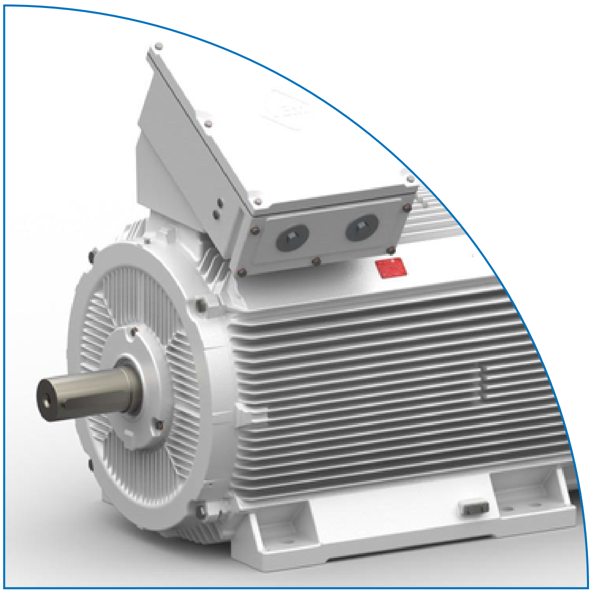
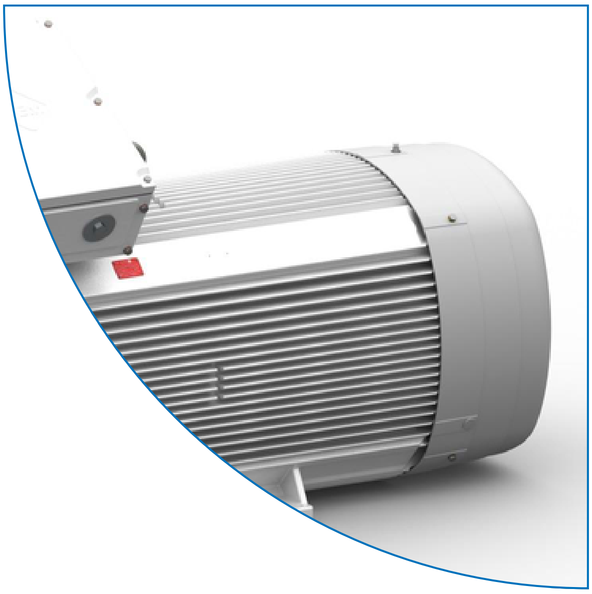
VEM COMPACT

Transnorm Motors





VEM SOLUTIONS

MOTOR - GENERATOR - VFD - IOT

LOW VOLTAGE AND HIGH VOLTAGE DESIGN

200 KW UP TO 2500 KW

VEMO COMPACT

TABLE OF CONTENTS

ABOUT VEM

VEM in Asia has been established in 2003 incorporated in Singapore. A small and smart Team leading new sales and after sales services for whole APEC and Oceania areas. A stock in Singapore ensure availability for Marine and flameproof motor within a few minutes.

VEM is an innovative, internationally-active and reliable manufacturer of technically sophisticated system and drive solutions, custom drives and single components. The output capacity ranges from 0.06 kilowatts to 60 megawatts / 90 megavolt ampere. Continuity and reliability, including in the future, this is what the production and service at VEM stands for. The engineering and quality of the products with the VEM logo are trendsetters within the market.

Introduction

More power and efficiency for the future

Millions of electric motors from VEM are used around the world. The trademark VEM is known as a quality mark. Large size motors and special motors as well as standard motors and special drive solutions are used reliably in all kinds of industrial applications. Numerous installations are equipped with motors, generators and drive solutions for each sort of voltage range. They are delivering an optimal performance for decades even under extreme ambient conditions – dust and heat of a rolling mill, areas with risk of explosion in a chemical plant or humid saline sea air on board of ships. VEM products comply with all relevant standards and directives.

With the new energy efficient series for transnorm motors VEM extends its product range to 1000 kW in the low voltage range. At the same time this design series is also available in high voltage design for the power range up to 1080 kW.

In the power range up to 800 kW the efficiencies of the low voltage motors comply with efficiency class IE3 "Premium efficiency" according to E DIN EN 60034-30:2012. The increasing importance of energy efficiency and the always increasing requirements for environmental protection have led to the enhancement and output extension of the well-proven VEM design series.

Pump drives in a paper machine

Technical characteristics

- Efficiency class IE3 *)
- Types of construction IM B3, IM B35 and IM V1 acc. to IEC
- Type of protection IP 55, as option IP 56 or IP 65
- Sturdy, die casted rotor in one piece
- Winding in thermal class 155, 180 as option, vacuum impregnation
- Optimised ventilation system with internal and external cooling from shaft size 355 MX
- Lubrication device with adjustable grease supply,
- Temperature monitoring with PTC (low voltage) or PT100 (high voltage design),
- spaciously designed terminal box,
- as standard designed with RFID transponder (Memory Motor),
- environmentally friendly paint system based on water-soluble paint

Advantages

- Energy efficient design and construction complying with efficiency class IE3 *)
- Storage of technical data and maintenance history via RFID transponder technology
- Sturdy grey cast iron design for the housing and the end shields
- Low vibration design
- Compact design with minimal installation dimensions
- High electric strength for mains and inverter operation
- Low noise operation
- Paint system for climate groups „moderate" and „worldwide" complying with IEC 721-2-1
- Modern system of modular design
- High operational reliability due to latest manufacturing methods

*) complying with draft E DIN EN 60034-30:2012

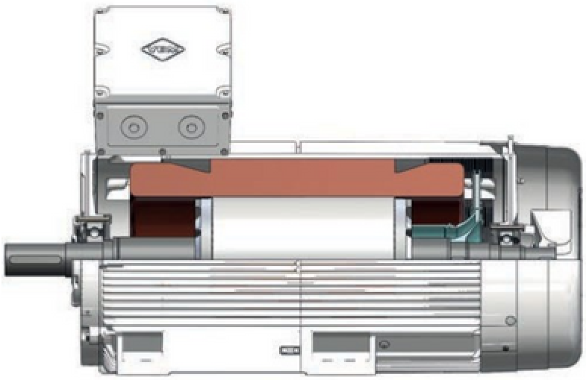
Many different operational options

The possible applications for motors of the new VEM generation are nearly without limits. They can be used as drives for the extraction of liquids or com- pression of gases as well as for operation in cement production plants, rolling mills and chemical plants. Together with frequency inverters they offer the pos- sibility for the operator to optimally design the pro- cess management. The optimised winding design allows it to use these motors in connection with variable speed drives. For inverter feeding with inver- ter output voltages up to 690 V a special winding system based on mica as insulation material is avail- able. The system for this design fulfils the require- ments of curve B from IEC TS 60034-25.

Our customer service includes not only technical assistance in project planning, testing and commissioning, but also inspections by our service departments.

The motors comply with all corresponding national and international regulations.

Development, design, production and testing are done according to the specification given in DIN ISO 9001 and this is certified by German Lloyd Certification GmbH.



Detail drawing 1 – motor construction

The motors comply with all corresponding EU standards. As option it is also possible to produce a design for operation in explosion protected areas of zone 2 and zone 22. The decision to produce our motors in Germany is another example of our quality philosophy.

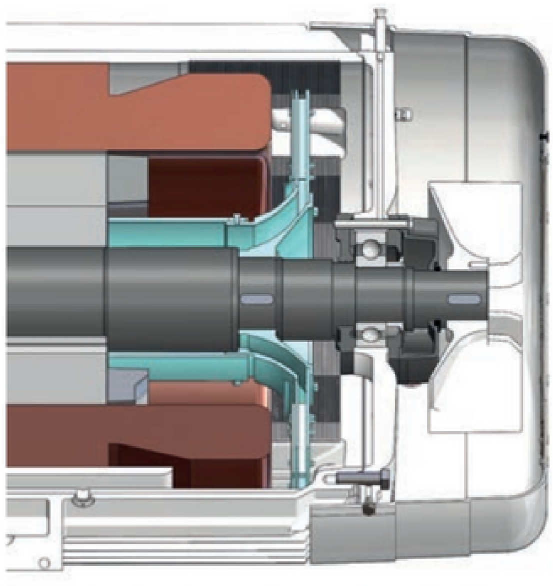
Memory design

The RFID technology is used successfully by VEM for many years. Important data of the drive system is saved on an RFID tag, which is attached physically to the system. This optional design – named "memory design" – is used as standard for all motors of shaft size 400 and bigger (RFID system iID®2000, 13.56 MHz, based on ISO 15693). For smaller motors (including motors of shaft size 355) this technology is also available as additional option.
On the memory chip of this transponder (TAG) information is stored about selected name plate and motor data as well as additional technical specifications for accessory equipment, selected spare parts, information about motor maintenance and customer or user data if applicable.
In addition it is possible to actively maintain a maintenance journal.

Constructive details

With the new transnorm motors W42R/W52R the cooling system of pure rip cooling is left aside and an additional inner cooling system is installed.

Here a new innovative ventilation system with a special two-cycle inner fan is used. With it the rotor, the stator and the winding heads are optimally cooled



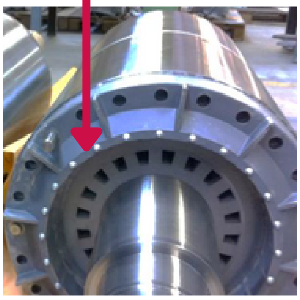
Detail drawing 2 – cooling cycle on N-side

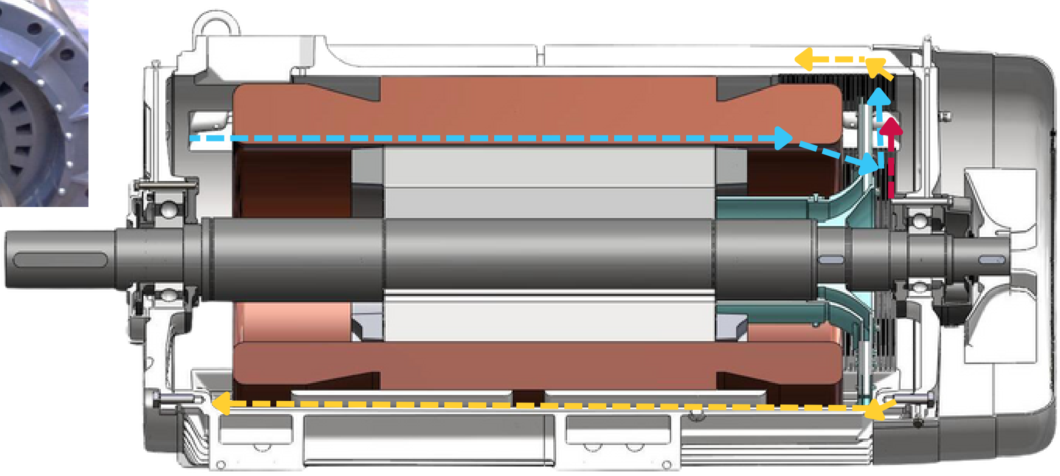
The sturdy housings produced by using latest casting technology are equipped with additional cooling ribs in the cooling channels. In connection with a new concept for pressure die casted rotors this design assists the cooling effect and allow for high efficiencies in connection with an extremely compact construction.

