FAAC

FAAC CITY

Automatic pneumatic concealing traffic bollard
FAAC CITY 220 H600
with pit

Technical installation manual

- CE Declaration of conformity
- Warnings for the installer
- Technical specifications of the traffic bollard
- Preparing and installing the traffic bollard
- Positioning safety inductive loops
- Traffic bollard installation lay-out
- Pipe laying lay-out
- Technical specifications for external control station
- Traffic bollard connections
- Connection terminal board
- DIP-SWITCH setting
- Control push-buttons
- Control station-lay out
- Manual lowering operation
- Maintenance operations

CE DECLARATION OF CONFORMITY FOR MACHINES

(DIRECTIVE 98/37/EC)

Manufacturer: FAAC S.p.A.

Address: Via Benini, 1 - 40069 Zola Predosa BOLOGNA - ITALY

Declares that: **AUTOMATIC PNEUMATIC** traffic bollard **FAAC CITY 220 H600**

- is built to be integrated into a machine or to be assembled with other machinery to create a machine under the provisions of Directive **98/37/EC**;
- conforms to the essential safety requirements of the following EEC directives:

  73/23/EEC and subsequent amendment **93/68/EEC**.
  89/336/EEC and subsequent amendment **92/31/EEC** and **93/68/EEC and 93/97/EEC**.

  and also declares that **it is prohibited to put into service the machinery** until the machine in which it will be integrated or of which it will become a component has been identified and declared as conforming to the conditions of Directive **98/37/EC**.

Bologna, 01 January 2007

The Managing Director
A. Bassi

WARNINGS FOR THE INSTALLER – GENERAL SAFETY OBLIGATIONS

1	**ATTENTION! To ensure the safety of people, it is important that you read all the following instructions. Incorrect installation or incorrect use of the product could cause serious harm to people.**	14	Make sure that the earthing system is perfectly constructed, and connect metal parts to it.
2	Carefully read the instructions before beginning to install the product	15	The automated system is supplied with an intrinsic anti-crushing safety device consisting of a torque control. Nevertheless, its tripping threshold must be checked as specified in the Standards indicated at point 10.
3	Do not leave packing materials (plastic, polystyrene, etc.) within reach of children as such materials are potential sources of danger.	16	The safety devices (EN 12978 standard) protect any danger areas against **mechanical movement Risks**, such as crushing, dragging, and shearing.
4	Store these instructions for future reference.	17	Use of at least one indicator-light is recommended for every system (i.e. flashing lamp integrated in the bollard head), as well as a warning sign in addition to the devices mentioned at point "16".
5	This product was designed and built strictly for the use indicated in this documentation. Any other use, not expressly indicated here, could compromise the good condition/operation of the product and/or be a source of danger.	18	For maintenance, strictly use original parts by FAAC S.p.A.
6	FAAC S.p.A. declines all liability caused by improper use or use other than that for which the automated system was intended.	19	FAAC S.p.A. declines all liability as concerns safety and efficient operation of the automated system, if system components not produced by FAAC S.p.A. are used.
7	Do not install the equipment in an explosive atmosphere: the presence of inflammable gas or fumes is a serious danger to safety.	20	Do not in any way modify the components of the FAAC CITY automated system.
8	For non-EU countries, to obtain an adequate level of safety, the Standards mentioned above must be observed, in addition to national legal regulations.	21	The installer shall supply all information concerning manual lowering of the bollard in case of an emergency, and shall hand over to the user the warnings handbook supplied with the product.
9	FAAC S.p.A. is not responsible for failure to observe Good Technique in the installation of the FAAC CITY products and relating accessories or for any deformation that may occur during use.	22	Do not allow children or adults to stay near the bollard while it is operating.
10	Installation must be performed in compliance with the currently Ruling Standards.	23	Keep radio controls or other pulse generators away from children, to prevent the automated system from being activated involuntarily.
11	Before attempting any job on the system, cut out electrical power .	24	Transit on the FAAC CITY traffic bollard is permitted only when the automated system is idle
12	The mains power supply of the automated system must be fitted with an all-pole switch with contact opening distance of 3mm or greater. Use of a differential 6A thermal breaker with all-pole circuit break is recommended.	25	The user must not attempt any kind of repair or direct action whatever and contact qualified personnel only.
13	Make sure that a differential switch with threshold of 0.03 A is fitted upstream of the system.	**26**	**Anything not expressly specified in these instructions is not permitted.**

TECHNICAL SPECIFICATIONS FAAC CITY 220 - H600 PNEUMATIC - STAINLESS STEEL	
Driving method	**Pneumatic with compressor in control station**
Driven cylinder	**Stainless steel AISI 304 – thickness 4 mm.**
Driven cylinder treatment	**Polyester powder paint, dark grey colour, metallised (RAL 7021)**
Paint option	**Colours: ivory, orange**
Finish option	**Satin finish**
Driven cylinder diameter	**220 mm.**
Driven cylinder stroke	**600mm.**
Cylinder top part (head)	**Anticorodal case hardened aluminium**
Treatment of cylinder top part	**Polyester powder paint, light grey colour (RAL 9006)**
Flashing light built into the head	**SI**
Descent time	**about 3 sec.**
Rise time	**about 10 sec.**
Protection class	**IP 67**
Reflecting adhesive strip	**Standard height 55 mm.**
Operating ambient temperature	**- 10°C + 50°C**
Total weight with pit	**Kg. 100**
Manual lowering operation	**YES inside control station (Fig. 8)**
Resistance against deforming impacts	**5,000 joules**
Break-in resistance	**60,000 joules**
Dimensions of pit to be walled in	**330 x 330 x 850 H**
Length of connected pipe	**10 m. + KIT (10 m.)**
Pneumatic system max pressure	**4 bar**
Power for heating element	**24 Vdc. 80 W.**

TECHNICAL SPECIFICATIONS FAAC CITY 220 - H600 PNEUMATIC - STEEL	
Driving method	**Pneumatic with compressor in control station**
Driven cylinder	**Steel FE37 – thickness 4 mm.**
Driven cylinder treatment	**Polyester powder paint, dark grey colour, metallised (RAL 7021)**
Paint option	**Colours: ivory, orange**
Driven cylinder diameter	**220 mm.**
Driven cylinder stroke	**600 mm.**
Cylinder top part (head)	**Anticorodal case hardened aluminium**
Treatment of cylinder top part	**Polyester powder paint, light grey colour (RAL 9006)**
Flashing light built into the head	**NO**
Descent time	**about 3 sec.**
Rise time	**about 10 sec.**
Protection class	**IP 67**
Reflecting adhesive strip	**Standard height 55 mm.**
Operating ambient temperature	**- 10°C + 50°C**
Total weight with pit	**Kg. 100**
Manual lowering operation	**YES inside the control station (Fig. 8)**
Resistance against deforming impacts	**5,000 joule**
Break-in resistance	**60,000 joules**
Dimensions of pit to be walled in	**330 x 330 x 850 H**
Length of connected pipe	**10 m. + KIT (10 m.)**
Pneumatic system max pressure	**4 bar**
Power for heating element	**24 Vdc. 80 W.**

PREPARATIONS FOR FAAC CITY 220 H600
AUTOMATIC PNEUMATIC TRAFFIC BOLLARD WITH PIT

1) Make sure that the place where the FAAC traffic bollard is to be installed is not a cavity; if this situation is present, partially protect the FAAC traffic bollard with a drainage channel equipped with covering grid.

