



**Use and maintenance handbook
Electromechanical actuator**

ALI4

ALI4



ENGLISH

1 GENERAL RULES AND REMARKS	4
1.1 Introduction	4
1.2 Law references	4
1.3 CE marking	4
2 DESCRIPTION OF THE MACHINE AND TECHNICAL FEATURES	5
2.1 Configurations of ALI4 models	6
2.2 Description of the components and options	6
2.2.1 Motorizations	7
2.2.2 Gear boxes	7
2.2.3 Lead screws	8
2.2.4 Actuator stroke control	8
2.2.5 Ends and fastening devices	9
2.2.6 Antirotation device	9
2.2.7 Safety nut	9
2.2.8 Lubricants	9
3 TRANSPORT AND DISPOSAL	10
3.1 Disposal	11
4 INSTALLATION	11
4.1 Installation instructions	11
4.2 Stroke control system setting	18
4.3 Connections	18
4.3.1 Electric connection	18
4.4 Duties of the end user	18
5 WORKING AND USE	19
5.1 Working	19
5.2 Use and usage conditions	19
5.3 Preparation of working and duty cycle	21
5.4 Residual risks	22
6 ACTUATOR MAINTENANCE	22
6.1 General cautions and hints	23
6.2 Actuator service operations	23
6.3 Actuator repair	24
6.4 Actuator replacement	24
7 EMERGENCY DRIVE	25
8 INTERACTION WITH THE OPERATOR	25
9 GENERAL WARRANTY CONDITIONS	25
10 REMARKS	25

1 GENERAL RULES AND REMARKS

1.1 INTRODUCTION

This handbook is property of MecVel. All rights are reserved, hence it is forbidden to copy and transfer to others this document contents.

MecVel has the right to modify this handbook, without any need for preliminary information.

Before using this product(o actuator), we strongly recommend to read this document carefully.

The actuator is not and must not be considered as a safety device. The final user, or the manufacturer of the machine or system, in which the actuator is installed, has the responsibility for the safety of the machine or system itself and he must install the actuator only in accordance to the current rules for safety of the land where the machine is used.

This handbook is about the range of ALI1 actuators, described in the next chapters.

1.2 LAW REFERENCES

The safety rules applied by the manufacturer for the design and the production of this apparatus, in accordance with “CE” marking are described in the technical brochure, section nr. 3, property of MecVel.

REMARK: For further explanations and details, please contact MecVel.

1.3 CE MARKING

Each actuator is provided with a label, containing the following details:

- **manufacturer's name**
- **model**
- **year of production**

As an example, here below you can find one of the labels applied by MecVel.

	Via Due Portoni, 23 40132 Bologna – I – Tel. +39 051 4143711
CERTIFICATA/CERTIFIED UNI EN ISO9001:2008	
DATA/DATE	COD.
O.P.	MOD./MODEL ALI4
CORSA/Stroke	VEL./Speed
RAPP./Ratio	Mot.
SERVIZIO/Duty cycle	S3 30%
	

2 DESCRIPTION OF THE MACHINE AND TECHNICAL FEATURES

COMPONENT/OPTION	FEATURES/VALUE
AC motor	Three - phase 400-830 V / 50 Hz 390-830 V / 60 Hz Single - phase 190-400 V / 50 Hz 220-480 V / 60 Hz
DC motor	12-24-36 V
Reduction unit	Worm screw - Worm wheel
Mechanism	Cold-rolled profile ACME Ballscrew
Push rod	Chromed (standard) Stainless Steel (on request)
Ends, joints, fastening devices	Rear, Front
Stroke control devices	Microswitch, Encoder, Magnetic external Magnetic internal, Potentiometer
Lubrication	Grease lubricated
Protection level	Actuator IP65 Motor depending on customer's demand (MAX IP65)
Weight	Depending on the configuration

Possible actuator configurations are listed below, with the following codes:

MOD. ALI 4

MOD. ALI 4-F

MOD. ALI 4-FCM

MOD. ALI 4-FCI

MOD. ALI 4-VRS

MOD. ALI 4-VRS-F

MOD. ALI4-VRS-FCM

MOD. ALI4-VRS-FCI

REMARK: Customized configurations can be carried out . To check if these configurations comply with this handbook, please contact the manufacturer.

2.1 CONFIGURATION OF ALI4 MODELS

For the technical features description of the following configurations components and devices, please see section 2 *TECHNICAL FEATURES* of this handbook.

