

FRC type high voltage induction motors

FRC type belongs to our general purpose F series, consisting of horizontal, foot mounted (IM B3, IEC 34-7) induction machines constructed on the principle of variable modules. FRC type is totally enclosed (IP 54, IEC 34-5), self-ventilated with air-to-water heat exchanger (IC 81 W7, IEC 34-6) and squirrel cage rotor for direct starting. The range of rated powers as a function of number of poles of the 6000 V, 50 Hz basic design motors with class F insulation for S1 type duty as per IEC 34-1 operational conditions are shown on the diagram below.

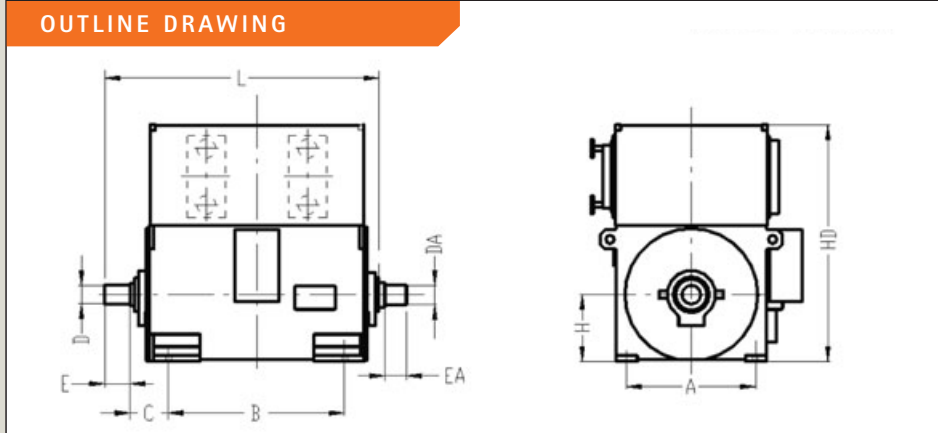
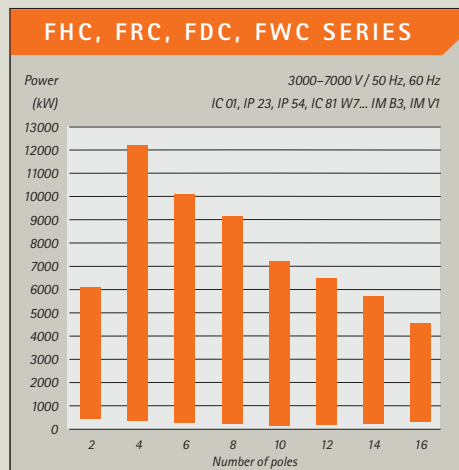


Pt 100 resistance temperature detectors are built in the stator slots and at the bearings.

Main constructional features of the motors are robust welded stator case, fabricated steel shields, labyrinth sealed bearings with grease disc, two symmetrical inner air circuits with radial air ducts for both directions of rotation, top mounted heat exchanger with brass tubes, two-layer stator winding with strengthened turn-to-turn insulation, fabricated steel terminal boxes of IP 55 protection grade with pressure relief membrane, double cage rotor for heavy starting.



On special request we build in additional sensors (microswitch, contact thermometer, vibration sensor, speed sensor) and space heaters. Beside the basic design we can deliver variants of special electrical (15 kV, 60 Hz, 6 terminals, two voltage level, even higher pole numbers than shown in the table) and constructional (two shaft ends, slide bearing, increased safety, pressurized and non-sparking type design for potentially explosive environment) versions and variants meeting special requirements and standards (low noise, high runaway speed, increased reliability for energetics, etc.).



