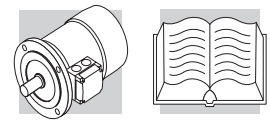


BN-BE-BX-M-ME-MX Series

Installation, Operation
and Maintenance Manual



PRODUCTS &
SOLUTIONS



OWNER'S MANUAL FOR ELECTRIC MOTORS SERIES BX, BE, BN, MX, ME, M



Description

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Read carefully

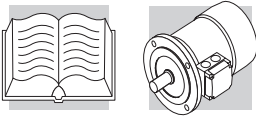


Electrical hazard

Revisions

Refer to page 32 for the catalogue revision index.

Visit www.bonfiglioli.com to search for catalogues with up-to-date revisions.



1 FIELD OF APPLICATION

The following instructions apply to the three-phase asynchronous electric motors manufactured by BONFIGLIOLI RIDUTTORI S.p.A., series:

- **BX, BE, BN**

- **MX, ME, M**

in their standard version, with or without brake.

Special versions as described in the catalogues and/or in offers, or special applications (for example, power supply from inverter) will require additional information.

2 GENERAL SAFETY INFORMATION

The electric motors described in the following instructions are designed to be used in industrial installations and must be operated by qualified personnel only.



During operation, motors have live or moving parts. Therefore, removal of electrical or mechanical guards, improper use, or inadequate maintenance may cause serious damage to persons or property.



Installation and maintenance on motors must be performed only by qualified personnel who have thorough knowledge of the instructions and technical data for the product and who have been authorised to perform such operations by the safety supervisor.



Since the electric motor does not have a defined function for the final user and is going to be physically coupled to another machine, it is the responsibility of the installer to guarantee that all provisions for its safe operation have been taken.

3 INSTALLATION

3.1 Identification

Gearmotors and motors have a nameplate carrying their identification data.

In the case of serial number composed of 17 digits, the year of production is identified by digits 3-4. In the case of serial number composed of 13 digits, the year of production is identified by digits 5-6. See the following examples:

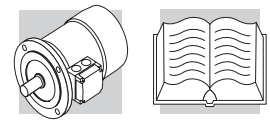
| | | | | | | | | | | | | | | | | |
|---|---|---|-------|---|---|------|---|---|----|----|----|----|----|----|----|----|
| 0 | 1 | 1 | 9 | 0 | 0 | 0 | 7 | 1 | 3 | 2 | 4 | 5 | 9 | 0 | 0 | 1 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | | | Month | | | Year | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|------|---|---|---|----|----|----|----|
| E | V | O | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| X | X | X | X | X | X | X | X | X | X | X | X | X |
| | | | | | Year | | | | | | | |

Table shows the plate used for all motor configurations.

On standard voltage electric motors with an FD brake, the nameplate only gives electrical data for the frequency identified by the motor designation.

On standard voltage electric motors with an FA brake, the nameplate gives electrical data for 50 Hz and 60 Hz.



On non-standard voltage electric motors with a brake, the nameplate only gives electrical data for the frequency identified by the motor designation.

On motors with the CUS option, the nameplate only gives electrical data for the frequency identified by the motor designation.

| | | | | | |
|----------------------|-------------|---------------------------------|-------------------|-------|----|
| IEC EN 60034 | | Bonfiglioli Riduttori | | CE | |
| 3~Mot BN 90LA 4 | | Cod. | | | |
| No | S | IMB | 13,6 kg | | |
| kW 1.5/50Hz-1.8/60Hz | | CLF | IP55 | Amb | °C |
| Hz | V | A | min ⁻¹ | cos φ | |
| 50 | 230/400 Δ/Y | 6.2/3.6 | 1410 | 0.77 | |
| 60 | 265/460 Δ/Y | 6.2/3.6 | 1690 | 0.77 | |
| 50Hz | 380-415 VY | | 3.7/3.8 A | | |
| 60Hz | 440-480 VY | | 3.7/3.8 A | | |

IE1

| | | | | | |
|-----------------|------------------------------------|---------------------------------|-------------------|-------|----|
| IEC EN 60034 | | Bonfiglioli Riduttori | | CE | |
| 3~Mot BE 90LA 4 | | Cod. | | | |
| No | S | IMB | 15,1 kg | | |
| kW 1.5 | | CLF | IP55 | Amb | °C |
| Hz | V ± 10% | A | min ⁻¹ | cos φ | |
| 50 | 230/400 Δ/Y | 6.1/3.5 | 1430 | 0.74 | |
| 60 | 265/460 Δ/Y | 5.4/3.1 | 1740 | 0.73 | |
| 50Hz-IE2 | 83.5(100%) - 83.0(75%) - 80.0(50%) | | | | |
| 60Hz-IE2 | 84.5(100%) - 83.9(75%) - 80.7(50%) | | | | |

IE2 - IE3

| | | | | | |
|----------------------|-------------|---------------------------------|-------------------|-------|----|
| IEC EN 60034 | | Bonfiglioli Riduttori | | CE | |
| 3~Mot BN 90LA 4 FA | | Cod. | | | |
| No | S | IMB | 20,3 kg | | |
| kW 1.5/50Hz-1.8/60Hz | | CLF | IP55 | Amb | °C |
| Hz | V | A | min ⁻¹ | cos φ | |
| 50 | 230/400 Δ/Y | 6.2/3.6 | 1410 | 0.77 | |
| 60 | 265/460 Δ/Y | 6.2/3.6 | 1690 | 0.77 | |
| 50Hz | | | IE1 78.5% | | |
| 60Hz | | | 81.5% | | |
| V ± 10% | | VB=VMOT | MB=26Nm | | |

FA

| | | | | | |
|--------------------|-------------|---------------------------------|---------------------|-------|----|
| IEC EN 60034 | | Bonfiglioli Riduttori | | CE | |
| 3~Mot BN 90LA 4 FD | | Cod. | | | |
| No | S | IMB | 19,6 kg | | |
| kW 1.5 / 50Hz | | CLF | IP55 | Amb | °C |
| Hz | V | A | min ⁻¹ | cos φ | |
| 50 | 230/400 Δ/Y | 6.2/3.6 | 1410 | 0.77 | |
| 50Hz | 380-415 VY | | 3.7/3.8 A IE1 78.5% | | |
| VB ~ 230V ± 10% | | MB=26Nm | NB | | |

FD

| | | | | | |
|---|-------------|---------------------------------|-------------------|-------------------------|-------|
| IEC EN 60034 | | Bonfiglioli Riduttori | | SP [®] c us | |
| 3~Mot BE 90LA 4 | | Cod. | | | |
| No | S | IMB | 15,1 kg | | |
| kW 1.5 HP 2 | | CLF | IP55 | Amb | 40 °C |
| Hz | V ± 10% | A | min ⁻¹ | cos φ | |
| 60 | 265/460 Δ/Y | 5.4/3.1 | 1740 | 0.73 | |
| IE2 84.5 (100%) - 83.9 (75%) - 80.7 (50%) | | | | | |
| TEFC - kVA Code K | | | | | |
| | | CE | | | |

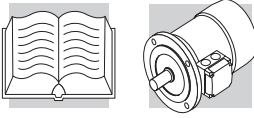
CUS

| | | | | | |
|----------------------|-------------|---------------------------------|-----------|--------------------|----|
| IEC EN 60034 | | Bonfiglioli Riduttori | | 邦 飞利减速机械有限公司 CE | |
| 三相异步电动机 BN 90LA 4 | | Cod. | | | |
| No | S | IMB | 13,6 kg | | |
| kW 1.5/50Hz-1.8/60Hz | | CLF | IP55 | Amb | °C |
| Hz | V | A | r/min | cos φ | |
| 50 | 230/400 Δ/Y | 6.2/3.6 | 1410 | 0.77 | |
| 60 | 265/460 Δ/Y | 6.2/3.6 | 1690 | 0.77 | |
| 50Hz | 380-415 VY | | 3.7/3.8 A | | |
| 60Hz | 440-480 VY | | 3.7/3.8 A | | |
| | | CCC | | A034374 | |
| | | 意大利制造 | | | |

CCC

3.2 Reception

Upon receipt of the motor, check that it was not damaged during transportation; if damage is noted, inform the carrier immediately. In addition, check that the characteristics stated on the plate conform to those ordered and confirmed by BONFIGLIOLI RIDUTTORI S.p.A.



3.3 Transport and handling

Cartons containing more than one motor are usually attached to wooden boards to facilitate handling by forklifts or transpallets.

Motors may be handled individually by lifting them with belts or chains (if required due to weight).

Motors of frame sizes BX 100 / MX3, BE 100 / ME3, BN 100 / M3, and larger, are provided with an eyebolt / lifting point for lifting purposes.



The eyebolts / lifting points are suitable for lifting the motor only.

Make sure that the motor rests in a stable manner and will not roll (in the case of flanged motors).

3.4 Storage

Observe the following instructions to ensure correct storage of products:

- a) Do not store outdoors, in areas exposed to weather or with excessive humidity.
- b) Always place boards in wood or other material between floor and products, to avoid direct contact with the floor.
- c) For storage periods exceeding 60 days, all coupling surfaces such as flanges and shafts must be protected with a suitable anti-oxidation product (Mobilarma 248 or equivalent).
- d) For storage periods exceeding 6 months, it is a good rule to turn the rotor every 1-2 months and to take adequate measures against corrosion and humidity.

3.5 Motor installation



Check that mains assembly and service conditions comply with the information on the plate and described in the technical documentation.

The following instructions must be observed when installing the motor:

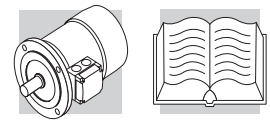
Prior to installing the motor remove from the shaft the plastic guards that are supplied for transportation purposes.

These must be disposed of according to the rules applicable in the Country where the installation takes place.

If applicable, remove oxidation preventative coating of shaft by means of a suitable solvent, which afterwards must be disposed of according to the regulations applying locally.



Do not let the solvent be in touch with oilseal lips.



Make sure that the motor is well-ventilated, that there is nothing to obstruct the free circulation of air, and that no situation will arise that could block the regular heat dissipation.

The installation must also allow the performance of ordinary maintenance on the motor and, if supplied, of the brake.



Avoid hitting on the motor shaft: bearings may be damaged.

In outdoor installations, protect the motor from direct sun radiation and, if possible, from inclement weather.

Prior to fitting flanged motors onto gear units make sure that the key is retained safely into the key seat. Coat thoroughly motor shaft with a suitable anti-seize product (Loctite 767 or equivalent) to prevent fretting corrosion and facilitate removal of motor at a later time.

Every 6-12 months it may be recommended to remove the motor from the gear head, clean the shaft area and re-apply the anti-seize product.

In order to avoid vibration once in operation, make sure the motor is secured tightly to mating gearbox flange. Should the motor need to be painted, screen name plate as well as vented plug (if applicable) and machined parts on beforehand.

After the installation of a brake motor is complete, unscrew and remove the lever that operates the manual brake release, thus preventing any accidental operation of the same.

3.6 Balancing

The rotor shaft is dynamically balanced with half key fitted. Assembly of external transmission unit must be performed with adequate instruments after suitable balancing, avoiding knocks which could damage the bearings.

Be especially careful not to operate the motor without having properly secured the key not being used (motors with two shaft ends).



Adopt adequate measures to avoid accidental contact with exposed live or moving parts.



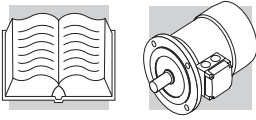
Avoid contact with the motor case, since the temperature under normal operating conditions may exceed 50 °C.

3.7 Insulation test

Before start-up, or after long storage (or idle) periods, check insulation resistance to mass with Megger at 500V DC.

The value measured at 25 °C for new windings in good condition should exceed 10 MΩ.

If this value is not reached, oven drying will be required to eliminate excess humidity.



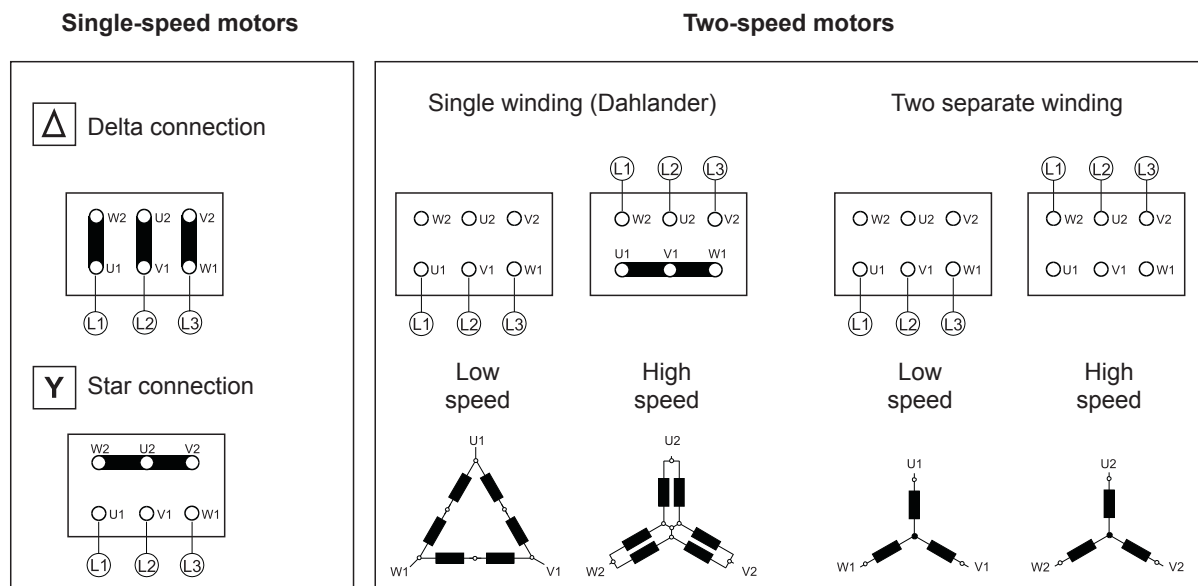
4 WIRING

4.1 Norms applicable to all motors

Use cables with suitable section for the rated current and for installation conditions, avoiding excessive heating and/or voltage drops. Connection at the terminal board must be performed according to the diagrams shown in chart below or according to the instructions supplied in the terminal box, using the appropriate plates, nuts and washers. Earth according to current norms before connecting to the mains.

In addition to the main terminals, the conduit box may contain thermal protection, anti-condensation heaters, and brake connections.

Wire any device according to the diagrams contained in the conduit box.



During rest time voltage may still apply to terminals of the heaters and/or the brake. When installing, repairing or maintaining the motor double check that all connections to the mains have been cut.