MODEL	MOTOR	GEARS	LEAD SCREW	PUSH ROD	END SWITCHES
ALI4	A o B	VR	TR o VRS	CHROMED (standard) INOX (a richiesta)	F-FCE- FCM-FCI

LEGEND:

VR	WORM SCREW - WORM WHEEL
TR	COLD - ROLLED PROFILE
VRS	BALLSCREW
F	INTEGRATED LIMIT STOP
FCE	EXTERNAL LIMIT STOP
FCM	MAGNETIC LIMIT STOP
FCI	INDUCTIV LIMIT STOP

MOTOR TYPE	A	B
MOTOR SIZE	CA	CC

2.2 DESCRIPTION OF THE COMPONENTS AND OPTIONS

Concerning technical features and performances, please refer to the catalogue of the product. From the below drawing, you can identify the main components.



2.2.1 Motorizations

The possible motorizations for the actuator are of two kinds:

- C.C., with the use of motors of different size;
- C.A., with the following configurations:
 - Three - phase;
 - Mono - phase;
 - Three - phase brakemotor, with electromagnetic brake;
 - Mono - phase brakemotor, with electromagnetic brake;
 - Mono - phase with electronic condenser;
 - Mono - phase brakemotor, with electronic condenser and electromagnetic brake.

Brake on motor allows for a higher precision and repeatability when positioning/stopping, and grants selflocking when actuator itself isn't.



WHEN IN ON/OFF DUTY WITH STRONG INERTIAS INVOLVED, BRAKE-MOTOR COULD SHORTEN LIFETIME OF ACTUATOR DUE TO MECHANICAL PARTS OVERLOADS.

IF A BRAKEMOTOR IS DRIVEN BY A FREQUENCY CONVERTER, BRAKE SHALL GET A SEPARATE POWER SUPPLY.

Following optional tools are available for the motors:

- Unclamping lever;
- Second shafts;
- Frequency converter.

2.2.2 Gearboxes

Different types are available: wormgear, planetary gears, 1:1 direct drive, belt, cross helix gears.

2.2.3 Lead screws

Basically made of C-20 steel and featuring cold-rolled profile; it is coupled with bronze or polymer nuts in order to grant safety against loads and low noise. In ballscrew (VRS) versions, lead screws are cold-rolled profile and tempered and coupled with hardened-grinded ballscrew nuts.

2.2.4 Actuator stroke control

Different types of stroke control devices can be applied to actuators: from simple microswitches, mechanical or magnetic, providing a signal to control motor supply (ON/OFF), up to electronic devices to obtain servo-mechanisms.

The different types of disposals available are:

Integrated mechanical limit switches

There are 2 or more changeover single - contact cam operated microswitches integrated to actuator gearbox, getting movement by a small reductor connected to lead screw. System is thus protected and compact, but its limit lies in long strokes. Precision and repeatability are negatively affected by actuator non-selflocking. A potentiometer is furthermore available, according to stroke to be controlled and actuator speed.

Magnetic limit switches

Sensors getting actuated by a magnetic field, they are installed on outer tube with brackets. They read magnetic field generated by a magnetic ring on nut; outer tube, in any case, shall be built with non - magnetic material.

Potentiometer

An absolute feedback to monitor actuator position, it can be installed alone or together with integrated limit switches, so to achieve end position control also. Potentiometer movement has same source as it is for integrated limit switches, so long strokes cannot be always controlled. Potentiometer electric screening, moreover, cant' grant 100% readability.

Encoder

It is an incremental rotative transducer, that turns spinning movements into digital pulses. It can be installed on actuators by using a longer wormscrew coming out the gear-box on the opposite side of the motor, or directly on board on the back of the motor itself, in AC and DC motors.

Its digital output allows for a feedback on actuator position, yet, every time there is a machiner reset, encoder shall be given the zero position.

2.2.5 Ends and fastening devices

Both standard and dedicated ends (according to customer's drawing) are available. Ends shall be carefully chosen, in order to avoid radial loads on actuator. Please note that front end receives reaction spinning torque when load is acting on actuator, so when yoke or balljoint ends (A3/A4) are used, antirotation key is advisable. It is important to keep the front and back fixing. Ends with parallel axis when mounting the actuator, in order to avoid having an iperstatic system, which would damage the actuator.

2.2.6 Antirotation device

Antirotation device is needed when the application does not allow preventing from rotating: in other words if the load is not guided. This device is realized by a long key fixed inside of the outer tube and a keyway cut into the nut, or by a safety nut with special slide running along a slide installed into the outer tube.

2.2.7 Safety nut

This element allows a nut wear check-up, avoiding load fall-down in case nut thread gets too worn out before scheduled service is done.

2.2.8 Lubricants

The technical features of the standard lubricants are shown on the below tables. For specific uses special lubricants are available: in this case, please contact the MecVel Technical Dept.

