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MAINTENANCE TITANO

GBR

INFORMATION:

Customer:

Installing Company:

Timbre&Signature

CAREFULLY READ THE MANUAL BEFORE USE

SUMMARY

titolo

MAC S.r.l. - Via Enrico Mattei n°9 - Loc. MORCIOLA
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WARRANTY

The company **MAC srl** undertakes, for the period of two(2) years starting from the date of the invoice, to substitute or repair free of charge the parts that will result faulty at the origin.
The warranty can be extended to a loger period, if the customer will undertake to do the semestral controls foreseen by the Law.

WARNING

The warranty is void when, the customer, wouldn't respect the contract of ordinary maintenance foreseen by the current Law, the builder and CEE 2006/42/CE.
The warranty is void in case of tampering or reparations done by unauthorized people or made with not original spare parts.
Do not remove the labels on the automation and in case of deterioration of the same require the replacement (the warranty is void if the labels are removed).

The supplied material is warranted for 24 (twentyfour) months from the date of delivery to the customer against defects in materials or construction.
The builder undertakes to free substitution and/or repair of the faulty piece upon return to his local Service in order to permit the discovery of the defect and the validity of the warranty.

Will be considered OUT OF GUARANTEE, at unquestionable judgment of MAC s.r.l: devices that are out of the temporal period of 2 (two) years; devices that have manumissions or failures due to incompetence or other like: various burns, electric engine burned, repair attempts, oxidation due to water infiltration, mechanical failures induced on the circuit and/or its components, whatever caused by negligence, improper use of the product or the occurrence of natural events.

The merchandise out of production and the obsolete goods will be substituted by others with similar technical characteristics.

Eventual complaints or disputes must be sent, with documentation, to MAC s.r.l. or to its local Services, within eight days from the date of receiving of the material; complaints or disputes do not confer the right to suspend payments. Any returned goods must be agreed and authorized by MAC s.r.l. before the return. The goods must be returned ex works, with carriage and packaging at cost, charged in the invoice.

MAINTENANCE DUTY

The Direttiva Macchine 2006/42/CE **requires** a "proper installation and mintenance" to keep the machines safety.

In the case of a working place the TESTO UNICO 81/2008 requires that "*installations and equipment are subject to regular maintenance and must be eliminated as much as' quickly as possible, the detected defects which may affect the safety and health of workers*".

If the automation is installed in a pubblic area, the place of intervention is considered "working environment", therefore must make reference to the appropriate Law.

In a private area the responsibility is of the owner, who must individually make the maintenance of its own product or stipulate a maintenance contract in terms and times foreseen by the Law.

THE PROGRAMMED MAINTENANCE OF EVERY 6 MONTHS IS MANDATORY, IN ORDER TO MAINTAIN IN THE TIME THE CONFORMITY OF THE PRODUCT ACCORDING TO THE EUROPEAN DIRECTIVES.
IF THE CUSTOMER, THE OWNER OR THE RESPONSABLE OF THE INSTALLATION, DOESN'T MAKE THE MAINTENANCE LIKE PRESCRIBED BY THE BUILDER, HE ASSUMES THE RESPONSABILITY OF EVENTUAL MALFUNCTIONS OF THE BOLLARD(MACHINE).

STOPPED USE OF THE BOLLARD

If you decide stop using the bollard for a long time, it must be made inoperative by cutting the main power switch.
At the time of new startup call a technician to check the efficiency of the automation in all its parts.

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re-use of the bollard

The laws in force require that there are at least two annual inspections mandatory on the installed components. In this regard, to the user is issued a document, with the results of the tests (test), that form, duly completed in all its parts, must be signed at the bottom by the technician and the customer.

For automation's defects, contact the installation company or a qualified technician contacting:

(space reserved to the installer / maintainer)

GENERAL WARNINGS

This maintenance instruction book contains all of the information necessary to the execution of the operations of mechanical maintenance, and the operations of electrical maintenance

OPERATIONS FOR THE PUTTING IN MAINTENANCE:
The maintenance must be done exclusively by a COMPANY SPECIALIZED IN MAINTENANCE.
It is necessary to call out the attention of the operator employed to the bollard's maintenance, recommending the full respect of all the prescriptions given by the Safety Agencies, other than the specific warnings written in this technical document.
All of the information on maintenance regard the ordinary maintenance and extraordinary one with operations to make the bollard daily working properly.
If further information are needed, or if problems should rise, don't hesitate to contact us.
It is really important; to avoid bad functioning that could create directly or indirectly bad accidents or damages to people and/or to materials and object, to follow all of the instructions and the signs of warning on the bollard , control board, on the schemes, in the documents enclosed and in this document.

The operator employed of the maintenance does:
Operations of ordinary maintenance (for example the general controls);
Operations of extraordinary maintenance (remind that it is good to use, for the reparations, only original materials to guarantee in every case the safety of the bollard)
The operator employed of the maintenance must be aware that making these operations can lead to dangers.

It is of fundamental importance:

- To avoid physical contact with parts in movement;
- That the personnel not allowed do not accede to the bollard working area when it is in state of maintenance;
- That the animals are kept away from the area interested in the operations of maintenance;
- That the operations of maintenance are made with enough light ; in case of maintenances in areas not enough enlightened , light devices must to be used taking care to avoid shadows that prevent or reduce the visibility of the point in which you operate or in the surrounding areas.

