

1. BASIC CONDITIONS AT THE RECEPTION

1.1. Handling

DO NOT HANDLE THE MOTOR WHEN IT IS RUNNING OR WHEN STOPPED BUT SWITCHED ON.

Machines and electrical appliances are part of industrial with electrical power installations and when in use, some parts are subjected to dangerous voltages, and others are subject to rotating movements which can cause serious personal injuries or damage if the necessary protections are unduly removed, misused or insufficiently maintained.

1.2. Technical Personnel

Specialized, responsible personnel must carry out assembly and installation. Particular attention must be paid to technical data, assembly and connection conditions, type of environment, level of protection and motor service, so that they can be duly applied when installing the motor in the relevant machine.

1.3. Basic Description

ID motors are intended for industrial installations and comply with EN60034 harmonised standards. Their use in areas with an explosion hazard is prohibited.

These low voltage motors are components for machines in accordance with Machines Directive 89/392/CEE. They may not be started until a check has been made that the final product complies with this Directive (see EN60204-1).

Unless otherwise indicated, the power given for continuous service (S1) corresponds to an environmental temperature of between -20° and $+40^{\circ}$ C, and to an operational altitude of 1000 metres above sea level.

1.4. Dispatch and Reception

The motors are shipped in completely sealed packaging with a wooden platform base.

2. SITING

Note that the motor must be located in an area that provides easy access to the brushes.

Care should also be taken to avoid the fan air inlet and outlet from being obstructed and recirculating the hot exhaust back into motor's air vent.

Motors must be mounted onto a solid base to avoid any external vibration.

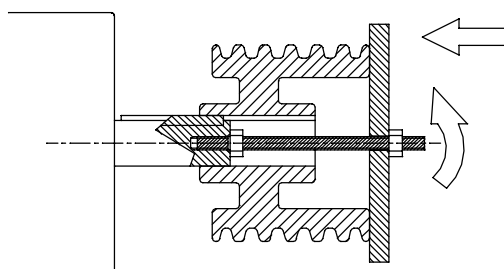
Vertically positioned motors need to be specifically protected to maintain the IP23S protection grade.

3. COUPLING TO THE MACHINE

This should be undertaken with extreme care as it has a significant effect on motor life. **Foot-mounting (B3)**, must be by 4 screws matching the diameter of the holes in the base. For **flange-mounted (B5/B14)** motors, the anti-rust varnish on the motor flange must first be removed, and the two flanges screwed together using screws of suitable diameter. The motor shaft protection varnish must be removed before fitting the coupling medium on the machine (direct drive, pulley, etc.) onto the motor shaft. Tolerances used must be those specified for each motor type.

The rotors are dynamically balanced accordingly to EN60034-14 Standards, with **half key** at the end of the shaft, and care must be taken to ensure that the balancing system itself is correct with regard to the pulley or coupling.

Never hammer the pulley or coupling to attach them. Heat them beforehand or use appropriate tools (See figure)



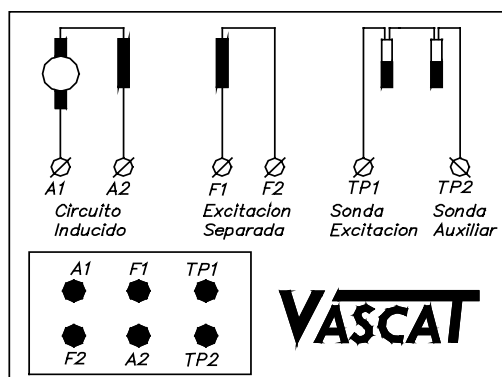
4. ELECTRICAL INSTALLATION

4.1. Electrical Hook-up

The motor is equipped with a terminal box containing its respective terminal strip for electrical hook-ups, using connection screws suitable for the current of each motor. Connect the motor according to the wiring diagram on the terminal box cover.

Ground the protection conductor wired to the respective terminal.

Make sure the fan connections provide it with the correct voltage. (See motor nameplate)



5. START-UP

5.1. Inspection

Make sure all connections are correct, i.e.: Those of the DC Motors, the thermal probes and the electrical fan and that they conform to the supply voltage of each component.

Make sure the direction of fan rotation is as indicated by an arrow on the housing.

Verify current consumption.

Make sure the motor is securely and correctly attached to the bedframe.

5.2. Checking

Make sure:

1. That when the motor is at a low load, there is no excessive overheating.
2. That the temperature of the bearings is not excessive and that there is no vibration owing to the motor being incorrectly aligned.
3. Regulate the inverter to the particular technical specifications of the selected motor, voltage speed, current, both in its maximum and minimum values.
4. The commutation is clean and regular.
5. The brushes must form a uniform patina on the commutator, as this guarantees their long service life.

