



ENARCO, S.A.

MOTOR AVMU-TRANSMISIONES Y AGUJAS
AVMU MOTOR- FLEXIBLE SHAFT AND POKERS
MOTEUR AVMU-TRANSMISSIONS ET AIGUILLES
AVMU MOTOR -ÜBERSETZUNGSGETRIEBE UND LANZEN



Manual de instrucciones
Instruction manual
Manuel d'instructions
Gebrauchsanweisungen



INDEX

1	INTRODUCTION	2
2	POWER UNIT CHARACTERISTICS	3
3	CHARACTERISTICS OF FLEXIBLE SHAFT AND POKERS	4
4	GENERAL AND SPECIFIC SAFETY RULES	5
4.1	WORK AREA	5
4.2	ELECTRICAL SAFETY	5
4.3	PERSONAL SAFETY	5
4.4	TOOL USE AND CARE	5
4.5	SERVICE	6
4.6	SPECIFIC SAFETY RULES	6
4.7	PERSONAL PROTECTIVE EQUIPMENT	6
5	USAGE CONDITIONS	7
6	OPERATION AND MAINTENANCE	7
6.1	GETTING STARTED	7
6.2	SHAFT CONECTION TO POWER UNIT	7
6.3	ELECTRIC MOTOR CONECTION TO THE SYSTEM	7
6.4	EARTH CONNECTION	7
6.5	EXTENSION CABLES	7
6.6	PROCEDURE TO DETERMINE THE NECESSARY TRANSVERSAL SECTION IN CABLE EXTENSION	8
6.7	POKER CONNECTION TO FLEXIBLE SHAFT	8
6.8	INSPECTION	8
7	DIMENSIONS OF WEAR FOR DIAMETERS AND LENGTHS OF THE POKERS	9
8	PERIODIC MAINTENANCE OF MOTOR	9
9	PERIODIC MAINTENANCE OF FLEXIBLE SHAFT AND POKERS	10
9.1	STORAGE	10
9.2	TRANSPORTATION	10
10	ELECTRICAL DIAGRAM EARTHING CONNECTION WITHOUT EARTHING	11
11	LOCATING MALFUNCTIONS OF MOTOR	12
12	LOCATING MALFUNCTIONS OF FLEXIBLE SHAFT AND POKERS	12
13	INSTRUCTIONS TO ORDER SPARE PARTS	13
13.1	INSTRUCTIONS TO ORDER SPARE PARTS	13
13.2	INSTRUCTIONS TO REQUEST WARRANTIES	13
14	RECOMENDATIONS OF USE OF CONCRETE VIBRATOR	14



1 INTRODUCTION

Thank you for trusting the ENAR brand

For the maximum performance of the equipment, we recommend to read carefully the safety recommendations, maintenance, and usage listed in this manual

Defective parts should be replaced immediately to avoid major problems.

The effective longevity of the equipment will increase if the manual instructions are followed.

We will glad to help you with any comments or suggestions in reference to our equipment.

МАГАЗИН
БАШ МАЙСТОРА®
ПРОФЕСИОНАЛНИ РЕШЕНИЯ



AVMU MOTOR - FLEXIBLE SHAFT AND POKERS

AX25, AX32, AX40, AX48, AX58 - AVMU

TAX1m, TAX1-5m, TAX2m, TAX3m, TAX4m, TAX5m, TAX6m -



2 POWER UNIT CHARACTERISTICS

MOTOR TYPE.....	UNIVERSAL SINGLE PHASE
ELECTRIC INSULATION TYPE	DOUBLE INSULATION, IP 44
OUTER CLADDING.....	HEAVY DUTY PLASTIC
POWER.....	2300 OR 1.600 WAT.
VOLTAGE	230V OR 115 V 50/60 HZ
(Make sure working voltage is according with stated in characteristics plate).	
LOADING CONSUMPTION.....	10 A (220 V) / 13 A (115 V)
UNLOADED SPEED.....	18.000 RPM
LOADED SPEED.....	12.000 RPM
WEIGHT.....	5 KG
FUNCTION.....	Transmits rotation power to an internal vibrator by a flexible shaft
CONNECTION TO FLEXIBLE SHAFT.....	HEXAGONAL 7
CONNECTION TYPE.....	THREAD LEFT





3 CHARACTERISTICS OF FLEXIBLE SHAFT AND POKERS

SCOPE

The flexible shaft connected to the AVMU power unit sends the movement to an eccentric placed in the poker, and so it is produced the vibration for the compacting of the concrete.

