

## 1. Where and when to install a Vortex Escape (BM2400-Escape) ?

Evacuation routes, also called emergency exits, must not only allow the premises to be evacuated, without constraints, in case of danger, but also in the majority of the cases to prevent any unauthorized exit.

This paradox of both locked and free access has so far only been managed by installing systems (UGIS French acronym which stands for "emergency exits control unit") that are as sophisticated as they are costly. Furthermore, these systems require the permanent control of a human.

As a consequence, small or medium sized sites which cannot afford such investments, finish up locking their doors with chains, padlocks or others. These systems are not ideal and, in fact, compromise all personal safety in the event of a disaster requiring rapid evacuation.

It is mainly to bring safety and security to these sites that we recommend the installation of the BM2400-Escape. Knowing that this solution can also be suitable for bigger sites.

A Vortex-Escape can be quickly installed on any existing door without modifying the existing equipment. Only a 24VDC - 3000mA power supply, and a pressure initialization element (green "Manual Release" box - MR) are required as external accessories.

## 2. What are the special features of the BM2400-Escape ?

It is a compact "All-in-one" unit consisting of :

- A very efficient locking system (holding force = 15 000N)
- An intelligence capable of interpreting data from its own sensors as well as external information
- programming allowing it to deduce its action at the door it controls.

The VX2400-Escape is equipped with numerous inputs dedicated to external information (green glass breakage, fire panel link, access control, reset, etc.) which support the incorporated sensors (camera, pressure sensor, door position sensor and of good locking,...). The set of information collected allows the on-board micro-intelligence to deduce the appropriate action to the situation.

## 3. Operation of the locking part of the BM2400-Escape:

The VORTEX BM2400-Escape is a hybrid lock (electromagnetic + mechanical) smaller than an electromagnet. It guarantees extremely powerful locking; up to ten times more efficient than basic electromagnets on the market! The exclusivity of this hybrid lock resides in a "diabolo" machine-manufactured from a high-strength alloy. The latter is captured within a well using the action of a vortex of electromagnetic forces. At this stage, the locking is ensured by the kinetics of the magnetic block. In the event of an attempted intrusion, the mechanical lock is triggered.

The "diabolo" is trapped in the well by the deployment of the metal balls contained in it. The Vortex BM2400-Escape is thus capable of resisting a break-in (pressure/tension) greater than 15,000N (1,500kgf), comparable to "grade 6++"!

The Vortex BM 2400-Escape operates on 24 VDC. A built-in reed sensor provides the on-board micro-intelligence with the position and status of the door lock.

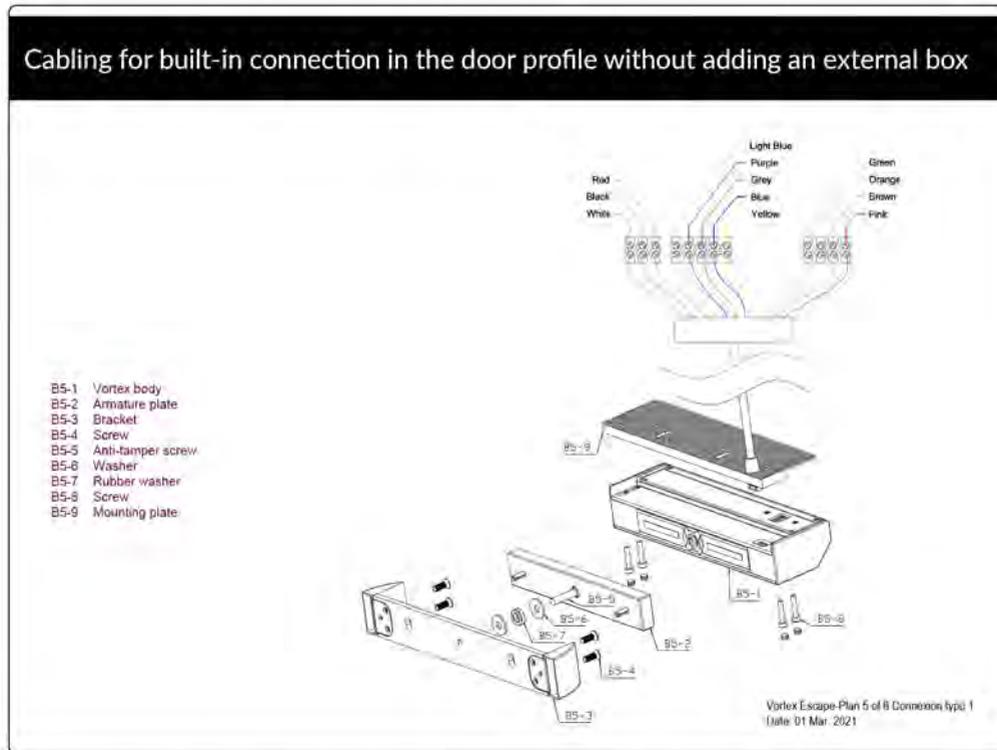
An 8-segment MegaLed and a buzzer locally warn of the status of the system.

