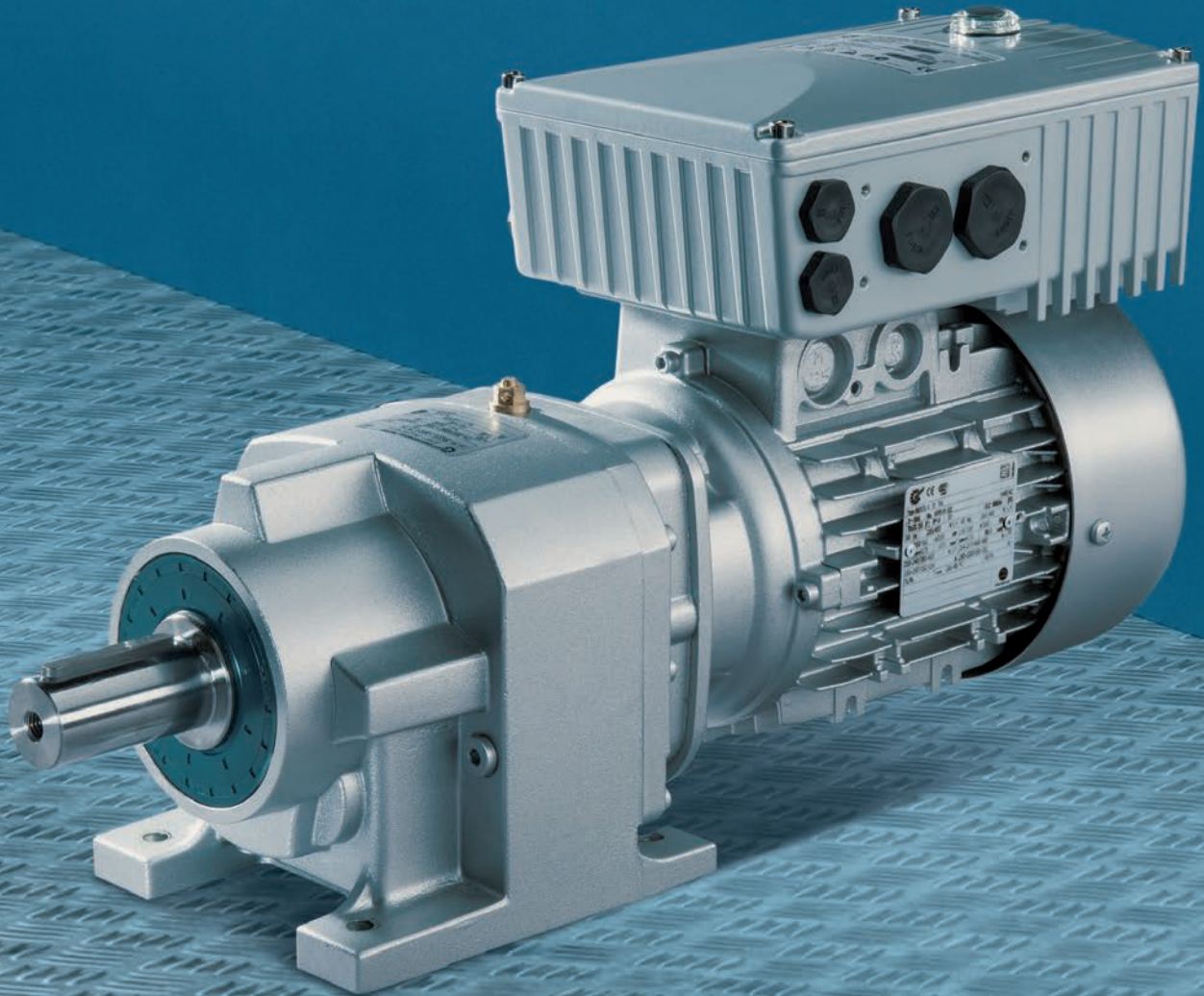


Intelligent Drivesystems, Worldwide Services

COMPACT VARIABLE FREQUENCY DRIVES FOR DECENTRALIZED APPLICATIONS



US

NORDAC® *BASE*
SK 180E

NORD®
DRIVESYSTEMS

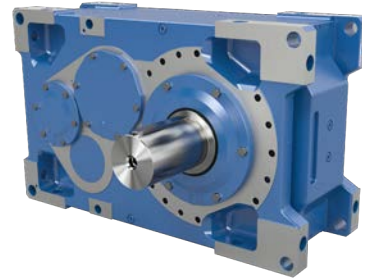
NORD DELIVERS COMPLETE DRIVE SOLUTIONS FROM A SINGLE SOURCE

Introduction



NORD Delivers

NORD offers full-featured drive solutions that can tackle the toughest requirements. All components are carefully selected and precisely configured to meet your exact specifications. In the rare case that standard components won't meet your needs, our in-house engineering team will work with you to design custom components or a complete customized system.



NORDAC PRO SK 500P



Reduce Lead Times and Decrease Inventory

- 25% of orders ship same day or next day with NO expedite fees
- 47% of orders ship within 5 working days
- 81% of orders ship in 2-3 weeks

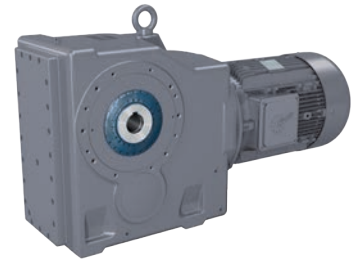


NORDAC LINK



Global Product Designs, Standards, and Support

- Innovative product range (one-stop shop)
- Global connected presence
- Mechanical and electrical application engineers ready to assist you
- Online resources



NORDAC FLEX



Increase Efficiency and Reduce Operation Costs

- First-class customer service and support, plus myNORD online tools
- Product flexibility through standard components and customizations
- Program personalization, such as weekly shipment schedules and custom nameplates
- Partner with a company that is easy to do business with and wants to see you succeed!