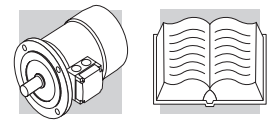
Furthermore, always prevent uncontrolled restarting of the motor as this may be extremely hazardous for the operator.

At the end of the wiring operations, place the gasket on its site and close the cover. Carefully tighten the cable gland and close all the openings that are not used.

4.2 Anti-condensate heaters



Power to the anti-condensate heaters must be supplied separately and it must always be disconnected while the motor is operating.



4.3 Ventilation

Motors are cooled through outer air blow (IC 411 according to CEI EN 60034-6) and are equipped with a plastic radial fan, which operates in both directions.





Ensure that fan cover is installed at a suitable distance from the closest wall so to allow air circulation and servicing of motor and brake, if fitted.

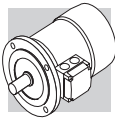
On request, all BX/MX, BE/ME motors and BN/M motors, starting from BN 71 or M1 size, can be supplied with independently power-supplied forced ventilation system.





Motor is cooled by an axial fan with independent power supply and fitted on the fan cover (IC 416 cooling system).

Brake motors of BN_BA type and all motors with rear shaft projection (PS option) are excluded.

4.4 Ratings of separate supply fan units

| U1 | | | | | |
|---|---|-------------------------|-----------|--------------|--------------|
| Fan wiring terminals are housed in a separate terminal box | | | | | |
|  |  | V a.c. ± 10% | Hz | P [W] | I [A] |
| BN 71 | M1 | 1 ~ 230 | 50 / 60 | 22 | 0.12 |
| BN 80 | M2 | | | 22 | 0.12 |
| BN 90 | — | | | 40 | 0.30 |
| BN 100 | M3 | | | 50 | 0.25 |
| BN 112 | — | 3 ~ 230 Δ / 400Y | 50 | 50 | 0.26 / 0.15 |
| BN 132 ... BN 160MR | M4 | | | 110 | 0.38 / 0.22 |
| BN 160M ... BN 180M | M5 | | | 180 | 1.25 / 0.72 |
| BN 180L ... BN200L | — | | | 250 | 1.51 / 0.87 |
|  |  | V a.c. ± 10% | Hz | P [W] | I [A] |
| BX 80 - BE 80 | MX2 - ME2 | 1 ~ 230 | 50 / 60 | 22 | 0.12 |
| BX 90 - BE 90 | — | | | 40 | 0.30 |
| BX 100 - BE 100 | MX3 - ME3 | | | 50 | 0.25 |
| BX 112 - BE 112 | — | 3 ~ 230 Δ / 400Y | 50 | 50 | 0.26 / 0.15 |
| BX 132 - BE 132 | MX4 - ME4 | | | 110 | 0.38 / 0.22 |
| BX 160 - BE 160 | MX5 - ME5 | | | 180 | 1.25 / 0.72 |
| BX 180 - BE 180 | — | | | 250 | 1.51 / 0.87 |



| U2 | | | | | |
|---|---|-------------------------|---------|-------|-------------|
| Fan terminals are wired in the motor terminal box | | | | | |
|  |  | V a.c. \pm 10% | Hz | P [W] | I [A] |
| BN 71 | M1 | 1 ~ 230 | 50 / 60 | 22 | 0.12 |
| BN 80 | M2 | | | 22 | 0.12 |
| BN 90 | — | | | 40 | 0.30 |
| BN 100 | M3 | 3 ~ 230 Δ / 400Y | | 40 | 0.12 / 0.09 |
| BN 112 | — | | | 50 | 0.26 / 0.15 |
| BN 132 ... BN 160MR | M4 | | | 110 | 0.38 / 0.22 |
|  |  | V a.c. \pm 10% | Hz | P [W] | I [A] |
| BE 80 | ME2 | 1 ~ 230 | 50 / 60 | 22 | 0.12 |
| BE 90 | — | | | 40 | 0.30 |
| BE 100 | ME3 | 3 ~ 230 Δ / 400Y | | 40 | 0.12 / 0.09 |
| BE 112 | — | | | 50 | 0.26 / 0.15 |
| BE 132 | ME4 | | | 110 | 0.38 / 0.22 |

4.5 Direction of rotation

If the mains with phase sequence L1, L2, L3 is connected to terminals U, V, W, the direction of rotation of the motor will be clockwise as seen from the drive end.
If any two terminals are switched, the direction of rotation will be counter-clockwise.

For unidirectional motors, a plate will be provided indicating the direction of rotation and the phase sequence to be applied (e.g., U, V, W).

This indication is present only when the motor, as a function of project characteristics, requires only one direction of rotation (for example, anti run-back device installed).

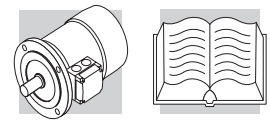
Pay special attention when single direction status is imposed by machine or plant specifications.

4.6 FD brake connections

On standard single-pole motors, the rectifier is connected to the motor terminal board at the factory.

For switch-pole motors and where a separate brake power supply is required, connection to rectifier must comply with brake voltage VB stated in motor name plate.

Because the load is of the inductive type, brake control and DC line interruption must use contacts from the usage class AC-3 to IEC 60947-4-1.

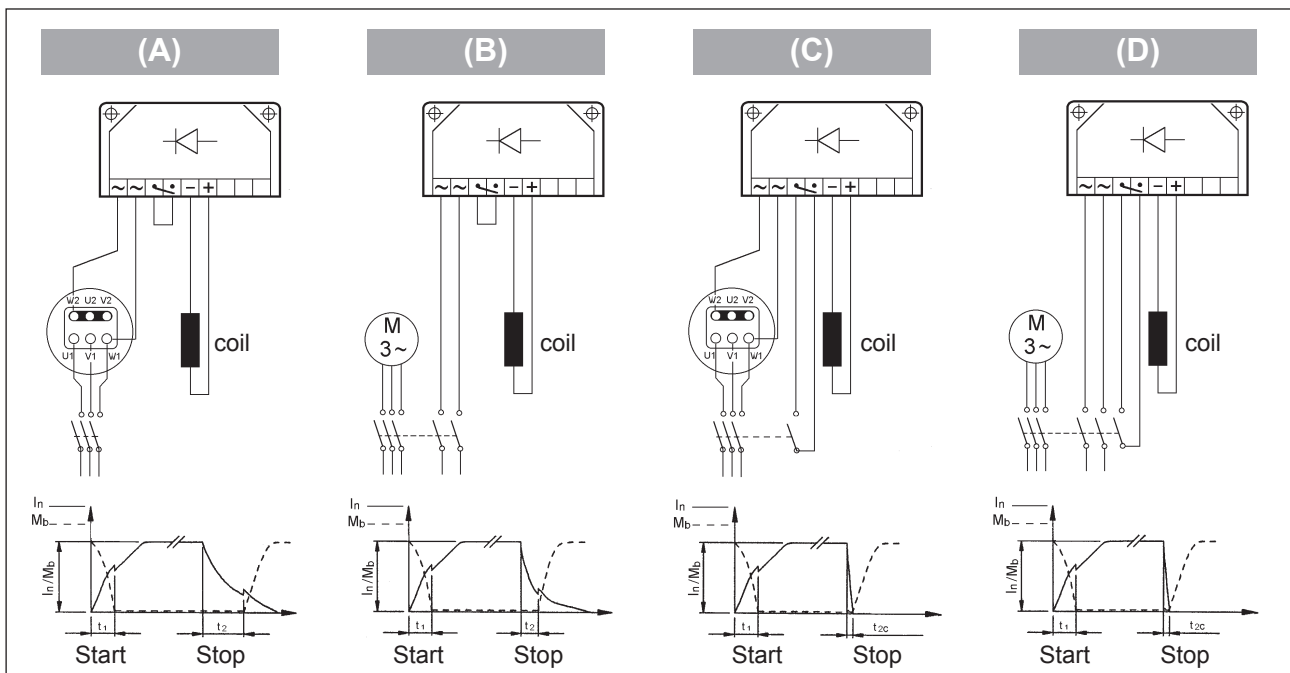


Scheme (A) - Brake power supply from motor terminals and a.c. line disconnection. Delayed stop time t_2 and function of motor constants. Mandatory when soft-start/stops are required.

Scheme (B) - Separate supply of brake coil and a.c. line disconnect. Regular stopping time, independent on time constants of motor.

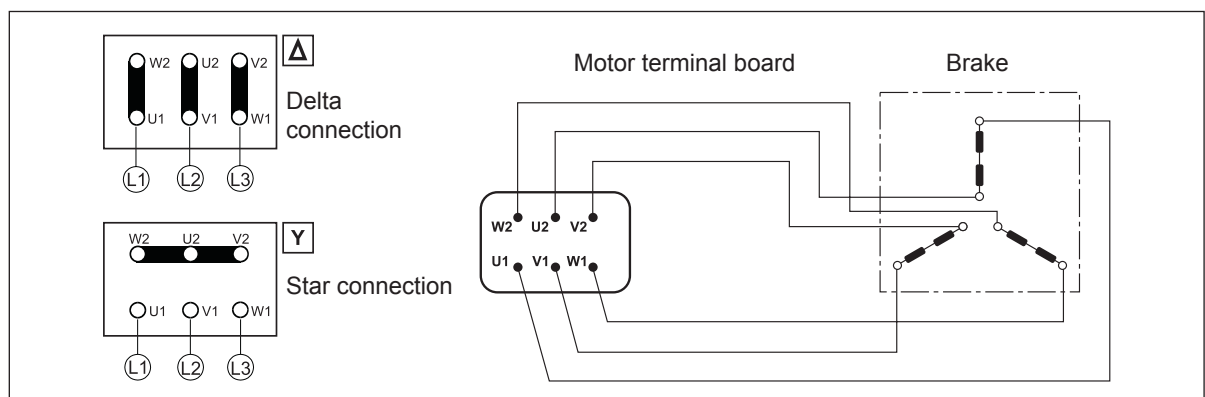
Scheme (C) - Brake coil power supply from motor terminals and AC/DC line disconnection.

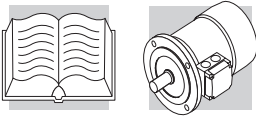
Scheme (D) - Brake coil with separate power supply and AC/DC line disconnection.



4.7 FA and BA brake connections

The diagram below shows the wiring when brake is connected directly to same power supply of the motor:

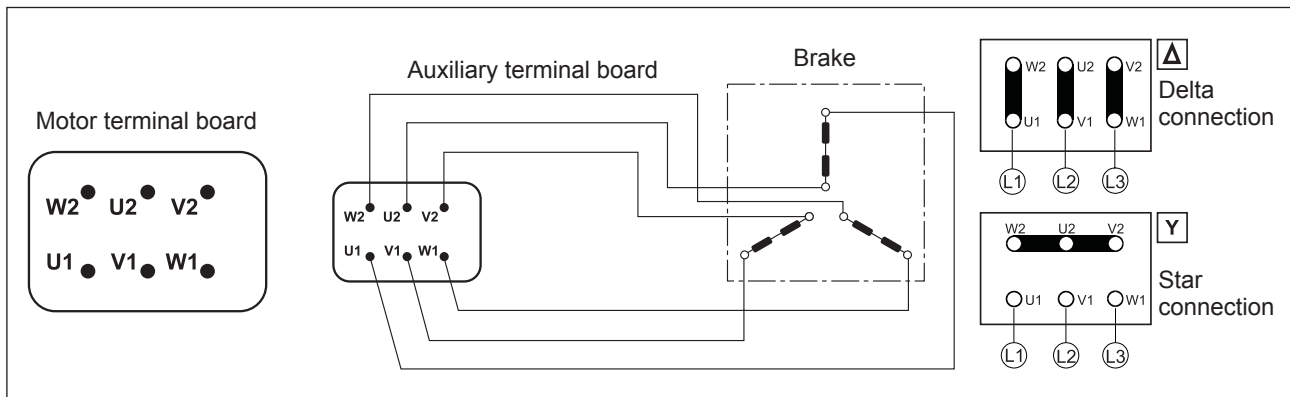




Switch-pole motors, nine pin motors (motors with voltage in ratio 2) and, at request, single-pole motors with separate power supply are equipped with an auxiliary terminal board with 6 terminals for brake connection.

In this version, motors feature a larger terminal box.

See diagram:



Wire the brake according to voltage and type of connection as shown on motor name plate.

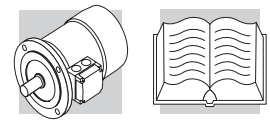
5 START-UP

Perform the following operations and checks before start-up:

- 1) check that all safety measures have been applied;
- 2) power up the motor unloaded at rated voltage;
- 3) check that the separate fan cooling (if any) is operating;
- 4) check that operation is smooth and vibration-free;
- 5) If the brake is fitted, verify that it operates regularly;
- 6) if operation is satisfactory, apply the load to the motor while checking on values of absorbed current, power and voltage.



Abnormal operations such as over current, overheating, noise, or vibrations, may cause serious damage or hazardous conditions. In these cases, cut power and notify maintenance personnel immediately.



6 MAINTENANCE

Before any intervention, the motor, auxiliary circuits and/or accessories must be disconnected from the mains.

In particular:

- check disconnection from the electrical mains,
- provide suitable protections from exposed live parts,
- double check that accidental restarts are not possible under any circumstances.

It is recommended that periodical checks of motor operating conditions are scheduled as a routine maintenance practice.

Check particularly on the following:

- 1) check that operation is smooth and absorbed current within rated value;
- 2) On brakemotors, check condition of the brake, gauge the air gap "T" and play "X" of the manual brake release device; when provided
- 3) keep motor clean and fan cowl unobstructed by accumulation of dust or foreign particles;
- 4) check that seal rings are in good condition;
- 5) check that lead-in wires and all wirings are safely and tightly secured;
- 6) If condensate draining holes are provided, remove periodically the screws that close the holes and allow the condensate to drain. On installing the motor make sure that the drain hole is located at the lowest point.
- 7) standard bearings are grease packed for life and in general no periodical maintenance is required; it is good practice however to check their condition and eventually replace them after approx. 3 years.

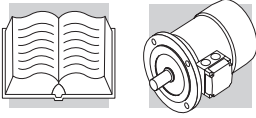
The motor does not have to be removed for normal inspections unless the bearings need to be replaced. In this case, the operations should be performed by specialised personnel and with appropriate tools.

6.1 Adjustment of air gap on motors with d.c. brake (FD) or a.c. brake (FA).

Loosen nut ref. 2

Depending on motor frame size adjust the air gap and set dimension T to the min. value indicated in diagram through either socket head screws ref. (1) or nut ref. (3).

