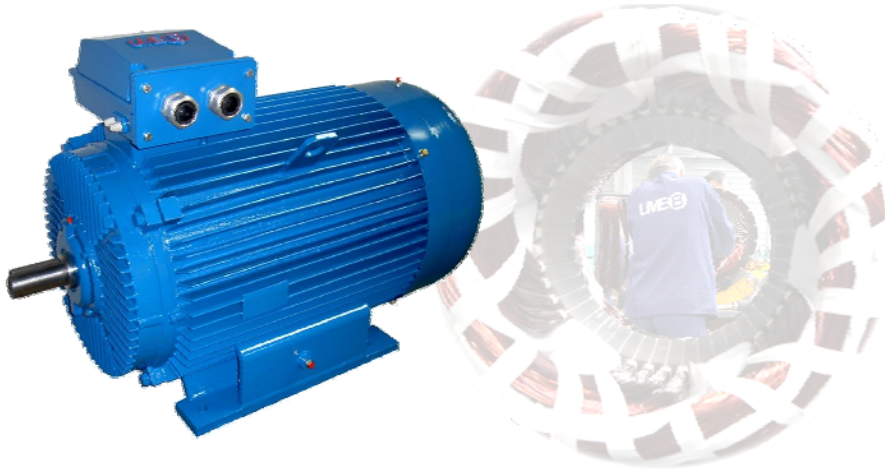
OPERATION MANUAL

Three-phase asynchronous squirrel cage motors of general purpose, type E2-ASU, ASU size 63-355



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USER'S MANUAL

Conditions for safe operation of low voltage three-phase motors with squirrel cage, general purpose, according to HG 457-2003 regulation regarding the safety of low voltage electrical equipment transposing Directive 73/23 EEC - low voltage.

These motors include under voltage, turning parts and hot surfaces. All the operations during the transport, putting into operation and maintenance of these motors have to be done by qualified and authorised persons.
Accidents and/or damages may occur in case of inadequate operations.
The manufacturer is not responsable for the accidents and damages risen from non-observance of present instructions and, if such events ocurr during the guarantee period the motors lose the manufacturer's guarantee.

1.Denomination and using fields of motors

1.1. Present instructions refer to the low voltage three phase asynchronous squirrel cage motors of general use E2-ASU, ASU.
These motors are used in industrial applications and comply with the following European Norms:
- SR EN 60034 – Electrical machines – harmonized norms
- EN 60034-6, Rotating electrical machines-Part 6; Methods of cooling (IC code)
- EN 60034-7 - Electrical machines seemed wheel-7, Classification of construction types and mounting modes (IM Code)
- SR EN 60034-14, Rotating electrical machines-Part 14, Mechanical vibration of certain machines with axis height greater than 56 mm. Measurement, evaluation and limits of vibration
- EN 60529 - Degrees of protection provided by enclosures (IP Code)
- HG 119-2004 - the requirements to be fulfilled by the industrial machines sold on European market - the provisions of Directive 98/37/EEC-machines
- HG 497-2003 - the manufacturing and operating requirements of the electric/electronic equipment on the electromagnetic compatibility – the provisions of the Directive 89/336/EEC- electromagnetic compatibility
1.2. Motors mentioned by this manual are used for driving pumps, fans, compressors and other similar equipment.
1.3. Usually these motors are intended to work within normal temperate climate – N – in the following conditions :
- Ambient temperature: -33^0C ± $+40^0$C
- Relative humidity : 80% at $+20^0$C
- Maximum altitude: max. 1000m
At request, the motors can be manufactured to work within other climatic conditions – tropical, etc- clearly specified and agreed by enduser and manufacturer.

1.4 1.4 The electrical and mechanical parameters as well as the sizes and mounting dimensions comply with ST 36 and/or the manufacturer catalogue and the following data:
• Nominal duty type S1 – continous
• Winding insulation class F
• Protection degree IP55

1.5 The motors are equipped with ball bearings as per Table 1

Table 1

Motor type	Drive end		Non-drive end	
	2p=2	2p=4,6,8	2p=2	2p=4,6,8
ASU size 63	6202 2Z		6202 2Z	
ASU size 71	6203 2Z		6203 2Z	
ASU size 80	6304 2Z		6304 2Z	
ASU size 90	6305 2Z		6305 2Z	
ASU size 100	6306 2Z		6306 2Z	
ASU size 112	6307 2Z		6307 2Z	
ASU size 132	6308 2Z		6308 2Z	
ASU size 160	6310 2Z		6310 2Z	
ASU size 180	6311 2Z		6311 2Z	
ASU size 200	6313 2Z		6313 2Z	
ASU size 225	6314 2Z		6314 2Z	
ASU size 250	6314	NU 314	6314	6314
ASU size 280	6316	6316	6316	6316
ASU size 315 SM	6317	6317	6317	6317
ASU size 315 ML	6316	6319	6316	6316
ASU size 355	6319	6322	6319	6322

The type of main cable inputs and maximum supplying cable diameters are mentioned in Table 2.