## 4. The general characteristics :

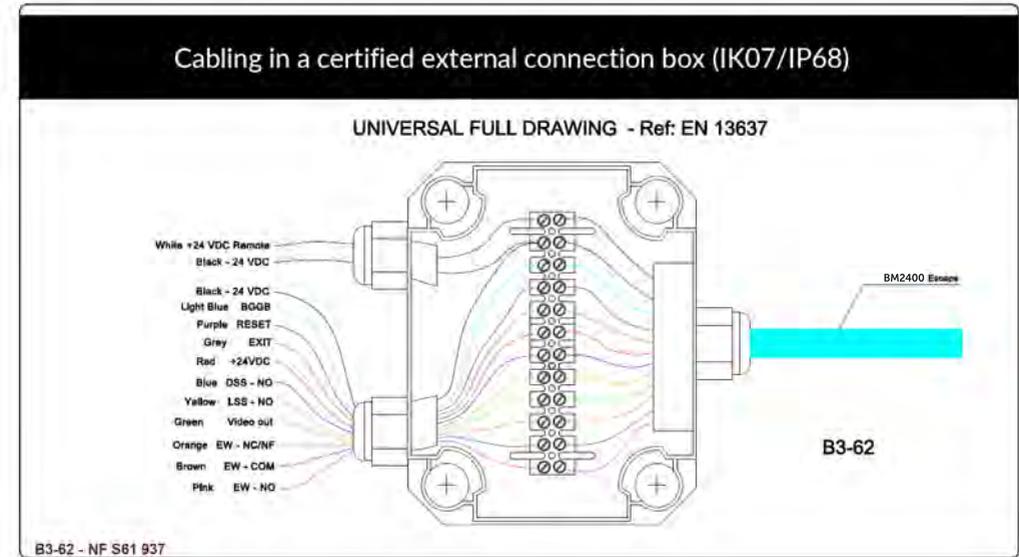
### 4.1. Of the locking :

- 24 VDC power supply – 7,2W / 0,35W
- Effective holding force: 15,000N
- Positive security (fail safe)
- Built-in pressure sensor and alarm buzzer

