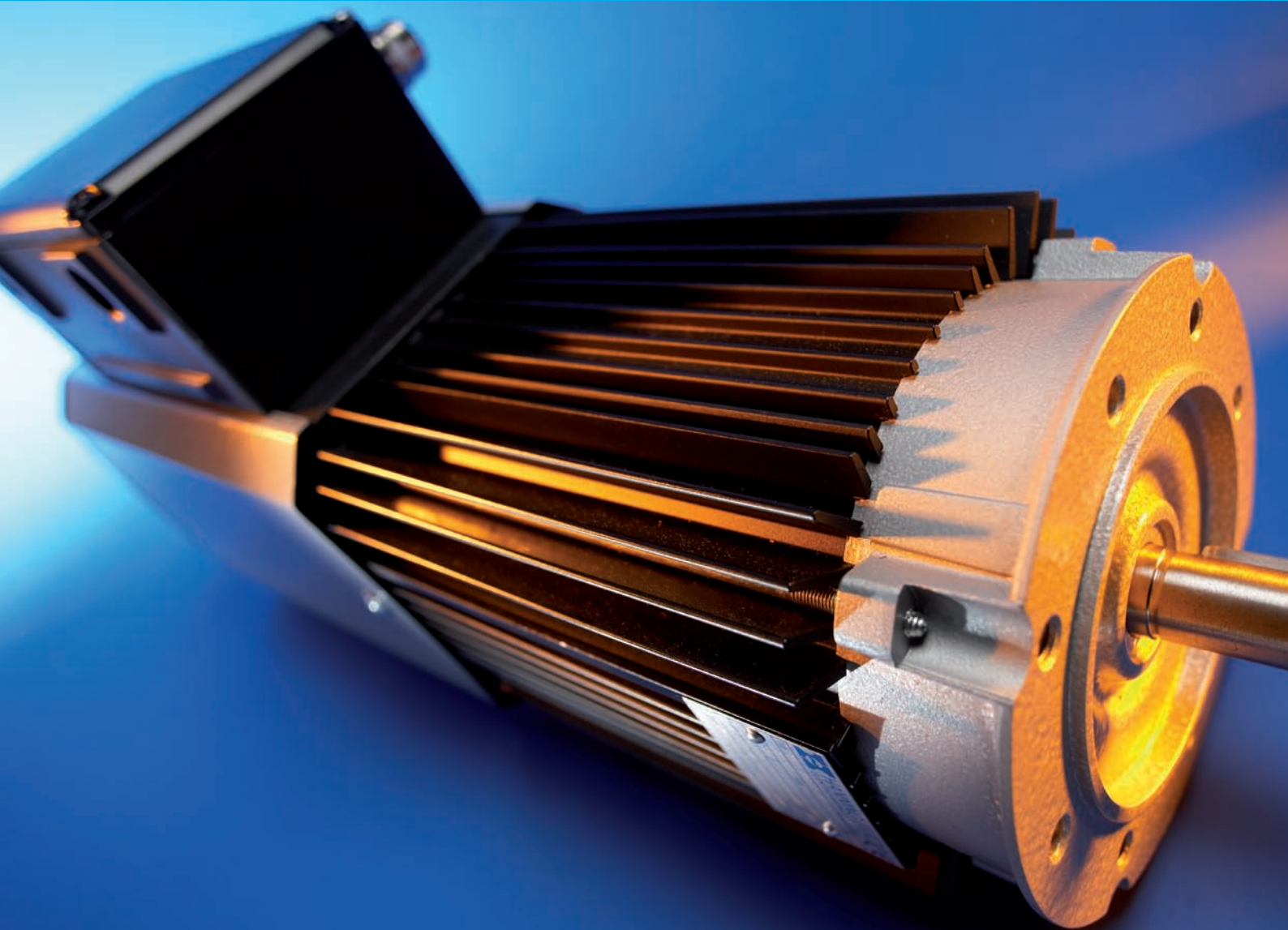
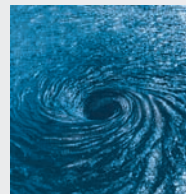


# VARICON

Three-phase AC motor  
with integrated frequency inverter



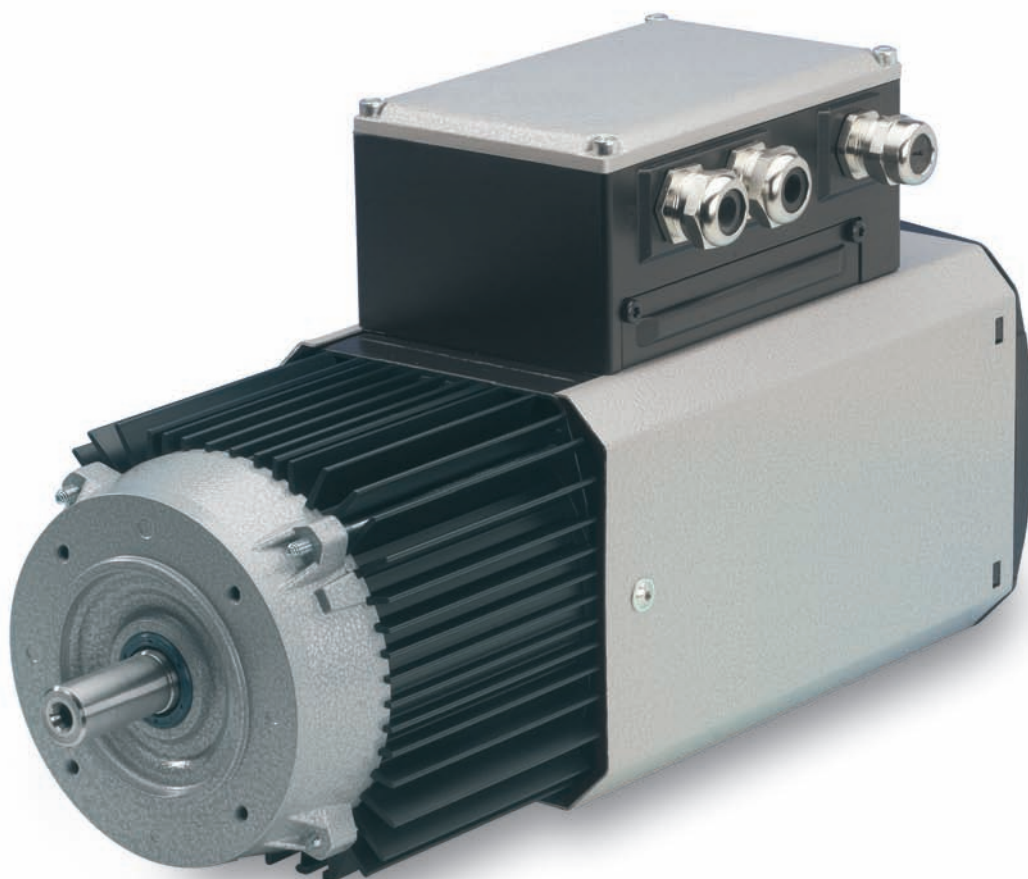
# moving



As one of the leading manufacturers of electrical and electronic drive components and systems we offer you a wide product range for almost every industrial application in many different branches of industry.