The operator employed to the maintenance must be always consider that:

- He must not smoke and don't approach fires during the operations of change and recharging of the fluid
- He must not done welds on the installation full of fluid and reparations with with the system in operation
- He must not exceed the maximum pressure indicated on the scheme, and not modify the electrical and hydraulical connections
- He must use the device for individual protection
- He must use utensil suitable to the use
- He must avoid in the absolute way the improper use of the tools
- The shelters and the safety devices can be partially or entirely removed during the operations of maintenance of the bollard. It hasn't to be put in function after an operation of maintenance without the protection and other devices are being reassembled.

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D.P.I. FOR THE OPERATOR EMPLOYED TO THE MAINTENANCE

Scheme N°1: D.P.I. for the operator employed to the mechanical maintenance		
Pictogram	Description	Description of the intervention for general controls
	SHOES	Use of safety shoes to avoid the risks generated from falling of materials during the operations of maintenance (mainly during the dismantlement of parts).
	PROTECTION GLOVES	Hand protection gloves at disposal in case of manipulation of objects that can cause damages.
	SUITABLE CLOTHES	Suitable clothes, as for example the overall: it is forbidden to use clothes with large sleeves or appendix that can be held back from mechanical devices.
	GLASSES	Keep at disposal:
		Accident prevention glasses, in case it is necessary to make operations of grinding or similar;
	GLASSES FOR WIELDING	Protective glasses for welders in case it is necessary to make operations of welding.

In case the maintenance is made within one of these working areas:
- Productive ambient (firm);
- Construction site;

The personnel must moreover worry and use the compulsory D.P.I. in such ambient of work.

MAINTENANCE OF HYDRAULIC COMPONENTS

STOCKING

The bollard can be stored for about six (6) months before putting in function, respecting the following prescriptions:
- All the connections foreseen for the pipes connected to the machine must remain sealed.
- No component must be removed from the bollard.
- The stocking must take place in a dry and not dusty environment with temperature between -30°C and 80°C.
- After six (6) months of stocking the lubrication and anti-oxidizing properties of the fluid used for the test are not guaranteed anymore.

INSTALLATION OF THE PIPES CONNECTED TO THE MACHINE

For the hydraulic connections made with stiff pipes must be used:
cold drawn steel pipes without welding, annealed copper pipes, PVC pipes for high pressure hydraulic systems.
For normal dimensions up to diameter 32 (DN32) use pipes according to DIN2391.
For normal dimensions starting from diameter 40 (DIN40) and pressure up to 160 Bar use pipes according to DIN2448.For choosing the diameter and thickness of the pipes it is necessary the maximum pressure and course, following these values:
-Fastness of the fluid in the pipes of going: 3-6 meters per second
-Fastness of the fluid in the pipes of return: 2-3 meters per second
-Fastness of the fluid in the pipes of aspiration: 0,5 meters per second
For the flexible pipes follow strictly the indications of the builder about the exercise pressure, the compatibility with the fluid and the Laws of installation and maintenance.
The set of connectors has to be chosen in function of the exercise pressure and of the diameter of the pipes.
For connectors until 1" ½ we recommend three pieces cutting ring, fillet weld and held with O-ring DIN2353. Over 1" ½ the connection must be done with flanges (SAE 3000 - SAE 6000).

STARTING OF THE BOLLARD

Check that all the components of the circuit are put on and ready to use.
Check that all the pipes are connected correctly verifying the clamping of the connectors to avoid damages and exits of fluid.
Before proceeding to the filling of the tank verify that it is clean inside, for cleaning use an aspirator for liquids and solids. Don't use degreasers or solvents for the inside cleaning.
The filling of the tank with exercise fluid is to be made only through the special cap of load.
Make sure to use the prescribed fluid or listed in the chart ADVISED FLUIDS.
Before putting the fluid in the tank you must filter it, because even a new fluid can contain pollutant particles.

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STARTING PROCEDURES

Open the eventual valves on the pump.
Set to zero the settings of the regulating and pressure reducing valves turning the regulating screws in anticlockwise.
Take off the air from the bollard. When you are sure that the circuit is desecrated and the sequences of the cycle are correct, that there aren't losses toward the outside and all the pipes are correctly jointed, it is possible to make the settings of pressure and capacity indicated in the scheme, locking them.
Take care about the noise during the functioning.

MAINTENANCE

It is important to do all the periodical controls.
- During the first hours of functioning you must check the level of fluid in the tank and verify possible points of escape.
- After the first 100 hours of functioning verify the cleaning of the filters and the temperatures.
- Check in the maintenance forms to decide how often you need to replace the fluid.

In case of substitution of one component it is necessary that the changed component is conformed to the original one in order to avoid dangers to people or damages to machines.

GUIDE TABLES FOR THE RESEARCH OF THE CAUSES OF SOME DRAWBACKS

In these tables we highlight the most common drawbacks and some probable causes.
All the drawbacks are thought with functioning bollard and control board(control panel) correcly installed and programmed.
IF YOU WILL CONTACT THE BUILDER INDICATE:
- IF YOU HAVE REPLACED ANY COMPONENT AND WITH WHICH COMPONENT.
- IF YOU HAVE READ TABLE N°2
- THE TYPE OF DRAWBACK, THE CAUSE, THE CIRCUMSTANCES IN WHICH OCCURS, THE EXTERNAL TEMPERATURES, MAINTENANCES DONE.

