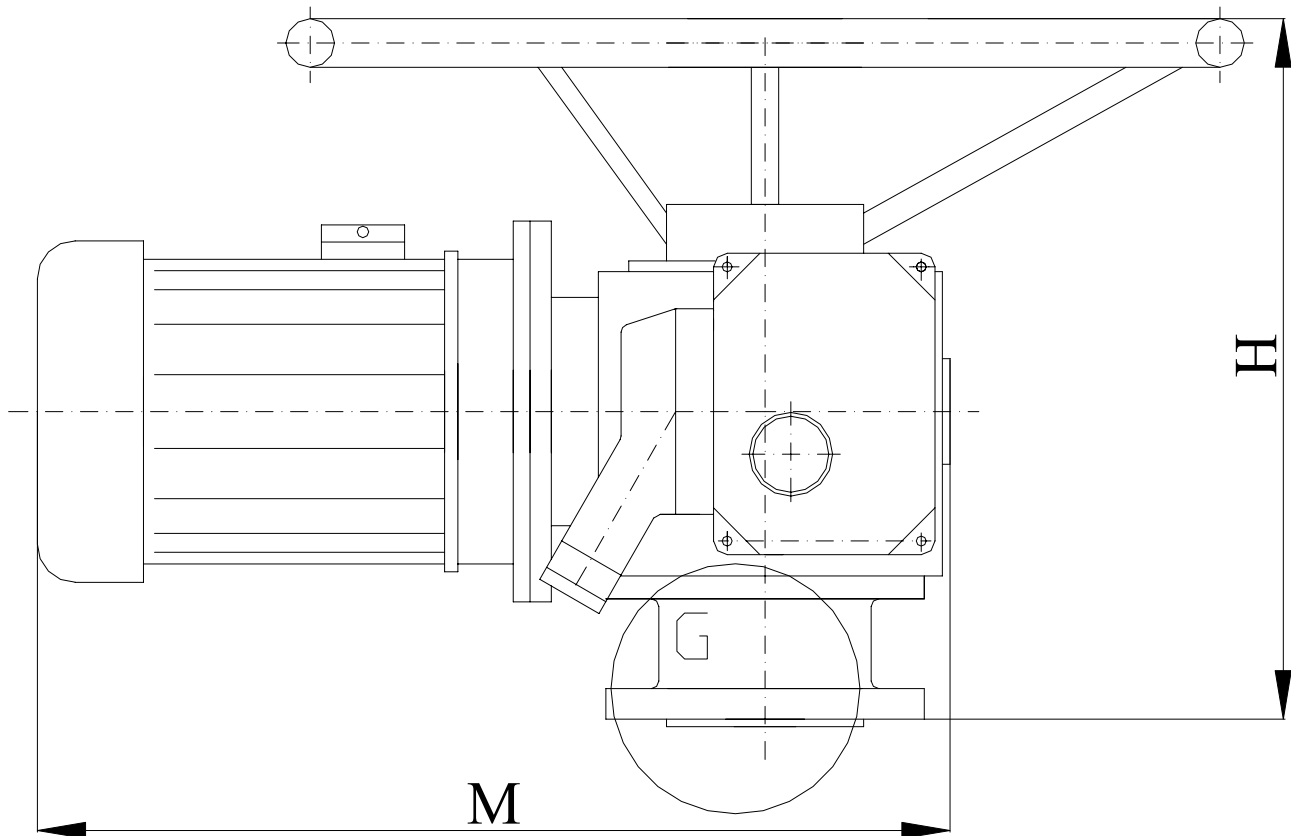


MECANISME ELECTRICE PENTRU ACTIONAREA  
ROBINETILOR MULTI-TURA

ELECTRIC ACTUATORS FOR MULTI-TURN VALVES

TIP/TYPE  
**NOTOR A/C**



Mecanismele tip **NOTOR A/C** se folosesc pentru actionarea electrica a robinetilor industriali multi-tura de inchidere-deschidere, precum si pentru alte aplicatii "multi-tura".