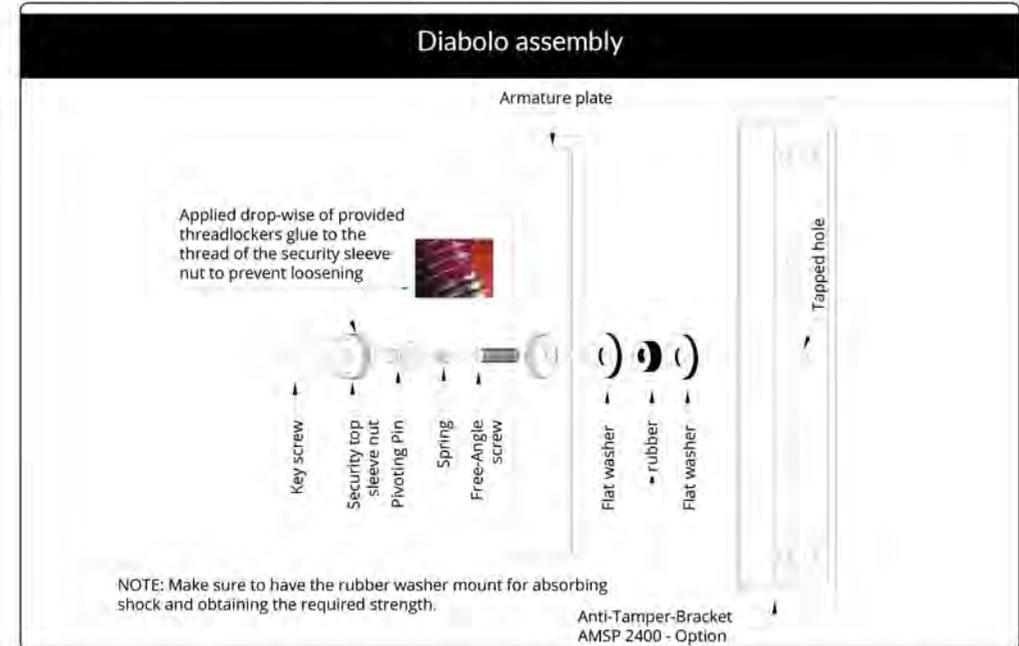
### 4.2. Of the connections:



To avoid any irreversible damage to the unit, check that the connections are correctly made before connecting the power supply to the Vortex®.



### 4.3. Swivel pin "diabolo" assembly:



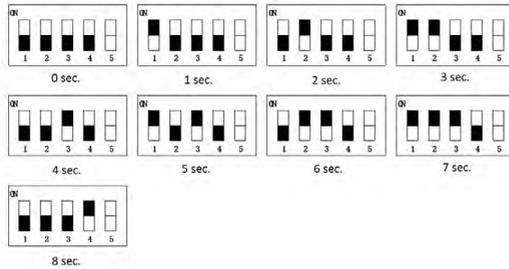
Correct locking of the magnetic block and its counter-plate is only ensured if the latter is fitted SOFTLY using the supplied rubber washer. A central screw too tight and/or insufficient electrical voltage are the two causes leading to a lack of power of magnetic block.

#### 4.4. Of the programming :

### Programming of the timing and color of the 8-segment MegaLed

#### T1 → Delay setting :

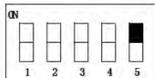
- **BGGB** - Timer setting - Default setting : 8 sec. ➤



#### LED color display setting:

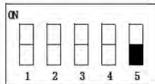
- Default setting : Pin 5 ON
- Unlocked →
- Locked →