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Chart N° 2 : Guide for the research of the causes of some drawbacks				
N	DRAWBACKS	CAUSES	HYPOTESIS OF BREAK	SOLUTIONS
1	THE BOLLARD DOESN'T GO UP	-LOW OIL LEVEL IN THE TANK	-DAMAGED GASKETS	-CHANGE GASKETS
	(presence of air in the circuit)			-ADD OIL
		-MANUAL RELEASE OPEN		
		-ELECTRICAL VALVES OPEN	-MANUAL UNLOCK OPEN	-CLOSE MANUAL UNLOCK
		-ELECTRICAL SECURITIES OPEN	-ELECTRICAL VALVES OPEN OR DAMAGED	-CHECK VOLTAGE TO COIL AND ELECTRICAL VALVE
		(photocells, sensitive head, magnetic coils, emergency button, clock)	-ELECTRICAL SECURITIES OPEN OR DAMAGED	-REPAIR/CHANGE ELECTRICAL SECURITIES
		-OIL LEAKS		
		-WRONG SENSE OF ROTATION	-BREAKING OF OIL-HYDRAULIC CIRCUIT	
		-REVERSED LIMIT SWITCH		-REPAIR THE CIRCUIT
			-WRONG CONNECTION OF THE ELECTRIC ENGINE	
			-WRONG CONNECTION LIMIT SWITCHES	-REWIRE THE ELECTRICAL ENGINE ON THE CONTROL PANEL
		-NO POWER SUPPLY		-REWIRE MAGNETIC LIMIT SWITCHES
		-CONTROL PANEL FAULT	- CUT-OUT OPEN	
			-CONTROL PANEL FAULT	-REACTIVATE CUT-OF SWITCH
		-FAULT FUSES		-CHANGE THE CONTROL PANEL
			-ABSORPTION PEAK HIGH	
			-SHORT CIRCUITS ON THE LINE	-CHANGE THE FUSES WITH OTHERS SUITABLES
			ENGINE, ELECTRICAL VALVE, ENTRANCES, EXIT 24Vac, TRAFFIC LIGHT	-CHECK AND REPAIR THE FAILURE
2	NON REGULAR CLIMB	-PUMP NOT COMPLETELY DEEPED IN OIL	-OCCLUDED ASPIRATION OR NOT DEEPED IN OIL	-CHECK THE OIL LEVEL
	OF THE BOLLARD	-AIR BUBBLE IN THE CIRCUIT	-ASPIRATION FAULT	-CHECK FILTER CLEANING
	(Pump in flaw of capacity)	-DIRTY OIL	-OIL WITH MANY HOURS OF WORK	
			-OIL WITH SOLID OBJECTS	-CHANGE THE OIL
				"BOLLARD'S OIL CHANGE"
		-MANUAL UNLOCK OPEN	-SEE POINT 1	
		-ELECTRICAL VALVES OPEN	-BROKEN PUMP	
		-MECHANICAL FAULT		-SEE POINT 1
		-NOT WORKING VALVES	-WATER LEVEL IN THE COCKPIT TOO HIGH	-CHANGE THE PUMP
				-CHECK THE GROUND DREINAGE
				-CHECK THE COCKPIT DREINAGE
		-OPERATION NEXT TO THE MANUAL UNLOCK	-AIR ASPIRATION IN THE PUMP	
		-DIFFERENT TENSION FREQUENCY		-WITH THE SECOND OPERATION THE PROBLEM IS SOLVED
3	SLOW CLIMB OF THE BOLLARD	-MAXIMUM VALVES PRESSURE NOT CORRECT	-MAXIMUM PRESSURE VALVE NOT MUCH CLOSED	-CALIBRATE CORRECLY THE VALVE CONSULTING "BOLLARD'S RAISING POWER REGULATION"
	(insufficient pressure)	-PRESENCE OF AIR IN THE CIRCUIT(the bollard doesn't go up)	-SEE POINT 1	-SEE POINT 1
	(at low temperature the oil is more viscous)	-PUMP IN A FLAW OF CAPACITY		
		(bollard's climb not regular)	-SEE POINT 2	-SEE POINT 2
		-OIL TOO VISCOUS		
			-OIL TOO COMPACT	-CHANGE THE OIL'S TYPE
		-BREAKINGS ON THE CIRCUIT OR		
		-EXCESSIVE LOSSES	-LOSSES ON THE CIRCUIT	-CHECK THE CIRCUIT
			-BREAKING O-Ring IN THE DISTRIBUTOR	-CHANGE O-RING IF NECESSARY
		-POWER SUPPLY TENSION NOT CORRECT		
			-CONTROL PANEL FAULT	-SEQUENTIAL PROGRAMMING TO MULTIPLE BOLLARDS CLIMB ON THE CONTROL PANEL
			-SCREW CONNECTIONS NOT CLOSED	-TIGHT THE SREWS
			-TENSION OF FUSES IS LOW	-CHECK POWER SUPPLY CABLE
			- FAILURE ON THE DISTRIBUTOR	-CHECK WITH THE DISTRIBUTOR
		-INADEQUATE CAPACITOR		
				-CHANGE CAPACITOR
		-FRICTION GUIDE SHOES	-CAPACITOR FAULT	
			-LITTLE CAPACITOR	-REGULATE GUIDE SHOES
			-GUIDE SHOES VERY TIGHT	"BOLLARD'S GUIDE SHOES REGULATION"
4	BOLLARD UP DOESN'T GO DOWN	-INADEQUATE CAPACITOR	- SEE POINT 3	- SEE POINT 3
	(PIPE BLOCKED IN POSITION UP)	-TOO HIGH PRESSURE	-PRESSURE VALVES TOO CLOSED	-CALIBRATE CORRECTLY THE VALVE CONSULTING"BOLLARD'S RAISING POWER REGULATION"
5	WHEN THE BOLLARD IS UP	-OIL LOSSES	-SEE POINT 1	-SEE POINT 1
	THE PIPE DOESN'T GO DOWN	-MANUAL UNLOCK OPEN	- SEE POINT 3 (UNLOCK O-Ring BROKEN)	- SEE POINT 3
	(MAINTAINING FAULTY)	-ELECTRICAL VALVES OPEN		
		-FAULTY MAINTAINING VALVES	-BREAK O-Ring MAINTAINING VALVE	-CHANGE O-RING IN THE DISTRIBUTOR
6	STARTING SPURT	-low temperature	- see point 3	- see point 3
	REDUCE THE RISE		-fatigued oil	-change oil
	(viscous oil)			-install a heater resistance
		-hight spurt pressure	-too much clutched pressure valves	-slacken the pressure valves
		-the power supply tension is not correct	- see point 3	- see point 3
		-insufficient capacitor	- see point 3	- see point 3