Innovative products and our sound technical competence have made us a reliable partner for 60 years. We understand our customers' problems and find individual solutions.

drive deliver con





# ideas

Our experience and orientation towards the future provide the foundations for our successful strategies. From our manufacturing site in Germany as well as our international sales offices we deliver HANNING products and service to successful companies all over the world.

moving ideas – With this slogan we present ourselves on the market. It encapsulates our aim to develop and produce modern and economic drive solutions for our customers.

trol pump adjust

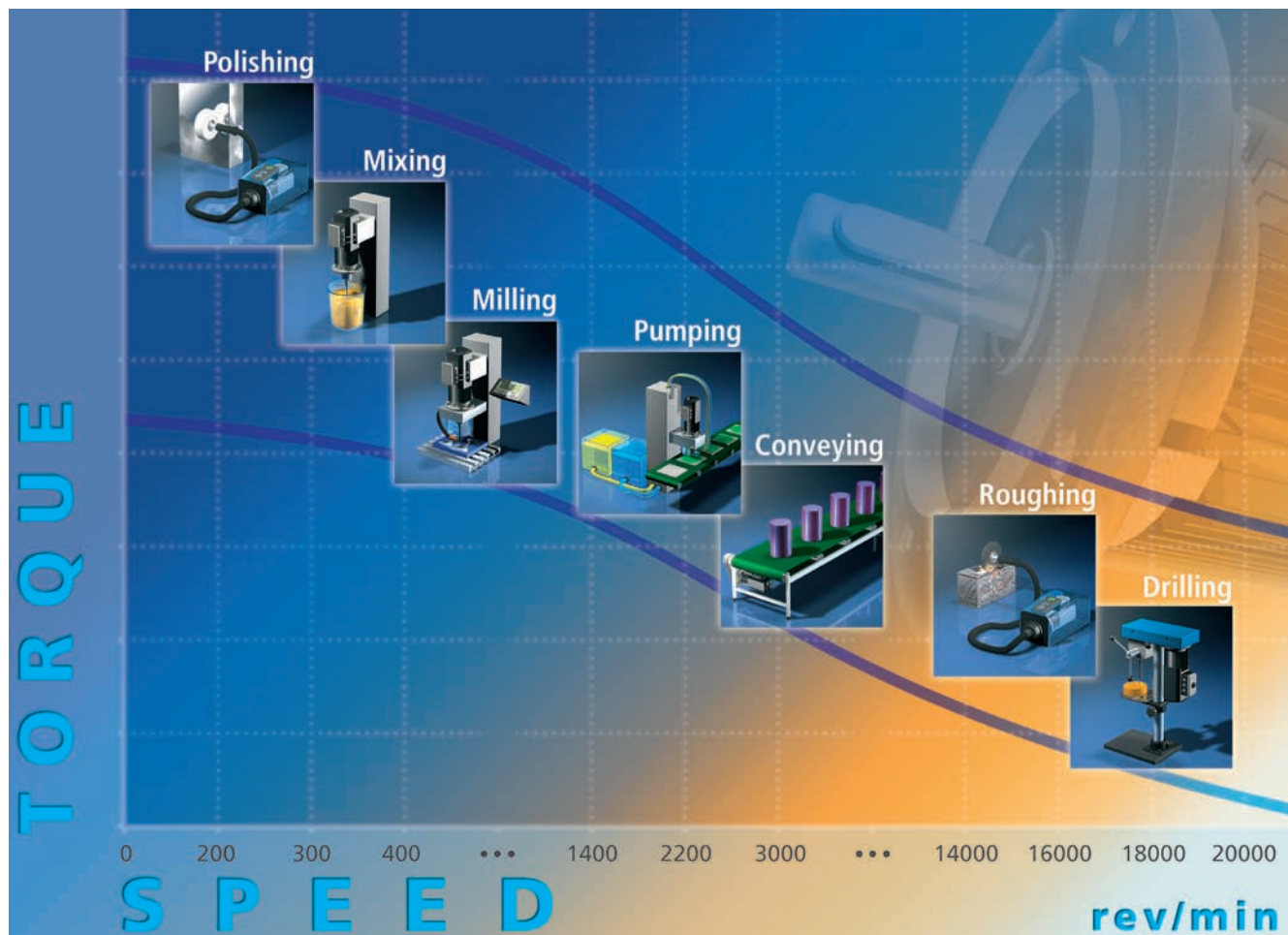
# drive and control

## **Three-phase AC motor with integrated frequency inverter**

The VARICON combines a three-phase AC motor with a frequency inverter. It is available for common fieldbus systems, the default setting is optimised for general operation, drive parameters are preset and it is equipped with complete radio interference suppression.

The VARICON – a variable speed drive in a rugged housing for versatile applications.