LED = Green  
LED = Red



- Pin 5 OFF.
- Unlocked →
- Locked →

LED = Red  
LED = Green

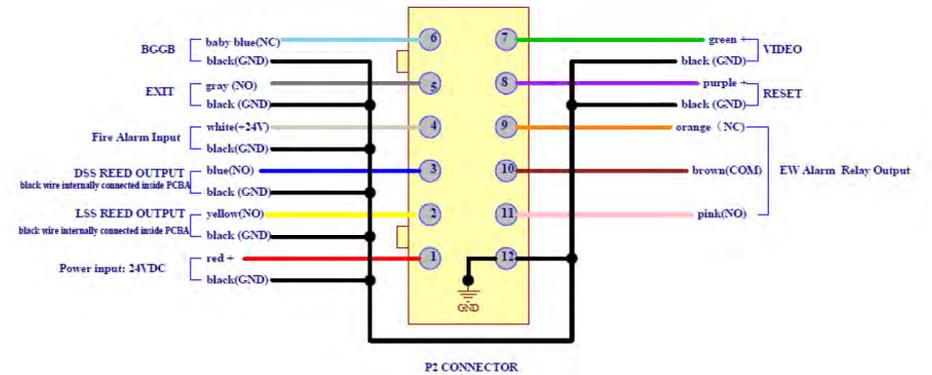


### Wiring configuration

The following electrical connections shall be understood as a common negative

#### Model: BM2400 Escape Wiring configuration:

- Power Input 12~24VDC: (1) RED +, (12) BLACK (GND)
- LSS sensor: (2) YELLOW (NO), (12) BLACK (GND); **10W**; 0.4A/24VDC
- DSS sensor: (3) BLUE (NO), (12) BLACK (GND); **10W**; 0.4A/24VDC
- Fire alarm output: (4) WHITE (NC), (12) BLACK (GND); 24VDC
- Exit output: (5) GRAY (NO), (12) BLACK (GND)
- BGGB output: (6) LIGHT BLUE(NC), (12) BLACK (GND)
- AV output: (7) GREEN +, (12) BLACK (GND)
- Reset output: (8) Purple +(NO), (12) BLACK (GND)
- EW alarm output: (9) **ORANGE** (NC), (10) BROWN (COM), (11) PINK (NO)

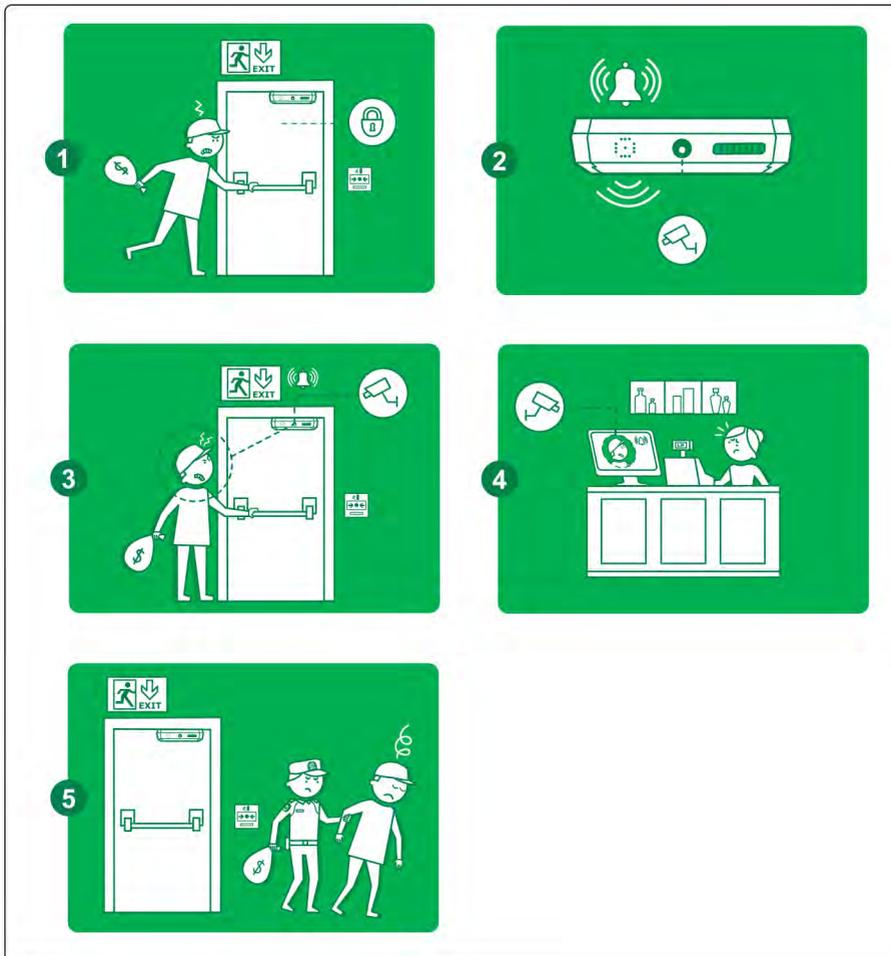


**4.5. Of the functions of BM2400-Escape : (Grounds : voluntary European standard on managing the systems for emergency exits EN 13637)**

While in standby, the BM2400-Escape's 8-segment MegaLed flashes intermittently. This is the self-control of on-board micro-intelligence.