LUBRICANT GEARBOX

Tabella A Lubrificazione interna riduttore a grasso Table A Gearstage grease-lubrication				
	Marca Brand	Tipo Product	Tmin °C	Tmax °C
Grasso standard Standard lubricant	Moliguard	VSF 00	-15	+150
Grassi equivalenti Alternative lubricants	Klueber	Klubersynth PEG 46-1200	-50	+120
	Agip	BLASIA 220	-20	+180
	Shell	TVX COMPOUND B GREASE	-45	+180
	Total	CARTER SY 00	-20	+160

STANDARD LUBRICANT

For technical and performance characteristics, see the catalog provided by the manufacturer.

mod. ALI4

LUBRICANT LEAD SCREW

Grasso standard - Standard lubricant							
Marca Brand	Tipo Product	Tmin °C	Tmax °C	Tgoccia °C Tdrop °C	Olio base Base oil	Addensante Thickener	Classe NLGI NLGI Class
Vanguard	G.S. Friction 2	-45	+150	+180	Sintetico Synthetic	Idrossistearato di litio Lithiumm hydroxide	2

Grassi equivalenti - Alternative lubricants							
Marca Brand	Tipo Product	Tmin °C	Tmax °C	Tgoccia °C Tdrop °C	Olio base Base oil	Addensante Thickener	Classe NLGI NLGI Class
Klueber	Isoflex LDS 18 Special A	-50	+120		Sintetico Synthetic	Saponi complessi di litio Lithiumm complex	2
Dow Corning	Molykote BG20	-45	+180	+290	Sintetico Synthetic	Saponi complessi di litio Lithiumm complex	2

3 TRANSPORT AND DISPOSAL

The product is supplied in carton or wooden boxes with or without pallets, depending on the agreements taken with the customer and on the dimensions/weight of the product itself. After unpacking, we recommend to move the products using adequate systems (such as fork lifts, transpallets, safety belts).

It is important that the operator pays attention to the safety conditions for the product transport. In particular, please remember to wear appropriate safety clothes, such as safety shoes and gloves, to avoid damages or injuries caused by an accidental fall of the product.

The weight of an actuator is reported in the table of section 2. Up to a weight of 10 Kg the actuator can be moved without using any particular tools, but please consider that for actuators with strokes longer than 500 mm, the barycenter shifted towards the motor can cause difficulties during the transport and it can be necessary the help of a second operator or of suitable tools. We strongly recommend to move the actuator box with the maximum care, to avoid that accidental collisions damage the actuator.

3.1 DISPOSAL

Hereafter is the list of the products connected with the actuator, that have to be disposed, in accordance with the current rules with the Country in which the product is installed and used:

- Package, during the installation;
- Actuator components, if replaced or repaired;
- Lubricants, after the cleaning or service of the actuator;
- Actuator itself, if replaced or repaired.

Please dispose of all waste carefully.

4 INSTALLATION

4.1 INSTALLATION INSTRUCTIONS

The actuator shall be installed paying attention to have only axial forces applied to it. It is important to get the mounting points perfectly aligned. They have to be chosen, taking into consideration the loads with which the actuator has to work, in order to avoid misalignments that would cause grease loss and non-regular working.

To guarantee stability of the actuator, a safe and stable installation, according to the following instructions, is recommended:

1. Front and rear connection points must have parallel axis;
2. Fix the rear connection point so that the actuator is strongly fastened to the structure;
3. connect the load to the front end of the actuator, using suitable fastening devices (tie - rods, screws, pins, etc.);
4. proceed with the electric connection.



OFF - SET LOAD, DUE TO WRONG FASTENING OR INSTALLATION, WITH NON ALIGNED ENDS, LEAD TO SIDEFORCES ON ACTUATOR AXIS, UNEXPECTED WEAR, LUBRICANT LOSS AND NON-REGULAR WORKOUTS.

Actuator shall work within its nominal stroke, avoiding mechanical end stop.

Running against mechanical stops cause serious damage of internal actuator parts, and nulls any kind of guarantee.

Before starting the actuator, following check-ups shall be performed:

- If actuator is equipped with electric limit switches, before starting the motor, be sure they have been connected and ensure they work properly, in order to avoid any mechanical end - stop.
- Make sure that push rod is regularly travelling and limit switches are correctly adjusted. Drive the actuator “step-by-step” to check all this.
- The first time you switch on the actuator it is advisable to start from the middle of the stroke to avoid damages due to starting the motor in the wrong direction and hitting the stroke end.
- Make sure that there are no interferences between the push rod and other parts of the machine or system on which the actuator is installed.