NORDAC BASE



NORDAC START

Accessories

Appendix

High-performance Solutions

NORD's extensive product portfolio is continuously evolving to meet the needs of today's fast-changing markets, but NORD does far more than manufacture the world's finest drive components. We provide our customers with optimum drive configurations for their specific purposes, providing each and every one of them with complete and efficient systems at a price/quality ratio that's unmatched.

By continuing to invest in the latest research, manufacturing, and automation technology, we are able to deliver innovative drive systems with the highest quality, reliability, and value found in the marketplace today. In short, we never stop improving.

On-time Delivery

NORD's linked global network of assembly and manufacturing operations gives you the best of both worlds – a world leader with local representatives. NORD has subsidiaries and sales partners in 98 countries on five continents, ensuring local inventory, assembly centers, technical support, and customer service.

This approach also allows us to provide the shortest lead times in the industry. As a NORD customer, you can rest assured that your order will be delivered on time and on spec. We offer our customers:

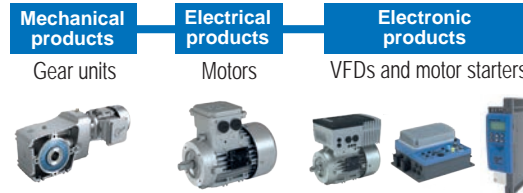
- Fast, accurate, reliable service
- Unmatched product versatility and customizations
- Short lead times
- Technical guidance from experienced engineers
- MyNORD online tools (configure, price, quote, and track your order)
- 24/7/365 after hours emergency support via the NORD 911 hotline

Peace of Mind

NORD's customer-first approach means superior drive solutions and peace of mind are just a call or click away. Put NORD's global team of engineers, manufacturing, service and support technicians to work for you. Together, we'll build something great!



Headquarters and technology center
in Bargteheide, near Hamburg



Innovative drive solutions
for more than 100 branches of industry



7 production locations with cutting-edge technology
produce gear units, motors, VFDs, and more to provide complete drive systems from a single source.



Subsidiaries and sales partners in 98 countries on 5 continents
provide local inventory, assembly, technical support, and industry-leading customer service.

The map shown above is for information only and does not claim to be created for or applicable to any legal purpose. For this reason, we do not assume any liability for legality, correctness and completeness.



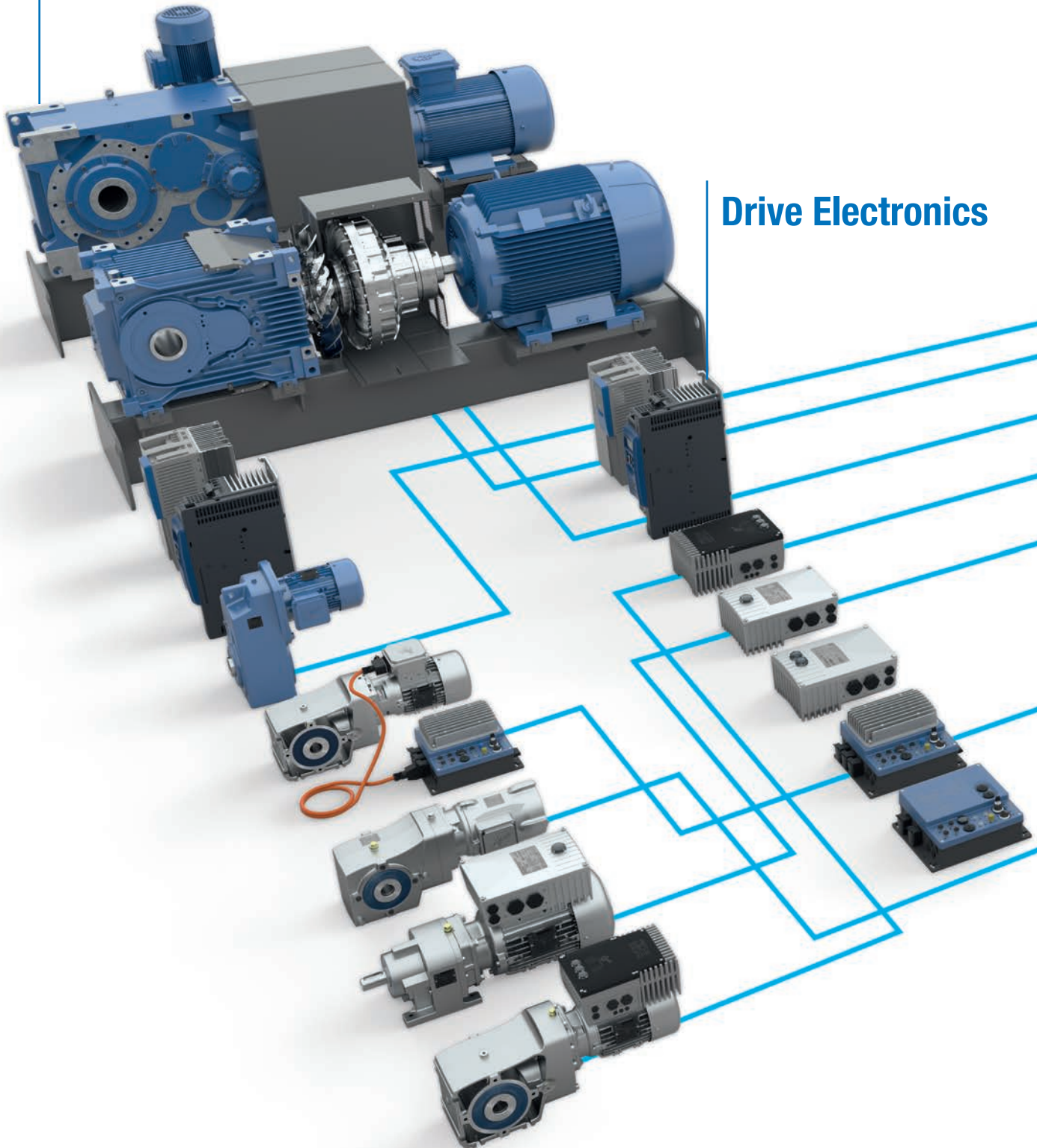
More than 4,000 employees throughout the world
create customized solutions.