Then after hold firmly screw ref. (1) and lock it by tightening nut ref.(2).



Check the air gap periodically and re-adjust it if dimension T is found exceeding the min/max values indicated in diagram.

Particularly, brake may become noisier if gap is wider than the max value. In extreme cases releasing of the brake might also be affected.

If the brake disengagement device is fitted, too wide a gap may lead the braking torque to drop significantly as a consequence of the reduced play in the release mechanism.

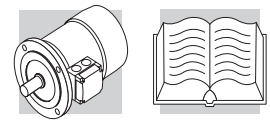
Distance “X” must mandatorily be equal to or greater than the value listed in the chart.

Thickness of disc lining must always be greater than 1.5 mm.

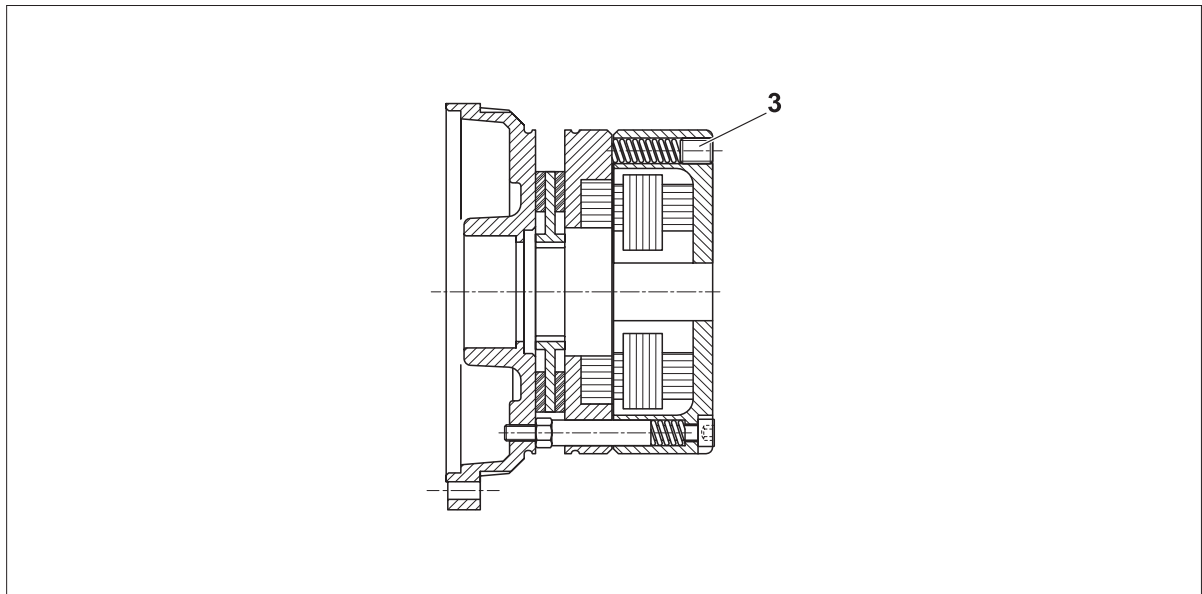
The diagram shows a cross-section of a brake assembly with dimensions X and T. Dimension X is the distance between the brake shoes, and dimension T is the air gap between the brake shoes and the disc. A table below provides the required values for X and T for various brake types.

| | | BRAKE TYPE | | | | | | | |
|----|-----|------------|----------------|----------------|-------------------------|--------|----------------|-------|----------------|
| FD | | FD 02 | FD 03 FD 53 | FD 04 FD 14 | FD 05 FD 15 FD 55 | FD 06S | FD 06 FD 56 | FD 07 | FD 08 FD 09 |
| | FA | FA 02 | FA 03 | FA 04 FA 14 | FA 05 FA 15 | FA 06S | FA 06 | FA 07 | FA 08 |
| T | Min | 0.2 | 0.2 | 0.3 | 0.3 | 0.35 | 0.35 | 0.4 | 0.5 |
| | Max | 0.5 | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | 0.8 | 1.0 |
| X | ≥ | 0.8 | 0.8 | 1.0 | 1.0 | 1.1 | 1.1 | 1.2 | 1.5 |

T (mm) = Air gap



6.2 Brake torque setting on motors with a.c. brake (FA)

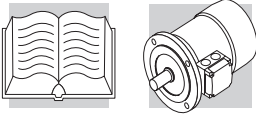


Brake torque can be adjusted steplessly by changing the preload of springs (3).



WARNING: For safety reasons, brake torque will not be set lower than 30% of rated value, even at springs fully unloaded.

| BRAKE | Max. brake torque |
|--------|-------------------|
| FA 02 | 3.5 |
| FA 03 | 7.5 |
| FA 04 | 15 |
| FA 14 | 15 |
| FA 05 | 40 |
| FA 15 | 40 |
| FA 06S | 60 |
| FA 06 | 75 |
| FA 07 | 150 |
| FA 08 | 250 |



6.3 Brake torque setting on motors with a.c. brake (BA)

Loosen locking nut (2). Through nut (1) adjust the air gap and restore distance “T” to its minimum value, as listed in the chart Repeat the operation symmetrically on each stud bolt holding the brake. When setting is complete tighten nuts (1) and (2) on each stud bolt.



Too wide an air gap may result into noise and vibrations in operation and, in extreme cases, even prevent the motor from braking.

| BRAKE TYPE | | | | | | | | |
|------------|-----|-------|-------|-------|-------|--------|--------|--------|
| BA | | BA 60 | BA 70 | BA 80 | BA 90 | BA 100 | BA 110 | BA 140 |
| T | Min | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 |
| | Max | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 |

T (mm) = Air gap

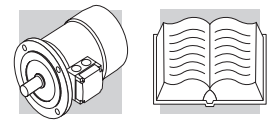
6.4 Brake torque setting on motors with a.c. brake (BA)

Brake torque can be adjusted steplessly by changing the preload of springs (4) acting on nuts (3).

Braking torque will increase proportionally to the compression of springs (4).

Repeat the operation symmetrically on each stud bolt holding the brake.

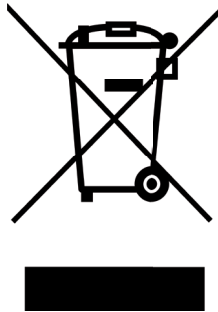
| BRAKE | Max. brake torque |
|--------|-------------------|
| BA 60 | 5 |
| BA 70 | 8 |
| BA 80 | 18 |
| BA 90 | 35 |
| BA 100 | 50 |
| BA 110 | 75 |
| BA 140 | 150 |



7 DISASSEMBLY, RECYCLING OR DISPOSAL

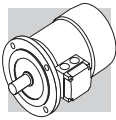
The electrical motors are mainly made by ferrous, non - ferrous, plastic materials and electric / electronic devices.

Bonfiglioli recommends and encourages the end of life motor dismantling and the differentiation and recycling of the components.

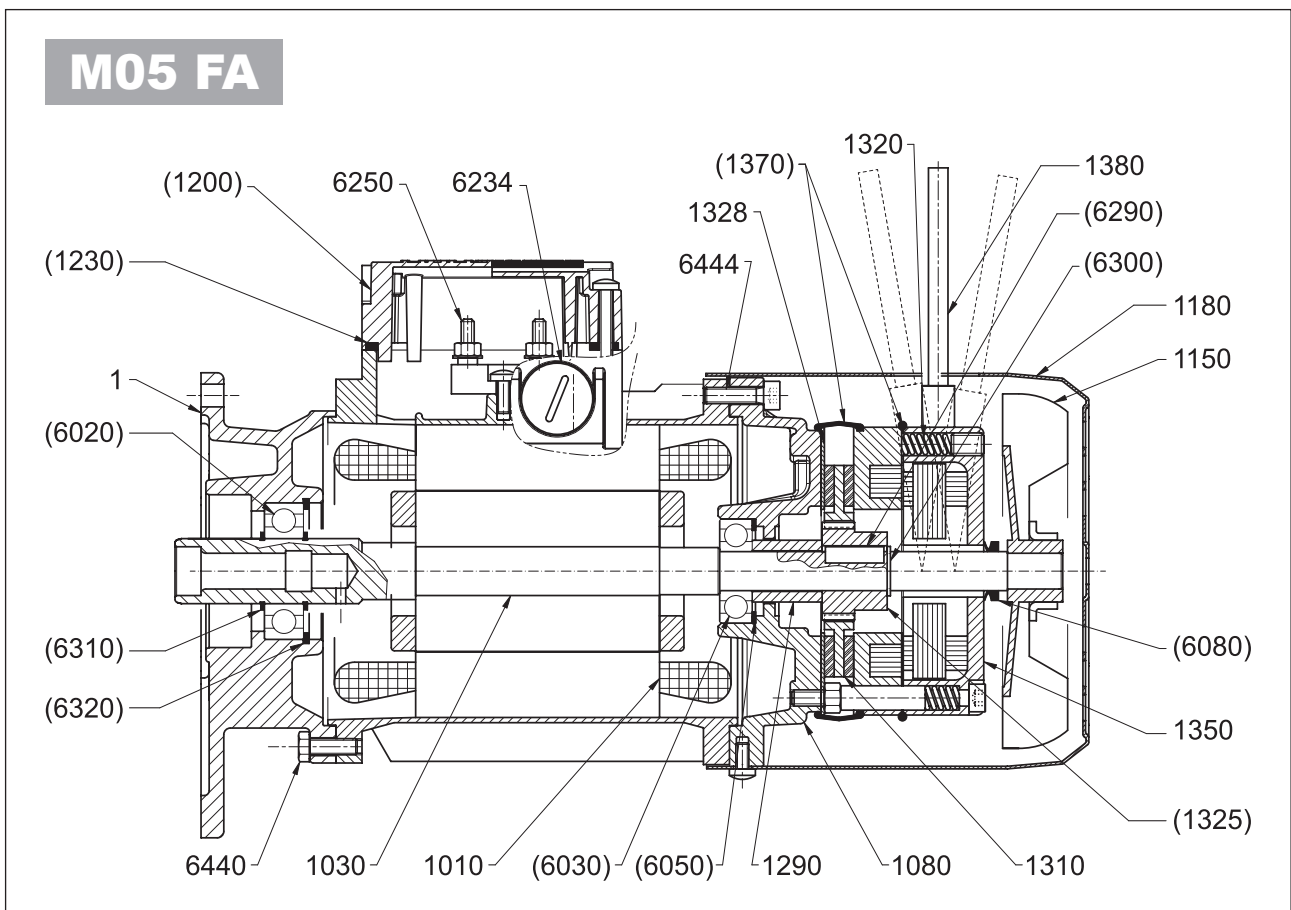
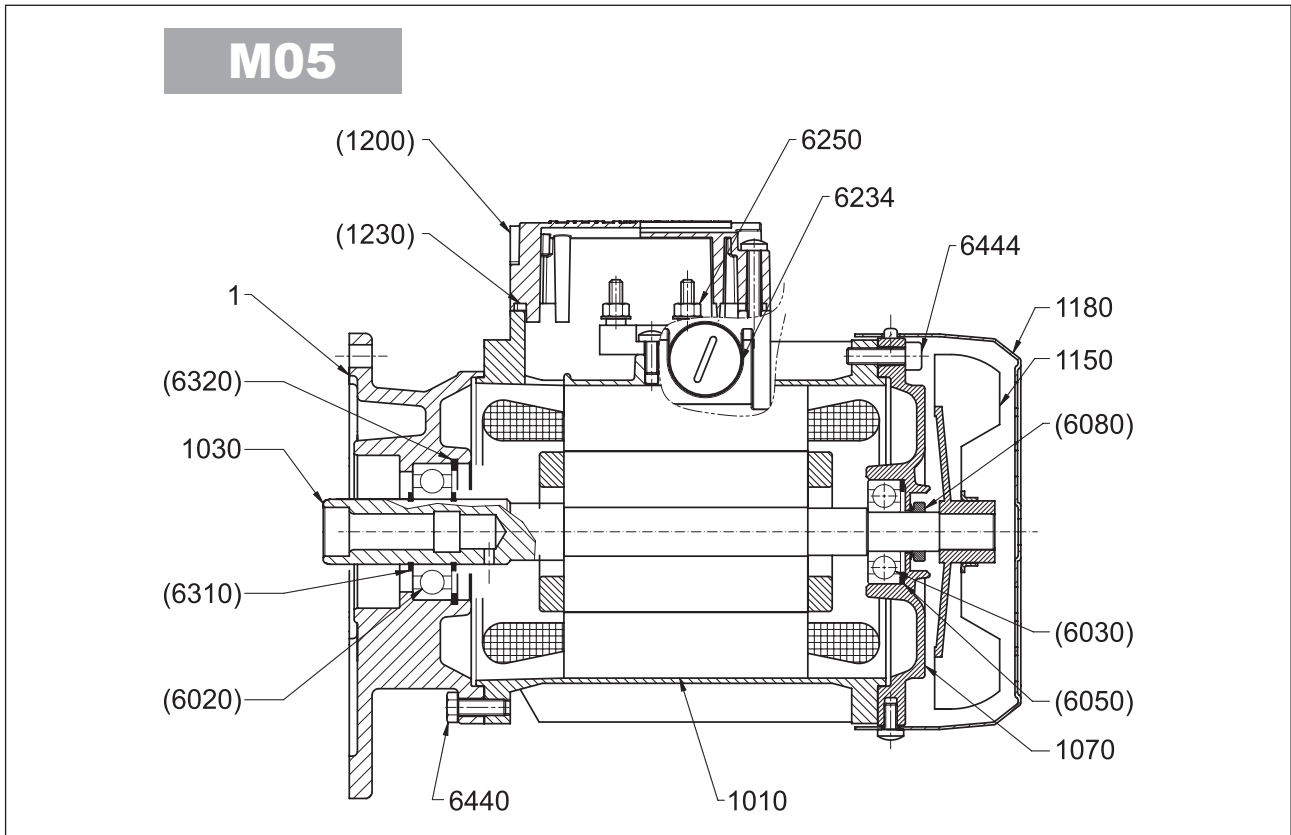


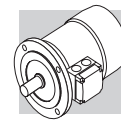
This product should not be mixed with general household waste. Disposal has to be carried out in conformity with EU Directive 2012/19/EU where established, and in accordance to national regulations.

Fulfill disposal in accordance with any other legislation in force throughout the country.