REMARK: check catalogue for more explanations about actuator stroke (contact MecVel).



IN CASE LIMIT SWITCHES ARE ALREADY ADJUSTED BY THE MANUFACTURER, MANUAL ROTATION OF THE PUSH - ROD WILL CAUSE ADJUSTMENT LOSS!

When installing the actuator, to avoid accidental overloads, we suggest to install a current overload relay on general control panel. Its function is to cut off the power supply when actuator current consumption is overriding a chosen limit. In fact, being current proportional to load, this device avoids actuator to be accidentally overloaded.

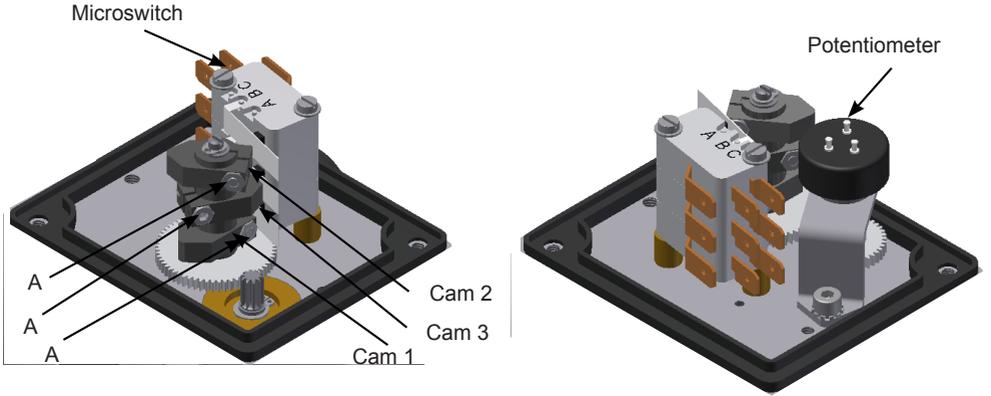
REMARK: Current threshold shall be adjusted not to react towards current spikes on motor startups.



PLEASE NEVER SWITCH ON THE ACTUATOR, BEFORE HAVING CORRECTLY COMPLETED ALL THE POSITIONING OPERATIONS.

4.2 STROKE CONTROL SYSTEM SETTING

SETTING INTERNAL LIMIT SWITCHES



To adjust the stroke of the Push Tube to the set value, turn on the Cams 1 and 2 as follows:

- A) Loosen the two cams by loosening the screws No. 3.
- B)* 1) Retract the Push Tube in the desired position
- 2) Rotate the lower cam No. 1 to toggle the corresponding microswitch
- 3) Close the cam in this position, with screw No. 3.
- C)* 1) Move the Push Tube in the desired position.
- 2) Rotate the upper cam No. 2 to toggle the corresponding microswitch
- 3) Retract the Push Tube in the desired position

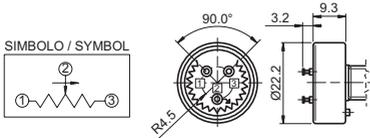
SETTING POTENTIOMETER

For models prepared.

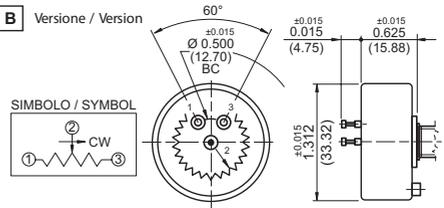
- A) *Move the push-tube in the middle of the mechanics stroke.
- B) Turn the potentiometer in the middle of the electrical stroke.
- C) Take pot'meter teeth-wheel close to gear, taking care not to move the adjustment previously made
- D) Tighten the screw for locking pot'meter into position.

* • This operation has to be done activating the motor, or using handwheel, if available on actuator purchased

A Versione / Version



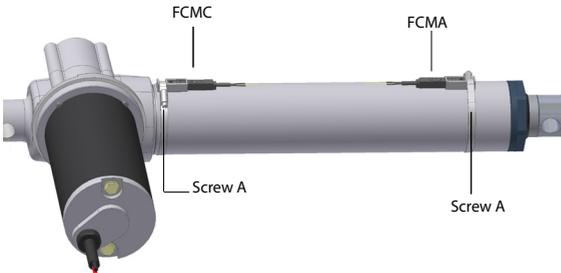
B Versione / Version



Potenzimetro rotativo - Spinning potentiometer

Prestazioni / Performances	Tipo / Type (A)	Tipo / Type (B)
Angolo max. di lavoro / Max. angle	340° ± 3°	352° ± 2°
Resistenza Ohm / Resistance	1K / 5K / 10K (standard)	1K / 5K / 10K (standard)
Alimentazione consigliata / Voltage	MAX 10 V	MAX 50 V
Linearità indipendente / Independent linearity	± 2%	± 1%
Tolleranza / Tolerance	± 20%	± 3%
Coefficiente deriva termica / Temperature coefficient of resistance	600 ppm / °C	20 ppm / °C