Table 2

Motor type	Size	Cable gland thread	Maximum supplying cable diameter [mm]
E2-ASU ASU	63, 71, 80, 90	1 x M25	12,5
	100, 112	1 x M25	12,5
	132	1 x M32	21
	160, 180	2 x M40	26,5
	200, 225	2 x M50	35
	250	2 x M50	35
	280	2 x M63	44
	315	2 x M63	44
	355	2 x M63	44
Optional	All sizes	1 x M16	10

At request , the motors could be equipped with thermistors and/or temperature transducers PT100 (mounted inside the winding and/or bearings) as well as with condense-proof resistors. In this case the terminal box has added 1 or 2 inputs M16.

2. Measuring and control devices

The following devices are required to put into operation or to test the motors:
- Megohmeter of 1000V to measure the insulation resistance
- Voltmeter to check the supplying voltage
- Ampermeter to measure the phase currents
- Tahometer to measure the motor speed

3. Specific tools and spare parts

The motor mounting or dismantling needs usual tools such as hexagonal keys for screws and extracting devices for ball bearings.These tools are not delivered by UMEB.
The motor spare parts are delivered at special request of the end user.

4. Motor preparation and putting into operation

4.1 Unpacking

- The motors that are not installed immediately after delivery, must be retained in their original packaging, in frost free, dry, oxidizing or corrosive vapors free environments.
- The motor unpacking and preparation have to be done in a clean room at a temperature of minimum $+15^0$C and relative humidity of maximum 70%.

- After unpacking it has to be checked the mounting surface integrity of following parts:

- shaft end
- flange (if it is)
- motor foot and its fixing holes(if there are)

If there are rust traces on these surfaces they are cleaned with diluent and then the surfaces are covered with a thin layer of corrosion-proof grease.

4.2 Preliminary checks before motor mounting

It has to be fulfilled the folowing checks:

4.2.1 The motor shaft has to be easy turned manually.

4.2.2 No damage of external surface protection (painted or galvanized)

4.2.3 The value of insulation resistance ; if it is lower than 20 MΩ the motor has to be dried.

This could be done :

- Introducing the motor in an oven with the air temperature of max. 80^0C
- Encircling the motor with a worm air flux at the air temperatur of max. 80^0C

The motor is dried when the insulation resistance become constant and higher than 20MΩ.

4.2.4 The check of ball bearing greasing is done with motor non-load running; in case of abnormal bearing noise or local heating or bearing blocking tendency the tightened ball bearings are replaced and , for other type of ball bearings , the grease has to be replaced. It must be used the grease type UM 185 Li3, Shell Alvania R3, SKF LGTH3, UNIREX N2 or equivalent. If the abnormal running is persistent the ball bearings must be replaced.

4.3 Preparation of motor mounting

- The mounting place have to satisfy the following conditions:
  - Easy access at the terminal box
  - Proper operation of the motor fan
  - Far from heating sources
  - Easy access for motor supervision and maintenance
- Before its mounting the motor has to be blown with dry compressed air to clean the impurities
- It has to be checked that the parameters mentioned on label are the needed ones :
  - Power
  - Speed
  - Voltage and frequency
  - Connection

4.4 Coupling to driven mechanism

Depending on the installation features and operation conditions ,the motor couple transmission could be done in the following ways:

4.4.1 Elastic coupling transmission

- This is the most frquent coupling way but it requires a perfect adjustment of semi-couples .
- Inadequate adjustment could generate vibrations , bearings overcharge , noise operation and , mainly , seizing of ball bearings and burning of motor winding.

4.4.2 Belt transmission

- It is accepted only if belts free from electrostatic charges are used. The motor has to be mounted on sliding foots in order to allow the belt adjustment .
- A high pressure in the belt lead to the over-load of the shaft and ball bearings but a low pressure in the belt lead to the belt slip and bad transmission of motor couple.

4.4.3 Gear wheel transmission

- In this case the motor shaft must be paralel with driven mechanism shaft and the pinions must operate perfectly in order to avoid the overcharges and premature wear of ball bearings .

Before transmission element fixing on motor shaft , this has to be lubricated to ensure an easy fixing of transmission elements.
The transmission elements are mounted by a pressing device on the next shaft step.

