



## INDUCTION MOTORS

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## GENERAL

### INTRODUCTION

Ganz Transelektro's new induction motor series meet the requirements of all industrial fields in wide range of rated power voltage speed and enclosures.

### REFERENCE STANDARDS

Our motors are supplied in compliance with the applicable IEC Standards, as well as, national standards of the European countries harmonised by CENELEC.

In particular, they comply with the following Standards:

- BS 4999 (U.K.)
- VDE 0530- Teil 1 (Germany)

Upon request, motors complying with US NEMA Standards MG.1. may also be supplied.

Output ratings main fixing and coupling dimensions (shaft height, etc.) of foot mounted motors comply with IEC Publication 72-2.

### OUTPUT POWER

Standard conditions for rated output are the following:

- Continuous duty (S1) at rated voltage and rated frequency
- Height above sea level not exceeding 1000 m
- Ambient temperature not exceeding 40°C
- Temperature of cooling water at inlet of heat exchanger not exceeding 25°C
- Rated voltage : 6kV, -frequency : 50Hz

Motors can be designed to operate with Class F temperature rise. In this case the rated load may be increased app. 13 %.

We can also deliver motors with other rated voltage levels between 0.4 - 15 kV and for 60Hz.

### QUALITY ASSURANCE

Our Quality Assurance Program covers design procurement manufacturing and testing.

This program meets the requirements of relevant International Standards such as: ISO 9000

The Quality System has been assessed by EQNet to be in compliance with ISO 9001 (EN 29001)

### TESTS

All motors are routine tested individually.

Type or special tests may be performed and will be quoted upon request.

## CONSTRUCTIONAL FEATURES

### TYPE OF CONSTRUCTION

Our standard constructions and mounting arrangements are IMB3 or IMV1 (IM1001 or IM3011) according to IEC 34-7.

Upon request, other versions are available for example IMB 20 or IMB 35 and others.

### DEGREE OF PROTECTION

Degree of protection of the motors complies with the following standards: IEC 34-5 and DIN 40050.

### METHOD OF COOLING

The method of cooling of motors complies with the IEC 34-6 Standard. The standard ventilation method of protected type machine is IC 01. The standard built in air-to-water heat exchangers (machines IC 81W7) are designed allowing 5 K temperature rise in water. Upon request we supply motors with coolers also for salt-water. Duct ventilated -IC 31- motors are also available. Standard air-cooled closed motor is as per IC 611.

### INSULATION SYSTEM AND STATOR WINDING

Stator laminations are made of high-grade insulated electrotechnical steel-sheets.

MICASYSTEM, the class F insulating system specially developed for stator windings of A.C. motors, is used for voltage rating from 400 up to 15000 V. This high reliability advanced insulating system is based on the use of cured mica tapes and vacuum pressure impregnation with a blend of solventless epoxy resin.

MICASYSTEM, which was developed through long research and extensive testing activity, provides excellent dielectric and mechanical properties and all physical characteristics needed by the different applications of motors.

### NOISE AND VIBRATION

Low noise and vibration is obtained by:

- rugged mechanical construction
- streamlined design of fans and air ducts to secure optimum air flow

Our motors meet the requirements of IEC 34-9 and VDI 2056.

Noise silencers are available upon request.

### MOTORS OPERATING IN HAZARDOUS ENVIRONMENT

We produce motors for explosive atmosphere with the following degrees of protection:

- Increased safety motors : EExe
- Pressurised motors : EExp
- Non sparking motors : EExn (cage rotor motors)

## TERMINAL BOXES

Terminal boxes consist of a sturdy welded construction with ample space for connecting the incoming cables. Basic design enables cable connections from bottom (standard) as well as from the top right and left, by turning the box in steps of 90 degrees.

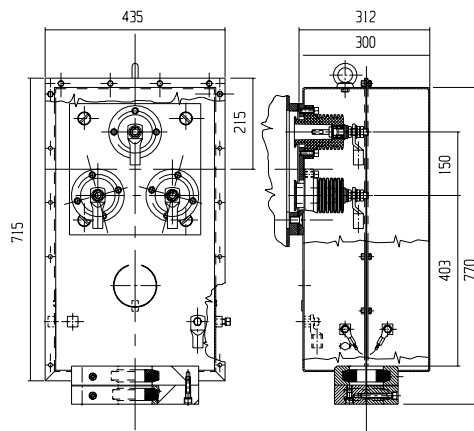
The terminal boxes comply with IP 55 degree of protection according to IEC 34-5, and are designed and built to withstand the thermal and dynamic stresses of an eventual phase-to-phase short-circuit in the terminal box or in winding.

### STATOR TERMINAL BOX

$$U_{\max.} = 6 \text{ kV}$$

$$I_{\max.} = 400 \text{ A}$$

$$H = 400 \div 800$$

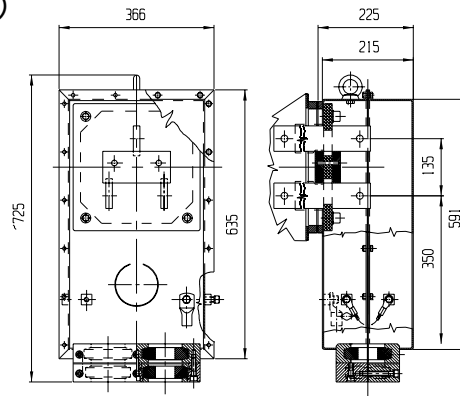


### ROTOR TERMINAL BOX (N/A for cage rotor motors)

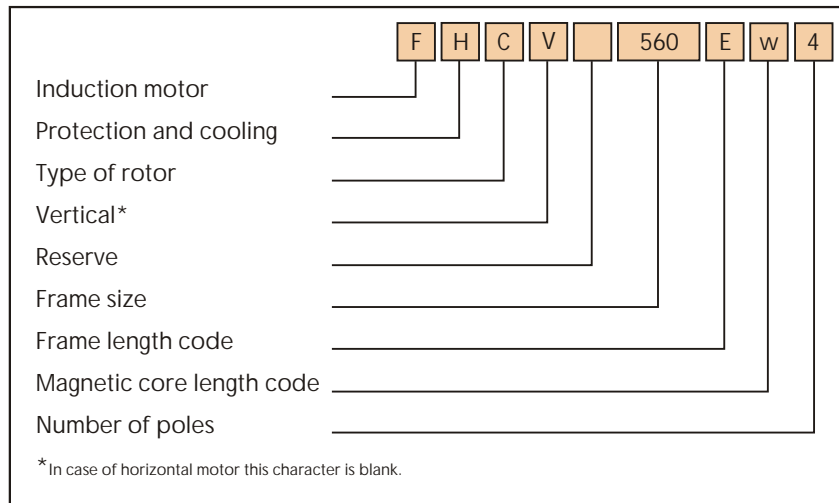
$$U_{\max.} = 1500 \text{ V}$$

$$I_{\max.} = 1260 \text{ A}$$

$$H = 500 \div 800$$



## TYPE DESIGNATION



### VARIANTS OF CONSTRUCTION

Construction	Protection	Cooling	Type of Construction	Bearings
FH	IP 23	IC 0A1	IM 1001 (IM B3)	roller bearing
FW	IPW 24			
FR	IP 54	IC 8A1W7	IM 1002	side bearing
FD		IC 3A1		
FT		IC 6A1A1	IM 3011 (IM V1)	

### VARIANTS OF ROTOR

Rotor Code	Rotor variants	
..A	wound rotor	constant contact
..E		manually operated brush lifting device
..M		motor driven brush lifting device
..S		synchronous induction motor
..C	cage rotor	for light and heavy start

## HORIZONTAL MOTORS



FTA 710K6 type motor, 3579 kW, 6.3 kV, 991 rpm.



FRC 710H4 type motor, 5500 kW, 6 kV, 1487 rpm.

## BEARINGS

Our motors are normally fitted with antifriction bearings.

For horizontal construction (IM1001), the fixed bearing is usually located at the drive end whereas the floating bearing is at the non drive-end.

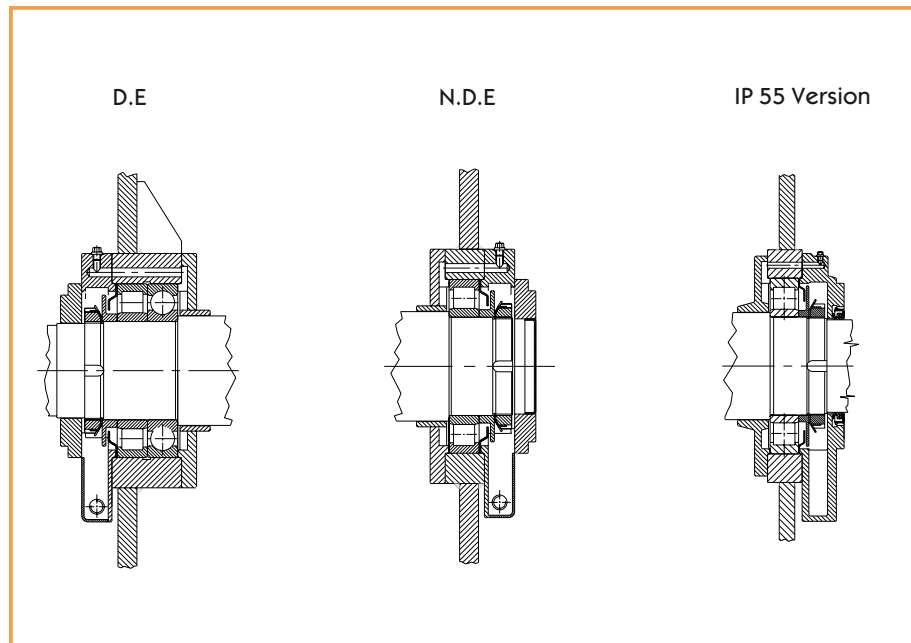
The fixed bearing on drive side is double one, consisting of a cylindrical roller bearing for radial load and a deep groove ball bearing to withstand the axial thrust.

Bearing compartments are equipped with relubricating device and SPM adapters.

For IP 55 protection the bearing are sealed with additional V - rings.

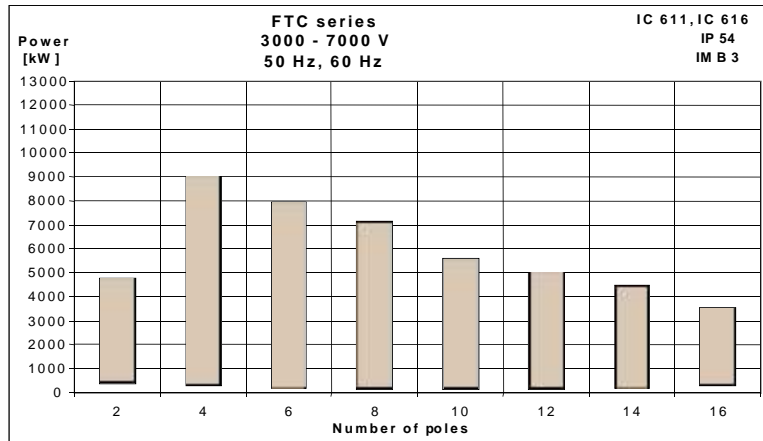
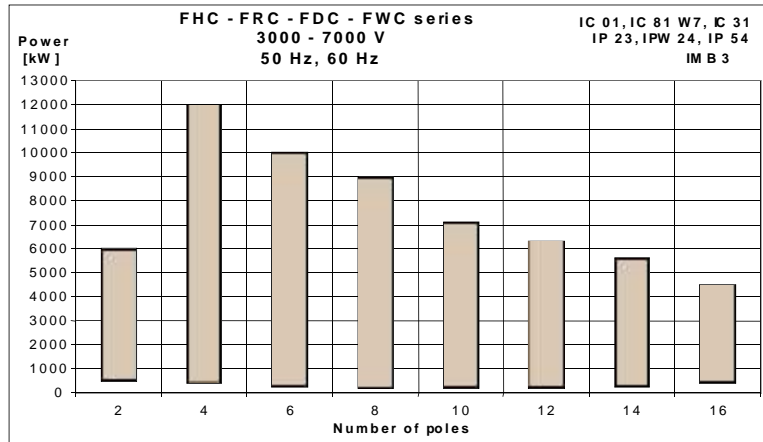
Sleeve bearings are available upon request.

