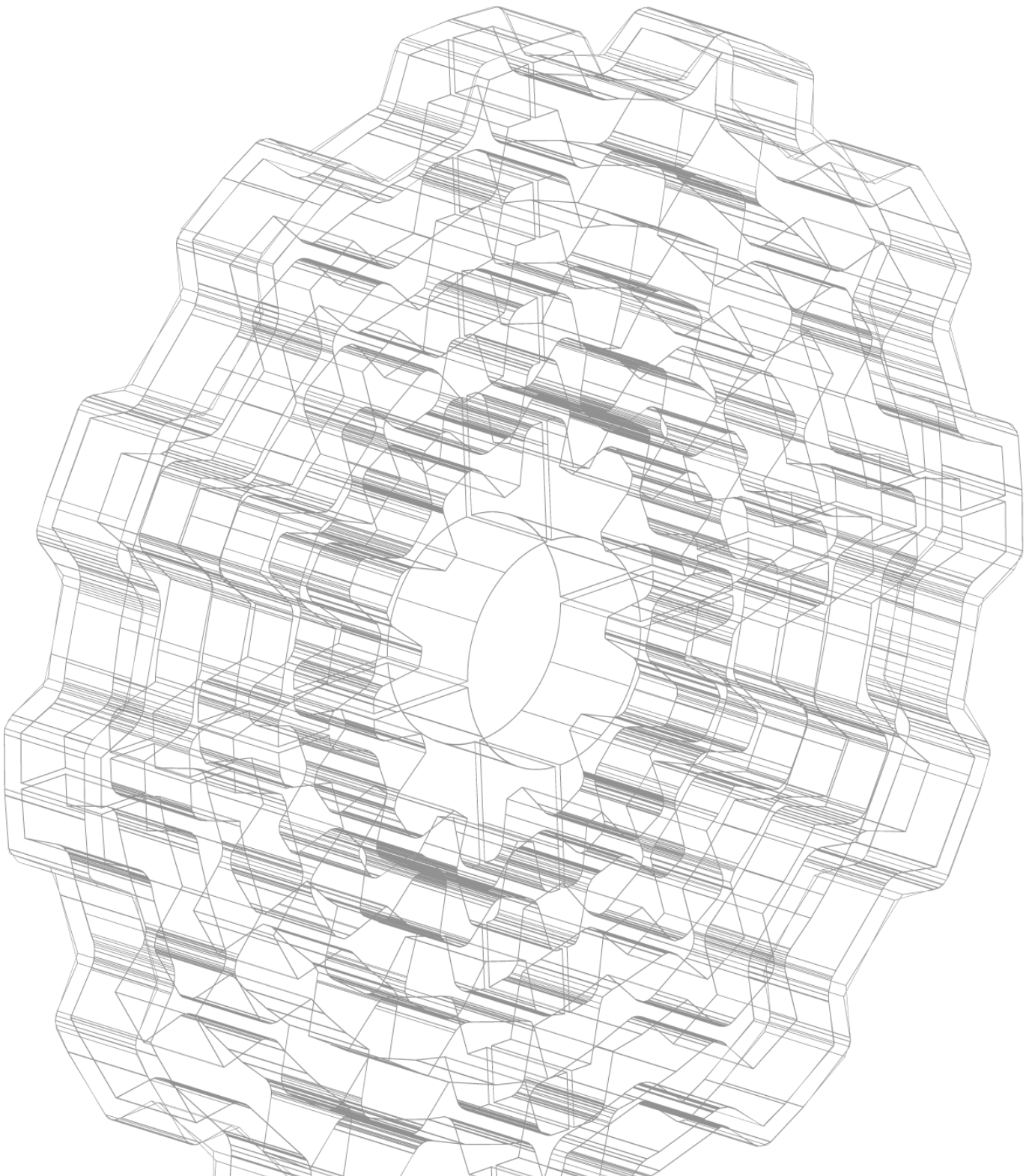


# USE AND MAINTENANCE INSTRUCTIONS



## USE AND MAINTENANCE INSTRUCTIONS FOR MOTOVARIO-SPAGGIARI PRODUCTS:

### Standard

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#### Atex 2G/2D

#### Atex 3G/3D

- COAXIAL REDUCERS SERIES: H, HA, SH, RT
- RIGHT ANGLE SHAFT REDUCERS SERIES B, BA
- WORM GEARED REDUCERS SERIES NMRV, NMRV-P, SW
- SHAFT MOUNTED REDUCERS SERIES S
- VARIATORS SERIES S, TXF
- VARIATOR REDUCERS SERIES VH, VHA, SR

## ORIGINAL VERSION IN ITALIAN ENGLISH VERSION - TRANSLATION

**IMPORTANT!** The data and information given in this document substitute those given in previous editions which are thus to be considered obsolete; periodically consult the technical documentation available on [www.motovario-group.com](http://www.motovario-group.com) for up-to-date performance information and specifications. For the motor section relating to motorvariators and geared motors, consult the motors manual available on [www.motovario-group.com](http://www.motovario-group.com).

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## 1. GENERAL INFORMATION

### Purpose

This manual has been provided by **Motovario Group** to give information to authorised persons regarding transport, installation, maintenance, repair, disassembly and scrapping of the reducer/variator.

Information regarding the electric motor can be found in the motor's User and Maintenance Instructions. Failure to follow the instructions is a health and safety hazard and can result in economic damages. The information must be kept carefully by the person charged with doing so and be available at all times for reference in good condition. In case of damage or loss, the documentation can be requested directly from **Motovario Group**.

### Symbols



#### Important - Danger

Indicates a serious personal health and safety hazard.



#### Important information

Indicates important technical information.

### Atex symbols



#### Important - Symbols referring to Atex Directive 94/9/CE

Indicates a serious personal health and safety hazard  
 . Work must always be done by qualified staff  
 with special safety training for potentially explosive atmospheres.

### Product identification

The variator/reducer bears an identifying nameplate. if the product includes a motor, the motor information is available in its manual.

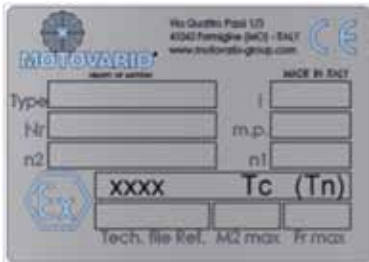
### Nameplate MOTOVARIO-SPAGGIARI



N. : order number  
 TYPE : Reducer/variator code  
 i : reduction ratio  
 xx : mounting position

# USE AND MAINTENANCE INSTRUCTIONS

## Nameplate Motovario Atex



### Nameplate information.

- Type: Reducer/variator code
- i : reduction ratio
- N. : order number
- m.p. : mounting position
- n2 : output shaft speed (rpm)
- n1 : input shaft speed (rpm)
- xxxx Atex identification field
  - for zone 2, 22     **II 3GD c**
  - for zone 1, 21     **II 2GD ck**
- Tn temperature class: T4 or T3
- Tc: max surface temperature
- Tech. file Ref. : technical file archive number
- M2 max : Max admissible torque (Nm)
- Fr max : Max admissible overhung load on slow shaft (N).

If the nameplate is illegible, request another from **Motovario Group**.

## Assistance

For any technical assistance requirements, contact the **Motovario Group** sale network directly and quote the nameplate data

## Manufacturer's liability:

Motovario Group declines all liability for:

- use of the reducer which does not comply with local safety and accident prevention legislation
- work done by unqualified persons
- incorrect installation
- tampering
- incorrect observance or failure to observe the instructions given in this manual
- for gearmotors, incorrect electrical power supply.

To avoid damage to the reducer/variator, run it within its admissible operating range, and run routine maintenance. Allow only qualified persons to inspect and service the unit and use only original spare parts.



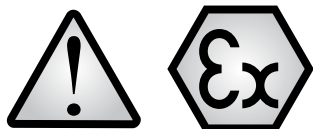
Use the variator/reducer only in the configurations given in the catalogue; do not use it in any other way. The instructions given in this manual do not substitute but rather complement the provisions of established safety legislation.

## 2. TECHNICAL INFORMATION

### Reducer/variator description

The variator/reducer is designed to be used for particular applications and is supplied in a variety of forms and configurations, including accessories and optional variants, to do so.

The user is responsible for using it appropriately and in line with the warnings given in this manual.

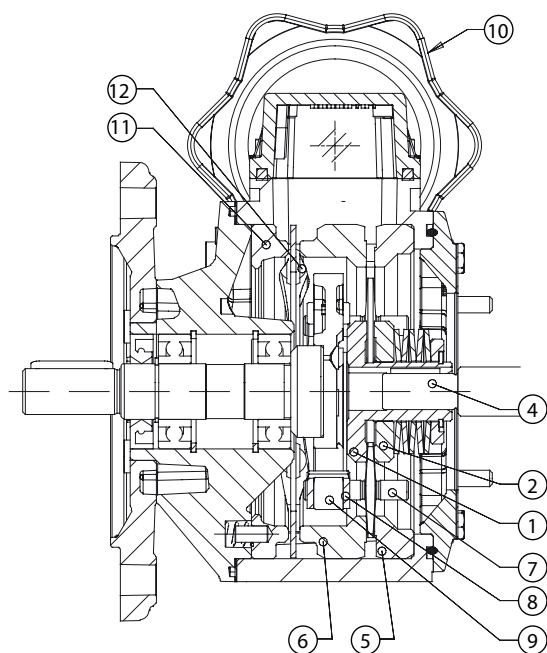


- The reducer/variator may be mounted only in the mounting position specified on its nameplate; any change in the mounting position must be authorised by Motovario Group.
- Variations in angle/inclination from the horizontal are allowed within a range of +/- 5°.
- Check for oil leaks; do not install the unit if any are found.
- After repairs, top the oil level up.

### Operation of the variator:

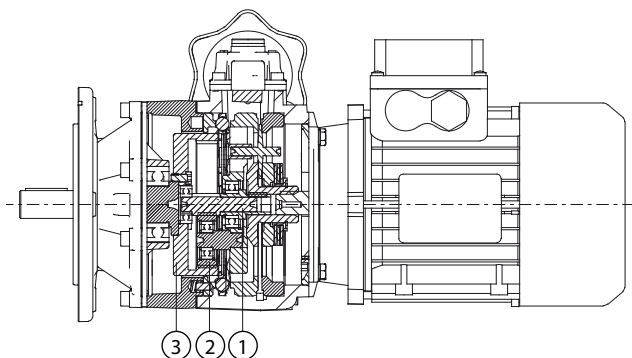
The motor variator is composed of two internal tracks (1 and 2) secured by Belleville washers (3) locked to the motor shaft (4), two external tracks (5 and 6) secured to the casing and a certain number of planets (7) mounted on bushes (8) which run radially on the planet carrier (9) which transmits the drive. The planets, in contact with the internal tracks, which drive them, and the fixed external tracks, are thus driven in a dual motion: rotation around their own axes, and rotation around the external tracks which drives the planet carrier, itself mounted to the output shaft. The speed is changed by operating the handwheel (10), which moves track (6), supported on a ball bearing race (12), angularly on the countertrack with cams (11). This movement modifies the space between the tracks (5 and 6) and thus varies the radial displacement of the planets and hence the drive transmitted to the planet carrier.

**N.B.: This adjustment may only be made with the unit running.**



- 1 Internal fixed track
- 2 Internal mobile track
- 3 Belleville washer
- 4 Shaft
- 5 External fixed track
- 6 External mobile track
- 7 Planet
- 8 Planet bush
- 9 Planet carrier
- 10 Handwheel
- 11 External adjuster track
- 12 Ball bearing race

### Differential:



The motor variator can be supplied complete with planetary unit/differential which allows for variations of the output speed from zero to the maximum allowed speed. This is possible because the constant input speed is also transmitted to the drive pinion (1) of the planetary variator/reducer. The constant input speed is transformed into variable variator speed and retransmitted to the planets (2) of the planetary reducer/variator. This makes the speed of the planets (2) equal to that of the drive pinion (1); in these conditions the speed of the outer track is zero and hence the output shaft speed is zero.

# USE AND MAINTENANCE INSTRUCTIONS

## Conformity:

The reducers are constructed according to applicable safety requirements. Note that the Machinery Directive 2006/42/CE applies to the entire system of which the reducer/variator forms a part. Motovario Group electric motors comply with the Low Voltage Directive 2006/95/CE and EMC Directive 2004/108/CE regarding their intrinsic characteristics in relation to emissions and levels of immunity.



When used in accordance with the enclosed instructions, the reducers in question may be used in the following contexts:

**Group II  
Category 2G and 2D  
Zone 1/21 for gas and powder**

Ignition protection:

EN13463-5 (c) constructional safety

EN13463-8 (k) immersion in liquids

The units classified in this way are not standard supply and are thus customised to satisfy the standards contained in the directive in question.

**Group II  
Category 3G and 3D  
Zone 2/22 for gas and powder**

Ignition protection:

EN13463-5 (c) constructional safety

The units classified in this way are standard supply, and are marked for conformity with the standards contained in the directive in question.

## Operating conditions and ranges:



DO NOT modify the mounting position or constructional form.  
Do not run the unit at speeds  $n_1$  higher than that given on the nameplate.  
**Failure to obtain authorisation voids the ATEX homologation.**

## CRITICAL APPLICATIONS

The performance specified in the catalogue corresponds to position B3 or similar, i.e. when the first stage is not completely submerged in oil. For different mounting positions or particular input speeds, refer to the tables which give diverse critical situations for each size of variator/reducer. Also bear in mind the following applications, and refer to our Technical Service for further information:

- Use in conditions which could lead to injury if the reducer/variator fails
- Applications with very high inertia
- Use as a lifting hoist
- Applications with high dynamic loading of the reducer/variator's casing
- Use in conditions with ambient temperature lower than  $-5^{\circ}\text{C}$  or higher than  $40^{\circ}\text{C}$
- Use in chemically aggressive conditions
- Use in saline conditions
- Mounting positions not envisaged in the catalogue
- Use in radioactive conditions
- Use at pressures other than atmospheric pressure
- Avoid use as a speed multiplier



Avoid applications in which the variator/reducer must be submerged, even partially, in fluid.

The maximum torque (\*) which can be borne by the variator/reducer may not exceed twice the nominal torque (f.s.=1) given in the performance tables.

(\*) understood as instantaneous overload due to starting at full load, braking, collision and other (dynamic) causes.