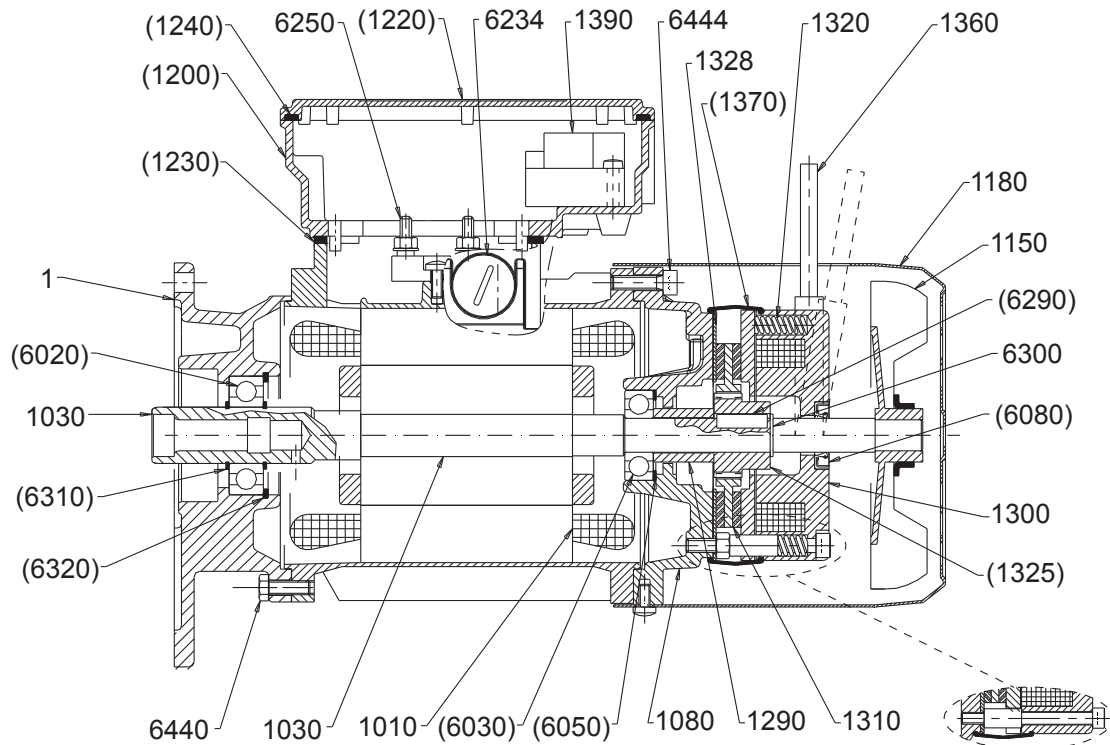


8 SPARE PARTS





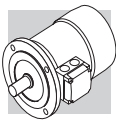
M05 FD



| | kit | ref. | Description |
|--|------------|-----------------|---------------------|
| M05 M05 FD M05 FA | | 1 | Motor flange |
| | | 1010 | Stator |
| | | 1030 | Rotor |
| | | 1150 | Fan |
| | | 1180 | Fan cowl |
| | KSM | (1200) | Terminal box |
| | | (1230) | Terminal box gasket |
| | KSA | (6020) | Bearing |
| | | (6030) | Bearing |
| | | (6050) | Compensation ring |
| | | (6310) | Circlip |
| | | (6320) | Circlip |
| | | 6234 | Blank plug |
| | 6250 | Terminal board | |
| | 6440 | Flange bolt | |
| | 6444 | NDE shield bolt | |
| M05 | | 1070 | Rear shield |
| | KSA | (6080) | V-ring |

| | kit | ref. | Description |
|--------------------------------|------------|--------|-------------------------------|
| M05 FD M05 FA | | 1080 | Shield for brake motor |
| | | 1290 | Spacer ring |
| | | 1310 | Brake disc |
| | | 1320 | Brake springs |
| | KTF | (1325) | Brake hub |
| | | (6290) | Key (brake hub) |
| | | (6300) | Circlip |
| | KPF | 1328 | Stainless steel disc |
| | | (1370) | Water/dust guard (IP55) |
| | | (6080) | Brake seal ring/V-ring (IP55) |
| M05 FD | KSM | (1220) | Terminal box lid |
| | | (1240) | Terminal box lid gasket |
| | | 1300 | d.c. brake type FD |
| M05 FA | | 1360 | Brake release |
| | | 1390 | ac/dc rectifier |
| | | 1350 | a.c. brake type FA |
| | | 1380 | Brake release |

(####) Only available as a complete kit



M1 ... M4

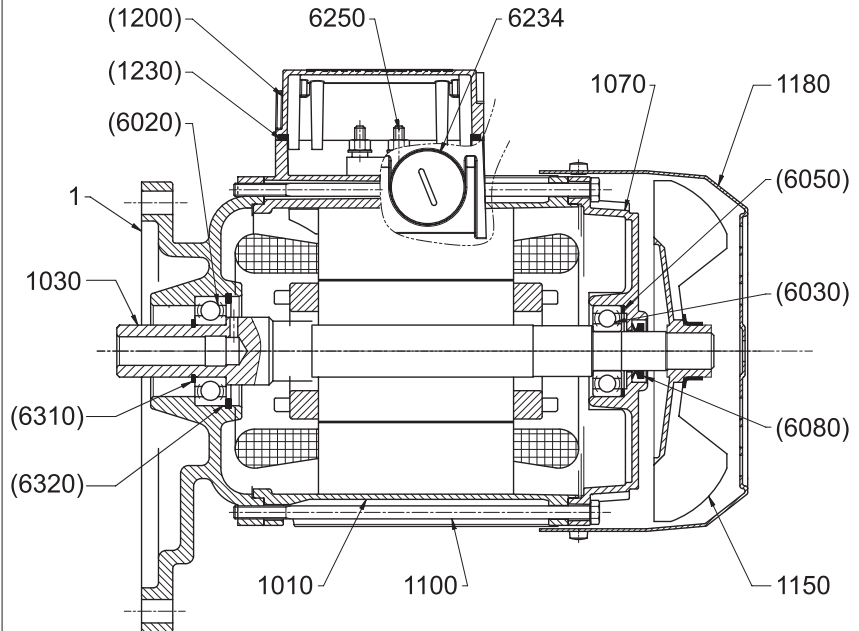
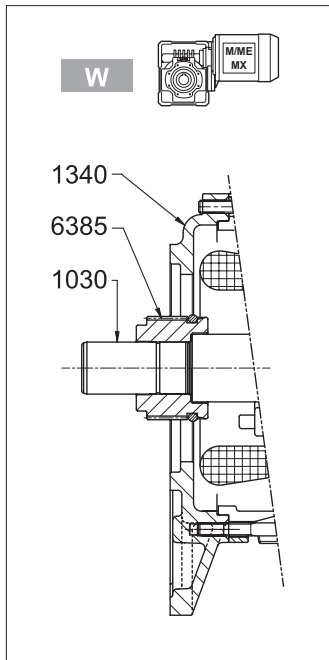
ME2 ... ME4

MX2 ... MX4

M_

ME_

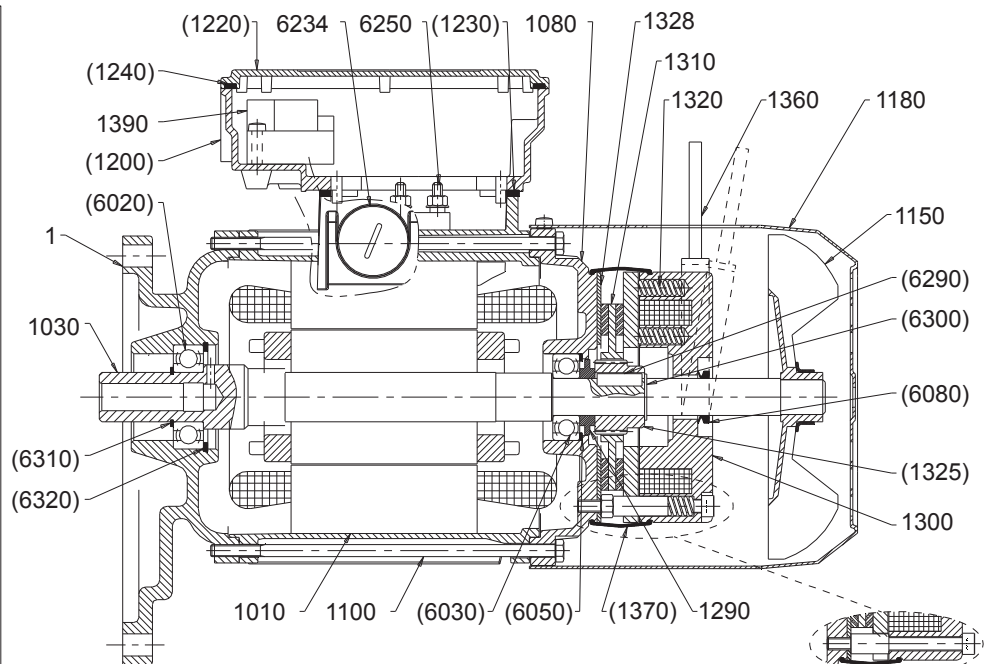
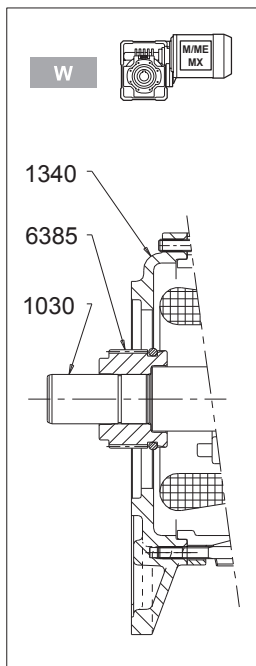
MX_

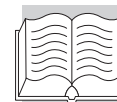
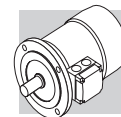


M_ FD

ME_ FD

MX_ FD

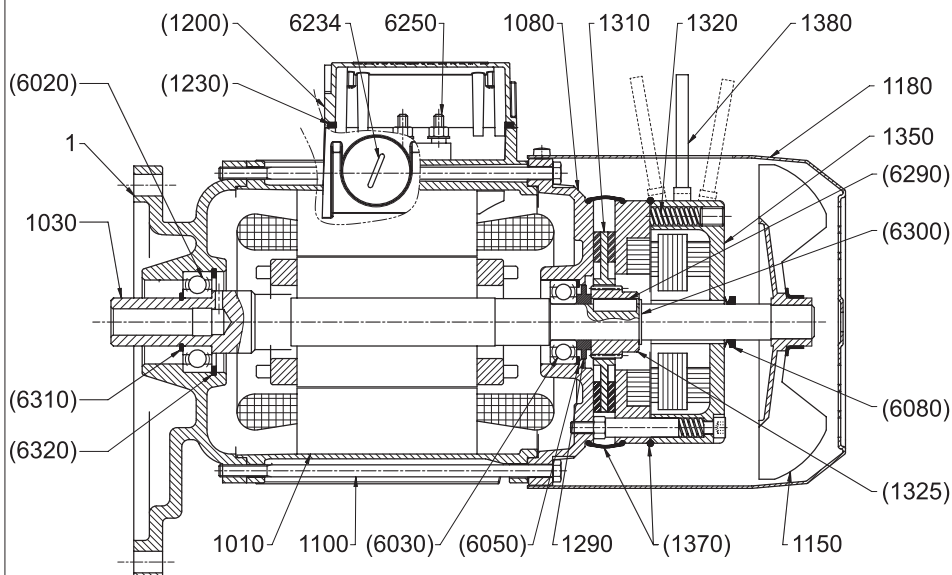
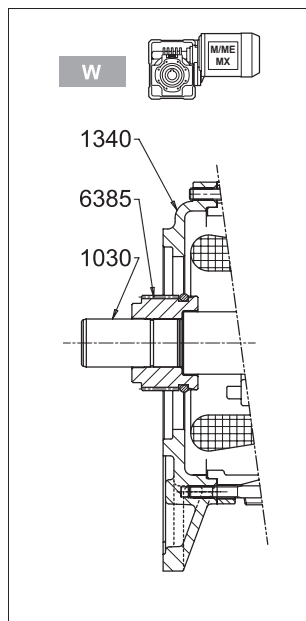