SETTING MAGNETIC LIMIT SWITCH



FCMC = All-closed position magnetic switch
 FCMA = opened position magnetic switch

- Stroke adjustment shall be done in following steps, acting on switches “FCMA” and FCMC” as follows:

- A) loose screws “A” to set brackets free
- B)* 1) Take pushtube up to needed position
- 2) take sensor “FCMC” to needed position (led lights up), sliding it from gearbox in direction of front end
- 3) tighten screw “A” to lock the bracket..
- C)* 1) - Take pushtube up to needed position
- 2) take sensor “FCMA” to needed position (led lights up), sliding it from tip of pushtube in direction of gearbox
- 3) tighten screw “A” to lock the bracket.

* • This operation has to be done activating the motor, or using handwheel, if available on actuator purchased

Magnetic Limit Switch FCM			
Performance	Type		
	Reed NC	Reed NO	PNP
DC Voltage	3 / 110 V	3 / 30 V	6 / 30 V
AC Voltage	3 / 110 V	3 / 30 V	/
25°C Current	0,5 A	0,1 A	0,20 A
Power	20 VA	6 VA	4 W
Supply cable	PVC 2 x 0,14 mm	PVC 2 x 0,14 mm	PVC 3 x 0,14 mm
Cablelength	2500 mm		
Protection	IP67		

Circuit Reed NC

Circuit with normally closed Reed switch protected by a varistor against overvoltages caused when switching off, with LED indicator.

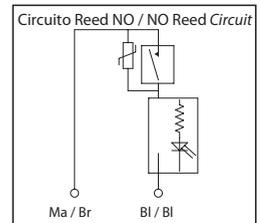
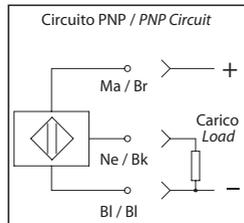
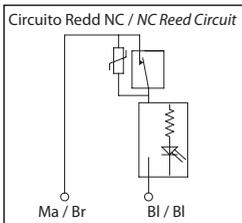
Circuit PNP

Circuit with Hall-effect switch and PNP outlet.

Protected against overvoltage spikes and reverse of polarity.
With LED indicator.

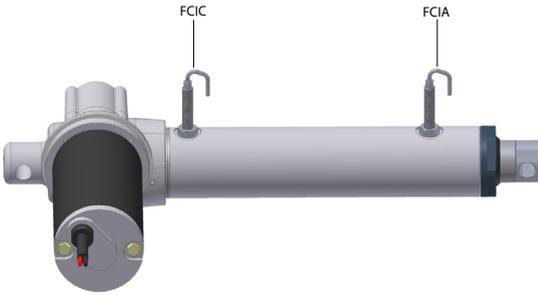
Circuit Reed NO

Circuit with normally open Reed switch protected by a varistor against overvoltages caused when switching off, with LED indicator.



SETTING INDUCTIVE LIMIT SWITCH

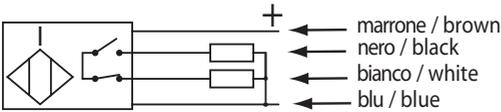
Proxy switches can't be adjusted from user.
– User shall declare stroke needed in order.



FCIC = All-closed position inductive sensor

FCIA = All opened position inductive sensor

NA + NC



Technical data:

Supply voltage (UB): 5 ÷ 40 Vdc

Temperature range: - 25° ÷ + 75°C

Degree of protection: IP67

Switch status indicator: yellow LED

ENCODER

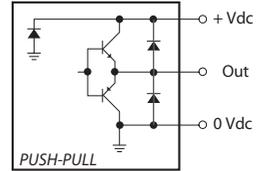
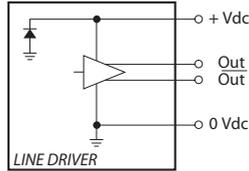
Encoder mounted on AC motors

Bidirectional incremental encoder, with (standard) or without zero-pulse, protection IP54.

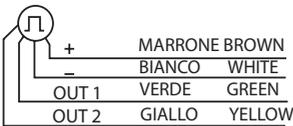
Available ppr: 50 / 100 / 200 / 400 / 500 / 512 / 1000 / **1024 (standard)**

Available output circuits: **Line Drive 5 Vdc (standard)** Push Pull 24 Vdc / Open Collector NPN 10 -30 Vdc / OpenCollector PNP 10 -30 Vdc.