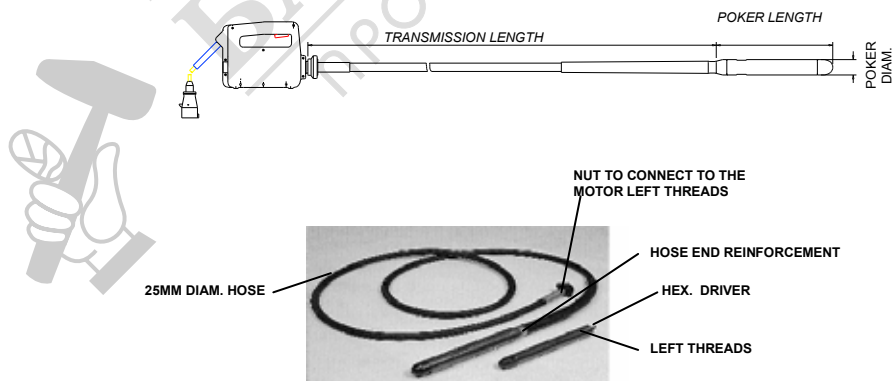
MODEL	DIÁMETER (mm)	LENGTH (mm)	WEIGHT (Kg)	CENTRIFUGAL FORCE (Kg)	V.P.M	CAPACITY (m ³ /h)	Acc. (m/s ²)*	Sound Pressure (dB)**	Sound Power (dB)**
AX 25	25	285	0,8	90	14.000	UP TO 10	1,24	85	93
AX 32	32	366	1,7	210	13.750	UP TO 14	1,41	86	94
AX 40	40	325	2,2	380	13.500	UP TO 17	1,38	88	95
AX 48	48	335	3,2	550	12.500	UP TO 28	1,42	88	95
AX 58	58	344	4,5	660	12.000	UP TO 35	1,67	88	95

*According to ISO5349, flexible shaft to 1m. of the poker and running unload K=2, handle acceleration 1,61 m/s²

**Test measured with motor AVMU, flexible shaft TAX 1,5m and poker unloaded K=1,5 at 1,5m of vibrator

MODEL	LENGTH (m)	WEIGHT (Kg)	AX 25	AX 32	AX 40	AX 48	AX 58
TAX 1m	1,0	3,0	14.250	14.000	13.750	12.750	12.250
TAX 1,5 m	1,5	3,5	14.000	13.750	13.500	12.500	12.000
TAX 2 m	2,0	4,0	13.750	13.500	13.250	12.250	11.750
TAX 3 m	3,0	5,0	13.500	13.250	13.000	12.000	11.500
TAX 4 m	4,0	6,0	13.000	12.750	12.500	11.500	11.000
TAX 5 m	5,0	7,0	13.000	12.500	12.000	11.000	10.500
TAX 6 m	6,0	8,0	12.000	11.500	11.000	10.500	10.000

Pokers AX25 y AX32 only be connected in the TAXE flexible shaft.



AVMU MOTOR - FLEXIBLE SHAFT AND POKERS

AX25, AX32, AX40, AX48, AX58 - AVMU

TAX1m, TAX1-5m, TAX2m, TAX3m, TAX4m, TAX5m, TAX6m -



4 GENERAL AND SPECIFIC SAFETY RULES



WARNING! READ AND UNDERSTAND ALL INSTRUCTIONS.

4.1 WORK AREA

KEEP your work area clean and well lit. Cluttered benches and dark areas invite accidents.
DO NOT OPERATE power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Power tools create sparks which may ignite the dust or fumes.
KEEP bystanders, children, and visitors away while operating a power tool.