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N	DRAWBACKS	CAUSES	HYPOTESIS OF BREAK	SOLUTIONS
7	NOISY PUMP	-PRESENCE OF AIR IN THE CIRCUIT (the bollard doesn't go up)	-SEE POINT 1	-SEE POINT 1
		-DENSE OIL		
		(bollard's climb not regular)	-SEE POINT 2	-SEE POINT 2
		-WORN OUT PUMP		
			-EXCESSIVE INTERNAL BACKLASH	-CHANGE THE PUMP
8	LOSSES OF OIL NEAR TO THE GASKETS	-ABRASIVE SUBSTANCES IN THE OIL	-LITTLE OPENING ON THE GASKET	-CHANGE OIL
	(losses of oil)			
		-HIGH OIL TEMPERATURE	-COLLAPSED GASKET	-COOL THE OIL AND CHANGE THE GASKETS
9	LOSSES OF OIL NEAR THE	-HIGH PRESSURE IN THE OIL TANK	-OIL CAP NOT SUBSTITUTED	-CHANGE BREATHER CAP
	OIL TANK		-BREATHER CAP OBSTRUCTED	-CHANGE BREATHER CAP
10	EXCESSIVE HEATING OF THE OIL HYDRAULIC CONTROL UNIT	-INTENSIVE USAGE OF THE SWITCHBOARD	-WORN OUT PUMP	-change the pump
	(OIL TOO MUCH HOT)		-OPERATIONS HIGHER THAN THOSE PROVIDED	-respect fUnctionning cycles
		-MANUAL UNLOCK OPEN	-SEE POINT 1	ask to the builder
		-ELECTRICAL VALVES OPEN		-see point 1
		-WRONG REGULATION OF THE LIMITS SWITCH SENSORS	-WRONG READING OF LIMITS SWITCH	
				-regulate the limit switches in the right position, (verify the functioning of the magnet and of the limit switch)
		-TOO HIGH PRESSURE		-regulate the right pression consulting "Bollard's rising power regulation"
			-MAXIMUM PRESSURE VALVES TOO TIGHT	(acting on the maximum pressure valves)
		-LOSSES OF OIL WITH LOSS OF PRESSURE	-SEE POINT 1	-SEE POINT 1
		-EXTERNAL TEMPERATURE HIGH	-SEE POINT 3	-SEE POINT 3
			-OIL OVERHEATING	-RESPECT THE WORKING TEMPERATURE
				-CONSULT THE BUILDER
11	THE BOLLARD DOESN'T MAKE THE WHOLE STROKE	-LOW LEVEL OF OIL IN THE TANK	-SEE POINT 1	-SEE POINT 1
	(wrong regulations)	-LIMIT SWITCH WRONG REGULATION		
		-INADEQUATE CAPACITOR	-SEE POINT 10	-SEE POINT 10
		-PRESSURE TOO MUCH HIGH		
			-SEE POINT 3	-SEE POINT 3
			-SEE POINT 10	-SEE POINT 10
12	HIGH WATER LEVEL	-OBSTRUCTED SEWER	-SOMETHING IS OBSTRUCTING THE WATER PASSAGE	-CLEAN THE COCKPIT
	(water in the formwork)			
			-the ground absorbs few water	-BUILD A SEWER SYSTEM OR A COCKPIT TO ASPIRATE THE WATER
		-NOT DRAINING GROUND		-REQUIRE AN HYDRAULIC CONTROL UNIT IP67
13	BRIGHT HEAD	-NOT CORRECT POWER SUPPLY TENSION	-WRONG CABLES INSTALLATION	-REWIRE THE CABLES RESPECTING POLARITY
	NOT FUNCTIONING		-CABLES FAULTS	-CHANGE CABLES
			-DISCONNECTED PLUG/SOCKET	-CONNECT THE PLUG WITH THE SOCKET IN THE HEAD
			-SEE POINT 14	-SEE POINT 14
14	BRIGHT HEAD	-NOT CORRECT POWER SUPPLY TENSION	-SEE POINT 3	-SEE POINT 3
	WITH LOW LIGHT INTENSITY		-SECONDARY TRANSFORMER BROKEN	-CHANGE THE CONTROL PANEL
			-FALL OF TENSION ON THE LINE	-ADD A NEW FIT TRANSFORMER
				-WRONG BOLLARD INSTALLATION
				-CHECK THE FALL OF TENSION
				-MAKE ORDINARY MAINTENANCE
		-OXIDATION OF THE CONTACTS	-FAILURE TO ELECTRICAL INSULATION OR TO ELECTRICAL CONTACTS	-CHANGE THE BRIGHT HEAD WITH LED
15	LIMIT SWITCH	-EXCEEDED NUMBER OF CYCLES	-BREAKING OF INTERNAL CONTACTS	-CHANGE THE LIMIT SWITCH WITH AN ORIGINAL OTHER
	SENSITIVE HEAD FAULT	-OXIDATION OF THE CONTACTS	-NO CONTACTS LUBRIFICATION	-MAKE ORDINARY MAINTENANCE
				-CONTACT THE BUILDER
16	SENSITIVE HEAD DOES NOT REVERSE THE MOTION	-SEE POINT 15	-SEE POINT 15	-SEE POINT 15
		-NOT WIRED ELECTRICAL CABLES	-WRONG CABLES INSTALLATION	-REWIRE RESPECTING CABLES POLARITY
			-FAULT CABLES	-CHANGE CABLES
			-PLUG/SOCKET DISCONNECTED	-CONNECT THE PLUG WITH THE SOCKET IN THE HEAD
17	FAULT ELECTRICAL VALVE	-POWER SUPPLY TENSION NOT CORRECT	- SEE POINT 3	-SEE POINT 3
		-ELECTRICAL INSULATION FAILURE		-CHECK THE FAILURE
			-SHORT CIRCUIT	-WRONG BOLLARD INSTALLATION
			-IP GRADE INADEQUATE	-RESPECT INSTALLATION TYPE AND IP GRADE
			-FAULT FUSE	-CHANGE FUSES
				-CONTACT THE BUILDER
		-EXTERNAL TEMPERATURE HIGH	-SEE POINT 10	-SEE POINT 10
		-DIRTY OIL	-SEE POINT 2	-SEE POINT 2