If after 200 hours of operation, this patina has not formed it means that the environment where the motor is installed requires special quality brushes. In this case consult VASCAT.

6. MAINTENANCE

WARNING. All maintenance and repair operations must be done when the motor is stopped and no voltage is applied to its terminals.

The direct current motor requires a minimum maintenance program to obtain the best performance from the motor and the machine in which it is installed, at the lowest cost.

6.1. Preventive Maintenance Program

COMPONENT	OPERATION	INTERVAL
Commutator	Make sure it remains smooth, has acquired a slightly brown colour without any burnt spots. Make sure the max run out does not exceed $0,03\text{ mm}$	Every 3 months
Brushes	Check sliding, and wear	Every month
Bearings	Check functioning	Every 3 months
Insulation	In humid environments, make sure its value at 1000V is higher than $5M\Omega$	Every month
Air filter	Clean or change filter	As environment requires
Coils	Visual inspection	Annually

6.2. Skimming of the Commutator

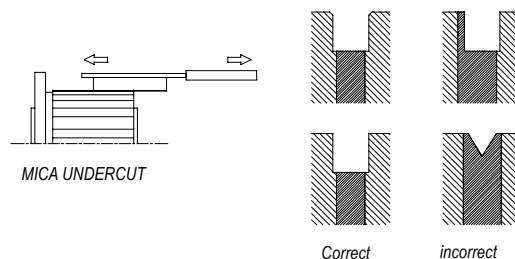
If due to wear or ovalization the commutator must be skimmed; this should be carried out according to the following technical specifications.

(This work should be done by qualified personnel or companies.)

DESCRIPTION	SKIMMING	FINAL FINISH
Tool	Tungsten Carbide	Tungsten Carbide
Cutting speed	0.6 to 3 m/sec.	0.6 to 4 m/sec.
Feed	0.05 to 0.1 mm/rev	0.05 to 0.08 mm/rev
Cutting depth	0.06 to 0.5mm	0.01 to 0.08 mm

Once this operation has been completed, the mica between segments should be undercut to a depth of 1mm, and the sides of the segments should be left perfectly clean. This can be done with a handsaw and finally the commutator should be polished with a pumice stone or very fine emerypaper.

After these operations, the commutator should appear as follows.



6.3. Commutation

A simple inspection of the commutator, should give a clear indication for establishing possible abnormalities that may have occurred in the motor or in the inverter.

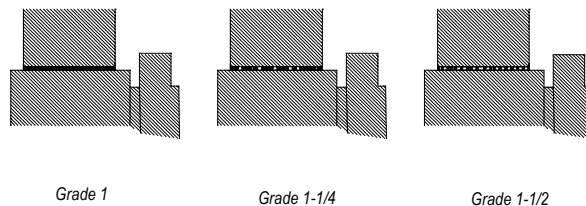
It is accepted that the commutation grade value = 1 (no sparking), when the motor is dynamo-powered, and Grade 1 ¼ (slight sparking) when it is supplied by thyristors.

When the motor is powered with a system which form factor exceeds 1.1, value 2 can be considered (continuous sparking). An appropriate inductor connected in series with the armature must be installed to correct this abnormality. Consult our Technical department.

The pressure of the brush-holder springs must be between 170 and 200 g/cm².

When for any reason one brush needs to be replaced, all of them must be replaced.

If the commutator shows roughness, it should be skimmed before replacing the brushes, because the brushes service life could be reduced depending on the status of the commutator.



6.4. Brushes

6.4.1. Changing the Brushes

The brushes should be changed once they are reduced to only 14 mm long.

They are changed as follows:

- a. Open the inspection covers.
- b. Loosen or remove the 4 screws holding the brush carrier ring in place so as to access the brushes underneath.
- c. Remove the pressure spring.
- d. Loosen the brush cable screw.
- e. Position the new brush, tighten the screws, replace the spring, replace the ring in its original position, re-tighten and adapt the brush to the collector using the pumice stone.

6.4.2. Brush-Holder Set Positioning

As the brush-holder set eventually has to be moved to change the brushes, so that it can subsequently be re-positioned, a paint mark has been made between the brush-holder and the cover.

If said the mark disappears:

- a. Disconnect all the external connectors.
- b. Feed the excitation terminals F1 and F2 with an a.c. 220V current.
- c. Connect a 2 Volt scale end a.c. voltmeter to the A1 and A2 armature terminals.
- d. Check the voltmeter reading, and rotate the brush-holder right or left until a reading of 0 Volt is reached. THIS IS THE CORRECT BRUSHHOLDER POSITION.

6.5. Filter Cleaning

The air inlet filters must be cleaned according to the environment in which they are used.