2) Excavate (with mini-excavator, or manually) down to a depth of about **1.10 m.**; the section must have a side of about **0.80 m.**

3) Make sure that the soil absorbs water well (run a test by feeding in about 40 litres of water and see if the water is emptied in less than 30 minutes); if it is not, construct a rain water drain, using a 60 mm diameter pipe, connected to the water mains or connected to a pit (with an emptying system e.g. an electric pump) with a depth greater than the cement pipe which collects and discharges rain water.

4) Introduce gravel (grain with a diameter of approx. 8 - 20 mm) to obtain a thickness of about **20 cm.**, taking care to compact it well to avoid future settlements.

5) Lay the metallic pit complete with counter frame taking care to position it plumb-straight and taking into account that the frame should be higher by about 10 mm than the tread surface height (to limit the intake of rain water in the pit).

6) When the pit has been installed, lay a flexible sheath, with **40 mm diameter**, from the electrical connection in the pit to the motion control station (to connect the traffic bollard to the control station).

7) Distribute concrete all around the pit, up to about -10 cm from the tread surface dimension (this dimensions should be evaluated according to the type of road carpet finish), making sure that the anchors supplied with the pit are appropriately positioned. When the cement has set, finish the road carpet with the same type of material.

8) Lay any other pipes from the laying point of the movement control station, to the laying point of the additional devices (e.g. traffic lights - inductive loops - card reader - etc), make the electrical and earthing connections.

N.B.: every pipe must be laid in compliance with the current rules.

