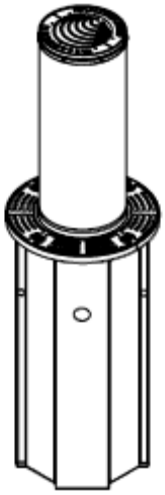
PAR537/STU094



ELECTRICAL CONNECTIONS FOR BRAIN4

CSAxxx CABxxx

[Compendium from Technical manual]

COMMITTENT DATA:

……:Firm
……
……: Name and surname
……: road, city, postal code
……
……

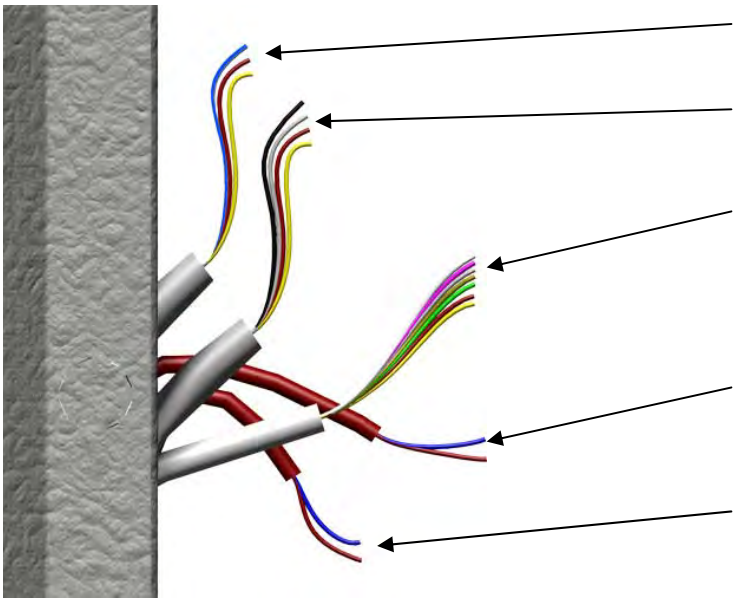
CLIENT DATA- JOBSITE:

……:Firm
……
……:Name and surname
……:road, city, postal code
……
……

READ CAREFULLY THE MANUAL BEFORE USE

ELECTRICAL CONNECTIONS CSAxxx FOR BRAIN4

Electrical connections: Electrical valve, oil-hydraulic power unit, Sensitive head+ LED Head, Magnetic limit switch.



--1--CABLE **Electrical Valve Vrac= 230Vac (ELET.V.)**
Type: 3 G 0,5 mm^2

--2—CABLE **Power supply engine V=230Vac (M1)**
Type: 4 G 1,5 mm^2

--3--CABLE **Sensitive head+ORION LED**
Power supply ORION LED (V= 24Vdc) +
n°2 L.s. head (N.C.) (SEC2) +
n°1 L.s. sensitive head (N.C.) (SEC1)+
Type: 7 G 0,5 mm^2

--4--CABLE **Limit switch (LOW)**
n°1 LO…(N.C.) (Limit switch1 Opening)
Type: 2x0,5 mm^2

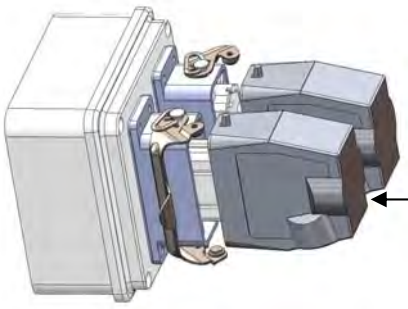
--5--CABLE **Magnetic limit switch (HIGH)**
n°1 LC…(N.C.) (Limit switch2 Closing)
Type: 2x0,5 mm^2

WARNING: Before the installation, please read carefully this manual .

N° connector PLUG	cords number	cords colour *(REF.PLUG)*	cords description	BRAIN4
--1 CABLE 3G0,5 mm^2 → **ELECTRICAL VALVE POWER SUPPLY CABLE(ELET.V.) (V=230vac)**				**(optional)**
T (10cont.)		YELLOW/GREEN	Cable grounding of electrical valve	
1 (10cont.)		BLUE	Electrical valve power supply 230Vac	**ELET.V.(19)**
2 (10cont.)		BROWN	Electrical valve power supply 230Vac	**ELET.V.(20)**
--2--CABLE 4G1,5 mm^2 → **ENGINE POWER SUPPLY CABLE((M1) (V=230vac 50Hz)**				
T (10cont.)		YELLOW/GREEN	Grounding cable of engine	
3 (10cont.)		GREY	**COMMON**	**(5) (8) (11) (14)**
4 (10cont.)		BLACK	Power supply for	
5 (10cont.)		BROWN	**OPENING** or **CLOSING**	**(4) (7) (10) (13)** **(6) (9) (12) (15)**
INSERT THE CONDENSER 20/25mF between the black and brown cable				
--3 CABLE 7G0,5 mm^2 → **SENSITIVE HEAD + bright head ORION LED (V=24vdc)**				**(optional)**
		YELLOW/GREEN	Grounding cable	
1 (12cont.)	*1	WHITE (-)	Power supply ORION LED (bright head)	**- 0 Vdc (25)**
2 (12cont.)	*2	PINK (+)	Power supply ORION LED (bright head)	**+ 24 Vdc(26)**
4 (12cont.)	*6	GREY	N°2 Contacts NC *(Limit switch with type of contacts:positive)* Limit switch sensitive head SECURITY2	**S2(47)**
5 (12cont.)	*5	YELLOW	COMMON limit switch sensitive head SECURITY2	**C (46)**
6 (12cont.)	*4	GREEN	COMMON limit switch sensitive head SECURITY1	**C (46)**
7 (12cont.)	*3	BROWN	N°1 Contact NC *(Limit switch with type of contacts:positive)* Limit switch sensitive head SECURITY1	**S1(45)**
--4 CABLE 2x0,5 mm^2 → **MAGNETIC LIMIT SWITCH1 → located LOW**			**Fn OPEN**	
3 (12cont.)		BLU	COMMON	**C(34)**
8 (12cont.)		BROWN	Contact NC	**L0(35)**
--5CABLE 2x0,5 mm^2 → **MAGNETIC LIMIT SWITCH2 → located HIGH**			**Fn CLOSED**	
3 (12cont.)		BLU	COMMON	**C(34)**
9 (12cont.)		BROWN	Contact NC	**LC(33)**
--6 CABLE 3x1,5 mm^2 → **SELF-ADJUSTED RESISTANCE (V=230vac)**				**(optional)**
T (10cont.)		YELLOW/GREEN	Grounding cable of resistance	
6 (10cont.)		BLU	Resistance power supply 230Vac	
7 (10cont.)		BROWN	Resistance power supply 230Vac	
--7--CABLE 2x1,5 mm^2 → **ACOUSTIC SIGNALLER (V=230vac)**				**(optional)**
8 (10cont.)		BLU	Acoustic signaller power supply 230Vac	
9 (10cont.)		BROWN	Acoustic signaller power supply 230Vac	
--8--CABLE 2x0,5 mm^2 → **MAGNETIC LIMIT SWITCH3 FOR SECURITY (high bollard)**				**(optional)**
11 (12cont.)		WHITE	COMMON	
12 (12cont.)		WHITE	Contact NC (max 10W) (max150Vac/dc) (max0.5A)	
--9--CABLE 2x0,5 mm^2 → **MAGNETIC SENSOR FOR SECURITY (no opening formwork)**				**(optional)**
11 (12cont.)		WHITE	COMMON	
10 (12cont.)		WHITE	Contact NC (max 10W) (max100Vcc) (max1A)	

For connections scheme without electrical device Brain4 it's necessary check the manual.
"Electrical connections CSA300 (BRAIN4)"

ELECTRICAL CONNECTIONS CSA300+PLUG



←--A--CABLE **Engine power supply V=230Vac**
Electrical valve Vrac=230Vac
Resistance V=230Vac
Type : Multicore cable 4x1,5 mm^2

←--B--CABLE (**ACCESSORIES)**
Power supply ORION LED V=24Vdc
Limit switch sensitive head S1-S2
Magnetic Limit switch 1/2 LC/LO
Magnetic Limit Switch 3 boll. HIGH
Magnetic Tracer FORMWORK
Type : Multicore cable 12x0,5 mm^2

WARNING: Before the installation, please read carefully this manual .

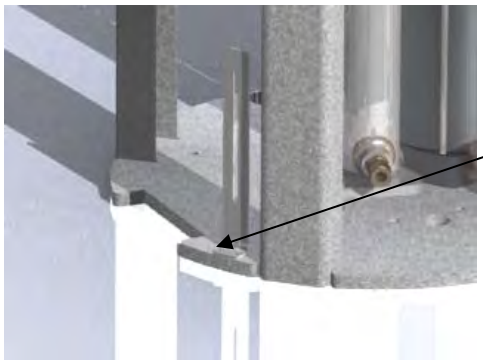
CORDICELLE SPINA			CORDICELLE PRESA			
Number plug	Num cords	colour cords	colour cords	Numb. plug	description cords	*BRAIN4*
--A-- CABLE multicore 12x0,5 mm^2 (ACCESSORIES)						
1 (12cont)	*1	WHITE	WHITE	1 (12cont)	Power supply ORION LED (Bright head)	**- 0 Vdc(25)**
2 (12cont)	*2	PINK	PINK	2 (12cont)	Power supply ORION LED (Bright head)	**+24Vdc(26)**
3 (12cont)		BLUE	LIGHT BLUE	3 (12cont)	COMMON Magnetic limit switch HIGH/LOW	**C (34)**
4 (12cont)	*4	GREY	GREY	4 (12cont)	COMMON Limit switch sensitive head SIC2	**C (46)**
5 (12cont)	*5	YELLOW	YELLOW	5 (12cont)	**NC** Limit switch sensitive head SIC2	**S2(47)**
6 (12cont)	*6	GREEN	GREEN	6 (12cont)	COMMON Limit switch sensitive head SIC1	**C (46)**
7 (12cont)	*3	BROWN	BROWN	7 (12cont)	**NC** Limit switch sensitive head SIC1	**S1(45)**
8 (12cont)		BROWN	RED	8 (12cont)	**NC** Magnetic Limit switch1 LOW (open)	**FA(35)**
9 (12cont)		BROWN	PURPLE	9 (12cont)	**NC** Magnetic Limit switch2 ALTO (closed)	**FC(33)**
10(12cont)		WHITE	RED-BLUE	10(12cont)	**NC** magnetic contact of security formwork	
11(12cont)		WHITE	BLACK	11(12cont)	COMMON security contacts	
12(12cont)		WHITE	GREY-PINK	12(12cont)	**NC** Magnetic limit switch3 of security boll. High	
B-- CABLE multicore 10G1,5 mm^2 (ENGINE+ELECTRICAL VALVE + RESISTANCE)						
T (10cont)		YELLOW/GREEN	RED-BLUE	T (10cont)	Grounding cable	
1 (10cont)		BLUE	WHITE	1 (10cont)	Electrical valve power supply 230Vac	**ELET.V.(19)**
2 (10cont)		BROWN	PINK	2 (10cont)	Electrical valve power supply 230Vac	**ELET.V.(20)**
3 (10cont)		GREY	GREY	3 (10cont)	Engine Power supply 230Vac **COMMON**	**(5)(8)(11)(14)**
4 (10cont)		BLACK	YELLOW	4 (10cont)	Engine Power supply 230Vac	
5 (10cont)		BROWN	GREEN	5 (10cont)	**OPENING** or **CLOSING**	**(4)(7)(10)(13) (6)(9)(12)(15)**
6 (10cont)		BLUE	BROWN	6 (10cont)	Resistance power supply 230Vac	
7 (10cont)		BROWN	LIGHT BLUE	7 (10cont)	Resistance power supply 230Vac	
8 (10cont)		BLUE	RED	8 (10cont)	Acoustic signaller power supply 230Vac	
9 (10cont)		BROWN	PURPLE	9 (10cont)	Acoustic signaller power supply 230Vac	
Insert the condenser of 20/25mF in the clamps of BRAIN4 between the black and brown cable on each installed bollard.						

ELECTRICAL CONNECTIONS HEAD CSA300

←--D-- CABLE **SENSITIVE HEAD + BRIGHT HEAD**
Type: Multicore cable 7G 0,5 mm^2

--D--CABLE 7G 0,5 mm^2 → **SENSITIVE HEAD + BRIGHT HEAD ORION LED (V=24vdc)**				
Number plug	***Number cords***	***Colour cords***	***Description***	***BRAIN4***
8 (7cont.)		YELLOW/GREEN	Grounding cable	
1 (7cont.)	*1	WHITE(-)	Power supply ORION LED (bright head)	**-0Vdc(25)**
2 (7cont.)	*2	PINK (+)	Power supply ORION LED (bright head)	**+24Vdc(26)**
6 (7cont.)	*4	GREEN	COMMON limit switch sensitive head SECURITY1	**C(46)**
5 (7cont.)	*5	YELLOW	COMMON limit switch sensitive head SECURITY2	**C(46)**
4 (7cont.)	*6	GREY	N°2 Contacts NC *(Limit switch with type of contacts: positive)* limit switch sensitive head SECURITY2	**S2(47)**
7 (7cont.)	*3	BROWN	N°1 Contact NC *(Limit switch with type of contacts: positive)* limit switch sensitive head SECURITY1	**S1(45)**

ELECTRICAL CONNECTIONS GROUND CONDUCTOR



--E-- CABLE 6mm^2
Connect here the grounding cable

--E--CABLE 6 mm^2 → **ground conductor**		**(optional)**
		Grounding cable bollard's structure

REVISION OF THE INSTRUCTION BOOK:

Revision	Edition	Made by	Approved by	Object
R0	10/11/2006	T.L.	M.F.	Instruction book CSA300
R1				
R2				
R3				
R4				

WARNING:

WARNINGS FOR THE INSTALLATION

NOTE:
At the end of the installation the specialized firm must fill the form, written in the last page, with all the identification data, stamp and signature.