Cooling concept

Internal cooling circuit: Twin-circuit system with double fan

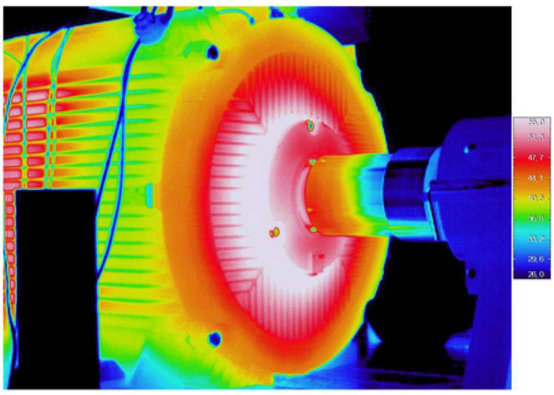
Circuit 1 via cooling channels in the rotor
Circuit 2 via the air gap
Return of both circuits via the 4 inside cooling channels



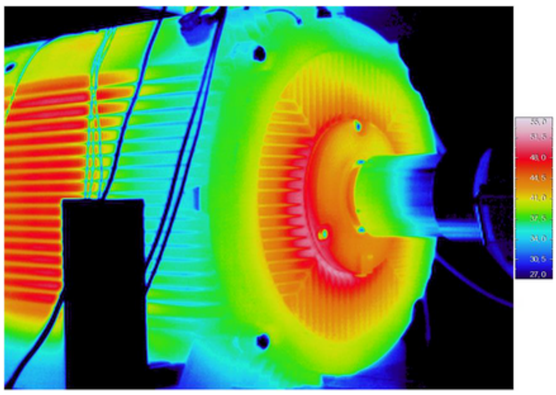


Balanced temperature conditions in the machine, with low rotor temperatures thanks to the internal cooling circuit

→ Improved utilisation



Without internal fan



With internal fan

Standards and regulations

The motors comply with the relevant standards and regulations, particularly with the following:

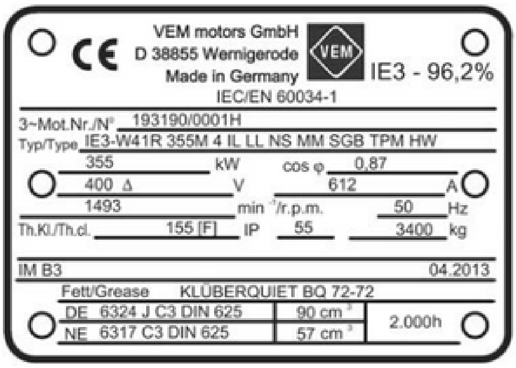
Ttile	EN	IEC
Rotating electrical machines, rating and performance	EN 60034-1	IEC 60034-1 IEC 60085
Efficiency classes of three-phase asynchronous motors	EN 60034-30	IEC 60034-30
Rotating electrical machines, standard methods for determining losses and efficiency	EN 60034-2-1	IEC 60034-2-1
Three-phase asynchronous motors for general use, with standardised dimensions and outputs, frame sizes 56 – 315	EN 50347	IEC 60072
Terminal markings and direction of rotation for rotating electrical machines	EN 60034-8	IEC 60034-8
Rotating electrical machines – Part 18-1: Functional evaluation of insulation systems – General guidelines	EN 60034-18-1	IEC 60034-18-1
Rotating electrical machines, symbols for types of construction and erection	EN 60034-7	IEC 60034-7
Built-in thermal protection	-	IEC 60034-11
Rotating electrical machines, methods of cooling	EN 60034-6	IEC 60034-6
Rotating electrical machines, types of protection	EN 60034-5	IEC 60034-5
Rotating electrical machines, mechanical vibrations	EN 60034-14	IEC 60034-14
Rotating electrical machines, noise limits	EN 60034-9	IEC 60034-9
Rotating electrical machines, starting performance of induction cage motors up to 660 V, 50 Hz	EN 60034-12	IEC 60034-12
IEC standard voltages	-	IEC 60038
Explosive atmospheres – Part 0: Equipment – General requirements	EN 60079-0	IEC 60079-0
Explosive atmospheres – Part 15: Equipment protection by type of protection "n"	EN 60079-15	IEC 60079-15
Explosive atmospheres – Part 15: Equipment protection by type of protection "n"	EN 60079-31	EN 60079-31

VEM motors conform furthermore to various foreign regulations which are aligned to IEC 60034-1 or else have taken over the latter's stipulations as European standard EN 60034-1.

Technical explanations

Name Plate

In standard design, the motor rating plate is normally marked in the German and English languages. Other languages may be used with non-EU languages available against extra price. The rating plate indicates the most important design data such as type designation and motor number, output, rated voltage and frequency, rated current, type of construction, degree of protection, power factor, speed, thermal class, bearing types and grease type. The data may vary according to type. In the case of motors with lubricating device, the quantity of grease per lubrication event and the lubricating intervals are also indicated on the rating plate or an additional plate. The rating plates are fastened on the housing with grooved drive studs and cannot be lost. They may be made of aluminium or stainless steel (extra price). For additional plates it will be required to consult the manufacturer.



Example of name plate

VEM Transnorm motors

Example: IE3-W42R 400 MX4 LL HW

IE3	-	W	4	2	R	400	M	X	4	LL
1		2	3	4	5	6	7	8	9	10

1	Energy efficiency class
	IE3 … Premium Efficiency acc. to E DIN EN 60034-30:2012.
2	Design version
	W … Energy-saving motor
3	Design condition/Product generation
	4 … Low voltage design
	5 … High voltage design
4	Standard characteristic number/letter
	1 … DIN/IEC, without inner cooling cycle
	2 … DIN/IEC, with inner cooling cycle
5	Degree of cooling
	R ... Fin cooled, IC 411
	O... Non-ventilated, IC 410
	F ... Forced-air cooled, IC 416
	B... cooled with water jacket, IC 31W
6	Shaft height in mm
	315, 355, 400, 450
7	Foot length
	S ... short
	M ... medium
	L ... long
8	Symbols for different output
	X, Y, Z ...
9	Pole number
	2, 4, 6, ... pole-changing separated by dashes
10...11	Special symbols
	LL ... light duty bearing
	... for further symbols refer to modifications summary in the main catalogue H01

Types of construction

The motors are available in types of construction IM B3, IM B35 and IM V1. Other types of construction on request. The type of construction is designated on the nameplate according to Code I, EN 60034-7.

Bearing/Lubrication

VEM motors are equipped with anti-friction bearings from respected manufacturers. The rated bearing lifetime is at least 20000 h with the exploitation of the maximum per- missible load. The rated bearing lifetime for motors install- ed in a horizontal position without additional axial loading is 40000 h in the case of coupling service.

The versions of the bearings can be taken from the over- views of the bearing arrangements. The respective flat grease nipples are contained in the tables of the design drawings. Motors in the normal versions with two deep groove ball bearings have preloaded bearings, where the preloading is implemented by a disk spring or a wave washer. Versions with cylindrical roller bearings on the D-end (heavy bearing arrangement VL) are excepted from the preloading. The most important prerequisite for achieving the normal bearing lifetime is correct lubrication, i.e. the use of the right kind of grease according to the application, the filling with the correct amount of grease and the maintenance of the subsequent lubrication periods. As standard the motors are designed with a lubrication device. Under normal service conditions, for version with lubrication device, 2000 or 4000 operational hours will apply. A grease of type Asonic GHY72 will be used as standard grease.

Information about bearing sizes, grease types and quantities and times for lubrication are to be taken from an additional plate (additional charge) attached to the motor. Bearings having a lubrication device should be lubricated through the lubrication nipple with the motor running and observing the quantity of grease and lubrication periods specified for the particular motor. The used grease is to be removed from the lubrication chamber in the external bearing cover after five lubrications. Information about bearing sizes, grease types and quantities and times for lubrication are to be taken from an additional plate (additional charge) attached to the motor. As is practised with all other motor series, the bearings are lubricated after they have been thoroughly cleaned. Use should be made of the same grade of grease. Only the grease types specified by the motor manufacturer are allowed to be used as equivalent grades. Care should be taken to fill the open space of the bearing to approx. two-thirds of its capacity with grease only. Filling the bearings and bearing covers to full capacity will lead to elevated bearing temperatures and thus to a higher rate of abrasion.

Use of cylindrical roller bearings

Relatively large radial forces or masses can be taken up at the end of the motor shaft by the use of cylindrical roller bearings ("heavy bearing arrangement" VL). Examples: belt drive, pinion or heavy couplings. The minimum radial force at the shaft end must be a quarter of the permissible radial force. The permissible shaft end load is to be taken into account. The information can be taken from the tables and diagrams in the design selection data.

Important Note:
If the radial force falls below the minimum value, damage to the bearings can be caused within a few hours. Test runs in no-load state only permissible for a short period.

If the specified minimum radial force is not reached, we recommend the use of grooved ball bearings ("easy bearing arrangement" LL). The bearings can be changed on request.

Loading of bearing and shaft end

The design of the bearing and the shaft can only be varied within certain limits because of the international standardization of asynchronous motors. Therefore, an optimum design size has been selected.

Permissible shaft end loading

PThe size of the permissible shaft end loading is determined by the following principle criteria:
– permissible bending of the shaft
– shaft end fatigue strength
– bearing lifetime

The permissible shaft end loading (radial and axial forces) is based on a rated bearing lifetime of 20000 hours and a security against fatigue failure of > 2.0. The permissible axial shaft loads are available on request from the manufacturer.

Bearing control

For controlling the condition of the bearings the motors may be equipped with temperature sensors, shock pulse and vibration detectors or prepared for such equipment. The temperature sensors mounted to the bearing points may be of type PT100 which can be of two-, three- or four-wire circuit design.

These can be connected either in the main connection box or in separate additional boxes which are fixed to the main terminal box or motor housing depending on construction.

For high voltage design the connection is always done in an additional terminal box.

The wear monitoring function for the anti-friction bearings may be achieved by shock pulse detectors [SPM] mounted to the bearing end shields. This allows the wear to be monitored with mobile detecting units. For remote control it is also possible to use firmly wired shock pulse or vibration detectors.

Limit speeds

When operating the motors in excess of the rated speed care should be taken to observe the limit values of the anti-friction bearings, the strength of the rotating parts, the critical rotor speeds and the circumferential speed of the fans.

The limit speeds listed in the table below may already require precautions to be taken such as special fans, special bearings or special balancing.

Limit speeds						
Type	Limit speeds at synchronous speed and 50 Hz					
	3000 rpm		1500 rpm		1000 rpm	750 rpm
IE3-W41R 315 S, M	3800		3000		2000	1500
IE3-W41R 315 MX	3600[1]	3000[2]	3000		2000	1500
IE3-W41R 315 MY, L, LX	3600[1]	3000[2]	3000[1]	2600[2]	2000	1500
IE3-W41R 355 M	3600[1]	3000[2]	3000[1]	2600[2]	2000	1500
IE3-W42R 355 MX, L	3600[1]	3000[2]	3000[1]	2600[2]	2000	1500
IE3-W42R/W52R 400, 450	3600[1]	3000[2]	3000[1]	2600[2]	2000	1500

[1] light bearing [2] heavy bearing

The limit values apply accordingly for non-ventilated, forced-ventilated motors and motors with water jacket cooling, cooling types IC 410, 416 and 31W.

Use of insulated bearings

Magnetic asymmetries will in mains-operated motors induce a voltage along the shaft. This shaft voltage leads to compensating currents between rotor and stator, which flow through the anti-friction bearings. If the voltage exceeds a threshold value of 500 mV, the bearings may be damaged. In VEM standard motors this value will in no case be exceeded due to their design.

The operation of the frequency inverter may intensify these effects with the inverter construction having a decisive influence. Pulse inverters will, depending on the timing frequency and the pulse modulation, generate particularly high-frequency voltages and currents. Output filters in the inverter will minimize these effects. To avoid bearing damage, the motors as of frame size 315 MY designed for inverter operation will always be equipped with an insulated bearing on the N-side. High voltage motors always are fitted with an insulated bearing on both sides and with an earth brush on D-end. This design is also available as option for low voltage motors.

TIn addition to this precaution, care should be taken to provide for an appropriate earthing of the motor housing to allow the currents circulating between inverter and stator to flow off. Other important measures to reduce bearing currents are: preference of an IT network (network with neutral point grounded), a separate potential equalisation between motor housing and working machine, use of motor chokes at the inverter and use of Du/dt filters or sinusoidal filters.

Shaft ends

The definition of the motor ends is made in accordance to IEC 60034-7:
– D-end (DS): Drive end of the motor (driving side)
– N-end (NS): End opposite to the drive (the side positioned opposite the DS) (Non-driving side)
– Centring borings as specified in DIN 332, Sheets 1 and 2, Form DS.

The feather key and feather key ways are executed as specified in DIN 6885 Sheet 1, Form A. The feather key lengths comply with EN 50347.

The motors are always supplied with the feather key fitted.

The second shaft end is able to transfer 80 % of the full nominal output in the case of coupling drive. The output transmission capability of the second shaft end is, in the case of belt, chain or pinion drive, available on request. The drive elements with key ways, such as belt pulleys or couplings, are to be balanced with a half feather key inserted with a balance quality grade of at least G 6.3 as specified in DIN ISO 1940-1.

Threads for press-on and dismantling devices

Shaft end diameters	Thread
from 50 to 85 mm	M20
from 85 to 130 mm	M24

True running characteristics of shaft ends

The true running characteristics of the shaft ends are in accordance with EN 50347. Optionally, the values may be reduced by 50 % (extra price).

Noise behaviour

The noise measurement is carried out at rated output, rated voltage and rated frequency, as specified in DIN EN ISO 3741. According to EN 60034-9, the spatial mean value of the sound pressure level LpA measured at a 1 m distance from the motor outline will be given as the noise intensity in dB(A).