4.5 Connection to the electric network

- The motors with 6 terminals could be started either by direct connection to electric network or through a star-delta switch or other starting way limitting the starting current.
- Star-delta start may be done whether the motor has delta connection only .
- Supplying cable link has to be done as follows :
  - The terminal box cover is dismantled with an adequate hexagonal key ;
  - The press device is dismantled with a fixed key and its parts(press ring, wall, tighten fitting and muff) are taken out .
  - The supplying cables are passed through the above parts ;
  - The supplying cables are introduced inside the terminal box ;
  - the press device is re-assembled and fixed in terminal box , so the cables are pressed and fixed inside the terminal box;
  - the supplying cables are connected to the motor terminals by screwing nuts;
  - the protection cable is linked to earthing terminal inside terminal box , cleaning and greasing the contact surfaces;
  - the connecting elements have to be screwed according to the couple values mentioned in table of paragraph.4.8.3.1
  - all the cable input elements and terminal box cover have to be properly mounted to ensure the protection degree of the motor;

- the terminal box cover is fixed by screws taking into consideration the screwing couple mentioned in the table of paragrapg 4.8.3.2
- the cable input elements being properly mounted the press device is screwed taking into consideration couple value mentioned in table 2 .

4.6 Earth terminal connection

- It has to be done by a multi-wire cable of low resistivity , observing the labour protection norms, in particular signed places provided with earthing terminals.
- The earthing screws and nuts are taken out , the contact surface is well cleaned and greased by a good electric vaseline (copper type) then the earthing cable is connected by nuts and screws.

4.7 Overload protection

- Motors have to be protected against the overload currents higher than the nominal currents indicated on motor label .

4.8 Motor circuit check

Before connecting the motor to the network, it is recommended to do the following checks:

4.8.1 All fixing elements of motor are tightened properly ;

4.8.2 The motor is properly coupled with the mechanism to be turned.

4.8.3 The electric contacts by screws and nuts are tightened observing the couple value indicated in table of paragraph 4.8.3.1 ; the screws assembling the motor parts are tightened with couple values mentioned in paragraph 4.8.3.2, the earthing connection is properly done.

4.8.3.1 Screwed joinings of electric connections

Screw size	Tighten couple [Nm]
M4	1,2
M5	2
M6	3
M8	6
M10	10
M12	15,5

4.8.3.2 Screwed joinings of quality class 8.8 for cast iron or steel components

Screw size	Tighten couple [Nm]
M4	2.3
M5	4.5
M6	7.9
M8	19
M10	38
M12	68
M14	105
M16	160

4.8.4 All parts under voltage are protected ;
4.8.5 All connecting apparata are on position „0" or „disconnected"
4.8.6 Fan cover holes are not covered
After all these checks a trial start is done in order to determine the turning direction and eventual abnormal noise or vibrations.
To change to turning direction the motor supplying voltage is disconnected and 2 phases have to be interchanged.
If during the trial start the motor works normally then it may be put into operation.

5. 5. Possible defects and repairing ways

Nr. Crt.	Defect	Defect cause	Repairing way
1.	The shaft cannot be turned easly manually	**a**. Ball bearing gripping	Ball bearings are replaced
		b. Used-up paraffin	Ball bearings are washed greased again
		c. Damaged fan cover(it reaches the fan)	The cover has to be repaired or replaced
2.	Motor does not start in non-load drive	**a.** Motor is supplied with 2 phase voltage	It has to be checked terminal box connections ,supply voltage connection and supplying cable
		b. One of coil phase has reversed end connection(at motors with 6 terminals)	It has to be checked the connections inside terminal box
		c. Rotor is blocked	It has to be checked that driven mechanism is not blocked

Nr. Crt.	Defect	Defect cause	Repairing way
3.	Motor does not start in load drive	**a.See** pct.**2**	-
		b. Supply voltage is below limits	It has to be done the required checks
		c. Inadequate motor choise (load higher than motor power)	
4.	Motor has a reduced speed in full load	**a.** Supply voltage is under limit	It has to be unsured a normal supply voltage
		b.Motor load is higher than nominal load	Correlation of motor load
		c.Supply cable is wrongly estimated (voltage fall on cable)	Proper cable using
		d.Voltage frequency is lower	
5.	Motor has diffrent curents on phases	**a.** Defective contact in a supply circuit connection	Electric circuit correction
		b.Shortcircuit in coil wires	The motor has to be re-wound
6.	Motor has vibrations and noises	**a.**Defective coupling	It has to be checked the coupling
		b.Damaged ball bearings	Ball bearings are replaced
		c.Rotor is unbalanced	The rotor is balanced
7.	Protection circuit disconnects the motor	**a.** See the causes and repairs from pct.2	
		b.Shortcircuit between winding wires	Motor has to be re- wound
		c. Defective protection adjustment	Proper adjustment of protection
8.	Insulation resistance lower than limit	**a.**Smotor was out of operation for long	The motor has to be dried as per pct.4.2.3
		b.Humidity is higher than limits	
		c.Water penetration inside the motor	
9.	Motor heating over the limits	**a.F**an cover orifices are covered	Orifices have to be opened

Nr. Crt.	Defect	Defect cause	Repairing way
		b.Motor housing is covered by dust or other impurities	Motor housing has to be cleaned
		c.Fan blades are broken	Fan has to be replaced
		d.Current surcharges	Adjustment of surcharge protection

6. Motor dismantling

Warning! Do not dismantle the motors when they are powered by electricity or when rotating.