## **1. Conditii de utilizare a mecanismelor**

### **- tensiuni de alimentare:**

- standard: 380 V.
- la cerere: 220 V; 400 V; 500 V.

### **-frecventa retelei:**

- standard: 50 Hz.
- la cerere: 60 Hz.
- numar maxim de porniri pe ora: **6**
- temperatura mediului ambiant:
  - pentru mecanism:
    - standard: -20°C.....+45°C.
    - la cerere: -40°C.....+40°C.
  - pentru cofretul electric:
    - standard: -5°C.....+40°C.
    - la cerere: -29°C.....+40°C.
- executie speciala pentru climat tropical umed **TH**, conform STAS 6692-83.
- puterea maxima a motorului electric: **4kW**.
- turatia motorului electric: **1500 rot/min**.
- gradul de protectie mecanica: **IP 54**.
- variante de executie:
  - normala: **N**

## **2. Caracteristici constructive**

Mecanismele tip **NOTOR** (vezi fig,1-4, tab.1 si 2), includ urmatoarele subansamble de baza:

- **mecanism** propriu-zis – poz.1
- **motor** – poz.2
- **ansamblu comanda cu microintreruptori** – poz.3

### **2.1 Mecanismul propriu-zis**

Gama de mecanisme in executie normala cuprinde 3 marimi de baza:

#### **- NOTOR 1A/C, NOTOR 2A/C, NOTOR 3A/C.**

Pentru momente de iesire peste 50 daN.m, mecanismul **NOTOR 3A/C** poate fi echipat cu reductoare cilindrice intermediare, care asigura actionarea cu momente de pana la 1000 daN.m.

**NOTOR A/C** electric actuators are designed to drive "multi-turn" ON-OFF industrial valves or any other "multi-turn" applications.

## **1. General operating conditions**

- supply voltages:
  - standard: 380 V.
  - by request: 220 V; 400 V; 500 V.
- frequency:
  - standard: 50 Hz.
  - by request: 60 Hz.
- maximum number of starts/hour: **6**
- temperature of the ambient:
  - for the actuator:
    - standard: -20°C.....+45°C.
    - by request: -40°C.....+40°C.
  - for the power switch box:
    - standard: -5°C.....+40°C.
    - by request: -29°C.....+40°C.
- special **TH** manufacturing available, as per STAS 6692-83.
- maximum power of the electric motor: **4kW**.
- electric motor speed: **1500 rot/min**.
- mechanical enclosure degree: **IP 54**.
- manufacturing variants available:
  - for normal environment: **N**

## **2. Constructive features**

**NOTOR** type actuators (see fig,1-4, tab.1 and 2), include the following basic units:

- **actuator** gearbox – pos.1
- **motor** – pos.2
- **control switch box** – pos.3

### **2.1. Actuator gearbox**

The range of actuators for normal environment has 3 basic sizes:

#### **- NOTOR 1A/C, NOTOR 2A/C, NOTOR 3A/C.**

For output torques higher than 50 daN.m, the actuator **NOTOR 3A/C** can be equipped with intermediate spur gearboxes. The combined units resulting can deliver output torques ranging from 160 daN.m up to 1000 daN.m.

### **2.1.1. Angrenaje**

**2.1.1.1.** Angrenajele cilindrice, melcii si arborii se executa din otel de imbunatatire.

**2.1.1.2.** Rotile melcate se executa din bronz cu staniu CuSn12.

### **2.1.2. Carcase**

**2.1.2.1.** Carcasele mecanismelor se executa din:

- aluminiu - **NOTOR 1A/C**,
- fonta – celelalte mecanisme si reductoarele intermediare.

### **2.1.3. Lagare**

Atat arborele de intrare cat si arborele de iesire sunt lagaruiti pe rulmenti radiali cu bile.

La reductoarele intermediare se folosesc bucese lagar din bronz si fonta.