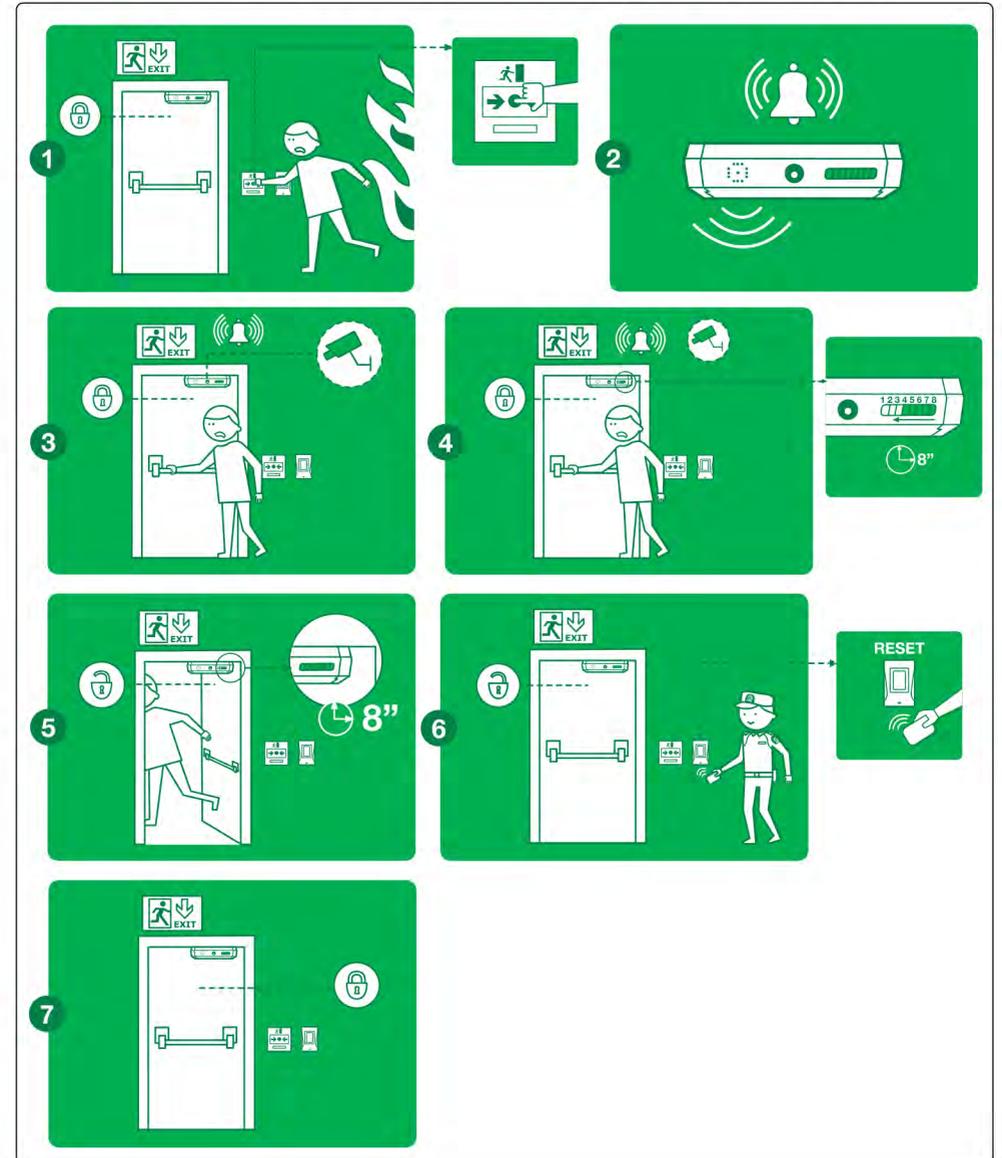
**4.5.1. Scenario 1: Detection of abnormal pressure on the door**

Detection of abnormal pressure on the door such as an attempt to open the door by operating an existing panic bar, or by simply pushing on the door (1).  
 Triggering of the built-in Vortex alarm and the remote alarm relay (Early Warning) (2).  
 The built-in camera works (3 and 4). The door will not unlock (5).