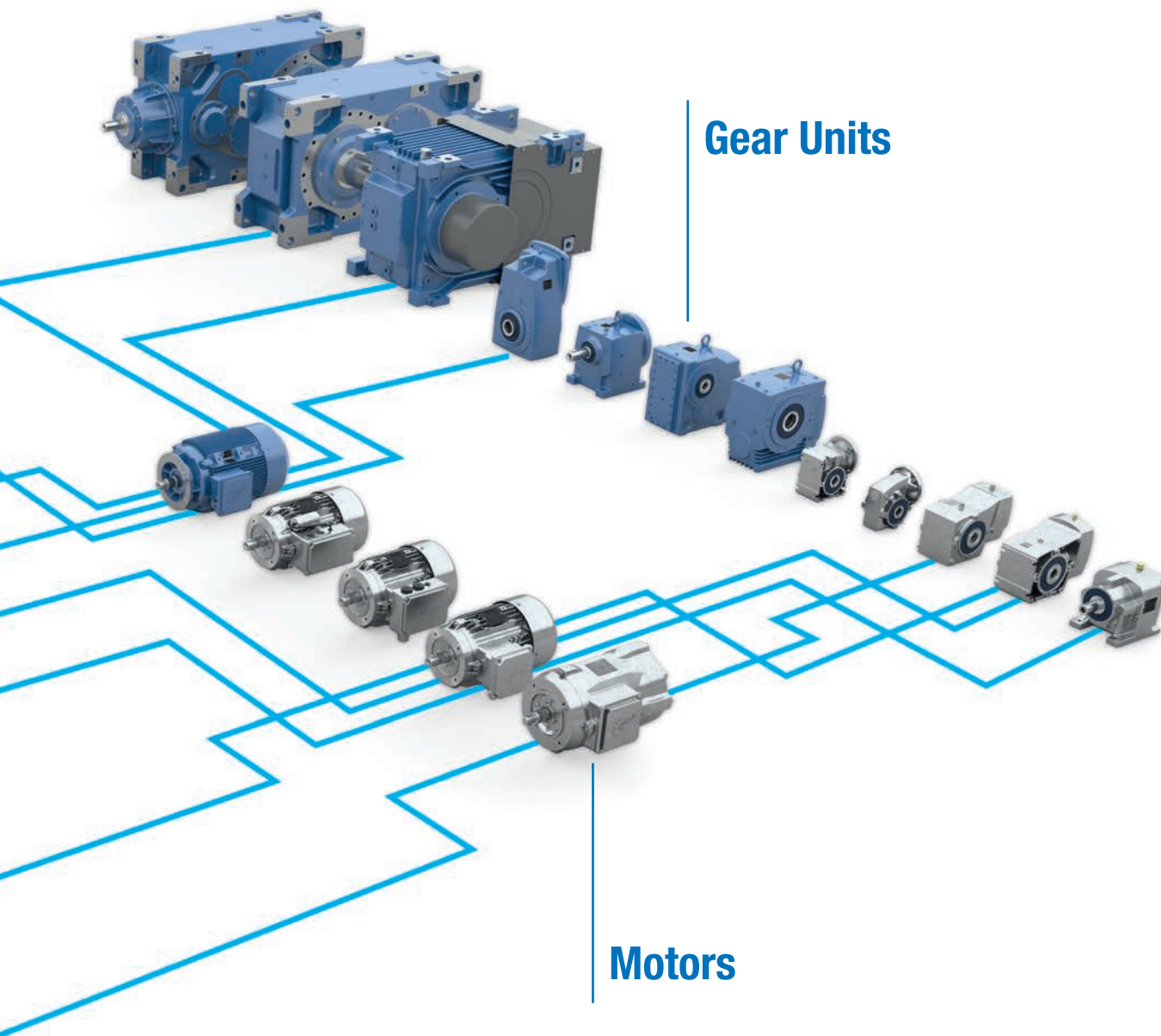


Contact Us Today! 888.314.6673
info.us@nord.com

Drive Solutions

Drive Electronics





Gear Units

Motors



Our products are available in ATEX certified versions.

An optimum and individual drive solution can therefore be created using the modular NORD system consisting of the gear unit, motor and drive electronics. The modular products are perfectly matched and can be combined in many variants. In addition, we offer planning, project management, installation, and service from a single source.

If required, industry solutions can be configured as a complete logistics package, programmed and ready for use. Each modular NORD product combines: highest product quality, short planning and assembly times, high delivery availability, and a good price/performance ratio. Our products are also available in ATEX certified versions.

THE ENTRY LEVEL

NORDAC® BASE PRODUCT FAMILY

Introduction

NORDAC PRO
SK 500P

NORDAC PRO
SK 500E

NORDAC LINK

NORDAC FLEX

NORDAC BASE

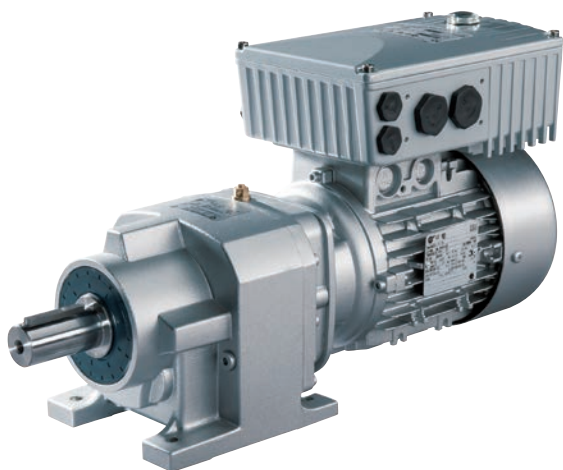
NORDAC START

Accessories

Appendix

The advantages of using a variable frequency drive to control an electric motor are obvious. Modern VFDs offer the typical basic functions such as speed control and communication with control units as well as more advanced features, such as the ability to automatically provide positioning and safety functions.

