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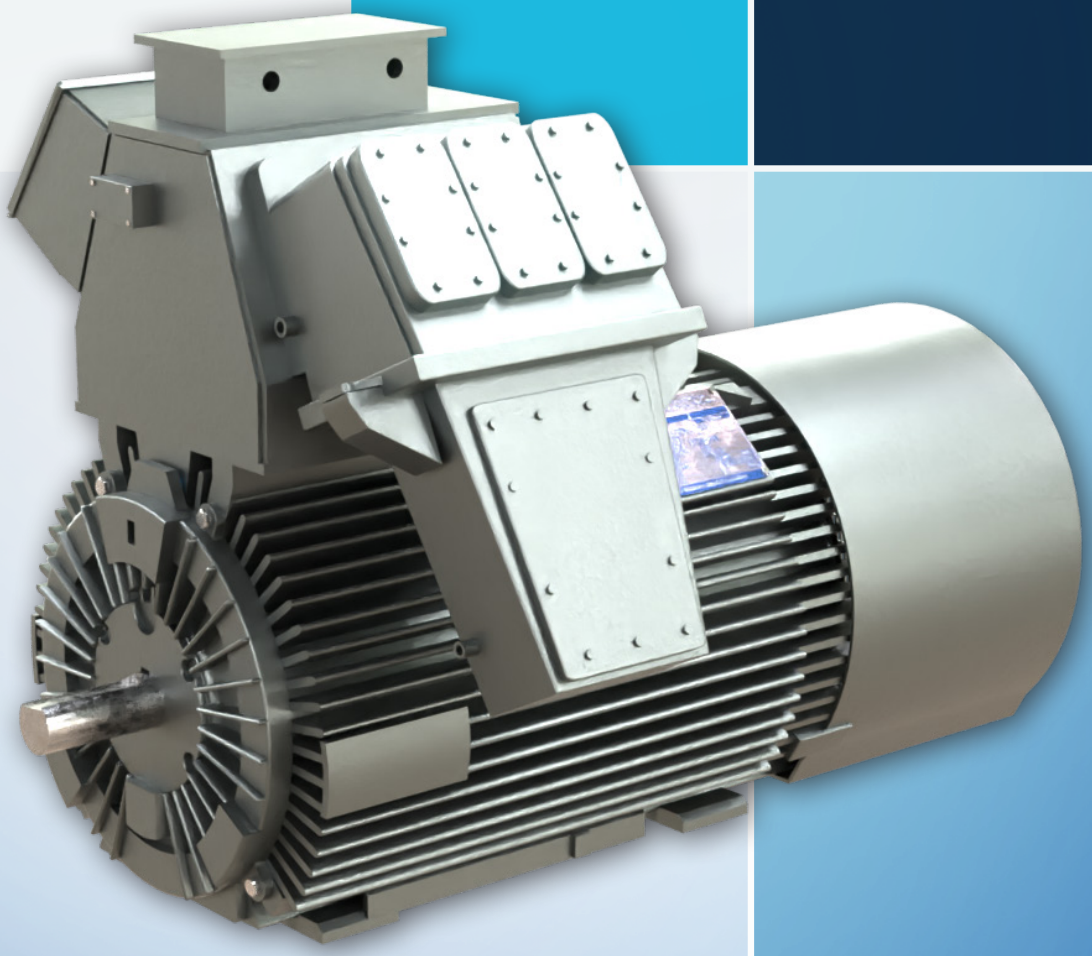
Coatings

Marathon Flowpak Series TEFC Cage Induction Motors

May 2025
India



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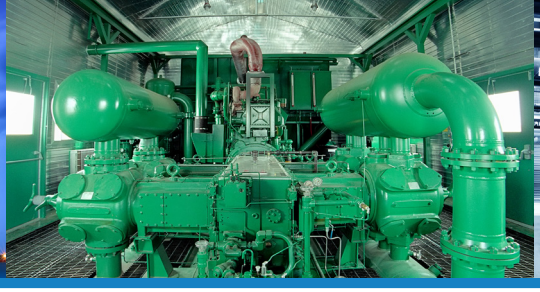
WEG Group

Driving efficiency and sustainability

weg


MARATHON® FLOWPAK SERIES MOTORS

Flowpak is a range of totally enclosed fan cooled cage induction motors available horizontally or vertically mounted for connection to supply voltages up to 11kV, outputs up to 1200kW.