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MAINTENANCE PROCEDURES

Proceed as follows:
Unauthorized personnel or pets are not allowed in the surrounding area of the bollard and in the execution area of the operations of maintenance; sign the zone considered dangerous during the maintenance (with signal posters or bordering the area with red-white stripes); dissect the electrical tension putting on “OFF” the general switch installed on the electrical board; do the operations of maintenance as described.

WARNING

ELEMENTS IN TENSION:
During the procedure of mechanical maintenance of the bollard, once the electrical energy is dissected as previous described, the operator must pay the maximum attention to the cables placed on top of the general switch as they remain in tension even with the dissected bollard.

ORDINARY AND PROGRAMMED MAINTENANCE

Chart N°3: Operations of ordinary and programmed maintenance		
Periodicity		Description of the operation for general checking
6months*1	12months*1	
Yes		Check that the bollard respect all the commands (mechanics and remote control)
Yes		Check that the command maintained action does not create danger to people
Yes		Check state of electronic devices and their operating logic
Yes		Check the condition of the paint surface and possibly clean it or manipulate
Yes		Check the linearity of the movements of the bollard
Yes		Check that the bollard doesn’t make strange noises
Yes		Check the function of the buzzer (where foreseen)
Yes		Check the function of the detector for the sirens of emergency vehicles approved Eropee (where forseen)
Yes		Check the function of the traffic light, flashing light, bright head LEDs (where foreseen)
Yes		Check the function of magnetic coils/electric photocells (where foreseen)
Yes		Check the function of the electrical valve (where foreseen)
Yes		Check the functionality of the manual unlocking
Yes		Check if there are some oil leaks (cylinder, pipes, breather cap, control panel, unlock)
Yes		Check with simple tests (using the witnesses)
		the correct functioning of all electrical or mechanical securities (like sensitive head)
Yes		Check the tightening of screws and bolts for fixing components
Yes		Check the power electrical line
Yes		Check the grounding of the system
Yes		Check grounding conductors, manifold, PE, primary and secondary equipotential bonding conductors
		Description of the intervention for detailed controls
Yes		Check the integrity of the polyurethane mold or polizene band (in plastic) scratch-resistant guide on the pipe / footboard
Yes		Check the function of mechanicals/magnetic limit switch
Yes		Check the function of the anti condensate resistance
Yes		Check the setting and the integrity of the plastic shoes (green / black)
Yes		Setting beat last race piston (where foreseen)
Yes		Pressure switch regulation (where foreseen)
Yes		Keep cleaned the water drainage discharge on the bottom of the formwork
	Yes	Check for the presence of water inside the formwork (consult the builder if the water level remains persistently high, in order to avoid unexpected malfunctions)
	Yes	Check the presence of condensation within the sensitive head (consult the builder for the presence of large quantities of water)
	Yes	Check for grease on the mechanicals contacts of the sensitive head
	Yes	Remove any materials or heaps of salt deposited in the formwork
	Yes	Change oil after 1,000,000 operations or after 1 year (only with compatible oil)
	Yes	Check the oil level or presence / traces of water inside
	Yes	Check the condition of the leakage of oil from the head
	Yes	Regulation of pressure valves (the amperage of the motor does not exceed 2.1 A)

It is preferred to do the operations of ordinary maintenance just before winter and just before summer, in this occasions you have to decide if turn on or not the resistance to maintain the temperature of the oil and avoid possible condensations or ice.

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ORDINARY AND PROGRAMMED MAINTENANCE

Chart N°4: Ordinary and programmed maintenance of oil-hydraulic components		
Periodicity	**Description of the intervention for general controls**	
6 months		
Yes	Check the fluid level in the tank:	
	CAUSE	CONSEQUENCES
	If the level quickly goes down	Losses of hydraulic oil
	If the level rises	Entrance of water from the breathing cap
Yes	Check tightness towards outside:	
	Visually check the pipes, the connectors and the support floors of the components; keep clean the bollard to find quickly the losses.	
Yes	Check noisiness:	
	An increase of the noise indicates anomalies in the bollard functioning.	
Yes	Check electrical absorbing:	
	An increase of the electrical absorbing of the electrical engine in parity of capacity/pressure indicates anomalies in the bollard functioning.	
Yes	Check fluid temperature:	
	The fluid must not exceed 90°C, the overcoming of this value causes the deterioration of gaskets and of the mechanical parts.	
Yes	Check settings of the pressures:	
	Verify the value of intervention of the pressure limiting valves, reduction gears, sequence.	
Yes	Check pollution of the fluid:	
	A emulsified, turbid or dark fluid indicates anomalies in the bollard functioning.	
Yes	Check flexible pipes:	
	Verify that on the pipes there aren't: cracks, abrasions, deformations, bubbles, tear coverage, swelling, sticking zones on the surface of the pipe, losses.	
	The anomaly above described needs the substitution of the pipe.	

