Drehstrommotoren

Three-Phase Motors

Moteurs triphasés

Motores trifásicos

Motori trifasi

Trefasmotorer

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Betriebsanleitung / Operating Instructions Ausgabe / Edition: 1.2000

Baugrößen (BG) / Frame sizes (BG) / Désignation de carcasse (BG) / Tamaños constructivos (BG) / Grandezze (BG) / Storlekar (BG)

BG 63 ... 90L - IM B3 BG 100L - IM B3 BG 112M ... 132M - IM B3 BG 160M ... 315L - IM B3

Bauformen / Types of construction / Formes de construction / Formas constructivas / Forme costruttive / Monteringssätt

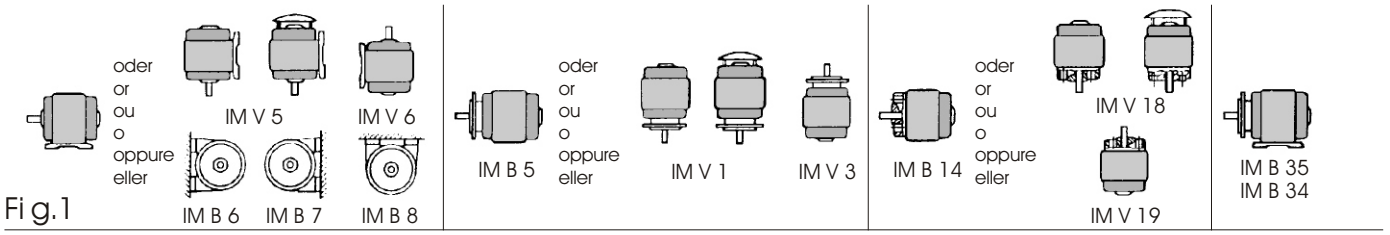


Fig.1

ENGLISH

General Notice

WARNUNG

The information and recommendations specified in all the operating instructions, and all other related instructions supplied with the motors, must always be observed.

This is mandatory to avoid hazardous situations and the risk of personal injury or damage to property and equipment. These instructions are accompanied by supplementary information (yellow) on the safety measures to be observed when working with electrical machines and equipment. These safety instructions thus supplement all other operating instructions and the instructions for related equipment.

The pertinent national, local and plant-specific standards, recommendations and guidelines must also be observed.

Special models and design variants may differ technically in some details. In the case of uncertainty, you are urgently recommended to contact the manufacturer, specifying type designation and serial number, or have any repair.

NOTE: Fig. 2 - 6 s. Appendix on page 3, 4

Description

Application

The motors have degree of protection IP 54/55 and tropicalized insulation, and can therefore be operated in dusty or damp environments. If the motors are properly stored or installed outdoors, there is generally no need to take any special weatherproofing measures.

Unless otherwise specified, the rated powers specified apply to continuous operation at coolant temperatures of between -20 and +40 °C and at altitudes of up to 1000 m above sea-level.

Construction and mode of operation

The motors are self-ventilated (with fans). The cooling air must be able to flow in and out of the motors unhindered. The feet of foot-mounted motors are cast integrally with the frame or screwed with it.

Operation

Before starting any work on the motor, be sure to isolate it from the power supply

Installation

If the motors are stored following delivery for more than four years under favourable conditions (kept in a dry place free from dust and vibrations) or for more than two years under adverse conditions prior to being put into service, the bearings should be replaced.

Special protective measures should be taken (e.g. the provision of protective roofing) in the case of motors with shaft extensions pointing upwards or downwards, or motors exposed to direct solar irradiation.

In the case of terminal boards with six terminals, the terminal box cover can be turned through 4 x 90 degrees.

Balancing rotors and the transmission elements connected to them

The rotors are dynamically balanced with a full featherkey fitted in the shaft end.

Make sure the transmission elements are balanced in the same way as the rotor .

Fit and remove drive components as shown in Fig. 6.

Electrical connections

Check to see that the system voltage and frequency agree with the data on the rating plate. Connect the terminal links as shown in the diagram inside the terminal box.

Connect the PE conductor to the terminal marked ⏚.

The recommended torques for tightening nuts etc. on the terminal board are listed in Fig. 2.

Use bent eyes or cable lugs to connect the phase conductors.

Insulation test

Before putting the motor into service for the first time, and after prolonged periods of storage or standstill, measure the insulation resistance of the windings to the frame with a DC voltage.

When measuring the insulation resistance and immediately afterwards, some of the terminals may carry dangerous voltages and must not be touched

When taking the measurements, do not stop until the final resistance value is reached. The measuring voltage, as well as the limiting values for the minimum insulation resistance and the critical insulation resistance (for measurements at a winding temperature of 25 °C), are listed in Fig. 5.