WARNING

During the movements the bollard must always be in a stable and safe position.
During the lifting up the area around the bollard is to be considered dangerous zone.

D.P.I. FOR THE OPERATOR RESPONSIBLE FOR THE MECHANICAL MAINTENANCE

Chart N°1: INDIVIDUAL PROTECTION DEVICES FOR THE OPERATOR RESPONSIBLE FOR THE MAINTENANCE		
Pictogram	***Description***	***Description of the operation for general controls***
	SHOES	Use of safety shoes to avoid the risks produced by the falling of materials during the operations of maintenance (especially during the dismantlement of parts).
	PROTECTION GLOVES	Hand protection gloves in case of manipulation of objects that can cause damage.
	SUITABLE CLOTHES	Suitable clothes (for example the overall): it is forbidden to use clothes with large sleeves or appendixes that can be held back by mechanical devices.
	GLASSES PROTECTIVE GLASSES FOR WELDING	Keep at your own disposal: Accident-prevention glasses, in case that grinding operations or similar operations are necessary. Protective glasses for welding, 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.

EQUIPMENT FOR THE INSTALLATION

The equipment for the installation is:

- drill;
- hammer;
- level;
- set of cross shaped and cut shaped screwdrivers;
- set of keys for hexagonal head screws;
- measure meter;
- set of keys for hollow hexagonal head screws (allen spanner);
- tester.

DELIVERY OF THE BOLLARD

All the material is carefully controlled by the builder before the shipment. Receiving the bollard make sure that it has not had damages during the transport and that nothing has been tampered or taken off. In the event that you find damages in the bollard or missing parts inform immediately the vector and the builder producing photographic documents.
At the moment of unpacking, throw away the components considering the National Laws of Solid Waste.

LIFTING UP AND TRANSPORT

The lifting up and the transport of the bollard can be realized:

- manually:
  n°2 people per bollard weighting less than 60Kg;
  n°4 people per bollard weighting less than 120Kg;

- Through a crane with ropes for lifting up a bollard weighting more than 120Kg; the ropes must have more lifting force than the bollard and must be in good state of maintenance and sealed CE.

For the bollards weighting more than 120Kg, the lifting up by crane is made through a ring SEE MECHANICAL MAINTENANCE INSTRUCTIONS.

WARNING

As regards the transport of the bollard it is necessary to use means having minimum capacity higher than the weight of the bollard (the weight of the bollard is on the identification plate).
Before starting the handling it is necessary to verify the efficiency of the means of lifting and their capacity.

WARNING

During the operations of lifting up and displacement of the bollard it is necessary to adopt any possible caution to avoid dangerous movements that could cause accidents or damages to people and/or material and objects.
Avoid sudden movements that could damage the bollard.
The operations of movement of the dissuader must be done by expert personnel.
During the lifting up all the surrounding area is to be considered dangerous zone: make sure that nobody is in that zone and check that the bollard is always in a stable and safe position.

INSTALLATION OF THE BOLLARD

WARNING

The following described procedures of installation must not be done by the final user or by a not specialized building firm.

DANGER OF CRUSHING

During the operations of installation it is necessary to adopt any possible caution to avoid movements that can cause accidents or damages to people and/or materials and objects.

For a correct installation of our product CSA300 please read all the instructions below.

WARNING

This symbol is used in these instructions when the respect or the wrong interpretation of the information, prescriptions or procedures, regarding the installation, can cause inconveniences or damages to the bollard CSA300.

Check the consistency of the ground; It has not to be friable (if friable it is necessary to realize a bigger dig to stabilize the bollard, in order to avoid the exit of the concrete plinth after a smash).
Make sure that the placing position of the bollard is not in a drainage area.
It is always necessary to install a sewage system for the water harvesting.
Proceed according to the following points:

1. Make a dig of 1,45 m.
   Follow carefully the drawing TI490 where the dig in the ground is shown in details.
   The view from above of the drawing TI490 shows:
   - A square dig of 1,2x1,2 m. on the surface of the road and another square dig 60x60 1,13 cm from the floor surface.

   The view in section A-A shows the pyramidal shape of the dig having a base with a side of 1,3 cm. After the pyramidal dig, make a square dig in the ground with side 60x60 for a total deepness of 1,45 m.
   Put 30 liters of water in the dig to verify the drainage. If after ten minutes the dig is empty there's no need to install a sewerage system.

2. If needed, proceed with the realization of a storm sewer posing a PVC pipe with diameter of 80 mm, to be joined to the sewerage system or in alternative to a catch basin with a draindown system with a deepness bigger than the pipe with 80 mm diameter for the water discharge.

3. Insert gravel with-large grain of 22 / 32 mm of diameter up to the filling of the dig 60x60 cm deepness 32 cm as in drawing TI491.
Compact the gravel to avoid changes due to the settlement of the ground.

4. Insert a layer of geotextile with a square surface 60x60 cm (gr. 300) on the compacted gravel.

5. Put the PVC pipe (diameter of 200 mm and length 21cm) in the middle of the dig on the geotextile (the PVC pipe is necessary for the passage of the rain-water).

6. Put 21 cm. of concrete (RCK 350 Kg/cmq) on the dig.
The dimension of concrete base must be 1,3x1,3 cm x H 21 cm.
Consider that the pipe must remain in the middle of the dig.
WARNING: the concrete base must be checked with a level (to have a good support for the bollard)
WARNING: compare the concrete base with the drawing TI491.

7. Wait for the solidification of concrete base.

8. Put the provided formwork on the concrete base taking care to position it perpendicularly, considering that the upper part of the formwork must be 1,15 cm higher than the trampling line (to limit the presence of rain-water in the catch basin).
Watch in the drawing TI492 the “U” guides of the formwork.

WARNING: PUT THE FORMWORK FOLLOWING THE TRAFFIC WAY AS IN THE VIEW FROM ABOVE OF THE DRAWING TI492.

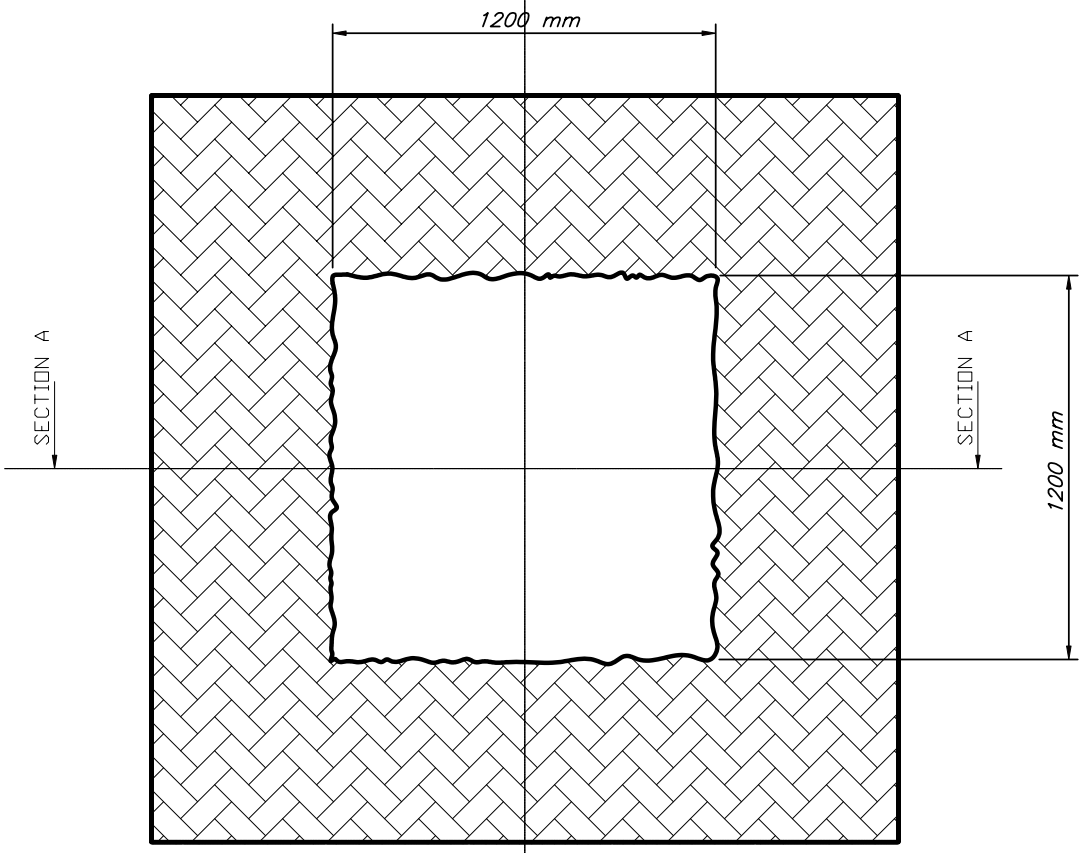
9. Insert the flexible corrugated piping (diameter 50 mm) in one of the 50 mm holes described in the drawing TI492 (for the passage of the power supply and commands).
This piping is to be connected to the catch basin of the station of management and movement.

10. Break the 32 mm pre-holes and insert the corrugated piping to join the foundation formwork as in example in the drawing TI494 (view from above).
This connection is necessary to connect the accessories of the bollard CSA300.

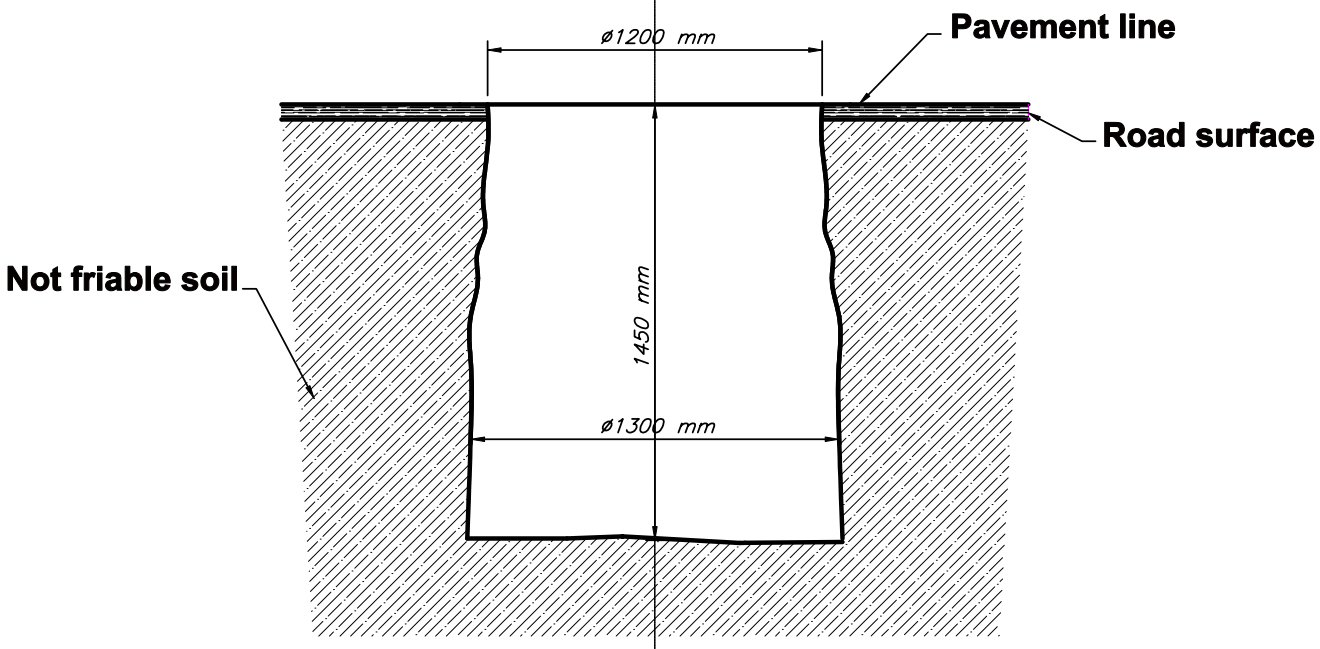
11. Put the concrete **RCK 350 Kg/cmq** all around the catch basin.
WARNING: Verify that the concrete sticks to the walls of the formwork.
WARNING: Verify that during the concrete cast the formwork remains at ground level.
WARNING: the concrete cast can’t be lower than 87cm from the first concrete base.
The second concrete cast can reach the trampling area.

NOTE: The piping must be posed in accordance with the laws in force.