Rosso / Red	\pm Vdc
Nero / Black	0 Vdc
Ver de / Green	A
Giallo / Yellow	B
Blu / Blue	Z
Marrone / Brown	-A
Arancione / Orange	-B
Bianco / White	-Z



- Encoder Power Supply 3,8 V - 24 Vdc
- PUSH-PULL
- 2 CH - 4 ppr
- Maximum output current: 100 mA



4.3 CONNECTIONS

4.3.1 Electric connection



THESE OPERATIONS MUST BE DONE BY QUALIFIED AND AUTHORIZED PERSONNEL.

Once installation is completed, following the above described instructions, the stroke control devices (if present) can be activated, by connection of the supply cable to the general control panel.

Connection operations must be done with the maximum attention to safety, using the proper safety tools (such as gloves, glasses, etc.).

Reference drawings for the electric connection are available on the catalogue of the product (contact MecVel).

REMARK: If a brakemotor is driven by a frequency converter, brake shall get a separate power supply.

4.4 DUTIES OF THE END USER

The end user must install the machine in suitable places, equipped with electrical system and lighting, according to the rules in force.

We recommend, moreover, the installation of the electricity in dry and lighted places, with temperature, humidity, etc., comply with the limits indicated by the laws in force.

In particular, the end user shall install on board of the machine the following devices:

- Device for the automatic interruption of the current (magnetothermic switch), controlling the functions of direct and indirect electrical connections, as well as protecting the electrical devices from overloads;
- A locked disconnecter, for maintenance operations, of the suitable size, that gathers all the current supply of the actuator, before it reaches all the different tools;
- Earthing to control indirect contacts and air discharges.

Remember to use disconnectors of the right dimension for the number and type of actuators that they have to disconnect. Please refer to the electric features described on the use and maintenance handbooks.

All these devices shall be installed in a general control panel, adequate to the application.

In case of additional end stroke devices, it is up to the installer to supply them by a current transformer.

The manufacturer cannot be considered as liable in case of loss of performance and/or damages to people or animals, if the installation instructions are not fulfilled as here recommended.

Please contact the manufacturer to verify the compatibility of the work place with the actuator itself.

REMARK: By laws/rules in force, it is meant the legislation of the Country in which the actuator is used.

5 WORKING AND USE

5.1 WORKING

This machine is used for loads movement. It is made up by an electrical motor, driving a lead screw directly or with a gearbox. A nut is then allowed to move along lead screw, and its movement drives push rod connected the nut itself.

Load shall be axial only, but it can be tensile or pushing, no matter what push rod direction is. The actuator can be selflocking or non-selflocking. Anyway, there is not a sharp threshold between selflocking and non-selflocking, because this feature is affected by gears wear, load, vibrations. In case of doubt about actuator behaviour, it is necessary to do some tests and to contact the manufacturer.

REMARK: We would like to stress that the selflocking of the actuator limits its accuracy and the repeat of the positioning. In case of doubts, please contact MecVel.

5.2 USE AND USAGE CONDITIONS

The actuator is designed for the use conditions specified by the manufacturer and explained on the catalogue of the product.

The supply is in AC or DC, but it is also possible to drive it manually, in case of emergency, through second shafts or stretched wormscrews acting as second shafts. Before starting with manual operation, it is important to disconnect the power supply of the actuator.

About use, it is important to define the actuator duty cycle and the environment.

These parameters need to be analyzed as linked together. Duty cycle is percentage rate between on-time and idle-time, on a timeframe of 5 mins.

Environment is mainly due to temperature and related elements, which can sometimes create an aggressive environment (humidity, dust...). A bellow protecting push rod is available: pharmaceutical and food industry or aggressive environment are typical examples of applications where this item can be requested; in any case, under such circumstances, please contact the manufacturer.

Standard duty cycle for our actuators is rated in S3-30% and the temperature gap is -10°C/+60°C, the pressure range is 0,8-1,1 bar.

Duty cycle can vary depending on the configuration and on the usage of the actuator. In any case, it is indicated on the label on the product. In case of doubt, please contact the Technical Dept. of MecVel.

The below table shows how to determine the actuator actual stroke. It depends on the speed and the weight of the lead screw (in case of assembling on the horizontal axis. Actuator shall work within stroke settled. During the project of the application, some 50 mm extra stroke (in both directions) are to be considered: lower possibilities of mechanical end - stops will then be involved.