During the service life of the motor, the insulation resistance of the windings may decrease as a result of environmental conditions and other influences. The critical value of the insulation resistance at a winding temperature of 25 °C is calculated by multiplying the rated voltage (kV) with the specific critical resistance value (Mohms/kV) (see Fig. 5); e.g. critical resistance for a rated voltage (U_{rated}) of 690 V:

0.69 kV x 0.5 Mohms/kV = 0.345 Mohms

If the measured insulation resistance assumes values above the calculated critical insulation resistance during the service life of the motor, the motor can be kept in service. Should the value measured reach or drop below the critical insulation resistance, the windings must be dried, or the rotor removed and the windings thoroughly cleaned and dried. If the value measured approaches the critical value, the insulation resistance should then be checked at appropriately short intervals, or the winding cleaned.

Maintenance

Before starting any work on the motor, Be sure to isolate it from the power supply

Lubrication - The motors of the construction group 56 to 160 are equipped with closed bearing and therefore cannot be re-lubricared.
For this reason, these bearings must be replaced after the fatigue service life or grease service live expires.

The bearings cannot be relubricated!

The motors of the construction group 180, open bearings are used that are lubricated with ball bearing grease on the basis of lithium soap with mineral oil.

The grease in the new bearings must have the properties and quality specified in Fig. 3.
For re-lubricating, the recommendations of the bearing and grease manufacturers are to be observed. For motors with vertical mounting, the re-lubrication interval must be halved.

Always use a suitable jig to fit and remove the rolling-contact bearings (Fig. 4).

Heat the rolling-contact bearings uniformly to a temperature of about 80 to 100 °C before fitting them. Avoid any hard blows (e.g. with a hammer or other tools).

Adjacent grease chambers are packed with grease (e.g. in the bearing endshields for sealing off the shaft bore-hole, generally 2/3 full). Use the same type of grease for this as for the bearings. Do not mix dif ferent types of grease.

NOTE: When replacing the bearings, it is advisable to also replace any sealing elements subject to wear (e.g. radial shaft sealing rings).

Replace any damaged parts.

Standard parts are obtainable from commercial sources (stating dimensions, material and surface finish).

Spare parts are available on application.

Anziehdrehmomente für Schraubenverbindungen der elektrischen Anschlüsse - Klemmenbrettanschlüsse (außer Klemmenleisten)
Tightening torques for screwed electrical connections - terminal board connections (except for terminal strips)
Couples de serrages des bornes de la plaque à bornes (ne concerne pas les borniers)
Pares de apriete para uniones atornilladas de las conexiones eléctricas en la placa de bornes (exceptuando las regletas de bornes).
Coppie di serraggio per le viti di attacco di collegamenti elettrici / dei portamorsetti (escluse morsettiere)
Åtdragningsmoment för de elektriska anslutningarnas skruvförband (utom på kontaktplintar)

Gewinde + / Thread- + +du filetage / +de la rosca Diametro del filetto / Gängdimeter		M4	M5	M6	M8	M10	M12	M16
Anziehdrehmoment Tightening torque Couple de serrage Par de apriete Coppia di serraggio Åtdragningsmoment	min	0,8	1,8	2,7	5,5	9	14	27
Nm	max	1,2	2,5	4	8	13	20	40

Die obigen Anziehdrehmomente gelten soweit keine anderen Werte angegeben sind!
The above values of tightening torque are applicable unless alternative values are given elsewhere.
Les couples de serrage indiqués ci-dessus sont valables pour autant qu'aucune valeur spécifique ne soit donnée.
Estos pares de apriete rigen mientras no se indiquen otros.
Le coppie di serraggio indicate qui di sopra sono valide se non sono indicati altri valori.
Ovanstående åtdragningsmoment gäller om ej andra värden angivits!

Fig.2

Schmierfett / Lubricant / Graisse de lubrification / Grasa / Grasso di lubrificazione / Smörjmedel

Motor in Wärmeklasse nach VDE 0530 Motor insulation class in accordance with VDE 0530 Classe d'isolation du moteur selon VDE 0530 Clase de material aislante del motor s. VDE 0530 Classe del materiale isolante sec. VDE 0530 Motor i isolermaterialklass enl. VDE 0530	Motorkühltemperatur Motor coolant temperature Température du fluide réfrigérant du moteur emperatura del medio refrigerante del motor Temperatura del refrigerante del motore Motorkylmedlets temp.	Fettsorte der Lagerschmierung Grease type for bearing lubrication Graisse pour roulements Tipo de grasa para lubrificar los rodamientos Qualità del grasso per la lubrificazione dei cuscinetti Fettsorter för lagersmörjningen
F	-20... +60 °C	DIN 51825-K3N
zum Beispiel / for example / example / por ejemplo / ad es. / Tex. UNIREX N3* (ES SO)		