Machine must be operated by **reliable operators who read and understand the operation manual of age above 18.**

4.2 ELECTRICAL SAFETY

GROUNDING TOOLS MUST BE PLUGGED INTO an outlet properly installed and grounded in accordance with all codes and ordinances.



NEVER REMOVE the grounding prong or modify the plug in any way.

DO NOT USE any adaptor plugs.

CHECK with a qualified electrician if you are in doubt as to whether the outlet is properly grounded.

AVOID body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators.

DON'T EXPOSE power tools to rain or wet conditions.

DO NOT ABUSE the cord.

NEVER USE the cord to carry the tool.

NEVER PULL the plug from an outlet.

KEEP cord away from heat, oil, sharp edges or moving parts.

REPLACE damaged cords immediately. Damaged cords increase the risk of electric shock.

WHEN OPERATING a power tool outside, use an outdoor extension cord marked "H07RN-F", "W-A" or "W".

4.3 PERSONAL SAFETY



STAY ALERT, watch what you are doing and use common sense when operating a power tool.

DO NOT USE TOOL while tired or under the influence of drugs, alcohol, or medication.

DRESS PROPERLY.

DO NOT WEAR loose clothing or jewellery.

CONTAIN long hair.

KEEP your hair, clothing, and gloves away from moving parts.

AVOID accidental starting.

BE SURE switch is off before plugging in.

REMOVE adjusting keys or switches before turning the tool on.

DO NOT overreach.

KEEP proper footing and balance at all times.

USE safety equipment.

Always WEAR eye protection.

4.4 TOOL USE AND CARE

USE clamps or other practical way to secure and support the work piece to a stable platform.

DO NOT FORCE tool.

USE the correct tool for your application.

DO NOT USE tool if switch does not turn it on or off.

DISCONNECT the plug from the power source before making any adjustments, changing accessories, or storing the tool.

STORE idle tools out of reach of children and other untrained persons. .





CHECK for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tools operation.

If damaged, HAVE the tool serviced before using.

USE only accessories that are recommended by the manufacturer for your model.

4.5 SERVICE



Tool service **MUST BE PERFORMED** only by qualified repair personnel.

When servicing a tool, **USE** only identical replacement parts.

FOLLOW instructions in the Maintenance section of this manual.

4.6 SPECIFIC SAFETY RULES



For the proper operation of the motor, **MAKE SURE** that operators have been instructed in the proper management of this machine.

The motor **SHOULD ONLY BE USED** in the specific jobs for with it the help of this manual.

Before connecting the motor to the electrical system, **MAKE SURE** that the voltage and frequency coincide with the ones stated in the characteristics equipment plate, located in the top part of the plastic housing.



DO NOT WORK CLOSE To flammable liquids or in areas exposed to flammable.

ENSURE that all frame screws are tight before starting work.

TO AVOID the flattening of the cable by heavy machinery with could cause breakage.

DO NOT CONNECT THE FLEXIBLE SHAFT TO THE MOTOR WHEN THIS IS WORKING.

DO NOT OPERATE in the motor shaft when this is working and without transmission.

DON NOT WORK with transmission or poker in bad conditions, the motor overheats.

DO NOT WORK with the plastic housing broken.

DO NOT PERMIT untrained personnel to operate the motor or connections.

MAINTAIN free ventilation of air.

KEEP the motor in a clean and dry area.



The motor plug should not be used to start stop the equipment.

The electrical feeding cable should not be used to remove the plug from the socket.

MAKE SURE that the electrical cable is with the proper section and functioning properly.

Before doing any type of repair, **DISCONNECT** the motor from the electrical system.

When connecting to a generator, **MAKE SURE** that the out tension and frequency is stable, right, and has the proper power, (the converter's feeding voltage should not vary more than $\pm 5\%$ as stated on the motor's plate).



When finishing the job or when taking a break, the operator **SHOULD UNPLUG**, disconnect it from the electrical system, and have it placed in such a way that it should not fall or tip

4.7 PERSONAL PROTECTIVE EQUIPMENT

Use approved protective equipment. Operators and all other persons in the working area must wear protective equipment:

Helmet, hearing and eye protection, gloves and boots.