POSITIONING THE FAAC CITY 220 H600

FAAC CITY 220 - H600 AUTOMATIC TRAFFIC BOLLARD

INSTALLATION DIAGRAM FOR METAL HOUSING

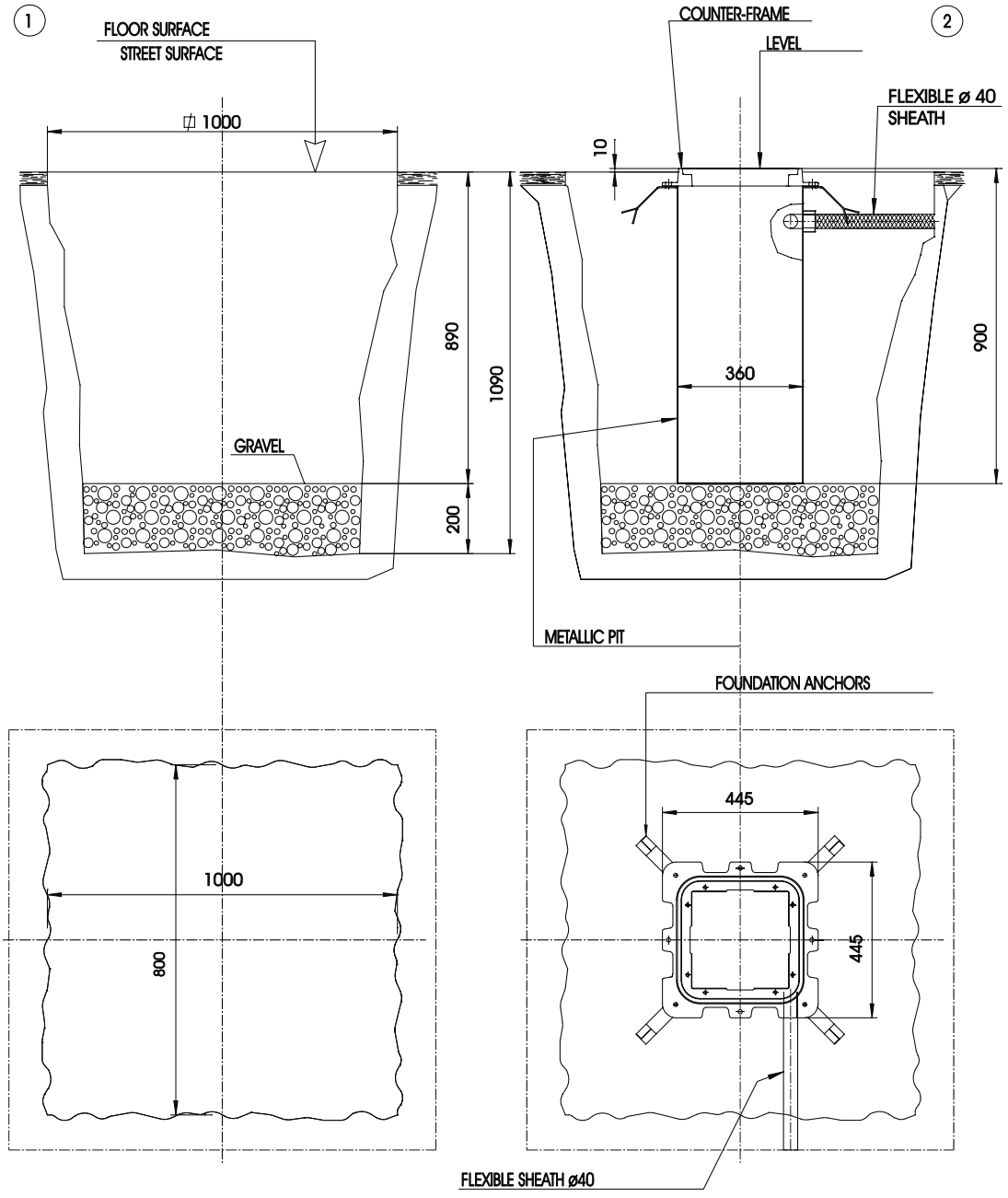


Fig. 1

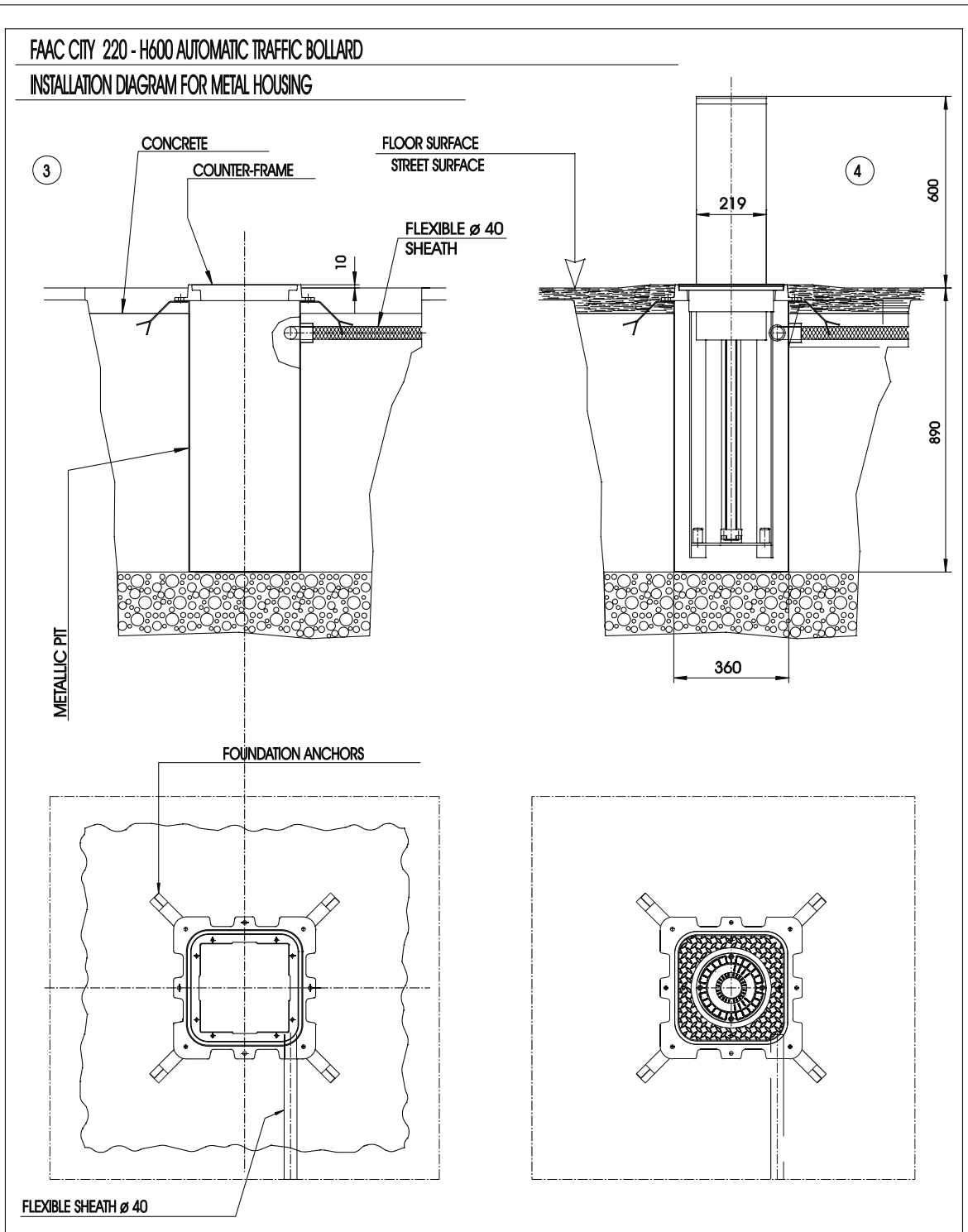

FAAC CITY 220 - H600 AUTOMATIC TRAFFIC BOLLARD
INSTALLATION DIAGRAM FOR METAL HOUSING
3
CONCRETE
COUNTER-FRAME
FLOOR SURFACE
STREET SURFACE
FLEXIBLE ø 40
SHEATH
10
METALLIC PIT
4
219
600
890
360
FOUNDATION ANCHORS
FLEXIBLE SHEATH ø 40

Fig. 2

POSITIONING THE SAFETY INDUCTIVE LOOPS

Any inductive loops making part of the system must be laid in compliance with the instruction of the detector.
Three laying examples are shown in the following figures.

1. **Fig. 3** shows the laying of a loop providing perimetric protection of the bollard.
2. **Fig. 4** shows the laying of two loops for protecting a very large gate.
3. **Fig. 5** shows an installation with a single traffic bollard and two magnetic loops to detect vehicle transit.