Laut Herstellerangabe: Laufprüfung B nach DIN 51806 bei der Prüftemperatur +60°C bestanden
Manufacturer's specification: Running test B to DIN 51806 passed successfully at a test temperature of +60°C
Indications du fabricant: satisfait à l'essai en marche B selon DIN 51806 à la température d'essai de +60°C
Según indicación del fabricante; se ha superado la prueba de marcha B según DIN 51806 a la temperatura de ensayo de +60°C
Secondo informazioni avute dal fornitore, la prova di marcia B sec. DIN 51806 è stata superata ad una temperatura di +60°C
Tillverkarens uppgift: Körtest B enl. DIN 51806 klarat vid provningstemperatur +60°C

Fig.3

Lagergrößen / Bearing sizes / Taille des roulements / Tamaño de los rodamientos / Dimensioni dei cuscinetti / Lagerstorlekar

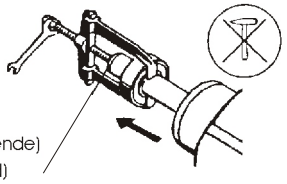
BG	56	63	71	80	90	100	112	132	160	180	200	225	250	280
AS	6200 ZZ	6201 ZZ	6202 ZZ	6204 ZZ	6205 ZZ	6206 ZZ	6306 ZZ	6308 ZZ	6309 ZZ	6310	6312	6313	63 15	63 17
BS	"	"	"	"	"	"	"	"	"	"	"	"	6315	6317

BG 280 2-polig 6316 AS 6316 BS
BG315 2-polig 6319 AS 6319 BS
BG315 4-8 polig NU 319 AS 6319 BS

BG = Baugrößen / Frame sizes
Désignation de carcasse / Tamaños constructivos
Grandezze / Utföringsstorlekar

AS = Lager -Abtriebsseite / Drive-end bearing
Palier côté accouplement / Rodamiento eje salida
Lato del cuscinetto / Lager på drivsidan

BS = Lager-Belüftungsseite / Non-drive-end bearing
Palier côté ventilateur / Rodamiento ventilador
Lato ventilazione del cuscinetto / Lager på icke drivande sidan



Zwischenscheibe (Schutz der Zentrierung im Wellenende)
Spacer washer (to protect centring bore in shaft end)
Rondelle (protection du centrage en bout d'arbre)
Disco intermedio (protege el centrado en el extremo del eje)
Spessore (protezione della centratura null'estremità d'albero)
Distansbricka (skydd av centreringen i axeltappen)

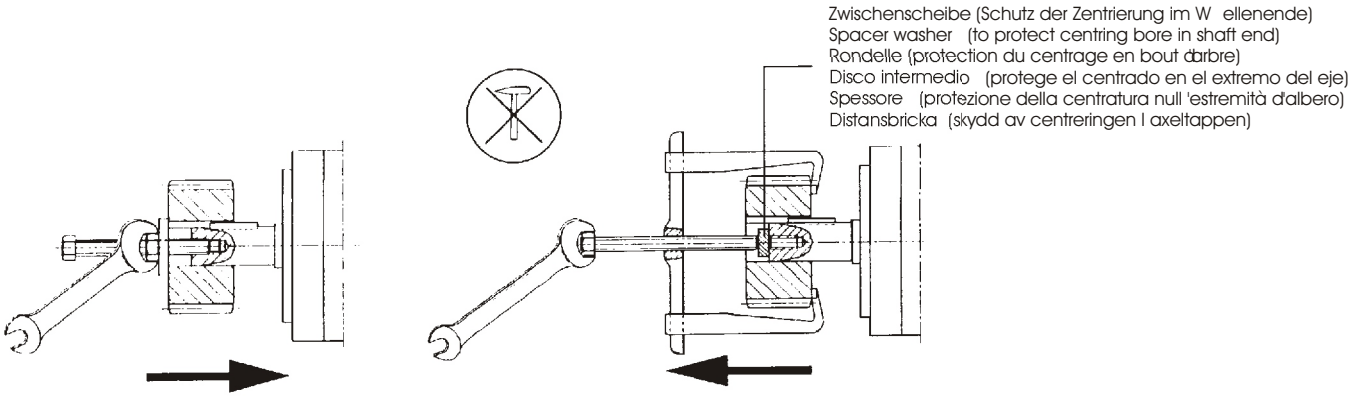
Fig.4

Isolationsprüfung / Insulation test / Contrôle d 'isolement / Prueba del aislamiento / Prova d 'isolamento / Isolationskontroll