# VARICON – a direct drive for any application



## Polishing

- Low speed
- Smooth running
- High torque
- No excessive heat generation in motor and electronics

## Mixing

- Following a selected speed
- Optimum speed for every
  - medium
  - quantity mixed

## Milling ...

- Very flexible in choice of milling insert through wide speed range
- Optimum speed for every
  - material
  - tool
  - infeed speed

## ... Thread cutting

- High breakaway torque
- Short response time for reversing
- Optimum speed for every
  - material
  - tool

## Pumping

- Optimum speed for every medium
- Smooth running
- High breakaway torque when starting under counterpressure
- Signal output proportional to delivery quantity

## Conveying and lifting

- Following a selected S-profile for starting and stopping
- Process networking of drives to form a system
- Optimum speed for every
  - infeed speed
  - good delivered

## Roughing

- Extremely wide speed range from 5,000 to 12,000 rev/min
- Constant noise generation of the fan
- Optimum speed for every
  - material
  - tool

## Drilling

- Optimum speed of up to 20,000 rev/min for every
  - material
  - tool
  - infeed speed





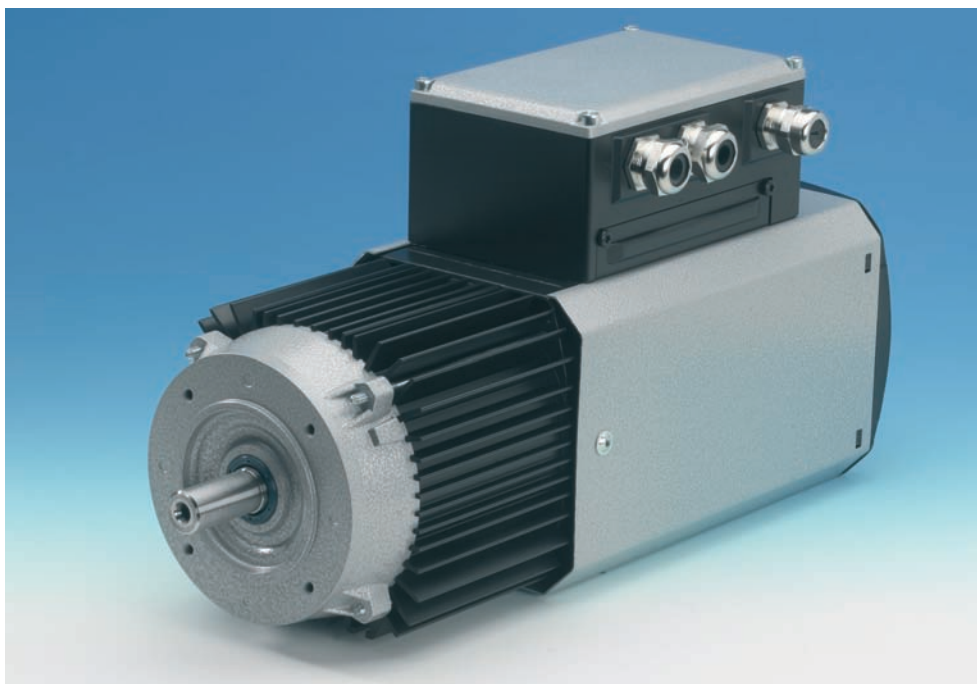
# Drive control directly at the operating process – inverter integrated into the motor

VARICON is available in all IEC sizes in foot and/or flange mounting as 2, 4 and 6 pole motor. It meets the protection class IP54/IP55 and insulation class F for different power classes. Sizes BG 80-100 are available. Powers above 3.0 kW are covered by size BG 90. Speeds higher than 20,000 r.p.m. are possible.

With VARICON the full torque is available over the entire speed setting range because a separate fan is integrated as standard. The separate ventilation ensures sufficient cooling at all rated conditions.

Thanks to its integrated control, VARICON can be used for decentralized control processes and in many different applications and industries. The default setting of the parameters ensures operation of the VARICON directly after its installation.

Its individual set-up and compact and slim design make VARICON a universally applicable drive system.



*Standard VARICON*

## Standard version

The standard version of the VARICON provides the following functions:

- Optimised cooling system with integrated separate fan
- Integrated two-track encoder
- Complete radio interference suppression to comply with the EMC guidelines
- Protection class IP54/IP55
- Universal interface or fieldbus connection; PROFIBUS, CANopen
- Networking / parameter setting via a RS485 interface
- 16 kHz operating frequency
- Easy installation



*Separate fan integrated into the VARICON*

# Customer benefits

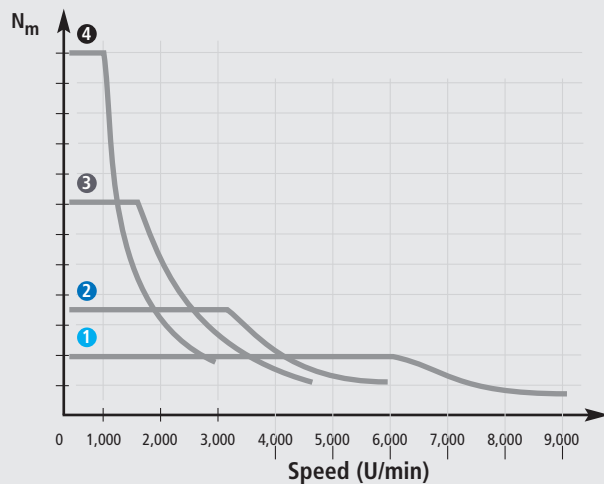
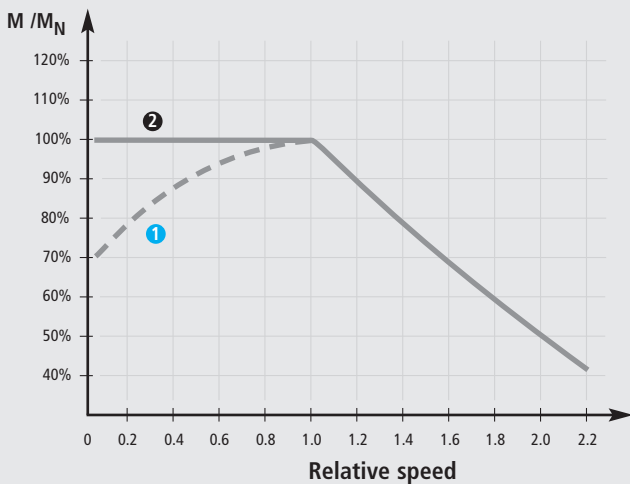
## Constant torque as from speed >0 onwards

The main advantage of the VARICON is the availability of full torque over the entire speed range from >0\* to the rated speed since a separate fan is integrated as standard! The size of the separate fan ensures best cooling performance at rated operation. Furthermore the VARICON is suitable for a wide speed setting range up to twice the transition frequency and for 2, 4 and 6 pole designs.

## Adjustable torque limit

An adjustable slip frequency limits the torque in controller operation.

### Characteristics



Speed-torque characteristic of a standard three-phase AC asynchronous motor connected to frequency-controlled drive  
 ① without separate fan  
 ② with separate fan integrated into the VARICON as standard.