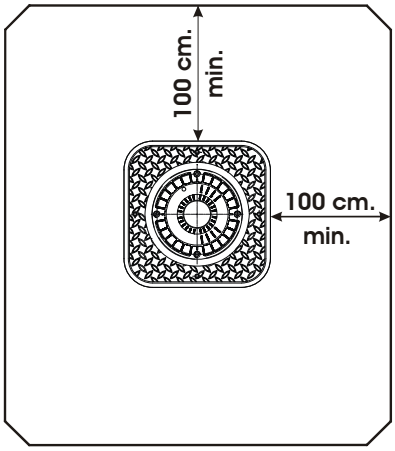


Fig. 3

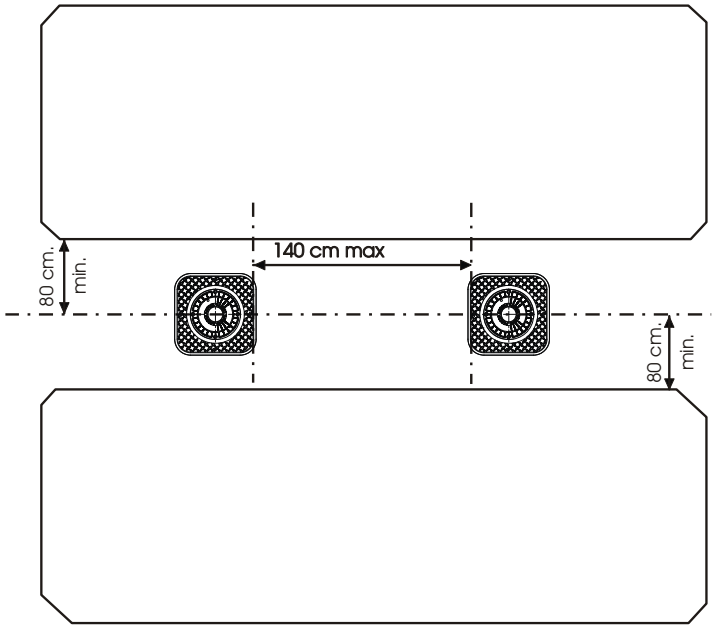
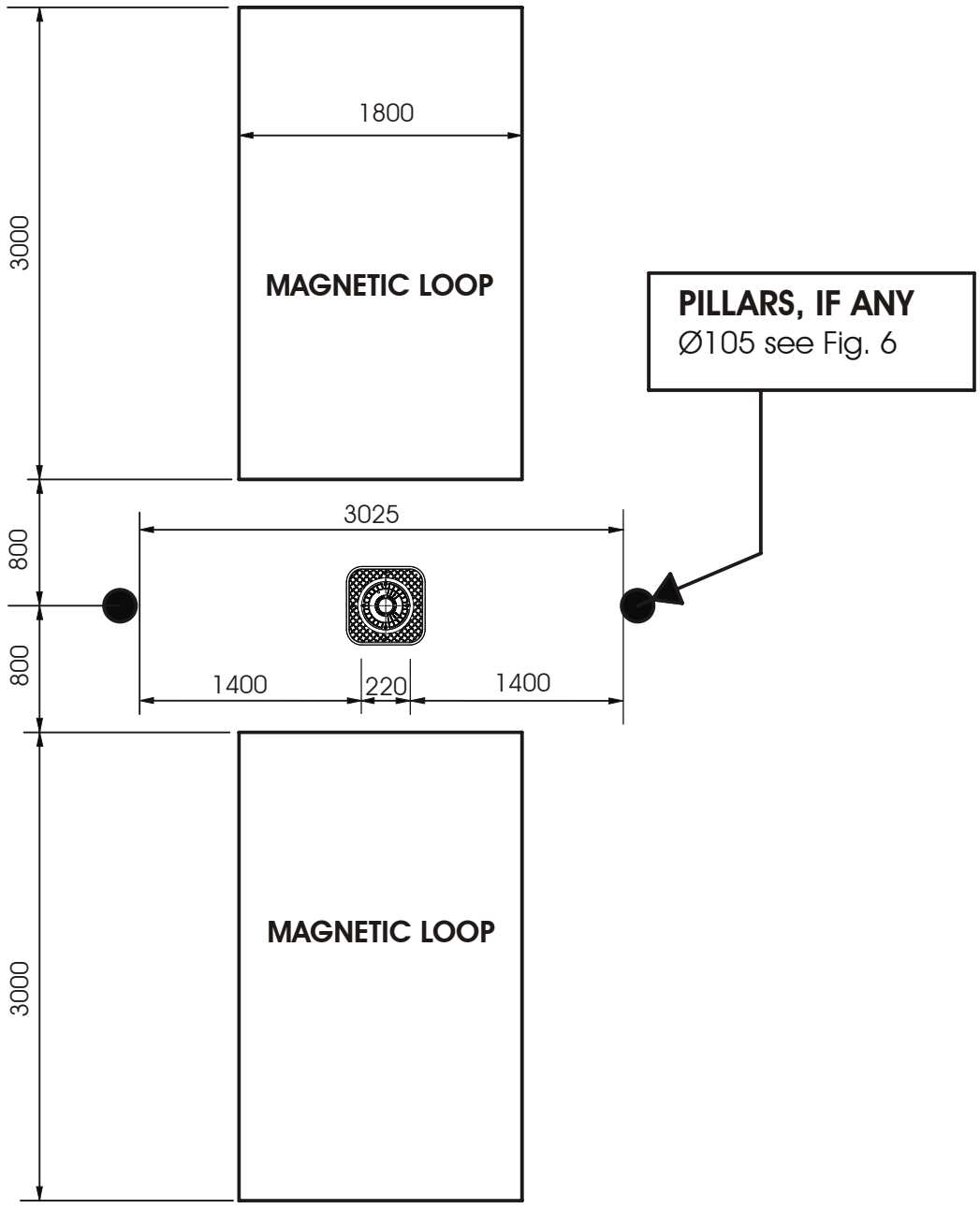


Fig. 4

INSTALLATION DIAGRAM FOR 1 FAAC CITY 220 H600



DIMENSIONS IN mm.

Fig. 5

INSTALLATION DIAGRAM FOR 2 FAAC CITY 220 H600

(maximum configuration)