However, many applications do not fully utilize the immense scope of functions available with today's VFDs. To fill the gap between simple motor starters and full-featured variable frequency drives, NORD has developed a compact model. The NORDAC® *BASE* concentrates on the essential functions needed for pumps and conveyor technology (PI/speed control, energy saving, communication with peripherals) and delivers significant savings in both price and performance.



- All common drive functions
- Leakage current <16 mA
- Consistent parameter structure
- Stand-alone operation (integrated 24 V power supply)
- 3 digital inputs and 2 digital outputs
- 2 analog inputs (can optionally be used for current or voltage setpoints, or can also be configured as digital inputs e.g. for sensors)
- 4 parameter sets which can be switched online
- Process controller / PI controller
- Energy saving function: "Automatic flux optimization"

Optional

- AS-Interface on board
- Common bus modules
- I/O modules
- System plug connectors (e.g. Harting HAN 10E)
- Variant for ATEX Zone 22 - 3D
- Various control options (switches, potentiometers or Parameter Boxes)

Energy-saving functions

- Automatic flux optimization for pump/fan applications
- Large energy savings
- Simple setting via parameters

AC line EMC filter

Class C1 (B)

- All 230 V / 400 V devices have an integrated line filter.
- Also ideal for applications in a domestic environment, due to compliance with Class C1 (for motor-mounting), or Class C2 (for wall mounting with motor cable up to 5 m long)
- Suitable for personal protection due to low leakage current (< 16 mA) for operation with universal fault current FI circuit breakers

Process controller, PI controller

- All NORDAC *BASE* devices feature integrated analog inputs.
- P and I components can be set separately
- High precision speed regulation.

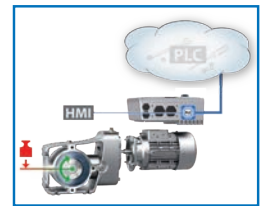
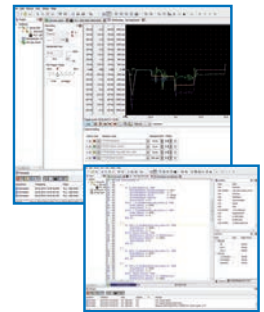
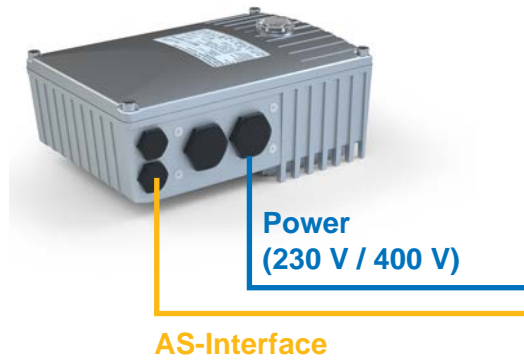
VERSATILE AND SUSTAINABLE FOR MODERN AUTOMATION SYSTEMS

Modern automation systems have a wide range of requirements. A suitable bus system and drive components are needed to ensure efficient implementation.

For the lower field level, the addition of an **AS-Interface** is a cost-effective solution that enables the networking of binary sensors and actuators.

The supply voltage is connected separately via the corresponding terminals. An integrated AC line unit generates the control voltage for the variable frequency drive, eliminating the need for an additional AUX cable (black).

Available in SK 190E



Device SK ...	190E
ASI profile	S-7.A.
ASI type	A/B
Control voltage	Internal power supply
Inputs/Outputs	4/4
Configuration via parameters	✓

- Introduction
- NORDAC PRO SK 500P
- NORDAC PRO SK 500E
- NORDAC LINK
- NORDAC FLEX
- NORDAC BASE
- NORDAC START
- Accessories
- Appendix

PERFECT PROTECTION

PROTECTION CLASS IP69K



Sealed Surface Conversion System

With **nsd tupH™**, NORD provides an alternative to stainless steel at a fraction of the price. Our special molecular conversion process ensures aluminum alloy drive equipment has all the surface protection that heavy wash-down applications require.

- Corrosion-resistant and won't blister or flake
- Easy-to-clean surfaces
- Resistant to acids and alkalis (wide pH range)
- Cost-effective alternative to stainless steel
- Dissipates heat more effectively than stainless steel
- Free of chromates
- Conforms to FDA Title 21 CFR 175.300

nsd tupH™ provides the perfect solution for extreme conditions:

- Surface-treated housing components
- DIN and standard stainless steel components
- Wash-down housing (gear unit and motor)
- Stainless steel shafts; special shaft sealing rings

Products available with nsd tupH™:

- NORDAC® *START* and NORDAC® *BASE*
- Helical inline, helical bevel and FLEXBLOC® gear units
- Smooth body motors



Introduction

NORDAC PRO
SK 500P

NORDAC PRO
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NORDAC BASE

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Appendix

ATEX-compliant drive systems, zone 22 3D

The NORDAC® *BASE* can be modified for operation in explosive environments. This allows the operation of the variable frequency drive directly in a hazardous area (ATEX 22-3D).