A	Inadvisable application	B	Check the application or contact our technical service	C	Infeasible application
---	-------------------------	---	--	---	------------------------

H	030	040	050	060	080	100	125	140
V5 - V1: 1500 < n1 < 3000	-	-	-	-	-	-	B	B
n1 > 3000	B	B	B	B	B	B	A	A
V3 - V6	B	B	B	B	B	B	B	B

H	A30	A40	A50	A60
V5 - V1: 1500 < n1 < 3000	-	-	-	-
n1 > 3000	B	B	B	B
V3 - V6	B	B	B	B

SH	020	030	040	050	060	080	090	100	125	140
V5 - V1: 1500 < n1 < 3000	-	-	-	-	-	-	-	-	B	B
n1 > 3000	B	B	B	B	B	B	B	B	A	A
V3 - V6	B	B	B	B	B	B	B	B	B	B

B	060	080	100	125	140	150	160
2000 < n1 < 3000	-	-	-	B	B	B	B
V6	B	B	B	B	B	B	B
n1 > 3000	B	B	B	B	A	A	A
...L : B6 - B7	B	B	B	B	B	B	B

B	A40	A50	A70
2000 < n1 < 3000	-	-	-
V6	B	B	B
n1 > 3000	B	B	B
...L : B6 - B7	B	B	B

S	050	060	080	100	125
2000 < n1 > 3000	-	-	-	-	-
V6	B	B	B	B	B
n1 > 3000	B	B	B	B	B
...L : V5 - V6	B	B	B	B	B

NMRV	025	030	040	050	063	075	090	105	110	130	150
V5: 1500 < n1 < 3000	-	-	-	-	-	B	B	B	B	B	B
n1 > 3000	B	B	B	B	B	A	A	A	A	A	A
V6	B	B	B	B	B	B	B	B	B	B	B

NMRV - P	063	075	090	110
V5: 1500 < n1 < 3000	B	B	B	B
n1 > 3000	B	B	A	A
V6	B	B	B	B

SW	030	040	050	063	075	090	105	110	130	150
V5: 1500 < n1 < 3000	-	-	-	-	B	B	B	B	B	B
n1 > 3000	B	B	B	B	A	A	A	A	A	A
V3 - V6	B	B	B	B	B	B	B	B	B	B

TXF - SF	002-003	005	010	020	030	050	100
2000 < n1 < 3000	-	-	-	B	A	A	A
n1 > 3000	B	B	B	A	A	A	A
V3 - V6	B	B	B	B	B	B	B

R	040	040	050	063	080	100	125
1500 < n1 < 3000	-	-	-	-	B	B	B
n1 > 3000	A	A	A	A	A	A	A
V3 - V6	B	B	B	B	B	B	B



## 3. SAFETY INFORMATION

Carefully read the manual and any instructions marked directly on the reducer/variator.

Staff working on the reducer/variator must be technically qualified and experienced to do so, and must also be equipped with the necessary safety equipment (as provided by Italian Legislative Decree 81/2008). Failure to observe this requirement may result in injury or damage.

Use the reducer/variator only for the purposes specified by Motovario Group. Improper use is a health and safety hazard and may cause economic damages.

Keep the reducer/variator in good running order with regular maintenance.

Variators/reducers can reach high temperatures in operation (in the case of variators, even when running under no or reduced load). Do not touch the casings with bare hands - use appropriate safety equipment.

**For proper maintenance ensure full safety precautions have been applied, including the use of safety clothing and equipment, as required by current workplace safety legislation.**

Use only original Motovario spare parts. Use only oils and greases recommended by Motovario Group.

Do not dump polluting materials - dispose of them according to environmental regulations.

After changing the lubricant, clean the reducer/variator's casing as well as the work area.



Reducers/variators are intended for industrial applications.  
Shut off the reducer/variator's power supply in potentially explosive atmospheres.

## 4. HANDLING AND STORAGE



On delivery, check that the consignment corresponds to the bill of sale and is not damaged or faulty; contact your Motovario Group reseller in case of need.

Dispose of the packaging as required by the law.

Make sure all safety requirements are satisfied when handling the unit. It is not always possible to move the reducer/variator manually due to its shape and weight; use appropriate handling equipment to prevent damage and injury.

The weight to be handled is listed in the catalogue.

Identify the reducer/variator's lifting points (eyebolts on series B, holes on series S units, threaded boring in the solid shaft of series H, SH and R reducers and variators, and holes in the feet of series NMRV) and take great care when moving it.

### Storage:

Take care during handling not to break or damage the unit's external components due to collision or dropping.

If the unit is to be stored for a long time (2/4 months), or if conditions are particularly aggressive, apply appropriate protective and water repellent products to prevent damage to the shafts and rubber components.

Before commissioning the unit, run the following controls:

- check the nameplate data for the variator/reducer and electric motor
- check for lubricant leaks
- if possible, clean off any dirt from the shafts and around the seal rings.

If the unit is to be stored for a particularly long time (4/6 months), if the seal ring is not submerged in the lubricant inside the casing, it should be replaced, since the rubber may be adhering to the shaft or have lost its elasticity.



ATEX products may not be stored for more than 4 months. If the unit is to be stored for a long time (2/4 months) apply appropriate protective and water repellent products to prevent damage to the shafts and rubber components.

## 5. INSTALLATION

Pay special attention to the installation conditions as these are the principal cause of damage and downtime. When choosing the motor, consider the mounting position and presence, below the motor itself, of parts, things or materials which may be damaged by oil leaks, however limited in amount. Choosing the right mounting position can eliminate many problems. It is often sufficient to place a guard under the drive to ensure operation in optimal safety.

Before commissioning the unit, run the following controls:

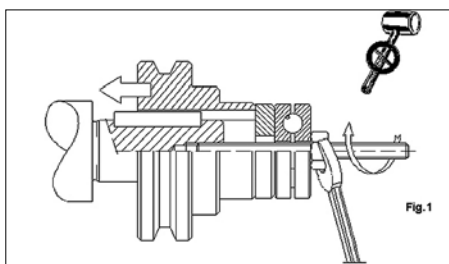
- Check that the consigned material is as ordered
- Check the direction of rotation of the reducer/variator's output shaft before installing the unit to the machine
- Mounting to the machine must be stable and vibration free. The structure may not be subject to torsion and must guarantee conduction of any electrical or electrostatic discharges (if not, install a proper grounding plant with a cable applied securely to the mounting area).
- In shaft mounted installation of hollow output shaft units, use the specially designed reaction arms supplied by Motovario Group.
- Use minimum quality 8.8 mounting bolts and take care not to deform the casing due to incorrect installation
- Avoid direct sunlight and other sources of heat: the cooling air must not exceed 40°C
- Make sure that air can flow freely to the fan to cool the unit
- In ambient temperatures < -5°C or > +40°C, contact our Technical Service
- For duty with frequent starts under load, we recommend installing temperature sensors (inside the motor)
- Lubricate the contact surfaces to prevent gripping and rusting
- Do not install the unit in other mounting positions that that for which it was ordered, since different mounting positions require different positions of the oil filler, drain and level plugs, as well as a different amount of lubricant where indicated/present.
- The motor must be in a class of precision such as to ensure proper coupling with the variator's input flanges.



- Check the nameplate ratings for conformity to the application: group, category, zone, maximum surface temperature.
- Check that the ATEX homologation data on the motor and variator/reducer agree.
- Check that the parts connected to the reducer/variator's input and output are also ATEX homologated.
- In ambient temperatures < -20°C or > +40°C, contact our Technical Service;

- For hollow shaft units with locking set, fit the provided cover.

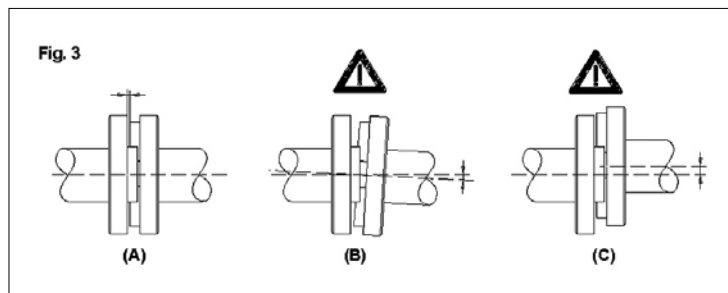
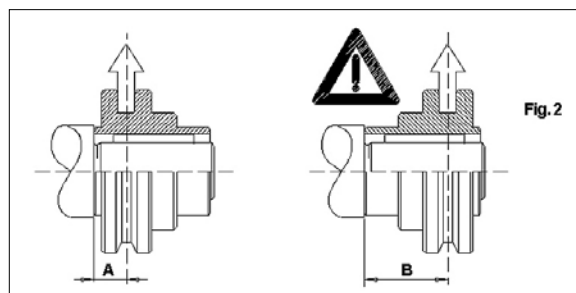
Install the pulley, toothed wheels, couplings, etc. to the shafts using the provided threaded holes or other systems which ensure correct operation without damage to the bearings or the unit's external components (fig. 1).



Example of correct installation of a part to the slow shaft of a reducer/variator.

N.B.: Do not use improper tools.

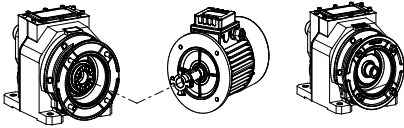
Correct (A) and incorrect (B) examples of installation of pulleys to the reducer/variator's slow shaft.



# USE AND MAINTENANCE INSTRUCTIONS

## Motor mounting – PAM flanges B5/B14:

If the unit is supplied without motor, proceed as follows to install the motor. Check that the tolerances of the shaft and motor flange correspond to at least "normal" quality. Thoroughly clean the shaft, spigot and flange surface of dirt and paint. Install the half-coupling/sleeve (see figure) to the electric motor shaft without forcing, otherwise check the position and tolerance of the motor key; make sure to employ appropriate systems to prevent damage to the motor's bearings. Now mount the motor complete with half-coupling, mating the motor side half-coupling drive teeth with those of the elastic element on the reducer side half-coupling. The key need not be adapted in any way. Check the direction of rotation of the reducer/variator's output shaft before installing the unit to the machine.



Check the lubricant level through the sight glass, where applicable, so that it corresponds to the desired mounting position.

## Mounting with locking set:

Series B and S reducers may be fitted with a locking set to mount the hollow shaft to the driven shaft. To install the reducer, undo the locking set's bolts in sequence and gradually, and carefully clean the reducer shaft/driven shaft mating surfaces. Check that the locking shaft diameter is correct (h7). Fit the reducer and torque the locking set bolts, in sequence and gradually, with a torque wrench, to the values given in the table:

	MT 12.9 (Nm)
S050-S060-S080-S100 BA40-BA50-BA70 B060-B080-B100	15
B123 - S125	40
B143	50
B153	70
B163	70

## Shaft mounting with reaction arm:

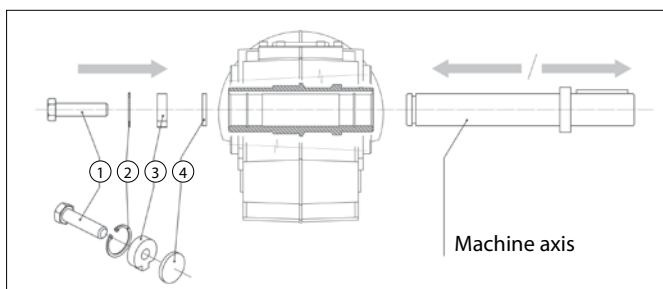
Series B, S, NMRV, NMRV-P and SW reducers can all be equipped with vibration damping reaction arms; on completion of assembly, check for axial loading of the vibration damping anchor. Check for anomalous vibration of the unit and its supporting frame during startup.

## Reinforced seals:

Series H/B/S reducers may be equipped with reinforced seals. Reinforced seals, depending on the size of the unit, will be composed of two seal rings or a standard seal ring + VRM ring. Coaxial reducers, sizes 060 to 140 (excluding single stage units) in mounting positions V1/V5 already have 2 seal rings as standard supply.

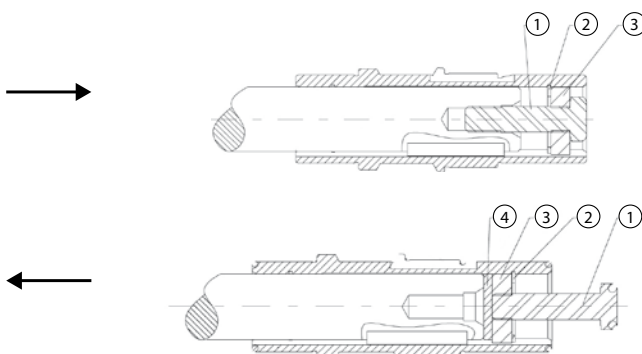
## Installing/removing hollow shaft reducers with key:

Series B and S reducers may be supplied with the optional Motovario installation/removal kit for the driven shaft.