### STANDARD BEARING ARRANGEMENTS

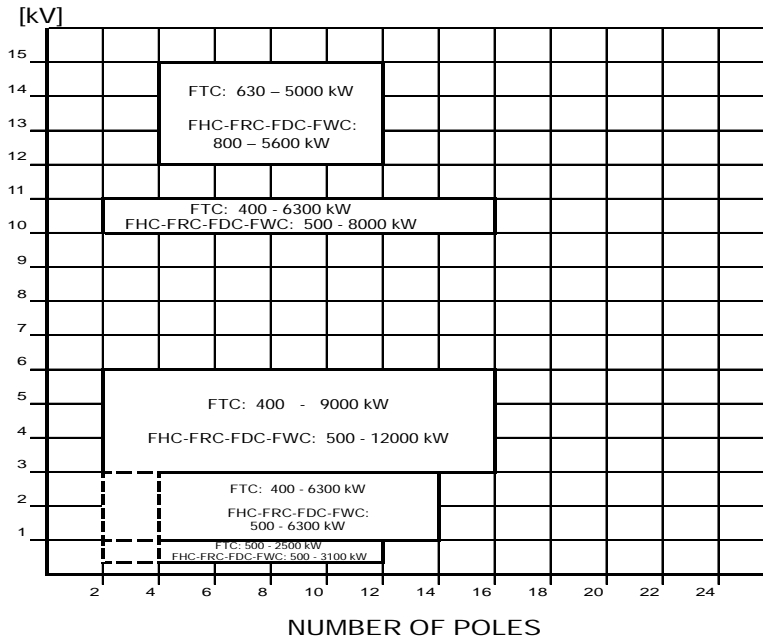




## CAGE ROTOR INDUCTION MOTORS

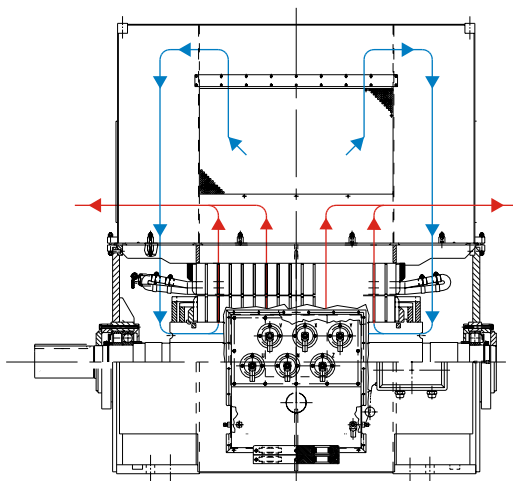


### VOLTAGE

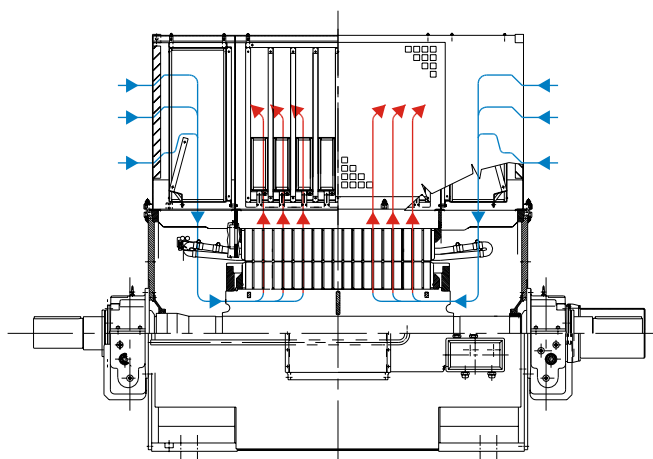


## METHOD OF COOLING

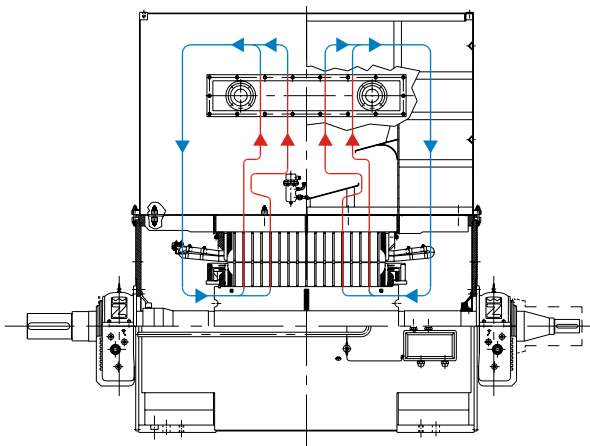
FWC IP W24 IC 31



FHC IP23 IC 01



FRC IP54 IC81 W7



## DIMENSIONS

Type FHC IP 23 IC 01

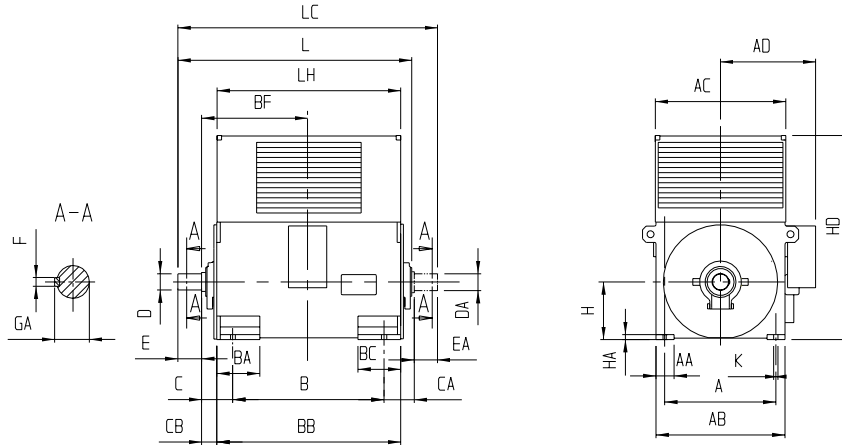
Design data and dimensions are subject to modification without notice.

Foot mounted motor

IM 1001

IM 1002

Dimensions in mm



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
400 K	4 - 12	800	110	888	900	795	800	355	1160	355	675	250	300	95
H	4 - 12	800	110	888	900	795	1000	370	1370	370	780	250	310	95
450 L	4 - 12	900	130	988	1000	845	800	330	1160	330	675	250	300	95
K	4 - 12	900	130	988	1000	845	900	340	1310	340	750	250	350	95
H	4 - 12	900	130	988	1000	845	1120	365	1480	365	835	250	300	95
500 L	4 - 12	1000	150	1138	1150	920	900	375	1310	375	760	280	340	105
K	4 - 12	1000	150	1138	1150	920	1000	400	1480	400	845	280	410	105
H	4 - 12	1000	150	1138	1150	920	1250	405	1670	405	940	280	350	105
560 L	4 - 12	1120	180	1284	1300	995	1000	390	1410	390	815	280	350	110
K	4 - 12	1120	180	1284	1300	995	1120	425	1600	425	910	280	420	110
H	4 - 12	1120	180	1284	1300	995	1400	410	1800	410	1010	280	340	110

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
400 K	4 - 12	110	110	210	210	28	116	400	30	1400	35	1555	1770	1150
H	4 - 12	110	110	210	210	28	116	400	30	1400	35	1765	1980	1360
450 L	4 - 12	120	120	210	210	32	127	450	35	1600	35	1555	1770	1150
K	4 - 12	120	120	210	210	32	127	450	35	1600	35	1705	1920	1300
H	4 - 12	120	120	210	210	32	127	450	35	1600	35	1875	2090	1470
500 L	4 - 12	140	140	250	250	36	148	500	45	1800	42	1765	2020	1300
K	4 - 12	140	140	250	250	36	148	500	45	1800	42	1935	2190	1470
H	4 - 12	140	140	250	250	36	148	500	45	1800	42	2125	2380	1660
560 L	4 - 12	160	160	300	300	40	169	560	45	2000	42	1925	2230	1400
K	4 - 12	160	160	300	300	40	169	560	45	2000	42	2115	2420	1590
H	4 - 12	160	160	300	300	40	169	560	45	2000	42	2315	2620	1790

<sup>1)</sup> Tolerance ISO m6

<sup>2)</sup> Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

<sup>3)</sup> Standard terminal box / Upon request alternative terminal box may be supplied.

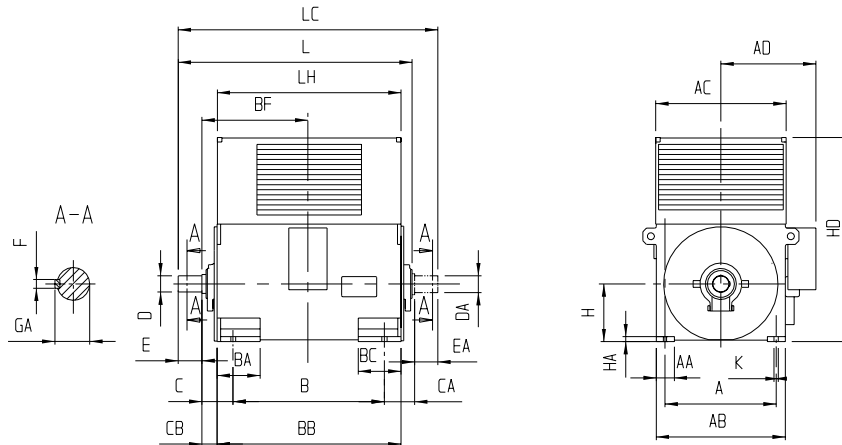
## DIMENSIONS

Type FHC IP 23 IC 01

Design data and dimensions are subject to modification without notice.

Foot mounted motor  
IM 1001  
IM 1002

Dimensions in mm



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
630	L 4-12	1250	200	1434	1450	1060	1120	465	1600	465	915	315	395	115
	K 4-12	1250	200	1434	1450	1060	1250	445	1800	445	1015	315	465	115
	H 4-12	1250	200	1434	1450	1060	1600	480	2050	480	1140	315	365	115
710	L 4* 6-12	1400	200	1630	1650	1160	1250	475	1740	475	1000	315	435	130
	K 4* 6-12	1400	200	1630	1650	1160	1400	480	1990	480	1125	315	535	130
	H 4* 6-12	1400	200	1630	1650	1160	1800	515	2240	515	1250	315	385	130
800	L 4* 6-12	1600	200	1830	1850	1260	1600	495	1920	495	1095	315	275	135
	K 4* 6-12	1600	200	1830	1850	1260	1800	520	2210	520	1240	315	365	135
	H 4*6* 8-12	1600	200	1830	1850	1260	2000	555	2500	555	1385	315	455	135

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
630	L 4-12	160	160	300	300	40	169	630	45	2250	48	2116	2430	1590
	K 4-12	180	180	300	300	45	190	630	45	2250	48	2320	2630	1790
	H 4-12	180	180	300	300	45	190	630	45	2250	48	2570	2880	2040
710	L 4* 6-12	180	180	300	300	45	190	710	50	2500	48	2280	2600	1730
	K 4* 6-12	200	200	350	350	45	210	710	50	2500	48	2585	2950	1980
	H 4* 6-12	200	200	350	350	45	210	710	50	2500	48	2835	3200	2230
800	L 4* 6-12	220	220	350	350	50	231	800	50	2800	56	2525	2890	1910
	K 4* 6-12	220	220	350	350	50	231	800	50	2800	56	2815	3180	2200
	H 4*6* 8-12	250	250	410	410	56	262	800	50	2800	56	3170	3590	2490

1) Tolerance ISO m6

2) Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

3) Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

## DIMENSIONS

Type FTC IP 54 IC 611

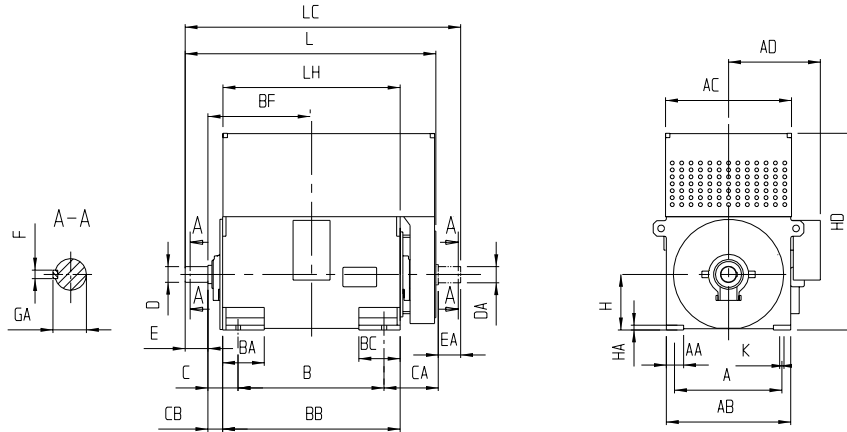
Design data and dimensions are subject to modification without notice.

Foot mounted motor

IM 1001

IM 1002

Dimensions in mm



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
400	K 4 - 12	800	110	888	900	795	800	355	1160	355	675	250	560	95
	H 4 - 12	800	110	888	900	795	1000	370	1370	370	780	250	570	95
450	L 4 - 12	900	130	988	1000	845	800	330	1160	330	675	250	560	95
	K 4 - 12	900	130	988	1000	845	900	340	1310	340	750	250	610	95
	H 4 - 12	900	130	988	1000	845	1120	365	1480	365	835	250	560	95
500	L 4 - 12	1000	150	1138	1150	920	900	375	1310	375	760	280	595	105
	K 4 - 12	1000	150	1138	1150	920	1000	400	1480	400	845	280	665	105
	H 4 - 12	1000	150	1138	1150	920	1120	405	1670	405	940	280	605	105
560	L 4 - 12	1120	180	1284	1300	995	1000	390	1410	390	815	280	620	110
	K 4 - 12	1120	180	1284	1300	995	1250	425	1600	425	910	280	690	110
	H 4 - 12	1120	180	1284	1300	995	1400	410	1800	410	1010	280	610	110

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
400	K 4 - 12	110	110	210	210	28	116	400	30	1600	35	1790	2030	1150
	H 4 - 12	110	110	210	210	28	116	400	30	1600	35	2000	2240	1360
450	L 4 - 12	120	120	210	210	32	127	450	35	1800	35	1790	2030	1150
	K 4 - 12	120	120	210	210	32	127	450	35	1800	35	1940	2180	1300
	H 4 - 12	120	120	210	210	32	127	450	35	1800	35	2110	2350	1470
500	L 4 - 12	140	140	250	250	36	148	500	45	2000	42	1990	2275	1300
	K 4 - 12	140	140	250	250	36	148	500	45	2000	42	2160	2445	1470
	H 4 - 12	140	140	250	250	36	148	500	45	2000	42	2350	2635	1660
560	L 4 - 12	160	160	300	300	40	169	560	45	2250	42	2175	2500	1400
	K 4 - 12	160	160	300	300	40	169	560	45	2250	42	2365	2690	1590
	H 4 - 12	160	160	300	300	40	169	560	45	2250	42	2565	2890	1790

<sup>1)</sup> Tolerance ISO m6

<sup>2)</sup> Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

<sup>3)</sup> Standard terminal box / Upon request alternative terminal box may be supplied.