## **2.2 Motor**

**2.2.1.** Pentru actionarea mecanismelor in executie normala se folosesc motoare electrice standard tip **ASI** trifazate de uz general, cu rotor in scurt-circuit, cu functionarea garantata pentru max. 6 porniri / ora, vezi tab.2.

**2.2.2.** La cerere, se pot folosi si alte tipuri de motoare, cum ar fi:

- motoare speciale tip **TAR**, cu puteri pana la **0,75 kW** inclusiv, cu functionare garantata pentru maximum 1200 porniri / ora.
- motoare cu frana, tip **ASFM** sau **ASM**, cu functionare garantata pentru maximum 120 porniri / ora.
- motoare monofazate cu moment marit, tip **CM**.

## **2.3. Bloc comanda cu microintreruptori**

Pentru realizarea functiunilor de limitare la capete de cursa, de limitare a momentului reglat, si indicarea pozitiei, mecanismele sunt echipate cu un bloc de comanda cu microintreruptori (ACM), care se executa in urmatoarele variante:

**2.3.1.** Executie normala:

Varianta **1E**:

- mecanism tip contor pentru reglarea oricarei curse in intervalul:  
**1-75** sau **1-750** rot / cursa – variante standard;
- 4 – 2750** rot / cursa – la cerere.
- mecanism de limitare a momentului
- rezistenta de incalzire anti-condens.

Varianta **2E**:

- componentele de la **1E**, plus mecanism de indicare locala a pozitiei, cu vizor.

### **2.1.1. Gears**

**2.1.1.1.** The cylindrical gears, the worms and the shafts are made of heat treated steel.

**2.1.1.2.** The worm wheels are made of cast tin bronze CuSn12.

### **2.1.2. Housings**

**2.1.2.1.** The housings are made of:

- alluminum - **NOTOR 1A/C**,
- cast iron – all the other actuators and the intermediate gear units.

### **2.1.3. Bearings**

Both the input shaft and the output shaft are supported on radial ball bearings.

Bronze and cast iron bearing sleeves are used at the intermediate gearboxes.

## **2.2 Motor**

**2.2.1.** Standard general use 3-phase squirrel cage motors type **ASI** are used to drive the actuators, guaranteed for maximum 6 starts / hour, see table 2.

**2.2.2.** By request, other types of motors can be used, such as:

- special **TAR** motors, with powers up to **0,75 kW** inclusively, guaranteed for maximum 1,200 starts / hour.
- brake motors type **ASFM** or **ASM**, guaranteed for maximum 120 starts / hour.
- single phase **CM** motors with increased torque.

## **2.3. Control switch box**

To perform the functions of stroke end limiting, set torque limiting and continuous position indication, the actuators are equipped with a control switch box (CSB), which can be produced in any of the following variants:

**2.3.1.** For normal environment:

Variant **1E**:

- counter mechanism for stroke setting within the range:  
**1-75** or **1-750** turns / stroke – as standard;  
**4 – 2750** turns / stroke – by request.
- torque limiting device
- heating resistance.

Variant **2E**:

- all the components from **1E**, plus local position indication.

#### Varianta **3E**:

- componentele de la **2E**, plus mecanism de indicare electrica continua a pozitiei, care poate fi:
- rezistiv (**P**) - cu potentiometru de 100  $\Omega$ .
- electronic (**T**) - cu traductor de semnal unificat 4-20 mA.
- inductiv (**SIP**) - cu senzor inductiv cu semnal unificat 4-20mA.

### **2.4. Actionare manuala**

Mecanismele sunt prevazute cu actionare manuala si sistem de cuplare a actionarii manuale. Acelasi sistem asigura decuplarea mecanica automata a actionarii manuale la reluarea alimentarii motorului electric.