The consignment includes:

1. Mounting bolt
2. Safety ring
3. Lug nut
4. Thrust disk



### Installation

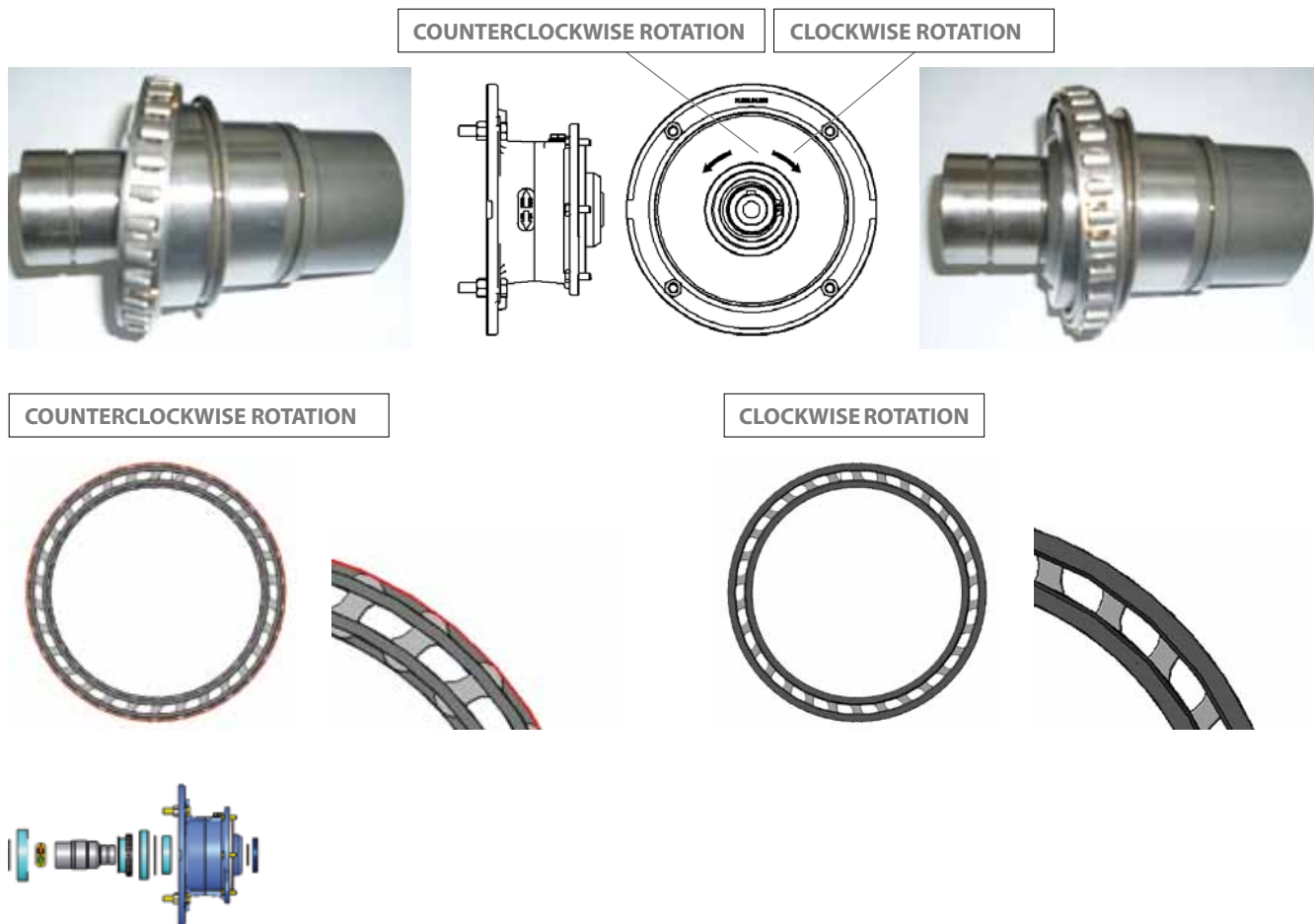
Fit the safety ring (2), insert the lug nut (3) and tighten down the bolt (1) from the Motovario installation kit on the end of the driven machine's shaft.

### Removal

Fit the thrust disk (4) and lug nut (3) from the Motovario removal kit between the driven machine's shaft and the safety ring (2). Insert the safety ring (2) and tighten down the mounting bolt (1). You can now extract the reducer from the shaft.

**Backstop device:**

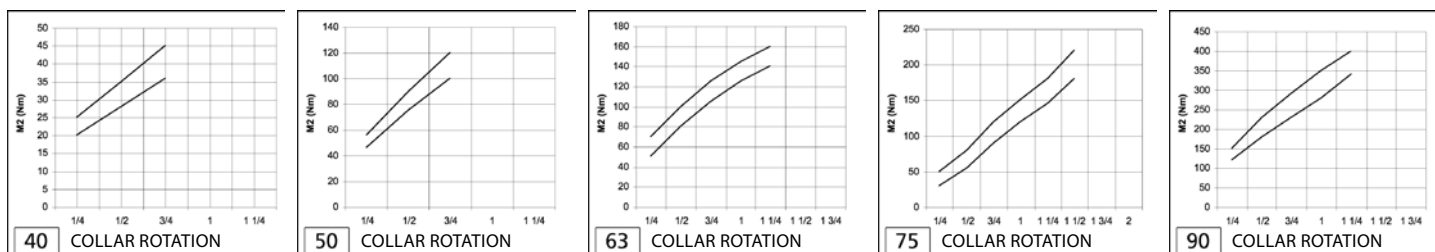
The reducer may be supplied with a backstop device on its fast shaft. The backstop device allows the shaft to rotate in one direction only, and is available - depending on size - in the PAM flange (series H/B/S/SH reducers only) or in the motor, without any size penalty. It is essential to specify the input side direction of rotation (clockwise/counterclockwise) in the order. The PAM flange bears a nameplate giving the direction of free rotation of the unit. Check this against the order.



**Torque limiter:**

Series NMRV, NMRV-P and SW reducers may be equipped with torque limiters. This device protects the reducer and the mechanical components connected to it against accidental or unexpected overloads. It is also useful when the output shaft must be rotated when the machine is stopped: to do so, slacken off the adjuster collar (mark the position of the collar first to restore the setting or recalibrate the unit afterwards). The device is not recommended in use on lifting equipment since it can compromise safety. It has no effect on the mounting of the reducer. The unit is supplied set to around 80% of the nominal torque given in the catalogue. When installing to the machine, if necessary, set the torque limit with the collar to suit the actual requirements of the application; to calibrate, check the torque and method with the plant designer. In case of need, to ensure proper safety, run operational checks.

The graph shows torque curve in relation to the collar adjustment. The curve has a minimum and maximum value since it covers the torque range of all ratios and in both directions of rotation. Other factors apart from torque which may influence the calibration value include: temperature, running in, vibration, etc..

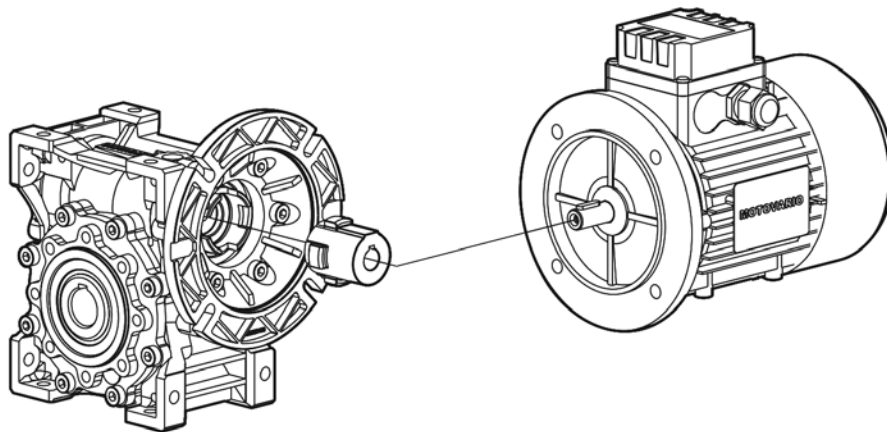


## USE AND MAINTENANCE INSTRUCTIONS

### Motor mounting – PAM flanges NMRV-P:

If the unit is supplied without motor, proceed as follows to install the motor. Check that the tolerances of the shaft and motor flange correspond to at least "normal" quality.

Thoroughly clean the shaft, spigot and flange surface of dirt and paint. Check that the bush (see figure) fits the electric motor shaft without forcing, if it does not, check the position and tolerance of the motor key. Now fit the bush to the reducer and mate its teeth with those of the screw. Next, mount the motor to the reducer. Use systems to ensure correct installation without damaging the motor bearings. The motor key need not be adapted in any way.

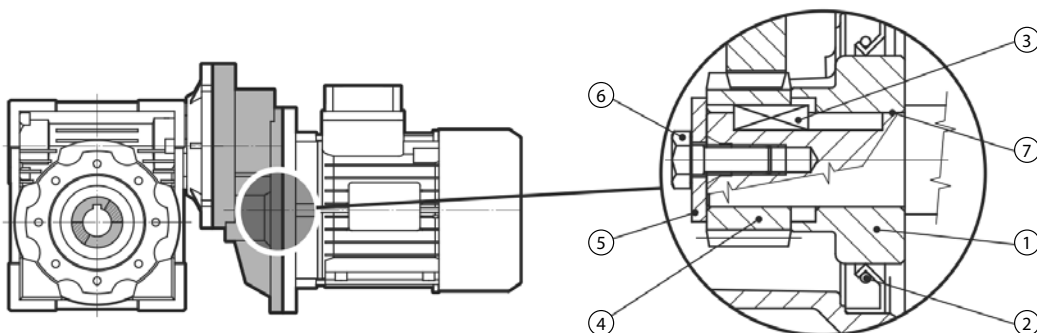


### Electric motor mounting – PC, NMRV

To mount the pinion to the motor shaft, proceed as follows:

- Thoroughly clean the motor shaft.
- Remove the motor's key from its seating.
- Fit the bush (1) to the motor shaft as shown in the diagram, using liquid seal (7). To facilitate installation, heat the bush to 70/80°C.
- Install the new key (3) supplied in place of the original one.
- Mount the pinion (4) taking the same measures as in point (c).
- Fit the washer (5) and tighten down bolt (6).
- Remove the rubber closed plug on the seal ring seating - note that the pre-stage unit is already lubricated.
- Fit the seal ring (2) and motor unit, taking care not to damage the seal ring's lip.

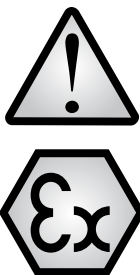
N.B.: For proper operation, without noise or vibration, we recommend using Motovario motors.



## 6. STARTUP

Before starting up the machine to which the reducer is mounted, check:

- that the machine is compliant with the Machinery Directive 2006/42/CE and any applicable safety regulations;
- that the mounting position corresponds to the nameplate rating;
- the electrical power supply, per EN60204-1 and EN50014;
- that the tension is per specifications;
- that the oil level is correct and no leaks are to be found;
- that there is no unusual vibration or noise.



Before starting up the machine to which the reducer/variator is mounted, check:

- check the oil level via the sightglass, if present.  
In units without sightglass, the correct oil charge is guaranteed by Motovario Group
- in case of mounting with vertical motor shaft, check during the first hour of operation for unusual running noise or overheating: if this happens stop the motor immediately
- after around 3 hours of operation at full load, measure the surface temperature: the temperature at the hottest point may not exceed the nameplate rating minus 10°C.  
If the nameplate rating is exceeded, immediately stop the motor
- after stopping the motor wait for 30 minutes before proceeding with disassembly.

Start the unit up gradually, and do not immediately apply the machine's maximum load, to check and correct malfunctions due to incorrect application.

For variators/variator reducers, the speed may only be changed (with the provided controls) while the unit is running.



### Surface temperature

- The temperature data given on the nameplate indicate the maximum admissible values for the variator/reducer at an ambient temperature of -20 °C to +40 °C.  
For operation at different ambient temperatures, contact our Technical Service.



### Measuring the surface temperature

- During commissioning, measure the unit's surface temperature under real operating conditions.
- The surface temperature must be measured in the vicinity of the fast shaft (reducers and variators) or at the connection between the motor and the reducer/variator (gearmotors and motor variators) and always at the least ventilated areas of the system.
- The measure temperature (Ts) summed to the difference between the maximum allowed ambient temperature (Tam) and the measured ambient temperature (Ta) must be less by at least 10 °C than the allowed maximum surface temperature:

$$Ts + (Tam - Ta) < Tc - 10 \text{ °C}$$

if the temperature does not meet this requirement, stop the unit and contact Technical Service;

Ts= measured surface temperature (°C)

Ta= measured ambient temperature (°C)

Tam= maximum allowed ambient temperature =40 °C

Tc= maximum allowed surface temperature as given on nameplate (°C).

### Using the unit:

Ensure that the plant satisfies all applicable workplace health and safety legislation.



Do not use the reducer/variator:

- in conditions with abrasive or corrosive fumes or dust
- in direct contact with loose foodstuffs.

Danger zone

The dangerous area of the variator/reducer is the protrusion of the shaft, direct contact with which is a mechanical hazard for persons in its vicinity (shearing, entrapment, crushing). A guard must be installed if the unit is operating in an accessible area.

For series B, S, NMRV and SW reducers the units can be fitted with protective boots if so required.



## 7. MAINTENANCE



Maintenance must be done by a technician familiar with workplace safety legislation and environmental issues.  
Do not dump polluting fluids, replaced parts or maintenance waste.  
Never improvise repairs!



Before working on the reducer/variator shut off its power supply, and take measures to prevent its being turned back on involuntarily and to prevent its parts being set in motion.  
Inform other operators and persons in the vicinity, and post notices around the area and prevent access to it. Employ all necessary environmental protection measures (dust, gas, etc.).

The precise machining of the unit's internal components ensures correct operation with minimum maintenance.

In general, the following rules apply: periodic control of external cleanliness, above all in areas most concerned in cooling;  
periodic checks for lubricant leaks, especially around the seal rings.

For life lubricated units, without oil plugs, no special maintenance is required except for that indicated in the previous point. For other units, maintenance is nonetheless very limited, since it consists solely in an oil change to be done after 10,000 hours of operation. The oil change depends on the operating conditions and type of duty.

Further to the above normal maintenance rules, makes sure the breather plug hole is clean and use the level sightglasses to check the lubricant level.

If necessary, top up the oil using oil of the same brand or similar, compatible with that in the reducer/variator. Use oils and greases recommended by Motovario Group. When running an oil change, follow the above instructions.

Do not hesitate to replace unreliable components. Replace worn parts only with original spare parts. Using non-original spare parts can compromise the operation of the variator/reducer, and also voids the warranty. If you require spare parts, follow the instructions given in the spare parts section for the variator/reducer in question.

Keep the reducer/variator in good running order with periodic checks of vibration and noise, absorption and tension, wear of friction surfaces, lubricant leaks, gaskets, bolted gaskets for wear, deformation and corrosion and restore them as necessary; keep the reducer/variator clean of dust and process residue (do not use solvents or other products incompatible with the materials of construction, and do not direct high pressure jets of water directly at the unit).

Following these instructions ensures the reducer/variator's operability and safety as specified.



- Make sure that dust does not build up on the unit to a depth of more than 5 mm.
  - Periodically check the oil level via the sightglass, if present.
  - Every 1,000 hours, check the oil seals and gaskets for leaks; replace the oil seals if necessary.
  - After 10,000 hours (5,000 for variators) change the oil; this schedule depends also on the type of duty. This is not necessary for units lubricated for life.
  - Periodically check that the breather plug hole is dust free (as applicable).
  - On units with covers (H/B/S) never remove the said covers for any reason.
- For variators, never remove the control cover for any reason. When servicing the unit, first stop it and wait for it to cool to ambient temperature, then disassemble it taking care not to drop anything into its interior.



## 8. PROBLEMS DURING OPERATION

If problems arise during first startup or the first hours of operation, contact Motovario Group aftersales. The table lists a series of problems and possible solutions.

This information is merely illustrative.

Note that tampering with the unit without Motovario Group's authorisation voids the warranty and often makes it impossible to determine the cause of the defect or malfunction.