Flowpak motors are part of integrated range of induction machines, manufactured in a modern production facility dedicated to total quality.

Flowpak 2 range has three frame sizes with shaft heights 280, 315 and 355mm and Flowpak 3 range has also five frame sizes with shaft centre height 355, 400, 450, 500 and 560mm. Standard designs cover 2 to 10 pole speeds and all sizes/ speeds are all available with grease lubricated rolling element.*

The Marathon® Flowpak range of induction motors has been in the global market for many years, supporting wide range of arduous industrial applications.

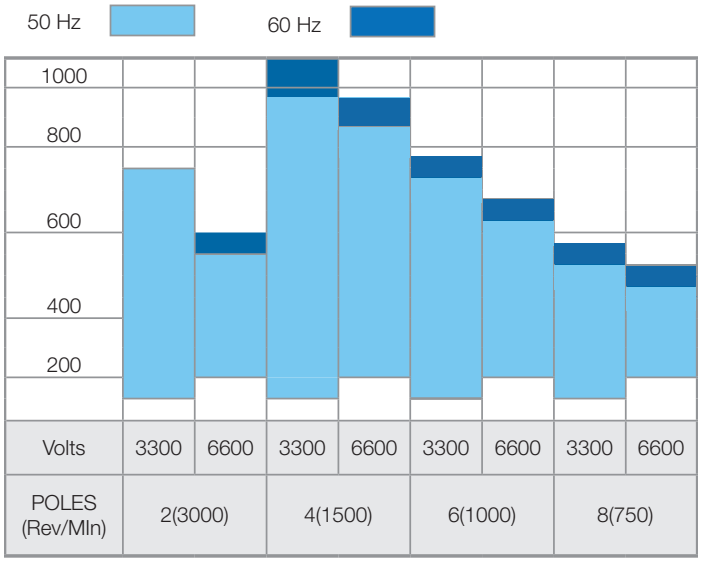
DESIGN AND OPERATIONAL FEATURES

High efficiency	Up to 97% (Flowpak 2) and 96% (Flowpak 3)
Low noise level (MSPL)	Up to 85dB (A) at 1.5 Mt.
Low stg. current	Up to 500% for 4 pole
High torque	80% voltage starting on load
Short manufacturing cycle	Upto 8 weeks
High flexibility	Adaptable to specific customer needs.
Low cost	Globally competitive

*For higher poles, please connect with works or sales representative.

STANDARDS AND SPECIFICATION

Power output



Volts	3300	6600	3300	6600	3300	6600	3300	6600
POLES (Rev/Mln)	2(3000)		4(1500)		6(1000)		8(750)	

Ratings and Performances

Flowpak motors comply with the requirement of IS/ IEC 60034-1, the relevant Indian standards. They are designed for continuous duty corresponding to Duty Type S1of IS/IEC 60034-1, with a temperature rise by resistance not exceeding 80K in a maximum ambient temperature of 40**0**C. The preferred rating will be offered and performance data will be quoted accordingly.

Dimensions

Dimensions are in accordance with IS1231, IEC 72 and 72A.

Degree of Protection by Enclosure

All motors in the Flowpak range have a degree of protection IP55 as standard, confirming to the requirements of IEC 34-5 & IS:4691. IP56 degree of protection, dust protected and suitable for operation in heavy seas (ships deck duty). Can also be provided on request.

Method of Cooling

The standard of cooling form as defined within IEC34-6 is IC411 - Totally Enclosed Fan Cooled (TEFC).