VIEW FROM HIGH

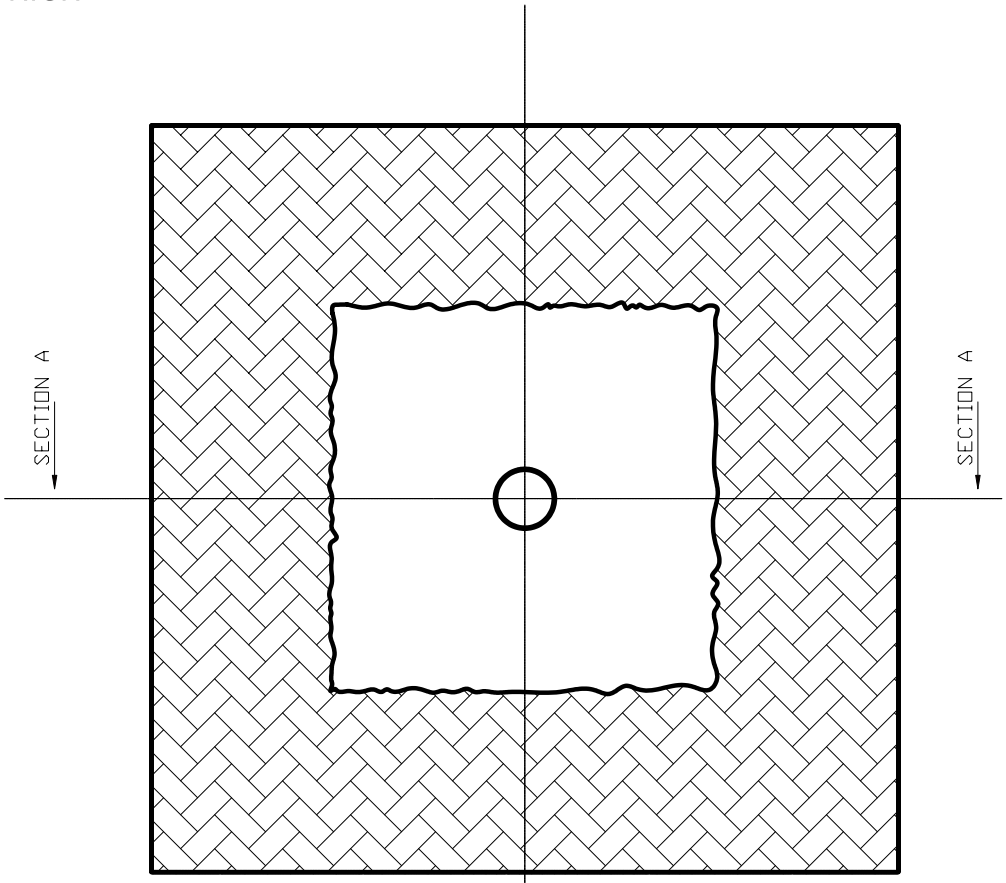


VIEW SECTION A-A

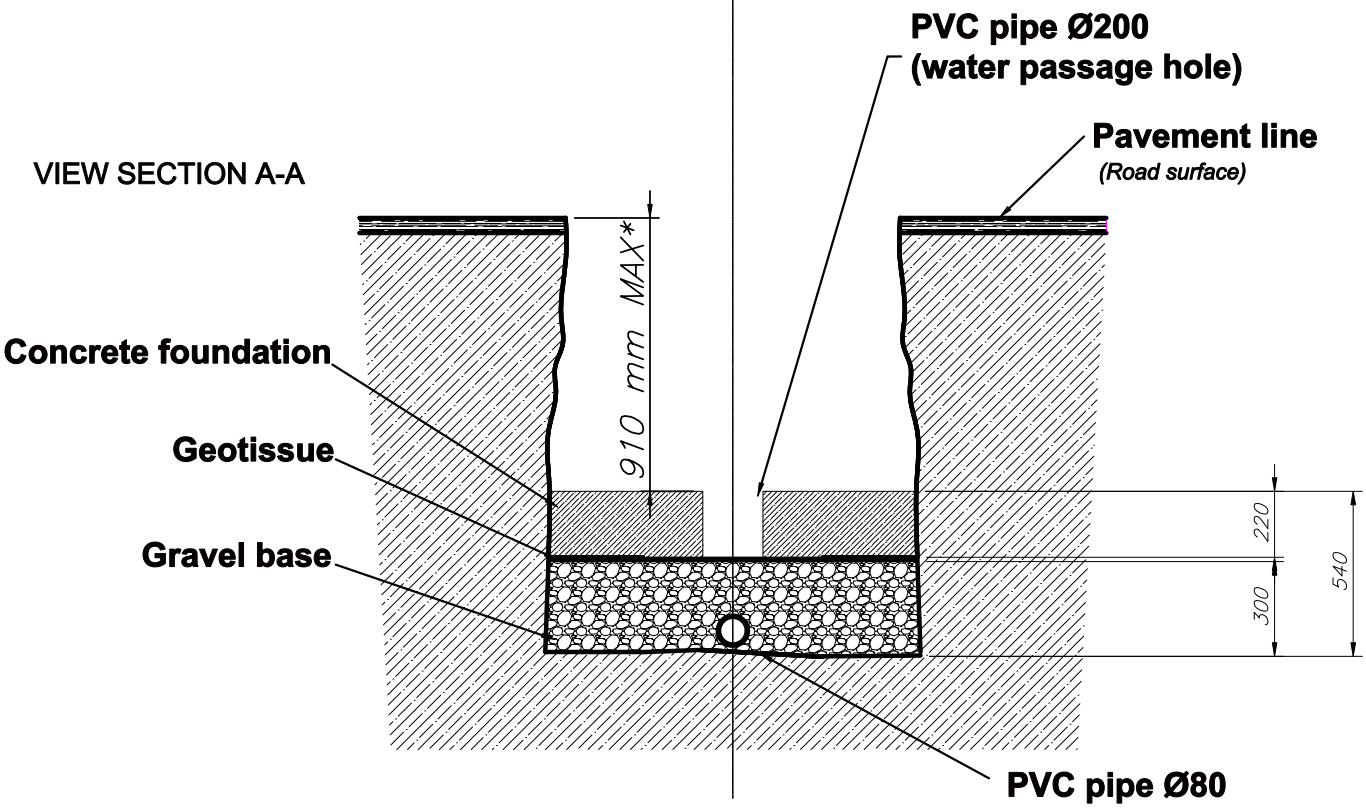


DATA	21/02/2011
DESCRIZIONE	Dimensions for the excavation in the ground
RIFERIMENTO	TI273 V.1
CODICE DISEGNO	TI490

VIEW FROM HIGH



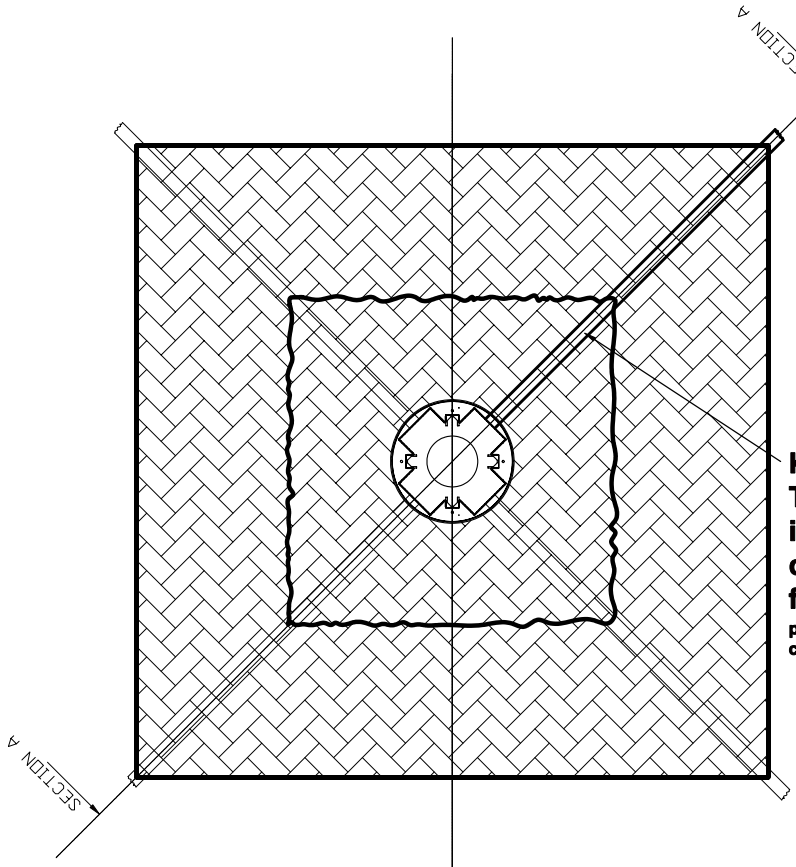
VIEW SECTION A-A



** THE MEASURE 910 mm. IS REALLY IMPORTANT IN ORDER TO HAVE A DIFFERENCE IN LEVEL BETWEEN THE FORMWORK OF THE BOLLARD AND THE PAVEMENT LINE OF 20 mm.*

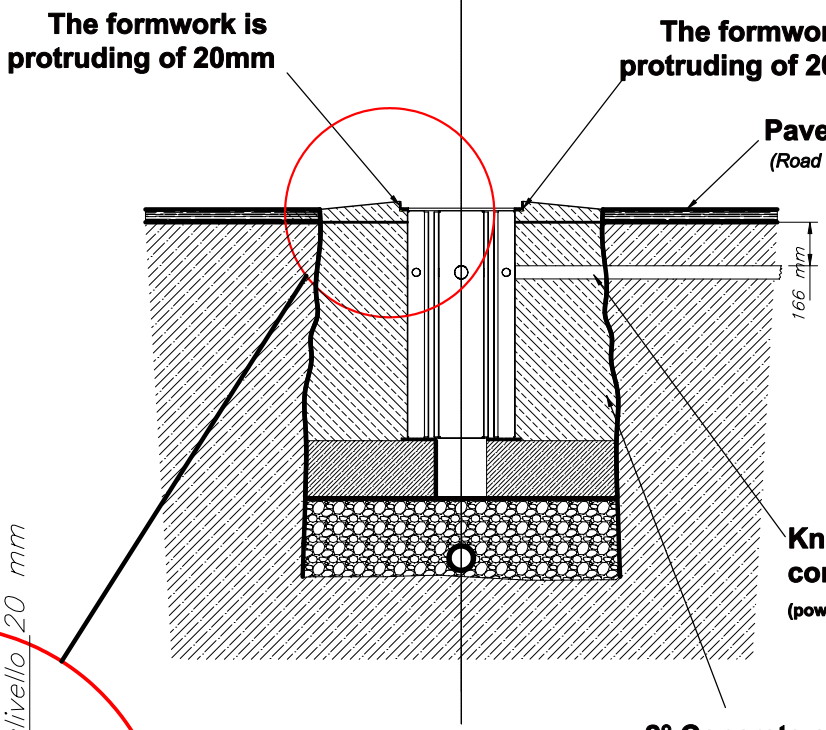
	21/02/2011
SCRIZIONE	Dimensions for placing the gravel base and drainage in place concrete formwork
	TI273 V.1
	TI491

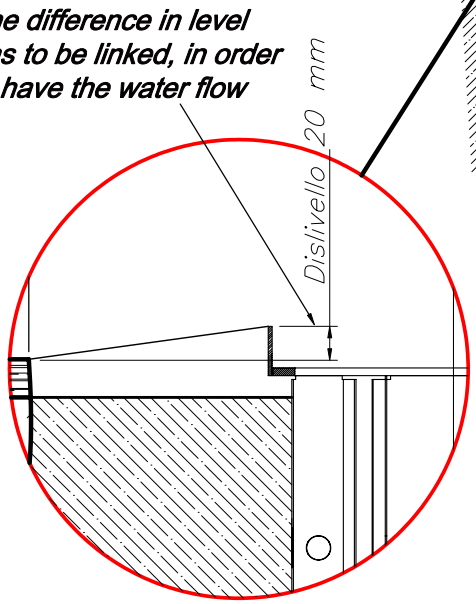
VIEW FROM HIGH



Knurled conduit Ø50. The conduit can be installed in four different point of the formwork (there are 4 provident pre-holes for the conduit of Ø50 mm.)