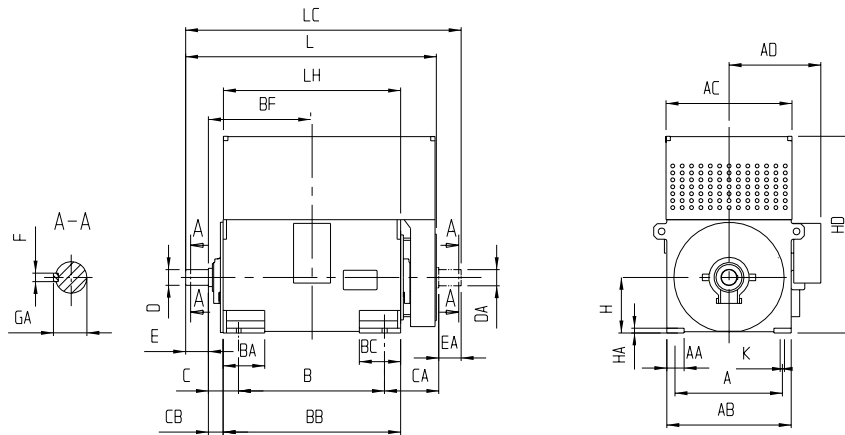
## DIMENSIONS

Type FTC IP 54 IC 611

Design data and dimensions are subject to modification without notice.

Foot mounted motor  
IM 1001  
IM 1002

Dimensions in mm



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
630 L	4 - 12	1250	200	1434	1450	1060	1120	465	1600	465	915	315	695	115
K	4 - 12	1250	200	1434	1450	1060	1250	445	1800	445	1015	315	765	115
H	4 - 12	1250	200	1434	1450	1060	1600	480	2050	480	1140	315	665	115
710 L	4* 6 - 12	1400	200	1630	1650	1160	1250	475	1740	475	1000	315	785	130
K	4* 6 - 12	1400	200	1630	1650	1160	1400	480	1990	480	1125	315	885	130
H	4* 6 - 12	1400	200	1630	1650	1160	1800	515	2240	515	1250	315	735	130
800 L	4* 6 - 12	1600	200	1830	1850	1260	1600	495	1920	495	1095	315	695	135
K	4* 6 - 12	1600	200	1830	1850	1260	1800	520	2210	520	1240	315	775	135
H	4*6* 8-12	1600	200	1830	1850	1260	2000	555	2500	555	1385	315	875	135

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
630 L	4 - 12	160	160	300	300	40	169	630	45	2250	48	2410	2730	1590
K	4 - 12	180	180	300	300	45	190	630	45	2500	48	2610	2930	1790
H	4 - 12	180	180	300	300	45	190	630	45	2500	48	2860	3180	2040
710 L	4* 6 - 12	180	180	300	300	45	190	710	50	2500	48	2630	2950	1730
K	4* 6 - 12	200	200	350	350	45	210	710	50	2800	48	2930	3300	1980
H	4* 6 - 12	200	200	350	350	45	210	710	50	2800	48	3180	3550	2230
800 L	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	2930	3310	1910
K	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	3220	3590	2200
H	4*6* 8-12	250	250	410	410	56	262	800	50	3150	56	3570	4010	2490

<sup>1)</sup> Tolerance ISO m6

<sup>2)</sup> Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

<sup>3)</sup> Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

## DIMENSIONS

Type FRC IP 54 IC 81 W7

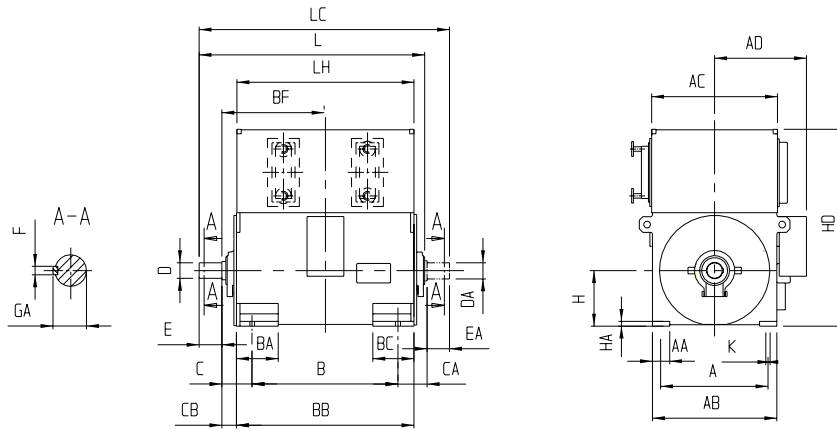
Design data and dimensions are subject to modification without notice.

Foot mounted motor

IM 1001

IM 1002

Dimensions in mm



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
400 K	4 - 12	800	110	888	900	795	800	355	1160	355	675	250	300	95
H	4 - 12	800	110	888	900	795	1000	370	1370	370	780	250	310	95
450 L	4 - 12	900	130	988	1000	845	800	330	1160	330	675	250	300	95
K	4 - 12	900	130	988	1000	845	900	340	1310	340	750	250	350	95
H	4 - 12	900	130	988	1000	845	1120	365	1480	365	835	250	300	95
500 L	4 - 12	1000	150	1138	1150	920	900	375	1310	375	760	280	340	105
K	4 - 12	1000	150	1138	1150	920	1000	400	1480	400	845	280	410	105
H	4 - 12	1000	150	1138	1150	920	1250	405	1670	405	940	280	350	105
560 L	4 - 12	1120	180	1284	1300	995	1000	390	1410	390	815	280	350	110
K	4 - 12	1120	180	1284	1300	995	1120	425	1600	425	910	280	420	110
H	4 - 12	1120	180	1284	1300	995	1400	410	1800	410	1010	280	340	110

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
400 K	4 - 12	110	110	210	210	28	116	400	30	1600	35	1555	1770	1150
H	4 - 12	110	110	210	210	28	116	400	30	1600	35	1765	1980	1360
450 L	4 - 12	120	120	210	210	32	127	450	35	1800	35	1555	1770	1150
K	4 - 12	120	120	210	210	32	127	450	35	1800	35	1705	1920	1300
H	4 - 12	120	120	210	210	32	127	450	35	1800	35	1875	2090	1470
500 L	4 - 12	140	140	250	250	36	148	500	45	2000	42	1765	2020	1300
K	4 - 12	140	140	250	250	36	148	500	45	2000	42	1935	2190	1470
H	4 - 12	140	140	250	250	36	148	500	45	2000	42	2125	2380	1660
560 L	4 - 12	160	160	300	300	40	169	560	45	2250	42	1925	2230	1400
K	4 - 12	160	160	300	300	40	169	560	45	2250	42	2115	2420	1590
H	4 - 12	160	160	300	300	40	169	560	45	2250	42	2315	2620	1790

<sup>1)</sup> Tolerance ISO m6

<sup>2)</sup> Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

<sup>3)</sup> Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

## DIMENSIONS

Type FRC IP 54 IC 81 W7

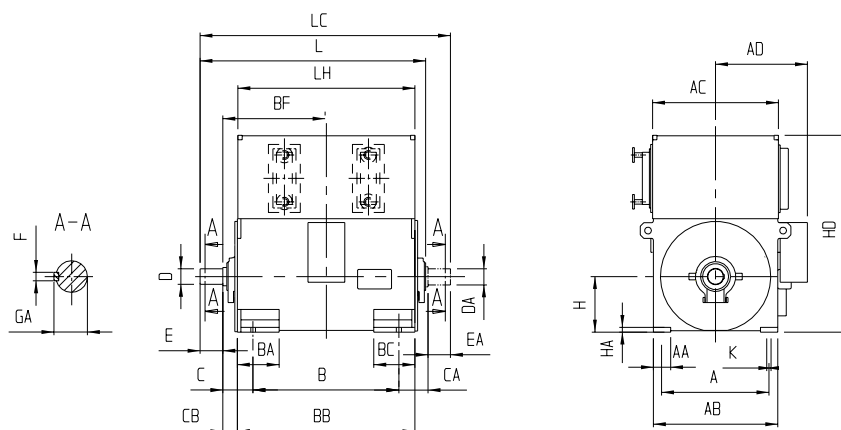
Design data and dimensions are subject to modification without notice.

Foot mounted motor

IM 1001

Dimensions in mm

IM 1002



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
630 L	4 - 12	1250	200	1434	1450	1060	1120	465	1600	465	915	315	395	115
K	4 - 12	1250	200	1434	1450	1060	1250	445	1800	445	1015	315	465	115
H	4 - 12	1250	200	1434	1450	1060	1600	480	2050	480	1140	315	365	115
710 L	4* 6 - 12	1400	200	1630	1650	1160	1250	475	1740	475	1000	315	435	130
K	4* 6 - 12	1400	200	1630	1650	1160	1400	480	1990	480	1125	315	535	130
H	4* 6 - 12	1400	200	1630	1650	1160	1800	515	2240	515	1250	315	385	130
800 L	4* 6 - 12	1600	200	1830	1850	1260	1600	495	1920	495	1095	315	275	135
K	4* 6 - 12	1600	200	1830	1850	1260	1800	520	2210	520	1240	315	365	135
H	4*6* 8-12	1600	200	1830	1850	1260	2000	555	2500	555	1385	315	455	135

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
630 L	4 - 12	160	160	300	300	40	169	630	45	2250	48	2116	2430	1590
K	4 - 12	180	180	300	300	45	190	630	45	2500	48	2320	2630	1790
H	4 - 12	180	180	300	300	45	190	630	45	2500	48	2570	2880	2040
710 L	4* 6 - 12	180	180	300	300	45	190	710	50	2500	48	2280	2600	1730
K	4* 6 - 12	200	200	350	350	45	210	710	50	2800	48	2585	2950	1980
H	4* 6 - 12	200	200	350	350	45	210	710	50	2800	48	2835	3200	2230
800 L	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	2525	2890	1910
K	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	2815	3180	2200
H	4*6* 8-12	250	250	410	410	56	262	800	50	2800	56	3170	3590	2490

<sup>1)</sup> Tolerance ISO m6

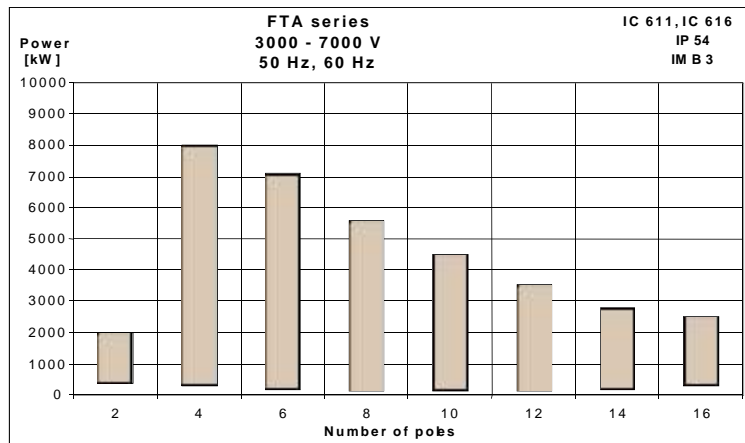
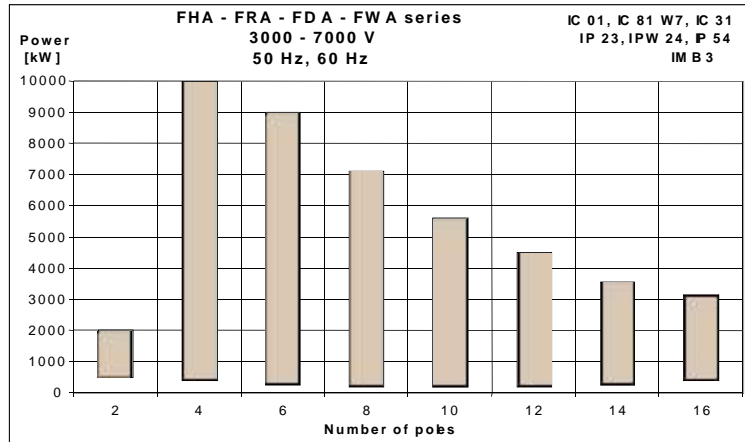
<sup>2)</sup> Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

<sup>3)</sup> Standard terminal box / Upon request alternative terminal box may be supplied.