5 USAGE CONDITIONS

For your own safety, as protection for others, and to avoid damage to the equipment, read carefully the usage recommendations.

1. Before working, to be sure the hose joint nut is fastened to the motor (screwed to left).
2. Be sure the poker is well screwed to the flexible shaft (screwed to left).
3. Do not work with flexible shaft with big bends.
4. Do not overlubricate the shaft.
5. Do not keep working the poker out of the concrete more than 5 minutes.
6. Do not restrict the movement of the poker during the work.
7. Do not stop the poker inside the concrete.
8. Change the wear parts to avoid damage to the internal parts. (Check wearing table for the poker)
9. Do the maintenance with the kinds and quantities of recommended lubricants.

IN ADDITION, LOCAL COUNTRY ESTABLISHED ORDINANCES SHOULD BE RESPECTED.

6 OPERATION AND MAINTENANCE

6.1 GETTING STARTED



Read item 5 USAGE CONDITIONS

6.2 SHAFT CONNECTION TO POWER UNIT



Power unit is designed to facilitate a quick and safe connection to flexible shaft.

CONNECTION PROCEDURE:

1. Introduce power unit hexagonal axle into the provided shaft housing
2. Screw plastic nut of shaft to aluminium thread of power unit . (Be aware of nut turns left and not tool is required)



CONNECTION CHOICES :

FLEXIBLE SHAFT LENGTH: TO 6 MTS (TAX1M, TAX1,5M, TAX2M, TAX3M, TAX4M, TAX5M, TAX6M)

VIBRATOR DIAMETER : TO 58 MM DIAMETER (AX25, AX32, AX40, AX48 AND AX58)

6.3 ELECTRIC MOTOR CONNECTION TO THE SYSTEM

Turn off the motor switch before connecting it.

6.4 EARTH CONNECTION

On motors that have plug with earth, to protect the user from an electrical shock, the motor should be correctly connected to earth.

6.5 EXTENSION CABLES

On motors that have plug with earthing, always use extension cables with earth wire and its respective plug with earth in the female and male switches, those which will use the male switch on the motor.

Do not use damaged or worn out cables.

To avoid heavy loads on top of cables.

To determine the transversal section, follow the following procedure



6.6 PROCEDURE TO DETERMINE THE NECESSARY TRANSVERSAL SECTION IN CABLE EXTENSION

To do the following verifications and take the highest section of cable:

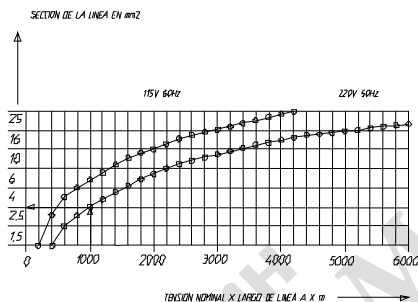
1. The ohmic resistance and inductive cable with the permitted voltage of 5%, $\cos\phi=0,8$ trough the frequency and voltage curve

I.e: Voltage nominal:..... 1- 220 V 50 Hz
 Nominal intensity:..... 10 A
 Cable length:..... 100 m

Entering the curve with the product: Intensity x Length=10x100=1000 Am We obtain a 4 mm² section
 2. The permitted heating of the cable according to VDE (minimum transversal section table required).

I. e. For 10 A, according to table for 15 A or inferior, the section is of 1 mm².

Therefore, the section chosen = 4mm², Always chose the highest transversal section of the two verifications



MINIMUM SECTION ACCORDING VDE RULES		
Line	Maximum	Max fuse
mm ²	A	A
1	15	10
1,5	18	10 / 3 – 16 / 1 –
2,5	26	20
4	34	25
6	44	35
10	61	50
16	82	63
25	108	80

6.7 POKER CONNECTION TO FLEXIBLE SHAFT

The flexible shafts **TAX** are intended to connect the pokers: **AX40, AX48** and **AX58**.

Allowing to interchange of a poker to other quickly and without a special tool. The model **AX25, AX32** due to the diameter need a special transmission. (**TAXE**).

