



## Variable frequency drives

# **X550** IP65

Variable frequency drives for pumps, also for wet and dusty environments

Information catalog





# Coverage IP65



**Variable frequency drives**

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Variable frequency drives for pumps, also for wet and dusty environments

Information catalog



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## Installation and commissioning

The driver can be customized according to the exact requirements that follow from specific applications.





Variable frequency drives

# X550 IP65



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# Quality management and certificates



VYBO Electric is a modern High-tech energy saving company that pays high attention to quality, environment, safety and precision and efficiency of work and energy in production. Therefore, it holds a lot of certificates and quality control systems. **Our priority is quality control.**

## Basic certificates include:

### ISO9001

The primary task of the ISO 9001 standard is to focus on system management and quality management in the organization. The satisfaction of the customer and the fulfillment of his requirements, which are specified in contracts, orders, or technical drawings, are in the first place. The quality management system is linked to all processes in the company. The standard focuses on the management of human and financial resources, on the stability of infrastructure, including buildings, transport, hardware, software and other communication or information technologies. An important part is also the planning of production and services, the management of the purchasing process, but also the management of non-conforming products.



### ISO14001

The main priority of the ISO 14001 standard is to identify and understand the environmental aspects and activities that are related to the entire infrastructure of the company and, based on this, to regulate the environmental impact on the environment.

In its scope, the ISO 14001 standard creates the conditions for determining environmental goals and plans, the fulfillment of which is examined at regular intervals by top management and also by an independent body during internal audits.

This standard is intended for all organizations and companies that consider environmental protection as their primary goal.

The benefit of the standard for society is mainly:

- control over the environmental impact on the environment
- control over produced emissions and waste
- saving material and energy
- prevention of accidents
- compliance of the company's activities with legal requirements
- zero fines for environmental behavior
- creation of a good reputation and prestige of the company



## The ISO 45001

Specification (formerly known as OHSAS 18001) is an internationally recognized standard that declares compliance with the principles of a safe enterprise, managing risks at work and protecting the health of workers during work. It does not only concern danger and accidents, but also emphasizes other aspects such as the good condition and mental well-being of the employee.

The certificate is held in Slovakia as STN ISO 45001:2019 and is under the title Management systems of safety and health protection at work. Requirements with guidance for use. It replaces the STN OHSAS 18001 standard.



## ISO50001

Energy management systems Energy efficiency help organizations save money, save energy resources and also help to prevent climate change. ISO 50001 encourages organizations in all sectors to use energy more efficiently through the development of an energy management system. The international standard ISO 50001: 2011 specifies the requirements for building, maintaining and improving the energy system. It aims to enable organizations to implement a systematic approach that will help achieve lasting improvements in energy efficiency, energy use and consumption.





*Variable frequency drives*

# **X550** IP65

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- ▶ MAXIMUM COVERAGE IP65
- ▶ COMPLETE DUSTPROOF COVER
- ▶ COVER AGAINST SPLASHING WATER





# Variable frequency drives

# X550 IP65

The frequency converter of the X550 series is a typical device of the economy class, which is not only universal and integrated, but also has simple and clear control elements. The device has IP65 protection, so it is suitable for humid, dusty or otherwise polluted environments. It is used in industry in various difficult conditions. Its use is wide.



## Variable frequency drive V900

### FUNCTIONS

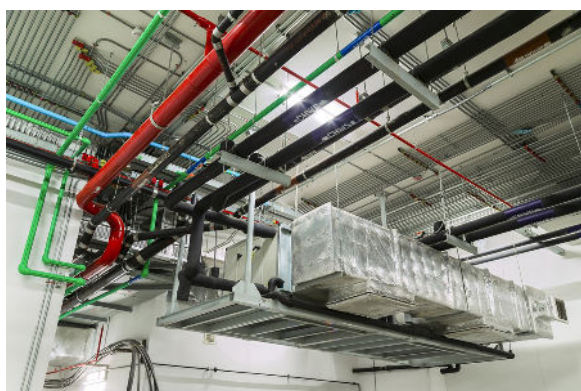
- Single-phase frequency inverter power supply voltage 1 x 230 V and three-phase 3 x 400 V
- Output frequency range 0,01 to 999 Hz
- Torque boost function electric motor by up to 20 %
- X550 is suitable for asynchronous control and synchronous motors
- Physical interface RS 485 serial built in
- Built-in PID
- 6 digital inputs are integrated, 2 multifunctional outputs -10 / +10 V; 0-10 V and 4-20 mA (or 0 to 20 mA)



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Most often, the X550 is used to control the drives of fans, pumps, centrifuges, gearboxes, to drive machines in the textile, ceramic, food industry, etc.