Grenzwerte bei Bemessungsspannung U_N / Limiting values of the rated voltage U_{rated} / Seuil pour tension assignée U_N Valores limite a la tensiónasignada U_N / Valori limite con tensione di taratura U_{Nom} / Gränsvärden vid märkspänning U_N	$U_N \leq 1$ kV
Meßspannung (Gleichspannung) / Measuring voltage (DC) Tension de mesure (tension continue) / T ensión de medida (tensión continua) Tensione di misura (tensione continua) / Uppmätt spänning (likspänning)	500 V DC
Mindestisolationswiderstand bei neuen, gereinigten oder instandgesetzten Wicklungen Minimum insulation resistance of new, cleaned and serviced windings Résistance minimale d'isolement d'enroulements neufs, nettoyés ou remis en état Resistencia mínima del aislamiento de devanados nuevos, limpiados o reparados Resistenza minima d'isolamento con avvolgimenti nuovi, puliti o riparati Minsta isolationsmotstånd i nya, rengjorda eller reparerade lindningar	10 MOhm
Spezifischer , kritischer Isolationswiderstand nach längerer Betriebszeit Specific critical insulation resistance after prolonged period of service Résistance d'isolement critique spécifique après une longue durée d'exploitation Resistencia crítica y específica del aislamiento, después de prolongados períodos de servicio Resistenza d 'isolamentospecifica critica dopo un periodo di attività prolungato Specifikt, kritiska isolationsmotstånd efter en längre tids drift	0,5 MOhm/kV

Fig.5

Auf - und Abziehen von Abtriebselementen / Pressing on and pulling off drive elements
Emmanchement et extraction d 'organes de transmission / Calado y extracción de elementos de accionamiento
Calettamento ed estrazione degli elementi di azionamento / På- och avdragning av drivdon



Zum Aufziehen von Abtriebselementen (K upplung, Zahnrad, Riemenscheibe usw.), Gewinde im Wellenende benutzen und - sofern möglich - Abtriebselemente nach Bedarf erwärmen. Zum Abziehen geeignete Vorrichtung verwenden. Es dürfen beim Auf- und Abziehen keine Schläge (z.B. mit Hammer oder ähnlichem) oder größere als die laut Katalog zulässigen radialen oder axialen Kräfte über das Wellenende auf die Motorlager übertragen werden.

Use the tapped hole provided in the end of the shaft for fitting drive components such as couplings, gearwheels, belt pulleys, etc. and, if possible, heat the components as necessary. Use a suitable puller tool for removing the components. Do not strike the components, e.g. with a hammer or similar tool, when fitting or removing them and do not exert more than the maximum value of radial or axial force - according to the catalog- transmitted to the motor bearings through the shaft extension.

Pour monter les organes de transmission (accouplements, roues dentées, poulies à courroie, etc.), utiliser le taraudage du bout d'arbre. Au besoin et lorsque cela est possible, chauffer les organes de transmission. Pour le démontage, utiliser un dispositif approprié. Aucun coup (par ex. marteau) supérieur aux efforts axiaux et radiaux admissibles mentionnés au catalogue ne doit être transmis par l'arbre aux roulements en cours de montage ou de démontage.

Para calar los elementos de acoplamiento (acoplamientos, rueda dentada, polea, etc.) utilizar la rosca en el extremo del eje y - siempre que sea posible - calentar convenientementedichos elementos. Utilizar el dispositivo adecuadopara la extracción. Durante las operaciones de calado o extracción no golpear (p. ej. con martillo o similar) ni ejercer sobre los cojinetes del motor a través del extremo del eje fuerzas axiales o radiales superiores a las admisibles según catálogo.

Per calettare gli elementi di azionamento (giunti, ruote dentate, pulegge, ecc.), utilizzare il foro filettato nell'estremità d'albero e, se possibile, riscaldare gli elementi di azionamento. Per l'estrazione vanno adoperati attrezzi adatti. Sono da evitare colpi o martellate, e forze radiali o assiali trasmesse dall'estremità d'albero ai cuscinetti che siano maggiori di quelle consentite sec. il catalogo.

Använd axeltappens gänga vid pådragning av drivdon (koppling, kugghjul, remskiva etc) och värm om möjligt upp drivdonen om så behövs. Använd lämpliga verktyg för avdragningen. Några slag (t.ex. med hammare e.dyl.) får aldrig förekomma vid på- och avdragning, och radiella och axiella krafter som är större än de som anges i katalogen får inte överföras till motorlagren via axeltappen.

Fig.6

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Sujeto a modificaciones/ Con riserva di eventuali modifiche/ Förbehåll för ändringar