ADVISED FLUIDS

SUPPLIER	DESCRIPTION/BRAND	CERTIFICATES
Eni	ATF DEXRON II D ISO VG32	
Panolin	HLPSYNTH E22 (olio biodegradabile)	ECOLABEL

WARNING FOR THE SUBSTITUTION OF THE FLUID

For the filling of the tank it is necessary to have a self-governing pump group of filling and filtering
The used fluid must be stocked in metallic watertight containers that must be put in appropriate places.
The used fluid must be only retired from authorized firms assigned to disposal and observing the current laws.
Possible rags wet with fluid must be kept in special containers for toxic materials, for the disposal follow the same rules foreseen for the fluid.

WARNINGS FOR THE PUTTING IN SERVICE

It is forbidden to put in service the Oil-hydraulic Central before the machine, where it will be incorporated, is declared conforming to the dispositions of the Directive 2006/42/CE and following modifications.

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For the manual operation, in case of missing power supply, consult the unlock illustrative card.
Verify that during the ordinary functioning of the bollard you don't hear vibrations or unusual noises.

NOTE FOR THE OPERATOR

It is recommended to the operator employed to the bollard's maintenance to:

- read carefully the following maintenance cards;
- photocopy the cards and fill them after having done the operation of maintenance
- preserve the cards with signature in original of the user of the bollard;
- preserve a copy of the filled card to have an updated register of maintenances (copy for whom does the maintenance).

Chart N°5: Tests for ordinary/extraordinary maintenance	
Card title	**Intervention description**
State standard commands / emergency for the operation of the bollard	
Functioning state of electronics equipments (response to controls, functioning logic, shutdown commands, emergency controls)	
State of the superficial paint	
State of obstacle detection with sensitive head **MAX3Kg** (not designed for the uprising of various objects and / or people)	
State detector for emergency vehicles (where foreseen)	
State traffic light or flashing lights, bright head LED (where foreseen)	
State magnetic coils / electronic photocells (where foreseen)	
State electrical valve (where foreseen)	
State efficiency hydraulic system (control unit, unlock, piston)	
State hydraulic oil (level and oil quality: degraded, emulsified)	
State of tightening of the screws and bolts for fixing components	
State power of the electrical components is correct	
State electronical devices (failures, presence of condensation, burns, sticked contacts, overheatings, shortcircuits, state of the tracks of the electrical circuit)	
State of the electrical power line	
State grounding system	
State ground conductors, manifold, PE, primary and secondary equipotential bonding conductors	
State of the polyurethane mold or polizene band (in plastic) scratch-resistant guide on the pipe / footboard	
State mechanic/magnetic limit switches	
State of the anti condensation resistance	
State of the plastic shoes (green / black)	
State setting beat last race piston (where foreseen)	
State pressure switch regulation (where foreseen)	
State of cleaning of the formwork	
State water drainage discharge on the bottom of the formwork	
State level of the water within the formwork	
State of the condensation within the sensitive head	
Presence of grease on the mechanicals contacts of the sensitive head	
General state, pressure, work, usury, cleaning.	

Signature of Technician:

_____

Signature of the Customer:

_____

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maintenance register

This maintenance register contains the technical references and records of installation, maintenance, repair and modifications done and must be made available for inspection by authorized people.

TECHNICAL DATA OF THE MOTORIZED TECHNICAL CLOSURE AND OF THE INSTALLATION

CUSTOMER: (Reference Person) _____
(Customer data) _____

CLIENT: (Reference Person) _____
(Client data) _____

CONSTRUCTION SITE: (Reference Person) _____
(Construction site data): _____

Order: (number of order) _____ (Order date) _____

Model and description: _____

Dimensions / weight / strength / speed: _____

Serial number / Year of building: _____

INSTALLED COMPONENTS LIST

The technical characteristics and the performances listed below are documented in the related installation manuals and/or on the component's label.

Actuation group: _____
Model, Type, Serial number

Control panel: _____
Model, Type, Serial number

Photocells: _____
Model, Type, Serial number

Security devices: _____
Model, Type, Serial number

Security devices: _____
Model, Type, Serial number

Security devices: _____
Model, Type, Serial number

Security devices: _____
Model, Type, Serial number

Security devices: _____
Model, Type, Serial number

Control devices: _____
Model, Type, Serial number

Control devices: _____
Model, Type, Serial number

Radio devices: _____
Model, Type, Serial number

Signaling devices: _____
Model, Type, Serial number

Signaling devices: _____
Model, Type, Serial number

Other: _____
Model, Type, Serial number

Other: _____
Model, Type, Serial number

PRODUCT CODES

FATHER	CONTROL PANEL	PISTON	RESISTANCE	ELECTRICAL VALVE	SENSITIVE HEAD

INDICATION OF RESIDUAL RISKS AND OF THE IMPROPER USE PREDICTABLE

Inform using signals affixed to the risk points of the product and / or by written indication to be delivered and explain to the user of the bollard or whoever is responsible, about the existing risks and about the improper predictable use.