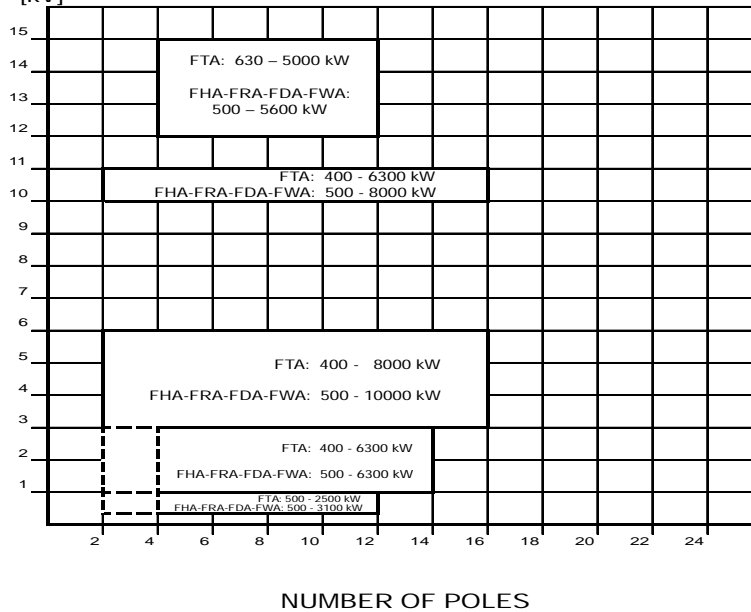
\* with plain-bearing block



## WOUND ROTOR INDUCTION MOTORS

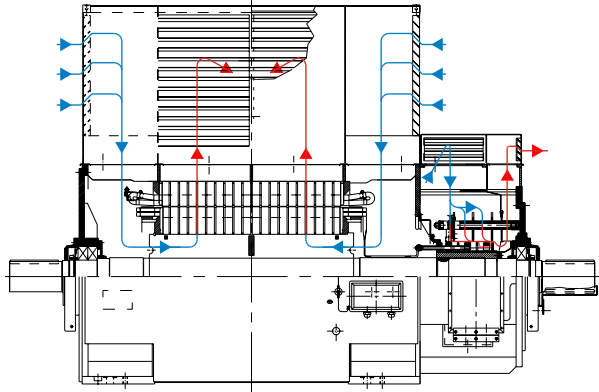


### VOLTAGE [kV]

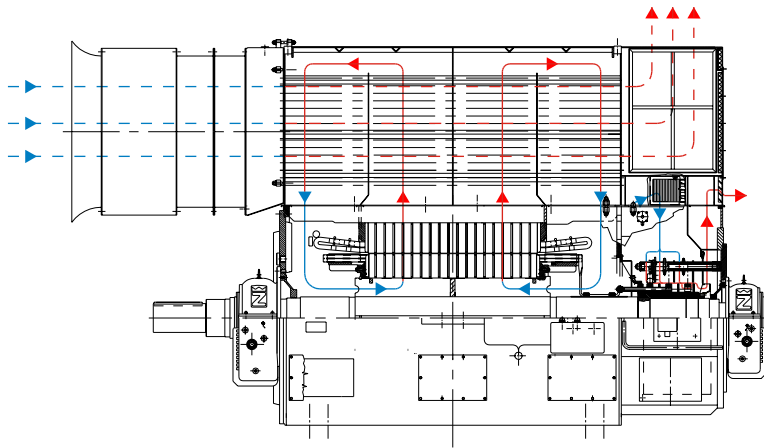


METHOD OF COOLING

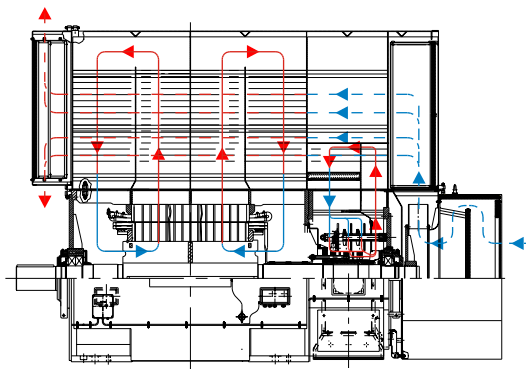
FHA IP23 IC 01



FTA IP54 IC 616



FTA IP54 IC 611



## DIMENSIONS

Type FHA IP 23 IC 01

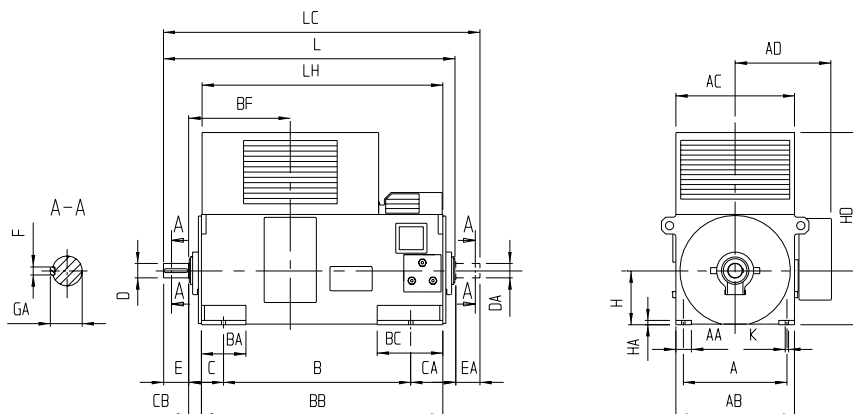
Design data and dimensions are subject to modification without notice.

Foot mounted motor

IM 1001

IM 1002

Dimensions in mm



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
400 F	4 - 12	800	110	888	900	795	1250	355	1690	542	675	250	380	95
E	4 - 12	800	110	888	900	795	1400	370	1900	542	780	250	440	95
450 G	4 - 12	900	130	988	1000	845	1250	330	1690	542	675	250	380	95
F	4 - 12	900	130	988	1000	845	1400	340	1840	542	750	250	380	95
E	4 - 12	900	130	988	1000	845	1600	365	2010	542	835	250	350	95
500 G	4 - 12	1000	150	1138	1150	920	1400	375	1840	542	760	280	370	105
F	4 - 12	1000	150	1138	1150	920	1600	400	2010	542	845	280	340	105
E	4 - 12	1000	150	1138	1150	920	1800	405	2200	542	940	280	330	105
560 G	4 - 12	1120	180	1284	1300	995	1600	390	2010	616	815	280	350	110
F	4 - 12	1120	180	1284	1300	995	1800	425	2200	616	910	280	340	110
E	4 - 12	1120	180	1284	1300	995	2000	410	2400	616	1010	280	340	110

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
400 F	4 - 12	110	110	210	210	28	116	400	30	1400	35	2085	2300	1680
E	4 - 12	110	110	210	210	28	116	400	30	1400	35	2295	2510	1890
450 G	4 - 12	120	120	210	210	32	127	450	35	1600	35	2085	2300	1680
F	4 - 12	120	120	210	210	32	127	450	35	1600	35	2235	2450	1830
E	4 - 12	120	120	210	210	32	127	450	35	1600	35	2405	2620	2000
500 G	4 - 12	140	140	250	250	36	148	500	45	1800	42	2295	2550	1830
F	4 - 12	140	140	250	250	36	148	500	45	1800	42	2465	2720	2000
E	4 - 12	140	140	250	250	36	148	500	45	1800	42	2655	2910	2190
560 G	4 - 12	160	160	300	300	40	169	560	45	2000	42	2525	2830	2000
F	4 - 12	160	160	300	300	40	169	560	45	2000	42	2715	3020	2190
E	4 - 12	160	160	300	300	40	169	560	45	2000	42	2915	3220	2390

<sup>1)</sup> Tolerance ISO m6

<sup>2)</sup> Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

<sup>3)</sup> Standard terminal box / Upon request alternative terminal box may be supplied.

## DIMENSIONS

Type FHA IP 23 IC 01

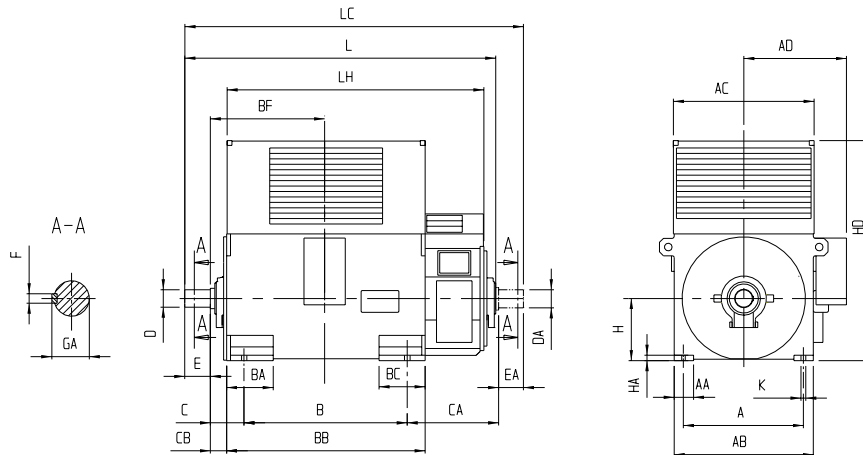
Design data and dimensions are subject to modification without notice.

Foot mounted motor

IM 1001

IM 1002

Dimensions in mm



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
630 L	4 - 12	1250	200	1434	1450	1060	1120	465	1595	460	915	315	995	115
K	4 - 12	1250	200	1434	1450	1060	1250	445	1795	440	1015	315	1065	115
H	4 - 12	1250	200	1434	1450	1060	1600	480	2045	475	1140	315	965	115
710 L	4* 6 - 12	1400	200	1630	1650	1160	1250	475	1735	470	1000	315	1105	130
K	4* 6 - 12	1400	200	1630	1650	1160	1400	480	1985	475	1125	315	1205	130
H	4* 6 - 12	1400	200	1630	1650	1160	1800	515	2235	510	1250	315	1055	130
800 L	4* 6 - 12	1600	200	1830	1850	1260	1600	495	1915	490	1090	315	945	135
K	4* 6 - 12	1600	200	1830	1850	1260	1800	520	2205	535	1230	315	1035	135
H	4*6* 8-12	1600	200	1830	1850	1260	2000	555	2495	550	1385	315	1125	135

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
630 L	4 - 12	160	160	300	300	40	169	630	45	2250	48	2716	3030	2190
K	4 - 12	180	180	300	300	45	190	630	45	2250	48	2920	3230	2390
H	4 - 12	180	180	300	300	45	190	630	45	2250	48	3170	3480	2640
710 L	4* 6 - 12	180	180	300	300	45	190	710	50	2500	48	2950	3270	2400
K	4* 6 - 12	200	200	350	350	45	210	710	50	2500	48	3255	3620	2650
H	4* 6 - 12	200	200	350	350	45	210	710	50	2500	48	3505	3870	2900
800 L	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	3195	3560	2580
K	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	3485	3850	2870
H	4*6* 8-12	250	250	410	410	56	262	800	50	2800	56	3840	4260	3160

1) Tolerance ISO m6

2) Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

3) Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

## DIMENSIONS

Type FTA IP 54 IC 611

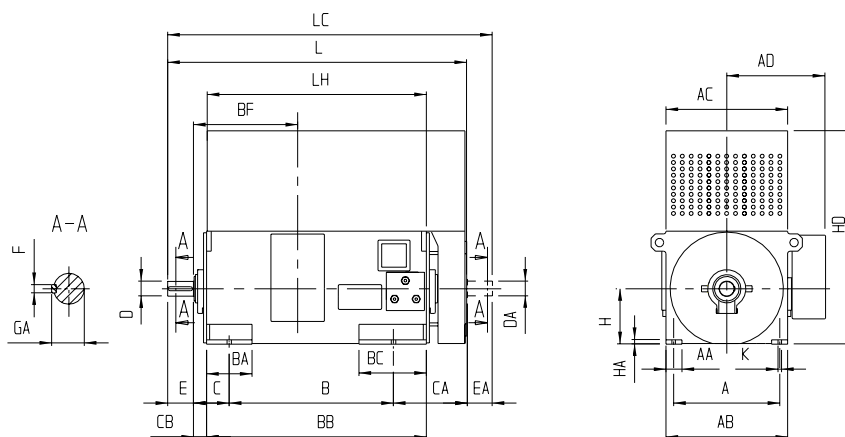
Design data and dimensions are subject to modification without notice.

Foot mounted motor

IM 1001

Dimensions in mm

IM 1002



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
400 F	4 - 12	800	110	888	900	795	1250	355	1690	542	675	250	640	95
	E 4 - 12	800	110	888	900	795	1400	370	1900	542	780	250	700	95
450 G	4 - 12	900	130	988	1000	845	1250	330	1690	542	675	250	640	95
	F 4 - 12	900	130	988	1000	845	1400	340	1840	542	750	250	640	95
	E 4 - 12	900	130	988	1000	845	1600	365	2010	542	835	250	610	95
500 G	4 - 12	1000	150	1138	1150	920	1400	375	1840	542	760	280	625	105
	F 4 - 12	1000	150	1138	1150	920	1600	400	2010	542	845	280	595	105
	E 4 - 12	1000	150	1138	1150	920	1800	405	2200	542	940	280	585	105
560 G	4 - 12	1120	180	1284	1300	995	1600	390	2010	616	815	280	620	110
	F 4 - 12	1120	180	1284	1300	995	1800	425	2200	616	910	280	610	110
	E 4 - 12	1120	180	1284	1300	995	2000	410	2400	616	1010	280	610	110

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
400 F	4 - 12	110	110	210	210	28	116	400	30	1600	35	2320	2560	1680
	E 4 - 12	110	110	210	210	28	116	400	30	1600	35	2530	2770	1890
450 G	4 - 12	120	120	210	210	32	127	450	35	1800	35	2320	2560	1680
	F 4 - 12	120	120	210	210	32	127	450	35	1800	35	2470	2710	1830
	E 4 - 12	120	120	210	210	32	127	450	35	1800	35	2640	2880	2000
500 G	4 - 12	140	140	250	250	36	148	500	45	2000	42	2520	2805	1830
	F 4 - 12	140	140	250	250	36	148	500	45	2000	42	2690	2975	2000
	E 4 - 12	140	140	250	250	36	148	500	45	2000	42	2880	3165	2190
560 G	4 - 12	160	160	300	300	40	169	560	45	2250	42	2775	3100	2000
	F 4 - 12	160	160	300	300	40	169	560	45	2250	42	2965	3290	2190
	E 4 - 12	160	160	300	300	40	169	560	45	2250	42	3165	3490	2390

<sup>1)</sup> Tolerance ISO m6

<sup>2)</sup> Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

<sup>3)</sup> Standard terminal box / Upon request alternative terminal box may be supplied.