CONNECTION PROCEDURE:

- 1-Introduce the hexagonal driver of the poker in the shaft.
- 2- Apply sealant or loctite 243 on the thread hose.
- 3-Screw the poker on the screwed end of the transmission up to fasten with the hand. (left threads).

6.8 INSPECTION

- 1.Before starting the job , check the correct working of all handling and safety devices
- 2.Inspect regularly the good condition of the feeding cables
- 3.Inspect regularly the good condition of the transmission. When the hose is broken, repair it or replace it to avoid damaging the shaft or the poker.
- 4.When notice wear parts, replace it.
5. If defects are found in the safety devices or other defects which could reduce the safe handling of the equipment, notify immediately to proper responsible person.



7 DIMENSIONS OF WEAR FOR DIAMETERS AND LENGTHS OF THE POKERS

MODELO	DIAMETER (mm)	LENGTH(mm)
AX 25	23,5 (25)	310 (320)
AX 32	30,5 (32)	360 (366)
AX 40	38,5 (40)	320 (325)
AX 48	45,5 (48)	330 (335)
AX 58	55,5 (58)	339 (344)



- The minimum dimensions are bold printed.
- The dimensions into brackets are the original dimensions.
- Replace the housing when reach the minimum diameter.
- Replace the tip when reach the minimum length.

8 PERIODIC MANTENANCE OF MOTOR

- Only an expert shall work on the electrical parts.
- Make sure that the electricity is off during repairs.
- In all maintenance operations, original parts will be used.
- A periodic lubrication of the converters' bearings is not necessary.
Every 50 hours carbon brushes should be inspected .They should be changed if effective length is under 8 mm. Change the brushes:
 - With a screwdriver remove the side cap of the housing, introducing the screwdriver between the cap and the housing and lever it.
 - We find the brush retainer (code 103652), this is a treated part, with a screwdriver. Remove it and so we can see the brush code 103653 (230v) and 103654 (115v), turn the motor the brush goes out or introduce a thin tool to remove it.
 - to assemble introduce the new brush and thread the retainer and finally close the housing with the cap.
 - Running motor for 5 minutes without shaft neither poker.
- Clean the ventilation vents in the front and back part of the converter periodically to avoid overheating. Clean or change air filter in the back part.
- After maintenance job and service, all safety devices should be assembled correctly.
- After working 40 hours inspect the housing's holding bolts.
- Every 12 months or more frequently, depending on the usage conditions, it's recommended a inspection be done by an authorized dealer.





9 PERIODIC MAINTENANCE OF FLEXIBLE SHAFT AND POKERS

- 1.-To do the maintenance works in the transmission and poker, firstly disconnect of the motor.
- 2.-In all maintenance operations, original parts will be used.
- 3.-To check the wear of the poker controlling the outside diameter and length of the poker. Replace the housing or cap when the diameter or length in the least point is less than the specified in the table according to the model.
- 4.-Lubricate the shaft every 100 working hours. Refer to utilize grease



A way to lubricate the shaft is to grasp some grease in the palm of the hand and run the close hand with the lubricant over the length of the shaft, leaving on the shaft a light coating of the lubricant on the entire length of the shaft, The recommended quantity is 20 grams per metre. Do not overlubricate, it could cause the grease penetrate into the poker, Do not clean the shaft with solvent. After connect to the motor, running flexible shaft without poker during 2 minutes.