# Use in industry



## FUNCTIONS

- pumps
- air conditioning
- textiles
- grocery store
- electric transmissions
- ceramics
- grinders
- centrifugal machines
- cutters
- diving machines
- cutting machines



Variable frequency drives

# X550 IP65

Robust metal self-cooling system

Maximum protection with IP65 protection

Modern design

Maximum protection  
cable outlets IP65

Integrated display

Armored cover  
of all outlets

Massive, thick thermoplastic



# General technical parameters for all types of X550

Input	Rated voltage/frequency	1-phase 1 x 230 V AC 50/60 Hz...Type 2S..... 3-phase 3 x 400 V AC 50/60 Hz...Type 4T.....
	Voltage range	230 V : 170 V to 240 V 400 V : 330 V to 440 V
Output	Voltage range	3 x 230 V: 0 to 230 V 3 x 400 V: 0 to 400 V
	Frequency range	0.10 to 999.9 Hz
Control method		V/F control, scalar control
Display		Operating status / Alarm definition / interactive guidance: e.g. frequency setting, output frequency / current, DC bus voltage, temperature etc
Output frequency range		0.10 Hz to 999.9 Hz
Frequency setting resolution		Digital input: 0.01 Hz, analog input: 0.1% of maximum output frequency
Output frequency accuracy		0.01 Hz
V/F control		Setting the V/F curve to meet different practice requirements
Torque control		Automatic increase: automatic increase of the torque according to the load Manual increase of the torque by user from 0,0 to 20,0%
Multifunctional input terminal block		Six multi-function input terminals that perform functions including fifteen-section speed control running program, four-step acceleration/deceleration switch UP/DOWN function and emergency stop and other functions...
Multifunctional output terminal block		2 multi-function output terminals to display the run, zero speed, counter, external abnormalities, program operation and other information and notices.