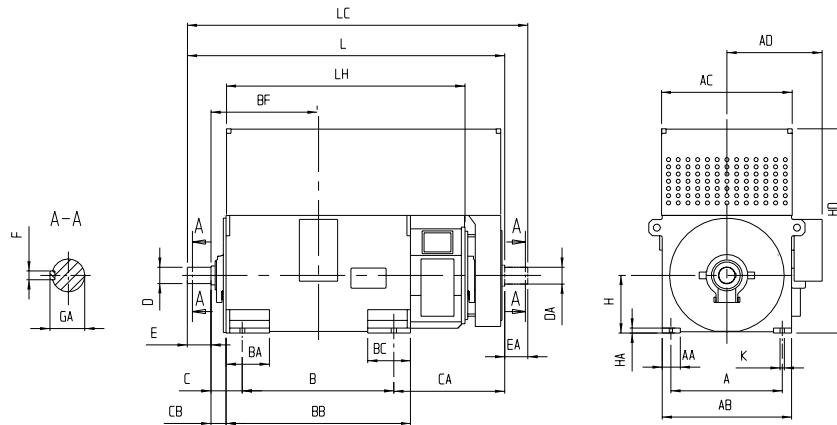
## DIMENSIONS

Type FTA IP 54 IC 611

Design data and dimensions are subject to modification without notice.

Foot mounted motor  
IM 1001  
IM 1002

Dimensions in mm



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
630 L	4 - 12	1250	200	1434	1450	1060	1120	465	1595	460	915	315	1295	115
K	4 - 12	1250	200	1434	1450	1060	1250	445	1795	440	1015	315	1365	115
H	4 - 12	1250	200	1434	1450	1060	1600	480	2045	475	1140	315	1265	115
710 L	4* 6 - 12	1400	200	1630	1650	1160	1250	475	1735	470	1000	315	1455	130
K	4* 6 - 12	1400	200	1630	1650	1160	1400	480	1985	475	1125	315	1555	130
H	4* 6 - 12	1400	200	1630	1650	1160	1800	515	2235	510	1250	315	1405	130
800 L	4* 6 - 12	1600	200	1830	1850	1260	1600	495	1915	490	1090	315	1365	135
K	4* 6 - 12	1600	200	1830	1850	1260	1800	520	2205	535	1230	315	1445	135
H	4*6* 8-12	1600	200	1830	1850	1260	2000	555	2495	550	1385	315	1545	135

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
630 L	4 - 12	160	160	300	300	40	169	630	45	2250	48	3010	3330	2190
K	4 - 12	180	180	300	300	45	190	630	45	2500	48	3210	3530	2390
H	4 - 12	180	180	300	300	45	190	630	45	2500	48	3460	3780	2640
710 L	4* 6 - 12	180	180	300	300	45	190	710	50	2500	48	3300	3620	2400
K	4* 6 - 12	200	200	350	350	45	210	710	50	2800	48	3600	3970	2650
H	4* 6 - 12	200	200	350	350	45	210	710	50	2800	48	3850	4220	2900
800 L	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	3600	3980	2580
K	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	3890	4260	2870
H	4*6* 8-12	250	250	410	410	56	262	800	50	3150	56	4240	4680	3160

1) Tolerance ISO m6

2) Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

3) Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

## DIMENSIONS

Type FRA IP 54 IC 81 W7

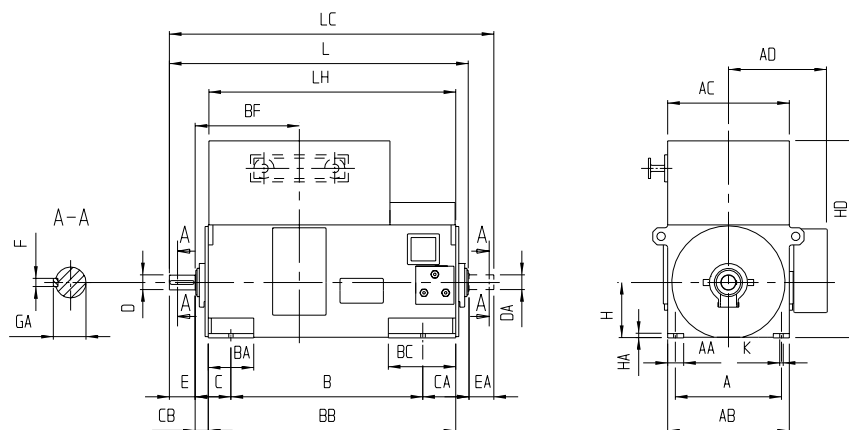
Design data and dimensions are subject to modification without notice.

Foot mounted motor

IM 1001

Dimensions in mm

IM 1002



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
400 F	4 - 12	800	110	888	900	795	1250	355	1690	542	675	250	380	95
	E 4 - 12	800	110	888	900	795	1400	370	1900	542	780	250	440	95
450 G	4 - 12	900	130	988	1000	845	1250	330	1690	542	675	250	380	95
	F 4 - 12	900	130	988	1000	845	1400	340	1840	542	750	250	380	95
	E 4 - 12	900	130	988	1000	845	1600	365	2010	542	835	250	350	95
500 G	4 - 12	1000	150	1138	1150	920	1400	375	1840	542	760	280	370	105
	F 4 - 12	1000	150	1138	1150	920	1600	400	2010	542	845	280	340	105
	E 4 - 12	1000	150	1138	1150	920	1800	405	2200	542	940	280	330	105
560 G	4 - 12	1120	180	1284	1300	995	1600	390	2010	616	815	280	350	110
	F 4 - 12	1120	180	1284	1300	995	1800	425	2200	616	910	280	340	110
	E 4 - 12	1120	180	1284	1300	995	2000	410	2400	616	1010	280	340	110

	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
400 F	4 - 12	110	110	210	210	28	116	400	30	1600	35	2085	2300	1680
	E 4 - 12	110	110	210	210	28	116	400	30	1600	35	2295	2510	1890
450 G	4 - 12	120	120	210	210	32	127	450	35	1800	35	2085	2300	1680
	F 4 - 12	120	120	210	210	32	127	450	35	1800	35	2235	2450	1830
	E 4 - 12	120	120	210	210	32	127	450	35	1800	35	2405	2620	2000
500 G	4 - 12	140	140	250	250	36	148	500	45	2000	42	2295	2550	1830
	F 4 - 12	140	140	250	250	36	148	500	45	2000	42	2465	2720	2000
	E 4 - 12	140	140	250	250	36	148	500	45	2000	42	2655	2910	2190
560 G	4 - 12	160	160	300	300	40	169	560	45	2250	42	2525	2830	2000
	F 4 - 12	160	160	300	300	40	169	560	45	2250	42	2715	3020	2190
	E 4 - 12	160	160	300	300	40	169	560	45	2250	42	2915	3220	2390

<sup>1)</sup> Tolerance ISO m6

<sup>2)</sup> Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

<sup>3)</sup> Standard terminal box / Upon request alternative terminal box may be supplied.

## DIMENSIONS

Type FRA IP 54 IC 81 W7

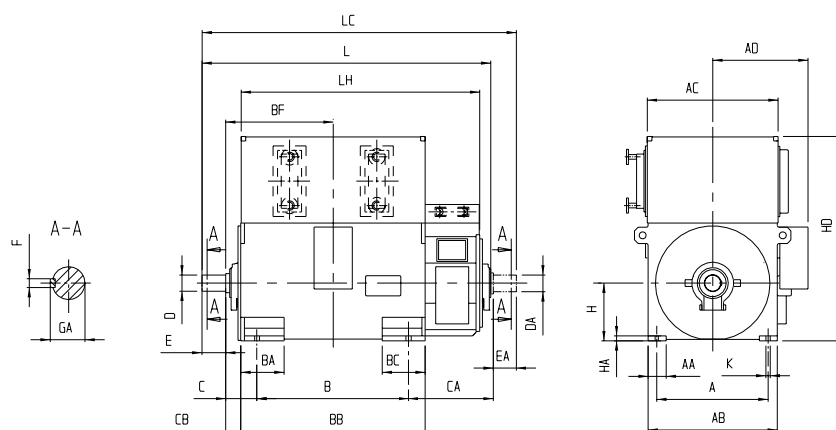
Design data and dimensions are subject to modification without notice.

Foot mounted motor

IM 1001

Dimensions in mm

IM 1002



Type	Number of poles	A	AA	AB	AC	AD <sup>3)</sup>	B	BA	BB	BC	BF	C	CA	CB
630 L	4 - 12	1250	200	1434	1450	1060	1120	465	1595	460	915	315	995	115
K	4 - 12	1250	200	1434	1450	1060	1250	445	1795	440	1015	315	1065	115
H	4 - 12	1250	200	1434	1450	1060	1600	480	2045	475	1140	315	965	115
710 L	4* 6 - 12	1400	200	1630	1650	1160	1250	475	1735	470	1000	315	1105	130
K	4* 6 - 12	1400	200	1630	1650	1160	1400	480	1985	475	1125	315	1205	130
H	4* 6 - 12	1400	200	1630	1650	1160	1800	515	2235	510	1250	315	1055	130
800 L	4* 6 - 12	1600	200	1830	1850	1260	1600	495	1915	490	1090	315	945	135
K	4* 6 - 12	1600	200	1830	1850	1260	1800	520	2205	535	1230	315	1035	135
H	4*6* 8-12	1600	200	1830	1850	1260	2000	555	2495	550	1385	315	1125	135

Type	Number of poles	D <sup>1)</sup>	DA <sup>1)</sup>	E	EA	F	GA	H <sup>2)</sup>	HA	HD	K	L	LC	LH
630 L	4 - 12	160	160	300	300	40	169	630	45	2250	48	2716	3030	2190
K	4 - 12	180	180	300	300	45	190	630	45	2500	48	2920	3230	2390
H	4 - 12	180	180	300	300	45	190	630	45	2500	48	3170	3480	2640
710 L	4* 6 - 12	180	180	300	300	45	190	710	50	2500	48	2950	3270	2400
K	4* 6 - 12	200	200	350	350	45	210	710	50	2800	48	3255	3620	2650
H	4* 6 - 12	200	200	350	350	45	210	710	50	2800	48	3505	3870	2900
800 L	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	3195	3560	2580
K	4* 6 - 12	220	220	350	350	50	231	800	50	2800	56	3485	3850	2870
H	4*6* 8-12	250	250	410	410	56	262	800	50	2800	56	3840	4260	3160

<sup>1)</sup> Tolerance ISO m6

<sup>2)</sup> Tolerance:  $\begin{matrix} 0 \\ -1 \end{matrix}$

<sup>3)</sup> Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block



## VERTICAL SHAFT MOTORS



FHAV 450K6 type motor, 560 kW, 6.6 kV, 988 rpm.



FTCV 400J6 type motor, 434 kW, 6 kV, 992 rpm.

## BEARINGS

Bearing configuration for vertical machines is selected taking into account the following design parameters.

- speed and dead load of the rotor;
- additional dead load due to the rotor of the driven machine;
- hydraulic upthrust and/or down thrust at running and starting conditions from coupled pumps.

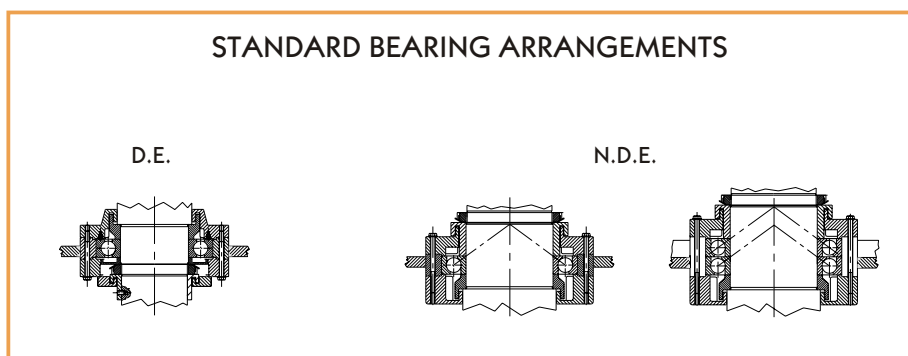
Basic configuration for medium-size motors, 4 poles and above, includes one single-row angular-contact grease lubricated ball bearing located in the upper shield having combined thrust and guide function, plus one deep-groove grease-lubricated ball bearing in the lower shield with guide function only.

The lower bearing is free to slide axially to allow thermal expansion of the shaft.