VIEW SECTION A-A

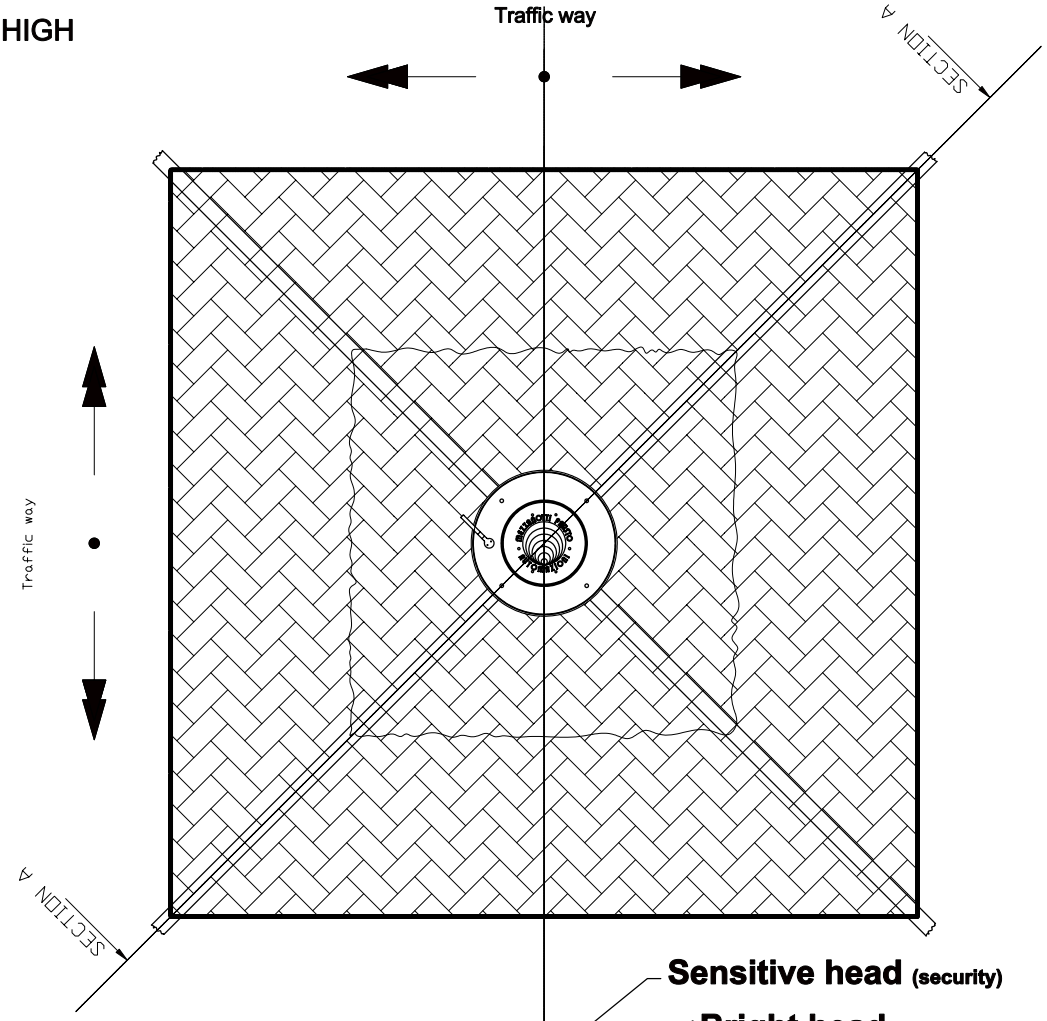




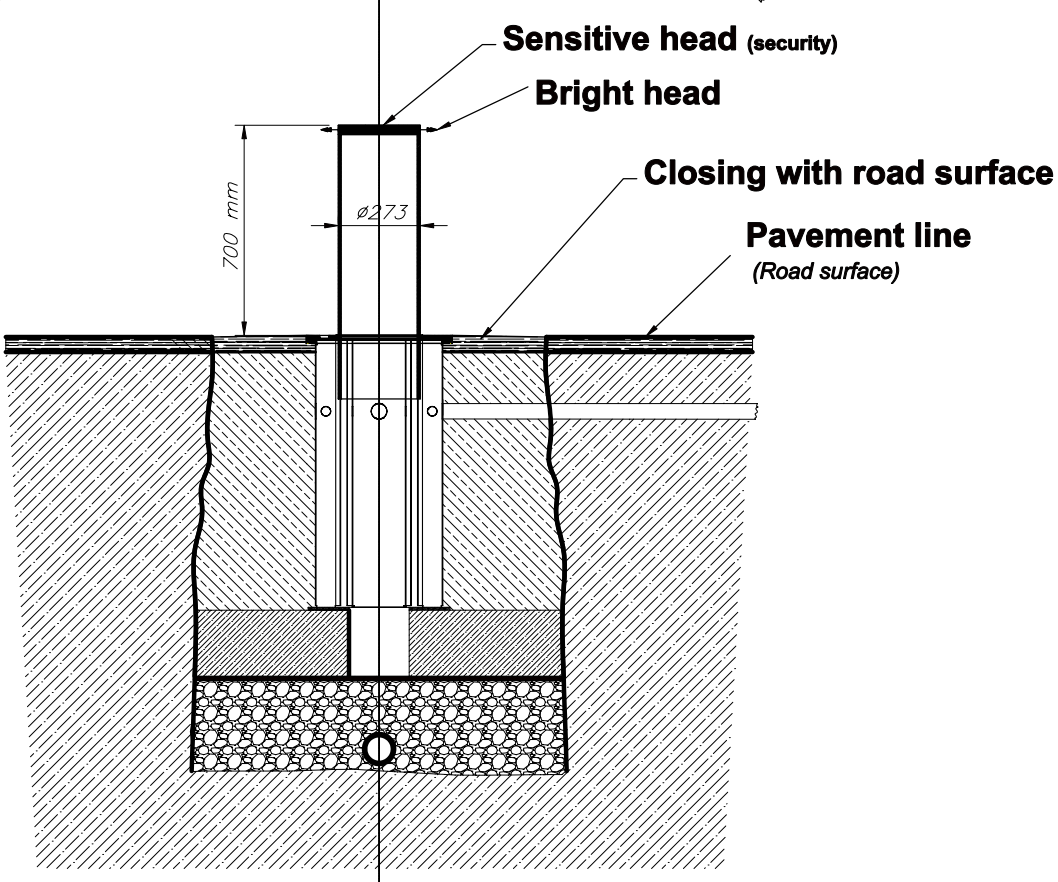
DATA	21/02/2011
DESCRIZIONE	Positioning of foundation formwork and concreting the second
RIFERIMENTO	TI273 V.1
CODICE DISEGNO	TI492

VEKTOR

VIEW FROM HIGH

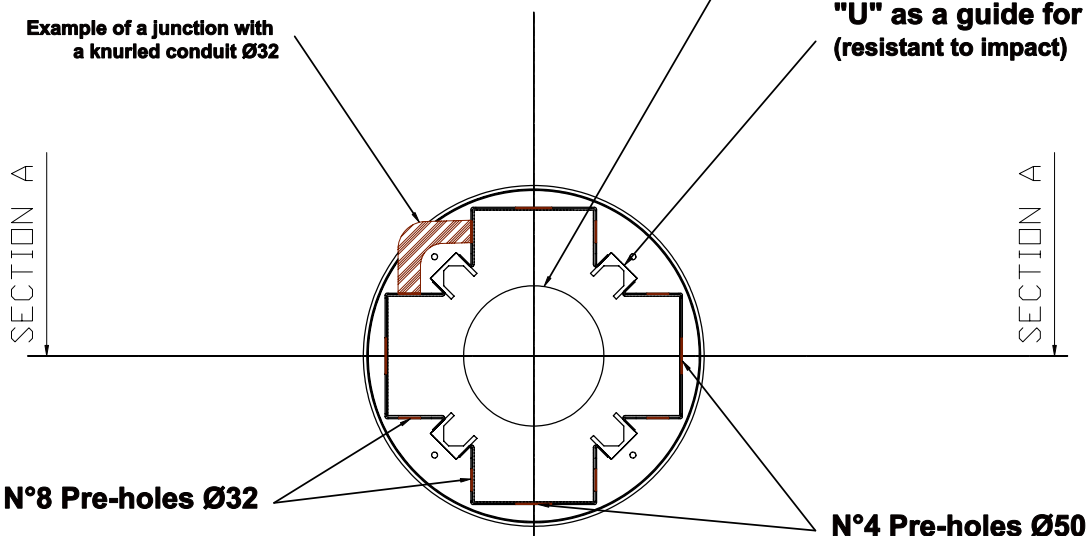


VIEW SECTION A-A

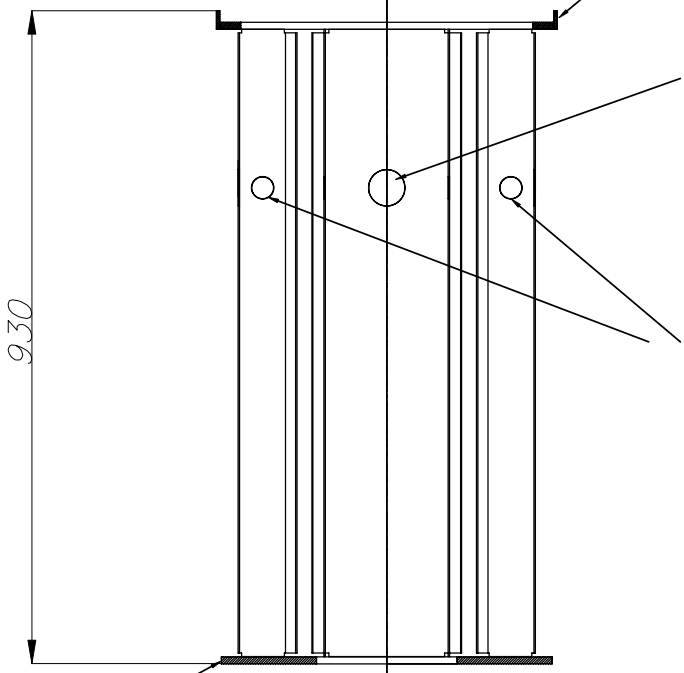


DATA	21/02/2011
DESCRIZIONE	Placement of the bollard and finishing last thrown
RIFERIMENTO	TI273 V.1
CODICE DISEGNO	TI493

VIEW FROM HIGH



VIEW SECTION A-A



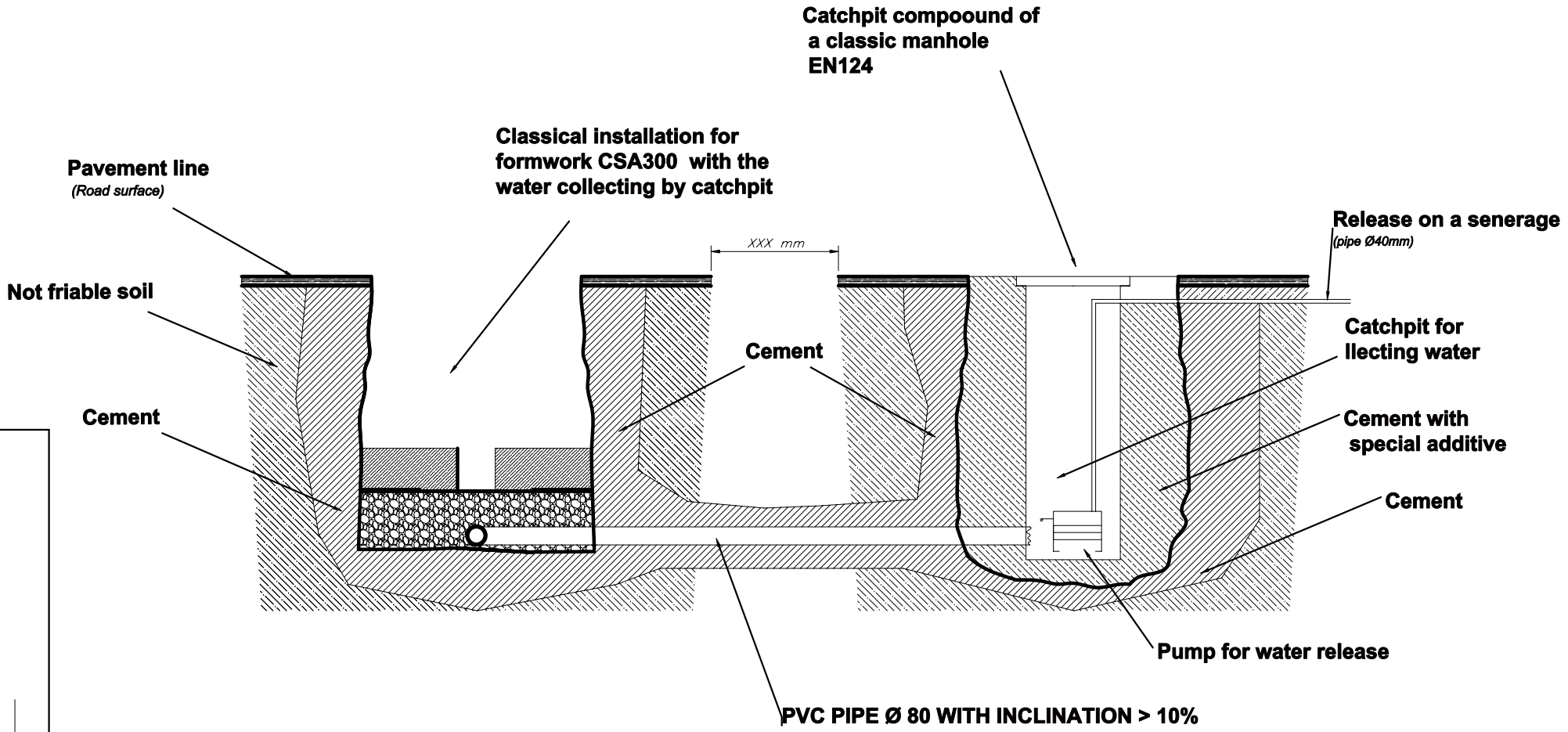
Calendered plate for contain flange

Pre-hole for the passage of flexible knurled pipe Ø 50
WARNING: You should break through in order to insert the pipe of power supply and commands.
(Total 4 holes located on the all four sides of bollard)

Pre-hole for the passage of flexible, knurled pipeØ 32
WARNING: you should break trought the pre-hole in order to insert the pipe.
INFO: This conduit is necessary for accessory links that are located inside the foundation formwork.
(Total 8 holes located on the all four sides of bollard)

Base flange of formwork

DATA	21/02/2011
DESCRIZIONE	Description of the foundation formwork
RIFERIMENTO	TI273 V.1
CODICE DISEGNO	TI494



WARNING:
This pipe of system has been thought for lands with a low quality of dreinage and/or where there isn't any chance to direct everything in a sewer system.