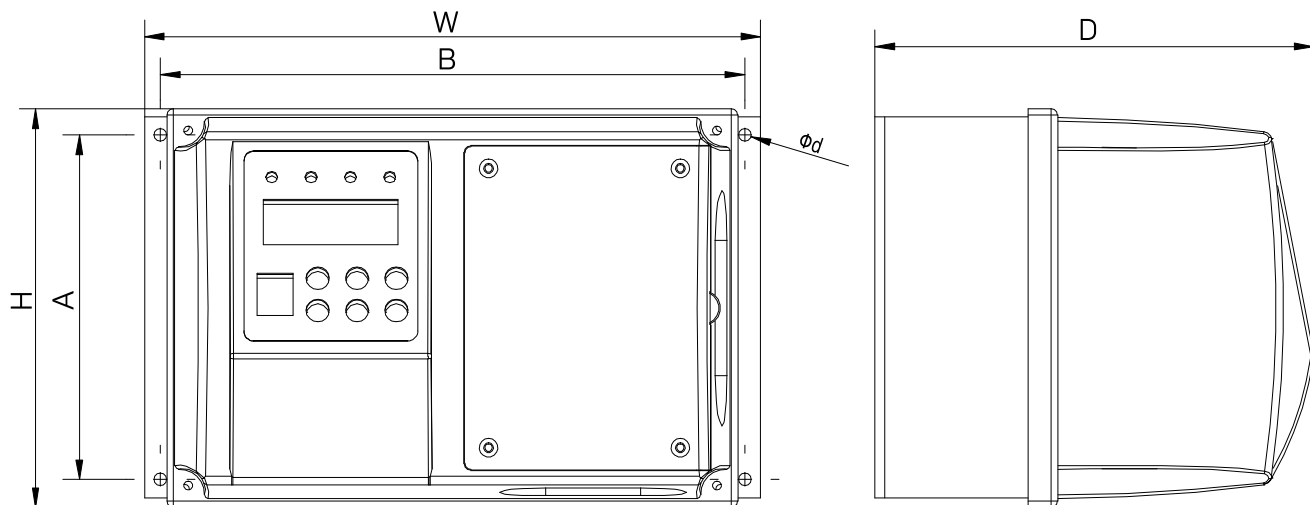


# General technical parameters for all types X550

Acceleration time setting/ deceleration time	The acceleration / deceleration time can be set individually in the range of 0 to 999.9 s
PID control	Built-in PID control
RS485	Standard communication function RS 485 (MODBUS)
Frequency setting	Analog input : 0 - 10 V; 0 - 20 mA, optional; Digital input: is entered via the rotary selector of the control panel or RS 485 or via UP/DOWN.
Multi-stage speed	Six multi-function input terminals, 15 speed settings can be selected
Automatic voltage regulation	AVR automatic voltage regulation function can be selected
Counter	Built-in 2 groups of counters
Overload	120 % / 60 sek., (constant torque)
Overvoltage	Overvoltage protection can be set
Undervoltage	Undervoltage protection can be set
Other protections	Overheating; short circuit at the output; overcurrent; parameter blocking
EMC compatibility	IEC 61000-4-6; IEC61000-4-4; IEC 61000-4-11; IEC 61000-4-5
Standards	EN/IEC 61800-3: 2017; C2; which is suitable for the 1st environment EN 61800-3:2004+A1:2012; EN 618-5-1:2007+A1:2017
Ambient temperature	od -10°C - 40°C (without icing)
Humidity	Max 95% (no condensation); IEC 60068-2-3
Height above sea level	Under 1000 a.s.l.
Vibration	Max. 0.5g; IEC 60068-2-6
Type of cooling	Cooling without forced air circulation through a cooler up to 4 kW Forced air cooling for models above 5.5 kW
Degree of coverage	IP 65
Mounting	On the wall or in the switchboard (depending on design)
Installation in the environment	Resistance to chemical pollution class 3C3 EN/IEC 3C3 EN/IEC 60721-3-3. Resistance to dust pollution 3S3 EN/IEC 60721-3-3.



# Dimensions



Model	W	H	H1	D	A	B	Ø d
X550-2S0007	188	122		134	105	178	M4
X550-2S00015							
X550-2S00022							
X550-4T0007	188	122		134	105	178	M4
X550-4T0015							
X550-4T0022							
X550-4T0040	235	154		179	129	225	M4
X550-4T0055							
X550-4T0075							
X550-4T0110							
X550-4T0150	192	280		178	200	180	M5.5
X550-4T0185	236	300		204	250	225	M7
X550-4T0220							
X550-4T0300							
X550-4T0370	236	400		231	225	175+175	M7
X550-4T0450							
X550-4T0550	300	450	482	278	210	465	M9



## Performance parameters of X550 series

Type of model X550	Rated output power (kW)	Maximum input current (A)	Rated output current (A)	Recommended motor power (kW)
1PH / 3PH AC 230 V ±15% a 1PH / 1PH AC 230 V ±15%				
X550-2S0007	0,75	7,2	4,5	0,75
X550-2S0015	1,5	10	7	1,5
X550-2S0022	2,2	16	10	2,2
3PH / 3PH AC 400 V ±15%				
X550-4T0007	0,75	3,8	2,5	0,75
X550-4T0015	1,5	5	3,7	1,5
X550-4T0022	2,2	5,8	5	2,2
X550-4T0040	4	10	9	4
X550-4T0055	5,5	15	13	5,5
X550-4T0075	7,5	19	17,5	7,5
X550-4T0110	11	26	25	11
X550-4T0150	15	35	32	15
X550-4T0150	18,5	38	37	18,5
X550-4T0220	22	46	45	22
X550-4T0300	30	62	60	30
X550-4T0370	37	77	75	37
X550-4T0450	45	95	90	45
X550-4T0550	55	115	110	55



# Performance parameters of X550 series

Type of model X550	Input voltage	Power (kW)	Recommended cross section of the voltage (mm <sup>2</sup> )	Circuit breaker (A)	Input contactor	Brake unit
X550-2S0007	1 phase 1x230 V	1,5	2,5	16	20	OPTION
X550-2S0015		2,2	2,5	20	25	OPTION
X550-2S0022		1,5	4	25	32	OPTION
X550 -4T0007	3 phase 3x400 V	0,75	2,5	6	10	OPTION
X550-4T0015		1,5	2,5	10	16	OPTION
X550-4T0022		2,2	2,5	10	16	OPTION
X550-4T0040		4	2,5	16	20	OPTION
X550-4T0055		5,5	2,5	20	25	OPTION
X550-4T0075		7,5	4	25	32	OPTION
X550-4T0110		11	4	32	40	OPTION
X550-4T0150		15	6	40	50	YES
X550-4T0185		18,5	10	50	63	YES
X550-4T0220		22	10	63	80	YES
X550-4T0300		30	16	80	100	YES
X550-4T0370		37	16	80	100	YES
X550-4T0450		45	25	100	125	OPTION
X550-4T0550		55	35	125	150	OPTION