They can be cleaned using compressed air or washed with water and detergent.

They must be replaced after 4 or 5 washes

The filter is type NGB 290/4 or equivalent

7. BEARINGS

The sizes 90 to 200 of ID series have built-in, permanently greased sealed bearings.

The sizes 225 to 280 of ID series must be lubricated periodically

The grease to be used should be ESSO UNIREX N3 or similar.

The bearings must be replaced after every 20,000 hours of operation.

The bearings should be removed using an appropriate tool (extractor)

The bearings should be heated to 60-80° to be positioned.

Do not hammer them when inserting them.

On the following pages the bearing specifications used in each type of MCC Motor are shown

Tipo de motor Motor Type	Rodamiento Bearing	n max rpm	n rpm	L10h h	C N	P max N	A mm	B mm	Xmax mm	Fr max N (**)
ID 090	D.E. 6206ZZC3	10000	1500	20000	19500	1603	18,5	279	60	1000
	N.D.E. 6205ZZC3	12000	1500	20000	14000	1151	18,5	279	60	3300
ID 100	D.E. 6307ZZC3	8500	1500	20000	33200	2729	24	317,5	80	1600
	N.D.E. 6207ZZC3	9000	1500	20000	25500	2096	24	317,5	80	5100
ID 112	D.E. 6308ZZC3	7500	1500	20000	41000	3370	26	371	80	2100
	N.D.E. 6208ZZC3	9000	1500	20000	30700	2524	26	371	80	7100
ID 132	D.E. 6310ZZC3	6300	1500	20000	61800	5080	35,5	448,5	110	3100
	N310 (*)	5000	1500	20000	110000	11609				7000
	N.D.E. 6208ZZC3	8500	1500	20000	30700	2524	35,5	448,5	110	6200
ID 160	D.E. 6312ZZC3	5000	1500	20000	81900	6733	38,5	538	110	4200
	N312 (*)	4300	1500	20000	151000	15937				10000
ID 180	N.D.E. 6308ZZC3	7500	1500	20000	41000	3370	38,5	538	110	9800
	D.E. 6313ZZC3	4800	1500	20000	92300	7588	50	679	140	4700
ID 180	N313 (*)	4000	1500	20000	183000	19314				12100
	N.D.E. 6311ZZC3	5600	1500	20000	71500	5878	50	679	140	16800
	D.E. 6315ZZC3	4300	1500	20000	114000	9372	55	757	140	6000
ID 200	N315 (*)	3400	1500	20000	242000	25541				16200
	N.D.E. 6313ZZC3	4800	1500	20000	92300	7588	55	757	140	23600
ID 225	D.E. 6218 C3(***)	3800	1500	20000	96500	7933	56	940	170	5100
	NU218 (*)	4300	1500	20000	183000	19314				12500
ID 250	N.D.E. 6216 C3(***)	4500	1500	20000	104000	8550	56	940	170	28400
	D.E. 6220 C3(***)	3400	1500	20000	122000	10029	56	940	170	6500
ID 250	NU220 (*)	3800	1500	20000	250000	26385				17000
	N.D.E. 6218 C3(***)	3800	1500	20000	96500	7933	58,5	1065	170	29600
ID 280	D.E. 6222 C3(***)	3000	1500	20000	143000	11756	56	940	210	7300
	NU222 (*)	3400	1500	20000	290000	30607				19100
ID 280	N.D.E. 6220 C3 (***)	3400	1500	20000	122000	10029	58,5	1065	210	31800

DE = Delantero / Drive end ; N.D.E. = Trasero / Non Drive End

(*) Ejecución bajo pedido / Under request

(**) El esfuerzo radial máximo en la polea es el menor de los valores del juego de rodamientos seleccionado
The maximum radial load on the pulley is the minimum value for the selected couple of bearings

(***) Rodamientos de bolas sin placas de obturación. / Ball bearings without obturating plates

Los rodamientos de bolas con placas de obturación ZZ están engrasados de por vida.
Ball bearings with obturating plates type ZZ are greased for life

Los rodamientos de rodillos y los de bolas sin placas de obturación deben ser engrasados regularmente con grasa ESSO UNIREX N3.
Roller bearings and ball bearings without obturating plates must be greased regularly with ESSO UNIREX N3 grease.

n max Velocidad máxima / Maximum speed
n Velocidad de trabajo / Working Speed

L10h Vida útil del rodamiento, en h / Bearing Life in hours

C Carga dinámica nominal del rodamiento / Rated Dynamic Load

Pmax Carga radial admisible en el rodamiento para L10h y n / Max. Radial load on the bearing for L10h and n

Fr max Esfuerzo radial máximo en la polea / Maximum radial load on the pulley