PROBLEM	CAUSE	SOLUTION (1)	SOLUTION (2)
The motor does not start.	Power supply problem. Defective motor. Incorrect motor rating.	Check power supply.	Replace motor. Check application.
The motor's draw is higher than the nameplate rating.	Incorrect motor rating.	Check application.	Replace motor and also variator/reducer, if necessary.
Motor casing temperature is very high.	Defective motor. Incorrect motor rating.	Check application.	Replace motor and also variator/reducer, if necessary.
Variator/reducer casing temperature is very high.	Incorrect reducer/variator rating. NC mounting position.	Check application.	Restore correct operating conditions: mounting position/lubricant level.
The variator/reducer output shaft speed is out of specification.	Reducer/variator ratio not as specified.	Check reducer/variator ratio.	Replace reducer/variator or motor.
	Motor polarity not as specified.	Check motor polarity.	
Oil leak from seal ring.	Defective seal ring.	Replace seal ring.	Replace component - send unit to Motovario Group.
	Seal ring damaged during shipping.	If the shaft seating is damaged, restore it if possible.	
	Shaft seating damaged.		
Oil leaks from surfaces.	Flat gasket or o-ring damaged.	Replace gasket or o-ring.	Send unit to Motovario Group.
Reducer/variator output shaft runs in wrong direction.	Incorrect motor hookup.	Swap two phases of the motor's power connection.	
Cyclic running noise.	Dented gearing.	No practical problem if the noise is not significant to the application.	Send the unit to Motovario Group if the noise is significant to the application.
Non-cyclic running noise.	Dirt inside the reducer/variator.	No practical problem if the noise is not significant to the application.	Send the unit to Motovario Group if the noise is significant to the application.
Running noise (whistling).	Baldly adjusted bearings.	Check lubricant level.	Send unit to Motovario Group.
	Gearing not meshing correctly.		
	Insufficient lubricant.		
Vibration of electric motor motor.	Geometrical error in coupling of motor/reducer/variator.	Check geometrical tolerance of motor flange.	Replace motor.
		Check motor key tolerance and geometry.	

# USE AND MAINTENANCE INSTRUCTIONS

## 9. LUBRICATION

Check the oil level before starting up the reducer/variator; this must be done with the unit in its expected mounting position. Top up the oil level if necessary.



If you find a leak, check the cause before topping up the lubricant.  
Do not dump lubricant - use all necessary environmental protection measures.

In case of ambient temperature not listed in the table, contact our Technical Service. If the temperature is lower than -30°C or higher than 60°C use special mixture seal rings.

In temperatures below 0°C, the following must be borne in mind:

- the motors must be suited to operation at the expected ambient temperature.
- the electric motor's power must be capable of overcoming the higher requested starting torques.
- If the variator/reducer has a cast iron casing, beware of collisions inasmuch as cast iron is fragile at temperatures lower than -15°C.
- During startup, to allow the oil to distribute itself and reach optimal temperature and hence viscosity, it is best to run the machine at no load for a few minutes.

Run an oil change after 10,000 hours (5,000 for variators); this period depends on the type of service and operating conditions. For units supplied without oil plugs, lubrication is permanent and such units are maintenance free. During oil changes, drain the exhausted oil into suitable containers under the drain plug.

Characteristics of Motovario Group approved lubricants.

	H A30 - A60 H 030 - 140 B 060 - 160 S 050 - 125 SH020 - 140 R040 - 125	B A40 - A70	NMRV 110 - 150 SW110 - 150	NMRV 025 - 105 NMRV-P 063 - 110 PC 063 - 090 HW 030 - 040 SW 030 - 105	TX002 - 010 S003 - 100		
	Mineral oil	Mineral oil	Mineral oil	Synthetic oil	Mineral oil		
*T°C ISO VG...	(-5) - (+40) ISO VG 220	(-15) - (+25) ISO VG 150	(-5) - (+40) ISO VG 340	(-5) - (+40) ISO VG 460	(-15) - (+25) ISO VG 220	(-25) - (+50) ISO VG 320	(-10) - (+40) ISO VG32
ENI	BLASIA 220	BLASIA 150	ROTRA MP	BLASIA 460	BLASIA 220	TELIUM VSF320	BLASIA 32
SHELL	OMALA OIL 220	OMALA OIL 150	SPIRAX ST	OMALA OIL 460	OMALA OIL 220	TIVELA OIL S320	A.T.F. DEXRON
ESSO	SPARTAN EP220	SPARTAN EP150	-	SPARTAN EP460	SPARTAN EP220	S220	A.T.F. DEXRON
MOBIL	MOBILGEAR 630	MOBILGEAR 629	-	MOBILGEAR 634	MOBILGEAR 630	GLYGOYLE 30	A.T.F. 220
CASTROL	ALPHA MAX 220	ALPHA MAX 150	-	ALPHA MAX 460	ALPHA MAX 220	ALPHASYN PG320	DEXRON II
BP	ENERGOL GR-XP220	ENERGOL GR-XP150	-	ENERGOL GR-XP460	ENERGOL GR-XP220	ENERGOL SG-XP320	AUTRAN DX

All units are supplied with ENI oil, unless otherwise specified by the client.

\*T°C Operating ambient temperature

SPECIAL OILS		ISO VG...	Synthetic oil	Mineral oil
Low ambient temperature oils	ENI	ISO VG46		ROTRA ATF
	KLUBER	ISO VG68	SYNTH GH 6-80	
	MOBIL	ISO VG32	SCH 624	
Low ambient temperature oils - Food industry	KLUBER	ISO VG32		SUMMIT HYSYN FG32
High operating temperature oils	KLUBER	ISO VG460	SYNTH GH 6-460	
	KLUBER	ISO VG680	SYNTH GH 6-680	
	ENI	ISO VG150	BLASIA 150 S	
	ENI	ISO VG220	BLASIA 220 S	
	KLUBER	ISO VG1000	SYNTH EG4-1000	
	SHELL	ISO VG680		OMALA OIL 680
High operating temperature oils - Food industry	KLUBER	ISO VG1500	4UH1-1500	
Food industry	KLUBER	ISO VG320	4UH1-320N	

For use of special lubricants, contact Technical Service

H - CH	H A41	CH A41	A51	A61	A32	A42	A52	A62	A33	A43	A53	A63
B3 - B5	0.23	0.13	0.25	0.62	0.68	0.7	1.2	1.9	1.1	1.16	1.9	2.4
B8							1.6	2.1			2.5	3.1
B6 - B7												
V5 - V1												
V6 - V3												

H - CH	041	051	061	081	101	121	041M	051M	061M	081M	101M	121M
B3 - B5	0.5	0.7	0.7	1.45	3.5	4.7	0.5	0.5	0.5	1.5	3.5	3.9
B8	0.5	0.5	0.5	1.5	3.5	3.9	0.5	0.7	0.7	1.45	3.5	4.7
B6 - B7	0.5	0.7	0.7	1.5	3.5	4.1	0.5	0.7	0.7	1.5	3.5	4.1
V5 - V1	0.5	0.7	0.9	1.5	3.5	4.7	0.5	0.7	0.9	1.5	3.5	4.7
V6 - V3	0.5	0.7	0.7	1.5	3.5	4.1	0.5	0.7	0.7	1.5	3.5	4.1

H - CH	032/ ..3	042/ ..3	052/ ..3	062/ ..3	082/ ..3	102/ ..3	122/ ..3	142/ ..3
B3 - B5	0.8	1.2	1.4	2.4	4.5	8.1	12.5	22.5
B8	0.85	1.2	1.4	3.1	5	8.9	12.5	20
B6 - B7	1	1.2	1.8	3	4.6	8.4	12.1	22.5
V5 - V1	1.3	1.75	2.15	3.9	7.6	12.7	20.5	30.5
V6 - V3	1.2	1.7	2.1	4.4	7.5	14.2	21	38

B	A42	A52	A53	A72	A73
B3	0.33	0.42	0.63	1	1.21
B8					
B6 - B7					
V5					
V6					

CB	A42	A52	A53	A72	A73
B3	0.33	0.42	0.55	1	1.13
B8					
B6 - B7					
V5					
V6					

B - CB	063	083	103	123	143	153	163
B3	1.2	2.5	3.7	5.7	11.1	19	33
B8	1.5	2.8	4.2	7.9	13	17.5	42.8
B6	1.5	2.8	3.9	7.3	11.8	19	34
B7							30
V5	2.1	3.7	7	9.9	18.5	32.5	54.5
V6	1.3	2.6	4.5	6.7	10.8	16.5	37.3

S - CS	052-053	062-063	082-083	102-103	122-123
B3	2.05	2.4	6	9	14.7
B8	1.8	2.3	4	6	11.8
B6	2.4	2.9	5.7	8	16
B7	2.1	2.6	4.5	6.8	11.3
V5	2.8	3.5	6.8	10.3	19
V6	2.4	2.9	6.4	9.9	18

TX	002	005	010
B5 - B6 - B7	0.11	0.15	0.38
B5 - V1 - V5	0.29	0.46	0.86
V3 - V6	0.29	0.46	0.86

Var S	003	005	010	020	030/050	100
B3 - B5 - B6 - B8	0.17	0.24	0.41	0.69	1.38	2.29
V1 - V5	0.24	0.38	0.78	1.23	2.46	4.10
V3 - V6	0.26	0.38	0.41	0.69	2.46	3.68

- Oil qty, litres

# USE AND MAINTENANCE INSTRUCTIONS

NMRV	025	030	040	050	063	075	090	105	110	130	150
B3	0.02	0.04	0.08	0.15	0.3	0.55	1	1.6	3	4.5	7
B8									2.2	3.3	5.1
B6 - B7									2.5	3.5	5.4
V5									3	4.5	7
V6									2.2	3.3	5.1

PC	063	071	080	090
B3 - B8	0.05	0.07	0.15	0.16
B6 - B7				
V5 - V6				

NMRV-P	063	075	090	110
B3	0.33	0.55	1	1.6
B8				
B6 - B7				
V5				
V6				

NMRV-P/HW	HW030		HW040	
	063	075	090	110
B3	0.06	0.09	0.11	0.12

SW	030	040	050	063	075	090	105	110	130	150
B3	0.04	0.08	0.15	0.3	0.55	1	1.6	3	4.5	7
B8								2.2	3.3	5.1
B6 - B7								2.5	3.5	5.4
V5								3	4.5	7
V6								2.2	3.3	5.1

RM	40/1	50/1	63/1	80/1	100/1	125/1
B3	0.18	0.3	0.55	1.1	1.6	3.7
B6 - B7	0.2	0.3	0.68	1.1	2.7	3.7
B8	0.18	0.35	0.68	1.67	3.6	5.4
V5	0.16	0.3	0.6	1.2	1.45	2.8
V6	0.21	0.3	0.68	1.75	3.6	4.9

RT - RF/1	40/1	50/1	63/1	80/1	100/1	125/1
B3 - B5	0.18	0.35	0.68	1.67	3.6	5.4
B6 - B7	0.2	0.3	0.68	1.1	2.7	3.7
B8	0.18	0.3	0.55	1.1	1.6	3.7
V1 - V5	0.16	0.3	0.6	1.2	1.45	2.8
V3 - V6	0.21	0.3	0.68	1.75	3.6	4.9

RT - RF/2	40/2	50/2	63/2	80/2	100/2	125/2
B3	0.42	0.8	1.5	3.6	6.8	13
B6 - B7	0.42	0.8	1.5	3.2	6.8	11
B8	0.42	0.8	1.4	3.6	6.2	13
V5	0.42	0.86	1.6	3.45	7	12
V6	0.63	1.1	2.2	4.2	10.6	17

RT - RF/3	40/3	50/3	63/3	80/3	100/3	125/3
B5	0.42	0.8	1.5	3.6	6.8	13
B6 - B7	0.42	0.8	1.5	3.2	6.8	11
B8	0.42	0.8	1.4	3.6	6.2	13
V5	0.63	1.1	2.2	4.7	9.2	16.2
V6	0.7	1.25	2.4	4.9	11.4	18

- Oil qty, litres

SRT - SRF/1	003-40/1	005-50/1	010-63/1	020-80/1	030/050-100/1	100-125/1
B3 - B5	0.18	0.35	0.6	1.3	2.7	4.2
B6D - B6S	0.18	0.32	0.6	1.1	2.7	3.7
B8	0.16	0.32	0.55	1.1	1.8	2.8
V1 - V5	0.18	0.35	0.65	1.2	1.45	2.8
V3 - V6	0.2	0.32	0.65	1.5	3.4	4.5

SRM/1	003-40/1	005-50/1	010-63/1	020-80/1	030/050-100/1	100-125/1
B3	0.16	0.32	0.55	1.1	1.8	2.8
B6D - B6S	0.18	0.32	0.6	1.1	2.7	3.7
B8	0.18	0.35	0.6	1.3	2.7	4.2
V5	0.18	0.35	0.65	1.2	1.45	2.8
V6	0.2	0.32	0.65	1.5	3.4	4.5

SRT-SRF/2-3	003-40/2-3	005-50/2-3	010-63/2-3	020-80/2-3	030/050-100/2-3	100-125/2-3
B3 - B5	0.42	0.8	1.6	3.8	6.8	14
B6D - B6S	0.42	0.8	1.2	3.2	6.2	12
B8	0.42	0.8	1.4	3.6	6.2	13
V1 - V5	0.6	1	2.2	4.7	9.2	16.2
V3 - V6	0.5	1.1	2.2	4.7	9.2	17

SH - CSH	041	051	061	081	101	121
B3 - B5	0.5	0.7	0.7	1.45	3.5	4.7
B8	0.5	0.5	0.5	1.5	3.5	3.9
B6 - B7	0.5	0.7	0.7	1.5	3.5	4.1
V5 - V1	0.5	0.7	0.9	1.5	3.5	4.7
V6 - V3	0.5	0.7	0.7	1.5	3.5	4.1

SH - CSH	022/..3	032/..3	042/..3	052/..3	062/..3	082/..3	092/..3	102/..3	122/..3	142/..3
B3 - B5	0.8	0.8	1.2	1.4	2.4	4.5	4	8.1	12.5	22.5
B8	0.85	0.85	1.2	1.4	3.1	5	5	8.9	12.5	20
B6 - B7	1	1	1.2	1.8	3	4.6	4.6	8.4	12.1	22.5
V5 - V1	1.3	1.3	1.75	2.15	3.9	7.6	7	12.7	20.5	30.5
V6 - V3	1.2	1.2	1.7	2.1	4.4	7.5	7.5	14.2	21	38

- Oil qty, litres



The oil quantities given in the table are approximate; use the oil plug or dipstick to check the real amount, if present. Differences in the level may depend on construction tolerance but also on the mounting of the variator/reducer or mounting surface at the client's premises. For this reason it is best to check and top up the oil level with the variator/reducer installed.