### **2.5. Conexiuni electrice**

**2.5.1.** Conectarea electrica a microintreruptoarelor si a rezistentei de uscare, precum si a potentiometrului / traductorului / senzorului cu instalatia de comanda se face cu priza si fisa cu contacte multiple tip CRD (Conect Bucuresti), cu prindere pe pini cu borne cu surub, ca varianta standard.

### **2.6. Ungere**

**2.6.1.** Mecanismele se ung cu unsoare consistenta tip **U 185 Li 2 EP**.

**2.6.2.** Reductoarele intermediare se ung cu unsoare consistenta **UM 185 LiCaPb 2**.

### **2.7. Instalatia electrica**

**2.7.1.** Schema electrica a ansamblului de comanda cu microintreruptori se afla pe eticheta lipita in interiorul capacului. Conexiunile electrice intre componentele din interiorul ansamblului de comanda si priza se vor face conform acestei scheme electrice.

**2.7.2.** La cerere, mecanismele se pot livra cu cofret electric de forta si comanda. Schema de conexiuni electrice a cofretului este fixata pe capacul interior.

#### Variant **3E**:

- all the components from **2E**, plus continuous position indication, which may respectively be:
- resistive (**P**) - with potentiometer of 100  $\Omega$ .
- electronic(**T**) - unified signal transducer, 4-20 mA.
- inductive(**SIP**) - inductive sensor with unified signal of 4-20mA.

### **2.4. Manual drive**

The actuators are provided with a handwheel and manual drive and a device for coupling the manual drive. The same system ensures the automatic mechanical disengagement of the manual drive, whenever the motor is energized.

### **2.5. Electrical connections**

**2.5.1.** The electrical connections of the micro-switches, the heating resistance and the potentiometer / transducer / sensor to the control installation are done by means of socket and multiple contact plugs type CRD (Conect Bucharest), using plugged pins with threaded terminals as standard.

### **2.6. Lubrication**

**2.6.1.** The actuators are lubricated with grease type **U 185 Li 2 EP**.

**2.6.2.** The intermediate gearboxes are lubricated with grease **UM 185 LiCaPb 2**.

### **2.7. Wiring**

**2.7.1.** The wiring diagram with the contact development is shown on the label glued inside the cover of the switch compartment. According to this contact development, the user can easily make the connections from the components to the electric plug.

**2.7.2.** By request, the actuators can be delivered with power control box. The wiring diagram with the contact development is glued inside the cover.

## 2.8. Alegerea mecanismului

Pornind de la momentul necesar pentru actionarea robinetului, clientul va alege marimea mecanismului din tabelul 1.

Pornind de la timpul de actionare dorit  $t_a$ , se calculeaza apoi turatia de iesire  $n$ , cu relatia:

$$n = c / p \times t_a, \text{ unde:}$$

- $n$  = turatia de iesire calculata [rot/min],
- $c$  = cursa elementului activ al robinetului [mm],
- $p$  = pasul elementului activ al robinetului [mm]  
( $c / p$  = numarul de rotatii pentru o cursa completa)
- $t_a$  = timpul de actionare necesar [min].

Din tabelul 1 se va alege apoi turatia de iesire cea mai apropiata de turatia de iesire calculata.

## 2.8. Choosing the actuator

Starting from the torque required to close the valve, the client will select the proper actuator from the table 1.

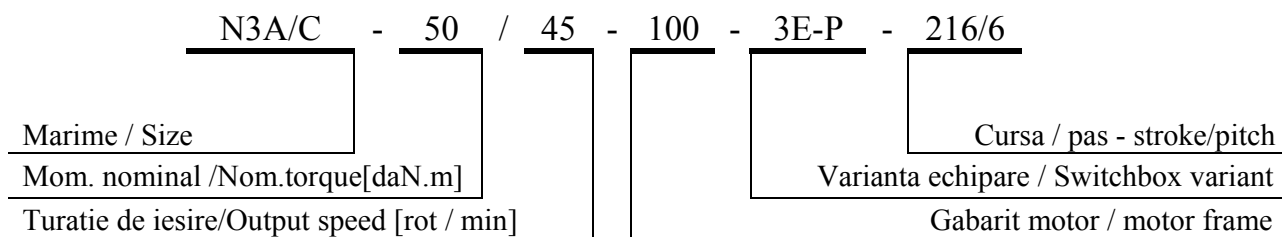
Considering the operation time required  $t_a$ , the output speed  $n$  can be calculated so:

$$n = c / p \times t_a, \text{ where:}$$

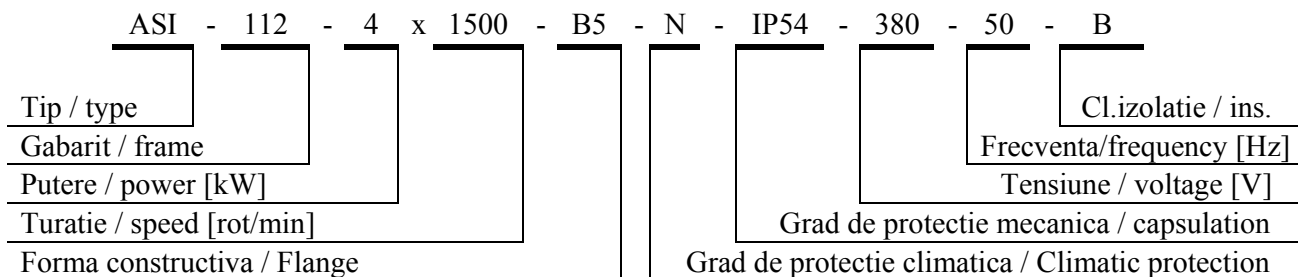
- $n$  = calculated output speed [rot/min],
- $c$  = stroke of the valve active element [mm],
- $p$  = pitch of the valve active element [mm]  
( $c / p$  = number of turns for a complete stroke)
- $t_a$  = operating time wanted [min].

The user would eventually choose the output speed nearest to the calculated output speed.

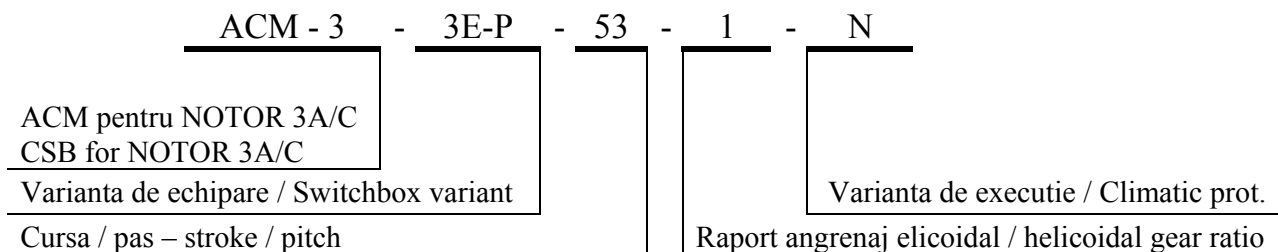
### SIMBOLIZARE MECANISM / ACTUATOR ORDERING CODE