REMARK: Running on block cause serious damage of actuator! For strokes 20 times larger than lead screw diameter, it is important to consider 150 mm of extra stroke, instead of 10 mm to avoid off set loads and compensate buckling effect.

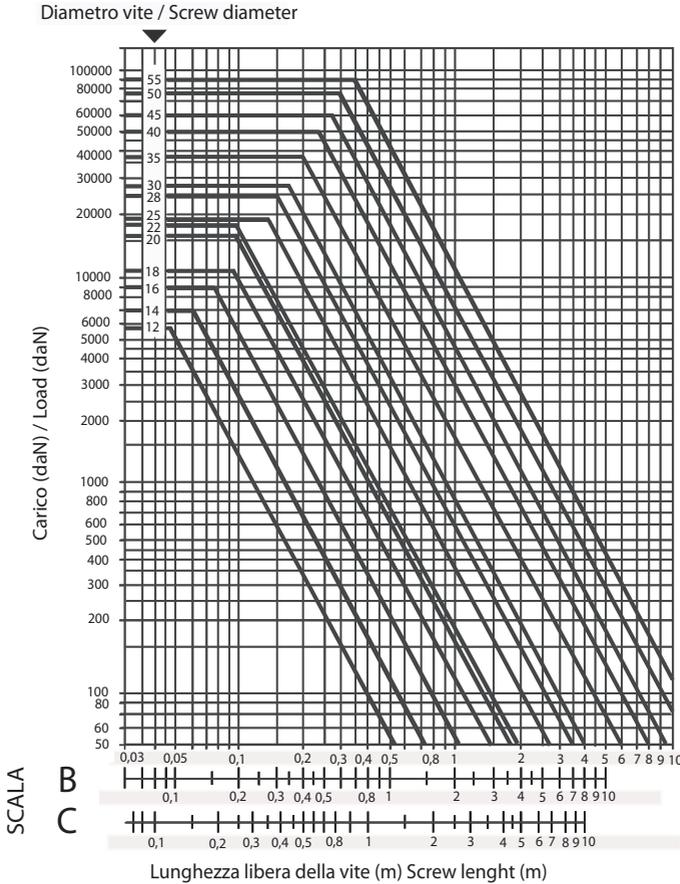
REMARK: Off set load lead to side-forces on actuator axis, unexpected wear, lubricant loss and non regular workout.

The diagram shows how to see what is max load admitted by a lead screw, basing upon its lenght and upon how actuator will be fixed on frame. As a general rule, choice is:

Actuator	Diagram
Actuator with stroke 15 - 20 time lower than lead screw diameter	C
Actuator with stroke 15 - 20 time larger than lead screw diameter	B



**THE STANDARD MODEL OF ACTUATOR CANNOT BE USED IN EXPLOSIVE OR POTENTIALLY EXPLOSIVE ENVIRONMENT.
FOR FURTHER INFORMATION REGARDING THE USE OF THE PRODUCT IN THESE CONDITIONS, PLEASE CONTACT MECVEL.**



5.3 PREPARATION OF WORKING AND DUTY CYCLES

Before starting the duty cycle, following checks have to be carried out:

- correct installation of the actuator;
- correct setting of the stroke control devices, if present;
- correct application of the load, with reference to the guidelines of this handbook.

It is necessary to consider the linear speed along stroke together with the load dynamics, in order to avoid inertias or vibrations. In case this situation might happen, we suggest to contact the Technical Department of MecVel to check the correct choice of the actuator, comparing with its dimensions.

5.4 RESIDUAL RISKS

The risks analysis and evaluation has shown that, even though all the possible measures to avoid dangers from the actuator use have been adopted, still some residual risks exist. In this section, we will explain all the cares that the operator shall adopt to avoid this residual risks. We will also show the signs used to indicated these risks on the machine.

RESIDUAL RISK	COMPONENT	PROCEDURE	SIGN
Parts in tension	Motor and electric parts	Before proceeding with any operation on the actuator, the operator must switch power off.	
Hot parts	Motor, electric parts, push rod, reduction unit	Wear the necessary clothes. Before proceeding with any operation, the operator must wait until all the hot parts are cooled.	
External parts in movement	Push rod	Before proceeding with any operation, switch power off. Do not wear clothes that can be dragged in the machine.	

6 ACTUATOR MAINTENANCE



DURING MAINTENANCE OPERATIONS, PLEASE TAKE ALL THE NECESSARY CARES, TO AVOID ANY DANGER FOR THE OPERATOR. WE RECOMMEND TO CAREFULLY READ THIS CHAPTER OF THE HANDBOOK FOR USE AND MAINTENANCE.