- All units are supplied complete with lubricant. Once the unit is installed, make sure to replace the closed plug used for shipping with the breather plug supplied with the reducer.

- For the plug positions, refer to the mounting positions.

# USE AND MAINTENANCE INSTRUCTIONS

## 10. SCRAPPING THE REDUCER/VARIATOR

This must be done only by expert persons and in observance of established workplace safety legislation. Do not dump non-biodegradable materials, oils, non-ferrous materials (PVC, rubber, resins, etc.), dispose of them as provided by established environmental legislation.



Do not reuse components which may appear in good order on inspection, have them replaced by specialised persons only.

## 11. MOUNTING

### MOUNTING POSITIONS STANDARD HA - H - SH /1, ATEX 3G/3D HA - H /1

<b>B3</b> 	<b>B6</b> 	<b>B3</b> 	<b>B6</b> 	<b>B5</b> 	<b>V1</b> 
<b>B8</b> 	<b>B7</b> 	<b>B8</b> 	<b>B7</b> 		<b>V3</b> 
<b>V5</b> 	<b>V6</b> 	<b>V5</b> 	<b>V6</b> 		

- Breather plug
- Level plug
- Closed plug

Plugs present only on sizes H081/101/121 and SH081/101/121

Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

### MOUNTING POSITIONS ATEX 2G/2D———H /1

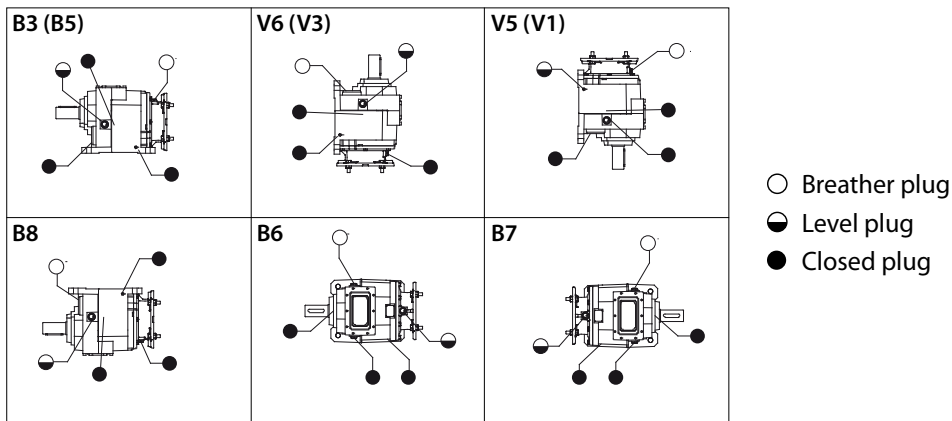
<b>B3</b> 	<b>B6</b> 	<b>B3</b> 	<b>B6</b> 	<b>B5</b> 	<b>V1</b> 
<b>B8</b> 	<b>B7</b> 	<b>B8</b> 	<b>B7</b> 		<b>V3</b> 
<b>V5</b> 	<b>V6</b> 	<b>V5</b> 	<b>V6</b> 		

- Breather plug
- Level plug

Breather valve plug present only on sizes H081/101/121. Closed plugs on all other holes.

Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

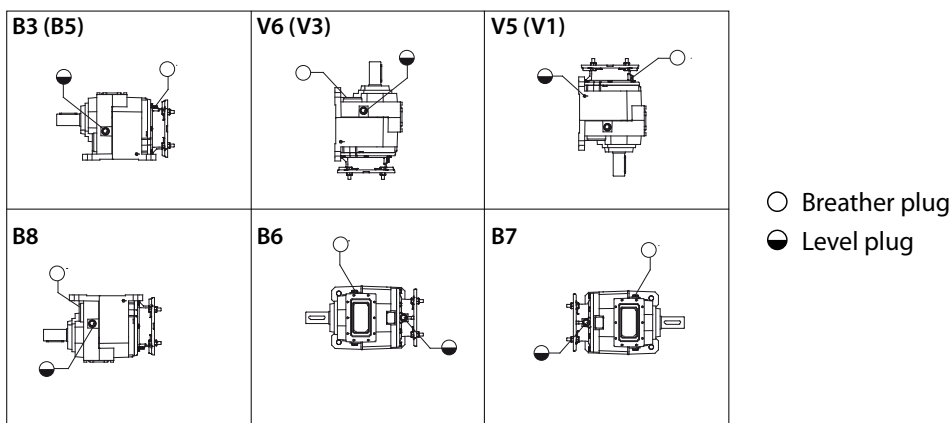
MOUNTING POSITIONS STANDARD HA - H - SH /2-3, ATEX 3G/3D HA - H /2-3



Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

Plugs present only on sizes H060/080/100/125/140 and SH060/080/100/125/140

MOUNTING POSITIONS ATEX 2G/2D———H /-3



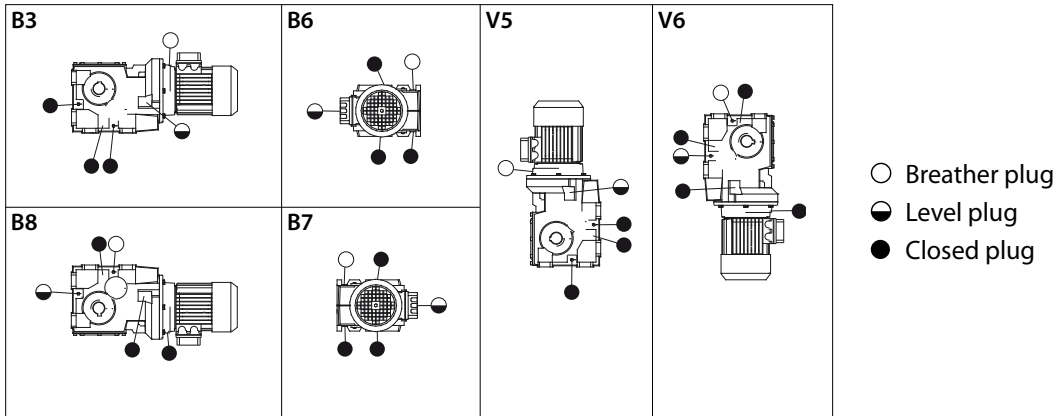
Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

Breather valve plug present only on sizes H060/080/100/125/140  
Closed plugs on all other holes.



# USE AND MAINTENANCE INSTRUCTIONS

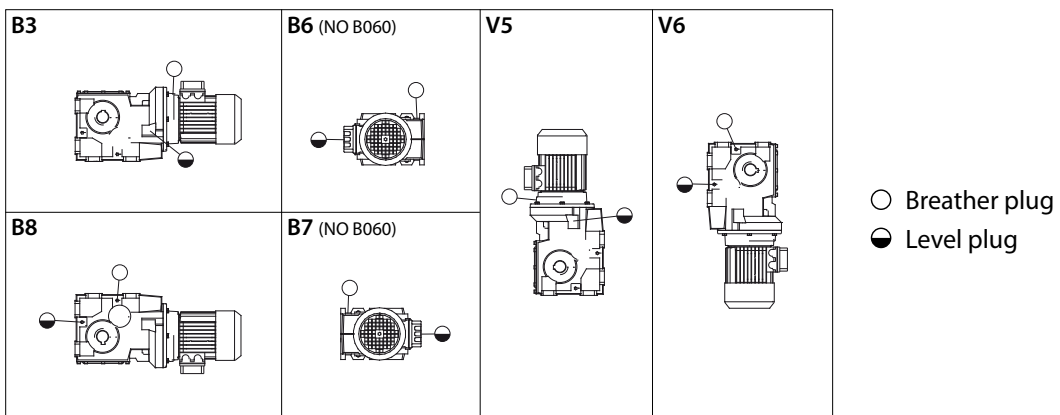
## MOUNTING POSITIONS STANDARD/ATEX 3G/3D———BA - B



Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

Plugs present only on sizes B080/100/125/140/150/160

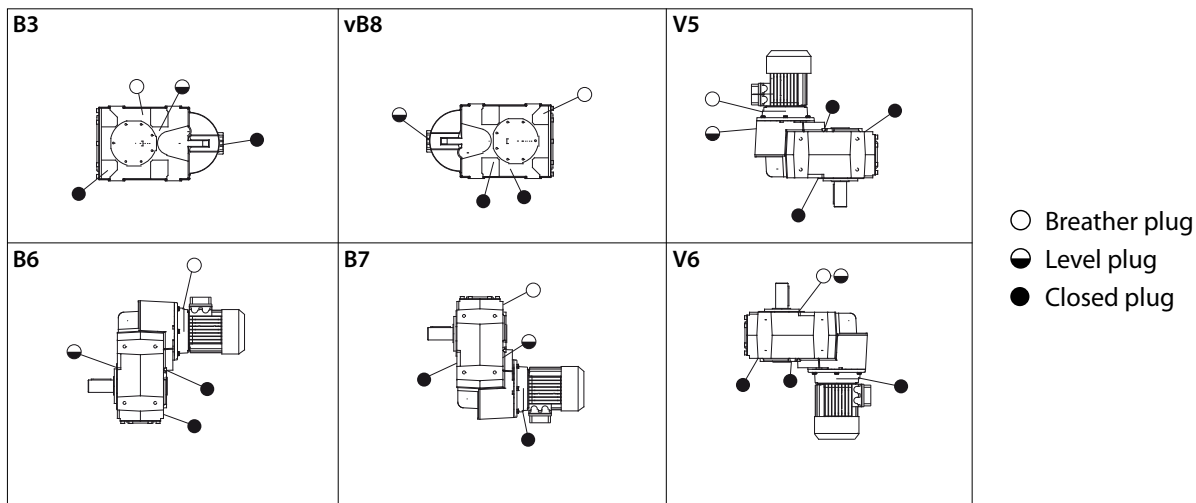
## MOUNTING POSITIONS ATEX 2G/2D———B



Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

Breather valve plug present only on sizes B080/100/125/140/150/160  
Closed plugs on all other holes.

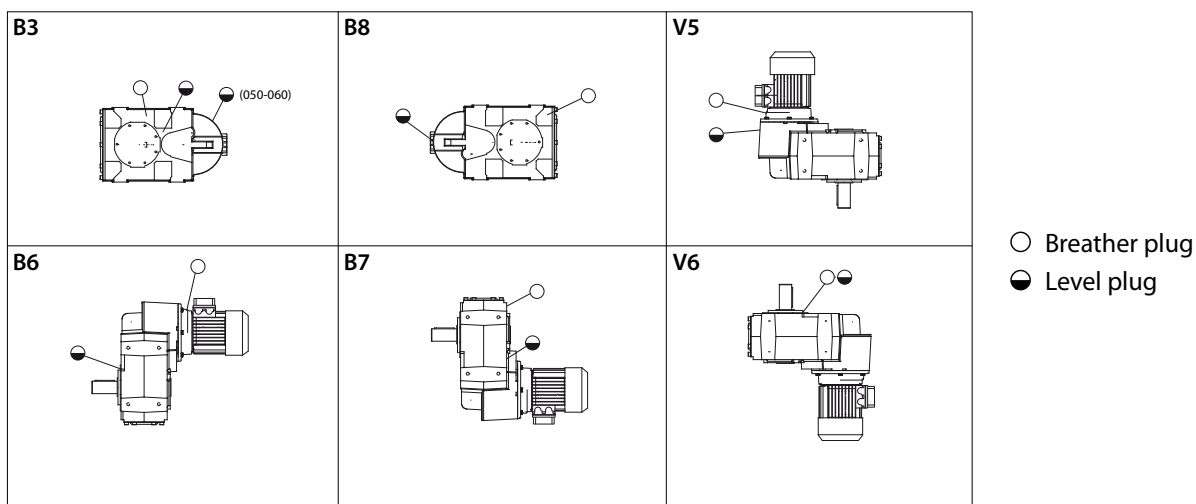
MOUNTING POSITIONS STANDARD/ATEX 3G/3D———S



Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

Plugs present only on sizes S080/100/125

MOUNTING POSITIONS ATEX 2G/2D———S

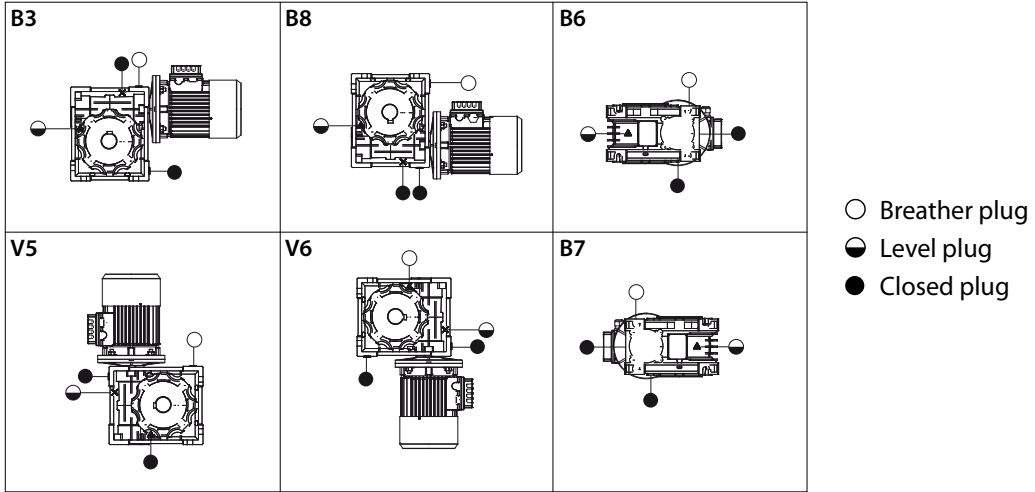


Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

Breather valve plug present only on sizes S080/100/125  
Closed plugs on all other holes.