## Table of main functions

Overloading in ND mode - Normal load (N. Duty)	150% / 60 s
Overloading in HD mode - Heavy load (H. Duty)	✗
Control mode V/F scalar control	✓
Open-loop vector SFVC control mode	✗
Closed-loop vector CLVC control mode	✗
Analog inputs	1
Digital inputs	6/4
Analog outputs	✗
Relay outputs	2/1
Open collector outputs	✗
Brake transistor	✗
EMC filter	✓
+10 V output	✓
+24 V output	✓
Input for PTC	✓
Safe Torque Off (STO)	✗
Emergency STOP (EMS)	✓
Integrated Ethernet	✗
Integrated MODBUS RTU	✓
PROFINET	✗
PG card for encoder	✗
PID + dry run detection LL + sleep mode SLP + high/low pressure detection HP/LP	✓
PLC intelligent function	✓
External panel connection (normally up to 30 m)	✓
Degree of protection IP 20	✗
Degree of protection IP 65	✓
Change of direction of rotation via external input	✓
Change of direction of rotation from the panel	✗



# Comparison of the main functions of VFDs

	A200	A550	V800	V810 ET	V810	V900	X550
Overloading in ND mode - Normal load (N. Duty)	150%/60 s	120%/60 s	120%/60 s	120%/60 s	120%/60 s	120%/60 s	150%/60 s
Overloading in HD mode - Heavy load (H. Duty)	✗	✗	150%/60 s	150%/60 s	150%/60 s	150%/60 s	✗
Control mode V/F scalar control	✓	✓	✓	✓	✓	✓	✓
Open-loop vector SFVC control mode	✗	✗	✓	✓	✓	✓	✗
Closed-loop vector CLVC control mode	✗	✗	✗	✗	✓	✓	✗
Analog inputs	1	1	2	✗	2	2	1
Digital inputs	5	4	6	2	8	6	6/4
Analog outputs	✗	✗	1	✗	1	2	✗
Relay outputs	✗	1	1	✗	2	2	2/1
Open collector outputs	1	✗	1	✗	1	1	✗
Brake transistor	✗	✗	✓	✓	✓	✓	✗
EMC filter	✓	✓	✓	✓	✓	✓	✓
+10 V output	✗	✓	✓	✗	✓	✓	✓
+24 V output	✗	✗	✗	✗	✓	✓	✓
Input for PTC	✗	✓	✓	✗	✓	✓	✓
Safe Torque Off (STO)	✗	✗	✗	✗	✗	✗	✗
Emergency STOP (EMS)	✓	✓	✓	✓	✓	✓	✓
Integrated Ethernet	✗	✗	✗	✓	✗	✗	✗
Integrated MODBUS RTU	✓	✓	✓	✓	✓	✓	✓
PROFINET	✗	✗	✗	✗	✗	✓	✗
PROFIBUS	✗	✗	✗	✗	✓	✗	✗
PG card for encoder	✗	✗	✗	✗	✓	✓	✗
PID + dry run detection LL+sleep mode +high/low pressure detection HP/LP	✓	✓	✓	✓	✓	✓	✓
PLC intelligent function	✗	✓	✓	✓	✓	✓	✓
External panel connection (normally up to 30m)	✓	✓	✓	✗	✓	✓	✓
Degree of protection IP20	✓	✓	✓	✓	✓	✓	✗
Degree of protection IP 65	✗	✗	✗	✗	✗	✗	✓
Change of direction of rotation via external input	✓	✓	✓	✓	✓	✓	✓
Change of direction of rotation from the panel	✓	✗	✗	✗	✓	✓	✗



# Accessories and modular constructions

## AC input choke

The AC input choke should be installed at the input terminal of the inverter and serves to prevent the transmission of harmonic interference generated by the inverter to the power grid, reduce the transmission of harmonic interference to other components from the grid, improve the quality of the power grid, increase power factors, and prevent abnormal voltage fluctuations in the power grid (if the imbalance is greater than 3%); inrush current in the electrical network, stabilization of the waveform and reduction of the influence on the converter.