FRC IP 44 IC 81 W7 / OVERALL DIMENSION OF MOTOR

Type	Number of poles	A	B	C	D, DA	E, EA	H	HD	L	LC
400 K	4-12	800	800	250	110	210	400	1600	1555	1770
400 H	4-12	800	1000	250	110	210	400	1600	1765	1980
450 L	4-12	900	800	250	120	210	450	1800	1555	1770
450 K	4-12	900	900	250	120	210	450	1800	1705	1920
450 H	4-12	900	1120	250	120	210	450	1800	1875	2090
500 L	4-12	1000	900	280	140	250	500	2000	1765	2020
500 K	4-12	1000	1000	280	140	250	500	2000	1935	2190
500 H	4-12	1000	1250	280	140	250	500	2000	2125	2380
560 L	4-12	1120	1000	280	160	300	560	2250	1925	2230
560 K	4-12	1120	1120	280	160	300	560	2250	2115	2420
560 H	4-12	1120	1400	280	160	300	560	2250	2315	2620
630 L	4-12	1250	1120	315	160	300	630	2500	2116	2430
630 K	4-12	1250	1250	315	180	300	630	2500	2320	2630
630 H	4-12	1250	1600	315	180	300	630	2500	2570	2880
710 L	4*-6-12	1400	1250	315	180	300	710	2500	2280	2600
710 K	4*-6-12	1400	1400	315	200	350	710	2800	2585	2950
710 H	4*-6-12	1400	1800	315	200	350	710	2800	2835	3200
800 L	4*-6-12	1600	1600	315	220	350	800	2800	2525	2890
800 K	4*-6-12	1600	1800	315	220	350	800	2800	2815	3180
800 H	4*-6-12	1600	2000	315	250	410	800	2800	3170	3590

* with slide-bearing block



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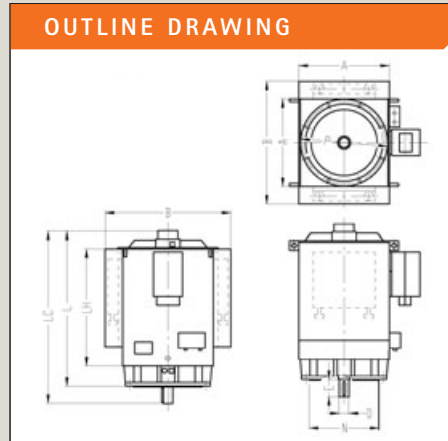
FRCV type high voltage induction motors

FRC type belongs to our general purpose F series, consisting of vertical, flange mounted (IMV1, IEC 34-7) induction machines constructed on principle of variable modules. FRC type is totally enclosed (IP 54, IEC 34-5), self-ventilated motor with air-to water heat exchanger (IC 81 W7, IEC 34-6) and squirrel cage rotor for direct starting. The range of rated powers as a function of number of poles of the 6000 V, 50 Hz basic design motors with class F insulation for S1 type duty as per IEC 34-1 operational conditions are shown on the diagram below.

Main constructional features of the motors are robust welded stator case, fabricated steel shields, labyrinth sealed bearings with grease disc, two symmetrical inner air circuits with radial air ducts for both directions of rotation, side mounted heat exchanger with brass tubes, two-layer stator winding with strengthened turn-to-turn insulation, fabricated steel

terminal boxes of IP 55 protection grade with pressure relief membrane, double cage rotor for heavy starting. Pt 100 resistance temperature detectors are built in the stator slots and at the bearings.

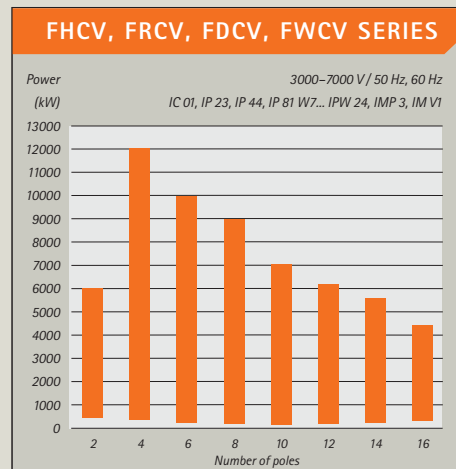
On special request we build in additional sensors (microswitch, contact thermometer, vibration sensor, speed sensor) and space heaters. Beside the basic design we can deliver variants of special electrical (15 kV, 60 Hz, 6 terminals, two voltage level, even higher pole numbers than shown in the table) and constructional (increased safety, pressurized and non-sparking type design for potentially explosive environment) versions and variants meeting with special requirements and standards (low noise, high runaway speed, increased reliability for energetics, etc.). Oil lubricated spherical roller bearings are applied for high axial loads and low-speed motors, or oil lubricated slide thrust bearings for high-speed motors.