# USE AND MAINTENANCE INSTRUCTIONS

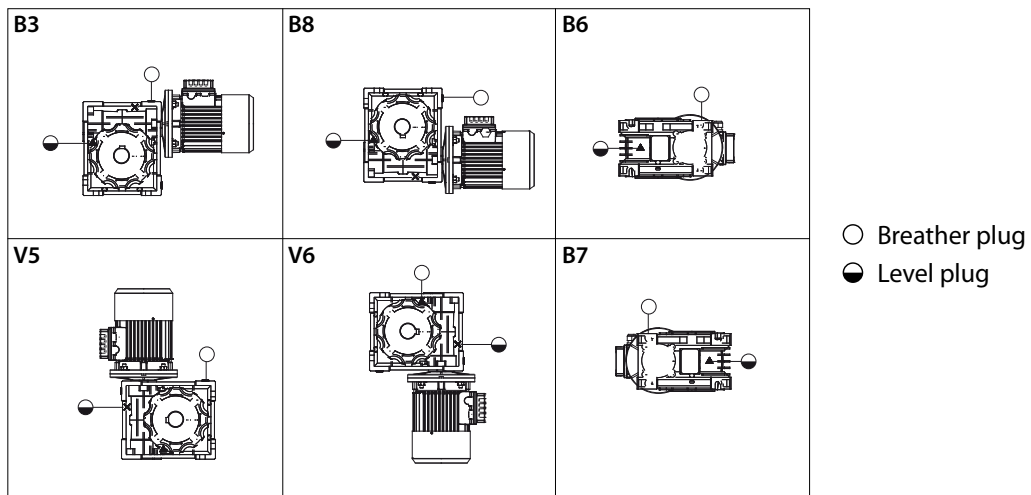
## MOUNTING POSITIONS STANDARD NMRV - NMRV-P - SW, ATEX 3G/3D NMRV - NMRV-P



Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

Plugs present only on sizes NMRV110/130/150 and SW110/130/150

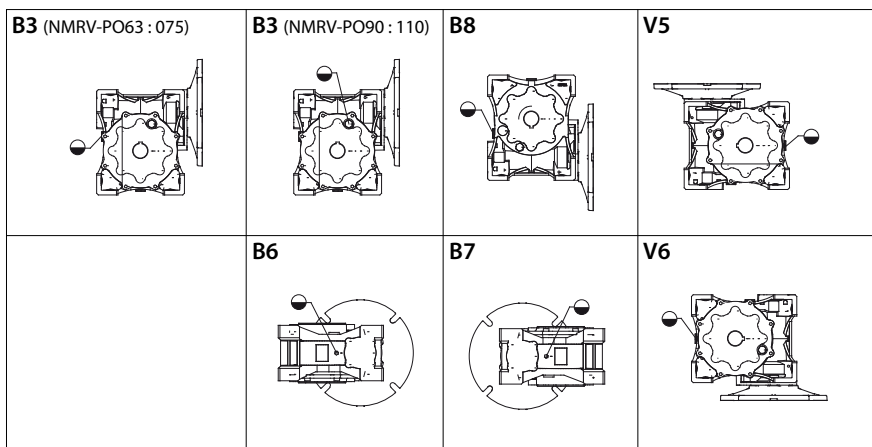
## MOUNTING POSITIONS ATEX 2G/2D———B



Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

Positions V5 and V6 are not available for sizes NMRV030/040/050.  
Breather valve plug present only on sizes NMRV110/130/150.  
Closed plugs on all other holes.

MOUNTING POSITIONS ATEX 2G/2D———NMRV-P

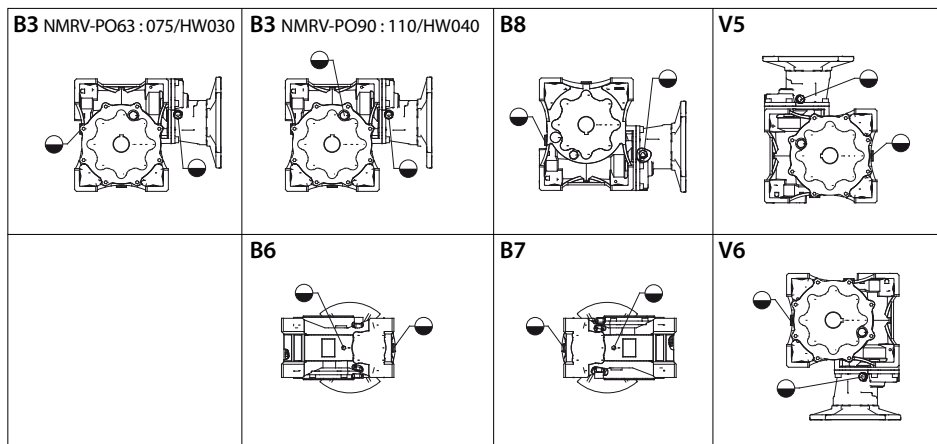


● Level plug

Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

Closed plugs on all other holes.

MOUNTING POSITIONS ATEX 2G/2D———NMRV-P/HW



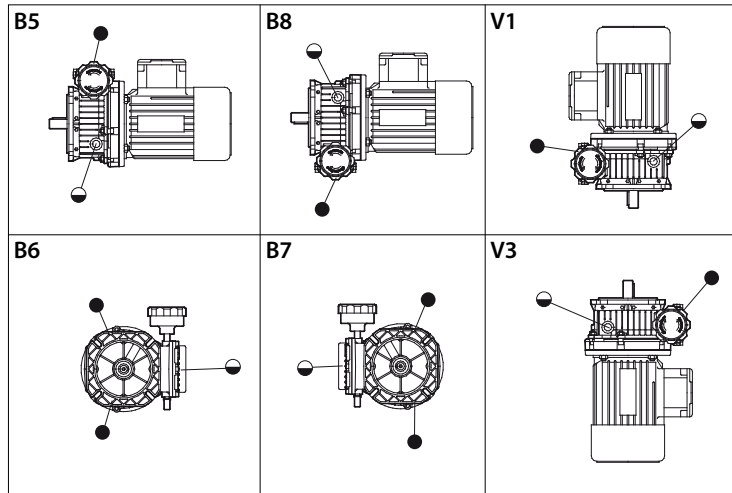
● Level plug

Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

Closed plugs on all other holes.

# USE AND MAINTENANCE INSTRUCTIONS

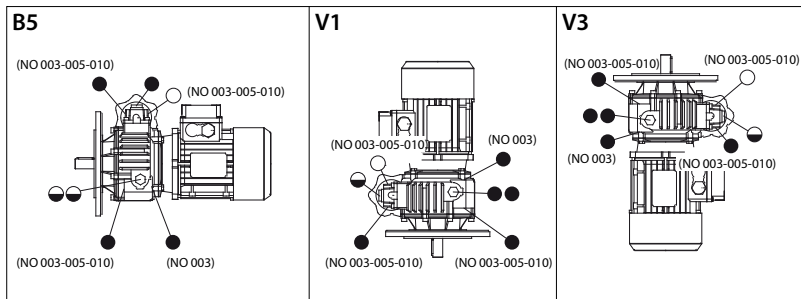
## MOUNTING POSITIONS STANDARD———TXF



- Breather plug
- Level plug

Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

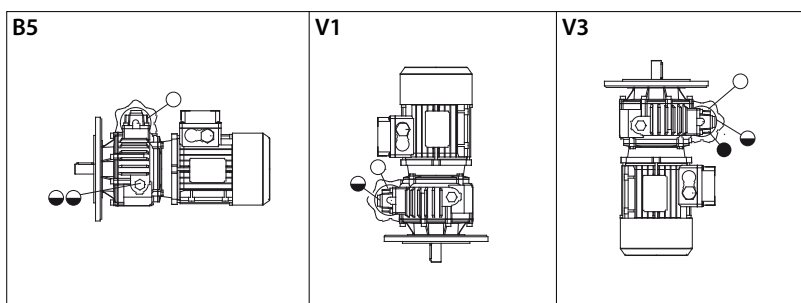
## MOUNTING POSITIONS STANDARD, ATEX 3G/3D———SF



- Breather plug
- Level plug
- Closed plug

Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

## MOUNTING POSITIONS ATEX 2G/2D———SF

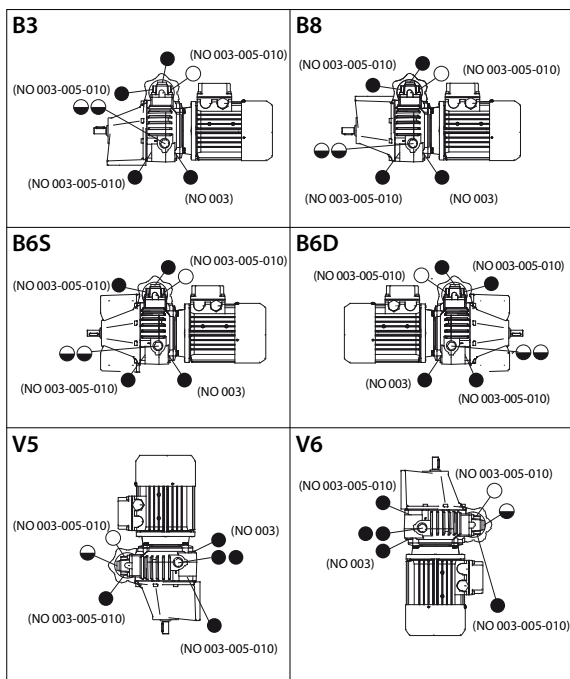


- Breather plug
- Level plug

Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

Breather valve plugs  
Closed plugs on all other holes.

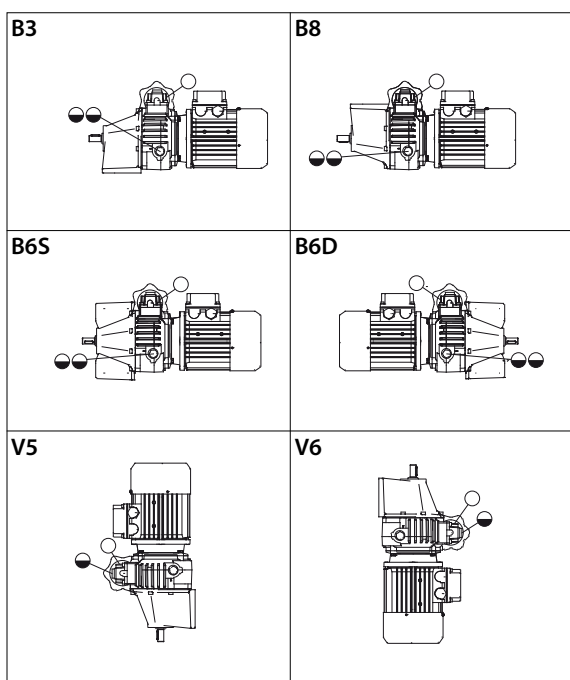
MOUNTING POSITIONS STANDARD, ATEX 3G/3D———ST



- Breather plug
- ◐ Level plug
- Closed plug

Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

MOUNTING POSITIONS ATEX 2G/2D———ST



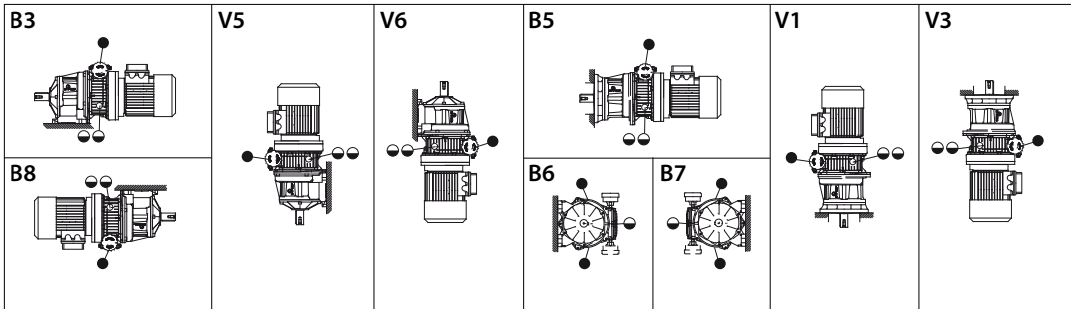
- Breather plug
- ◐ Level plug

Breather valve plugs  
Closed plugs on all other holes.

Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

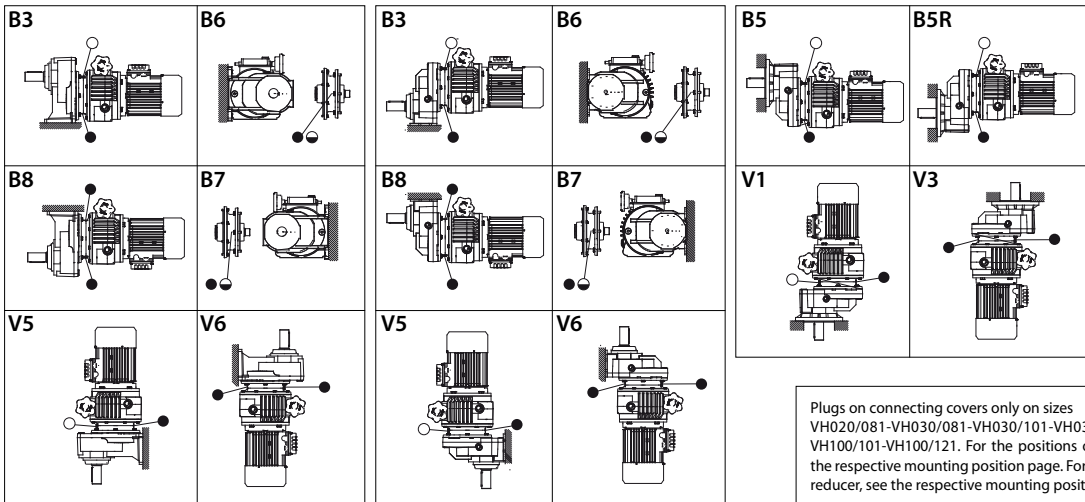
# USE AND MAINTENANCE INSTRUCTIONS

## MOUNTING POSITIONS STANDARD-----VH/A - VHF/A



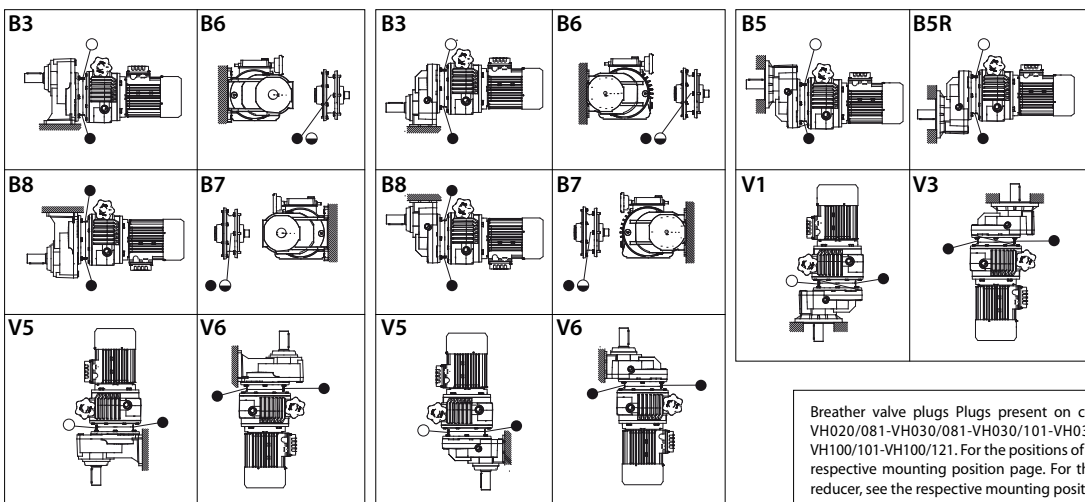
Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