Winding and insulation

Motors in low voltage design are constructed according to thermal class 155 [F]. Use is made of high-grade enamel-insulated wires and insulating sheet materials in conjunction with a low-solvent impregnating resin. The standard insulation system is intended for rated voltages up to 725 V [mains supply] and ensures a high mechanical and electrical strength and a long service life of the motors. A design according to thermal class 180 [H] is available against extra price. The windings are suitable for the use in frequency inverters with inverter input voltages from 420 V to 500 V (peak voltages $\hat{U} \leq 1800$ V and rate of voltage rise du/dt ≤ 5.0 kV/μs) and inverter input voltages above 500 V (peak voltages $\hat{U} \leq 2500$ V and rate of voltage rise du/dt ≤ 5.0 kV/μs). Special insulation systems are available.

For high voltage motors the well-proven insulation system VEMoDUR®-VPI-155 is used. It ensures highest product security and long service life in all applications. Only preformed coils are used for the three-phase double-layer windings. They are inserted into the open slots of the stator core. For winding insulation only insulations made of mica foil are used that are resistant against partial discharges and cementable. The main insulation in the slots and the winding head consists of low-solvent glass fibre ribbons with mica paper. To control the potential a low resistance semiconductive corona protection tape is used for the slots and winding head. The impregnation is done with epoxy resin in a VPI process followed by a rotating curing process. Thus winding insulation without cavities and tight fit of slot wedges is ensured. The components of the insulation system are ideally matched. Electric and thermal durability have been proven by long-term operational experience and functional evaluation according to IEC 60034-18. It is qualified as a reliable high voltage insulation system. In addition the high voltage insulation system is also qualified for use in connection with medium voltage frequency inverters complying with IEC 60034-18-42.

Rated voltage and frequency, low voltage design

In the basic version, motors are supplied for the following rated voltages and frequencies:

400/690 V Δ/Y, 50 Hz	380…420 V Δ/ 660…725 V Y, 50 Hz
500 V, 50 Hz	475…525 V, 50 Hz
480 V Δ/Y, 60 Hz	460…500 V Y, 60 Hz
600 V, 60 Hz	570…630 V, 60 Hz

The motors can be operated in networks in which the voltage at the rated frequency deviates from the rated value by up to ±5 % without changing the rated output. The tolerances for voltage and frequency comply with Zone A of EN 60034-1.

Rated voltage and frequency, high voltage design

For the standard series the motors are designed for rated voltage 6 kV and rated frequency 50 Hz. Voltage and frequency deviations during operation are possible complying with the specifications of EN 60034-1. Motors for voltage ranges ≤ 3.3 kV have higher rated output for similar designs, whereas motors for voltage ranges > 6.6 kV have lower rated output. All motors can be operated on a 60 Hz grid. With exception of 2-pole motors the rated voltage and the rated speed is changing proportionally with the frequency.

Rated output

The rated output applies to continuous operation as specified in EN 60034-1, related to a coolant temperature of 40 °C and an altitude of ≤1000 m above sea level, operat-ing frequency 50 Hz and rated voltage.

Motor torque

The design torque in Nm given at the motor shaft will be

$$M = 9550 \cdot \frac{P}{n}$$

where P = design output in kW
n = speed in rpm

The starting torque, pull-up torque and pull-out torque are given as multiples of the design torques in the motor selection data tables. If the voltage deviates from its rated value, the torques will change approximately quadratically.

Ambient temperature

The standard versions of all VEM motors are suitable for use under ambient temperatures from -20 °C to +40 °C. The motors can be used at ambient temperatures as low as -40 °C, but they have to be ordered accordingly.

For deviating ambient temperatures at places of installation below 1000 m above sea level, the following factors shall apply for defining the permissible output levels depending on thermal class:

Refrigerant temperature °C	10	15	20	25	30	35	40	45	50	55	60
Factor Th. Cl. F	1.21	1.17	1.14	1.10	1.07	1.03	1.00	0.95	0.90	0.85	0.80

Overload capacity

All motors can be subjected to the following overload conditions as specified in EN 60034-1:
– 1.5-fold rated current for 2 min.
– 1.6-fold rated torque for 15 sec.

Both conditions apply to rated voltage and rated frequency

Installation altitude

Unless specified otherwise by the customer, it is assumed that the place of installation is not higher than 1000 m above sea level.

If the motor is to be operated at an altitude above 1000 m but below 4000 m, the limit values for the overtemperature will not change while the rated output is subject to the following adjusting factors:

Installation altitude above sea level in m	Refrigerant temperature in °C					
	<30	30-40	45	50	55	60
1500	1.04	0.97	0.93	0.89	0.84	0.79
2000	1.00	0.94	0.90	0.86	0.82	0.77
2500	0.96	0.90	0.86	0.83	0.78	0.74
3000	0.92	0.86	0.82	0.79	0.75	0.70
3500	0.88	0.82	0.79	0.75	0.71	0.67
4000	0.82	0.77	0.74	0.71	0.67	0.63

At an installation altitude > 4000 m, the limit values for the overtemperature are subject to agreement between manufacturer and customer.

Design efficiency and power factor

The efficiency η and the power factor cos ϕ are given in the lists of the motor selection data.

Restarting during residual field and phase opposition

After switching off an electrical motor its winding will for a short time be subject to a voltage system as a result of the decaying magnetic field. Upon restart, transient electrodynamic reactions may occur for the motor, whereas the most unfavourable case is phase opposition of the residual field against the electrical network. It is possible to restart all VEM motors after a network failure with 100 % residual field.

Motor protection

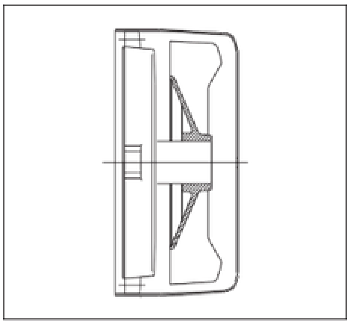
The following variations of motor protection are possible, if ordered:
– motor protection with thermistor temperature sensors in the stator winding (as standard from shaft size 400)
– bimetal temperature sensor as opener or closer in the stator winding
– silicon diodes KTY
– resistance thermometer to monitor winding or bearing temperature
– bearing vibration diagnosis

Duty types

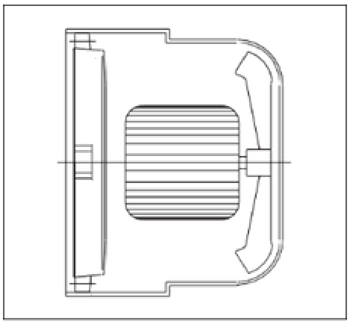
The figures in the tables refer to duty type S1, continuous duty. Special types of operation for switched operation, shorttime operation or electrical braking are possible on request.

Modular structure of the different series and modifications

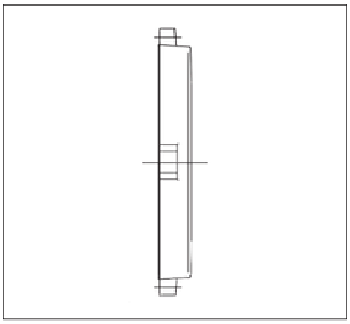
The design concept of the series permits the option of adding components to solve modern control tasks, such as a pulse generator, a tacho generator, brakes, a speed monitor and forced-ventilation units according to the customer's need.



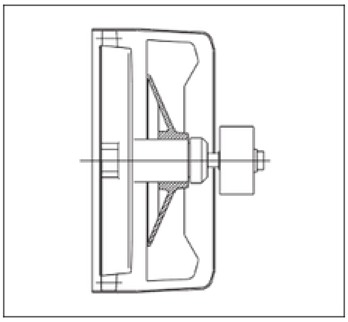
Standard version
Cooling method IC 411
Self-ventilation



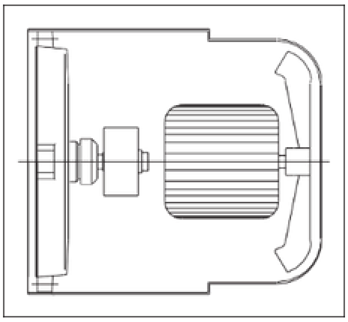
Special version
Cooling method IC 416
Forced-ventilation



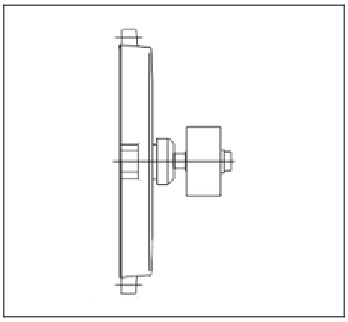
Special version
Cooling method IC 410
Non-ventilated



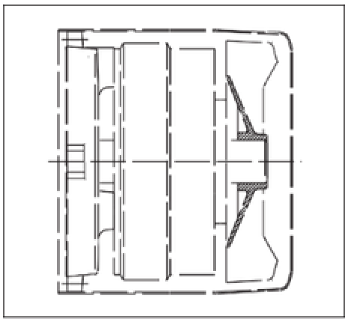
Special version
Cooling method IC 411
Self-ventilation
With built-on incremental senso



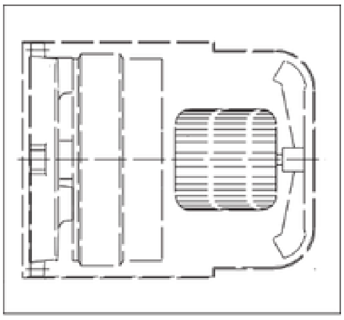
Special version
Cooling method IC 416
Forced-ventilation
With built-on incremental sensor



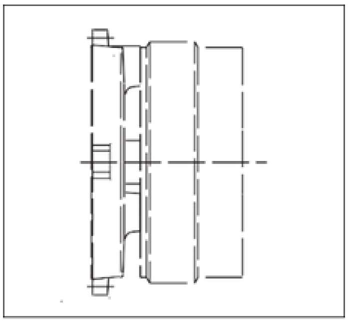
Special version
Cooling method IC 410
on-ventilated
With built-in incremental sensor



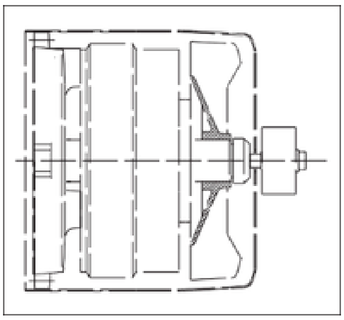
Special version
Cooling method IC 411
Self-ventilation, with built-on brake



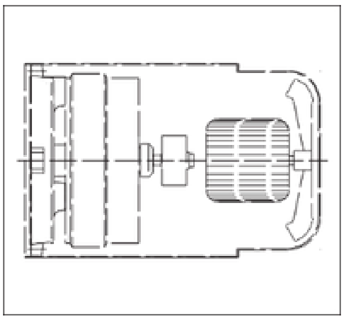
Special version
Cooling method IC 416
Forced-ventilation, with built-on brake



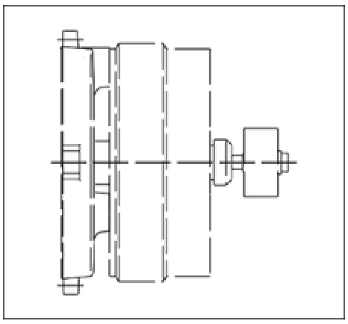
Special version
Cooling method IC 410
Non-ventilated, with built-on brake



Special version
Cooling method IC 411
Self-ventilated, with built-on brake and incremental sensor



Special version
Cooling method IC 416
Forced-ventilation, with built-on brake and incremental sensor



Special version
Cooling method IC 410
Non-ventilated, with built-on brake and incremental sensor

Fits: Shaft ends

Shaft ends	m6
Mating components	H7

Flange dimensions

Flange type acc. to EN 50347	Flange type acc. to DIN 42948	LA c_1	M e_1	N b_1	P a_1	S s_1	T f_1
FF600	A660	22	600	550	660	22	6
FF740	A800	25	740	680	800	22	6
FF940	A1000	25	940	880	1000	28	6
FF1080	A1150	32	1080	1000	1150	28	6

In EN 50347 the flanges FF with through hole are assigned to the shaft sizes.
The standard DIN 42948 is still valid for flanges A and C.