FRCV IP 44 IC 81 W7 / OVERALL DIMENSION OF MOTOR

Type	Number of poles	A	D	N	P	E	LH	L	LC
400 L	4-12	950	100	780	900	210	1050	1390	1600
400 J	4-12	950	100	780	900	210	1200	1540	1750
400 H	4-12	950	100	780	900	210	1350	1690	1900
450 L	4-12	1050	110	880	1000	210	1150	1540	1750
450 K	4-12	1050	110	880	1000	210	1300	1690	1900
450 H	4-12	1050	110	880	1000	210	1450	1840	2050
500 L	4-12	1150	130	1000	1150	250	1300	1690	1940
500 K	4-12	1150	130	1000	1150	250	1450	1840	2090
500 H	4-12	1150	130	1000	1150	250	1650	2040	2290
560 L	4-12	1300	150	1120	1250	250	1400	1920	2170
560 K	4-12	1300	150	1120	1250	250	1600	2120	2370
560 H	4-12	1300	150	1120	1250	250	1800	2320	2570
630 L	4-12	1400	180	1250	1400	300	1600	2120	2420
630 K	4-12	1400	180	1250	1400	300	1800	2320	2620
630 H	4-12	1400	180	1250	1400	300	2050	2570	2870
710 L	4*-6-12	1600	200	1400	1600	350	1700	2360	2710
710 K	4*-6-12	1600	200	1400	1600	350	2000	2660	3010
710 H	4*-6-12	1600	200	1400	1600	350	2250	2910	3260
800 L	6-12	1800	220	1600	1800	350	1900	2560	2910
800 K	6-12	1800	220	1600	1800	350	2200	2860	3210
800 H	6-12	1800	220	1600	1800	350	2450	3110	3460

*with slide-bearing block



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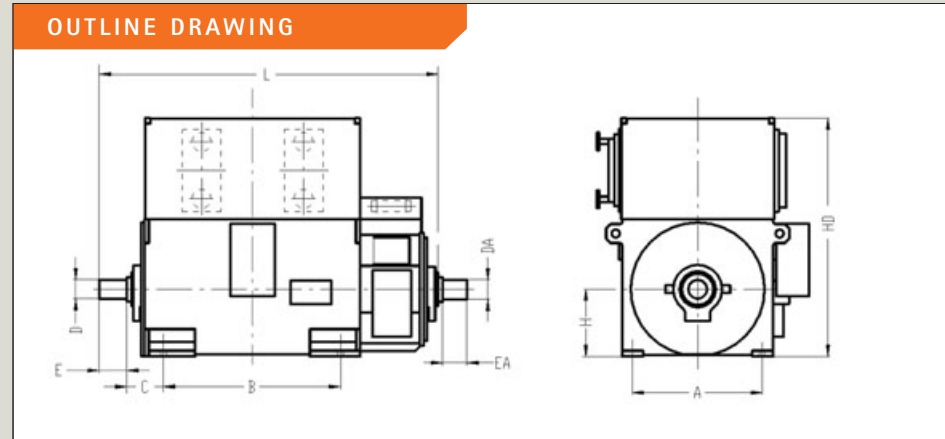
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FRA type high voltage induction motors

FRA type belongs to our general purpose F series, consisting of horizontal, foot mounted (IM B3, IEC 34-7) induction machines constructed on principle of variable modules. FRA type is totally enclosed (IP 54, IEC 34-5), self cooled with air-to-water heat exchanger (IC 81 W7, IEC 34-6) and slip-ring rotor with permanently operating brushes with rotor circuit resistance for starting and speed control. The range of rated powers as a function of number of poles of the 6000 V, 50 Hz basic design motors with class F insulation for S1 type duty as per IEC 34-1 operational conditions are shown on the diagram below.