6.1 GENERAL CAUTIONS AND HINTS

All the maintenance operations must be done by qualified and authorized technicians, adequately informed and trained about the dangers, arising from them.

Moreover, it is important to consider the integration and usage of the actuator into more complicated systems.

If the actuator is installed in dangerous environment, the operators must behave accordingly, for example, wearing protecting masks, glasses, etc.

All the operations must be fulfilled in safety conditions, with power supply switched off, and after checking the non - possibility of an external switch on of the machine or of the system in which it is integrated, during these operations.

Before starting any operation, operator must wear the following safety clothes:



6.2 ACTUATOR SERVICE OPERATIONS



BEFORE STARTING WITH ANY SERVICE OPERATION, CHECK THAT THE TEMPERATURE OF THE PARTS IS NOT SO HOT TO CAUSE DAMAGES, INJURIES OR BURNS TO THE OPERATOR. IN THIS CASE, WAIT UNTIL THE PARTS ARE COOLER.

Actuator needs only few service operations: cleaning and eventually greasing (if necessary, lubricant has to be added by the appropriate lubricator).

REMARK: Lubricants that can be used are listed in chapter 2 TECHNICAL FEATURES of this handbook.

Anyway, MecVel recommends a scheduled inspection on actuator or screwjacks to detect any problem, especially about movements and in case of noises.

The schedule of the checks should vary according to the application and the use: in case of continuative use or for any doubts, please contact the Technical Department of MecVel.

It is necessary to frequently check the nut wear.

To do this, follow this procedure:

1. disconnect load from actuator;
2. put load on push rod, according to model rating (from nominal load till 0.1 times nominal load, lowering this parameter the more actuator size is high);
3. with a dial - gauge, putting both compressing and tensile load, check that axial backlash is always lower than 0,3 times the screwpitch.

In case backlash is higher, then actuator needs to be replaced.

It is necessary to periodically check:

- the isolation and preservation of the cables;
- the cable inlets;
- the preservation of the external surfaces, with particular attention to the parts in movement and their shelters.

6.3 ACTUATOR REPAIR



IF SOMETHING WRONG IS DETECTED, DO NOT TRY TO REPAIR IT BY YOUR OWN, BUT CONTACT AFTER-SALES DEPT. OF MECVEL TO GET THE NECESSARY INSTRUCTIONS.

All the repairs must be done by qualified technicians, adequately informed and trained about the dangers, arising from them. Moreover, it is important to consider the integration and usage of the actuator into more complicated systems.

Every repair must be fulfilled in safety conditions, with power supply switched off, and after checking the non - possibility of an external switch on of the machine or of the system in which it is integrated.

If the actuator is installed in dangerous environment, the operator must behave accordingly, for example, wearing protecting clothes and tools.

6.4 ACTUATOR REPLACEMENT

It is necessary to replace the actuator, in the following cases: if it breaks, if it is not working correctly for its use and if the whole system or application on which it is installed is dismantled. In these cases, the operator must take care to follow the safety instructions about actuator service, explained in this handbook.

If the actuator has problem of functioning or control, please get in touch with the Technical Service of MecVel for the instructions and the authorizations about replacement or repair.

REMARK: For the Technical Service MecVel is important the O.P. number written on the label on the motor.



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CERTIFICATA/CERTIFIED UNI EN ISO9001:2008

DATA/DATE	COD.
O.P.	MOD./MODEL ALI4
CORSA/Stroke	VEL./Speed
RAPP./Ratio	Mot.
SERVIZIO/Duty cycle	S3 30%

CE

7 EMERGENCY DRIVE

In case of emergency, it is possible to move the actuator manually, as described in section 5, *WORKING AND USE* of this handbook.

Please take the greatest care during these operations and follow carefully the guidelines of this handbook, in particular:

- be sure that load is safely held, braked and/or supported by external tools;
- be sure that the environment is not intrinsically dangerous during the emergency operation (bad lighting, smoke or gases or toxic and burning vapours, etc.);
- use safety tools and wear safety clothes;
- do not proceed with emergency operation without some personnel that can help the operator in case of unexpected danger.

8 INTERACTION WITH THE OPERATOR

This section cannot be applied, because the actuator has no interaction with the operator. External drive is possible only in case of service, repair or emergency. In these cases, remember to switch off power supply of the actuator and be sure that hot surfaces are cool and parts in movement are still.

Please refer to chapter 6, *ACTUATOR MAINTENANCE* for all the necessary hints to safely fulfill these operations.

9 GENERAL WARRANTY CONDITIONS

For general sales conditions consult the catalog or website www.mecvel.com.

10 REMARKS

Particular guidelines for the use and maintenance of customized actuators are available only in case of special configurations.



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