This draining shows how install a catchpit for the release of excess water from the formwork of the bollard.
All the cement that it covers the bollard and the catchpit, it has to contain a special additives that they isolate and hold the water from the land.
It can install only one catchpit also, in order to aspirate the water of the all four bollards.

TI495	TI273 V.1	Illustrazione di creazione secondo pozzetto per eventuale installazione pompa per deflusso acqua eccessiva	21/02/2011

zzazione

EDITION

Code **MECHANICAL MAINTENANCE INSTRUCTION BOOK** Edition **29/04/2010**

REVISION OF THE INSTRUCTION BOOK:

Revision	Edition	Made by	Approved by	Object
R0	21/03/2008	T.L.	M.F.	MECHANICAL MAINTENANCE CSA300-2008.pdf
R1				
R2				
R3				
R4				

WARNING:

WARNINGS FOR THE INSTALLATION

The installation must be entrusted to **BUILDING ENTERPRISES SPECIALIZED IN INSTALLATION.**

NOTE:
At the end of the installation the specialized firm must fill the form, written in the last page, with all the identification data, stamp and signature. On the contrary the company MAC SRL reserves all its right to recede from the guarantee terms.

The person involved in the installation of the bollard must have an appropriate formation and must be well-informed about the work he is about to do.
The operator must use proper means fit for the installation in safety conditions. So it is advised to use working tools in perfect state of use as foreseen by the respective builders.
The operator must also know the laws that protects himself and the people exposed, in subject of machines and environment of use. The operator will have to consider carefully the place where the bollard must be installed so that the operations do not lead to dangers of residual nature: the operator must take care that the movable parts are free from obstacles and the movements are linear.

Before starting the movements of the bollard, it must be verified:

- The efficiency of the means of lifting;
- The lifting force of the means of lifting;

During the operations of lifting up and displacement of the bollards, it is necessary to adopt safety measures to avoid any possible dangerous movement that could cause accidents or damages to people and materials.
During the lifting up avoid sudden movements that could damage the bollard.
For the lifting up of the bollard or parts of it, it is necessary to use means having a minimum force higher than the claimed weight.
Operate with extreme care to avoid damages to people and things.

The lifting up operations must be done by expert staff. Make sure that nobody is in the dangerous zone.

WARNING

During the movements the bollard must always be in a stable and safe position.
During the lifting up the area around the bollard is to be considered dangerous zone.

Up till the bollard is not entirely lifted up it is advisable to verify the correct balancing of it.
The lifting up must be done with continuity (avoiding impulses).
Keep the load in the lowest possible position during the movements to gain stability.

GENERAL WARNINGS

NOTE: 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 **FIRM 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 Corporate Body of Safety, 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 call 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 pets 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 are 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 aware that he has to consider that:

- 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 utensil or tool;
- The shelters and the safety devices can be removed partially or entirely 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.

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

Chart 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 damage
	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 PROTECTIVE GLASSES FOR WIELDING	Keep at disposal: Accident prevention glasses, in case it is necessary to make operations of grinding or similar. 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.

PROCEDURES OF MAINTENANCE

PUT IN STATE OF MAINTENANCE:

Proceed as follows:

1. Unauthorized personnel or pets are not allowed in the surrounding area of the bollard and in the execution area of the operations of maintenance;
2. Sign the zone considered dangerous during the maintenance (with signal posters or bordering the area with red-white stripes);
3. Dissect the electrical tension putting on “OFF” the general switch installed on the electrical board;
4. Do the operations as described.

ELEMENTS IN TENSION:

WARNING

During the procedure of mechanical maintenance of the bollard CSA300, 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°2: OPERATIONS OF ORDINARY AND PROGRAMMED MAINTENANCE

Periodicity		*Description of the operation for general checking*
6 months[1]	**12 months**[*1]	
☑	☐	Check that the bollard respect all the commands
☑	☐	Check the linearity of the movements of the bollard
☑	☐	Check the clamping of the screws and the bolts for the fixing of the components
☑	☐	Check the mechanical limits switch
☑	☐	Check the losses of oil
☑	☐	Check the functionality of the release
☑	☐	Check that the bollard doesn’t make strange noises
☑	☐	Check the regulation and the integrity of the anti-wear shoes (of green color)
☑	☐	Check with easy tests (using witnesses) the correct functioning of all the safeties
☑	☐	Check the electrical line of power
☑	☐	Check the earthing plant
☑	☐	Check the earth conductors, collector, PE, equipotential primary and secondary conductors
		Description of operation for detailed checking
☑	☐	Check the integrity of the rubber guide
☑	☐	Lubrication of pivots lever of the sensitive head
☑	☐	Regulation wisecracks last run piston
☑	☐	Regulation manostat (where foreseen)
☐	☑	Change oil after 1.000.000 movements or after 1 year
☑	☐	Control the oil level
☑	☐	Regulation valves of maximum pressure (the amperage of the engine must not be more than 2,1A)

[*1] It is preferred to do the operations of ordinary maintenance just before winter and just before summer.

MAINTENANCE CARDS

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;
- Keep the cards with signature in original of the user of the door;
- Keep a copy of the filled card to have an updated register of maintenances (copy for whom does the maintenance).

Chart N°3: List maintenance cards	
Card title	***Description for general checking***
Check the regulation and the integrity of anti-worn shoes (green colour)	
Points for extracting GRUPPO A from the formwork	
Check the stem and dust-proof of the oil-hydraulic cylinder	
Lubrication of pivots lever of the sensitive head	
Regulation and centering of mechanical pipe	
Regulation of limits switch of piston	
Change oil	
Regulation valves of maximum pressure	

GENERALITIES AND WARNINGS

MAINTENANCE OF HYDRAULIC COMPONENTS

- The bollard has been carefully controlled and tested in all its functions before leaving the factory.
- Every right of warranty decays if it is recognized that the bollard has been modified or tampered from personnel not called by us.
- The oil-hydraulic central is built to be installed in closed places.
- Do not smoke and don't get flames near during the operations of changing and filling up of the fluid.
- Do not weld on the bollard full of fluid or do reparations with the bollard in function.
- Do not overrun the maximum pressure indicated on the scheme and do not modify the electrical and oil-hydraulic connections.
-

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 ambient with temperature between 0°C and 40°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 oil-hydraulic connections made with hard pipes, cold drawn steel pipes without welding must be used, or annealed copper pipes.

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 metres per second
- Fastness of the fluid in the pipes of return 2-3 metres per second
- Fastness of the fluid in the pipes of aspiration 0,5 metres 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 and of the diameter of the pipes.

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 exit 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
- Verify that frequency and web tension are suitable with the used components.
- 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.

Procedures of starting

- Set to zero the settings of the regulating and pressure reducing valves turning the regulating screws in anticlockwise.
- If indicated in the scheme, before the starting, you must fill the pumps with the exercise fluid.
- Make sure that all the electrical commanded valves are not in tension.

- Check the correct sense of the pump rotation.
- If the difference of temperature between the pump and the fluid is more than 25°C make the pump working without pressure up to the thermal equilibrium.
- If the fluid is heated by a heating device the pump is to be started during the period of pre-heating.
- With the primed pump gradually increase the pressure until the minimum value necessary to operate the actuators.
- 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.
- Inside the tank the temperature must not be over 60°C. 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.
Every 3000 hours of functioning change the fluid and the filtering elements; these must be changed also in every signal of clogged filter.
You need to keep the bollard clean outside, avoiding the use of solvents, degreasers and detergents that can pollute the fluid.
In case of substitution it is necessary that the changed component is conformed to the original one in order to avoid dangers to people or damages to machines.

TEMPORARY STOP OF THE BOLLARD

- BRIEF STOP: a stop less than 2 months does not request any particular precaution, but the bollard must be kept in the same conditions in which it has been stopped.
- LONG STOP: if the bollard is stopped for more than 2 months it is advised to make the bollard work for some minutes at regular intervals (about every 2 months) without pressure to ensure the interior lubrication of the components;

RESTARTING OF THE CYCLE: after a brief stop it is enough to take off the air from the bollard; after a long stop it is necessary to check that the fluid is not modified, and eventually change it with a new one; verify all the tightness towards the outside and eventually change the gaskets of the pose floors of the valves; verify the tightness of the connectors and eventually shut them.

Chart N° 2 : Operations of ordinary maintenance for hydraulic components		
Periodicity	***Description intervention for general controls***	
1 month		
☑	**Level tank fluid:**	
	CAUSE	**CONSEQUENCES**
	If the level quickly goes down	Losses of hydraulic oil
	If the level rises	Loss of water from the cooling system
		Emptying of the pipes during the stops
☑	**Tightness towards outside:**	
	Visually check the pipes, the connectors and the support floors of the components; keep clean the bollard to find a quickly the losses.	
☑	**Filters cloging:**	
	Check the possible optical indicator; at the signal of clogged filter, it is necessary to change the filtering element within 8 working hours.	
☑	**Noisiness:**	
	An increase of the noise indicates anomalies in the bollard functioning.	
☑	**Electrical absorbing:**	
	An increase of the electrical absorbing of the electrical engine in parity of capacity/pressure indicates anomalies in the bollard functioning.	
☑	**Fluid temperature:**	
	The fluid must not exceed 60°C, the overcoming of this value causes the deterioration of gaskets and of the mechanical parts.	
☑	**Setting of the pressures:**	
	Verify the value of intervention of the pressure limiting valves, reduction gears, sequence.	
☑	**Pollution of the fluid:**	
	A emulsified, turbid or dark fluid indicates anomalies in the bollard functioning	
☑	**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.	

Chart N° 3 : Guide for the research of the causes of some drawbacks				
N	DRAWBACKS	CAUSES	HYPOTESIS OF BREAK	SOLUTIONS
1	THE BOLLARD DOESN'T GO UP (presence of air in the circuit)	LOW OIL LEVEL IN THE TANK MANUAL RELEASE OR ELECTRICAL VALVES OPEN WRONG SENSE OF ROTATION	DAMAGED GASKETS MANUAL RELEASE OR ELECTRICAL VALVES OPEN BREAKING OF OIL-HYDRAULIC CIRCUIT WRONG CONNECTION OF THE ELECTRIC ENGINE	ADD OIL CLOSE THE MANUAL RELEASE AND CHECK THE VOLTAGE TO THE COIL OF THE ELECTRICAL VALVE CHANGE THE GASKETS AND REPAIR THE CIRCUIT CHECK THE MANUAL RELEASE AND RECONNECT THE ELETRIC ENGINE
2	NON REGULAR CLIMB OF BOLLARD (Pump in flaw of capacity)	LOW OIL LEVEL IN THE TANK MANUAL RELEASE OR ELECTRICAL VALVES OPEN MECHANICAL FLAW DENSE OIL (caused by low temperatures) AIR BUBBLE IN THE CIRCUIT NOT WORKING VALVES	OCCLUDED ASPIRATION OR ABSENCE OF OIL MANUAL RELEASE OR ELECTRICAL VALVES OPEN BROKEN PUMP WORN OUT OIL	CHECK THE OIL LEVEL CLOSE THE MANUAL RELEASE AND CHECK THE VOLTAGE OF THE COIL OF THE ELECTRICAL VALVE CHANGE THE PUMP CHANGE THE OIL'S TYPE
3	SLOW CLIMB OF THE BOLLARD (insufficient pressure)	REGULATION OF THE MAXIMUM PRESSURE VALVES NOT CORRECT PRESENCE OF AIR IN THE CIRCUIT(the bollard doesn't go up) PUMP IN A FLAW OF CAPACITY(bollard's climb not regular) BREAKINGS IN THE CIRCUIT OR EXCESSIVE LOSSES	MAXIMUM PRESSURE VALVE NOT MUCH CLOSED SEE POINT 1 SEE POINT 2 LOSSES IN THE CIRCUIT	SET CORRECTLY THE VALVE CHECKING " *REGULATION OF THE CLIMB'S STRENGHT OF THE BOLLARD*" SEE POINT 2 SEE POINT 2 CHECK THE CIRCUIT
4	NOISY PUMP	PRESENCE OF AIR IN THE CIRCUIT(the bollard doesn't go up) DENSE OIL (bollard's climb not regular) WORN OUT PUMP	SEE POINT 1 SEE POINT 2 EXCESSIVE INTERNAL GAMES	SEE POINT 1 SEE POINT 2 CHANGE THE PUMP