6.1 Terminal box dismantling (see Annex 2 - fig.2÷6)

- The terminal box cover(1) is dismantled then the screws fixing the cable are unscrewed by a hexagonal key .
- The press device(2) is dismantled by a fixed key then the cable is withdrawn from the terminal box .
- the terminal box(3) is dimantled .

6.2 Fan dismantling (see Annex 2 - fig.2÷6)

- The fan cover is dimantled ; if the motor has greasing device during operation firstly is dismantled this device ;
- The fan safe ring is withdrawn
- The fan is withdrawn with an adequate device

6.3 Rotor dismantling (see Annex 2 - fig.2÷6)

- Rotor dismantling has to be done following the steps showed in Annex 2 - fig.2÷6
- Fan and traction shields are withdrawn either manually or by an adequate press device. Dismantling has to be done carefully , the shields are drawn uniformly in order to avoid joining surface damage or ball bearings gripping .

6.4 Ball bearings dismantling

Ball bearings are withdrawn by a clamp press device.

6.5 Motor mounting

It has to followed the motor dimantling steps in reverse order (see Annex 2 - fig.2÷6)

7. Meintenance rules

- ***As a rule, it is*** *recommended that the first inspection is carried out after every about 500 hours of operations (or, after 6 months), while subsequent inspections should follow the schedules established for lubrification and general inspection. During operation the motor it is important to check that:*

-if the machine shows anomalous working characteristics (greather, noisiness, vibrations) inform the personnel in charge of maintenance immediately;

-the motor must only assembled and operated in the construction form indicated on the motor plate;.
Check that the transmission elements are in perfect condition, etc.

- The ball bearings have to be particularly supervised, mainly their heating and produced noise .
- The ball bearings are working properly in a clean atmosphere and only clean and dried tools or vessels have to be used at their handling.
- Motors of sizes 280-315 have greasing devices during operation.The timetable of grease completion and greasing intervals are mentioned in Table 4, as per the catalogue of ball bearings manufacturer.
    - The recommended greases to be used is UM 185 Li3 conform STAS 12721-89 or equivalent greases such as Shell Alvania R3 , SKF LGTH 3 sau UTJ 185 Li2/3, UNIREX N2.
- Used-up encapsulated ball beraings (2Z) have to be replaced with identical ones
- The lips joining the shields with motor housing have to be cleaned and greased at every dismantling
- The insulation resistance has to be measured periodically; when it is lower than 20MΩ the motor has to be dried as per pct. 4.2.3.

Note: If a three-phase motor works normal, generally is not necessary to dismantle it unless for replacing worn bearings.

- ***Main inspection –*** *every year*

While the motor is running::
-check that the temperature of the bearings is excessive
- check if the electrical motor parameters are within the tolerances
- check if the noise and vibration are abnormal.
With the motor at rest:
-check the insulation resistance of windings, clean the winding and dry it if necessary
-check the cable entries, cable glands, the state of the seals, the state of the connections' condition inside the terminal box
- check the foundation, mounting screws, for cracks

WARNING!
280-355 frame sizes motors are provided with bearing grease drain plugs for both drive end and non drive end. These are mounted on the lower side of the bearing caps. Both drain plugs must be removed before refilling with greas or regreasing. On the non drive end side, the grease drain plugs must be removed using a 24 mm socket wrench, after removing the fan hood.

Note regarding electromagnetic compatibility

When motors are used as intended and connected to the power supply according to EN 50160 SR motors with protection degree IP55, are consistent with the requirements of EU Directive no. 2004/108EC- Electromagnetic Compatibility.
If motors are powered by frequency converters, interference will depend on the design of the converter. Allowed to prevent exceedance of standards or legislation for all motor-converter, inverter manufacturer instructions should be strictly observed.

Immunity to interference

The motors meet the requirements for interference immunity provided in the documentation norms. If motors are equipped with integrated temperature sensors (thermistors with CPT), the user must ensure immunity to interference by choosing a shielded cable for sensor signal.
If motors are powered by drives at speeds higher than rated speed, maximum mechanical speed should not be exceeded.

8. Marking, Packing ,Transport, Storage, Preservation

- Marking - Motors have a metalic label indicating their parameters .
- Packing – Motors could be packed or unpacked before delivery , according to contract clauses.
- Transport – Motors have to be transported with covered vehicles being well fixed on vehicle floor ;the shocks have to be avoided during loading /unloading operations.
- Storage – Before mounting , the motors will be kept in original package , in closed places with max. humidity of 80%(at $+25^0$C), free of gas or corosive vapours , at a temperature in range -5^0C ± $+40^0$C
- Preservation – The motors stored for long have to be covered with a plastic cover having inside humidity absorbing substances (silicagel).