Tolerances for dimension N (b1) see corresponding dimensional tables LA (c_1) length of engagement

Tolerances – Electrical parameters

The following tolerances are permitted as specified in EN 60034-1:

Efficiency (when determined indirectly)	- 0.15 (1-η) for PN ≤ 150 kW - 0.1 (1-η) for PN > 150 kW
Power factor	$\frac{1-cosj}{6}$ at least 0.02 at most 0.07
Slip (at standard load in warmed-up state)	± 20% for PN ≥ 1kW
Starting current (in the planned starting connection)	+ 20% without lower limit
Starting torque	-15% and + 25%
Pull-up torque	-15%
Pull-out torque	-10% (after application of this tolerance MK/M still at least 1.6)
Moment of inertia	±10%
Noise level (measurement area – sound intensity level)	+3 dB (A)

Tolerances – Mechanical parameters

Taking necessary manufacturing tolerances and deviations in materials in the case of the raw materials used into account, these tolerances are permitted for three-phase asynchronous motors. The following remarks are given in the standard:

1. A guarantee of all or any of the values as specified in the table is not mandatory. Guaranteed values to which the permissible deviations should apply must be specified expressly in tenders. The permissible deviations must comply with the table.
2. Attention is drawn to the differences in the interpretation of the concept of a "guarantee". In some countries, there is a differentiation between typical and declared values.
3. If a permissible deviation only applies in one direction, the value will not be limited in the other direction Bearing arrangement

Letter codes acc. Fit or tolerance to En50347	Meaning of the dimension	Fit or tolerance
B [a]	Spacing of feet fixing holes in axial direction	±1 mm
P [a_1]	Diameter or width across corners of flange	-1 mm
A [b]	Spacing of feet fixing holes across axial direction	±1 mm
N [b_1]	Diameter of centring flange	h6
D, DA [d, d_1]	Diameter of the cylindrical shaft end	m6
M [e_1]	Pitch circle diameter of the mounting flange	±0.8 mm
AB [f], AC [g]	Largest width of the motor (without terminal boxes)	+2%
H [h]	Shaft height (lowest edge of foot to centre of shaft end)	-1 mm
L, LC [k, k_1]	Total length of the motor	+1%
HD [p]	Total height of the motor (lowest edge of foot)	+2%
K, K' [s, s_1]	Diameter of the mounting holes of the foot or flange	+3%
GA, GC [t, t_1]	Lowest edge of shaft end to the upper edge of the key	+0.2 mm
F, FA [u, u_1]	Width of the key	h9
C, CA [w_1, w_2]	Distance from the centre of the first foot mounting hole to the ±3 mm shaft shoulder or flange face	±3 mm
	Distance from the shaft shoulder to the flange face in the case ±0.5 mm of fixed bearing on D-end	±0.5 mm
	Distance from the shaft shoulder to the flange face	±3 mm
m	Motor mass	- 5 to +10%

Bearing

Type	Type of construction	D-end (DS)										N-end (NS)						
		Light bearing LL		Pressure spring				Heavy bearing VL						Pressure spring		DS	DS	NS
		Bearing typ	Plate washer	Type	Units	V-Ring	Y-Ring	Bearing typ	Plate washer	V-Ring	Y-Ring	Bearing typ	V-Ring	Type	Units	LL	VL	LL
IE3-W41R 315 S2, M2	IM B3 IM V1	6316 C3	170	-	-	80A	-	NU 316 E	170	80A	-	6316 C3	80A	-	-	1	2	3
IE3-W41R 315 MX2, MY2, L2, LX2	IM B3 IM V1	6317 C3	180	-	-	-	85	NU 317 E	180	-	85	6317 C3 Q317 C3	85A	-	-	1	2	3
IE3-W41R 315 S4, M4	IM B3 IM V1	6317 C3	180	-	-	85A	-	NU 317 E	180	85A	-	6316 C3 Q316 C3	80A	-	-	1	2	3
IE3-W41R 315 MX4, MY4 IE3-W41R 315 L4, LX4	IM B3 IM V1	6320J C3	215	-	-	-	100	NU 320 E	215	-	100	6317 C3 Q317 C3	85A	-	-	1	2	3
IE3-W41R 315 S6, M6, MX6, MY6 W41R 315 S8, M8, MX8, MY8		6320J C3	215	-	-	-	100	NU 320 E	215	-	100	6317 C3 Q317 C3	85A	-	-	1	2	3
IE3-W41R 355 M2	IM B3 IM V1	6317 C3	180	-	-	-	85	NU 317 E	180	-	85	6317 C3 Q317 C3	85A	-	-	1	2	3
IE3-W41R 355 M4, 6	IM B3 IM V1	6324J C3	260	-	-	-	120	NU 324 E	260	-	120	6317 C3 Q317 C3	85A	-	-	1	2	3
W41R 355 MY8, M8	IM B3 IM V1	6324J C3	260	-	-	-	120	NU 324 E	260	-	120	6317 C3 Q317 C3	85A	-	-	1	2	3
W42R 355 MX2, L2	IM B3 IM V1	6317 C3	180	-	-	-	85	NU 317 E	180	-	85	6317 C3 Q317 C3	85A	- -	- -	1	2	3
W42R 355 MX4, 6, 8; L4, 6, 8	IM B3 IM V1	6324J C3	260	-	-	-	120	NU 324 E	260	-	120	6317 C3 Q317 C3	85A	- -	- -	1	2	3
W42R/W52R 400 M2, MX2, L2	IM B3	6317 C3	-	OD12110 1.1200	12	-	85	NU 317 E	-	-	85	6317 C3	85A	-	-	4	2	3
	IM V1	7317B		-	-	-	85	7218B+NU218 E	-	-	90	6317 C3	85A	OD12110 1.1200	12	1	5	6
W42R/W52R 400 M4, 6, 8; MX4, 6, 8; L4, 6, 8	IM B3	6324 C3	-	OD12110 1.4310	12	-	120	NU 324 E	-	-	120	6319 C3	85A	-	-	4	2	3
	IM V1	7324B		-	-	-	85	7226B+NU226 E	-	-	90	6319 C3	85A	OD12110 1.1200	21	1	5	6
W42R/W52R 450 M2, MX2, L2	IM B3	6317 C3	-	OD12110 1.1200	12	-	85	NU 317 E	-	-	85	6317 C3	85A	-	-	4	2	3
W42R/W52R 450 M4, 6, 8; MX4, 6, 8; L4, 6, 8	IM B3	6326J C3	-	OD22400 1.4310	18	-	130	NU 326 E	-	-	130	6322 C3	110A	-	-	4	2	3

Light bearings LL

High voltage designs W52R

Type	Type of construction	D-end Anti-friction bearing LL	VL	Y-Ring	Pressure spring Type	Units	N-end *) Anti-friction bearing Standard	Insulated	V-Ring	Figure DS	NS
W52R 400 M2, MX2, L2	IM B3 IM V1	6317 C3	NU 317 E	85			6317 C3	6317 MC3 VL0241	85A		
W52R 400 M4, 6, 8; MX4, 6, 8; L4, 6, 8	IM B3 IM V1	6324J C3	NU 324 E	120	0D22400 1.4310	12	6317 C3	6317 MC3 VL0241	85A		
W52R 450 M2, MX2, L2	IM B3 IM V1	6317 C3	NU 317 E				6317 C3	6317 MC3 VL0241	85A		
W42R 450 M4, 6, 8; MX4, 6, 8; L4, 6, 8	IM B3	6326J C3	NU 326 E				6322 C3	6322 MC3 VL0241			

*) fixed bearing

Figures

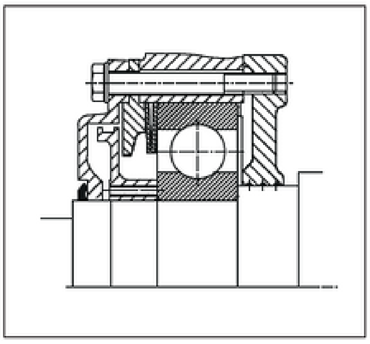


Figure 1

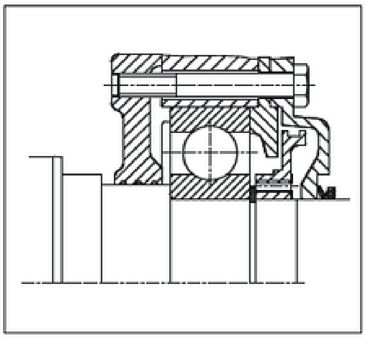


Figure 2

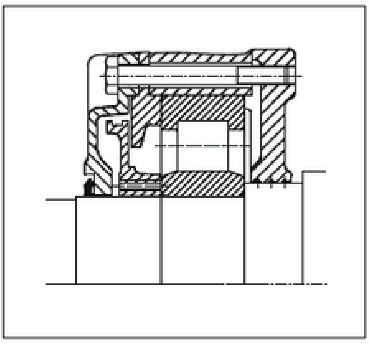


Figure 3

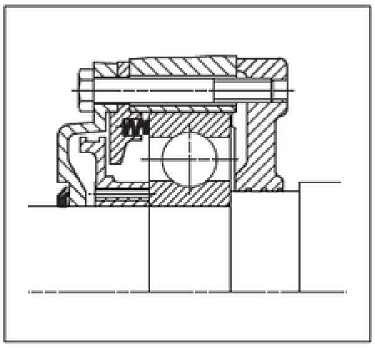


Figure 4

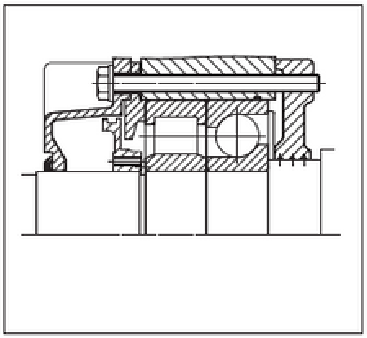


Figure 5

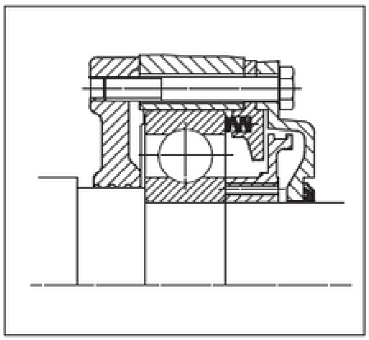


Figure 6

Low voltage motors | Terminal boxes

Standard design, VIK design

Type	Material	Intermediate flange	Dimensions				Thread ingoing cables	Max. cable diameter	Terminal board	Number of terminals	Thread connecting bolt	Thread earth connector	Figure
			AG	LL	AH	BE	0	0 max					
			X	Z	-	-	r	..r max					
Standard design													
KK 200A	GG-15	-	282	242	-	-	M63 x 1.5	Ø 45 mm	SB 10	6	M10	M10	01
KK 400A	GG-15	-	315	294	-	-	M63 x 1.5	Ø 45 mm	Sb 12	6	M12	M10	01
KK400B	GG-15	-	415	340	265	-	M63 x 1.5	Ø 45 mm	KM 12	6	M12	LK	02
KK 400B	GG-15	-	415	340	265	-	M72 x 2	Ø 56.6 mm	KM 12	6	M12	LK	02
KK 630A	GG-15	straight	496	390	301	140	M72 x 2	Ø 56.6 mm	KLP 630-20	6	M20	LK	03G
Kk 630A	GG-15	inclined	496	390	301	140	M72 x 2	Ø 56.6 mm	KLP 630-20	6	M20	LK	03S
KK 1000A	GG-15	straight	615	474	385	200	M72 x 2	Ø 56.6 mm	KLSO 1000	6	StS	LK	04G
KK 1000A	GG-15	inclined	615	474	385	200	M72 x 2	Ø 56.6 mm	KLSO 1000	6	StS	LK	04S
KK 1000A	GG-15	straight	615	474	385	200	M80 x 2	Ø 68 mm	KLSO 1000	6	StS	LK	04G
KK 1000A	GG-15	inclined	615	474	385	200	M80 x 2	Ø 68 mm	KLSO 1000	6	StS	LK	04S
VIK-design													
KK 200A - SB Ex e II	GG-15	-	335	270	200	-	M63 x 1.5	Ø 45 mm	KM 10/8	6	LK	LK	05
KK 400A - SB Ex e II	GG-15	-	415	340	265	-	M63 x 1.5	Ø 45 mm	KM 16/12	6	LK	LK	05
KK 630A Ex e II	GG-15	straight	496	390	301	140	M75 x 1.5	Ø 45 mm	KLP 630-20	6	LK	LK	06G
KK 630A Ex e II	GG-15	inclined	496	390	301	140	M75 x 1.5	Ø 45 mm	KLP 630-20	6	LK	LK	06S
KK 1000A Ex e II	GG-15	straight	615	474	385	200	M80 x 1.5	Ø 68 mm	KLSO 1000	6	StS	LK	07G
Kk 1000A Ex e II	GG-15	inclined	615	474	385	200	M80 x 1.5	Ø 68 mm	KLSO 1000	6	StS	LK	07S