Mounting

Mounting designations are in accordance with IEC 34-7 Code 11 and BS4999. The standard mounting arrangements available on all frame sizes are:

IM1001 - Horizontal foot

IM3001 - Vertical flange

IM2001 - Horizontal foot and flange

Supply

Standard ratings are based on supply voltages of 415V, 690V, 3300V, 6600V or 11000V on a 50Hz supply frequency. Other voltages and frequency combinations available on request.

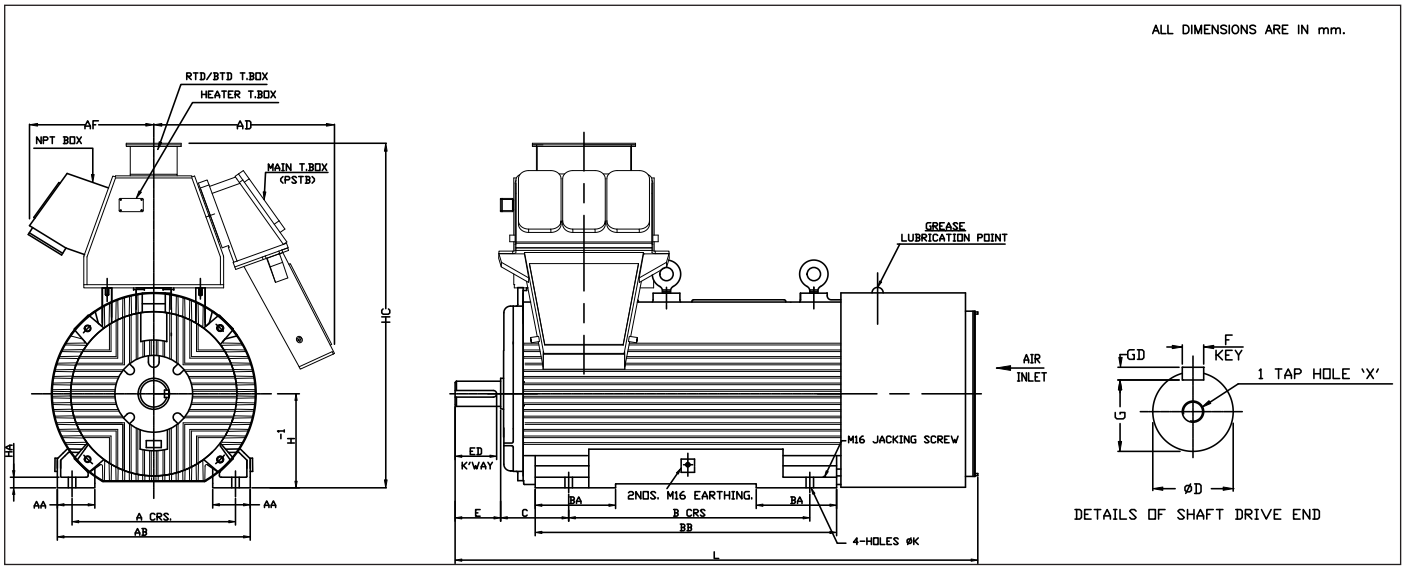
Insulation

The winding insulation system is Class F in accordance with IEC 85. More detailed information on insulation and Vacuum Pressure and Impregnation (VPI) systems/ processes are available on request in a separate publication entitled Resiv ac - The VPI insulation system.

Special Applications

The range design has been developed other considering many industry standards and most requirements can be met with the range standard plus standard optional extras. Also, the motors are suitable for VFD applications (60) Variable torque & Constant torque can be provided on request.