9. Labour protection rules

- Before motor starting it has to be checked the correct connection of the motor to the protection installation (earth and null). It is forbidden motor operation without earthing or null adequated connections .
- During the motor operation the turning parts (coupling elements) have to be protected against accidental touch .
- It is forbidden terminal box cover dismantling during motor operation or under voltage .
- It is forbidden the operation of motors without terminal box cover and/or fan cover .
- Any intervention in the motor circuit is allowed after voltage switching off only.

10. Timetable with completion and greasing intervals of untight ball bearings

Horizontal mounting IM B **Table 4**

Size	Ball bearings	Operating conditions		Operating temperature of ball bearing [°C]		Greasing Interval [hours]	completion Interval [ore]	Grease quantity [g]
		Speed [rpm]	Hours/day [hours]					
280	6316 6316	2970	24	Normală	63 ÷ 78	3700	2000	33
				High	78 ÷ 93		1000	
		≤1470		Normală	63 ÷ 78	10700	5600	
				High	78 ÷ 93		2800	
315SM	6317 6317	2970		Normală	63 ÷ 78	3300	1700	37
				High	78 ÷ 93		900	
		≤1470		Normală	63 ÷ 78	10000	3500	
				High	78 ÷ 93		1800	
315ML	6316	2970		High	63 ÷ 78	3700	2000	33
				High	78 ÷ 93		1000	
	6319	≤1470		Normală	63 ÷ 78	8700	3000	45
				High	78 ÷ 93		1500	
355	6319	≤ 2970		Normală	63 ÷ 78	4200	2000	37
				High	78 ÷ 93		1000	

Size	Ball bearings	Operating conditions		Operating temperature of ball bearing [°C]		Greasing Interval [hours]	completion Interval [ore]	Grease quantity [g]
		Speed [rpm]	Hours/day [hours]					
	6322	≤1470		Normală	63 ÷ 78	7500	6000	75
				High	78 ÷ 93		3000	

Vertical mounting IM V

Gabarit	Rulment	Condiții de fucționare		Temperatura de funcționare a rulmentului [°C]		Interval reungere [ore]	Interval de completare [ore]	Cantitateunsoare [g]
		Turație [rpm]	Ore/zi [ore]					
280	6316 6316	2970	24	Normal	63 ÷ 78	3700	1000	33
				High	78 ÷ 93		500	
		≤1470		Normal	63 ÷ 78	10700	2800	
				High	78 ÷ 93		1400	
315SM	6317 6317	2970		Normal	63 ÷ 78	3300	900	37
				High	78 ÷ 93		400	
		≤1470		Normal	63 ÷ 78	10000	2600	
				High	78 ÷ 93		1300	
315ML	6316	2970		Normal	63 ÷ 78	3700	1000	33
				High	78 ÷ 93		500	
	6319	≤1470		Normal	63 ÷ 78	8700	1500	45
				High	78 ÷		800	

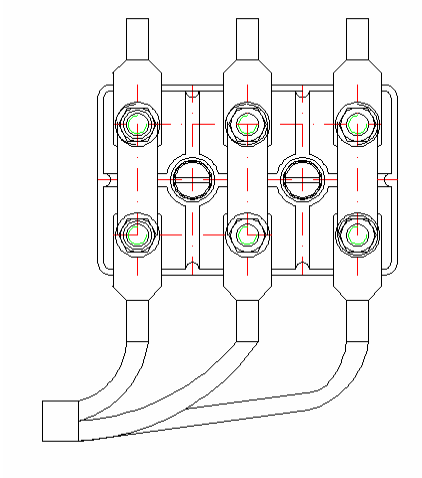
Size	Ball bearings	Operating conditions		Operating temperature of ball bearing [°C]		Greasing Interval [hours]	completion Interval [ore]	Grease quantity [g]
		Speed [rpm]	Hours/day [hours]		93			
355	6319	≤2970		Normal	63 ÷ 78	4200	1000	37
				High	78 ÷ 93		500	
	6322	≤1470		Normal	63 ÷ 78	7500	3000	75
				High	78 ÷ 93		1500	

Polution/Humidity – Moderate **Shocks – No**
Ambient temperature – Moderata **Others– No**