M_FA

ME_FA

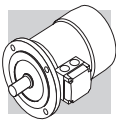
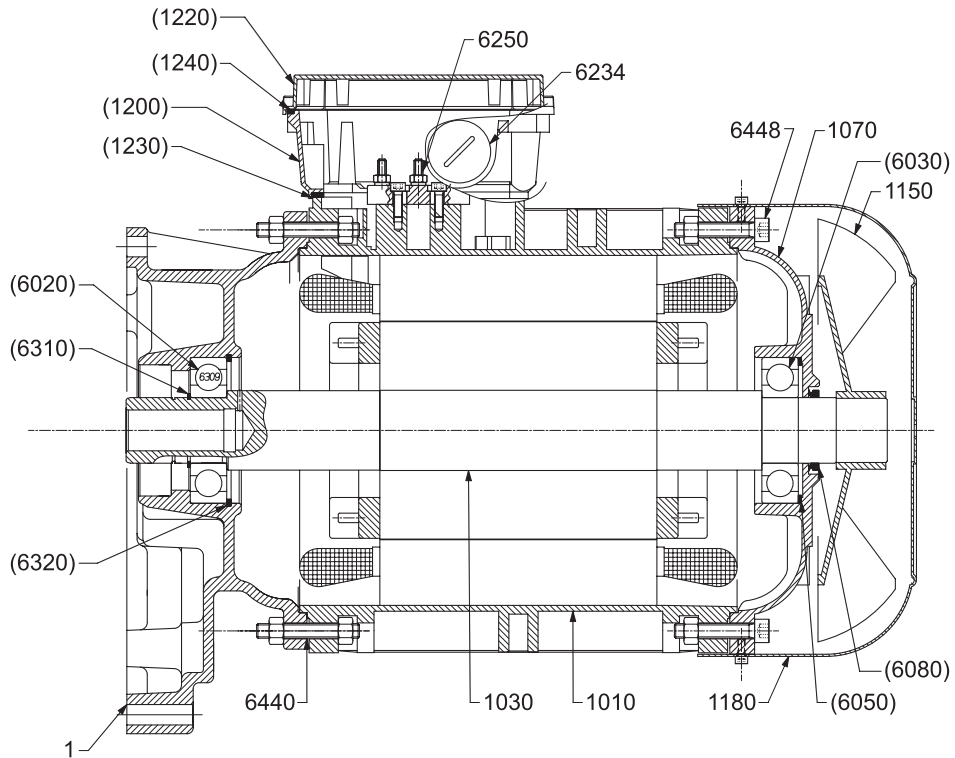
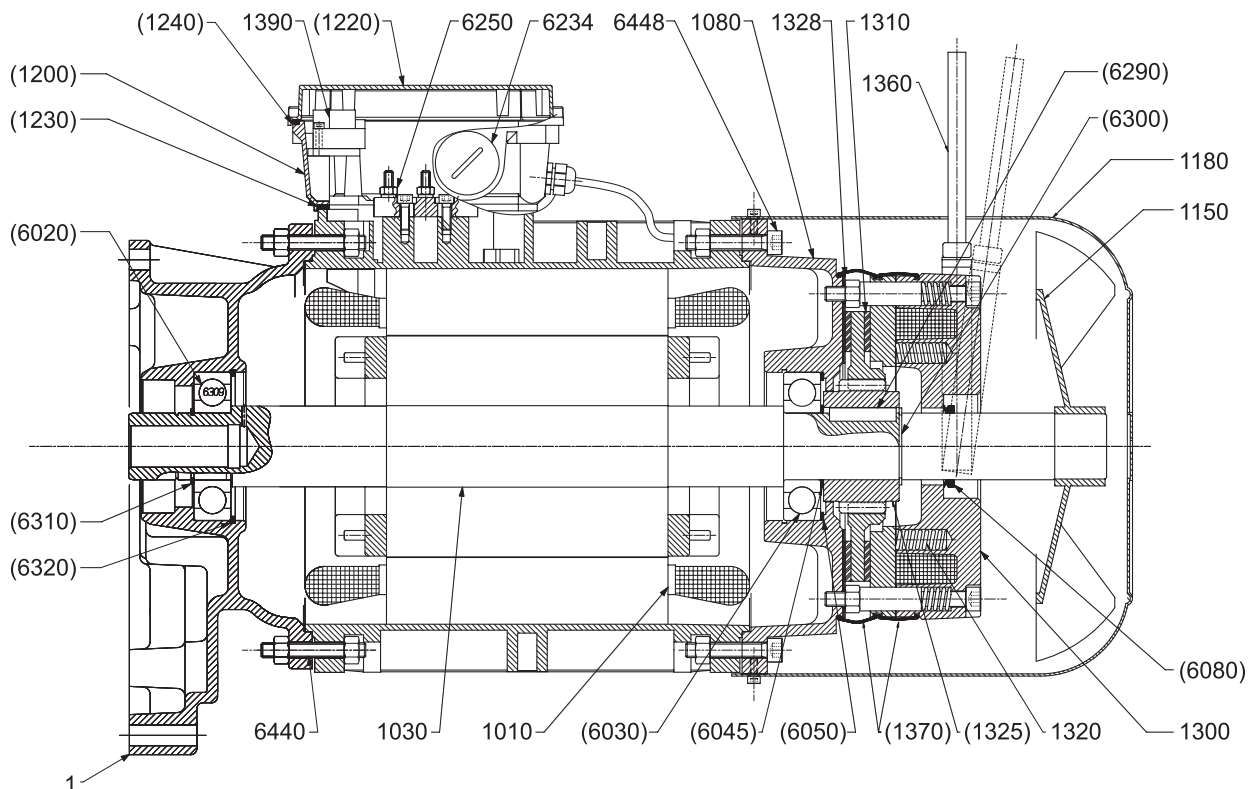
MX_FA

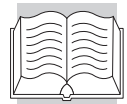
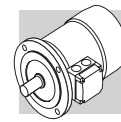


| | kit | ref. | Description |
|-----------------------|-----------------------|--------|----------------------------|
| M_ M_FD M_FA | | 1 | Motor flange |
| | | 1010 | Stator |
| | | 1030 | Rotor |
| | | 1100 | Tie-rods |
| | | 1150 | Fan |
| | | 1180 | Fan cowl |
| | ME_ ME_FD ME_FA | KSM | (1200) |
| (1230) | | | Terminal box gasket |
| MX_ MX_FD MX_FA | KSA | 1340 | Motor flange for W gearbox |
| | | (6020) | Bearing |
| | | (6030) | Bearing |
| | | (6050) | Compensation ring |
| | | (6310) | Circlip |
| M_ / ME_ MX_ | KSA | (6320) | Circlip |
| | | 6234 | Blank plug |
| | | 6250 | Terminal board |
| | | 6385 | Kit bushing for W gearbox |
| | | 1070 | Rear shield |
| | | (6080) | V-ring |

| | kit | ref. | Description |
|------------------------|-----|--------|-------------------------------|
| M_FD M_FA | | 1080 | Shield for brake motor |
| | | 1290 | Spacer ring |
| | | 1310 | Brake disc |
| | | 1320 | Brake springs |
| ME_FD ME_FA | KTF | (1325) | Brake hub |
| | | (6290) | Key (brake hub) |
| MX_FD MX_FA | KPF | (6300) | Circlip |
| | | (1370) | Water/dust guard (IP55) |
| M_FD ME_FD MX_FD | KSM | (6080) | Brake seal ring/V-ring (IP55) |
| | | (1220) | Terminal box lid |
| | | (1240) | Terminal box lid gasket |
| | | 1300 | d.c. brake type FD |
| | | 1328 | Stainless steel disc |
| M_FA ME_FA MX_FA | | 1360 | Brake release kit |
| | | 1390 | ac/dc rectifier |
| | | 1350 | a.c. brake type FA |
| | | 1380 | Brake release kit |

(####) Only available as a complete kit

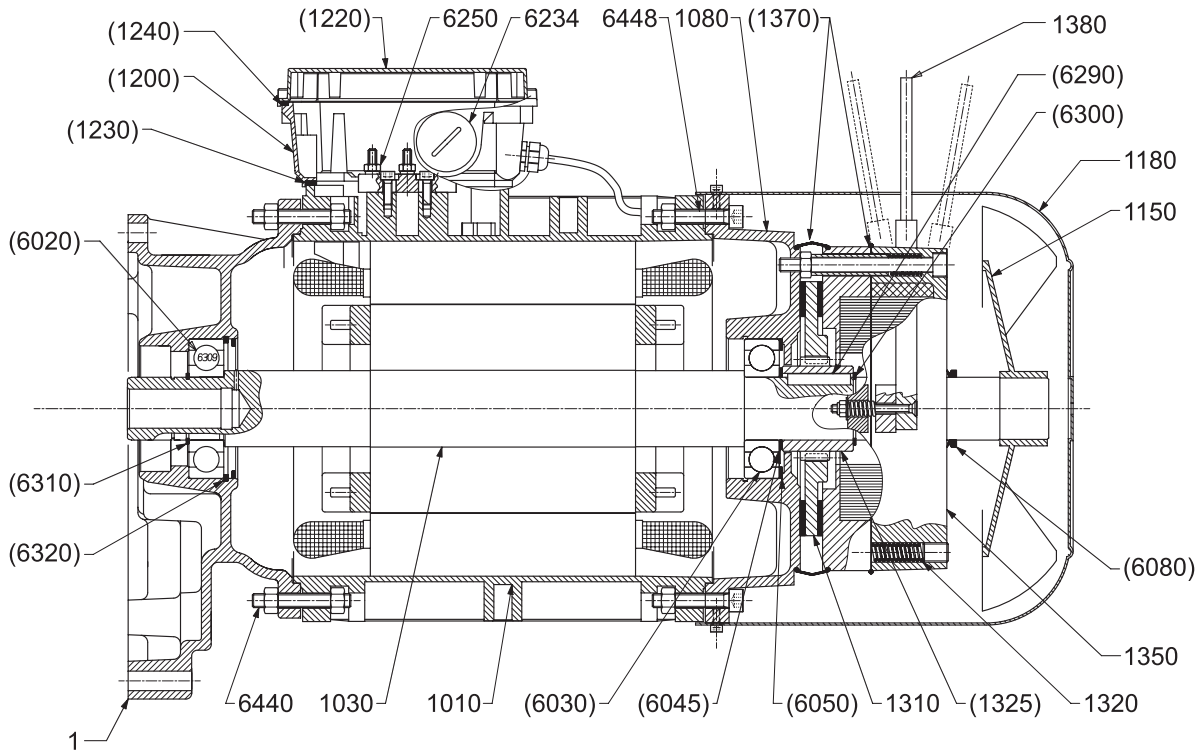
**M5****ME5****MX5****M5****ME5****MX5****M5 FD****ME5 FD****MX5 FD**



M5 FA

ME5 FA

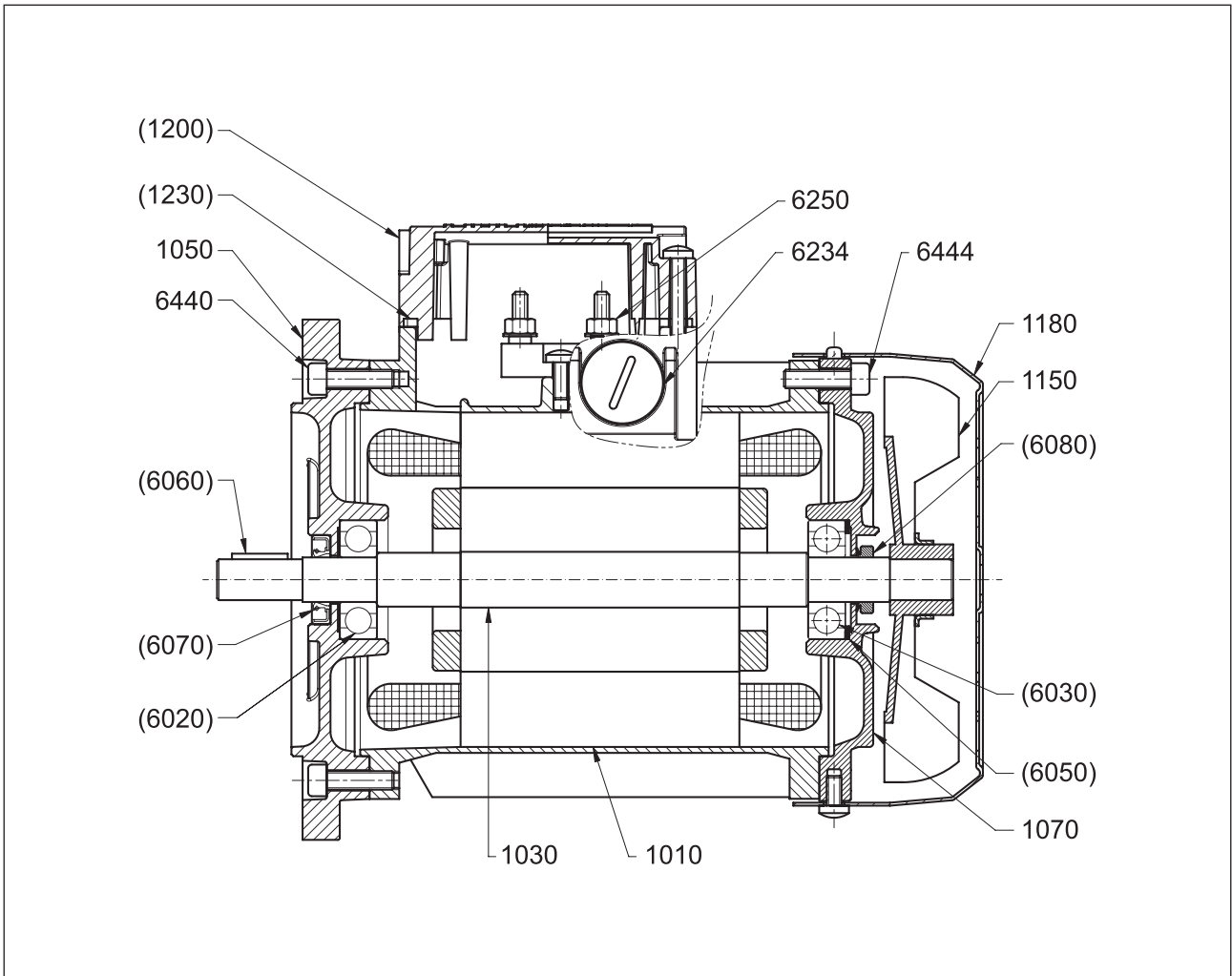
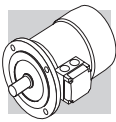
MX5 FA



| | kit | ref. | Description |
|---|--|------------|-------------------------|
| M5 M5 FD M5 FA | | 1 | Motor flange |
| | | 1010 | Stator |
| | | 1030 | Rotor |
| | | 1150 | Fan |
| | | 1180 | Fan cowl |
| | KSM | (1200) | Terminal box |
| | | (1220) | Terminal box lid |
| | | (1230) | Terminal box gasket |
| | ME5 ME5 FD ME5 FA | (1240) | Terminal box lid gasket |
| | | KSA | (6020) |
| | (6030) | | Bearing |
| (6050) | Compensation ring | | |
| (6310) | Circlip | | |
| (6320) | Circlip | | |
| | | 6234 | Blank plug |
| | | 6250 | Terminal board |
| | | 6440 | Flange bolt |
| | | 6448 | NDE shield bolt |

| | kit | ref. | Description |
|--|------------|--------|-----------------------------|
| M5 / ME5 MX5 | | 1070 | Rear shield |
| | KSA | (6080) | V-ring |
| M5 FD M5 FA | | 1080 | Shield for brake motor |
| | | 1310 | Brake disc |
| ME5 FD ME5 FA | KTF | 1320 | Brake springs |
| | | (1325) | Brake hub |
| | | (6045) | Spacer |
| MX5 FD MX5 FA | KPF | (6290) | Key (brake hub) |
| | | (6300) | Circlip |
| M5 FD ME5 FD MX5 FD | | (1370) | Water/dust guard (IP55) |
| | | (6080) | Brake V-ring (IP55) |
| | | 1300 | d.c. brake type FD |
| | | 1328 | Stainless steel disc (IP55) |
| | | 1360 | Brake release |
| M5 FA ME5 FA MX5 FA | | 1390 | ac/dc rectifier |
| | | 1350 | a.c. brake type FA |
| | | 1380 | Brake release |