### SIMBOLIZARE MOTOR / MOTOR ORDERING CODE



### SIMBOLIZARE ACM / SWITCHBOX ORDERING CODE



MECANISME DE INCHIDERE-DESIDERE / "ON-OFF" ELECTRIC ACTUATORS

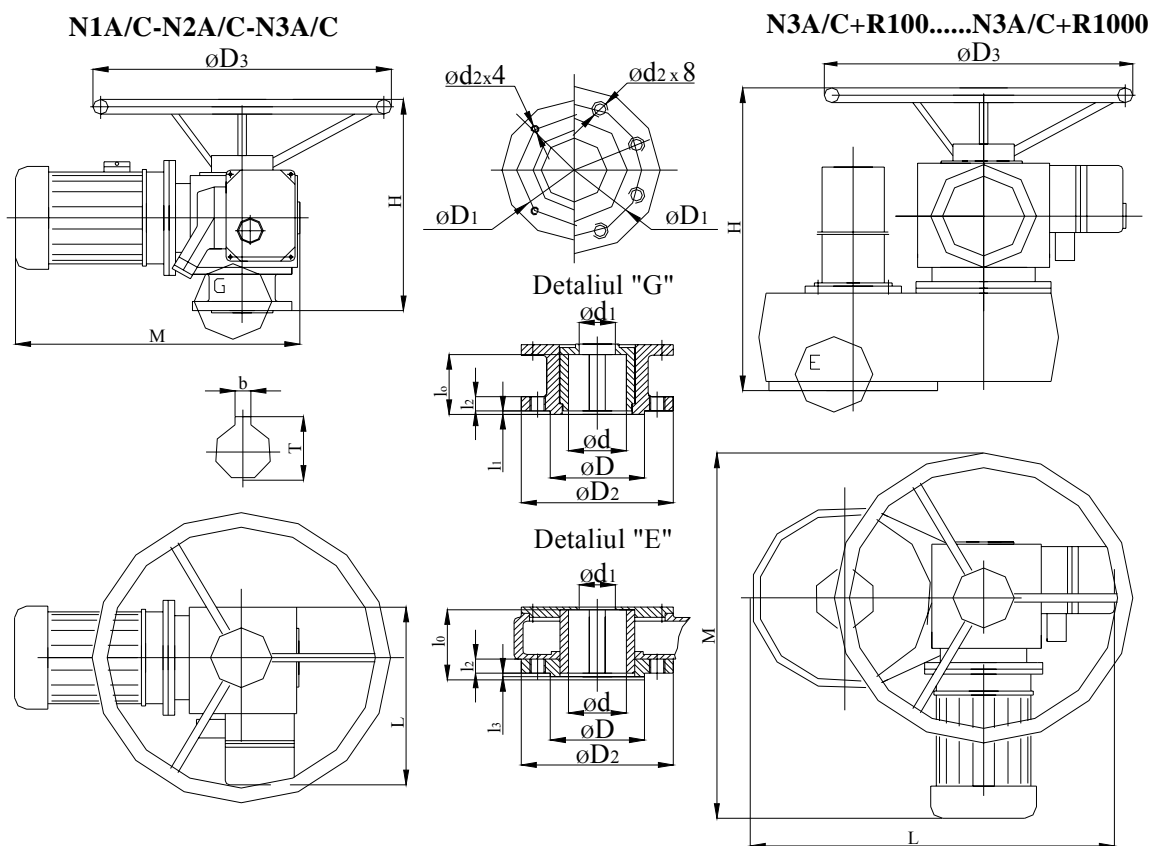
**NOTOR A/C**

CARACTERISTICI TEHNICE / TECHNICAL CHARACTERISTICS

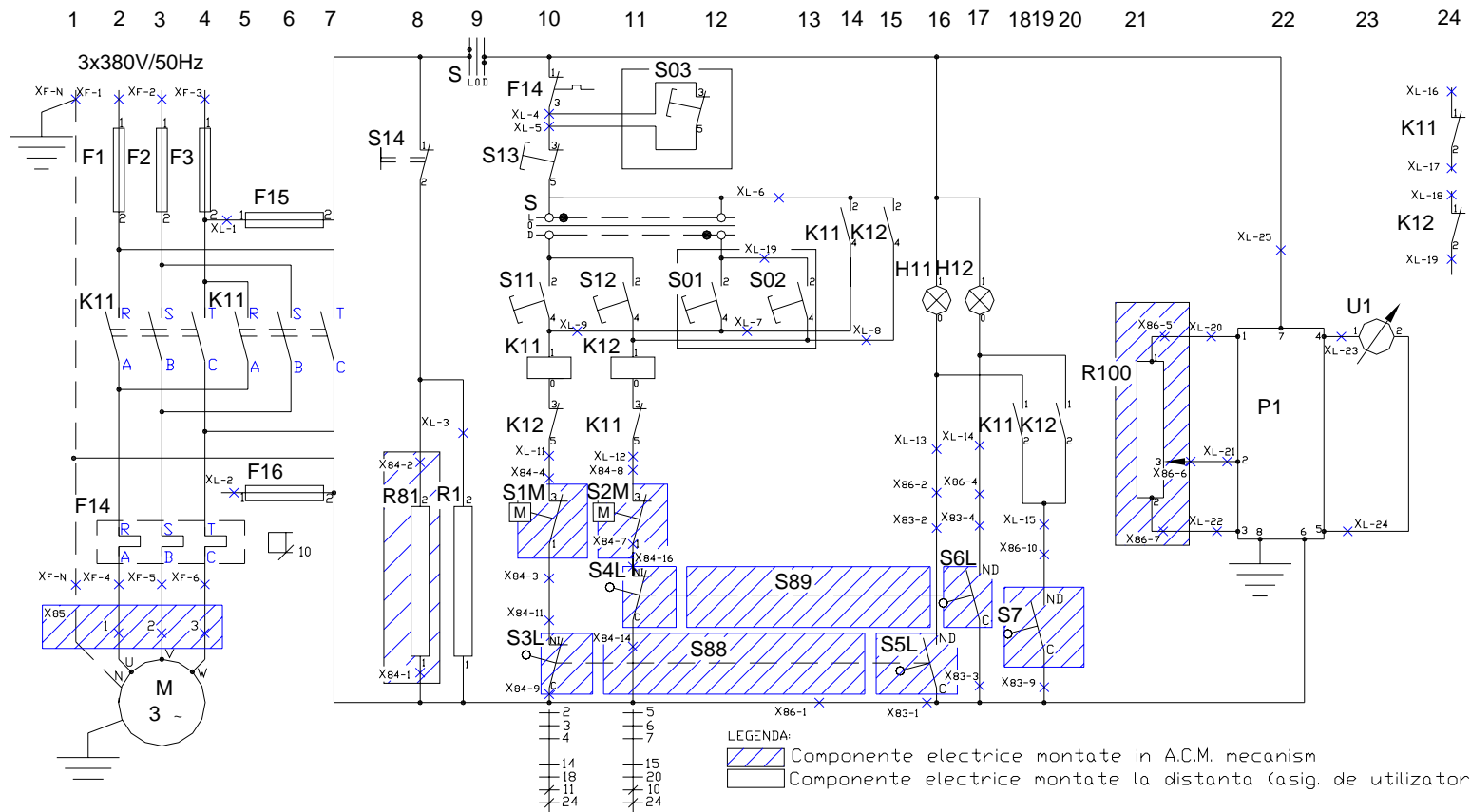
TIP MECANISM	MOMENT NOMINAL [daN.m]		MOMENT DE PORNIERE [daN.m]	TURATIE DE IESIRE (rot/min)	MOTOR ELECTRIC ASI 220/380V - 50Hz - IP54			MASA CU MOTOR ASI [kg]
	minim	maxim			PUTERE [kW]	TURATIE [rot/min]	GABARIT	
ACTUATOR TYPE	NOMINAL TORQUE [daN.m]		START TORQUE [daN.m]	OUTPUT SPEED (rot/min)	ELECTRIC MOTOR ASI 220/380V - 50Hz - IP54			WEIGHT [kg]
	minim	maxim			POWER [kW]	SPEED [rot/min]	SIZE	
<b>N1A/C</b>	<b>1</b>	<b>3</b>	<b>4</b>	28	0,18	1500	63-71	18
				45	0,25		71	18,5
				71	0,37		71	21
	<b>3</b>	<b>8</b>	<b>10</b>	25	0,37		71	21
<b>N2A/C</b>	<b>5</b>	<b>12</b>	<b>15</b>	36	0,75	1500	80	47,6
				45	1,1		90S	51,1