StS… current bar
LK… saddle terminal

Low voltage motors | Terminal boxes

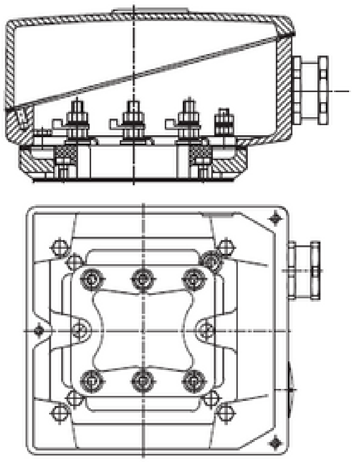


Figure 01
Terminal box 200A, 400A

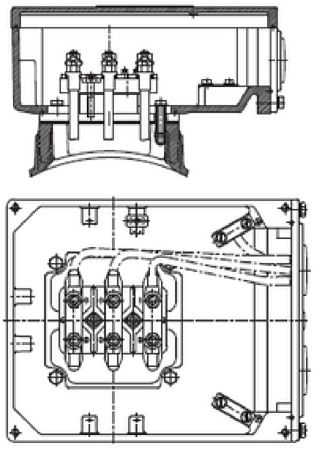


Figure 02
Terminal box 200B, 400B

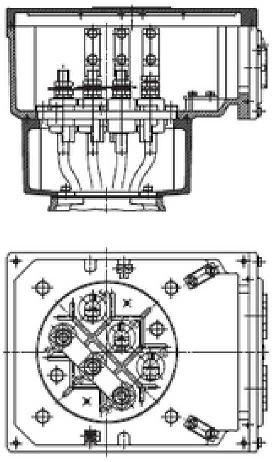


Figure 03G
Terminal box 630A, straight intermediate flange

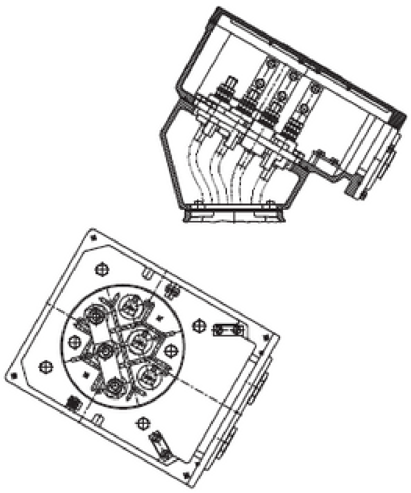


Figure 03S
Terminal box 630A, inclined intermediate flange

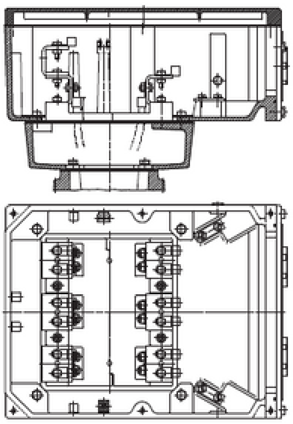


Figure 04G
Terminal box 1000A, straight intermediate flange

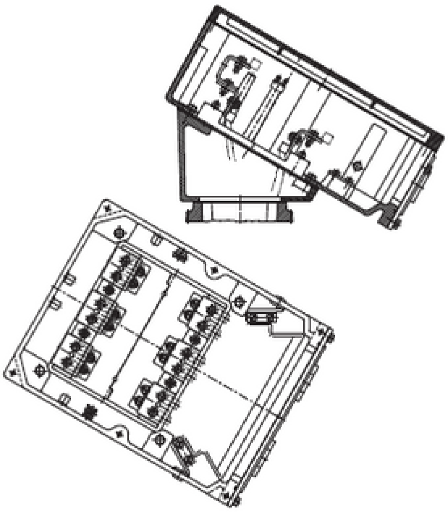


Figure 04S
Terminal box 1000A, inclined intermediate flange

Low voltage motors | Terminal boxes

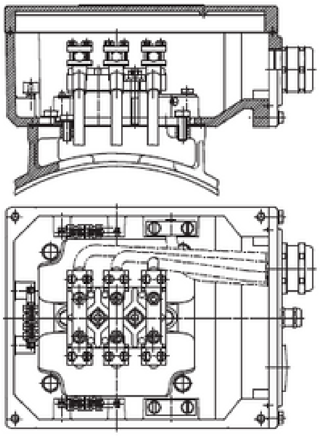


Figure 05
Terminal box 200B, 400B

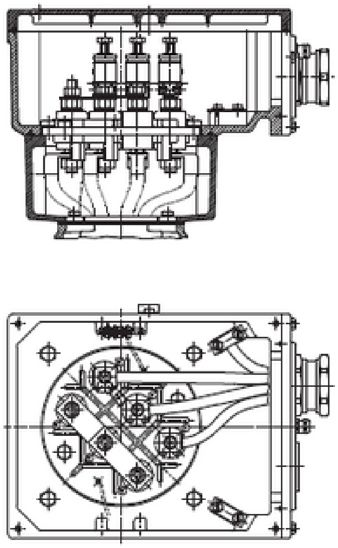


Figure 06G
Terminal box 630A Ex, straight intermediate flange

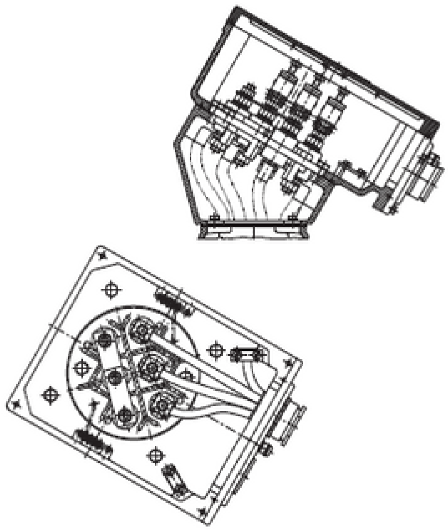


Figure 06S
Terminal box 630A Ex, inclined intermediate flange

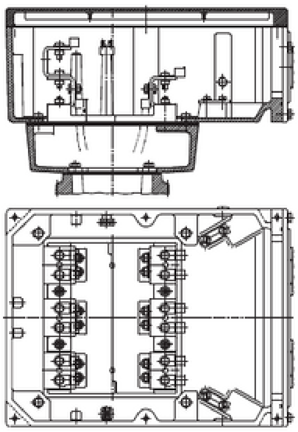


Figure 07G
Terminal box 1000A Ex, straight intermediate flange

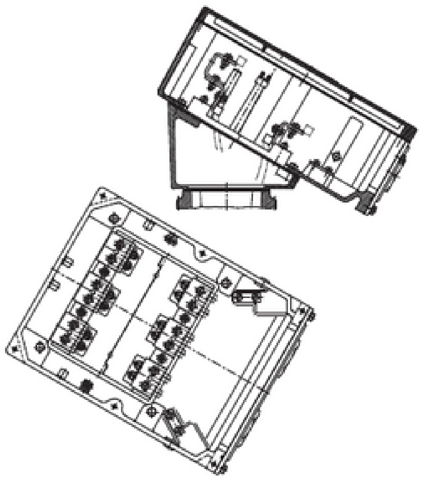


Figure 07S
Terminal box 1000A EX, inclined intermediate flange

High voltage motors | Terminal boxes

The terminal box is a welded construction and because of its vertical spacing allows an easy and fast connection of all commercially available connecting cables including the fitting of all common cable end plugs (connecting cable and cable end plug are not included in the scope of delivery of the motor). The terminal box is design for type of protection IP 55. Other types of protection on request. The arrangement of terminals is done according to DIN 42962.

Seen from the drive end of the motor the terminal box is mounted on the stator housing with the cable entry from below and on the right side. On request the terminal box can also be mounted with cable entry from below on the left side. In addition the terminal box can be rotated for 90° or 180° if the space available is sufficient. Mounting and rotation of the terminal box must be stated in the order.

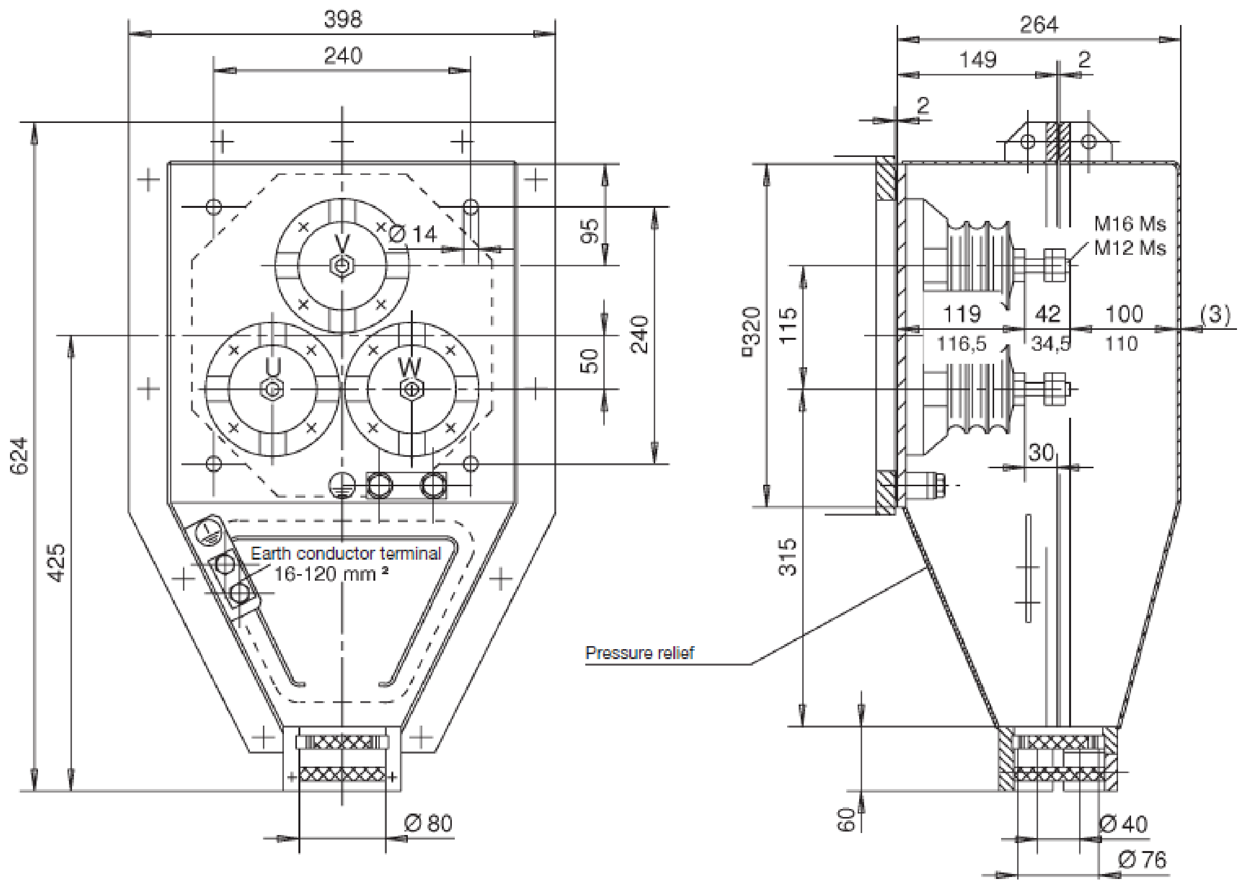
The terminal box consists of a lower part which is screwed to the motor housing and a cover which can be removed by loosening the screws. The lower part is used for attaching the cast resin lead-through terminals and the earth terminal. In the lead-through terminals the current stems are installed secure against twisting. The connecting cables are clamped on the current stems by using cable lugs (not included in the scope of delivery of the motor). The terminal box is designed for resistance against short circuits. When a short circuit happens on the motor side or from the mains, the forces resulting from the short circuit current are securely covered by the mounted parts (cast resin lead-through terminals).

In addition the terminal box is short-circuit-proof. The pressure overload resulting from a possible electric arc is immediately dissipated by a pressure release in the lower part of the terminal box.