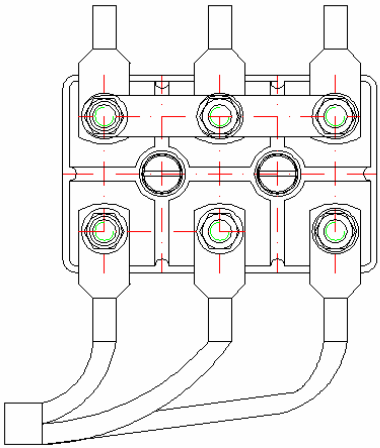
ANNEX 1
MOTOR CONNECTION TO SUPPLY NETWORK

fig.1

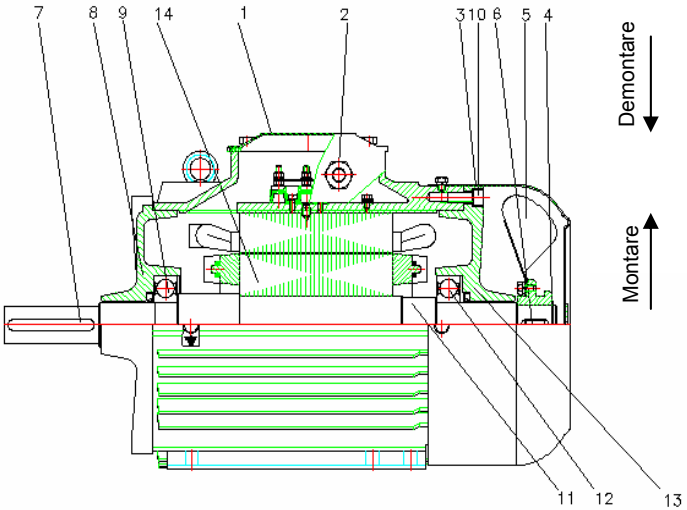
1. **Direct start . Voltage between the supply network phases corresponds to delta (∆) connecton of motor windings**