				71	1,5		90L	54,9
	<b>8</b>	<b>20</b>	<b>25</b>	19	0,75		80	47,6
				24	1,1		90S	51,1
				37	1,5		90L	54,9
<b>N3A/C</b>	<b>20</b>	<b>50</b>	<b>60</b>	31	3	1500	100L	97
				45	4		112M	103
				71	4		112M	103
				90	4		112M	103
<b>N3A/C - R100</b>	<b>30</b>	<b>80</b>	<b>100</b>	16	3	1500	100L	191,5
				25	4		112M	197,5
				40	4		112M	197,5
<b>N3A/C - R160</b>	<b>50</b>	<b>125</b>	<b>160</b>	10	3	1500	100L	198,5
				16	4		112M	204,5
				25	4		112M	204,5
<b>N3A/C - R250</b>	<b>80</b>	<b>200</b>	<b>250</b>	6,3	3	1500	100L	294
				10	4		112M	300
				16	4		112M	300
<b>N3A/C - R400</b>	<b>140</b>	<b>320</b>	<b>400</b>	4	3	1500	100L	308
				6,3	4		112M	314
				10	4		112M	314
<b>N3A/C - R630</b>	<b>220</b>	<b>500</b>	<b>630</b>	2,5	3	1500	100L	435
				4	4		112M	441
				6,3	4		112M	441
				8	4		112M	441
<b>N3A/C - R1000</b>	<b>360</b>	<b>800</b>	<b>1000</b>	1,6	3	1500	100L	449
				2,5	4		112M	455
				4	4		112M	455
				5	4		112M	455