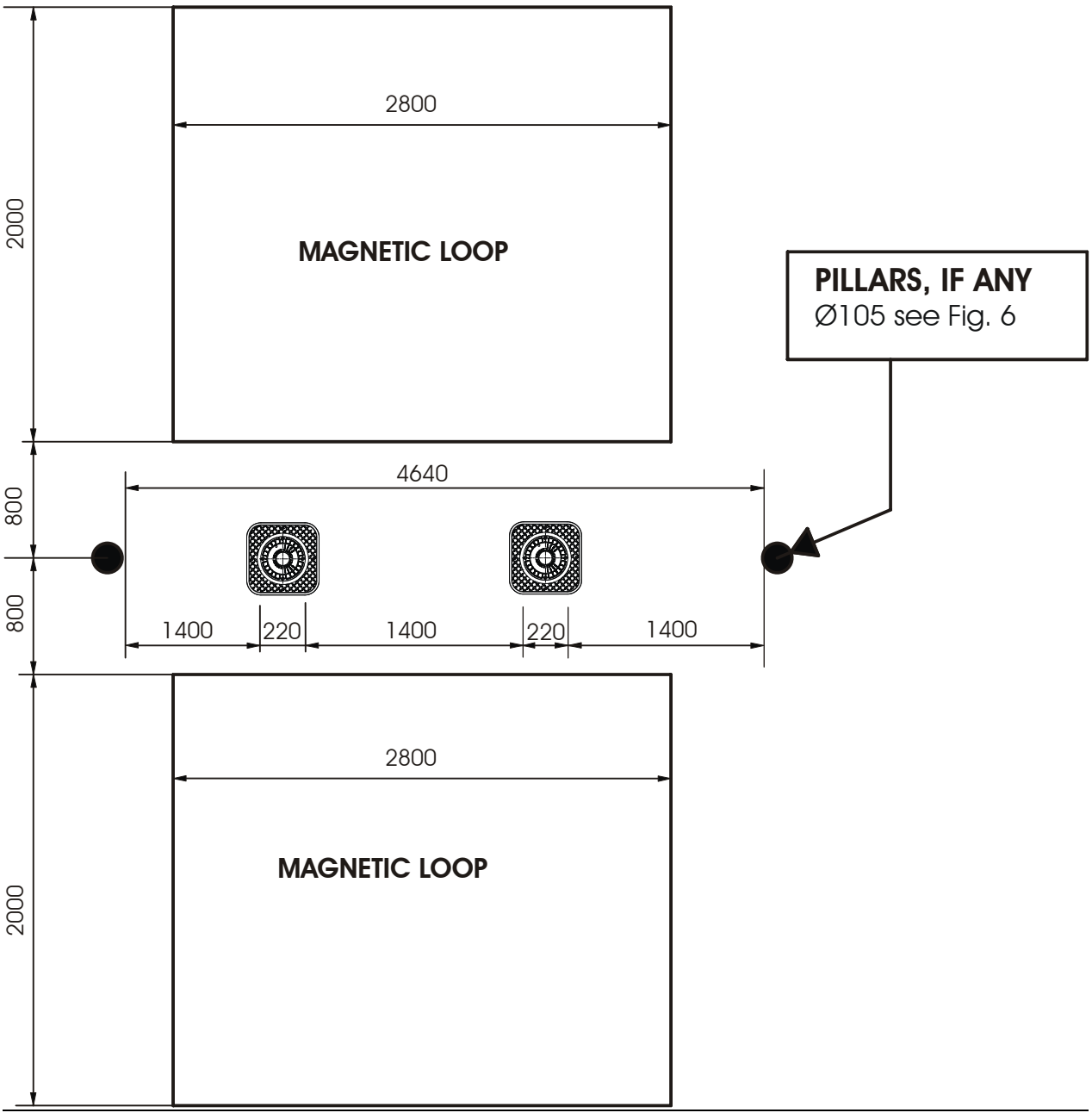


Fig. 5A

PIPE LAYING DIAGRAM FOR 1 FAAC CITY 220 H600

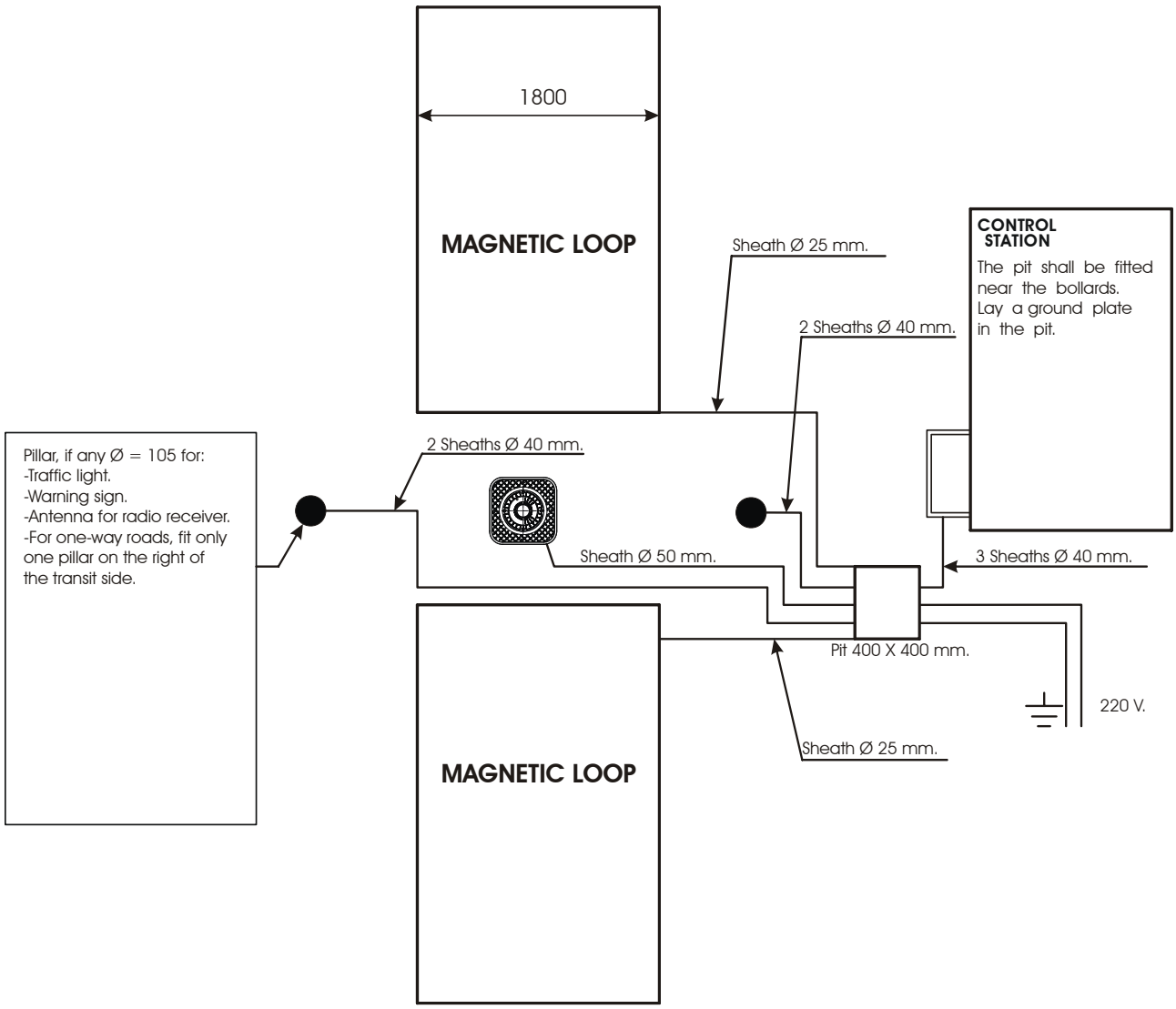


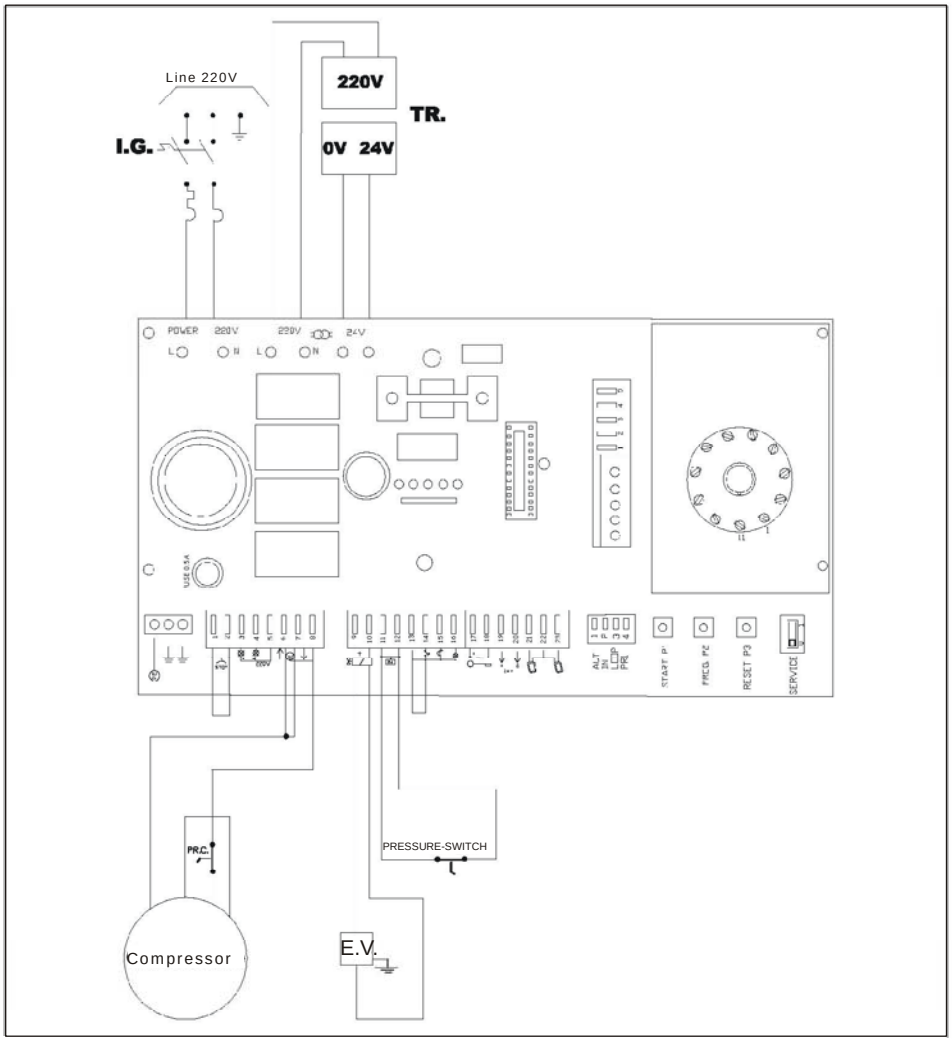
Fig. 6

TECHNICAL SPECIFICATIONS FOR EXTERNAL CONTROL STATION SPCL 1	
Electronic control circuit	**By microprocessor with specific software for controlling 1 FAAC CITY 220 bollard**
Enclosure for SP control station	**Wall fitting**
Enclosure dimensions	**400 x 400 x 200**
Protection class	**IP 55**
Operating ambient temperature	**-10°C + 50°C**
Control station power supply	**230V. ± 10% - 50Hz**
Protective switch	**Thermal-magnetic 1P+N–6A÷16 A-6KA**
Service transformer	**24V. 25 VA**
Work frequency - resistance class of movement compressor	**60 manoeuvres per day +/-20% average life: 150,000 +/- 20% manoeuvres**