FLOWPAK MOTOR BASIC DIMENSIONS



FRAME	POLE	A	B	C	K	BB	BA	AB	AA	HA ±3	H TOL-1	HC MAX.	AD MAX.	AF MAX.	D NOM.	D TOL.	E	ED	F	GD	G TOL-0.2	X	L MAX
DC80F2	2	457	710	190	24	810	140	536	100	32	280	1250	725	480	75	+0.030 +0.011	140	120	20	12	67.5	M20	1750
DC80F2	4-8	457	710	190	24	810	140	536	100	32	280	1250	725	480	75	+0.030 +0.011	140	120	20	12	67.5	M20	1750
DC315F2	2	508	800	216	28	900	140	608	120	38	315	1300	725	480	75	+0.030 +0.011	140	110	20	12	67.5	M20	1850
DC315F2	4-8	508	800	216	28	900	140	608	120	38	315	1300	725	480	95	+0.035 +0.011	170	155	25	14	86	M24	1950
DC355F3	2	610	900	254	28	1125	300	720	140	40	355	1350	725	480	75	+0.030 +0.011	140	120	20	12	67.5	M20	2000
DC355F3	4-8	610	900	254	28	1125	300	720	140	40	355	1350	725	480	95	+0.035 +0.013	170	155	25	14	86	M24	2100
DC400F3	2	686	1000	280	35	1100	250	786	140	40	400	1450	725	480	85	+0.030 +0.011	170	165	22	14	76	M24	2200
DC400F3	4-8	686	1000	280	35	1100	250	786	140	40	400	1450	725	480	110	+0.035 +0.013	210	205	28	16	100	M24	2250
DC450F3	2	750	1120	315	35	1220	250	900	170	45	450	1600	725	480	85	+0.035 +0.013	170	155	32	14	76	M20	2200
DC450F3	4-8	750	1120	315	35	1220	250	900	170	45	450	1600	725	480	120	+0.035 +0.013	210	205	32	18	109	M24	2450

NOTE: FOR OTHER FRAME SIZE, PLEASE REFER WORKS.

CONSTRUCTION

Stator Frame and Endshields

Stator frames and endshields are produced from high grade cast iron upto 450 frame size with deep external cooling ribs. Spigotted endshields are fitted to the frame and incorporate the bearing housings. Frame size 500 & 560 are of mild steel fabricated.

Motor feet, terminal facings and two lifting eyebolt bosses are integral with the frame. Horizontal frames also have jacking screw provision and pilot dowel holes as standard.

Bearings

The Standard bearing arrangement has C3 internal clearance metric rolling element bearing that are mounted directly into the bore of the enshield. Premium quality lithium based grease containing oxidation and corrosion inhibitors is used and pressure grease relief facilities are a standard feature. All rolling element bearings have long relubrication intervals and an L10 bearing life of greater than 40,000 hours.

Self contained or flow lubricated plain bearings can also be fitted if required. Flow lubricated plain bearings are fitted with inlet and outlet flanged stub pipes, for connection to an oil supply provided by others.

For vertically mounted motors, the rotor weight is supported by suitably selected top bearing, depending on the thrust loading to be accommodated.

All bearings used are of the highest quality produced by internationally recognized manufacturers, ensuring spare parts are readily available. An insulated bearing arrangement can also be provided on request.

Motor bearings have been selected on the basis that the machines are directly coupled, without external thrust being imposed by the driven equipment. If this is not the case then details should be provided to allow appropriate design consideration.

Stator and Rotor Cores

Machines have a laminated and insulated sheet steel stator core assembly, which is built on a mandrel and welded under compression, before fitting into the stator frame. The rotor core made of laminated steel sheet is an interference fit on the shaft. The core is compressed between fabricated steel endplates and the assembly is then securely locked into position with a steel key ring.

Stator Coils

Stator coils are formed from annealed copper strip, insulated with mica. Loops of the appropriate number of turns are formed, the coil straight portion is bonded and the loop is then pulled to shape. The coil is insulated with layers of mica tape, dependent on voltage, prior to the application of the finishing tapes.

Coil Connections and Bracing

The coils are inserted in the slots, and firmly wedged in position with epoxy glass or magnetic slot wedges. Endwinding are securely braced to prevent movement during service. Strict quality control is exercised during the winding process.