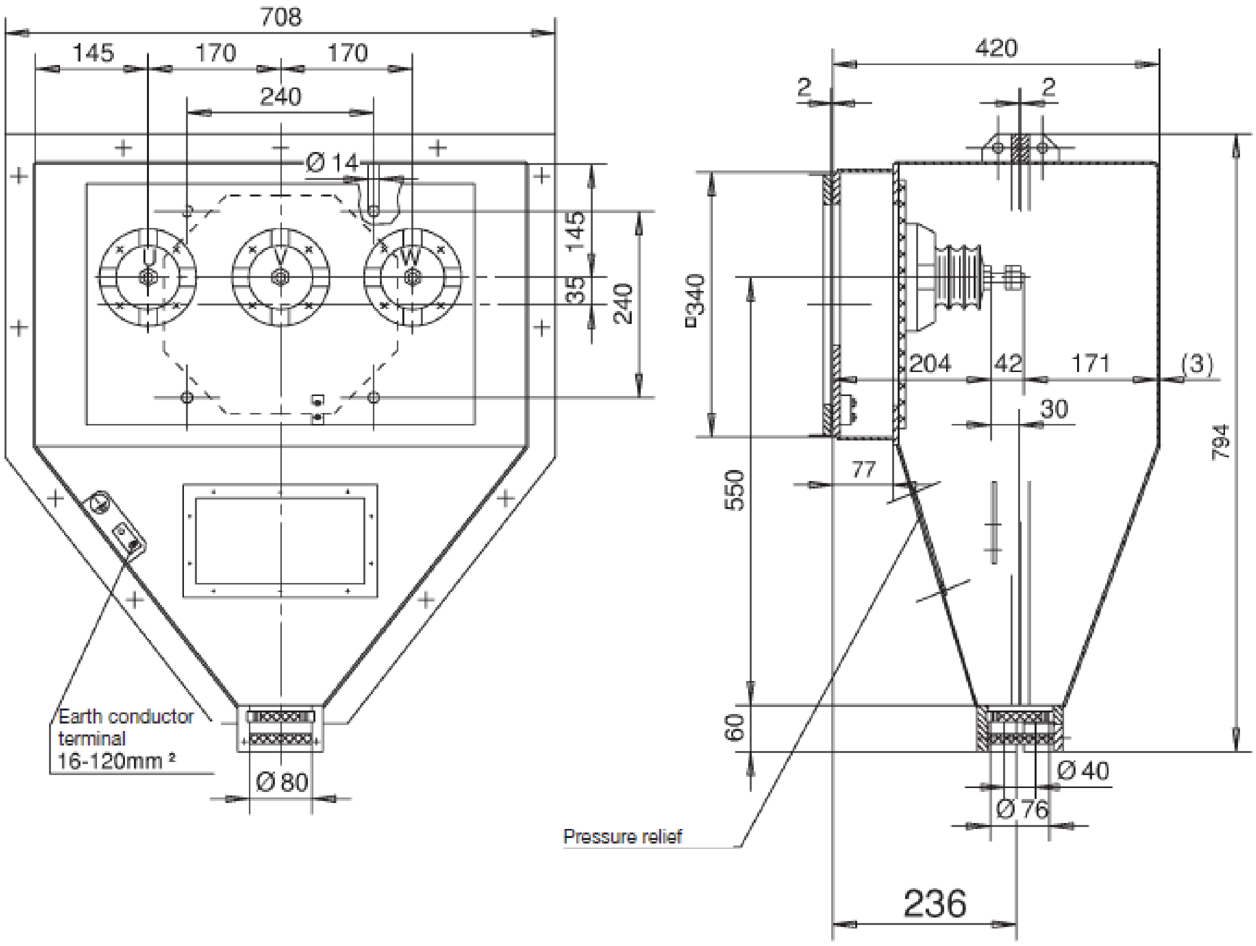
Short circuit power

200 MVA at 6 kV 0.2 s current stem M12
400 MVA at 6 kV 0.2 s current stem M16
400 MVA at 10 kV 0.2 s current stem M16

Terminal box rated output 6 kV / rated current max. 250 A



Terminal box rated output 10 kV ±10 %/ rated current 315 A (400 A)



Data sheet

3-6,6 kV

2 - 6,6 kV, 50 Hz / IM B3

2-pole, 3000 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
W52R 315 L2	115	369	2976	93,6	0,94	12,6	7	1,5	3	2,74	1700
W52R 355 M2	325	1041	2981	95,6	0,92	35,7	6,2	1	2,5	4,22	2100
W52R 355 MX2	380	1217	2982	95,8	0,92	41,6	6,3	1	2,5	4,66	2200
W52R 400 MY2	410	1311	2986	95,7	0,93	44,5	6,3	1	2,5	8,74	2700
W52R 400 M2	450	1439	2986	95,8	0,92	48,9	6,3	1	2,5	9,55	2800
W52R 400 MX2	490	1567	2986	95,9	0,93	53	6,3	1	2,5	10,37	3000
W72R 450 MY2	730	2334	2986	96,8	0,91	79,8	6	1	2,4	11,09	4300
W72R 450 M2	840	2686	2987	96,9	0,91	91,4	6	1	2,4	12,08	4500
W72R 450 MX2	930	2973	2987	96,9	0,92	100,8	6,2	1	2,5	13,46	4700
W72R 450 L2	1000	3196	2987	97	0,92	107,9	6,2	1	2,5	14,65	4900
DKCEJ5021-2WG	1050	3355	2989	96,6	0,91	116	6,3	0,8	2,7	33,4	5949
DKCEJ5023-2WG	1180	3770	2989	96,7	0,91	129	6,3	0,8	2,7	36,1	6175
DKCEJ5025-2WG	1250	3993	2989	96,7	0,91	137	6,5	0,8	2,8	39,2	6481
DKCEJ5028-2WG	1400	4472	2990	97	0,91	152	6,5	0,8	2,8	42,8	6784
DKCEJ 5623-2	1400	4473	2989	96	0,9	156,9	4,79	1,09	1,99	60,9	10040
DKCEJ 5625-2	1600	5112	2989	96,1	0,9	178,3	4,85	1,08	2,02	66,7	10490
DKCEJ 5628-2	1800	5750	2989	96,3	0,91	198,8	5,18	1,13	2,16	71,8	10870
DKCEJ 5630-2	2000	6386	2990	96,4	0,91	219	5,66	1,2	2,38	76,9	11290

3-6,6 kV

2 - 6,6 kV, 50 Hz / IM B3

4-pole, 1500 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
W52R 315 L4	120	772	1484	93,6	0,86	14,3	6,1	1,5	2,7	4,76	1670
W52R 355 MY4	315	2018	1490	96,1	0,86	36,6	6,3	1	2,5	7,68	2200
W52R 355 M4	360	2306	1491	96,2	0,86	41,7	6,4	1	2,6	8,74	2300
W52R 355 MX4	430	2756	1490	96,3	0,88	49	6,3	1	2,5	10,1	2500
W52R 400 MY4	500	3198	1493	96,6	0,87	57,5	6,3	1	2,5	13,03	2800
W52R 400 M4	560	3583	1492	96,5	0,88	63,6	6,2	1	2,4	14,35	3000
W52R 400 MX4	630	4030	1493	96,8	0,88	71,1	6,3	1	2,4	15,89	3200
W72R 450 MY4	710	4540	1493	96,4	0,87	81,6	6	1	2,4	21,49	4400
W72R 450 M4	800	5114	1494	97,1	0,87	91,5	6,2	1	2,5	24,28	4600
W72R 450 MX4	900	5752	1494	97,2	0,86	104,1	6,6	1	2,6	26,37	4800
W72R 450 L4	1000	6397	1493	97,2	0,88	112,4	5,7	1	2,3	29,17	5100
DKCAJ5023-4WG	1120	7157	1494	96,7	0,89	126	6	0,7	2,7	50,7	5951
DKCAJ5025-4WG	1250	7988	1495	96,8	0,89	140	6	0,7	2,7	55,4	6242
DKCAJ5028-4WG	1400	8945	1495	96,8	0,89	156	6,1	0,7	2,7	61,4	6541
DKCAJ5031-4WG	1600	10221	1495	96,9	0,89	179	6,2	0,7	2,8	67,4	6924
DKCAJ 5627-4	1600	10229	1494	96,6	0,9	175,8	6,28	1,03	3	108,6	10310
DKCAJ 5629-4	1800	11509	1494	96,7	0,9	197,4	6,04	0,99	2,87	115,9	10640
DKCAJ 5631-4	2000	12789	1493	96,8	0,9	219,1	5,84	0,96	2,76	125,5	11050
DKCAJ 5634-4	2240	14327	1493	96,9	0,91	245,2	5,74	0,95	2,7	135,2	11500
DKCAJ 6329-4	2500	15972	1495	97,3	0,92	270	6,1	0,81	3,14	193,2	15500
DKCAJ 6333-4	2800	17890	1495	97,4	0,92	302	6	0,79	3,08	210,6	16100
DKCAJ 6336-4	3150	20125	1495	97,4	0,92	338	5,99	0,79	3,06	228,1	16700

3-6,6 kV

2 - 6,6 kV, 50 Hz / IM B3

6-pole, 1000 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
W52R 315 L6	100	965	990	92,8	0,76	13,7	6	1,6	2,7	4,73	1600
W52R 355 M6	315	3028	993	95,9	0,79	40,2	6	1,1	2,5	11,45	2300
W52R 355 MX6	355	3415	993	96	0,8	44,2	5,8	1	2,3	13,03	2500
W52R 400 MY6	400	3839	995	95,8	0,81	49,4	6,3	1	2,5	21,67	3000
W52R 400 M6	450	4318	995	95,8	0,82	55,3	6,2	1	2,5	23,87	3200
W52R 400 MX6	480	4606	995	95,9	0,82	58,8	6,6	1	2,5	27	3400
W72R 450 MY6	620	5946	996	96,6	0,84	73,8	6,1	1,2	2,5	44,29	4700
W72R 450 M6	670	6426	996	96,6	0,84	79,5	6	1,1	2,5	46,58	4800
W72R 450 MX6	730	7002	996	96,7	0,84	86,7	6	1,1	2,5	50,02	5000
W72R 450 L6	800	7672	996	96,7	0,84	95	6,1	1,1	2,5	54,03	5200
DKCAJ5025-6WG	1000	9595	995	96,7	0,88	114	5,4	0,6	2,3	96,7	6215
DKCAJ5028-6WG	1120	10745	995	96,8	0,88	127	5,4	0,6	2,3	104,8	6497
DKCAJ5030-6WG	1250	11991	995	96,8	0,88	141	5,5	0,6	2,3	112,9	6785
DKCAJ5033-6WG	1400	13429	996	96,9	0,88	159	5,5	0,6	2,3	123,3	7152
DKCAJ 5629-6	1250	11990	996	96,6	0,88	141,1	6,31	0,97	3,22	186,79	10720
DKCAJ 5632-6	1400	13431	995	96,7	0,89	157,2	6,07	0,93	3,08	202,74	11150
DKCAJ 5633-6	1600	15350	995	96,8	0,89	179,3	5,93	0,91	3	212,71	11430
DKCAJ 5637-6	1800	17274	995	96,9	0,89	200,8	5,78	0,89	2,91	232,65	11960
DKCAJ 6334-6	2000	19178	996	96,9	0,9	222	5,59	0,81	2,71	372,8	16900
DKCAJ 6337-6	2240	21478	996	97	0,9	248	5,58	0,81	2,7	403,8	17500
DKCAJ 6341-6	2500	23971	996	97,1	0,9	276	5,58	0,81	2,69	445,1	18300

3-6,6 kV

2 - 6,6 kV, 50 Hz / IM B3

8-pole, 750 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
W52R 355 M8	200	2566	744	94,8	0,72	28,1	5,4	1,1	2,2	12,48	2400
W52R 355 MX8	260	3339	744	95,2	0,73	35,8	5	1	2,1	14,28	2600
W52R 400 MY8	330	4229	745	95,6	0,76	43,8	6	1,1	2,5	22,4	3000
W52R 400 M8	380	4871	745	95,7	0,77	49,9	5,9	1	2,5	24,99	3200
W52R 400 MX8	430	5512	745	95,8	0,77	56,4	5,9	1	2,5	27,91	3400
W72R 450 MY8	500	6400	746	96	0,75	66,8	5,3	1,1	2,1	48,82	4800
W72R 450 M8	560	7168	746	96	0,75	74,9	5,3	1,1	2,1	52,43	5000
W72R 450 MX8	630	8067	746	96	0,76	83,5	5,2	1,1	2,1	56,64	5200
W72R 450 L8	650	8318	746	96,1	0,74	88,5	5,8	1,4	2,3	60,84	5400
DKCAJ5028-8WG	900	11508	747	96,7	0,78	115	5,3	0,7	2,5	105,1	6442
DKCAJ5030-8WG	1000	12787	747	96,8	0,78	127	5,3	0,7	2,5	113,2	6724
DKCAJ5033-8WG	1100	14064	747	96,8	0,78	140	5,3	0,7	2,5	123,7	7090
DKCAJ5036-8WG	1200	15356	746	96,9	0,81	147	5	0,6	2,1	133	7404
DKCAJ 5625-8	900	11527	746	96,1	0,85	106,7	6,28	1,27	3,12	201,27	10120
DKCAJ 5627-8	1000	12810	745	96,2	0,85	118	6,19	1,25	3,06	218,88	10480
DKCAJ 5630-8	1120	14349	745	96,3	0,85	131,5	6,1	1,23	3	239	10900
DKCAJ 5633-8	1250	16012	745	96,3	0,85	146,4	6,13	1,23	3	261,63	11360
DKCAJ 5637-8	1400	17932	746	96,4	0,86	163,6	6,2	1,26	3,03	289,3	11920
DKCAJ 6333-8	1600	20458	747	97	0,84	189	5,6	0,87	2,7	354,8	17100
DKCAJ 6337-8	1800	23013	747	97	0,84	213	5,82	0,92	2,8	395,8	17800
DKCAJ 6341-8	2000	25574	747	97,1	0,85	235	5,49	0,86	2,62	436,9	18600
DKCAJ 6345-8	2240	28649	747	97,1	0,85	262	5,25	0,82	2,48	477,9	19300