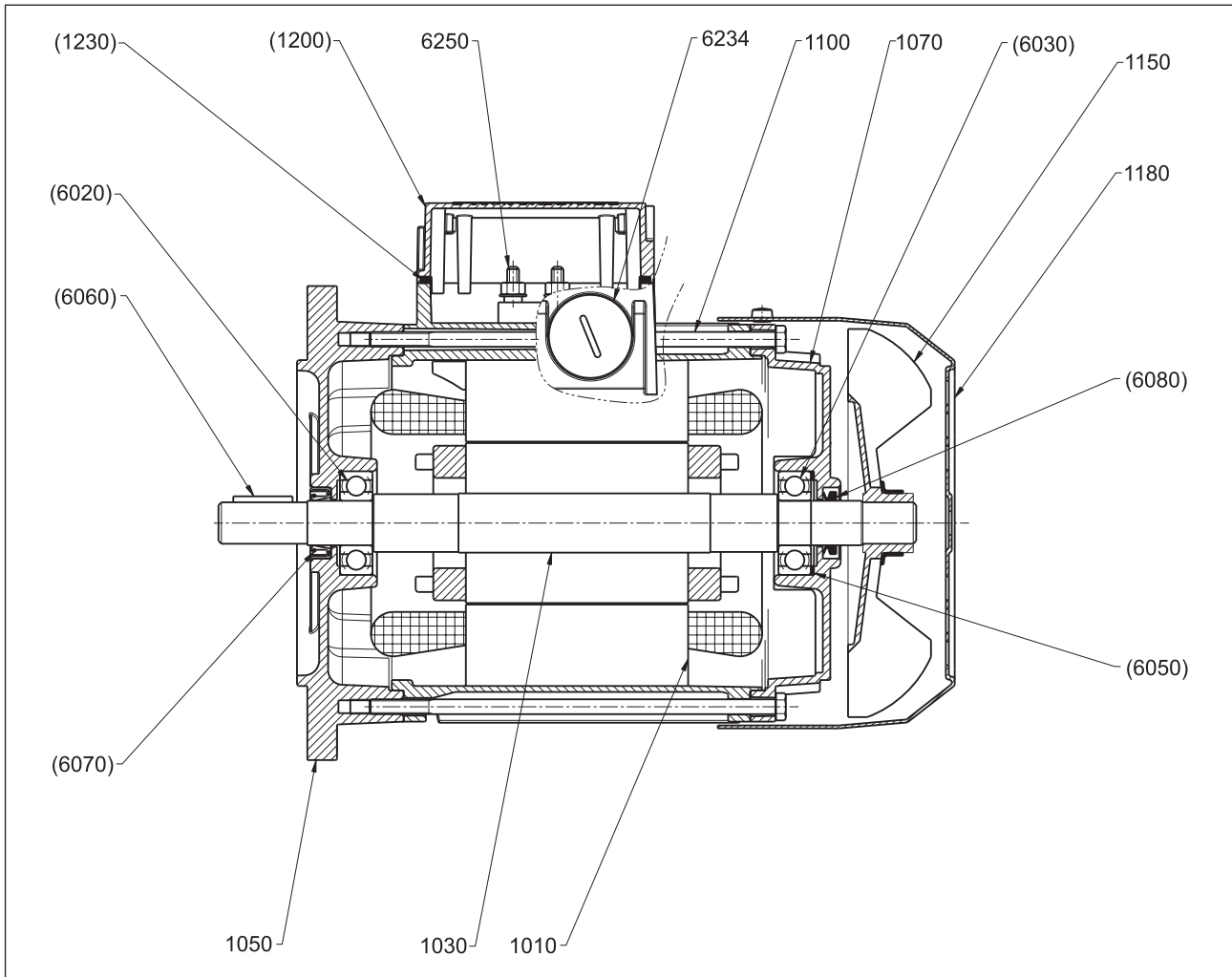
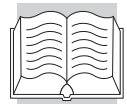
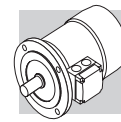
(####) Only available as a complete kit



| kit | ref. | Description |
|------------|--------|--------------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (IM B5/IM B14) |
| | 1070 | Rear shield |
| | 1150 | Fan |
| | 1180 | Fan cover |
| KSM | (1200) | Terminal box lid |
| | (1230) | Terminal box gasket |
| | 6234 | Blank plug |

| kit | ref. | Description |
|------------|--------|-------------------|
| | 6250 | Terminal board |
| | 6440 | Flange bolt |
| | 6444 | NDE shield bolt |
| KSA | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Compensation ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | (6080) | V-ring |

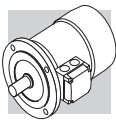
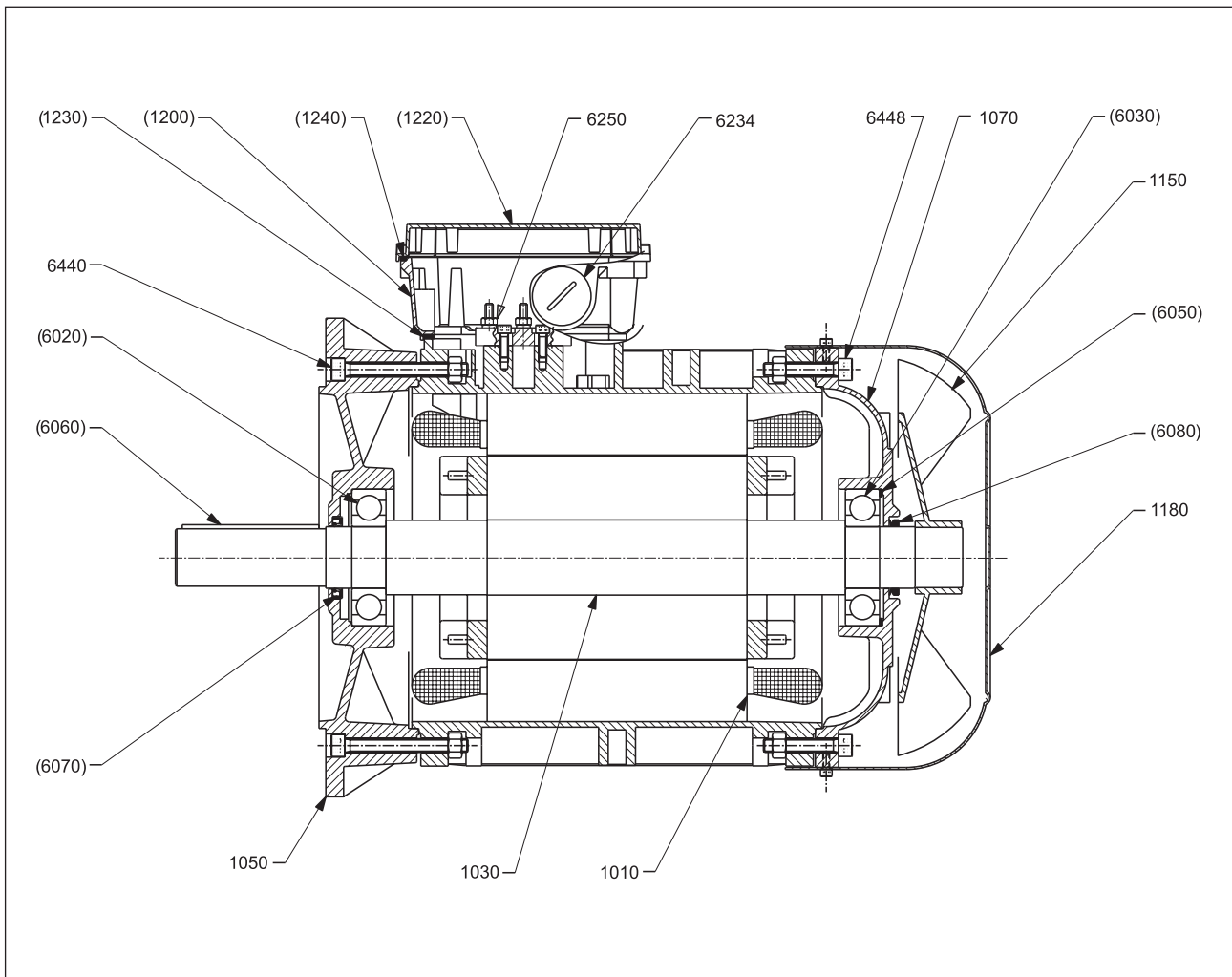
(####) Only available as a complete kit



| kit | ref. | Description |
|------------|--------|--------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (B5/B14) |
| | 1070 | Rear shield |
| | 1100 | Tie-rods |
| | 1150 | Fan |
| | 1180 | Fan cover |
| KSM | (1200) | Terminal box lid |
| | (1230) | Terminal box gasket |

| kit | ref. | Description |
|------------|--------|-------------------|
| | 6234 | Blank plug |
| | 6250 | Terminal board |
| KSA | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Compensation ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | (6080) | V-ring |

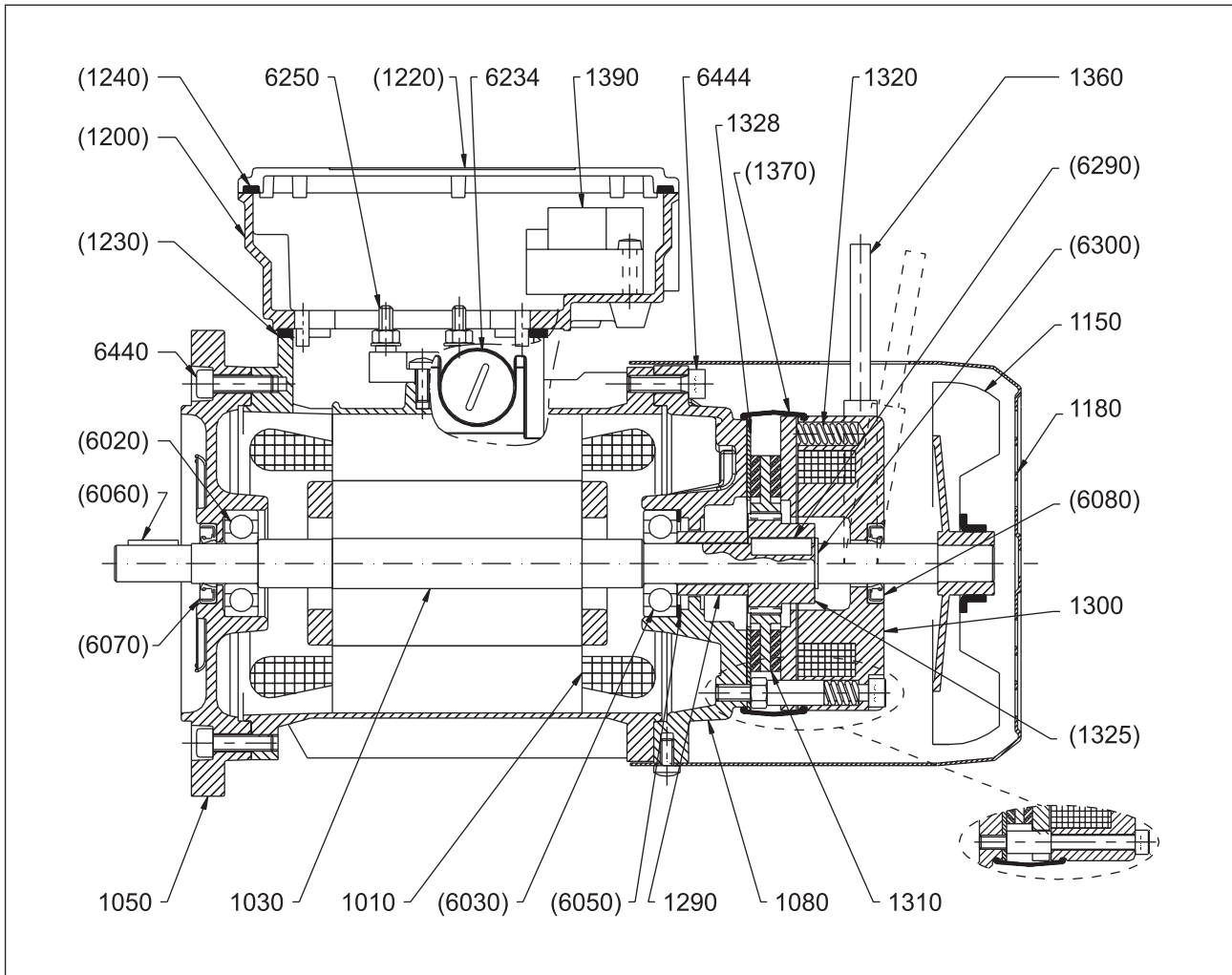
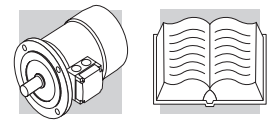
(####) Only available as a complete kit

**BX 160 , BX 180****BN 160M ... BN 200****BE 160 , BE 180**

| kit | ref. | Description |
|------------|--------|-------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (IM B5) |
| | 1070 | Rear shield |
| | 1150 | Fan |
| | 1180 | Fan cover |
| KSM | (1200) | Terminal box |
| | (1220) | Terminal box lid |
| | (1230) | Terminal box gasket |
| | (1240) | Lid gasket |

| kit | ref. | Description |
|------------|--------|-------------------|
| | 6234 | Blank plug |
| | 6250 | Terminal board |
| | 6440 | DE flange bolts |
| | 6448 | NDE shield bolts |
| KSA | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Compensation ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | (6080) | V-ring |

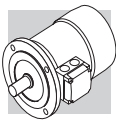
(####) Only available as a complete kit



| kit | ref. | Description |
|------------|--------|--------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (B5/B14) |
| | 1080 | Rear shield |
| | 1150 | Fan |
| | 1180 | Fan cover |
| KSM | (1200) | Terminal box |
| | (1220) | Terminal box lid |
| | (1230) | Terminal box gasket |
| | (1240) | Lid gasket |
| | 1290 | Spacer ring |
| | 1300 | d.c. brake type FD |
| | 1310 | Brake disc |
| | 1320 | Brake springs |
| KTF | (1325) | Brake hub |
| | (6290) | Key (brake hub) |
| | (6300) | Circlip |

| kit | ref. | Description |
|------------|--------|-----------------------------|
| | 1328 | Stainless steel disc (IP55) |
| | 1360 | Hand release lever |
| KPF | (1370) | Grommet (IP55) |
| | (6080) | V-ring (IP55) |
| | 1390 | ac/dc rectifier |
| KSA | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Compensation ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | 6234 | Blank plug |
| | 6250 | Terminal board |
| | 6440 | Flange bolt |
| | 6444 | NDE shield bolts |