2. Direct start .Voltage between supply network phases corresponds to star connection (Y) of motor windings

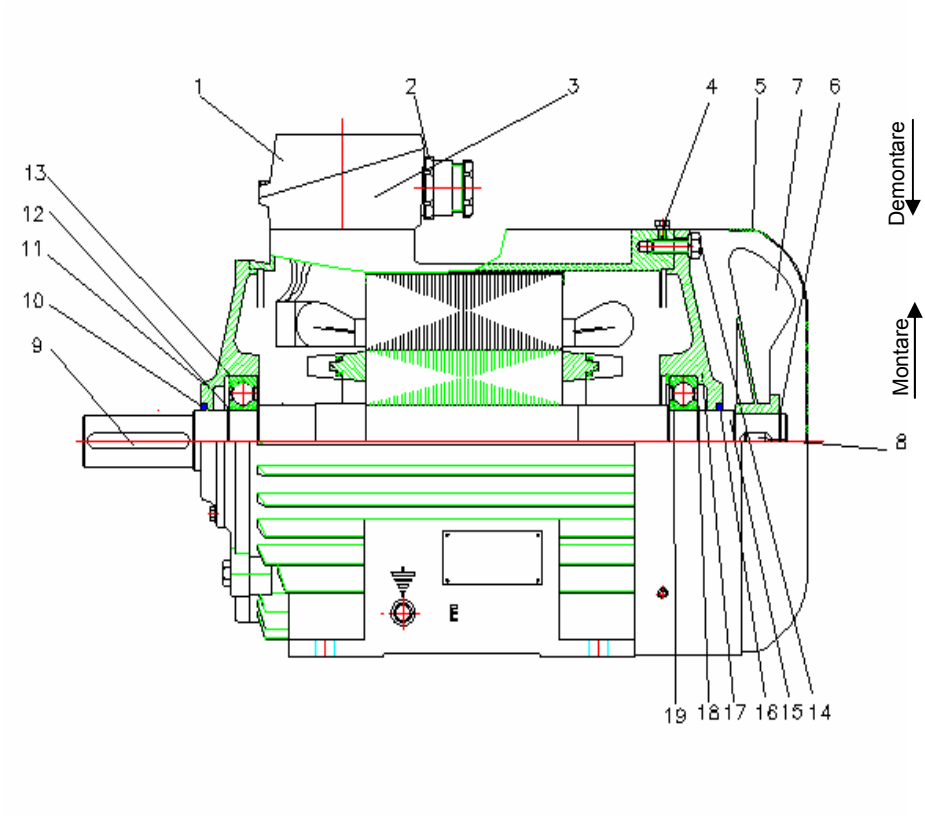


ANNEX 2
E2-ASU, ASU size 63-71 **fig. 1**



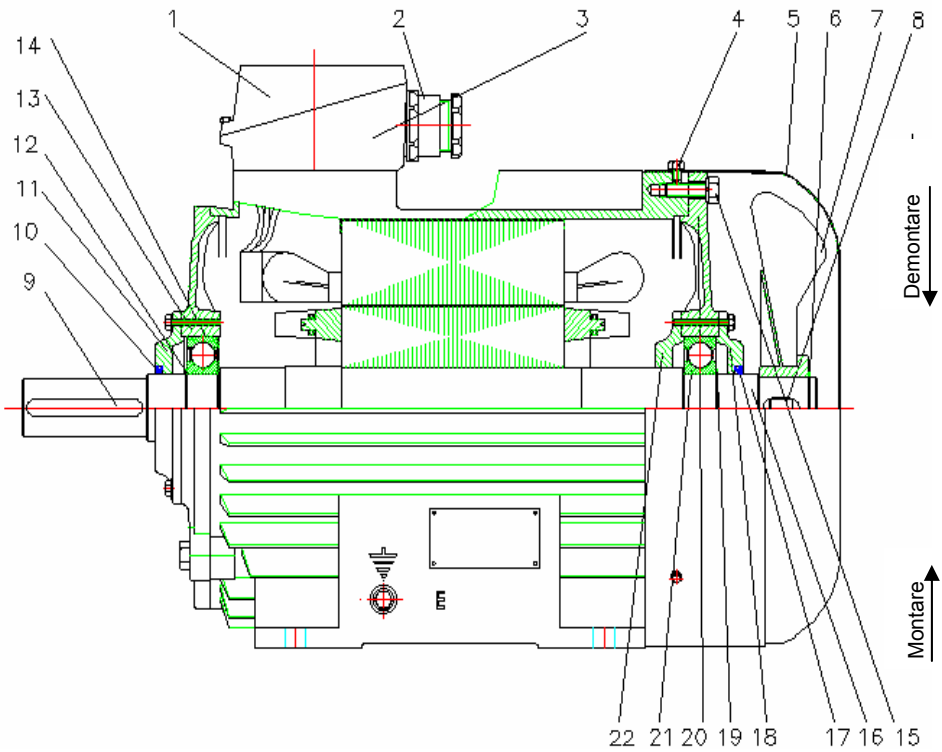
1	terminal box cover	8	drive shield
2	pressor	9	bearing
3	hood	10	Screw
4	safety ring	11	rotor
5	fan	12	support shield
6	wedge	13	bearing
7	Head to Shaft		

E2-ASU, ASU size 80-225 **fig. 2**



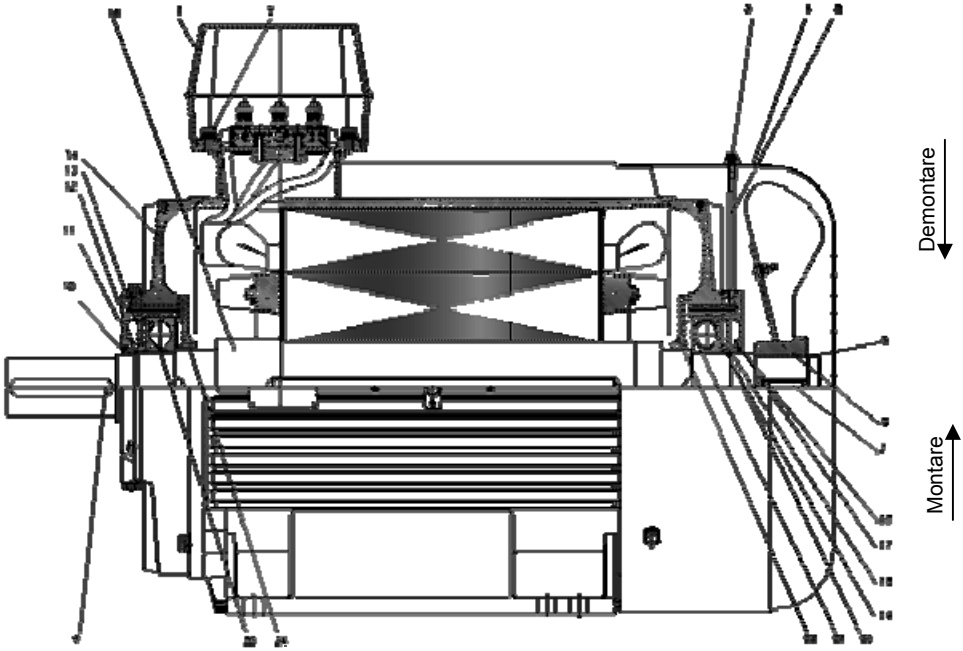
1	terminal box cover	11	drive shield
2	pressor	12	safety ring
3	terminal box	13	bearing drive
4	Screw lid	14	Screw
5	hood	15	rotor
6	safety ring	16	ring VA
7	fan	17	support shield
8	fan wedge	18	safety ring
9	Head of Shaft wedge	19	support bearing
10	ring VA		

E2-ASU, ASU size 250 **fig. 3**



1	terminal box cover	12	safety ring
2	pressor	13	bearing drive shield
3	terminal box	14	bearing
4	Screw lid	15	Screw
5	hood	16	rotor
6	safety ring	17	ring VA
7	fan	18	end cap
8	fan wedge	19	safety ring
9	Head of Shaft wedge	20	fan shield with bearing
10	ring VA	21	bearing
11	end cap	22	inside cover