## MOUNTING POSITIONS STANDARD, ATEX 3G/3D-----VH/1-VHF/1-VHM



Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

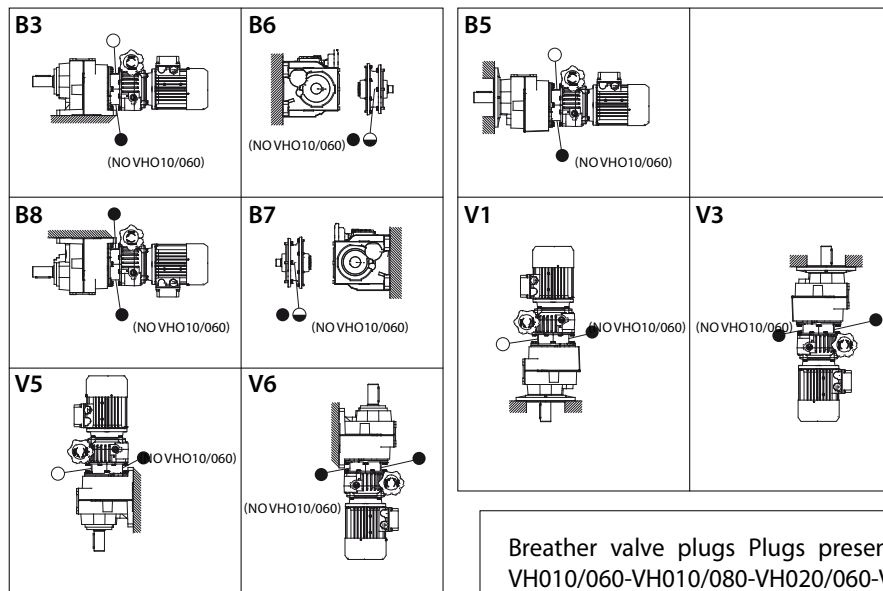
## MOUNTING POSITIONS ATEX 2G/2D-----VH/1-VHF/1-VHM



Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.



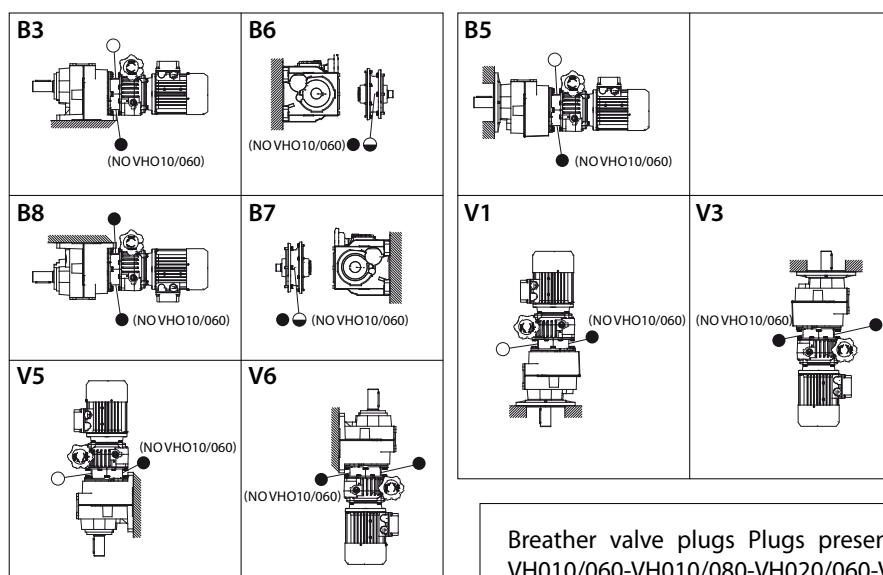
MOUNTING POSITIONS STANDARD, ATEX 3G/3D———VH/2-3 – VHF/2-3



Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

Breather valve plugs Plugs present on connecting covers only on sizes VH010/060-VH010/080-VH020/060-VH020/080- VH030/060-VH030/080- VH030/100-VH030/125- VH050/100- VH050/125- VH100/100- VH100/125. For the positions of the plugs on the variator, see the respective mounting position page. For the positions of the plugs on the reducer, see the respective mounting position page.

MOUNTING POSITIONS ATEX 2G/2D———VH/2-3 – VHF/2-3

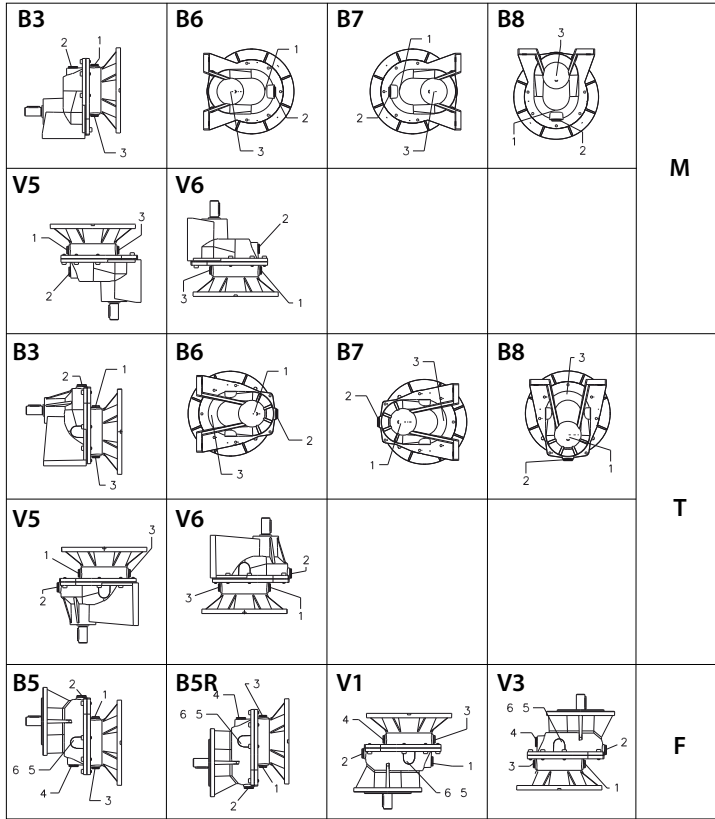


Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

Breather valve plugs Plugs present on connecting covers only on sizes VH010/060-VH010/080-VH020/060-VH020/080- VH030/060-VH030/080- VH030/100-VH030/125- VH050/100- VH050/125- VH100/100- VH100/125. For the positions of the plugs on the variator, see the respective mounting position page. For the positions of the plugs on the reducer, see the respective mounting position page.

# USE AND MAINTENANCE INSTRUCTIONS

## MOUNTING POSITIONS STANDARD, ATEX 2G/2D/3G/3D ———RM-RT/1-RF/1



Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

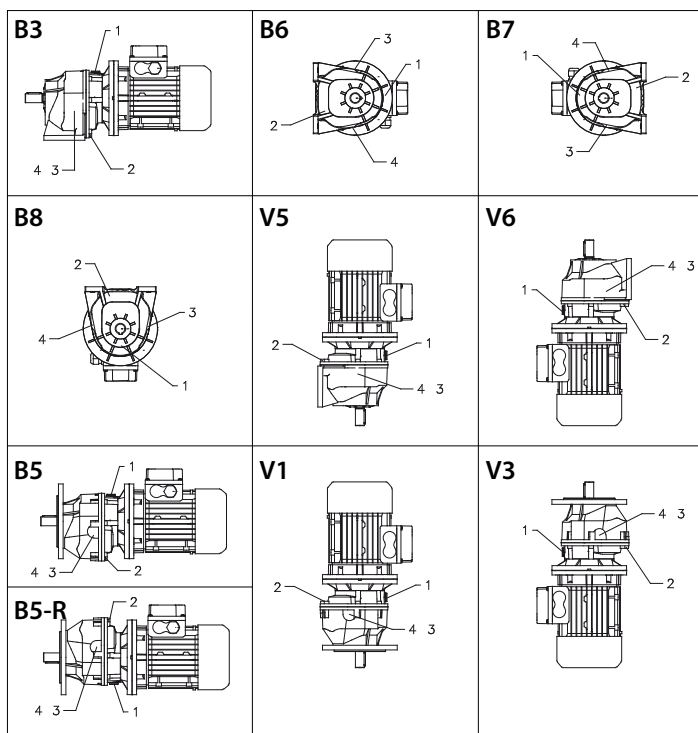
		RM					
		B3	B6	B7	B8	V5	V6
041	1	●	●	●	●	●	●
	2	●	●	●	●	●	●
	3						
051	1	●	●	●	●	●	●
	2	●	●	●	●	●	●
	3	●	●	●	●	●	●
061	1						
	2	●	●	●	●	●	●
	3						
081	1	○	●	●	●	○	●
	2	●	●	●	●	●	●
	3	●	●	●	●	●	●
101	1	○	●	●	●	○	●
	2	●	●	●	●	●	●
	3	●	●	●	○	●	●
121	1	○	●	●	●	○	●
	2	●	●	●	●	●	●
	3	●	●	●	○	●	●

		RT					
		B3	B6	B7	B8	V5	V6
041	1						
	2	●	●	●	●	●	●
	3	●	●	●	●	●	●
051	1	●	●	●	●	●	●
	2	○	●	●	●	●	●
	3	●	●	●	●	●	●
061	1						
	2	●	●	●	●	●	●
	3						
081	1	●	●	●	●	○	●
	2	○	●	●	●	●	●
	3	●	●	●	○	●	●
101	1	●	●	●	●	○	●
	2	○	●	●	●	●	●
	3	●	●	●	○	●	●
121	1	●	●	●	●	○	●
	2	○	●	●	●	●	●
	3	●	●	●	○	●	●

		RF			
		B5	B5R	V1	V3
041	1				
	2	●	●	●	●
	3	●	●	●	●
	4	●	●	●	●
	5				
	6				
051	1	●	●	●	●
	2	●	●	●	●
	3	●	●	●	●
	4	●	●	●	●
	5				
	6				
061	1				
	2	●	●	●	●
	3	●	●	●	●
	4	●	●	●	●
	5				
	6				
081	1	●	●	●	●
	2	●	●	●	●
	3	●	○	●	●
	4	●	●	○	●
	5	○	○	○	○
	6	●	●	●	●
101	1	●	●	●	●
	2	○	●	●	●
	3	●	○	●	●
	4	●	●	○	●
	5				
	6				
121	1	○	●	●	●
	2	●	●	●	●
	3	●	○	●	●
	4	●	●	○	●
	5				
	6				

- Breather plug
- ◐ Level plug
- Closed plug

MOUNTING POSITIONS STANDARD———RT/2-3 - RF/2-3



- Breather plug
- ◐ Level plug
- Closed plug

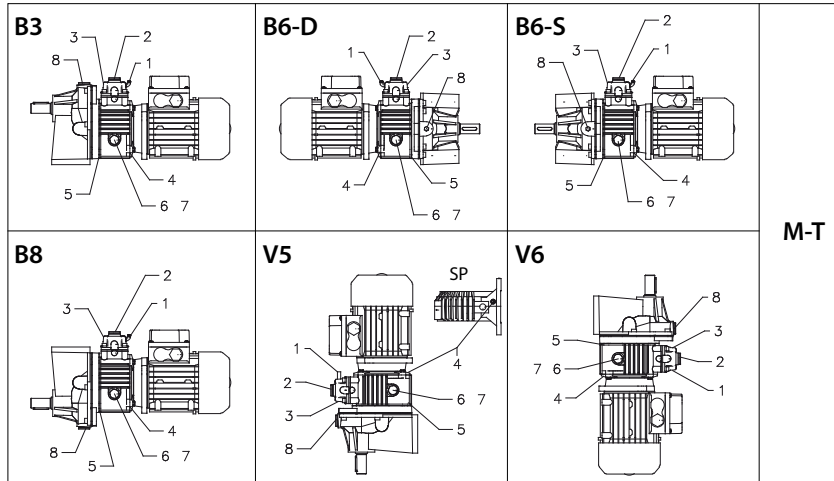
Mount the unit in the mounting position for which it is designed. Otherwise, contact our Technical Service.

		RT 2/3						RF 2/3			
		B3	B6	B7	B8	V5	V6	B5	B5R	V1	V3
040	1	●	●	●	●	○	●	●	○	●	
	2										
	3										
	4										
050	1	●	●	●	●	○	●	●	○	●	
	2										
	3										
	4										
060	1	●	●	●	●	●	●	●	●	●	
	2										
	3										
	4										
080	1	○	◐	●	●	○	●	○	○	●	
	2	●	●	◐	○	●	●	○	●	●	
	3	◐	○	●	◐	●	●	◐	◐	●	
	4	◐	●	○	◐	◐	●	◐	◐	●	
100	1	○	◐	●	●	○	●	○	○	●	
	2	●	●	◐	○	●	●	○	○	●	
	3	◐	○	●	◐	◐	●	◐	◐	●	
	4	◐	●	○	◐	◐	●	◐	◐	●	
125	1										
	2	●	●	●	○	○	●	●	○	○	
	3	◐	○	●	◐	◐	●	◐	◐	●	
	4	◐	●	○	◐	◐	●	◐	◐	●	

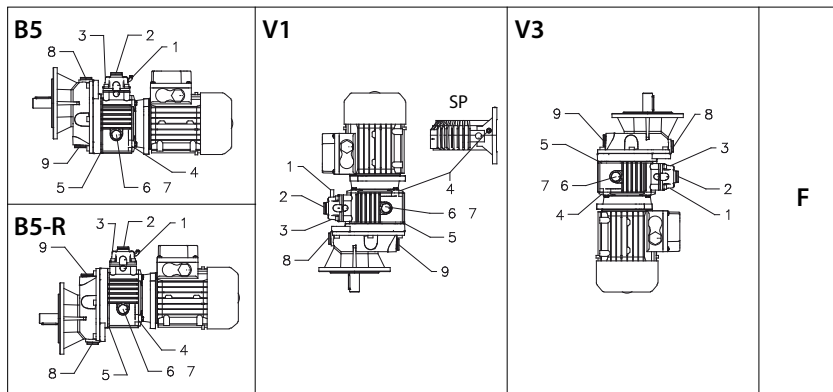
- Breather plug
- ◐ Level plug
- Closed plug

# USE AND MAINTENANCE INSTRUCTIONS

## MOUNTING POSITIONS STANDARD, ATEX 2G/2D/3G/3D———SRM-SRT/1-SRF /1



Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.