**4.5.2. Scenario 2: Voluntary request for exit by actuation of the green pressure initialization element, Manual Release (MR)**

Triggering of a pulsed alarm by the incorporated buzzer of the Vortex and the remote alarm relay (EW) (1 and 2). The built-in camera works. The door does not unlock immediately (3). Triggering of the grade 1 time delay countdown (called simple, t1, adjustable from 0 to 8 seconds). The 8-segment LED display shows the count synchronously (4). At the end of the countdown, the door is unlocked and remains unlocked until the system is manually reset (5). An input dedicated to reset system by key or any other local electronic system such as a card reader or encoder, ensures that the system is rearmed by a duly authorized person (6). After this reset, the system returns to its initial standby condition (7).

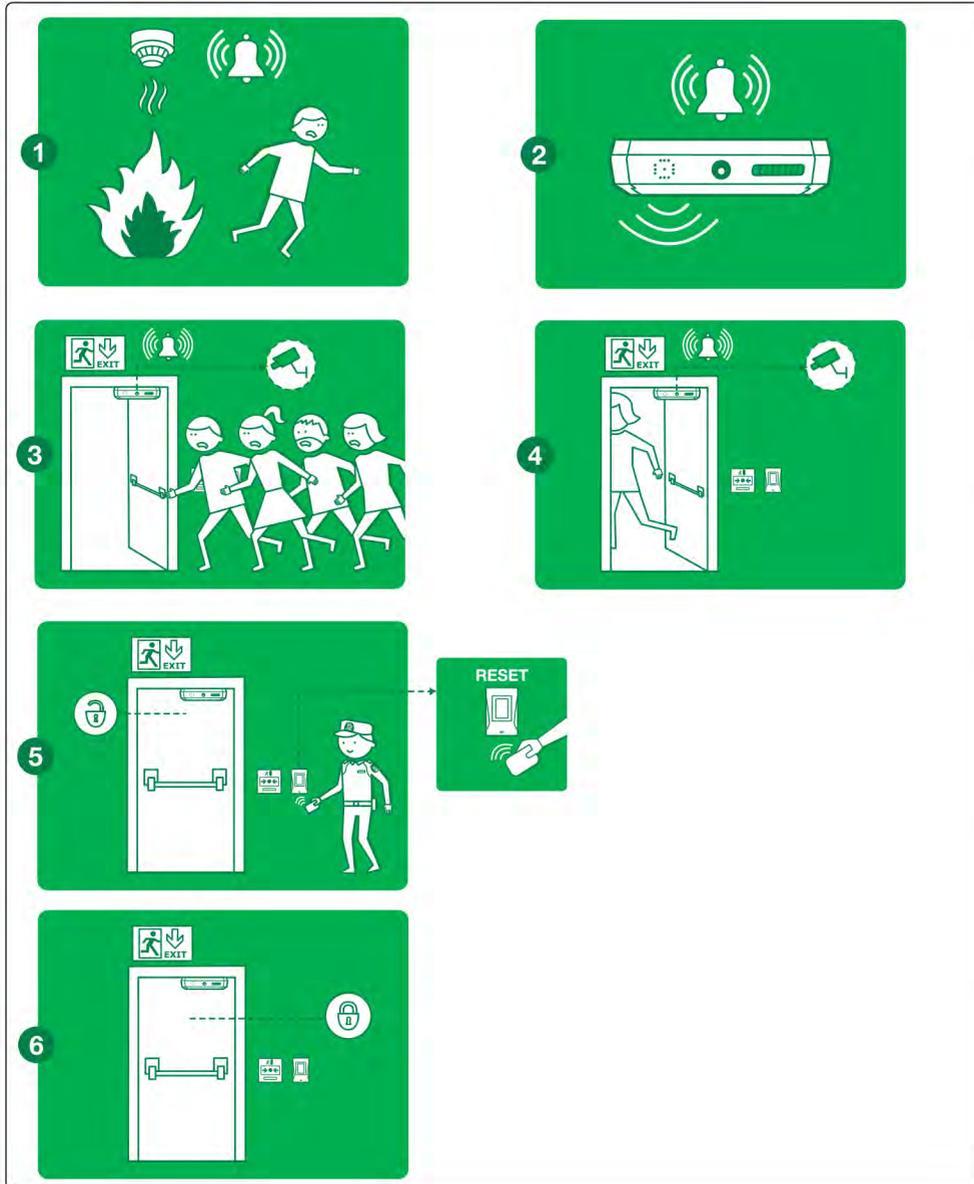


**4.5.3. Scenario 3: Alarm signal coming from a fire detection system or a system triggering an emergency evacuation. (1)**

Triggering of a pulsed alarm by the incorporated buzzer of the Vortex and the remote alarm relay (EW) (2). The built-in camera works (3). The door is instantly unlocked (< 1sec.) and remains unlocked until the system is manually reset (4).

An input dedicated to reset system by key or any other local electronic system such as a card reader or encoder, ensures that the system is rearmed by a duly authorized person (5).

After this reset, the system returns to its initial standby condition (6).



**4.5.4. Scenario 4: Entrance from the outside / inside via an access control**

Function intended to respond to situations where the escape door is also an authorized access from the outside and/or inside, for example for deliveries or for the entry of people. By connecting an identification system to this input such as a badge reader, keypad, biometrics or key system, the entry will be authorized by the immediate unlocking of the system for a period equal to the one programmed via the control access device (1, 2 and 3). At the end of the access control timeout, and, if the door is properly closed, the system will return to its initial standby condition (4).