## Input filter

The external EMC input filter between the inverter and the power source not only limits the interference of the inverter caused by the surrounding electromagnetic noise, but also prevents the interference of the surrounding devices by the inverter itself.

## DC choke

The DC choke is mainly used on the inverter and rectifier to increase the power factor and filter the interference of pulses, voltage, current and reduce the harmonic interference of the inverter.

## Filter on the output side

The task of this filter is to reduce interference generated by high switching frequencies, which are created by IGBT switching and are transmitted by wires. An EMI filter can be selected to limit the noise generated on the output side of the converter and the ground wire.



## AC output choke

The AC output choke is mounted on the output terminal of the inverter and serves to limit the discharge current of the connection cable between the inverter and the motor, the degree of accumulation of the PWM wave voltage of the passive inverter, increase the power factor and quality of the electrical network, and stabilize the waveform. When the line from the frequency converter to the motor is a long line (over 20 m), the choke will limit radio frequency interference and leakage current. The choke also reduces motor vibrations caused by inverter switching pulses. At the same time, the choke reduces the effect of wave reflection on the electrical line, especially with longer cable lengths.

## Suppression toroid (ferrite core)

This suppression element helps reduce the interference that is radiated from the conductors. It can be used both at the input and at the output of the frequency converter. It is most effective to wind at least three turns of the conductor around the ferrite core. To improve the effect, it is possible to use more toroids in one circuit.

## Braking resistance - Dynamic braking

The purpose of dynamic braking using braking resistors is to stop the spinning rotor of an electric motor with a load in a set (mostly very short) time. Connecting a braking resistor also improves the braking capabilities of the frequency converter to prevent overvoltage during deceleration.

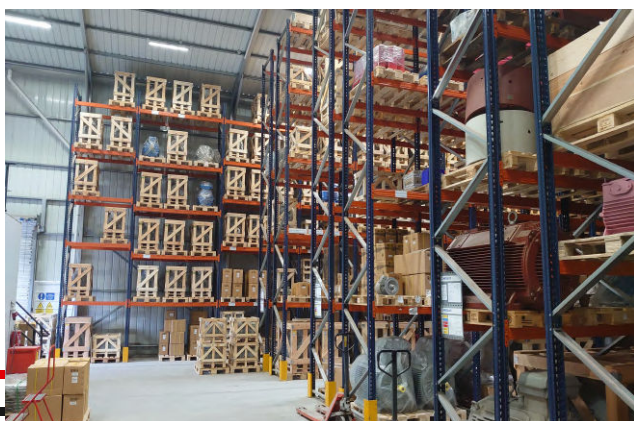


VYBO Electric KINESYSTEM 1 -



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# Warehouse stock



## We solve

- unit supply
- complete plant supply
- bulk supply for production
- any customer requirements included in our industry
- an online worker specializing in your company
- complete warranty and post-warranty service of LV and HV frequency converters VYBO Electric KineDrive
- call our line 24 hours a day, 365 days a year
- we provide all available documentation for our frequency converters and industrial drives





# Care of variable frequency drives, care of your business

If the inverter is part of the product you sell or is included in your production process, the priority is its problem-free and reliable operation. A wide range of lifetime services, it has been designed to meet all your expectations for every application.



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### Installation and commissioning

The driver can be customized according to the exact requirements that follow from specific applications.





# Company

VYBO Electric is a hi-tech manufacturing plant and supplier of industrial electric motors. It is also dedicated to the research and development of frequency converters of its brand and further covers a wide range of products and products. The company is located in the European Union in the Slovak Republic in Spišská Nová Ves in the center of the eastern part of the country. We have extensive experience in the production of electric motors and in the design of electric drives, as well as many years of experience in the aforementioned research and development of frequency converters.



**More than 120 years of electrical industry in our region ...**

The region has been known for its developed electrotechnical industry and also for the production of electric motors and electrotechnical equipment for more than 120 years. The Slovak Republic is still one of the leading producers of electrical and technical equipment.