Main constructional features of the motors are robust welded stator case, fabricated steel shields, labyrinth sealed bearings with grease disk, two symmetrical inner air circuits with radial air ducts for both directions of rotation, top mounted heat exchanger with brass tubes, two-layer stator winding with strengthened turn-to-turn insulation, fabricated steel terminal boxes of IP 55 protection grade with pressure relief membrane, 3-phase two-layer rotor winding. Pt 100 resistance temperature detectors are built in the stator slots and at the bearings.

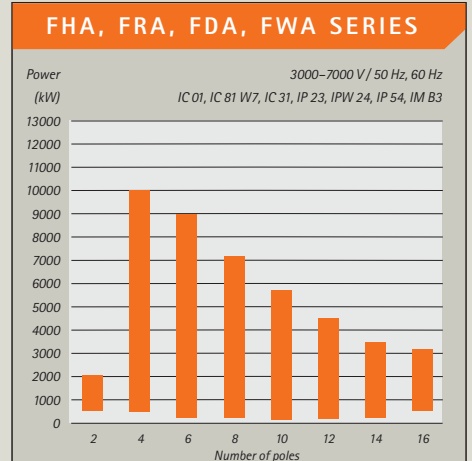
On special request we build in additional sensors (microswitch, contact thermometer, vibration sensor, speed sensor) and space heaters. Beside the basic design we can deliver variants of special electrical (15 kV, 60 Hz, 6 terminals, two voltage level, even higher pole numbers than shown in the table) and constructional (two shaft ends, slide bearings, manual or motor driven brush-lifting device with short circuiting contacts, weather protected or pipe connection design) versions and variants meeting special requirements and standards (low noise, high runaway speed, speed control with thyristor cascade, etc.).



FRA IP 44 IC 81 W7 / OVERALL DIMENSION OF MOTOR

Type	Number of poles	A	B	C	D, DA	E, EA	H	HD	L	LC
400 K	4-12	800	800	250	110	210	400	1600	2085	2300
400 H	4-12	800	1000	250	110	210	400	1600	2295	2510
450 L	4-12	900	800	250	120	210	450	1800	2085	2300
450 K	4-12	900	900	250	120	210	450	1800	2235	2450
450 H	4-12	900	1120	250	120	210	450	1800	2405	2620
500 L	4-12	1000	900	280	140	250	500	2000	2295	2550
500 K	4-12	1000	1000	280	140	250	500	2000	2465	2720
500 H	4-12	1000	1250	280	140	250	500	2000	2655	2910
560 L	4-12	1120	1000	280	160	300	560	2250	2525	2830
560 K	4-12	1120	1120	280	160	300	560	2250	2715	3020
560 H	4-12	1120	1400	280	160	300	560	2250	2915	3220
630 L	4-12	1250	1120	315	160	300	630	2250	2716	3030
630 K	4-12	1250	1250	315	180	300	630	2500	2920	3230
630 H	4-12	1250	1600	315	180	300	630	2500	3170	3480
710 L	4*-6-12	1400	1250	315	180	300	710	2500	2950	3270
710 K	4*-6-12	1400	1400	315	200	350	710	2800	3255	3620
710 H	4*-6-12	1400	1800	315	200	350	710	2800	3505	3870
800 L	4*-6-12	1600	1600	315	220	350	800	2800	3195	3560
800 K	4*-6-12	1600	1800	315	220	350	800	2800	3485	3850
800 H	4*-6-12	1600	2000	315	250	410	800	2800	3840	4260