E2-ASU, ASU size 280-355 **fig. 5**



1	terminal box cover	13	deflector
2	terminal box	14	shield drive
3	oil cup	15	rotor subassembly
4	hood	16	ring VA
5	safety ring	17	end cap
6	fan	18	safety ring
7	fan wedge	19	deflector
8	pipe lubrication	20	shield fan
9	Head of Shaft wedge	21	bearing
10	ring VA	22	inside cover
11	end cap	23	bearing
12	safety ring	24	inside cover

ANNEX 3

RADIAL STRENGTHS ALLOWED ON MASTER SHAFT END FOR A BALL BEARING WORKING LIFE OF 20.000 HOURS

Size	No. of poles	Fr [N]	Size	No. of poles	Fr [N]
size 63	2p=2	240	size 180	2p=2	2600
	2p=4	270		2p=4	3200
				2p=6	3700
				2p=8	4150
size 71	2p=2	305	size 200	2p=2	2970
	2p=4	395		2p=4	3740
	2p=6	435		2p=6	4130
	2p=8	520		2p=8	4415
size 80	2p=2	480	size 225	2p=2	3360
	2p=4	610		2p=4	4200
	2p=6	645		2p=6	4520
	2p=8	708		2p=8	4700
size 90	2p=2	530	size 250	2p=2	3360
	2p=4	690		2p=4	4320
	2p=6	740		2p=6	3950
	2p=8	820		2p=8	4220
size 100	2p=2	655	size 280	2p=2	5060
	2p=4	828		2p=4	7100
	2p=6	905		2p=6	7900
	2p=8	1025		2p=8	8650
size 112	2p=2	800	size 315	2p=2	6100
	2p=4	940		2p=4	9300
	2p=6	1030		2p=6	10500
	2p=8	1150		2p=8	11200
size 132	2p=2	1290	size 315ML	2p=2	6000
	2p=4	1480		2p=4	9500
	2p=6	1600		2p=6	10900
	2p=8	1760		2p=8	12300
size 160	2p=2	2250	size 355	2p=2	4500
	2p=4	2800		2p=4	8500
	2p=6	3150		2p=6	8800
	2p=8	3600		2p=8	9100

ANNEX 4

LIST OF SPARE PARTS

1. Ball bearings

Motor type	Drive end		Non-Drive end	
	2p=2	2p=4,6,8	2p=2	2p=4,6,8
size 63	6202 2Z		6202 2Z	
size 71	6203 2Z		6203 2Z	
size 80	6304 2Z		6304 2Z	
size 90	6305 2Z		6305 2Z	
size 100	6306 2Z		6306 2Z	
size 112	6307 2Z		6307 2Z	
size 132	6308 2Z		6308 2Z	
size 160	6310 2Z		6310 2Z	
size 180	6311 2Z		6311 2Z	
size 200	6313 2Z		6313 2Z	
size 225	6314 2Z		6314 2Z	
size 250	6314	NU 314	6314	6314
size 280	6316	6316	6316	6316
size 315 SM	6317	6317	6317	6317
size 315 ML	6316	6319	6316	6316
size 355	6319	6322	6319	6322

2. Terminal plate part

Motor type	Size	Terminal plate size
E2-ASU ASU	63	M4
E2-ASU ASU	71	M4
E2-ASU ASU	80	M4
E2-ASU ASU	90	M4
E2-ASU ASU	100	M5
E2-ASU ASU	112	M5
E2-ASU ASU	132	M6
E2-ASU ASU	160	M6
E2-ASU ASU	180	M6
E2-ASU ASU	200	M8
E2-ASU ASU	225	M8
E2-ASU ASU	225	M8
E2-ASU ASU	250	M10
E2-ASU ASU	280	

Motor type	Size	Terminal plate size
E2-ASU ASU	315 SM	M12
E2-ASU ASU	315 ML	
E2-ASU ASU	355	M16

3. Gland piece

Motor type	Size	Cable gland thread	Maximum supplying cable diameter [mm]
E2-ASU ASU	63, 71, 80, 90	1 x M25	12,5
	100, 112	1 x M25	12,5
	132	1 x M32	21
	160, 180	2 x M40	26,5
	200, 225	2 x M50	35
	250	2 x M50	35
	280	2 x M63	44
	315	2 x M63	44
	355	2 x M63	44
Optional	All sizes	1 x M16	10

Remarks :

- At user request , other parts and pieces could be offered as spare parts
- Any request of spare parts has to indicate the type , power and speed of motor.
- UMEB-SA recommends to be used only original spare parts for a good motor operation.
-UMEB-SA assures service and repaires of its motors with original spare parts during guarantee period according to the normes into force. UMEB-SA can also make motor repaires after guarantee period.

ANNEX 5

Torque/speed characteristic of the motors fed from PWM frequency converters