3-6,6 kV

2 - 6,6 kV, 50 Hz / IM B3

10-pole, 600 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
DKCAJ5028-10WG	630	10096	596	96,2	0,84	75	5,4	0,8	2,4	150,1	6280
DKCAJ5030-10WG	710	11365	597	96,3	0,83	85	6,2	0,9	2,8	162	6555
DKCAJ5033-10WG	800	12806	597	96,4	0,83	96	6,2	0,9	2,8	177,3	6908
DKCAJ5036-10WG	900	14404	597	96,4	0,83	108	6,3	0,9	2,8	190,9	7218
DKCAJ 5625-10	710	11378	596	95,8	0,83	86,4	5,66	1,12	2,96	205,45	10070
DKCAJ 5627-10	800	12823	596	96	0,83	96,9	5,52	1,09	2,88	220,63	10420
DKCAJ 5630-10	900	14429	596	96,1	0,83	108,5	5,42	1,07	2,81	240,86	10830
DKCAJ 5633-10	1000	16029	596	96,1	0,83	120,4	5,48	1,08	2,84	261,1	11240
DKCAJ 5636-10	1120	17951	596	96,2	0,83	134,7	5,58	1,11	2,89	286,39	11750
DKCAJ 6331-10	1250	19994	597	96,6	0,83	151	5,36	0,86	2,67	375,2	17000
DKCAJ 6335-10	1400	22390	597	96,7	0,83	168	5,48	0,89	2,72	421,1	17600
DKCAJ 6340-10	1600	25587	597	96,7	0,83	192	5,55	0,9	2,75	478,4	18600
DKCAJ 6345-10	1800	28772	597	96,8	0,82	218	6,02	0,99	3,02	535,7	19500
DKCAJ 5625-8	900	11527	746	96,1	0,85	106,7	6,28	1,27	3,12	201,27	10120
DKCAJ 5627-8	1000	12810	745	96,2	0,85	118	6,19	1,25	3,06	218,88	10480
DKCAJ 5630-8	1120	14349	745	96,3	0,85	131,5	6,1	1,23	3	239	10900
DKCAJ 5633-8	1250	16012	745	96,3	0,85	146,4	6,13	1,23	3	261,63	11360
DKCAJ 5637-8	1400	17932	746	96,4	0,86	163,6	6,2	1,26	3,03	289,3	11920
DKCAJ 6333-8	1600	20458	747	97	0,84	189	5,6	0,87	2,7	354,8	17100
DKCAJ 6337-8	1800	23013	747	97	0,84	213	5,82	0,92	2,8	395,8	17800
DKCAJ 6341-8	2000	25574	747	97,1	0,85	235	5,49	0,86	2,62	436,9	18600
DKCAJ 6345-8	2240	28649	747	97,1	0,85	262	5,25	0,82	2,48	477,9	19300

3-6,6 kV

2 - 6,6 kV, 50 Hz / IM B3

12-pole, 500 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
DKCAJ5028-12WG	500	9612	497	95,9	0,77	65	5,3	0,8	2,5	150,1	6294
DKCAJ5030-12WG	560	10755	497	95,8	0,74	76	6	0,9	2,9	162	6535
DKCAJ5033-12WG	630	12103	497	95,9	0,75	84	6	0,9	2,9	177,3	6891
DKCAJ5036-12WG	710	13639	497	96	0,75	95	6	0,9	2,9	190,9	7205
DKCAJ 5625-12	560	10786	496	95,5	0,81	69,6	5,25	1,07	2,88	201,49	10030
DKCAJ 5627-12	630	12136	496	95,6	0,81	78	5,19	1,05	2,84	214,16	10320
DKCAJ 5629-12	710	13681	496	95,7	0,82	87,4	5,07	1,02	2,76	234,42	10700
DKCAJ 5633-12	800	15415	496	95,8	0,82	98	4,95	0,99	2,68	259,75	11210
DKCAJ 5636-12	900	17341	496	95,9	0,82	110,1	5	1,01	2,71	285,08	11720
DKCAJ 6333-12	1000	19187	498	96,4	0,79	127	5,73	1,03	2,97	397,1	17100
DKCAJ 6336-12	1120	21496	498	96,5	0,8	140	5,45	0,96	2,78	431,6	17700
DKCAJ 6341-12	1250	23984	498	96,5	0,79	157	5,75	1,03	2,95	489	18600
DKCAJ 6345-12	1400	26866	498	96,6	0,8	174	5,58	0,99	2,83	534,9	19300
DKCAJ 5625-8	900	11527	746	96,1	0,85	106,7	6,28	1,27	3,12	201,27	10120
DKCAJ 5627-8	1000	12810	745	96,2	0,85	118	6,19	1,25	3,06	218,88	10480
DKCAJ 5630-8	1120	14349	745	96,3	0,85	131,5	6,1	1,23	3	239	10900
DKCAJ 5633-8	1250	16012	745	96,3	0,85	146,4	6,13	1,23	3	261,63	11360
DKCAJ 5637-8	1400	17932	746	96,4	0,86	163,6	6,2	1,26	3,03	289,3	11920
DKCAJ 6333-8	1600	20458	747	97	0,84	189	5,6	0,87	2,7	354,8	17100
DKCAJ 6337-8	1800	23013	747	97	0,84	213	5,82	0,92	2,8	395,8	17800
DKCAJ 6341-8	2000	25574	747	97,1	0,85	235	5,49	0,86	2,62	436,9	18600
DKCAJ 6345-8	2240	28649	747	97,1	0,85	262	5,25	0,82	2,48	477,9	19300

10-11 kV

10 - 11 kV, 50 Hz / IM B3

2-pole, 3000 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
W52R 400 MY2G	420	1343	2987	95,2	0,93	27,4	6,6	1	2,6	8,9	2700
W72R 450 MY2G	620	1983	2986	96,4	0,91	40,7	5,6	1	2,4	11,1	3750
W72R 450 M2G	710	2270	2987	96,6	0,91	46,4	6	1	2,4	12,1	3900
W72R 450 MX2G	840	2685	2987	96,6	0,92	54,8	6,1	1	2,5	13,5	4150
DKCES 5023-2WG	1000	3196	2988	96,3	0,91	66	6	0,7	2,5	36,1	6116
DKCES 5025-2WG	1060	3386	2989	96,2	0,91	70	6,2	0,8	2,6	39,2	6343
DKCES 5028-2WG	1120	3579	2989	96,2	0,91	74	6,1	0,7	2,6	42,8	6630
DKCES 5623-2	1250	3992	2990	95,5	0,9	83,7	5,38	1,19	2,23	60,1	10110
DKCES 5624-2	1400	4472	2990	95,7	0,91	93,5	5,31	1,17	2,21	62,2	10300
DKCES 5626-2	1600	5109	2991	96	0,91	105,9	5,83	1,26	2,44	66,4	10650
DKCES 5628-2	1800	5748	2991	96,1	0,91	118,7	5,81	1,24	2,44	69,8	10940

10-11 kV

10 - 11 kV, 50 Hz / IM B3

4-pole, 1500 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
W52R 400 MY4	400	3197	1494	95,6	0,88	34,9	6,6	1	2,6	13,2	2800
W52R 400 M4	460	3581	1494	95,8	0,88	38,9	6,7	1	2,6	14,6	2900
W72R 450 MY4	560	4220	1494	96,8	0,87	45,8	6,1	1	2,5	21,1	3900
W72R 450 M4	630	4731	1494	96,8	0,88	50,9	6,1	1	2,5	23,9	4100
W72R 450 MX4	700	5178	1494	96,9	0,88	55,6	6,1	1	2,5	26	4300
DKCAS 5023-4WG	1000	6390	1495	96,4	0,89	67	6,1	0,7	2,7	50,7	5819
DKCAS 5025-4WG	1120	7155	1495	96,5	0,89	76	6,3	0,7	2,8	55,4	6087
DKCAS 5028-4WG	1250	7987	1494	96,5	0,89	84	6	0,6	2,6	61,4	6456
DKCAS 5031-4WG	1400	8943	1495	96,6	0,89	94	6,3	0,7	2,8	67,4	6816
DKCAS 5622-4	1250	7990	1494	97,2	0,9	82,8	6,17	0,98	3	90,4	9520
DKCAS 5624-4	1400	8951	1493	97,2	0,9	92,5	5,86	0,94	2,82	98,9	9880
DKCAS 5627-4	1600	10227	1494	97,3	0,9	105,4	6,36	1,03	3,04	109,8	10330
DKCAS 5629-4	1800	11506	1494	97,4	0,9	118,3	6,29	1,02	2,99	118,3	10690
DKCAS 5632-4	2000	12786	1494	97,4	0,9	131,2	6,34	1,04	3	128	11110
DKCAS 6326-4	2240	14310	1495	97,2	0,91	146	5,9	0,77	3,08	169,9	13700
DKCAS 6329-4	2500	15973	1495	97,2	0,92	162	5,92	0,77	3,06	187,3	14300
DKCAS 6332-4	2800	17889	1495	97,3	0,92	181	6,02	0,78	3,1	204,8	14900

10-11 kV

10 - 11 kV, 50 Hz / IM B3

6-pole, 1000 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
W52R 400 MY6	400	4316	995	96,1	0,81	33,7	6,5	1	2,5	21,7	2900
W52R 400 M6	450	4795	996	96,2	0,8	35,3	6,7	1	2,6	23,9	3100
W72R 450 MY6	500	5081	996	96,2	0,85	37,5	6	1,1	2,4	44,3	4100
W72R 450 M6	530	5753	996	96,3	0,85	42,4	6,3	1,2	2,5	46,6	4250
W72R 450 MX6	600	3395	996	96,4	0,85	21	6,3	1,2	2,5	50	4400
DKCAS 5025-6WG	900	8628	996	96,5	0,87	62	6	0,7	2,7	96,7	6133
DKCAS 5028-6WG	1000	9586	996	96,6	0,87	69	6,3	0,8	2,7	104,8	6407
DKCAS 5030-6WG	1120	10745	995	96,6	0,88	76	5,5	0,7	2,3	112,9	6654
DKCAS 5033-6WG	1250	11983	996	96,6	0,88	85	6,1	0,8	2,7	123,3	6995
DKCAS 5628-6	1120	10747	995	96,3	0,89	75,9	5,99	0,91	3,04	182,8	10450
DKCAS 5630-6	1250	11996	995	96,4	0,89	84,3	5,72	0,86	2,9	194,8	10790
DKCAS 5633-6	1400	13430	995	96,5	0,89	94,7	6,23	0,95	3,16	208,7	11160
DKCAS 5635-6	1600	15353	995	96,6	0,89	107,7	5,95	0,91	3	222,7	11530
DKCAS 6332-6	1800	17257	996	96,8	0,89	120	5,76	0,83	2,81	355,6	15900
DKCAS 6335-6	2000	19177	996	96,9	0,9	133	5,62	0,8	2,72	386,6	16400
DKCAS 6339-6	2240	21479	996	97	0,9	149	5,45	0,78	2,62	424,4	17100