Torque depending on speed for different selections  
 ① CCD x2-2  
 ② CCD x4-2  
 ③ CCD x4-1  
 ④ CCD x6-1

## Customer-specific mechanical design

Our manufacturing expertise and modern production facilities ensure the implementation of individual customer solutions such as special shafts, flanges and end shields as well as especially designed housings.

## Quality assurance

VARICON drives are tested in our laboratories. Depending on the customer's requirements we can simulate all application conditions to test the drive components manufactured to the customer's requirements in operation and optimise the set-up if necessary. HANNING laboratories are designed for long-term test series.

## Engineering offer

More and more applications in all different fields of mechanical and system engineering are solved by individually adapted drives. Designing and manufacturing these drives requires a lot of expertise regarding motors, electronics and software as well as extensive engineering knowledge.

HANNING analyse customer requests, develops and manufactures drive components according to the requirements and integrates them into the drive or the customer's plant.

\* Smooth running as of approx. 1/20 rated speed



# Communication modules

## Universal interface and fieldbus connection

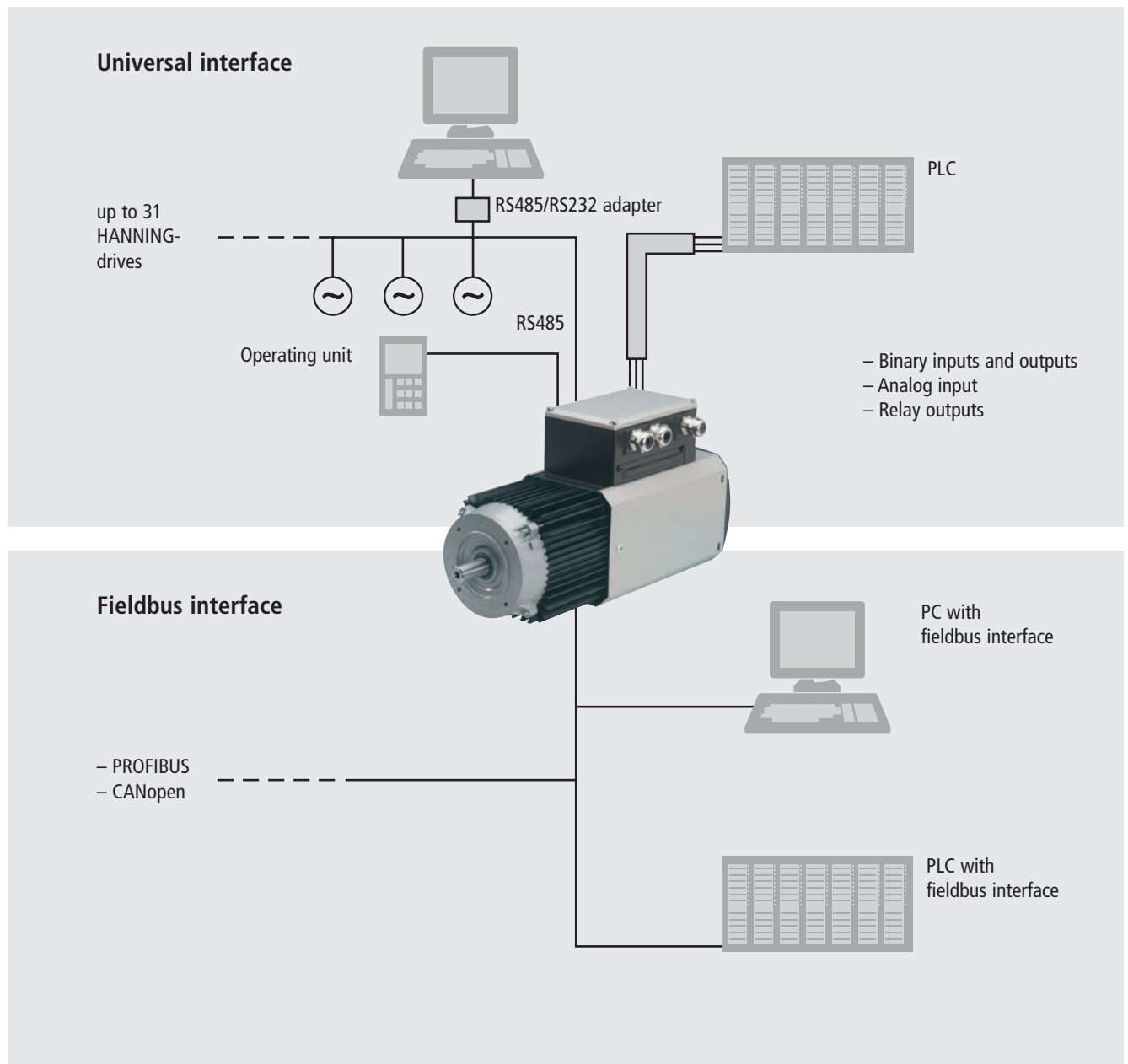
The VARICON can be equipped with different interface modules. You can choose between the following options:

### Universal interface

The universal interface contains not only different PLC-compatible signals but also a serial data interface (RS485). Therefore the universal interface is perfectly suitable for individual and flexible applications.

### Fieldbus connection

By means of different bus modules it is also possible to easily connect the frequency inverter with a host and/or other drives connected to the network. The communication modules for PROFIBUS and CANopen are available.



# Options at a glance

## The following options are available:

- Interface adapter RS485 / RS232
- Fieldbus connections, i. e. PROFIBUS or CANopen
- PC operating program (DrivePAR)
- Operating unit
- Different terminal box covers
- Brake resistor
- Holding brake
- Gearbox
- Special shaft
- Customer specific end shield



### Operating unit

The comfortable menu-assisted operating unit with plain-text display helps to quickly and easily set the parameters for the VARICON. The operating unit with its connection cable enables the user to transfer parameter sets between several VARICON drives.



### Customer-specific end shield

Customer-specific end shield – no problem! We produce the end shield according to customer specifications which means that it is not necessary to use an adapter flange.



### Universal interface and fieldbus connection

VARICON can be equipped with different interface modules, the universal interface with PLC compatible signals and serial data interface RS485 and the fieldbus connection via PROFIBUS and CANopen.



### Different terminal box covers

Different terminal box covers will be available with following operating elements: Power switch, right/left-button, start/stop-button, manual/external-button and a setpoint potentiometer for manual setting of speed between 0 and 100%.