Air tank for compressor	**Integrated in the control station**

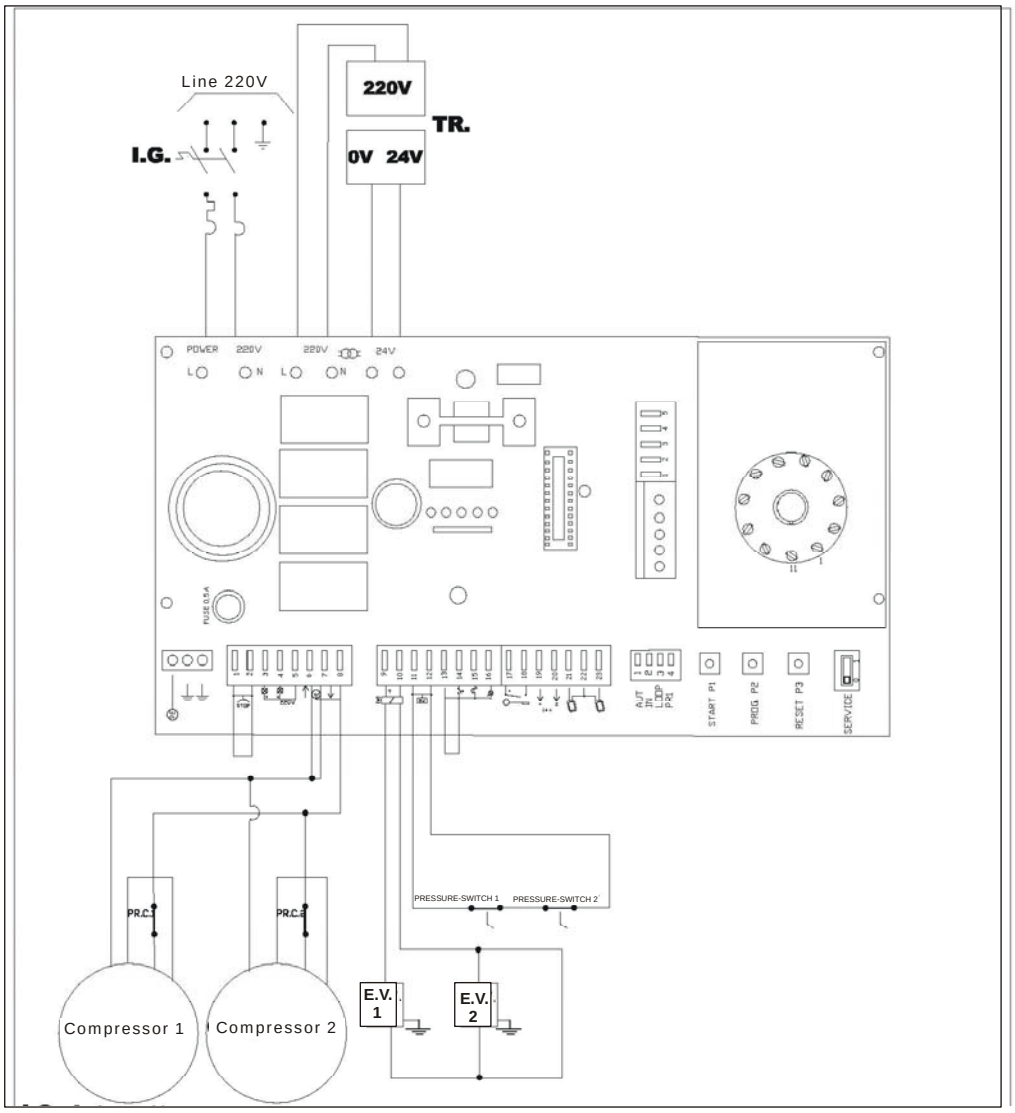
TECHNICAL SPECIFICATIONS FOR EXTERNAL CONTROL STATION SPCL2	
Electronic control circuit	**By microprocessor with specific software for controlling 2 FAAC CITY 220 bollards**
Enclosure for SP control station	**Wall fitting**
Enclosure dimensions	**400 x 600 x 200**
Protection class	**IP 55**
Operating ambient temperature	**-10°C + 50°C**
Control station power supply	**230V. ± 10% - 50Hz**
Protective switch	**Thermal-magnetic 1P+N–6A÷16 A-6KA**
Service transformer	**24V. 125 VA**
Work frequency - resistance class of movement compressor	**60 manoeuvres per day +/-20% average life: 150,000 +/- 20% manoeuvres**
Air tank for compressor	**Integrated in the control station**