The advantages:

- Compact drive unit
- No complex protective devices
- No motor cables
- Optimum EMC
- Permissible characteristic curves 50 Hz / 87 Hz
- Control range up to 100 Hz or 3000 rpm

Depending on the area of application (conductive or non-conductive dust) the modification also includes the replacement of the transparent diagnostic caps with a version made of aluminum and glass.

It must be noted that operation of the device within the hazardous area is only permitted with integrable modules (SK CU4 modules, internal brake resistors) or specially approved accessories (ATEX potentiometer "SK ATX-POT").

There are exceptions for SK TU4 modules, which are described in detail in the manual for the device. Other accessories (e.g. external brake resistors, plug connectors) are not approved for use within a hazardous area.



Approval

- According to 2014/34/EU
- ATEX Zone 22 - 3D
 - Version for non-conducting dust: IP55
 - Version for conducting dust: IP66

Available in all devices



THE ENTIRE TEAM

ALL DEVICE VERSIONS AT A GLANCE

		SK 180E	SK 190E
		Size 1+2 .33 – 3 HP 0.25 – 2.2 kW	Size 1+2 .33 – 3 HP 0.25 – 2.2 kW
Introduction	Motor and wall mounting possible ¹	✓	✓
	Energy bus - loop-through of AC line supply cables ²	✓	✓
	Communication bus for various devices ²	✓	✓
	Sensorless current vector control (ISD control)	✓	✓
	Brake chopper (Brake resistor optional) (Size 2 and above)	✓	✓
	RS-232, RS-485 diagnostic interface	✓	✓
	4 switchable parameter sets	✓	✓
	Complete range of functions, as with a control cabinet VFD	✓	✓
	Parameters pre-set with standard values	✓	✓
	Scalable display values	✓	✓
	Automatic determination of motor data	✓	✓
	Energy-saving function, optimized efficiency in partial load operation	✓	✓
	Class C1 line filter in case of motor mounting	✓	✓
	Class C2 line filter in case of wall mounting	✓	✓
	Extensive monitoring functions	✓	✓
	Load monitor	✓	✓
	Process controller / PI controller	✓	✓
	PLC functionality	✓	✓
	Synchronous motor operation (PMSM)	✓	✓
	Modification for operation in an IT network by means of jumpers	✓	✓
NORDAC PRO SK 500P	All common field bus systems	○	○
	Brake management for mechanical holding brake	○	○
	Lifting gear functionality	○	○
	AS-Interface on board	-	✓
	Internal / external brake resistors (Size 2)	○	○
	Switch and potentiometer versions	○	○
	Plug connectors for control, motor and AC line cables	○	○
NORDAC PRO SK 500E			
NORDAC LINK			
NORDAC FLEX			
NORDAC BASE			
NORDAC START			
Accessories			
Appendix			

¹ Wall mounting: wall mounting kit required
 Motor mounting: an adapter for connection to the motor terminal box may be necessary.
² Direct connection to the terminal bar or via system plug connectors

✓ Standard
 ○ Optional
 - Not available

THE SENSES

CONTROL CONNECTIONS

		SK 180E	SK 190E
		Sizes 1 + 2 .33 – 3 HP 0.25 – 2.2 kW	
Control terminals	Number of digital inputs (DIN)	3	3
	Number of digital outputs (DOUT)	2	2
	Number of analog inputs (AIN) ¹	2	2
	Temperature sensor (PTC)	✓	✓
Communication	RS-485 / RS-232 RJ12	✓	✓
	AS-I Terminal connection	–	✓

¹ 0(2) - 10 V, 0(4) - 20 mA

Note

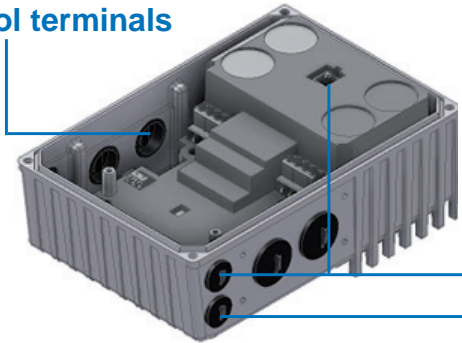
Control terminals can be supplemented by optional modules (IOs, brake management).

Status and diagnostic cockpit

The RJ12 interface for connection of a diagnostic and parameterization tool (e.g. PC with NORDCON software, Parameter Box) is located behind the transparent cover cap. Analysis, diagnostics, parameterization and monitoring of the drive unit via software is possible during commissioning or service.

In addition to status and readiness indicators, the current overload level, warnings and error messages are indicated in coded form by the LEDs.

Connection and control terminals



Communication



NORD Getriebebau NORD GmbH & Co. KG
 D-22941 Bargteheide / Germany Y: 2013
 Getriebebau-Nord-Str. 1 www.nord.com

Type: SK 180E-500-340-B-C
 Part-No: 275234855
 ID: 81N202441383

Input: 3ph 380-20%...480+10%VAC 47-63Hz
 Input Current: 3ph 2.6A*1
 Output: 3ph 0...Input Voltage 0-400Hz
 Output Current: 1.7A*1
 Output Power: 0.55kW*1 / 3/4hp
 Protection: IP66 Env. type 1
 Temp. Range: -25...40°C*1 / -13...104°F

Version: 1.0R1
 Hardware: AAA
 *1 see manual

81N202441383

⚠ RISK OF ELECTRIC SHOCK
 ⚠ WARNING! HOT SURFACE
 ⚠ RISK OF BURN
 N23134 Env. type 1
 For NFA79 applications only
 Rate Freq. 50/60Hz

CAUTION! Device is alive > 5min after removing mains voltage

NORDAC® BASE

1 ~ 110 ... 120 V, 1 / 3 ~ 200 ... 240 V AND 3 ~ 380 ... 400 V

Introduction	Output frequency	0.0 ... 400.0 Hz	Protection class	IP55, optional IP66, optional IP69K
	Pulse frequency	3.0 ... 16.0 kHz		Regulation and control
NORDAC PRO SK 500P	Typical overload capacity	150% for 60 s, 200% for 3.5 s	Motor temperature monitoring	
	Efficiency	> 95%		Leakage current
	Ambient temperature	-25 °C ... +40 °C (S1) -25 °C ... +50 °C (S3, - 70 % ED)		