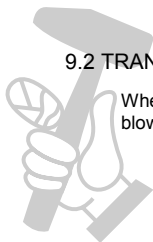
- 5.- When the length of the shaft is longer to the hose it is necessary to repair before producing a bigger breakdown.
- 6.- Every 300 hours of working is recommended to change the lubricant of the poker. To change the oil in the poker dismount the cap. Hold the housing on a vise and tap the cap with a plastic hammer. This will help to break the seal and to loosen the threads. Take out the old oil and fill the cavity of the cap with a light oil non-foaming 0W30 or equivalent. Mount according to the recommendations of the following point. If inspection reveals that the oil is thick, heavy, sticky mixture, then the grease of the flexible shaft has penetrated into the head, and the seals have to be replaced. Follow the steps of the point 7 to replace it.
- 7.-To do a maintenance follow the following steps:
 - Flush the parts with solvent and wipe all part.
 - Examine bearings, seals and hex driver. If inspection reveals that grease of transmission has penetrated into the head, the oil seals need replacement. When replacing seals, mount them back to back (neoprene seal lips face away from each other).
 - The purpose of the seals is to keep the oil of the head in, and the flexible shaft grease out. Be careful not to damage the polished surface where the seals goes. When the seals are dismounted it is recommended to change it.
 - Fill the cavity of the cap with a light oil non-foaming 0W30 or equivalent.
 - Apply sealant before assembling and fix the O ring. Tighten and clean the excess sealant. It is important all the parts are tightened to avoid water and cement try to get into the head.
- 8.-After maintenance job and service, all the parts must be assembled correctly.
- 9.-Every 12 months or more frequently, depending on the usage conditions. It is recommended an inspection be done by an authorized dealer.

9.1 STORAGE

WHEN THE AVMU MOTOR HAS NOT BEEN USED FOR LONG PERIODS OF TIME, IT SHOULD ALWAYS BE STORED IN CLEAN, DRY, AND PROTECTED AREAS.

9.2 TRANSPORTATION

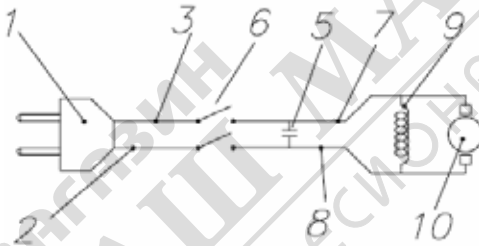
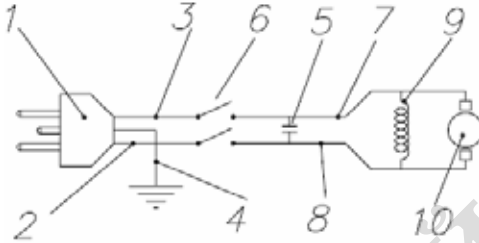
When transporting by vehicles, ensure the AVMU motor is safe against slipping, overturning and blows.





10 ELECTRICAL DIAGRAM

EARTHING CONNECTION



WITHOUT EARTHING

NOTE:

All cables should be properly adapted to the housing provided in the plastic clad before closing the two sells.

- | | |
|---------------------------------------------|--------------------------------------------------|
| 1.PLUG | 6.SWITCH |
| 2.SWITCH CABLE. 1.5 MM ² SECTION | 7.MOTOR-SWITCH CABLE 1.5 MM ² SECTION |
| 3.SWITCH CABLE. 1.5 MM ² SECTION | 8.SWITCH-MOTOR CABLE 1.5 MM ² SECTION |
| 4.EARTH CABLE (green-yellow/ green -UL-) | 9.ESTATOR MOTOR |
| 5.CAPACITOR | 10. CONNECTION TO BRUSHES |



11 LOCATING MALFUNCTIONS OF MOTOR

PROBLEM	CAUSE / SOLUTION
The unit is not working	1. Make sure power is on
	2. Carbon brushes defect
	3. Defective switch
The motor works but it overheats	1. Clean the frames' in and out air vents
	2. Make sure nuts and bolts fixing outer box are properly fixed
The motor works slowly and it overheats ¹	1. Verify voltage of electrical system
	2. Check the cable specification
	3. Defective poker or shaft
The motor becomes too noisy	1. Defective carbon brushes
	2. Defective bearings
	3. The rotor might be touching the stator
	4. Outer cladding broken or has loose bolts

12 LOCATING MALFUNCTIONS OF FLEXIBLE SHAFT AND POKERS

PROBLEM	CAUSE/SOLUTION
The motor works overload and overheats	1.- Head is overlubricated.
	2.- Too much grease in shaft or too little.
	3.- Failure of seal and the transmission grease have gone into the head or the head oil have gone out.
	4.- Head movement is restricted.
	5.- Transmission with extreme bents.
	6.- Transmission in bad condition, broken hose.
Bearing failure	1.- Not enough oil in the head.
	2.- The head has been working out of the concrete during a long time.
	3.- Water has penetrated the head.
	4.- The housing has received strong stroke.