TRAFFIC BOLLARD CONNECTIONS

The following connections must reach the control station:



I.G. = Master thermal breaker
E.V. = Movement solenoid-valve 24 Vdc.
TR. = Transformer 25 VA. 50/60 Hz.
PR.C. = Maximum pressure pressure switch inside compressor (max. 4.2 bar.)
PRESSURE SWITCH = Safety pressure switch (set at 2.3 bar.)



I.G. = Master thermal breaker
E.V. 1, 2 = Movement solenoid-valve 24 Vdc.
TR. = Transformer 25 VA. 50/60 Hz.
PR.C.1, 2 = Maximum pressure pressure switch inside compressor (max. 4.2 bar.)
PRESSURE SWITCH 1, 2 = Safety pressure switch (set at 2.3 bar.)

CONNECTION TERMINAL BOARD

Terminal		
1-2	=	connection to emergency push-button if supplied to cut 220V power to the system
3-4-5	=	traffic lights connection (2320 V.) **NOTE**
6-7-8	=	pneumatic compressors
9-10	=	connection to solenoid-valve
11-12	=	connection to pressure switch
13	=	common contact travel limit device - buzzer - flashing lamp
14	=	connection to low travel limit device (facility for traffic lights control)
15	=	connection to intermittent buzzer (facility)
16	=	connection to integrated flashing lamp in the bollard head
17-18	=	N.O. input to control movement
19-20	=	24 VDC for users (500 mA. max)
21-22-23	=	connection of two safety loops
NOTE	⚠	If the system has traffic lights, the **LOW** travel limit device must be installed

DIP-SWITCH SETTINGS

DIP – SWITCH OFF		DIP – SWITCH ON
AUTOMATIC RISE ENABLED	**1**	AUTOMATIC RISE DISABLED
COMMANDS ENABLED	**2**	COMMANDS DISABLED
INDUCTIVE LOOP ENABLED	**3**	INDUCTIVE LOOP DISABLED
PRESSURE SWITCH ENABLED	**4**	PRESSURE SWITCH DISABLED

DIP – SWITCH 1:

⚠ (If no safety devices are used, it **MUST** be set to **ON**)

- **OFF Position = AUTOMATIC RISE ENABLED:**

The traffic bollard is normally in high position. Following an appropriate command, it moves into low position. When the vehicle has transited through the controlled gate (and therefore engages and releases the safety devices), the bollard returns to its high position. If the vehicle does not transit, the bollard automatically returns to high position after 30".

- **ON Position = AUTOMATIC RISE DISABLED**

Following a first command, the bollard moves from high position to low position. Following a further command, it moves into high position.

DIP – SWITCH 2:

(Normally in **OFF** position)

- **OFF Position = CONTROLS ENABLED:** the traffic bollard movement commands connected to terminals 17-18 are in operational service.
- **ON Position = CONTROLS DISABLED:** the bollard movement commands connected to terminals 17-18 are excluded - if the FAAC CITY 220 H600 bollard does not rise, when intervening the technician can temporarily exclude the commands and use the relevant push-button (P1-START) located on the circuit, to give test commands.

DIP – SWITCH 3:

(Normally in **OFF** position)

➢ **OFF Position = INDUCTIVE LOOP ENABLED:**

The inductive loop function is enabled. Install the inductive detector **FG2** in the Undecal quick coupling base, and the **1** and/or **2** inductive loop and connect them to terminals **21-22-23** (if it is enabled without the above mentioned accessories, the TRAFFIC BOLLARD does not rise because the safety devices are always in alarm state.

➢ **ON Position = INDUCTIVE LOOP EXCLUDED:**

The function described above is excluded and, therefore, the safety devices are excluded too.

DIP – SWITCH 4:

(Normally in **OFF** position)

➢ **OFF Position = TRAVEL LIMIT RISE PRESSURE SWITCH ENABLED:**

During the final lifting stage, when the pressure switch reaches 3 BAR, it commands the end of the rise stage.

➢ **ON Position = TRAVEL LIMIT RISE PRESSURE SWITCH DISABLED:**

The function described above is excluded; the rise stop occurs due to time out (time out duration can vary according to the EPROM memory installed in the electronic control circuit)

COMMAND PUSH-BUTTONS

PUSH-BUTTON P1 (START):

the START push-button commands the system and follows the function set with DIP 1. If we exclude the external commands with DIP 2, the START push-button stays enabled.

PUSH-BUTTON P2 (PROG): the PROG push-button is used in the programming function of the system's 'parameters'.

⚠ **factory-set programming. Do not change.**

⚠ The set parameters are permanently resident in the eprom and therefore, if the circuit needs to be replaced, the eprom must be moved to the new circuit. In this way the reset parameters remain in operation

RESET PUSH-BUTTON P3: the **RESET** push-button **"RESTARTS"** the EPROM if the programming or blocking of the EPROM varies following extraordinary events (overloading and the like).

SERVICE SWITCH: the **SERVICE** switch excludes the functionality of all the outputs (therefore blocking all the functionalities in the field) and should be used when the control stations is being maintained, in order to avoid accidental commands (as a result, making the TRAFFIC BOLLARD rise).

CONTROL STATION CONNECTIONS

230V POWER SUPPLY

- **230V power supply** = connect upstream of the protective switch.
- **Earthing** = connect to the marked earthing point.