MECANISME DE INCHIDERE-DESCHIDERE  
 "ON-OFF" ELECTRIC ACTUATORS  
**NOTOR A/C**

Fig.1 - DIMENSIUNI DE GABARIT SI DE PRINDERE  
 OVERALL AND CLAMPING DIMENSIONS



Marime Size	D f8	D1	D2	D3	d H8	d1	T	B Js9	M <sub>max</sub>	l <sub>0</sub>	l <sub>1</sub>	l <sub>2</sub>	H	L	n x d2
N1A/C	60	102	125	180	42	28	45,3	12	450	48	3	12	236	236	4xM10
N2A/C	100	140	175	240	60	38	64,4	18	496	67	4	15	325	360	4xM16
N3A/C	130	165	210	600	80	60	85,4	22	555	85	5	20	415	395	4xM20
N3A/C-R100	160	254	300	400	100	74	106,4	28	555	146	5	25	550	735	8xM16
N3A/C-R160	180	300	350	400	120	84	127,4	32	555	151	5	30	566	735	8xM20
N3A/C-R250	180	300	350	600	120	84	127,4	32	555	222	5	30	622	875	8xM20
N3A/C-R400	220	356	410	600	160	114	169,4	40	555	240	8	45	648	875	8xM30
N3A/C-R630	220	356	410	600	160	114	169,4	40	555	292	8	45	667	1065	8xM30
N3A/C-R1000	230	406	476	600	180	134	190,4	45	555	292	8	45	700	1065	8xM36



LEGENDA:  
 Componente electrice montate in A.C.M. mecanism  
 Componente electrice montate la distanta (asig. de utilizator)

VARIANTA DE ECHIPARE EXECUTIE ANTTEX NORMALA	Antrenare motor		Intr. rezist. de uscare		Comanda locala		Comanda la distanta		Contacte automentinare		Semnalizare		Indicarea pozitiei		Contacte auxiliare
	Deschidere	Inchidere	Mecanism	Cofret	Deschidere	Inchidere	Deschid	Inchid.	Deschid.	Inchid.	Deschid.	Inchid.	Blincker	Rezistiv	
	0E		1E ; 2E		3E										
	0E		1E ; 2E		3E										

**SIMBOLIZARE**