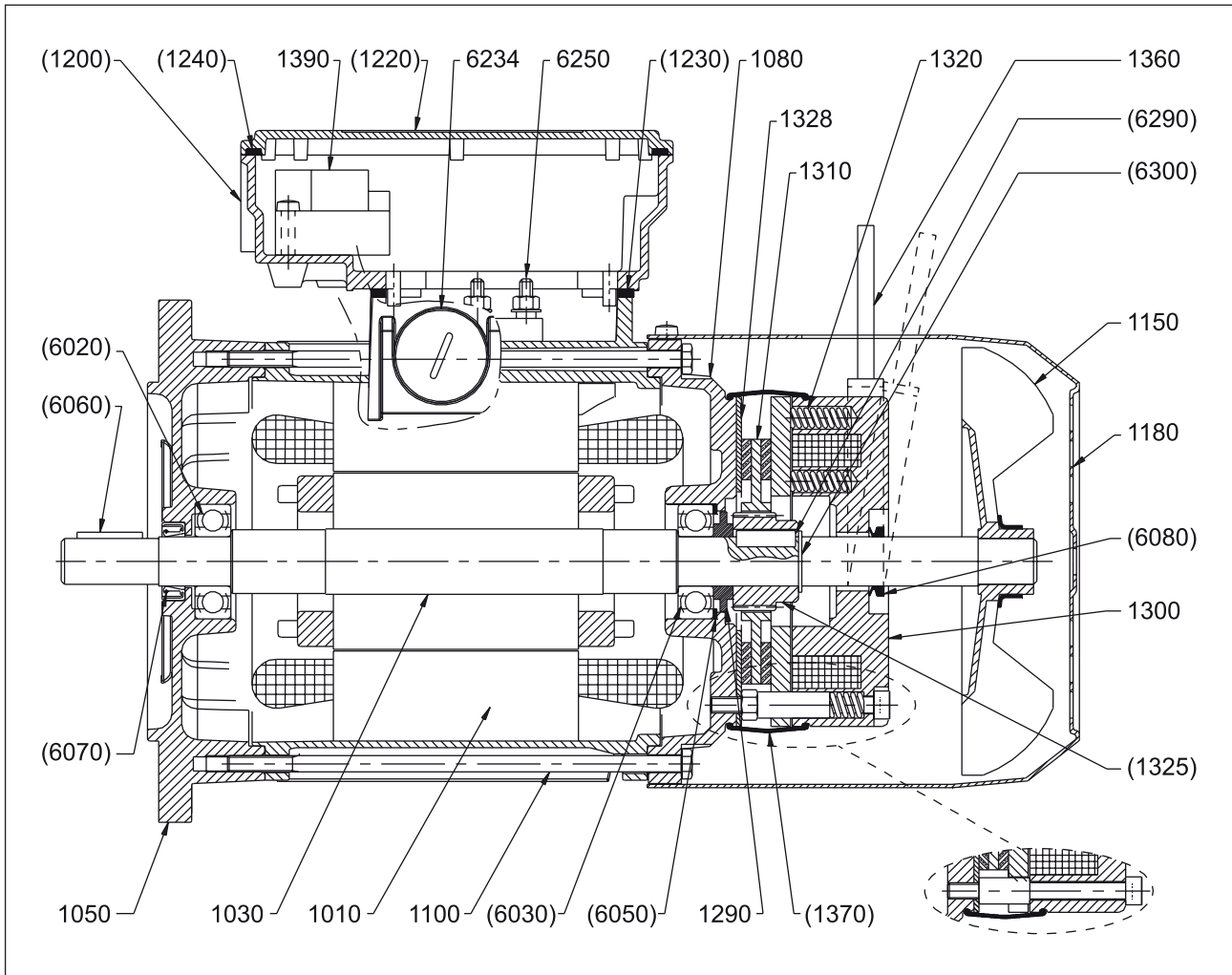
(####) Only available as a complete kit



BN 71 FD ... BN 160MR FD

BE 80 FD ... BE 132 FD

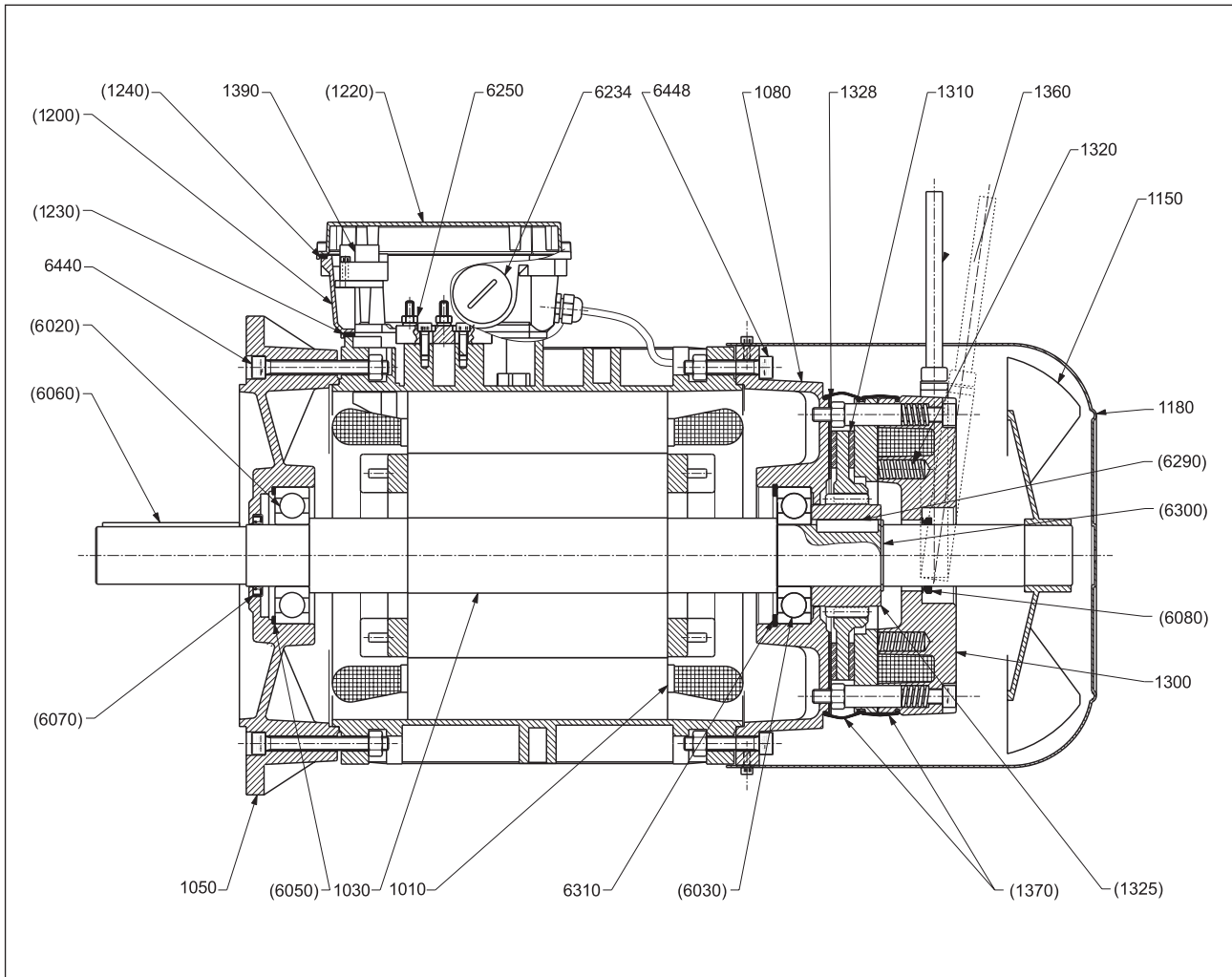
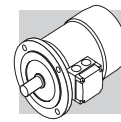
BX 80 FD ... BX 132 FD



| kit | ref. | Description |
|------------|--------|--------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (B5/B14) |
| | 1080 | Rear shield |
| | 1100 | Tie-rods |
| | 1150 | Fan |
| | 1180 | Fan cover |
| KSM | (1200) | Terminal box |
| | (1220) | Terminal box lid |
| | (1230) | Terminal box gasket |
| | (1240) | Lid gasket |
| | 1290 | Spacer ring |
| | 1300 | d.c. brake type FD |
| | 1310 | Brake disc |
| | 1320 | Brake springs |

| kit | ref. | Description |
|------------|--------|-----------------------------|
| | (1325) | Brake hub |
| KTF | (6290) | Key (brake hub) |
| | (6300) | Circlip |
| | 1328 | Stainless steel disc (IP55) |
| | 1360 | Hand release lever |
| KPF | (1370) | Grommet (IP55) |
| | (6080) | V-ring (IP55) |
| KSA | 1390 | ac/dc rectifier |
| | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Compensation ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | 6234 | Blank plug |
| | 6250 | Terminal board |

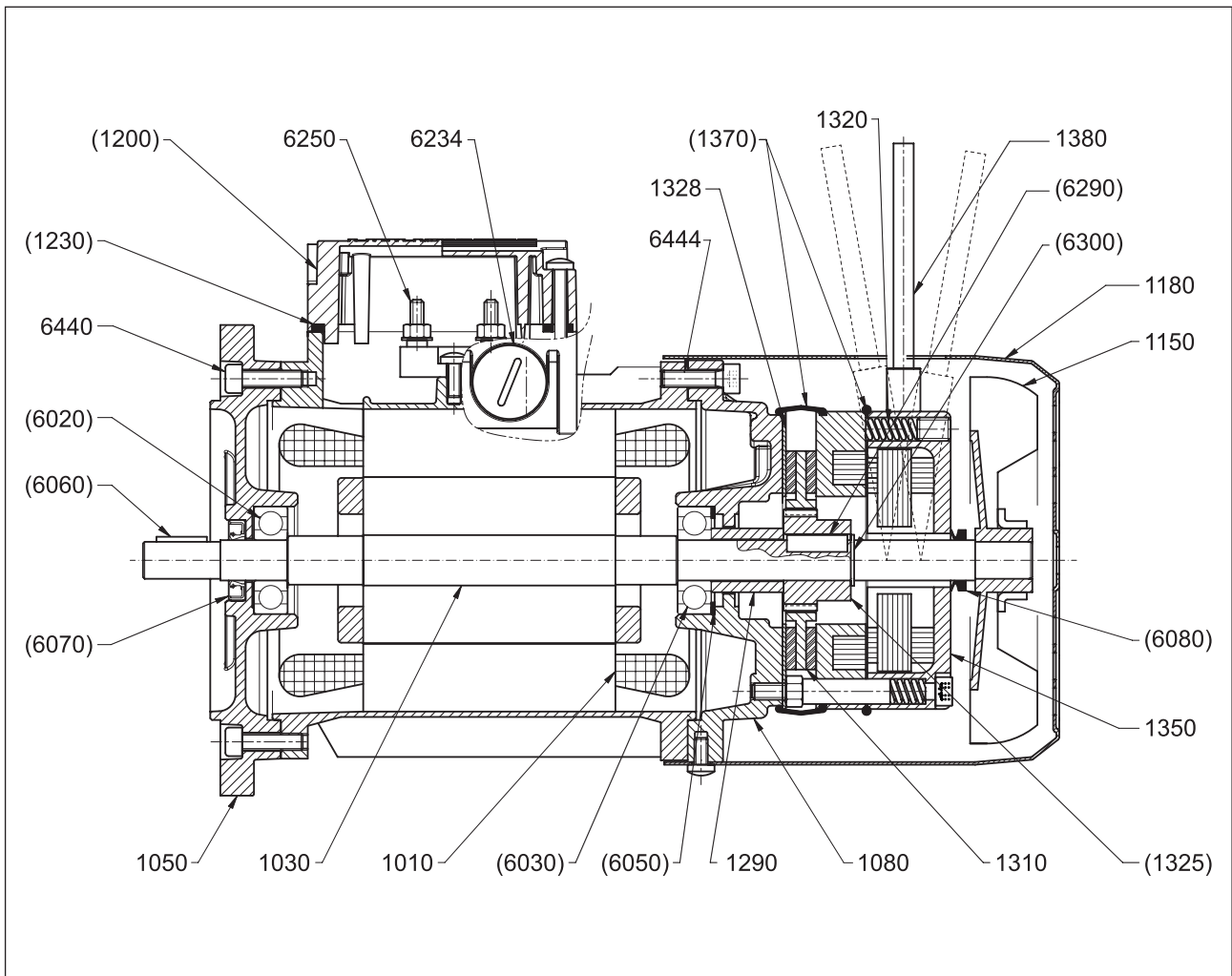
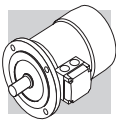
(####) Only available as a complete kit



| kit | ref. | Description |
|------------|--------|-------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (IM B5) |
| | 1080 | Rear shield (NDE) |
| | 1150 | Fan |
| | 1180 | Fan cover |
| KSM | (1200) | Terminal box |
| | (1220) | Terminal box lid |
| | (1230) | Terminal box gasket |
| | (1240) | Lid gasket |
| | 1300 | d.c. brake type FD |
| | 1310 | Brake disc |
| | 1320 | Brake springs |
| KTF | (1325) | Brake hub |
| | (6290) | Key (brake hub) |
| | (6300) | Circlip |

| kit | ref. | Description |
|------------|--------|-----------------------------|
| | 1328 | Stainless steel disc (IP55) |
| | 1360 | Hand release lever |
| KPF | (1370) | Grommet (IP55) |
| | (6080) | V-ring (IP55) |
| | 1390 | ac/dc rectifier |
| KSA | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Compensation ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | 6234 | Blank plug |
| | 6250 | Terminal board |
| | 6310 | Circlip |
| | 6440 | Bolts DE |
| | 6448 | Bolts NDE |