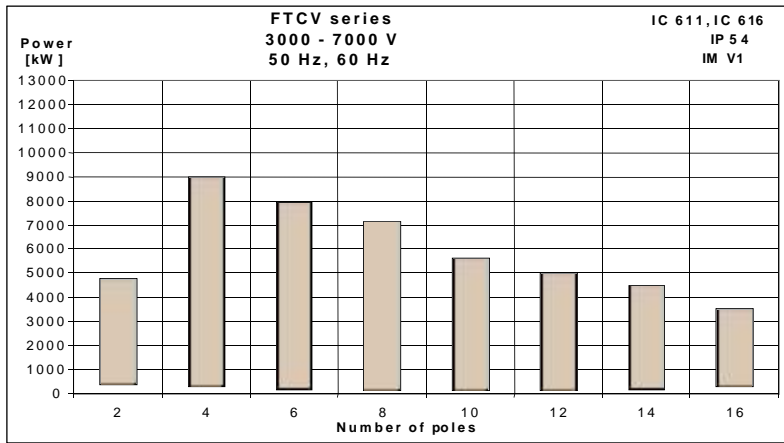
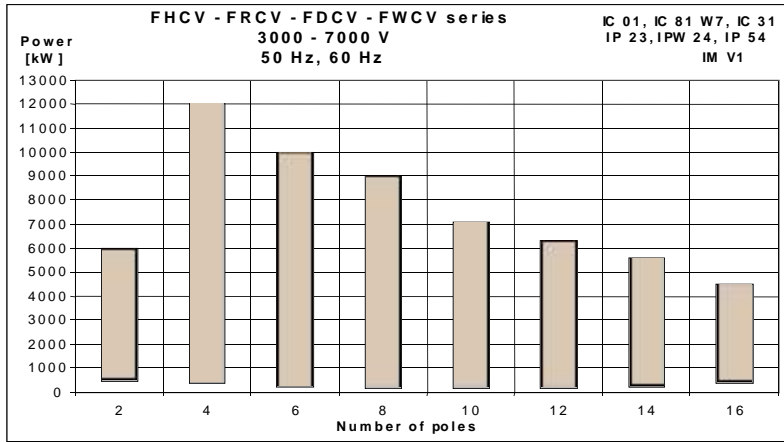
For severe conditions the basic configuration can be modified providing two angular-contact grease lubricated and self-cooled ball bearings in tandem.

Another configuration, especially designed for low-speed motors with heavy rotors, includes one spherical roller thrust bearing to carry axial load and one deep-groove ball bearing performing the guide function on the upper side. Each bearing is self-cooled or provided with water cooled oil lubrication. In the lower shield there is a deep-groove ball or cylindrical roller bearing to perform guide function.

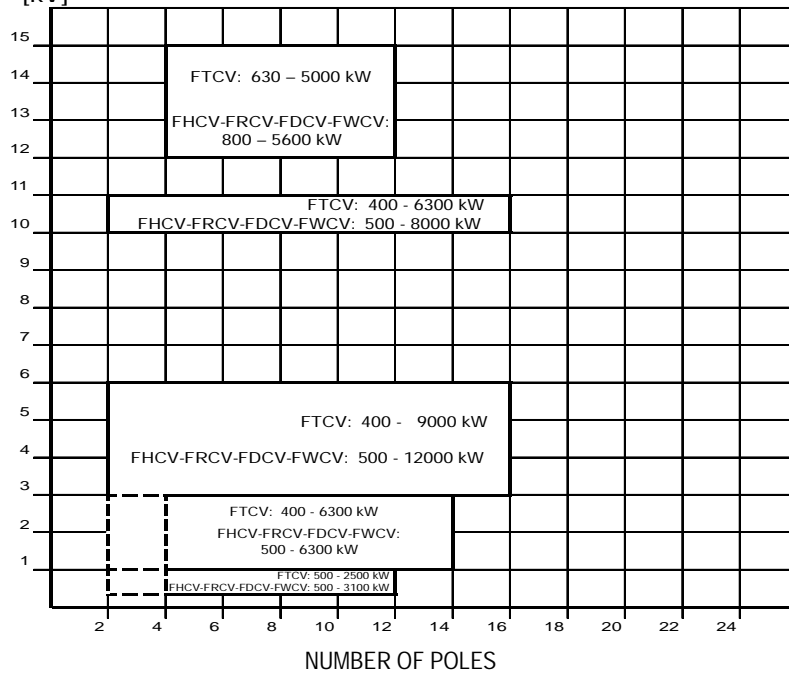
When the speed/load conditions exceed the capability of antifriction bearings, or upon request, pivoting-pad combined vertical thrust and guide bearing is used in the upper shield. Pivoting-pad or cylindrical guide bearing is mounted in the lower shield. Depending on design conditions these bearings can be self-lubricated and cooled by natural air circulation around the oil reservoir or by induced air over the finned cooling surfaces of the bearing compartment. They can also be cooled by water circulating in wire wound tube coolers submerged in the oil tank or by circulating the oil through an external air-to-water heat exchanger.



## VERTICAL SHAFT CAGE ROTOR MOTORS

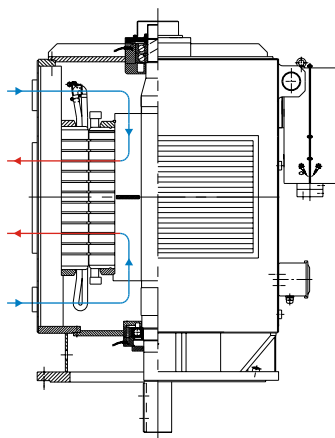


### VOLTAGE [kV]

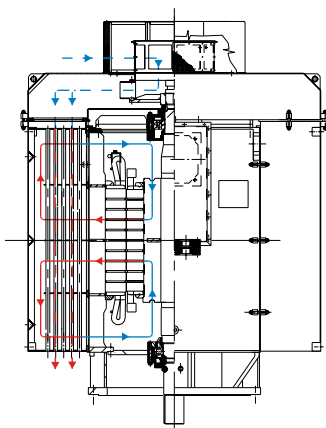


## METHOD OF COOLING

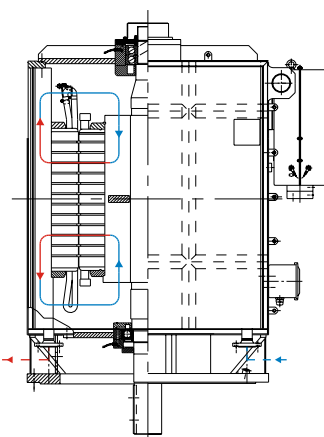
FHCV IP23 IC 01



FTCV IP54 IC 611



FRCV IP54 IC 81 W7



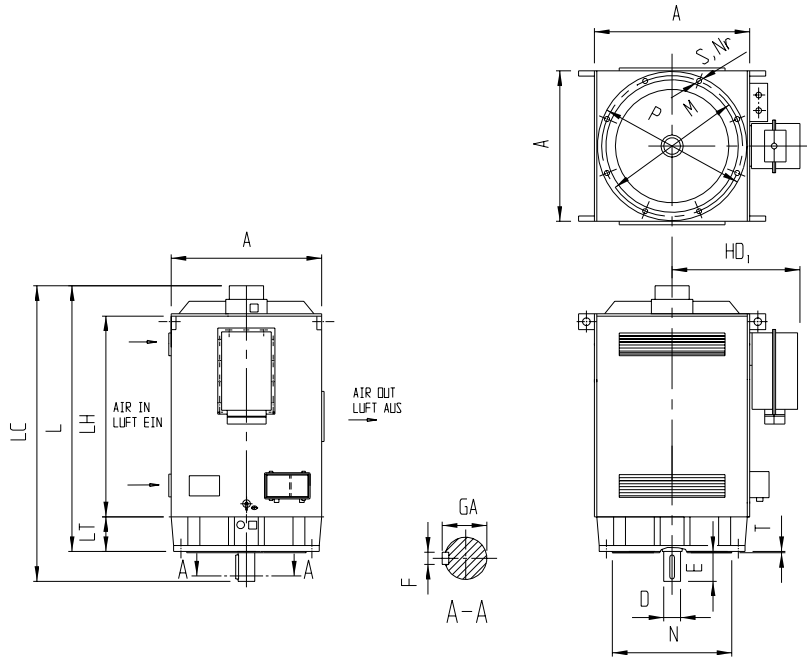
## DIMENSIONS

Type FHCV IP 23 IC 01

Design data and dimensions are subject to modification without notice.

Flange mounted motor  
IM 3011

Dimensions in mm



Type	Number of poles	A	D <sup>1)</sup>	M	N	P	S	Nr	T	E	F	GA	HD <sub>1</sub> <sup>2)</sup>	LH	LT	L	LC
400L	4-12	950	100	840	780	900	24	8	6	210	28	106	815	1050	195	1390	1600
J	4-12	950	100	840	780	900	24	8	6	210	28	106	815	1200	195	1540	1750
H	4-12	950	100	840	780	900	24	8	6	210	28	106	815	1350	195	1690	1900
450L	4-12	1050	110	940	880	1000	28	8	6	210	28	116	865	1150	245	1540	1750
K	4-12	1050	110	940	880	1000	28	8	6	210	28	116	865	1300	245	1690	1900
H	4-12	1050	110	940	880	1000	28	8	6	210	28	116	865	1450	245	1840	2050
500L	4-12	1150	130	1080	1000	1150	28	8	6	250	32	137	915	1300	245	1690	1940
K	4-12	1150	130	1080	1000	1150	28	8	6	250	32	137	915	1450	245	1840	2090
H	4-12	1150	130	1080	1000	1150	28	8	6	250	32	137	915	1650	245	2040	2290
560L	4-12	1300	150	1180	1120	1250	28	8	7	250	36	158	990	1400	275	1920	2170
K	4-12	1300	150	1180	1120	1250	28	8	7	250	36	158	990	1600	275	2120	2370
H	4-12	1300	150	1180	1120	1250	28	8	7	250	36	158	990	1800	275	2320	2570
630L	4-12	1400	180	1320	1250	1400	28	8	8	300	45	190	1040	1600	275	2120	2420
K	4-12	1400	180	1320	1250	1400	28	8	8	300	45	190	1040	1800	275	2320	2620
H	4-12	1400	180	1320	1250	1400	28	8	8	300	45	190	1040	2050	275	2570	2870
710L	4* 6-12	1600	200	1500	1400	1600	28	12	8	350	45	210	1140	1700	315	2360	2710
K	4* 6-12	1600	200	1500	1400	1600	28	12	8	350	45	210	1140	2000	315	2660	3010
H	4* 6-12	1600	200	1500	1400	1600	28	12	8	350	45	210	1140	2250	315	2910	3260
800L	6-12	1800	220	1700	1600	1800	28	12	9	350	50	231	1240	1900	315	2560	2910
K	6-12	1800	220	1700	1600	1800	28	12	9	350	50	231	1240	2200	315	2860	3210
H	6-12	1800	220	1700	1600	1800	28	12	9	350	50	231	1240	2450	315	3110	3460

1) Tolerance ISO m6

2) Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

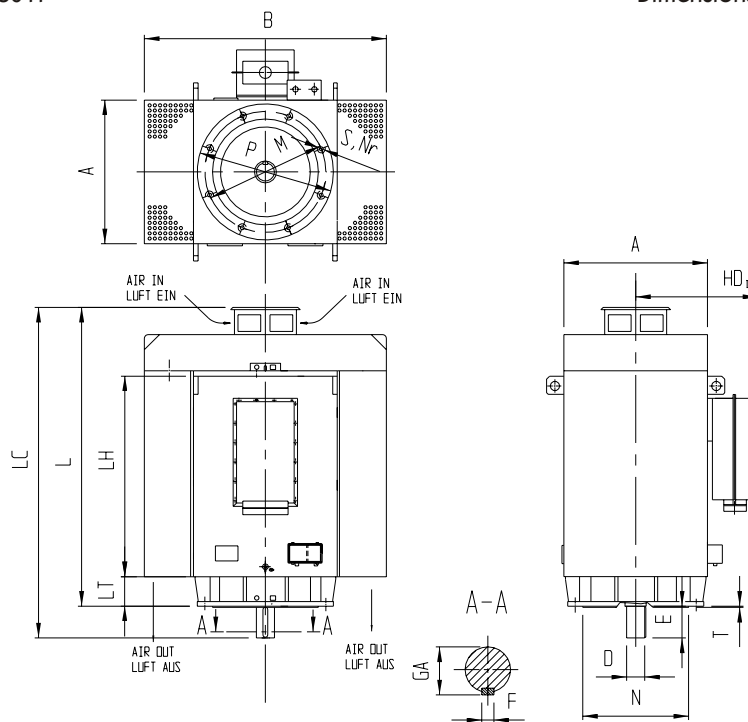
## DIMENSIONS

Type FTCV IP 54 IC 611

Design data and dimensions are subject to modification without notice.