The winding is high voltage tested at both mains and high frequency immediately after the coils are inserted and wedged, and again after connecting. On completion of winding phase resistances and impedances are checked for balance and conformance with design.

Impregnation

Flowpak stators are Vacuum Pressure Impregnated (VPI) with an epoxy resin.

The VPI system utilizes materials with a minimum resin content at the winding stage, and places greater emphasis on the final impregnation treatment. This is not only extracts all air from the winding, but also forces the resin, under pressure, into the interstices of the coils until they are totally filled. All coil packing retail a high proportion of resin and the connections become one consolidated ring after rotate curing in time and temperature controlled ovens.

Rotor Bars

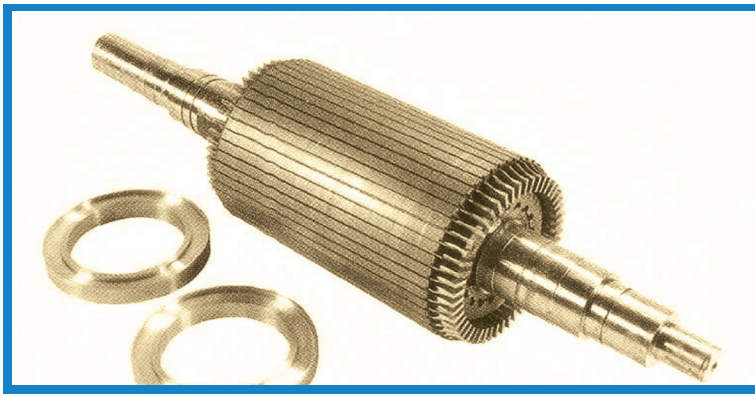
All motors have copper, copper alloy or aluminium dia cast/aluminium bar rotor cages. All rotors are dynamically balanced to more stringent levels than those specified in ISO2372. Overall motor vibration severity does not exceed the limits specified in IS:12075.

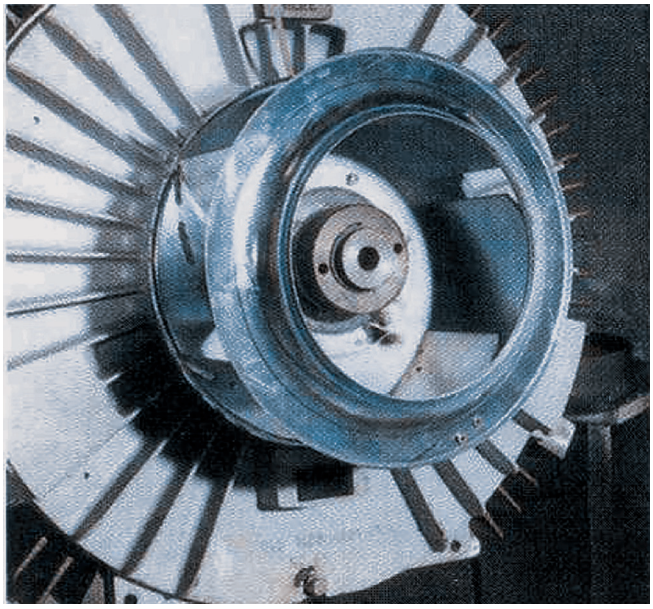
Shafts

Shafts are manufactured from carbon alloy steel of suitable grade. Standard motors have a single plain parallel shaft extension with a single keyway and motors are balanced with a half key fitted. The shaft extension is drilled and tapped in accordance with IS2540.

Fans and Cowls

Motors are fitted with uni-directional/bi-directional low noise level fans manufactured from steel. Fan cowls are also manufactured from steel.





Terminations

Unless otherwise specified, motors are supplied with a single fabricated steel, air insulated terminal box (for voltage <3.3kV) containing three or six mains terminals suitable for direct-on-line or star/delta starting. The box is mounted on the side of a top mounted adaptor and is supplied to order. Phase segregated terminal box is provided for 6.6kV motors and for 3.3kV motors on request. A wide range of alternative boxes are available.