Chart N° 3 : Guide for the research of the causes of some drawbacks				
N	DRAWBACKS	CAUSES	HYPOTESIS OF BREAK	SOLUTIONS
5	GOING OUT OIL CLOSE TO THE GASKETS	ABRASIVE SUBSTANCES IN THE OIL	LITTLE OPENING ON THE GASKET	CHANGE OIL
		HIGH OIL TEMPERATURE	COLLAPSED GASKET	CHANGE THE GASKETS
			EXCESSIVE FUNCTIONING CYCLES (check the Manual)	OBSERVE THE FUNCTIONING CYCLES
6	EXCESSIVE HEATING OF THE SWITCHBOARD (oil too much hot)	WRONG REGULATION OF THE LIMITS SWITCH SENSORS	WORN OUT PUMP	CHANGE THE PUMP
			MANUAL RELEASE OR ELECTRICAL VALVE OPEN	CLOSE THE MANUAL RELEASE. VERIFY THE CONNECTION BETWEEN THE ELECTRICAL VALVE AND THE CONTROL BOARD, CHANGE IT IF NECESSARY
		INTENSIVE USAGE OF THE SWITCHBOARD	WRONG READING OF LIMITS SWITCH	REGULATE THE LIMITS SWTCH ON THE RIGHT POSITION(verify the functioning of the magnet and of the limits switch sensor)
				OBSERVE THE FUNCTIONING CYCLES
		TOO HIGH PRESSURE		REGULATE THE RIGHT PRESSURE CHECKING "*REGULATION OF THE CLIMB'S STRENGHT OF THE BOLLARD"* (operating on the maximum pressure valves)
		GOING OUT OIL WITH LOSS OF PRESSURE		CHECK THE GASKETS AND PROVIDE FOR THE SUBSTITUTION

FIRM	SPECIFIC DIN 51524 Part 2	
	HLP 32	**HLP 46**
FOX	**YE ISO VG 32**	**YE ISO VG 46**

WARNING FOR THE SUBSTITUTION OF THE FLUID

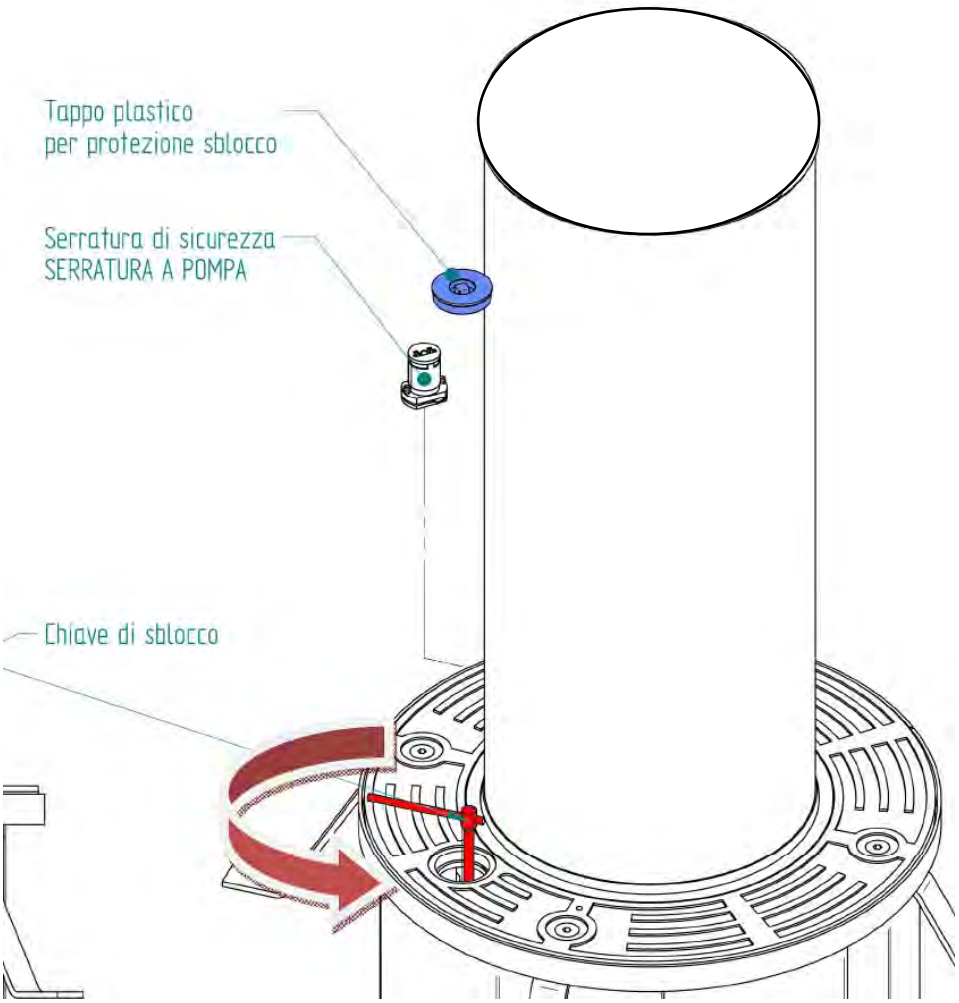
For the filling of the tank it is necessary to have a self-governing pump group of filling and filtering
The used fluid must be stocked in metallic watertight containers that must be put in appropriate places.
The used fluid must be only retired from authorized firms assigned to disposal and observing 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 89/392 and following modifications.

BOLLARD RELEASE DEVICE

Type of maintenance	/
Periodicity	/
Point of intervention	/



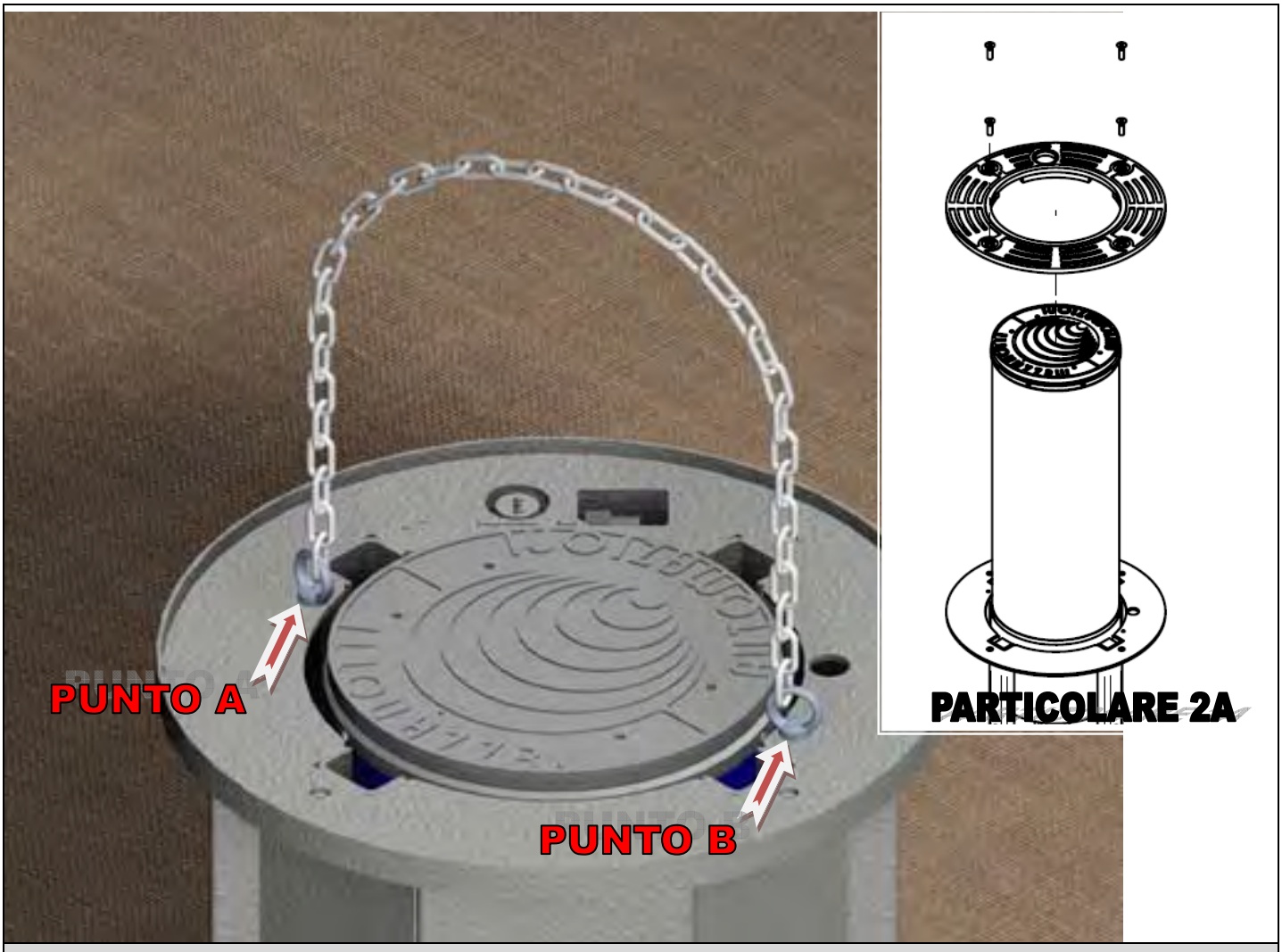
Drawing1A: PAG3_CSA300 view bollard release.pdf **Drawing 3di4 USE OF MANUAL RELEASE DEVICE**

1. Take the release key (in the above drawing it is in red colour) unscrew the plastic cap that protects the release, then turn in anticlockwise to expel the cap.
2. Take off the safety lock with the proper personal key in models where foreseen.
3. Insert the release key, previously used, to unlock the bollard.
   Note: the release key has a square hollow that will have to get jammed with the gold-yellow bolt.

WARNING **:** *Use the following release only in case of emergency or when the bollard is blocked. After having unlocked the bollard (in low position) reclose the release turning the key in clockwise.*

MECHANICAL MAINTENANCE

Type of maintenance	/
Periodicity	/
Description	Points for the removal of the EXTRACTABLE structure from the UNDERGROUND FORMWORK

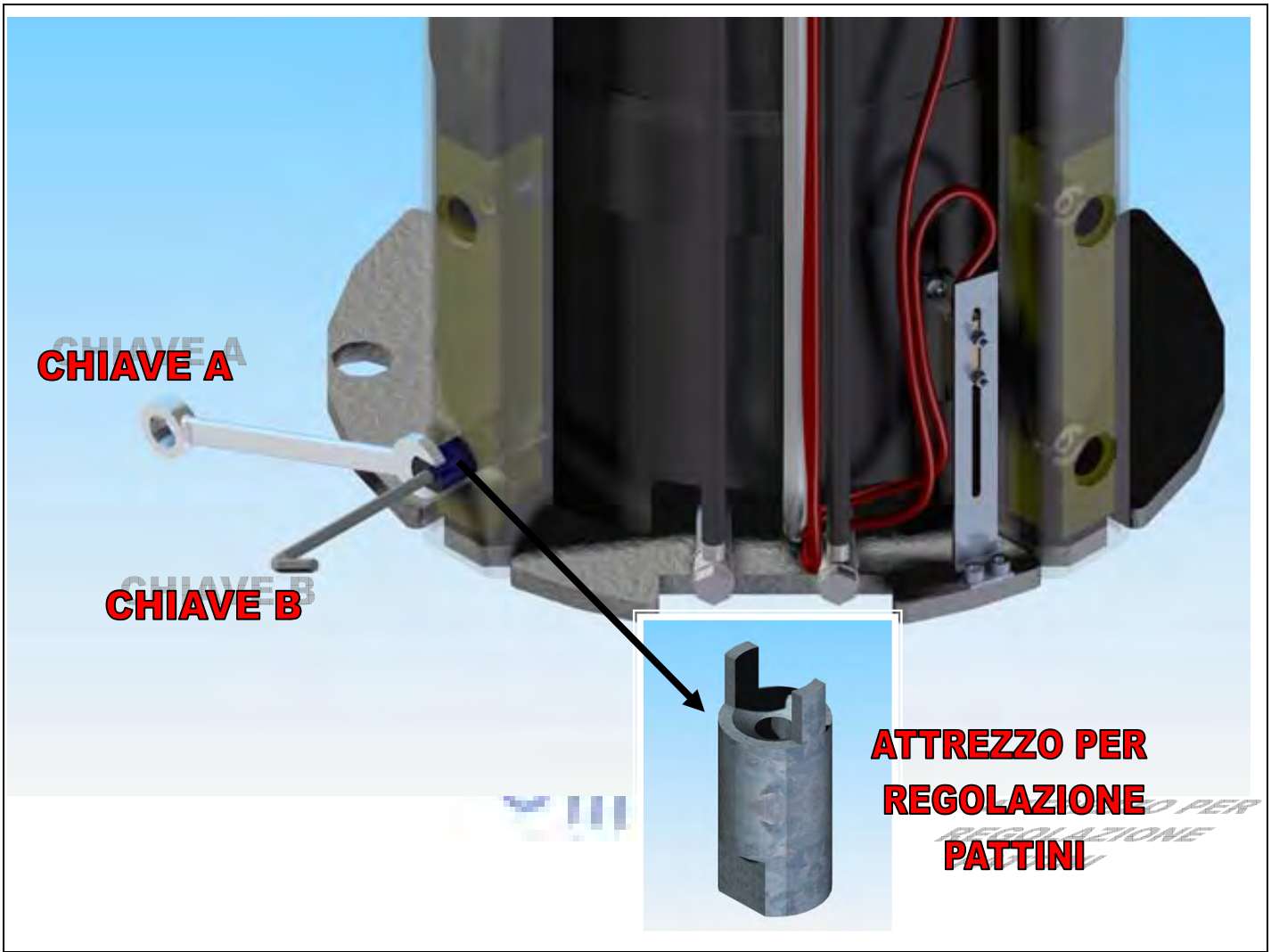


Drawing2A: Removal structure estr_with EYEBOLTS.jpg **BOLLARD REMOVAL**

Extract the carriageable platform unscrewing the four boltsMA10x35 (using the allen wrench N°6).
Now it is possible to expel the extractable structure inserting the eyebolts M8 as in DRAWING 2A.
The weight of the extratable structure including the mechanical pipe is 105Kg (weight of the formwork 35Kg).
To lift the extractable structure you have to use a lifting arm or 4 people of strong costitution.