# Parameter setting and operating software DrivePAR

DrivePAR is a software developed by Hanning which makes parameter setting for Hanning frequency inverters (VARICON or stand-alone unit DriveCCI) easy and quick.

Since the VARICON is delivered with all main settings prepared for most common applications, the drive can start operation directly after it has been installed.

If you want to adapt the drive parameters to your application, use the parameter setting and operating software DrivePAR. The three main features are:

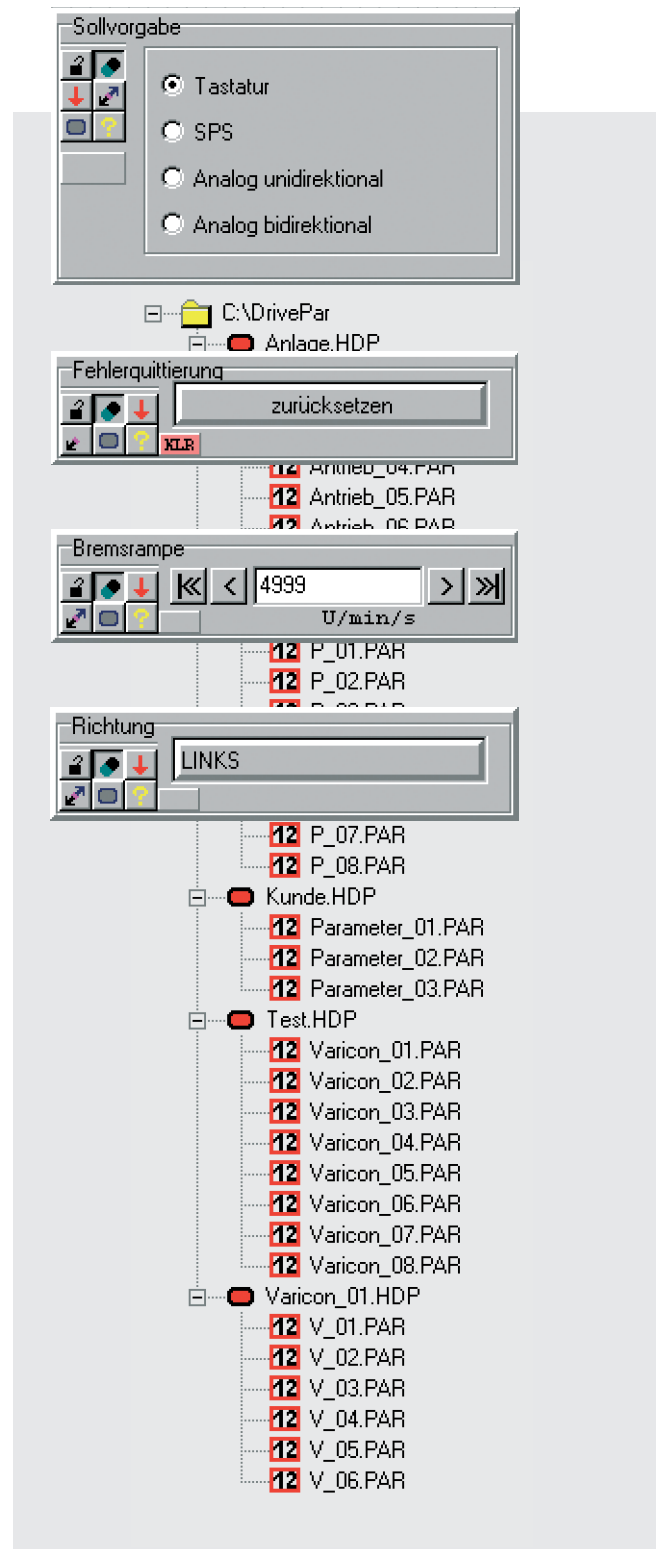
1. Individual and comfortable parameter setting for one or several Hanning frequency inverters
2. Easy and quick programming of test sequences
3. Easy troubleshooting during the test run and while the drive is set up

The DrivePAR parameter setting and operating software is based on WINDOWS and is therefore user-friendly and easy to use. All necessary drive functions can be quickly displayed. The tools you need for parameter setting are available as icons in the tool bar. The individually configurable user's interface can be saved as HDP file (Hanning DrivePar file) and is therefore available for future parameter settings. Furthermore it is possible to create parameter value files which contain different parameter configurations, for instance, parameters for certain applications. These parameter value files can be re-used for new applications or when you replace a drive.

Just click the mouse and DrivePAR creates a structured parameter list in WORD format which can be used for archives and documentation.

## Program functions provided by the user's interfaces WINDOWS 9x and NT:

- User's interface manager
- Parameter manager
- Actuators support easy parameter setting (VARICON or DriveCCI)
- Extensive configuration possibilities
- Diagnostics functions
- Automatic parameter documentation as WORD file
- Integrated help functions