**Maximum quality, maximum flexibility and super-fast delivery times...**





## Address

VYBO ELECTRIC a. s. | tel: +421 944 105 361  
Radlinského 18 | e-mail: mv@vyboelectric.eu  
052 01 Spišská Nová Ves  
Slovenská republika

[www.vyboelectric.com](http://www.vyboelectric.com)



SOLUTIONS FOR INDUSTRY

BUREAU VERITAS  
Certification



**VYBO Electric a.s.**  
Radlinského 18, 052 01 Spišská Nová Ves  
Slovak Republic

Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

### ISO 14001: 2015

Scope of certification

**MANUFACTURE AND SALE OF ELECTRIC MOTORS, SALES AND DEVELOPMENT OF VARIABLE FREQUENCY DRIVES.**

Original cycle start date: 18.05.2022  
Expiry date of previous cycle: N/A  
Certification Audit date: 31.03.2022  
Certification cycle start date: 18.05.2022

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: 17.05.2025

Certificate No. SK-U22 055E Version: 1 Issue date: 18.05.2022

Certification body address: 5<sup>th</sup> Floor, 86 Prescott Street, London E1 8HG, United Kingdom  
Local office: Plynárenská 7/B, BRATISLAVA 821 09, Slovak Republic



Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation. To check this certificate validity please call: +421 2 2341 4165

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Bureau Veritas Certification

### Certificate

Awarded to

**VYBO Electric a.s.**  
Radlinského 18, 052 01 Spišská Nová Ves  
Slovak Republic

BUREAU VERITAS CERTIFICATION (Z) s.r.o. certifies that the Management System of the above organisation has been assessed and found to be in accordance with the requirements of the management system standard detailed below

Standard

### ISO 45001:2018

Scope of supply

**MANUFACTURE AND SALE OF ELECTRIC MOTORS, SALES AND DEVELOPMENT OF VARIABLE FREQUENCY DRIVES.**

Original Approval Date: 18-05-2022  
Expiry date of previous cycle: N/A  
Certification Cycle Start Date: 18-05-2022  
Certification Cycle End Date: 17-05-2025  
Subject to the continued satisfactory operation of the organisation's Management System, this certificate is valid until: 17-05-2025

To check this certificate validity please call: +420 210 090 215

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.

Version 1 Issue Date: 18-05-2022  
Certificate Number: CZF - 2206117

ISSUING OFFICE ADDRESS: BUREAU VERITAS CERTIFICATION CZ, s.r.o., Obchodní 1, 143 02 Praha 4, Czech Republic

1/1

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ CERTIFICADO ◆ CERTIFICAT



# CERTIFICATE

**TÜV SÜD Slovakia s.r.o.**  
Certification Body for Management Systems  
Accredited by SNAS  
Certificate on accreditation No. Q-011  
certifies that



**VYBO Electric a.s.**  
Radlinského 18  
SK – 052 01 Spišská Nová Ves  
ICO: 45 537 143

has established and applies  
a Quality Management System for

**Manufacture and sale of electric motors.  
Sales and development of variable frequency drives.**

An audit was performed, Report No. 2264/40/22/Q/AS/C  
Proof has been furnished that the requirements  
according to

### STN EN ISO 9001:2016

are fulfilled. The certificate is valid from 2022-04-14 until 2025-04-13  
Certificate Registration No. Q 2264-1

Bratislava, 2022-04-14

TÜV SÜD Slovakia s.r.o.  
Certification Body for Management Systems  
Member of Group TÜV SÜD  
Jaskovka 6, 821 03 Bratislava

F-Q-019/26

Certificate SK22/3701

The management system of

**VYBO Electric a.s.**  
Radlinského 18  
052 01 Spišská Nová Ves, Slovakia

has been assessed and certified as meeting the requirements of

### EN ISO 50001:2018

For the following activities

**Production & sales of electric motors.  
Sales & development of variable frequency drives.**

Further clarifications regarding the scope of this certificate and the applicability of EN ISO 50001:2018 requirements may be obtained by consulting the organisation.

This certificate is valid from 7 April 2022 until 6 April 2025  
and remains valid subject to satisfactory surveillance audits.  
Recertification audit due a minimum of 60 days  
before the expiration date.  
Issue 1. Certified with SGS since 7 April 2022

Authorised by

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Director  
SGS Slovakia spol. s r. o.  
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