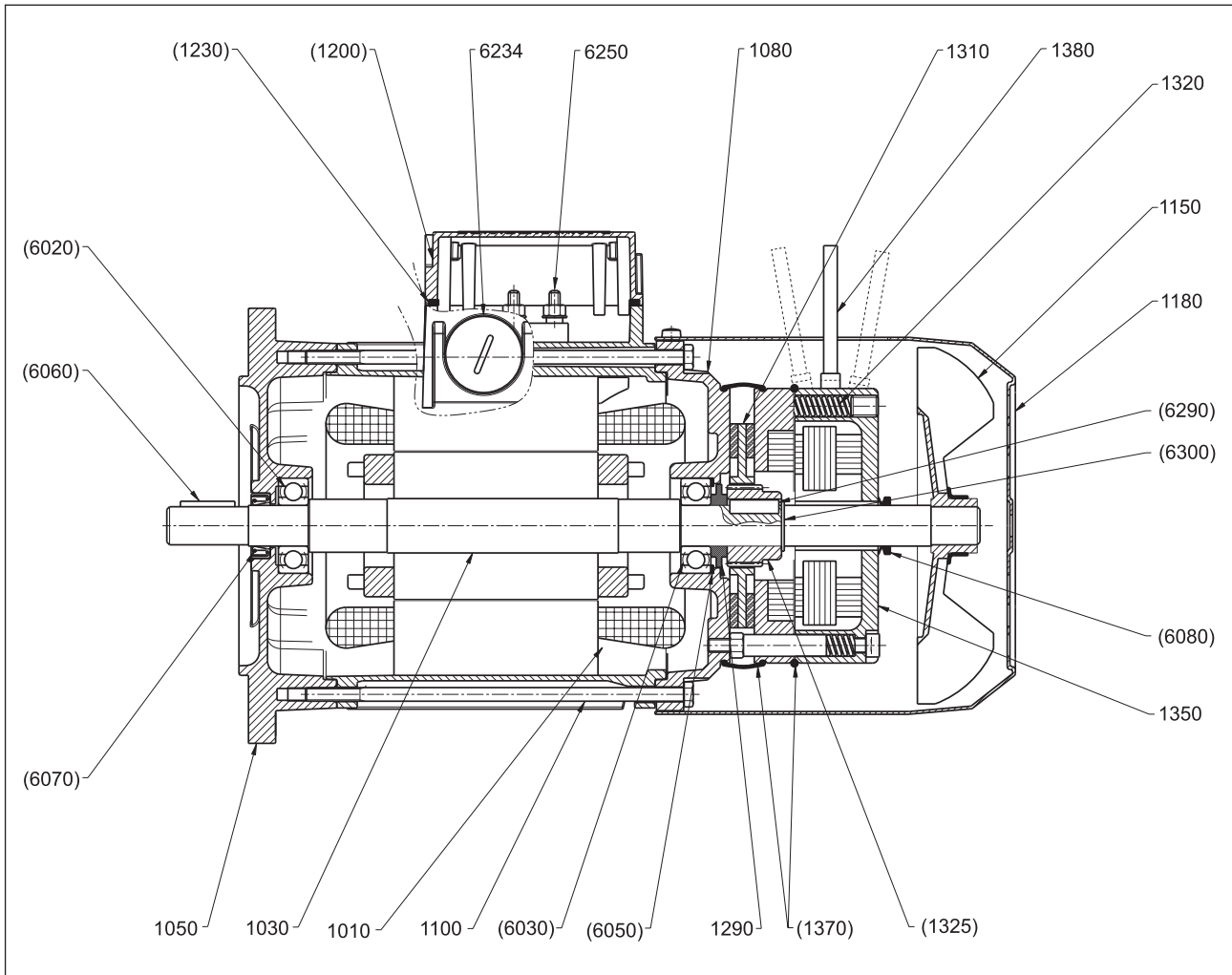
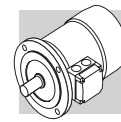
(####) Only available as a complete kit



| kit | ref. | Description |
|------------|--------|--------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (B5/B14) |
| | 1080 | Rear shield |
| | 1150 | Fan |
| | 1180 | Fan cover |
| KSM | (1200) | Terminal box |
| | (1230) | Terminal box gasket |
| | 1290 | Spacer ring |
| | 1310 | Brake disc |
| | 1320 | Brake springs |
| KTF | (1325) | Brake hub |
| | (6290) | Key (brake hub) |
| | (6300) | Circlip |

| kit | ref. | Description |
|------------|--------|-----------------------------|
| | 1328 | Stainless steel disc (IP55) |
| | 1350 | a.c. brake type FA |
| KPF | (1370) | Grommet (IP55) |
| | (6080) | V-ring (IP55) |
| | 1380 | Hand release lever |
| KSA | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Compensation ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | 6234 | Blank plug |
| | 6250 | Terminal board |
| | 6440 | Flange bolt |
| | 6444 | NDE shield bolts |

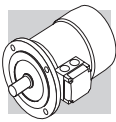
(####) Only available as a complete kit



| kit | ref. | Description |
|------------|--------|--------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (B5/B14) |
| | 1080 | Rear shield |
| | 1100 | Tie-rods |
| | 1150 | Fan |
| | 1180 | Fan cowl |
| KSM | (1200) | Terminal box |
| | (1230) | Terminal box gasket |
| | 1290 | Spacer ring |
| | 1310 | Brake disc |
| | 1320 | Brake springs |
| KTF | (1325) | Brake hub |
| | (6290) | Key (brake hub) |
| | (6300) | Circlip |

| kit | ref. | Description |
|------------|--------|-----------------------|
| | 1350 | a.c. brake type FA |
| KPF | (1370) | Brake seal kit (IP55) |
| | (6080) | V-ring (IP55) |
| | 1380 | Hand release lever |
| KSA | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Compensation ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | 6234 | Blank plug |
| | 6250 | Terminal board |

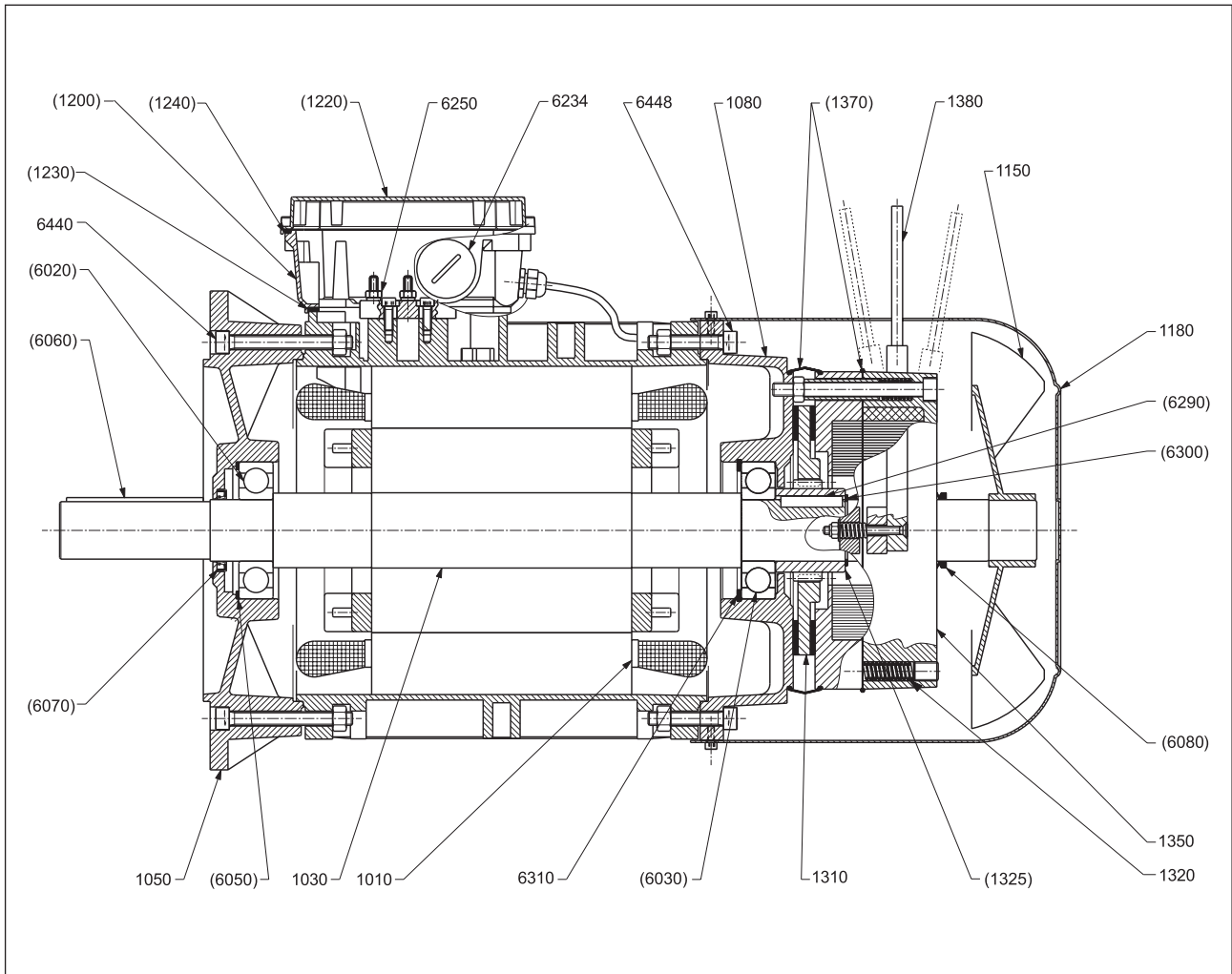
(####) Only available as a complete kit



BN 160 FA ... BN 180M FA

BE 160 FA , BE 180 FA

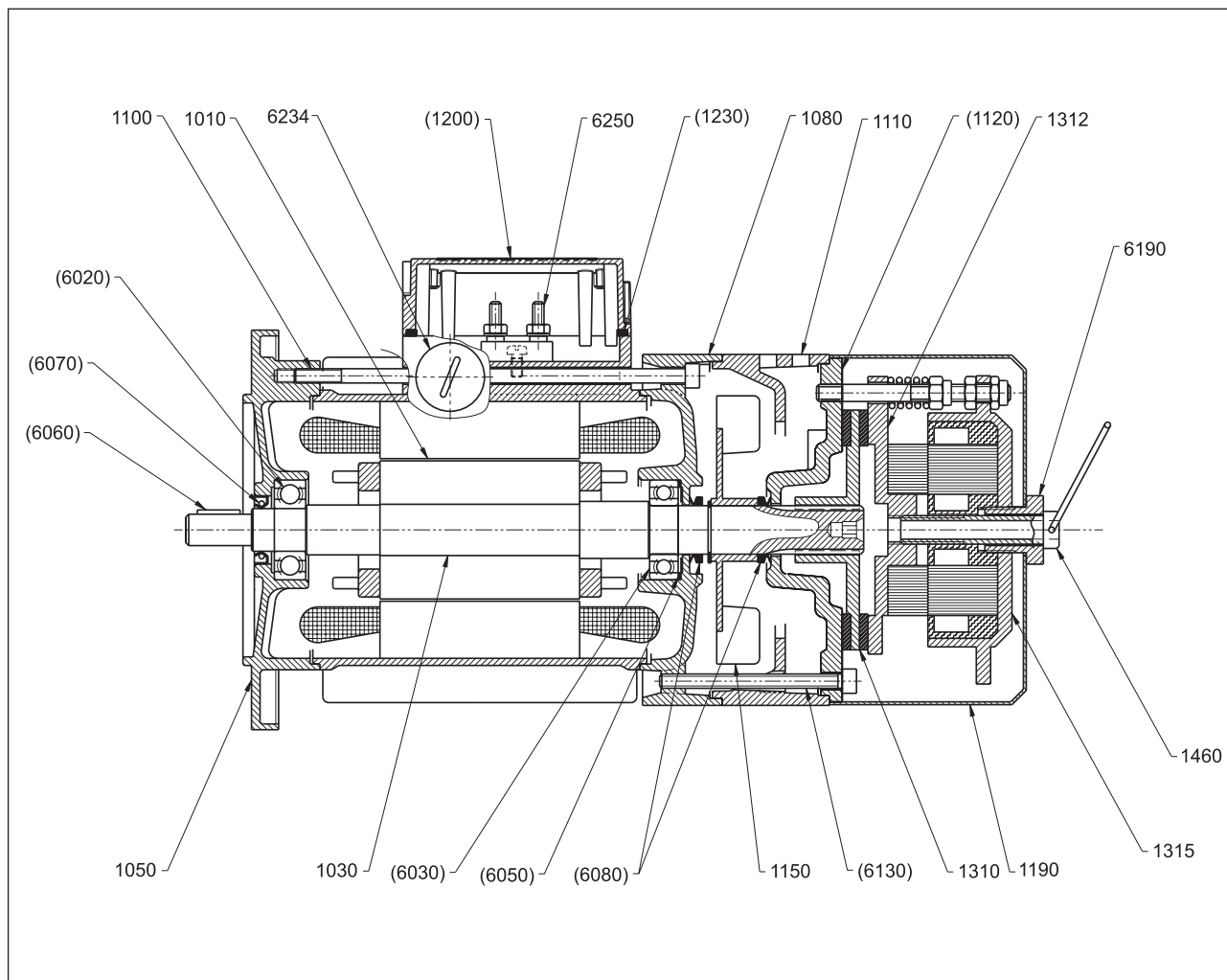
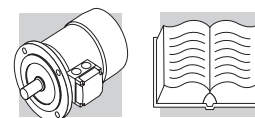
BX 160 FA , BX 180 FA



| kit | ref. | Description |
|------------|--------|-------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (IM B5) |
| | 1080 | Rear shield |
| | 1150 | Fan |
| | 1180 | Fan cowl |
| KSM | (1200) | Terminal box |
| | (1220) | Terminal box lid |
| | (1230) | Terminal box gasket |
| | (1240) | Terminal box lid gasket |
| | 1310 | Brake disc |
| | 1320 | Brake springs |
| KTF | (1325) | Brake hub |
| | (6290) | Key (brake hub) |
| | (6300) | Circlip |

| kit | ref. | Description |
|------------|--------|-----------------------|
| | 1350 | a.c. brake type FA |
| KPF | (1370) | Brake seal kit (IP55) |
| | (6080) | V-ring (IP55) |
| | 1380 | Hand release lever |
| KSA | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Elastic ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | 6234 | Blank plug |
| | 6250 | Terminal board |
| | 6310 | Circlip |
| | 6440 | Bolt DE |
| | 6448 | Bolt NDE |

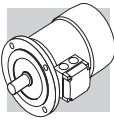
(####) Only available as a complete kit




| kit | ref. | Description |
|------------|--------|--------------------------|
| | 1010 | Stator winding complete |
| | 1030 | Rotor shaft |
| | 1050 | Mounting flange (B5/B14) |
| | 1080 | Rear shield |
| | 1100 | Tie rods |
| | 1110 | Fan cowling |
| KSF | (1120) | Brake holding plate |
| | (6130) | Bolts |
| | 1150 | Fan |
| | 1190 | Brake guard |
| KSM | (1200) | Terminal box |
| | (1230) | Terminal box gasket |
| | 1310 | Brake disc |

| kit | ref. | Description |
|------------|--------|--------------------|
| | 1312 | Armature plate |
| | 1315 | a.c. brake type BA |
| | 1460 | Brake release |
| KSA | (6020) | Bearing |
| | (6030) | Bearing |
| | (6050) | Compensation ring |
| | (6060) | Key |
| | (6070) | Seal ring |
| | (6080) | V-ring |
| | 6190 | Nut screw |
| | 6234 | Blank plug |
| | 6250 | Terminal board |

(####) Only available as a complete kit



INDEX OF REVISIONS (R)

| BR_IOM_BX-BE-BN-MX-ME-M_STD_ENG_R02_1 | |
|---|--|
|  | Description |
| 2 | Updated paragraph 3.1 "Identification" |
| ... | Removed information on brakes type AFD |
| ... | Added information on BX, MX motors |
| 15 | Updated chapter "Disassembly, recycling or disposal" |

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