Flange mounted motor  
IM 3011

Dimensions in mm



Type	Number of poles	A	B	D <sup>1)</sup>	M	N	P	S	N <sup>*</sup>	T	E	F	GA	HD <sup>2)</sup>	LH	LT	L	LC
400L	4-12	950	1600	100	840	780	900	24	8	6	210	28	106	815	1050	195	1690	1900
J	4-12	950	1600	100	840	780	900	24	8	6	210	28	106	815	1200	195	1840	2050
H	4-12	950	1600	100	840	780	900	24	8	6	210	28	106	815	1350	195	1990	2200
450L	4-12	1000	1700	110	940	880	1000	28	8	6	210	28	116	865	1150	245	1840	2050
K	4-12	1000	1700	110	940	880	1000	28	8	6	210	28	116	865	1300	245	1990	2200
H	4-12	1000	1700	110	940	880	1000	28	8	6	210	28	116	865	1450	245	2140	2350
500L	4-12	1150	2000	130	1080	1000	1150	28	8	6	250	32	137	915	1300	245	1990	2240
K	4-12	1150	2000	130	1080	1000	1150	28	8	6	250	32	137	915	1450	245	2140	2360
H	4-12	1150	2000	130	1080	1000	1150	28	8	6	250	32	137	915	1650	245	2340	2590
560L	4-12	1300	2300	150	1180	1120	1250	28	8	7	250	36	158	990	1400	275	2180	2430
K	4-12	1300	2300	150	1180	1120	1250	28	8	7	250	36	158	990	1600	275	2380	2630
H	4-12	1300	2300	150	1180	1120	1250	28	8	7	250	36	158	990	1800	275	2580	2830
630L	4-12	1400	2500	180	1320	1250	1400	28	8	8	300	45	190	1040	1600	275	2380	2680
K	4-12	1400	2500	180	1320	1250	1400	28	8	8	300	45	190	1040	1800	275	2580	2880
H	4-12	1400	2500	180	1320	1250	1400	28	8	8	300	45	190	1040	2050	275	2830	3130
710L	4* 6-12	1600	2800	200	1500	1400	1600	28	12	8	350	45	210	1140	1700	315	2620	2970
K	4* 6-12	1600	2800	200	1500	1400	1600	28	12	8	350	45	210	1140	2000	315	2920	3270
H	4* 6-12	1600	2800	200	1500	1400	1600	28	12	8	350	45	210	1140	2250	315	3170	3520
800L	6-12	1800	3150	220	1700	1600	1800	28	12	9	350	50	231	1240	1900	315	2820	3170
K	6-12	1800	3150	220	1700	1600	1800	28	12	9	350	50	231	1240	2200	315	3120	3470
H	6-12	1800	3150	220	1700	1600	1800	28	12	9	350	50	231	1240	2450	315	3370	3720

1) Tolerance ISO m6

2) Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

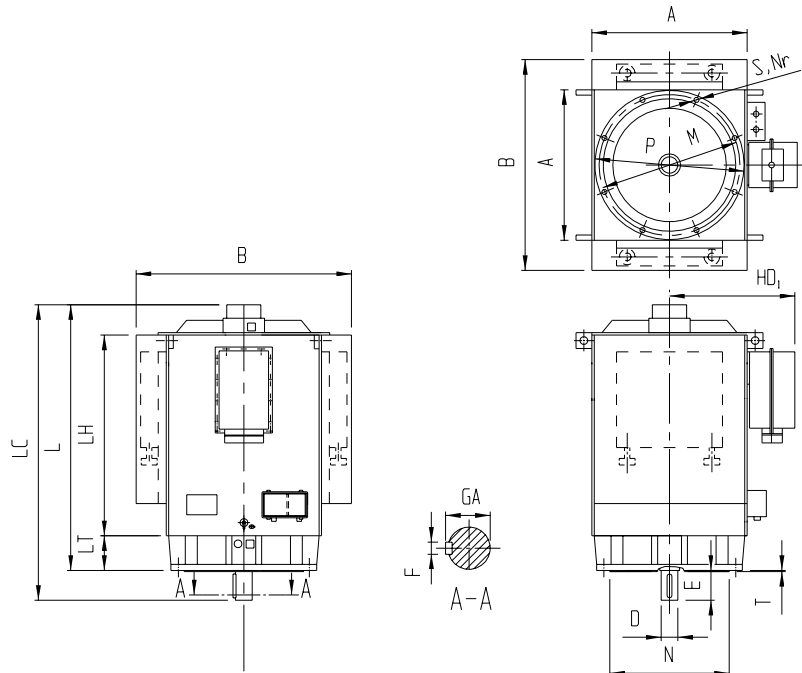
## DIMENSIONS

Type FRCV IP 54 IC 81 W7

Design data and dimensions are subject to modification without notice.

Flange mounted motor  
IM 3011

Dimensions in mm



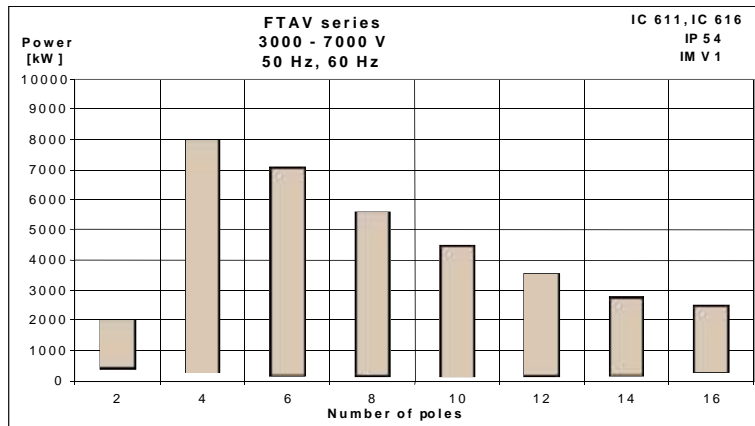
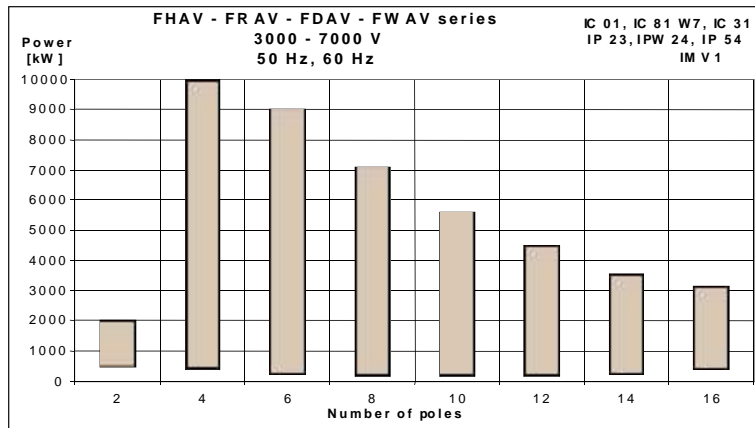
Type	Number of poles	A	B	D <sup>1)</sup>	M	N	P	S	Nr	T	E	F	GA	HD <sup>2)</sup>	LH	LT	L	LC
400 L	4-12	950	1400	100	840	780	900	24	8	6	210	28	106	815	1050	195	1390	1600
J	4-12	950	1400	100	840	780	900	24	8	6	210	28	106	815	1200	195	1540	1750
H	4-12	950	1400	100	840	780	900	24	8	6	210	28	106	815	1350	195	1690	1900
450 L	4-12	1000	1600	110	940	880	1000	28	8	6	210	28	116	865	1150	245	1540	1750
K	4-12	1000	1600	110	940	880	1000	28	8	6	210	28	116	865	1300	245	1690	1900
H	4-12	1000	1600	110	940	880	1000	28	8	6	210	28	116	865	1450	245	1840	2050
500 L	4-12	1150	1800	130	1080	1000	1150	28	8	6	250	32	137	915	1300	245	1690	1940
K	4-12	1150	1800	130	1080	1000	1150	28	8	6	250	32	137	915	1450	245	1840	2090
H	4-12	1150	1800	130	1080	1000	1150	28	8	6	250	32	137	915	1650	245	2040	2290
560 L	4-12	1300	2000	150	1180	1120	1250	28	8	7	250	36	158	990	1400	275	1920	2170
K	4-12	1300	2000	150	1180	1120	1250	28	8	7	250	36	158	990	1600	275	2120	2370
H	4-12	1300	2000	150	1180	1120	1250	28	8	7	250	36	158	990	1800	275	2320	2570
630 L	4-12	1400	2250	180	1320	1250	1400	28	8	8	300	45	190	1040	1600	275	2120	2420
K	4-12	1400	2250	180	1320	1250	1400	28	8	8	300	45	190	1040	1800	275	2320	2620
H	4-12	1400	2250	180	1320	1250	1400	28	8	8	300	45	190	1040	2050	275	2570	2870
710 L	4* 6-12	1600	2500	200	1500	1400	1600	28	12	8	350	45	210	1140	1700	315	2360	2710
K	4* 6-12	1600	2500	200	1500	1400	1600	28	12	8	350	45	210	1140	2000	315	2660	3010
H	4* 6-12	1600	2500	200	1500	1400	1600	28	12	8	350	45	210	1140	2250	315	2910	3260
800 L	6-12	1800	2800	220	1700	1600	1800	28	12	9	350	50	231	1240	1900	315	2560	2910
K	6-12	1800	2800	220	1700	1600	1800	28	12	9	350	50	231	1240	2200	315	2860	3210
H	6-12	1800	2800	220	1700	1600	1800	28	12	9	350	50	231	1240	2450	315	3110	3460

1) Tolerance ISO m6

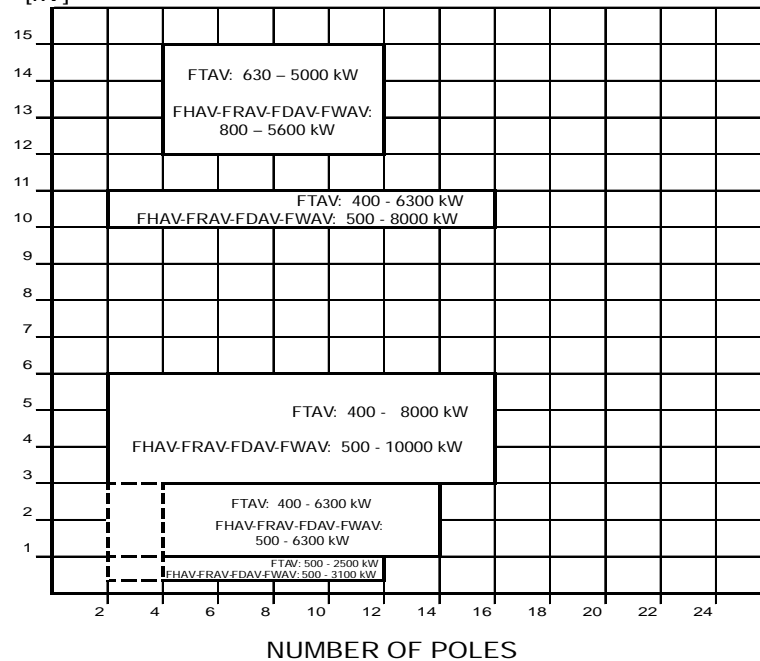
2) Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

## VERTICAL SHAFT WOUND ROTOR MOTORS



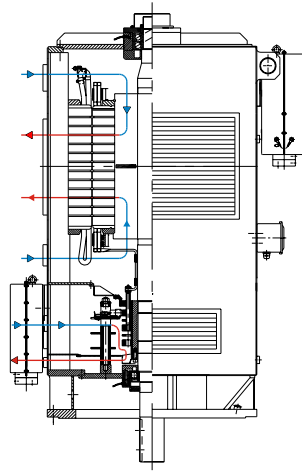
### VOLTAGE [kV]



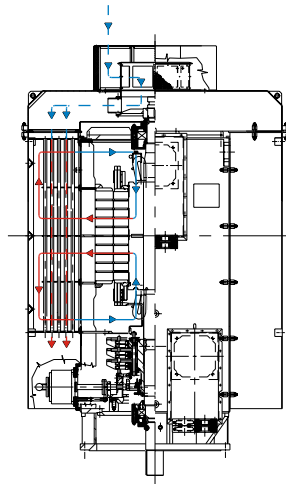


## METHOD OF COOLING

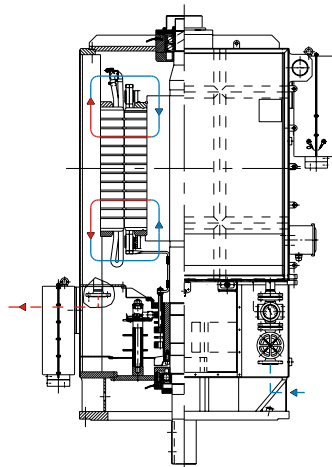
FHAV IP23 IC01



FTMV IP54 IC611



FRAV IP54 IC 81W7



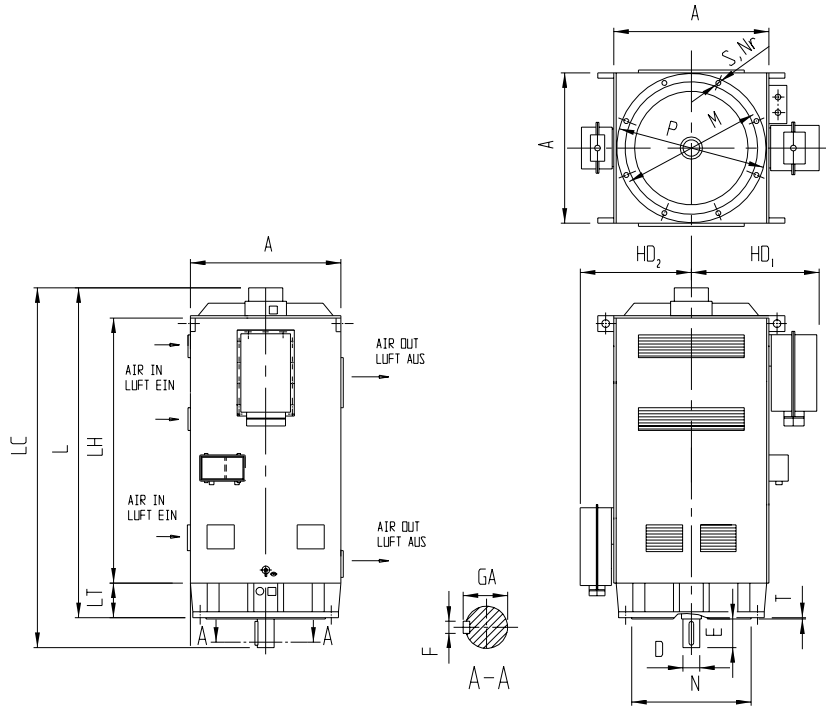
## DIMENSIONS

Type FHAV IP 23 IC 01

Flange mounted motor  
IM 3011

Design data and dimensions are  
subject to modification without notice.