10-11 kV

10 - 11 kV, 50 Hz / IM B3

8-pole, 750 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
W52R 400 MY8	265	4486	745	94,9	0,77	28	6	1	2,5	22,4	2900
W52R 400 M8	315	5759	746	95,1	0,75	36,3	6,3	1,1	2,7	25	3100
W72R 450 MY8	400	6658	747	95,6	0,73	41,6	5,8	1,2	2,5	48,8	4250
W72R 450 M8	450	7427	747	95,7	0,73	46,3	5,8	1,2	2,5	52,4	4400
W72R 450 MX8	500	6395	747	95,8	0,73	41,03	5,8	1,2	2,5	56,6	4600
DKCAS 5028-8WG	710	9077	747	96,5	0,79	54	5,5	0,7	2,5	105,1	6369
DKCAS 5030-8WG	800	10227	747	96,6	0,79	60	5,5	0,7	2,5	113,2	6642
DKCAS 5033-8WG	900	11505	747	96,7	0,79	68	5,5	0,7	2,5	123,7	6995
DKCAS 5036-8WG	1000	12781	747	96,7	0,78	77	5,8	0,8	2,7	133	7304
DKCAS 5623-8	800	10252	745	95,7	0,85	57	5,91	1,18	2,93	188,7	9780
DKCAS 5626-8	900	11535	745	95,8	0,85	63,8	5,82	1,16	2,86	206,3	10140
DKCAS 5628-8	1000	12815	745	95,9	0,85	70,6	5,87	1,17	2,87	226,4	10540
DKCAS 5632-8	1120	14354	745	96	0,86	78,9	5,91	1,18	2,88	251,6	11040
DKCAS 5635-8	1250	16015	745	96,1	0,85	88,1	6,17	1,25	3,01	276,7	11530
DKCAS 6333-8	1400	17894	747	96,7	0,84	100	5,99	0,98	2,91	361,7	16500
DKCAS 6337-8	1600	20447	747	96,8	0,83	115	6,2	1,02	3,01	412,9	17400
DKCAS 6341-8	1800	23004	747	96,8	0,84	128	6,07	1	2,93	443,7	18000
DKCAS 6344-8	2000	25557	747	96,9	0,84	143	6,18	1,02	2,99	471,1	18500

10-11 kV

10 - 11 kV, 50 Hz / IM B3

10-pole, 600 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
DKCAS 5624-10	630	10102	596	95,6	0,83	46	5,31	1,03	2,77	192,8	9820
DKCAS 5625-10	710	11385	596	95,7	0,83	51,8	5,32	1,04	2,77	205,5	10080
DKCAS 5628-10	800	12828	595	95,8	0,83	58,1	5,27	1,03	2,74	225,7	10480
DKCAS 5631-10	900	14431	596	95,9	0,83	65,3	5,37	1,05	2,78	245,9	10880
DKCAS 5633-10	1000	16025	596	95,9	0,83	72,9	5,69	1,13	2,97	266,2	11280
DKCAS 6334-10	1120	17904	597	96,2	0,83	81	5,94	1,01	2,95	409,6	16600
DKCAS 6338-10	1250	19974	598	96,3	0,82	92	6,41	1,11	3,22	455,5	17300
DKCAS 6340-10	1400	22372	598	96,4	0,82	102	6,3	1,08	3,15	489,9	17900
DKCAS 6344-10	1600	25573	598	96,5	0,82	117	6,11	1,05	3,07	524,3	18500

10-11 kV

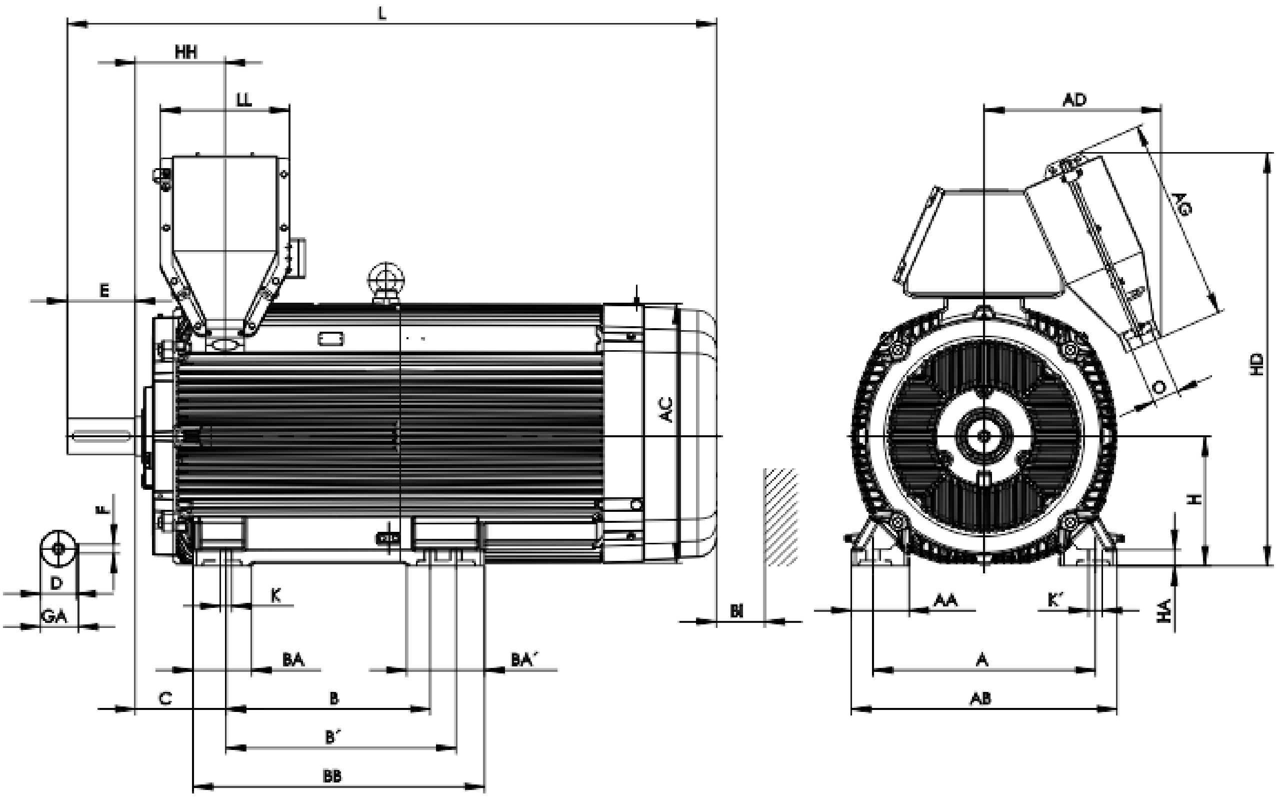
10 - 11 kV, 50 Hz / IM B3

12-pole, 500 rpm

Type	P[kW]	M[Nm]	n[rpm]	η[%]	cosφ[-]	I[A]	Ia/In[-]	Ma/Mn[-]	Mk/Mn[-]	J[kgm2]	m[kg]
DKCAS 5627-12	500	9611	497	94,5	0,74	41,3	5,84	1,14	3,47	220	10300
DKCAS 5629-12	560	10766	497	94,6	0,75	45,8	5,74	1,11	3,38	235,2	10610
DKCAS 5632-12	630	12116	497	94,8	0,76	50,9	5,58	1,06	3,25	255,5	11020
DKCAS 5634-12	710	13654	497	94,9	0,76	57,4	5,59	1,07	3,27	270,7	11330
DKCAS 5636-12	800	15394	496	95,1	0,77	63,5	5,18	0,96	2,98	285,9	11650
DKCAS 6334-12	900	17260	498	95,9	0,77	70	6,26	1,14	3,3	408,6	16400
DKCAS 6337-12	1000	19177	498	96	0,78	77	6,16	1,11	3,22	443,1	17000
DKCAS 6340-12	1120	21481	498	96,1	0,78	87	6,13	1,1	3,19	477,5	17500
DKCAS 6344-12	1250	23972	498	96,2	0,78	96	6,12	1,1	3,18	523,5	18200

Dimensional sheet

2.2 - 11 kV, 50 Hz / IM B3

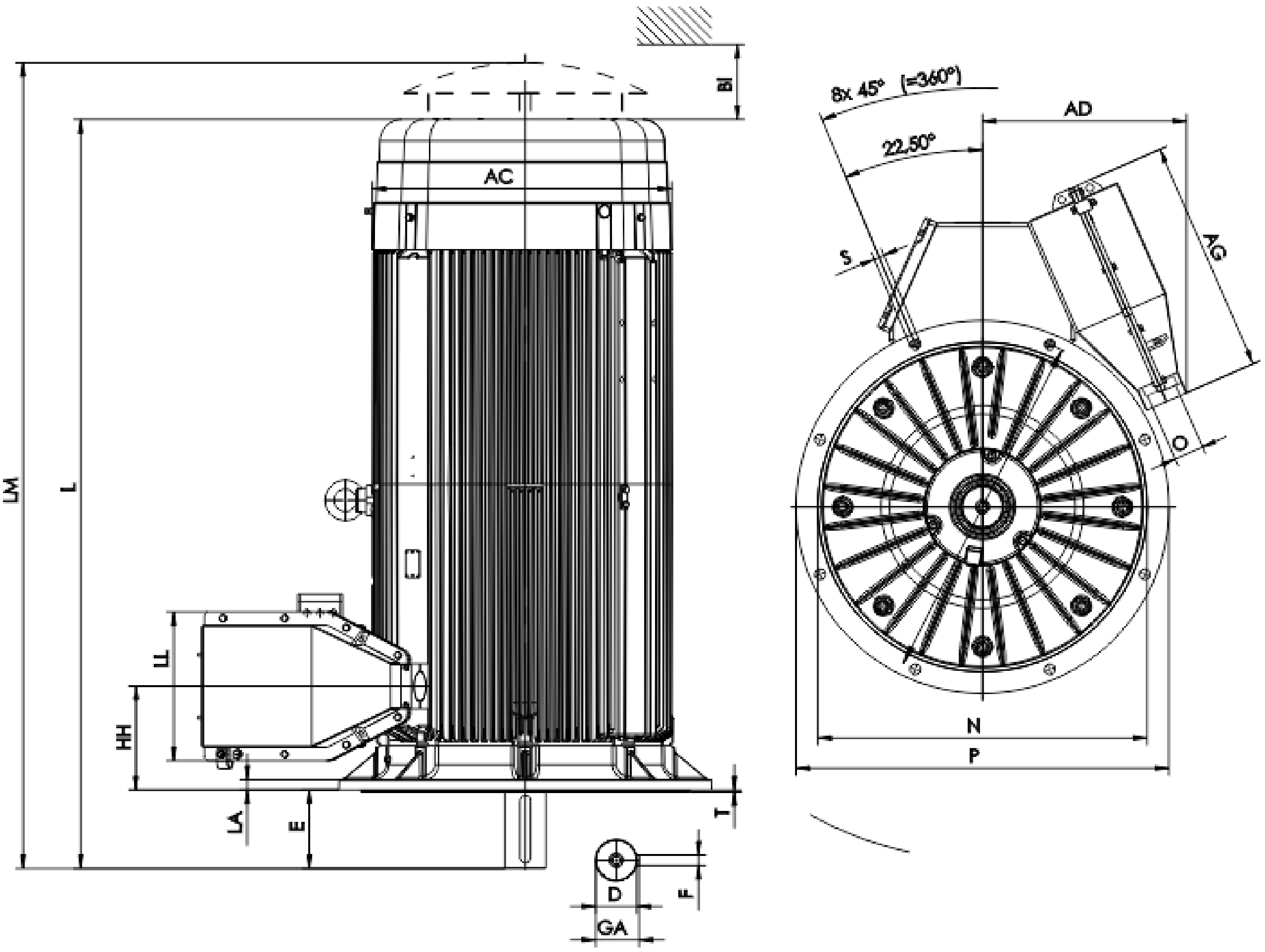


Type	A	AA	AB	AD	B	BB	C	HD	L	H	D	E
W52R 315	508	110	590	-	508	624	216	996	1537	315	65	170
W52R 355	610	128	700	546	560	750	254	1167	1770	355	100	210
W52R 400	710	198	860	546	900	1235	224	1275	2003	400	110	210
W72R 450	850	204	980	912	1000	1480	250	1174	2254	450	120	210
DKCAJ 50	950	204	1080	1004	1250	1730	315	1320	2772	500	140	210
DKCAJ 56	1000	240	1270	1000	1400	1800	355	1490	2880	560	150	250
DKCAJ 63	1120	-	1300	1100	1600	1960	355	1600	3000	630	170	300

All dimensions in mm (metric) according to IEC

Dimensional sheet

2.2 - 11 kV, 50 Hz / IM V1



Type	P	M	N	LA	T	AD	L	D	E
W52R 315	1150	1080	1000	32	6	-	1537	65	170
W52R 355	800	740	680	25	6	546	1770	100	210
W52R 400	1000	940	880	25	6	546	2003	110	210
W72R 450	1150	1080	1000	32	6	912	2254	120	210
DKCAJ 50	1150	1080	1000	32	6	1004	2772	140	210
DKCAJ 56	1150	1080	1000	32	6	1000	2880	150	250
DKCAJ 63	1150	1080	1000	32	6	1100	3000	170	300

All dimensions in mm (metric) according to IEC

VEM SOLUTIONS

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