# Technical data – Motor data

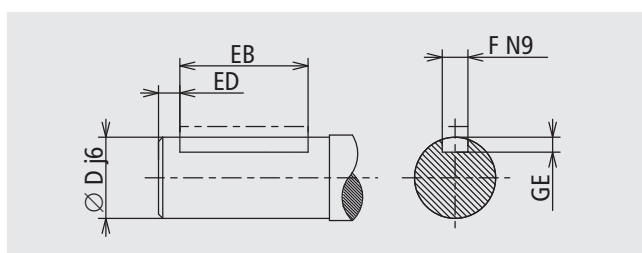
Rated data [kW]	Type	Rated torque [Nm]	Rated speed [1/min]	Speed range [1/min]	Moment of inertia [kgm <sup>2</sup> ]	System efficiency [%]	Mains input rated current [A]	Weight** [kg]
<b>Size 80</b>								
0.18 at 1~ AC 230 V ± 10% (400 V ± 10%)	CCD-8A2-2	0.3	5800	0-9000	0.00029	60	2.0 (1.0)	8.4
	CCD-8A4-2	0.6	2900	0-4500	0.00055	61	2.0 (1.0)	8.4
	CCD-8A4-1	1.2	1400	0-2250	0.00092	60	1.9 (1.0)	8.5
	CCD-8A6-1	1.9	900	0-1500	0.00092	60	2.2 (1.1)	8.5
0.37 at 1~ AC 230 V ± 10% (400 V ± 10%)	CCD-8C2-2	0.6	5800	0-9000	0.00029	64	3.8 (1.7)	9.5
	CCD-8C4-2	1.2	2900	0-4500	0.00055	64	3.6 (1.6)	10.0
	CCD-8C4-1	2.5	1400	0-2250	0.00092	62	4.5 (2.0)	11.5
	CCD-8C6-1	3.8	910	0-1500	0.00092	62	5.0 (2.3)	12.0
0.55 at 1~ AC 230 V ± 10% (400 V ± 10%)	CCD-8D2-2	0.9	5770	0-9000	0.00037	66	5.6 (2.4)	10.4
	CCD-8D4-2	1.8	2900	0-4500	0.00089	68	5.4 (2.3)	11.2
	CCD-8D4-1	3.7	1400	0-2250	0.00116	69	5.3 (2.3)	11.9
	CCD-8D6-1	5.8	900	0-1500	0.00152	63	5.9 (2.6)	12.8
0.75 at 1~ AC 230 V ± 10% (400 V ± 10%)	CCD-8F2-2	1.2	5800	0-9000	0.00047	68	7.4 (3.8)	10.7
	CCD-8F4-2	2.5	2890	0-4500	0.00116	68	7.4 (3.8)	11.9
	CCD-8F4-1	5.2	1380	0-2250	0.00157	72	7.6 (4.0)	13.4
	CCD-8F6-1***	8.7	900	0-1500	0.00188	72	-- (4.8)	15.2
1.1 at 1~ AC 230 V ± 10% (400 V ± 10%)	CCD-8G2-2	1.8	5800	0-9000	0.00064	70	10.6 (6.1)	12.2
	CCD-8G4-2	3.6	2910	0-4500	0.00188	68	10.9 (6.3)	14.4
	CCD-8G4-1	7.6	1380	0-2250	0.00225	69	10.9 (6.3)	18.0
1.5 at 3~ AC 230 V ± 10% (400 V ± 10%)	CCD-8H2-2	2.6	5820	0-9000	0.00083	71	12.0 (7.3)	14.2
	CCD-8H4-2	4.9	2900	0-4500	0.00230	70	12.0 (7.3)	17.0
	CCD-8H4-1***	10.4	1370	0-2250	0.00479	71	-- (7.8)	20.8
<b>Size 90 / 100</b>								
1.1 at 3~ AC 400 V ± 10%	CCD-9G6-1/CCD-10G6-1	11.5	910	0-1500	0.00623	71	7.2	22.1
1.5 at 3~ AC 400 V ± 10%	CCD-9H6-1/CCD-10H6-1	16.0	900	0-1500	0.00810	74	9.1	25.2
2.2 at 3~ AC 400 V ± 10%	CCD-9I2-2/CCD-10I2-2	3.6	5810	0-9000	0.00157	79	8.0	22.0
	CCD-9I4-2/CCD-10I4-2	7.3	2890	0-4500	0.00360	72	8.4	24.2
	CCD-9I4-1/CCD-10I4-1	15.0	1400	0-2250	0.00479	81	8.5	26.1
3.0 at 3~ AC 400 V ± 10%	CCD-9K2-2/CCD-10K2-2	4.9	5800	0-9000	0.00182	80	8.9	24.2
	CCD-9K4-2/CCD-10K4-2	10.0	2860	0-4500	0.00291	83	8.9	26.5
	CCD-9K4-1/CCD-10K4-1	19.9	1440	0-2250	0.00600	84	9.6	27.5

\* min. 50 % rated torque (see characteristic, page 6), smooth running as of approx. 1/20 rated speed

\*\* with standard shaft, FT flange (B14)

\*\*\* not available in 230 V

## Shaft end dimensions

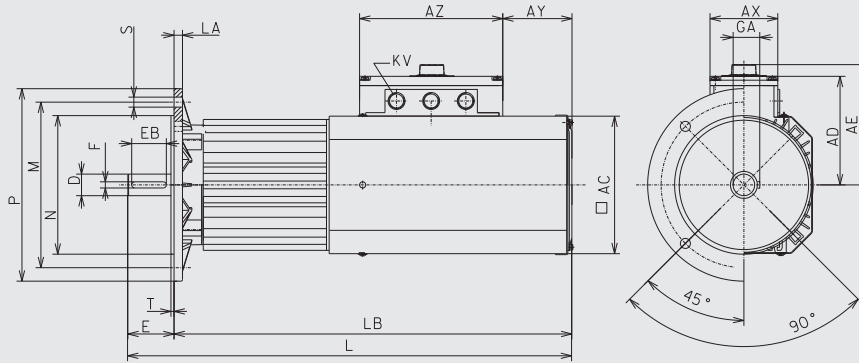


Size	Shaft end	ED	EB	F N9	GE +0.2	Centre hole DIN 332	Key cross-section
CCD8	∅ 19 x 40	5	30	6	3.5	DM6	6 x 6
CCD8	∅ 24 x 50	5	40	8	4.1	DM8	8 x 7
CCD9	∅ 24 x 50	5	40	8	4.1	M8	8 x 7
CCD10	∅ 28 x 60	5	45	8	4.1	M10	8 x 7



# Dimensions for FF flange design

## FF flange design



## Dimensions for FF flange design

Type	Flange	M	N	P	T	S	LA	L*	LB*	AC	AE	AX	AY*	AZ	AD	D	E	EB	GA	F	KV
CCD-8A...																					
CCD-8C...	FF130	130	110	160	3.5	9	9	435.5	395.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20
CCD-8D2-2	FF165	165	130	200	3.5	11	10	424.5	384.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20
CCD-8D4-2																					
CCD-8F2-2																					
CCD-8D4-1																					
CCD-8D6-1																					
CCD-8F4-2	FF130	130	110	160	3.5	9	9	465.5	425.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20
CCD-8F4-1	FF165	165	130	200	3.5	11	10	454.5	414.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20
CCD-8G2-2																					
CCD-8H2-2																					
CCD-8F6-1																					
CCD-8G4-2	FF130	130	110	160	3.5	9	9	505.5	465.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20
CCD-8G4-1	FF165	165	130	200	3.5	11	10	494.5	454.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20
CCD-8H4-2																					
CCD-8H4-1																					
CCD-9G6-1																					
CCD-9H6-1																					
CCD-9I2-2																					
CCD-9I4-2	FF165	165	130	200	3.5	11	10	595	545	181	174	112	94	167	154	24	50	40	26.9	8	3xM20
CCD-9I4-1																					
CCD-9K2-2																					
CCD-9K4-2																					
CCD-9K4-1																					
CCD-10G6-1																					
CCD-10H6-1																					
CCD-10I2-2																					
CCD-10I4-2	FF215	215	180	250	4.0	13	11	605	545	181	174	112	94	167	154	28	60	45	30.9	8	3xM20
CCD-10I4-1																					
CCD-10K2-2																					
CCD-10K4-2																					
CCD-10K4-1																					