## 5. Labeling and Norm

Standardized labeling regarding quality and compliance to standard EN 13637 chap. 7:

Labeling of BM2400-Escape									
a	b	c	d	e	f	g	h	k	
3	9	9				6++	6++	0	B

Ref: EN 13637:2015 + Corrosion EN ISO 9227: Grade 3

- a** = High frequency of use
- b** = Reliability: 1,000,000 cycles
- c** = Weight of the door:> 200 kgs
- d** = Fire / smoke suitability standard EN1634-x
- e** = Complies with the personal safety standard
- f** = IP protection min: IP43 - EN1670 grade 3 - damp heat test 12h + 12h
- g** = Holding force from outside: 15000N
- h** = Inner holding force: 15000N  
= Time delay: t1 (adjustable 0 to 8 seconds)
- j** = Unauthorized exit mode: No function unless CMC
- k** = Configuration of the emergency locking system: Other system

## 6. Safety precaution:

It is the installer or system integrator's responsibility to ascertain if the conditions allow the installation to be in good, secure and reliable conditions. In no case the company, Visual Plus Corporation SA, could be responsible for potential direct or indirect consecutive damages caused by use or bad use of the product.

## 7. Maintenance:

The contact surface between the electromagnet and the counterplate must be kept clean. Surfaces can be cleaned, if necessary, with a non-abrasive product. Never use chemicals containing solvents or varnish. Do not sand the surfaces, do not drill the counterplate, do not modify the dimensions in any way, as you could seriously compromise the correct functioning of the system.

## 8. Trouble shooting :

PROBLEM	POSSIBLE CAUSE	SOLUTION
Door will not lock	Not enough DC voltage	Check power at lock and wiring connection
	Wrong wire connection	Check wiring and refer to wiring instruction
Holding force reduced	Bad physical contact between armature plate and the electromagnet or poorly tightened vandal-proof screw	Make sure the contact surfaces are clean and properly aligned with the counterplate.