13 INSTRUCTIONS TO ORDER SPARE PARTS

13.1 INSTRUCTIONS TO ORDER SPARE PARTS

- i** 1. All spare parts request must include **PART CODE NUMBER AS STATED IN THE PART LIST**. We recommend to include **ITEM'S MANUFACTURE NUMBER**.
2. The identification plate with manufacture and model number is located in the top part of the motor's plastic frame. The transmission and pokers have the manufacture number engraved outside.
3. Let us to know the correct shipping instructions, including the wished route and the address and consignee's complete name.

13.2 INSTRUCTIONS TO REQUEST WARRANTIES

- i** 1.- The warranty is valid for 1 year after the purchasing of the machine, the warranty will cover parts with manufacturing defects. In any case the warranty will cover a malfunction **due to improper usage of the equipment**.
- 2.- In all warranty requests **THE MACHINE MUST BE SENT TO ENARCO, S.A.** or to an **AUTHORIZED DEALER**, always including the complete address and name of the consignee.
- 3.- The Technical Assistance Service will immediately notify to the customer if the warranty is accepted and, if requested, it will send a technical report.
- 4.- The warranty will be void if any equipment has been previously handled by personnel outside of **ENARCO, S.A.** or not authorized by it.

NB: **ENARCO, S.A.**, reserves the right to modify any part of this manual without prior notice.



МАГАЗИН МАШИНОСТРОИТЕЛЬНОЙ ПРОФЕССИОНАЛЬНОЙ ТЕХНИКИ
БАШ МАШИНОСТРОИТЕЛЬНОЙ ПРОФЕССИОНАЛЬНОЙ ТЕХНИКИ

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RECOMENDATIONS OF USE OF CONCRETE VIBRATOR

1. Choose the type of vibrator adequate to the dimensions of the structure to vibrate, the distance among the reinforcement and the slump cone. It is recommendable to have an additional concrete vibrator.
2. Before starting check that the concrete vibrator is in good use and it works correctly. Use the means of safety and protection.
3. Pour the concrete in the structure avoiding high heights. Try to pour levelled the concrete. The thickness of every layer should be less than 50 cm, it is recommendable between 30 and 50 cm.
4. Introduce the vibrator vertically in the concrete mass without moving it horizontally. Do not use the vibrator to push the concrete horizontally. The concrete vibrator should be introduced into the mass at regular intervals. The interval should be from 8 to 10 times the diameter of the poker. See the concrete in the process of vibrating to determine the field of action of the vibrator. This field should be overlapped to avoid areas without vibrating. To obtain an optimum compacting of the concrete, plunge it 10 cm into the precedent layer to assure a good adherence. The time in vibrating the different layers should not be big to avoid cold joints. Do not push or force the vibrator into the mass, it could be stuck in the reinforcements.
5. The time of vibration in each point depends on the type of the concrete, the size of the vibrator and other factors. This time can be from 5 to 15 seconds after the immersion in each point. The time is shorter for a fluid mass, a vibration in excess can produce segregation. It is considered the concrete to be well vibrated when the surface around the poker is shiny and compact and there is no more air bubbles, as well a change in the noise of the vibrator is produced. So much defects in structures are produced due to perform the vibration in an unmethodically way and in a hurry.
6. Do not push or force the vibrator against the reinforcement. Keep a distance of 7 cm minimum from the walls.
7. Always remove the poker vertically with movements upwards and downwards so the concrete fills the empty space again. Do not switch off until you stop the vibration completely. Se speed of removing is approximately 8 cm per second. When the vibrator is nearly out extract quickly to avoid shaking the surface.
8. In order to vibrate slabs, the poker has to be kept oblique so that the contact superfcy with mass is bigger and the compacting effect is better.
9. Do not keep the concrete vibrator out of the concrete during long periods. If you do not continue vibrating stop it.
10. Follow the maintenance instructions.

The concrete has to be carefully prepared to get the best effects of the vibration in terms of consistency and resistance