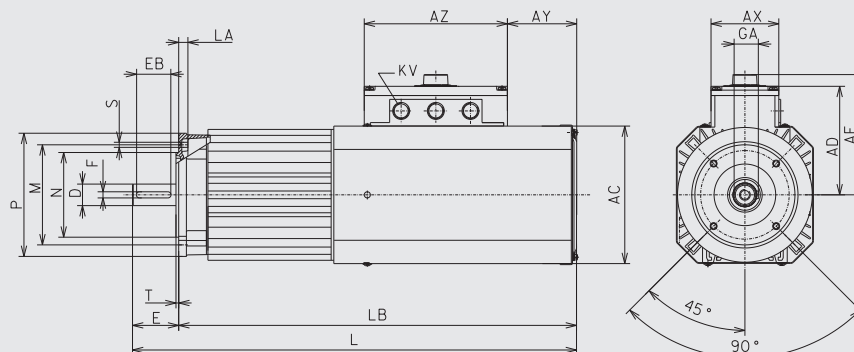
\* For IP55-Version the fan cover is extended by 45 mm





# Dimensions for FT flange design

## FT flange design



## Dimensions for FT flange design

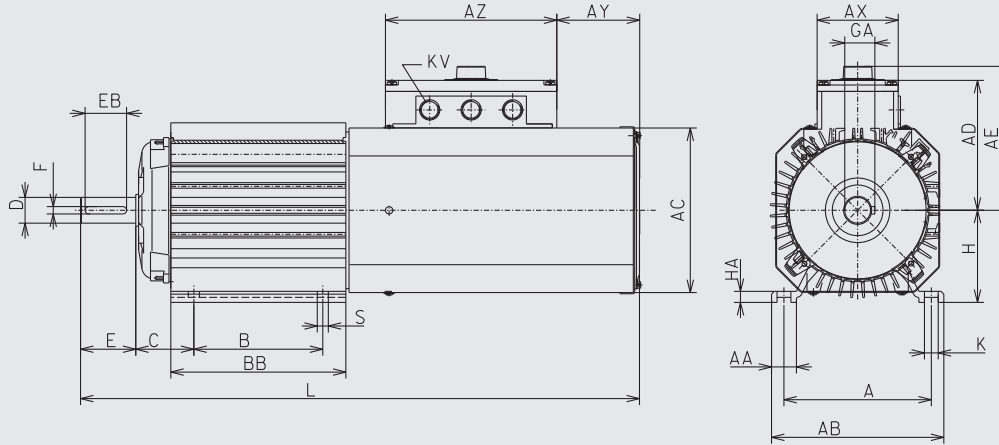
Type	Flange	M	N	P	T	S	LA	L*	LB*	AC	AE	AX	AY*	AZ	AD	D	E	EB	GA	F	KV	
CCD-8A...	FT 85	85	70	105	2.5	M6	11	424.5	384.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8C...	FT100	100	80	120	3.0	M6	11	424.5	384.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8D2-2	FT115	115	95	140	3.0	M8	11	424.5	384.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8D4-2	FT130	130	110	160	3.5	M8	14	424.5	384.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8F2-2																						
CCD-8D4-1	FT 85	85	70	105	2.5	M6	11	454.5	414.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8D6-1	FT100	100	80	120	3.0	M6	11	454.5	414.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8F4-2	FT115	115	95	140	3.0	M8	11	454.5	414.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8F4-1	FT130	130	110	160	3.5	M8	14	454.5	414.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8G2-2																						
CCD-8H2-2																						
CCD-8F6-1	FT 85	85	70	105	2.5	M6	11	494.5	454.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8G4-2	FT100	100	80	120	3.0	M6	11	494.5	454.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8G4-1	FT115	115	95	140	3.0	M8	11	494.5	454.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8H4-2	FT130	130	110	160	3.5	M8	14	494.5	454.5	141	164	106	55	167	144	19	40	30	21.5	6	3xM20	
CCD-8H4-1																						
CCD-9G6-1																						
CCD-9H6-1																						
CCD-9I2-2	FT 85	85	70	105	2.5	M6	11	582	532	180	174	112	92	167	154	24	50	40	26.9	8	3xM20	
CCD-9I4-2	FT100	100	80	120	3.0	M6	16,5	582	532	180	174	112	92	167	154	24	50	40	26.9	8	3xM20	
CCD-9I4-1	FT115	115	95	140	3.0	M8	16,5	582	532	180	174	112	92	167	154	24	50	40	26.9	8	3xM20	
CCD-9K2-2	FT130	130	110	160	3.5	M8	16,5	582	532	180	174	112	92	167	154	24	50	40	26.9	8	3xM20	
CCD-9K4-2																						
CCD-9K4-1																						
CCD-10G6-1																						
CCD-10H6-1																						
CCD-10I2-2																						
CCD-10I4-2	FT115	115	95	140	3.0	M8	10	605	545	180	174	112	92	167	154	28	60	45	30.9	8	3xM20	
CCD-10I4-1	FT130	130	110	160	3.5	M8	12	605	545	180	174	112	92	167	154	28	60	45	30.9	8	3xM20	
CCD-10K2-2																						
CCD-10K4-2																						
CCD-10K4-1																						