During the removal of the bollard you must pay attention to the cables, so you have to take off the cables from the catch basin up to the underground formwork.

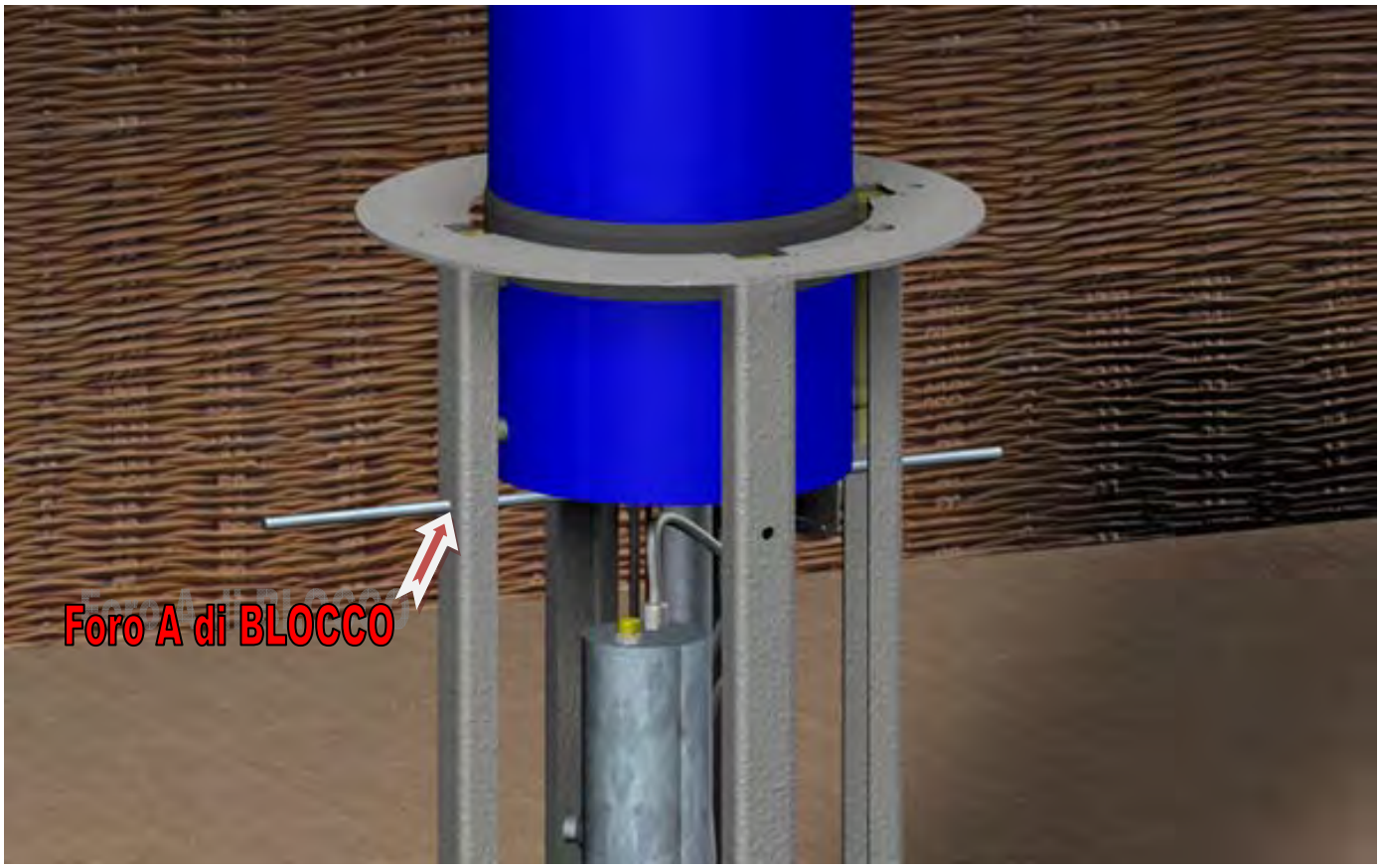
Type of maintenance	Ordinary
Periodicity	Every 6 months
Description	Check the regulation and the integrity of the anti-wear guide shoes in polizene (in green color)



Drawing 3A: Regulation of the shoes in POLIZENE.jpg **GUIDES REGULATIONS OF THE BOLLARD**

Use the **KEY A** (monkey wrench from 13) to regulate the distance of the shoe from the mechanical pipe.
Use the **KEY B** (allen wrench n. 5) to lock the regulation of the shoe.
WARNING: Turning the KEY A (clockwise) we will take the shoe far from the bollard.
The regulation of the shoe must be done on both the bolts. The regulation of the shoe has a slip distance of 11 mm.
The shoe must NOT seize up on the guide but only guide the vertical motion of the bollard.
Check after the regulation that the mechanical pipe rises up easily.

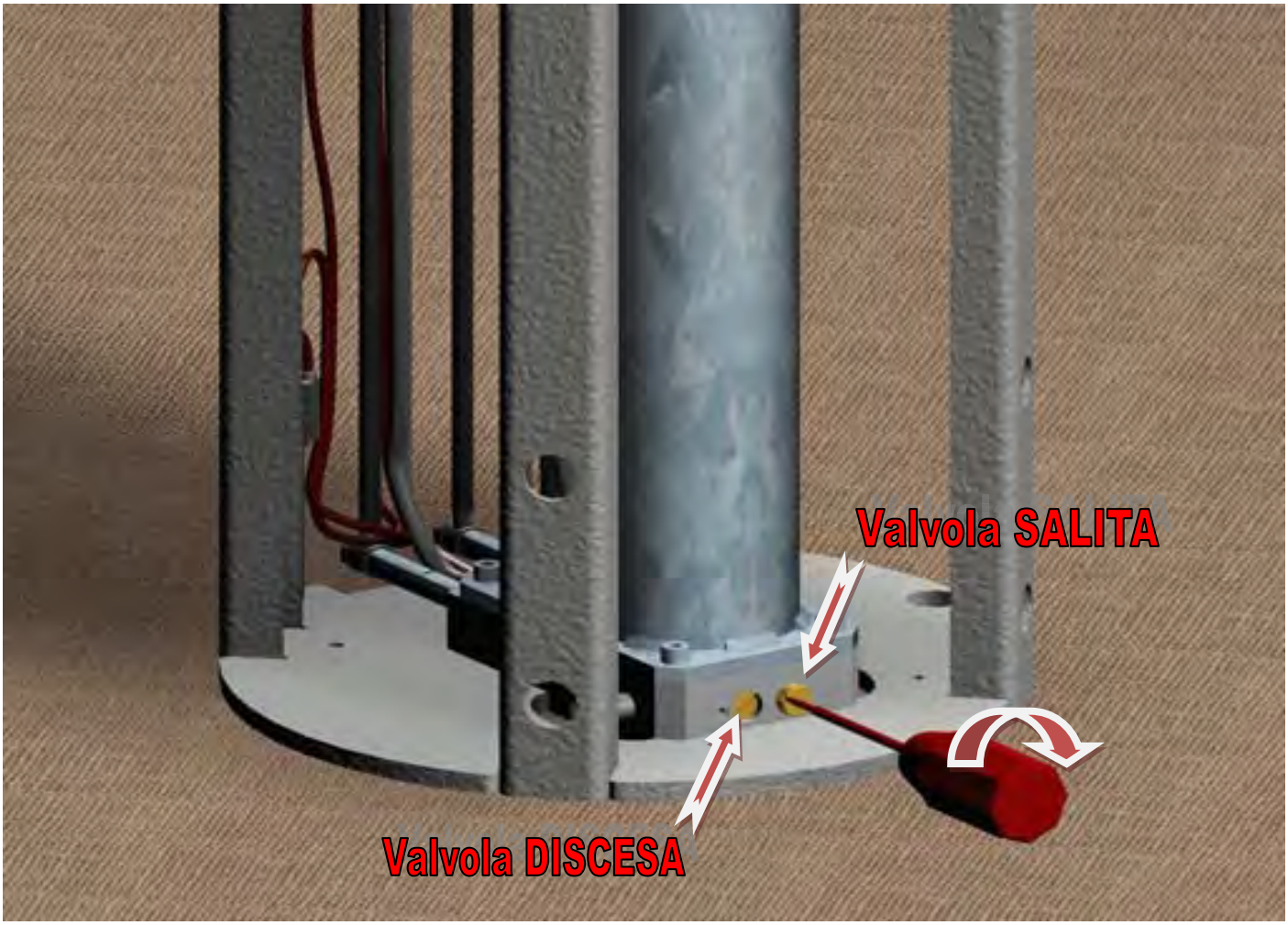
Type of maintenance	/
Periodicity	/
Description	Safety point for the hydraulic product maintenance



Drawing4A: Safety bar.jpg **PUTTING IN SAFETY OF THE BOLLARD**

Insert a steel rod with a diameter of *Ø10mm and a minimum lenght of 60mm* inside the predisposed holes to lock the bollard (LOCK HOLE A).
After introducing the safety bar you can proceed to the mechanical maintenance of the hydraulic product.

Type of maintenance	Ordinary
Periodicity	Every 6 months
Description	Regulation of the bollard rising force



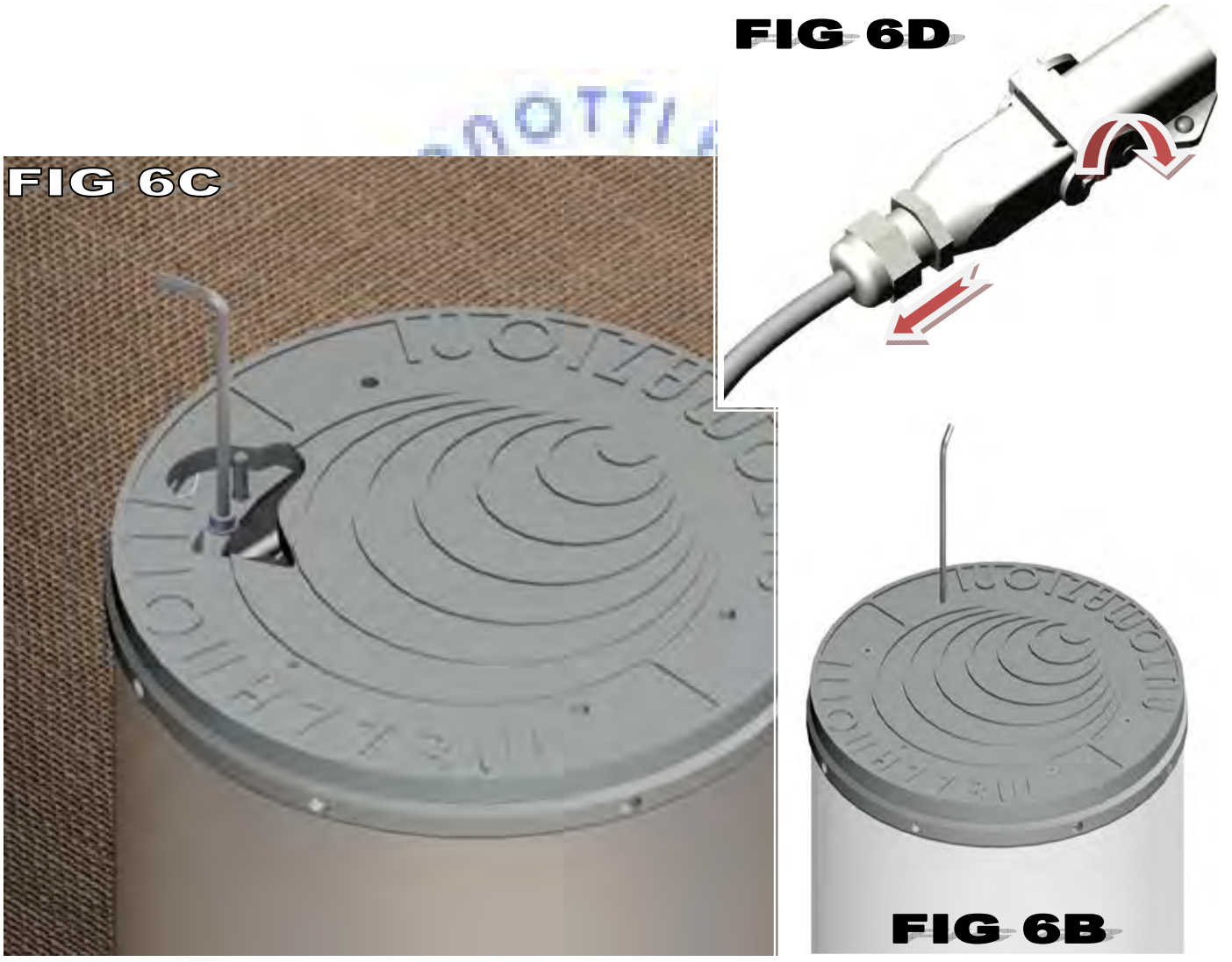
Drawing5A: Pressure regulation MAX.jpg **Maximum pressure regulation of the hydraulic product**

After having put the bollard in safety position it is possible to regulate the going up and going down valves of the bollard.
Turning clockwise the screwdriver, the hydraulic pressure of the bollard increases.