Variable frequency drives SK 180E...	Nominal motor power		Nominal output current rms [A]	AC line voltage	Output voltage
	230 V [kW]	240 V [hp]			
-250-112-O (-C)	0.25	1/3	1.7	1 ~ 110...120 V -/+10% 47 ... 63 Hz	3 ~ AC 0 V up to double the AC line voltage
-370-112-O (-C)	0.37	1/2	2.1		
-550-112-O (-C)	0.55	3/4	3.0		
-750-112-O (-C)	0.75	1	3.7		

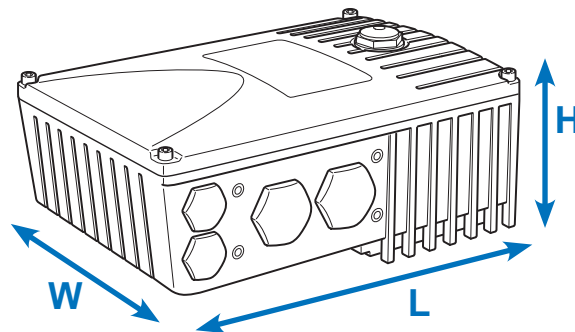
Variable frequency drives SK 180E...	Nominal motor power		Nominal output current rms [A]	AC line voltage	Output voltage
	230 V [kW]	240 V [hp]			
-250-323-B (-C)	0.25	1/3	1.7	1/3 ~ 200 ... 240 V, -/+ 10% 47 ... 63 Hz	3 ~ AC 0 V up to AC line voltage
-370-323-B (-C)	0.37	1/2	2.2		
-550-323-B (-C)	0.55	3/4	3.0		
-750-323-B (-C)	0.75	1	4.0		
-111-323-B (-C)	1.1	1 1/2	5.5		
-151-323-B (-C)	1.5	2	7.0	3 ~ 200 ... 240 V, -/+ 10% 47 ... 63 Hz	3 ~ AC 0 V up to AC line voltage

Variable frequency drives SK 180E...	Nominal motor power		Nominal output current rms [A]	AC line voltage	Output voltage
	400 V [kW]	480 V [hp]			
-250-340-B (-C)	0.25	1/3	1.2	3 ~ 380...480 V, -20 % / +10%, 47 ... 63 Hz	3 ~ AC 0 V up to AC line voltage
-370-340-B (-C)	0.37	1/2	1.5		
-550-340-B (-C)	0.55	3/4	1.7		
-750-340-B (-C)	0.75	1	2.3		
-111-340-B (-C)	1.1	1 1/2	3.1		
-151-340-B (-C)	1.5	2	4.0		
-221-340-B (-C)	2.2	3	5.5		

IP66 measures

- Coated aluminum components
- Coated circuit boards
- Low-pressure test
- Diaphragm valve
- As for IP66
- nsd tupH-surface treatment

IP69K measures



Variable frequency drives SK180E ...	Weight	Dimensions L x W x H	Size
-250-112-O (-C)	2.9 kg / 6.3 lbs	221 x 154 x approx. 101 mm 8.70 x 6.06 x approx. 3.97 in	1
-370-112-O (-C)			
-550-112-O (-C)			
-750-112-O (-C)			

Variable frequency drives SK180E ...	Weight [kg]	Dimensions L x W x H	Size
-250-323-B (-C)	2.9 kg / 6.3 lbs	221 x 154 x approx. 101 mm 8.70 x 6.06 x approx. 3.97 in	1
-370-323-B (-C)			
-550-323-B (-C)			
-750-323-B (-C)	4.1 kg / 9.0 lbs	254 x 165 x approx. 123 mm 10.00 x 6.49 x approx. 4.84 in	2
-111-323-B (-C)			
-151-323-B (-C)			

Variable frequency drives SK180E ...	Weight [kg]	Dimensions L x W x H	Size
-250-340-B (-C)	2.9 kg / 6.3 lbs	221 x 154 x approx. 101 mm 8.70 x 6.06 x approx. 3.97 in	1
-370-340-B (-C)			
-550-340-B (-C)			
-750-340-B (-C)			
-111-340-B (-C)	4.1 kg / 9.0 lbs	254 x 165 x approx. 123 mm 10.00 x 6.49 x approx. 4.84 in	2
-151-340-B (-C)			
-221-340-B (-C)			

Introduction

NORDAC PRO SK 500P

NORDAC PRO SK 500E

NORDAC LINK

NORDAC FLEX

NORDAC BASE

NORDAC START

Accessories

Appendix

VARIED INSTALLATION POSSIBILITIES

MOTOR AND WALL MOUNTING

Motor assembly

The variable frequency drive can be mounted directly on the terminal box of the gear motor, thus forming a perfect unit consisting of the drive and the control technology. This motor-mounted format makes full use of its unbeatable advantages: compact overall dimensions of the drive unit; near immediate readiness for use after connection to the AC line supply thanks to the pre-configuration of the drive unit at the factory; optimum EMC due to short cable lengths, or elimination of a motor cable.

Wall mounting

As an alternative to motor mounting, the device can be mounted close to the motor using an optional wall mounting kit. You can select from different versions depending on the prevalent ambient conditions.

1. Standard version **SK TIE4-WMK-1-K**

Note: If the VFD is wall mounted, the cooling air flow from the motor is not present. This can ultimately result in power restrictions (derating) for the variable frequency drive.