- Breather plug
- ◐ Level plug
- Closed plug

Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

ATEX 2G/2D  
Breather valve plugs

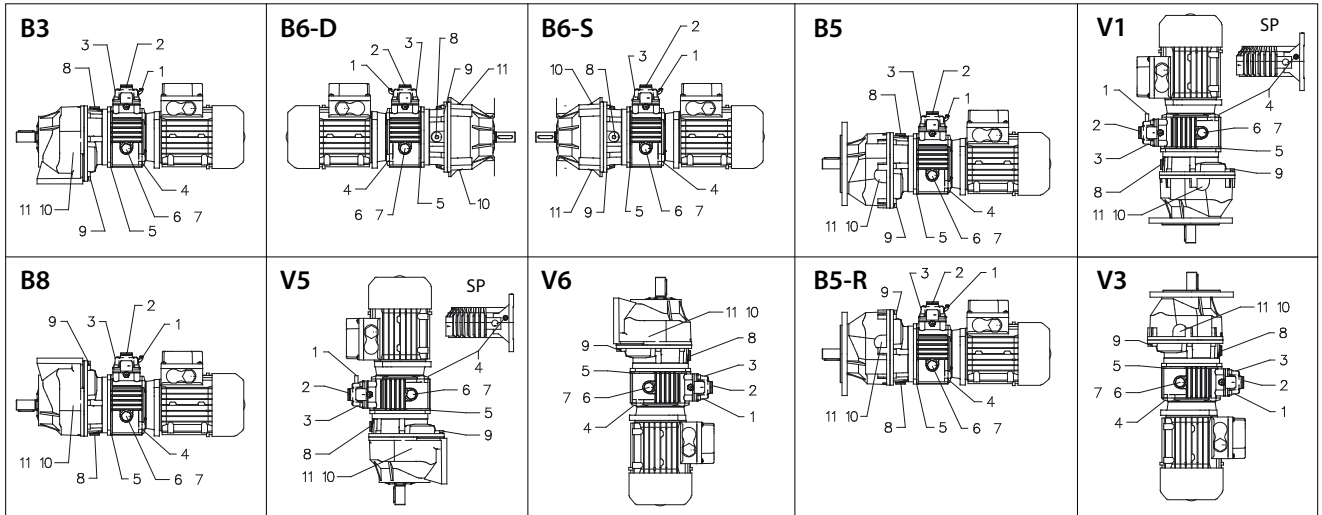
MOUNTING POSITIONS STANDARD, ATEX 2G/2D/3G/3D ----- SRM-SRT/1-SRF/1

		SRM-SRT - 1					
		B3	B6-D	B6-S	B8	V5	V6
003/041	1						
	2	●	●	●	●	○	○
	3						
	4						
	5						
	6	○	○	○	○	●	●
	7	○	○	○	○	●	●
	8	●	●	●	●	●	●
005/051	1						
	2	●	●	●	●	○	○
	3						
	4	●	●	●	●	●	●
	5						
	6	○	○	○	○	●	●
	7	○	○	○	○	●	●
	8	●	●	●	●	●	●
010/061	1						
	2	●	●	●	●	○	○
	3						
	4	●	●	●	●	●	●
	5						
	6	○	○	○	○	●	●
	7	○	○	○	○	●	●
	8	●	●	●	●	●	●
020/081	1	○	○	○	○	○	●
	2	●	●	●	●	○	○
	3	●	●	●	●	●	○
	4	●	●	●	●	●	●
	5	●	●	●	●	●	●
	6	○	○	○	○	●	●
	7	○	○	○	○	●	●
	8	○	●	●	●	●	●
030-050/101	1	○	○	○	○	○	●
	2	●	●	●	●	○	○
	3	●	●	●	●	●	○
	4	●	●	●	●	●	●
	5	●	●	●	●	●	●
	6	○	○	○	○	●	●
	7	○	○	○	○	●	●
	8	○	●	●	●	●	●
100/121	1	○	○	○	○	○	●
	2	●	●	●	●	○	○
	3	●	●	●	●	●	○
	4	●	●	●	●	●	●
	5	●	●	●	●	●	●
	6	○	○	○	○	●	●
	7	○	○	○	○	●	●
	8	○	●	●	●	●	●

		SRF - 1			
		B5	B5R	V1	V3
003/041	1				
	2	●	●	○	○
	3				
	4				
	5				
	6	○	○	●	●
	7	○	○	●	●
	8	●	●	●	●
	9	●	●	●	●
005/051	1				
	2	●	●	○	○
	3				
	4	●	●	●	●
	5				
	6	○	○	●	●
	7	○	○	●	●
	8	●	●	●	●
	9	●	●	●	●
010/061	1				
	2	●	●	○	○
	3				
	4	●	●	●	●
	5				
	6	○	○	●	●
	7	○	○	●	●
	8	●	●	●	●
	9	●	●	●	●
020/081	1	○	○	○	●
	2	●	●	○	○
	3	●	●	●	○
	4	●	●	●	●
	5	●	●	●	●
	6	○	○	●	●
	7	○	○	●	●
	8	○	●	●	●
	9	●	○	●	●
030-050/101	1	○	○	○	●
	2	●	●	○	○
	3	●	●	●	○
	4	●	●	●	●
	5	●	●	●	●
	6	○	○	●	●
	7	○	○	●	●
	8	○	●	●	●
	9	●	○	●	●
100/121	1	○	○	○	●
	2	●	●	○	○
	3	●	●	●	○
	4	●	●	●	●
	5	●	●	●	●
	6	○	○	●	●
	7	○	○	●	●
	8	○	●	●	●
	9	●	○	●	●

# USE AND MAINTENANCE INSTRUCTIONS

## MOUNTING POSITIONS STANDARD———SRT/2-3 – SRF/2-3



Mount the unit in the mounting position for which it is designed.  
Otherwise, contact our Technical Service.

MOUNTING POSITIONS STANDARD———SRT/2-3 - SRF/2-3

SRT - 2/3		SRF - 2/3									
		B3	B6-D	B6-S	B8	V5	V6	B5	B5R	V1	V3
003/042-043 003/052-053 003/063	1										
	2	●	●	●	●	⊖	⊖	●	●	⊖	⊖
	3										
	4										
	5										
	6	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	7	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	8	●	●	●	●	●	●	●	●	●	●
	9										
	10										
	11										
005/042 005/052-053 005/062-063 010/052 010/062-063	1										
	2	●	●	●	●	⊖	⊖	●	●	⊖	⊖
	3										
	4	●	●	●	●	●	●	●	●	●	●
	5										
	6	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	7	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	8	●	●	●	●	●	●	●	●	●	●
	9										
	10										
	11										
005/083 010/082-083 010/103	1										
	2	●	●	●	●	⊖	⊖	●	●	⊖	⊖
	3										
	4	●	●	●	●	●	●	●	●	●	●
	5										
	6	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	7	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	8	○	●	⊖	●	○	●	○	●	○	●
	9	●	○	○	○	●	●	○	●	○	●
	10	⊖	●	○	⊖	⊖	●	⊖	⊖	⊖	●
	11	⊖	○	●	⊖	⊖	●	⊖	⊖	⊖	●

- Breather plug
- ⊖ Level plug
- Closed plug

SRT - 2/3		SRF - 2/3									
		B3	B6-D	B6-S	B8	V5	V6	B5	B5R	V1	V3
010/123	1										
	2	●	●	●	●	⊖	⊖	●	●	⊖	⊖
	3										
	4	●	●	●	●	●	●	●	●	●	●
	5										
	6	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	7	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	8										
	9	●	○	●	○	○	●	●	○	○	●
	10	⊖	●	○	⊖	⊖	●	⊖	⊖	⊖	●
	11	⊖	●	●	⊖	⊖	●	⊖	⊖	⊖	●
020/062	1	○	○	○	○	○	●	○	○	○	●
	2	●	●	●	●	⊖	⊖	●	●	⊖	⊖
	3	●	●	●	●	●	○	●	●	●	○
	4	●	●	●	●	●	●	●	●	●	●
	5	●	●	●	●	●	●	●	●	●	●
	6	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	7	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	8	●	●	●	●	●	●	●	●	●	●
	9										
	10										
	11										
020/082-083 020/102-103 030-050/082 030-050/102-103 100/102-103	1	○	○	○	○	○	●	○	○	○	●
	2	●	●	●	●	⊖	⊖	●	●	⊖	⊖
	3										
	4	●	●	●	●	●	●	●	●	●	●
	5										
	6	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	7	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	8	○	●	⊖	●	○	●	○	●	○	●
	9	●	⊖	○	○	●	●	○	●	○	●
	10	⊖	●	○	⊖	⊖	●	⊖	⊖	⊖	●
	11	⊖	○	●	⊖	⊖	●	⊖	⊖	⊖	●
020/123 030-050/122-123 100/122-123	1	○	○	○	○	○	●	○	○	○	●
	2	●	●	●	●	⊖	⊖	●	●	⊖	⊖
	3	●	●	●	●	●	○	●	●	●	○
	4	●	●	●	●	●	●	●	●	●	●
	5	●	●	●	●	●	●	●	●	●	●
	6	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	7	⊖	⊖	⊖	⊖	●	●	⊖	⊖	●	●
	8										
	9	●	○	●	○	○	●	○	○	○	●
	10	⊖	●	○	⊖	⊖	●	⊖	⊖	⊖	●
	11	⊖	●	●	⊖	⊖	●	⊖	⊖	⊖	●



## 12. DECLARATION OF PARTLY COMPLETED MACHINERY INCORPORATION

Sede operativa ed amm.va:  
Via Quattro Passi 1/3  
41043 Formigine (MO) Italy  
Tel. +39 059 579700  
Fax +39 059 579710  
italy@motovario-group.com  
www.motovario-group.com

Logistica e spedizioni:  
Via Giardini 45 - 41042  
Ubersetto di Fiovanò (MO) Italy  
Tel. +39 0536 843702  
Fax +39 0536 920672  
spedizioni@motovario.it



Versione originale in lingua italiana  
Original version in italian language

### Dichiarazione di Incorporazione di quasi-macchina Declaration of partly completed machinery incorporation MOTOVARIO S.p.A.

Dichiara sotto la propria esclusiva responsabilità la conformità dei seguenti prodotti  
Hereby declares under its exclusive responsibility the conformity of the following products:

Motoriduttori serie: H - B - S - NMRV - NMRL - NMRV-P - SW - SWL - R - SH - PC  
(la presente dichiarazione vale anche per la serie riduttori compatti)

Geared motor units series: H - B - S - NMRV - NMRL - NMRV-P - SW - SWL - R - SH - PC  
(this declaration is valid also for the compact gear units series)

Motovariatori serie: S - TX  
Motovariators series: S - TX

Motovariariduttori serie: SR - VH  
Motovariator-Gear reducers: SR - VH

fino alla commessa di produzione n°  
until the production order n°

Destinazione d'uso prevista: impianti/macchinari ad uso civile o industriale  
Intended use : plants/equipments for civil or industrial use

È fatto divieto alla quasi-macchina oggetto della presente dichiarazione di essere messa in servizio prima che la macchina in cui sarà incorporata o con cui verrà assemblata sia stata dichiarata conforme alle disposizioni della Direttiva 2006/42/CE  
The partly completed machinery of the present declaration is forbidden from being started until the machine in which it will be incorporated or which will be assembled, has been declared in conformity with the 2006/42/CE Rule.

Sono stati applicati e rispettati i seguenti requisiti essenziali di sicurezza e di tutela della salute dell'allegato I della Direttiva 2006/42/CE: 1.1.2, 1.1.3, 1.1.5, 1.2.6 (se presenti sistemi di comandi elettronici), 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.3.8, 1.4.1, 1.4.2.1, 1.5.1, 1.5.2, 1.5.4, 1.5.6, 1.5.7, 1.5.8, 1.5.9, 1.5.11 (solo per conformità alla Direttiva sotto riportata 2004/108/CE nei casi previsti), 1.6.1, 1.6.4, 1.7.1, 1.7.2, 1.7.3, 1.7.4, 2.1.1

The following essential safety and health care requirements from enclosure I of the 2006/42/CE Rule, were applied and respected: 1.1.2, 1.1.3, 1.1.5, 1.2.6 (where electronic control systems are set), 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.3.8, 1.4.1, 1.4.2.1, 1.5.1, 1.5.2, 1.5.4, 1.5.6, 1.5.7, 1.5.8, 1.5.9, 1.5.11 (only for compliance with the 2004/108/CE Rule below, where provided), 1.6.1, 1.6.4, 1.7.1, 1.7.2, 1.7.3, 1.7.4, 2.1.1

- L'azienda firmataria della presente DICHIARA sotto la sua esclusiva responsabilità che la quasi-macchina a cui la presente dichiarazione si riferisce, se presenti equipaggiamenti elettrici, è conforme alle prescrizioni della Direttiva 2004/108/CE (Direttiva Compatibilità Elettromagnetica)  
The undersigned Company hereby DECLARES under its exclusive responsibility that the partly completed machinery to which this declaration relates, where electrical equipments are set, meets the requirements of the 2004/108/CE Rule (Electromagnetic Compatibility Rule).

L'azienda firmataria della presente si impegna a trasmettere, in risposta a una richiesta adeguatamente motivata delle autorità nazionali, informazioni pertinenti sulla quasi-macchina oggetto della presente dichiarazione, fatti salvi i diritti di proprietà intellettuale del fabbricante della quasi-macchina. Le informazioni verranno trasmesse direttamente all'autorità nazionale che le ha richieste.  
The undersigned Company is committed to provide, in response to a reasoned request by the national authorities, relevant information about the partly completed machinery covered by this declaration, except for the intellectual property rights of the partly completed machinery manufacturer. The information will be transmitted directly to the national authority who have requested them.

Direzione Generale - General Manager

Formigine,

La presente dichiarazione di incorporazione è stata redatta secondo quanto indicato nell'allegato II, punto B, della Direttiva 2006/42/CE  
The present declaration of incorporation has been drafted as indicated in the enclosure II, point B, of the 2006/42/CE Rule.

QL0201 rev. 2