Dimensions in mm



Type	Number of poles	A	D <sup>1)</sup>	M	N	P	S	N <sup>r</sup>	T	E	F	GA	HD <sub>1</sub> <sup>2)</sup>	HD <sub>2</sub> <sup>2)</sup>	LH	LT	L	LC
400 L	4-12	950	100	840	780	900	24	8	6	210	28	106	815	725	1600	195	1940	2150
J	4-12	950	100	840	780	900	24	8	6	210	28	106	815	725	1750	195	2090	2300
H	4-12	950	100	840	780	900	24	8	6	210	28	106	815	725	1900	195	2240	2450
450 L	4-12	1000	110	940	880	1000	28	8	6	210	28	116	865	775	1700	245	2090	2300
K	4-12	1000	110	940	880	1000	28	8	6	210	28	116	865	775	1850	245	2240	2450
H	4-12	1000	110	940	880	1000	28	8	6	210	28	116	865	775	2000	245	2390	2600
500 L	4-12	1150	130	1080	1000	1150	28	8	6	250	32	137	915	825	1850	245	2240	2490
K	4-12	1150	130	1080	1000	1150	28	8	6	250	32	137	915	825	2000	245	2390	2640
H	4-12	1150	130	1080	1000	1150	28	8	6	250	32	137	915	825	2200	245	2590	2840
560 L	4-12	1300	150	1180	1120	1250	28	8	7	250	36	158	990	900	2000	275	2520	2770
K	4-12	1300	150	1180	1120	1250	28	8	7	250	36	158	990	900	2200	275	2720	2970
H	4-12	1300	150	1180	1120	1250	28	8	7	250	36	158	990	900	2400	275	2920	3170
630 L	4-12	1400	180	1320	1250	1400	28	8	8	300	45	190	1040	950	2200	275	2720	3070
K	4-12	1400	180	1320	1250	1400	28	8	8	300	45	190	1040	950	2400	275	2920	3220
H	4-12	1400	180	1320	1250	1400	28	8	8	300	45	190	1040	950	2650	275	3170	3470
710 L	4* 6-12	1600	200	1500	1400	1600	28	12	8	350	45	210	1140	1050	2400	315	3060	3410
K	4* 6-12	1600	200	1500	1400	1600	28	12	8	350	45	210	1140	1050	2650	315	3310	3660
H	4* 6-12	1600	200	1500	1400	1600	28	12	8	350	45	210	1140	1050	2900	315	3560	3910
800 L	6-12	1800	220	1700	1600	1800	28	12	9	350	50	231	1240	1150	2600	315	3260	3610
K	6-12	1800	220	1700	1600	1800	28	12	9	350	50	231	1240	1150	2900	315	3560	3910
H	6-12	1800	220	1700	1600	1800	28	12	9	350	50	231	1240	1150	3150	315	3810	4160

1) Tolerance ISO m6

2) Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

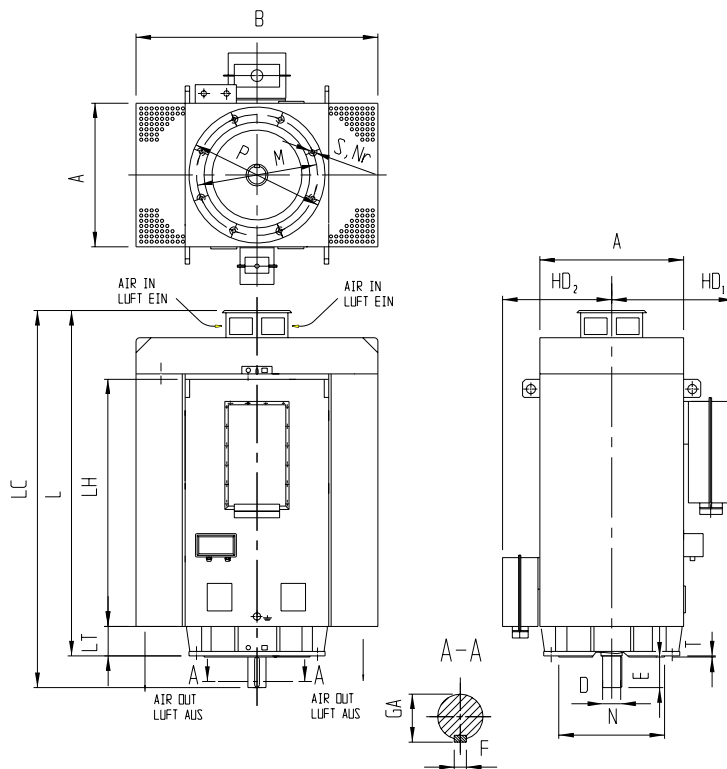
## DIMENSIONS

Type FTAV IP 54 IC 611

Design data and dimensions are subject to modification without notice.

Flange mounted motor  
IM 3011

Dimensions in mm



Type	Number of poles	A	B	D <sup>1)</sup>	M	N	P	S	Nr	T	E	F	GA	HD <sub>1</sub> <sup>2)</sup>	HD <sub>2</sub> <sup>2)</sup>	LH	LT	L	LC
400 L	4-12	950	1600	100	840	780	900	24	8	6	210	28	106	815	725	1600	195	2240	2450
J	4-12	950	1600	100	840	780	900	24	8	6	210	28	106	815	725	1750	195	2380	2600
H	4-12	950	1600	100	840	780	900	24	8	6	210	28	106	815	725	1900	195	2540	2750
450 L	4-12	1000	1700	110	940	880	1000	28	8	6	210	28	116	865	775	1700	245	2380	2600
K	4-12	1000	1700	110	940	880	1000	28	8	6	210	28	116	865	775	1850	245	2540	2750
H	4-12	1000	1700	110	940	880	1000	28	8	6	210	28	116	865	775	2000	245	2690	2900
500 L	4-12	1150	2000	130	1080	1000	1150	28	8	6	250	32	137	915	825	1850	245	2540	2790
K	4-12	1150	2000	130	1080	1000	1150	28	8	6	250	32	137	915	825	2000	245	2690	2940
H	4-12	1150	2000	130	1080	1000	1150	28	8	6	250	32	137	915	825	2200	245	2890	3140
560 L	4-12	1300	2300	150	1180	1120	1250	28	8	7	250	36	158	990	900	2000	275	2780	3030
K	4-12	1300	2300	150	1180	1120	1250	28	8	7	250	36	158	990	900	2200	275	2980	3230
H	4-12	1300	2300	150	1180	1120	1250	28	8	7	250	36	158	990	900	2400	275	3180	3430
630 L	4-12	1400	2500	180	1320	1250	1400	28	8	8	300	45	190	1040	950	2200	275	2980	3280
K	4-12	1400	2500	180	1320	1250	1400	28	8	8	300	45	190	1040	950	2400	275	3180	3480
H	4-12	1400	2500	180	1320	1250	1400	28	8	8	300	45	190	1040	950	2650	275	3430	3730
710 L	4* 6-12	1600	2800	200	1500	1400	1600	28	12	8	350	45	210	1140	1050	2400	315	3320	3670
K	4* 6-12	1600	2800	200	1500	1400	1600	28	12	8	350	45	210	1140	1050	2650	315	3570	3920
H	4* 6-12	1600	2800	200	1500	1400	1600	28	12	8	350	45	210	1140	1050	2900	315	3820	4170
800 L	6-12	1800	3150	220	1700	1600	1800	28	12	9	350	50	231	1240	1150	2600	315	3520	3870
K	6-12	1800	3150	220	1700	1600	1800	28	12	9	350	50	231	1240	1150	2900	315	3820	4170
H	6-12	1800	3150	220	1700	1600	1800	28	12	9	350	50	231	1240	1150	3150	315	4070	4420

1) Tolerance ISO m6

2) Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

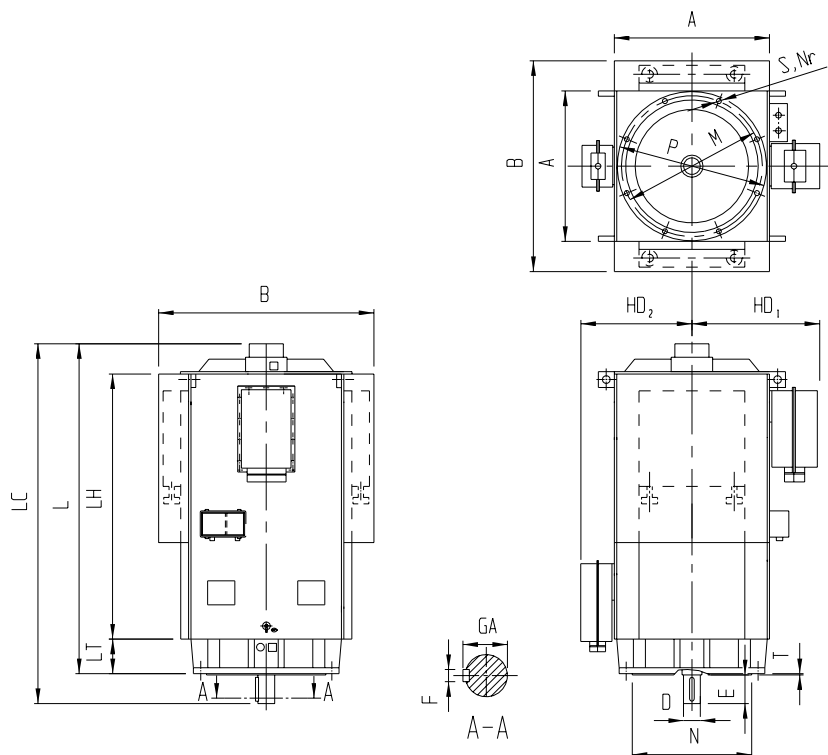
## DIMENSIONS

Type FRAV IP 54 IC 81 W7

Flange mounted motor  
IM 3011

Design data and dimensions are  
subject to modification without notice.

Dimensions in mm



Type	Number of poles	A	B	D <sup>1)</sup>	M	N	P	S	N <sup>r</sup>	T	E	F	GA	HD <sub>1</sub> <sup>2)</sup>	HD <sub>2</sub> <sup>2)</sup>	LH	LT	L	LC
400 L	4-12	950	1400	100	840	780	900	24	8	6	210	28	106	815	725	1600	195	1940	2150
J	4-12	950	1400	100	840	780	900	24	8	6	210	28	106	815	725	1750	195	2090	2300
H	4-12	950	1400	100	840	780	900	24	8	6	210	28	106	815	725	1900	195	2240	2450
450 L	4-12	1000	1600	110	940	880	1000	28	8	6	210	28	116	865	775	1700	245	2090	2300
K	4-12	1000	1600	110	940	880	1000	28	8	6	210	28	116	865	775	1850	245	2240	2450
H	4-12	1000	1600	110	940	880	1000	28	8	6	210	28	116	865	775	2000	245	2390	2600
500 L	4-12	1150	1800	130	1080	1000	1150	28	8	6	250	32	137	915	825	1850	245	2240	2490
K	4-12	1150	1800	130	1080	1000	1150	28	8	6	250	32	137	915	825	2000	245	2390	2640
H	4-12	1150	1800	130	1080	1000	1150	28	8	6	250	32	137	915	825	2200	245	2590	2840
560 L	4-12	1300	2000	150	1180	1120	1250	28	8	7	250	36	158	990	900	2000	275	2520	2770
K	4-12	1300	2000	150	1180	1120	1250	28	8	7	250	36	158	990	900	2200	275	2720	2970
H	4-12	1300	2000	150	1180	1120	1250	28	8	7	250	36	158	990	900	2400	275	2920	3170
630 L	4-12	1400	2250	180	1320	1250	1400	28	8	8	300	45	190	1040	950	2200	275	2720	3070
K	4-12	1400	2250	180	1320	1250	1400	28	8	8	300	45	190	1040	950	2400	275	2920	3220
H	4-12	1400	2250	180	1320	1250	1400	28	8	8	300	45	190	1040	950	2650	275	3170	3470
710 L	4* 6-12	1600	2500	200	1500	1400	1600	28	12	8	350	45	210	1140	1050	2400	315	3060	3410
K	4* 6-12	1600	2500	200	1500	1400	1600	28	12	8	350	45	210	1140	1050	2650	315	3310	3660
H	4* 6-12	1600	2500	200	1500	1400	1600	28	12	8	350	45	210	1140	1050	2900	315	3560	3910
800 L	6-12	1800	2800	220	1700	1600	1800	28	12	9	350	50	231	1240	1150	2600	315	3260	3610
K	6-12	1800	2800	220	1700	1600	1800	28	12	9	350	50	231	1240	1150	2900	315	3560	3910
H	6-12	1800	2800	220	1700	1600	1800	28	12	9	350	50	231	1240	1150	3150	315	3810	4160

1) Tolerance ISO m6

2) Standard terminal box / Upon request alternative terminal box may be supplied.

\* with plain-bearing block

## OPTIONS

SLIDE BEARINGS

SEPARATE FAN MOTORS ( IC 616 )

SECONDARY SHAFT EXTENSION

MOTOR DRIVEN BRUSH LIFTING DEVICE

TACHOGENERATOR

COUPLING INSTALLATION

NOISE SILENCER

BACK STOP DEVICE

TERMINAL BOXES :                      Secondary main terminal box  
   Neutral point terminal box  
   Neutral point terminal box with CT-s  
   Main terminal box with lightning  
   arrestors and / or surge capacitors

Foundation ACCESSORIES :      Base plate  
   Sole plate  
   Foundation beam

INSTRUMENTATION :                  Additional RTD-s (Pt 100)  
   Dial type thermometers  
   Thermistors on end winding parts  
   Vibration monitoring  
   Bearing SPM probes  
   Bently Nevada bearing monitoring  
   Water leakage detector  
   Humidity sensor  
   Water flow-switch  
   Water flow-meter  
   Water pressure-gauge  
   Differential manometer or  
   vacuum-switch for filter fouling  
   Oil flow regulator  
   Oil pressure-gauge

FURTHER EXTRAS :                      Slipring room lighting  
   Power factor correcting capacitor  
   Starting rheostat  
   Special inox-wool filter