\* For IP55-Version the fan cover is extended by 45 mm



# Dimensions for foot design

## Foot design



Type	H	L*	AE	AD	AC	A	B	C	K	S	AA	AB	HA	BB	D	E	EB	GA	F	AX	AY*	AZ	KV
CCD-8A... CCD-8C... CCD-8D2-2 CCD-8D4-2 CCD-8F2-2	80	424.5	164	144	141	125	70	50	12	10	23	148	9	103	19	40	30	21.5	6	106	55	167	3xM20
CCD-8D4-1 CCD-8D6-1 CCD-8F4-2 CCD-8F4-1 CCD-8G2-2 CCD-8H2-2	80	454.5	164	144	141	125	100	50	12	10	23	148	9	133	19	40	30	21.5	6	106	55	167	3xM20
CCD-8F6-1 CCD-8G4-2 CCD-8G4-1 CCD-8H4-2 CCD-8H4-1	80	494.5	164	144	141	125	100	50	12	10	23	148	9	173	19	40	30	21.5	6	106	55	167	3xM20
CCD-9G6-1 CCD-9H6-1 CCD-9I2-2 CCD-9I4-2 CCD-9I4-1 CCD-9K2-2 CCD-9K4-2 CCD-9K4-1	90	548.5	174	154	180	140	125	56	12	10	24	164	10	172	24	50	40	26.9	8	112	92	167	3xM20
CCD-10G6-1 CCD-10H6-1 CCD-10I2-2 CCD-10I4-2 CCD-10I4-1 CCD-10K2-2 CCD-10K4-2 CCD-10K4-1	100	584	174	154	180	160	140	63	15	12	27	187	12	190	28	60	45	30.9	8	112	92	167	3xM20

\* For IP55-Version the fan cover is extended by 45 mm



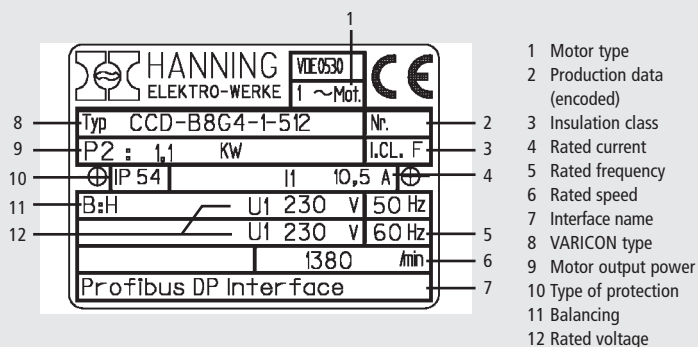
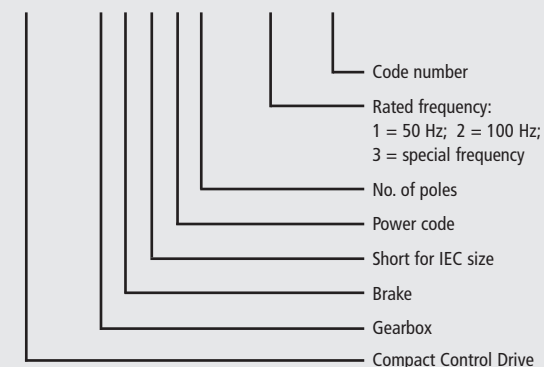
# Mechanical design and type code

Designs according to IEC 60072/DIN EN 50347		
Design	Picture	Explanation
With feet (B3)		2 end shields, housing with feet, free shaft end, installation on base. Suitable for horizontal and vertical mounting positions.
With FF flange (B5)		2 end shields, housing without feet, free shaft end, FF flange near bearing on drive end, flange connection. Suitable for horizontal and vertical mounting positions.
With feet and FF flange (B3/B5)		2 end shields, housing with feet, free shaft end, FF mounting flange near bearing on drive end, installation on base for flange connection. Suitable for horizontal and vertical mounting positions.
With FT flange (B14)		2 end shields, housing without feet, free shaft end, FT mounting flange near bearing on drive end, flange connection. Suitable for horizontal and vertical mounting positions.
With feet and FT flange (B3/B14)		2 end shields, housing with feet, free shaft end, FT mounting flange near bearing on drive end, installation on base for flange connection. Suitable for horizontal and vertical mounting positions.

## Type code and nameplate

Example: VARICON 1.1 kW

CCD - G B 8 G 4 - 1 - 055



# Standards and regulations

IEC/CEI	EN/HD	DIN/VDE	Contents
IEC 60027-4	-	DIN 1304-7	Letter symbols to be used for electrical machines
IEC 60034-1	EN 60034-1	DIN EN 60034-1 / VDE 0530-1	Rotating electrical machines: Rating and performance
IEC 60034-2	EN 60034-2	DIN EN 60034-2 / VDE 0530-2	Methods for determining losses and efficiency of rotating electrical machinery
IEC 60034-5	EN 60034-5	DIN EN 60034-5 / VDE 0530-5	Degrees of protection by the integral design of rotating electrical machines (IP code)
IEC 60034-6	EN 60034-6	DIN EN 60034-6 / VDE 0530-6	Methods of cooling (IP code)
IEC 60034-7	EN 60034-7	DIN EN 60034-7 / VDE 0530-7	Classification of types of construction, mounting arrangements and terminal box position (IM code)
IEC 60034-8	EN 60034-8	DIN EN 60034-8 / VDE 0530-8	Terminal markings and direction of rotation
IEC 60034-9	EN 60034-9	DIN EN 60034-9 / VDE 0530-9	Noise limits
IEC 60034-11	-	-	Integrated thermal protection
IEC 60034-12	EN 60034-12	DIN EN 60034-12 / VDE 0530-12	Starting performance of single-speed three-phase cage induction motors except for pole changing motors
IEC 60034-14	EN 60034-14	DIN EN 60034-14 / VDE 0530-14	Mechanical vibration of certain machines with shaft heights 56 mm and higher
IEC 60038	HD 472 S1	DIN IEC 60038 / VDE 0175	IEC standard voltages
IEC 60072	EN 50347	DIN EN 50347	General purpose three-phase induction motors having standard dimensions and outputs - Frame numbers 56 to 315 and flange numbers 65 to 740
IEC 60072	-	DIN EN 50347	Tolerances of shaft extension run-out and of mounting flanges for rotating electrical machinery
IEC 60085*	HD 566	DIN IEC 60085 / VDE 0301-1	Thermal evaluation and classification of electrical insulation
IEC 60445	EN 60445	DIN EN 60445 / VDE 0197	Identification of equipment terminals and of terminations of certain designated conductors
-	EN 55014-2	DIN EN 55014-2 / VDE 0875-14-2	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity
-	EN 50178	DIN EN 50178 / VDE 0160	Electronic equipment for use in power installations
IEC 61800-3	EN 61800-3	DIN EN 61800-3 / VDE 0160-103	Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods

\* IEC 15E/205/CD:2002







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- Extensive knowledge of different branches of industry





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