2. Version with **nsd tupH™** surface treatment **SK TIE4-WMK-1-NSD**

This version differs from the standard version due to the different material and **nsd tupH** surface treatment. It is intended for applications in which protection class IP69K is required.

3. ATEX version **SK TIE4-WMK-1-EX**

This version is functionally comparable to the standard version, however it is suitable for use in explosion hazard environments (ATEX Zone 22 3D).

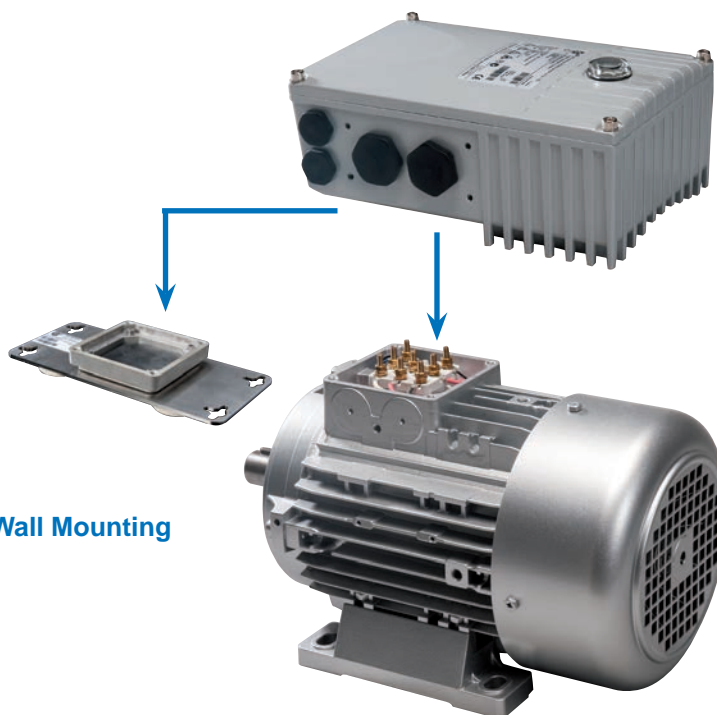
Designation	Material No.	VFD Frame Size
SK TIE4-WMK-1-K	275 274 004	Size 1, 2
SK TIE4-WMK-1-NSD	275 274 014	Size 1, 2
SK TIE4-WMK-1-EX	275 175 053	Size 1, 2
SK TIE4-WMK-TU	275 274 002	Type: SK TU4-

¹ Mounting of the WMK underneath the motor starter

² H = Increase in the total height of the device if mounted on the wall mounting kit

³ Mounting of the WMK on the connection unit of the technology unit

Motor-mounted or wall-mounted motor starters



Wall Mounting

Motor Assembly

Designation	Version Material	Inte-grated fan	Achievable protection class	Weight	Dimensions L x W x H	Remarks
SK TIE4-WMK-1-K	Plastic	-	IP66	0.2 kg .44 lb	205 x 95 x 5 mm 8.07 x 3.74 x .19 in	Derating as necessary
SK TIE4-WMK-1-NSD	Stainless steel	-	IP69K	0.6 kg 1.32 lb	205 x 95 x 4 mm 8.07 x 3.74 x .15 in	nsd tupH on terminal box cover. Derating as necessary
SK TIE4-WMK-1-EX	Stainless steel	-	IP66	0.6 kg 1.32 lb	205 x 95 x 4 mm 8.07 x 3.74 x .15 in	Derating as necessary
SK TIE4-WMK-TU	Stainless steel	-	IP66	0.4 kg .88 lb	155 x 85 x 3 mm 610 x 3.34 x .11 in	

Introduction

NORDAC PRO SK 500P

NORDAC PRO SK 500E

NORDAC LINK

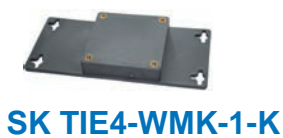
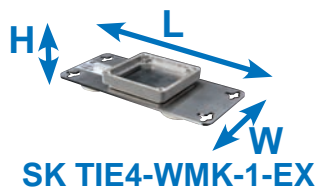
NORDAC FLEX

NORDAC BASE

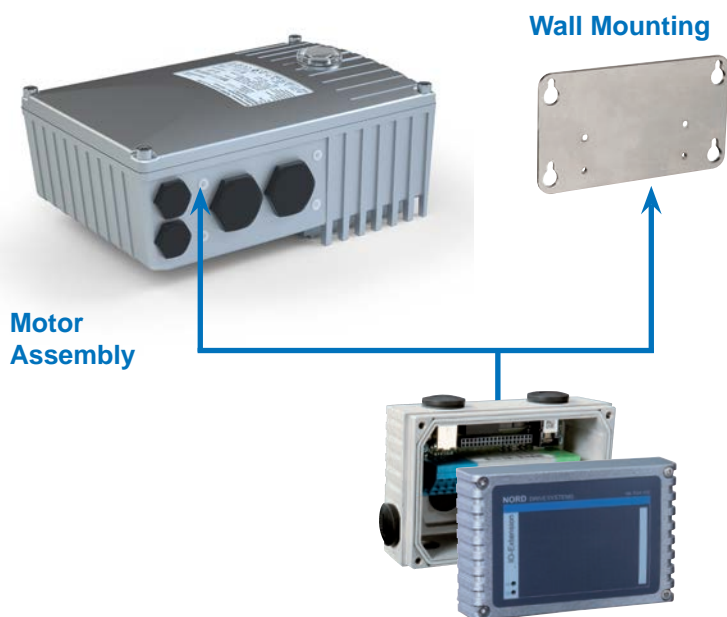
NORDAC START

Accessories

Appendix



Technology unit on NORDAC® BASE or wall mounting



INTERNAL VERSIONS

Internal brake resistor SK BRI4

Internal brake resistors are intended for applications where slight, sporadic or brief braking is expected (e.g. conveyor equipment, mixing equipment). In addition, they enable the use of the variable frequency drive in very confined spaces or in an explosive atmosphere.