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maintenance register

Description of the intervention

(Tick the box corresponding to the intervention made. Describe any residual risks and / or predictable improper use)

☐Installation ☐Starting ☐Settings ☐Maintenance ☐Repair ☐Changes☐ Enlargement☐ Other

NOTE____

____

Date:______________Signature of the Technician:___________________Signature of the Customer______________

Description of the intervention

(Tick the box corresponding to the intervention made. Describe any residual risks and / or predictable improper use)

☐Installation ☐Starting ☐Settings ☐Maintenance ☐Repair ☐Changes☐ Enlargement☐ Other

NOTE____

____

Date:______________Signature of the Technician:___________________Signature of the Customer______________

Description of the intervention

(Tick the box corresponding to the intervention made. Describe any residual risks and / or predictable improper use)

☐Installation ☐Starting ☐Settings ☐Maintenance ☐Repair ☐Changes☐ Enlargement☐ Other

NOTE____

____

Date:______________Signature of the Technician:___________________Signature of the Customer______________

Description of the intervention

(Tick the box corresponding to the intervention made. Describe any residual risks and / or predictable improper use)

☐Installation ☐Starting ☐Settings ☐Maintenance ☐Repair ☐Changes☐ Enlargement☐ Other

NOTE____

____

Date:______________Signature of the Technician:___________________Signature of the Customer______________

Description of the intervention

(Tick the box corresponding to the intervention made. Describe any residual risks and / or predictable improper use)

☐Installation ☐Starting ☐Settings ☐Maintenance ☐Repair ☐Changes☐ Enlargement☐ Other

NOTE____

____

Date:______________Signature of the Technician:___________________Signature of the Customer______________

Description of the intervention

(Tick the box corresponding to the intervention made. Describe any residual risks and / or predictable improper use)

☐Installation ☐Starting ☐Settings ☐Maintenance ☐Repair ☐Changes☐ Enlargement☐ Other

NOTE____

____

Date:______________Signature of the Technician:___________________Signature of the Customer______________

Description of the intervention

(Tick the box corresponding to the intervention made. Describe any residual risks and / or predictable improper use)

☐Installation ☐Starting ☐Settings ☐Maintenance ☐Repair ☐Changes☐ Enlargement☐ Other

NOTE____

____

Date:______________Signature of the Technician:___________________Signature of the Customer______________

Description of the intervention

(Tick the box corresponding to the intervention made. Describe any residual risks and / or predictable improper use)

☐Installation ☐Starting ☐Settings ☐Maintenance ☐Repair ☐Changes☐ Enlargement☐ Other

NOTE____

____

Date:______________Signature of the Technician:___________________Signature of the Customer______________

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ORDINARY MAINTENANCE CHART

Client / Construction site:		Model and description:					Serial number of the system:		
Tests done:		Date + ref.	Date + ref.	Date + ref.	Data + rif.	Data + rif.	Data + rif.	Data + rif.	LEGEND
		.....	.....	.....	.....	.....	.....	.....	
		RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	
1	Hydraulic control panel								
2	Hydraulic pipes / fittings								
3	Hydraulic circuit pressure								
4	Tensions / Amperage measuredi								
5	Hydraulic control panel oil level / lubrication systems								
6	Oil change (with same type of oil and gradation)								
7	Capacitor								
8	Engine/ Gear motor / Pneaumatic engine								
9	Electric brake / mechanical clutch								
10	Lubrication devices								
11	Counterweights and suspensions								
12	Trapezoidal screw of lifting								
13	Unlock / Maximum pressure valves								
14	Bright head LED / Flashing								
15	Traffic light / Additional bright signals								
16	Sensitive head / additional pressure switch								
17	Electrical valve								
18	Security devices								
19	Metal masses magnetic coils / Photocells								
21	Buzzers								
22	Detector for emergency vehicles								
23	Commands for emergency stop								
24	Selectors / control buttons								
25	Remote controls								
26	Command programmed time								
27	Electronic programmer								
28	Radio receiver / antenna								
29	Transformers / voltage reducers								
30	Anticondensate electric resistance / Thermostats								
31	Temperature detectors / Water / Level states								
32	Protections / fixed shelters / mobile shelters								
33	Mechanicals stops								
34	guidance skates / Wheels / Lanes / Printed strips								
36	Ground conductor / equipotential / Pickets								
37	Electric line / electric cables / connection plu-gs-sockets								
39	Test done with device regulated at .....mA								
40	Cable insulation with the appropriate tool								
41	Circuit breaker / Differential								
42	Paint and surface treatments								
NOTE:									Esito finale
		Technician Sign.	Technician Sign.	Technician Sign	Technician Sign	Technician Sign.	Technician Sign	Technician Sign.	
		Client Signature	Client Signature	Client Signatur	Client Signatur	Client Signature	Client Signatur	Client Signature	

LEGEND: (R)->Regularly working (N)->Negative result (X)->Not related to automation

In "final Result" should be reported R or N depending on the checks carried out.
If the check fails must be filled in also the "Maintenance negative results card", with the signature of the technician and the customer. Photocopy maintenance schedules and keep them into an archive therefore send it to the manufacturer when required.

info@mac-srl.it

NEGATIVE RESULTS MAINTENANCE CHART

Client / Construction site:	Model and description:	Serial number of the system:

	Tests done:	Date + ref. …… RESULT		LEGEND
1	Hydraulic control panel			
2	Hydraulic pipes / fittings			
3	Hydraulic circuit pressure			
4	Tensions / Amperage measuredi			
5	Hydraulic control panel oil level / lubrication systems			
6	Oil change (with same type of oil and gradation)			
7	Capacitor			
8	Engine/ Gear motor / Pneaumatic engine			
9	Electric brake / mechanical clutch			
10	Lubrication devices			
11	Counterweights and suspensions			
12	Trapezoidal screw of lifting			
13	Unlock / Maximum pressure valves			
14	Bright head LED / Flashing			
15	Traffic light / Additional bright signals			
16	Sensitive head / additional pressure switch			
17	Electrical valve			
18	Security devices			
19	Metal masses magnetic coils / Photocells			
21	Buzzers			
22	Detector for emergency vehicles			
23	Commands for emergency stop			
24	Selectors / control buttons			
25	Remote controls			
26	Command programmed time			
27	Electronic programmer			
28	Radio receiver / antenna			
29	Transformers / voltage reducers			
30	Anticondensate electric resistance / Thermostats			
31	Temperature detectors / Water / Level states			
32	Protections / fixed shelters / mobile shelters			
33	Mechanicals stops			
34	guidance skates / Wheels / Lanes / Printed strips			
36	Ground conductor / equipotential / Pickets			
37	Electric line / electric cables / connection plugs-sockets			
39	Test done with device regulated at …….mA			
40	Cable insulation with the appropriate tool			
41	Circuit breaker / Differential			
42	Paint and surface treatments			
NOTE:		Esito finale	WITH THE COMPLETION OF THIS FORM	
		Technic Sign	HAS BEEN REMOVED POWER TO THE AUTOMATION	
		Client Sign.		

LEGEND: (R)->Regularly working (N)->Negative result (X)->Not related to automation

In "final Result" should be reported R or N depending on the checks carried out.

If the check fails must be filled in also the "Maintenance negative results card", with the signature of the technician and the customer.

Photocopy maintenance schedules and keep them into an archive therefore send it to the manufacturer when required

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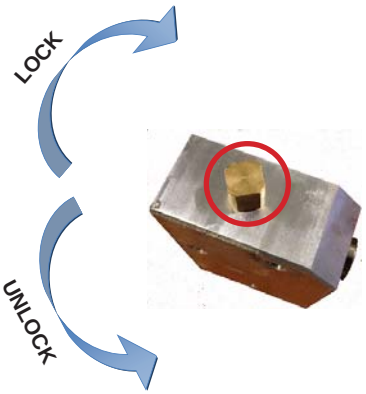
BOLLARD UNLOCK

1. Take the unlock key

2. Screw off the cap for unlock protection, turn anticlockwise to extract the cap.

3. Insert the key used previously to unlock the bollard. The unlock key has a sqare groove that must fit with the yellow shutter.

Warning:
Use this type of unlocking only in case of emergency or when the bollard is in block-out.
After the unlocking (when the bollard is completely down) close the unlock turning clockwise the key until the end.



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OIL CHANGE

Ordinary Maintenance
Periodicity every **12 months**

Maintain the oil level observable from the cap marked in the picture.
- Oil tank capacity 1,5 liters.
- TYPE: check the label.

- - - - Level Bollard Down

- - - - Level Bollard Up

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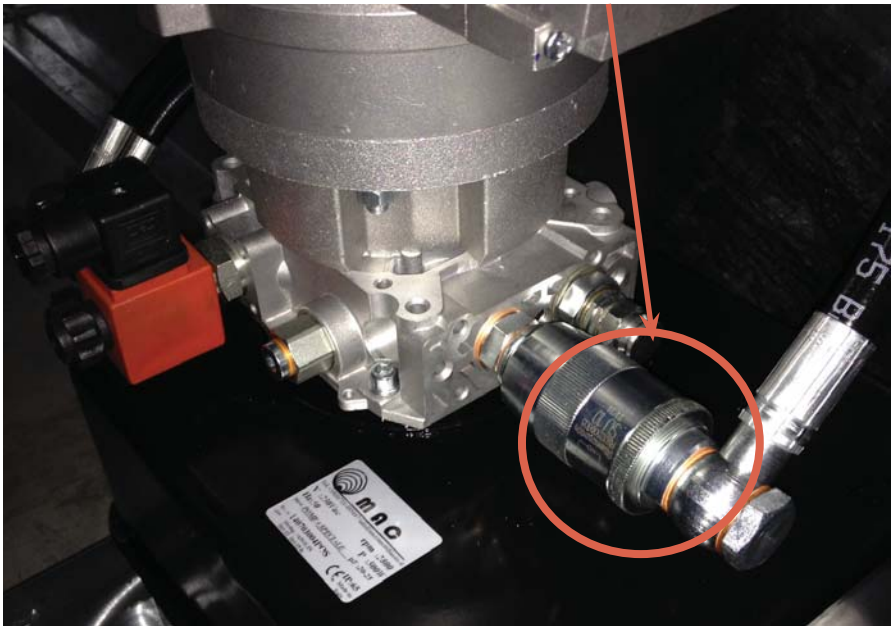
BOLLARD'S CLIMB STRENGTH REGULATION

Ordinary Maintenance
Frequency every **6 months**

After used the safety measures it's possible to regulate the lift and descent valves.

Turning the valves clockwise using the screwdriver you increase the hydraulic pressure.

Rising Pressure Valve



Electrical valve

BUZZER

The buzzer (can be placed within the bollard), is an intermittent acoustic device (“beep”…”beep”). It is activated few seconds before the handling of the bollard until the end of the handling.

DESCRIPTION	Un.	DATA
Power supply	Vac	230-50Hz
Power absorbed	mA	300
Operative frequency	Khz	2.8 ± 0.5
SPL at 1 mt. (V=220Vac)	dBa	100
Working temperature	°C	-20 / +60
Protection degree	IP	67

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