For the regulation of the thrust it is necessary to proceed in the following way:

1- Insert the ammeter at the top of the “common” cables of the engine power supply. (terminal board 5, 8, 11, 14).
2- Turn clockwise the screwdriver and then regulate the rising pressure. The ammeter must measure an absorption of 2,1 Ampere.

Type of maintenance	/
Periodicity	/
Description	Sensitive head removal for bollard’s regulation and additional centering

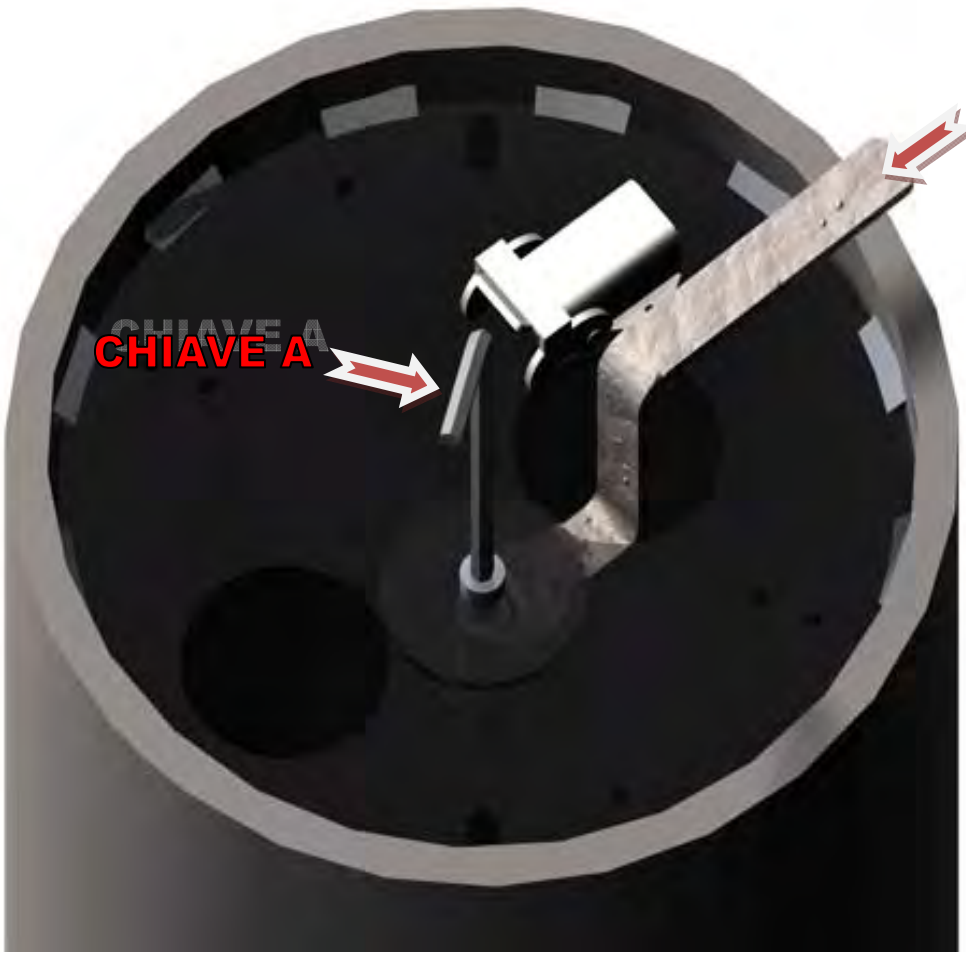


Drawing6A: **Extraction of the sensitive head**

Use allen wrench N°4 as shown in the drawing 6B to extract the dust-proof bolts M8.

Insert inside the holes (hole uncovered after the extraction of the bolt M8x8) the allen wrench N°5 for bolts M6x40 removal, as shown in the drawing 6C.
Before taking off the sensitive head it is necessary to unlock and take off the plug as shown in the drawing 6D, remove the earth connection on the flange of the mechanical pipe.

Type of maintenance	\
Periodicity	\
Description	Regulation and additional centering of the mechanical pipe with oil-hydraulic piston



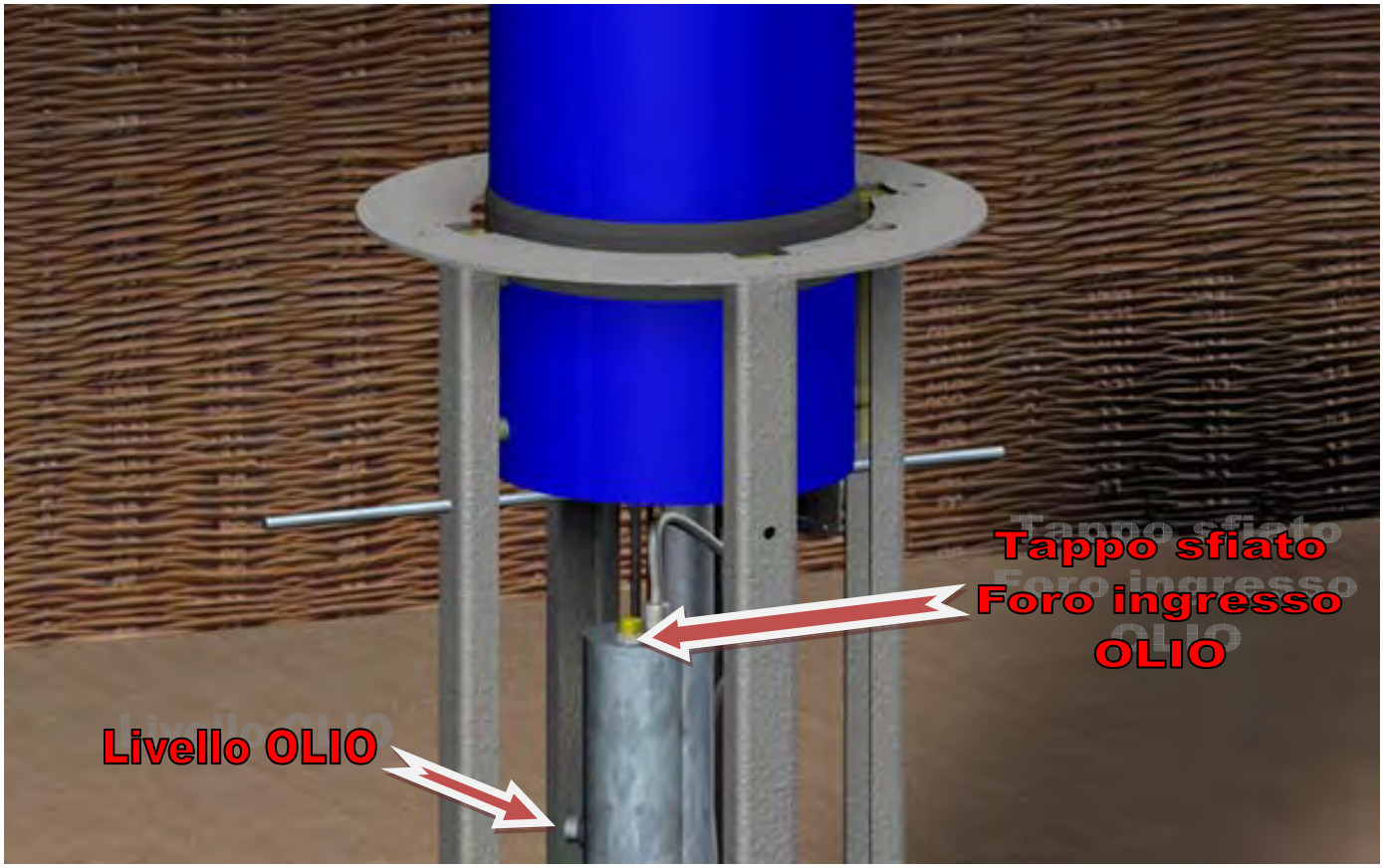
Drawing7A Fixing and regulation piston.jpg : **Regulation and centering**

Loosen the bolt M8x30 with the KEY A (allen wrench N°6) it is possible to move the bollard's pipe in every direction for some centimeters.

As the mechanical pipe is regulated, tighten emphatically (within the limits of the bolt M8) the bolt with the KEY A using also the KEY B (this key locks the stem of the bollard, key N°14).

Type of maintenance	Ordinary
Periodicity	Every 12 months or every 1.000.000 movements
Description	Change oil

Lay-out point of intervention



Drawing 8A: **Change of oil in the bollard**

Before every operation read carefully the maintenance instruction book for hydraulic components.
Keep the oil until level as shown in drawing 8A.

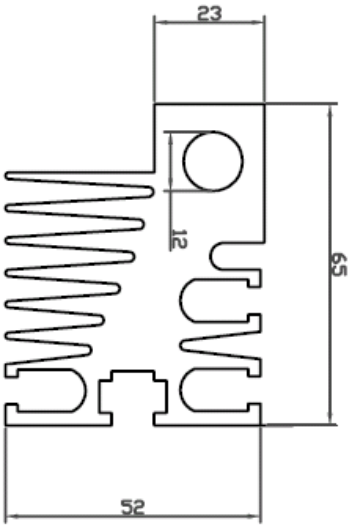
Capacity oil tank 2,5litres, TYPE of oil red ATF DEXRON ISOVG32.
For the expulsion of the oil it is possible to use the hole of the leak cap.

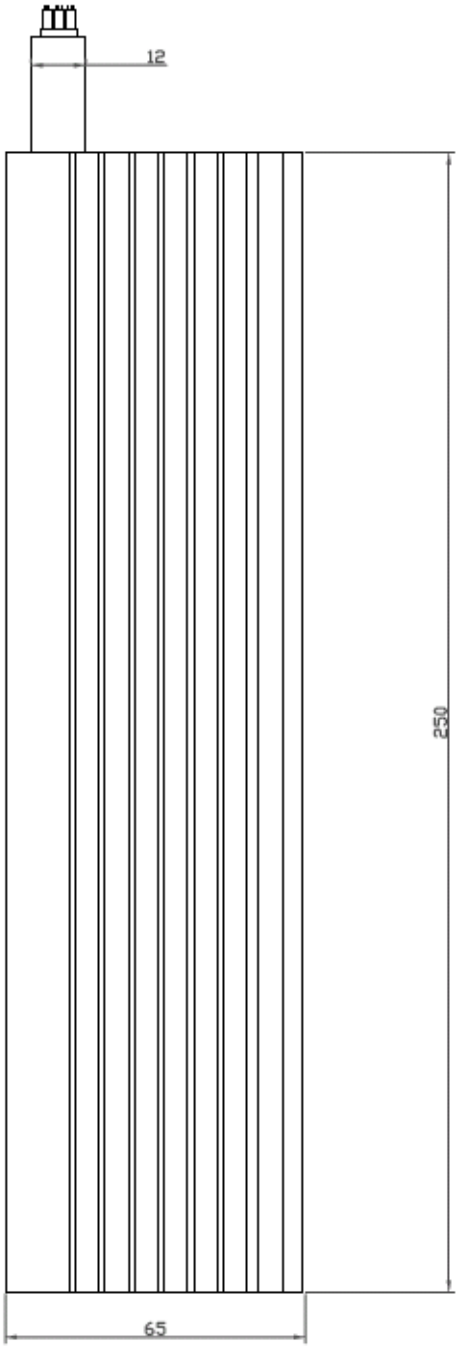
SELF-ADJUSTING RESISTANCE

This device keeps a constant temperature inside the formwork. It has a self-organizing system that keeps the ambient temperature (about 15 °C). When environmental conditions get colder (minimum °0 C) the resistance will increase its heater power up to 80 ° C. On the contrary when the temperature exceeds a value of 25° C the resistance will lower its heater power (bringing it to a minimum level).
This resistance can easily be connected to the mains (220 Vac) and can remain in operation because its main feature and main advantage is the self-regulation that keeps very low and, therefore, advantageous consumption.

PROTECTION RATING IP 67

POWER SUPPLY	220 / 265 Vac and 110 Vac
POWER	MAX: 300 W (initial peak) IN WATER: 150 W IN AIR: 40 W
CONSUMPTION	1.30 A





ACOUSTIC SIGNALLER

The acoustic signaller (that can be placed inside the bollard), is an intermittent sound device (beeep…..beeep) that is on for some seconds before the movement of the bollard until the end of the movement.

Input power supply	Vac	230 – 50 Hz
Absorbed power supply	mA	300
Operating frequency	KHz	2.8 ± 0.5
SPL at 1 mt. (V=220Vac)	dBa	100
Working temperature	°C	-20 ÷ +60
Protection rating	IP	67