Internal brake resistors are intended for installation in the connection unit of the VFD. The units offer space for implementing one brake resistor each. For thermal reasons, the rated continuous output is limited to 25%. Equipment with a brake resistor must be specified during ordering. Retrofitting is not possible.



Variable frequency drives SK 180E / SK190E		Resistor type	Material No.	Resistance [Ω]	Continuous power [W]	Power consumption ² [kW]
1/3~230 V	... -750-323-B up to ... -151-323-B	SK BRI4-1-200-100	275 272 008	200	100/25%	1.0
3~480 V	... -151-340-B up to ... -221-340-B	SK BRI4-1-400-100	275 272 012	400	100/25%	1.0

¹ Reduction of the continuous output of the brake resistor to 25% of the rated output

² Permissible max. once within 10 s

BRAKE RESISTORS (ONLY FOR SIZE 2 DEVICES BG2)

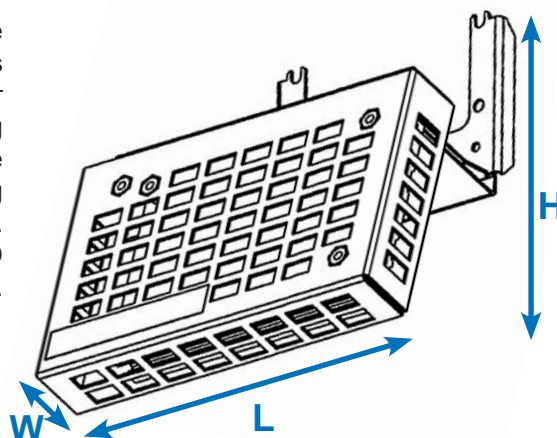
EXTERNAL VERSIONS

External brake resistors SK BRE4

External brake resistors (IP67) are intended for applications in which longer (lifting equipment), frequent (cyclic operation) or intensive (highly dynamic positioning applications) braking is expected. They are mounted directly on the VFD. Typically, they can develop high surface temperatures (>70°C), which exclude their use in an explosive atmosphere.

Note

The brake resistors listed here are designed for typical applications with occasional braking. For applications with higher braking power (lifting equipment), we recommend specific planning of the necessary brake resistor. Please contact the NORD DRIVESYSTEMS Group directly.



Variable frequency drives SK 180E / SK190E		Resistor type Material No.	Resistance [Ω]	Continuous output [W]	Power consumption ¹ [kW]	L x W x H
1/3~230 V	... -750-323-B up to ... -151-323-B	SK BRE4-1-100-100 275 273 005	100	100	2.2	150 x 61 x 178 mm 5.9 x 2.40 x 7.00 in
		Alternatively: SK BRE4-2-100-200 275 273 105	100	200	4.4	255 x 61 x 178 mm 10.03 x 2.40 x 7.00 in
3~480 V	... -151-340-B up to ... -211-340-B	SK BRE4-1-200-100 275 273 008	200	100	2.2	150 x 61 x 178 mm 5.9 x 2.40 x 7.00 in
		Alternatively: SK BRE4-2-200-200 275 273 108	200	200	4.4	255 x 61 x 178 mm 10.03 x 2.40 x 7.00 in

¹ Permissible max. once within 120 s

Introduction

NORDAC PRO
SK 500P

NORDAC PRO
SK 500E

NORDAC LINK

NORDAC FLEX

NORDAC BASE

NORDAC START

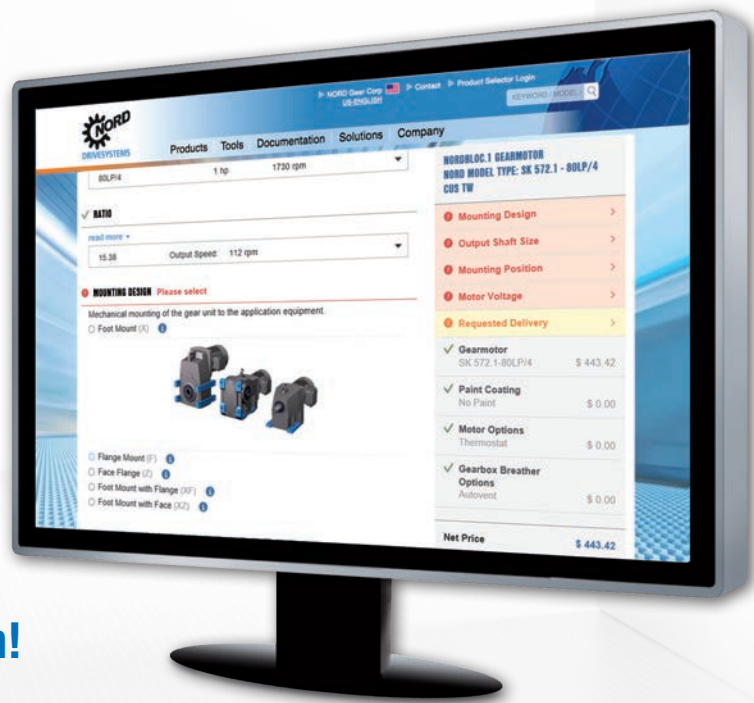
Accessories

Appendix

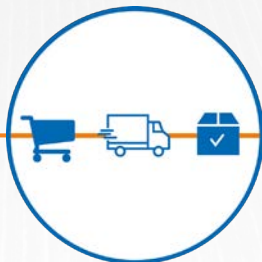
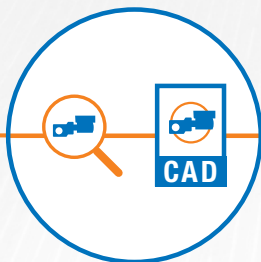


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