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- **Air delivery pipe**= connect the 10m diameter pipe to the connection.
- **Air discharge pipe**= connect the 6m diameter pipe to the connection.
- **Flashing lamp cable (in STAINLESS STEEL version only)**= connect the red wire to terminal 13, and the black wire to terminal 16.

MOVEMENT COMMANDS

- **Possible command from terminal-board and/or radio receiver**= connect the neutral command (normally open) to terminals 17 and 18 - connect 24VDC power supply for the radio receiver to terminals 19 - 20.

MANUAL LOWERING OPERATION

In case of an emergency or fault, manually controlled bollard lowering is possible with the following procedure:

- Open the door of the control station.
- Unscrew anti-clockwise the emergency tap in Fig.8 until the traffic bollard is completely lowered.
- Tighten clockwise the emergency tap.
- Close the door of the control station.

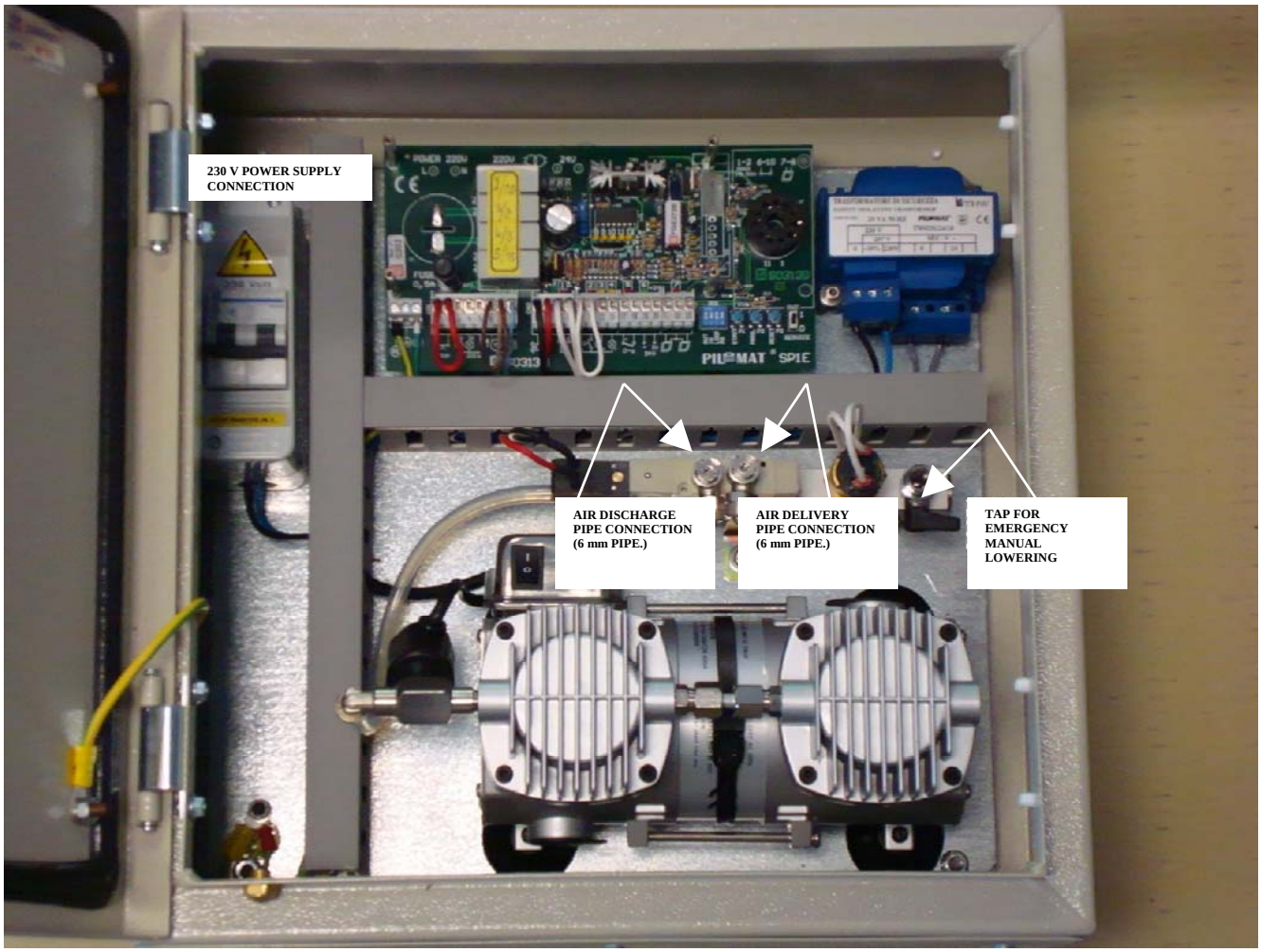
230 V POWER SUPPLY CONNECTION
AIR DISCHARGE PIPE CONNECTION (6 mm PIPE.)
AIR DELIVERY PIPE CONNECTION (6 mm PIPE.)
TAP FOR EMERGENCY MANUAL LOWERING

Fig. 8

ROUTINE MAINTENANCE PROCEDURE

(SIX-MONTHLY FOR FAAC CITY 220 H600 CONCEALING TRAFFIC BOLLARDS)

This is the standard routine six-monthly maintenance sequence:

- Clean the pit and remove any settled material by suction.
- Clean the water drainage systems on the pit bottom.
- Clean and lubricate the central sliding guide with silicone oil.
- Check (and, if necessary, replace) the gaskets of the lower limit stop.
- Check and, if necessary, remedy any air losses in the piston.
- Check the correct tightening of the bollard screws.
- Clean the driven cylinder and touch up paint, if necessary.
- Check the pneumatic unit and, if necessary, remedy any air losses.
- Check and, if necessary, set the safety pressure switch (40 Kg.).
- Test the insulation and continuity of the differential thermal breaker located upstream of the system, using an appropriate instrument (loop tester).
- Run the test on the value (earth resistance) and continuity of the earth connection, using a suitable instrument (loop tester).

FURTHERMORE, IF THESE ITEMS ARE PRESENT IN THE SYSTEM, CHECK THE FOLLOWING:

- Check the operation of the traffic light lamp/s –
- Check the operation of the safety induction loops -
- Check if the electrical power cut procedure is operating correctly –
- Check the operation of the command radio receiver –
- Check if the emergency lowering acoustic analyser is operating correctly –
- Check the operation of the GSM remote-control activator -
- Visually check the electronic control unit for movement management (example: 'flame burnt' contacts - oxidised terminals - etc.)

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732884 rev. A