When specified, access to the winding neutral can be provided by removal of a steel cover or within a separate terminal box.

The prospective system fault level should be advised to enable selection of the most suitable terminal arrangement.

Auxiliaries

Flowpak range allows the flexibility of fitting a wide variety of instrumentation and auxiliaries including winding and bearing temperature sensing elements, vibration transducers, anti-condensation heaters and silencing elements.

Separate ancillary terminal boxes can be arranged on the top mounted terminal box adaptor.

Facilities

Marathon implemented major restructuring of facilities. The new equipment together with the introduction of upgraded CAD facilities has laid to significant reduction in delivery lead times.

Operational flexibility has also improved and the introduction of “World Class”systems has enabled the company to introduced many product improvements.

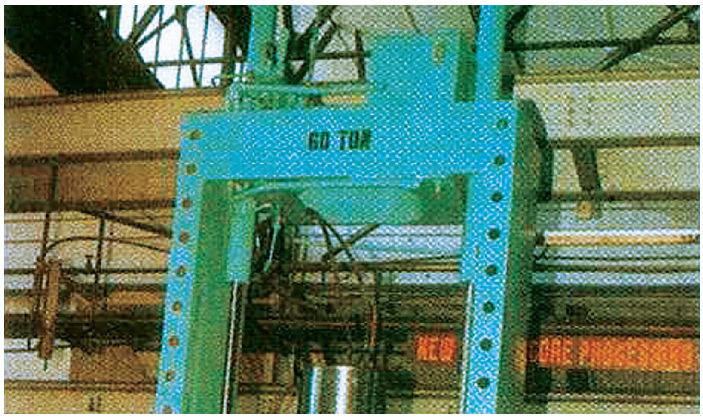
The upgrade of test facilities enabled us to test motors upto 4000KW, 11kV, 4 pole. The introduction of new facilities has improved production and manufacturing effectiveness

Noise

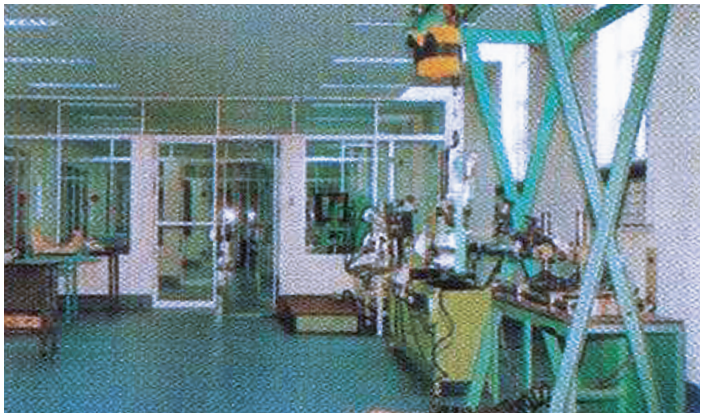
The Flowpak motor range is designed with a low overall noise level. Using special silencer to meet a noise level of 85 dB (A) at a distance of 1.5 meter.

Vibration

The Flowpak range motors, including the 2 pole machines, meet the specified standard if vibration of IS:12075. Rotors are dynamically balanced at more or less rated RPM utilizing two planes in areas of likely unbalance.