* with slide-bearing block



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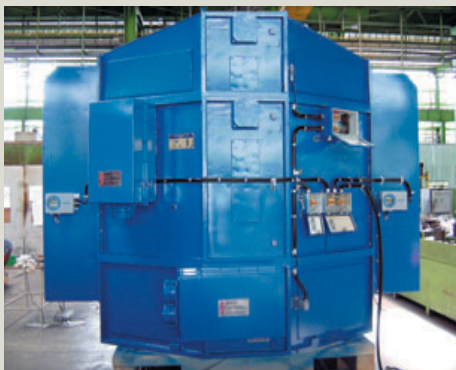
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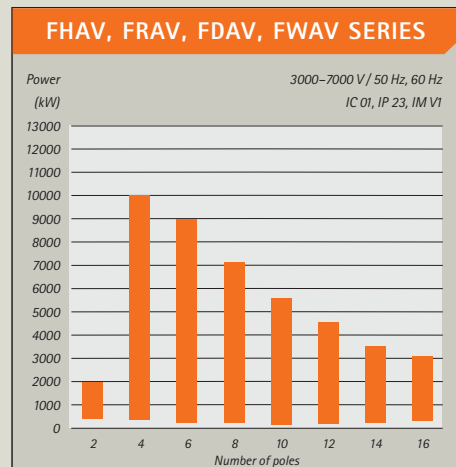
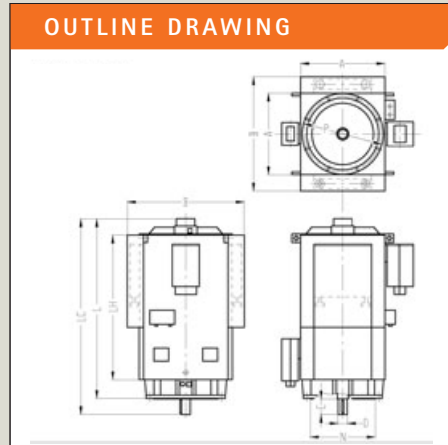
FRAV type high voltage induction motors

FRAV type belongs to our general purpose F series, consisting of vertical, flange mounted (IM V1, IEC 34-7) induction machines constructed on principle of variable modules. FRAV type is totally enclosed (IP 54, IEC 34-5), self cooled motor with air-to-water heat exchanger (IC 81 W7, IEC 34-6) and slip-ring rotor with permanently operating brushes with rotor circuit resistance for starting and speed control. The range of rated powers as a function of number of poles of the 6000 V, 50 Hz basic design motors with class F insulation for S1 type duty as per IEC 34-1 operational conditions are shown on the diagram below.

Main constructional features of the motors are robust welded stator case, fabricated steel shields, labyrinth sealed bearings with grease disk, two symmetrical inner air circuits with radial air ducts for both directions of rotation, side mounted heat exchanger with brass tubes, two-layer stator winding with strengthened turn-to-turn insulation, fabricated steel terminal boxes of IP 55 protection grade with pressure relief membrane, 3-phase two-layer rotor winding. Pt 100 resistance temperature detectors are built in the stator slots and at the bearings.



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FRAV IP 44 IC 81 W7 / OVERALL DIMENSION OF MOTOR

Type	Number of poles	A	D	N	P	E	LH	L	LC
400 L	4-12	950	100	780	900	210	1600	1940	2150
400 J	4-12	950	100	780	900	210	1750	2090	2300
400 H	4-12	950	100	780	900	210	1900	2240	2450
450 L	4-12	1050	110	880	1000	210	1700	2090	2300
450 K	4-12	1050	110	880	1000	210	1850	2240	2450
450 H	4-12	1050	110	880	1000	210	2000	2390	2600
500 L	4-12	1150	130	1000	1150	250	1850	2240	2490
500 K	4-12	1150	130	1000	1150	250	2000	2390	2640
500 H	4-12	1150	130	1000	1150	250	2200	2590	2840
560 L	4-12	1300	150	1120	1250	250	2000	2520	2770
560 K	4-12	1300	150	1120	1250	250	2200	2720	2970
560 H	4-12	1300	150	1120	1250	250	2400	2920	3170
630 L	4-12	1400	180	1250	1400	300	2200	2720	3070
630 K	4-12	1400	180	1250	1400	300	2400	2920	3220
630 H	4-12	1400	180	1250	1400	300	2650	3170	3470
710 L	4*-6-12	1600	200	1400	1600	350	2400	3060	3410
710 K	4*-6-12	1600	200	1400	1600	350	2650	3310	3660
710 H	4*-6-12	1600	200	1400	1600	350	2900	3560	3910
800 L	6-12	1800	220	1600	1800	350	2600	3260	3610
800 K	6-12	1800	220	1600	1800	350	2900	3560	3910
800 H	6-12	1800	220	1600	1800	350	3150	3810	4160

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