors. The tool provides a very extensive product library from which project files with comprehensive technical documentation can be created and used for the subsequent ordering process. At WEG, you can be sure to find precisely the right product for your sector and application.

www.cat4cad.com



16 WEG
The complete supplier

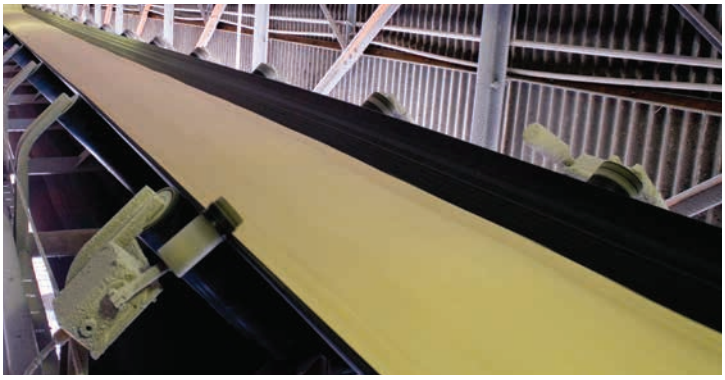
Do you need a one-stop solution that is the optimum match for your application? This is exactly what WEG can offer you as a complete supplier of drive systems: the supply of a complete range of perfectly matched components in the exact configuration you require. In addition to the extensive standard product portfolio, WEG can also offer you special customised solutions. Thanks to a very high vertical range of manufacture, WEG, as a premium manufacturer of electric motors, gearboxes and automation products, is in complete control of quality assurance from development through to production and delivery. Under the term “WEGmotion Drives”, the portfolio ranges from electric motors and gear units, from which WEG combines modular geared motors, to suitable soft starters and variable speed drives, low-voltage switchgear and complete control cabinet solutions. In addition to this, there is a wide range of gear unit accessories available, such as IEC, NEMA or servo adapters. Thanks to the high **Vertical Range of Manufacture** **18** and the global **Sales Network at WEG** **19**, you can be certain of fast availability at all times – wherever you need a reliable geared motor.



WEGmotion Drives

17 Customised solutions
for different industries

WEG has the right solution for you, no matter what industrial application and environment you need a solution for – be it, for example, in conveyor technology, the food industry, intralogistics, environmental technology, the steel industry or mining. WEG is well versed as a drive expert and has exactly what the end user needs for all sectors of industry with their different requirements in terms of performance, protection classes, service life or energy efficiency. WEG’s wide portfolio has the right products for all of these requirements allowing customised combinations to create exactly the systems you need to your specifications.





18 Utmost reliability and a secured supply chain

Machine manufacturers and plant operators require geared motors that are not only available worldwide at all times, but are also highly reliable in operation. WG20 geared motors meet both of these criteria. Thanks to a very high vertical range of manufacture, the premium manufacturer WEG is in complete control of quality assurance from development through to production and delivery.

From electric motor development and production in Brazil to gear unit development and production in Austria – the WG20 geared motors meet the highest quality requirements. WEG's vertical range of manufacture is globally unique amongst drive technology manufacturers. It ranges from the production of the gearing units, the housings and the tools required for them, to the copper wire for the windings of the electric motors and the sheet metal required for these, right through to the in-house production of the varnishes and packaging materials. As a machine manufacturer or plant operator, you can rest assured that you will receive geared motors of the highest manufacturing quality and thus reliability in operation. Thanks to WEG's high vertical range of manufacture and global sales network, you can be certain of fast availability at all times – wherever you need a top-class reliable geared motor.

19 WEG's global sales and service network

If you are looking for maximum system availability, you need a partner who is readily available anywhere in the world – whether for service or the delivery of solutions. As an international group, it is crucial to maintain close proximity to the customer. This is why WEG has more than 1,400 service centres worldwide. This means that as a manufacturer WEG is always close by and able to handle enquiries in the local language.

Besides allowing short distances for service technicians, this also saves a lot of time and thereby costs during machine downtimes. If required, qualified sales and service experts can support you from the initial planning phase onwards, assisting you during the implementation of a project and throughout the entire product life cycle. The global service team will also help to make the necessary spare parts available to you anywhere in the world at short notice.



20 Drive is always in motion

There are so many good reasons for choosing a powerful high-quality WG20 geared motor – and at WEG, they find many new reasons on a daily basis. Even faster response times, new technologies, even more individual solutions from our standard range: With its own research and development, WEG supports individual branches of industry in achieving technical progress and in finding and implementing the best and most suitable solutions for them.

Your drive is what inspires us!

If you have any questions about geared motors or need some advice about your planned application, please get in touch with us at:

WEG (UK) Ltd
Phone: +44 (0) 1527 513800
E-Mail: info-uk@weg.net

Everything you've always wanted to know about gear units



Please have a read of our other guides:

- *Technical Guide to Gear Unit Basics*
- *Gear Unit Guide for Purchasers*
- *Gear Unit Guide for Maintenance Staff*

Simply request via **wgs-marketing@weg.net**



WEG – international solutions for drive and energy projects

The WEG Group, founded in 1961, is a Brasilian company and one of the world‘s leading manufacturers of electrical components and systems. The business is divided into six divisions: motors, power generation, power transmission and distribution, automation, digital solutions and varnishes. The company employs more than 45,000 people worldwide and in 2023 achieved sales of more than 32 billion R$ across a broad range of products. These include the latest generation of low/medium and high-voltage motors, transformers, generators, geared motors, low-voltage switchgear, frequency inverters, soft starters, ATEX-compliant flameproof motors, smoke extraction motors and full turnkey systems.

The company‘s solutions in the field of energy generation, transmission and distribution ensure more efficient operation of systems in various industries. In this way, they contribute to a reduction in energy consumption and CO_2 emissions as well as to an improvement in environmental compatibility. WEG also supplies comprehensive solutions for renewable energy projects, e.g. complete wind turbines.

WEG Gear Systems - gear expertise with a long tradition

WEG Gear Systems, founded 1972 as „Wustinger Antriebstechnik“ and later widely known as „Watt Drive Antriebstechnik“, is an Austrian technology company with its head office in the south of Vienna. It has specialised in products and system solutions for automation and drive technology.

Since Dec. 2011 the company is part of the WEG Group, one of the leading international manufacturers of electric motors.

WEG Gear Systems develops, produces and sells geared motors, three-phase motors and frequency inverters. With its motor- and gear system, it offers a modular combinable array of complete drive systems for production machines and industrial manufacturing plants.

More information:	**www.weg.net**

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