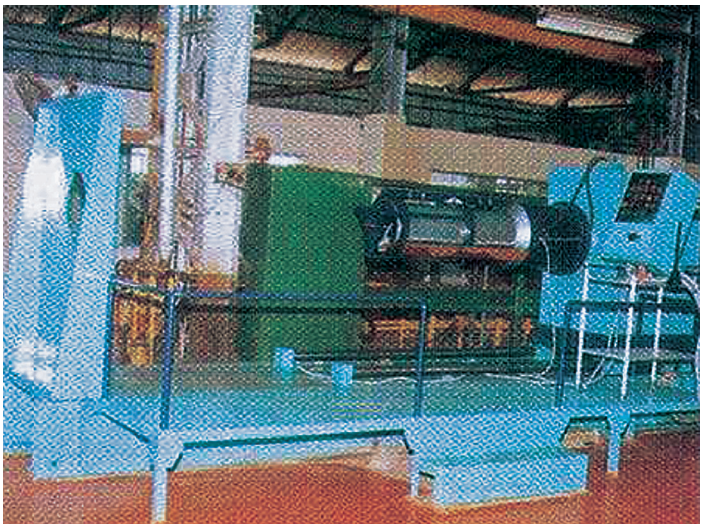


Vertical press installed for accurate rotor core building.

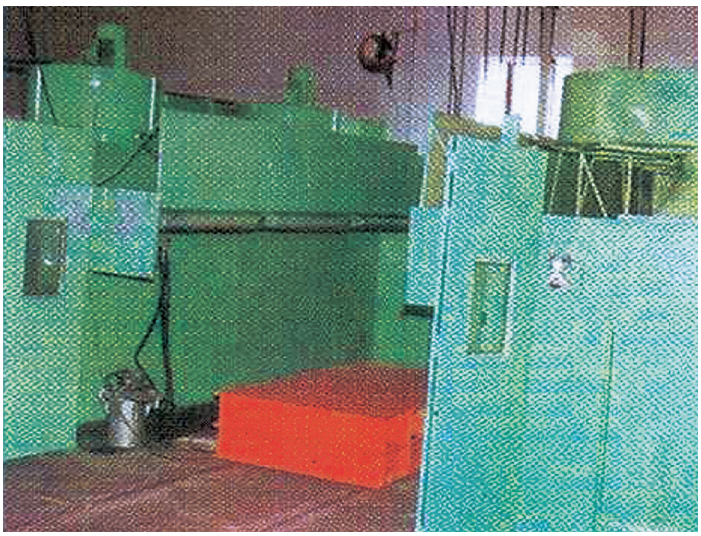


Air-conditioned dust free facility provided for coil making and insulation taping

Dust free facility installed for motor winding.

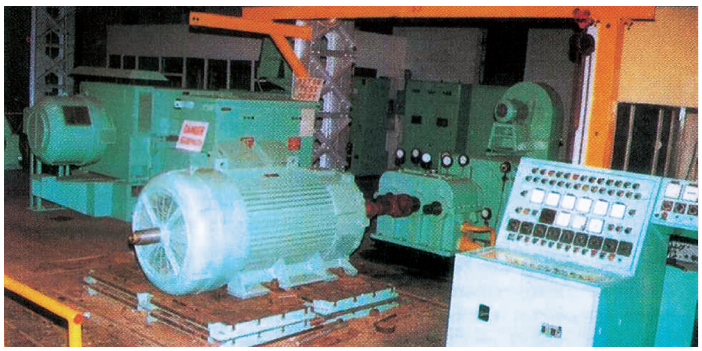


Core Insertion machine installed for insertion of wound core into frame.



Spray painting booth.

Vacuum Pressure and Impregnation Plant



Test Plant

Enclosure protection

Particular attention has been paid to compliance with the specified standards. All machines in the range have IP55 protection as standard. IP56 can be provided on request.

Paint System

Surfaces are degreased then cleaned to ISO 8501 and ISO 8503, which define surface cleanliness and roughness.

Surface are then primed using a modified synthetic resin red oxide primer to a dry film.

A single finish coat of two pack Epoxy paint is applied.

Total Quality

The complete range of Flowpak motors are manufactured to a quality assurance plan which lays down stringent acceptance norms for each stage of production.

All materials are critically tested in-house to ensure the Flowpak product range meets National and International standards. Customers are welcome to carry out stage inspection or final inspection during manufacture.

Balancing M/C

CMM M/C

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